

REPORT NUMBER: SNCAP-CAL-11-008

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

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

NHTSA NUMBER: MB0122

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



Test Date: August 11, 2010

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
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WASHINGTON, D.C. 20590**

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Date: _____

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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 Chevrolet Traverse FWD LS 4-Door SUV 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 August 11, 2010. The impact velocity of the Moving Deformable Barrier (MDB) was 61.8 km/h, and the ambient temperature at the struck side (driver side) of the vehicle was 21.7°C. The target vehicle's maximum post test static crush was 227 mm at level 2. 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;">61.1</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;">10</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;">524</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;">1734</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;">161.8</td> </tr> <tr> <td>Lower Spine Acceleration</td> <td style="text-align: center;">G</td> <td style="text-align: center;">82</td> <td style="text-align: center;">20.9</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;">2653.9</td> </tr> </tbody> </table>				Driver ATD (ES-2re)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	61.1	Maximum Chest Deflection	mm	44	10	Total Abdominal Force	N	2500	524	Pubic Symphysis Force	N	6000	1734	Passenger ATD (SID-IIs)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	161.8	Lower Spine Acceleration	G	82	20.9	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2653.9
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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
15	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 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 Chevrolet Traverse FWD LS 4-Door SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated January 2010.

SUMMARY

A 2011 Chevrolet Traverse FWD LS 4-Door SUV 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 61.8 km/h (38.3 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 August 11, 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 nine 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 Load Cells

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	61.1
Maximum Chest Deflection	mm	44	10
Total Abdominal Force	N	2500	524
Pubic Symphysis Force	N	6000	1734

	Passenger ATD (SID-IIs)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	161.8
Lower Spine Resultant Acceleration	G	82	20.9
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2653.9

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
Front Airbag	Yes	No	NA	NA
Knee Airbag	No	NA	NA	NA
Side Airbag 1 – Side Torso/Pelvis	Yes	Yes	No	NA
Side Airbag 2 – Side Curtain	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	NA
Seat Belt Load Limiter	Yes	Yes	No	NA
Other	NA	NA	NA	NA

GENERAL COMMENTS

None

SECTION 2
DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Chevrolet Traverse LS
Test Program: Side NCAP

NHTSA No.: MB0122
Test Date: August 11, 2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB0122	Anti-Lock Brakes	Yes
Model Year	2011	All-Wheel Drive	No
Make	Chevrolet	Power Steering	Yes
Model	Traverse FWD LS	Driver Front Airbag	Yes
Body Style	4-Door SUV	Driver Curtain Airbag	Yes
VIN	1GNKRFED5BJ116781	Driver Head/Torso Airbag	No
Body Color	Gray	Driver Torso Airbag	No
Delivery Date	7/12/2010	Driver Torso/Pelvis Airbag	Yes
Odometer Reading (km/mi)	17 mi	Driver Pelvis Airbag	No
Dealer	Raymond Chevrolet	Driver Knee Airbag	No
Transmission	Automatic	Rear Pass. Curtain Airbag	Yes
Final Drive	Front Wheel	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	V6	Rear Pass. Torso Airbag	No
Engine Displacement (L)	3.6	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Lateral	Rear Pass. Pelvis Airbag	No
Roof Rack	No	Pretensioners	Yes
Sunroof/T-Top	No	Load Limiters	Yes
Tinted Glass	No	Automatic Door Locks	Yes
Traction Control	Yes	Bucket Seats	Yes
Power Brakes	Yes	Tilt Steering	Yes
Front Disc	Yes	Other	
Rear Disc	Yes	Other	

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

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC	GVWR (kg)	2908
Date of Manufacture	6/10	GAWR Front (kg)	1450
		GAWR Rear (kg)	1600

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	3	8.0	
Capacity Weight (VCW) (kg)				759.0	(A)
DSC x 68.04 (kg)				544.3	(B)
Cargo Weight (RCLW) (kg)				136.0	(A-B)

* Maximum allowable RCLW is 136 kg

VEHICLE SEAT TYPE

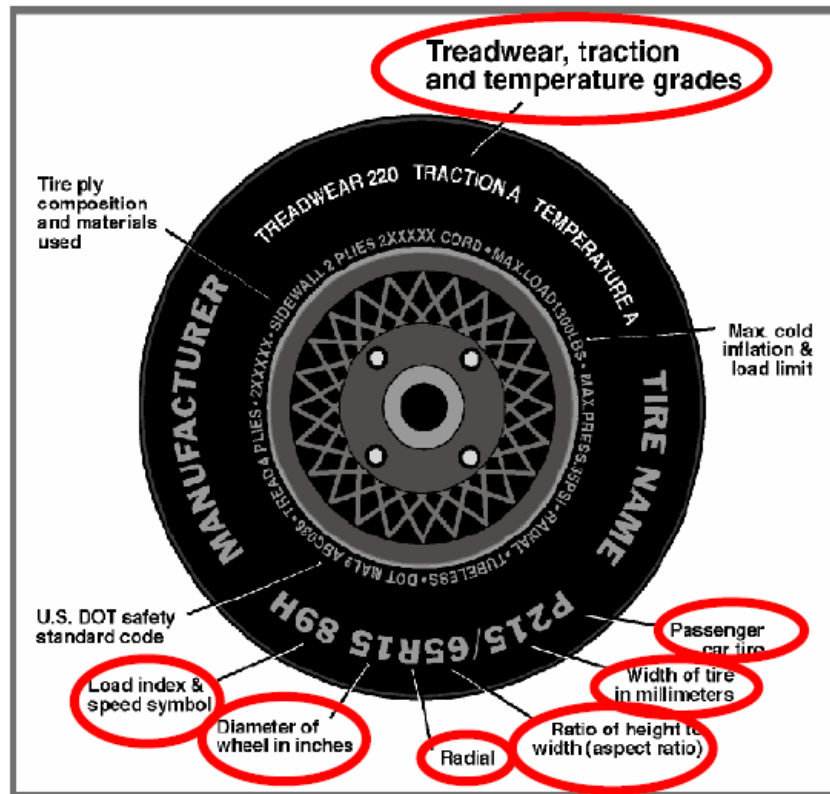
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X	-	-		-	X	-
Rear or Second Row Seat		-	X	-	-	X	-
Third row seat	-	X	-	-	X	-	-

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

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 2010

VEHICLE TIRE INFORMATION



	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240 (35 psi)	240 (35 psi)
Recommended Tire Size	P245/70R17	P245/70R17
Tire Size on Vehicle	P245/70R17	P245/70R17
Tire Manufacturer	Grabber HTS	Grabber HTS
Tire Model	General	General
Treadwear	640	640
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Ply Polyester	2 Ply Polyester
Tire Plies Body	2 Polyester + 2 Steel + 1 Polyamide	2 Polyester + 2 Steel + 1 Polyamide
Load Index/Speed Symbol	108S	108S
Tire Material	-	-
DOT Safety Code Right	A383 BMB 2010	A383 BMB 1810
DOT Safety Code Left	A383 BMB 1810	A383 BMB 1810

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

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 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	614.0	443.0	1057.0	663.0	561.0	1224.0	653.0	582.0	1235.0
Right	kg	594.0	454.0	1048.0	614.0	525.0	1139.0	604.0	547.0	1151.0
Ratio	%	57.4%	42.6%		54.0%	46.0%		52.7%	47.3%	
Totals	kg	1208.0	897.0	2105.0	1277.0	1086.0	2363.0	1257.0	1129.0	2386.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2105.0	(A)
Sum of Actual Weight of 2 P572 ATDS Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136.0	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	2370.3	(A+B+C)

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	LF	RF	RR	LR	CG (aft of front axle)
Fully Loaded	mm	850	860	857	850	
As Tested (Fully Loaded $\pm$ 10 mm at each wheel well)	mm	848	854	845	840	1391

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3026
Total Vehicle Length at Left Side	mm	5010
Total Vehicle Length at Centerline	mm	5194
Total Vehicle Length at Right Side	mm	5011
Weight of Ballast in Cargo Area	kg	118.0
Weight of Vehicle Components Removed	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	L	76.4

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	515

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

Test Vehicle: 2011 Chevrolet Traverse LS
Test Program: Side NCAP

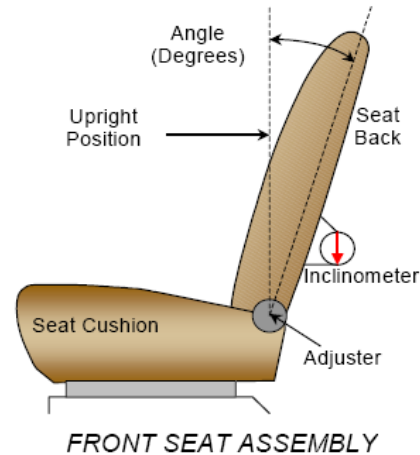
NHTSA No.: MB0122
Test Date: August 11, 2010

NORMAL DESIGN RIDING POSITION

Driver seat: Seat was placed in the 5th detent from the forward most locking.

From the head restraint post the seat was positioned to 2.9 degrees with the ATD in seat.

Passenger Seat: Seat was placed in the forward most locking position to achieve the level head requirement.



SEAT BACK ANGLES

	Degrees
Driver w/ Seated Dummy	2.9
Passenger w/ Seated Dummy	Full up

SEAT FORE/AFT POSITIONS

The front outboard seat was placed in the mid-travel position while maintaining the seat cushion mid-angle position. The rear outboard seat was placed in the most rearward position. No cushion angle was required.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	240	12 (120 mm) - mid
Rear Seat	100	9 (most rearward)

SEAT BELT UPPER ANCHORAGES

The driver seating position was placed in the highest position.

SEAT BELT UPPER ANCHORAGES

	Total # of Positions	Placed in Position #
Driver Seat	5	0
Rear Seat	NA	NA

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

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

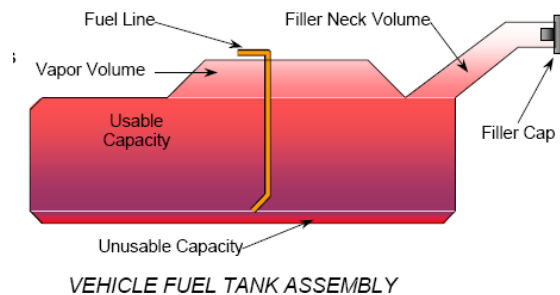
NHTSA No.: MB0122
 Test Date: August 11, 2010

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	82.1
Usable Capacity of "Optional Tank"	NA
Usable Capacity Used for FMVSS 301	76.4
Actual Amount of Solvent Used	76.4

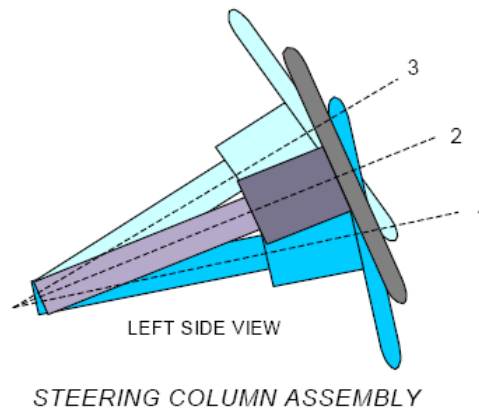
The fuel pump will operate when the key is in the "ON" position.

The fuel filler pipe is located on the left rear side of vehicle.



STEERING COLUMN ADJUSTMENT

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



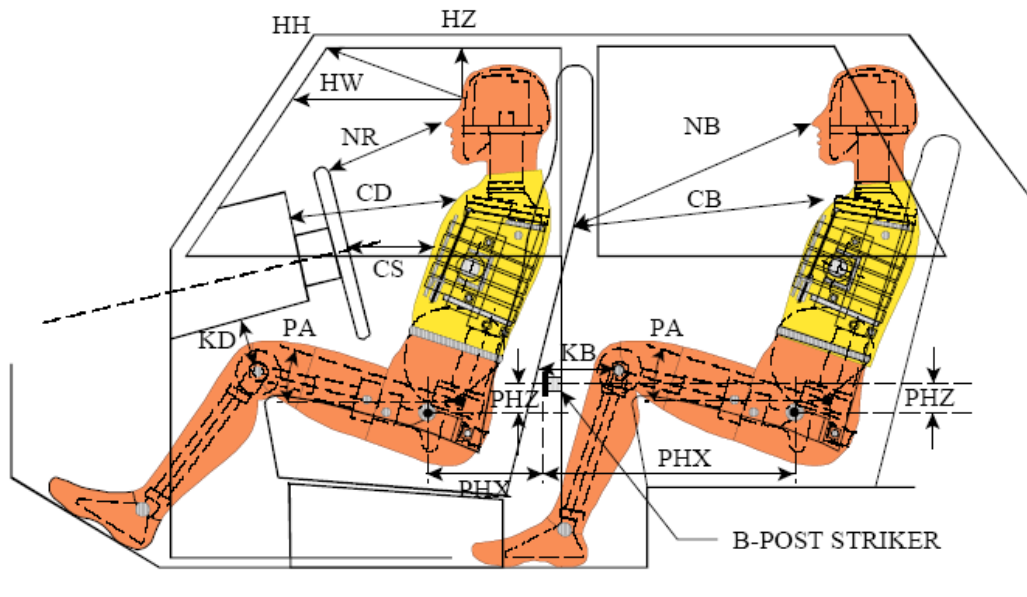
STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	25.0	
Geometric Center - Position 2	22.2	
Uppermost - Position 3	19.4	
Telescoping Steering Wheel Travel		50
Test Position	22.2	25

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 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

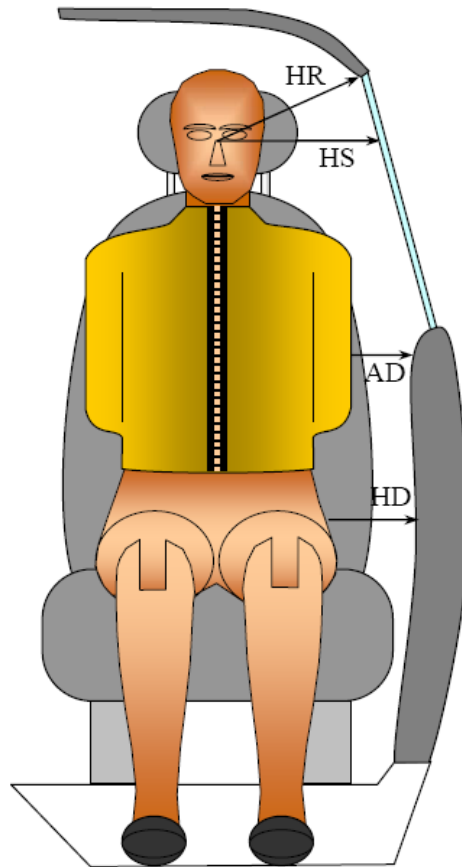
Driver Code	Pass. Code	Measurement Description	Driver S/N F033		Passenger S/N 300	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	404.0	11.0		
HW		Header to Windshield	715.0	0.0		
HZ	HZ	Head to Roof	199.0	90.0	310.0	90.0
NR	NB	Nose to Rim/Seat Back	401.0	21.0	559.0	12.0
CD	CB	Chest to Dash/Seat Back	575.0	5.0	573.0	12.0
CS		Chest to Steering Wheel	298.0	0.0		
KDL	KBL	Left Knee to Dash/Seat Back	208.0	28.0	343.0	20.0
KDR	KBR	Right Knee to Dash/Seat Back	198.0	22.0	343.0	12.0
PA	PA	Pelvic Angle		18.6		19.2
PHX	PHX	H-Point to Striker (X-Axis)	193.0	0.0	195.0	0.0
PHZ	PHZ	H-Point to Striker (Z-Axis)	20.0	90.0	-48.0	90.0
SA	SA	Seat Back Angle		2.9 *		Full upright

* Measurement from the head restraint post

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Chevrolet Traverse LS
Test Program: Side NCAP

NHTSA No.: MB0122
Test Date: August 11, 2010



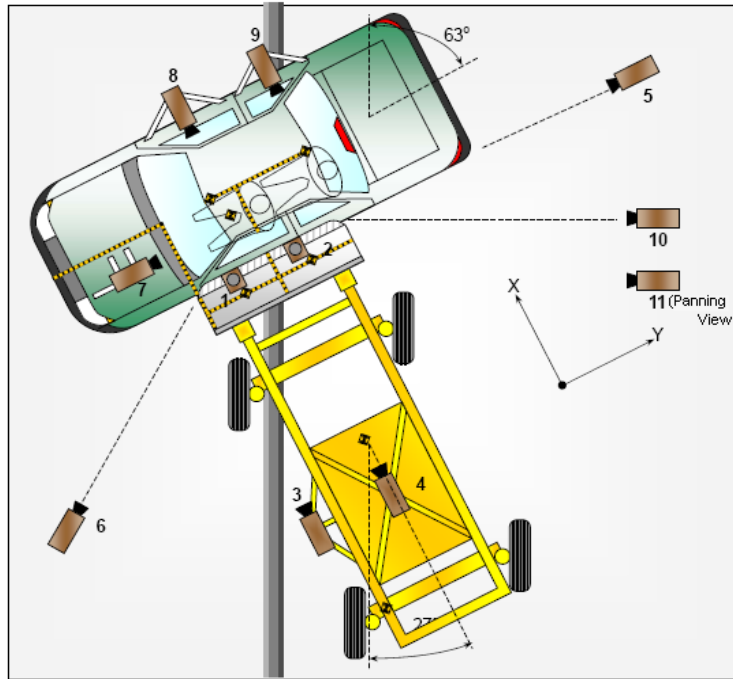
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Description	Units	Driver S/N 033	Passenger S/N 300
HR	Head to Side Header	mm	208	282
HS	Head to Side Window	mm	344	395
AD	Arm to Door	mm	128	168
HD	H-point to Door	mm	177	164

DATA SHEET NO. 5
CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Chevrolet Traverse LS
Test Program: Side NCAP

NHTSA No.: MB0122
Test Date: August 11, 2010



CAMERA LOCATIONS AND DATA

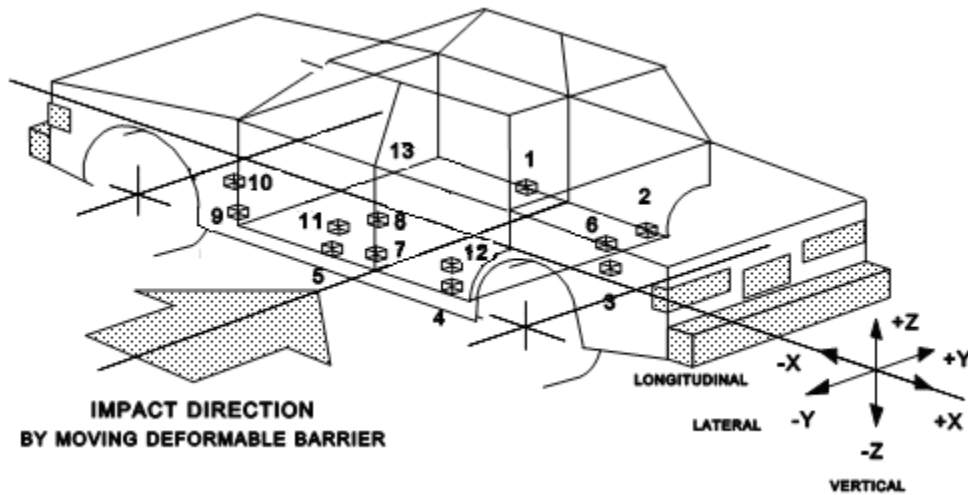
No.	Camera View	Location			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead Overall	900	1250	4880	-90	20	1000
2	Overhead Close-up View	600	1130	4880	-90	28	1000
3	Left Impact Point (MDB)	-1470	0	-847	0	25	500
4	Side Overall (MDB)	-1140	838	-1587	-17	12.5	500
5	Rear	220	11103	920	0	50	1000
6	Left Front	-3010	-710	985	-3	28	1000
7	Driver Front	590	-590	1480	-8	25	500
8	Driver Side	1430	760	1025	-4	12.5	500
9	Passenger Side	1430	1705	1070	-1	12.5	500
10	Real-time Left Rear	-	-	-	-	-	24
11	Real-time Inrun	-	-	-	-	-	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 Chevrolet Traverse LS
Test Program: Side NCAP

NHTSA No.: MB0122
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VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

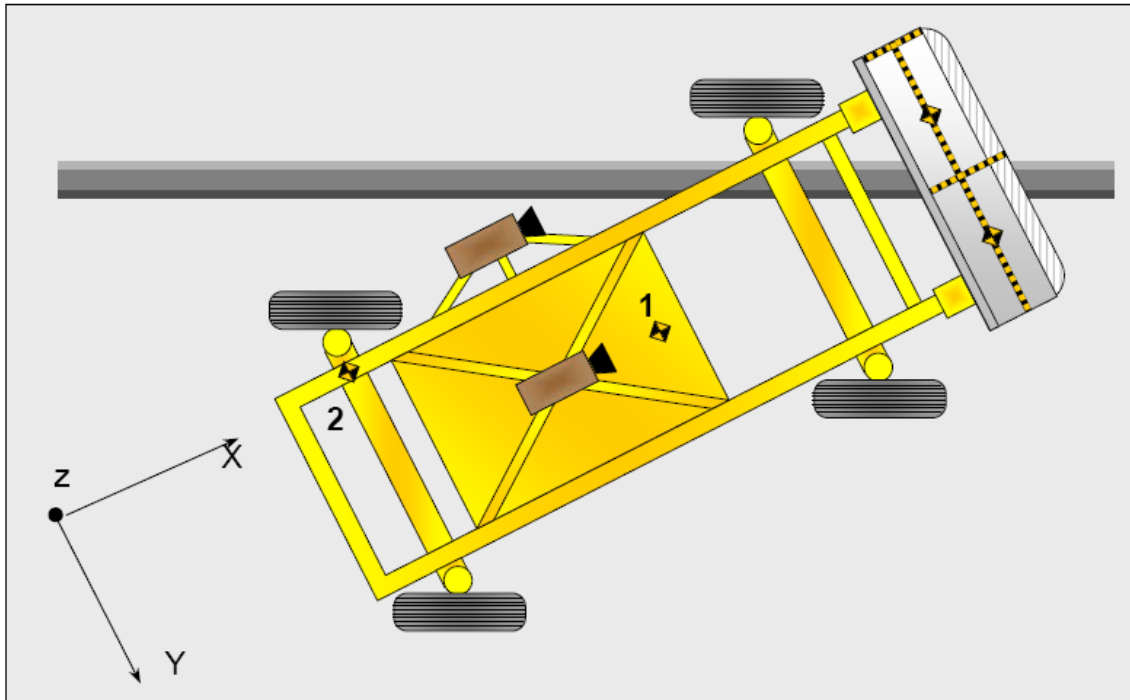
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3345.0	770.0	466.0
2	Right Sill at Rear Seat	1870.0	756.0	520.0
3	Rear Floorpan Above Axle	1301.0	-26.0	603.0
4	Left Sill at Rear Door	1885.0	-747.0	510.0
5	Left Sill at Front Door	3336.0	-723.0	421.0
6	Rt. Rear Occ. Compartment	2319.0	372.0	502.0
7	B-Post Lower	2594.0	-685.0	545.0
8	B-Post Middle	2548.0	-722.0	1077.0
9	A-Post Lower	3570.0	-709.0	507.0
10	A-Post Middle	3582.0	-709.0	647.0
11	Front Seat Track	2726.0	-583.0	511.0
12	Rear Seat Structure	1842.0	-593.0	530.0
13	Vehicle CG	3144.0	46.0	708.0

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

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 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 (+ rearward)
 Y – MDB centerline (+ to right)
 Z – Ground plane (+ up)

DATA SHEET NO. 8
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 2010

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	151	510
2	Occupant H-Point	mm	227	759
3	Mid Door	mm	210	833
4	Window Sill	mm	101	1107
5	Window Top	mm	7	1687
	Maximum Penetration	mm	227	759

INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total No. of Contact Switches	2 *
Total	60

* Vehicle manufacturer requested that 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 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 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	61.8
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.8
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.5

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	160
B	Top of Bumper	533	800	Left	150
C	Mid-Level	686	700	Right	207
D	Top of Stack	813	800	Right	307

MDB INSTRUMENTATION

Accelerometers	5
Contact Switches	2

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

Test Vehicle: 2011 Chevrolet Traverse LS
Test Program: Side NCAP

NHTSA No.: MB0122
Test Date: August 11, 2010

TEST DUMMY INFORMATION AND CONTACT

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Dummy Type/Serial No.	F033	300
Head Contact	Side of Head - Side Curtain Airbag and Header	Side of Head -Side Curtain Airbag and Header
Upper Torso Contact	Torso/Pelvis Airbag	Shoulder with Door Trim
Lower Torso Contact	Torso/Pelvis Airbag	No Contact
Left Knee Contact	No Contact	No Contact
Right Knee Contact	No Contact	No Contact

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Doors	Jammed shut	Jammed shut
Right Side Doors	Remained closed and operational	Remained closed and operational
Hatch and Other Doors	Remained closed and operational	Remained closed and operational
Seat Movement	None	None
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	The left side B-Pillar was pushed inboard during test event
Sill Separation	No visible tears or separations
Windshield Damage	No Damage
Window Damage	Left Front Window intact; Left Rear Window intact
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT INFORMATION

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

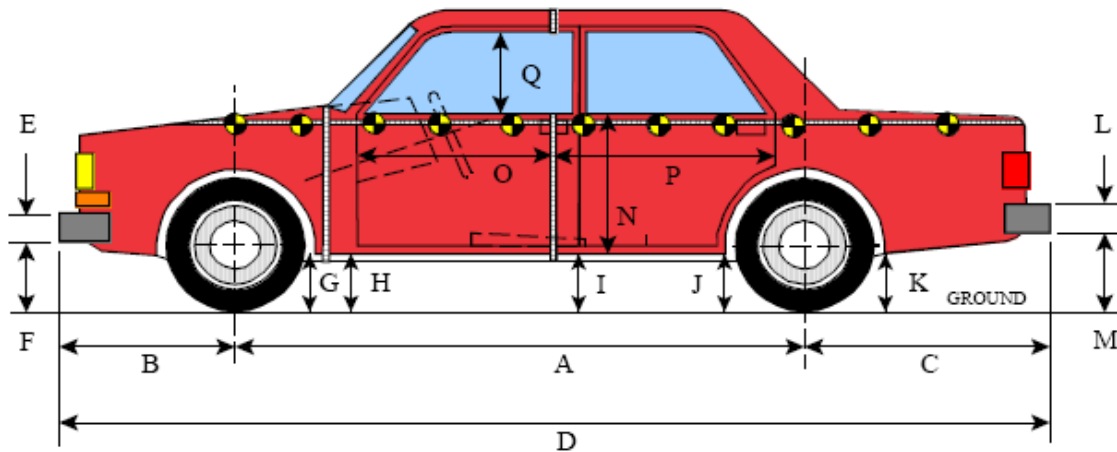
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	-7
Vertical Offset	mm	+/- 20	+8

DATA SHEET NO. 11
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 2010



LEFT SIDE VIEW

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

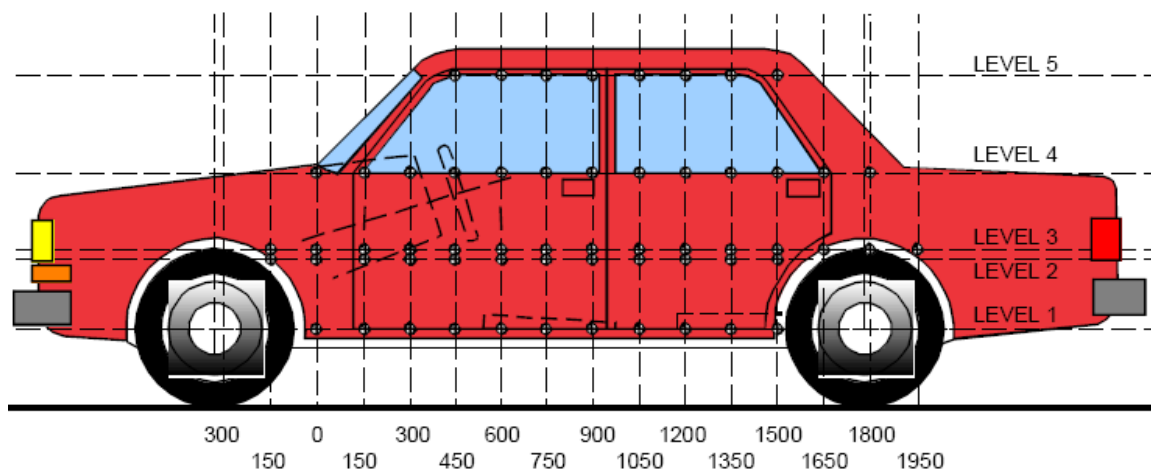
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3026	3027	-1
B	Front Axle to FSOV	1021	1019	2
C	Rear Axle to RSOV	1147	1143	5
D	Total Length at Centerline	5194	5189	5
E	Front Bumper Thickness	110	110	0
F	Front Bumper Bottom to Ground	416	425	-9
G	Sill Height at Front Wheel Well	198	198	0
H	Sill Height at Front Door Leading Edge	266	266	0
I	Sill Height at B Pillar	308	320	-12
J1	Sill Height at Rear Wheel Well	295	316	-21
J2	Pinch Weld Height at Rear Wheel Well	296	320	-24
K	Sill Height Aft of Rear Wheel Well	248	278	-30
L	Rear Bumper Thickness	165	165	0
M	Rear Bumper Bottom to Ground	444	479	-35
N	Sill Height to Window Bottom Sill	718	687	32
O	Front Door Leading Edge to Impact CL	844	791	53
P	Rear Door Trailing Edge to Impact CL	1209	1154	55
Q	Front Window Opening	489	507	-18
R	Right Side Length	5011	5008	3
S	Left Side Length	5010	5007	3
T	Vehicle Width at B Post	1967	1776	191

DATA SHEET NO. 12
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 2010



LEFT SIDE VIEW

Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	510.1
2	Occupant H-Point	758.6
3	Mid-Door	832.9
4	Window Sill	1106.9
5	Window Top	1687.4

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 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	--	959	939	--	--	--	952	933	--	--	--	7	6	--	--
-750	--	--	985	--	--	--	--	982	--	--	--	--	3	--	--
-600	--	--	--	836	--	--	--	--	831	--	--	--	--	5	--
-450	--	--	--	854	--	--	--	--	848	--	--	--	--	6	--
-300	--	--	997	876	--	--	--	968	870	--	--	--	29	6	--
-150	--	987	979	894	--	--	918	934	888	--	--	69	45	6	--
0	951	966	966	904	--	901	958	956	897	--	50	8	10	7	--
150	945	963	965	910	--	813	848	855	900	--	132	115	110	10	--
300	950	964	967	916	--	801	783	796	889	--	149	181	171	27	--
450	952	965	968	921	--	801	768	784	899	--	151	197	184	22	--
600	952	966	969	926	--	803	764	779	904	--	149	202	190	22	--
750	953	966	970	929	611	810	769	778	901	606	143	197	192	28	5
900	953	966	970	933	644	812	762	784	899	640	141	204	186	34	4
1050	953	964	970	935	649	812	789	819	888	644	141	175	151	47	5
1200	952	964	969	938	651	814	738	784	870	644	138	226	185	68	7
1350	949	964	968	938	653	811	737	759	869	648	138	227	209	69	5
1500	947	963	967	938	652	811	745	757	859	648	136	218	210	79	4
1650	944	961	964	939	650	821	759	767	853	646	123	202	197	86	4
1800	940	958	961	939	647	859	784	783	838	644	81	174	178	101	3
1950	943	959	960	937	644	895	885	883	876	643	48	74	77	61	1
2100	--	981	979	934	637	--	949	955	909	637	--	32	24	25	0
2250	--	--	995	932	628	--	--	983	914	628	--	--	12	18	0
2400	--	--	--	932	616	--	--	--	916	616	--	--	--	16	0
2550	--	--	--	927	598	--	--	--	913	598	--	--	--	14	0
2700	--	--	986	920	566	--	--	975	911	565	--	--	11	9	1
2850	--	971	966	908	523	--	964	958	901	523	--	7	8	7	0

MAXIMUM CRUSH DATA

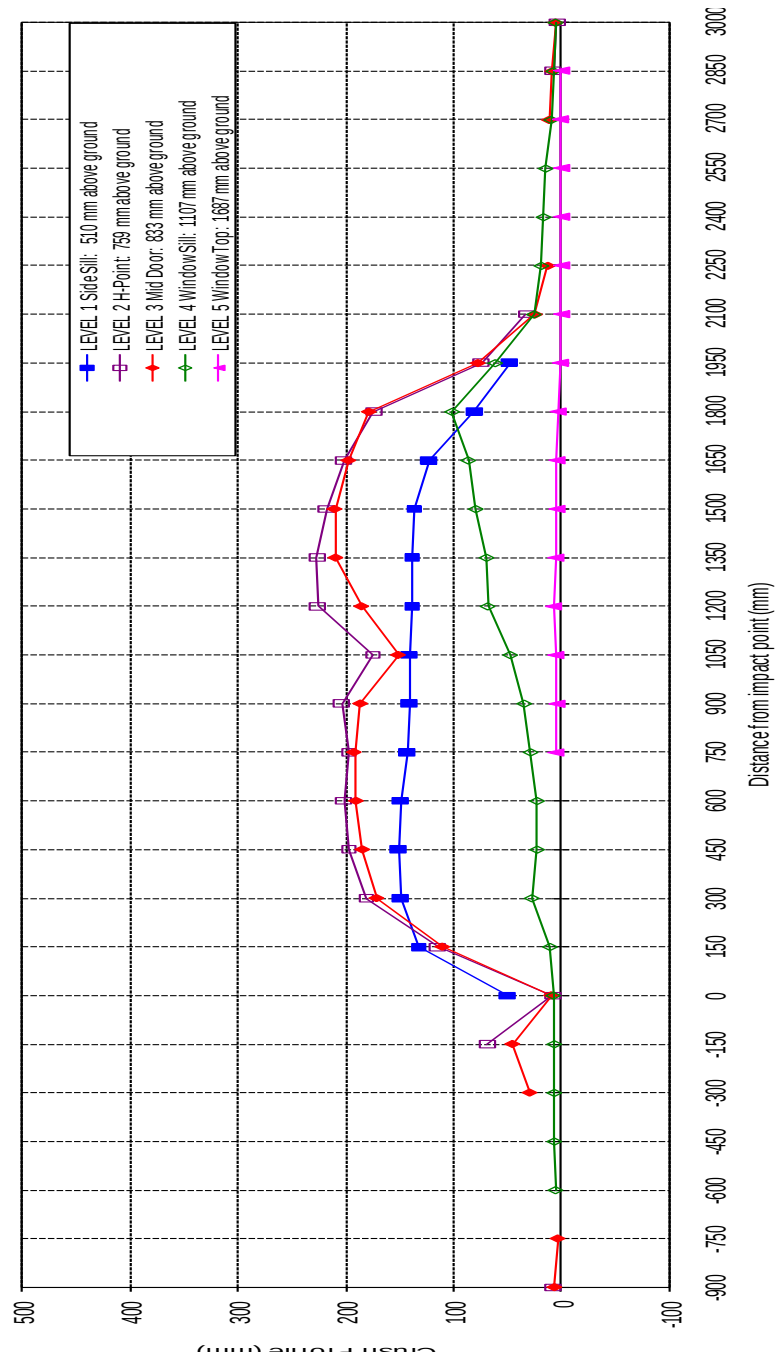
	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	151	227	210	101	7
Distance From Impact (mm)	450	1350	1500	1800	1200

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 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 2010

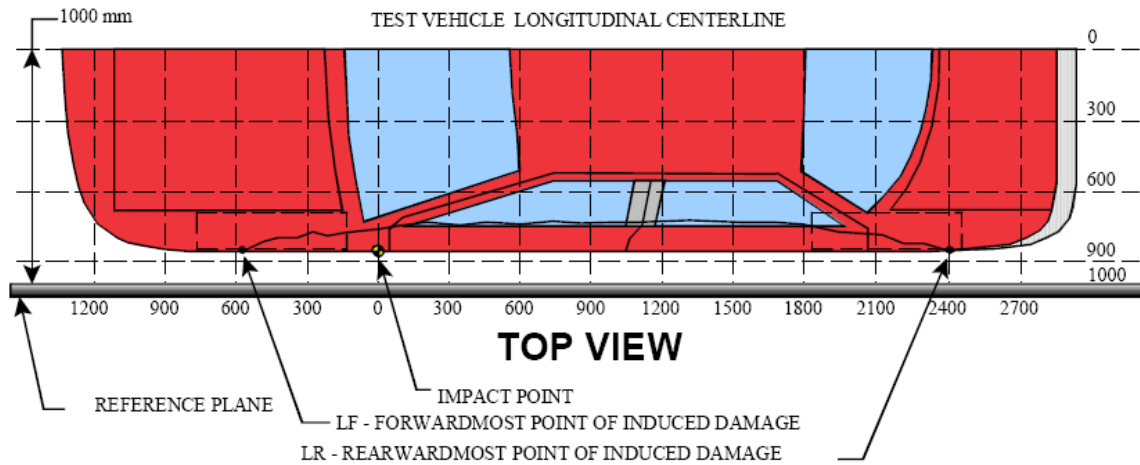


DATA SHEET NO. 13

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 2010



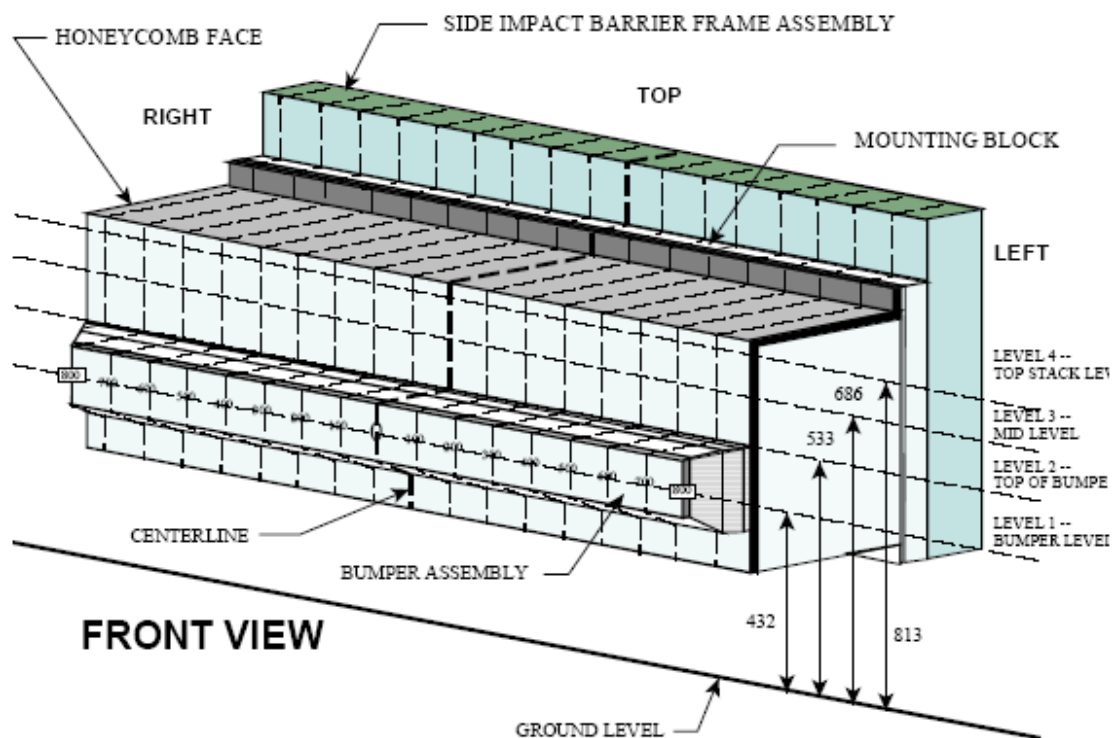
DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Maximum Static Crush (mm)
1	2400	1107	68	84	16
2	1830	833	39	197	158
3	1260	759	36	262	226
4	690	759	34	233	199
5	0	510	54	169	115
6	-450	1107	146	152	6

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 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	307	306	302	298	294	291	287	284	279	276	272	265	262	256	252	249	249
2	206	207	203	198	194	189	178	173	178	173	168	158	160	156	152	147	145
3	131	119	114	113	111	112	128	108	86	82	78	75	74	72	75	94	150
4	111	94	85	68	60	71	87	112	98	85	83	84	92	94	99	119	160

FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

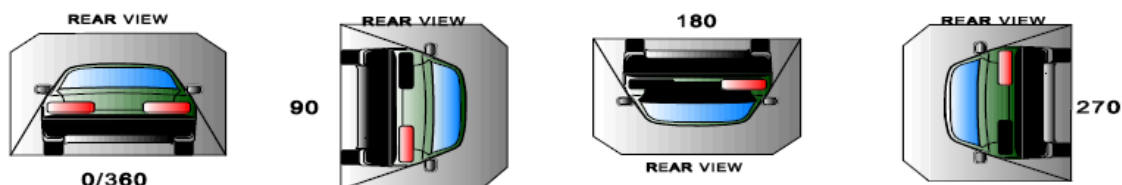
Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 2010

Test Time: 3:05 PM Temperature: 21.7° 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	1:07	5:00	6:07
90 to 180	1:07	5:00	6:07
180 to 270	1:00	5:00	6:00
270 to 360	1:08	5:00	6:08

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

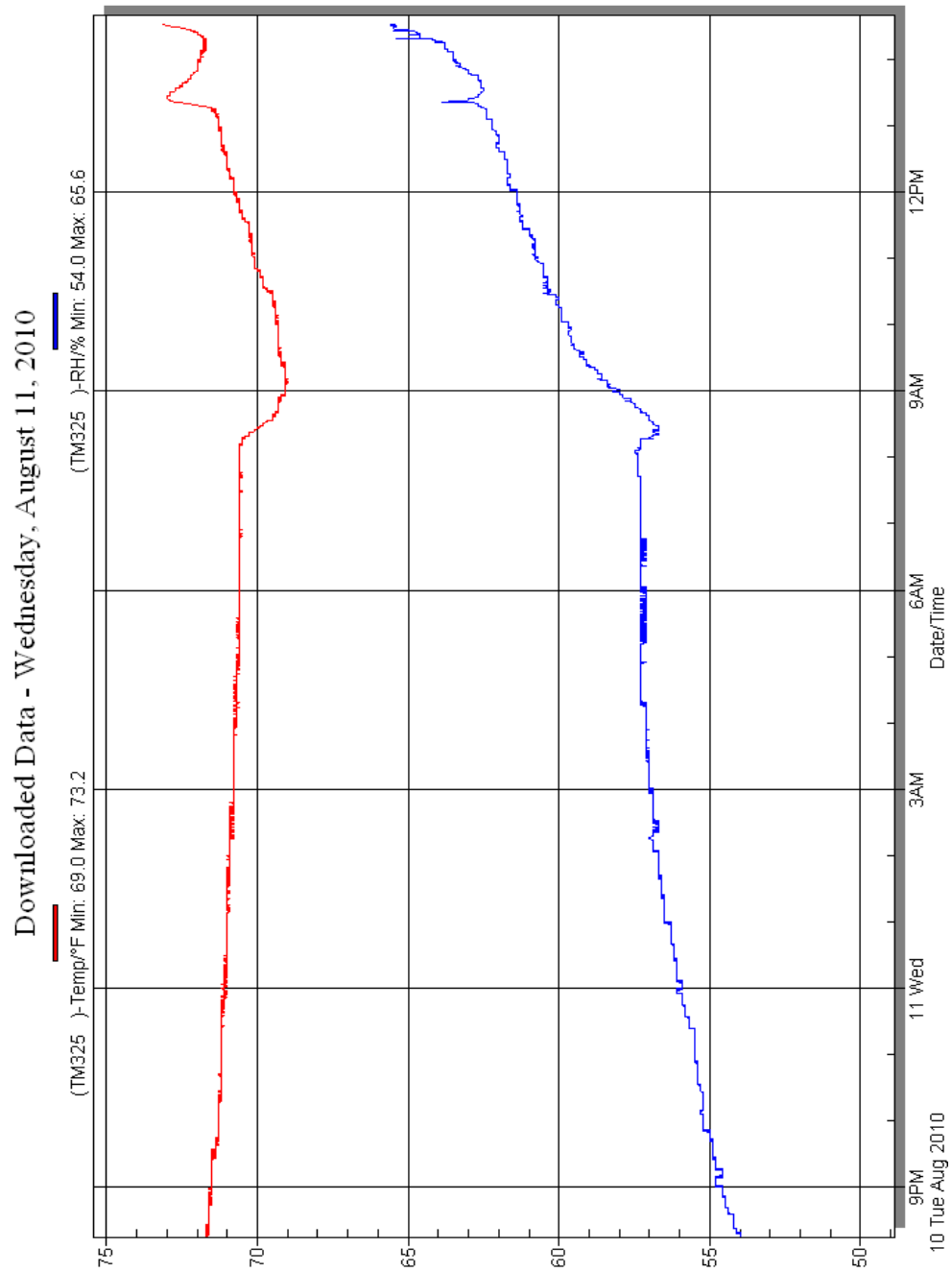
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0 to 90	None
90 to 180	None
180 to 270	None
270 to 360	None

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Chevrolet Traverse LS
 Test Program: Side NCAP

NHTSA No.: MB0122
 Test Date: August 11, 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



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

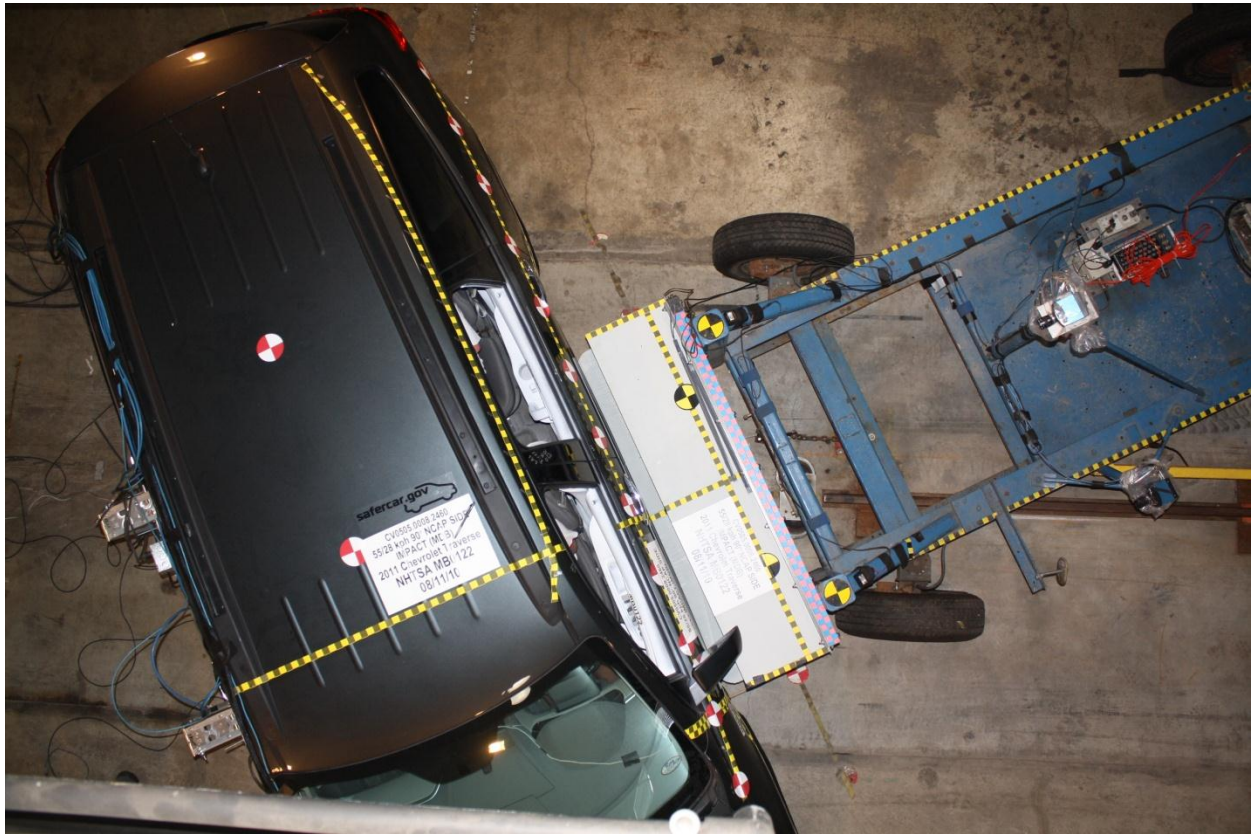


Figure A-15: Pre-Test Overhead View of the Test Vehicle and MDB



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 Lath Close-up

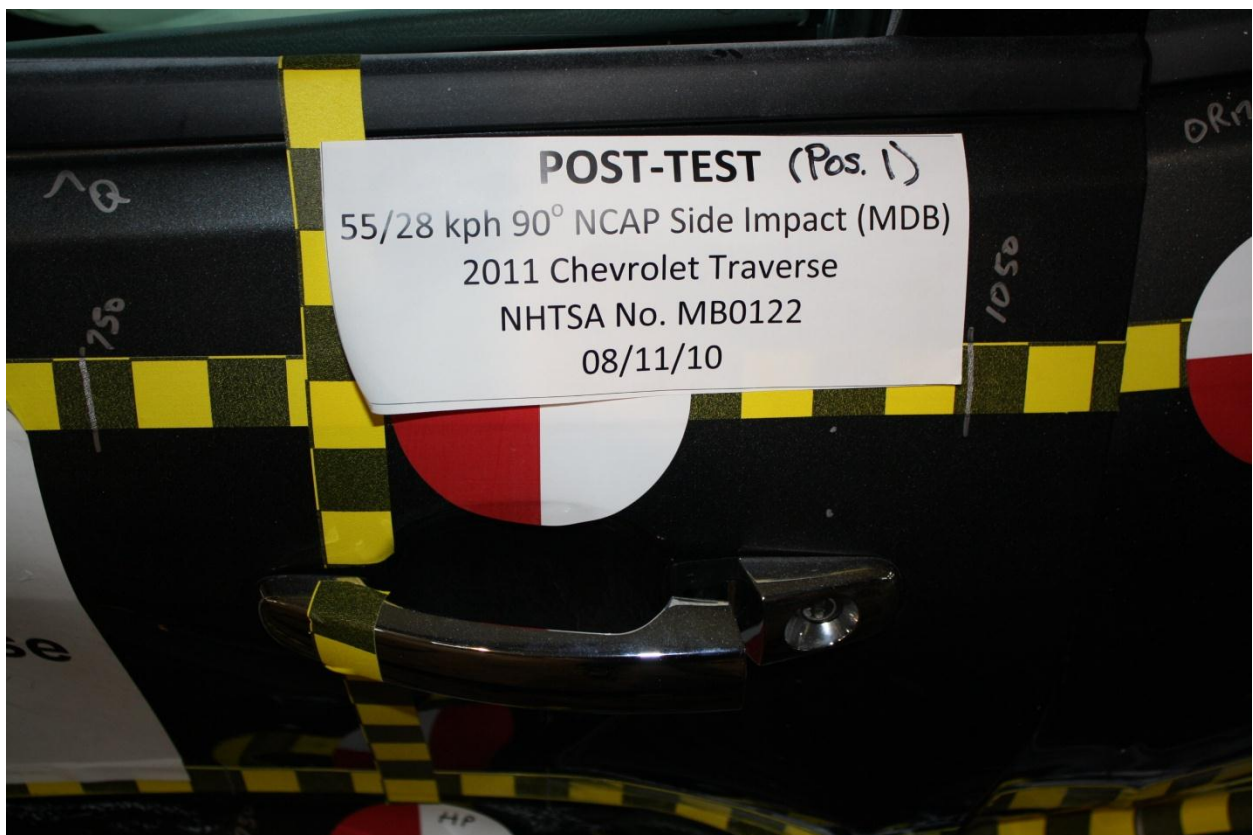


Figure A-22: Post-Test Left Front Door Lath Close-up

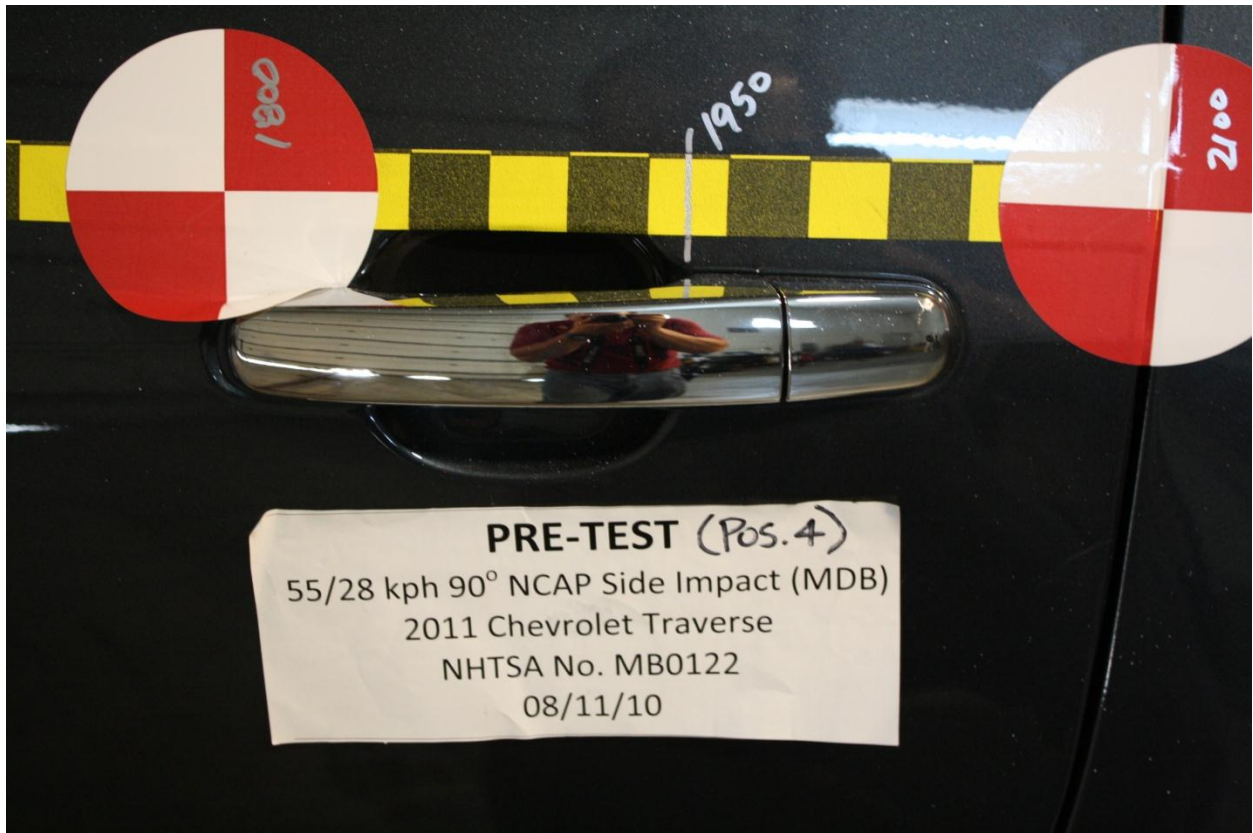


Figure A-23: Pre-Test Left Rear Door Latch Close-up



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

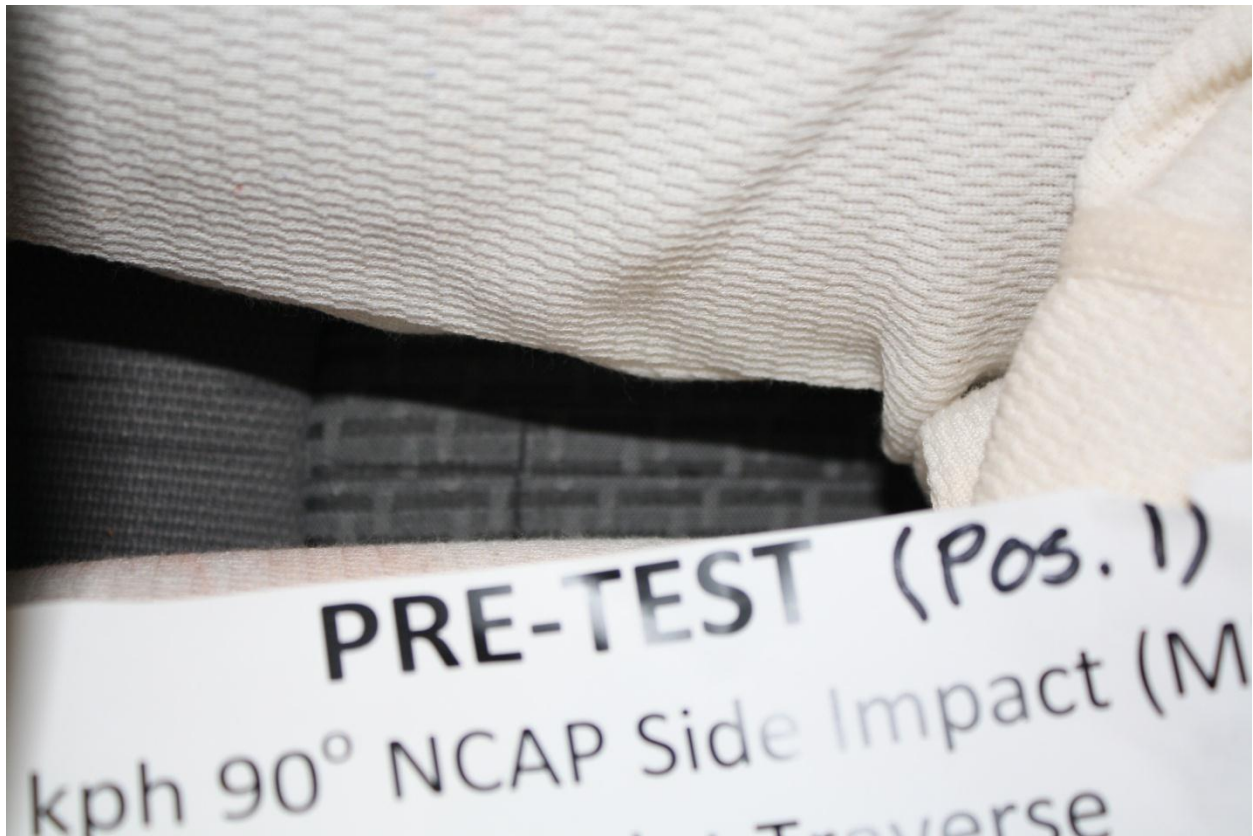


Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



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

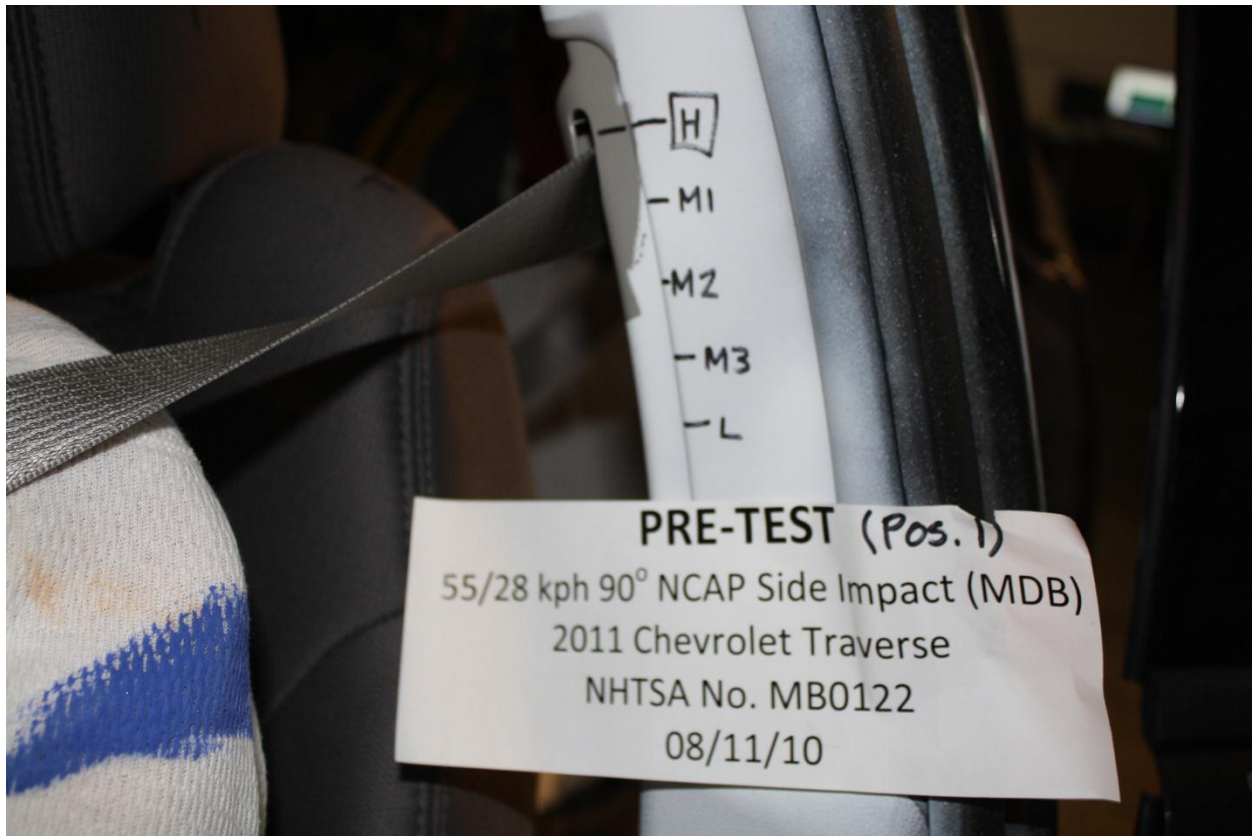


Figure A-35: Pre-Test View of Belt Anchorage for Driver Dummy to Show Position

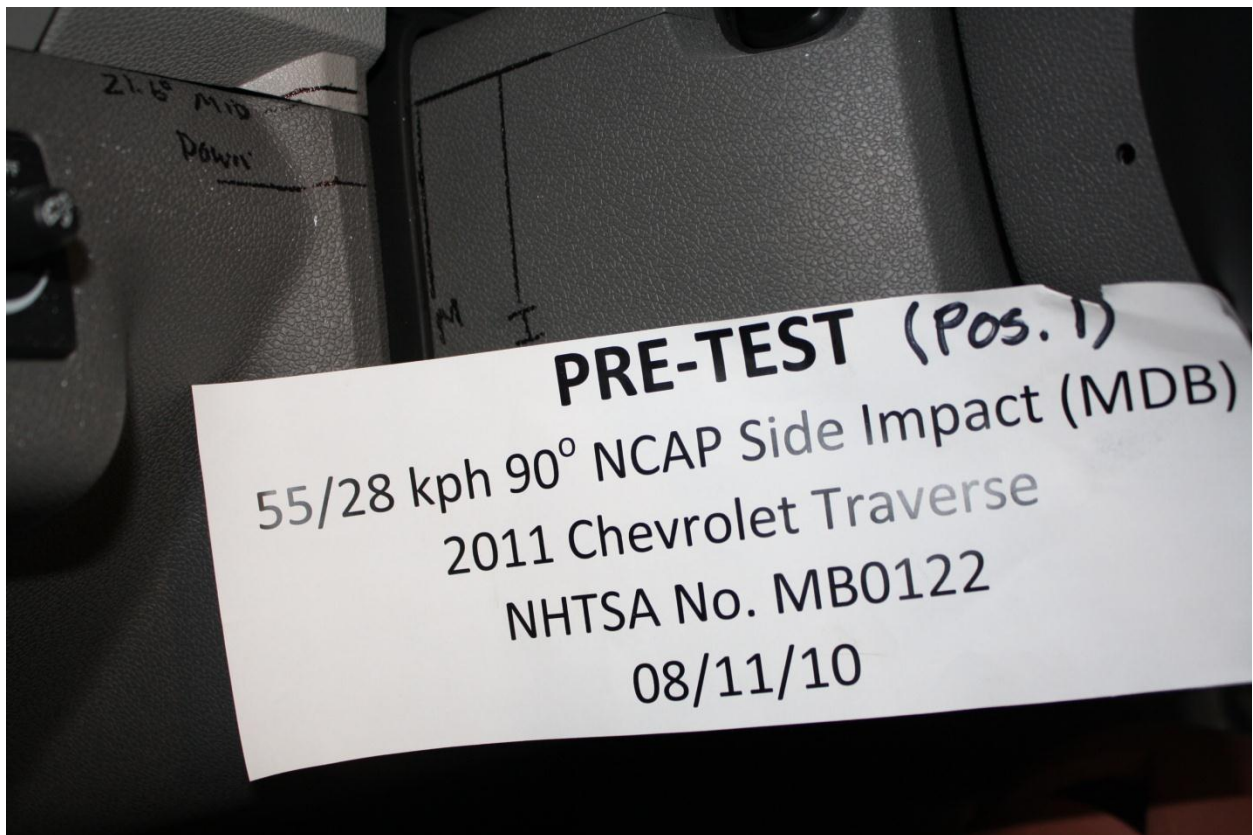


Figure A-36: Pre-Test Left Side View of Steering Wheel to Show Position



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

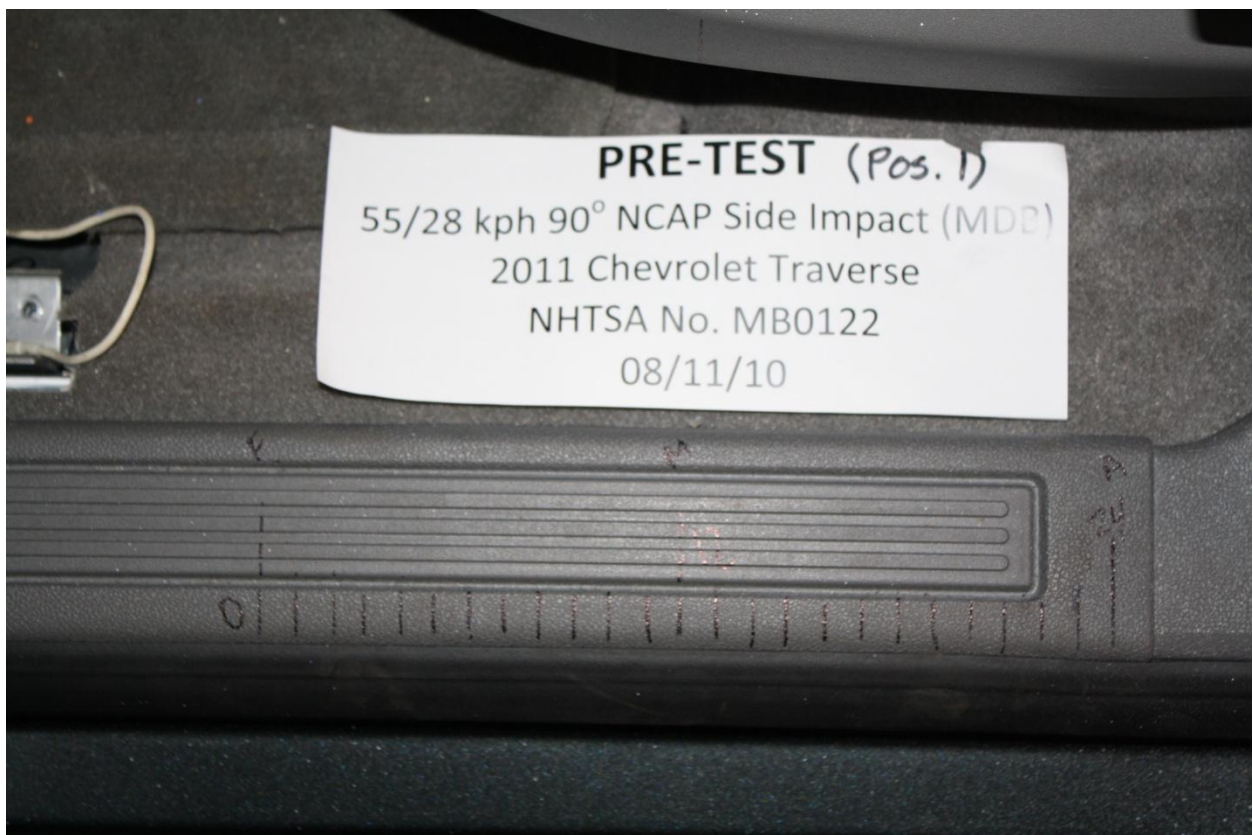


Figure A-38: Pre-test Close-up Left Side View of Driver Seat Track Showing Seat Positioning



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

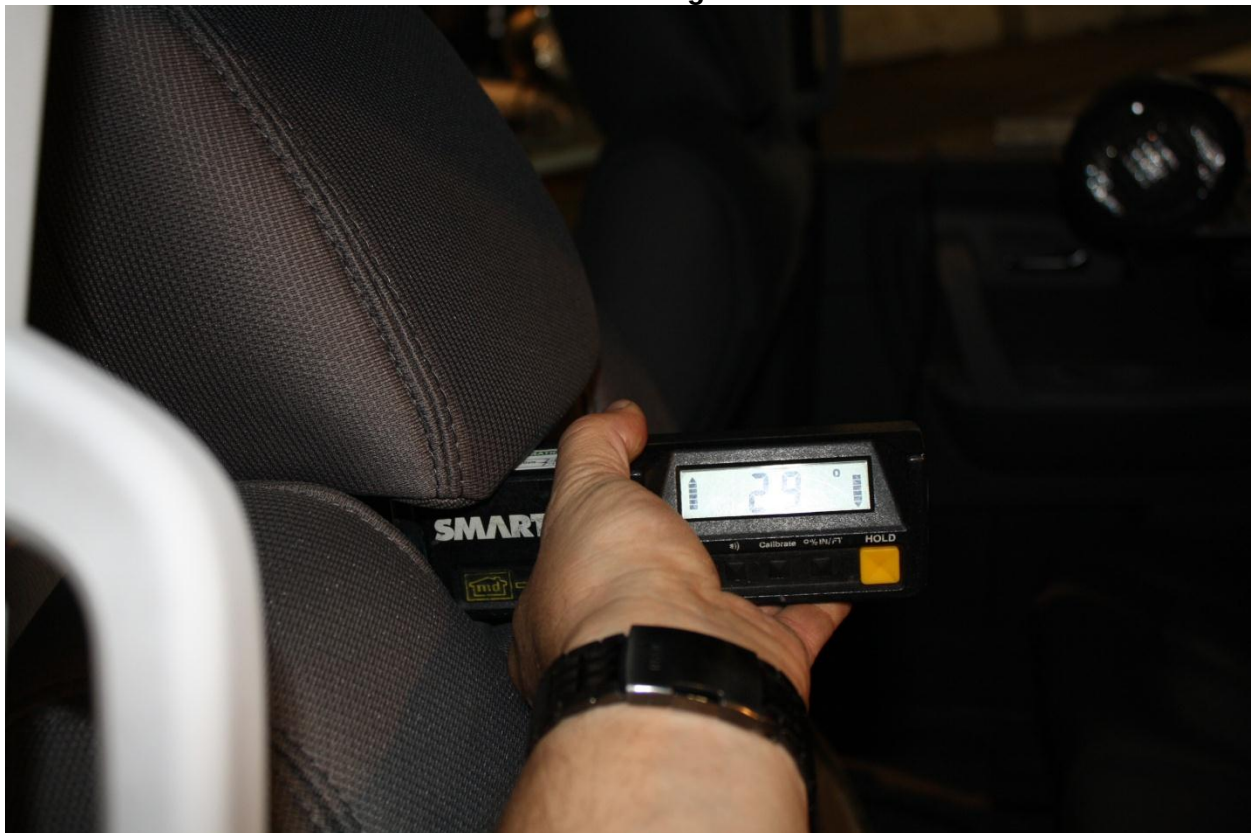


Figure A-40: Pre-Test Close-Up View of Driver Seat Back or Head Restraint Showing Seat Back Test Position



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

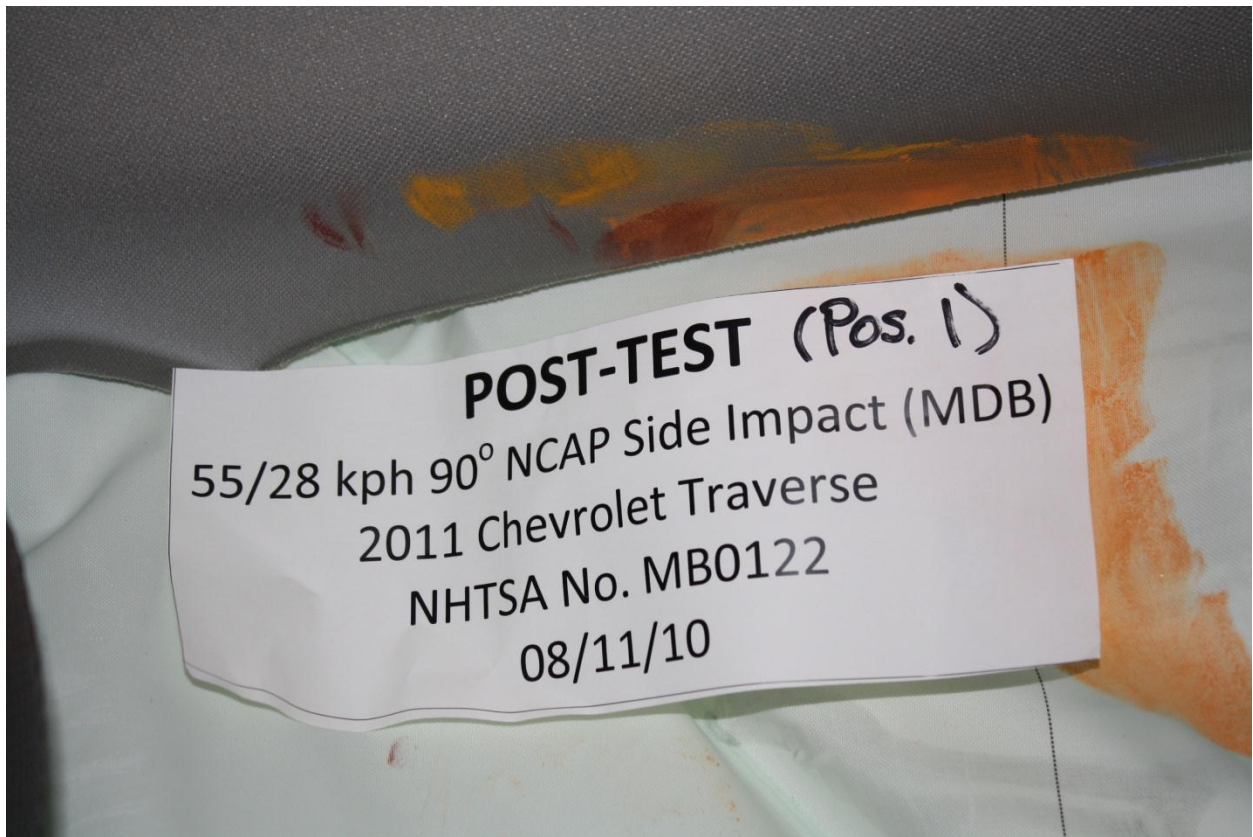


Figure A-47: Post-test Driver Dummy Close-Up Head Contact with Vehicle View

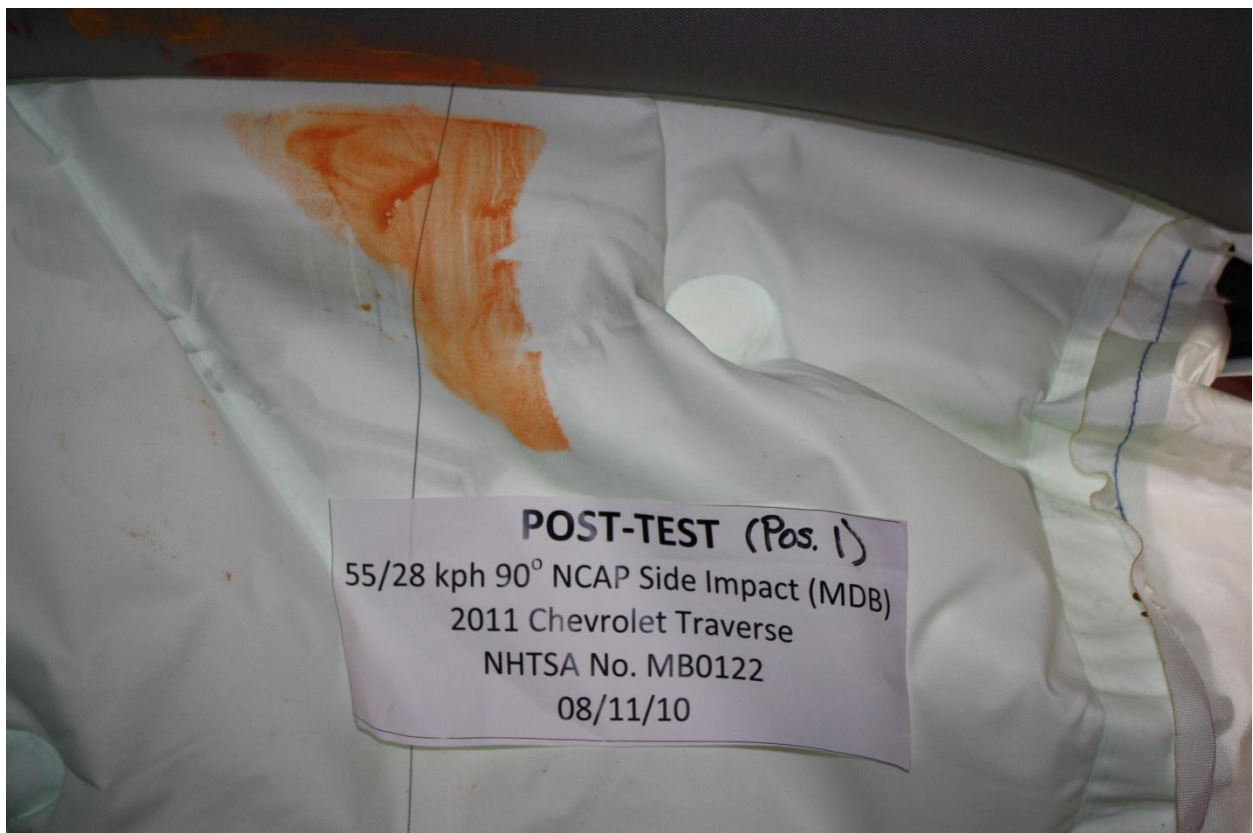


Figure A-48: Post-test Driver Dummy Close-Up Head Contact with Side Airbag View



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



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

Photograph Not Available

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

Photograph Not Available

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

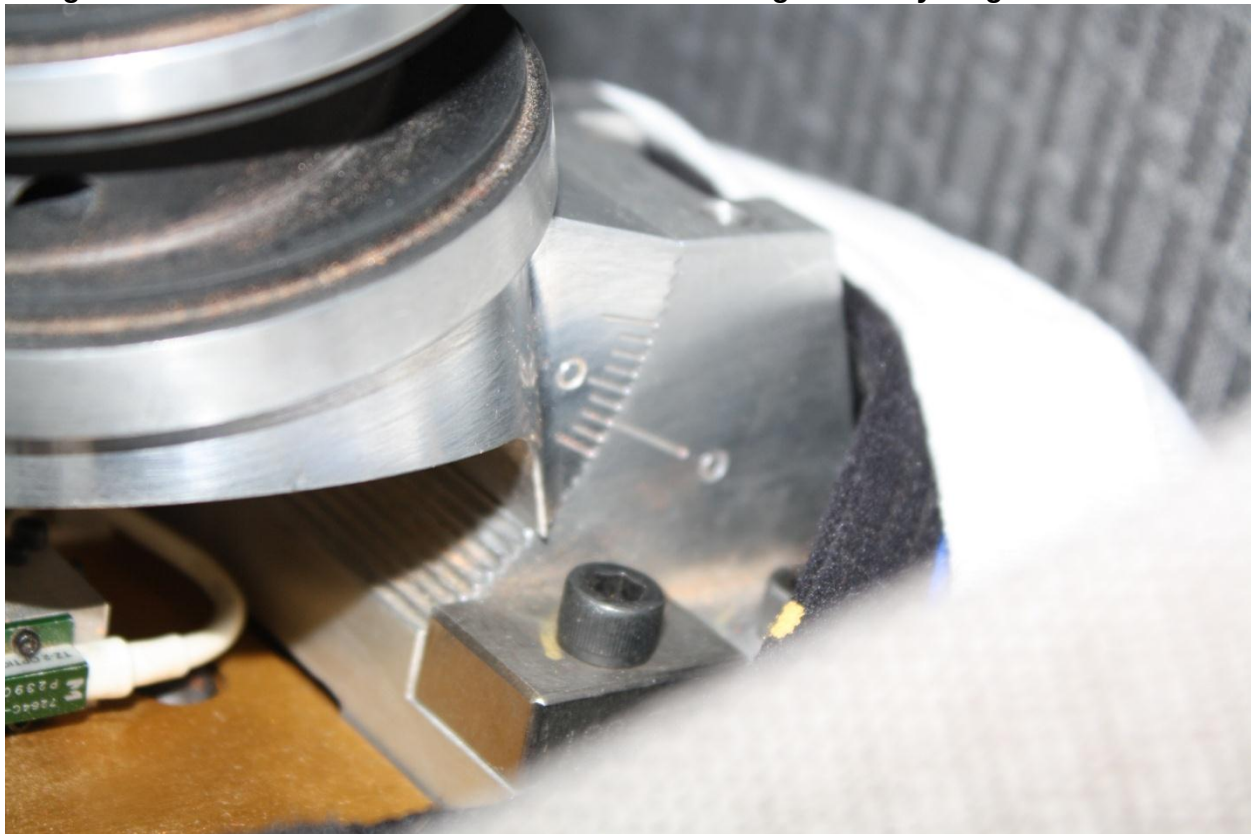


Figure A-60: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



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

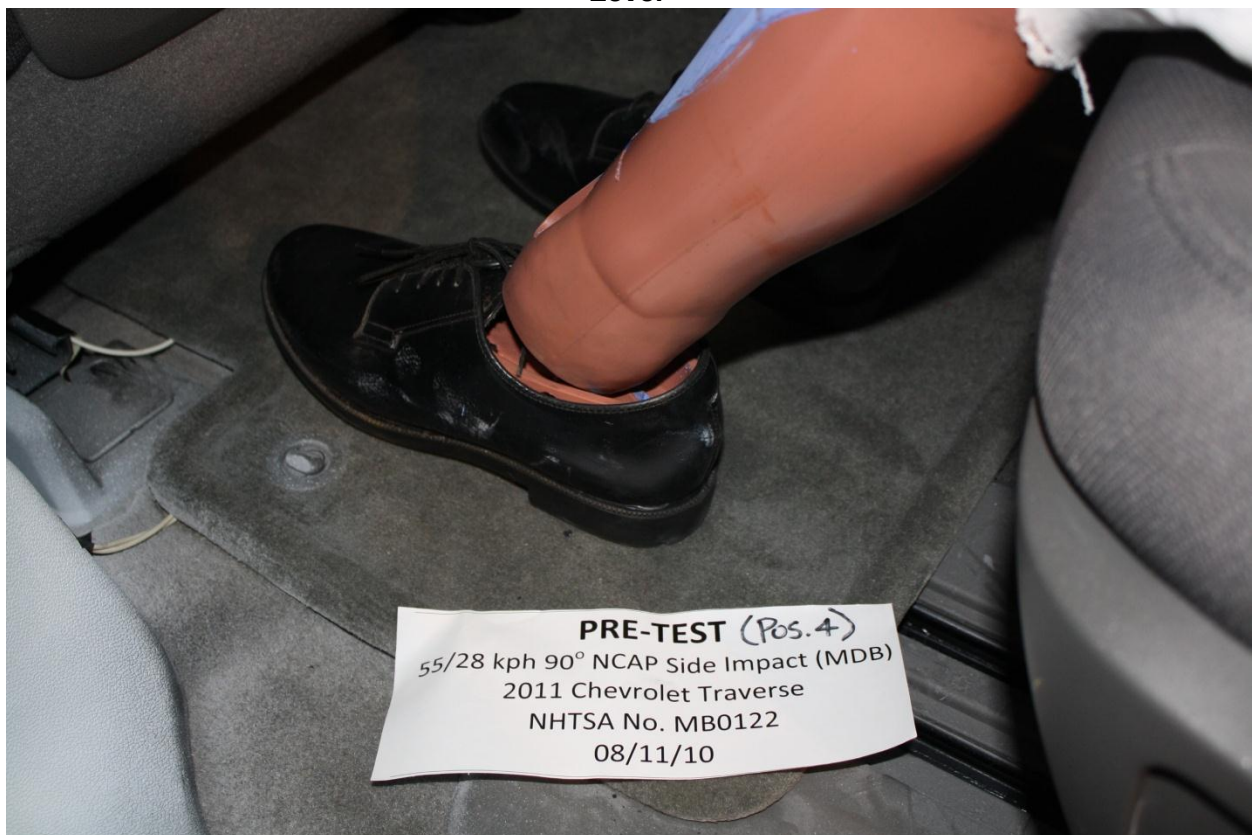


Figure A-62: Pre-Test Placement of Rear Passenger Dummy's Feet



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

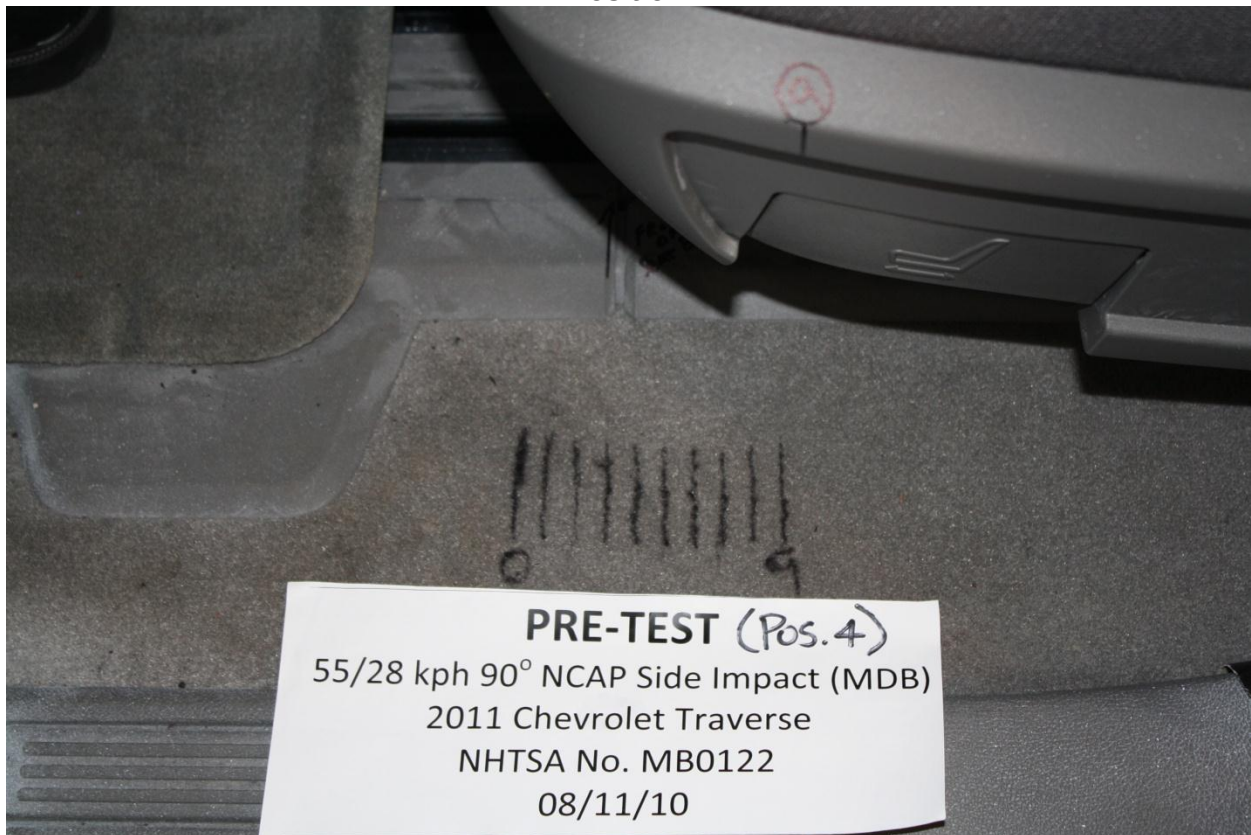


Figure A-64: Pre-test Close-Up Left Side View of Rear Passenger Seat Track Showing Test Position

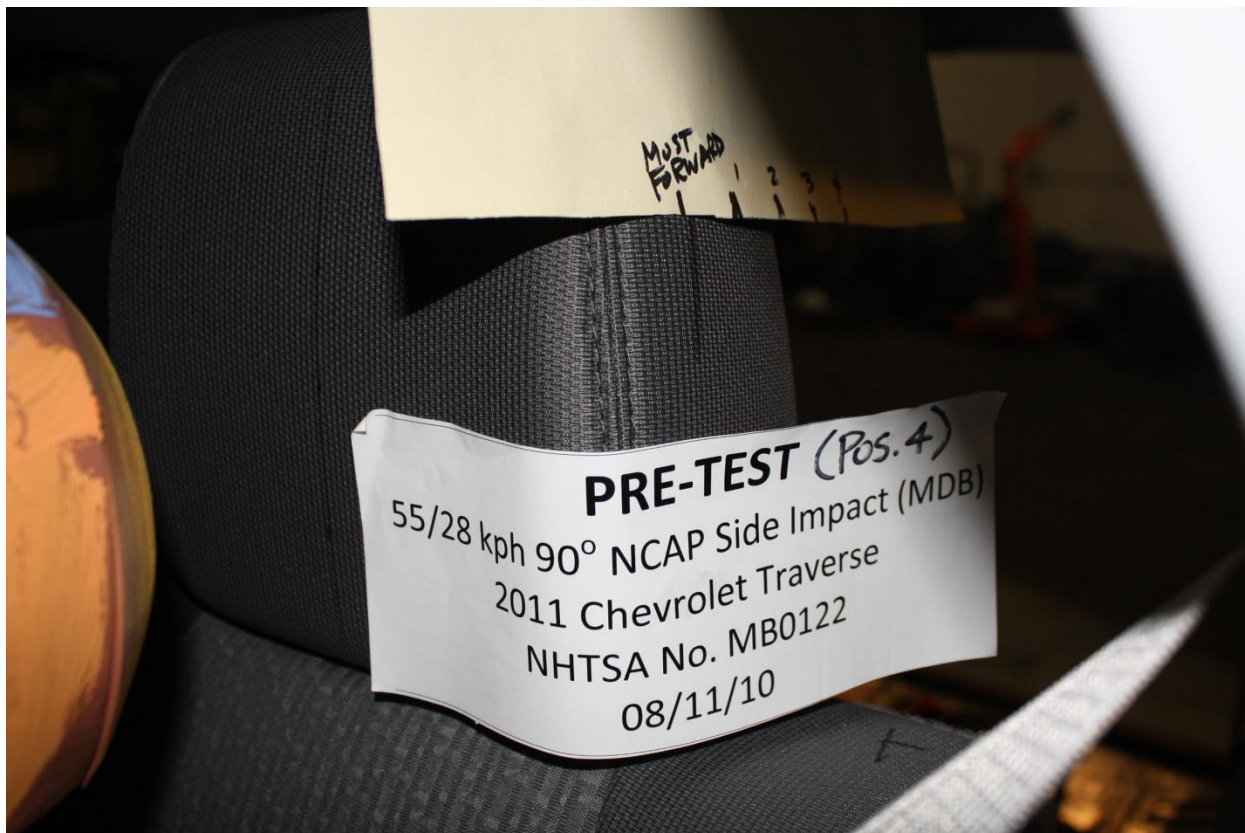


Figure A-65: Pre-test Close-Up Left Side View of Rear Passenger Seat Back Showing Test Position

Photograph Not Available

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

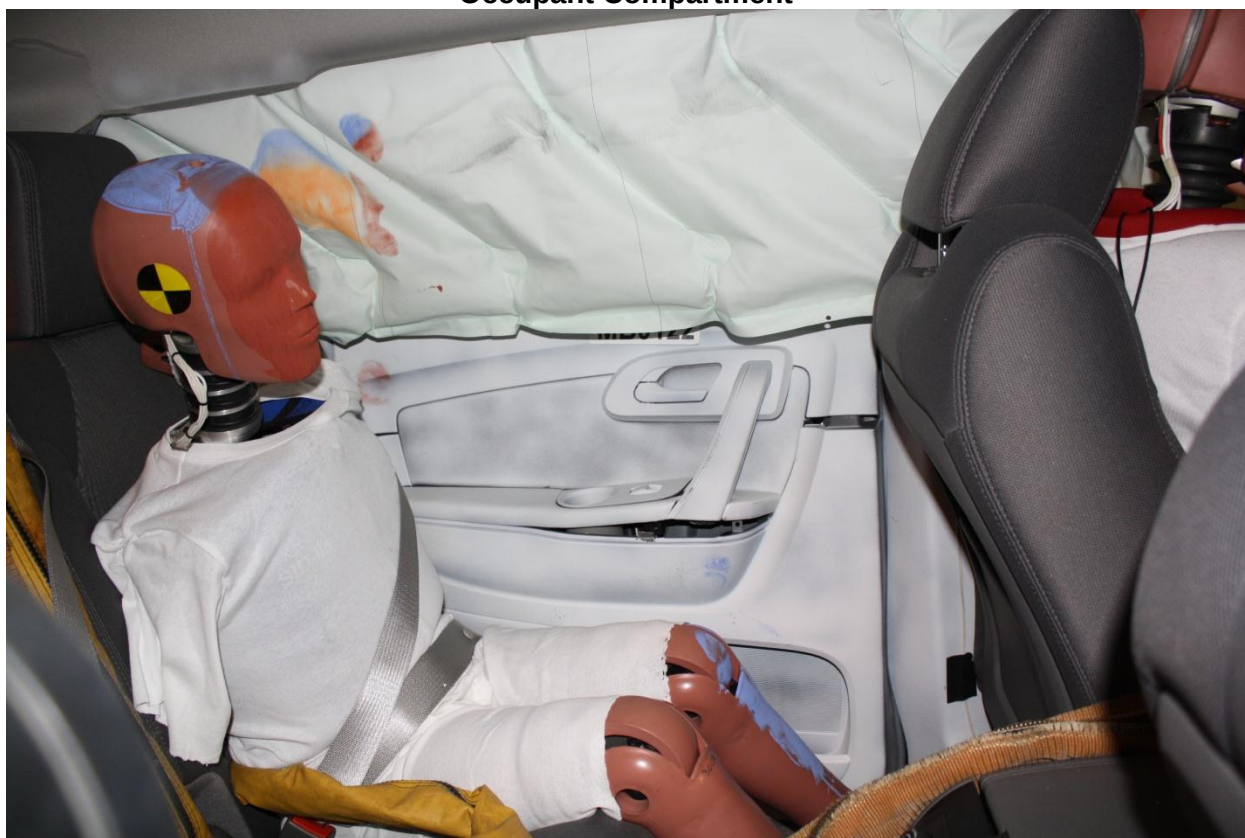


Figure A-70: Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



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

Photograph Not Available

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

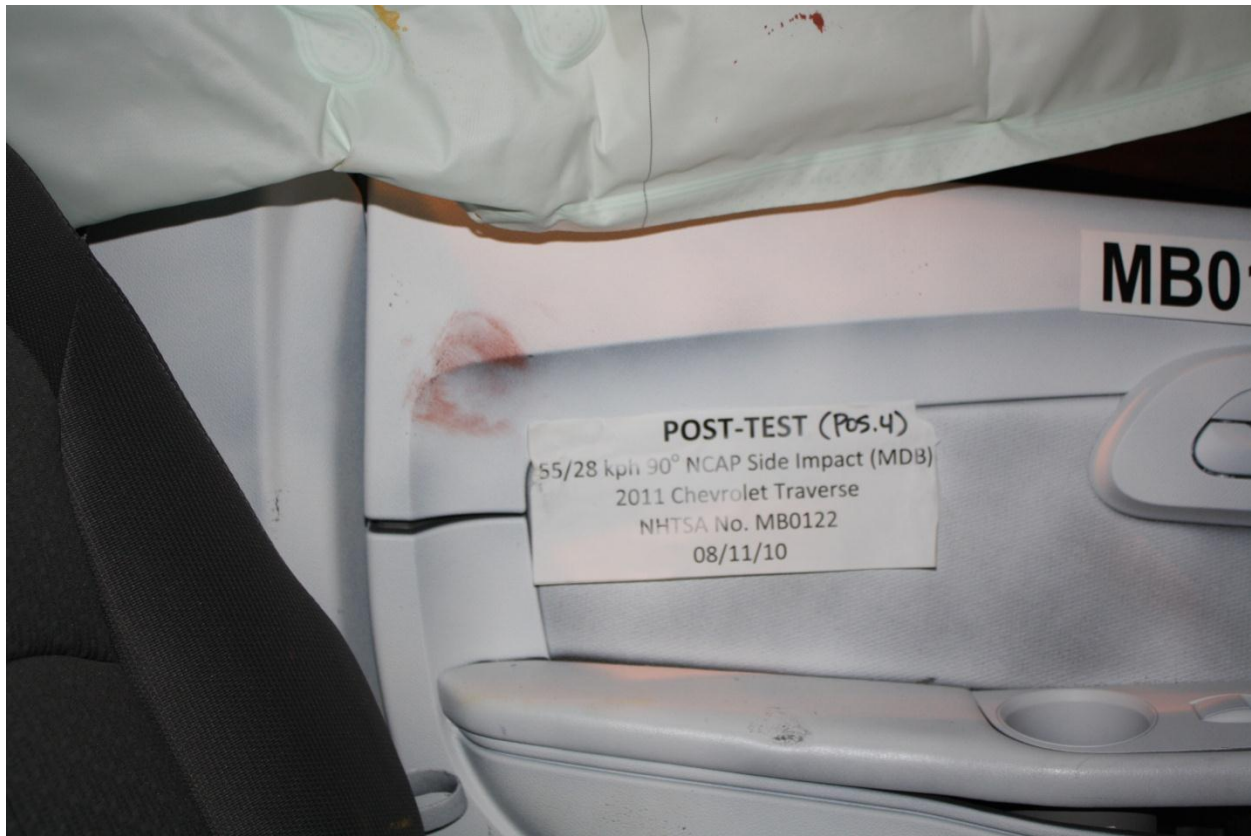


Figure A-75: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View

Photograph Not Available

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

Photograph Not Available

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

Photograph Not Available

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

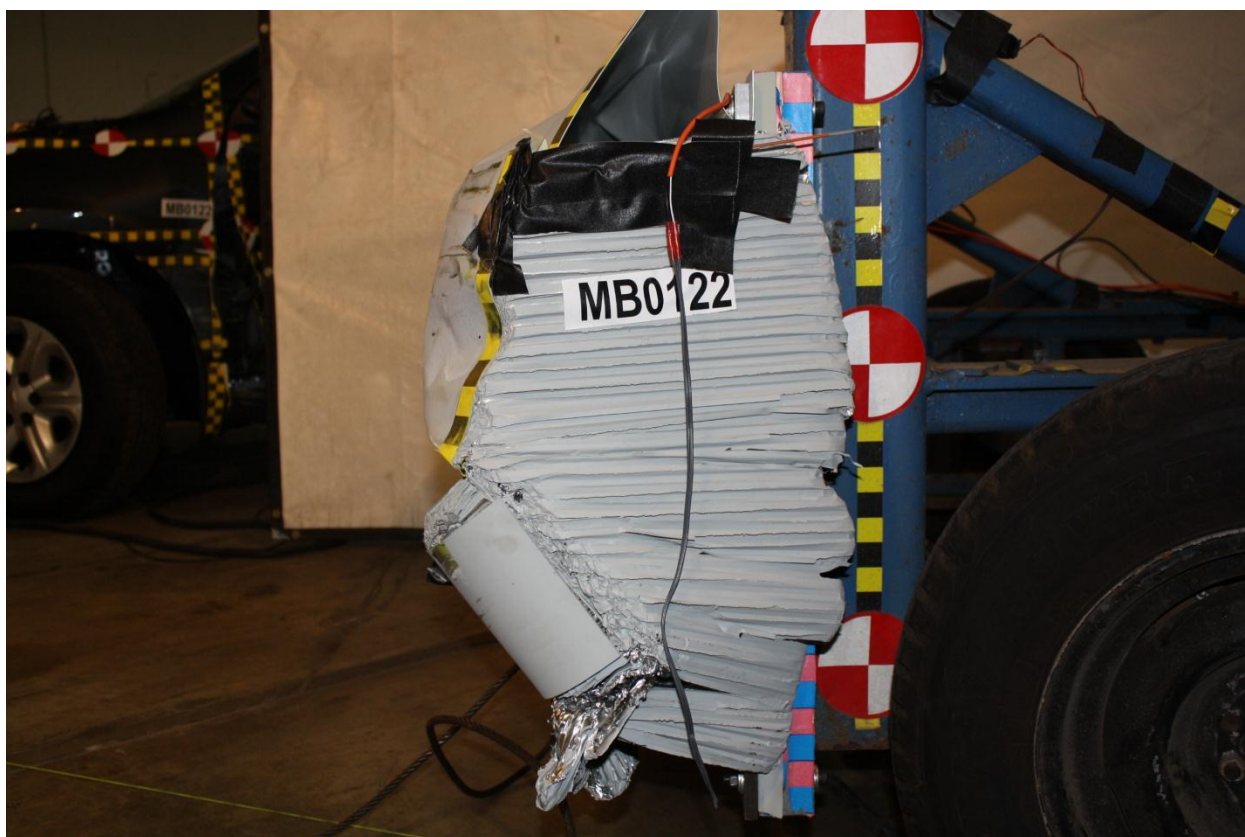


Figure A-86: Post-Test Left Side View of MDB Impactor Face



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

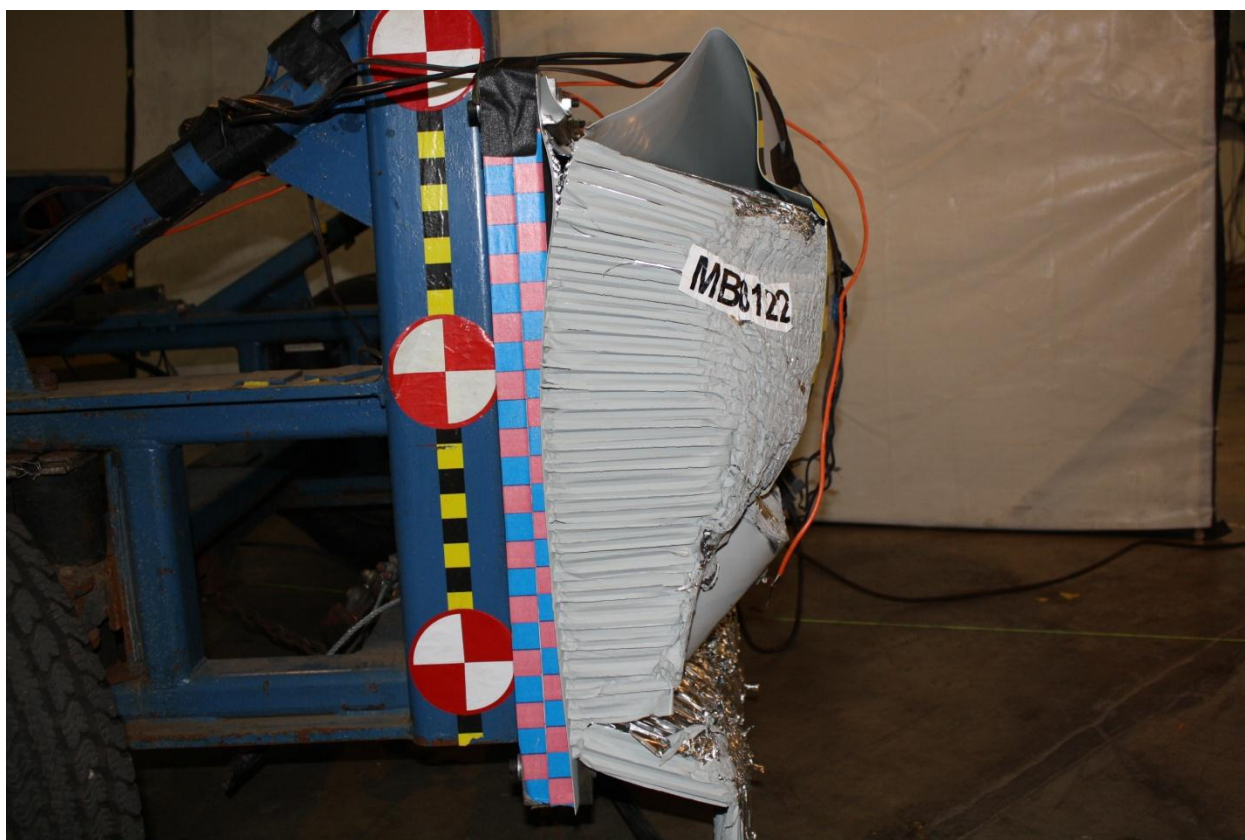


Figure A-88: Post-Test Right Side View of MDB Impactor Face

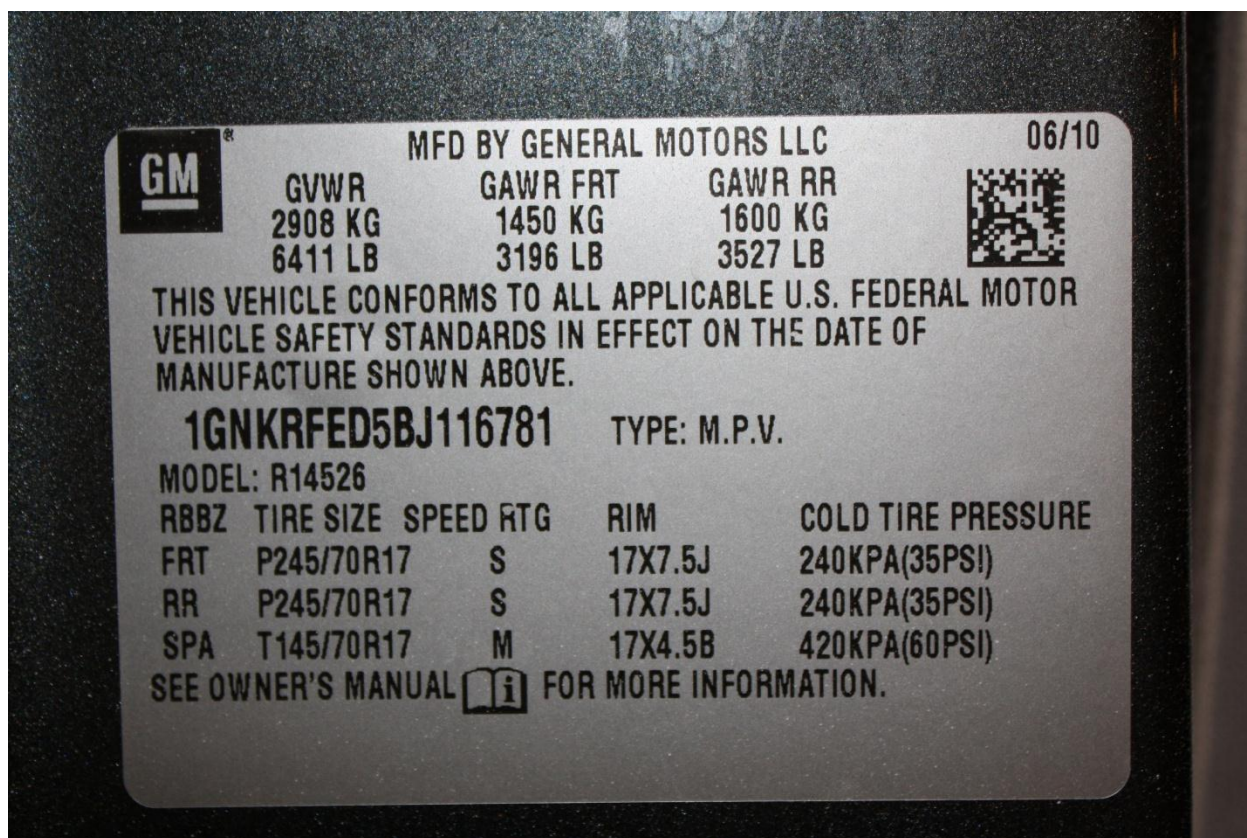


Figure A-89: Close-Up View of Vehicle's Certification Label



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

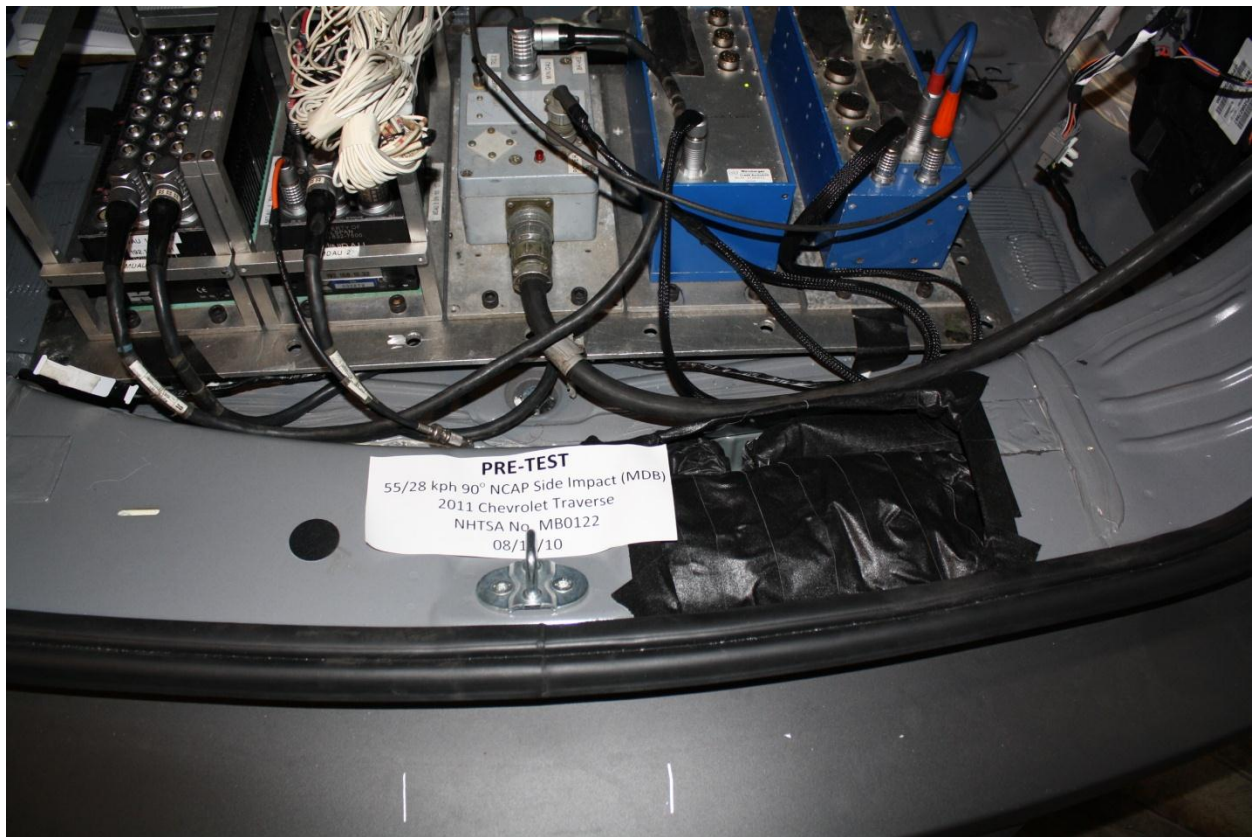


Figure A-91: Pre-Test Ballast View



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°

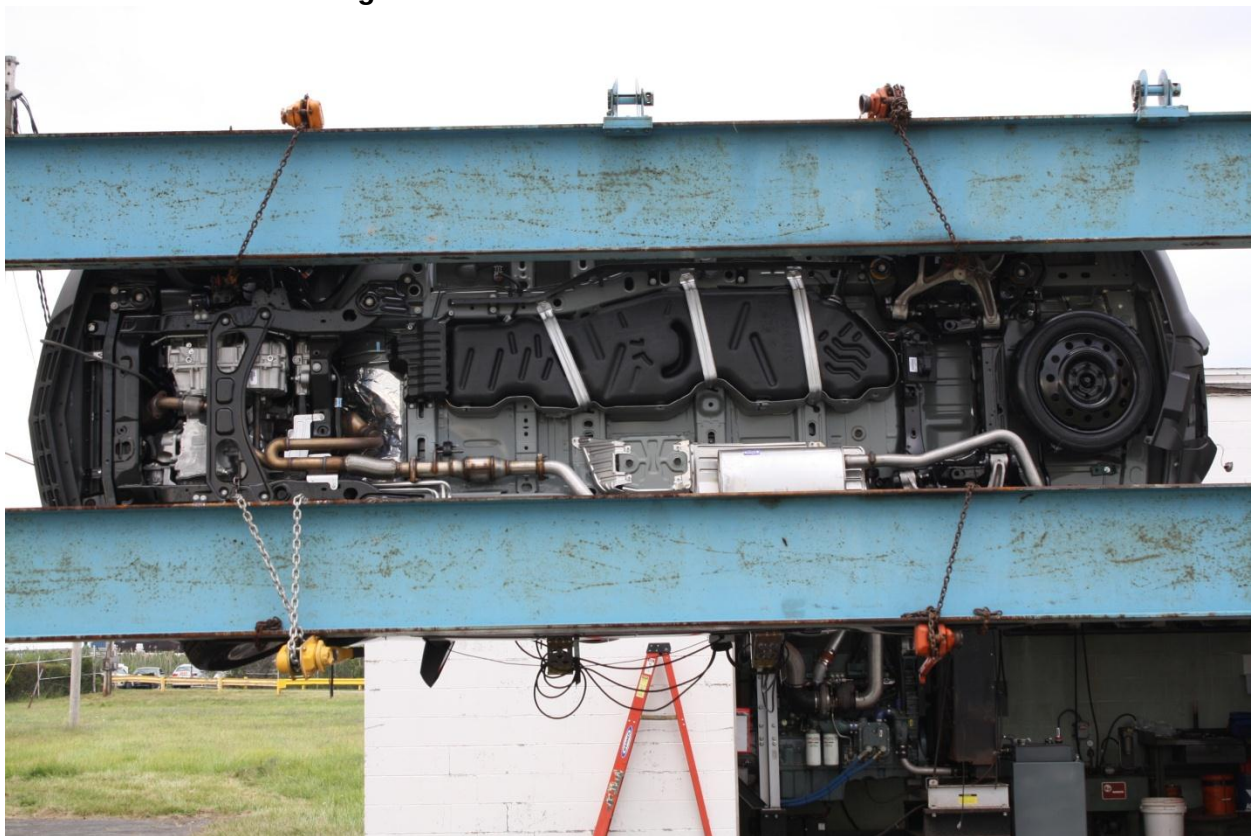


Figure A-96: FMVSS No. 301 Rollover 270°



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



Figure A-98: Impact Event (Impact Side)



2011 TRAVERSE FWD LS

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INTERIOR: DARK GRAY

ENGINE: 3.6L SIDI V6
TRANSMISSION: 6-SPEED AUTO

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Rec 7/12 12 miles	STANDARD EQUIPMENT (ITEMS LISTED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN) • 5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS MECHANICAL • ENGINE, 3.6L SIDI V6 • TRANSMISSION 6-SPEED AUTO FWD • OIL LIFE MONITORING SYSTEM • TIRE SEALANT & INFLATOR KIT IN PLACE OF SPARE TIRE SAFETY & SECURITY • ANTILOCK BRAKE SYSTEM • STABILITRAK-STABILITY CONTROL SYSTEM W/ TRACTION CONTROL • TIRE PRESSURE MONITORING SYS • AIR BAGS, DUAL FRONTAL • FRONT SIDE IMPACT AIR BAGS • HEAD CURTAIN SIDE AIR BAGS ALL ROWS • PASSENGER SENSING SYSTEM	CHILD SAFETY LATCH SYSTEM • REMOTE KEYLESS ENTRY • THEFT DETERRENT SYSTEM • 6 MTHS ONSTAR DIRECTIONS & CONNECTIONS WITH AUTOMATIC CRASH RESPONSE AND TURN-BY-TURN NAVIGATION (ASK DEALER ABOUT GEOGRAPHIC COVERAGE) EXTERIOR • REAR LIFTGATE, MANUAL • POWER OUTSIDE MIRRORS • BODYSIDE MOLDING, BLACK • 17" STEEL WHEELS WITH COVERS INTERIOR • PREMIUM CLOTH SEATS • SEATS, FRONT BUCKET • 8 PASS SEATING W/ 2ND & 3RD ROW SPLIT BENCH SEAT • SMART SLIDE 2ND ROW FEATURE • FRONT & REAR AIR CONDITIONING • REAR CARGO STORAGE • STEERING, TILT & TELESCOPING	CRUISE CONTROL • AM/FM STEREO CD PLAYER • XM RADIO - SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUS/XM AFTER 3 MONTHS OPTIONS & PRICING MANUFACTURER'S SUGGESTED RETAIL PRICE STANDARD VEHICLE PRICE \$29,224.00 OPTION INSTALLED BY THE MANUFACTURER MAY REPLACE STANDARD EQUIPMENT LISTING BLUETOOTH CONNECTIVITY FOR PHONE PACKAGE 340.00 *BLUETOOTH FOR PHONE *LEATHER WRAPPED STEERING WHEEL W/ AUDIO CONTROLS SPARE TIRE & WHEEL (REPLACES TIRE SEALANT & INFLATOR KIT) 100.00 8 PASS SEATING W/ 2ND & 3RD ROW SPLIT BENCH SEAT INC.	TOTAL OPTIONS \$440.00 TOTAL VEHICLE & OPTIONS \$29,664.00 DESTINATION CHARGE 775.00 TOTAL VEHICLE PRICE* \$30,439.00			
	EPA Fuel Economy Estimates <table border="1"><tr><td>CITY MPG 17 Expected range for most drivers 14 to 20 MPG</td><td>Estimated Annual Fuel Cost \$2,051 based on 15,000 miles at \$2.60 per gallon</td><td>HIGHWAY MPG 24 Expected range for most drivers 19 to 29 MPG</td></tr></table> Combined Fuel Economy This Vehicle 19 10 19 32 MPG See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov			CITY MPG 17 Expected range for most drivers 14 to 20 MPG	Estimated Annual Fuel Cost \$2,051 based on 15,000 miles at \$2.60 per gallon	HIGHWAY MPG 24 Expected range for most drivers 19 to 29 MPG	GOVERNMENT SAFETY RATINGS This vehicle has not been rated by the government for frontal crash, side crash or rollover risk. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4236
CITY MPG 17 Expected range for most drivers 14 to 20 MPG	Estimated Annual Fuel Cost \$2,051 based on 15,000 miles at \$2.60 per gallon	HIGHWAY MPG 24 Expected range for most drivers 19 to 29 MPG					

Figure A-99: Monroney Label

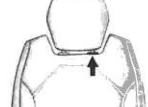
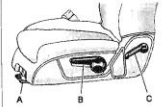
3-2 Seats and Restraints Head Restraints The vehicle's front seats have adjustable head restraints in the outboard seating positions. WARNING With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly. Adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head. This position reduces the chance of a neck injury in a crash. 	 1. Pull the head restraint up to raise it. To lower the head restraint, press the release button, located on the head restraint post on the top of the seatback, while you push the head restraint down.
2. Push down on the head restraint after the button is released to make sure that it is locked in place. The vehicle's second-row seats have head restraints in the outboard seating positions that cannot be adjusted. The vehicle's third-row seats have headrests in the outboard seating positions that cannot be adjusted. The vehicle's head restraints and headrests are not designed to be removed.	Front Seats Seat Adjustment WARNING You can lose control of the vehicle if you try to adjust a manual driver seat while the vehicle is moving. The sudden movement could startle and confuse you, or make you push a pedal when you do not want to. Adjust the driver seat only when the vehicle is not moving.  A. Manual Seat Adjustment Handle. B. Driver Seat Height Adjuster. C. See Reclining Seatbacks on page 3-7. To adjust a manual seat: 1. Lift the handle (A) under the seat to unlock it. 2. Slide the seat and release the handle. Try to move the seat to be sure it is locked in place.

Figure A-100: Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Head Restraints

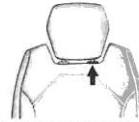
The vehicle's front seats have adjustable head restraints in the outboard seating positions.

WARNING

With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.



Adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head. This position reduces the chance of a neck injury in a crash.



1. Pull the head restraint up to raise it. To lower the head restraint, press the release button, located on the head restraint post on the top of the seatback, while you push the head restraint down.

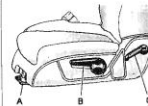
2. Push down on the head restraint after the button is released to make sure that it is locked in place.

The vehicle's second-row seats have head restraints in the outboard seating positions that cannot be adjusted.

The vehicle's third-row seats have headrests in the outboard seating positions that cannot be adjusted. The vehicle's head restraints and headrests are not designed to be removed.

Front Seats**Seat Adjustment****WARNING**

You can lose control of the vehicle if you try to adjust a manual driver seat while the vehicle is moving. The sudden movement could startle and confuse you, or make you push a pedal when you do not want to. Adjust the driver seat only when the vehicle is not moving.



- A. Manual Seat Adjustment Handle.
- B. Driver Seat Height Adjuster.
- C. See *Reclining Seatbacks* on page 3-7.

To adjust a manual seat:

1. Lift the handle (A) under the seat to unlock it.
2. Slide the seat and release the handle.

Try to move the seat to be sure it is locked in place.

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

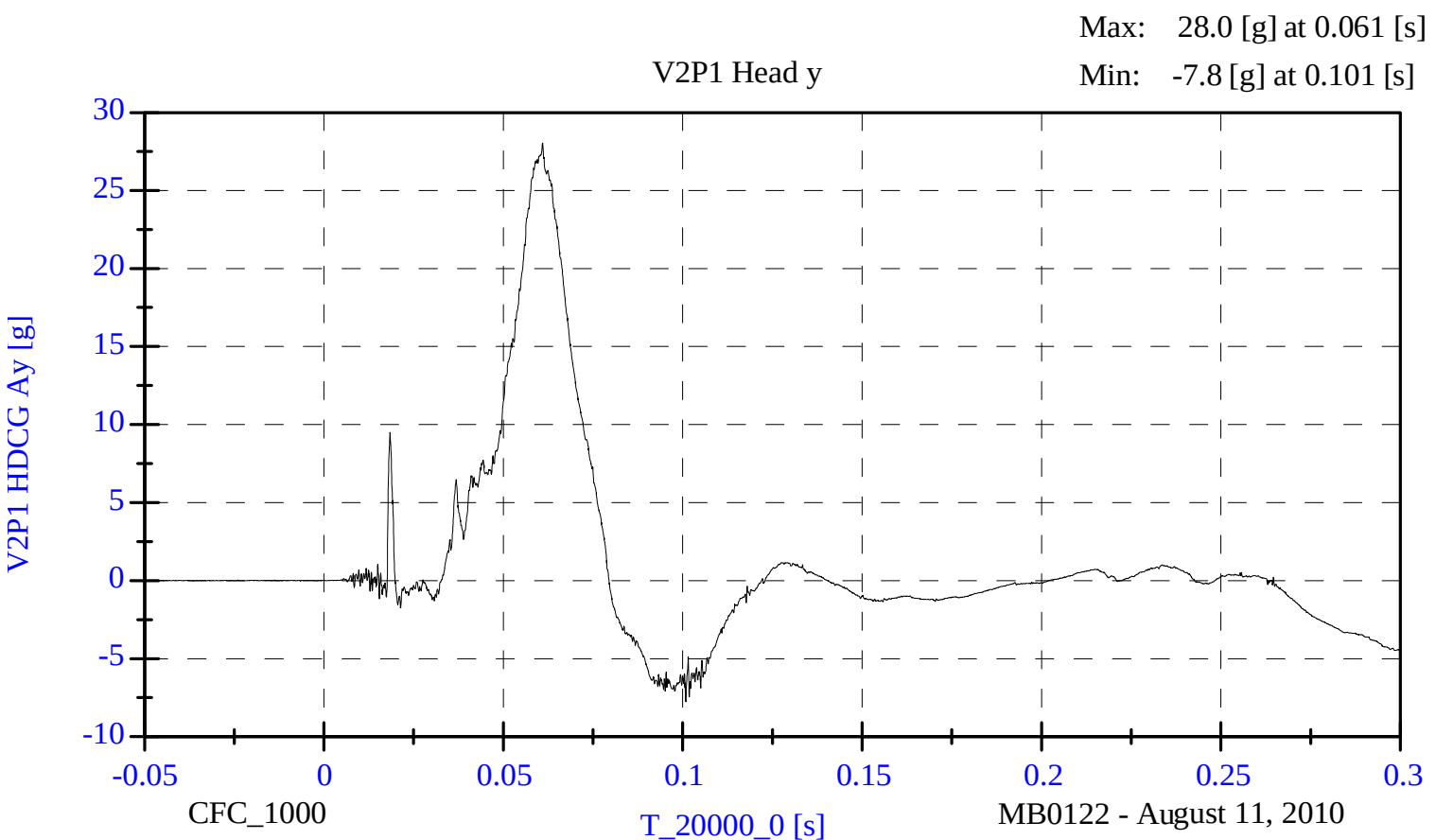
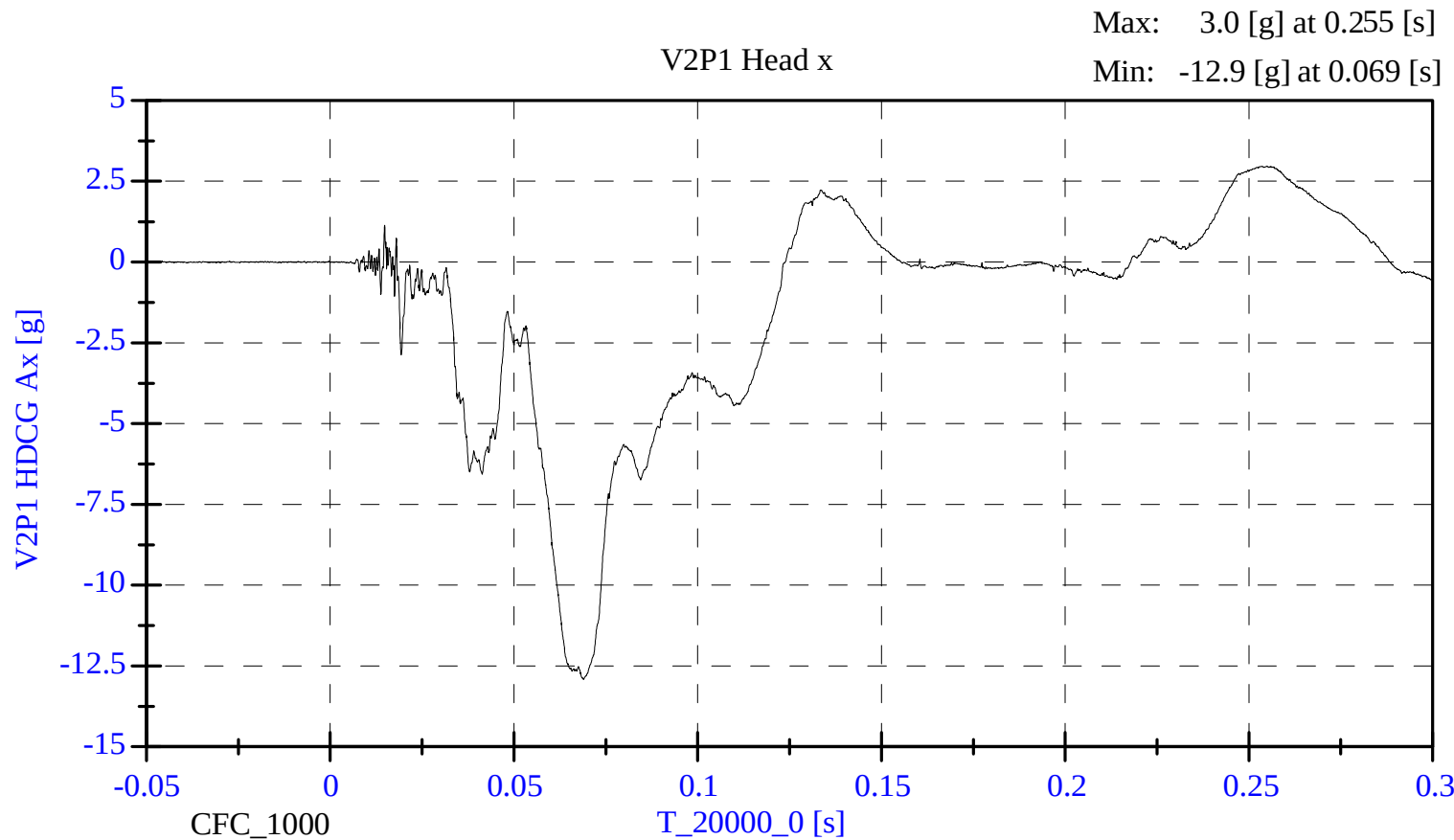
Vehicle Instrumentation Data

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)

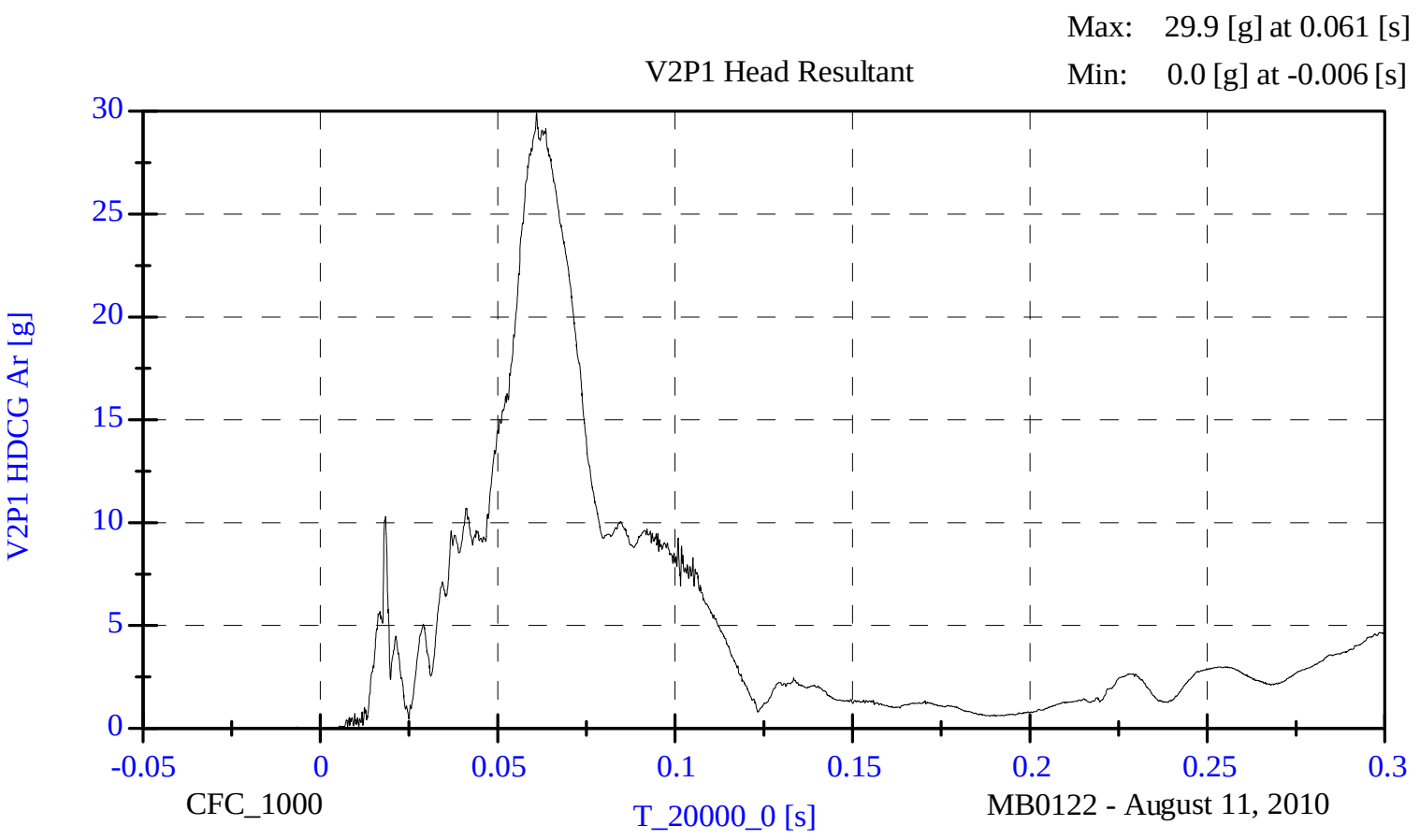
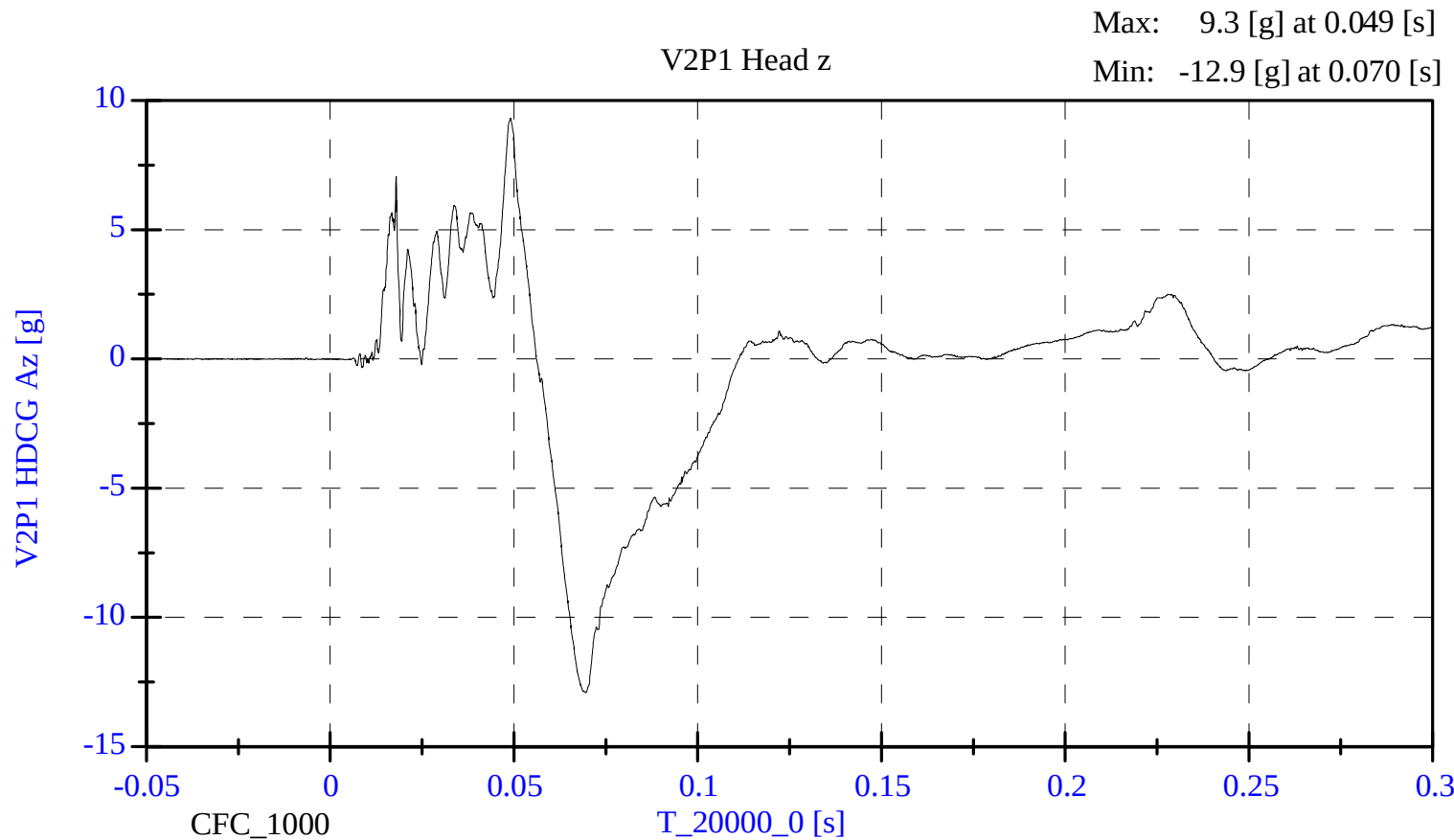
Rear Seat Track Acceleration (Y)
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)

MDB Instrumentation Data

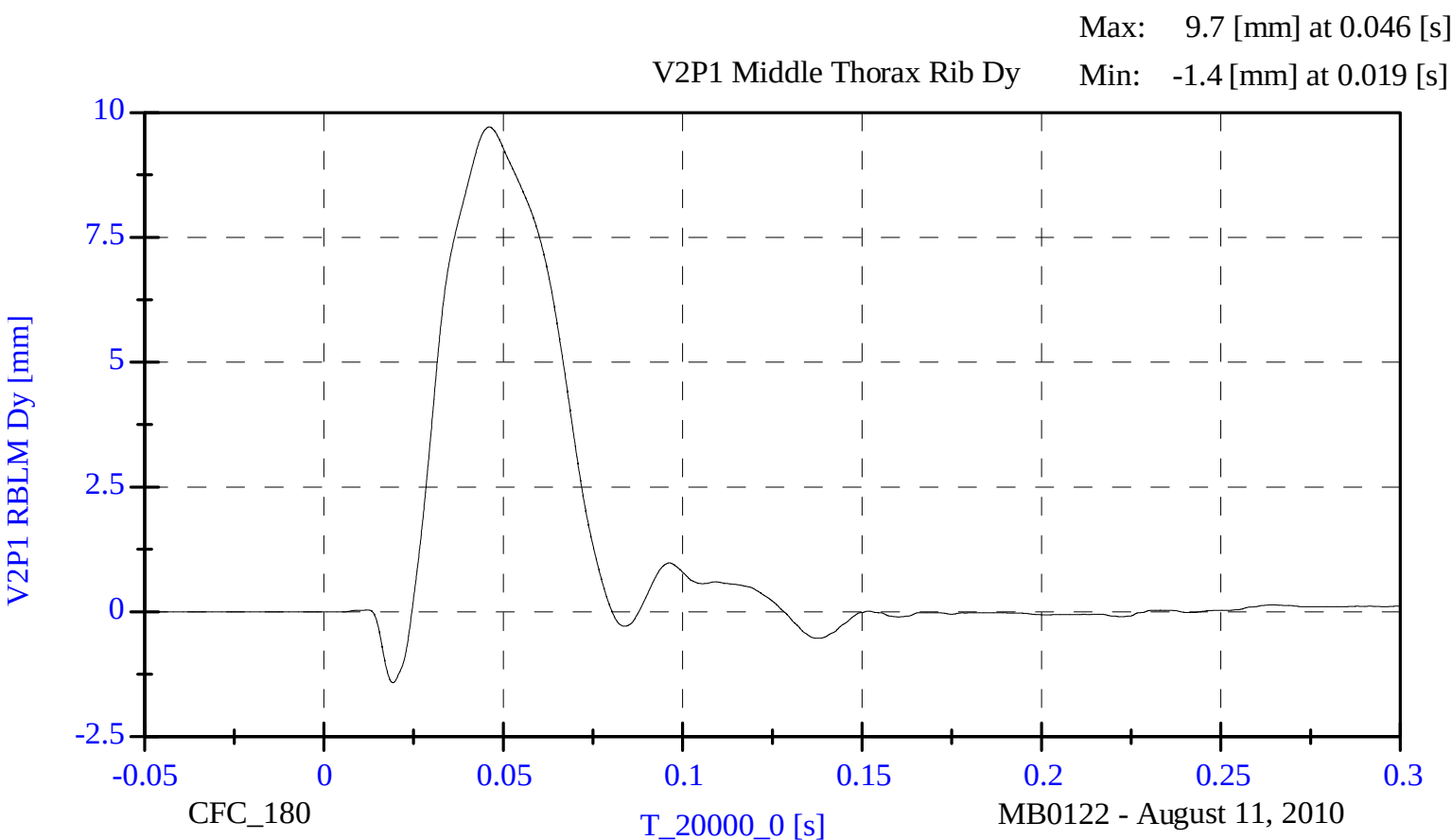
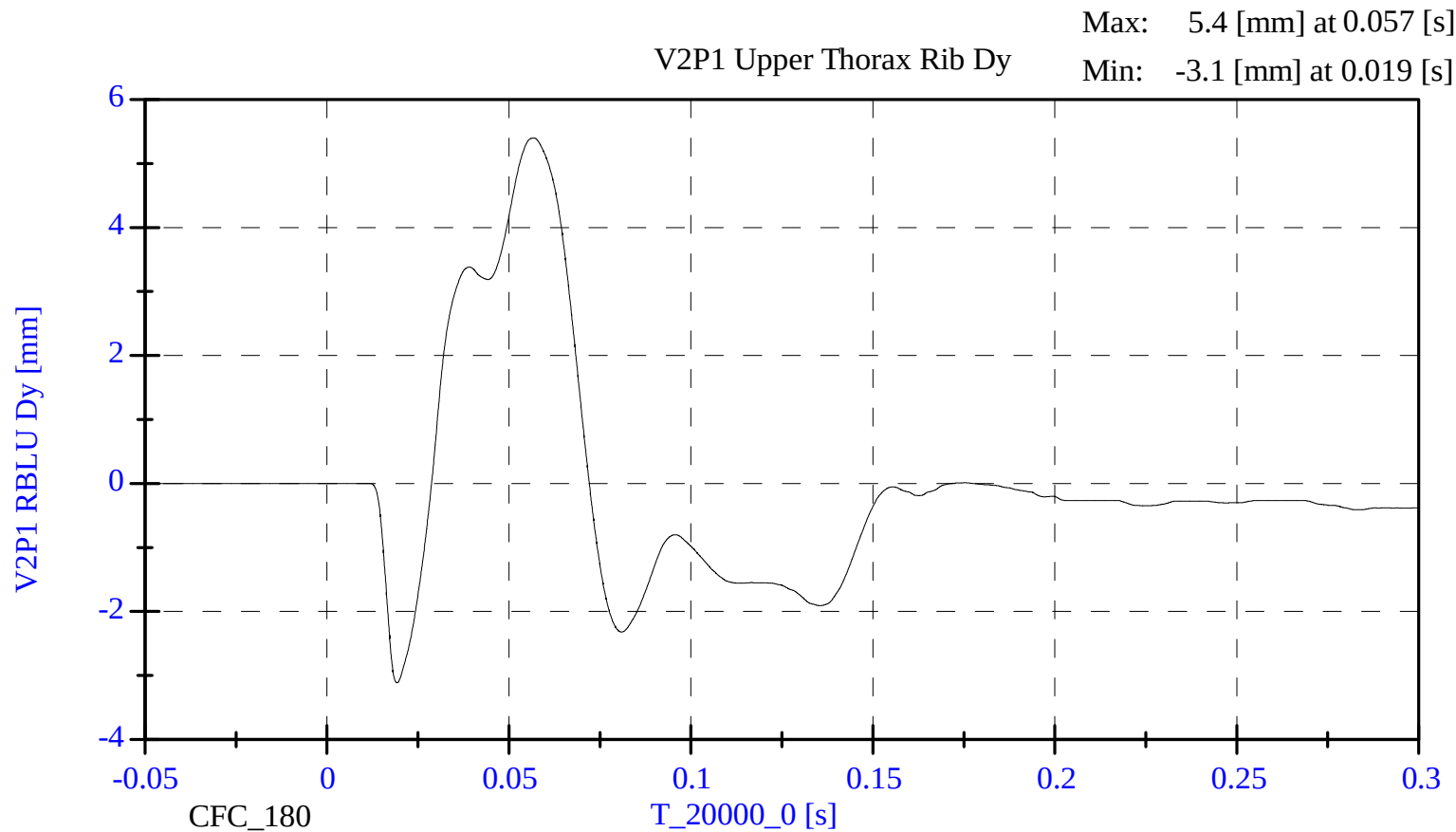
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch



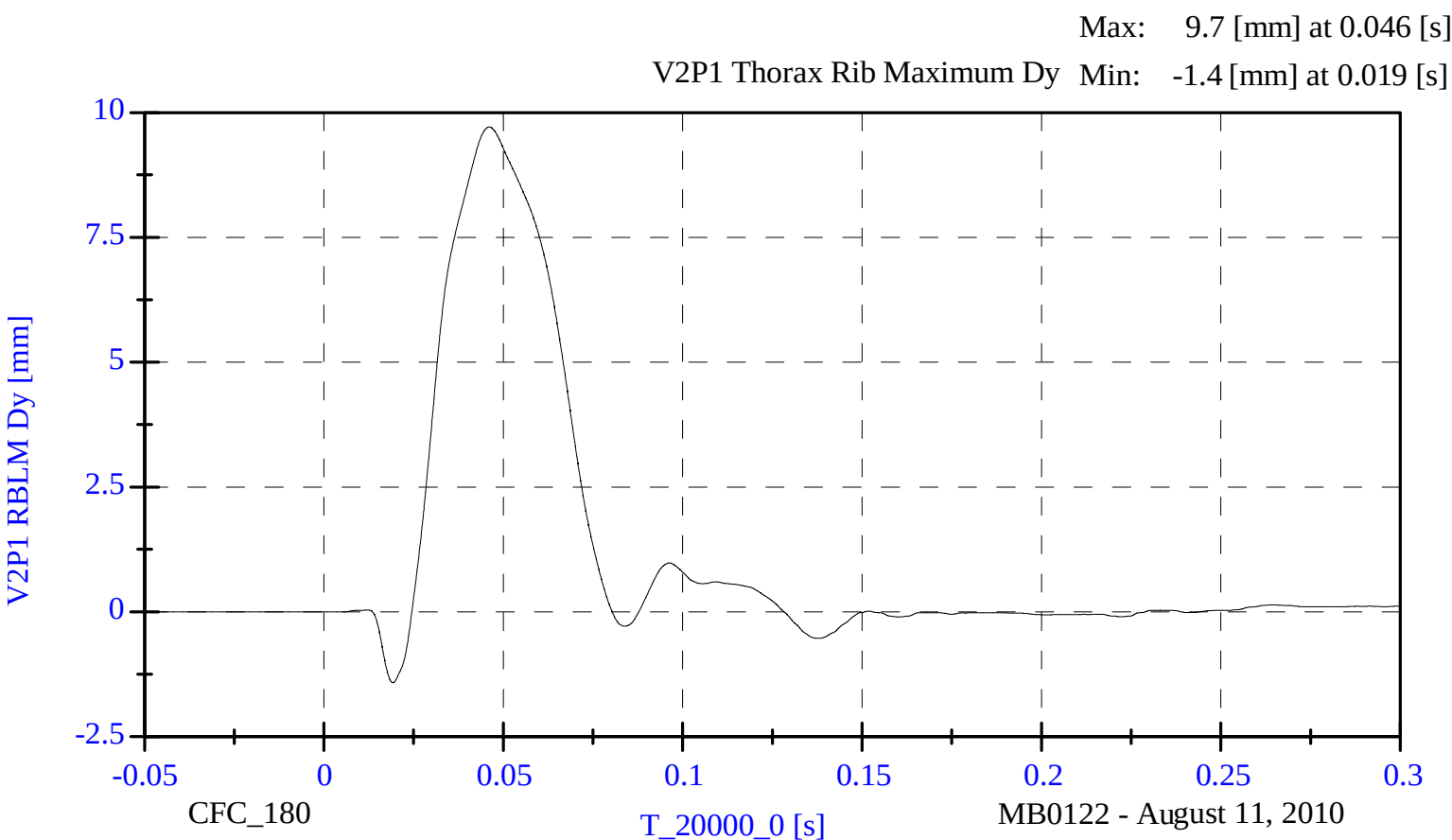
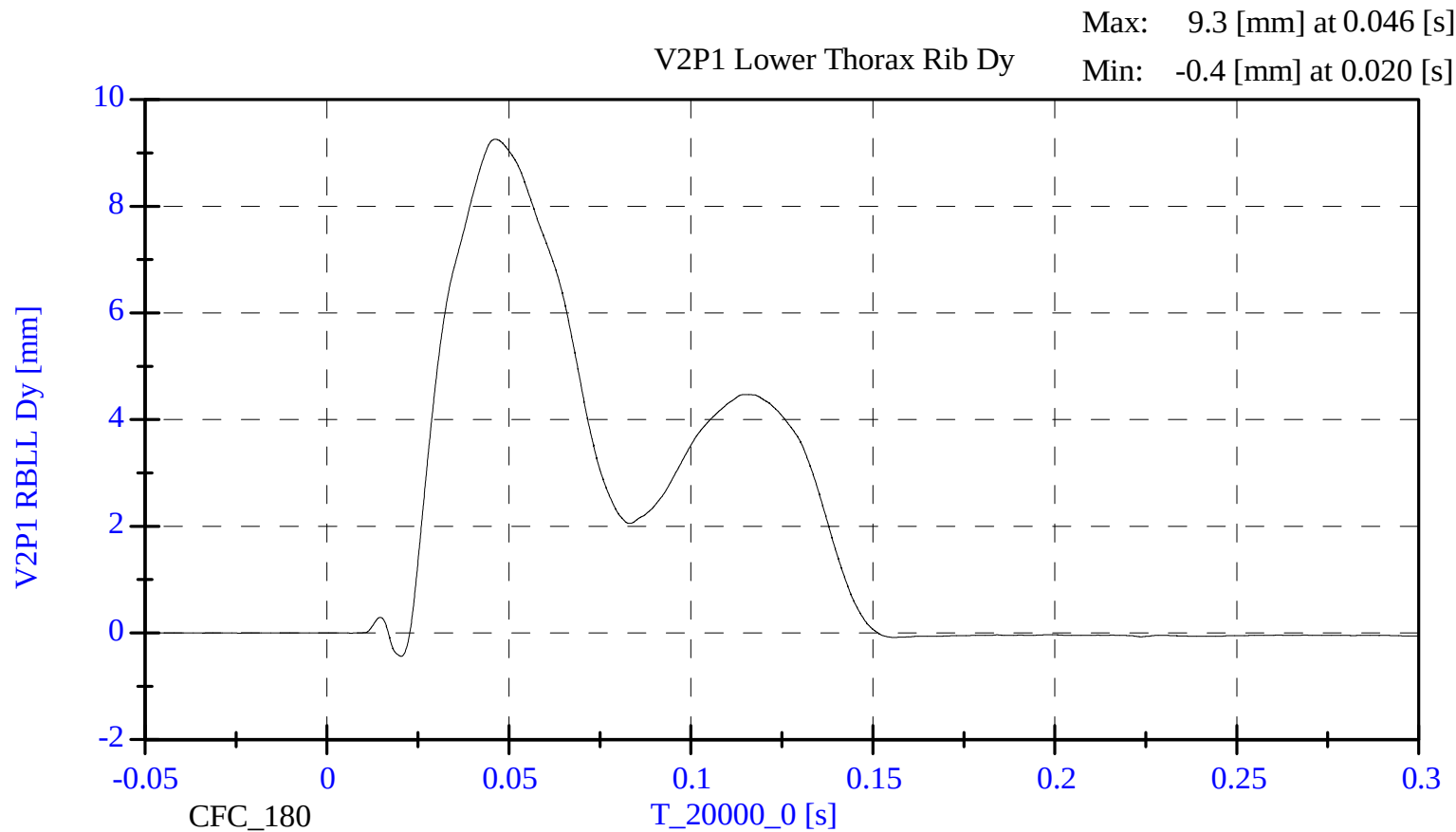
MB0122 - August 11, 2010



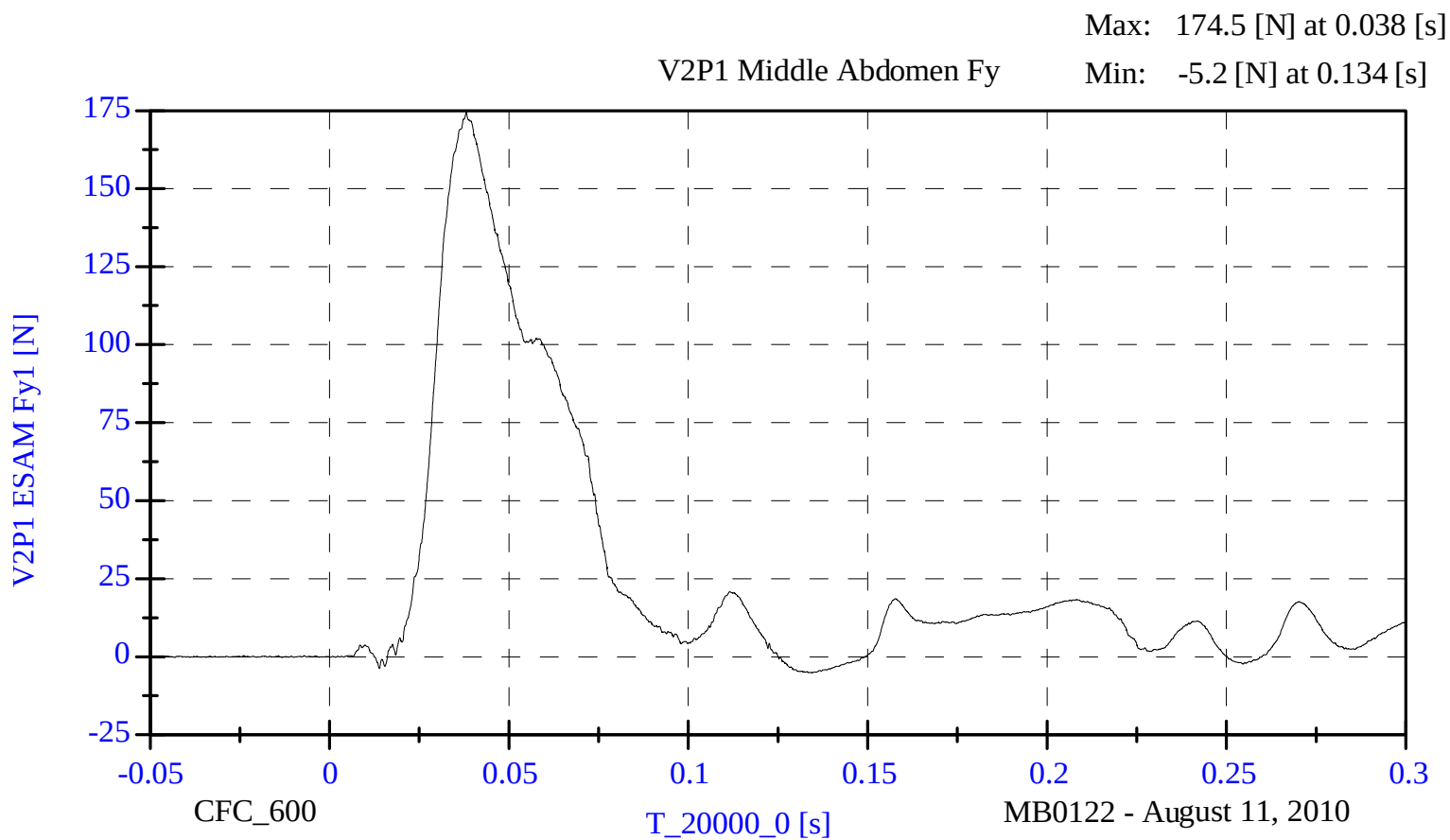
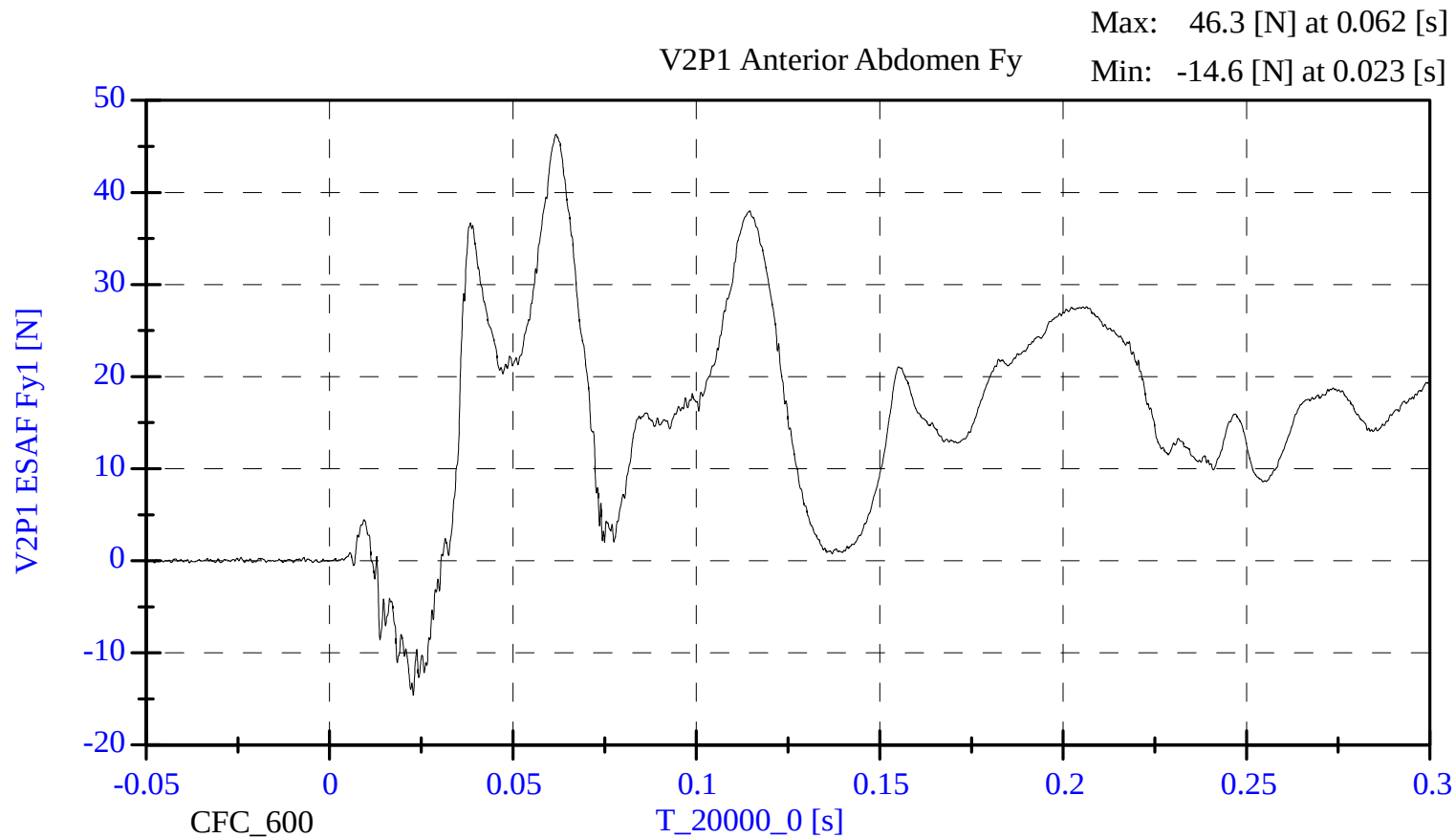
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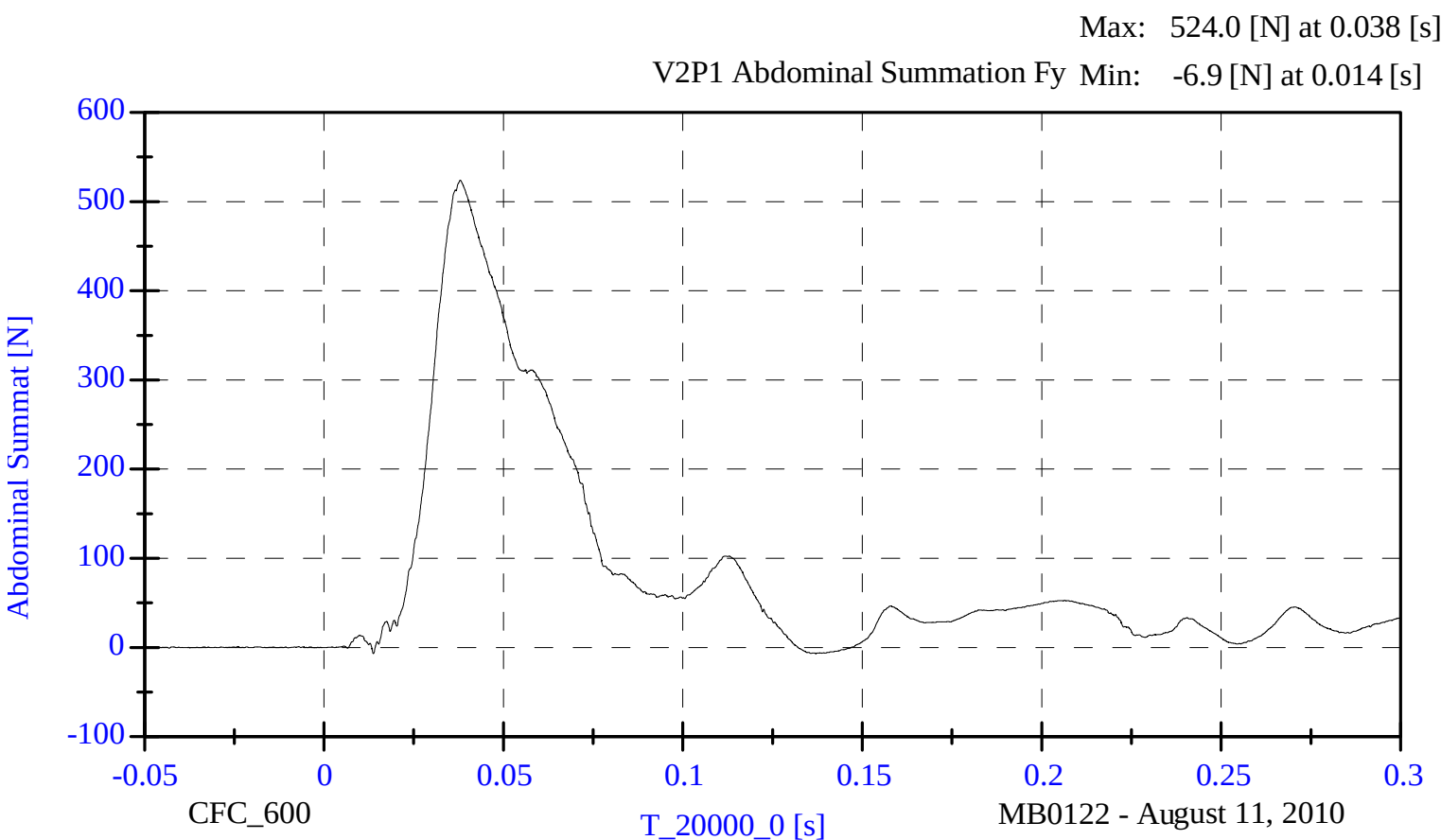
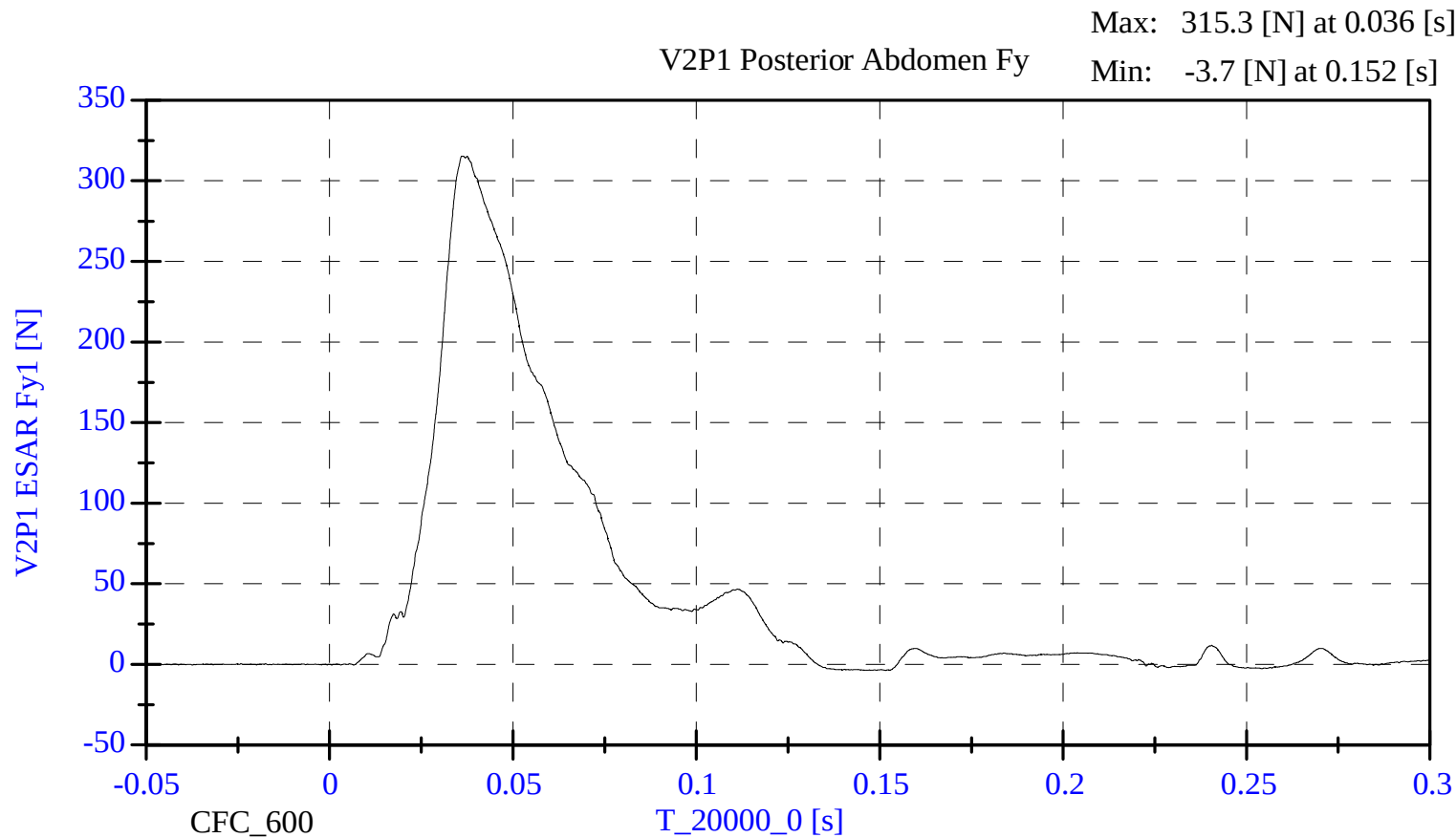


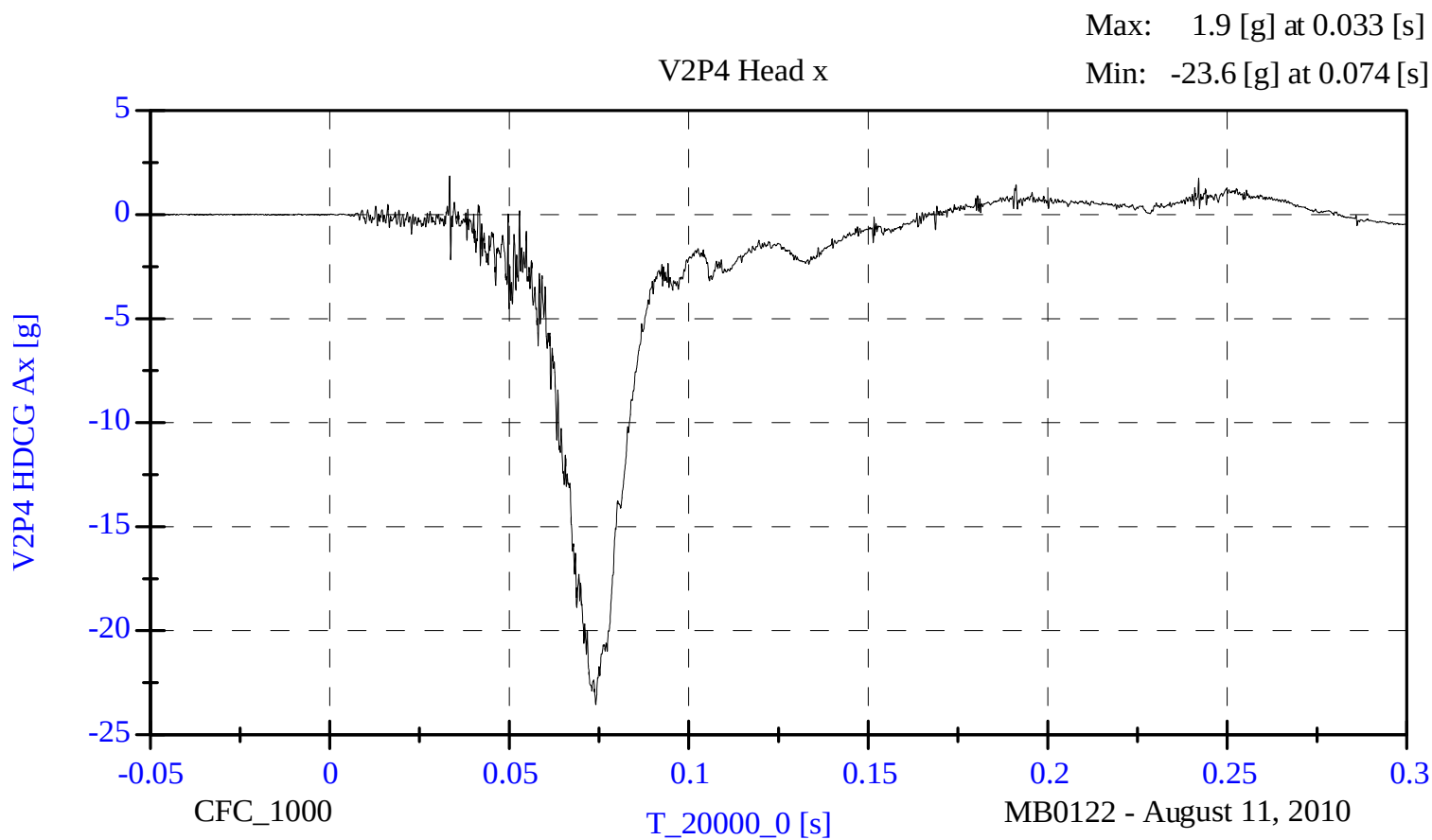
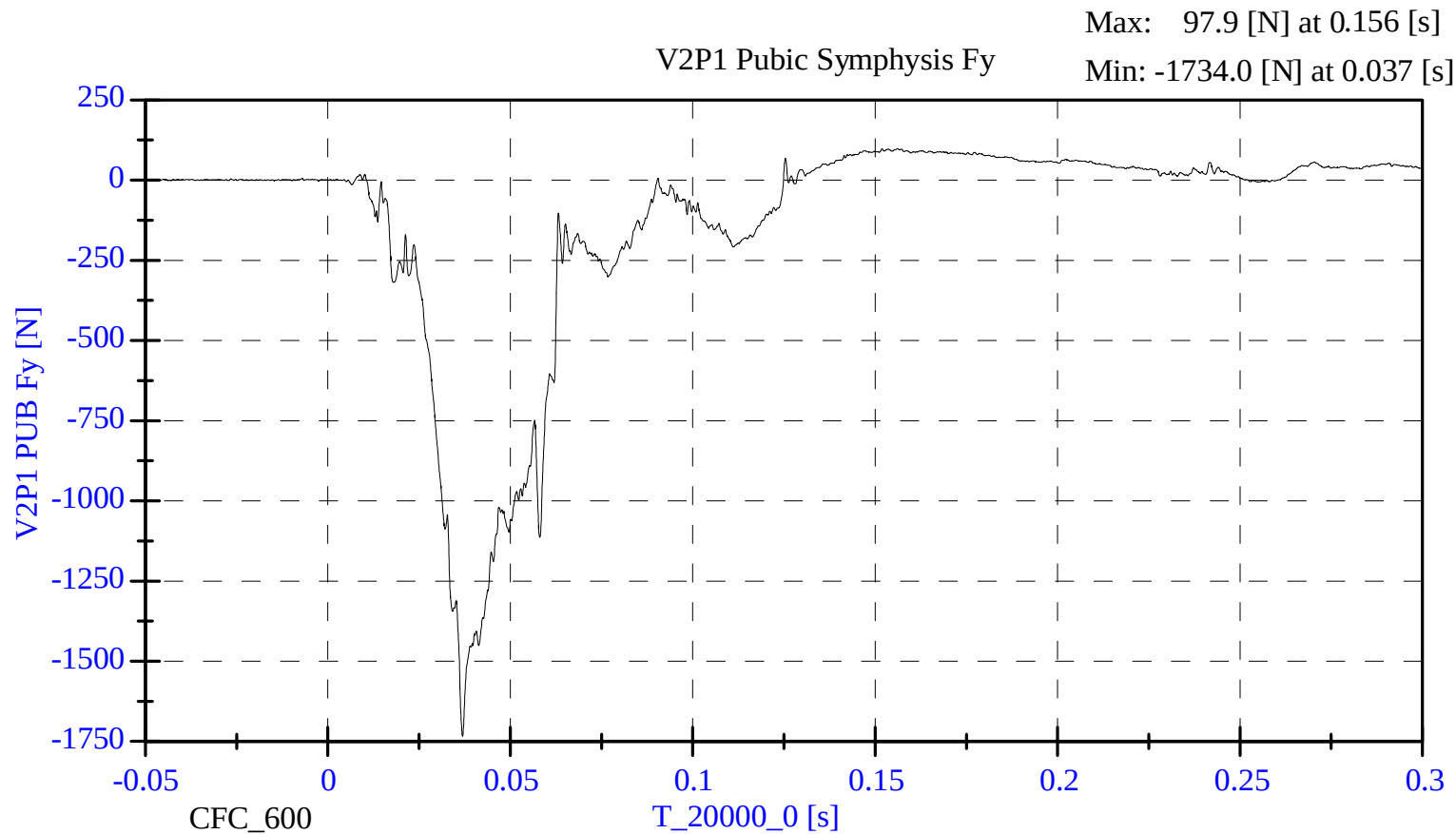
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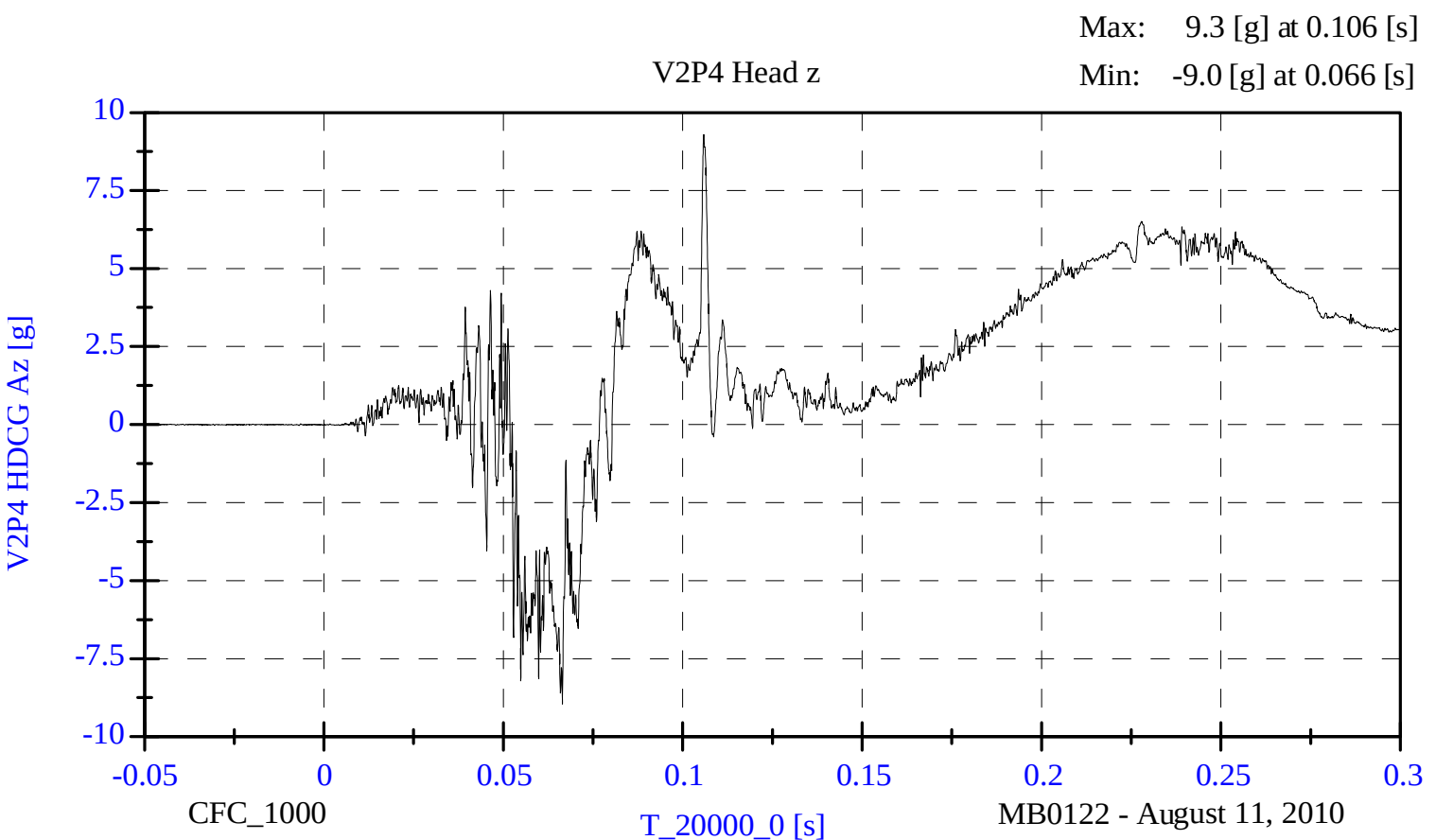
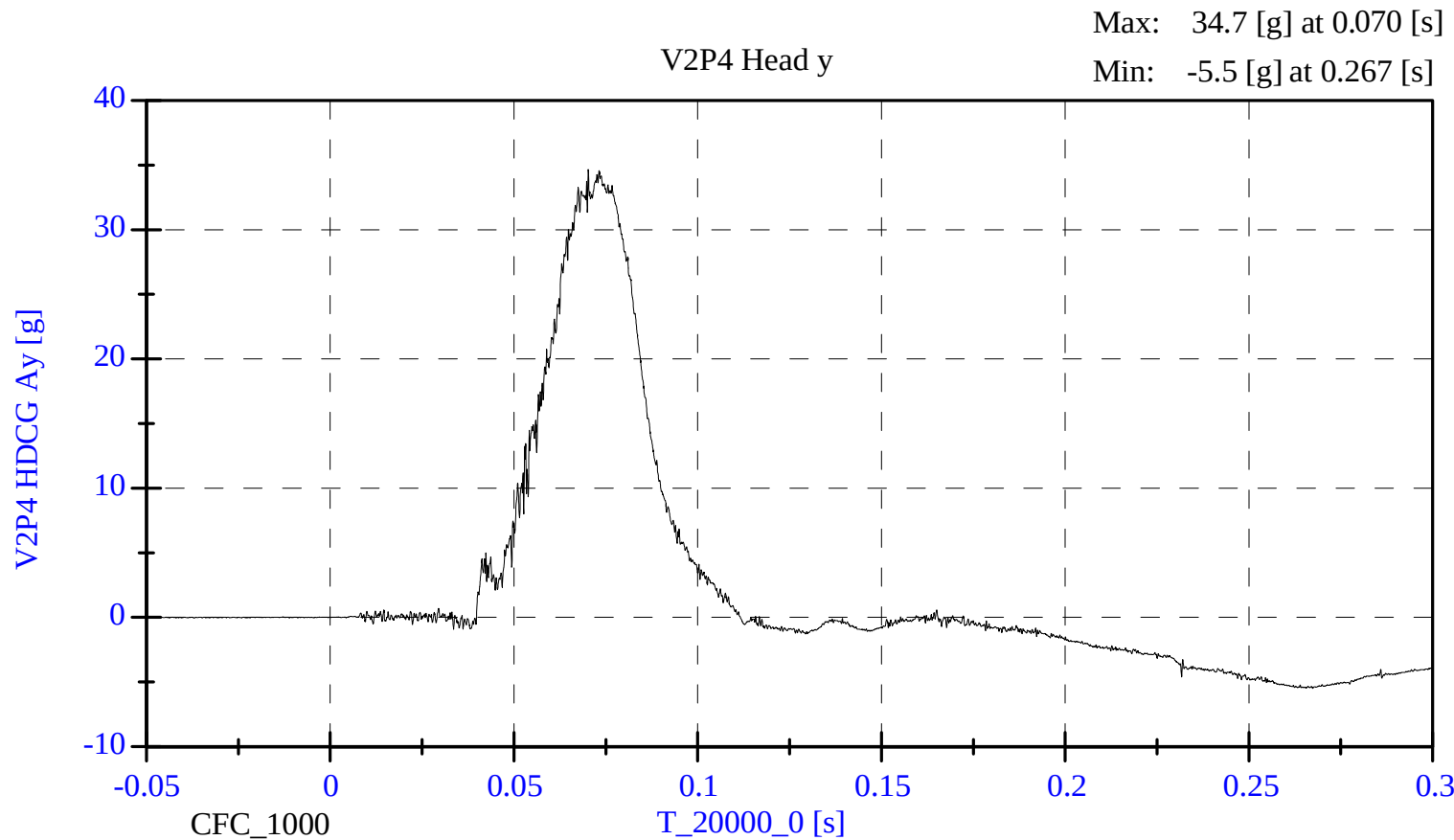
MB0122 - August 11, 2010



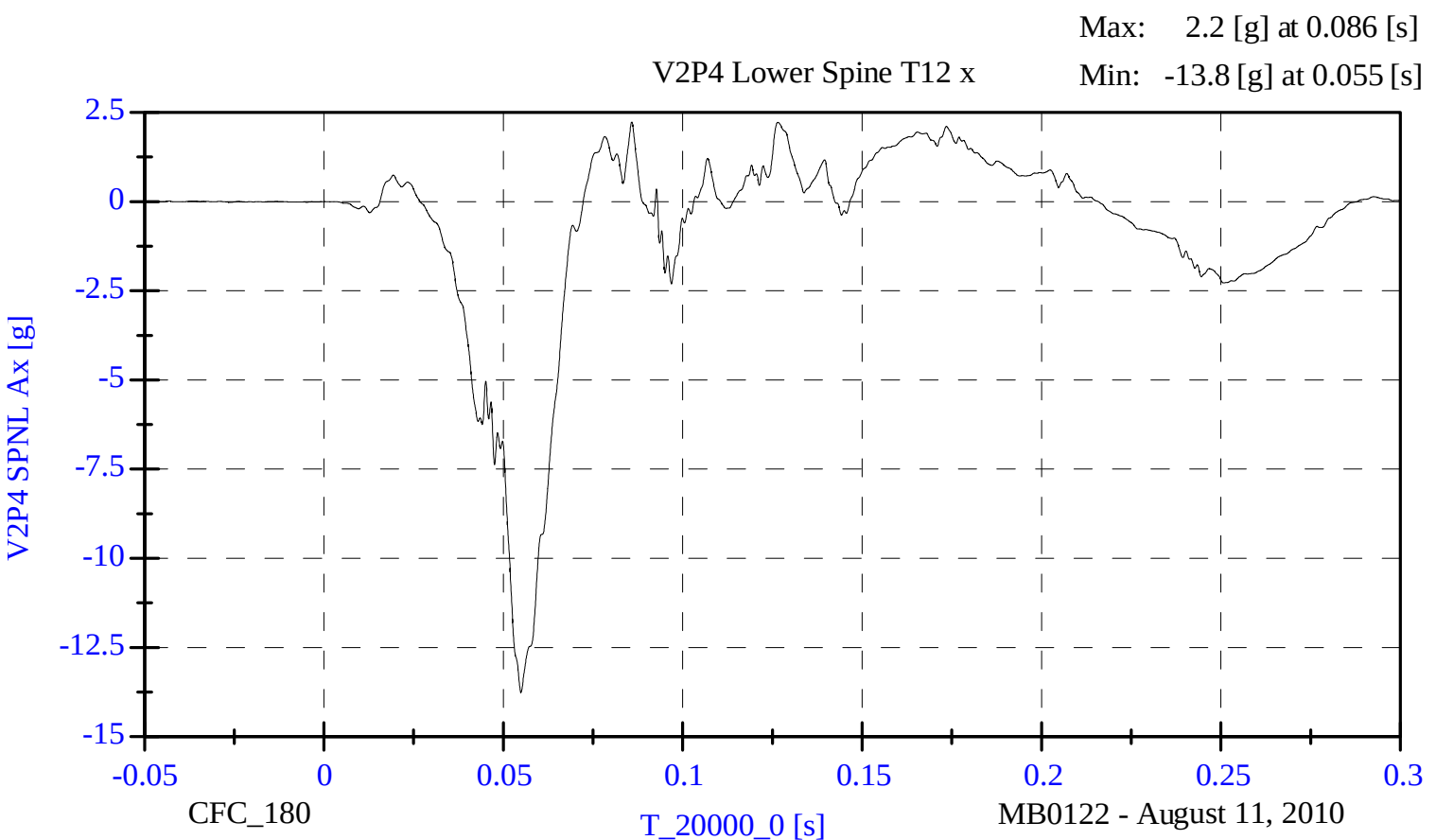
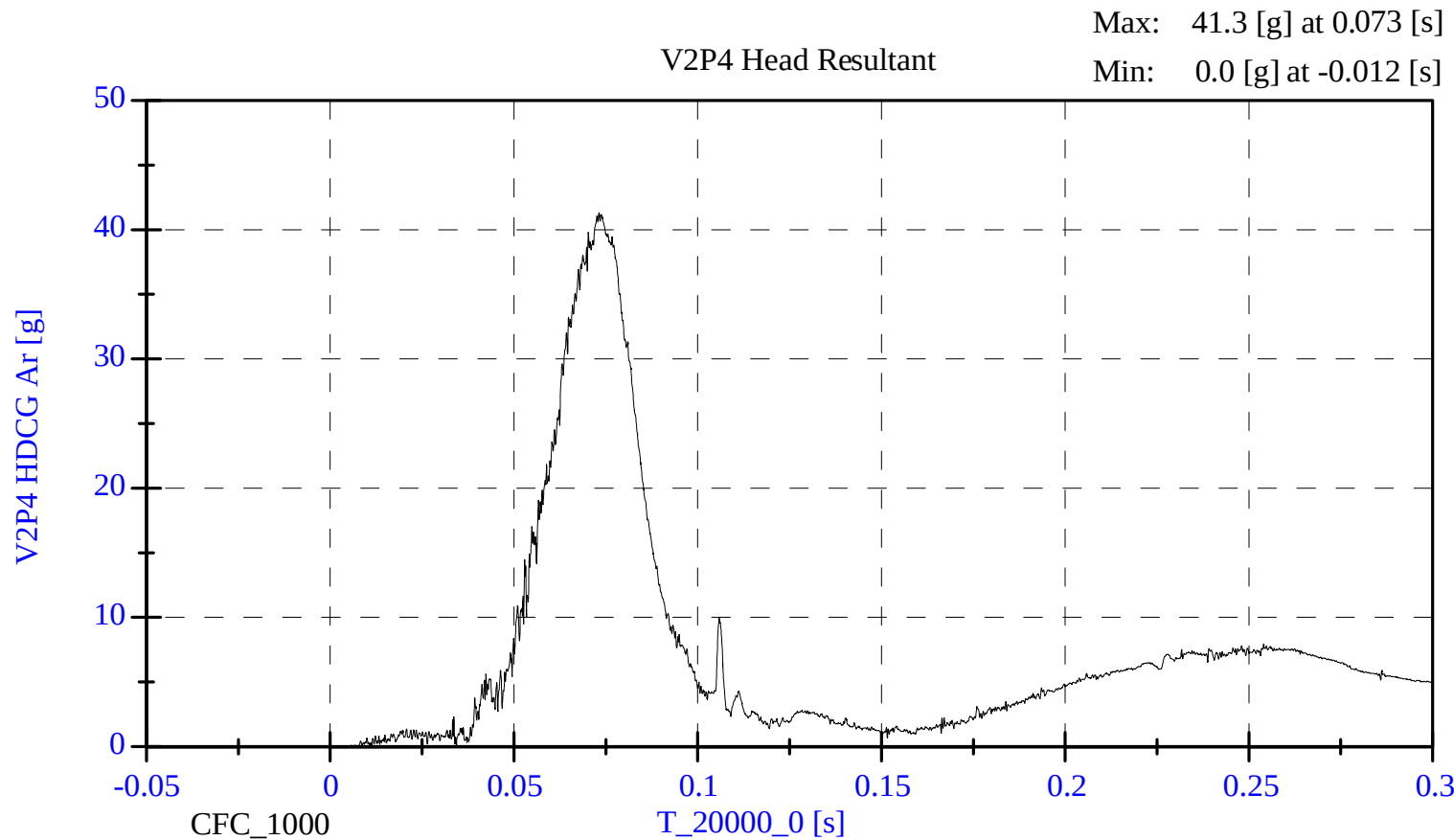


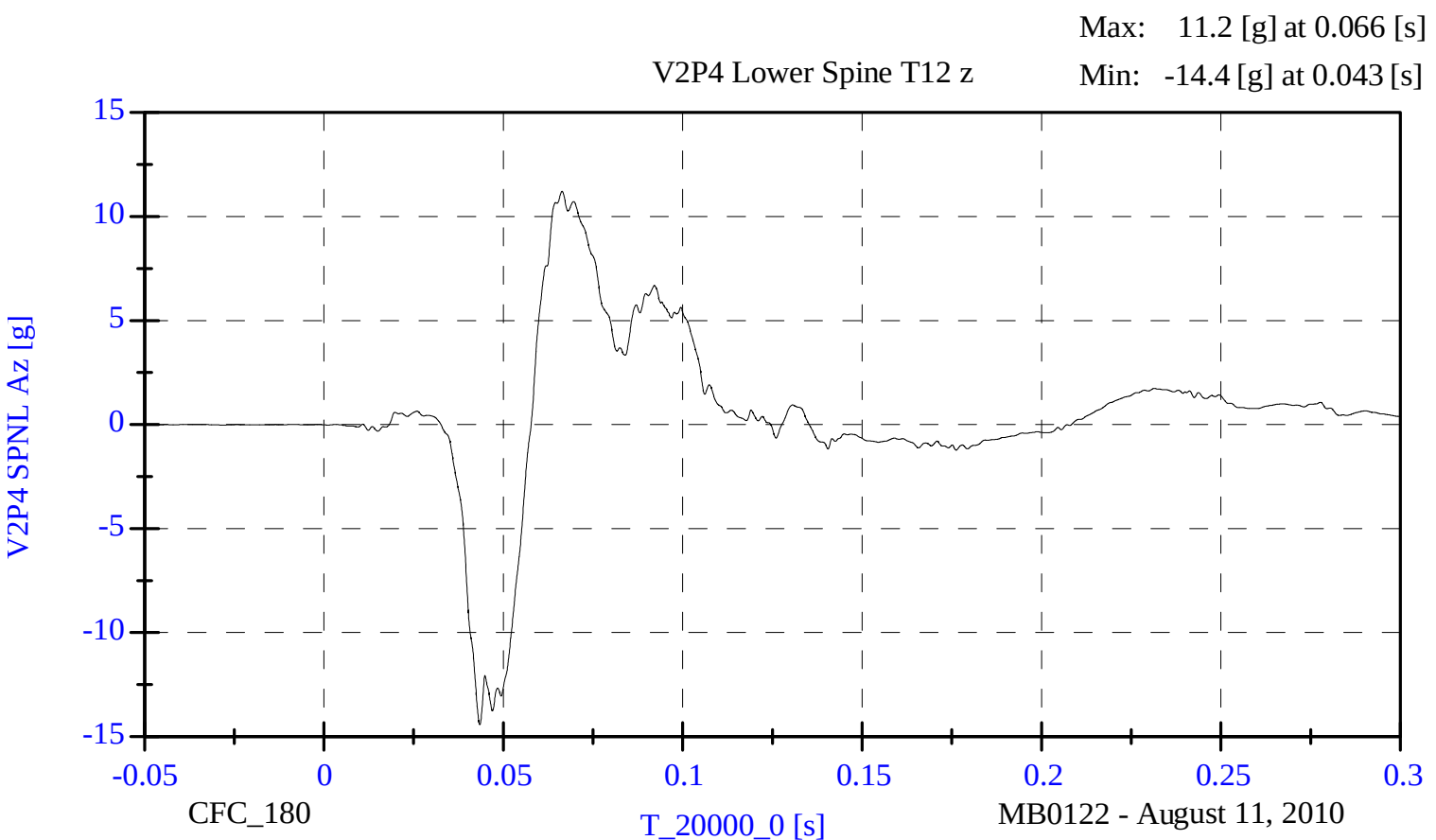
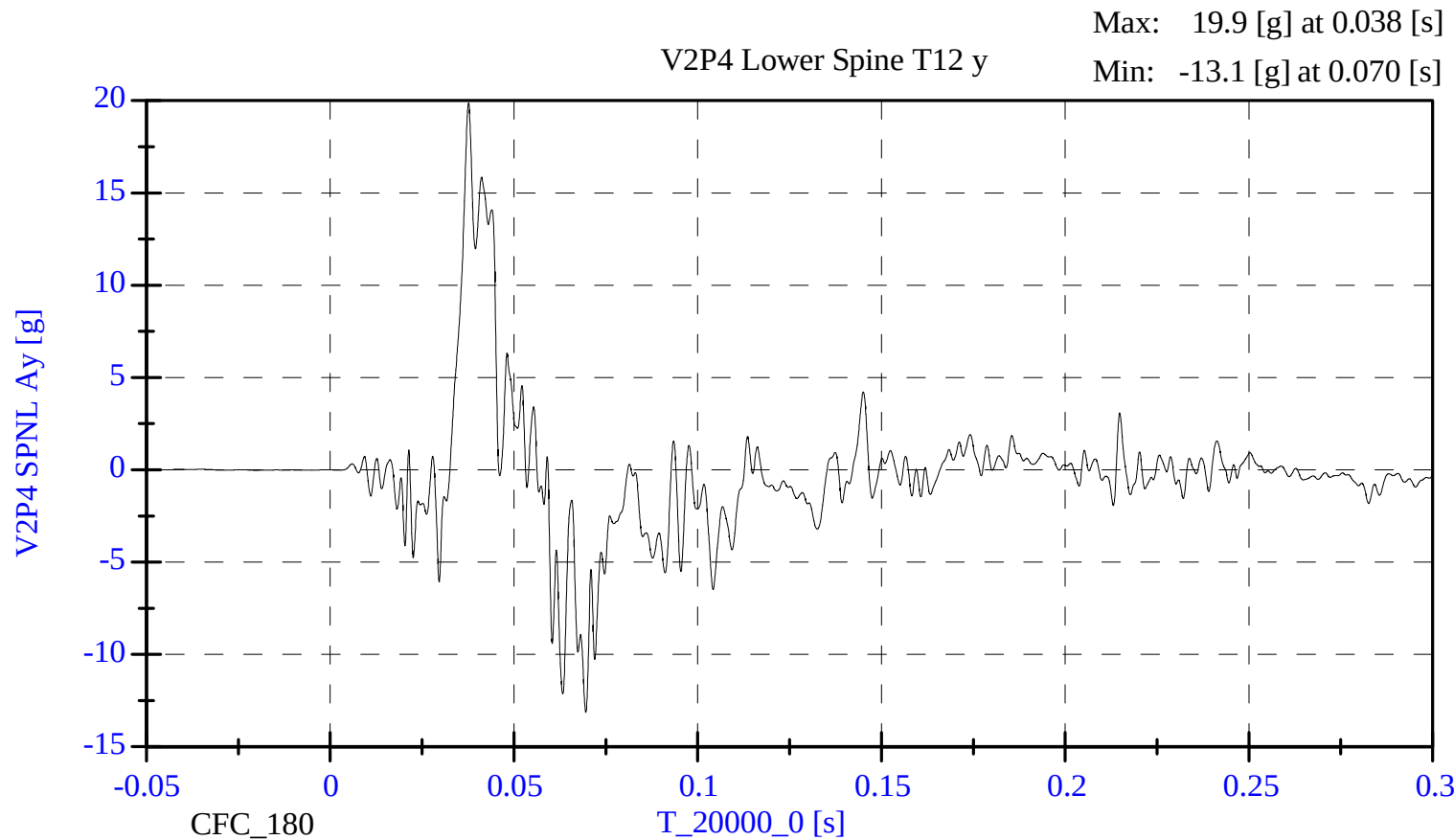


MB0122 - August 11, 2010

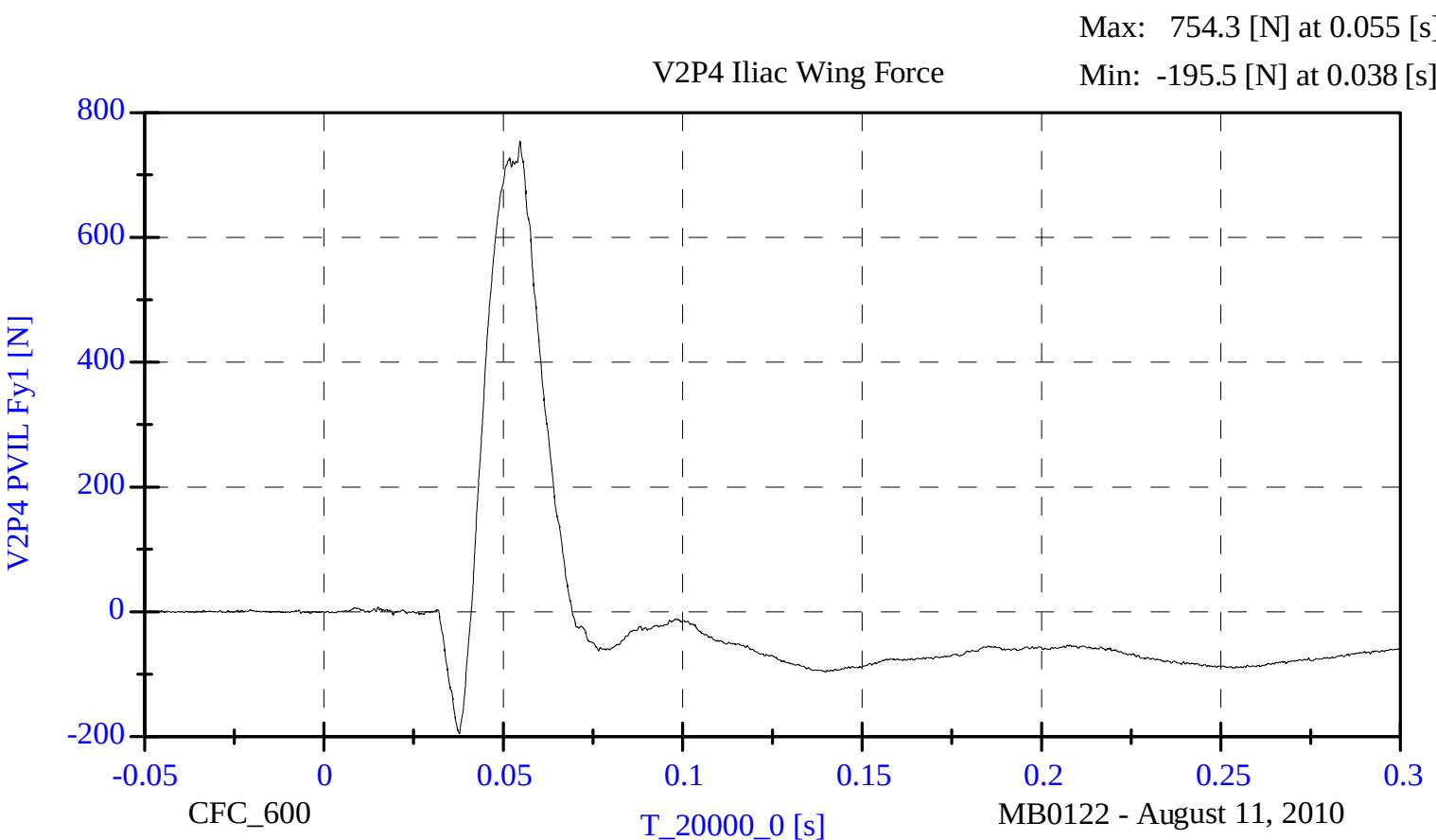
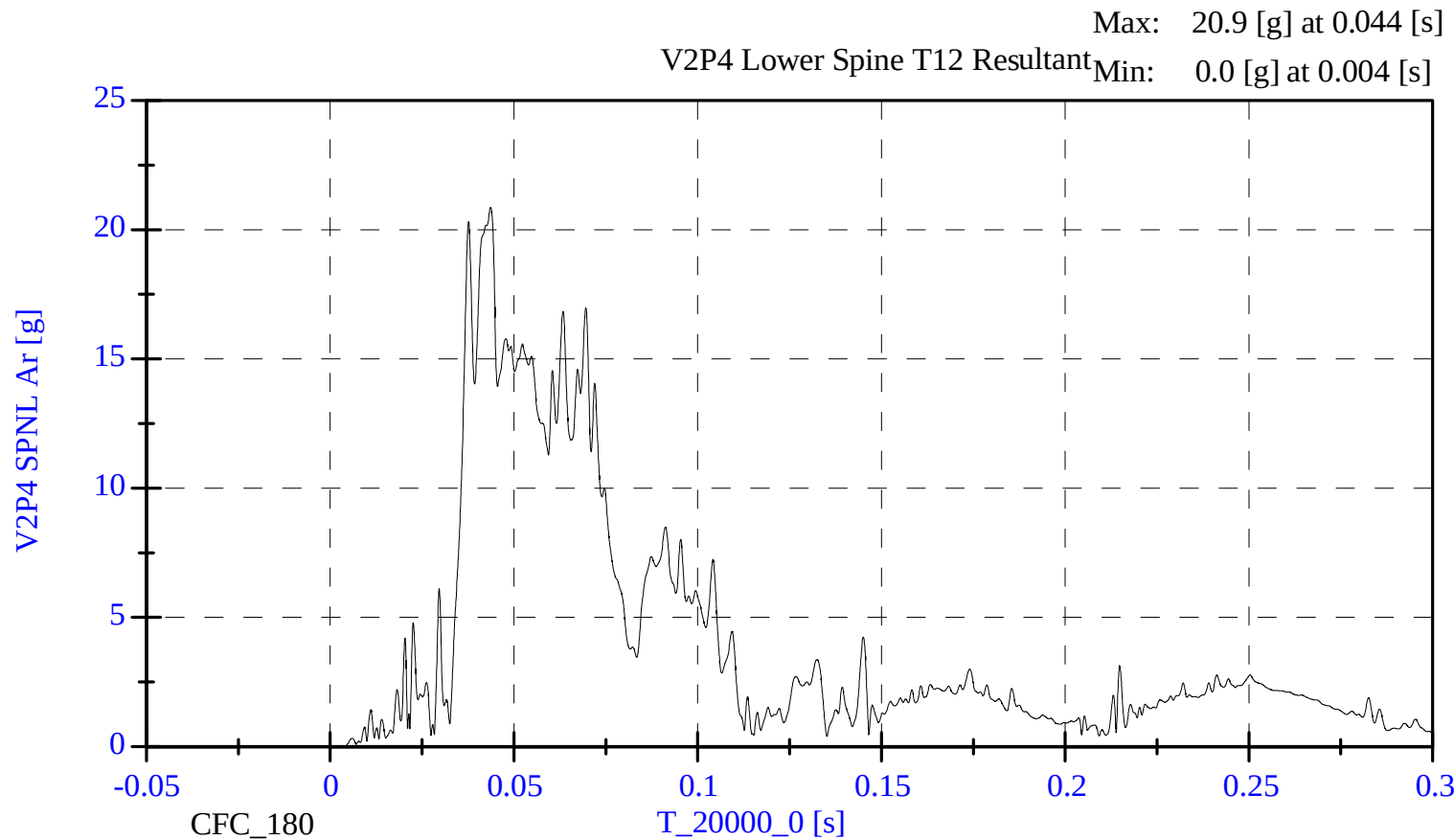


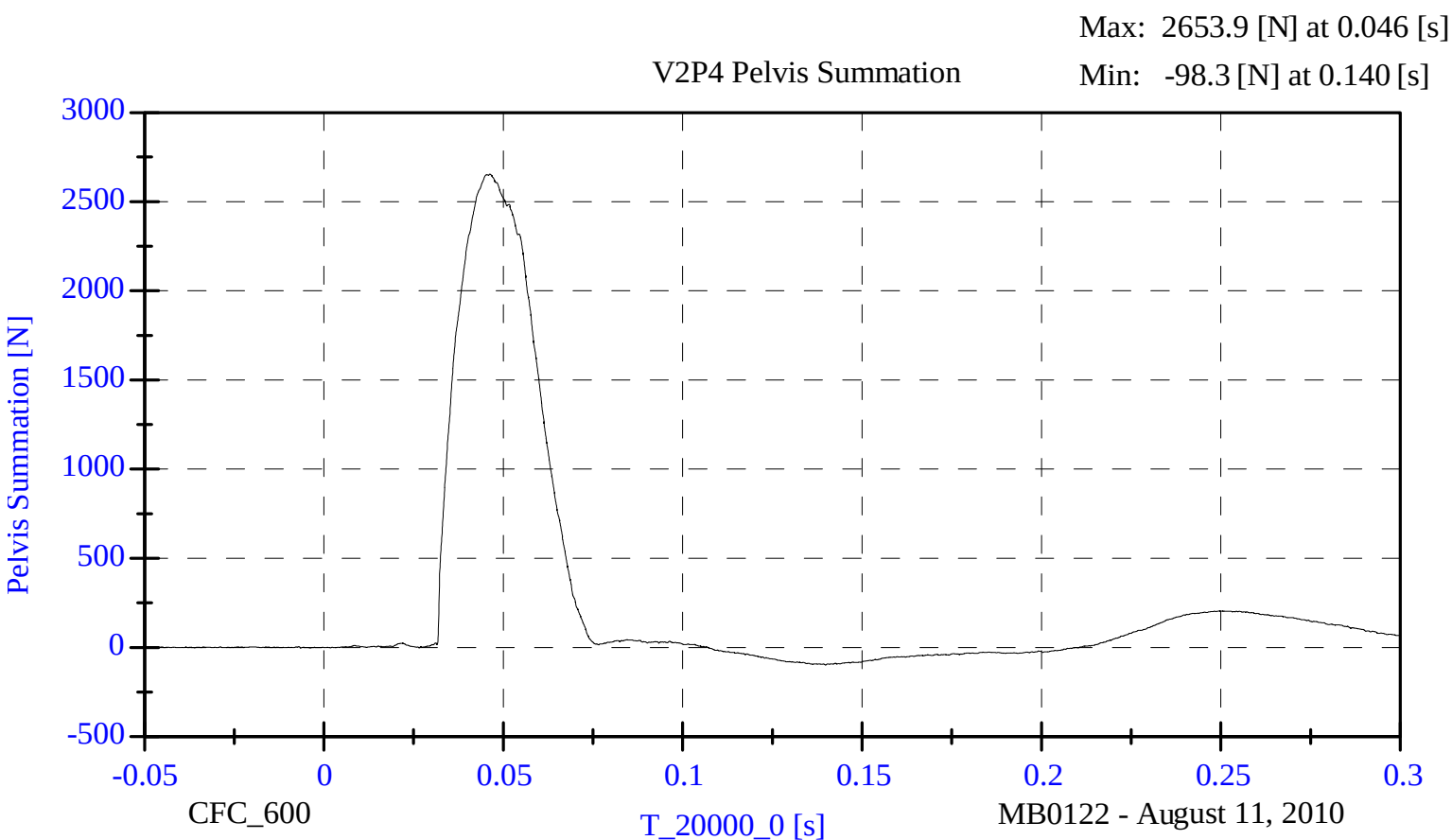
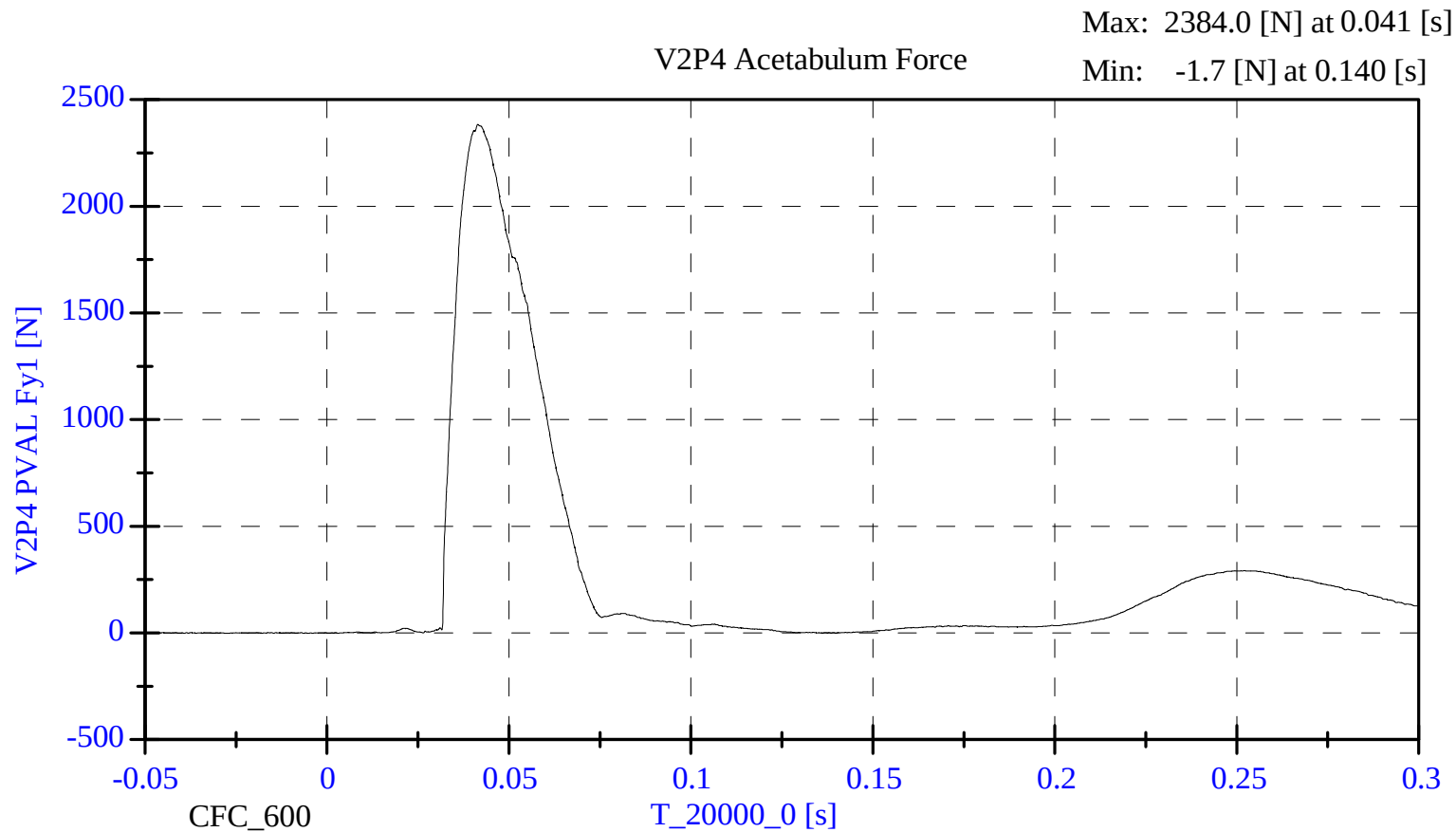
MB0122 - August 11, 2010





MB0122 - August 11, 2010





MB0122 - August 11, 2010

APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

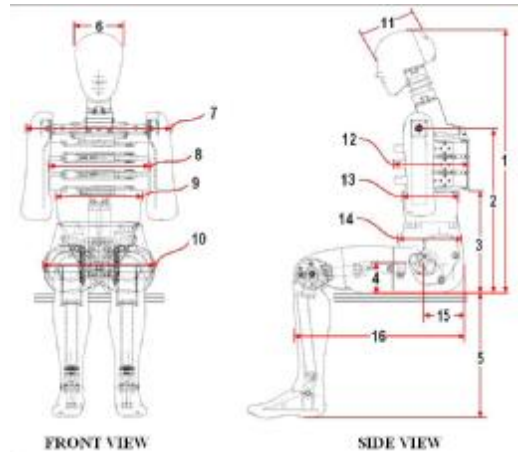
PRE-TEST

Es-2re No: F033

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	906	Pass
2	Seat to Shoulder Joint	558-572	570	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	101	Pass
5	Sole to Seat, Sitting	333-451	436	Pass
6	Head Width	152-158	153	Pass
7	Shoulder/Arm Width	461-479	466	Pass
8	Thorax Width	322-332	324	Pass
9	Abdomen Width	273-287	284	Pass
10	Pelvis Lap Width	359-373	368	Pass
11	Head Depth	196-206	202	Pass
12	Thorax Depth	262-272	267	Pass
13	Abdomen Depth	194-204	201	Pass
14	Pelvis Depth	235-245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	158	Pass
16	Back of Buttocks to Front Knee	597-615	603	Pass

Technician: A. Rudniski

Date: 07/29/2010



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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:	7/29/2010
Test Number:	1	Test Time:	1:35:03 PM

Component Part Number	Component Serial Number
455-1007	8473

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	53 %RH P
Resultant Acceleration	125 -- 155	142 g P
Oscillation	0.0 -- 15.0	3.4 % P
Fore-Aft Acceleration	-15.00 -- 15.00	5.24 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **1:35:03 PM**

Test Date: **7/29/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P15526	7/25/2010
Endevco	7264-2000	P51949	5/26/2010
Endevco	7264-2000	P26269	4/6/2010

Test ID: **Head Drop**

Test Time: **1:35:03 PM**

Test Date: **7/29/2010**



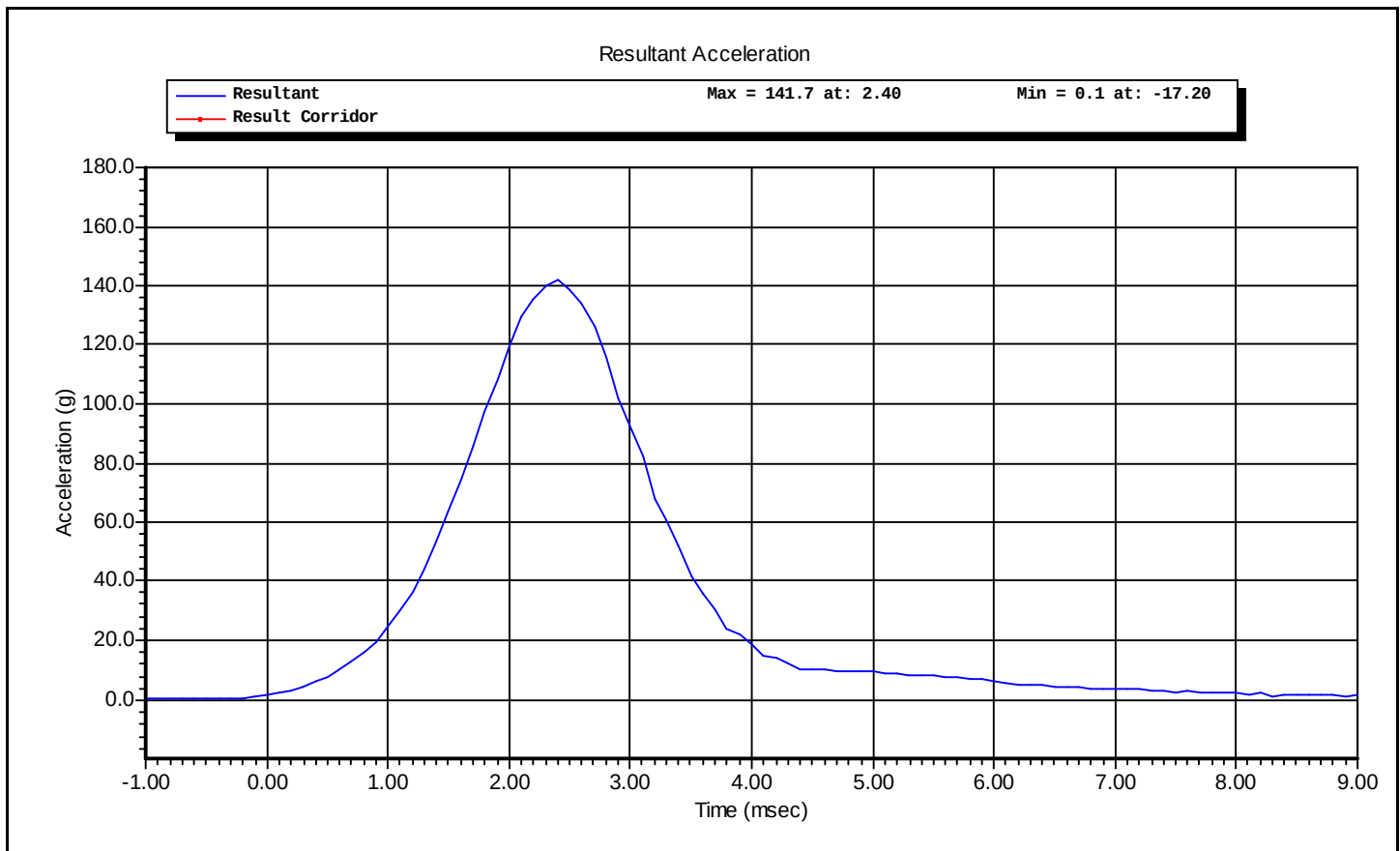
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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	7/29/2010
Test Number:	1	Test Time:	1:35:03 PM

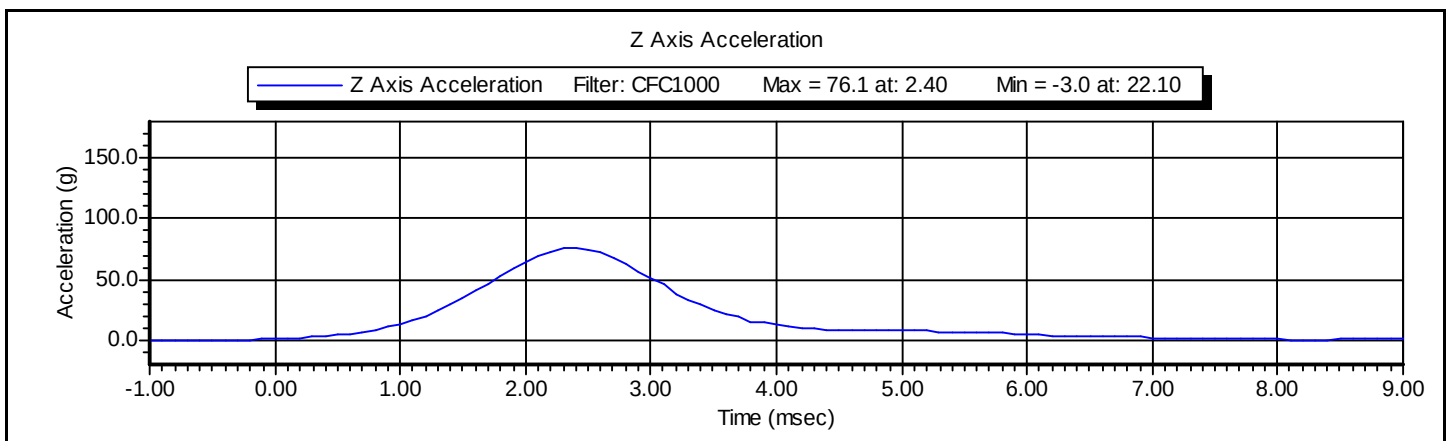
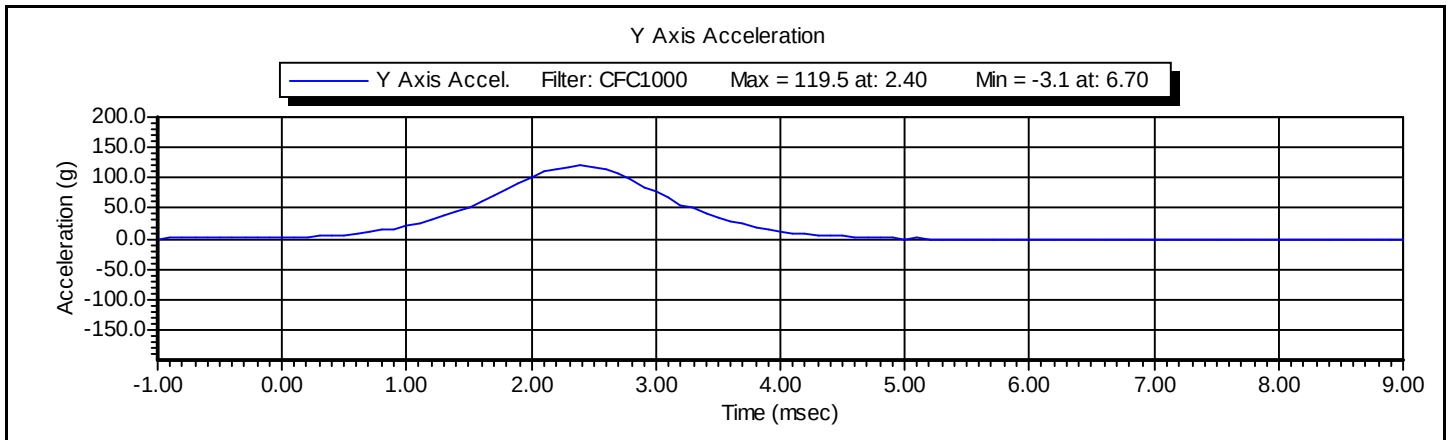
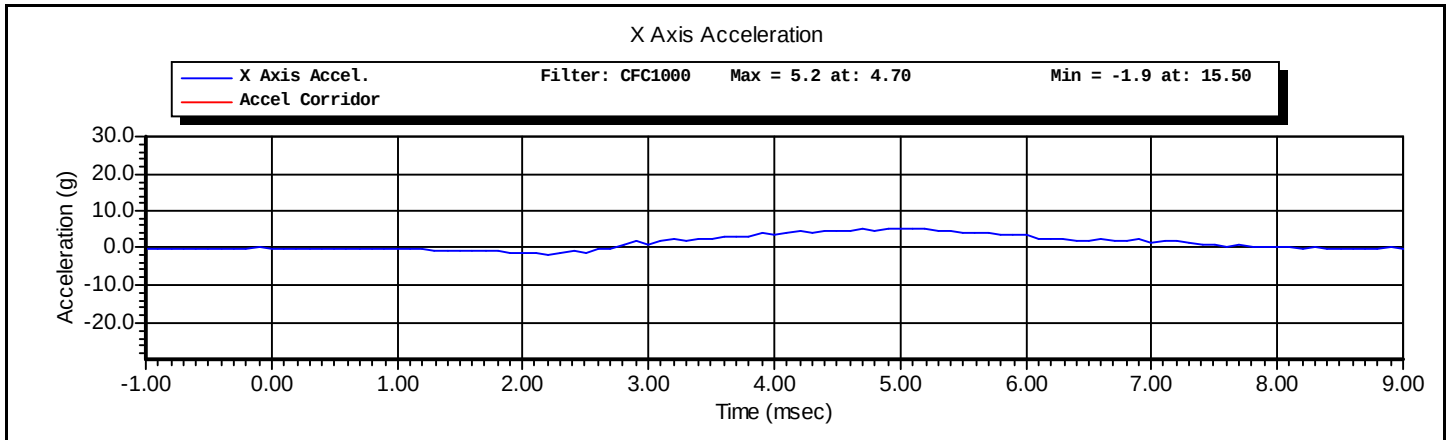
Component Part Number	Component Serial Number
455-1007	8473



Test ID: **Head Drop**

Test Time: **1:35:03 PM**

Test Date: **7/29/2010**





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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:	7/29/2010
Test Number:	1	Test Time:	2:38:40 PM

Component Part Number	Component Serial Number
455-2002	07085

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	56 %RH P
Velocity	3.30 -- 3.50	3.42 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	52.0 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	60.0 ms P
Decay to Zero Degrees	53.0 -- 88.0	57.2 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **2:38:40 PM**

Test Date: **7/29/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Neck Flexion**

Test Time: **2:38:40 PM**

Test Date: **7/29/2010**



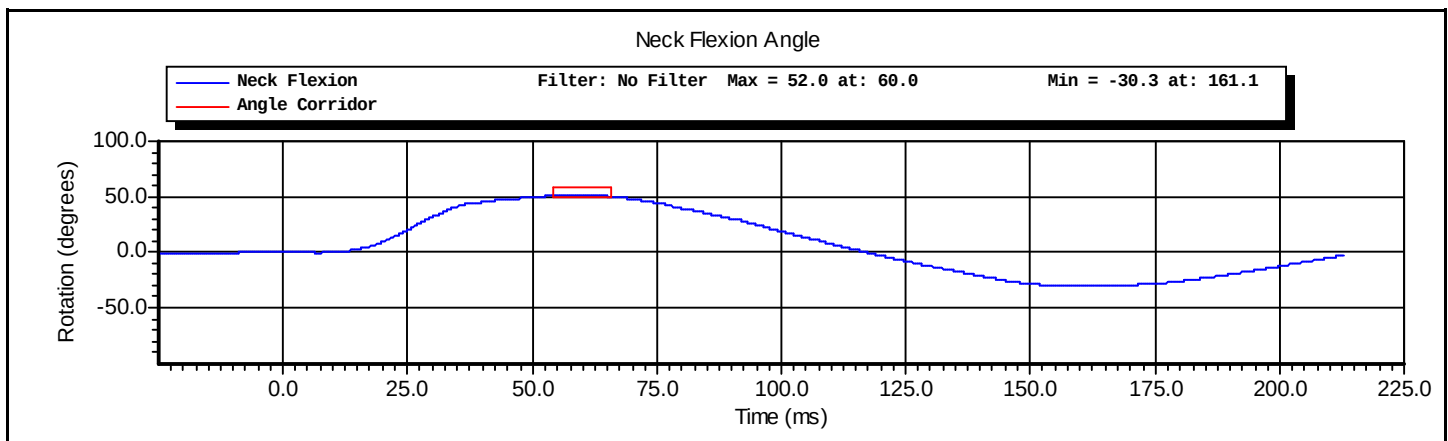
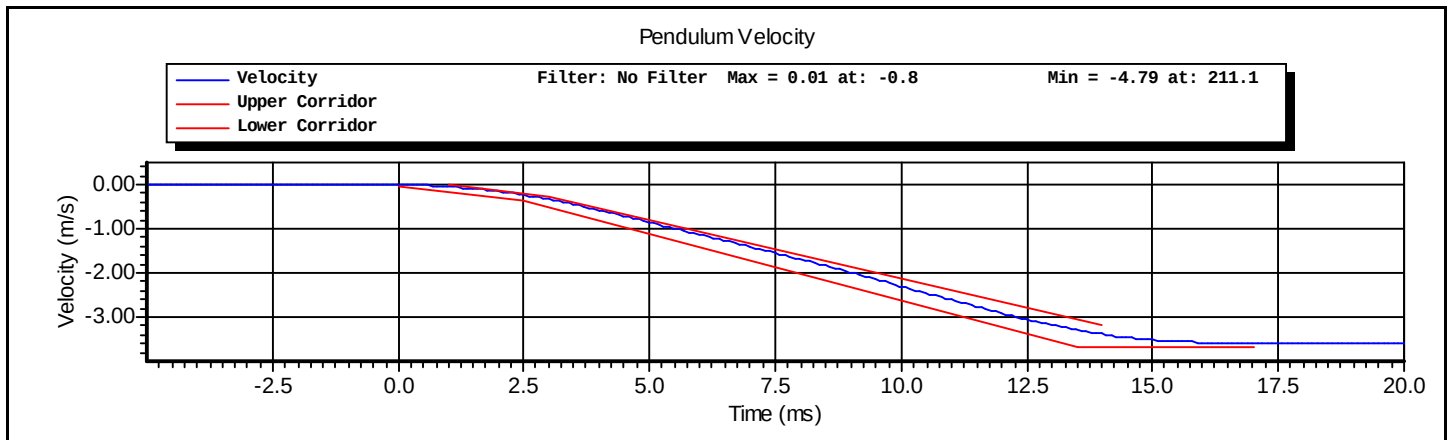
www.calspan.com

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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:	7/29/2010
Test Number:	1	Test Time:	2:38:40 PM

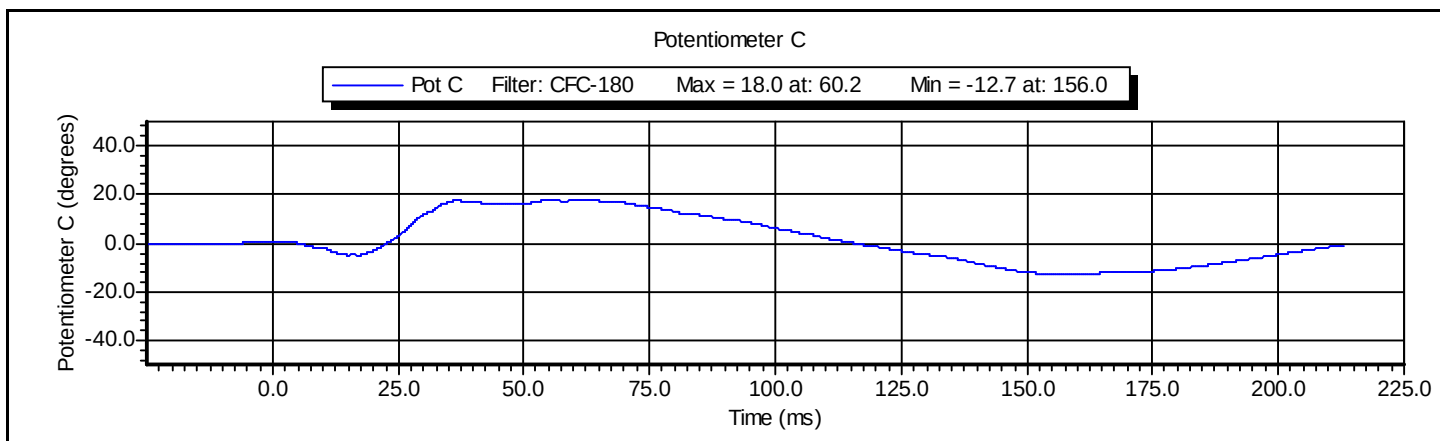
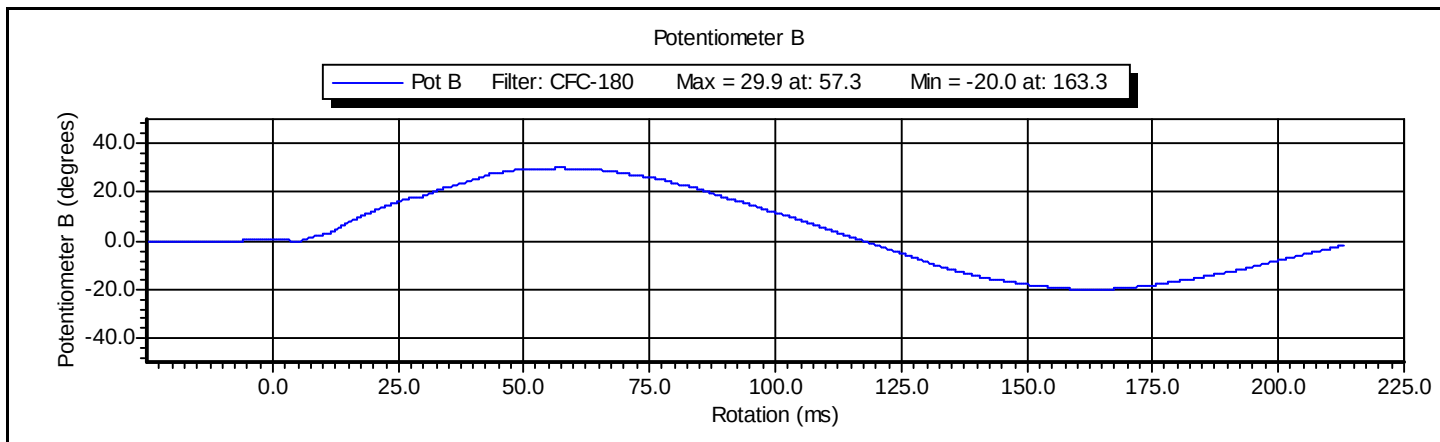
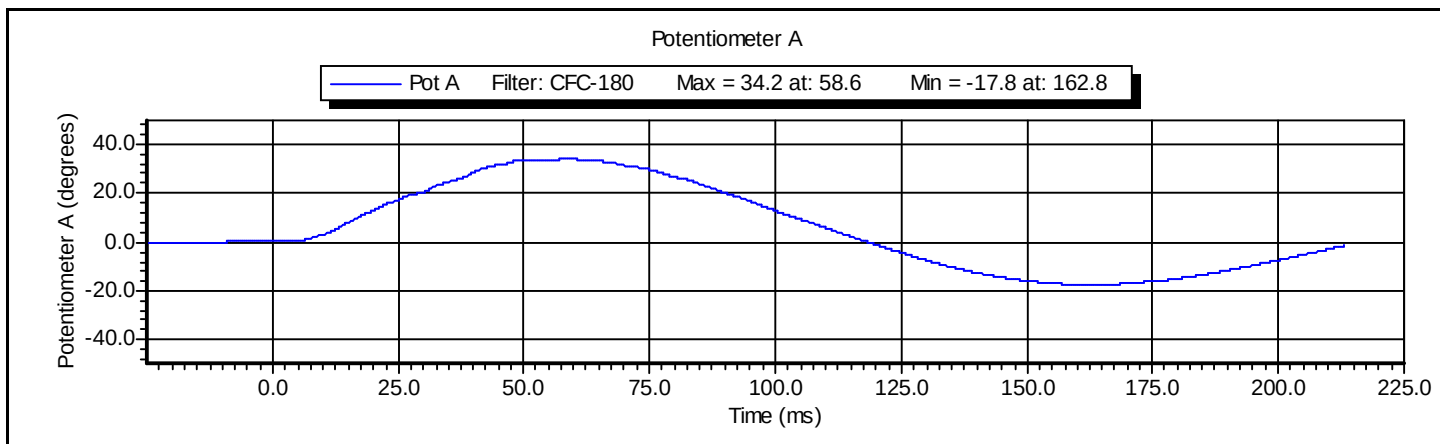
Component Part Number	Component Serial Number
455-2002	07085



Test ID: Neck Flexion

Test Time: 2:38:40 PM

Test Date: 7/29/2010





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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	Test Date:	7/30/2010
Test Number:	1	Test Time:	3:45:42 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	51.0 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.29 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder**

Test Time: **3:45:42 PM**

Test Date: **7/30/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010

Test ID: **Shoulder**

Test Time: **3:45:42 PM**

Test Date: **7/30/2010**



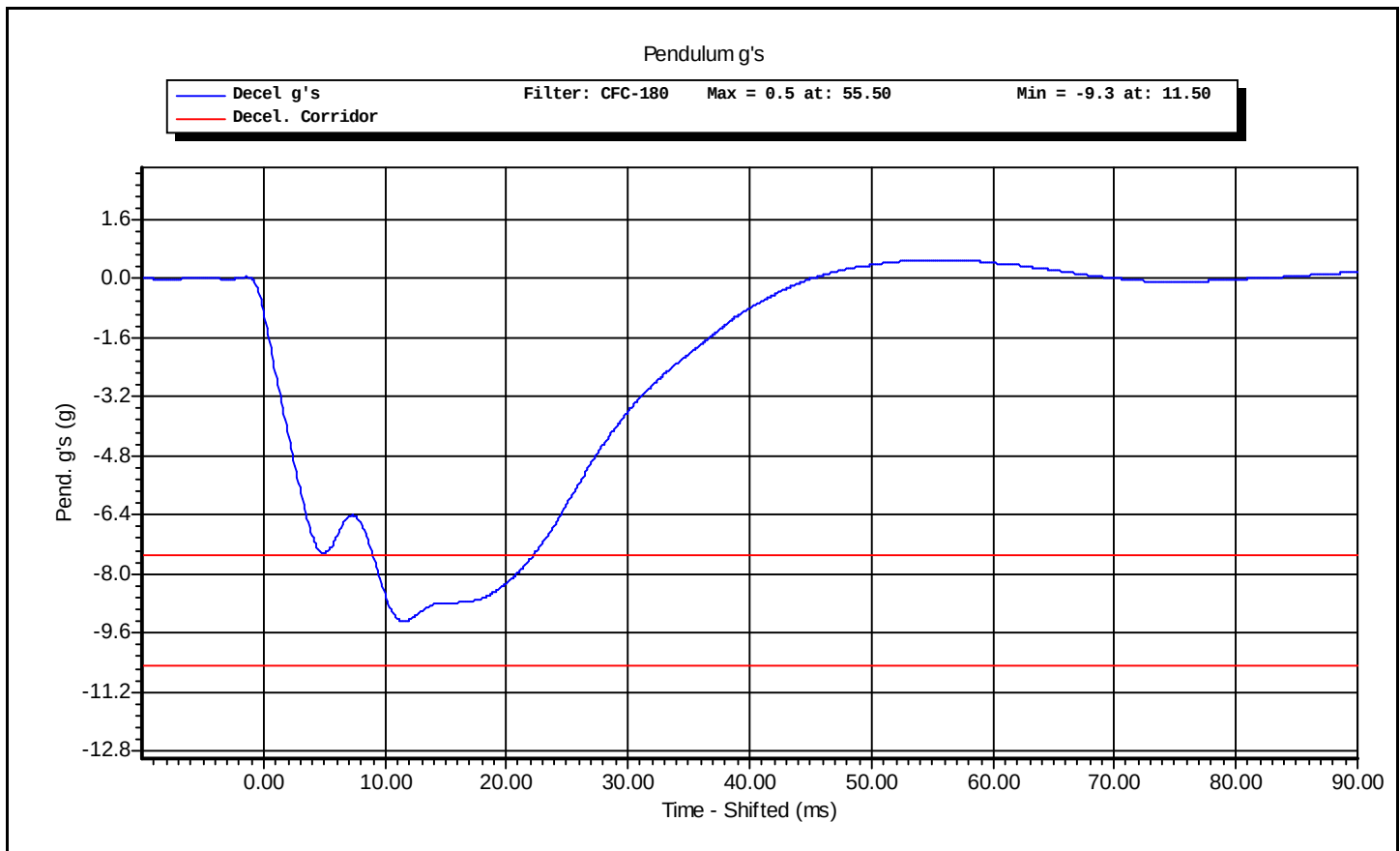
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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	7/30/2010
Test Number:	1	Test Time:	3:45:42 PM

Component Part Number	Component Serial Number
960715-313	



Test ID: **Shoulder**

Test Time: **3:45:42 PM**

Test Date: **7/30/2010**



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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:	7/30/2010
Test Number:	1	Test Time:	1:33:59 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	51.0 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Rib Displacement	-51.00 -- -46.00	-47.62 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: **1:33:59 PM**

Test Date: **7/30/2010**



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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: **1:33:59 PM**

Test Date: **7/30/2010**



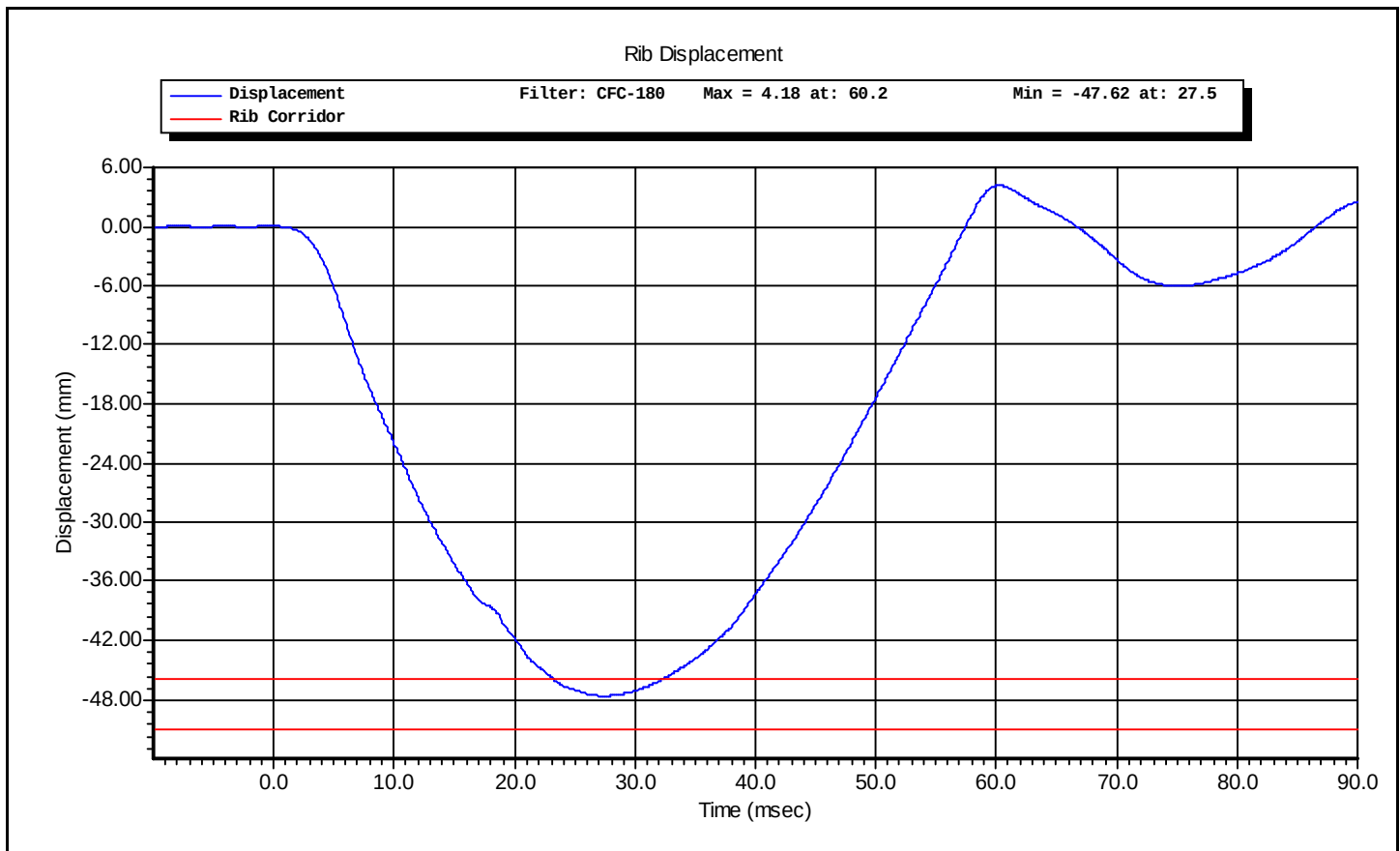
www.calspan.com

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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:	7/30/2010
Test Number:	1	Test Time:	1:33:59 PM

Component Part Number	Component Serial Number
455-3100	LOWER



Test ID: Lower Rib 4 m/s Test Time: 1:33:59 PM

Test Date: 7/30/2010



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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:	7/30/2010
Test Number:	1	Test Time:	1:42:58 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	51.0 %RH P
Velocity	2.90 -- 3.10	2.96 m/s P
Rib Displacement	-40.00 -- -36.00	-37.21 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: **1:42:58 PM**

Test Date: **7/30/2010**



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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: **1:42:58 PM**

Test Date: **7/30/2010**



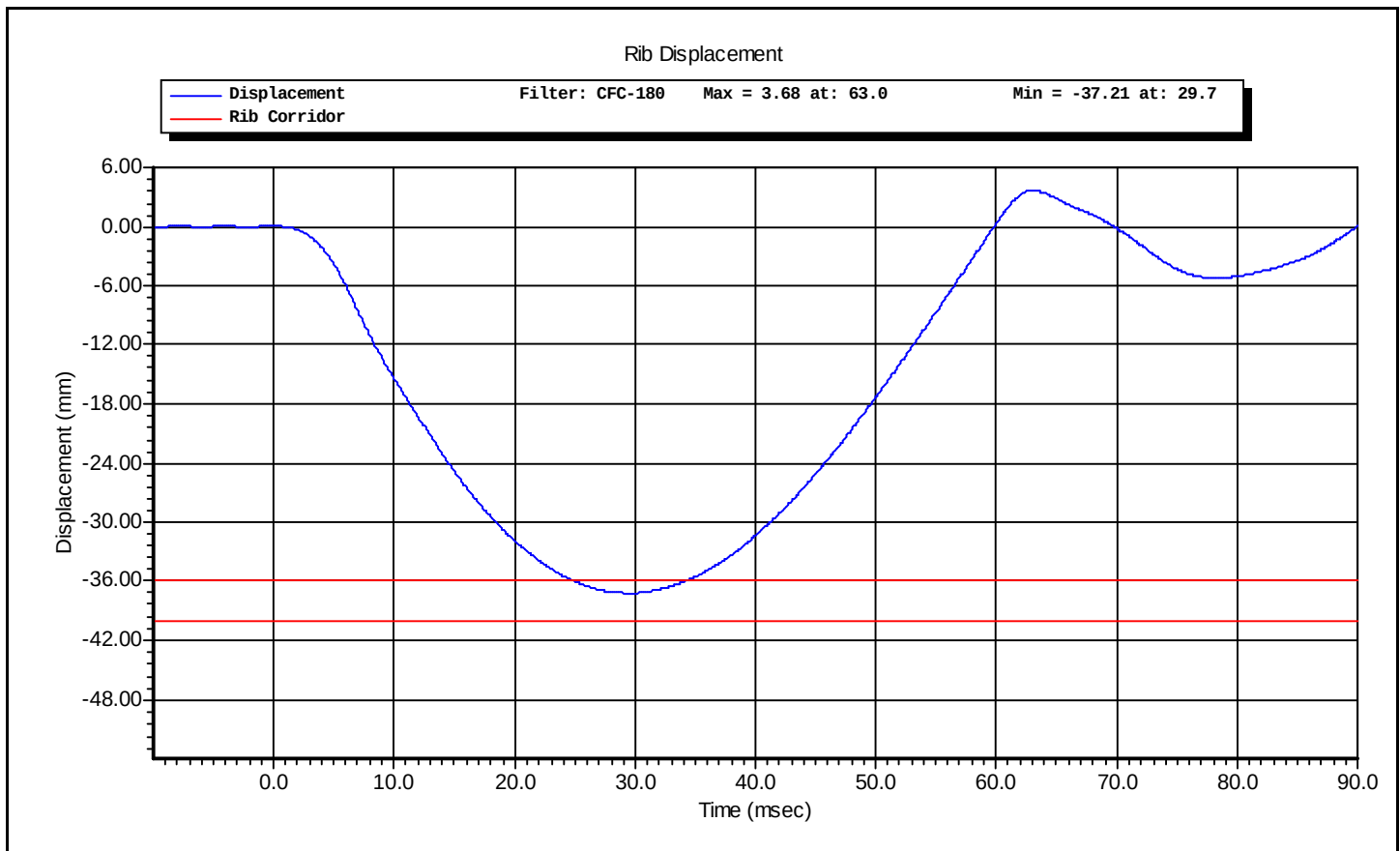
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	7/30/2010
Test Number:	1	Test Time:	1:42:58 PM

Component Part Number	Component Serial Number
455-3100	LOWER



Test ID: Lower Rib 3 m/s Test Time: 1:42:58 PM

Test Date: 7/30/2010



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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:	7/30/2010
Test Number:	1	Test Time:	1:18:40 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	50.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-47.60 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: **1:18:40 PM**

Test Date: **7/30/2010**



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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: **1:18:40 PM**

Test Date: **7/30/2010**



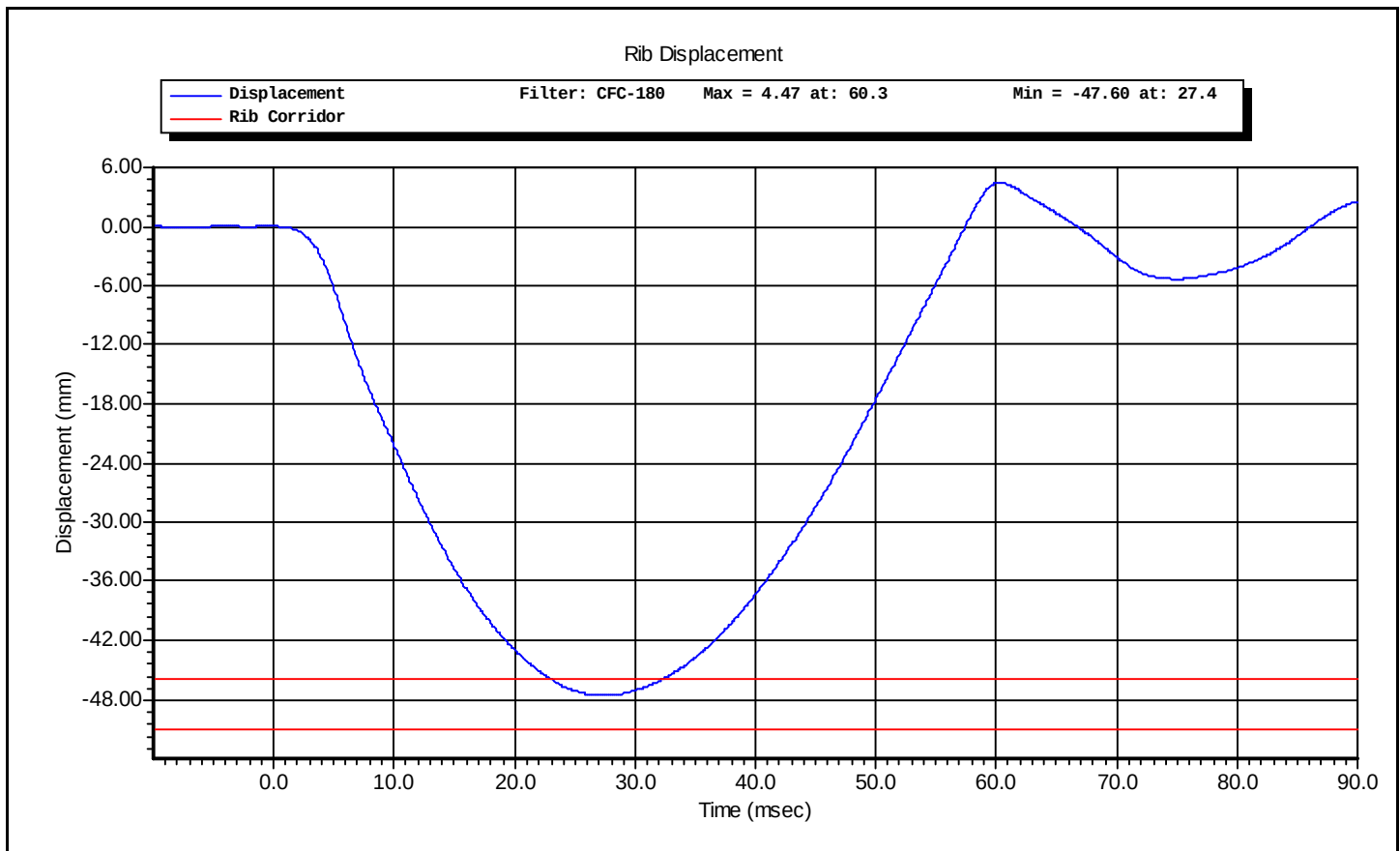
www.calspan.com

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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:	7/30/2010
Test Number:	1	Test Time:	1:18:40 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE



Test ID: Middle Rib 4 m/s Test Time: 1:18:40 PM

Test Date: 7/30/2010



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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:	7/30/2010
Test Number:	1	Test Time:	1:28:50 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	51.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-36.91 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: **1:28:50 PM**

Test Date: **7/30/2010**



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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: **1:28:50 PM**

Test Date: **7/30/2010**



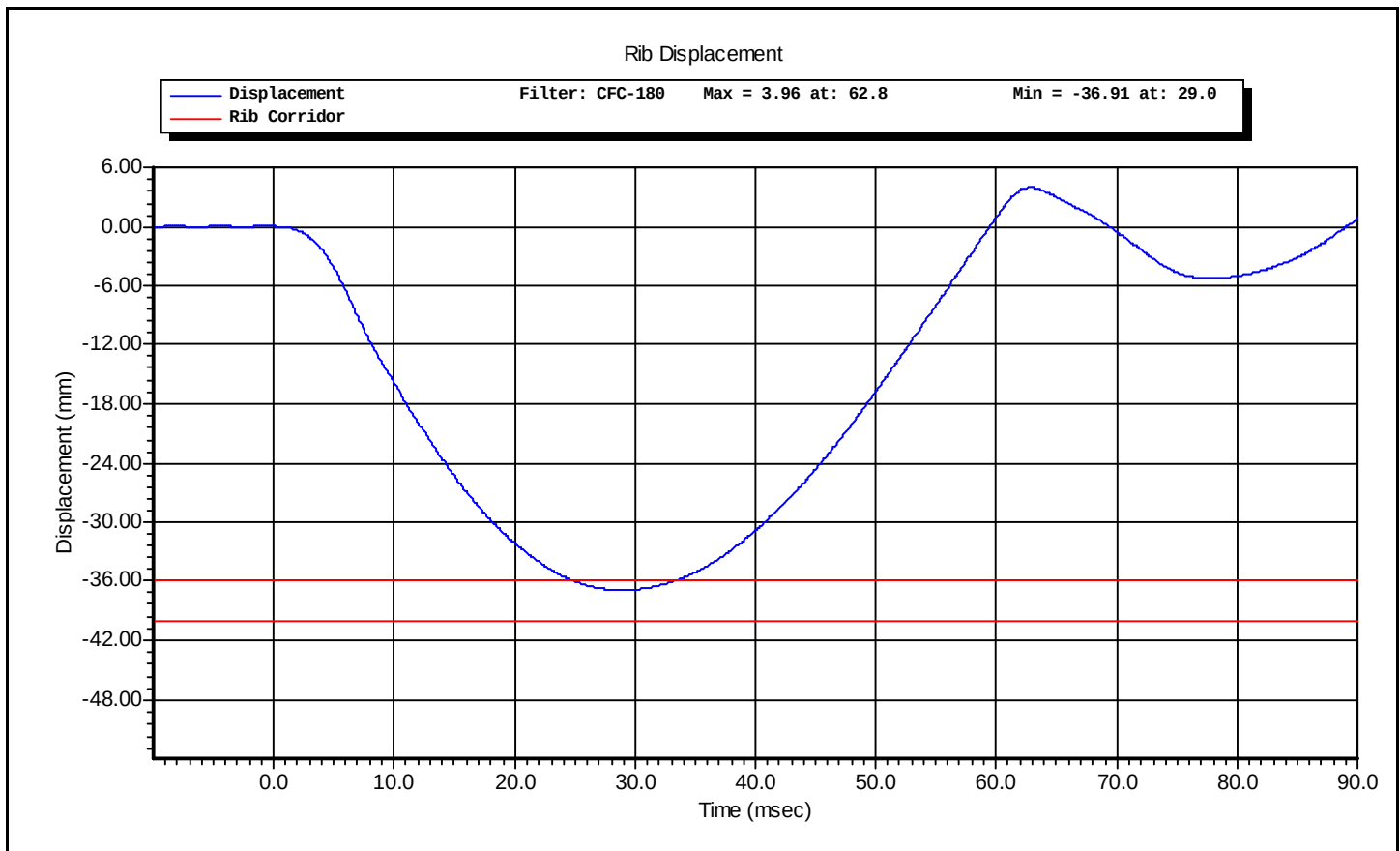
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	7/30/2010
Test Number:	1	Test Time:	1:28:50 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE



Test ID: Middle Rib 3 m/s Test Time: 1:28:50 PM

Test Date: 7/30/2010



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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:	7/30/2010
Test Number:	1	Test Time:	11:54:15 AM

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	54.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-47.48 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: **11:54:15 AM**

Test Date: **7/30/2010**



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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: **11:54:15 AM**

Test Date: **7/30/2010**



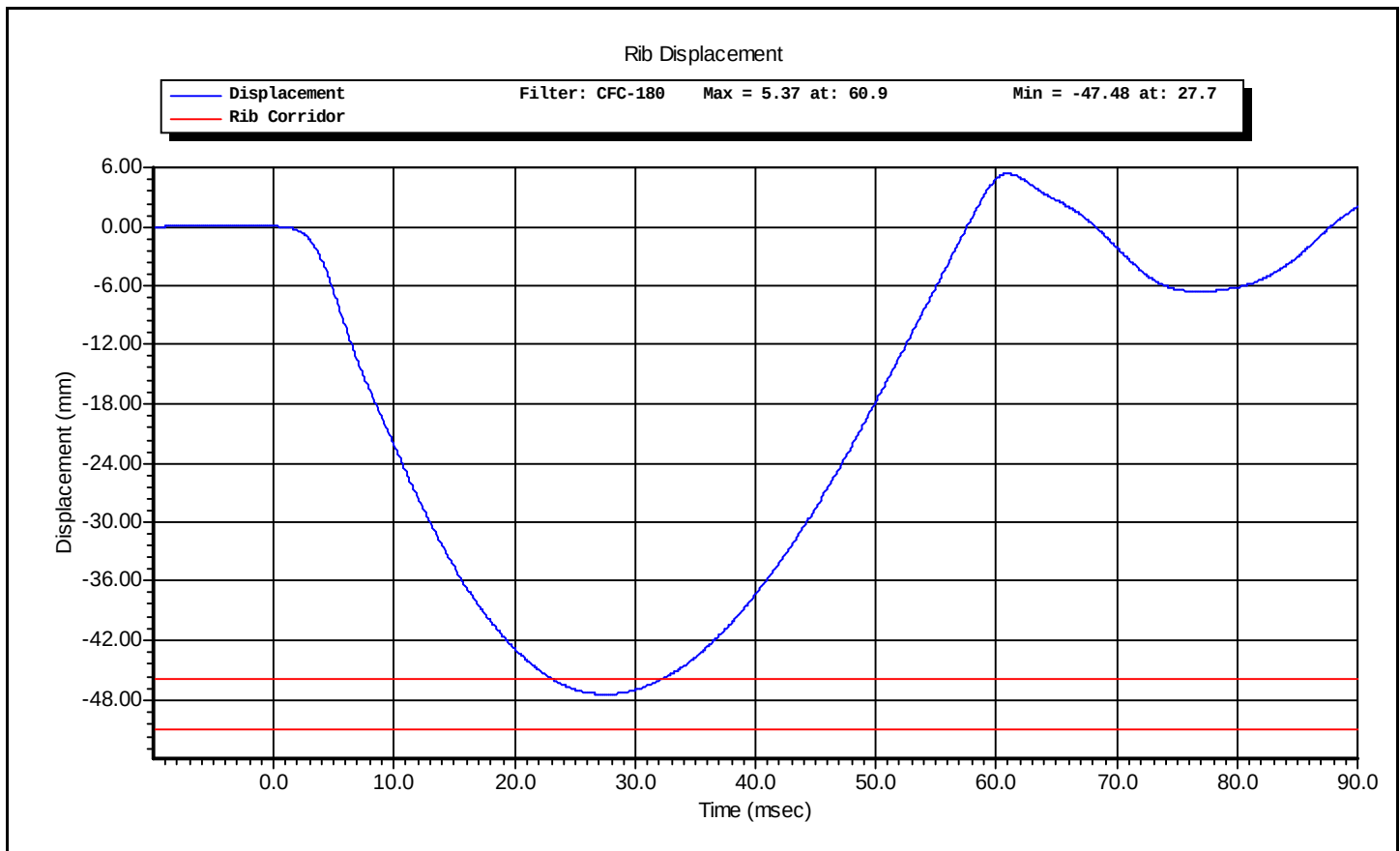
www.calspan.com

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

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:	7/30/2010
Test Number:	1	Test Time:	11:54:15 AM

Component Part Number	Component Serial Number
455-3100	UPPER



Test ID: **Upper Rib 4 m/s** Test Time: **11:54:15 AM**

Test Date: **7/30/2010**



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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:	7/30/2010
Test Number:	1	Test Time:	1:11:29 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	50.0 %RH P
Velocity	2.90 -- 3.10	2.96 m/s P
Rib Displacement	-40.00 -- -36.00	-36.74 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: **1:11:29 PM**

Test Date: **7/30/2010**



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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: **1:11:29 PM**

Test Date: **7/30/2010**



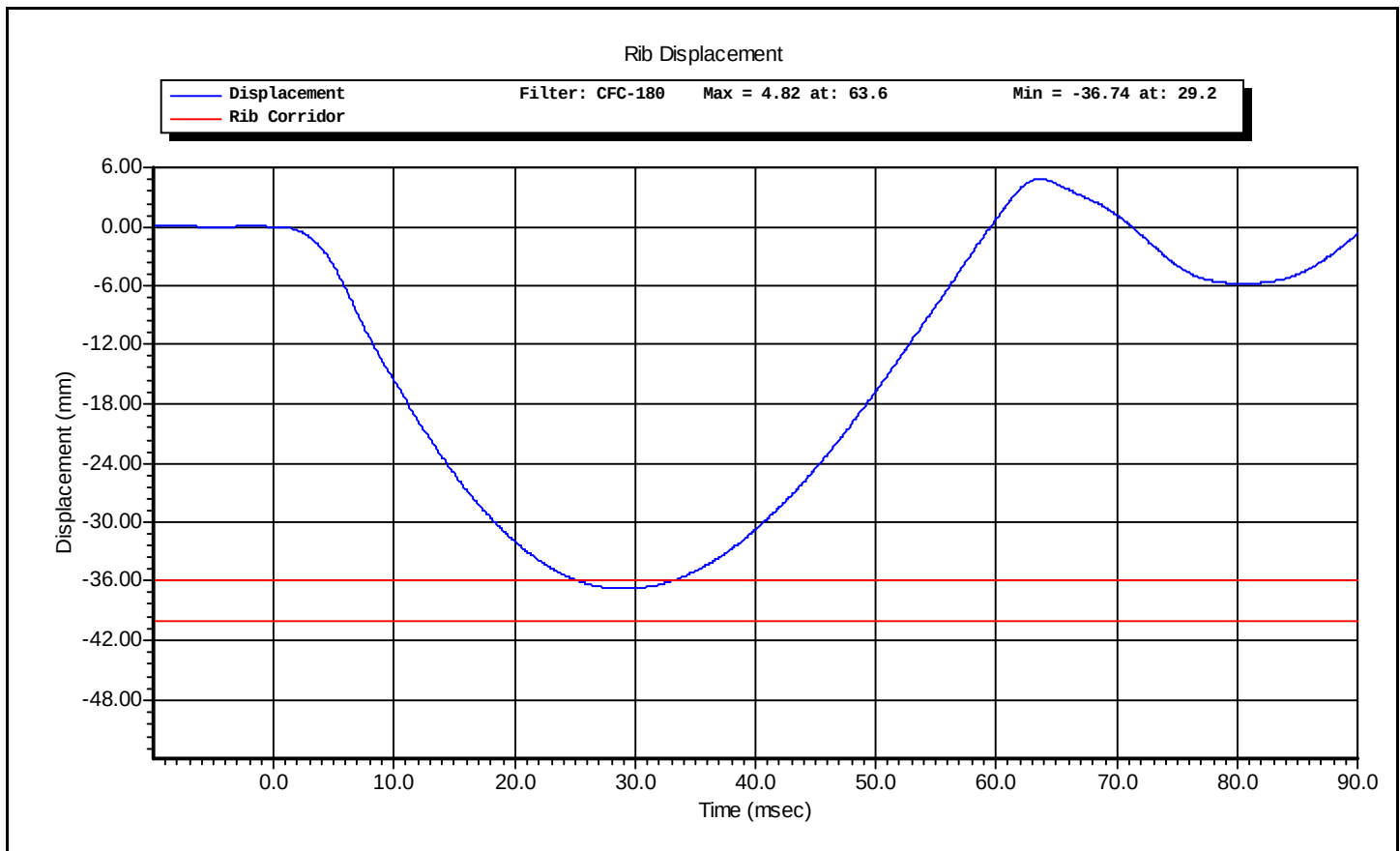
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	7/30/2010
Test Number:	1	Test Time:	1:11:29 PM

Component Part Number	Component Serial Number
455-3100	UPPER



Test ID: Upper Rib 3 m/s Test Time: 1:11:29 PM

Test Date: 7/30/2010



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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 Impact	Test Date:	7/30/2010
Test Number:	1	Test Time:	2:31:55 PM

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	22.2 deg C	P
Humidity	10.0	--	70.0	50.0 %RH	P
Velocity	5.40	--	5.60	5.49 m/s	P
Upper Rib Displacement	34.0	--	41.0	37.4 mm	P
Middle Rib Displacement	37.0	--	45.0	41.1 mm	P
Lower Rib Displacement	37.0	--	44.0	40.4 mm	P
Impactor Force	5100	--	6200	5500 N	P

All test parameters are within specifications

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

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

Test ID: **Thorax Impact**

Test Time: **2:31:55 PM**

Test Date: **7/30/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
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 Impact**

Test Time: **2:31:55 PM**

Test Date: **7/30/2010**



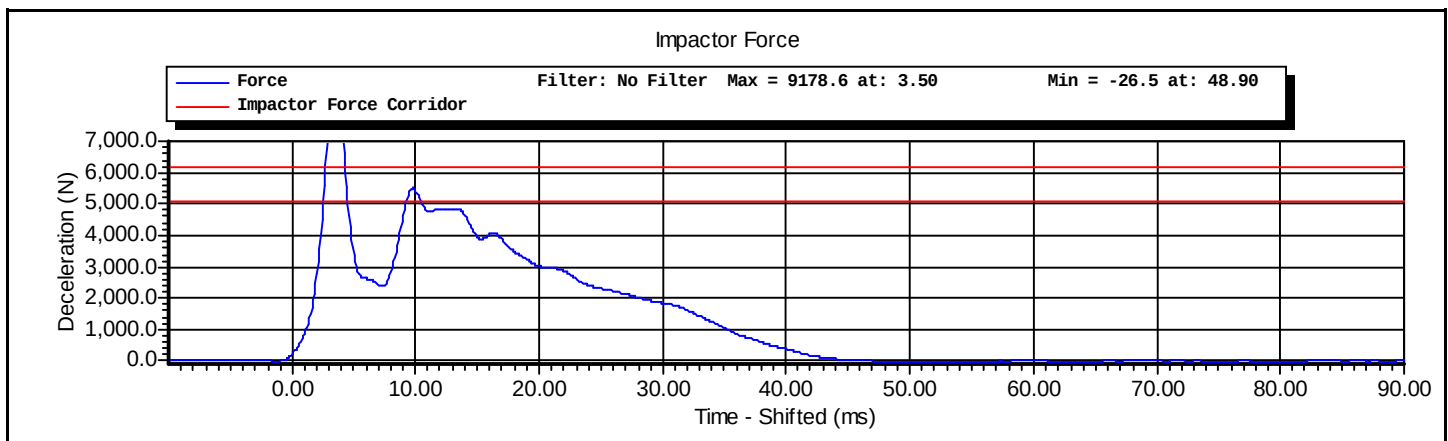
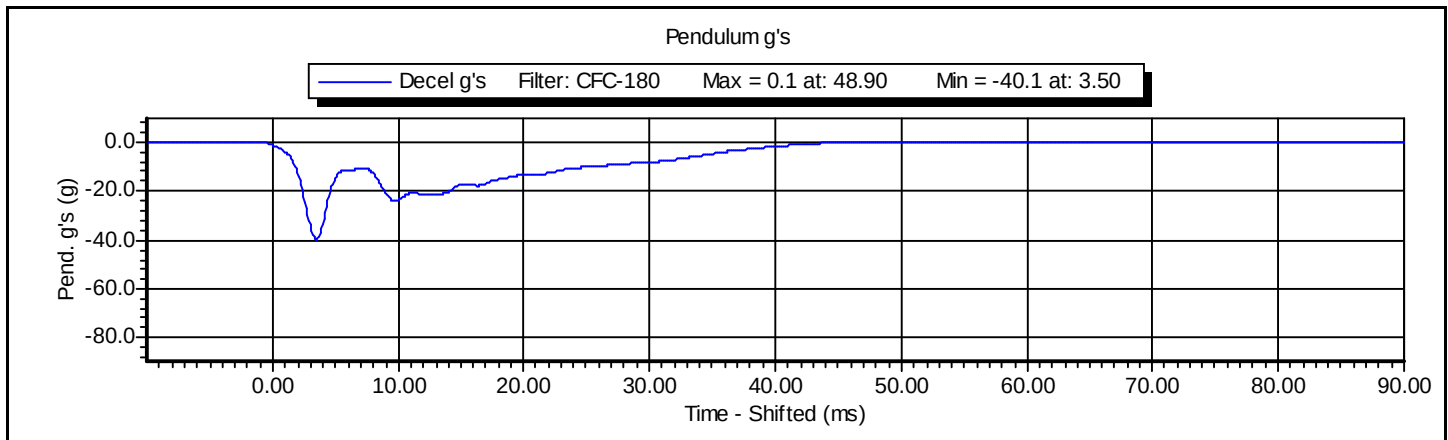
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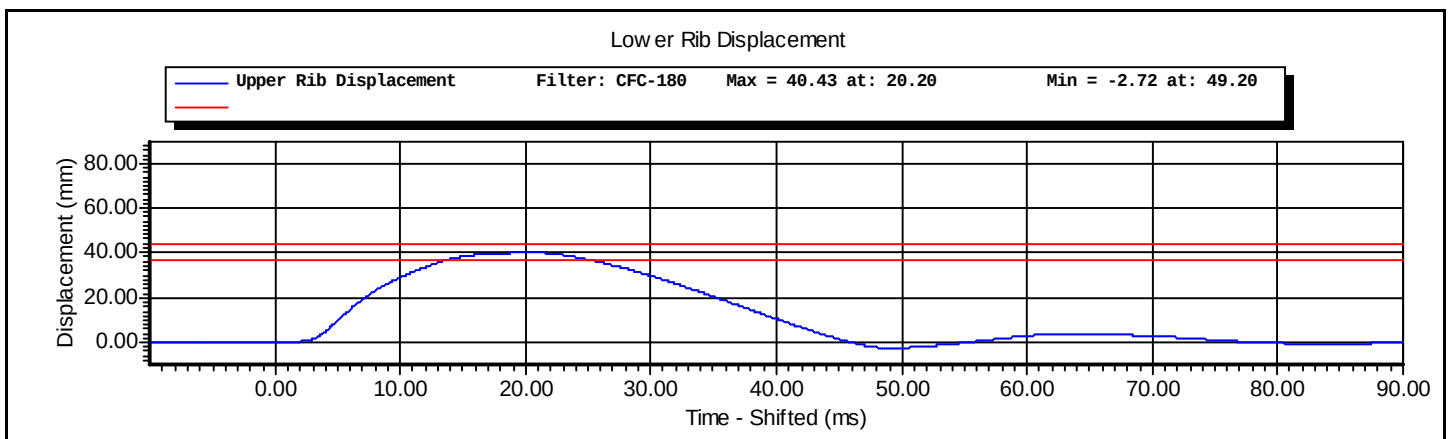
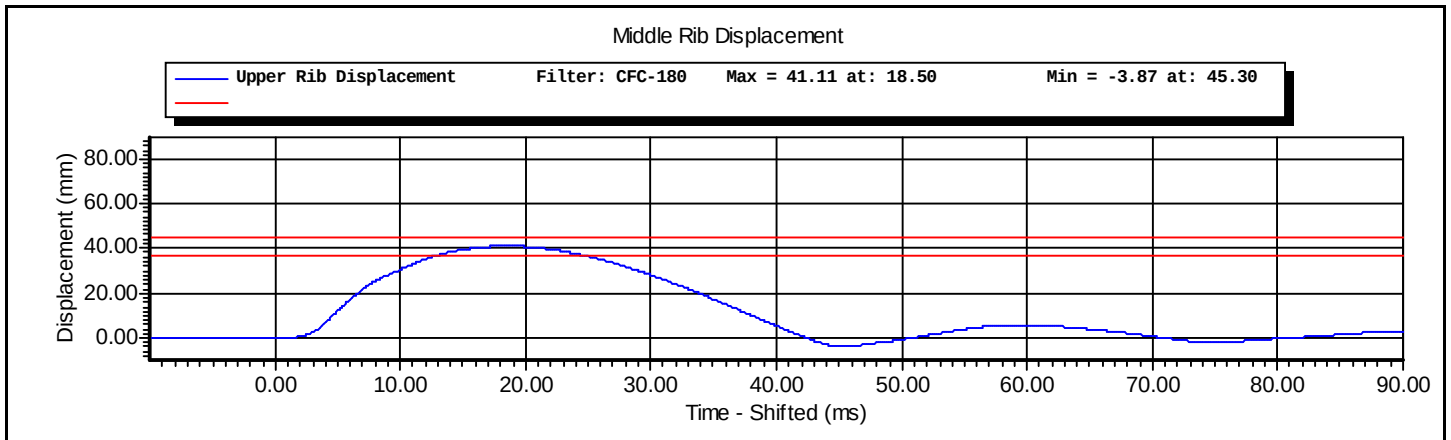
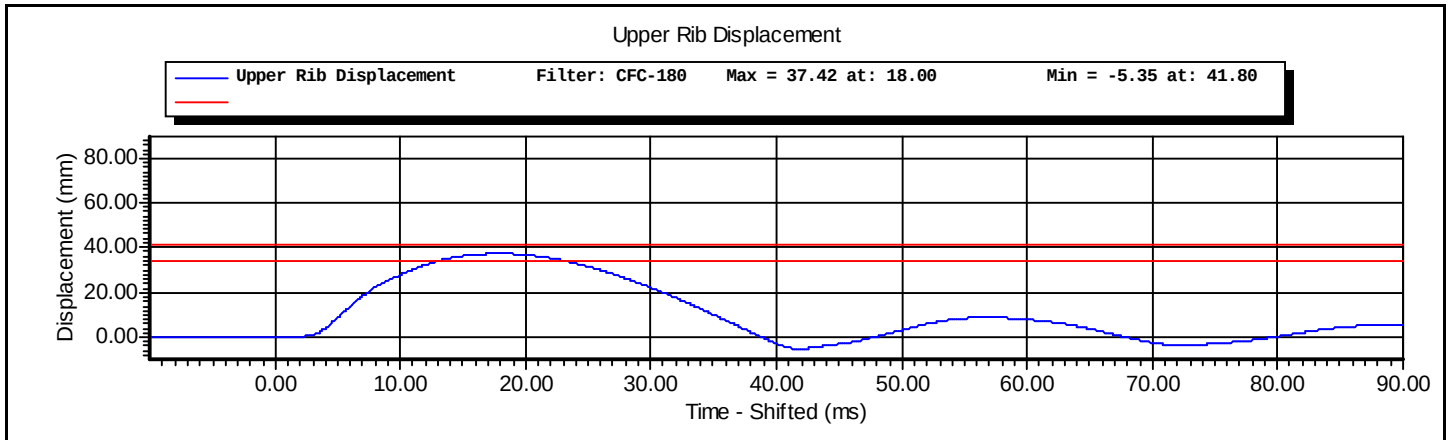
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax Impact	Test Date:	7/30/2010
Test Number:	1	Test Time:	2:31:55 PM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	UPPER



Test ID: **Thorax Impact** Test Time: **2:31:55 PM**

Test Date: **7/30/2010**





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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:	7/30/2010
Test Number:	2	Test Time:	10:21:51 AM

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	56 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.43 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	11.9 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.17 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	12.4 ms P

All test parameters are within specifications

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

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

Test ID: **Abdomen**

Test Time: **10:21:51 AM**

Test Date: **7/30/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010
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: **10:21:51 AM**

Test Date: **7/30/2010**



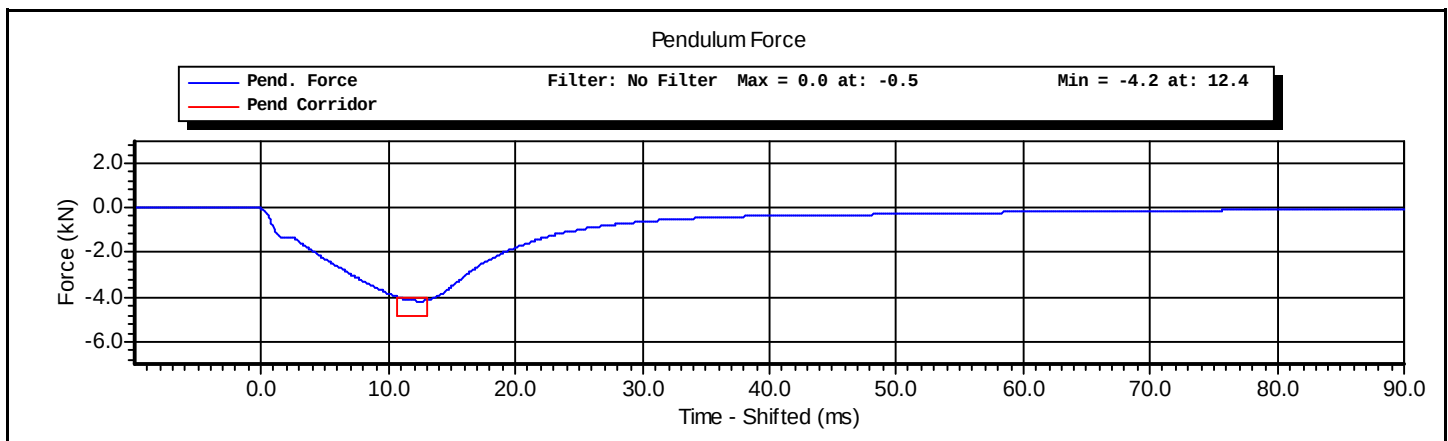
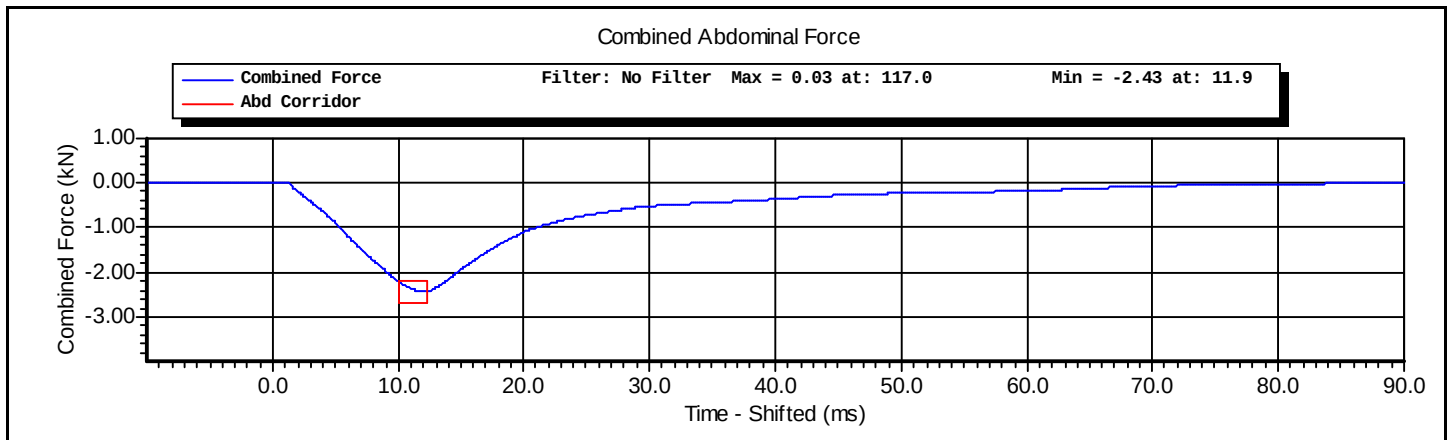
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Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	7/30/2010
Test Number:	2	Test Time:	10:21:51 AM

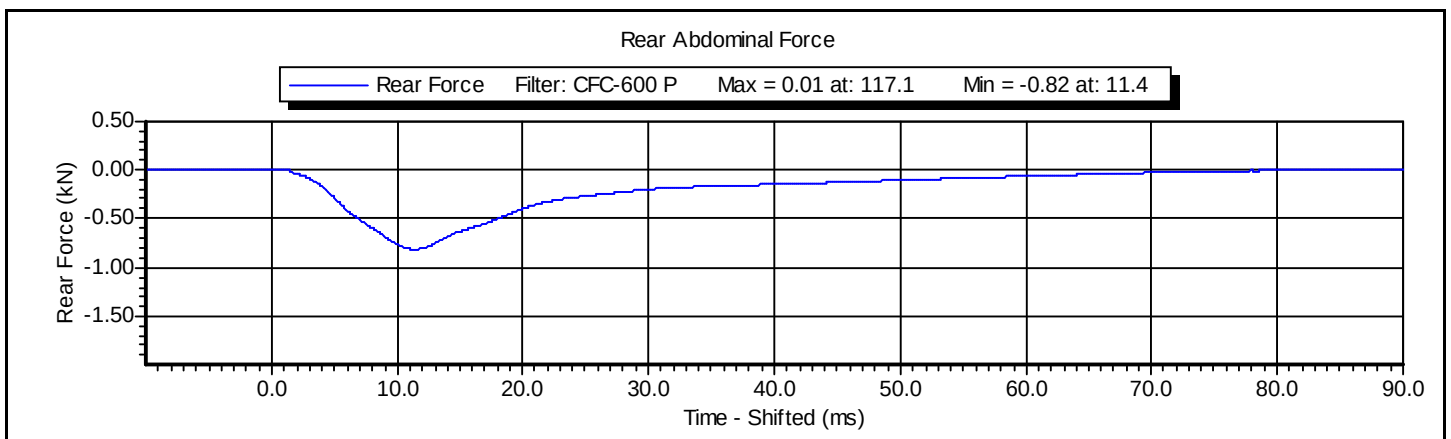
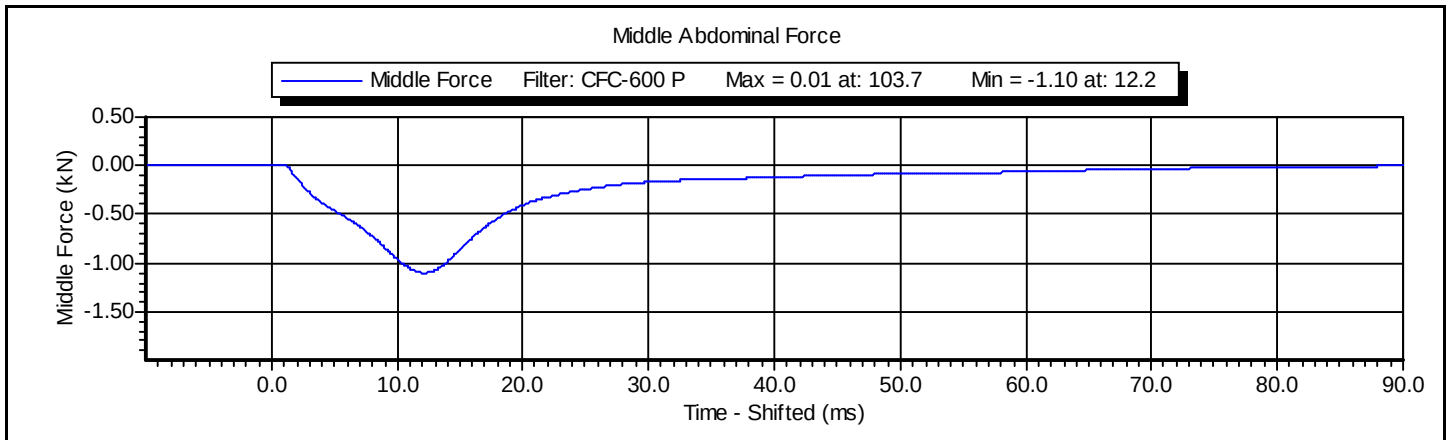
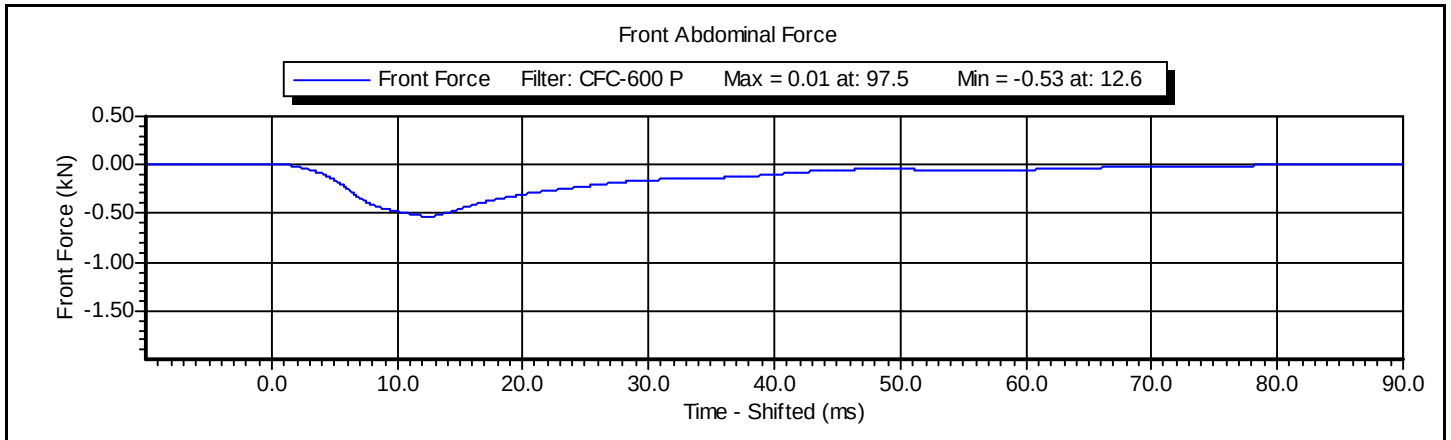
Component Part Number	Component Serial Number
455-4001	07/136



Test ID: **Abdomen**

Test Time: **10:21:51 AM**

Test Date: **7/30/2010**





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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:	7/29/2010
Test Number:	1	Test Time:	3:51:21 PM

Component Part Number	Component Serial Number
175-5501	19-0545

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	50 %RH P
Velocity	5.95 -- 6.15	6.14 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	45.5 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	42.8 ms P
Decay to Zero Degrees	37.0 -- 57.0	38.4 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

Test ID: **Lumbar Spine**

Test Time: **3:51:21 PM**

Test Date: **7/29/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Lumbar Spine**

Test Time: **3:51:21 PM**

Test Date: **7/29/2010**



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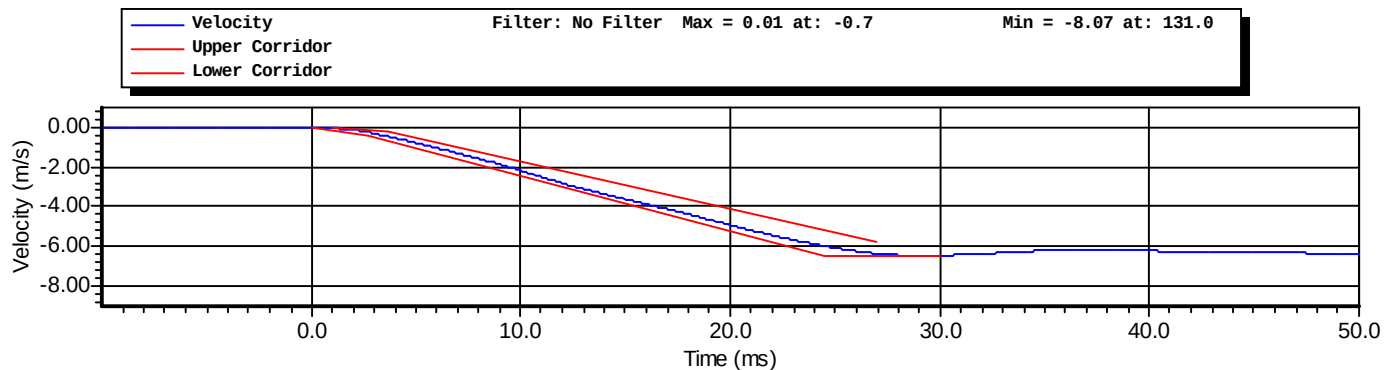
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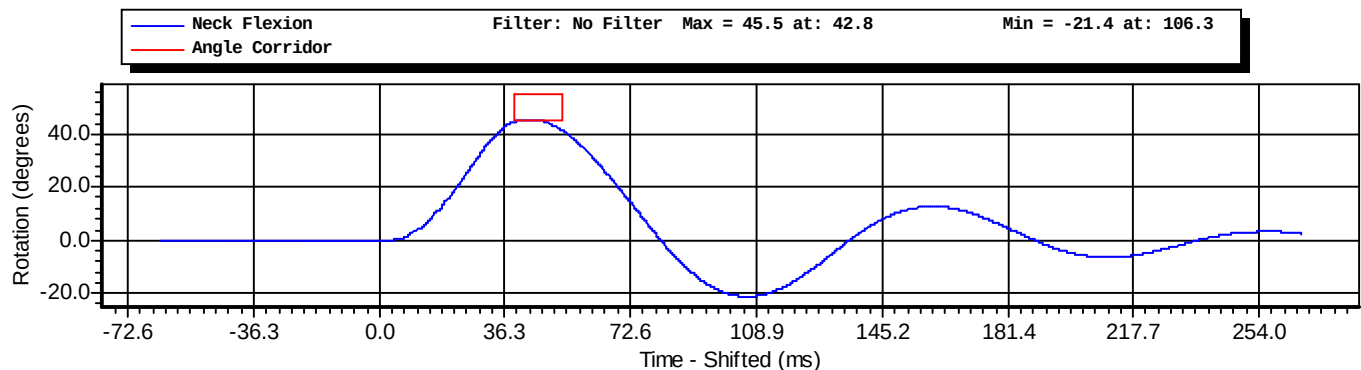
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	7/29/2010
Test Number:	1	Test Time:	3:51:21 PM

Component Part Number	Component Serial Number
175-5501	19-0545

Pendulum Velocity

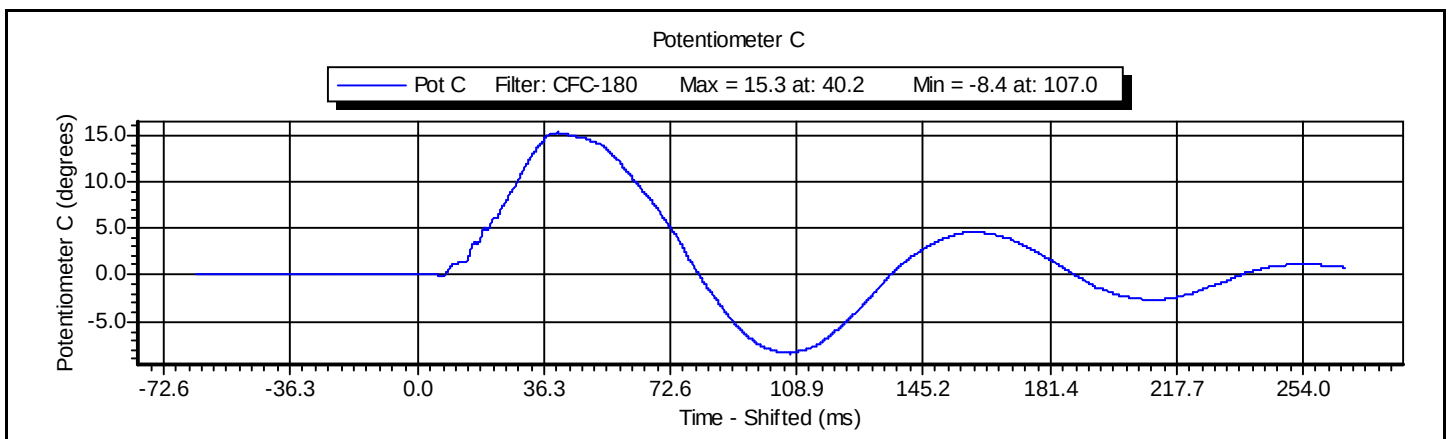
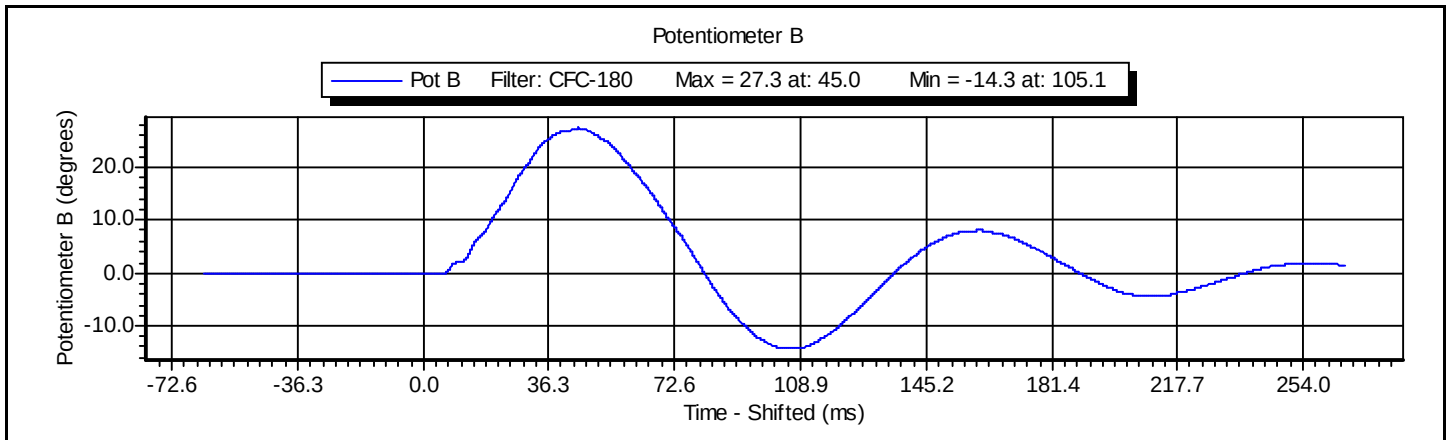
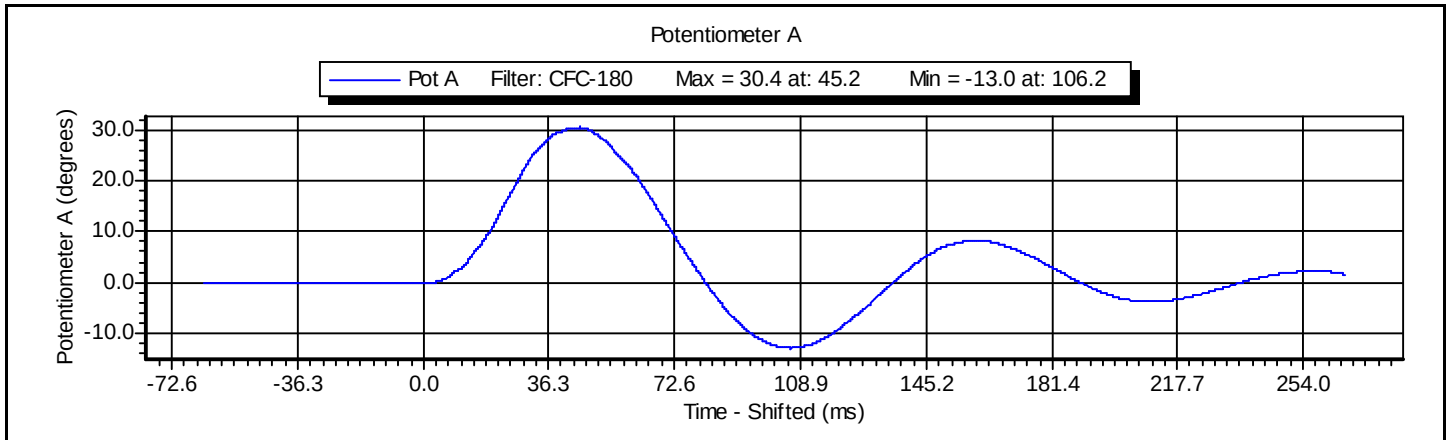


Neck Flexion Angle



Test ID: **Lumbar Spine** Test Time: **3:51:21 PM**

Test Date: **7/29/2010**





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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:	7/30/2010
Test Number:	1	Test Time:	8:50:49 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.1 deg C	P
Humidity	10	--	70	60 %RH	P
Velocity	4.20	--	4.40	4.32 m/s	P
Peak Pendulum Force	-5.40	--	-4.70	-4.91 kN	P
Time at Peak Pendulum Force	11.80	--	16.10	14.31 ms	P
Peak Pubic Symphysis Force	-1.59	--	-1.23	-1.41 kN	P
Time at Peak Pubic Symphysis Force	12.20	--	17.00	15.61 ms	P

All test parameters are within specifications

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

Test ID: **Pelvis**

Test Time: **8:50:49 AM**

Test Date: **7/30/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010
Denton	3096	LC-456Fy	4/22/2010

Test ID: **Pelvis**

Test Time: **8:50:49 AM**

Test Date: **7/30/2010**



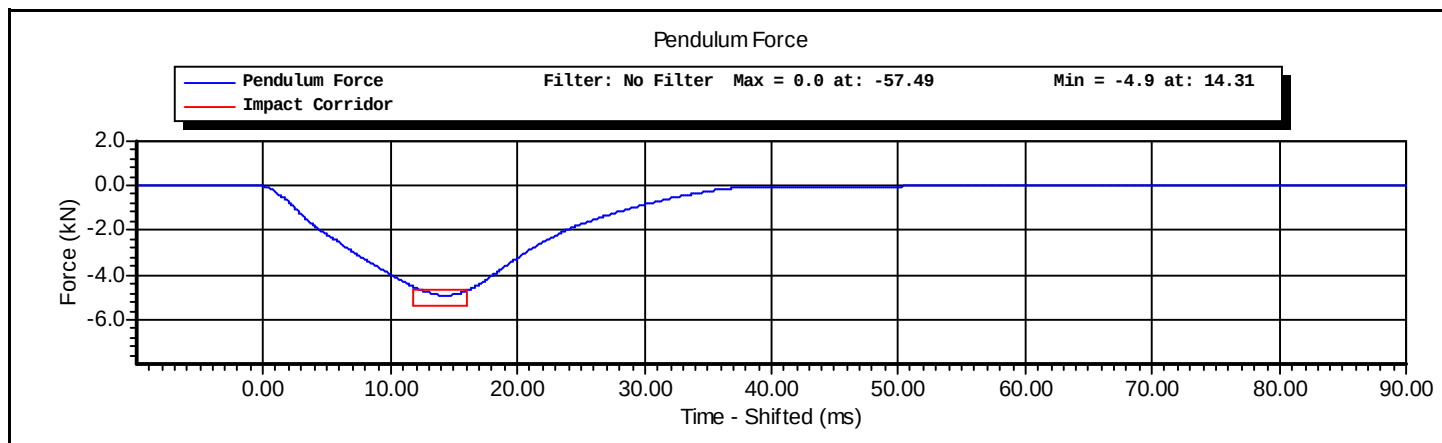
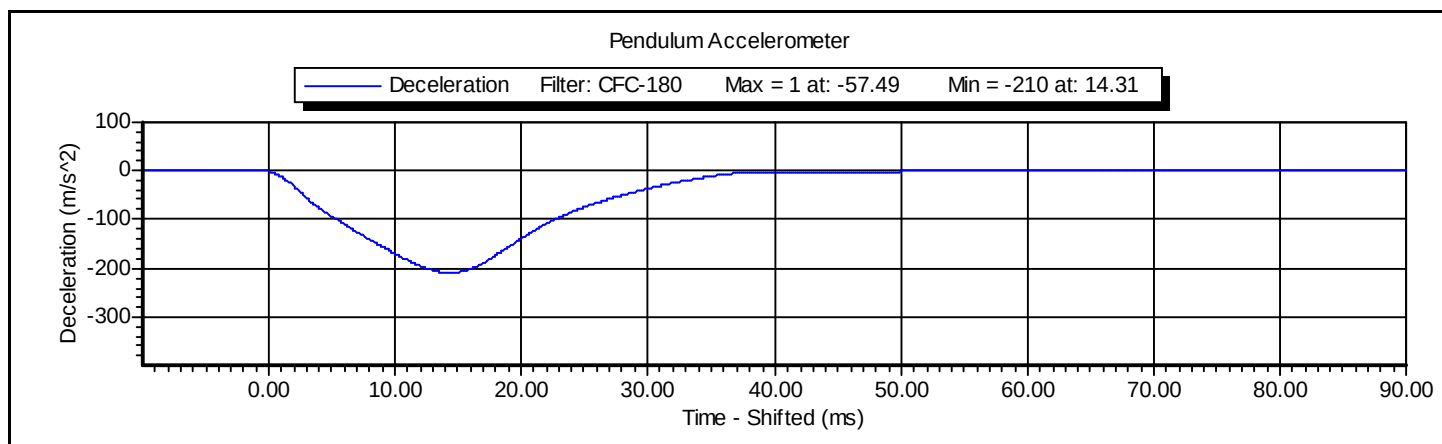
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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	7/30/2010
Test Number:	1	Test Time:	8:50:49 AM

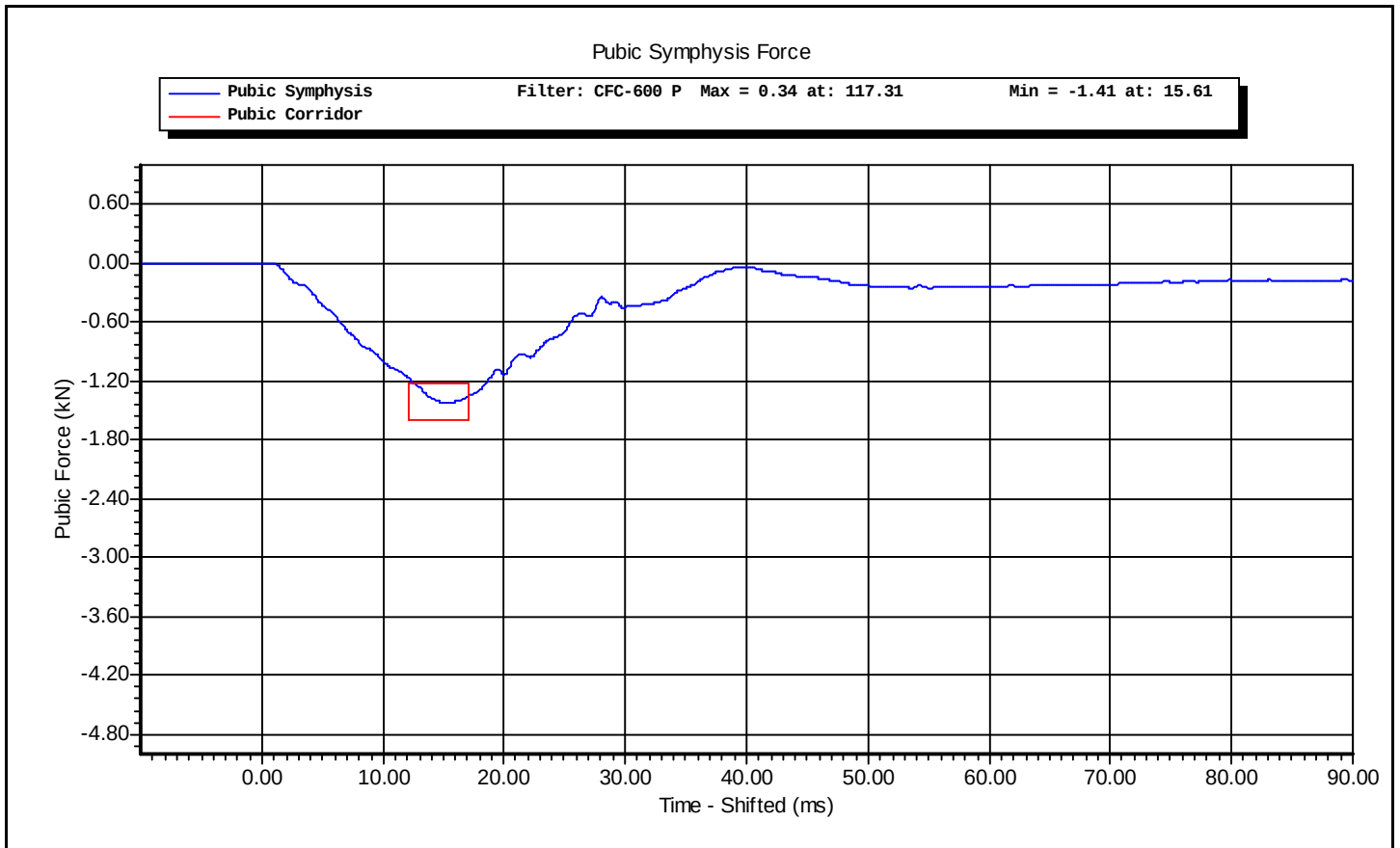
Component Part Number	Component Serial Number
455-4003	



Test ID: **Pelvis**

Test Time: **8:50:49 AM**

Test Date: **7/30/2010**



CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

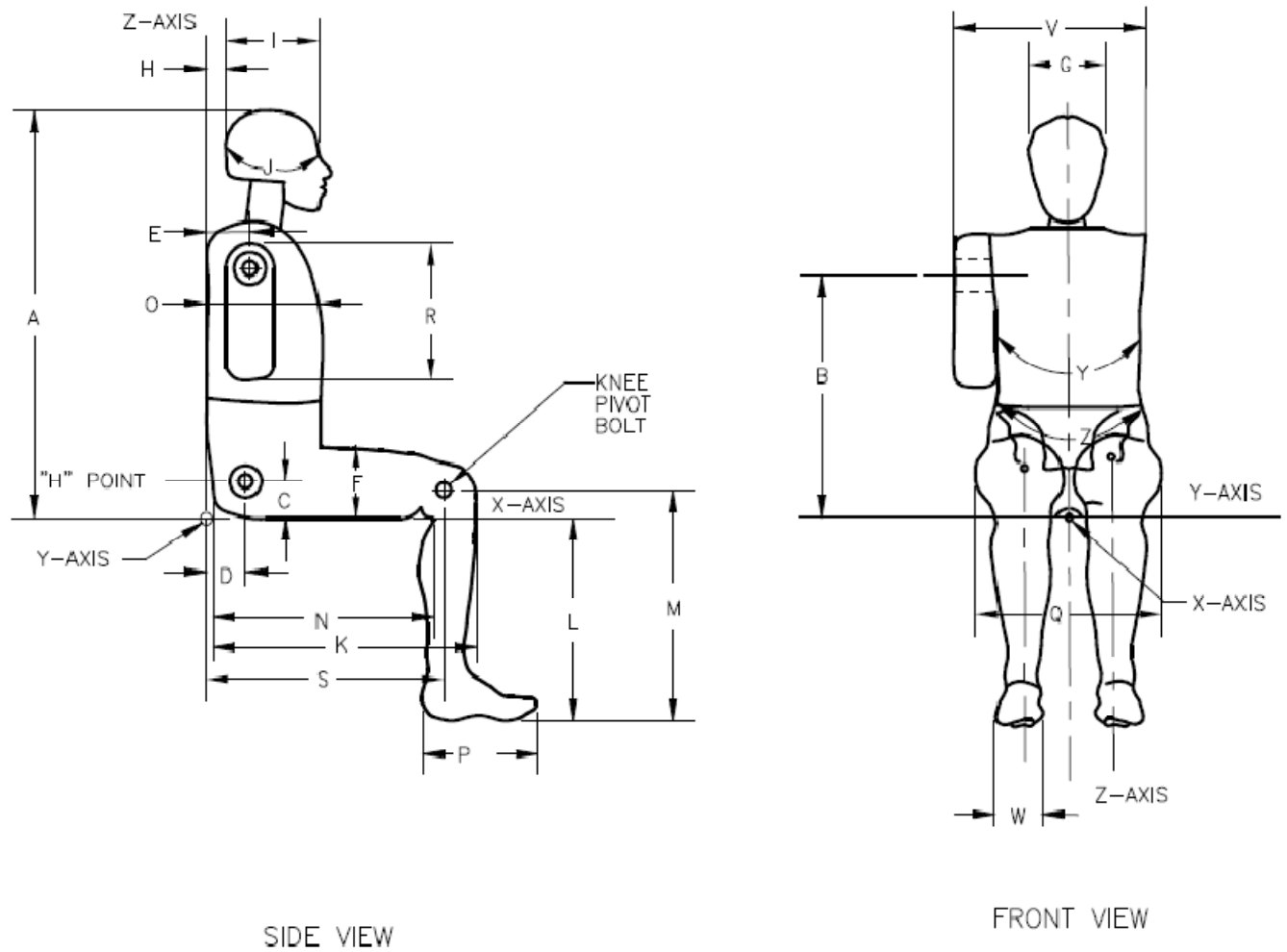
NHTSA ATD S/N 300

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

Technician: A. Rudniski

Date: 7/26/2010

SID-IIIsD External Dimension Reference Diagram



Technician: A. Rudniski

Date: 7/26/2010



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	7/26/2010
Test Number:	1	Test Time:	2:03:14 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	60 %RH P
Resultant Acceleration	115.0 -- 137.0	135.9 g P
Oscillation	0.0 -- 15.0	2.5 % P
Fore-Aft Acceleration	-15.0 -- 15.0	6.7 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **2:03:14 PM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P51685	4/7/2010
Endevco	7264-2000	P51682	4/7/2010
Endevco	7264-2000	P51699	4/7/2010

Test ID: **Head Drop**

Test Time: **2:03:14 PM**

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



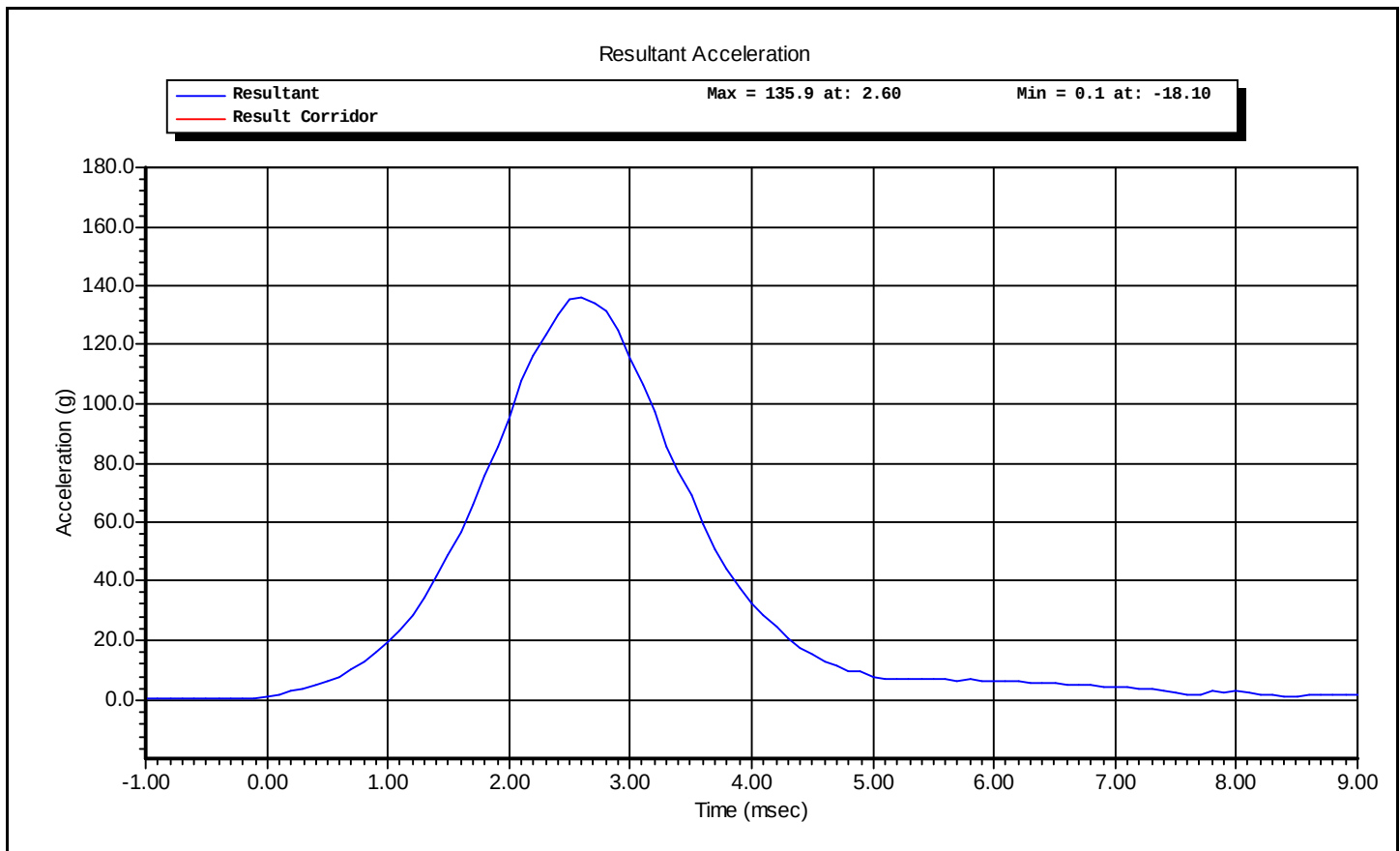
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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	7/26/2010
Test Number:	1	Test Time:	2:03:14 PM

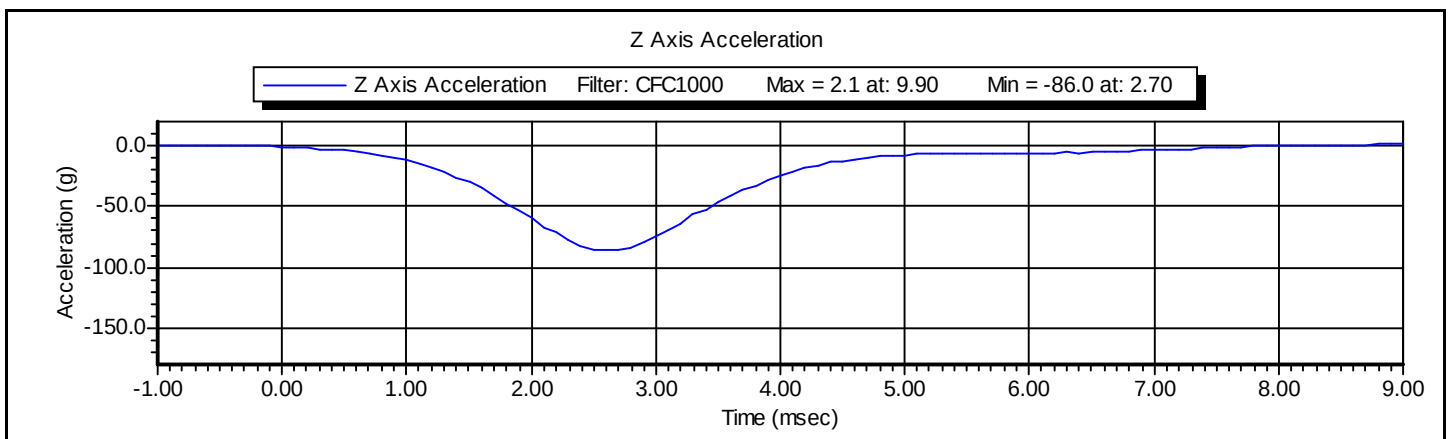
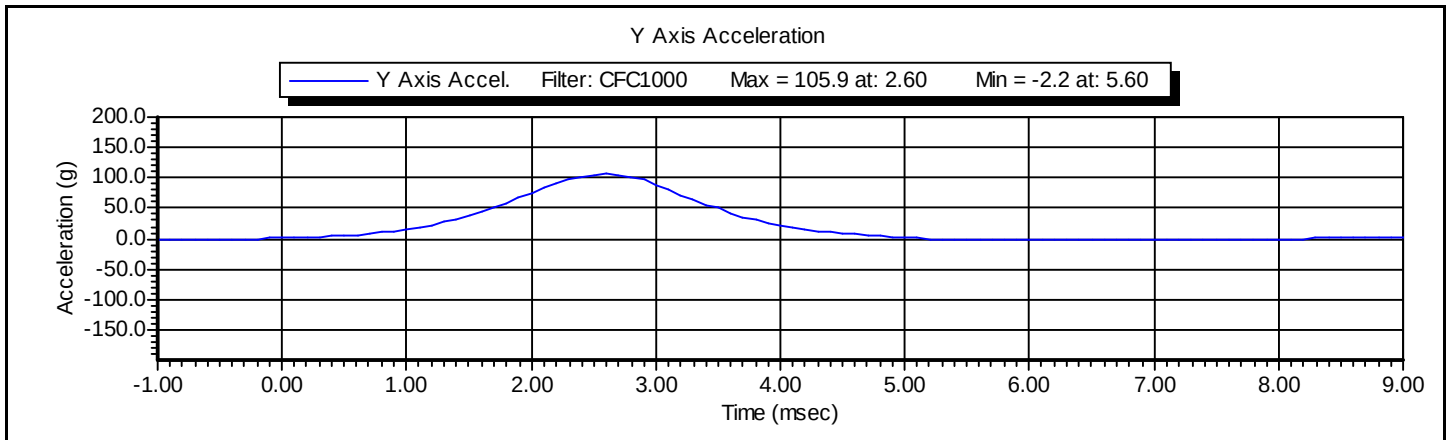
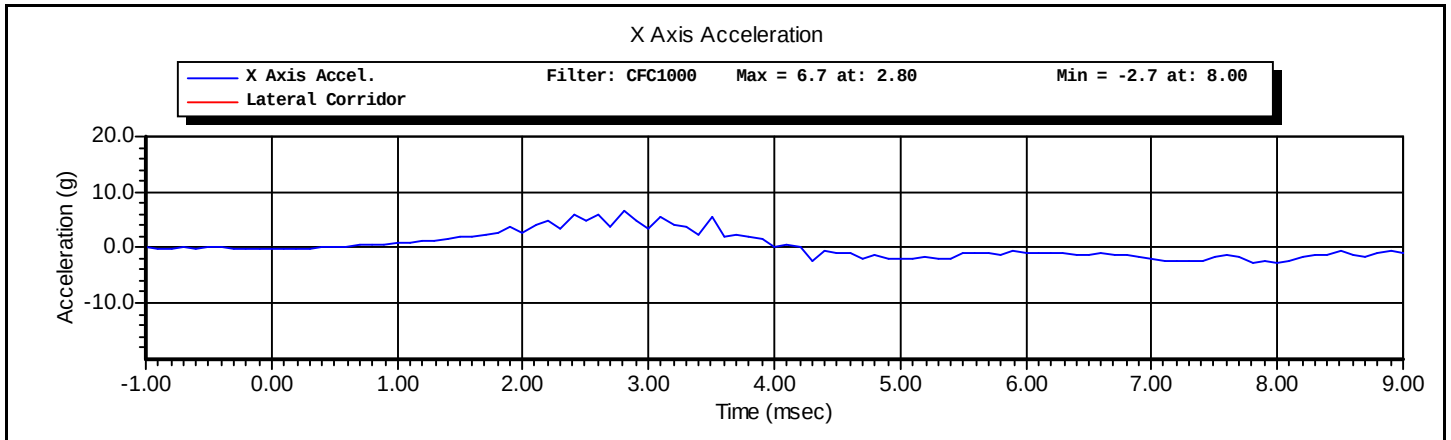
Component Part Number	Component Serial Number
Head Skin - 180-1002	1355



Test ID: Head Drop

Test Time: 2:03:14 PM

Test Date: 7/26/2010





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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	7/27/2010
Test Number:	1	Test Time:	8:24:10 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	61 %RH P
Velocity	5.51 -- 5.63	5.58 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.55 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.73 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	5.01 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.88 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.94 m/s P
Max D Plane Rotation	71.0 -- 81.0	74.0 degrees P
Time at Max Rotation	50.0 -- 70.0	61.7 ms P
Moment about OC	-44.0 -- -36.0	-41.7 Nm P
Moment Decay to Zero	102.0 -- 126.0	116.1 ms P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **8:24:10 AM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
Denton	1716A	LC-265 Fy	7/28/2009
Denton	1716A	LC-265 Mx	7/28/2009
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: **8:24:10 AM**

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



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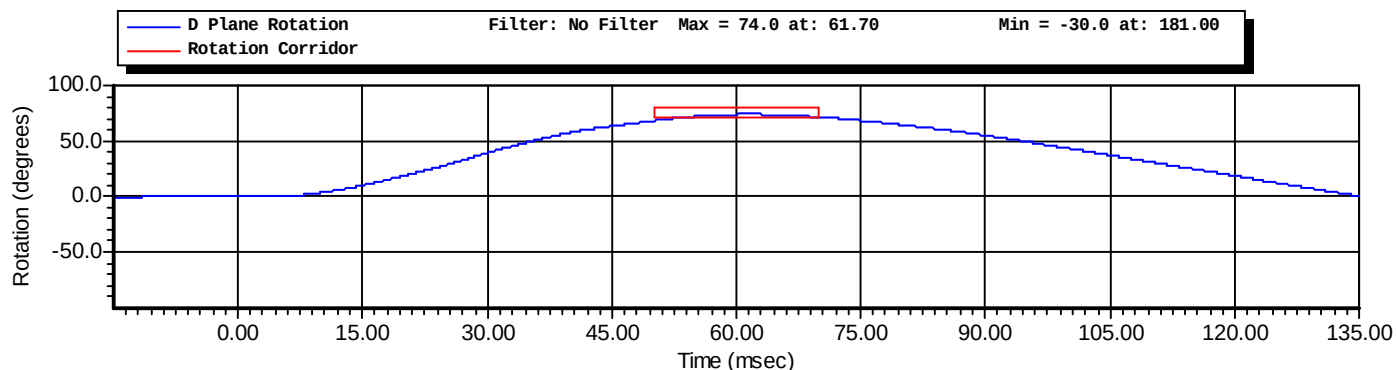
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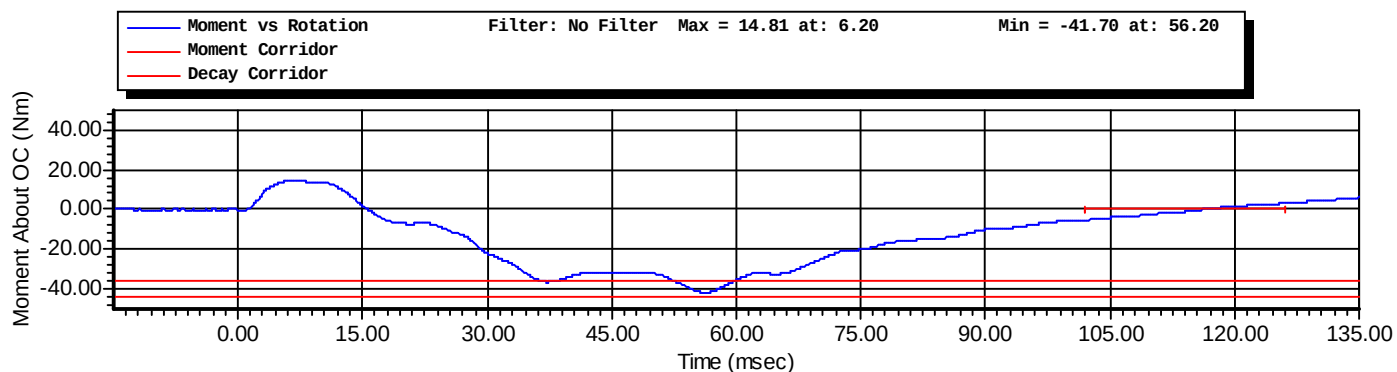
Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	7/27/2010
Test Number:	1	Test Time:	8:24:10 AM

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

D Plane Rotation



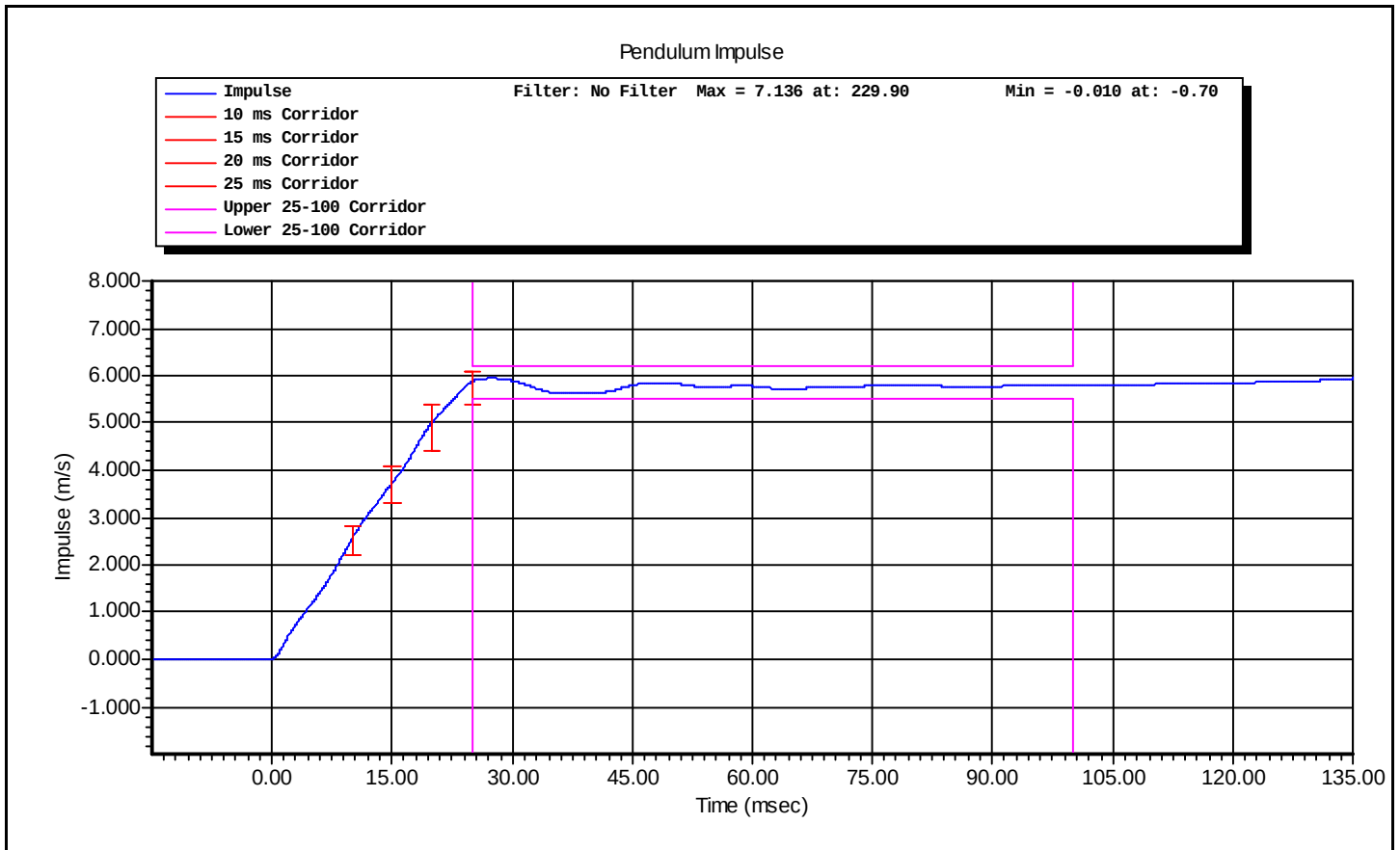
Moment About Occipital Condyle



Test ID: Neck Flexion

Test Time: 8:24:10 AM

Test Date: 7/27/2010





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	7/28/2010
Test Number:	1	Test Time:	3:27:59 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	56.0 %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	33.1 mm P
T1 Acceleration	17.0 -- 22.0	19.8 g P

All test parameters are within specifications

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

Test ID: **Shoulder**

Test Time: **3:27:59 PM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010
Servo	180-3885	DS-1063	4/7/2010
Endevco	7264-2000	P23904	3/15/2010

Test ID: **Shoulder**

Test Time: **3:27:59 PM**

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



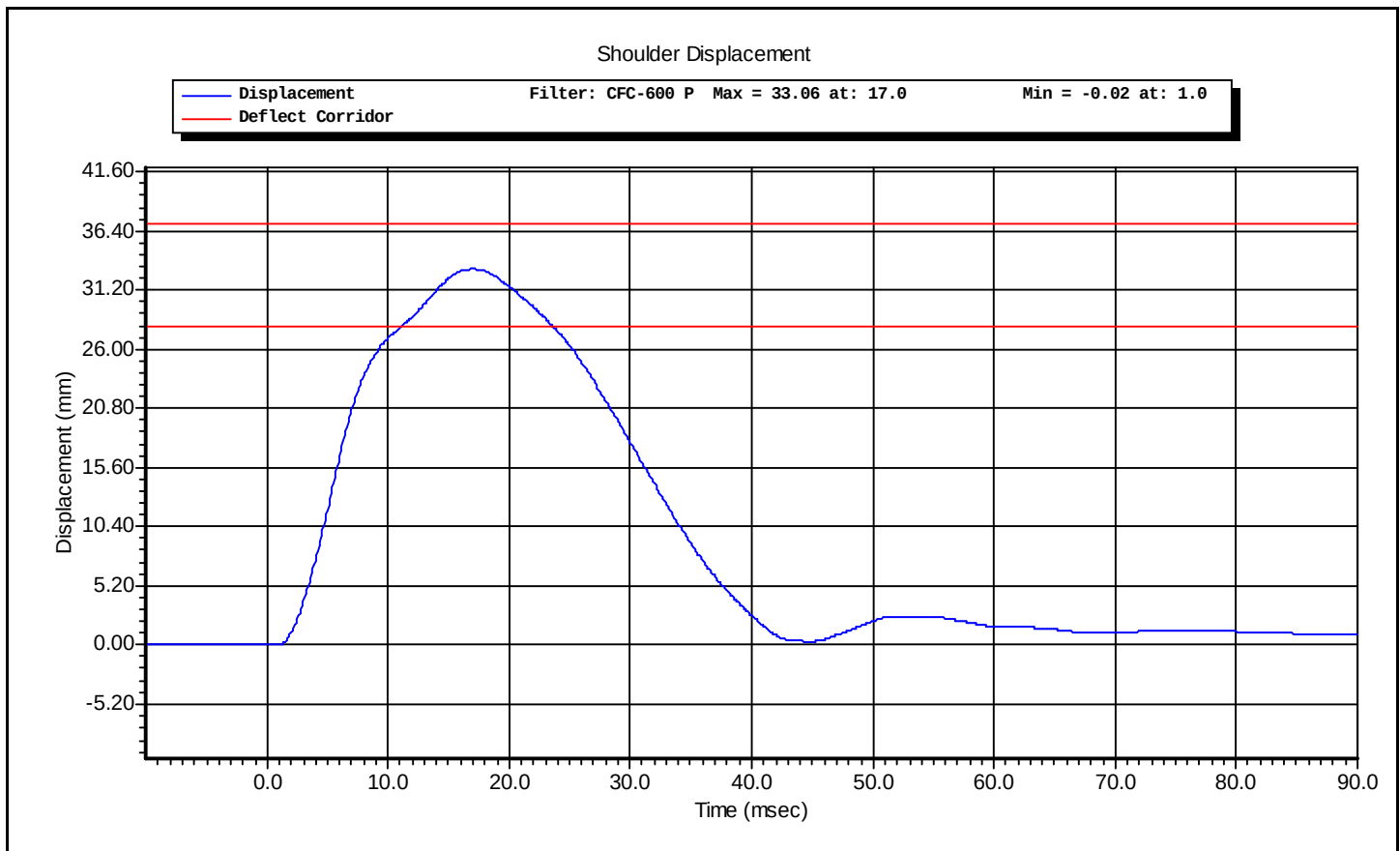
www.calspan.com

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Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	7/28/2010
Test Number:	1	Test Time:	3:27:59 PM

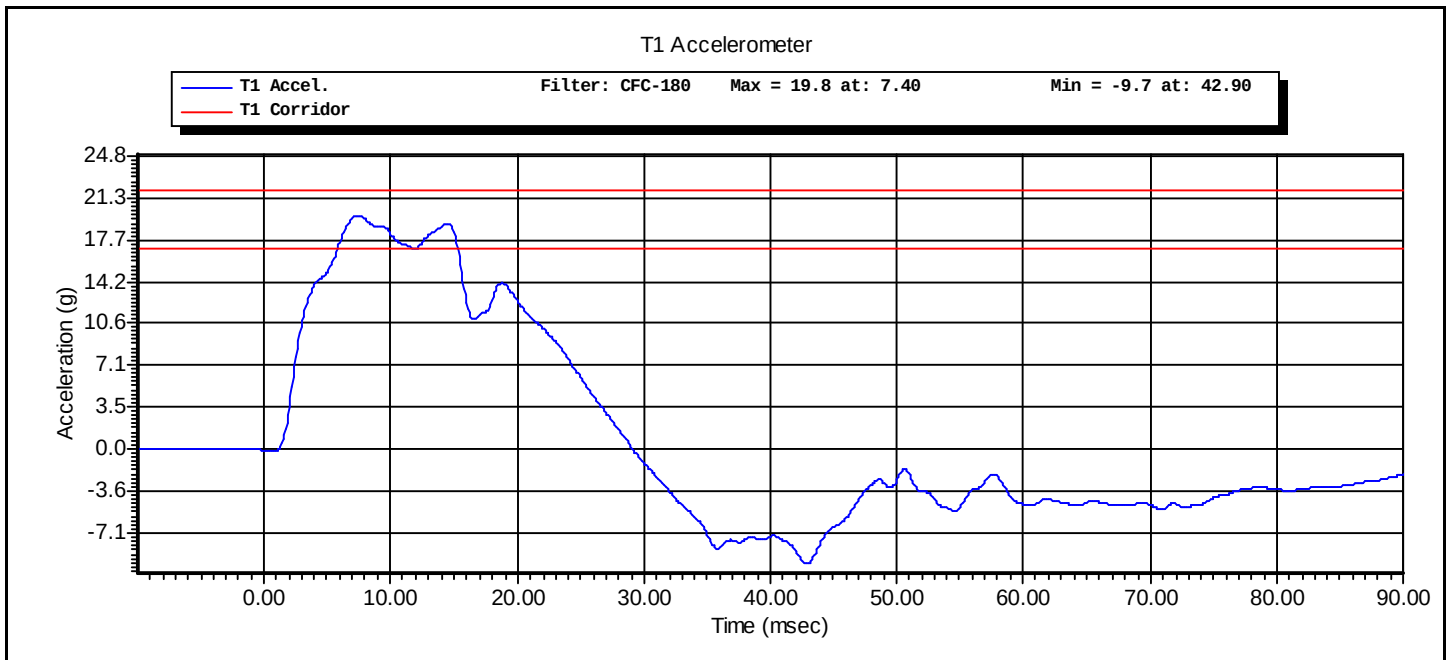
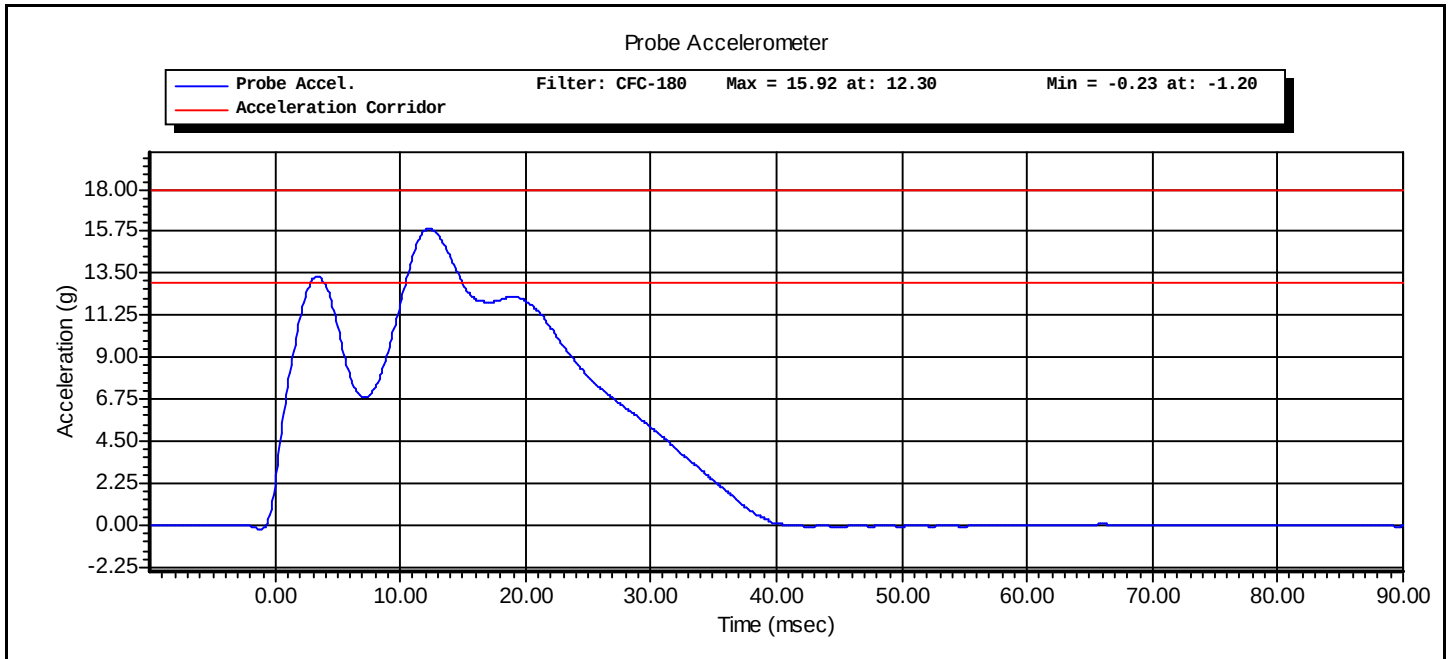
Component Part Number	Component Serial Number
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Test ID: **Shoulder**

Test Time: **3:27:59 PM**

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





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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:			
Test ID:		Test Date:	7/28/2010
Test Number:	1	Test Time:	4:10:11 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	56 %RH	P
Velocity	6.60	--	6.80	6.69 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	32.7 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	27.1 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	32.2 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	36.9 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	40.1 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	33.8 g	P
Shoulder Deflection	31.0	--	40.0	37.5 mm	P

All test parameters are within specifications

Technician: _____ Signature: _____

Supervisor: _____ Signature: _____

Test ID:

Test Time: **4:10:11 PM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P23904	3/15/2010
Endevco	7264-2000	P50078	7/2/2010
Servo	180-3885	DS-1063	4/7/2010

Test ID:

Test Time: **4:10:11 PM**

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

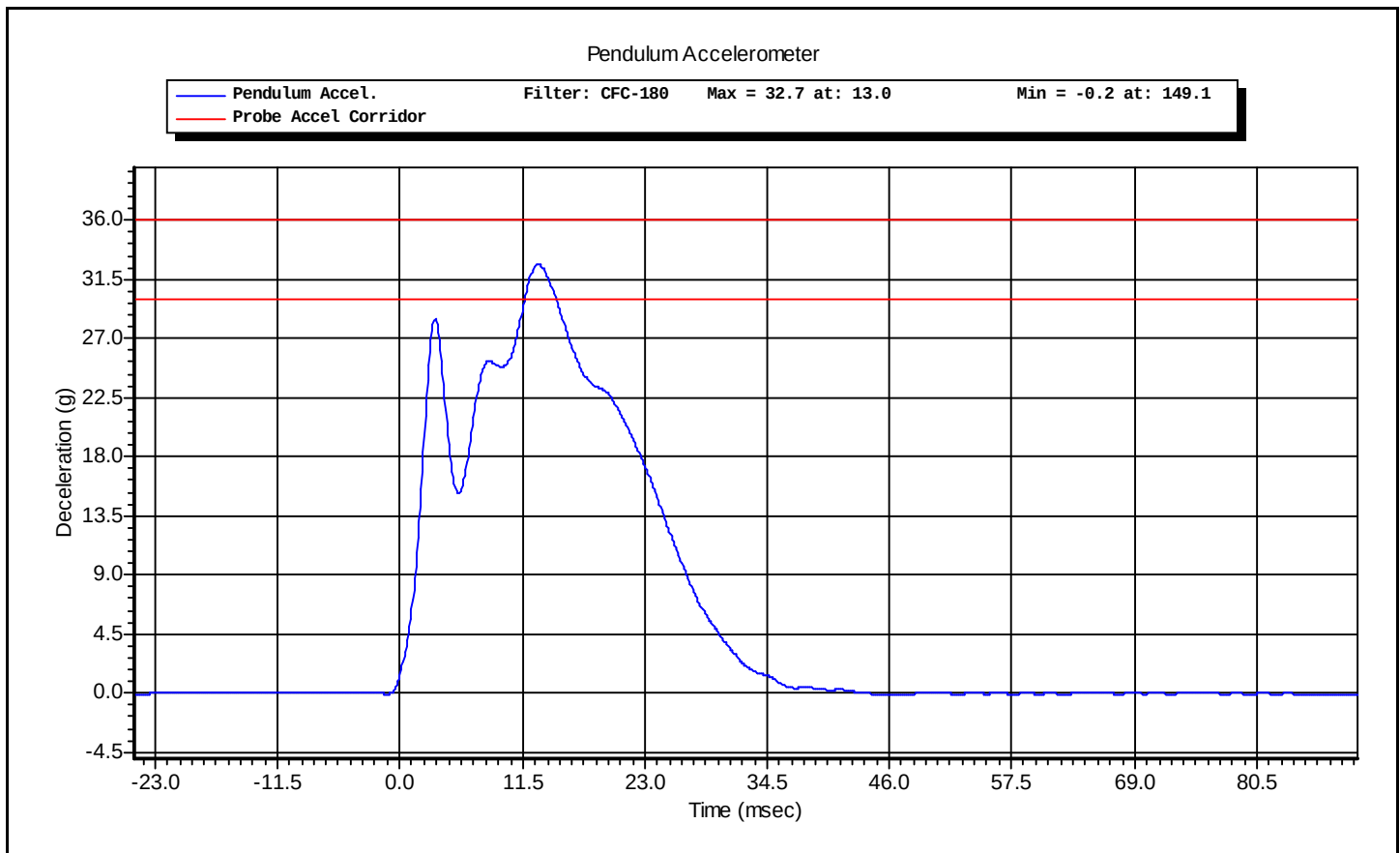


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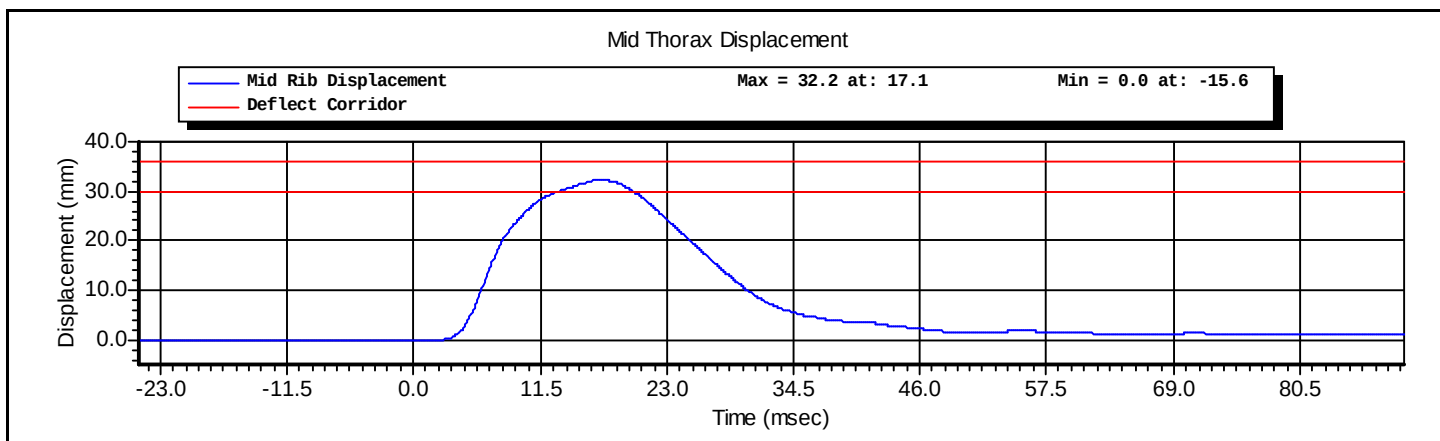
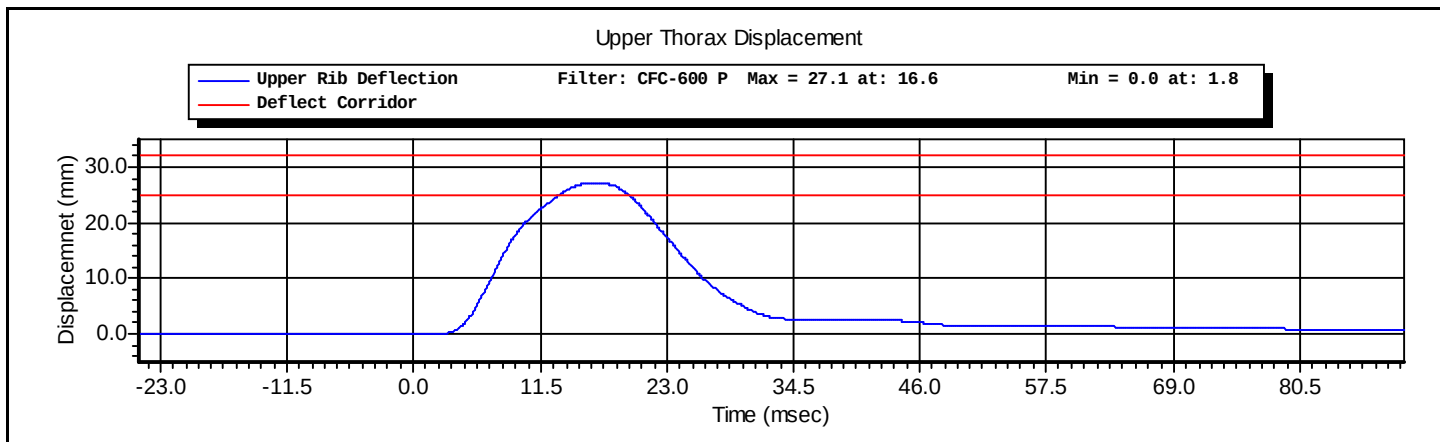
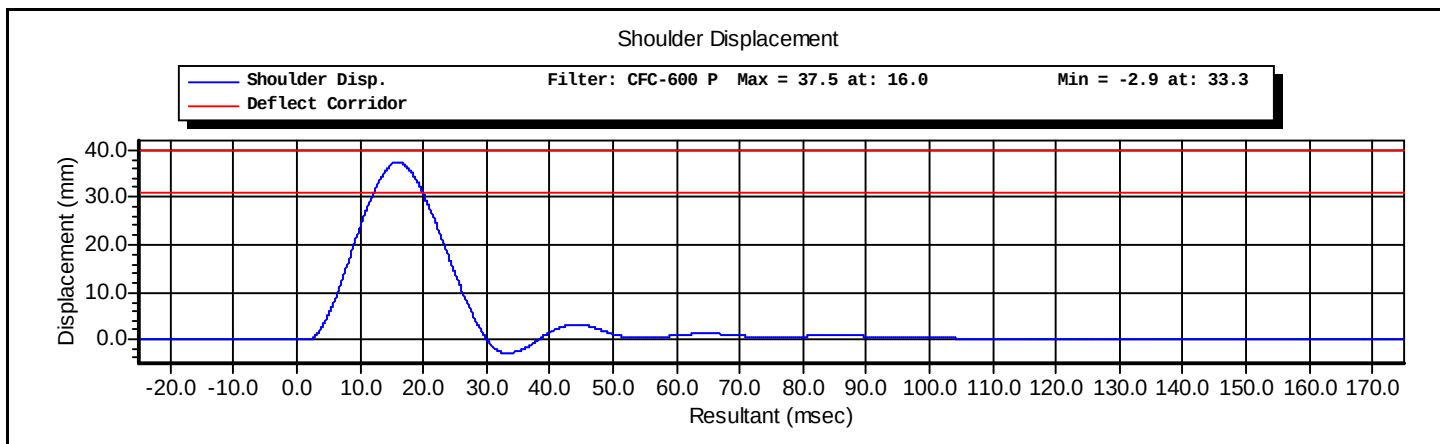
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:			
Test ID:		Test Date:	7/28/2010
Test Number:	1	Test Time:	4:10:11 PM
Component Part Number	Component Serial Number		

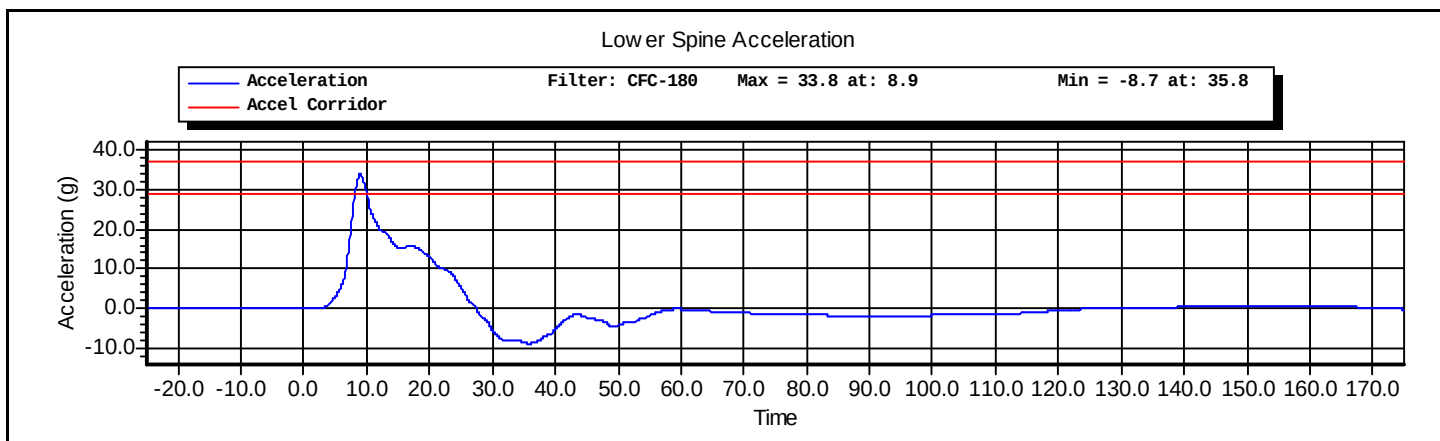
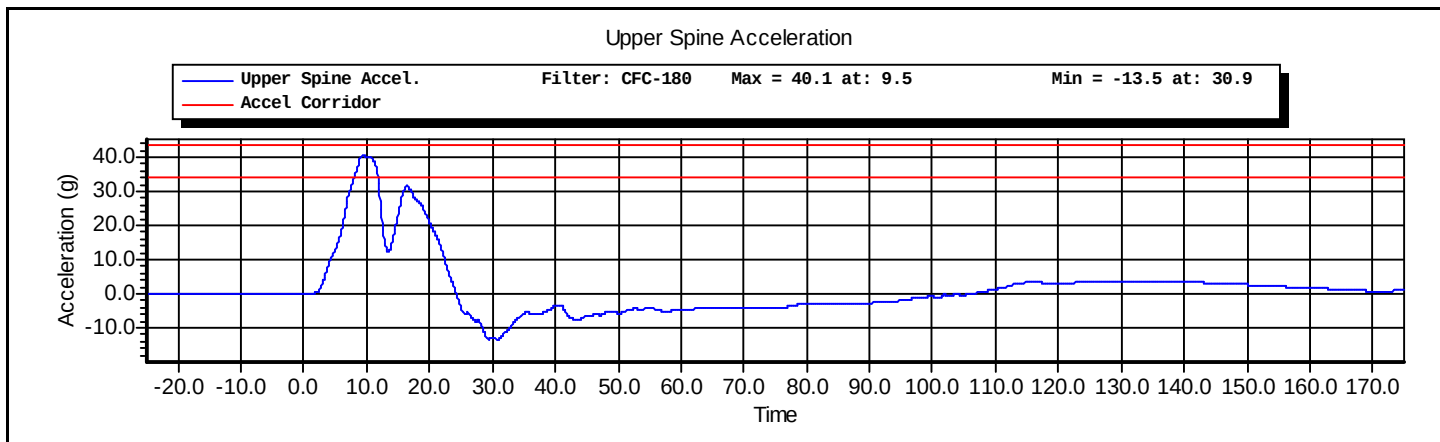
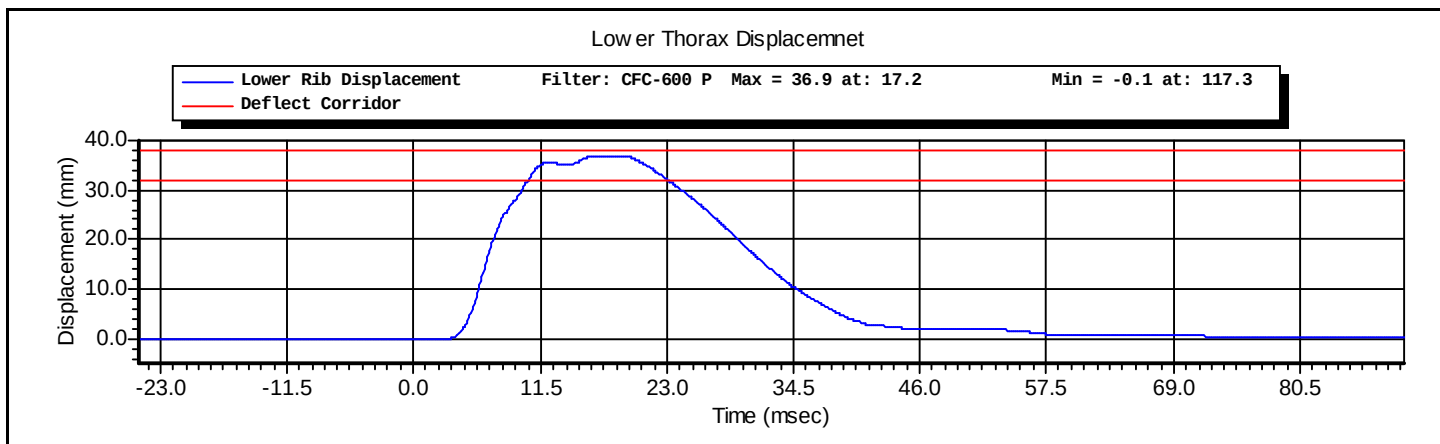


Test ID:

Test Time: 4:10:11 PM

Test Date: 7/28/2010







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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	7/28/2010
Test Number:	1	Test Time:	3:02:58 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	56 %RH	P
Velocity	4.20	--	4.40	4.36 m/s	P
Probe Acceleration	14.0	--	18.0	15.4 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	34.2 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	41.4 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	40.9 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	15.8 g	P
Lower Spine Acceleration T12	7.0	--	11.0	9.8 g	P

All test parameters are within specifications

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

Test ID: **Thorax Without Arm** Test Time: **3:02:58 PM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P23904	3/15/2010
Endevco	7264-2000	P50078	7/2/2010

Test ID: **Thorax Without Arm** Test Time: **3:02:58 PM**

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



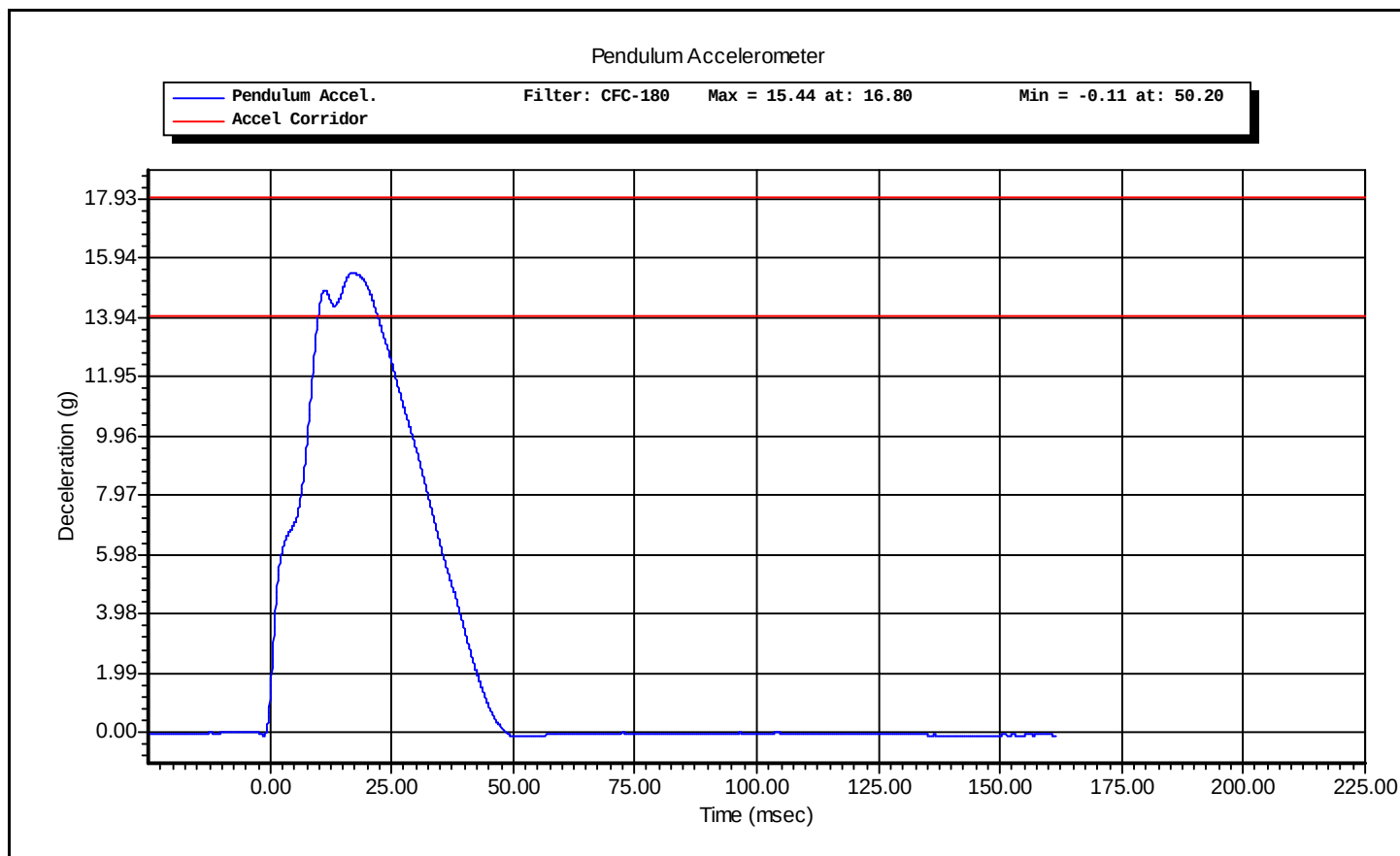
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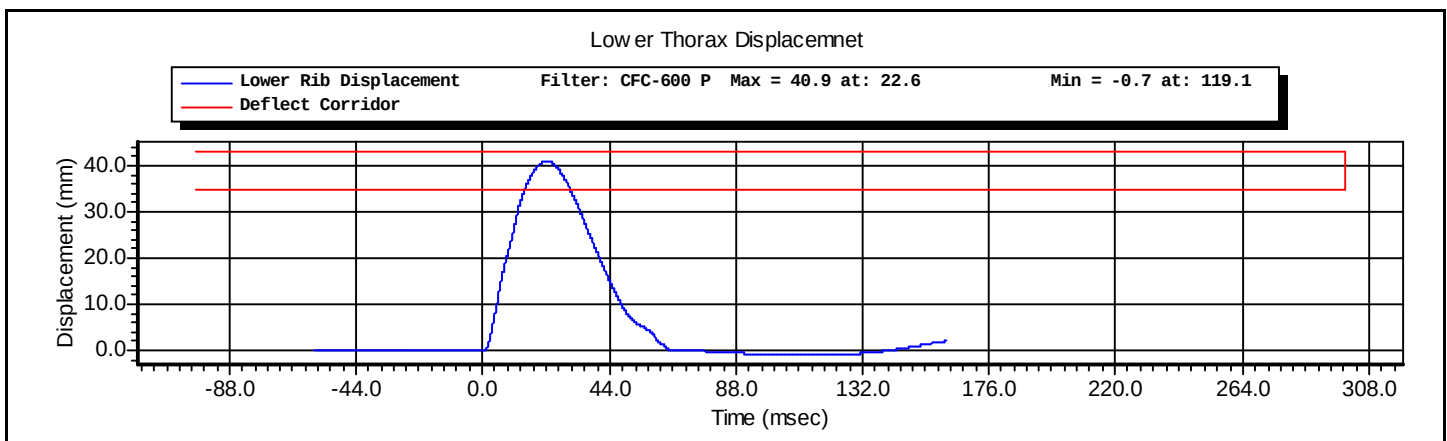
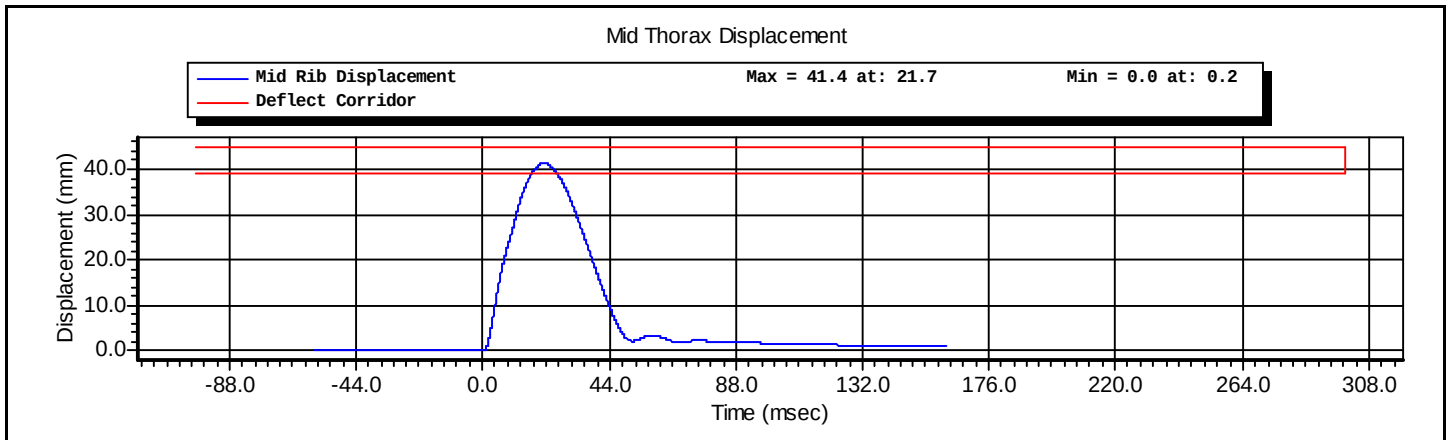
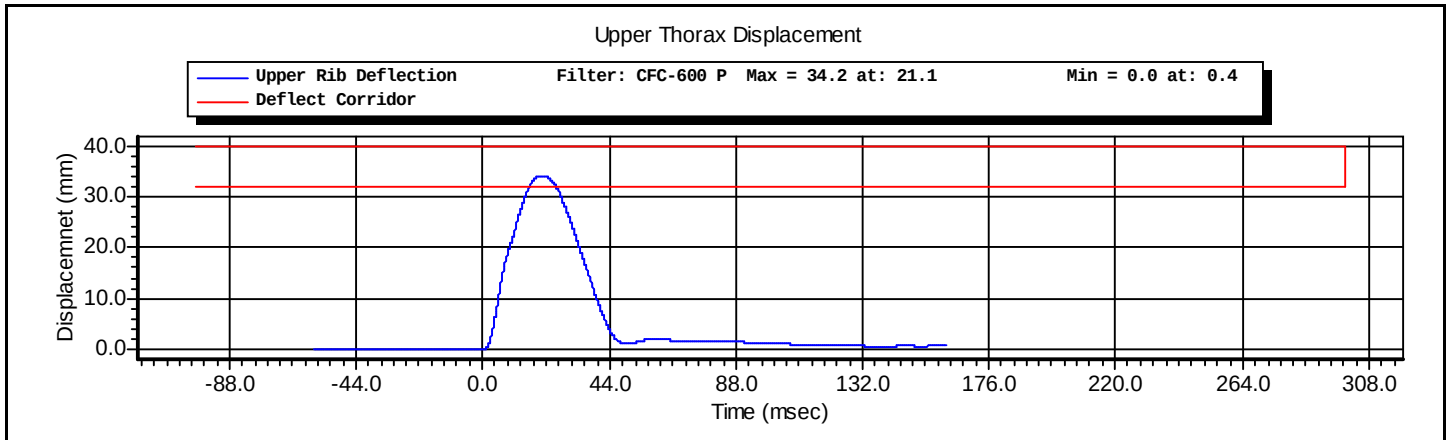
Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	7/28/2010
Test Number:	1	Test Time:	3:02:58 PM

Component Part Number	Component Serial Number
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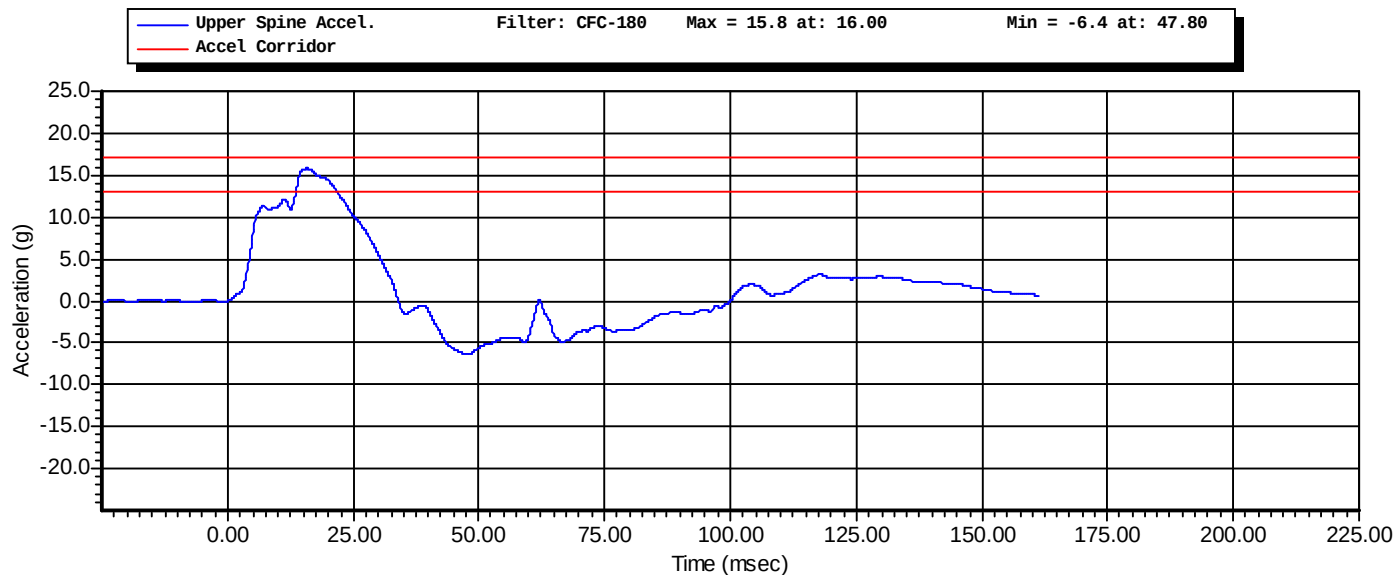


Test ID: **Thorax Without Arm** Test Time: **3:02:58 PM**

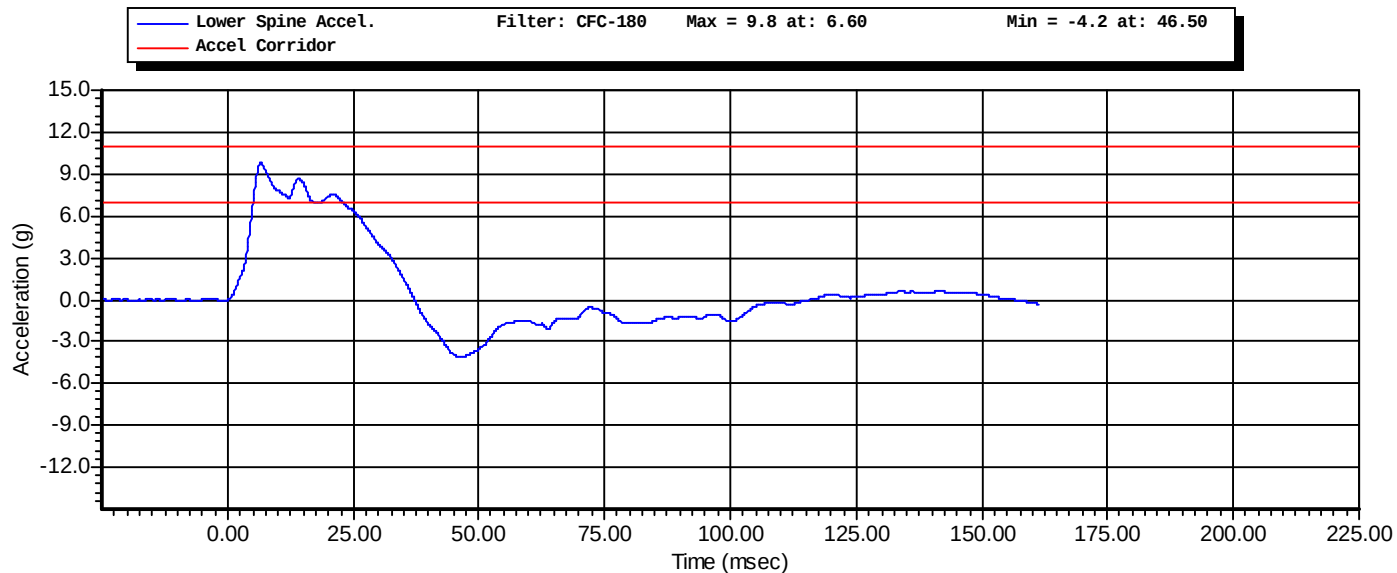
Test Date: **7/28/2010**



Upper Spine Acceleration



Lower Spine Acceleration





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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	7/28/2010
Test Number:	2	Test Time:	2:12:50 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	56 %RH	P
Velocity	4.20	--	4.40	4.36 m/s	P
Probe Acceleration	12.0	--	16.0	13.5 g	P
Upper Abdominal Rib Deflection	36.0	--	47.0	40.3 mm	P
Lower Abdominal Rib Deflection	33.0	--	44.0	38.1 mm	P
Lower Spine Acceleration - T12	9.0	--	14.0	12.0 g	P

All test parameters are within specifications

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

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

Test ID: **Abdomen**

Test Time: **2:12:50 PM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-1162	4/7/2010
Servo	180-3885	DS-1232	4/7/2010
Endevco	7264-2000	P50078	7/2/2010

Test ID: **Abdomen**

Test Time: **2:12:50 PM**

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



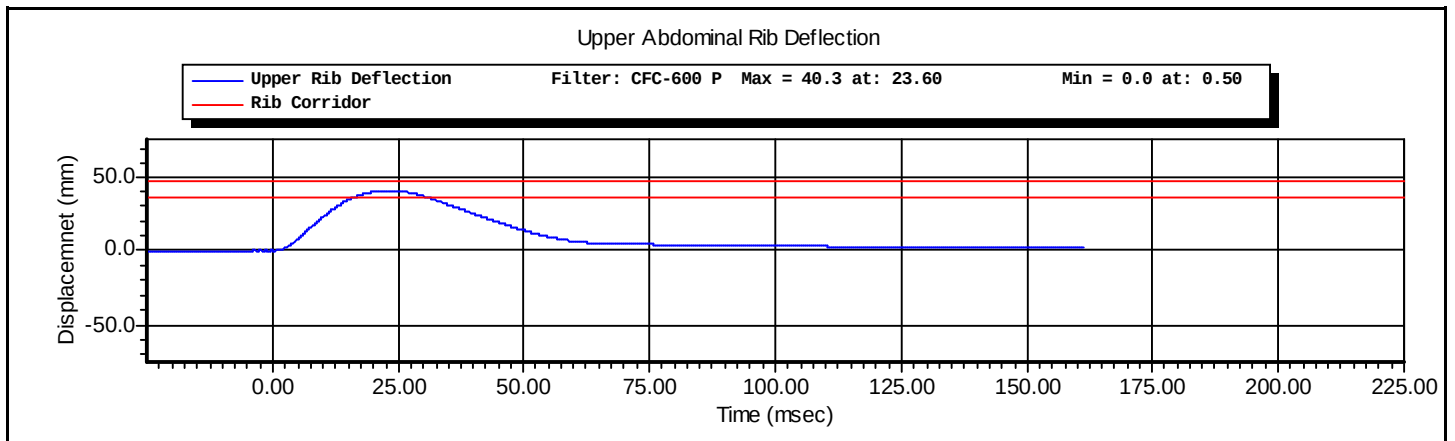
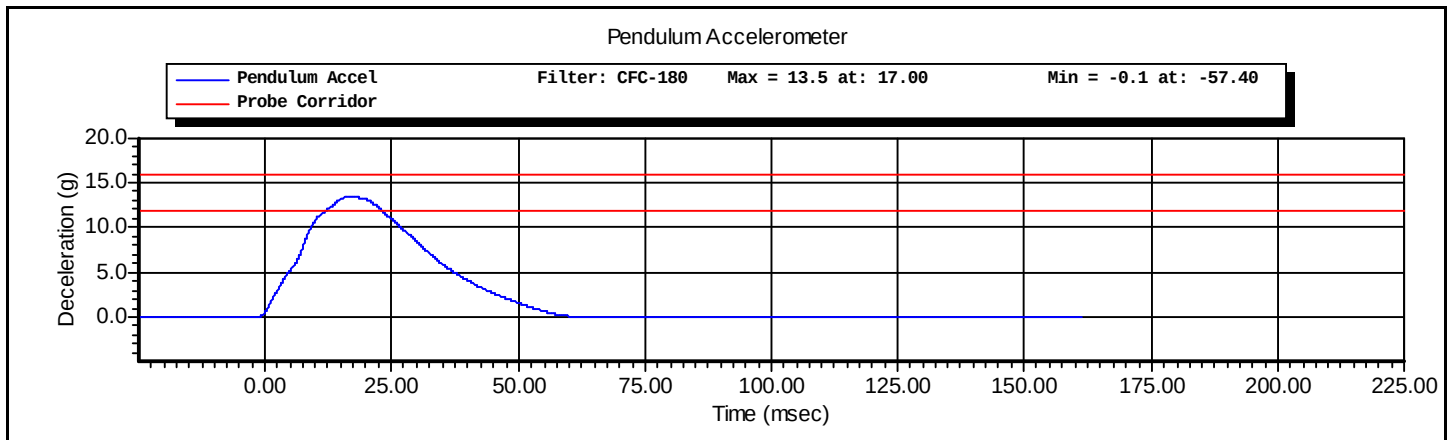
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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	7/28/2010
Test Number:	2	Test Time:	2:12:50 PM

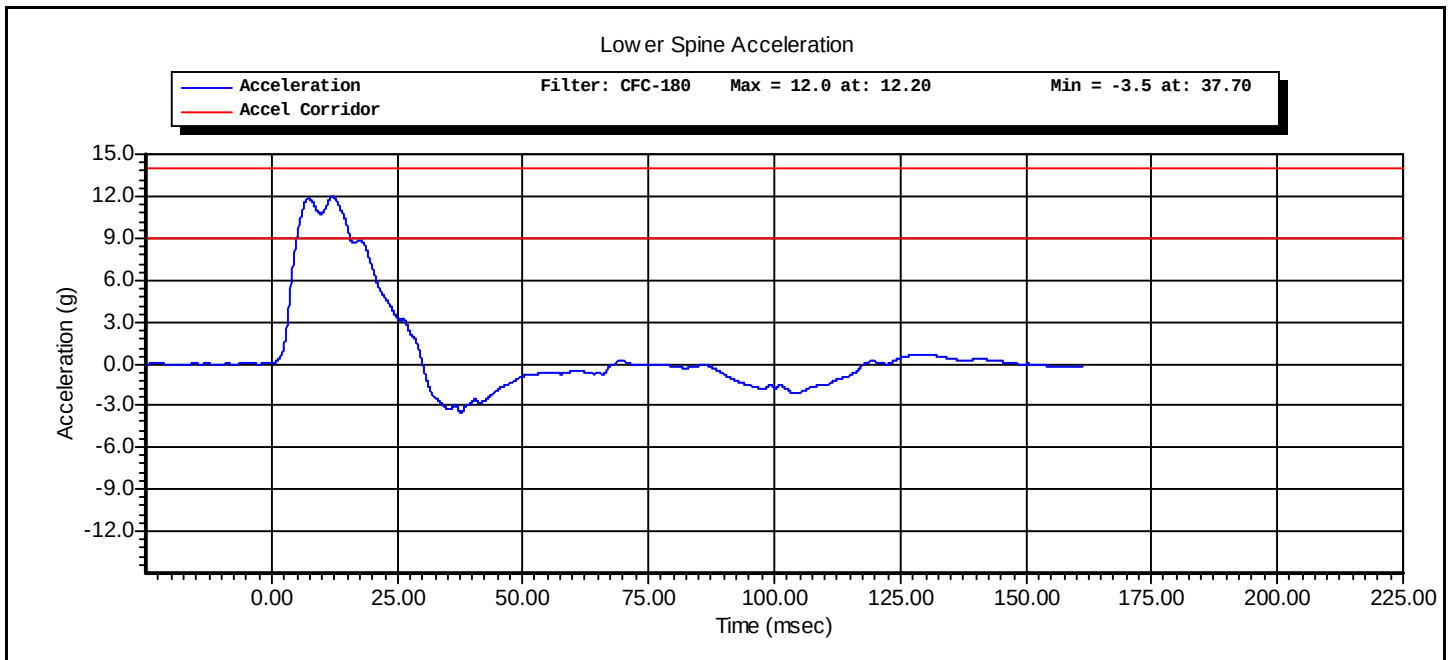
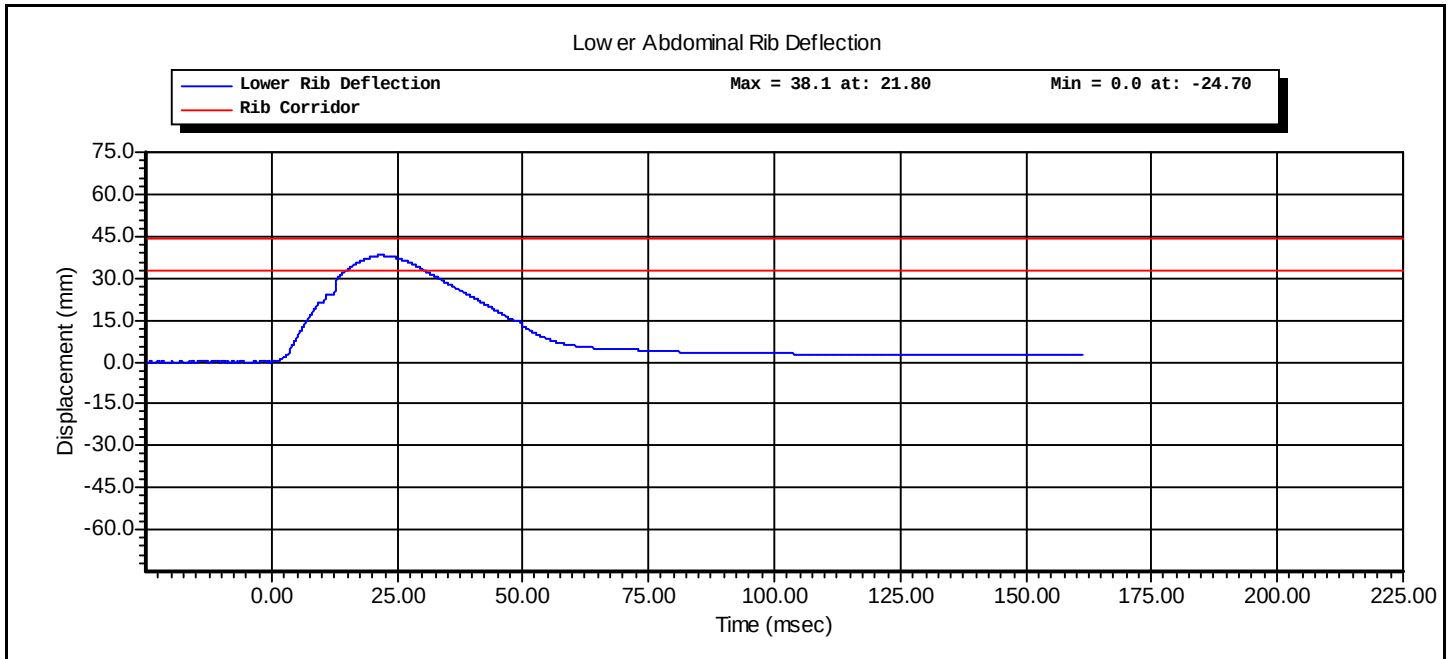
Component Part Number	Component Serial Number
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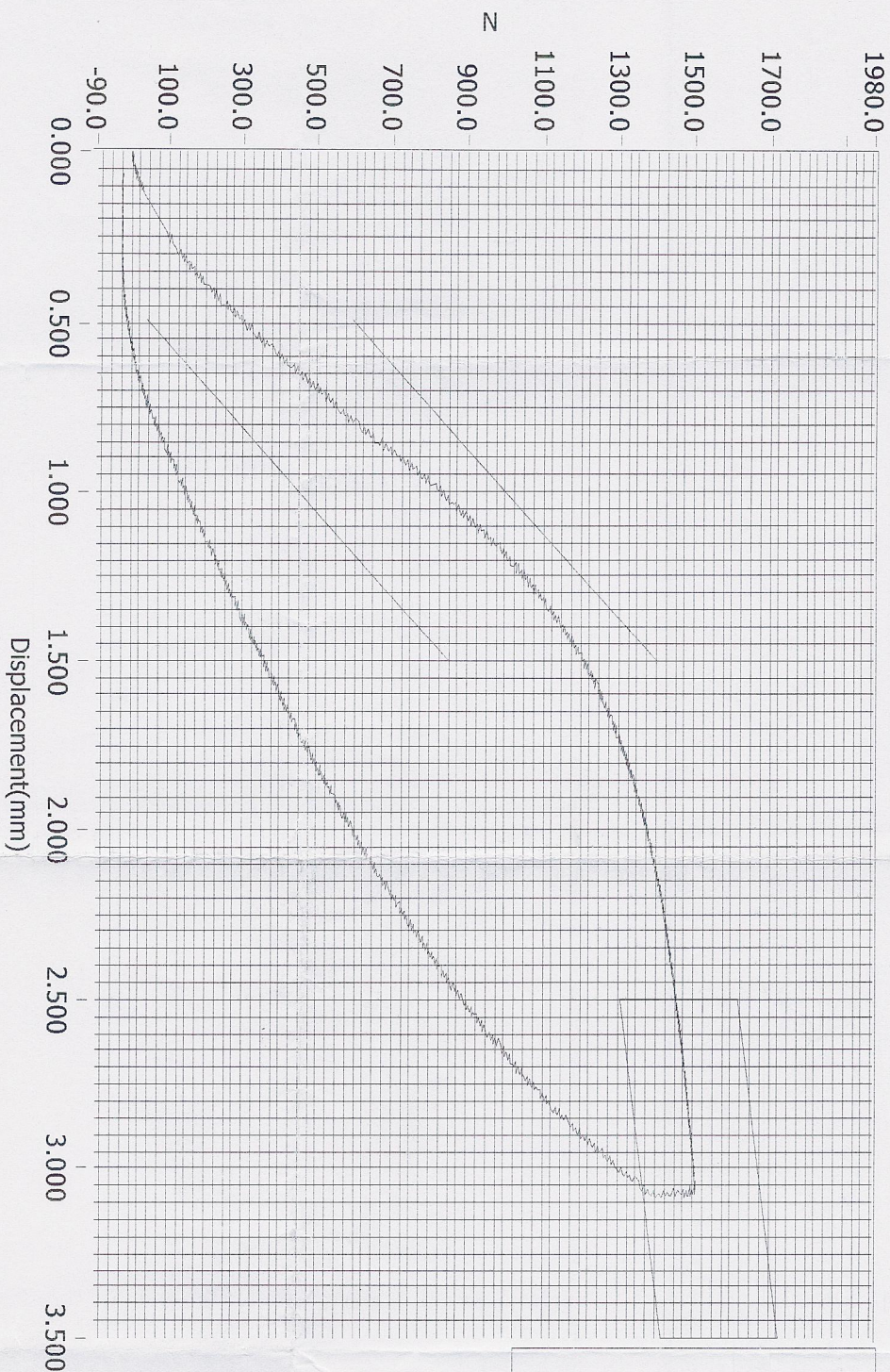
Test ID: **Abdomen**

Test Time: **2:12:50 PM**

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



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

12287

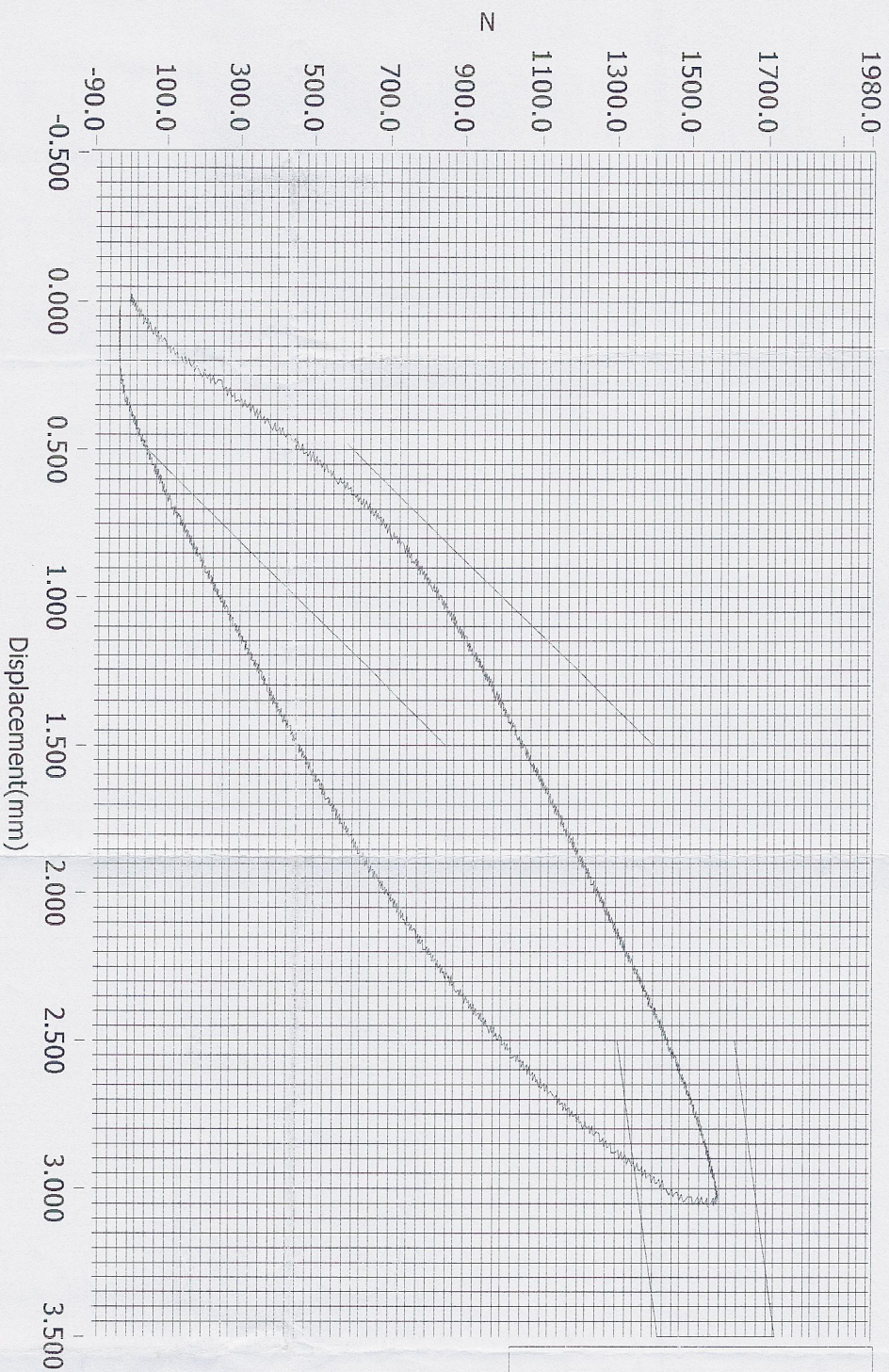
SIDIIs

Current Date : 7/6/2007

Current Time : 08:13:17

C

Resultant Data - SIDIIs Plug Compression



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

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

13972

SIDIIs

Current Date : 8/30/2007

Current Time : 04:46:05

F S



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	7/28/2010
Test Number:	1	Test Time:	11:47:35 AM

Comments:

Pelvis Plug Used For Certification:

FTSS S/N 12287

Force @ 3mm = 1504N

Pelvis Plug Used For Full Scale Test:

FTSS S/N 13972

Force @ 3mm = 1568N

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	56 %RH	P
Velocity	6.60	--	6.80	6.67 m/s	P
Peak Probe Acceleration	38.0	--	47.0	44.9 g	P
Peak Pelvis Acceleration	34.0	--	42.0	41.7 g	P
Peak Acetabulum Force	3.60	--	4.30	4.15 kN	P

All test parameters are within specifications

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

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

Test ID: **Pelvis Acetabulum** Test Time: **11:47:35 AM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010
Endevco	7264-2000	P51671	4/12/2010
DentonATD	3249J	LC-275a	4/12/2010

Test ID: **Pelvis Acetabulum** Test Time: **11:47:35 AM**

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



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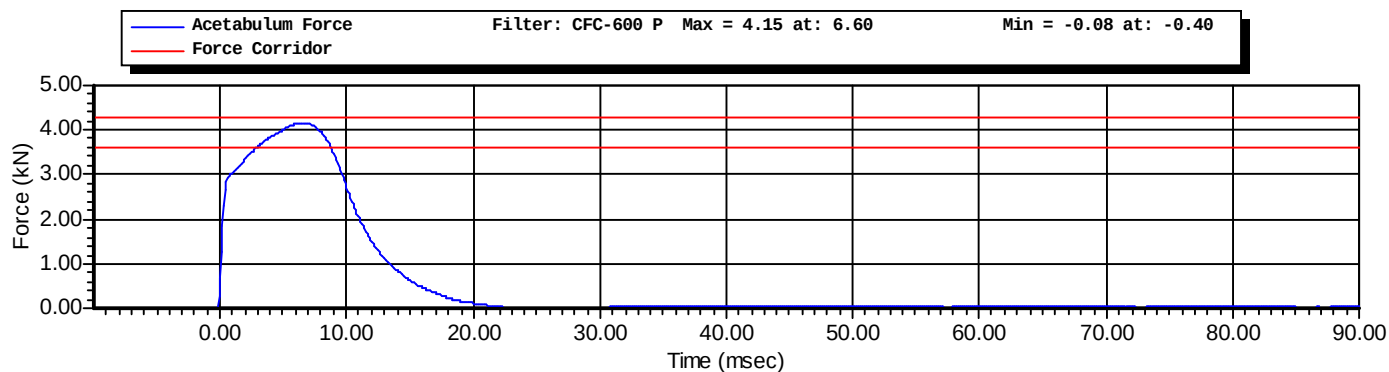
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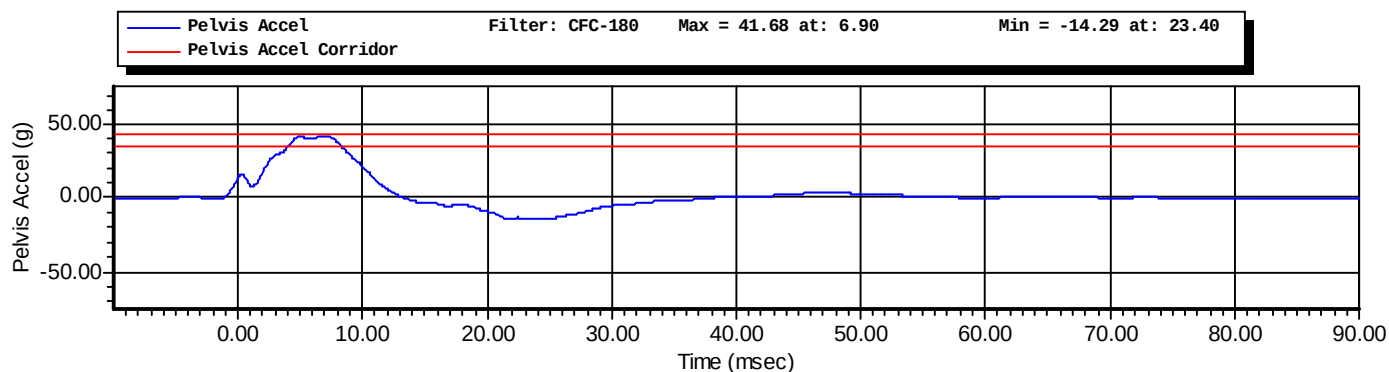
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Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	7/28/2010
Test Number:	1	Test Time:	11:47:35 AM

Component Part Number	Component Serial Number
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Acetabulum Force

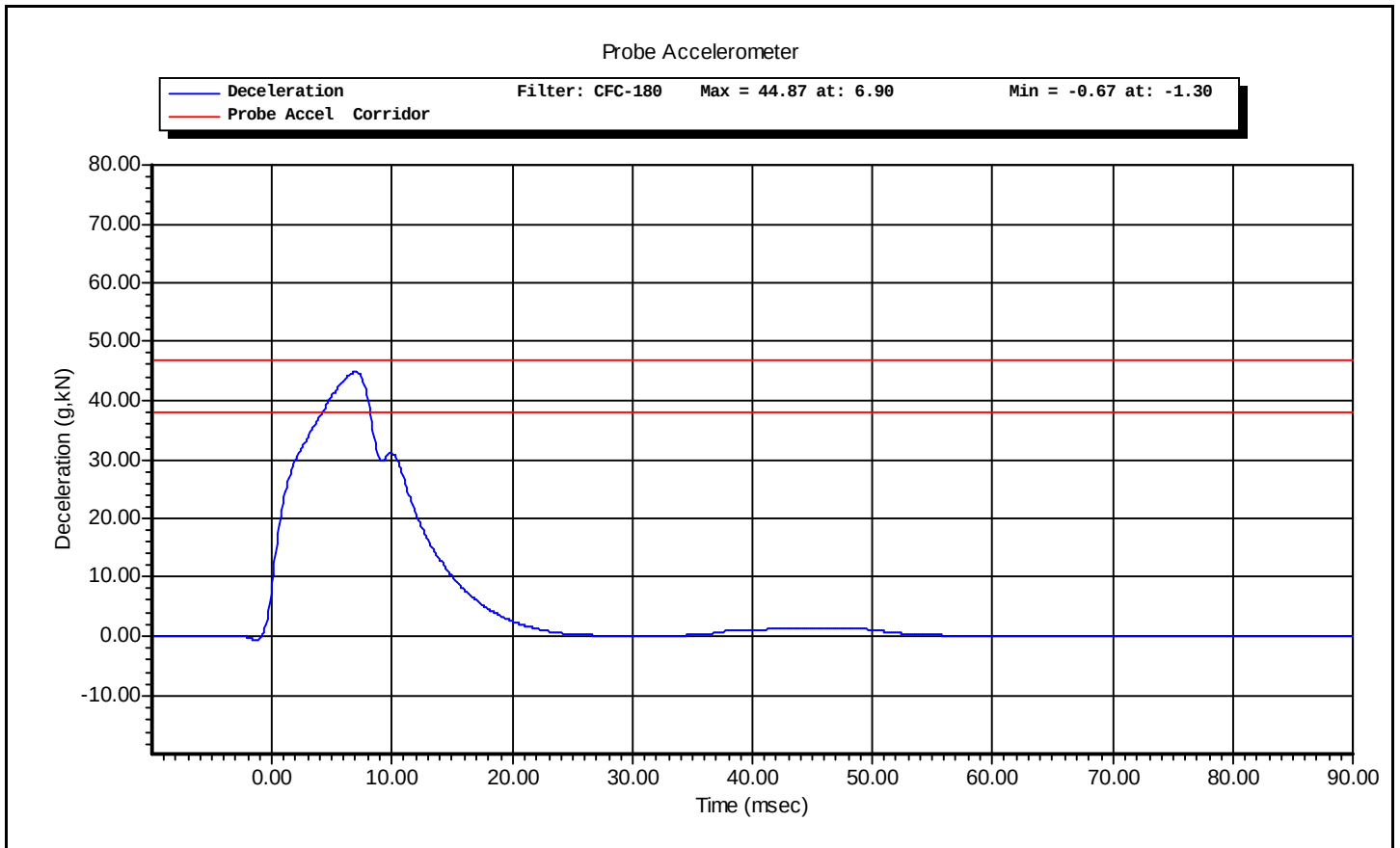


Pelvis Accelerometer



Test ID: **Pelvis Acetabulum** Test Time: **11:47:35 AM**

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





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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Iliac Pelvis	Test Date:	7/27/2010
Test Number:	1	Test Time:	1:45:51 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	56 %RH P
Velocity	4.20 -- 4.40	4.23 m/s P
Peak Probe Acceleration	36.0 -- 45.0	39.6 g P
Peak Pelvis Acceleration	28.0 -- 39.0	34.5 g P
Peak Iliac Force	4.10 -- 5.10	4.59 kN P

All test parameters are within specifications

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

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

Test ID: **Iliac Pelvis**

Test Time: **1:45:51 PM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010
Endevco	7264-2000	P51671	4/12/2010
DentonATD	3228J	LC-279 Fy	4/12/2010

Test ID: **Iliac Pelvis**

Test Time: **1:45:51 PM**

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



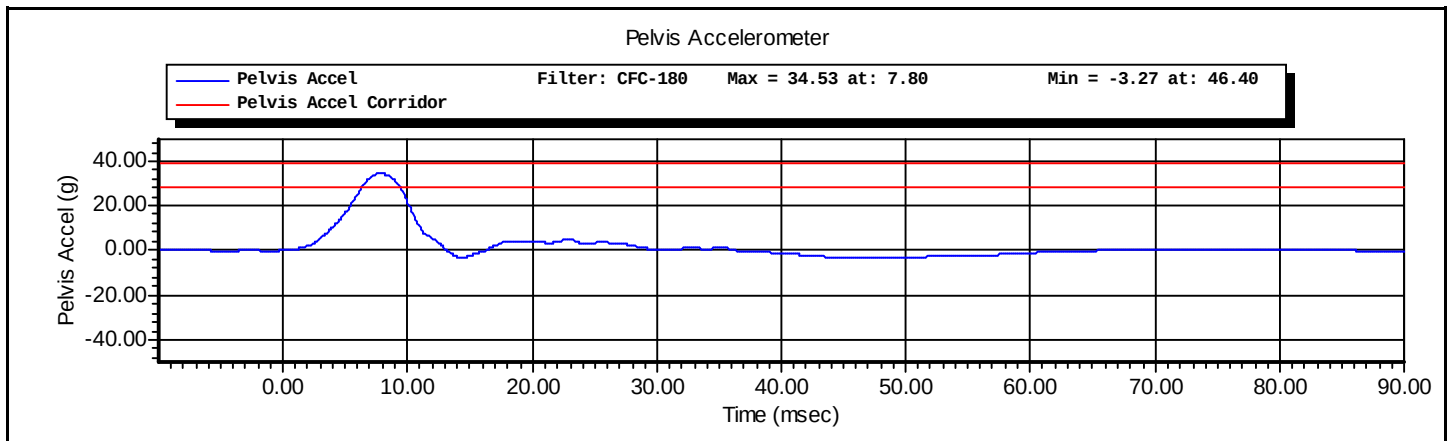
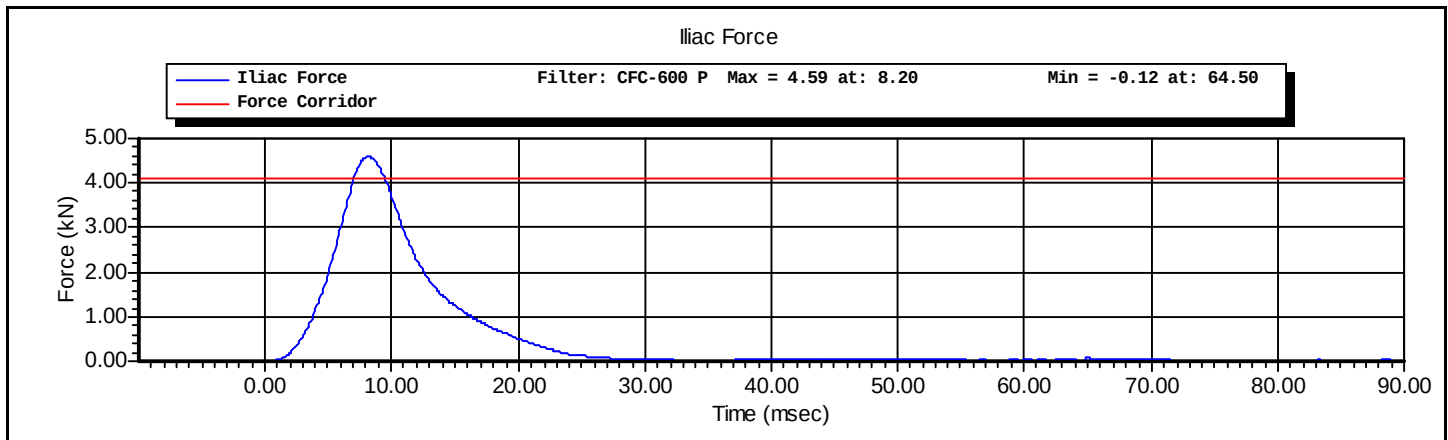
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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Iliac Pelvis	Test Date:	7/27/2010
Test Number:	1	Test Time:	1:45:51 PM

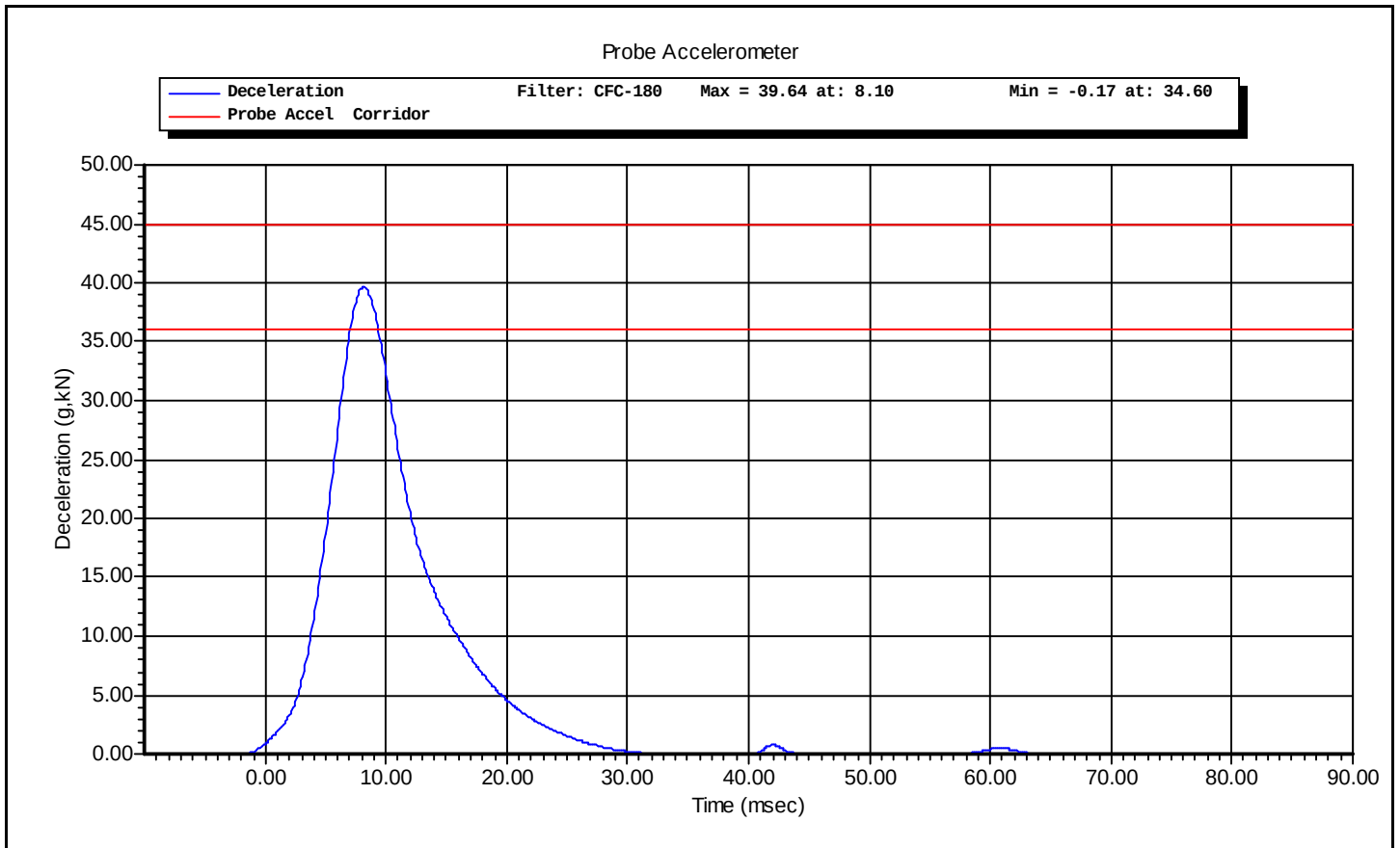
Component Part Number	Component Serial Number
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Test ID: **Iliac Pelvis**

Test Time: **1:45:51 PM**

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



CALIBRATION TEST RESULTS

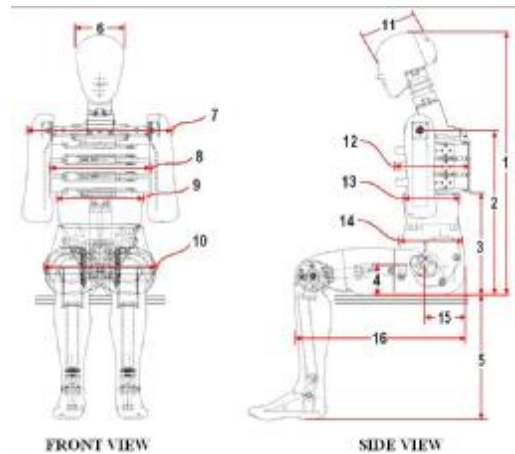
POST-TEST

ES2-re No: F033

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	906	Pass
2	Seat to Shoulder Joint	558-572	570	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	101	Pass
5	Sole to Seat, Sitting	333-451	436	Pass
6	Head Width	152-158	153	Pass
7	Shoulder/Arm Width	461-479	466	Pass
8	Thorax Width	322-332	324	Pass
9	Abdomen Width	273-287	284	Pass
10	Pelvis Lap Width	359-373	368	Pass
11	Head Depth	196-206	202	Pass
12	Thorax Depth	262-272	267	Pass
13	Abdomen Depth	194-204	201	Pass
14	Pelvis Depth	235-245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	158	Pass
16	Back of Buttocks to Front Knee	597-615	603	Pass

Technician: AR

Date: 08/23/2010



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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:	8/23/2010
Test Number:	1	Test Time:	11:00:45 AM

Component Part Number	Component Serial Number
455-1007	8473

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	62 %RH P
Resultant Acceleration	125 -- 155	134 g P
Oscillation	0.0 -- 15.0	3.3 % P
Fore-Aft Acceleration	-15.00 -- 15.00	6.10 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **11:00:45 AM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P15526	7/25/2010
Endevco	7264-2000	P51949	5/26/2010
Endevco	7264-2000	P26269	4/6/2010

Test ID: **Head Drop**

Test Time: **11:00:45 AM**

Test Date: **8/23/2010**

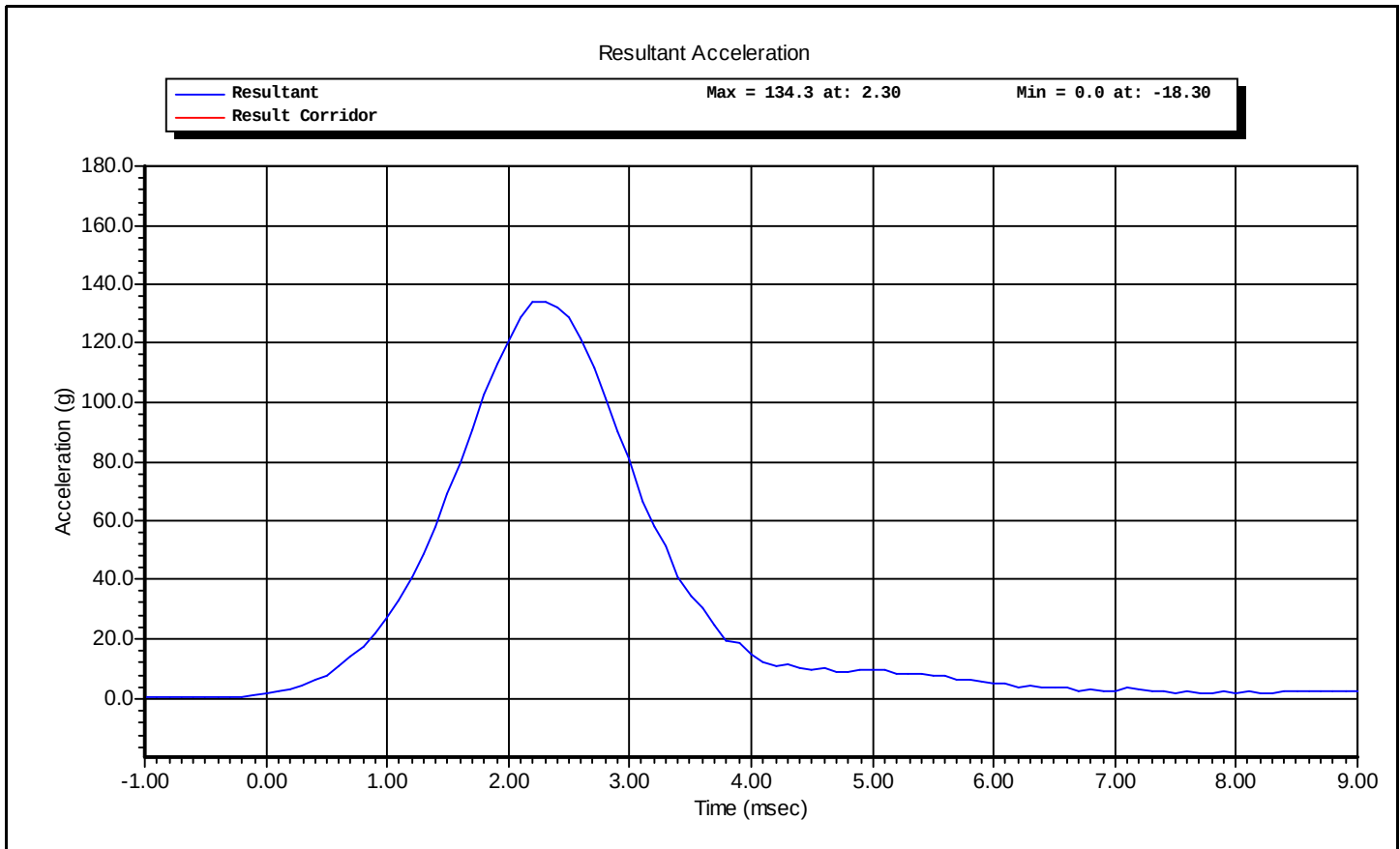


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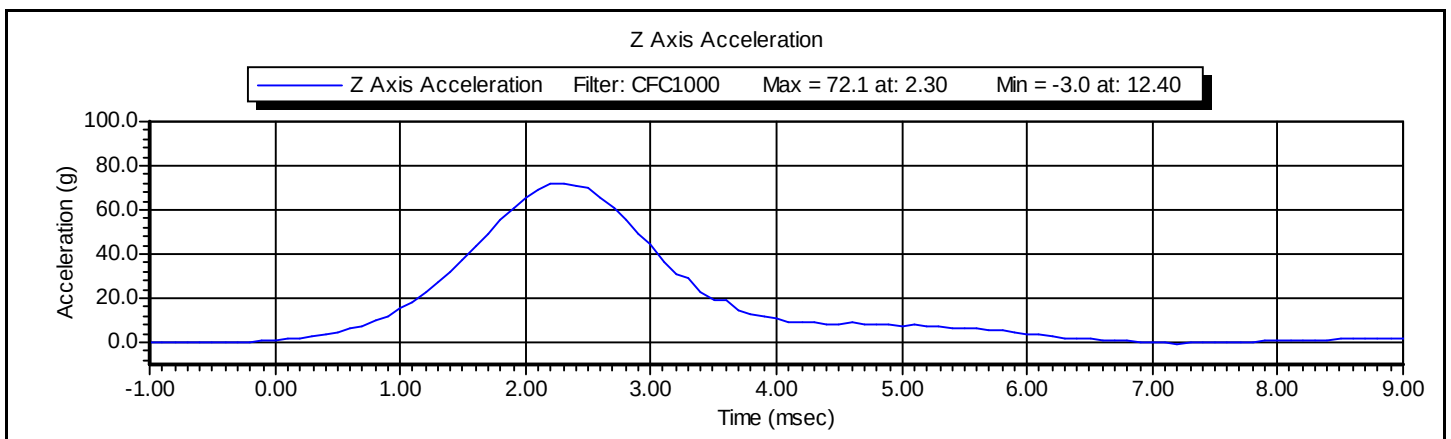
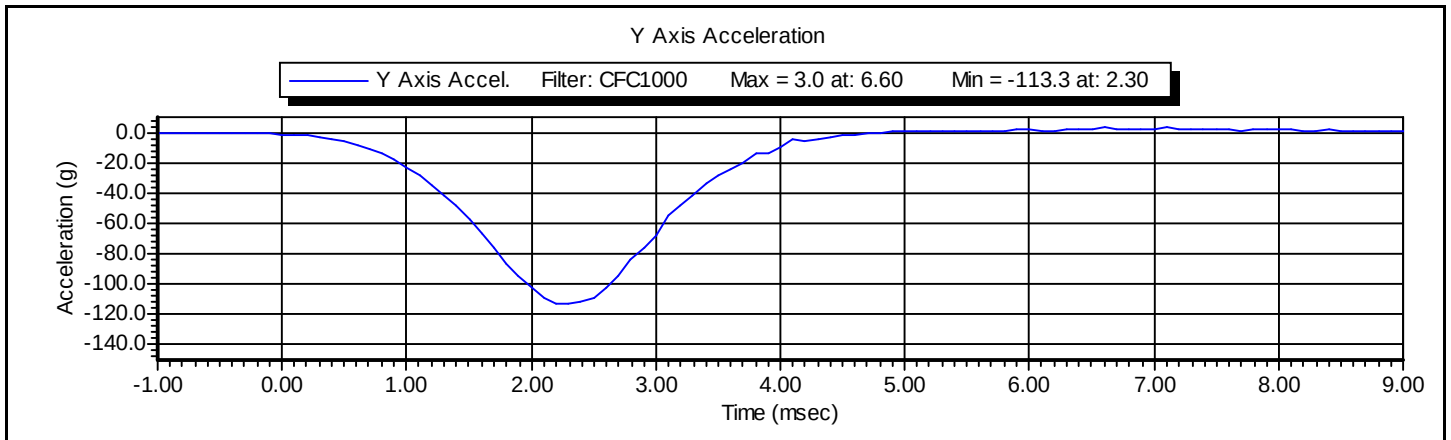
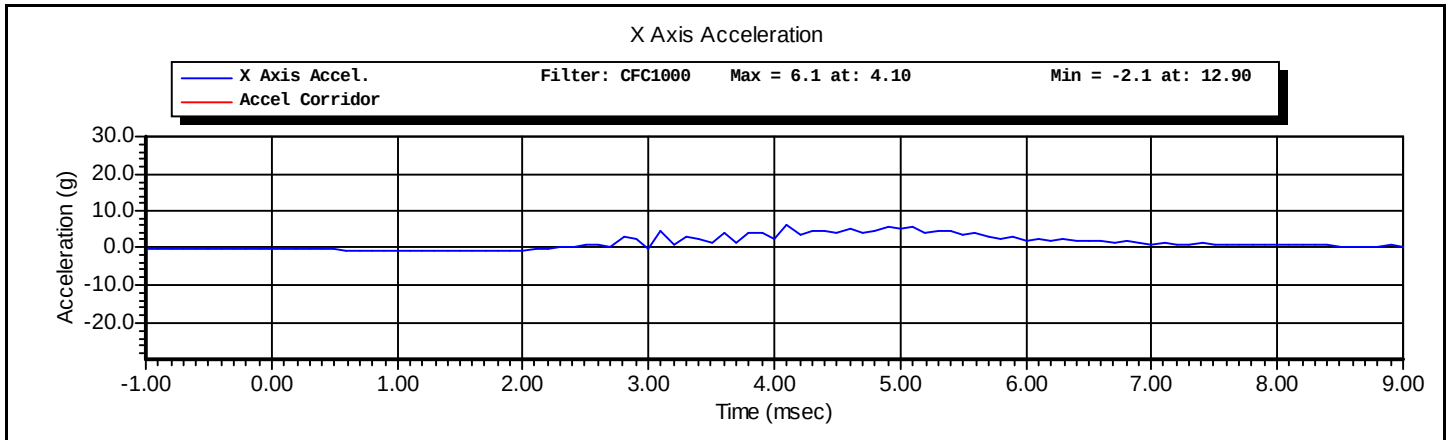
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	8/23/2010
Test Number:	1	Test Time:	11:00:45 AM



Test ID: **Head Drop**

Test Time: **11:00:45 AM**

Test Date: **8/23/2010**





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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:	8/23/2010
Test Number:	1	Test Time:	11:48:05 AM

Component Part Number	Component Serial Number
455-2002	07085

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	65 %RH P
Velocity	3.30 -- 3.50	3.42 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	51.6 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	60.6 ms P
Decay to Zero Degrees	53.0 -- 88.0	56.4 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **11:48:05 AM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	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: **11:48:05 AM**

Test Date: **8/23/2010**



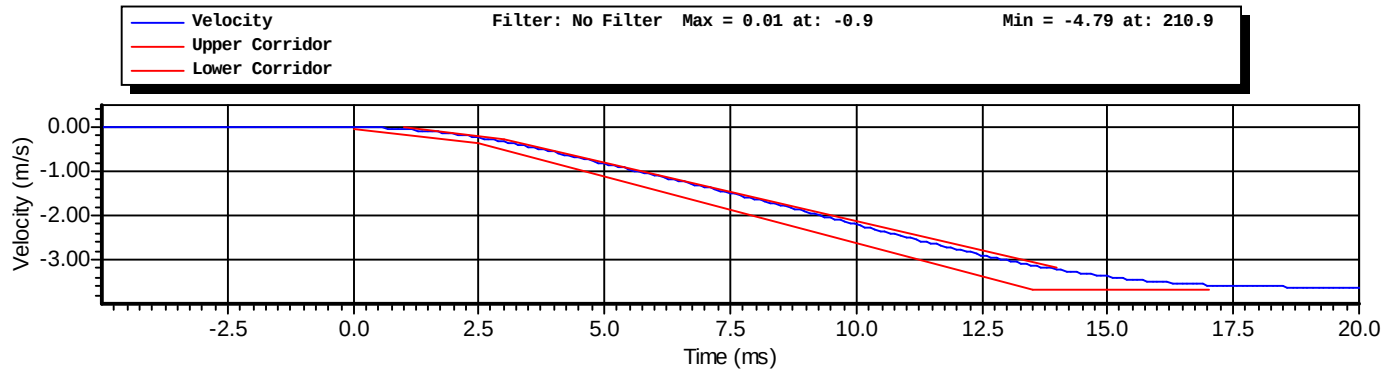
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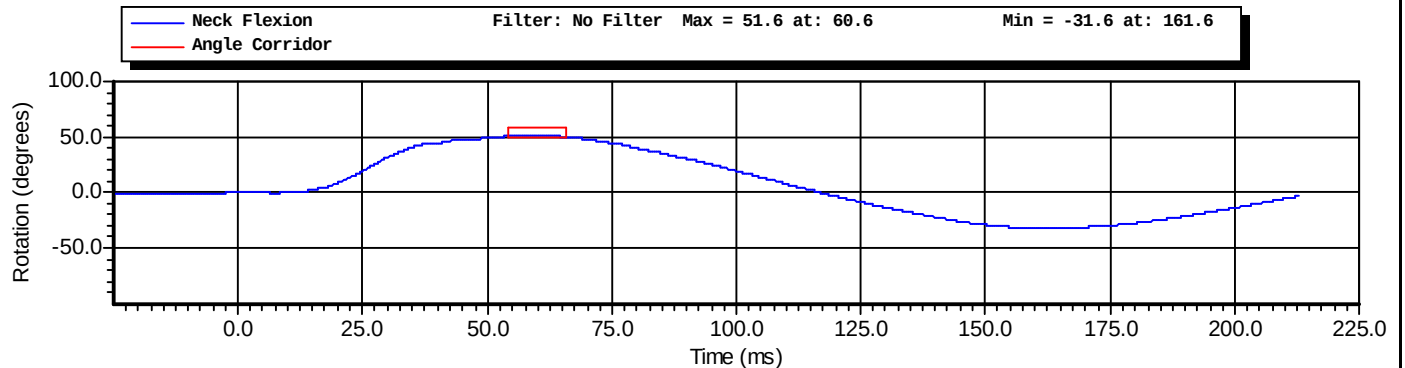
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	8/23/2010
Test Number:	1	Test Time:	11:48:05 AM

Pendulum Velocity



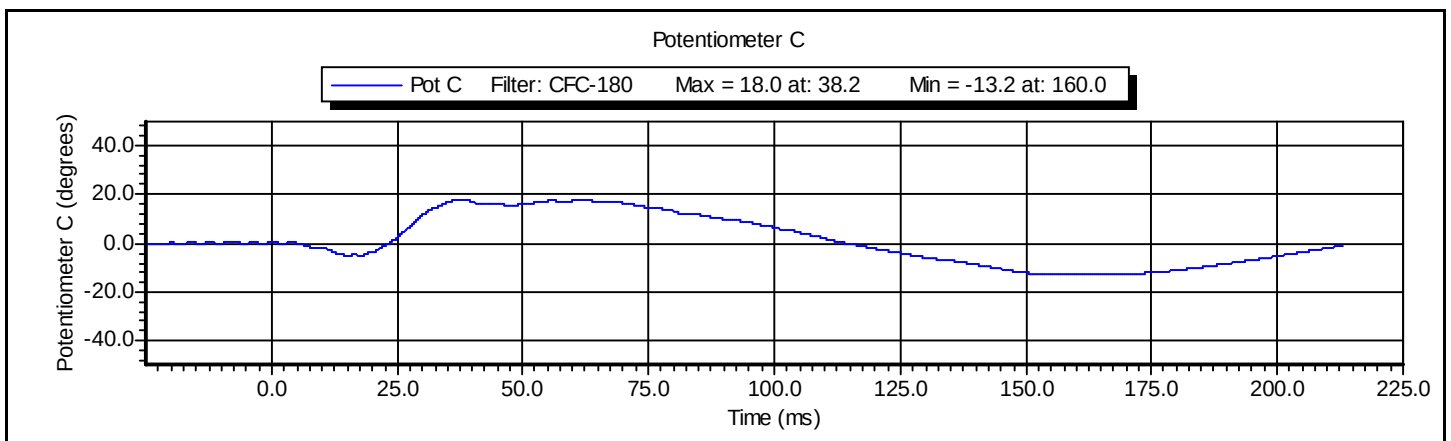
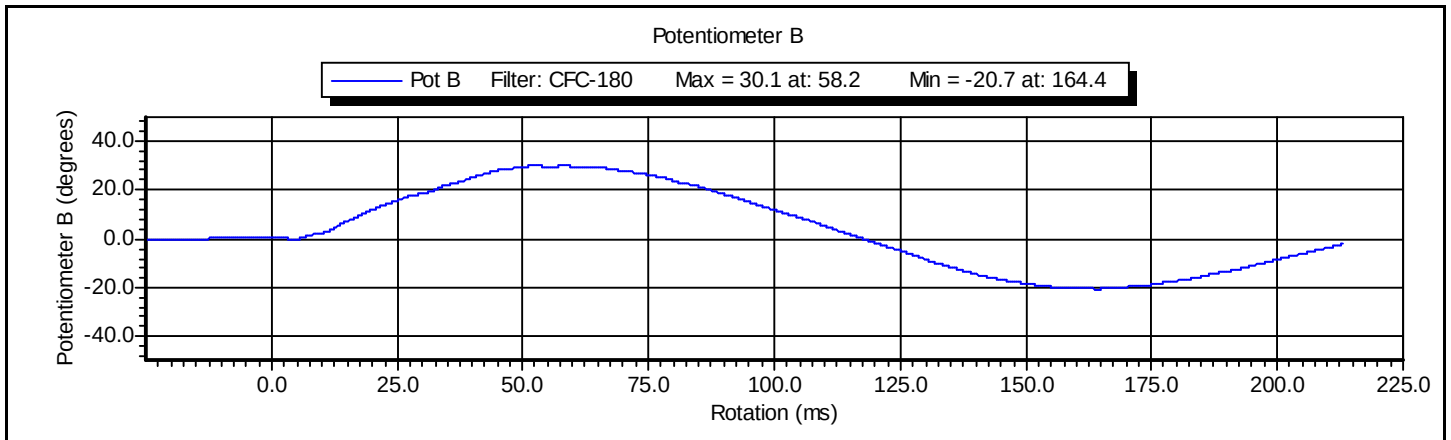
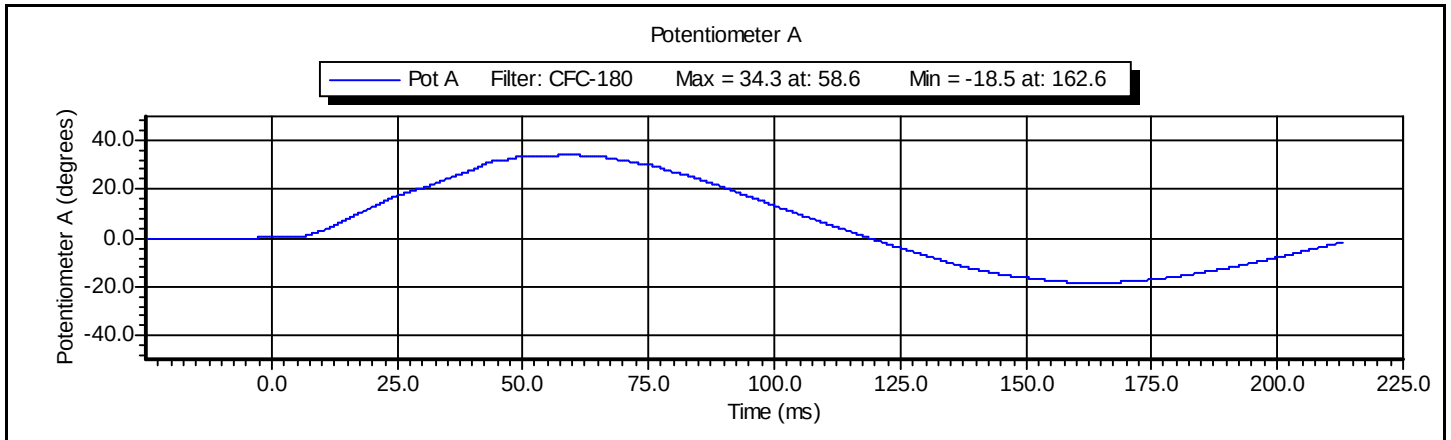
Neck Flexion Angle



Test ID: Neck Flexion

Test Time: 11:48:05 AM

Test Date: 8/23/2010





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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	Test Date:	8/23/2010
Test Number:	1	Test Time:	4:34:33 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	58.0 %RH P
Velocity	4.20 -- 4.40	4.34 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.07 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder**

Test Time: **4:34:33 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010

Test ID: **Shoulder**

Test Time: **4:34:33 PM**

Test Date: **8/23/2010**

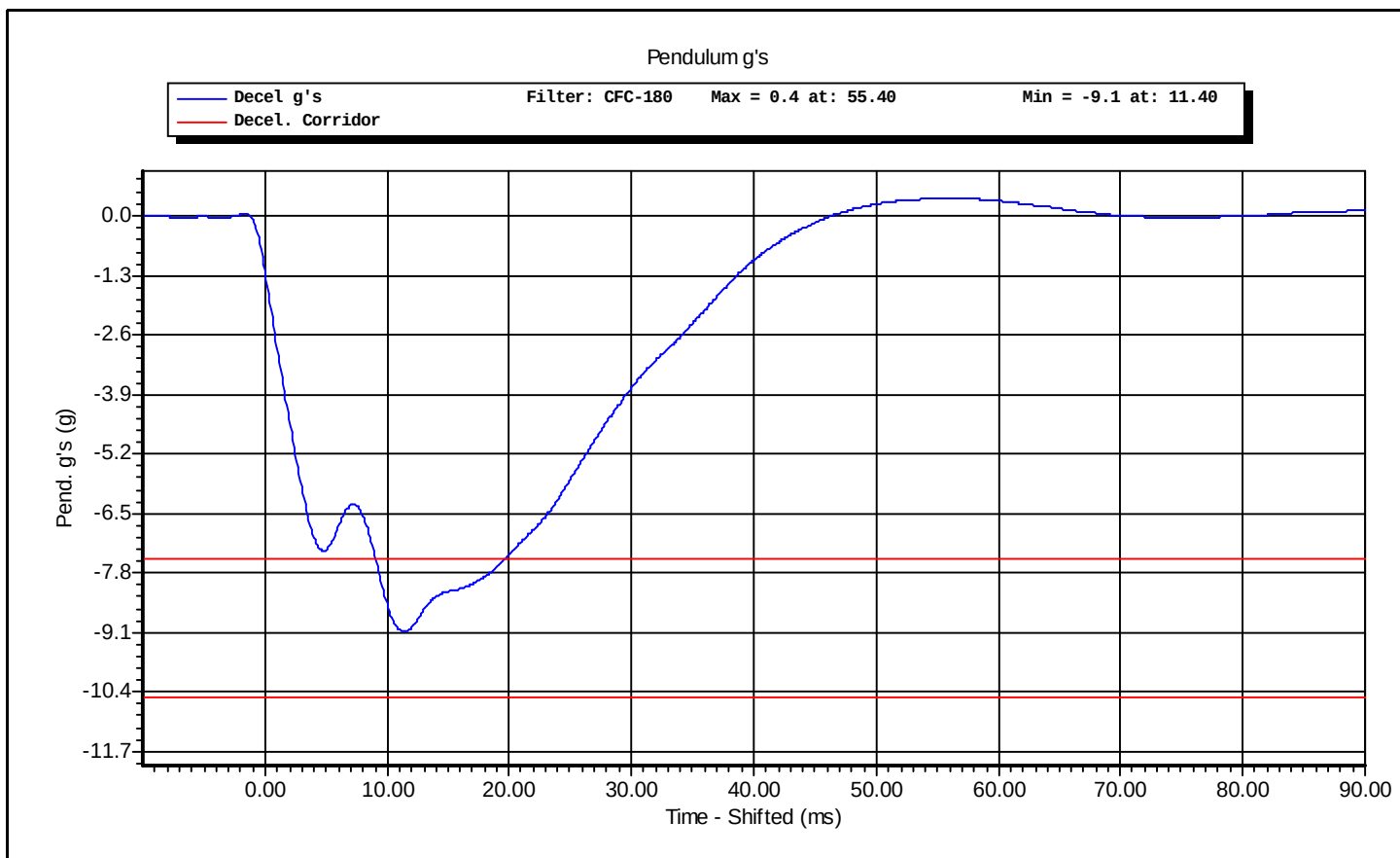


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	8/23/2010
Test Number:	1	Test Time:	4:34:33 PM



Test ID: **Shoulder**

Test Time: **4:34:33 PM**

Test Date: **8/23/2010**



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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:	8/23/2010
Test Number:	1	Test Time:	2:38:03 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	63.0 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Rib Displacement	-51.00 -- -46.00	-47.41 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: **2:38:03 PM**

Test Date: **8/23/2010**



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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: **2:38:03 PM**

Test Date: **8/23/2010**

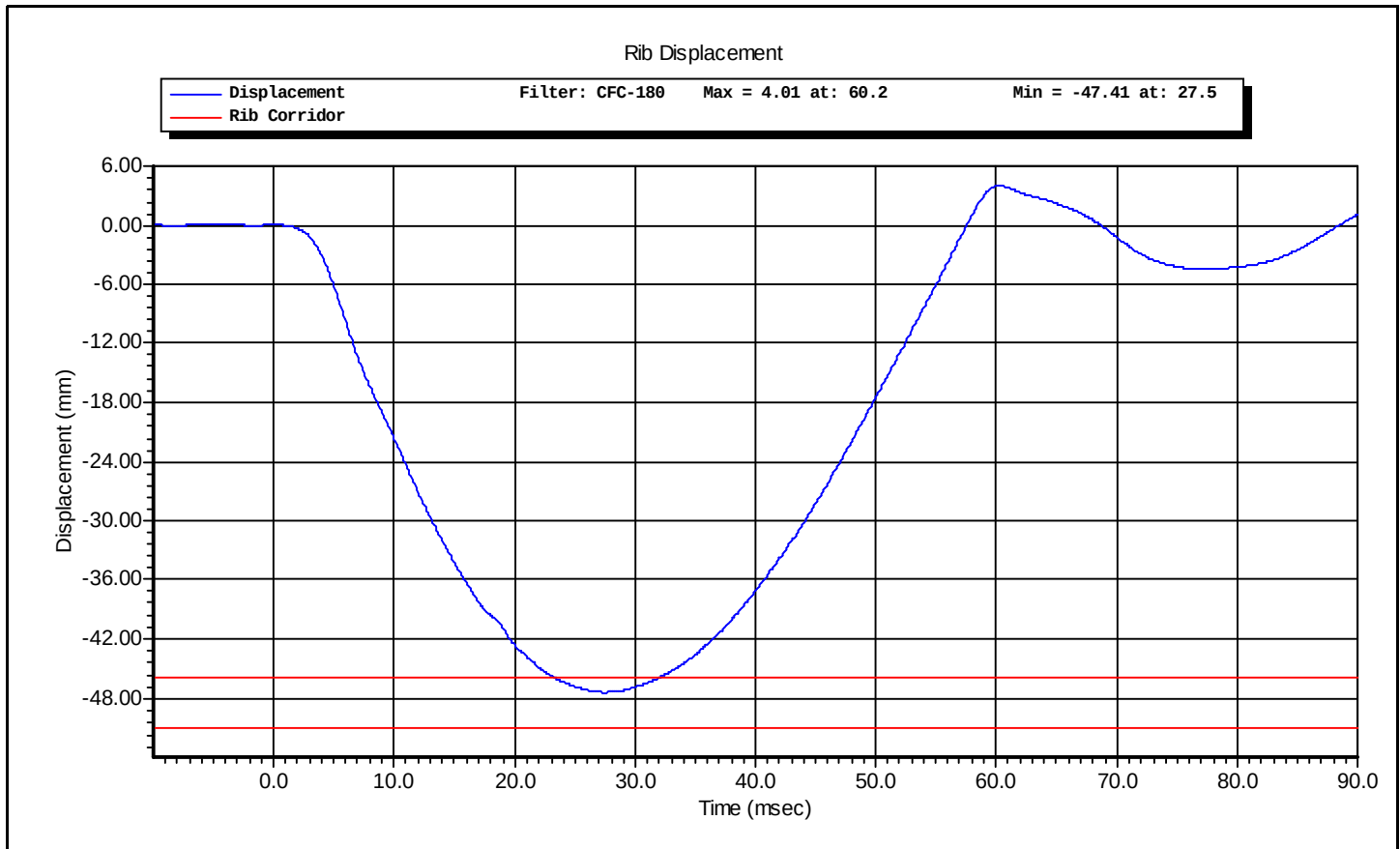


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:38:03 PM



Test ID: Lower Rib 4 m/s Test Time: 2:38:03 PM

Test Date: 8/23/2010



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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:	8/23/2010
Test Number:	1	Test Time:	2:44:02 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	63.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.01 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: **2:44:02 PM**

Test Date: **8/23/2010**



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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: **2:44:02 PM**

Test Date: **8/23/2010**

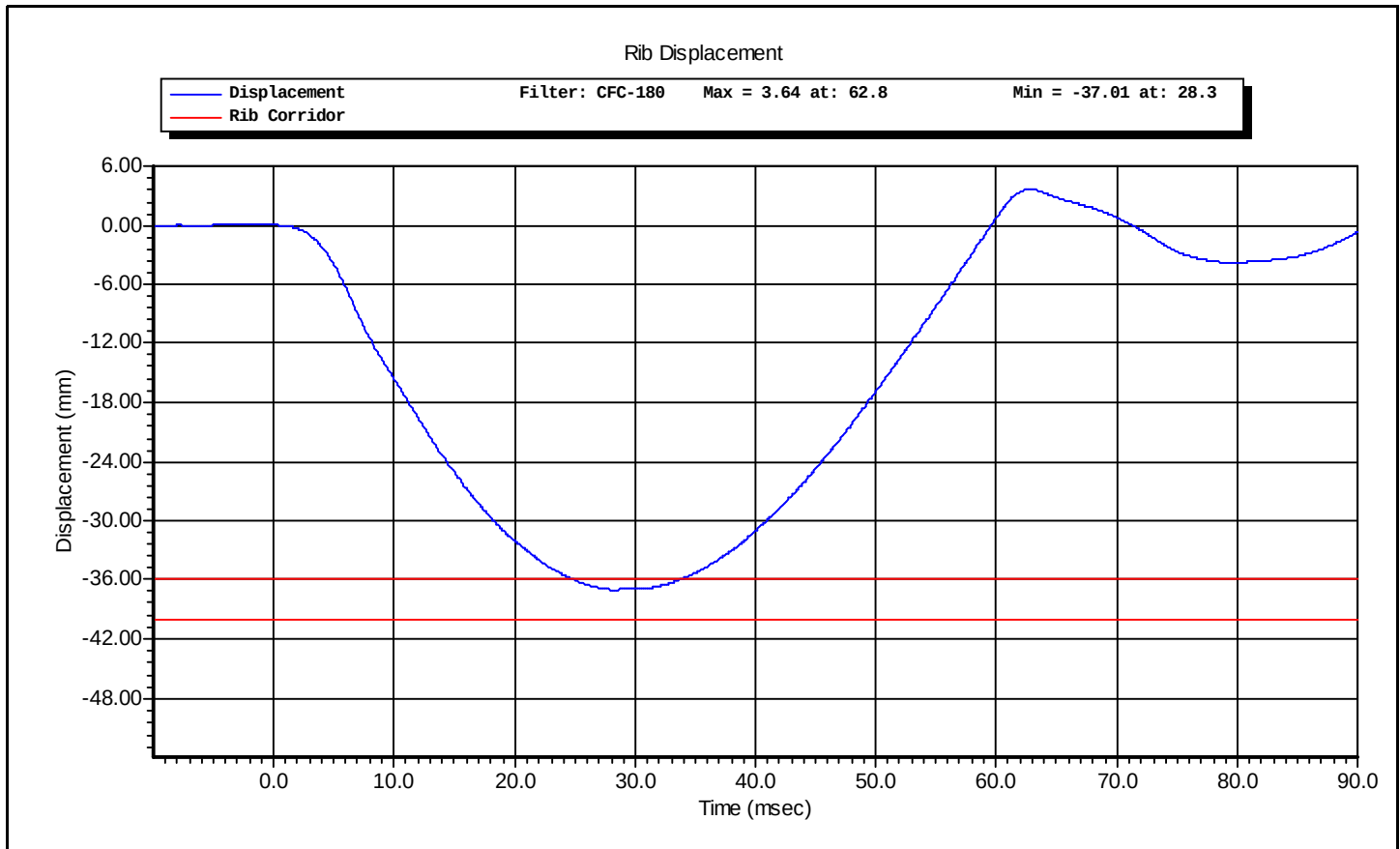


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:44:02 PM



Test ID: Lower Rib 3 m/s Test Time: 2:44:02 PM

Test Date: 8/23/2010



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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:	Rib Middle 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:23:56 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	62.0 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Rib Displacement	-51.00 -- -46.00	-47.41 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: **Rib Middle 4 m/s** Test Time: **2:23:56 PM**

Test Date: **8/23/2010**



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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: **Rib Middle 4 m/s** Test Time: **2:23:56 PM**

Test Date: **8/23/2010**

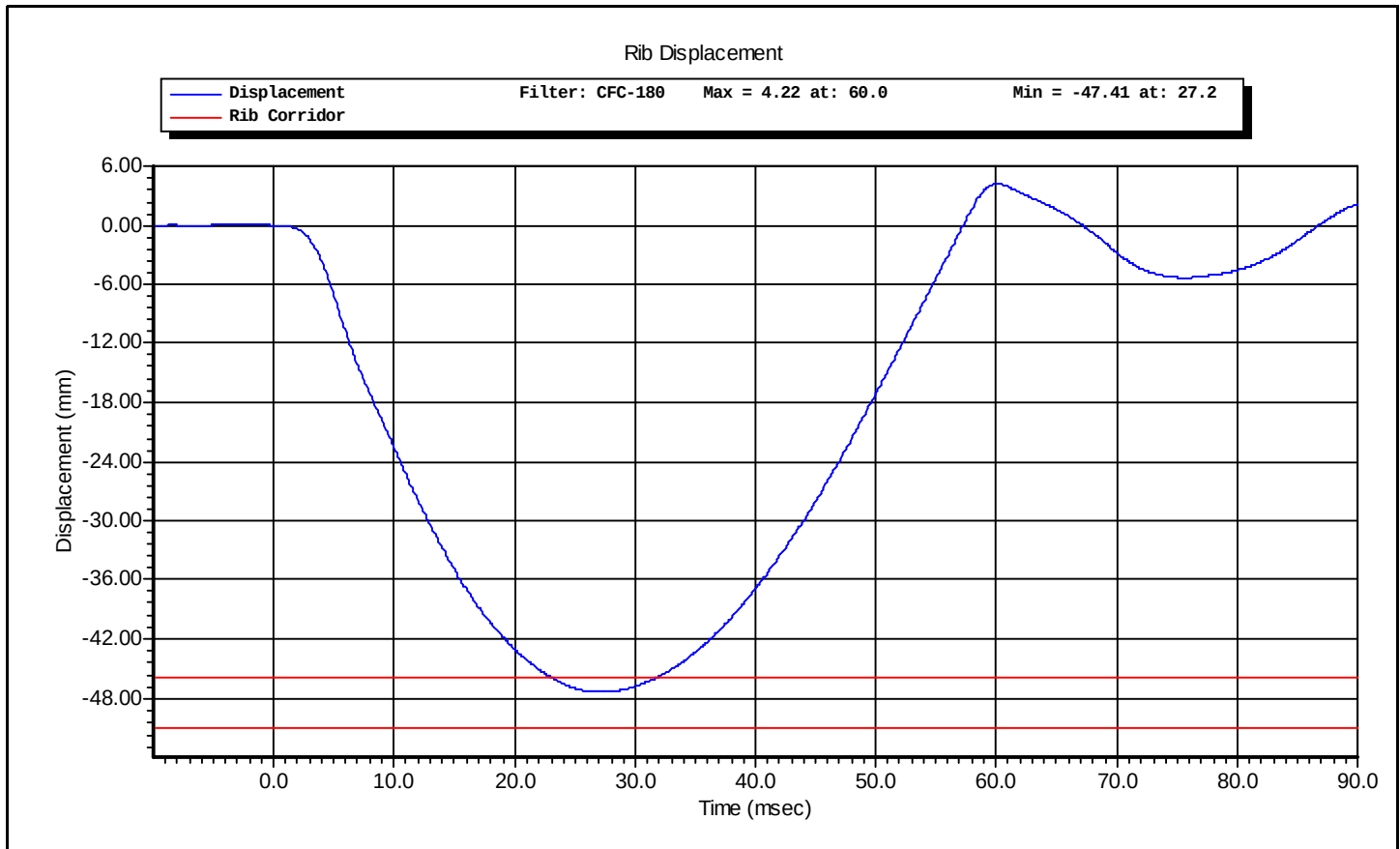


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Rib Middle 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:23:56 PM



Test ID: Rib Middle 4 m/s Test Time: 2:23:56 PM

Test Date: 8/23/2010



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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:	8/23/2010
Test Number:	1	Test Time:	2:30:29 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	62.0 %RH P
Velocity	2.90 -- 3.10	2.92 m/s P
Rib Displacement	-40.00 -- -36.00	-36.46 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: **2:30:29 PM**

Test Date: **8/23/2010**



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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: **2:30:29 PM**

Test Date: **8/23/2010**

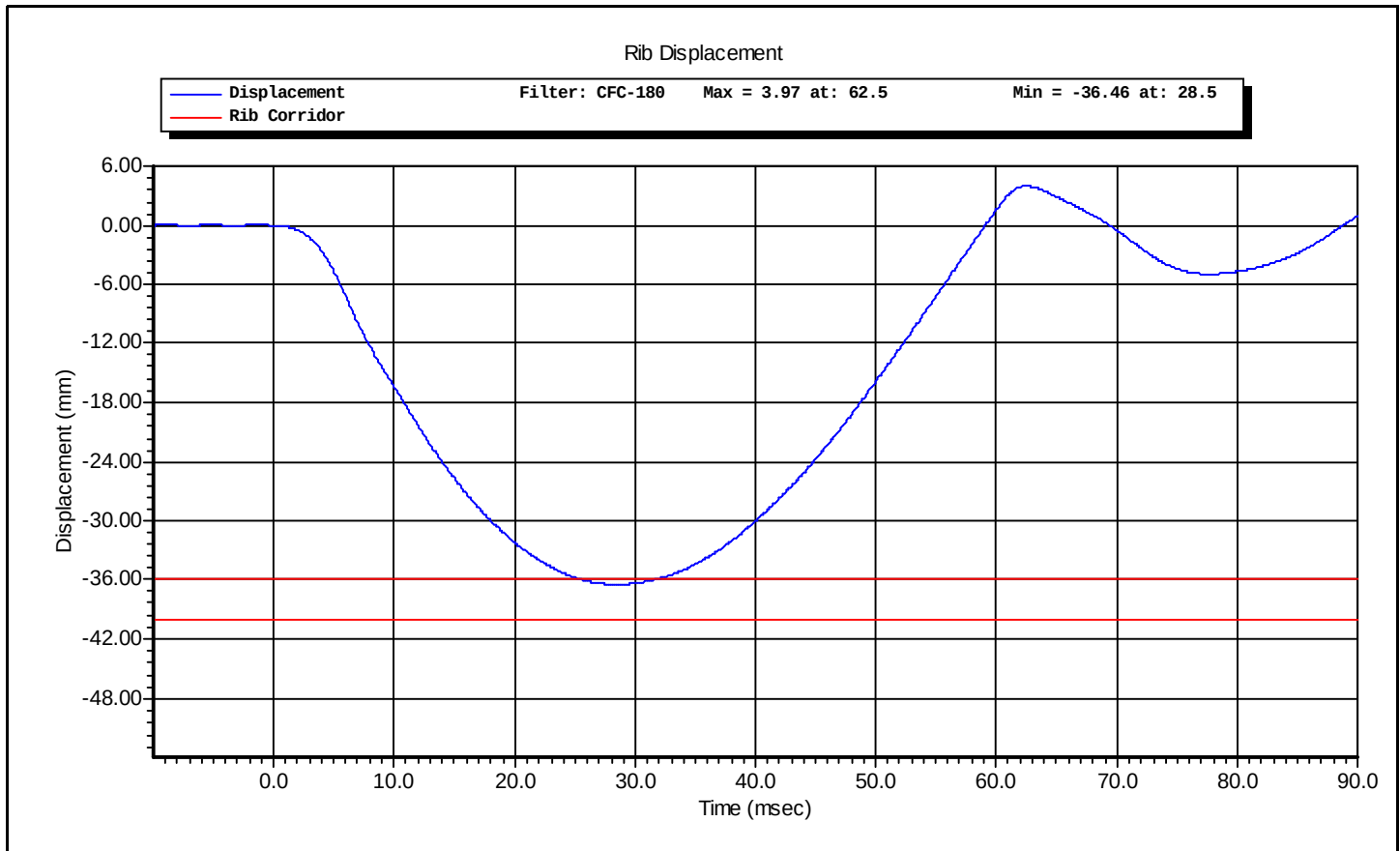


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:30:29 PM



Test ID: Middle Rib 3 m/s Test Time: 2:30:29 PM

Test Date: 8/23/2010



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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:	8/23/2010
Test Number:	1	Test Time:	2:10:34 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	60.0 %RH P
Velocity	3.90 -- 4.10	3.99 m/s P
Rib Displacement	-51.00 -- -46.00	-47.45 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: **2:10:34 PM**

Test Date: **8/23/2010**



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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: **2:10:34 PM**

Test Date: **8/23/2010**

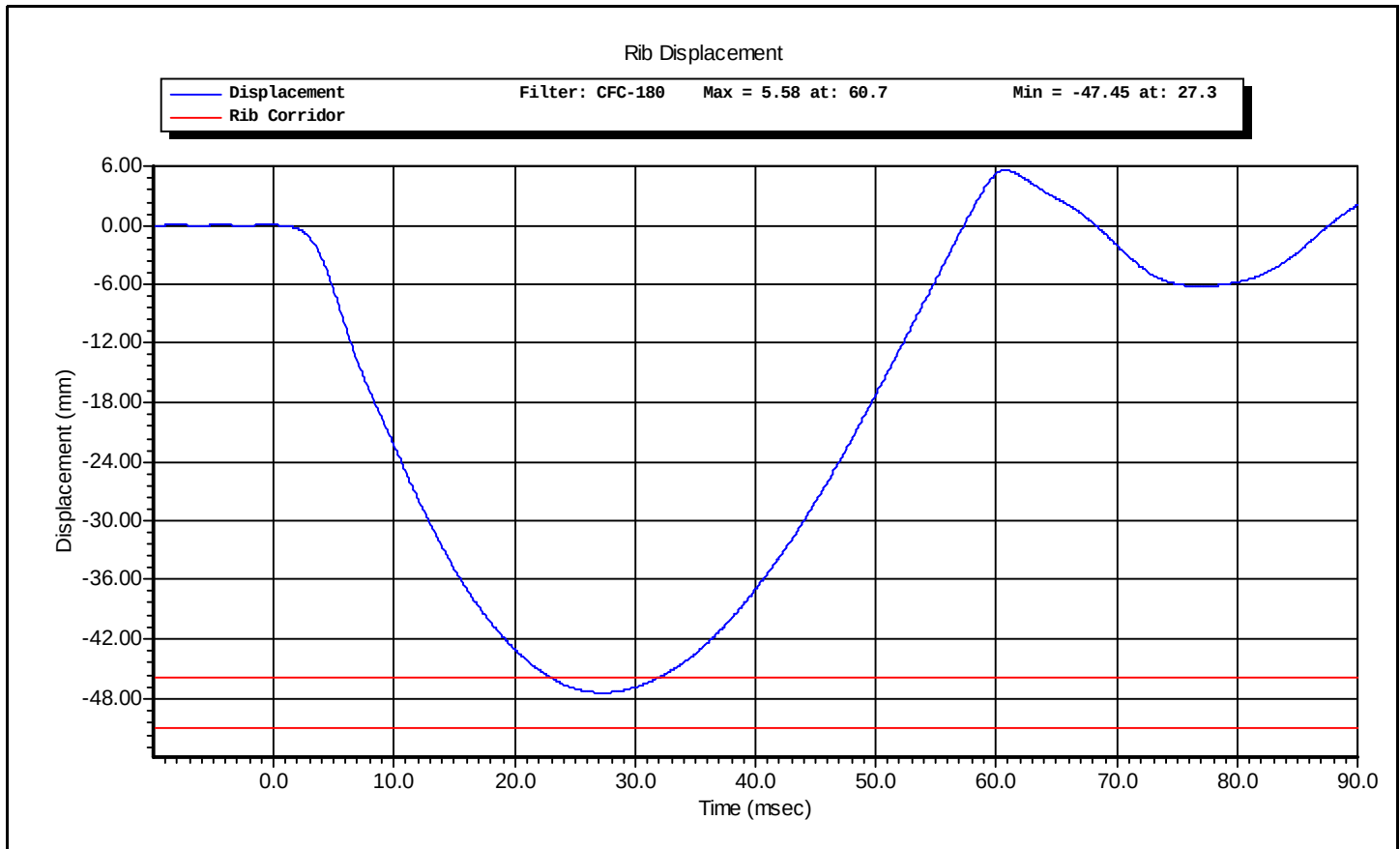


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:10:34 PM



Test ID: Upper Rib 4 m/s

Test Time: 2:10:34 PM

Test Date: 8/23/2010



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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:	8/23/2010
Test Number:	1	Test Time:	2:19:41 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	61.0 %RH P
Velocity	2.90 -- 3.10	2.99 m/s P
Rib Displacement	-40.00 -- -36.00	-36.81 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: **2:19:41 PM**

Test Date: **8/23/2010**



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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: **2:19:41 PM**

Test Date: **8/23/2010**

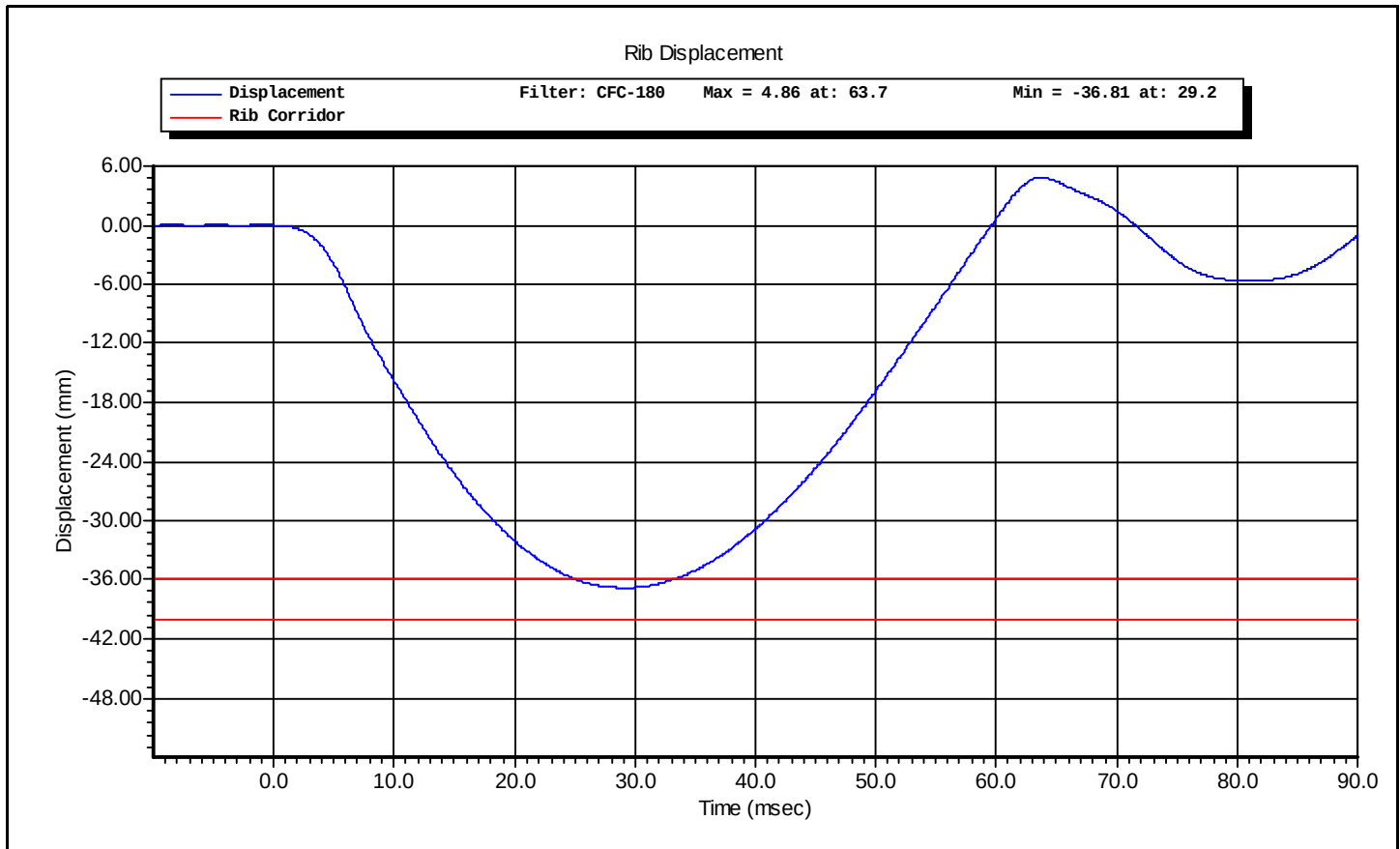


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:19:41 PM



Test ID: Upper Rib 3 m/s

Test Time: 2:19:41 PM

Test Date: 8/23/2010



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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:	8/23/2010
Test Number:	1	Test Time:	5:50:31 PM

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	22.2 deg C P
Humidity	10.0 -- 70.0	58.0 %RH P
Velocity	5.40 -- 5.60	5.51 m/s P
Upper Rib Displacement	34.0 -- 41.0	36.8 mm P
Middle Rib Displacement	37.0 -- 45.0	41.1 mm P
Lower Rib Displacement	37.0 -- 44.0	40.9 mm P
Impactor Force	5100 -- 6200	5407 N P

All test parameters are within specifications

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

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

Test ID: **Thorax**

Test Time: **5:50:31 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
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: **5:50:31 PM**

Test Date: **8/23/2010**

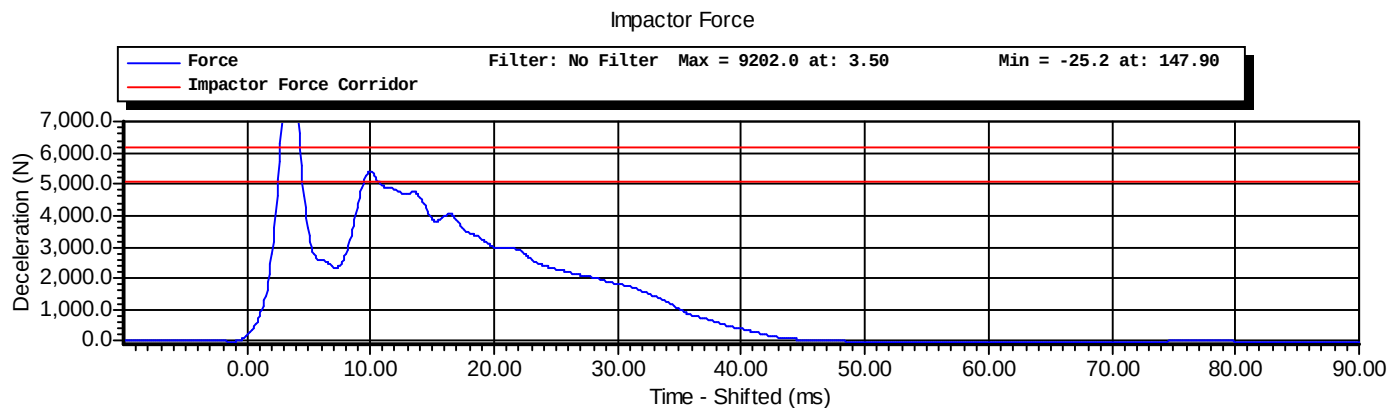
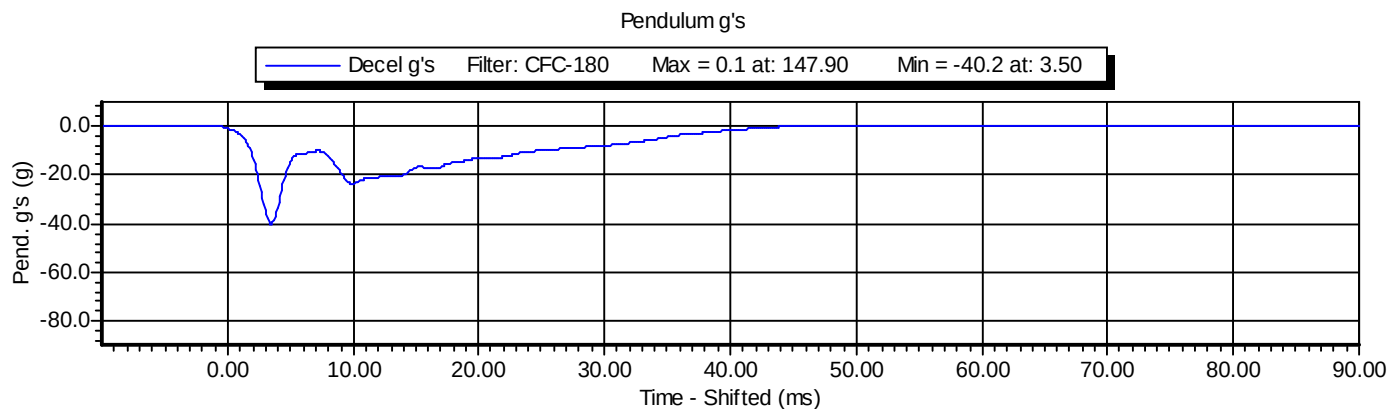


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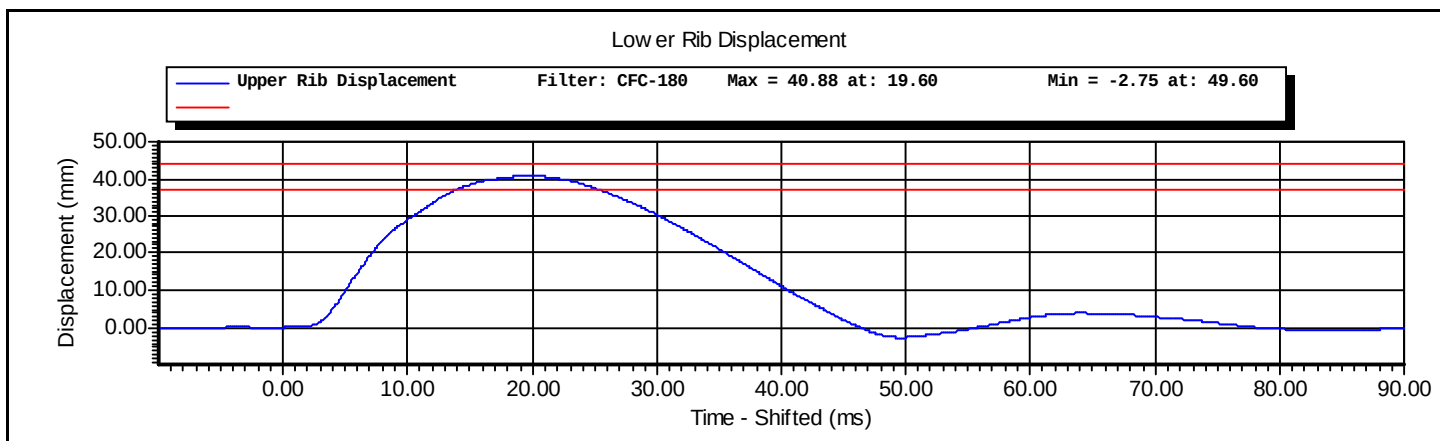
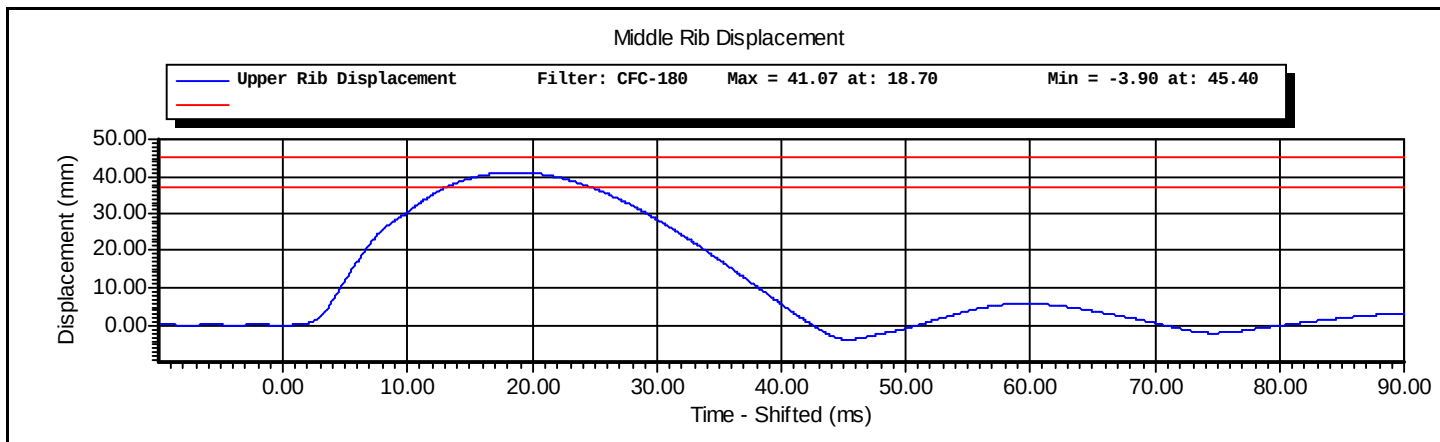
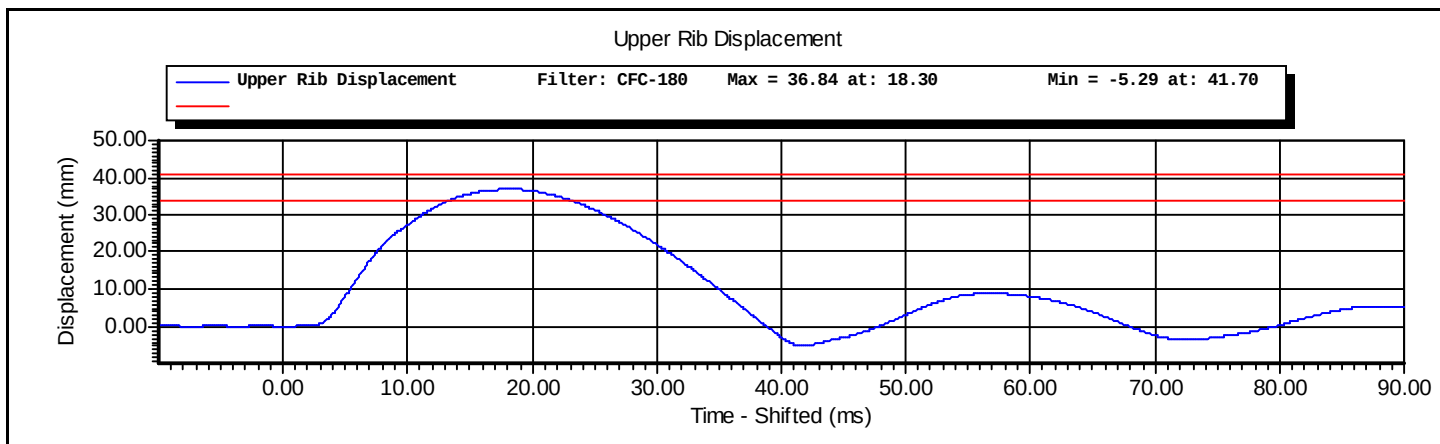
Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	8/23/2010
Test Number:	1	Test Time:	5:50:31 PM



Test ID: Thorax

Test Time: 5:50:31 PM

Test Date: 8/23/2010





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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:	8/23/2010
Test Number:	2	Test Time:	5:31:44 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	58 %RH P
Velocity	3.90 -- 4.10	4.03 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.53 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	12.2 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.30 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	12.7 ms P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **5:31:44 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
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: **5:31:44 PM**

Test Date: **8/23/2010**

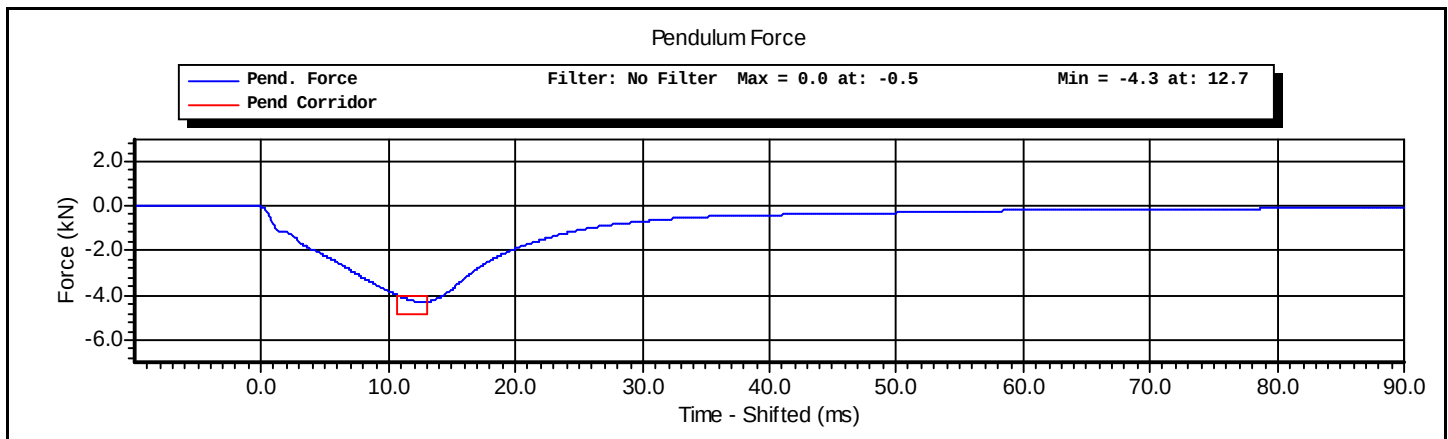
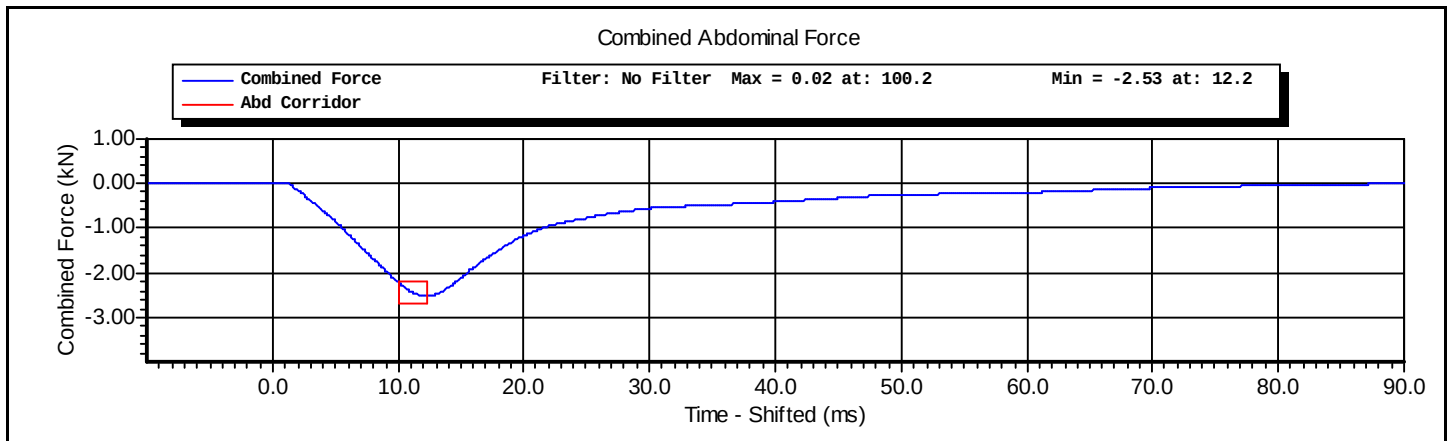


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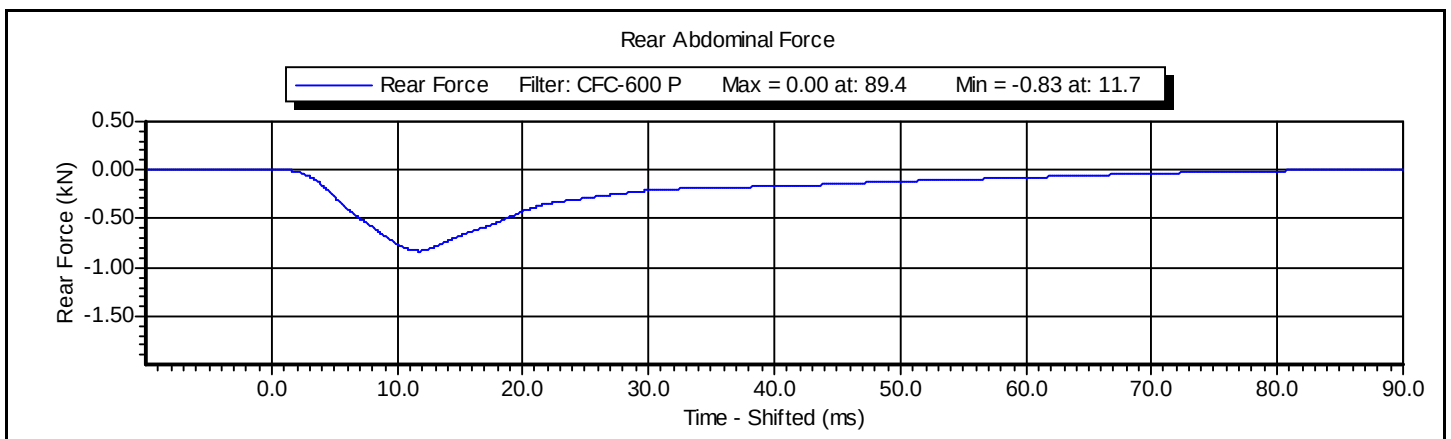
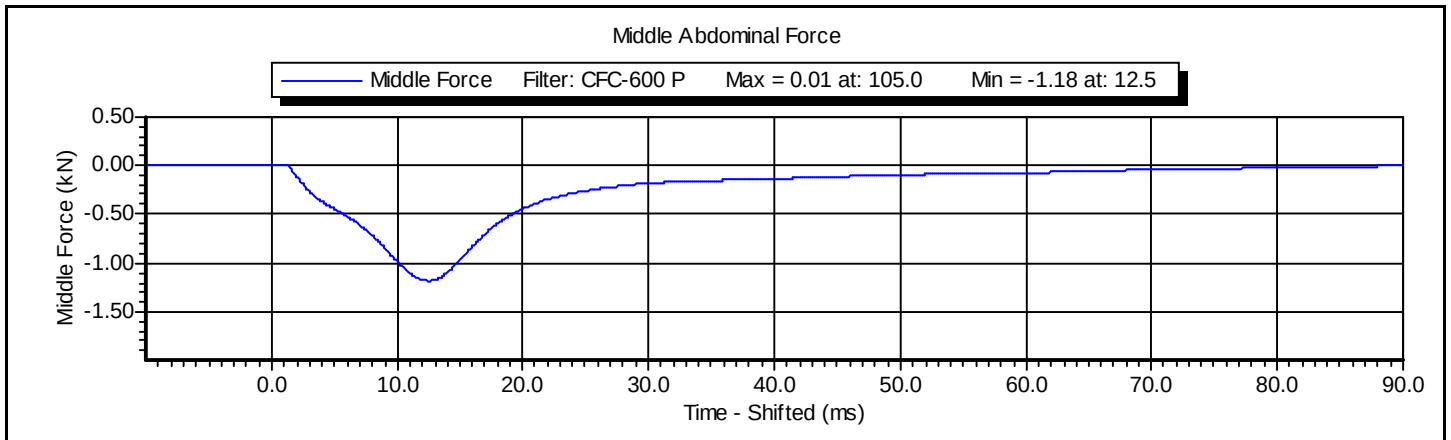
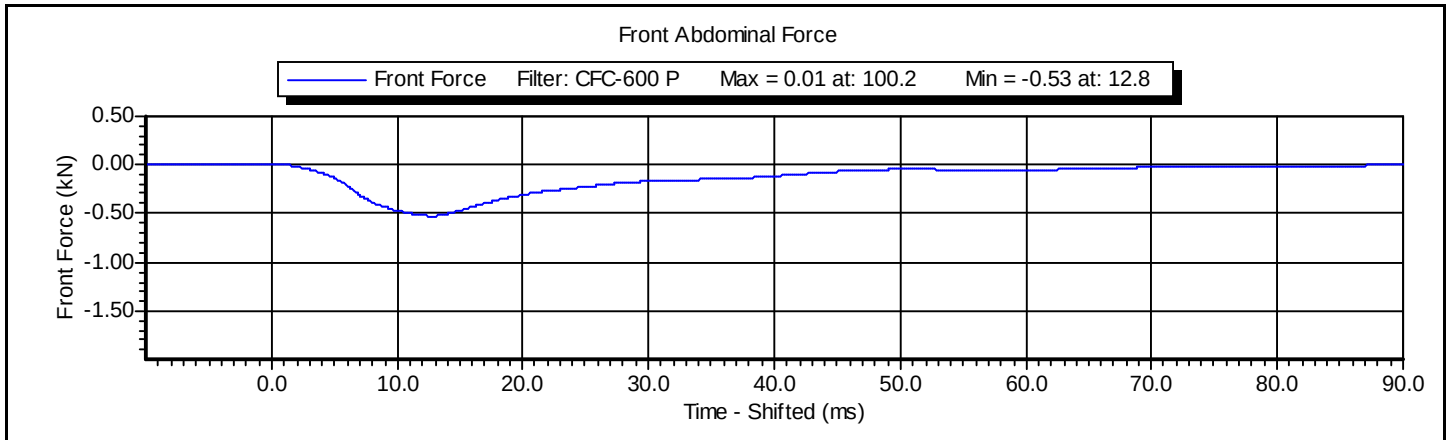
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	8/23/2010
Test Number:	2	Test Time:	5:31:44 PM



Test ID: **Abdomen**

Test Time: **5:31:44 PM**

Test Date: **8/23/2010**





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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:	8/23/2010
Test Number:	3	Test Time:	3:04:41 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	60 %RH	P
Velocity	5.95	--	6.15	6.13 m/s	P
Maximum Flexion Angle	45.0	--	55.0	50.8 degrees	P
Time at Maximum Flexion Angle	39.0	--	53.0	45.5 ms	P
Decay to Zero Degrees	37.0	--	57.0	39.4 ms	P
Velocity Corridor		--			P

All test parameters are within specifications

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

Test ID: **Lumbar Spine**

Test Time: **3:04:41 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

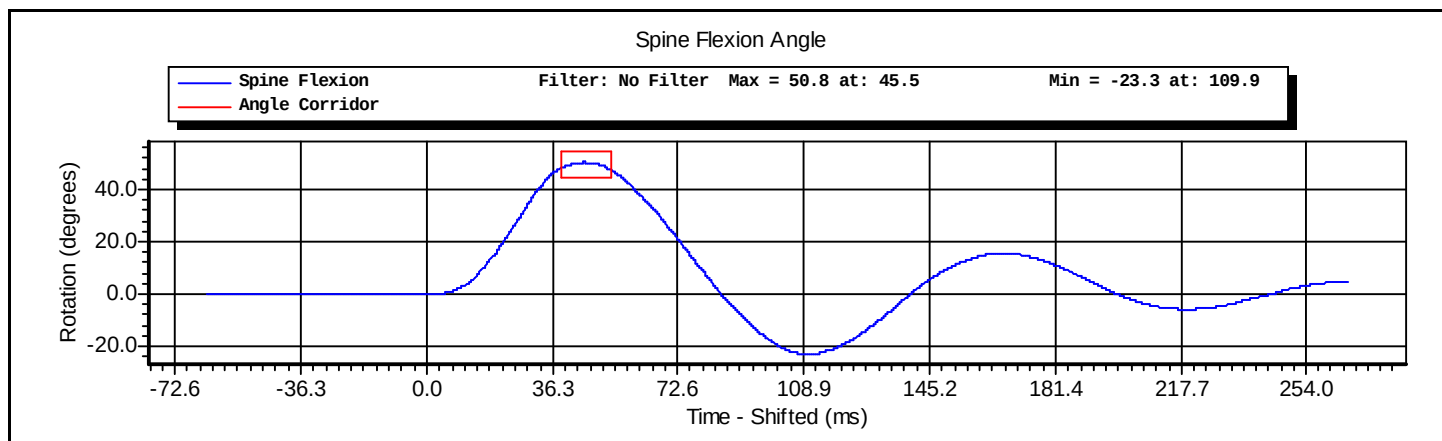
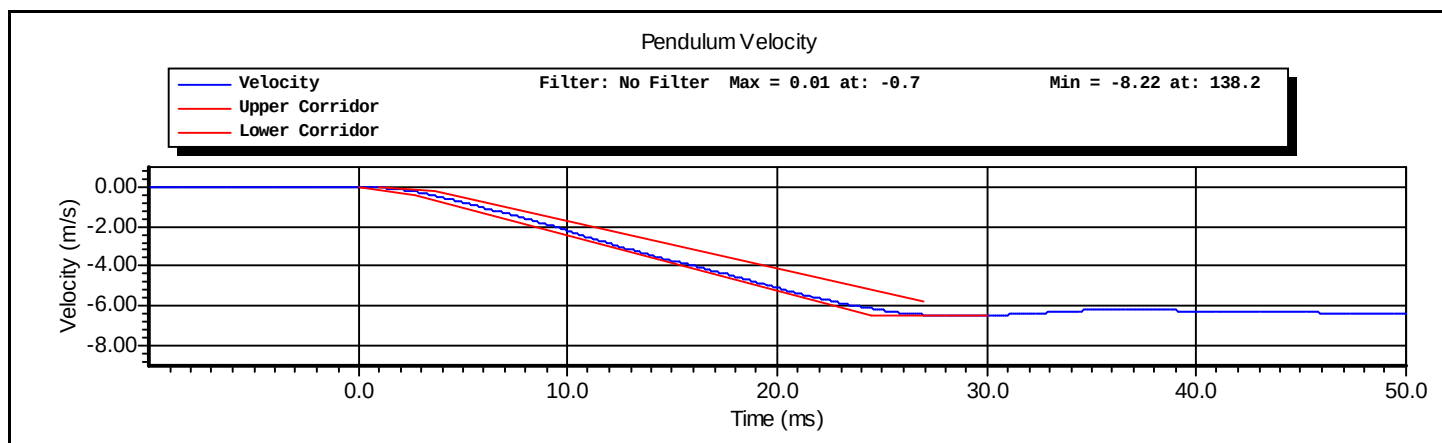
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

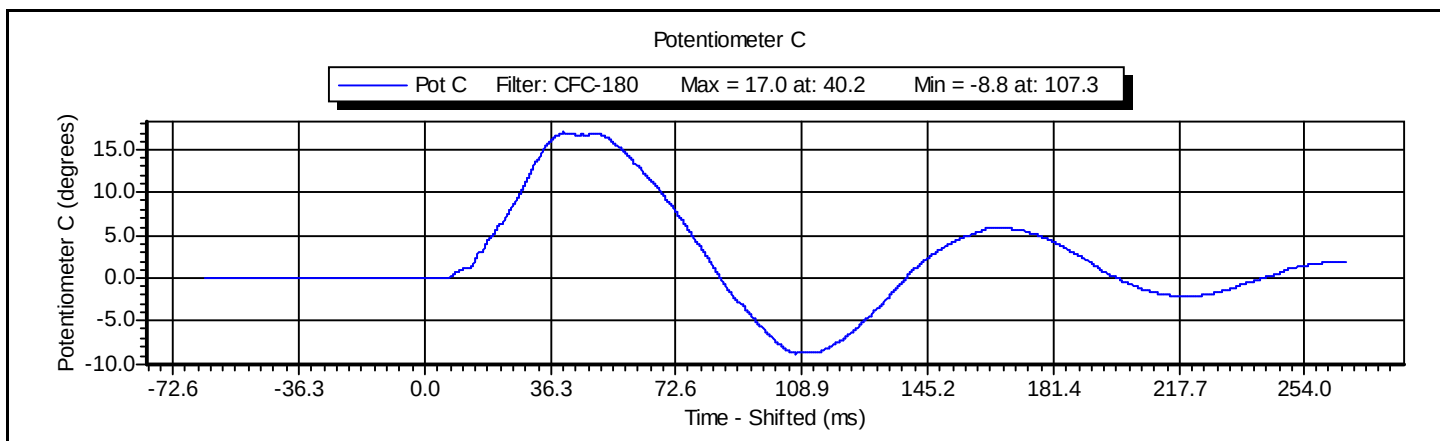
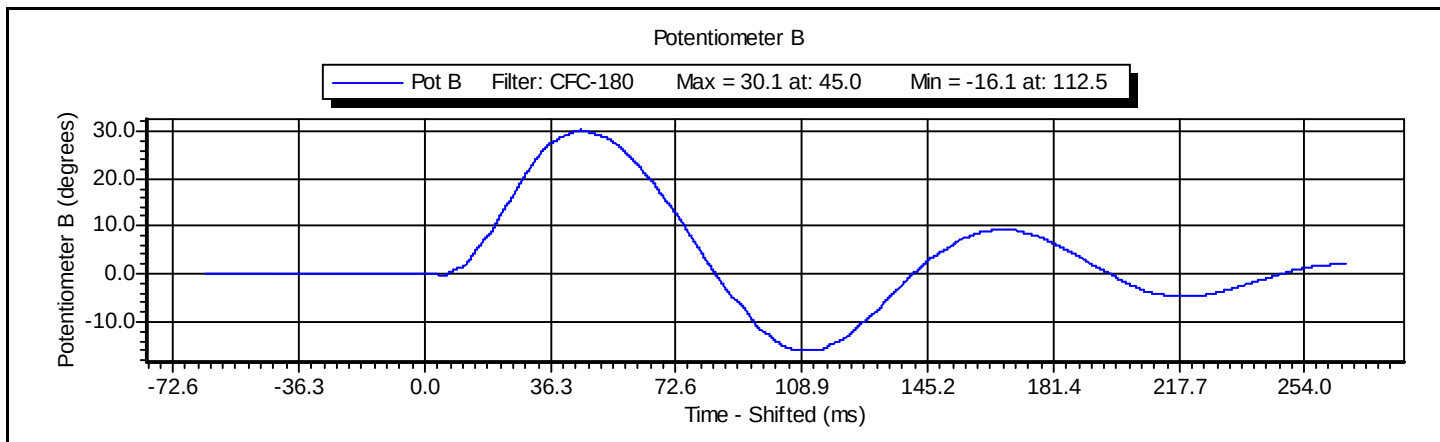
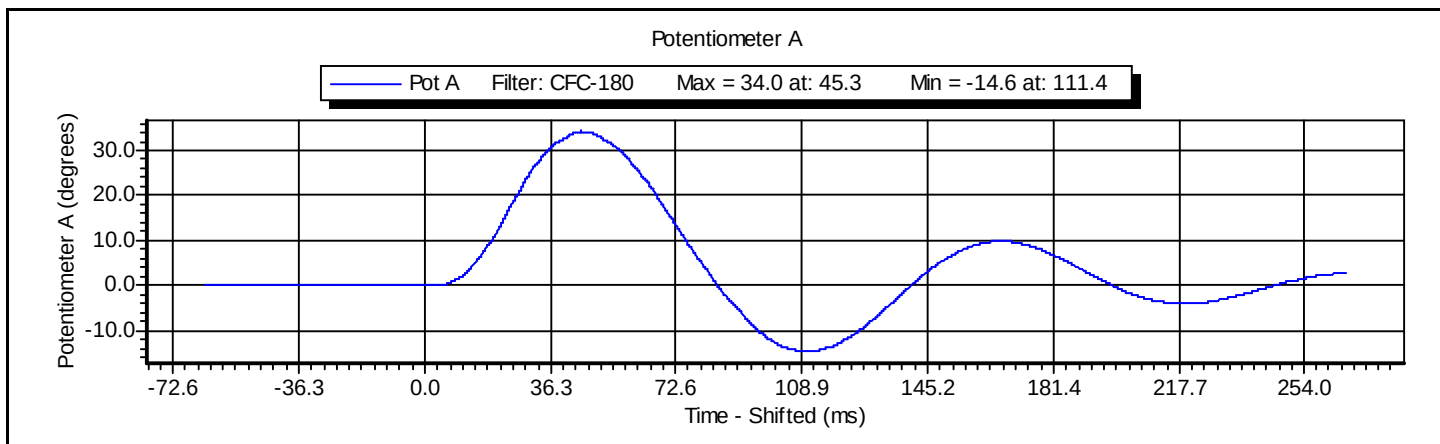
Test ID: **Lumbar Spine**

Test Time: **3:04:41 PM**

Test Date: **8/23/2010**

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:	8/23/2010
Test Number:	3	Test Time:	3:04:41 PM







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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:	8/23/2010
Test Number:	1	Test Time:	3:55:38 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	63 %RH	P
Velocity	4.20	--	4.40	4.34 m/s	P
Peak Pendulum Force	-5.40	--	-4.70	-5.00 kN	P
Time at Peak Pendulum Force	11.80	--	16.10	14.55 ms	P
Peak Pubic Symphysis Force	-1.59	--	-1.23	-1.36 kN	P
Time at Peak Pubic Symphysis Force	12.20	--	17.00	15.25 ms	P

All test parameters are within specifications

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

Test ID: **Pelvis**

Test Time: **3:55:38 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Denton	3096	LC-456Fy	4/22/2010

Test ID: **Pelvis**

Test Time: **3:55:38 PM**

Test Date: **8/23/2010**



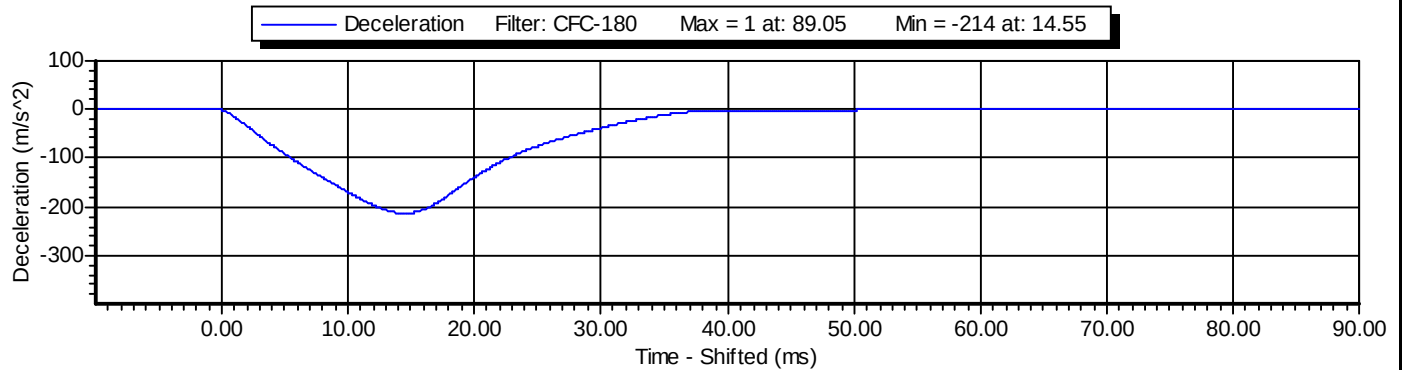
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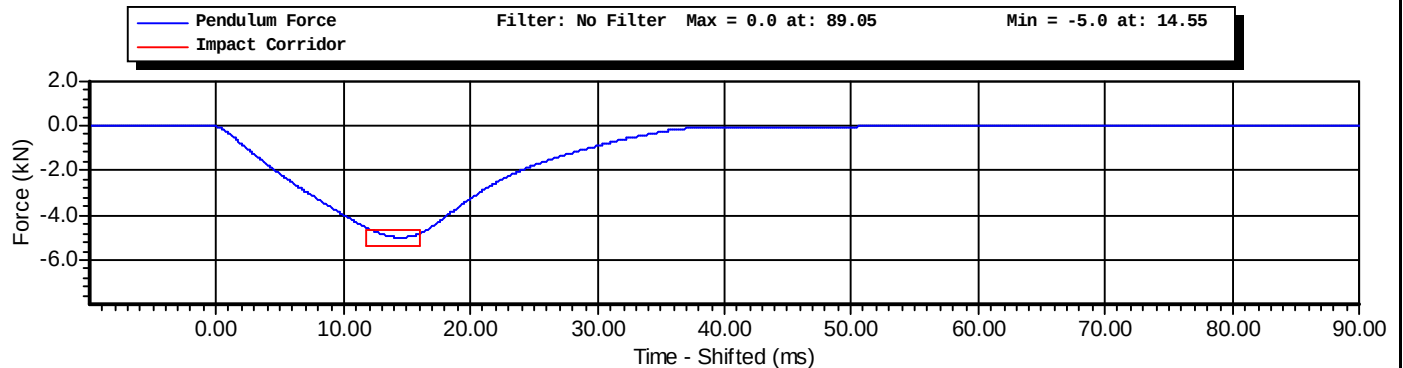
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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	8/23/2010
Test Number:	1	Test Time:	3:55:38 PM

Pendulum Accelerometer



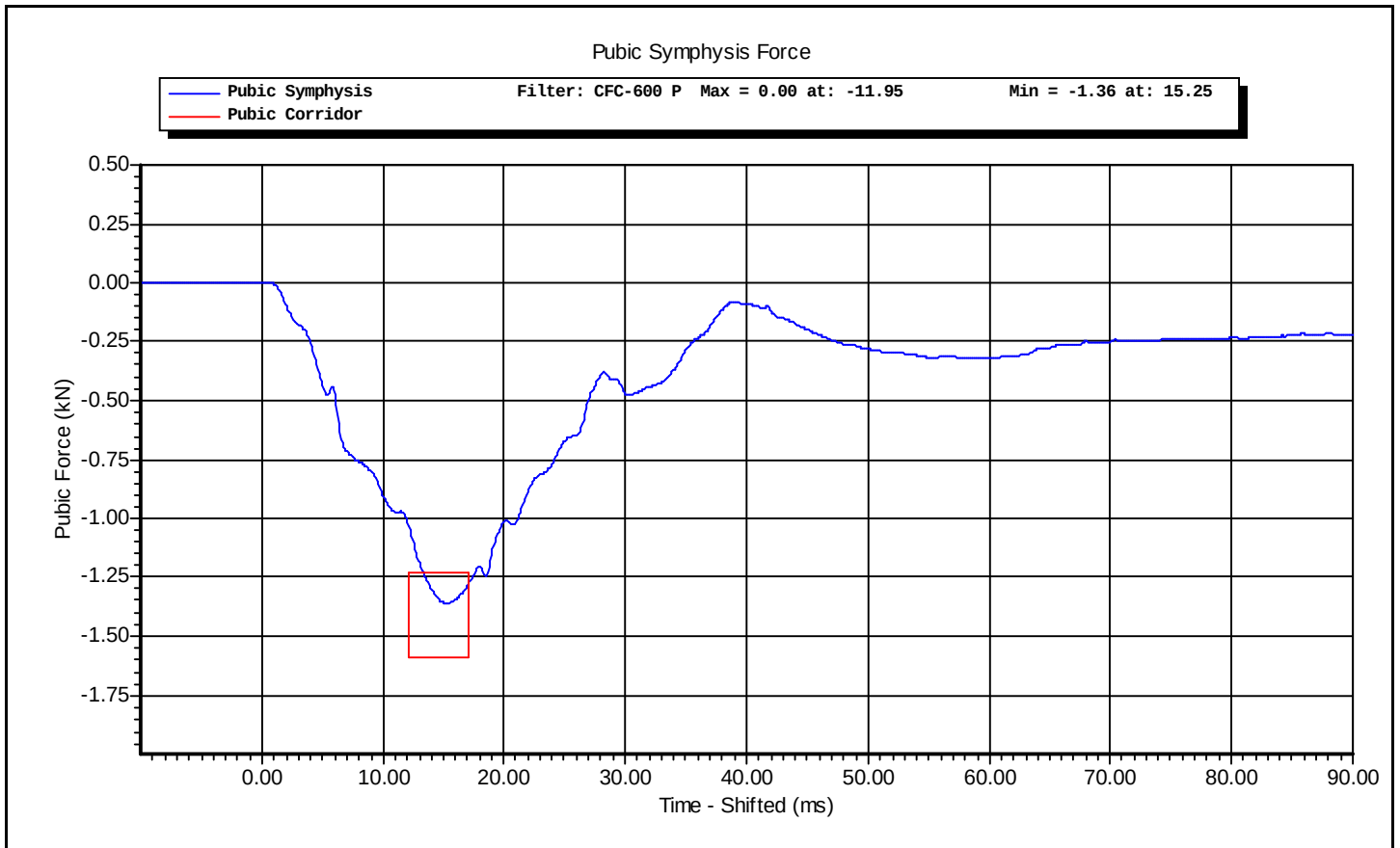
Pendulum Force



Test ID: **Pelvis**

Test Time: **3:55:38 PM**

Test Date: **8/23/2010**



CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

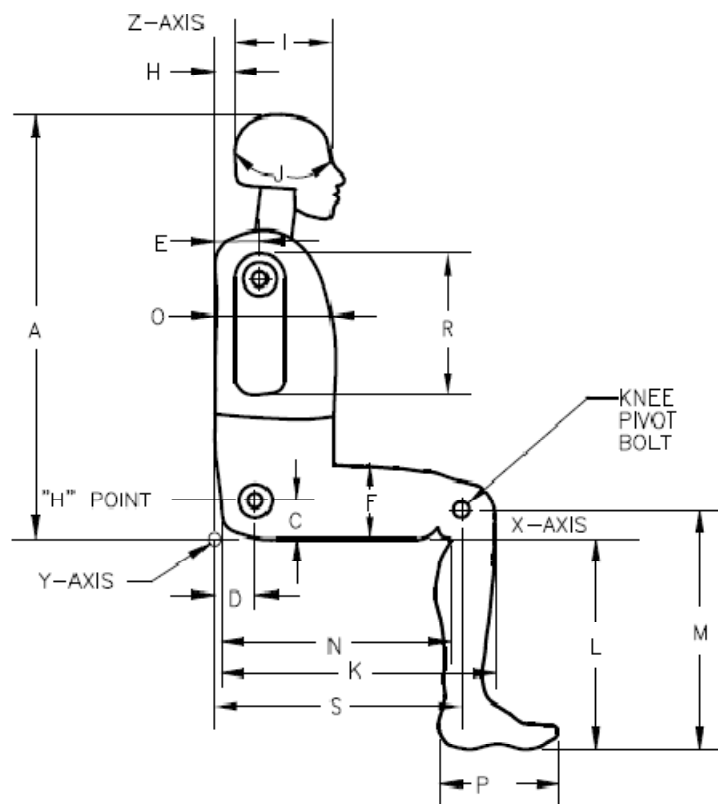
NHTSA ATD S/N 300

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

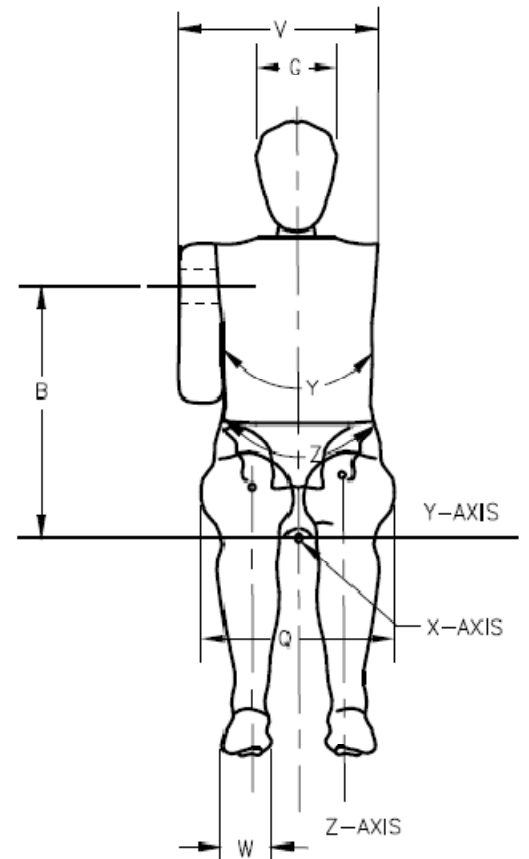
Technician: AR

Date: 8/23/2010

SID-IIIsD External Dimension Reference Diagram



SIDE VIEW



FRONT VIEW



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	8/23/2010
Test Number:	1	Test Time:	6:50:25 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	61 %RH P
Resultant Acceleration	115.0 -- 137.0	131.7 g P
Oscillation	0.0 -- 15.0	3.1 % P
Fore-Aft Acceleration	-15.0 -- 15.0	8.8 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **6:50:25 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P51685	4/7/2010
Endevco	7264-2000	P51682	4/7/2010
Endevco	7264-2000	P51699	4/7/2010

Test ID: **Head Drop**

Test Time: **6:50:25 PM**

Test Date: **8/23/2010**

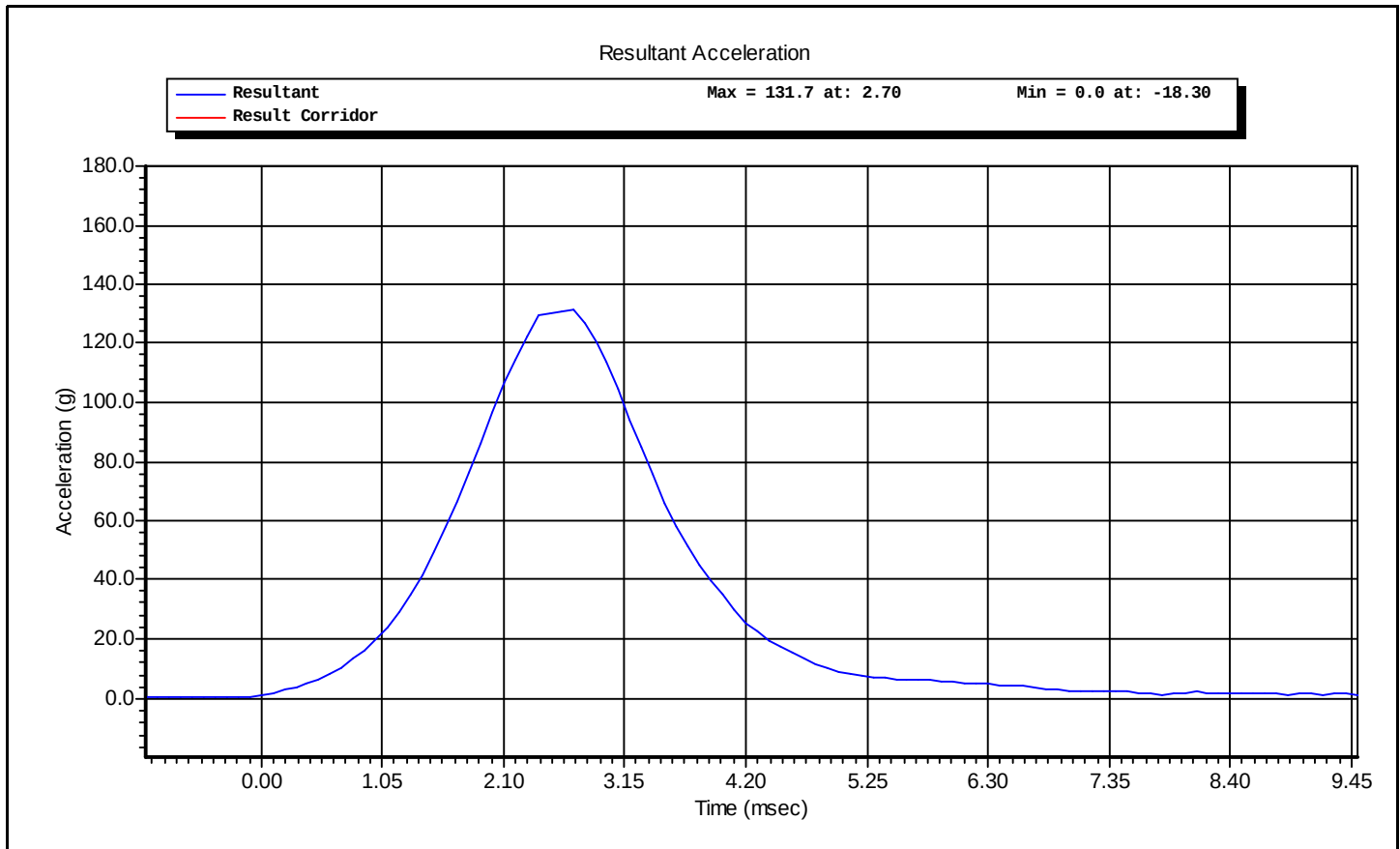


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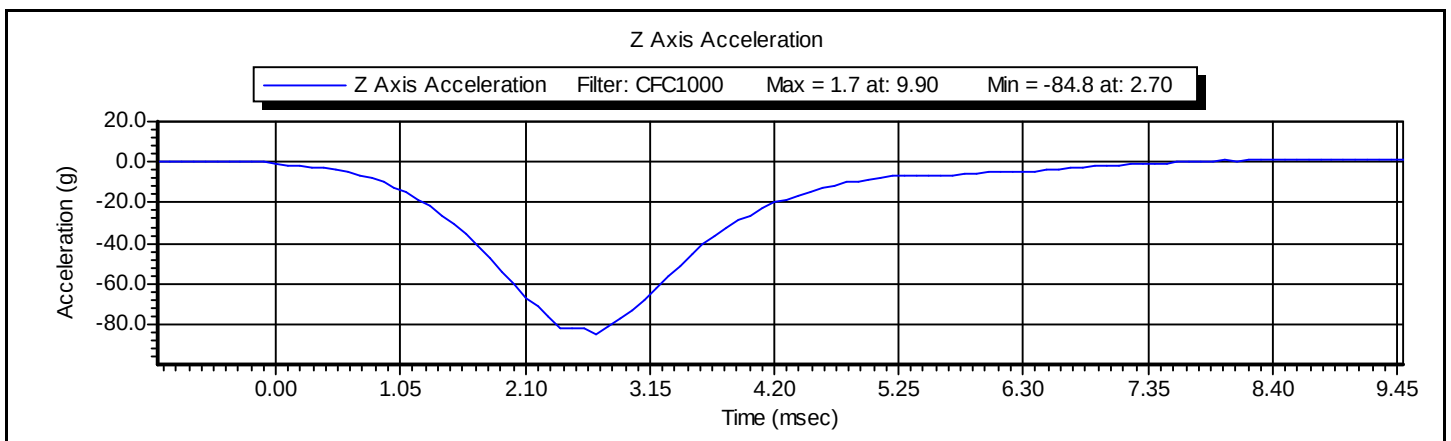
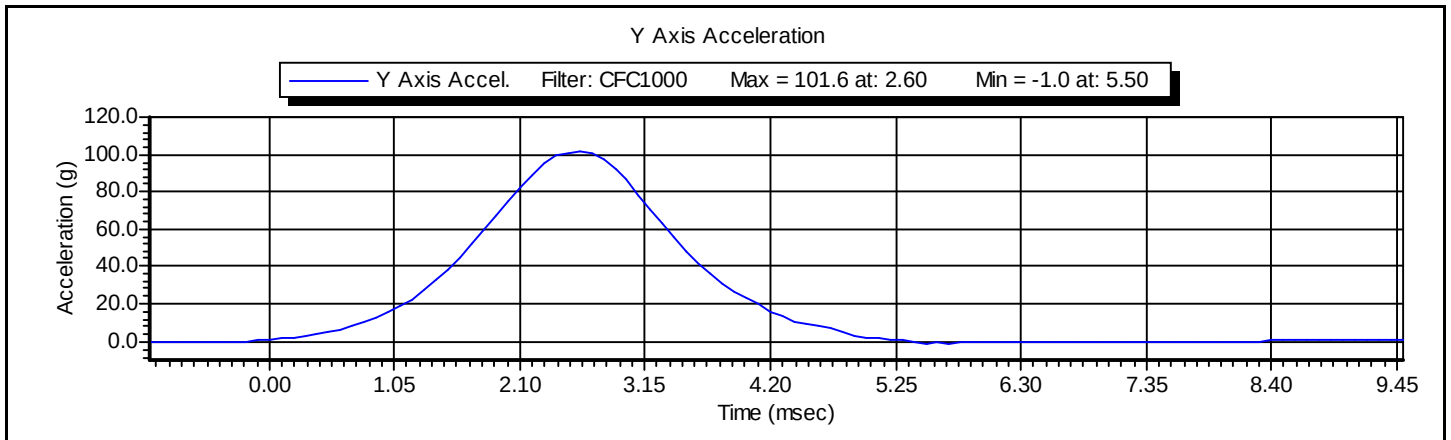
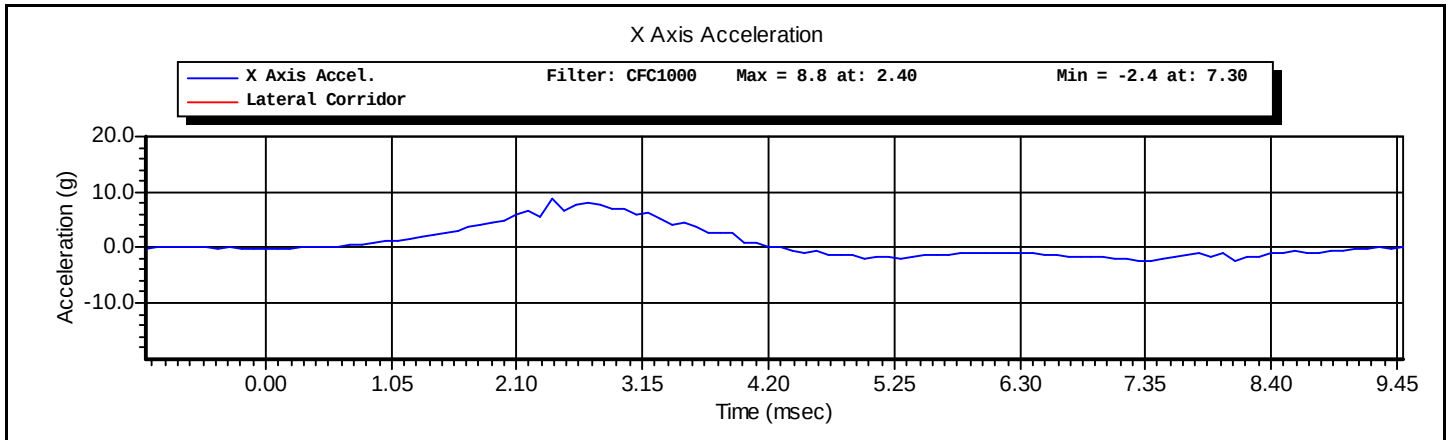
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	8/23/2010
Test Number:	1	Test Time:	6:50:25 PM



Test ID: Head Drop

Test Time: 6:50:25 PM

Test Date: 8/23/2010





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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	8/24/2010
Test Number:	1	Test Time:	10:07:12 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	57 %RH P
Velocity	5.51 -- 5.63	5.57 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.65 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.82 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	5.25 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.88 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.91 m/s P
Max D Plane Rotation	71.0 -- 81.0	75.7 degrees P
Time at Max Rotation	50.0 -- 70.0	60.7 ms P
Moment about OC	-44.0 -- -36.0	-42.2 Nm P
Moment Decay to Zero	102.0 -- 126.0	116.3 ms P

All test parameters are within specifications

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

Test ID: **Neck Flexion**

Test Time: **10:07:12 AM**

Test Date: **8/24/2010**



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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: **10:07:12 AM**

Test Date: **8/24/2010**



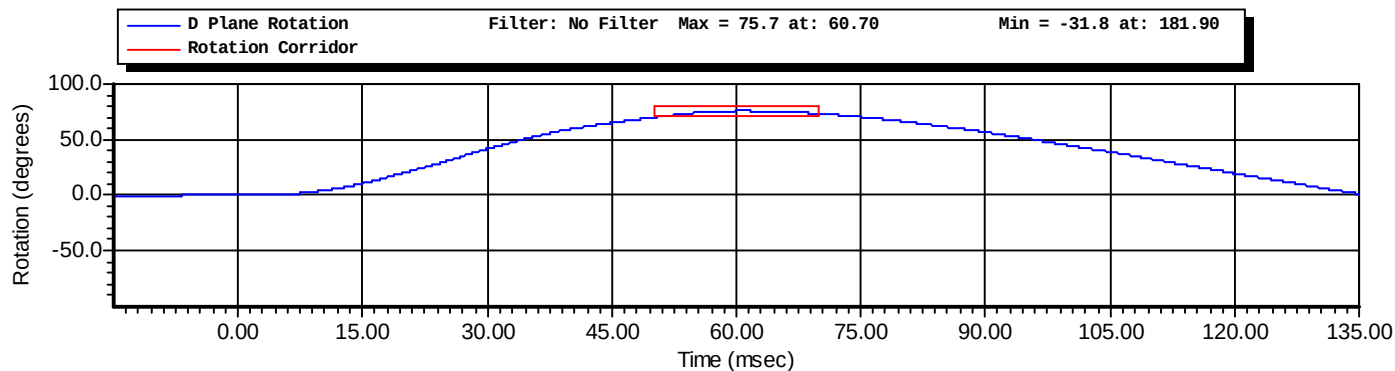
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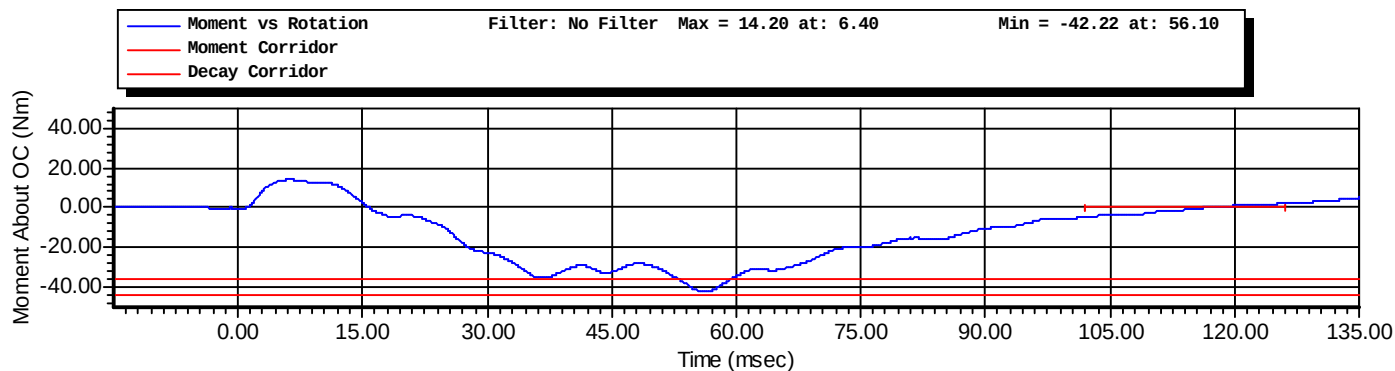
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	8/24/2010
Test Number:	1	Test Time:	10:07:12 AM

D Plane Rotation



Moment About Occipital Condyle

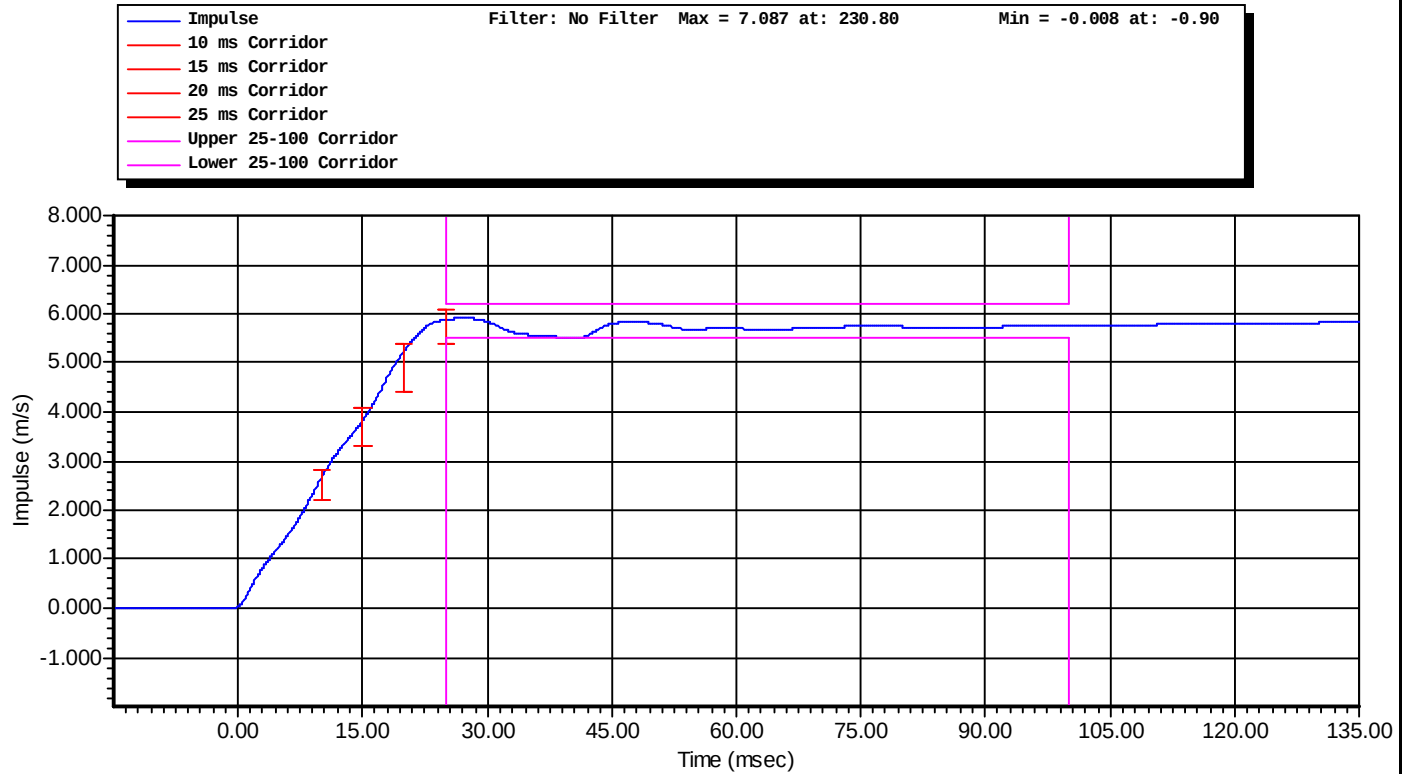


Test ID: Neck Flexion

Test Time: 10:07:12 AM

Test Date: 8/24/2010

Pendulum Impulse





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	8/24/2010
Test Number:	1	Test Time:	1:29:07 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	53.0 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	13.0 -- 18.0	16.1 g P
Shoulder Deflection	28.0 -- 37.0	33.56 mm P
T1 Acceleration	17.0 -- 22.0	19.2 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder**

Test Time: **1:29:07 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1063	4/7/2010
Endevco	7264-2000	P23904	3/15/2010

Test ID: **Shoulder**

Test Time: **1:29:07 PM**

Test Date: **8/24/2010**

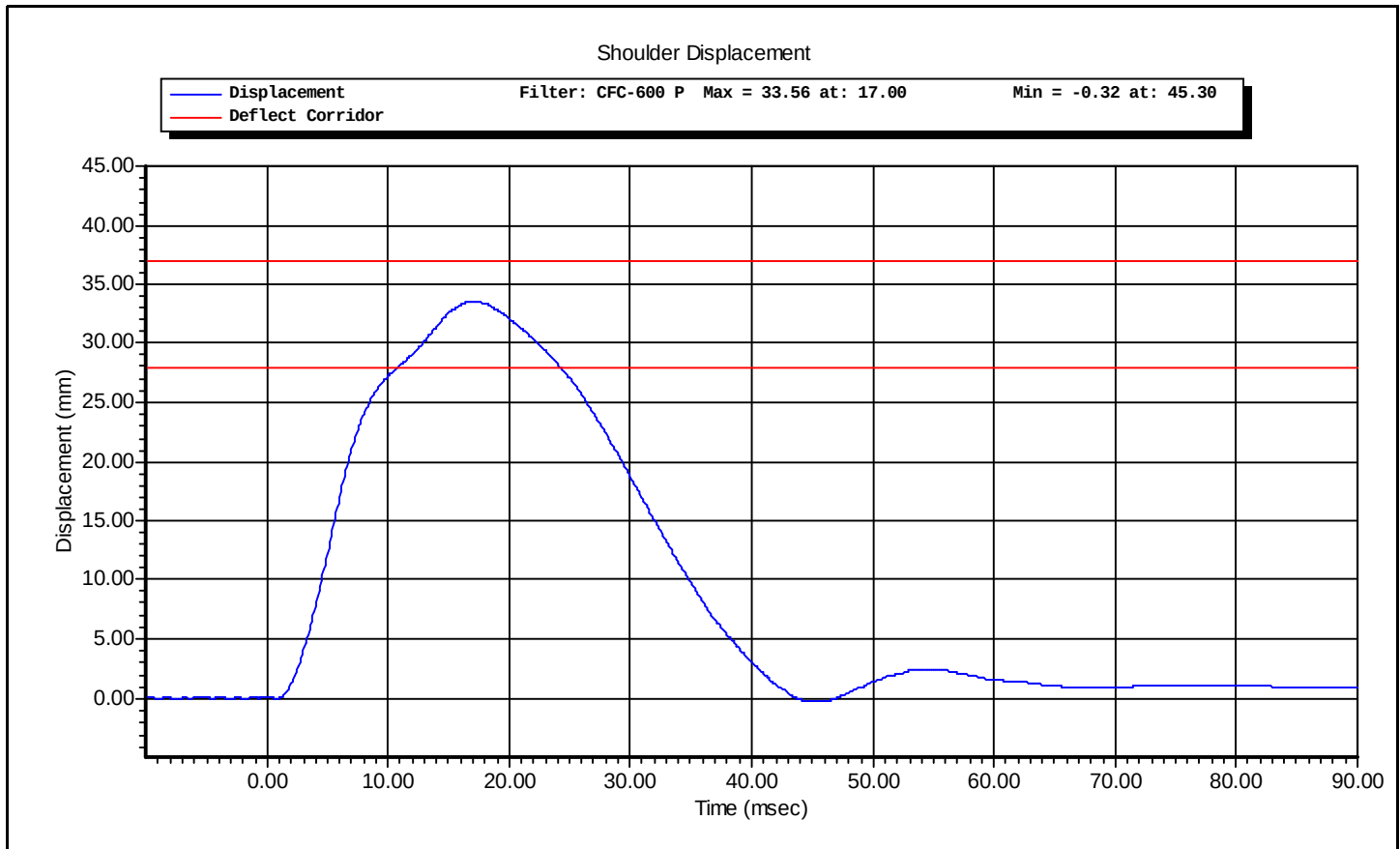


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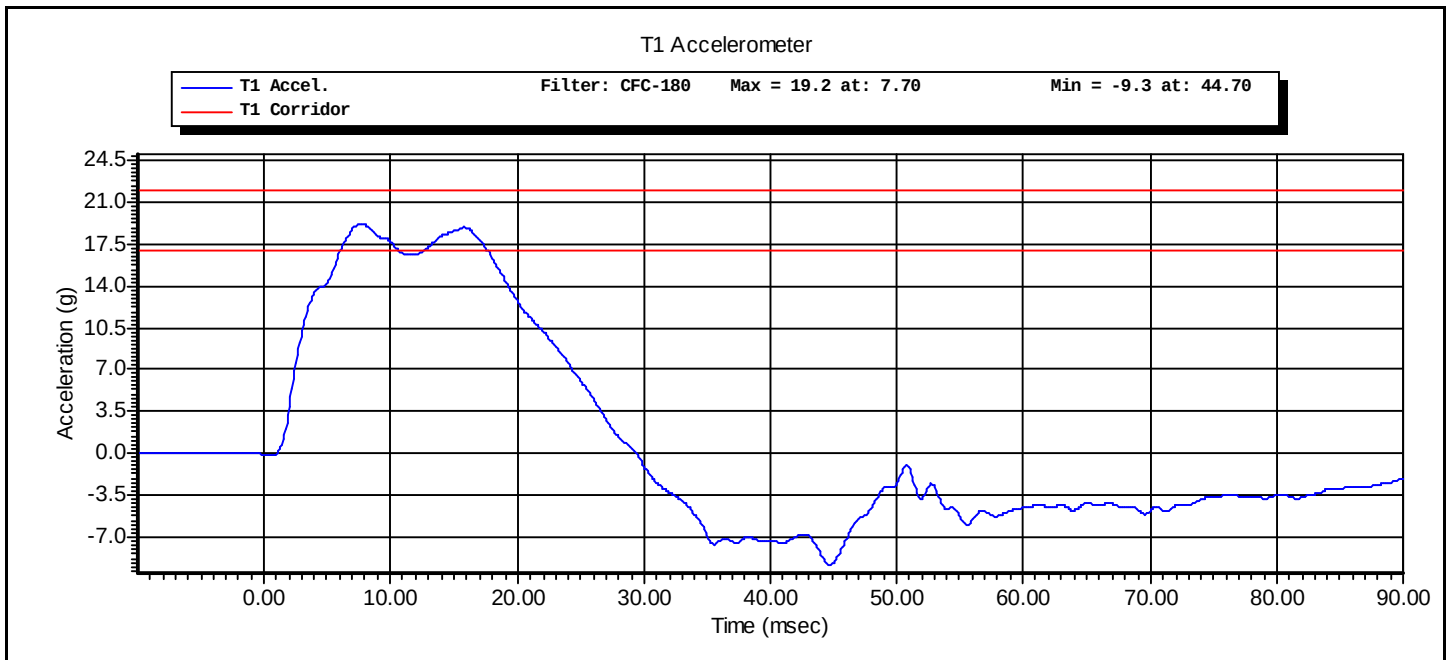
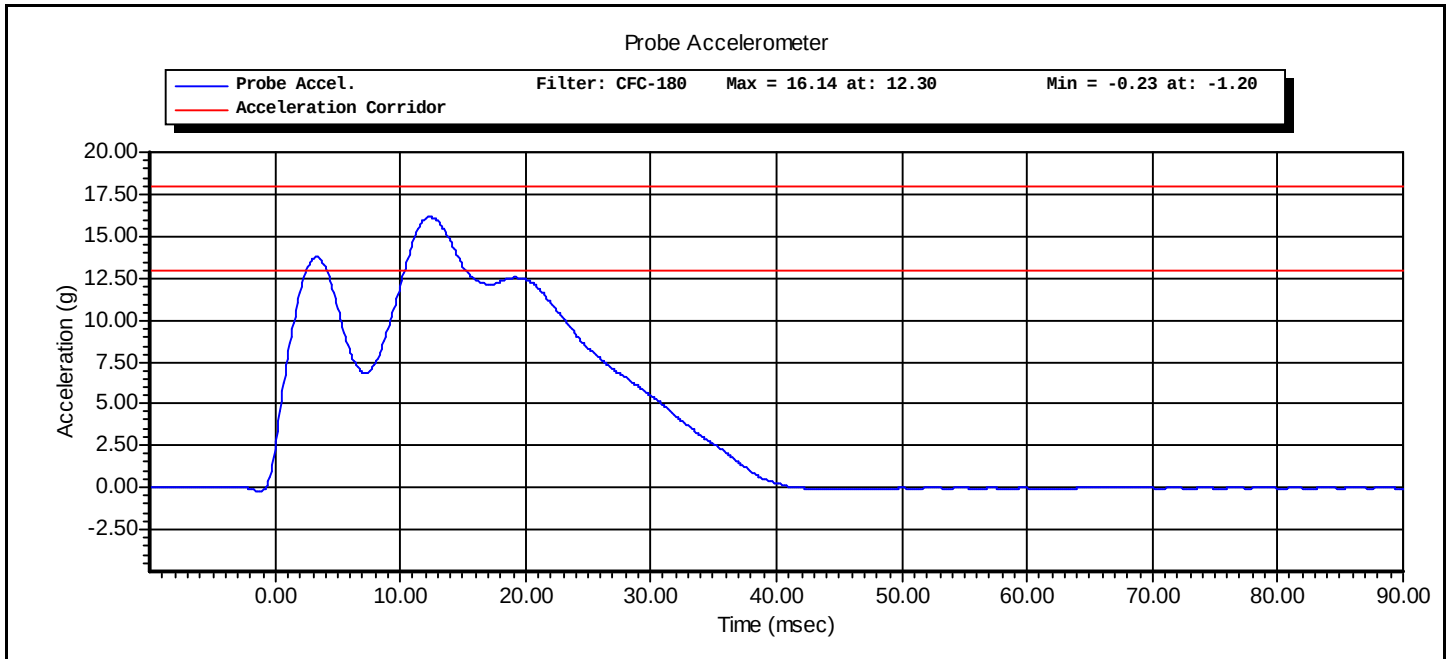
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	8/24/2010
Test Number:	1	Test Time:	1:29:07 PM



Test ID: **Shoulder**

Test Time: **1:29:07 PM**

Test Date: **8/24/2010**





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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	8/24/2010
Test Number:	2	Test Time:	3:53:05 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	52 %RH	P
Velocity	6.60	--	6.80	6.72 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	33.4 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	27.3 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	32.1 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	37.0 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	40.4 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	33.0 g	P
Shoulder Deflection	31.0	--	40.0	37.9 mm	P

All test parameters are within specifications

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

Test ID: **Thorax With Arm** Test Time: **3:53:05 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P23904	3/15/2010
Endevco	7264-2000	P50078	7/2/2010
Servo	180-3885	DS-1063	4/7/2010

Test ID: **Thorax With Arm** Test Time: **3:53:05 PM**

Test Date: **8/24/2010**

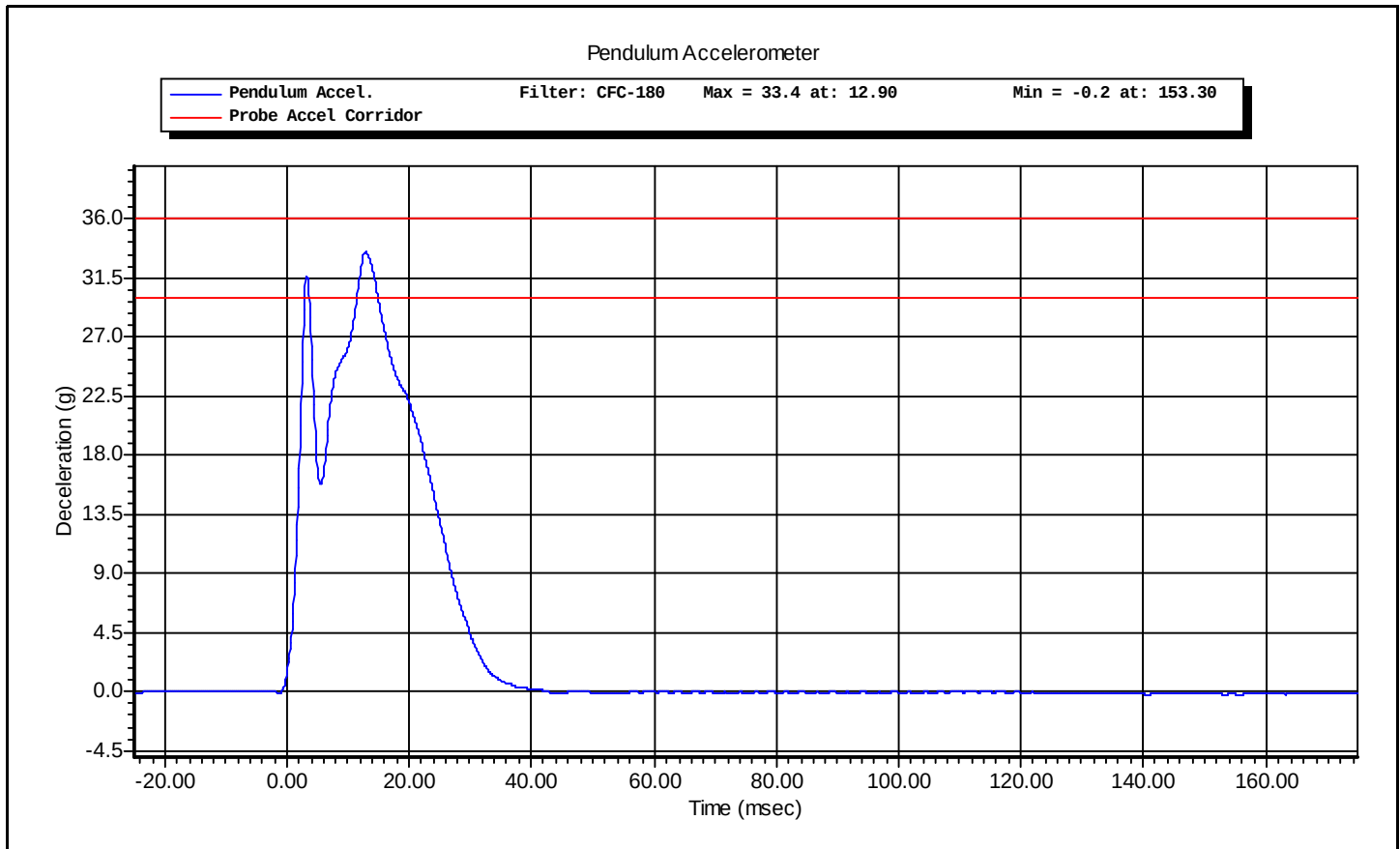


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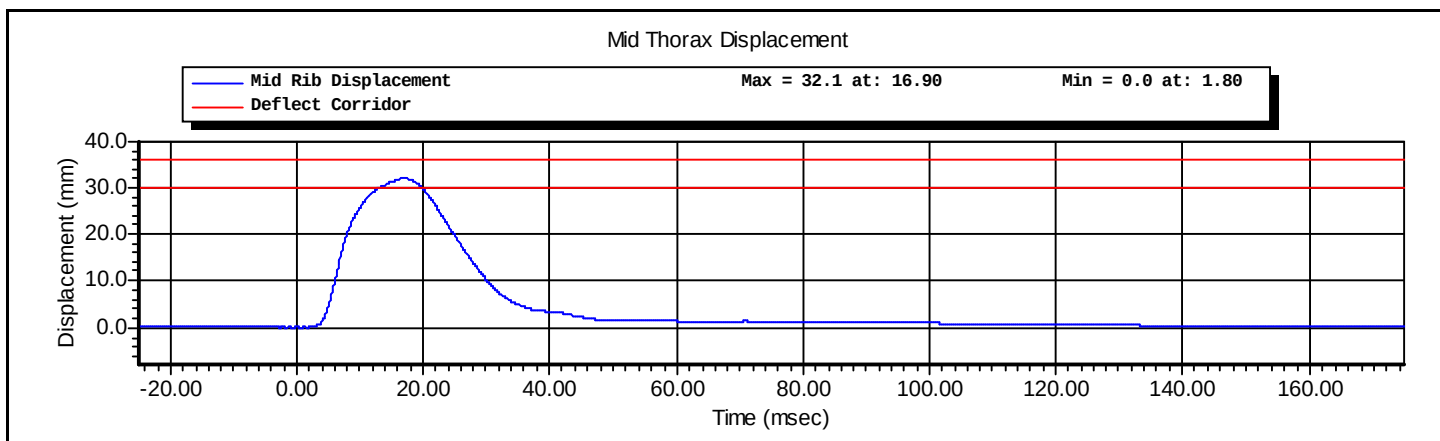
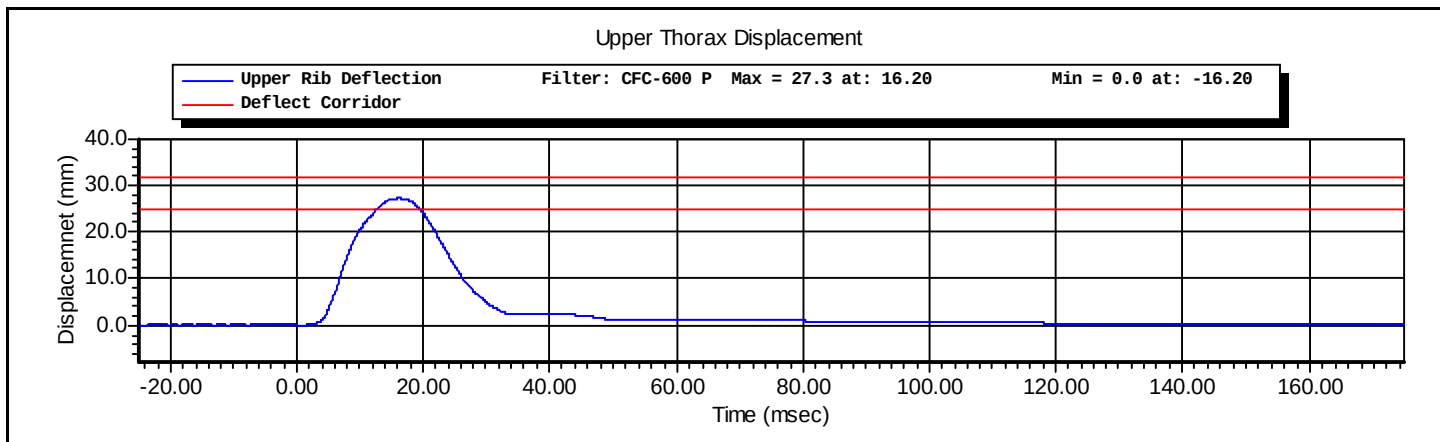
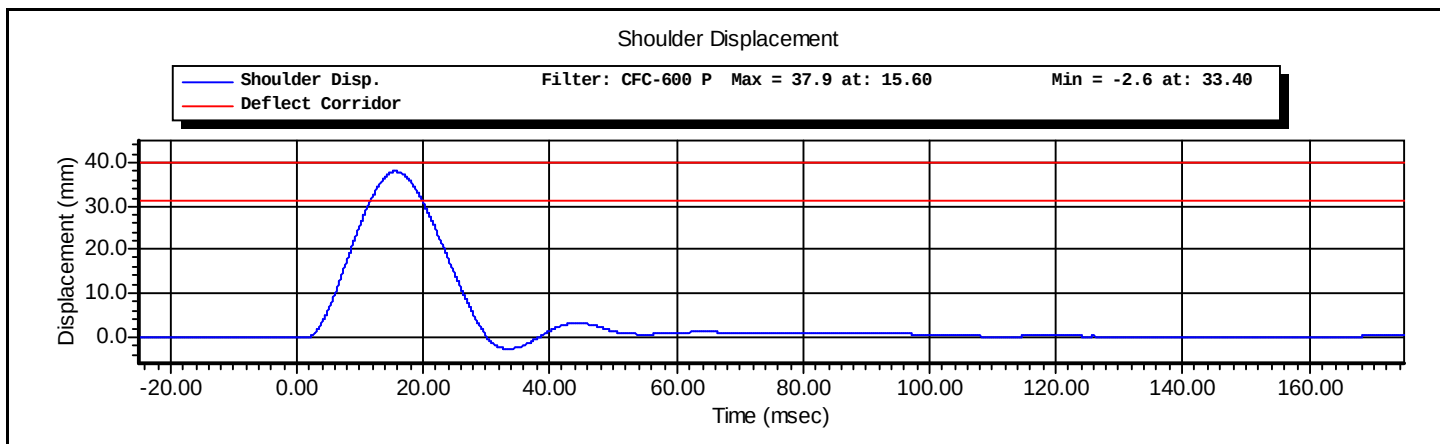
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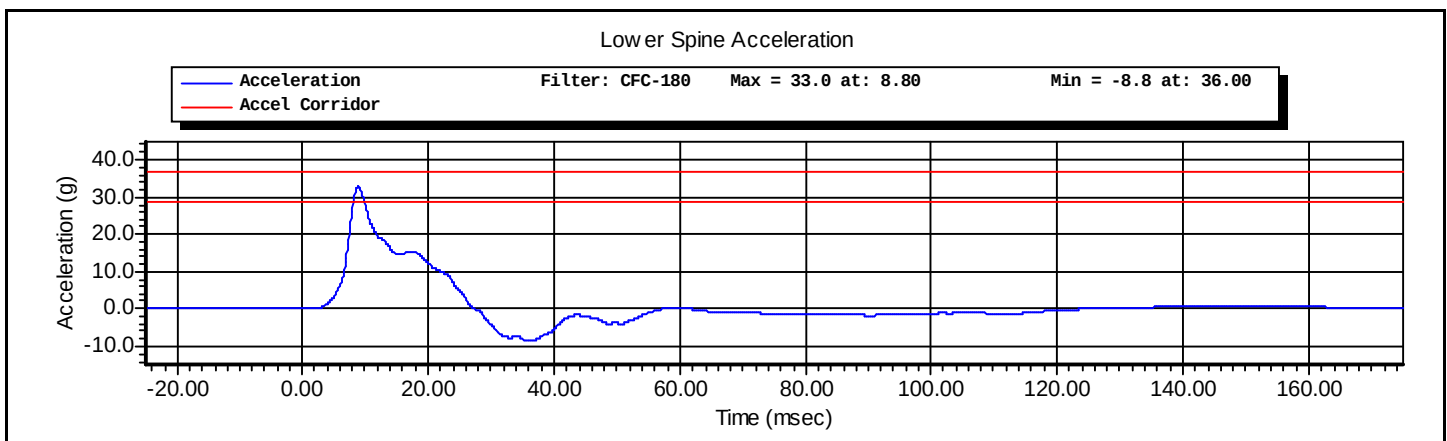
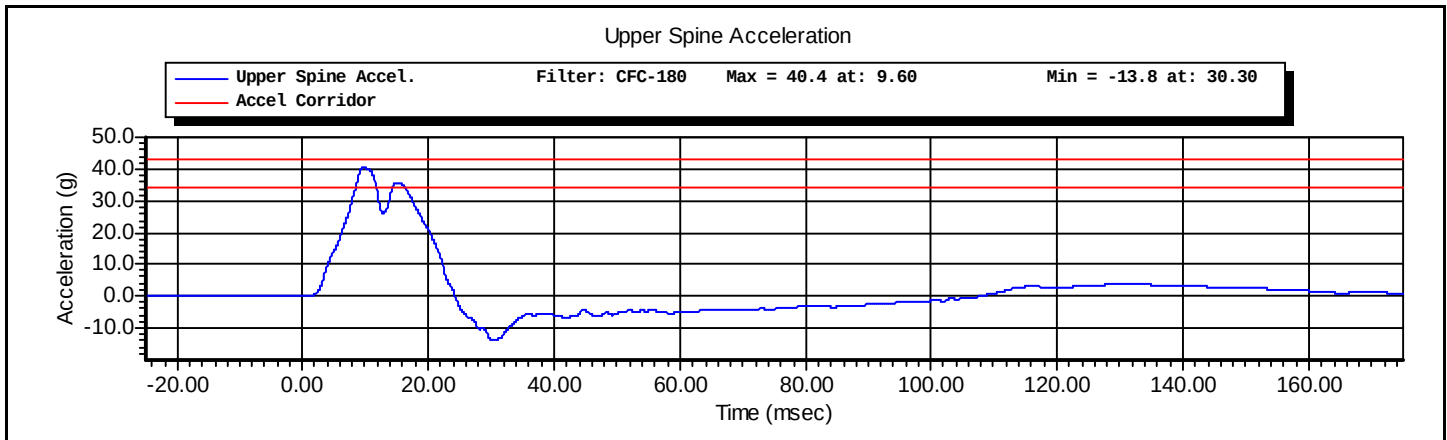
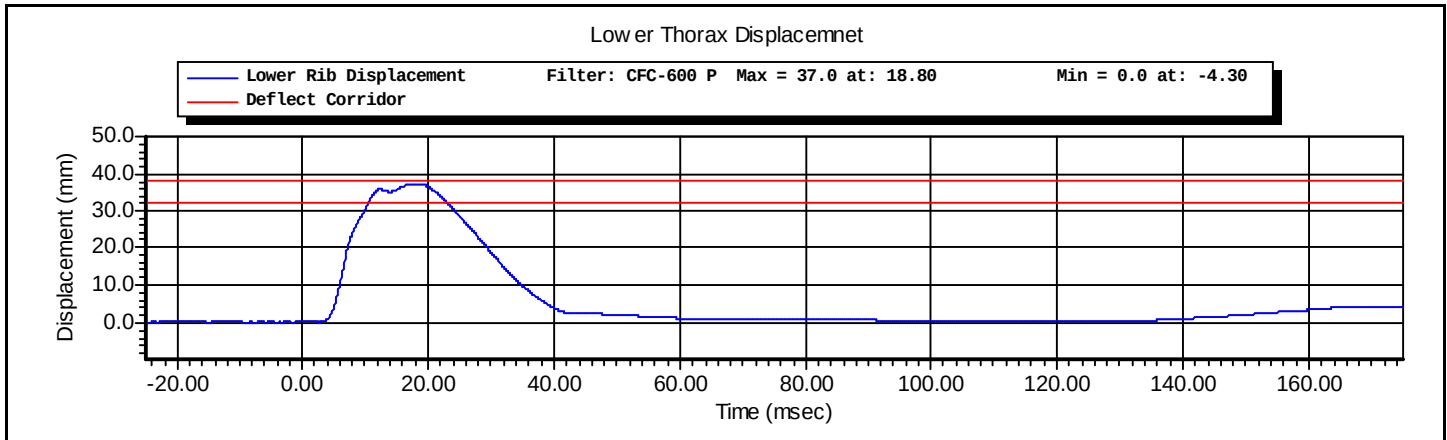
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	8/24/2010
Test Number:	2	Test Time:	3:53:05 PM



Test ID: Thorax With Arm Test Time: 3:53:05 PM

Test Date: 8/24/2010







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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:54:43 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	4.36 m/s	P
Probe Acceleration	14.0	--	18.0	15.7 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	36.0 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	42.1 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	41.8 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	15.8 g	P
Lower Spine Acceleration T12	7.0	--	11.0	9.7 g	P

All test parameters are within specifications

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

Test ID: **Thorax Without Arm** Test Time: **2:54:43 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P23904	3/15/2010
Endevco	7264-2000	P50078	7/2/2010

Test ID: **Thorax Without Arm** Test Time: **2:54:43 PM**

Test Date: **8/24/2010**

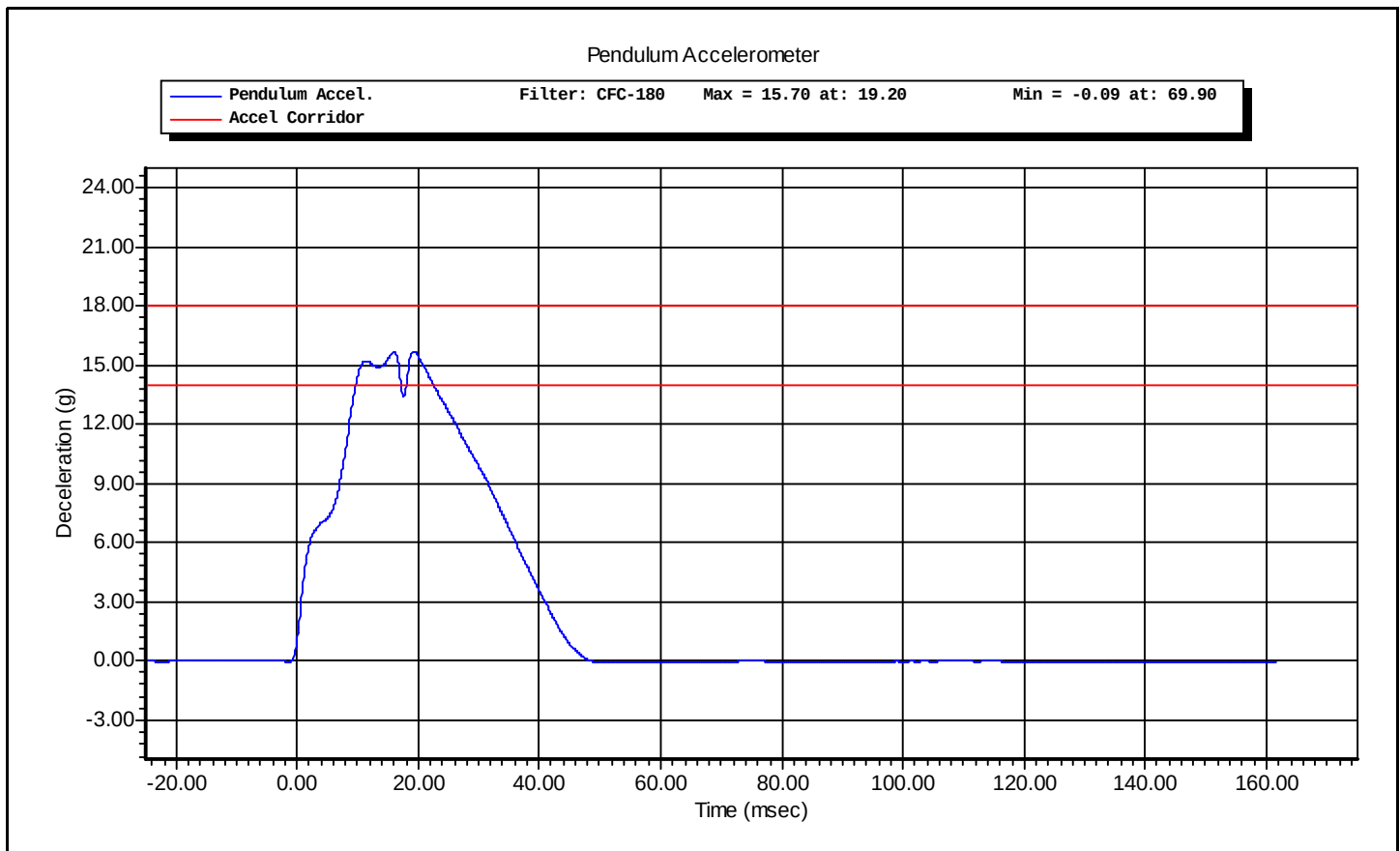


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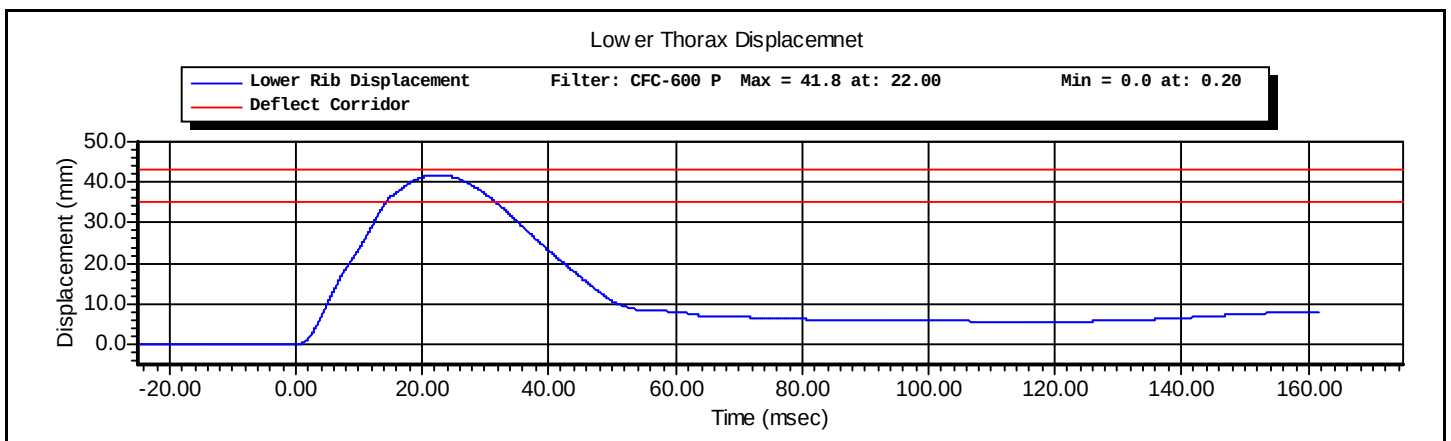
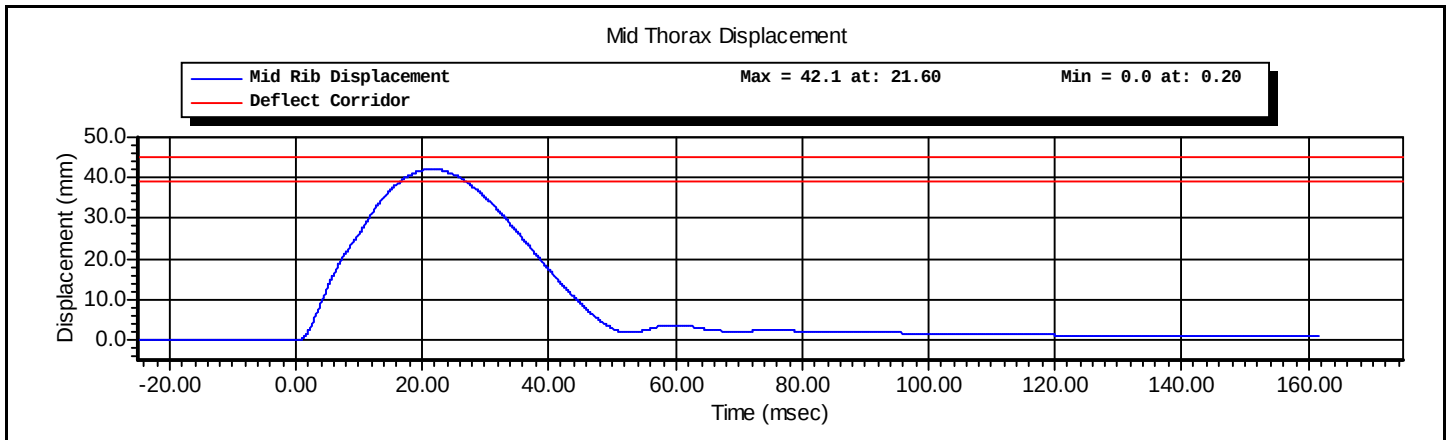
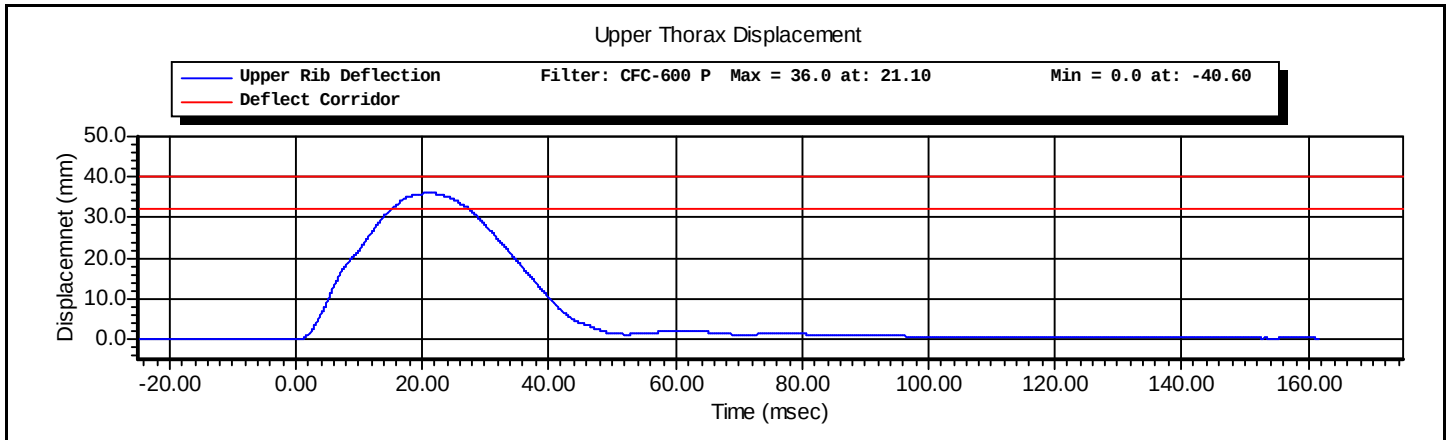
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:54:43 PM

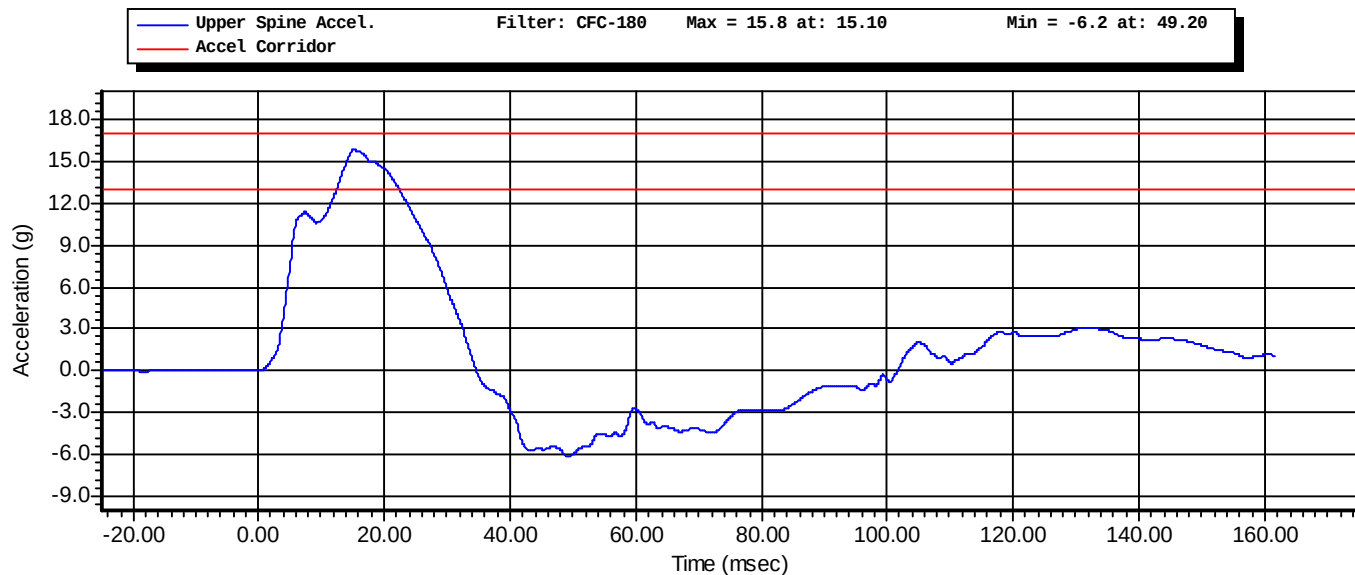


Test ID: Thorax Without Arm Test Time: 2:54:43 PM

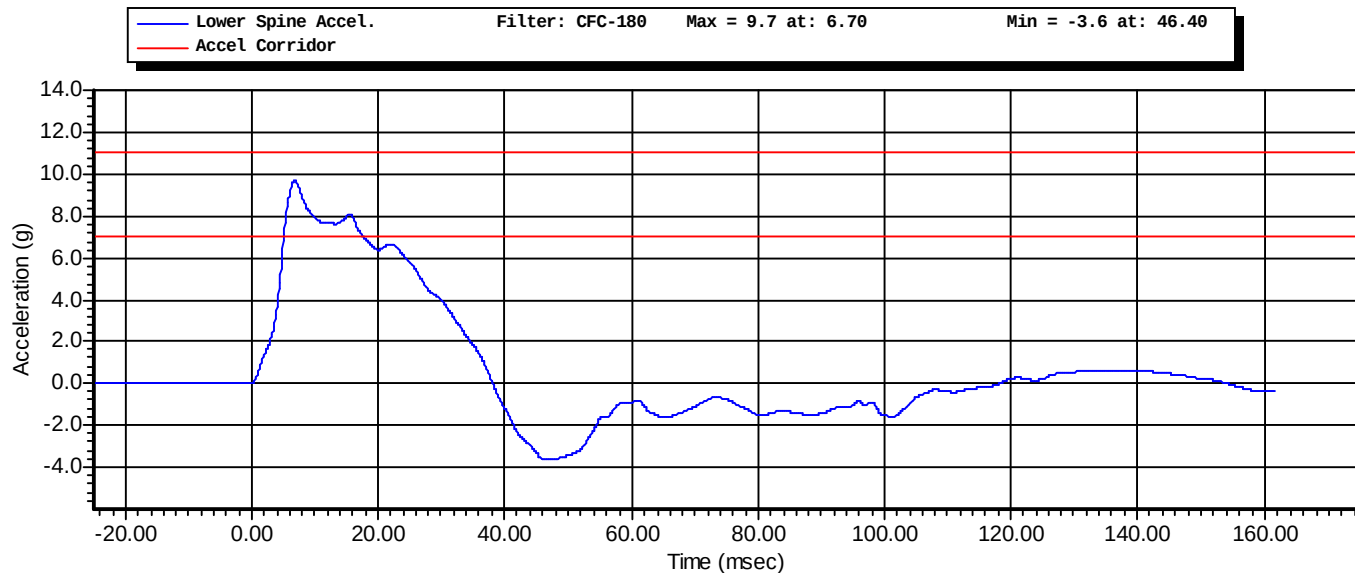
Test Date: 8/24/2010



Upper Spine Acceleration



Lower Spine Acceleration





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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:01:33 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	54 %RH	P
Velocity	4.20	--	4.40	4.35 m/s	P
Probe Acceleration	12.0	--	16.0	14.8 g	P
Upper Abdominal Rib Deflection	36.0	--	47.0	39.2 mm	P
Lower Abdominal Rib Deflection	33.0	--	44.0	38.3 mm	P
Lower Spine Acceleration - T12	9.0	--	14.0	11.9 g	P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **2:01:33 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1162	4/7/2010
Servo	180-3885	DS-1232	4/7/2010
Endevco	7264-2000	P50078	7/2/2010

Test ID: **Abdomen**

Test Time: **2:01:33 PM**

Test Date: **8/24/2010**



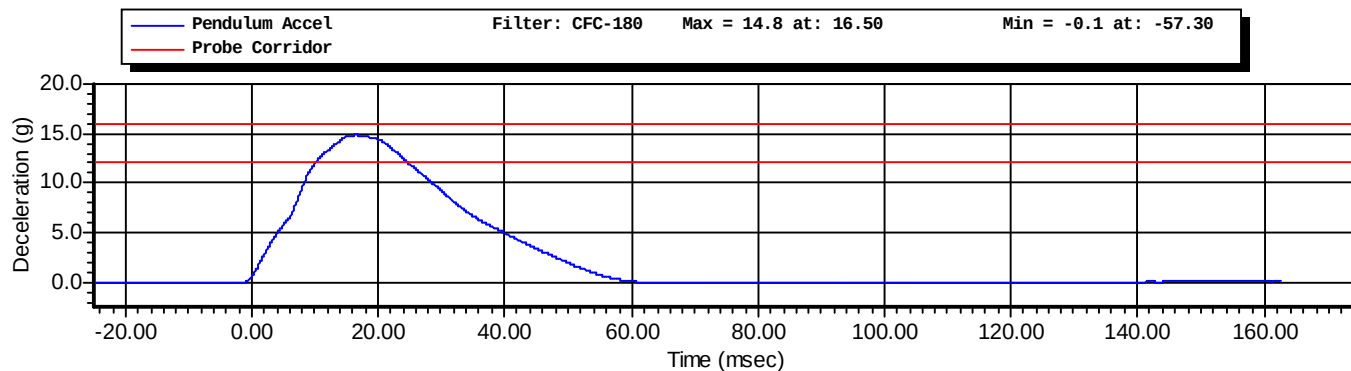
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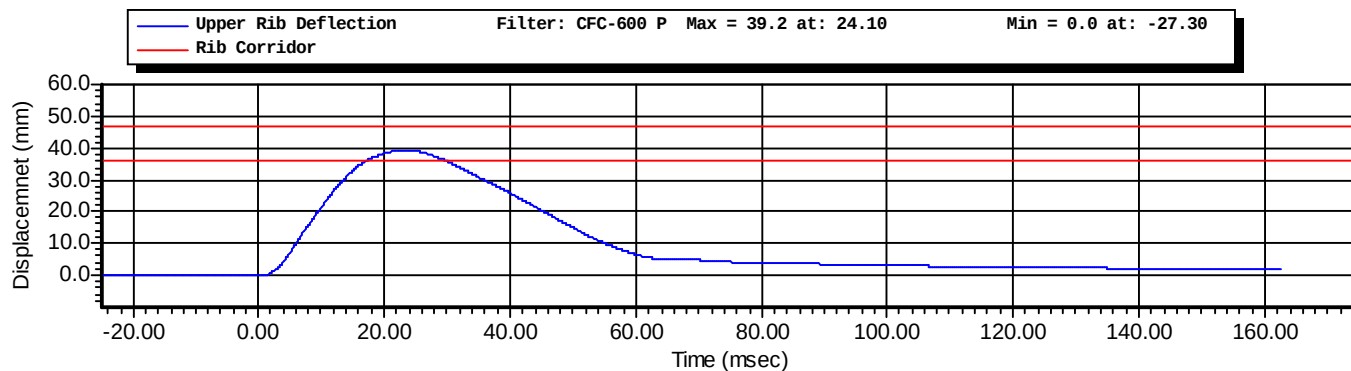
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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:01:33 PM

Pendulum Accelerometer



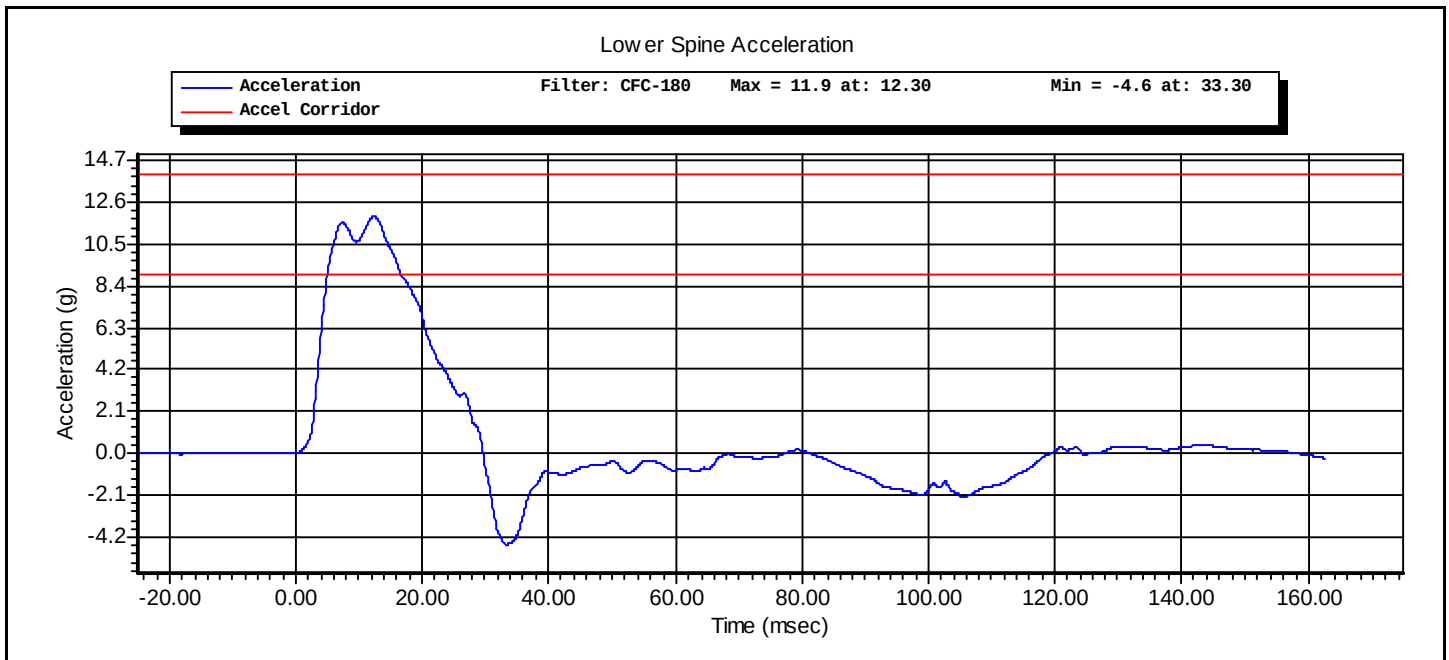
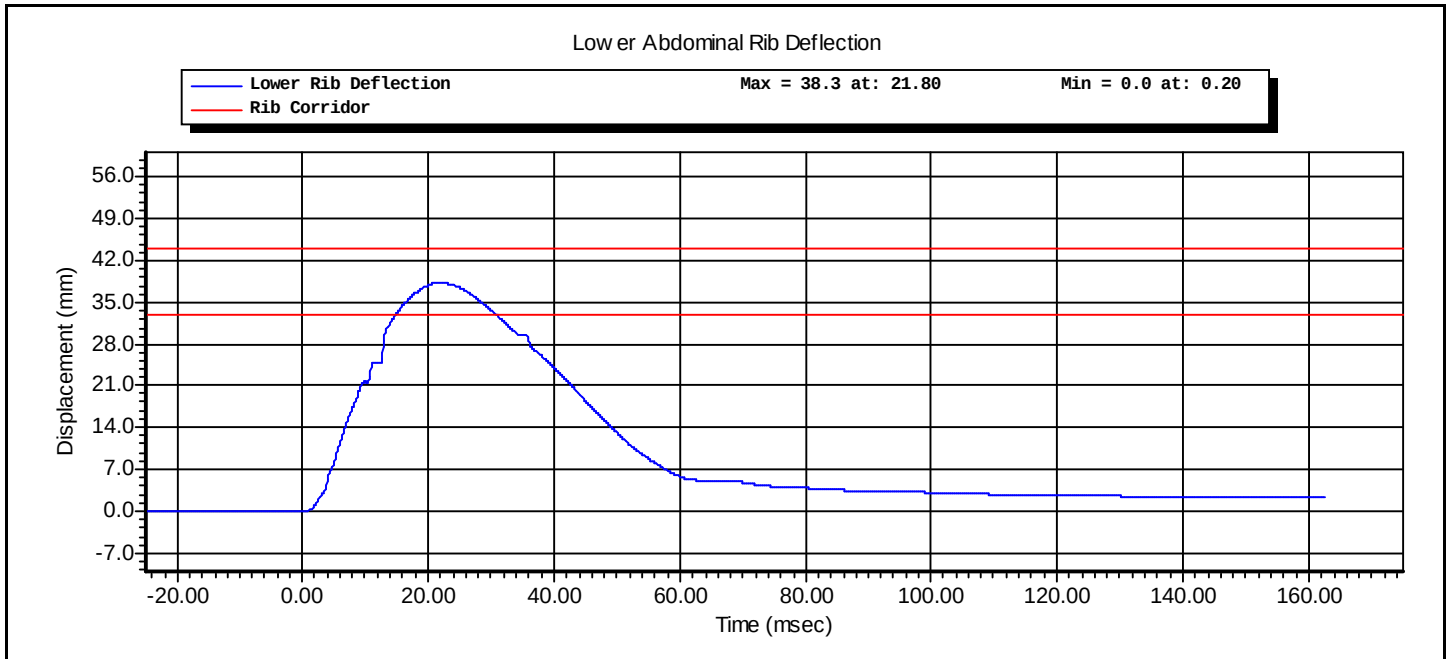
Upper Abdominal Rib Deflection



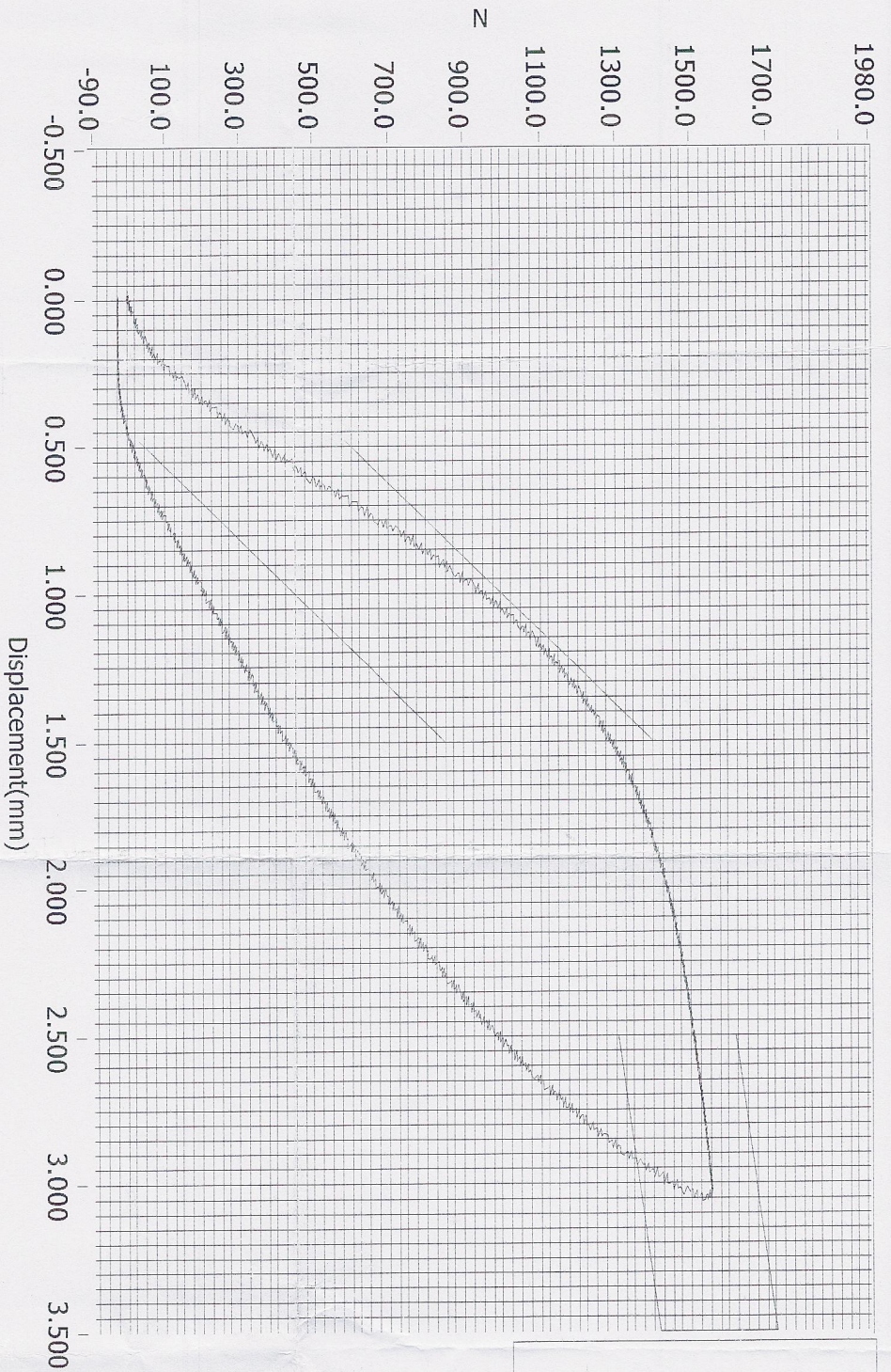
Test ID: **Abdomen**

Test Time: **2:01:33 PM**

Test Date: **8/24/2010**



Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

12461

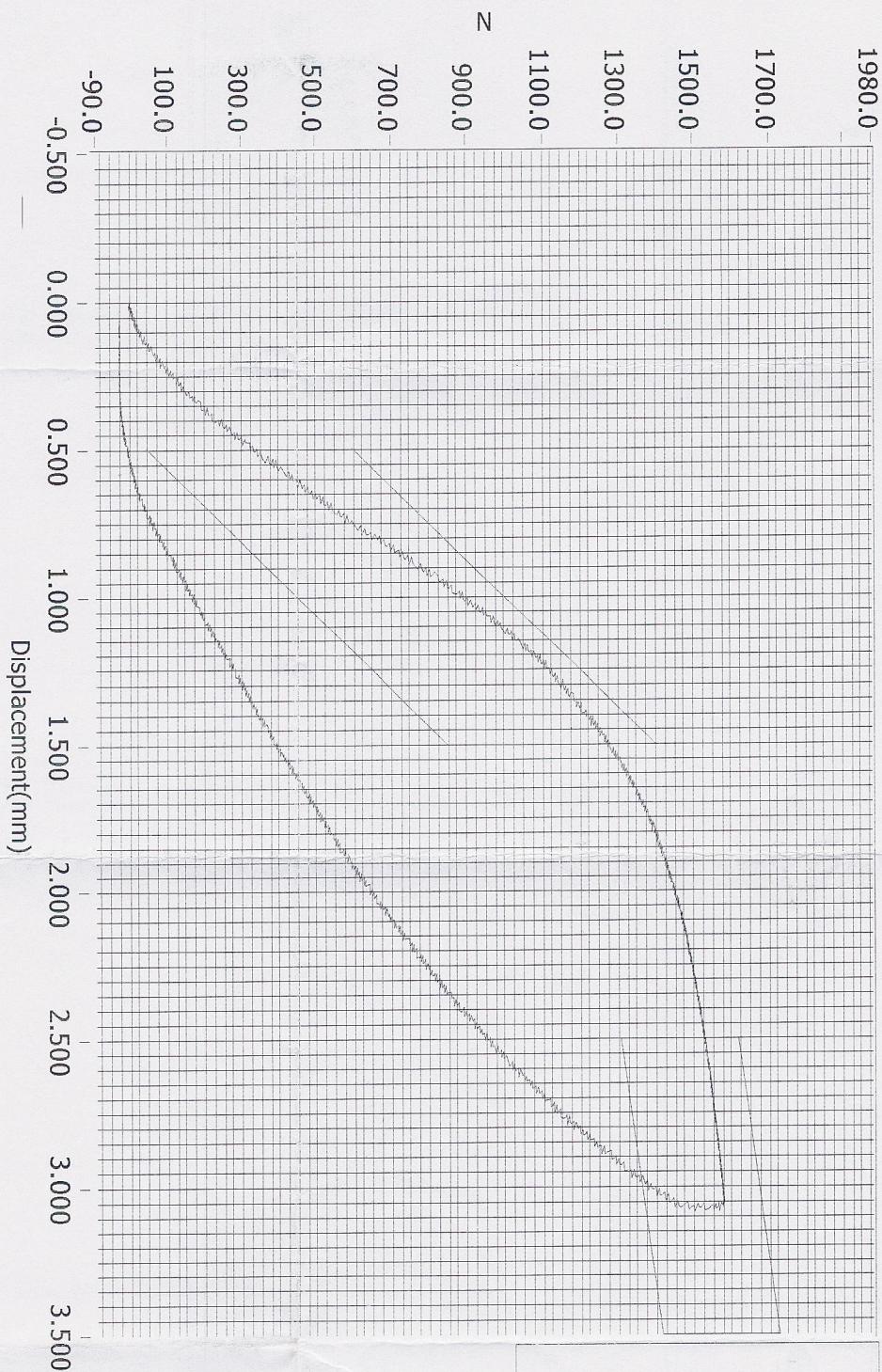
SIDIIs

Current Date : 7/9/2007

Current Time : 09:11:29

C

Resultant Data - SIDIIs Plug Compression



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

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

12282

SIDIIs

Current Date : 7/6/2007

Current Time : 07:58:07

FS



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	8/24/2010
Test Number:	1	Test Time:	12:53:51 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	53 %RH P
Velocity	6.60 -- 6.80	6.66 m/s P
Peak Probe Acceleration	38.0 -- 47.0	44.9 g P
Peak Pelvis Acceleration	34.0 -- 42.0	40.9 g P
Peak Acetabulum Force	3.60 -- 4.30	4.12 kN P

All test parameters are within specifications

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

Test ID: **Pelvis Acetabulum** Test Time: **12:53:51 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

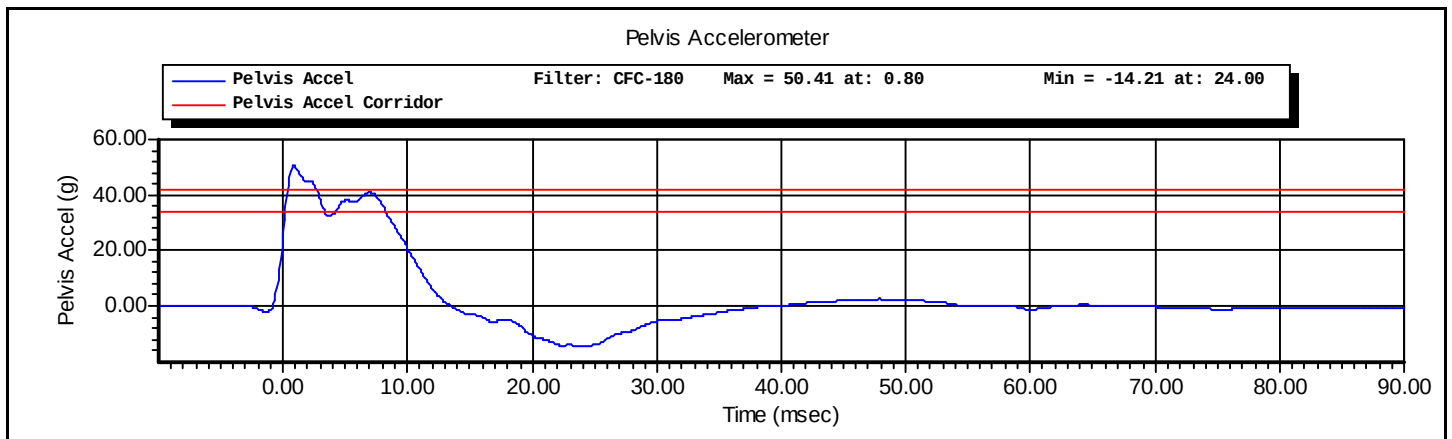
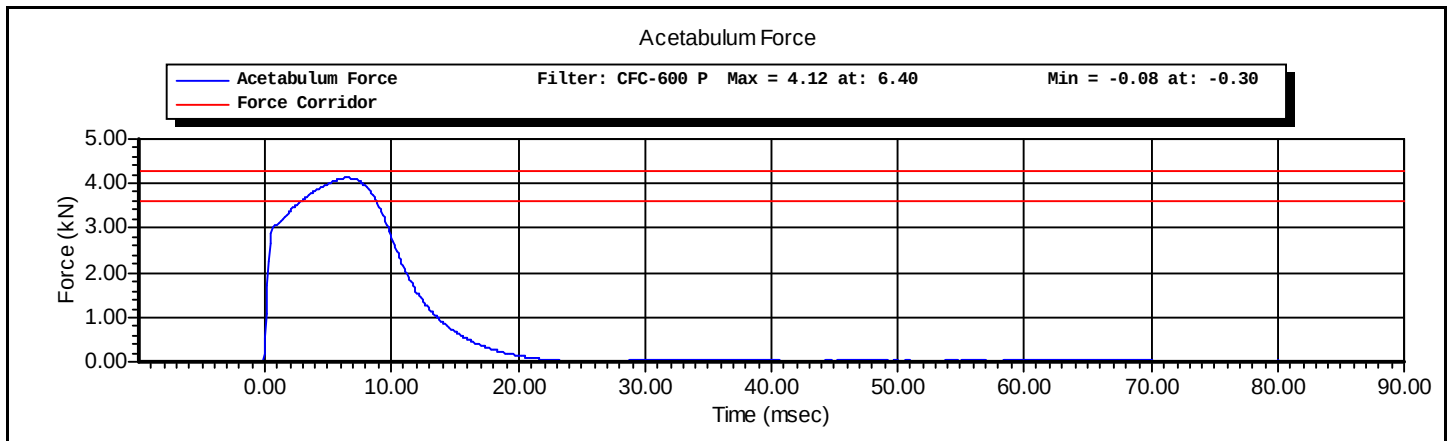
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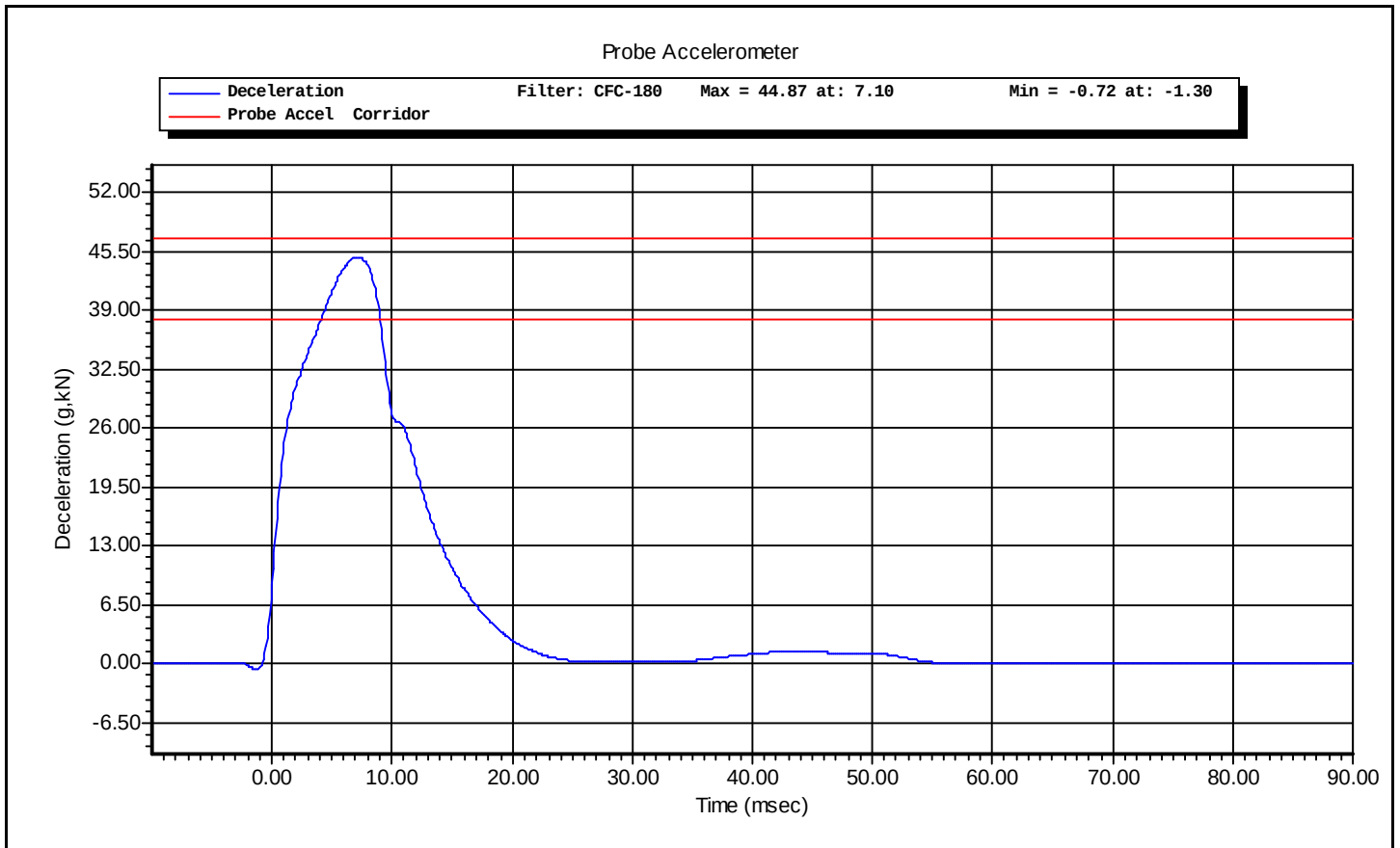
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Endevco	7264-2000	P51671	4/12/2010
DentonATD	3249J	LC-275a	4/12/2010

Test ID: **Pelvis Acetabulum** Test Time: **12:53:51 PM**

Test Date: **8/24/2010**

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	8/24/2010
Test Number:	1	Test Time:	12:53:51 PM







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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Iliac	Test Date:	8/24/2010
Test Number:	1	Test Time:	11:45:14 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	59 %RH P
Velocity	4.20 -- 4.40	4.27 m/s P
Peak Probe Acceleration	36.0 -- 45.0	39.4 g P
Peak Pelvis Acceleration	28.0 -- 39.0	33.6 g P
Peak Iliac Force	4.10 -- 5.10	4.32 kN P

All test parameters are within specifications

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

Test ID: **Pelvis Iliac**

Test Time: **11:45:14 AM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Endevco	7264-2000	P51671	4/12/2010
DentonATD	3228J	LC-279 Fy	4/12/2010

Test ID: **Pelvis Iliac**

Test Time: **11:45:14 AM**

Test Date: **8/24/2010**

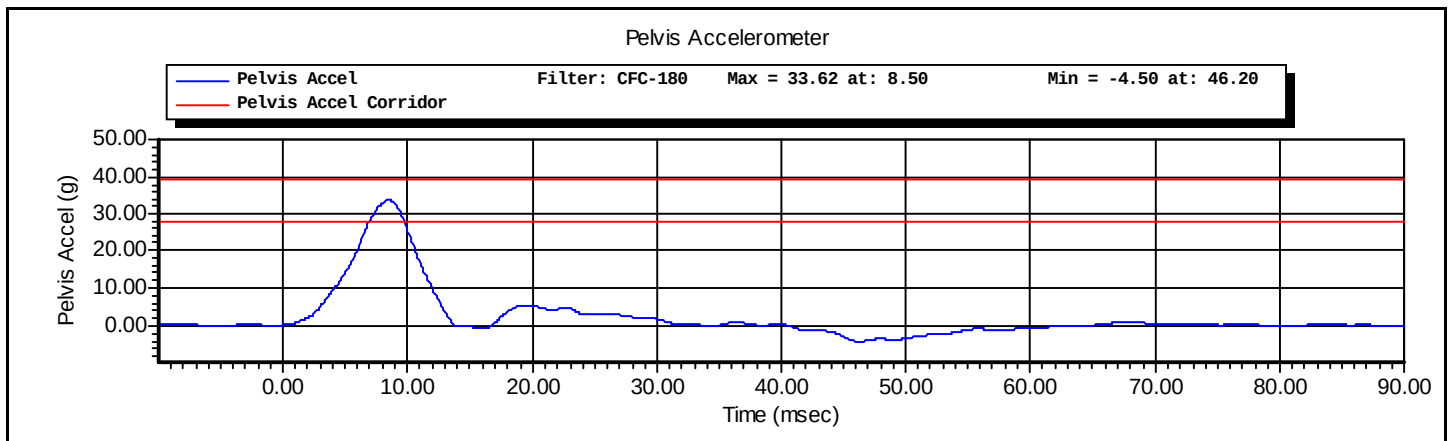
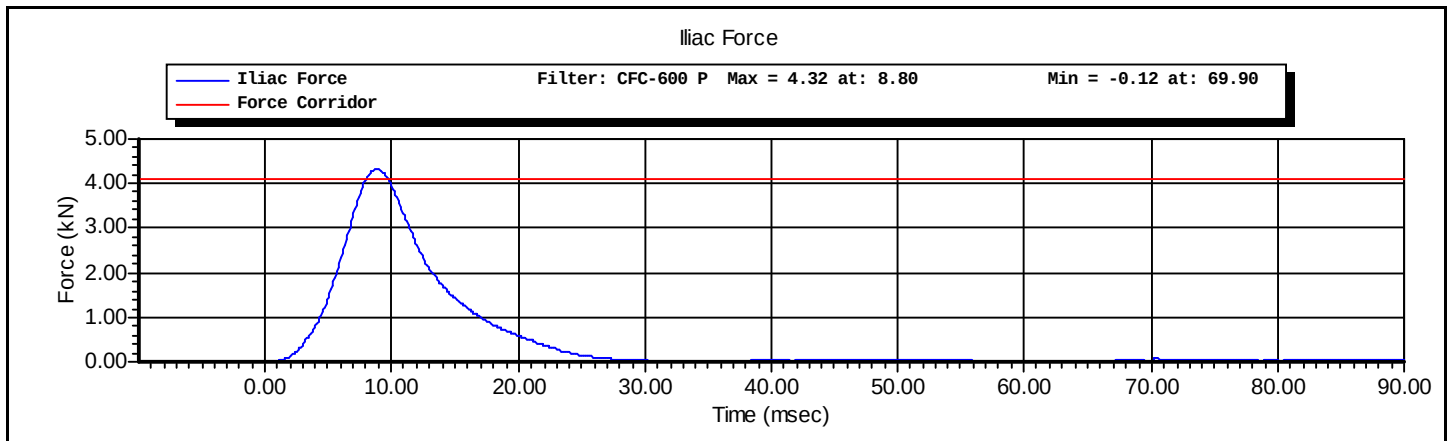


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Iliac	Test Date:	8/24/2010
Test Number:	1	Test Time:	11:45:14 AM



Test ID: **Pelvis Iliac**

Test Time: **11:45:14 AM**

Test Date: **8/24/2010**

