

REPORT NUMBER: SNCAP-CAL-11-33

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

**Toyota Motor Manufacturing
2011 Toyota Camry
Four Door Sedan**

NHTSA NUMBER: YB5100

**PREPARED BY:
CALSPAN CORPORATION
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February 11, 2011

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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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 Toyota Camry Four Door Sedan 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 1/7/2011. The impact velocity of the Moving Deformable Barrier (MDB) was 62.31 km/h, and the ambient temperature at the struck side (driver side) of the vehicle was 22°C. The target vehicle's maximum post-test static crush was 230 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;">164.99</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;">24.74</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;">1028.31</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;">2355.06</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;">157.02</td> </tr> <tr> <td>Lower Spine Resultant Acceleration</td> <td style="text-align: center;">G</td> <td style="text-align: center;">82</td> <td style="text-align: center;">72.78</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;">4448.90</td> </tr> </tbody> </table>				Driver ATD (ES-2re)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	164.99	Maximum Chest Deflection	mm	44	24.74	Total Abdominal Force	N	2500	1028.31	Pubic Symphysis Force	N	6000	2355.06	Passenger ATD (SID-IIs)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	157.02	Lower Spine Resultant Acceleration	G	82	72.78	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4448.90
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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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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

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

SUMMARY

A 2011 Toyota Camry Four Door Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.31 km/h (38.72 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 1/7/2011. Pretest and post- test photographs of the test vehicle, the MDB and the dummies (ES-2re and SID-IIs) are included in this report.

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

The Dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

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

PASSENGER ATD (SID-IIs)

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

Dummy injury values were recorded as follows:

	Driver ATD (ES-2re)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	164.99
Maximum Chest Deflection	mm	44	24.74
Total Abdominal Force	N	2500	1028.31
Pubic Symphysis Force	N	6000	2355.06

	Passenger ATD (SID-IIs)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	157.02
Lower Spine Resultant Acceleration	G	82	72.78
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4448.91

Supplemental restraint information is given below:

SUPPLEMENTAL RESTRAINT INFORMATION

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

GENERAL COMMENTS

SECTION 2
DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Toyota Camry
Test Program: Side MDB NCAP

NHTSA No.: YB5100
Test Date: 1/7/2011

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	YB5100	Anti-Lock Brakes	Yes
Model Year	2011	All-Wheel Drive	No
Make	Toyota	Power Steering	Yes
Model	Camry	Driver Front Airbag	Yes
Body Style	Four Door Sedan	Driver Curtain Airbag	Yes
VIN	4T1BF3EKXBU684971	Driver Head/Torso Airbag	No
Body Color	Light gray/silver	Driver Torso Airbag	Yes
Delivery Date	12/27/2010	Driver Torso/Pelvis Airbag	No
Odometer Reading (km/mi)	3 / 2	Driver Pelvis Airbag	No
Dealer	VanDerStyne Toyota	Driver Knee Airbag	Yes
Transmission	6-Speed Manual	Rear Pass. Curtain Airbag	Yes
Final Drive	Front Wheel Drive	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	4 Cylinder Inline	Rear Pass. Torso Airbag	No
Engine Displacement (L)	2.5	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Transverse	Rear Pass. Pelvis Airbag	No
Roof Rack	No	Pretensioners	Yes
Sunroof/T-Top	No	Load Limiters	No
Tinted Glass	Yes	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	Toyota Motor Manufacturing	GWR (kg)	1,950
Date of Manufacture	12/10	GWR Front (kg)	1,210
		GWR Rear (kg)	1,070

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				410.0	(A)
DSC x 68.04 (kg)				340.2	(B)
Cargo Weight (RCLW) (kg)				69.8	(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	X		
Third row seat							

Test Vehicle:	<u>2011 Toyota Camry</u>	NHTSA No.:	<u>YB5100</u>
Test Program:	<u>Side MDB NCAP</u>	Test Date:	<u>1/7/2011</u>

The diagram shows a cross-section of a tire with the following labels and specifications:

- Treadwear, traction and temperature grades:** TREADWEAR 220 TRACTION A TEMPERATURE A
- Tire ply composition and materials used:** TREAD 4 PLYS • 2XXXXY • SIDEWALL 2 PLYS 2XXXXX CORD • MAX LOAD 1300 LBS • MAX PRESS 35 PSI • RADIAL • TUBELESS • DOT M43 AB 6006
- Max. cold inflation & load limit:** MAX COLD INFLATION & LOAD LIMIT
- Tire Name:** TIRE NAME
- Manufacturer:** MANUFACTURER
- U.S. DOT safety standard code:** U.S. DOT SAFETY STANDARD CODE
- Load index & speed symbol:** P215/65R15 89H
- Diameter of wheel in inches:** 15
- Radial:** RADIAL
- Ratio of height to width (aspect ratio):** 65
- Width of tire in millimeters:** 215
- Passenger car tire:** PASSENGER CAR TIRE

	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	P215/60R16	P215/60R16
Tire Size on Vehicle	P215/60R16	P215/60R16
Tire Manufacturer	Michelin	Michelin
Tire Model	Energy MXV4	Energy MXV4
Treadwear	440	440
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester + 1 Polyamide + 2 steel	1 Polyester + 1 Polyamide + 2 steel
Load Index/Speed Symbol	94V	94V
Tire Material		
DOT Safety Code Right	HN49 JUAX 4210	HN49 JUAX 4210
DOT Safety Code Left	HN49 JUAX 4210	HN49 JUAX 4210

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

Test Vehicle: 2011 Toyota Camry

NHTSA No.: YB5100

Test Program: Side MDB NCAP

Test Date: 1/7/2011

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	441.0	298.5	739.5	483.5	393.5	877.0	476.0	392.5	868.5
Right	kg	445.5	291.5	737.0	442.5	355.0	797.5	440.5	362.0	802.5
Ratio	%	60	40		55	45		55	45	
Totals	kg	886.5	590.0	1,476.5	926.0	748.5	1,674.5	916.5	754.5	1,671.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1,476.5	(A)
Sum of Actual Weight of 2 P572 ATDS Used	kg	136.8	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	69.8	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1,683.1	(A+B+C)

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	LF	RF	RR	LR	CG (aft of front axle)
Fully Loaded	mm	711	720	695	690	
As Tested (Fully Loaded $\pm$ 10 mm at each wheel well)	mm	713	718	692	690	1,240

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2,774
Total Vehicle Length at Left Side	mm	4,608
Total Vehicle Length at Centerline	mm	4,806
Total Vehicle Length at Right Side	mm	4,610
Weight of Ballast in Cargo Area	kg	42.0
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	64.7

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	447
Actual Impact Point Aft of Front Axle	mm	447

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

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011

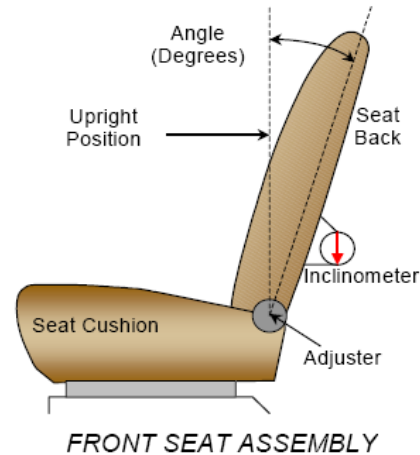
NORMAL DESIGN RIDING POSITION

Driver seat:

The driver's seat back was adjusted according to the specifications provided in FORM 1.

Passenger Seat:

The rear seat back was not adjustable



SEAT BACK ANGLES

	Degrees
Driver w/ Seated Dummy	3.2
Passenger w/ Seated Dummy	Fixed

SEAT FORE/AFT POSITIONS

The driver's seat was positioned at the mid-point of the fore/aft travel range. The rear passenger Seat was not adjustable in the Fore/aft position

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	18	9
Rear Seat	NA	NA

SEAT BELT UPPER ANCHORAGES

The driver's upper belt anchorage was positioned at the first position down from the topmost. The rear passenger's upper belt anchorage was not adjustable.

SEAT BELT UPPER ANCHORAGES

	Total # of Positions	Placed in Position #
Driver Seat	4	1
Rear Seat	NA	NA

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

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

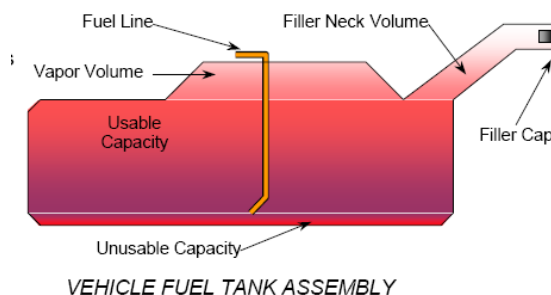
NHTSA No.: YB5100
 Test Date: 1/7/2011

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	70.0
Usable Capacity of "Optional Tank"	NA
Usable Capacity Used for FMVSS 301	70.0
Actual Amount of Solvent Used	64.7

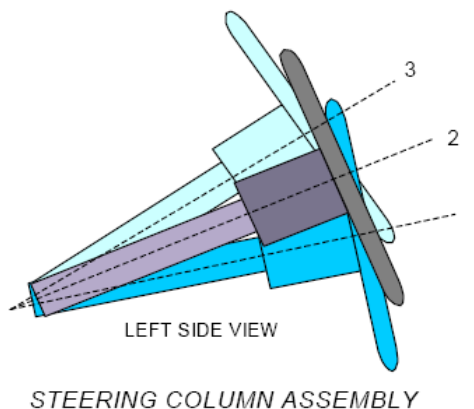
FUEL PUMP

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



STEERING COLUMN ADJUSTMENT

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



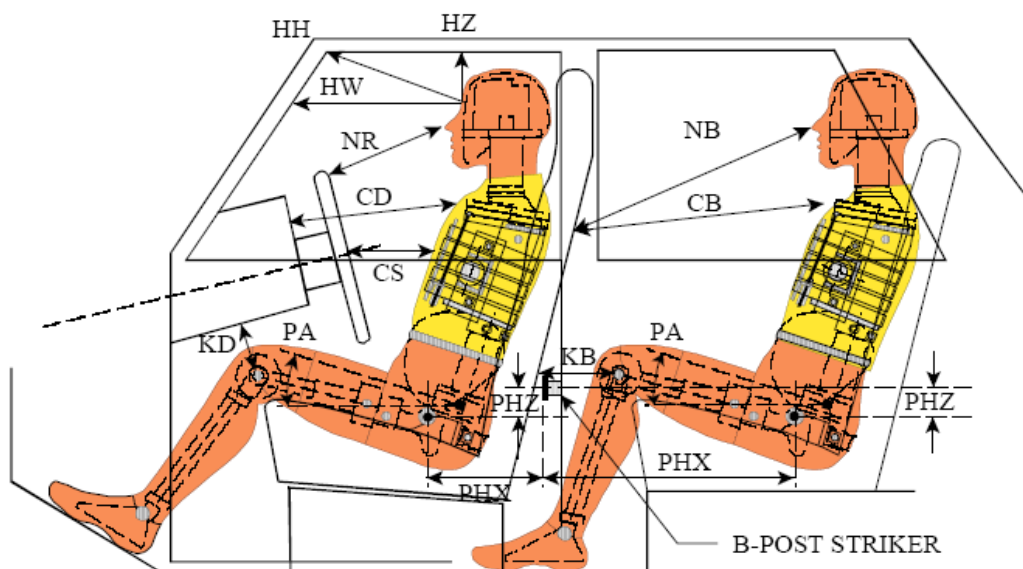
STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	67.0	
Geometric Center – Position 2	65.2	
Uppermost – Position 3	63.4	
Telescoping Steering Wheel Travel		40
Test Position	65.2	20

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011



LEFT SIDE VIEW

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

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

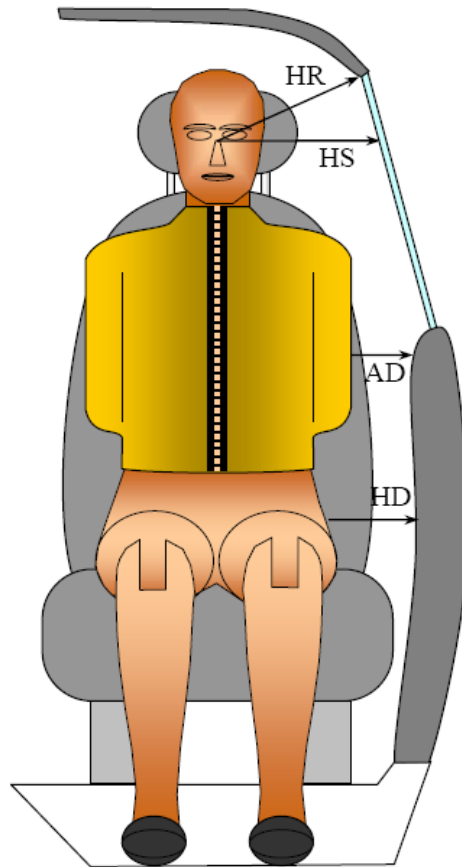
Driver Code	Pass. Code	Measurement Description	Driver S/N 033		Passenger S/N 300	
			Length (mm)	Angle	Length (mm)	Angle
HH		Head to Header	387	14.7		
HW		Head to Windshield	620	0		
HZ	HZ	Head to Roof	165	90.0	250	90.0
NR	NB	Nose to Rim/Seat Back	484	-16.9	585	-10.1
CD	CB	Chest to Dash/Seat Back	618	2.8	551	-1.5
CS		Chest to Steering Wheel	318	0		
KDL	KBL	Left Knee to Dash/Seat Back	177	15.5	299	15.5
KDR	KBR	Right Knee to Dash/Seat Back	152	23.5	292	16.2
PA	PA	Pelvic Angle		23.1		21.4
PHX	PHX	H-Point to Striker (X-Axis)	219		392	
PHZ	PHZ	H-Point to Striker (Z-Axis)	229		352	
SA	SA	Seat Back Angle		3.2 *		NA

* Measurement from the head restraint post

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Toyota Camry
Test Program: Side MDB NCAP

NHTSA No.: YB5100
Test Date: 1/7/2011



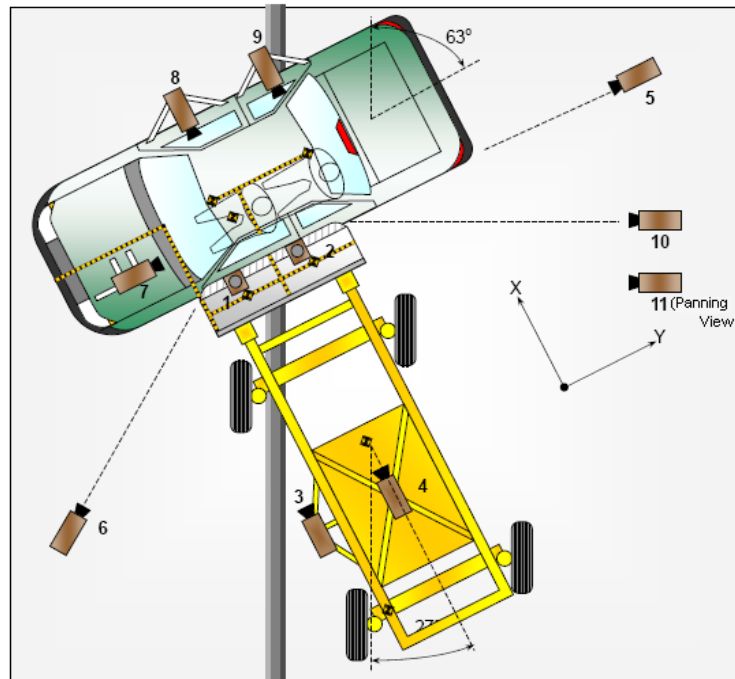
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Description	Units	Driver S/N 033	Passenger S/N 300
HR	Head to Side Header	mm	179	218
HS	Head to Side Window	mm	350	353
AD	Arm to Door	mm	101	176
HD	H-point to Door	mm	132	179

DATA SHEET NO. 5
CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Toyota Camry
Test Program: Side MDB NCAP

NHTSA No.: YB5100
Test Date: 1/7/2011



CAMERA LOCATIONS AND DATA

No.	Camera View	Location			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead Wide View	72	812	-4880	-90	14	1000
2	Overhead Close-up View	195	855	-4880	-90	24	1000
3	Impact Point	-1470	0	-847	0	25	500
4	Struck-Side View at Impact	-1140	838	-1587	-17	12.5	500
5	Rear Impact View of Struck Side	210	10640	985	-2.1	50	1000
6	Front Oblique Impact View of Struck Side	-1660	-1470	915	-5.1	24	1000
7	Driver Dummy Front View (OB)	610	-350	1300	-12.2	25	500
8	Driver Dummy Side View (OB)	1480	670	890	1.4	12.5	500
9	Rear Passenger Dummy Side View (OB)	1480	1630	940	3.5	12.5	500
10	Real-time Rear View of Impact	-	-	-	-	-	24
11	Real-time Pan View of Impact	-	-	-	-	-	24

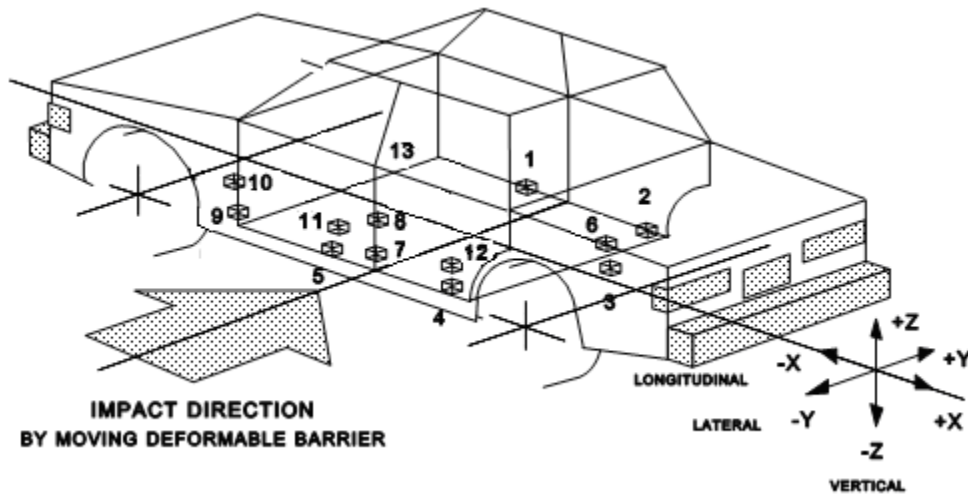
Reference: Impact Point projected to Ground
+X = To Front of MDB,
+Y = To Right of MDB,
+Z = Down

*All measurements accurate to ± 6 mm.

DATA SHEET NO. 6
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Toyota Camry
Test Program: Side MDB NCAP

NHTSA No.: YB5100
Test Date: 1/7/2011



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

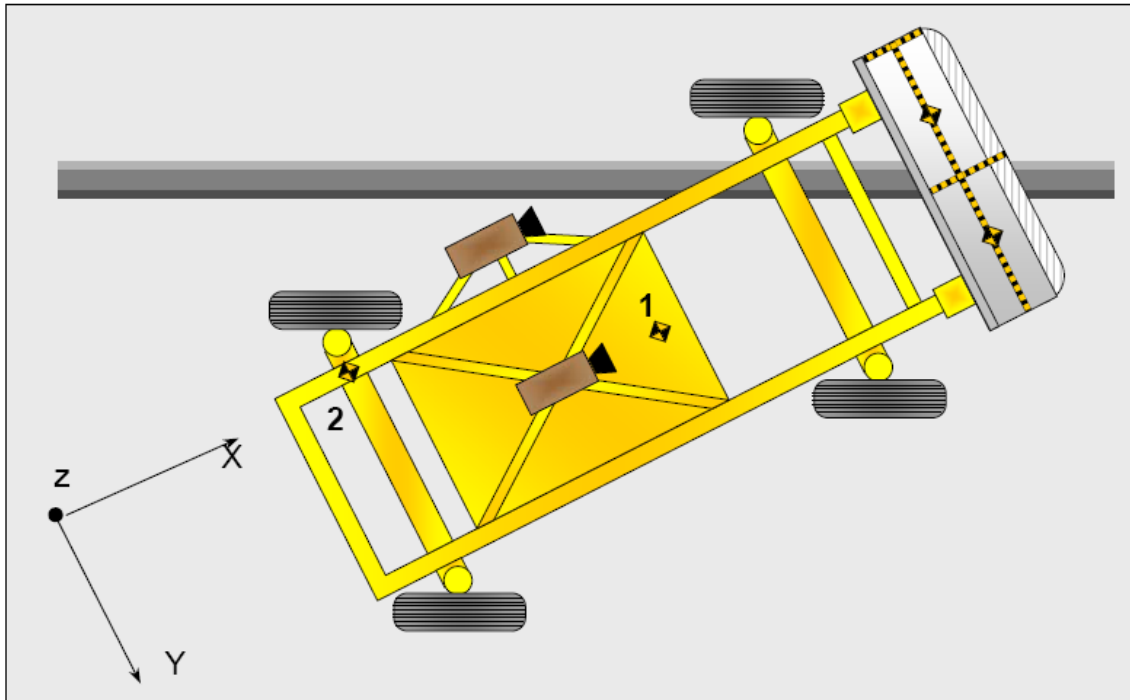
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3138	664	253
2	Right Sill at Rear Seat	2014	633	215
3	Rear Floorpan Above Axle	872	27	475
4	Left Sill at Rear Door	2016	-655	232
5	Left Sill at Front Door	3076	-648	253
6	Rt. Rear Occ. Compartment	2168	349	223
7	B-Post Lower	2313	-686	451
8	B-Post Middle	2216	-658	1004
9	A-Post Lower	3289	-692	385
10	A-Post Middle	3305	-668	997
11	Front Seat Track	2380	-553	288
12	Rear Seat Structure	1234	-521	626
13	Vehicle CG	2971	8	574

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

**DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS**

Test Vehicle: 2011 Toyota Camry
Test Program: Side MDB NCAP

NHTSA No.: YB5100
Test Date: 1/7/2011



MDB ACCELEROMETER LOCATIONS

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

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

DATA SHEET NO. 8
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	152	313
2	Occupant H-Point	mm	230	516
3	Mid Door	mm	217	621
4	Window Sill	mm	161	924
5	Window Top	mm	19	1388
	Maximum Penetration	mm	230	516

INSTRUMENTATION

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

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

CAMERA COVERAGE

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

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

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1,250
Overall Length Including Honeycomb Frame	4,120
Wheel Base of Framework Carriage	2600
CG Location of Front Axle	1,120

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	392.5	297.5	690.0
Right	kg	386.0	291.5	677.5
Ratio	%	56.9	43.1	-
Totals	kg	778.5	589.0	1367.5

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	NA
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.31
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.3

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	430	800	Right	153
B	Top of Bumper	542	800	Right	110
C	Mid-Level	682	800	Left	60
D	Top of Stack	811	800	Left	93

MDB INSTRUMENTATION

Accelerometers	5
Contact Switches	2

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

Test Vehicle: 2011 Toyota Camry
Test Program: Side MDB NCAP

NHTSA No.: YB5100
Test Date: 1/7/2011

TEST DUMMY INFORMATION AND CONTACT

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Dummy Type/Serial No.	033	300
Head Contact	Airbag and Side Header Trim	Airbag
Upper Torso Contact	Airbag	Door Trim Panel
Lower Torso Contact	Door Trim Panel	Door Trim Panel
Left Knee Contact	Door Trim Panel	Door Trim Panel
Right Knee Contact		

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

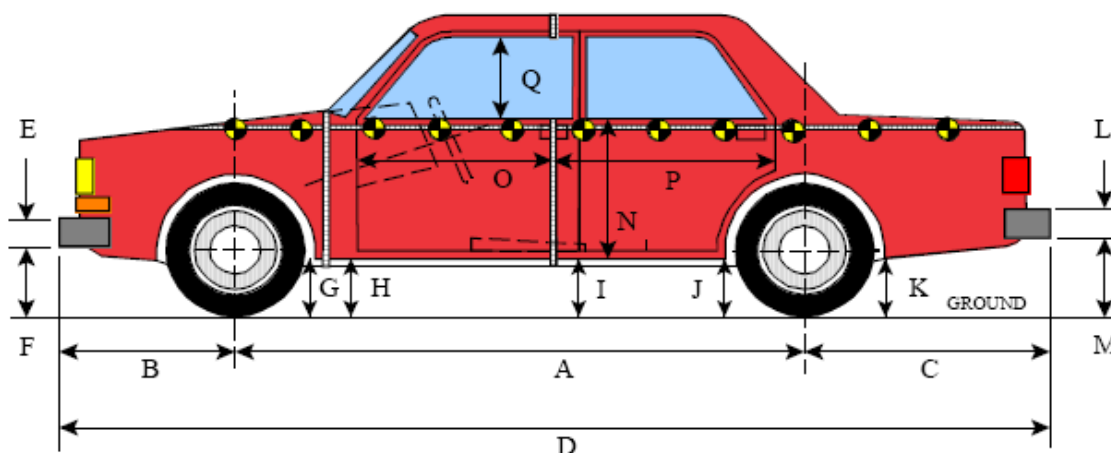
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	0
Vertical Offset	mm	+/- 20	-12

DATA SHEET NO. 11
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011



LEFT SIDE VIEW

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

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

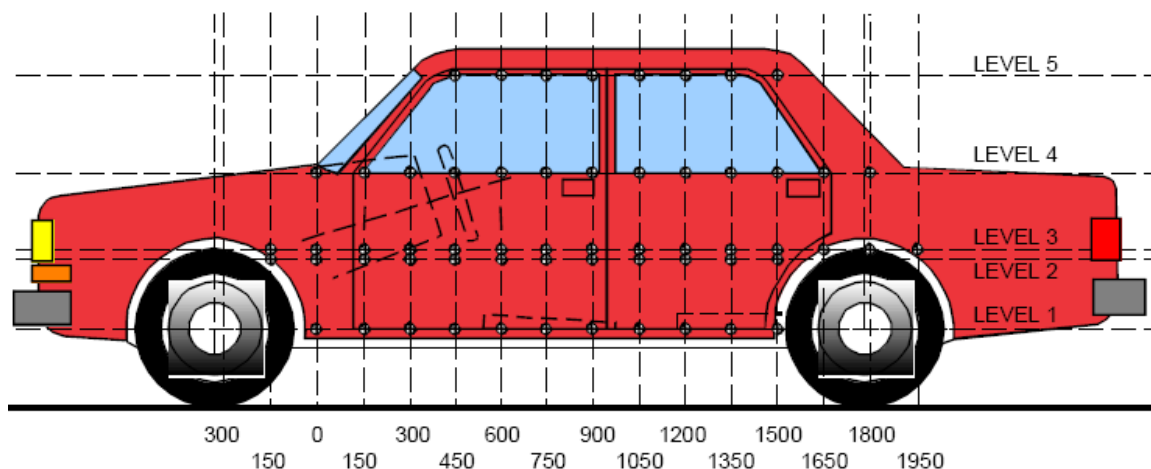
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2774	2743	-31
B	Front Axle to FSOV	952	963	11
C	Rear Axle to RSOV	1081	1089	8
D	Total Length at Centerline	4806	4794	-12
E	Front Bumper Thickness	345	345	0
F	Front Bumper Bottom to Ground	222	230	8
G	Sill Height at Front Wheel Well	165	175	10
H	Sill Height at Front Door Leading Edge	175	177	2
I	Sill Height at B Pillar	170	231	61*
J1	Sill Height at Rear Wheel Well	175	181	6
J2	Pinch Weld Height at Rear Wheel Well	199	179	-20
K	Sill Height Aft of Rear Wheel Well	216	237	21
L	Rear Bumper Thickness	380	380	0
M	Rear Bumper Bottom to Ground	270	277	7
N	Sill Height to Window Bottom Sill	711	650	-61
O	Front Door Leading Edge to Impact CL	834	778	-56
P	Rear Door Trailing Edge to Impact CL	1194	1150	-43
Q	Front Window Opening	446	448	2
R	Right Side Length	4610	4608	-2
S	Left Side Length	4608	4576	-32
T	Vehicle Width at B Post	1819	1603	-216

* Plastic sill trim became disengaged from vehicle during the crash test. Measurement may not reflect true deformation

DATA SHEET NO. 12
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011



LEFT SIDE VIEW

Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	313
2	Occupant H-Point	516
3	Mid-Door	621
4	Window Sill	924
5	Window Top	1388

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 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--
-750	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--
-600	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--
-450	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--
-300	--	--	--	785	--	--	--	--	809	--	--	--	--	-24	--
-150	--	--	911	799	--	--	--	924	815	--	--	--	-13	-16	--
0	892	902	902	810	--	903	897	907	818	--	-11	5	-5	-8	--
150	887	901	902	826	--	849	777	779	823	--	38	124	123	3	--
300	884	902	905	835	--	824	743	739	807	--	60	159	166	28	--
450	885	903	908	846	--	806	725	726	791	--	79	178	182	55	--
600	885	904	909	853	--	795	716	717	772	--	90	188	192	81	--
750	886	904	910	856	567	784	702	711	763	573	102	202	199	93	-6
900	885	904	910	862	598	773	687	704	764	598	112	217	206	98	0
1050	883	902	909	864	605	765	686	692	765	599	118	216	217	99	6
1200	880	899	908	865	607	728	669	700	745	592	152	230	208	120	15
1350	877	895	905	864	605	739	678	691	703	586	138	217	214	161	19
1500	872	890	901	865	601	759	699	690	717	582	113	191	211	148	19
1650	868	885	897	863	590	782	721	703	758	572	86	164	194	105	18
1800	872	884	893	861	565	827	755	740	796	561	45	129	153	65	4
1950	--	899	902	857	--	--	846	837	841	--	--	53	65	16	--
2100	--	--	--	836	--	--	--	--	829	--	--	--	--	7	--
2250	--	--	--	845	--	--	--	--	837	--	--	--	--	8	--
2400	--	--	--	835	--	--	--	--	821	--	--	--	--	14	--
2550	--	--	--	822	--	--	--	--	816	--	--	--	--	6	--
2700	--	--	--	808	--	--	--	--	808	--	--	--	--	0	--
2850	--	--	--	789	--	--	--	--	789	--	--	--	--	0	--

MAXIMUM CRUSH DATA

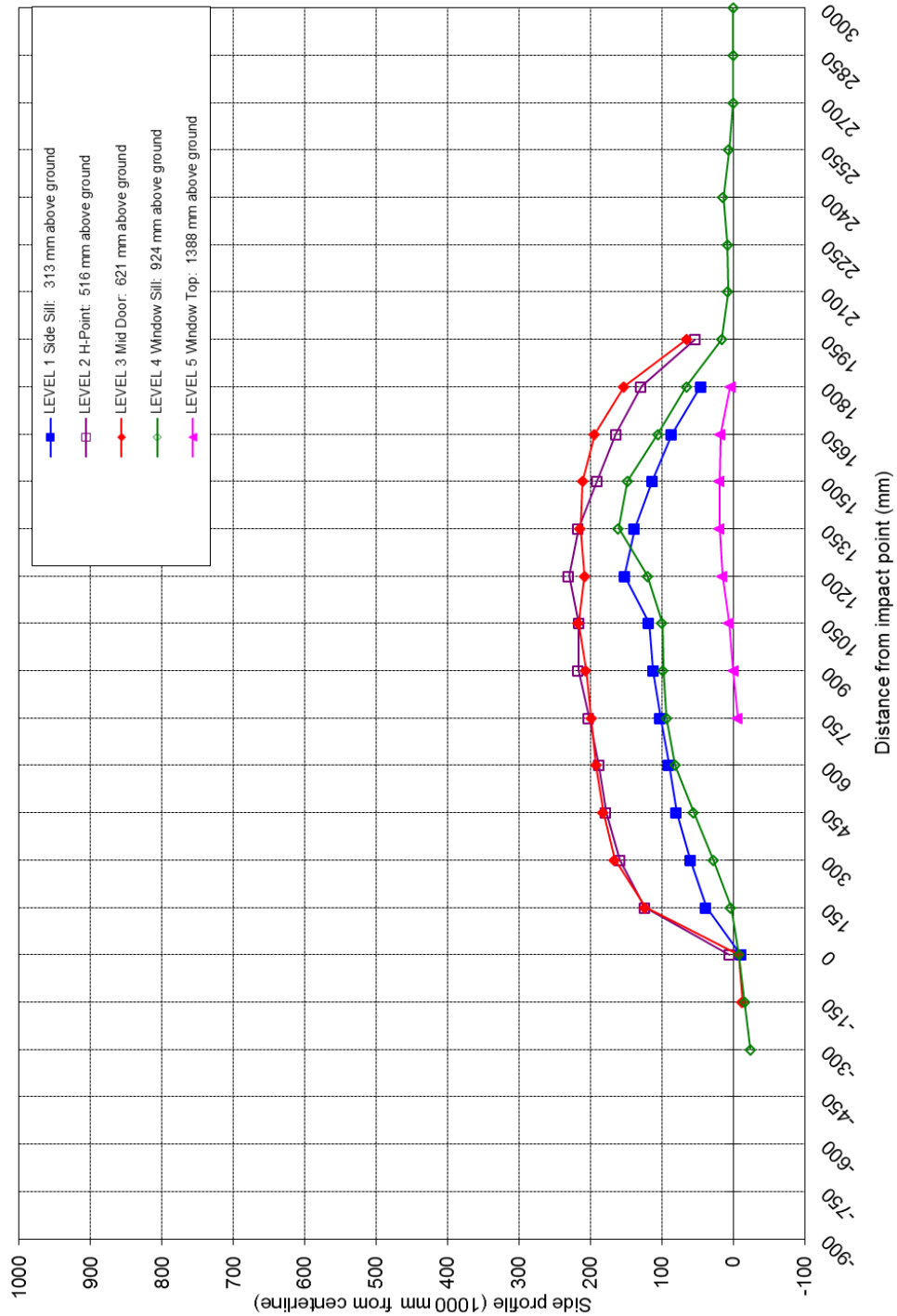
	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	152	230	217	161	19
Distance From Impact (mm)	1200	1200	900	1350	1500

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 Toyota Camry
 Test Program: Side MDB NCAP

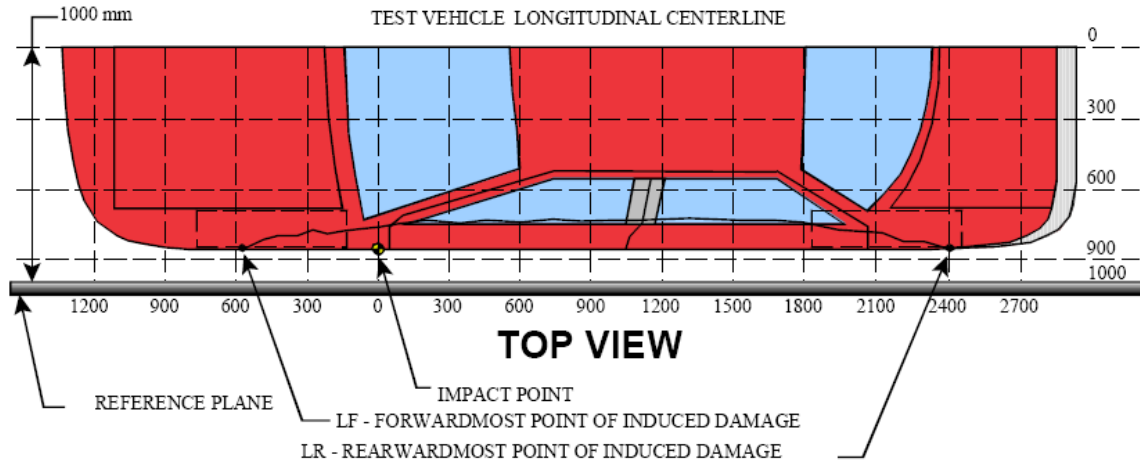
NHTSA No.: YB5100
 Test Date: 1/7/2011



DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011



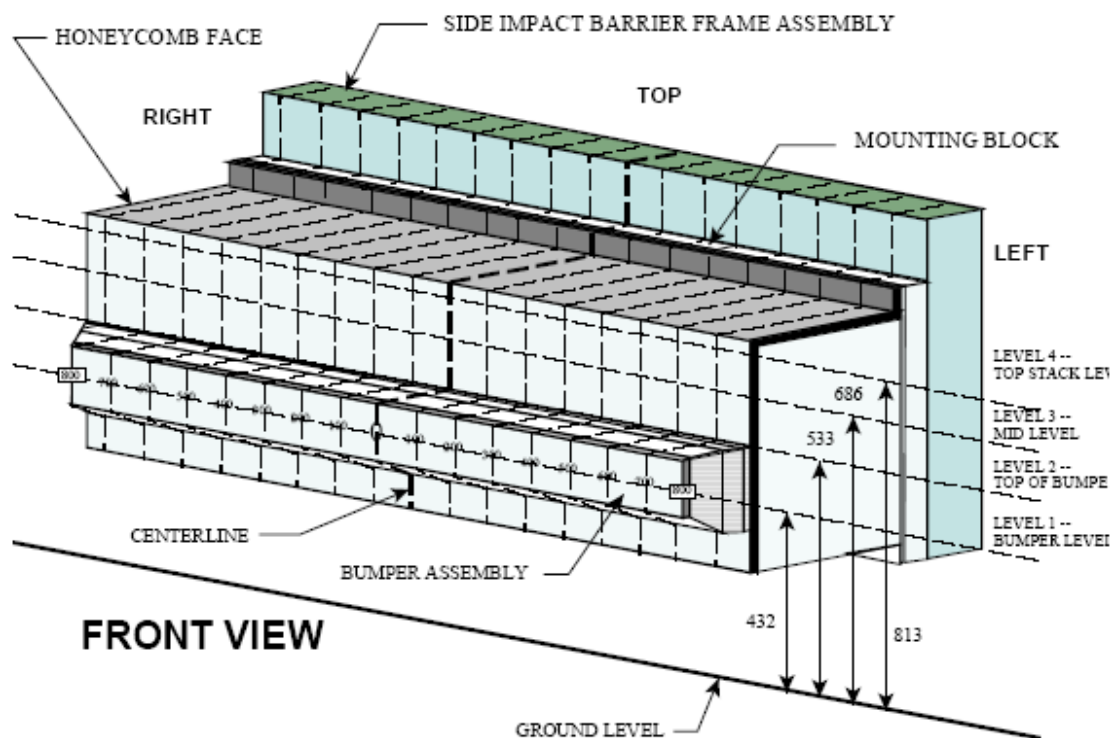
DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Maximum Static Crush (mm)
1	2550	4	178	184	6
2	2010	4	151	164	13
3	1470	3	98	310	212
4	930	2	96	313	217
5	0	3	93	269	176
6	-150	3	89	76	-13

DATA SHEET NO. 14
EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011



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	153	148	137	133	131	129	127	126	123	119	117	114	113	110	110	114	124
2	110	107	100	90	81	76	63	73	67	68	77	81	81	79	77	81	86
3	41	20	16	18	23	36	54	40	26	26	23	17	18	21	26	33	60
4	62	30	9	14	26	47	73	81	49	35	32	31	33	46	59	76	93

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

Test Vehicle: 2011 Toyota Camry
 Test Program: Side MDB NCAP

NHTSA No.: YB5100
 Test Date: 1/7/2011

Test Time: 15:00 Temperature: -4° 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	1:12	5:00	6:12
90 to 180	1:08	5:00	6:08
180 to 270	1:03	5:00	6:03
270 to 360	1:10	5:00	6:10

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

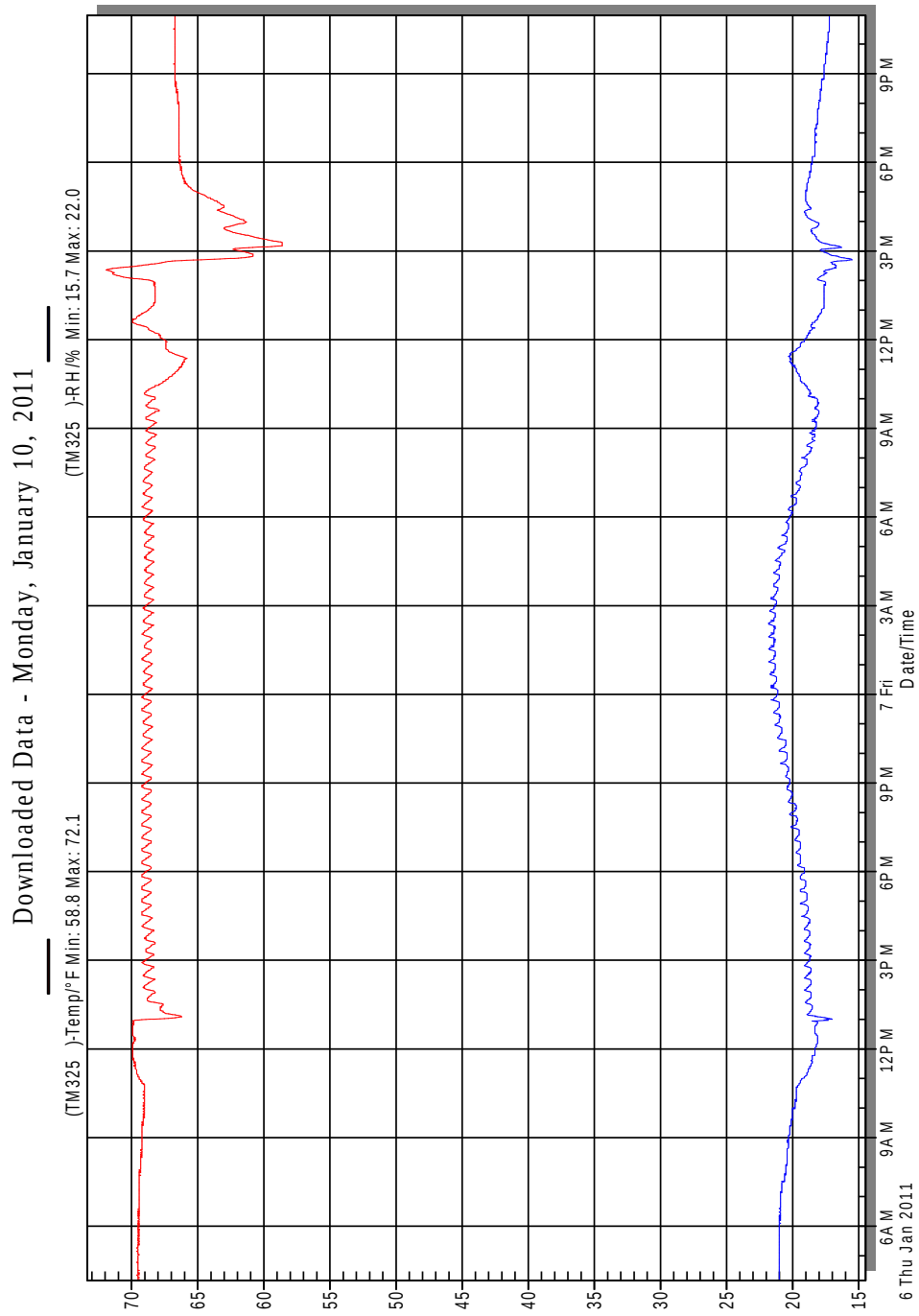
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 16
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Toyota Camry
Test Program: Side MDB NCAP

NHTSA No.: YB5100
Test Date: 1/7/2011



APPENDIX A
PHOTOGRAPHS

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



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



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



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



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

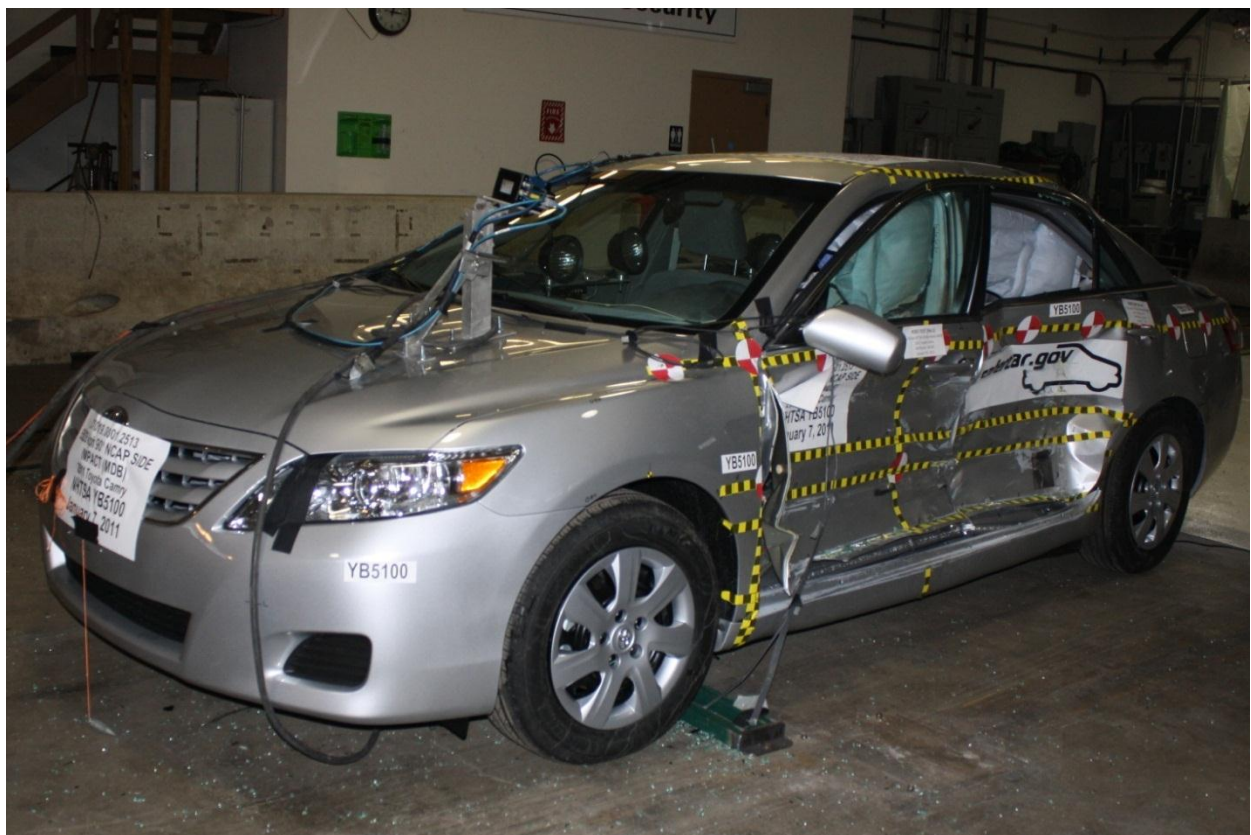


Figure A-6: Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



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



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



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



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



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



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



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



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



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



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



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



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



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



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

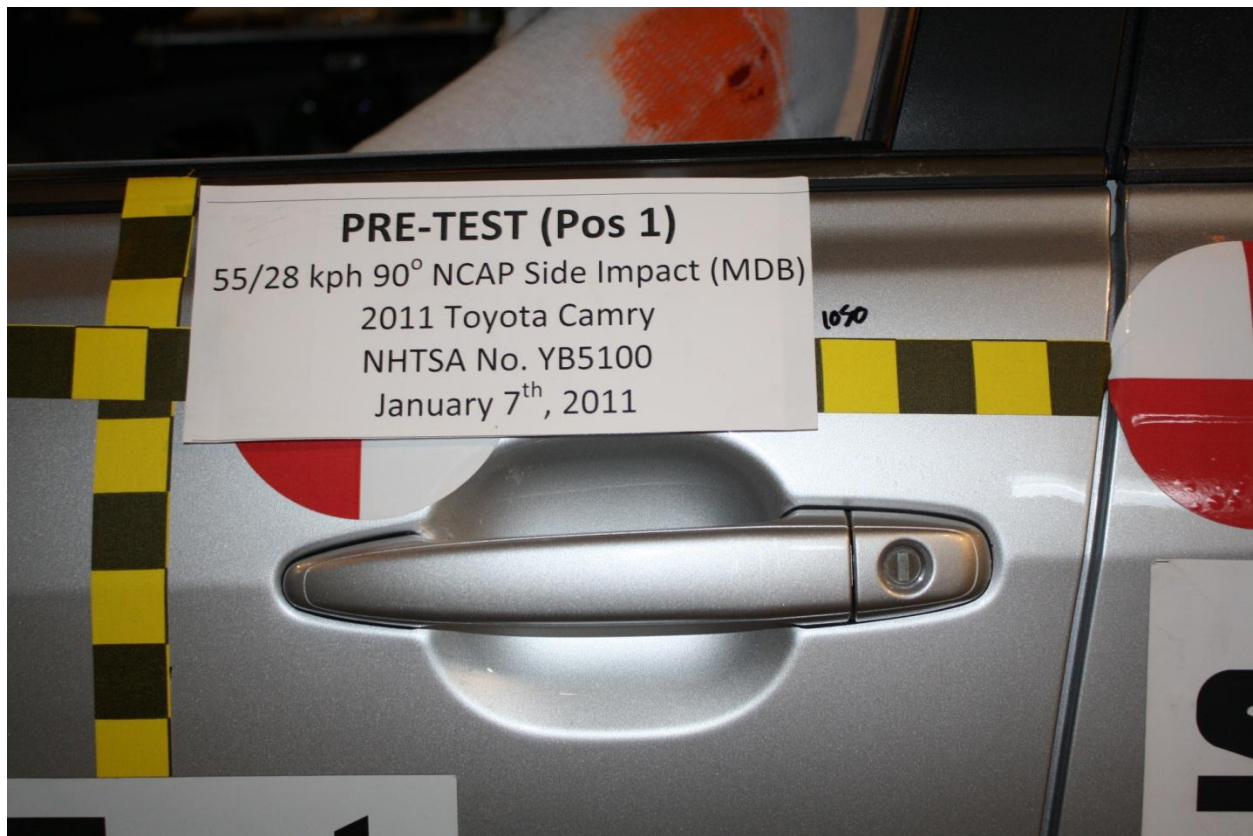


Figure A-21: Pre-Test Left Front Door Latch Close-up

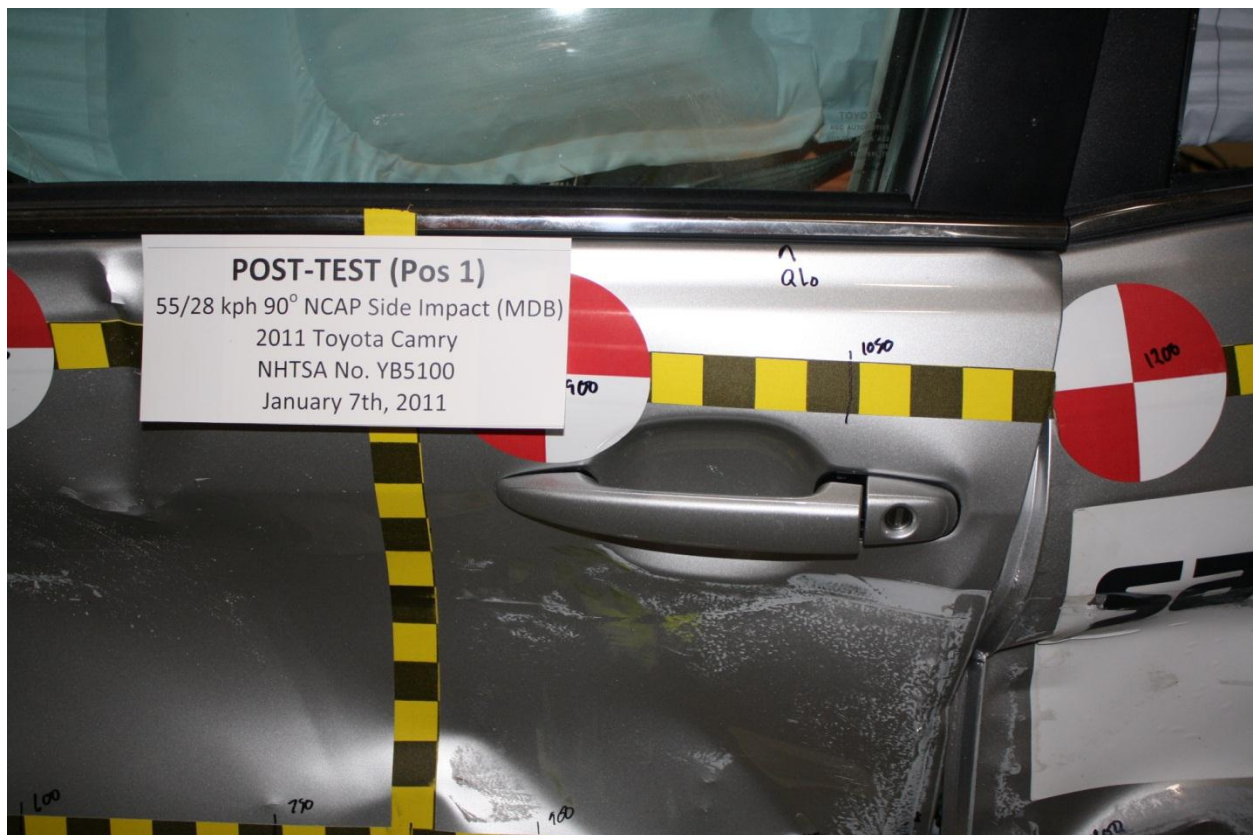


Figure A-22: Post-Test Left Front Door Latch Close-up

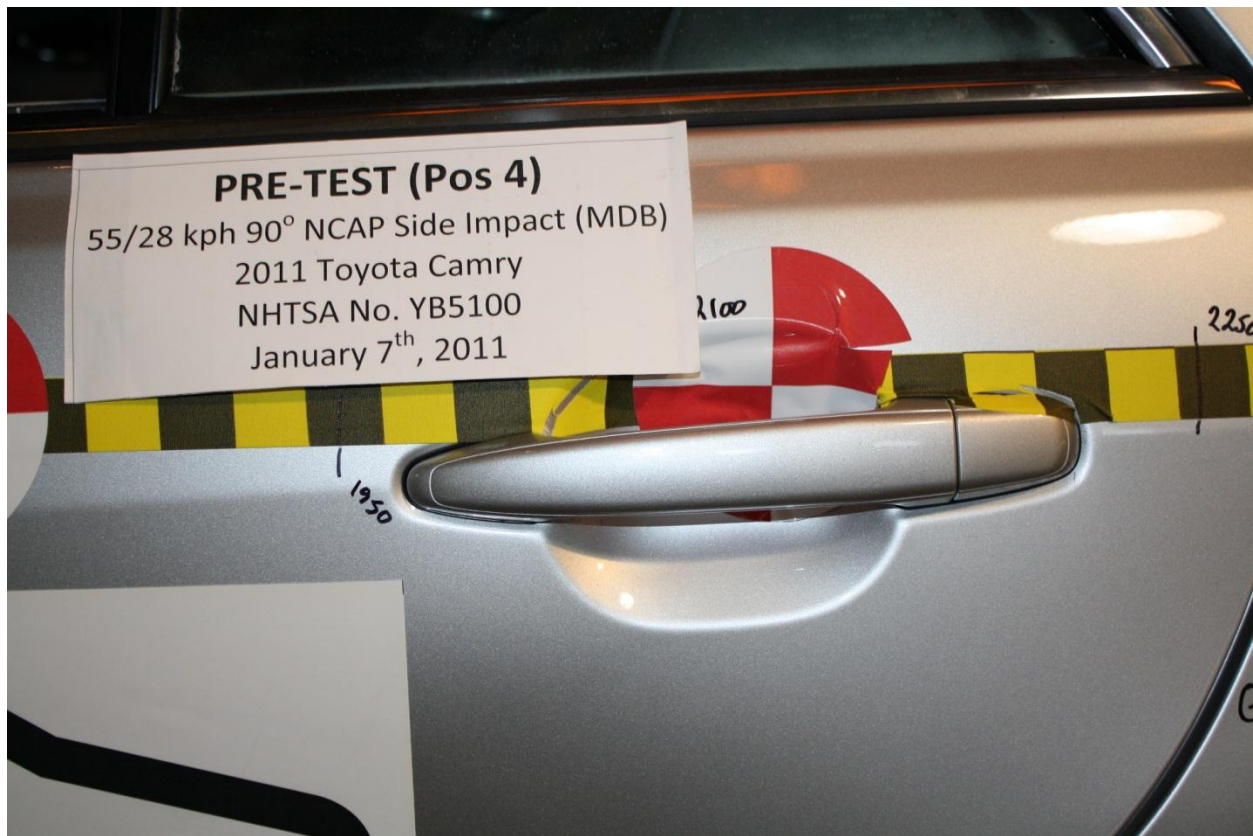


Figure A-23: Pre-Test Left Rear Door Latch Close-up

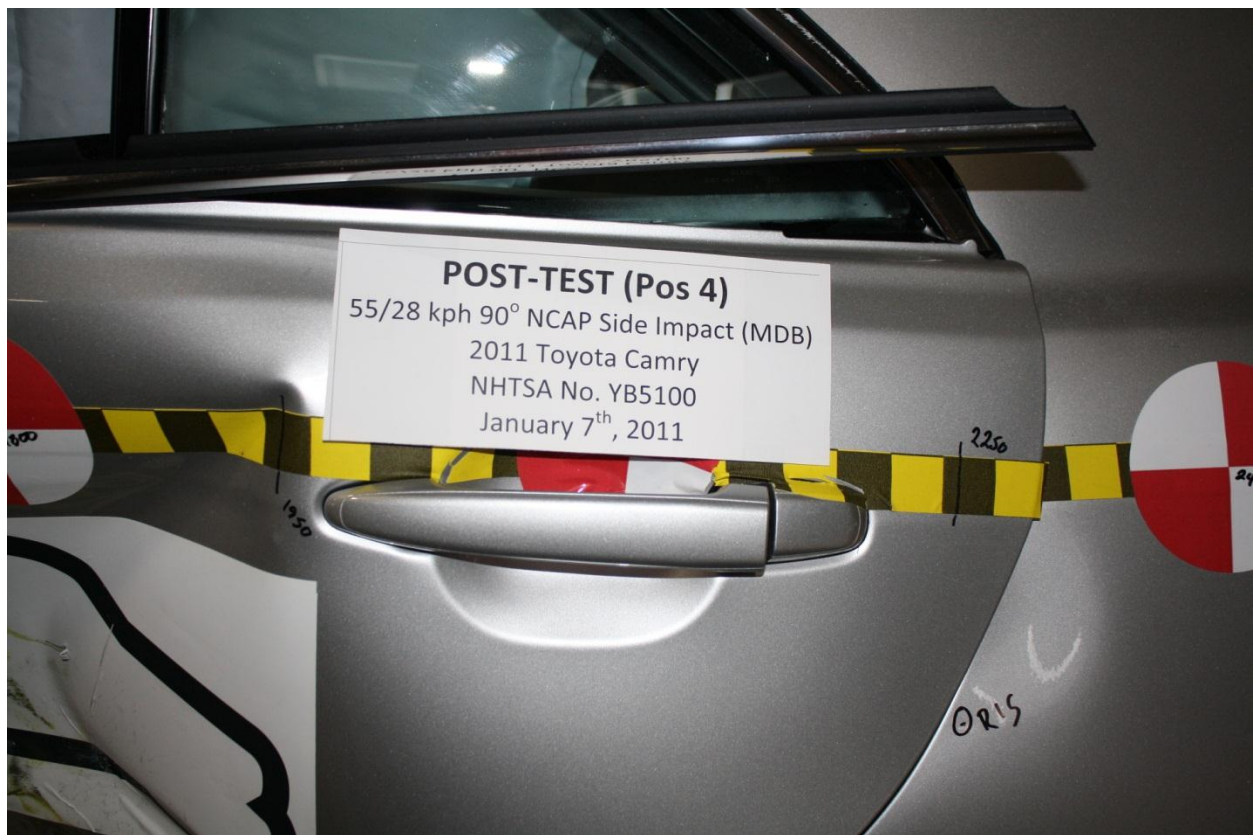


Figure A-24: Post-Test Left Rear Door Latch Close-up



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



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



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



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



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



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



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



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

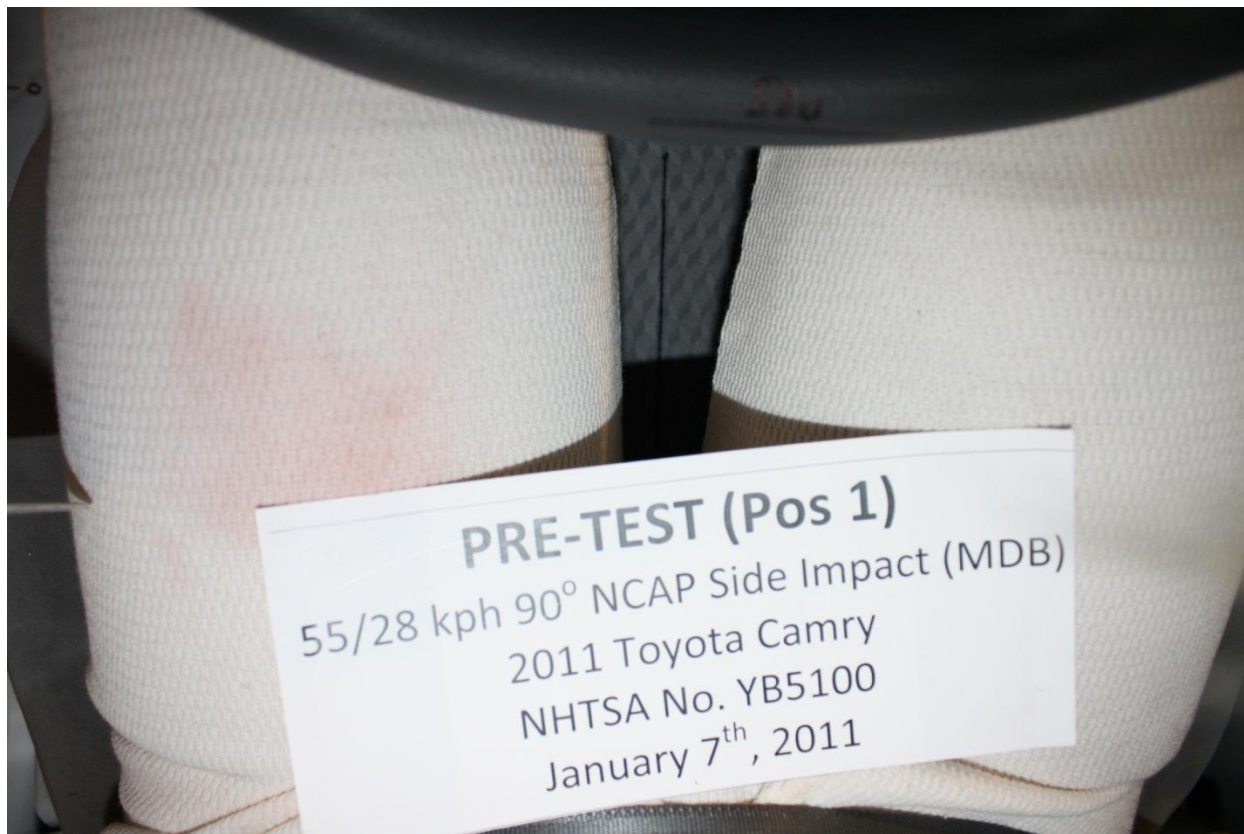


Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



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

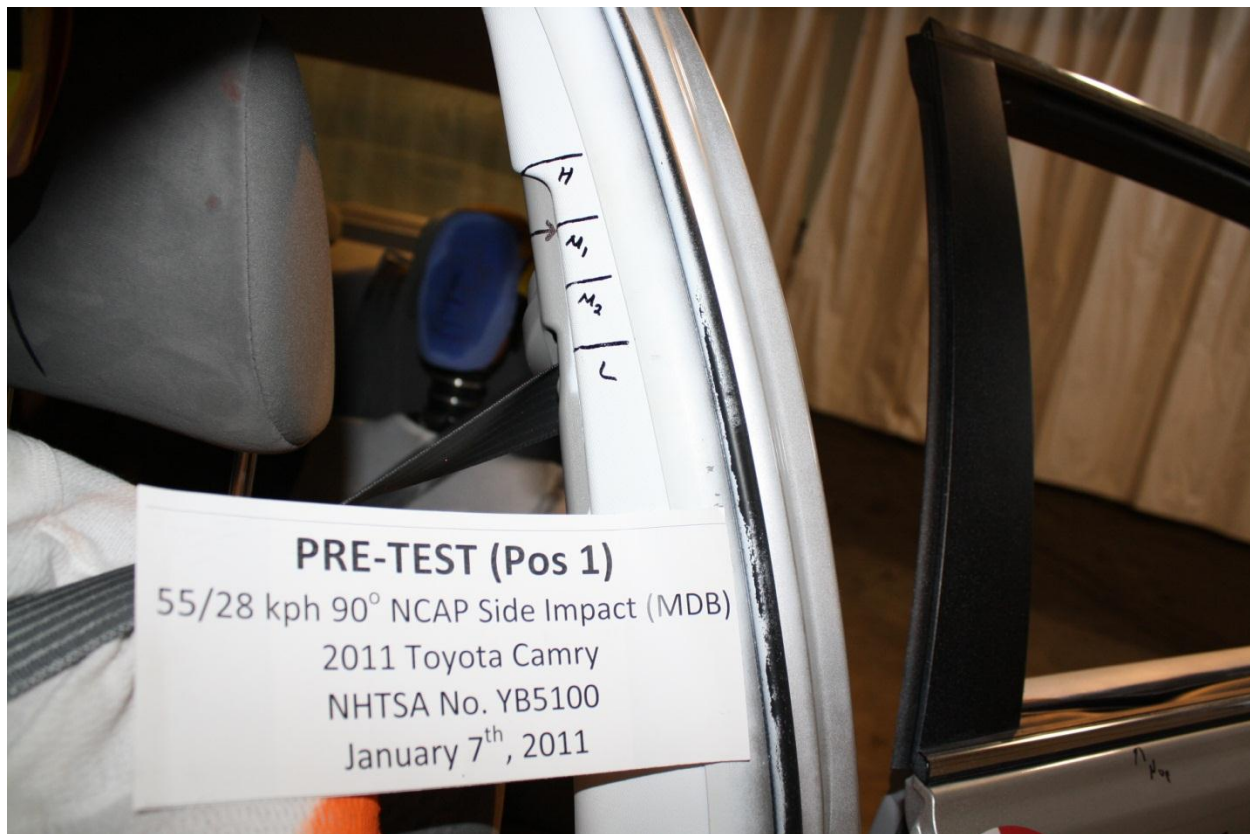


Figure A-35: Pre-Test View of Belt Anchorage for Driver Dummy to Show Position

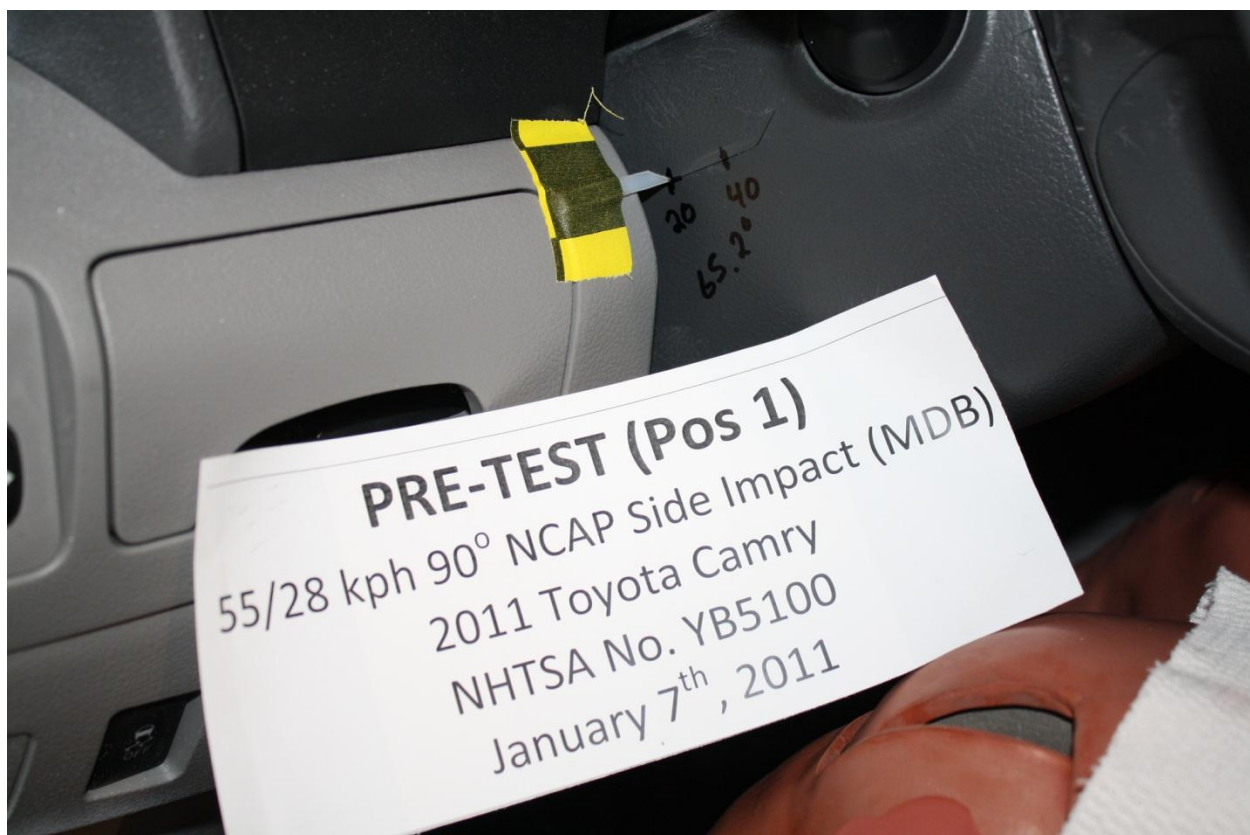


Figure A-36: Pre-Test Left Side View of Steering Wheel to Show Position

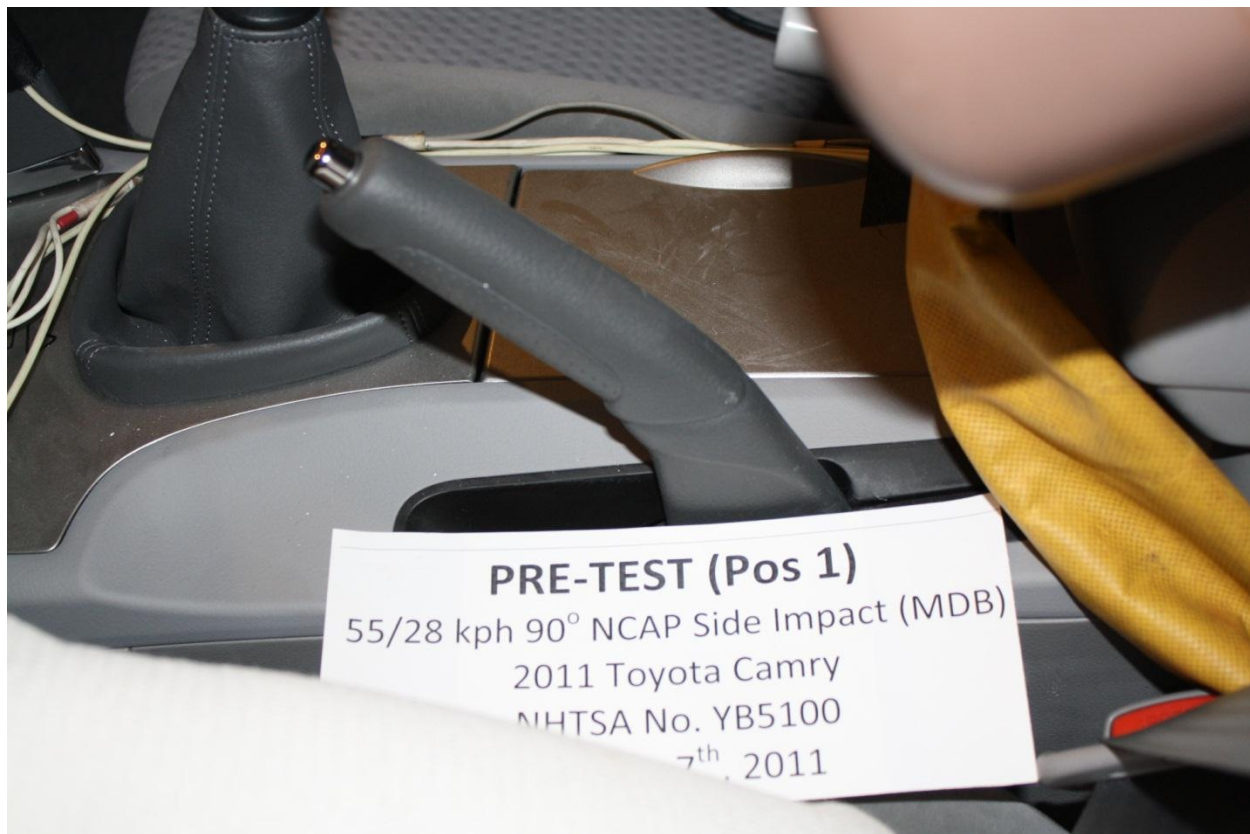


Figure A-37: Pre-Test View of Parking Brake

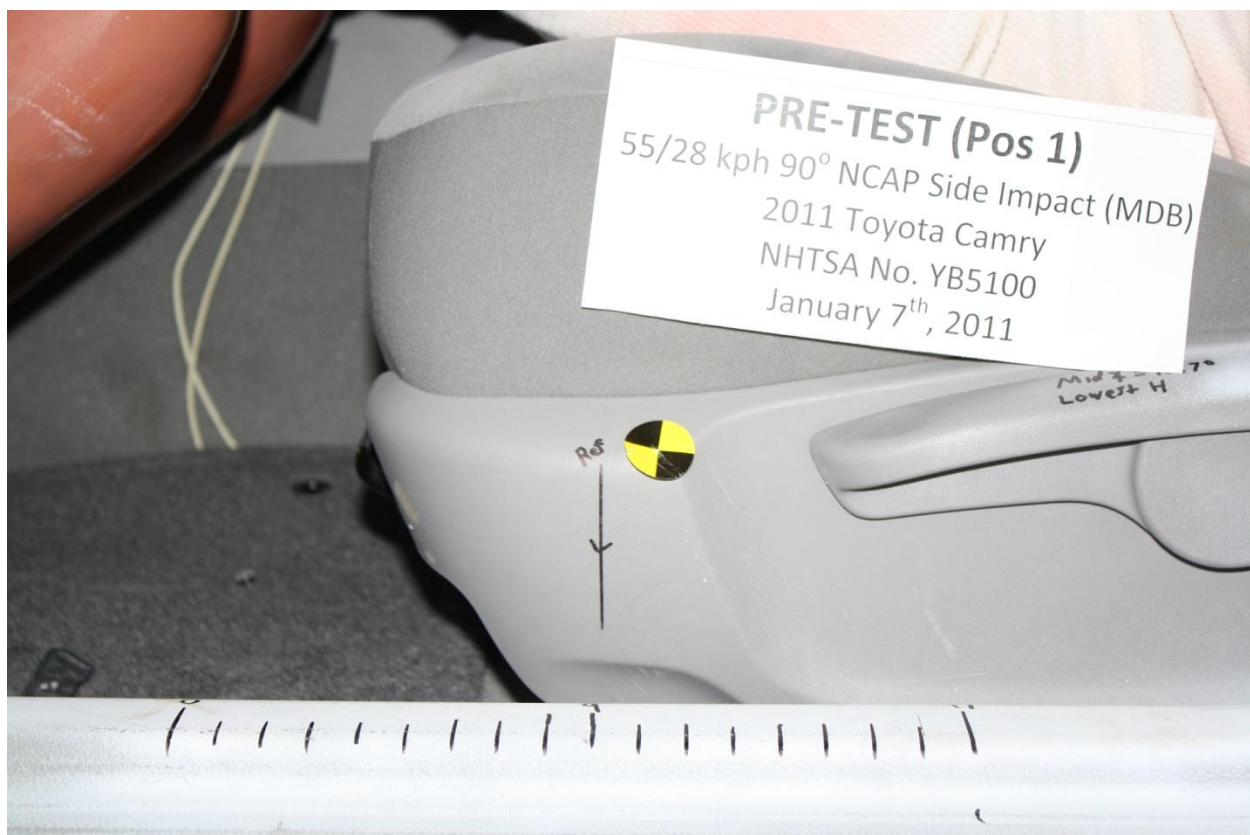


Figure A-38: Pre-test Close-up Left Side View of Driver Seat Track Showing Seat Positioning

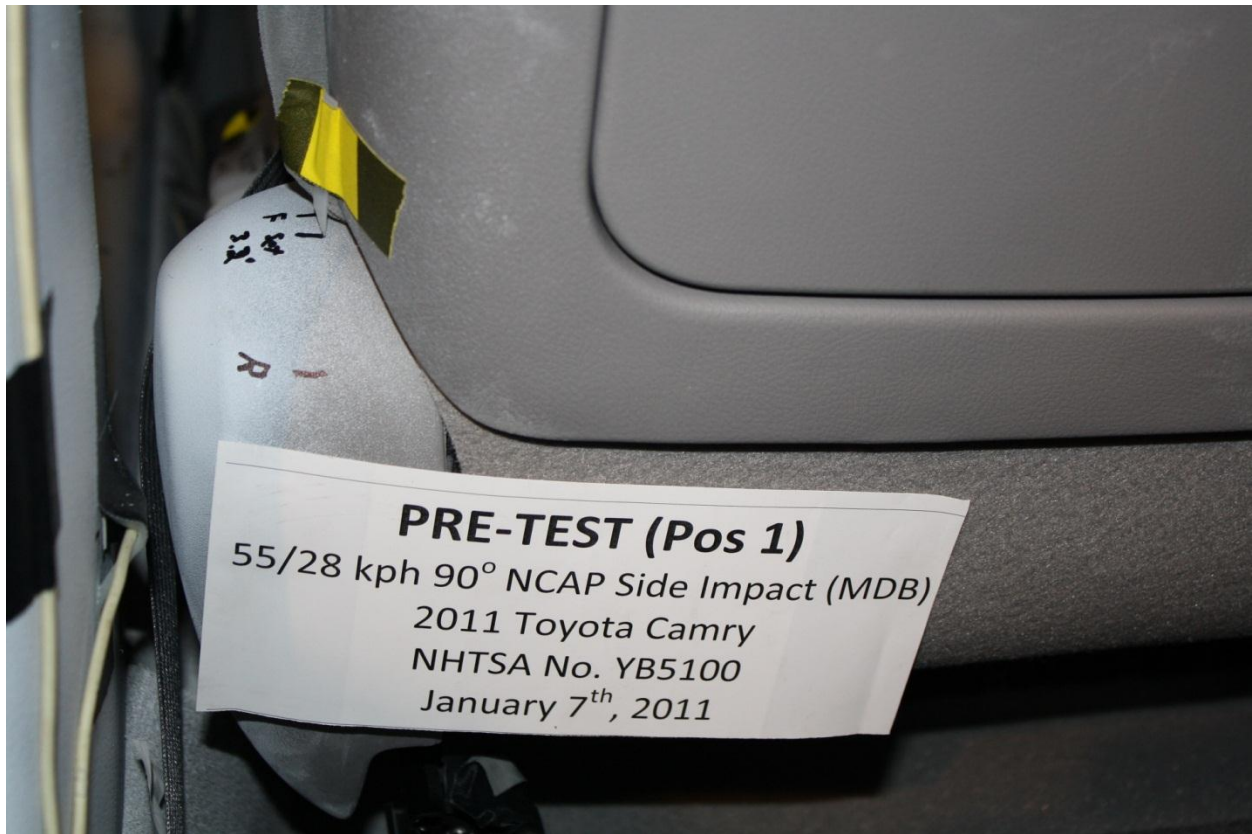


Figure A-39: Pre-test Close-up Left Side View of Driver Seat Back Showing Seat Back Positioning



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

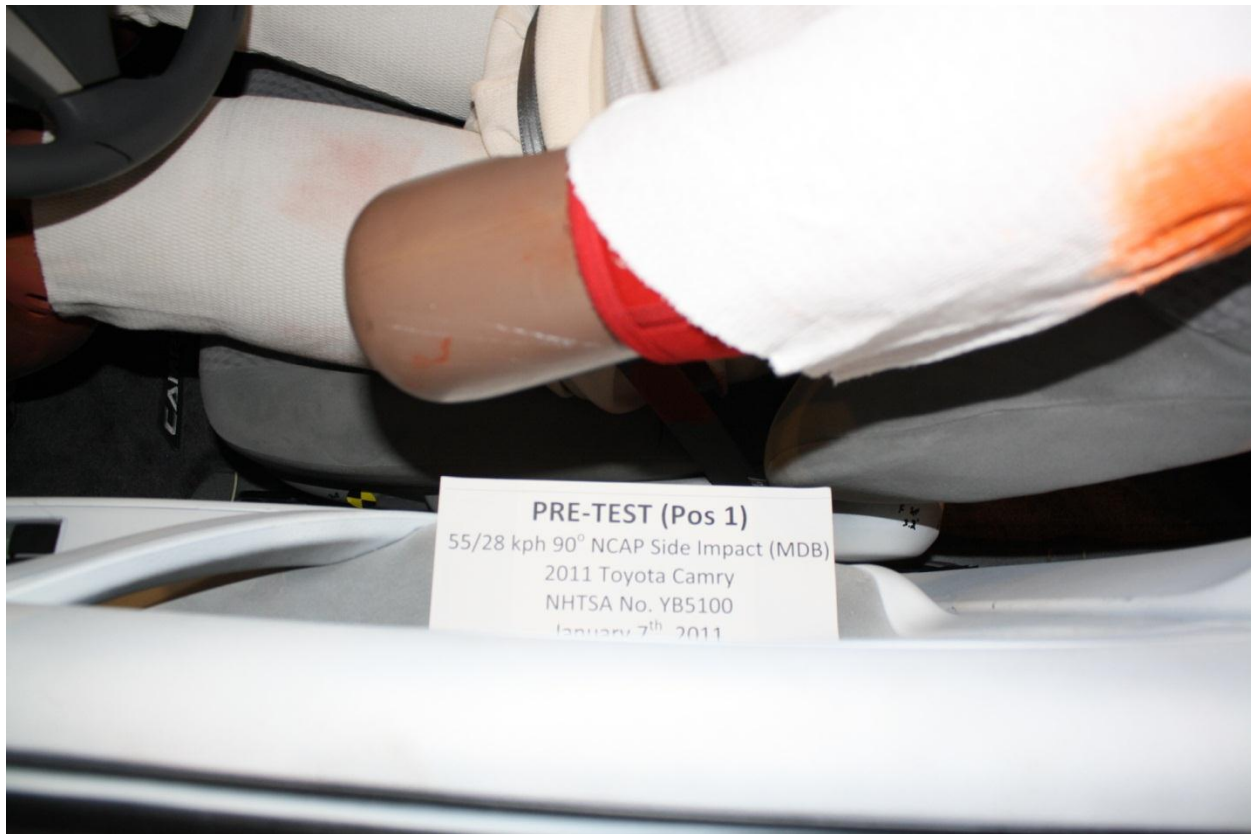


Figure A-41: Pre-test Driver Dummy and Door Clearance View



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



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



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



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



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



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

Photo Not Applicable

Torso Airbag Prevented contact with Vehicle

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

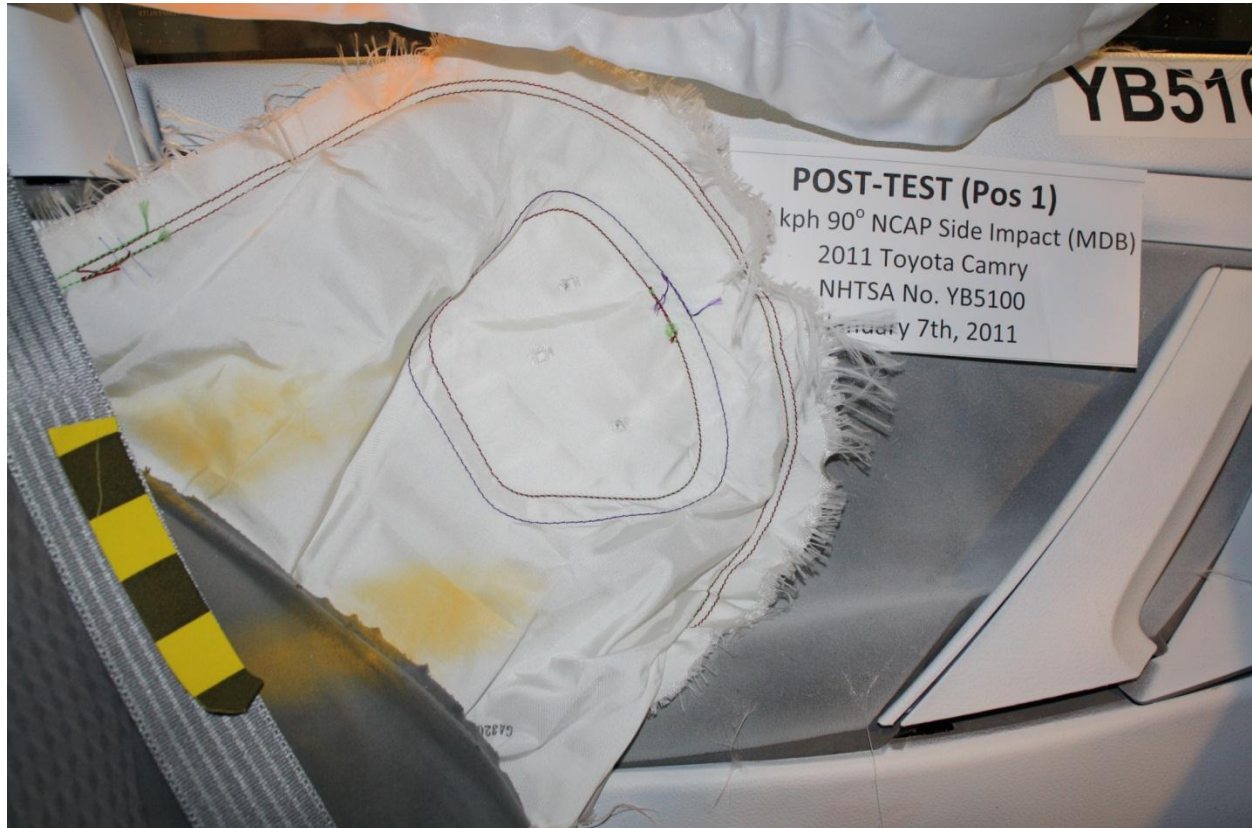


Figure A-50: Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View



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

Photo Not Applicable

No Pelvic Airbag

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

Photo Not Applicable
Rear Passenger Seat Track Not Adjustable

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

Photo Not Applicable

Rear Seat Back Not Adjustable

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

Photo Not Applicable

Rear Seat Back Not Adjustable

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

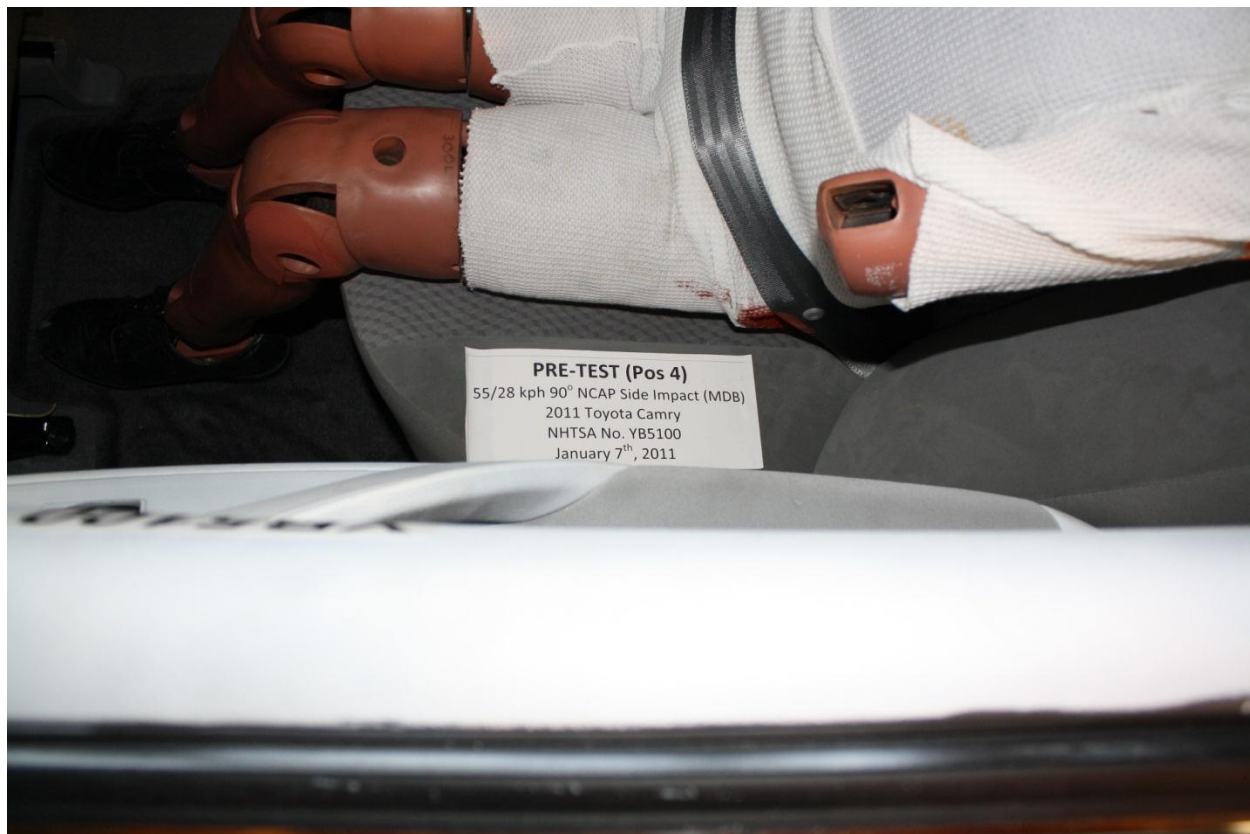


Figure A-67: Pre-Test Passenger Dummy and Door Clearance View



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



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



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



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



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



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



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



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

Photo Not Applicable

Airbag Not Installed

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

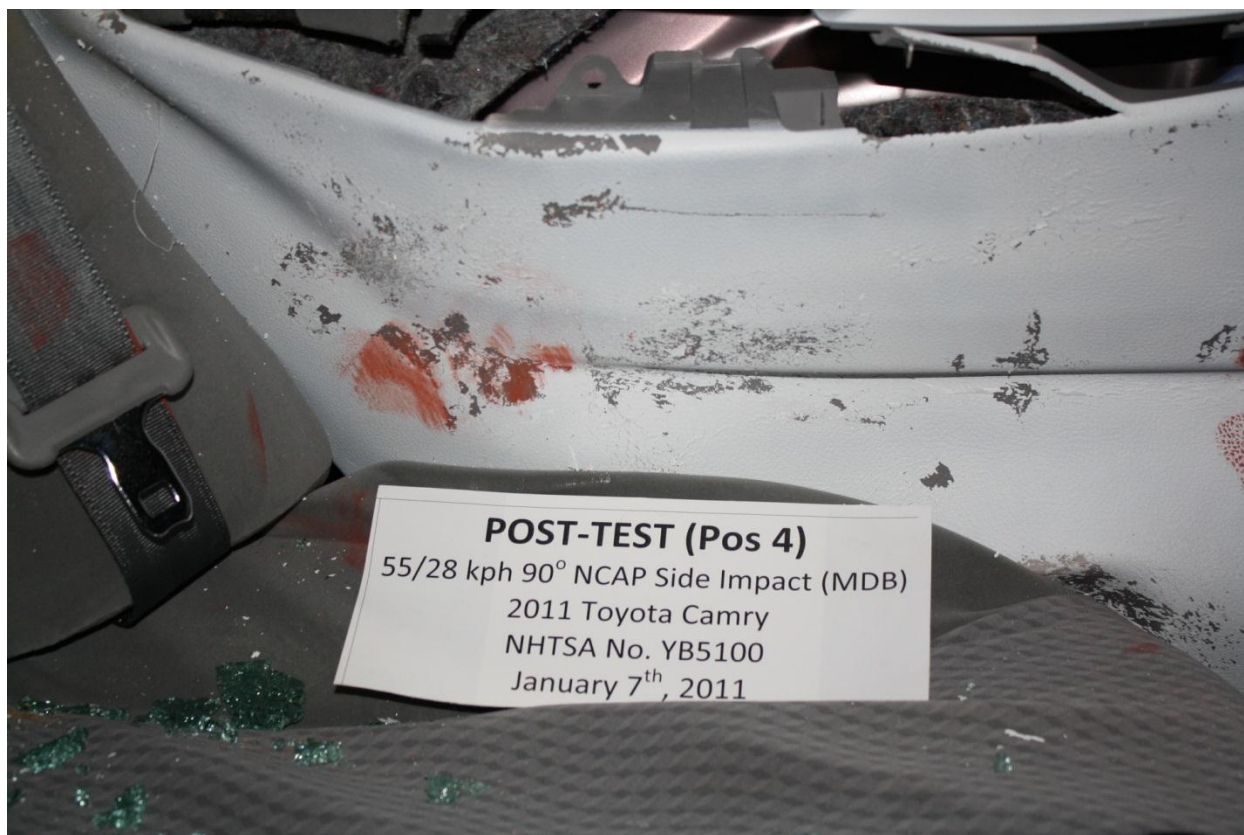


Figure A-77: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View

Photo Not Applicable

Airbag Not Installed

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

Photo Not Available

fuel door release lever not accessible after the crash

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

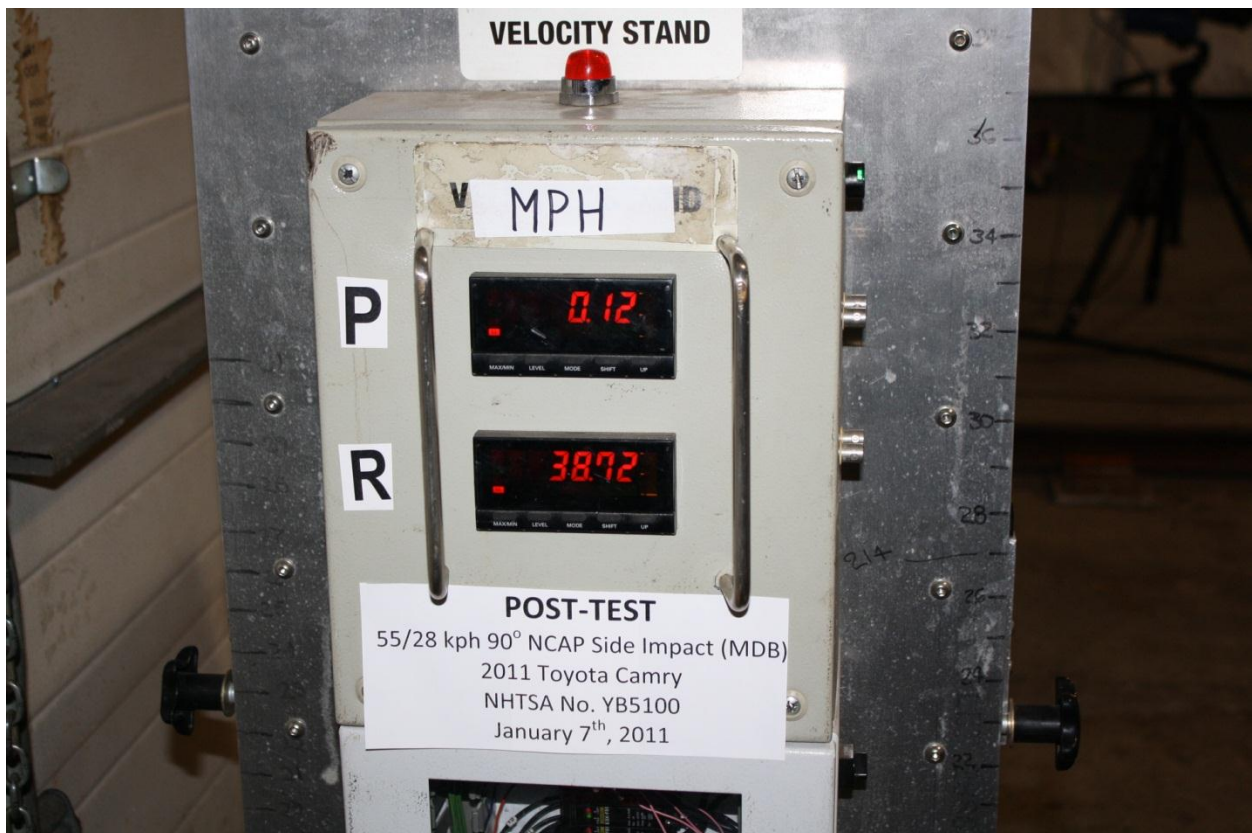


Figure A-92: Post-Test Primary and Redundant Speed Trap Read-Out



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



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

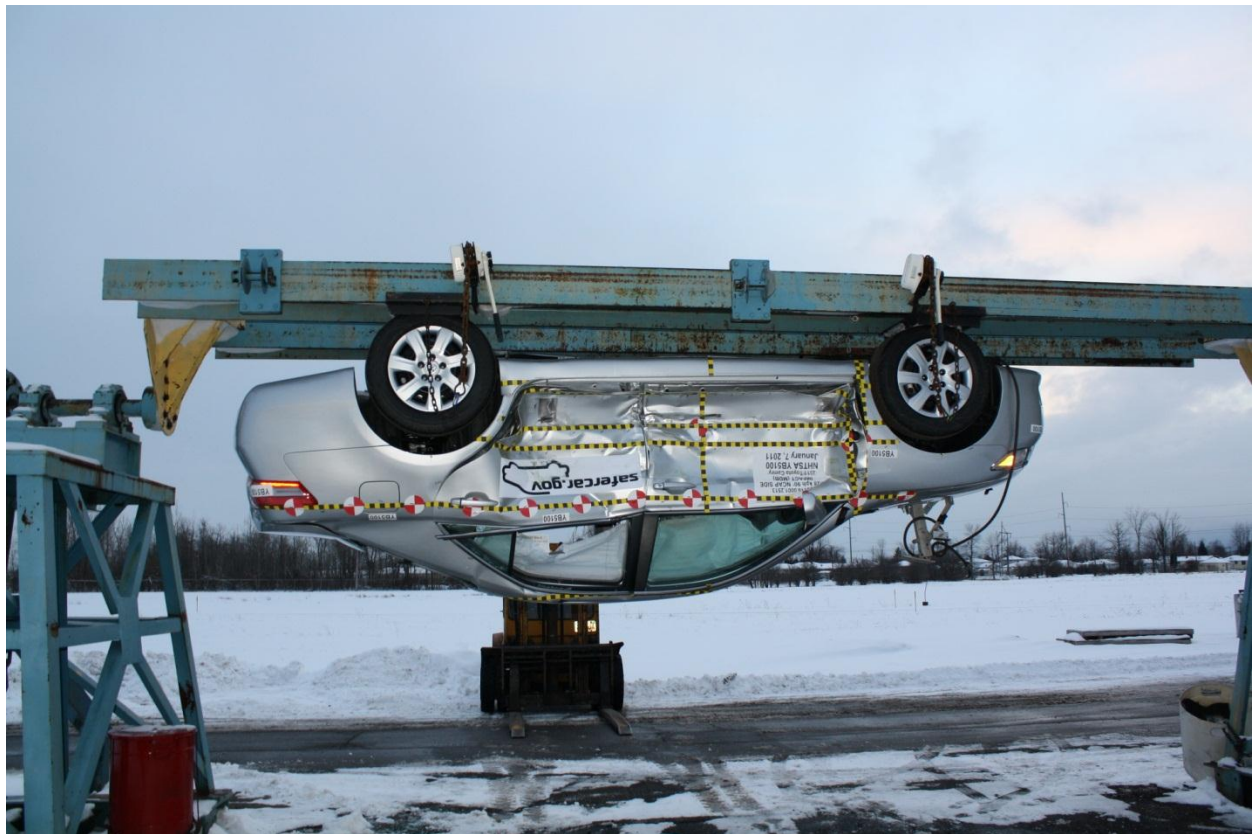


Figure A-95: FMVSS No. 301 Rollover 180°



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



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



Figure A-98: Impact Event (Impact Side)

TOYOTA

DESC: **CAMRoving forward** 4-DOOR SEDAN
VIN: **4T1BF3EKXBU684971**
YR/MDL: 2011/2513C
CLR: CLASSIC SILVER MET/1B13 (01F7/13)
PORT/PLANT: Georgetown, KY/TMMK RAILHEAD:

MECHANICAL & PERFORMANCE

- 2.5L 4-Cyl DOHC 16V w/ Dual VVT-i Engine
- 5-Speed Manual Overdrive Transmission
- 16" Steel Wheels w/ Covers
- 17" 150R18 Tires
- Variable-Assist Power Rack-and-Pinion
- Power-Steering w/ Disc/Solid Br Disc

SAFETY

- Star Safety System Includes: VSC w/TRAC, ABS w/EBD & Brake Assist
- Smart Stop Technology
- Dr & Pr Pass Advanced Airbag System
- Dr & Pr Pass Seat-Mounted Side Airbags and Front and Rear Side Curtain Airbags
- Driver's Knee Airbag
- LATCH(Low Anchor & Tethers for Children) for Outboard Rear Seating Positions Only
- Direct Tire Pressure Monitor System

EXTERIOR

- Projector-Beam Headlamps with Auto On/Off Feature
- Daytime Running Lights (DRL) with On/Off Feature
- Color-Keyed Power Outside Mirrors

COMFORT & CONVENIENCE

- Air Conditioning w/Air Filter
- AM/FM/CD Player w/ MP3/WMA Capability
- Six Speakers, XM Compatible and Auxiliary Audio Jack
- 60/40 Fold Rear Bench w/ Adjustable Headrests and Center Armrest w/ Cup Holders
- Cruise Control
- Power Windows w/Auto Up/Down, Jam Protection & Retained-Power Features
- Power Door Locks
- Tilt/Telescopic Steering Wheel w/ Audio Controls
- Variable Intermittent Windshield Wipers
- Center Console Armrest
- Rear Window Defogger with Timer
- Digital Quartz Clock
- High-Lever Parking Brake (MT Only)
- Full Tank of Gas...

OPTIONAL EQUIPMENT

FE 50 State Emissions
CF Carpet/Trunk Mat Set 200.00

GOVERNMENT SAFETY RATINGS

Frontal Driver Passenger ★★★★★

Crash Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.

Side Front seat ★★★★★
Crash Rear seat ★★★★★

Star ratings based on the risk of injury in a side impact.

Rollover ★★★★★

Star ratings based on the risk of rollover in a single vehicle crash.

Star ratings from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA).

www.safercar.gov or 1-888-327-4236

EPA Fuel Economy Estimates

CITY MPG
22
Expected range for most drivers 18 to 26 MPG

Estimated Annual Fuel Cost \$1,732
based on 15,000 miles at \$3.00 per gallon

Combined Fuel Economy This Vehicle 26

Highway MPG
33
Expected range for most drivers 27 to 39 MPG

Your actual mileage will vary depending on how you drive and maintain your vehicle.

See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov

DELIVERY PROCESSING AND HANDLING FEE 760.00

TOTAL \$20,680.00

The New York Times Limited Warranty provides 3-year/50,000 mile basic coverage, 5-year/100,000 mile powertrain coverage. Other restrictions and limitations apply. See dealer for details. Dealer's suggested retail price includes manufacturer's recommended pre-delivery service. Gasoline, tires and the new, optional battery, and the dealer's suggested retail price for optional features, accessories and services are not included in the manufacturer's suggested retail price.

Dealer Name / Address: 31136 VANCOUVER TOYOTA
4374 RIDGE ROAD WEST
RICHMOND, BC V6X 1A6

Ship to:

Figure A-99: Monroney Label

1-3. Adjustable components (seats, mirrors, steering wheel)

Head restraints

Head restraints are provided for all seats.

1 Up
Pull the head restraints up.

2 Down
Push the head restraint down while pushing the lock release button.

Lock release button

Before driving

Removing the head restraints

Pull the head restraint up while pressing the lock release button.

Installing the head restraints

Align the head restraint with the installation holes and push it down to the lock position. Press and hold the lock release button when lowering the head restraint.

1-3. Adjustable components (seats, mirrors, steering wheel)

Adjusting the height of the head restraints

Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top of your ears.

Adjusting the rear center seat head restraint

Always raise the head restraint one level from the stowed position when using.

CAUTION

Head restraint precautions

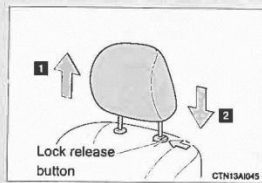
Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- Use the head restraints designed for each respective seat.
- Adjust the head restraints to the correct position at all times.
- After adjusting the head restraints, push down on them and make sure they are locked in position.
- Do not drive with the head restraints removed.

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

1-3. Adjustable components (seats, mirrors, steering wheel) Head restraints

Head restraints are provided for all seats.



- 1 Up**
Pull the head restraints up.
- 2 Down**
Push the head restraint down while pushing the lock release button.

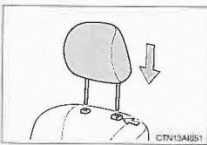
Before driving

■ Removing the head restraints



Pull the head restraint up while pressing the lock release button.

■ Installing the head restraints



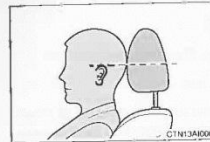
Align the head restraint with the installation holes and push it down to the lock position.

Press and hold the lock release button when lowering the head restraint.

57

1-3. Adjustable components (seats, mirrors, steering wheel)

■ Adjusting the height of the head restraints



Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top of your ears.

■ Adjusting the rear center seat head restraint

Always raise the head restraint one level from the stowed position when using.

⚠ CAUTION

■ Head restraint precautions

Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- Use the head restraints designed for each respective seat.
- Adjust the head restraints to the correct position at all times.
- After adjusting the head restraints, push down on them and make sure they are locked in position.
- Do not drive with the head restraints removed.

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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

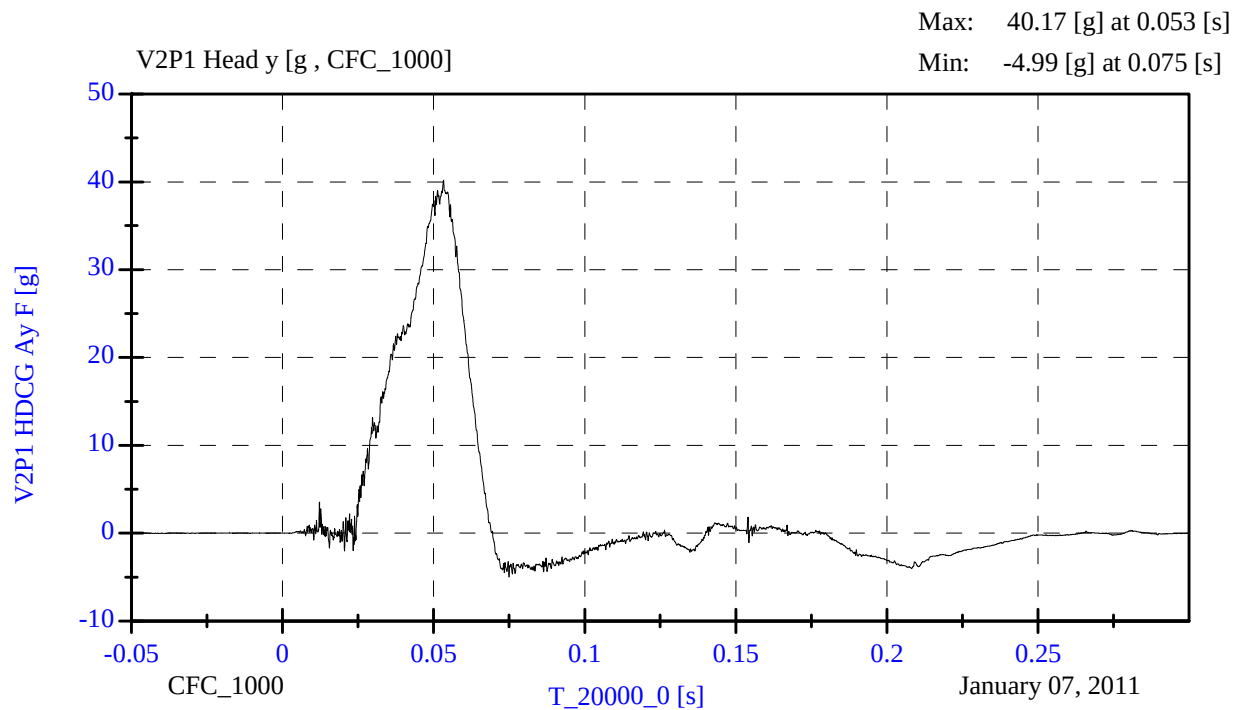
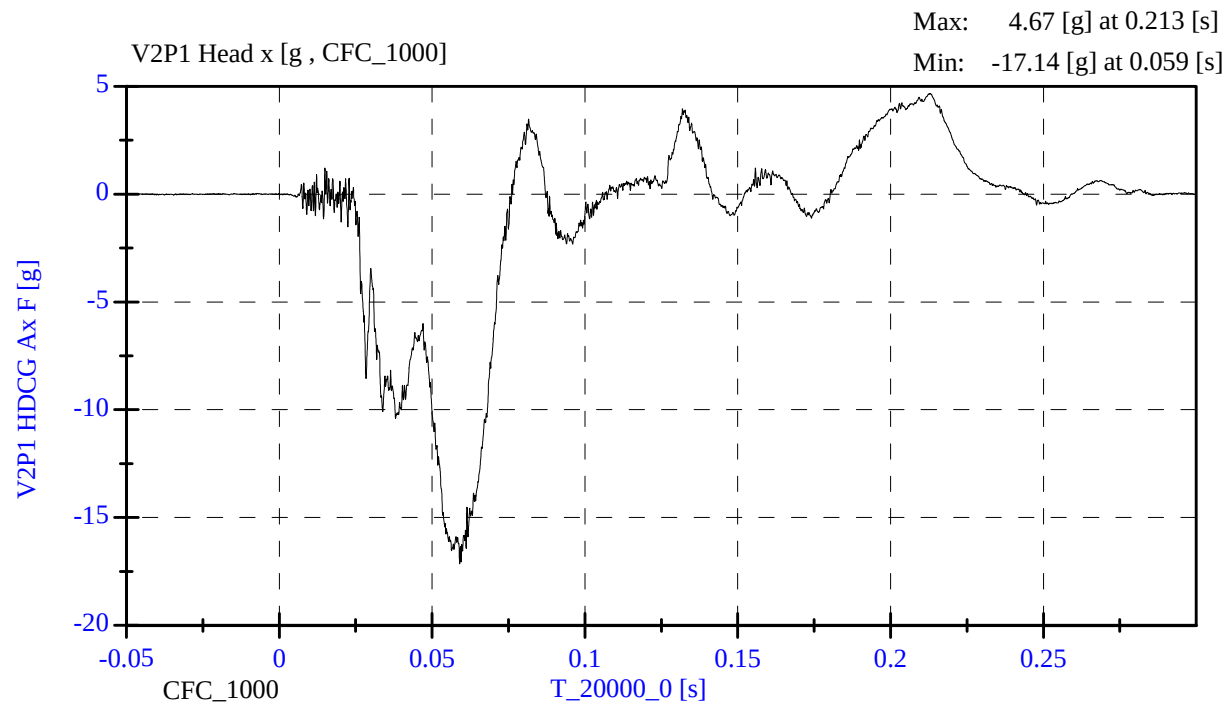
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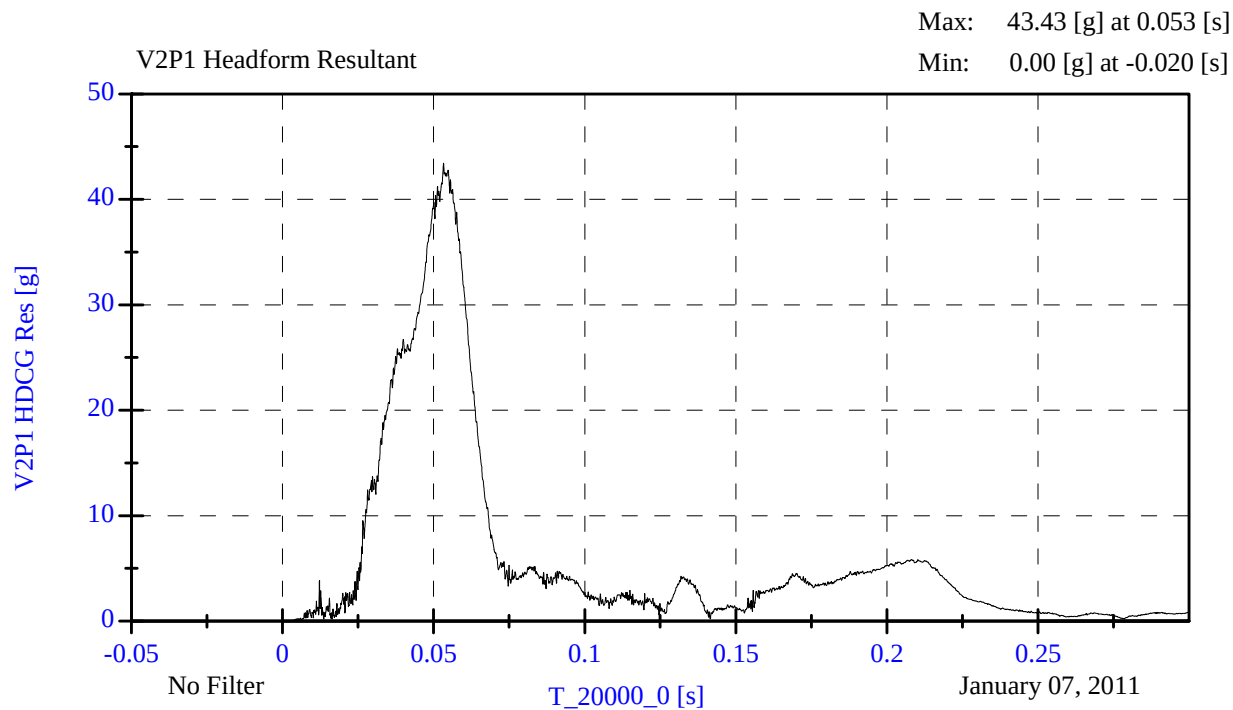
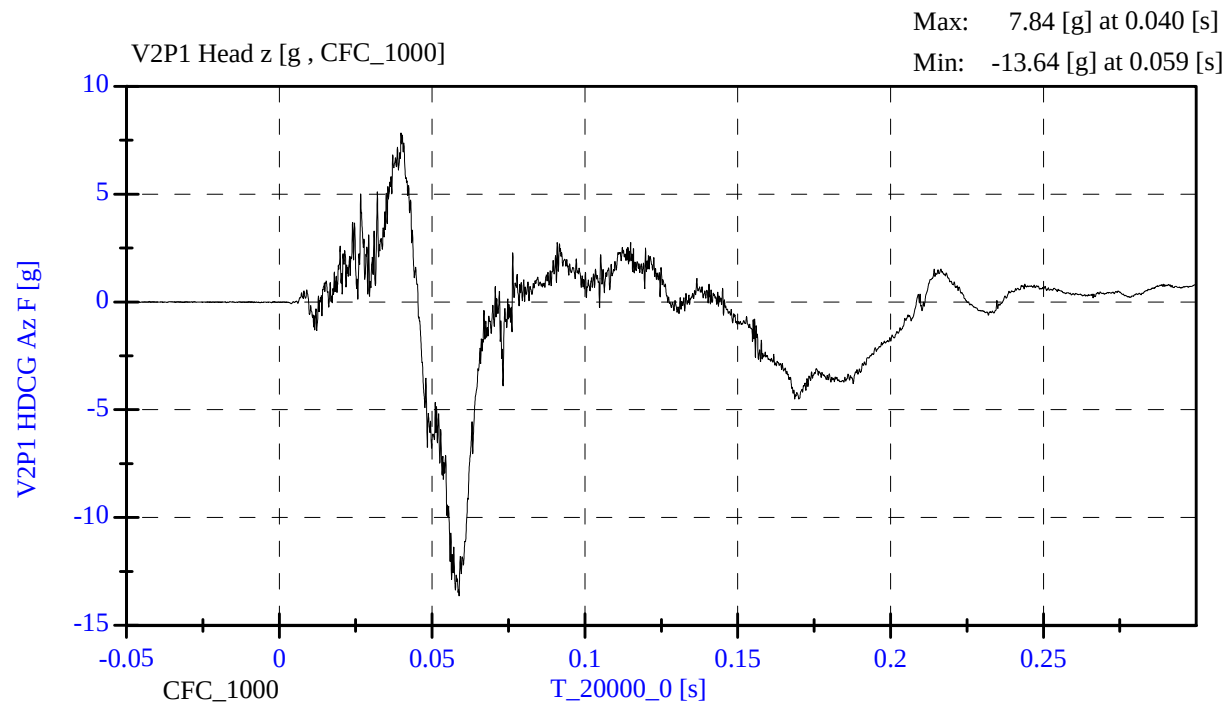
Driver Side Airbag Timing
Driver Side Curtain Airbag Timing
Passenger Side Airbag Timing (if applicable)
Passenger Side Curtain Airbag Timing (if different from Driver)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (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)

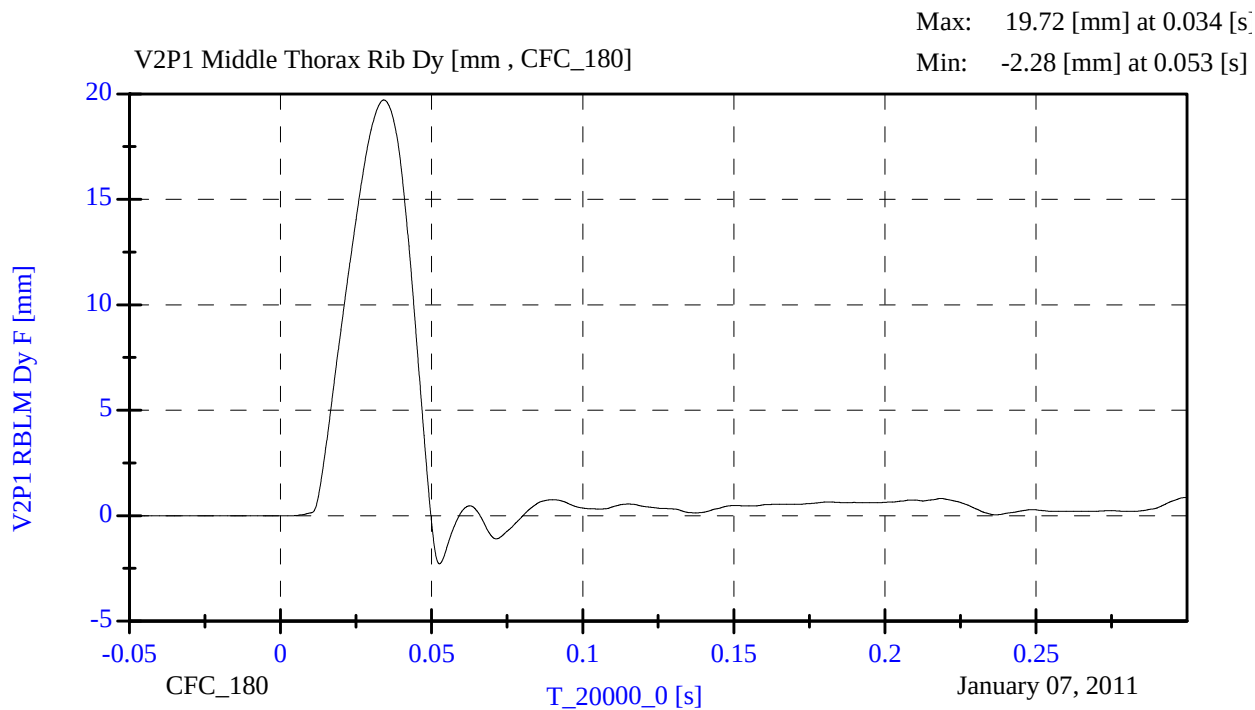
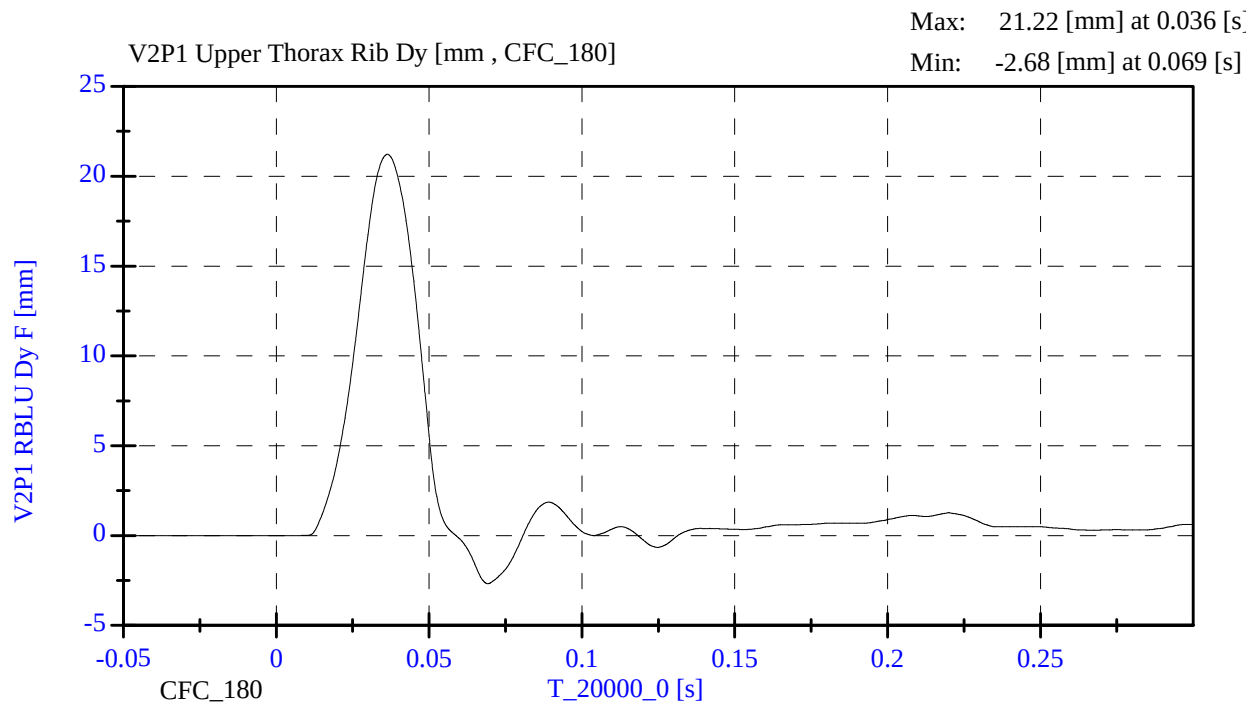
Rear Seat Track Acceleration (Y)
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)

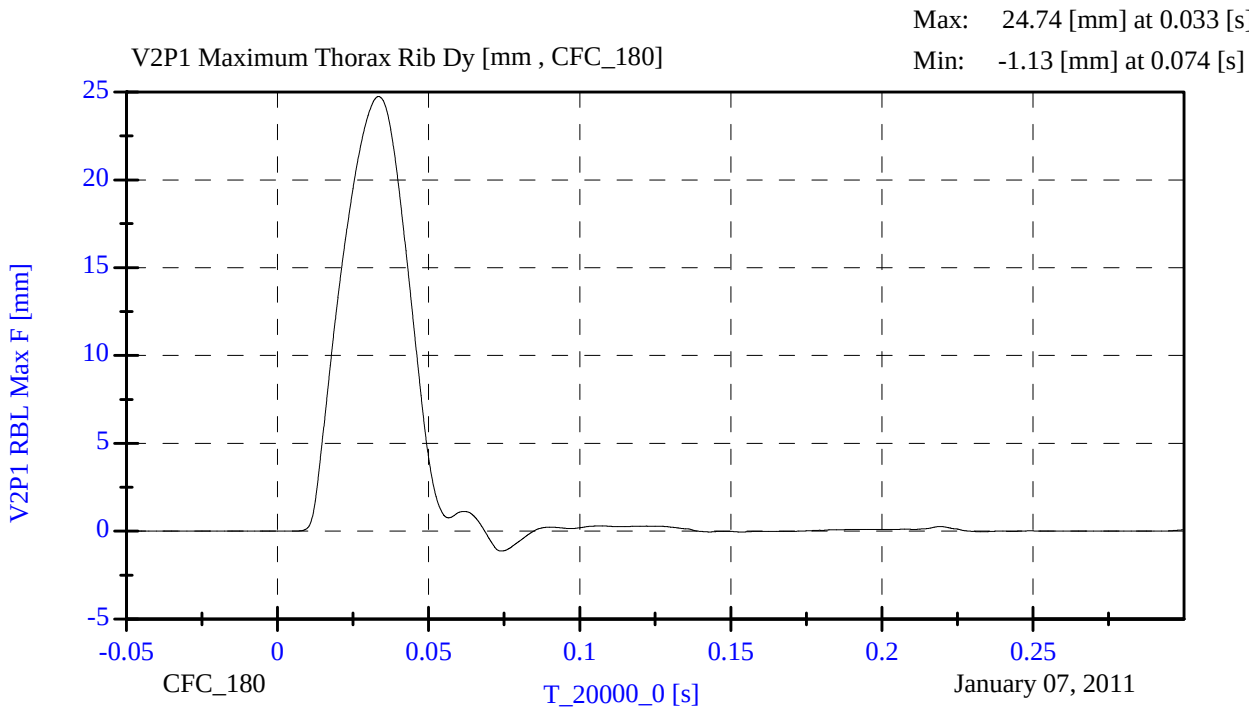
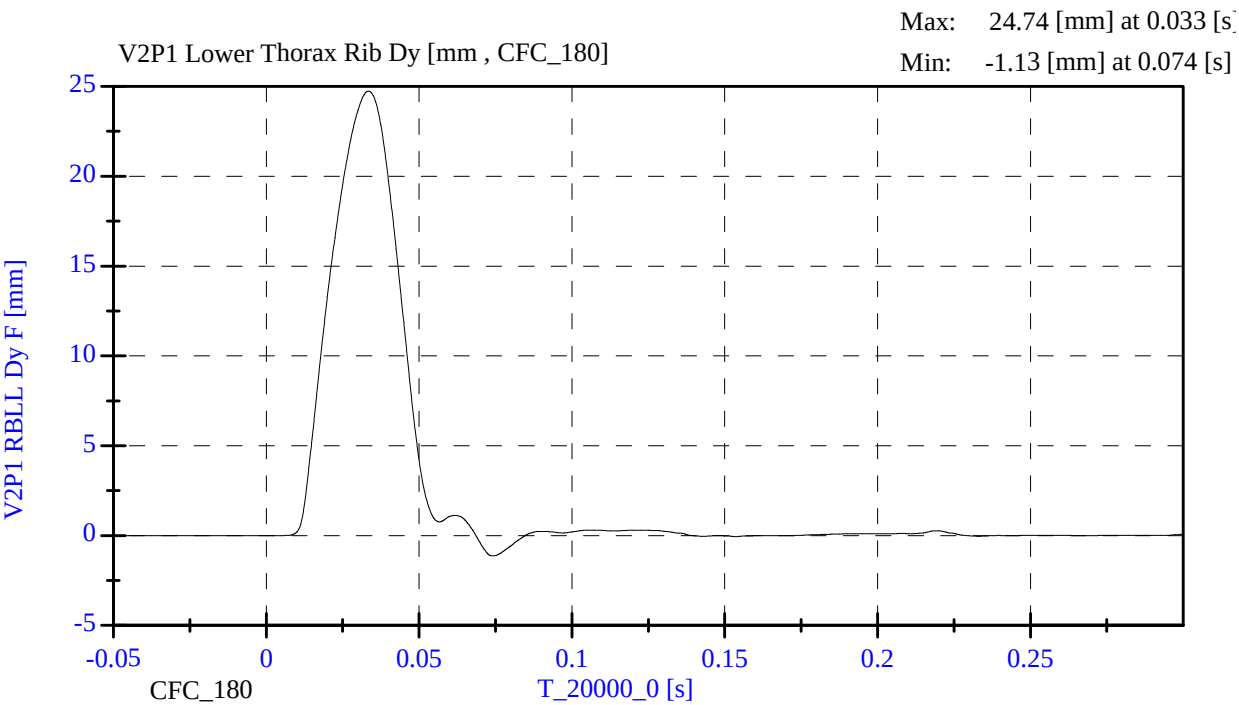
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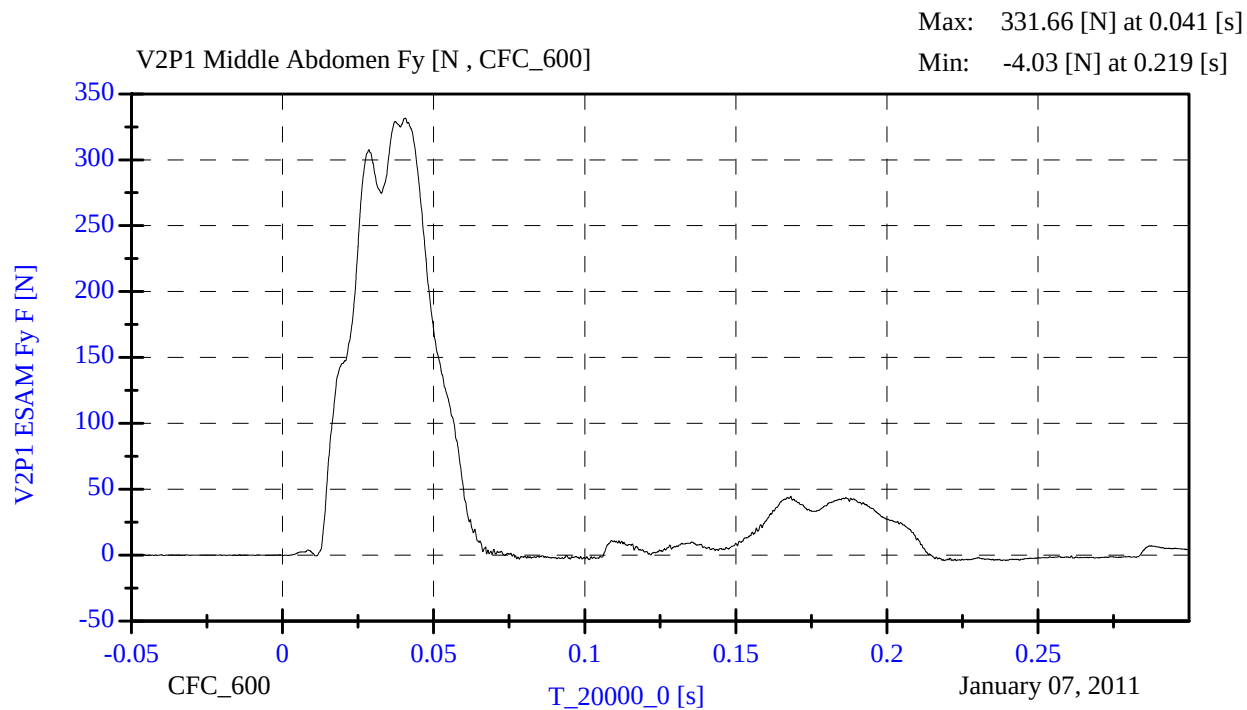
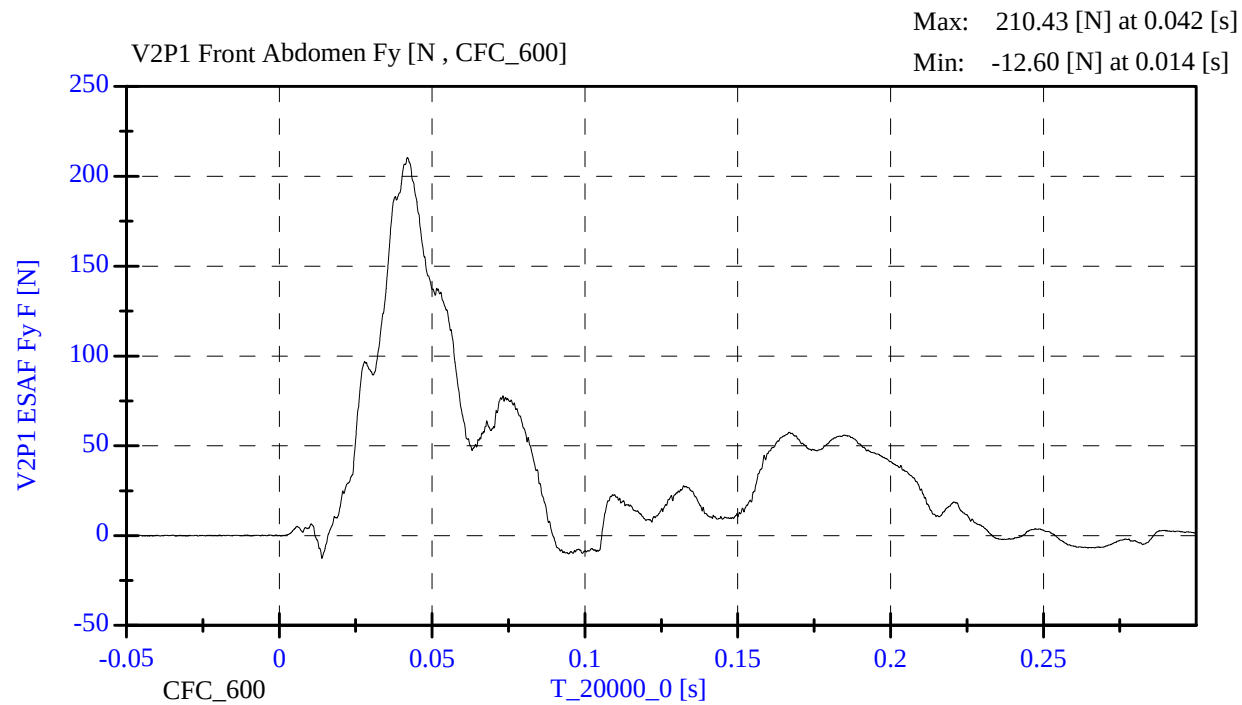
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

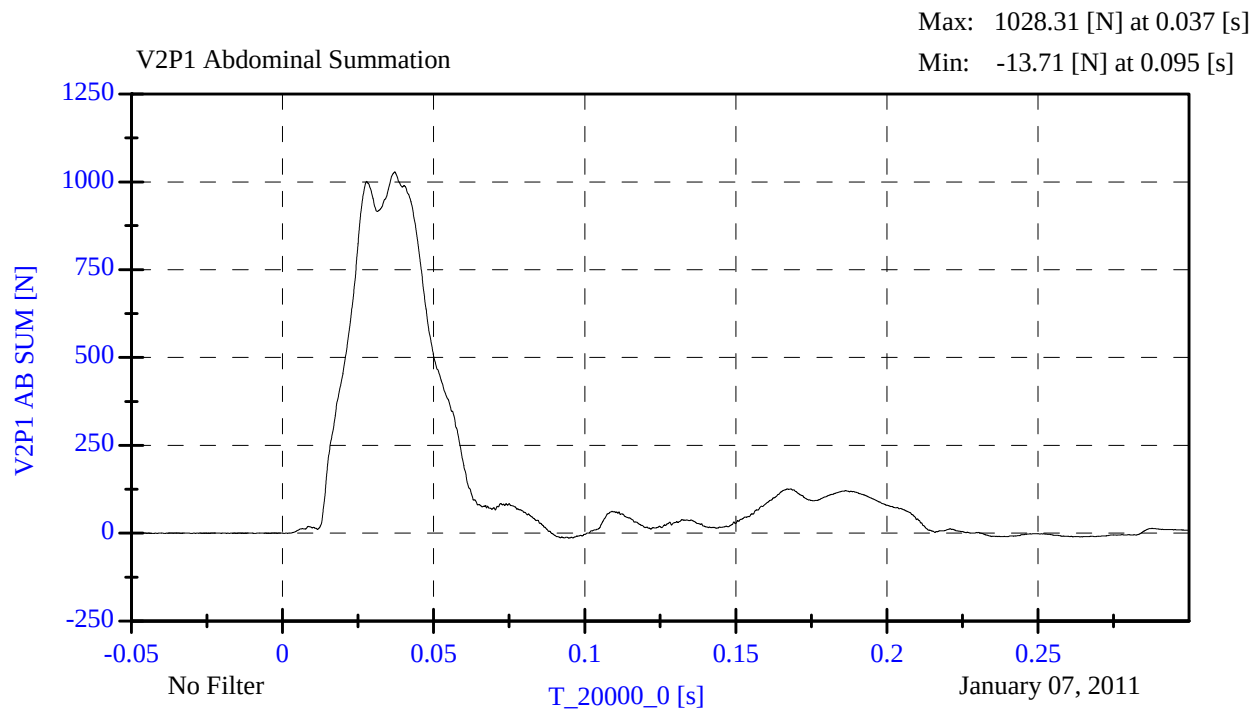
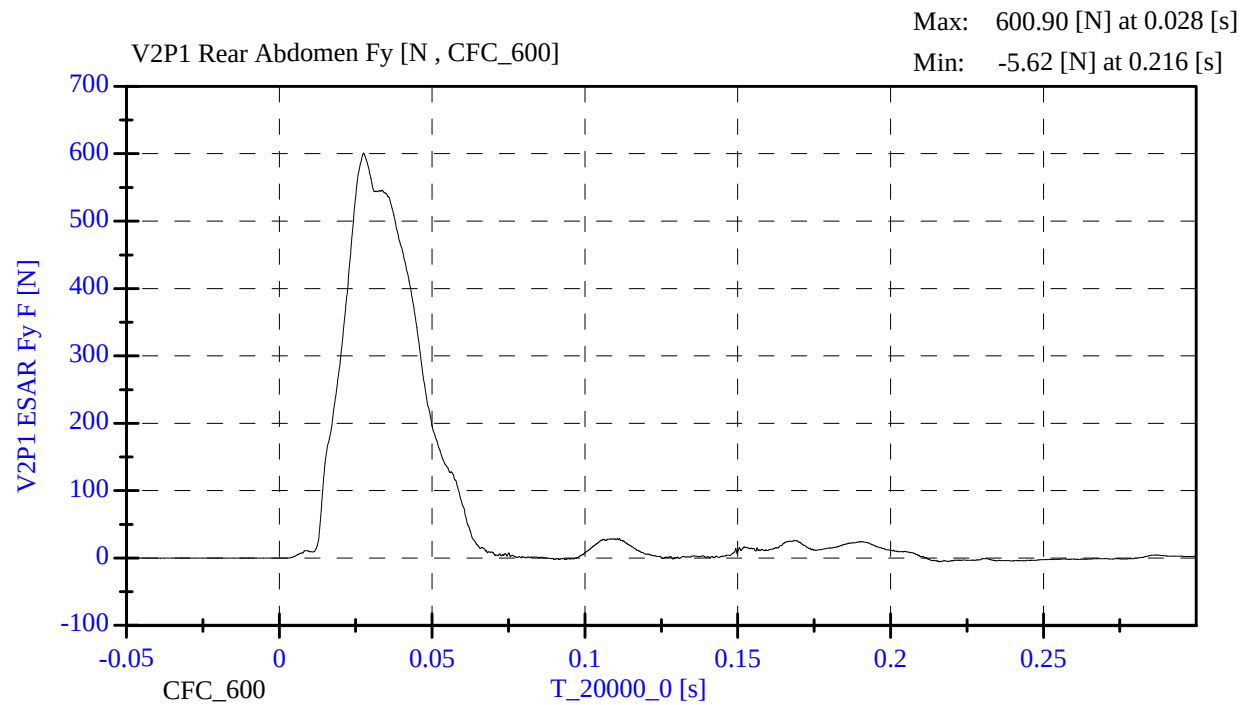


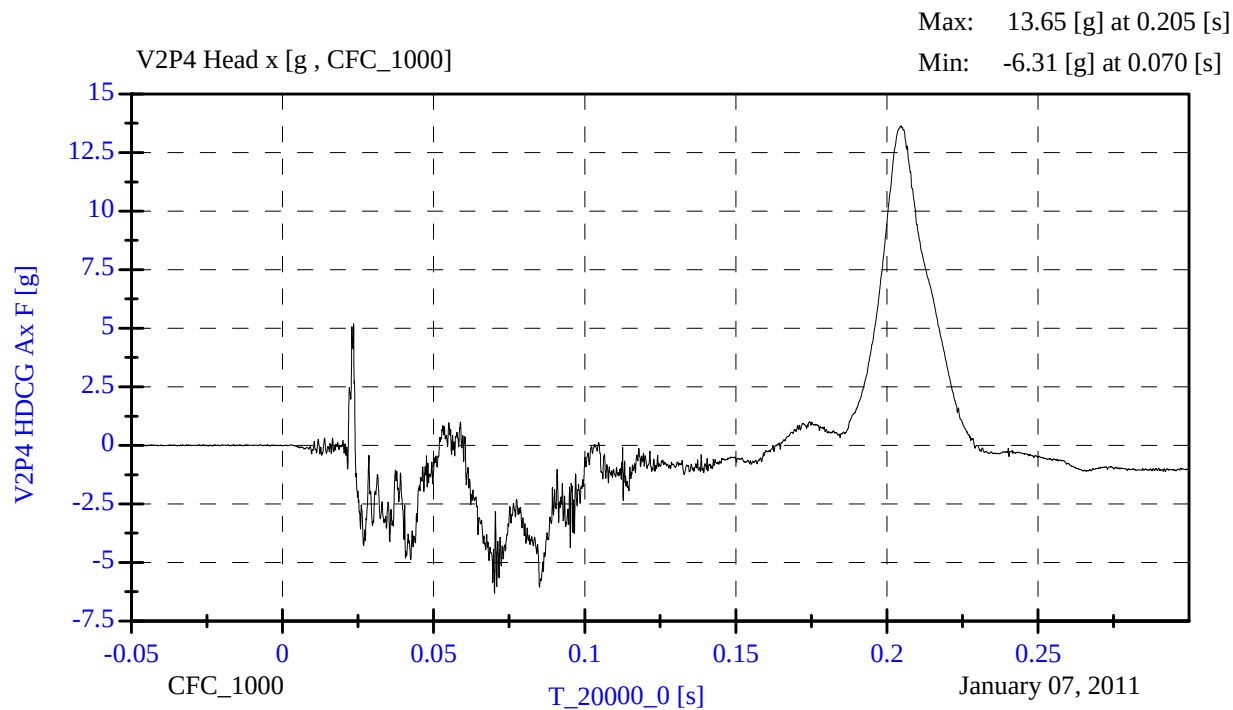
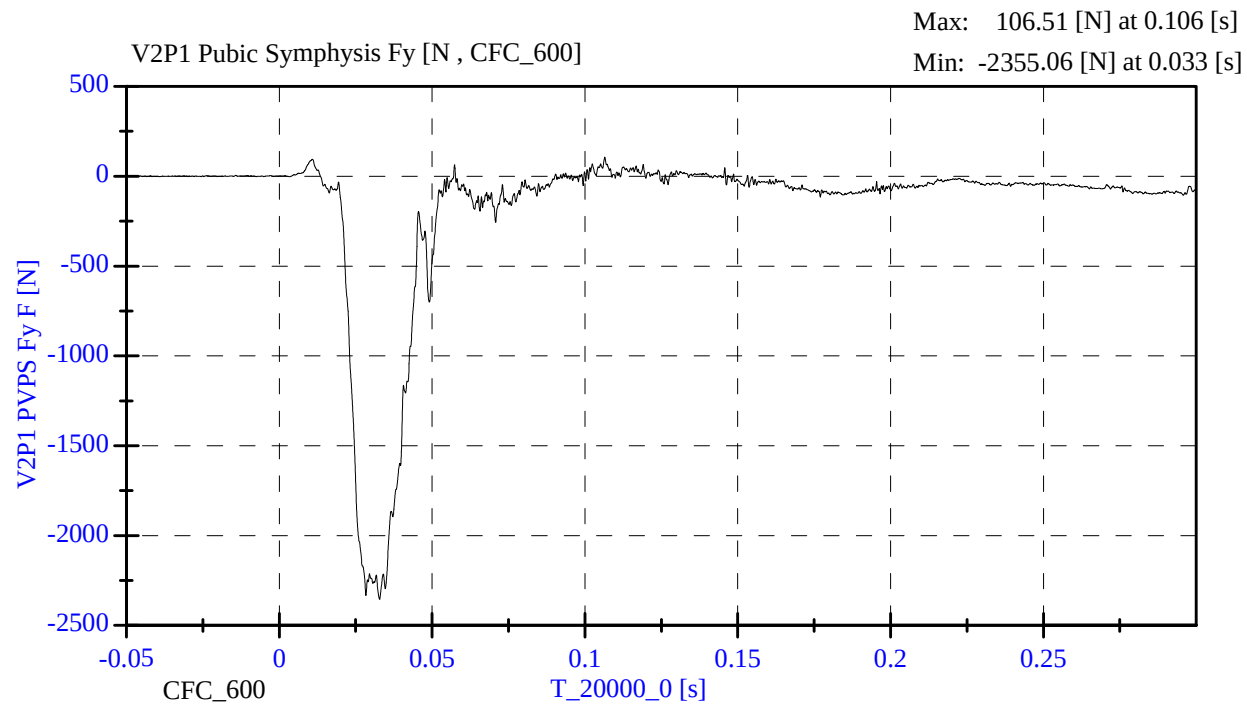


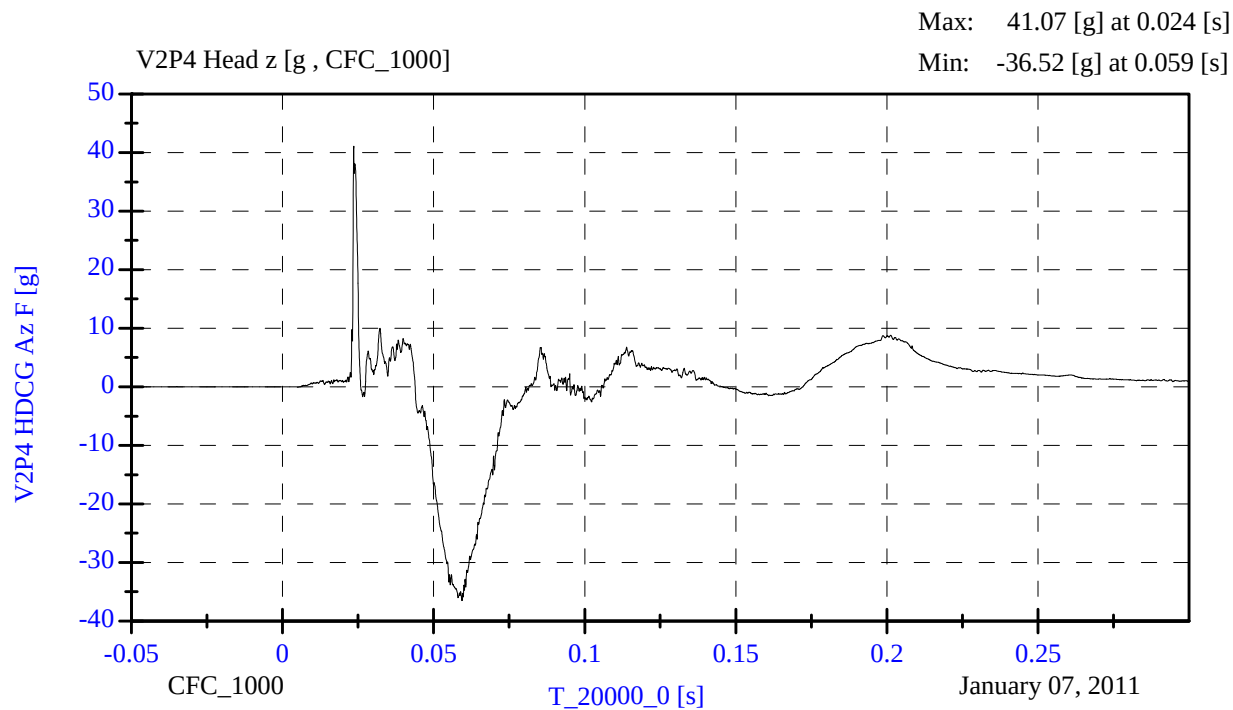
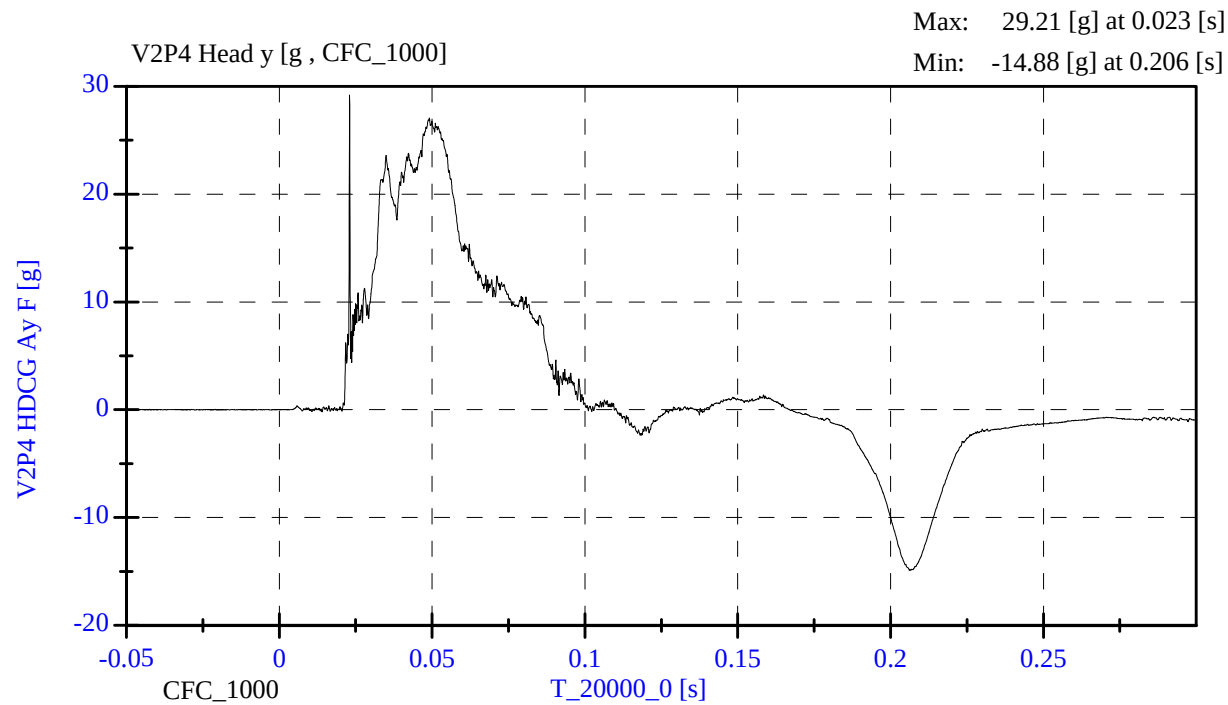


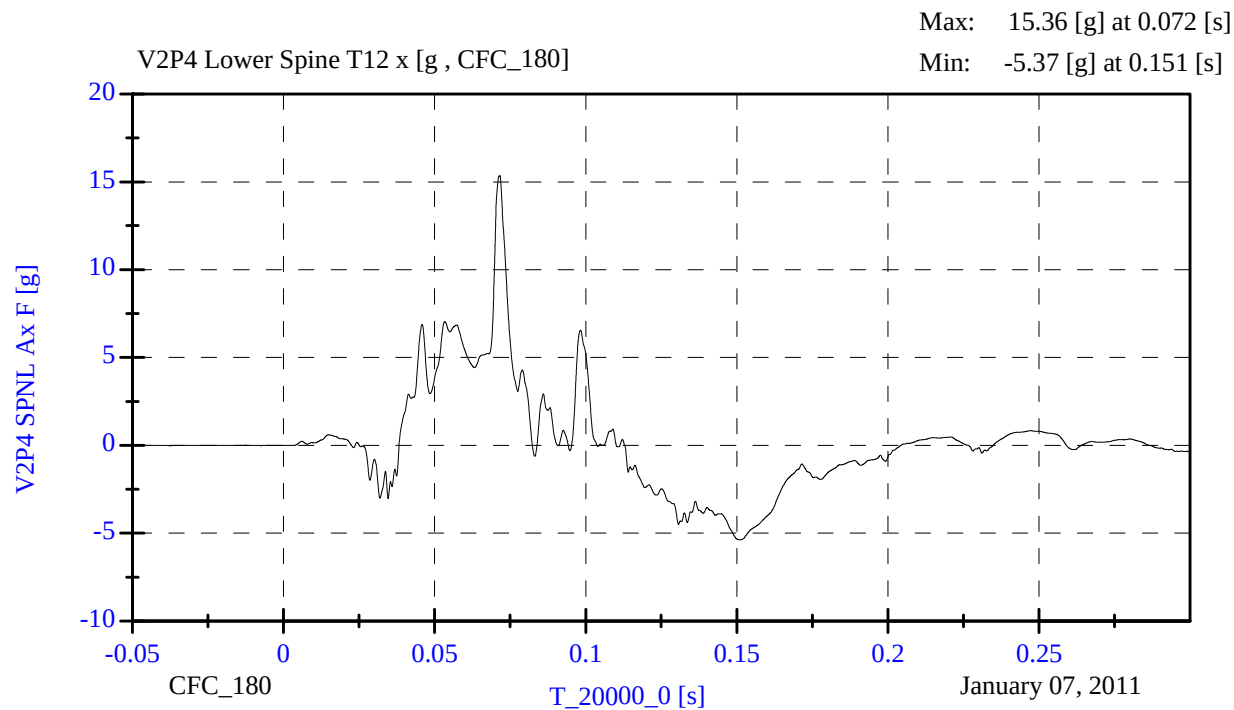
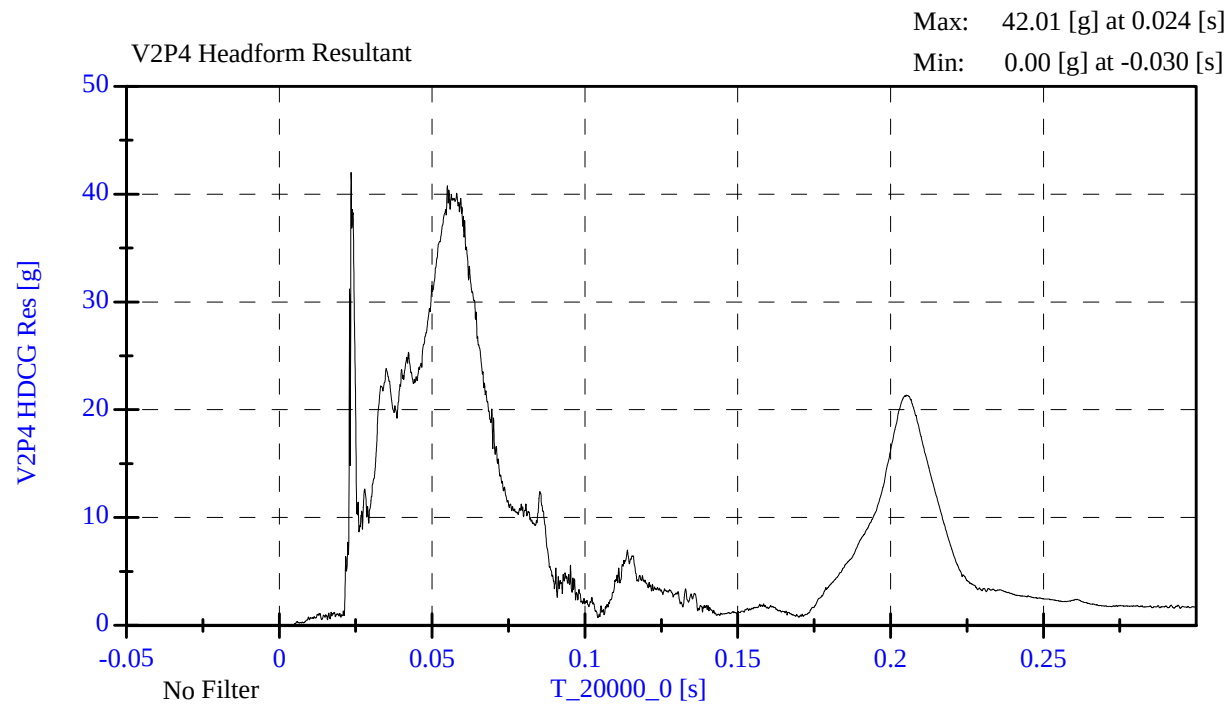


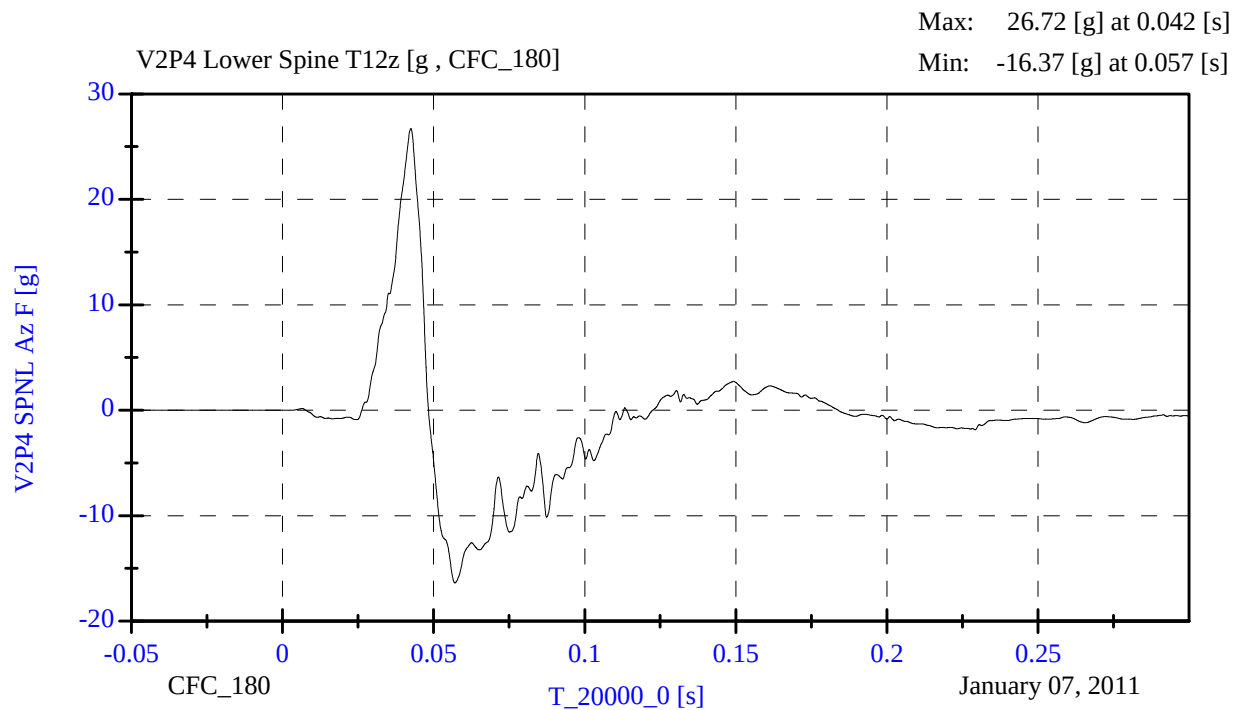
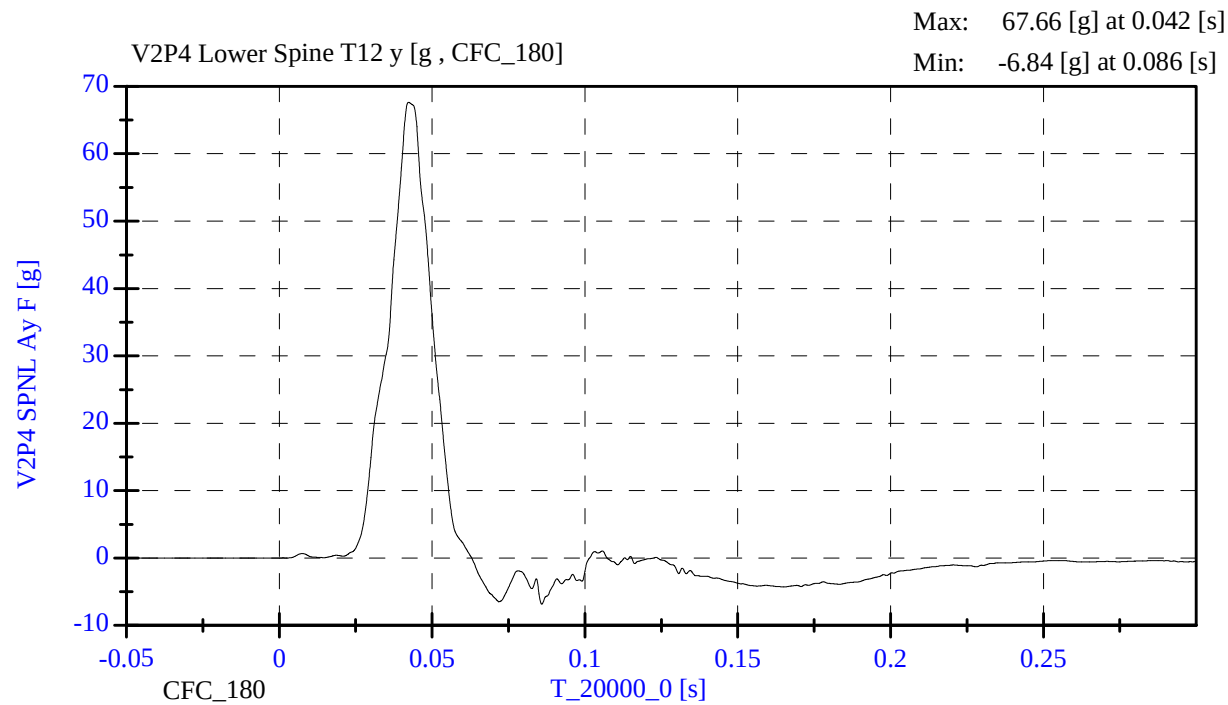


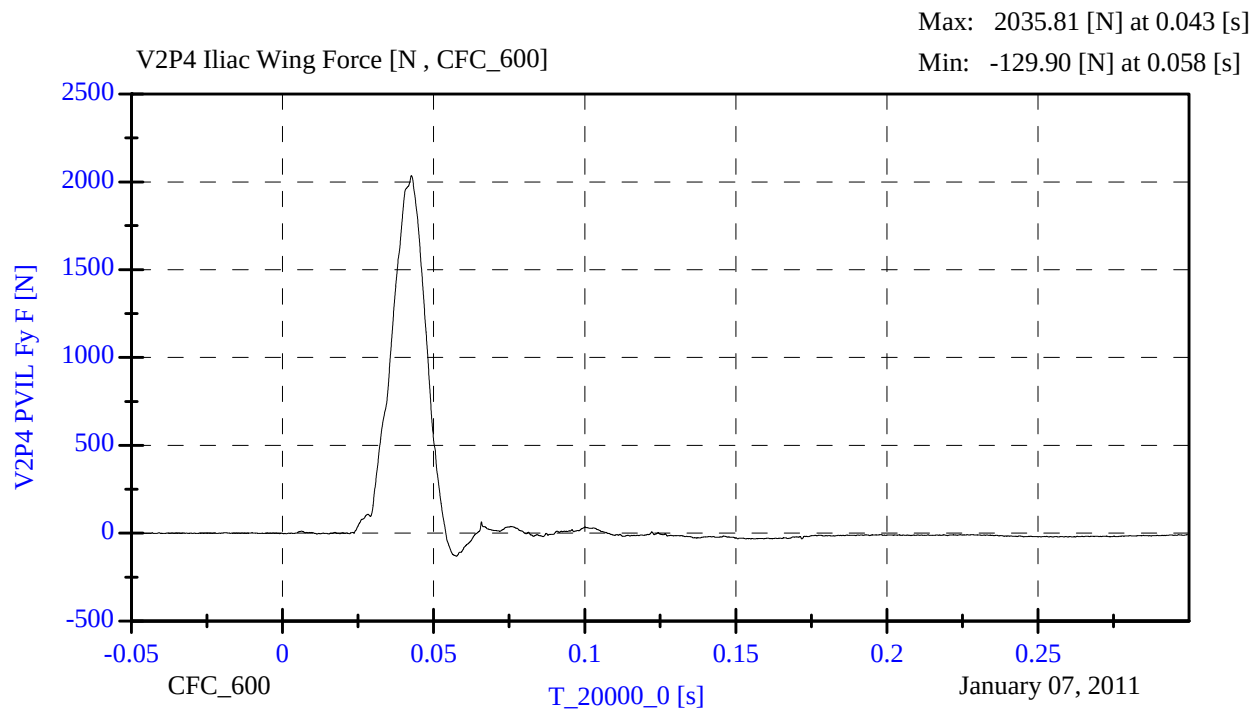
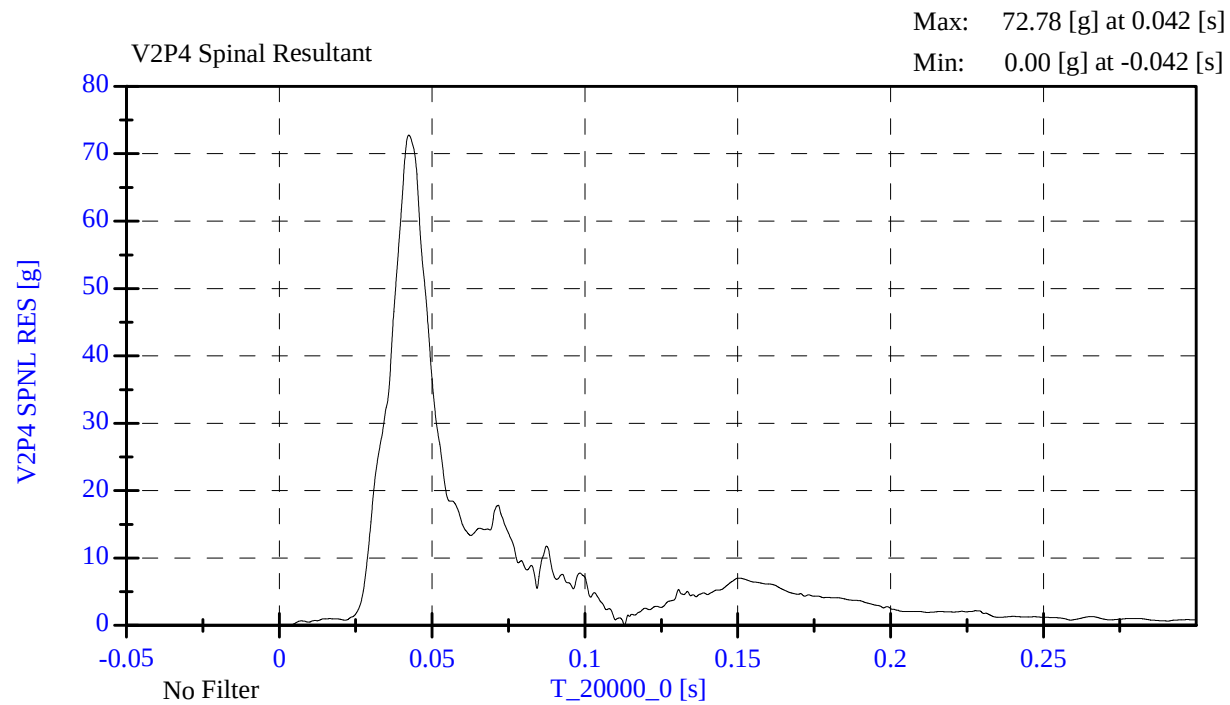


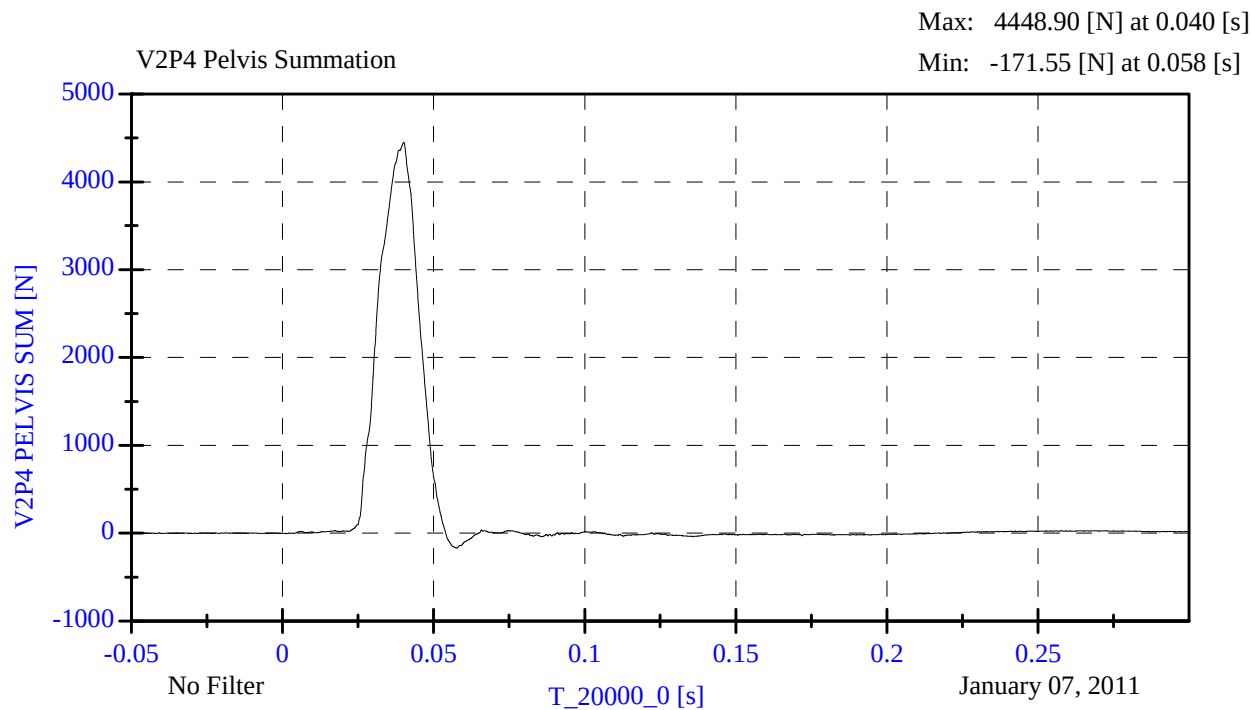
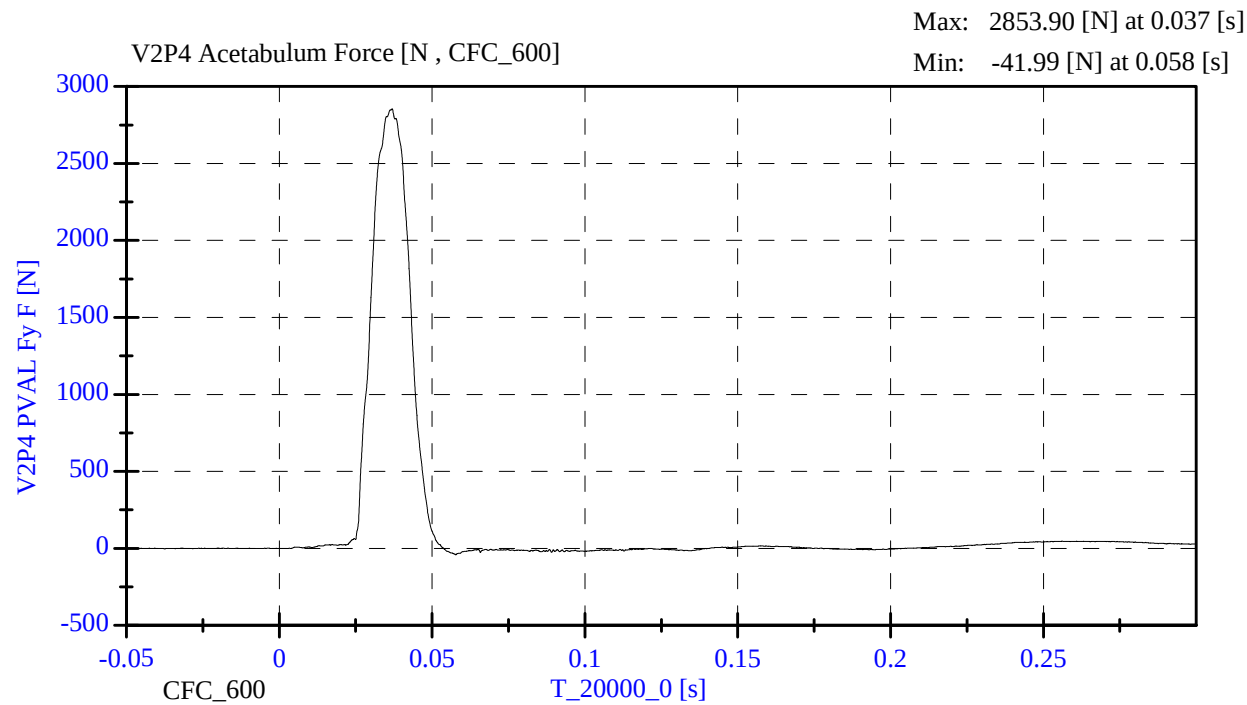












APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

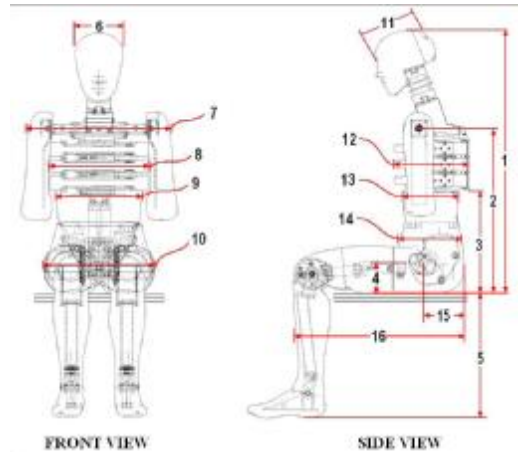
PRE-TEST

Es-2re No: 033

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

NHTSA SN F033



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

Technician: AR

Date: 01/05/2011



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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:	1/6/2011
Test Number:	1	Test Time:	12:45:06 PM

Component Part Number	Component Serial Number
455-1007	8473

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	24 %RH P
Resultant Acceleration	125 -- 155	146 g P
Oscillation	0.0 -- 15.0	5.9 % P
Fore-Aft Acceleration	-15.00 -- 15.00	4.60 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **12:45:06 PM**

Test Date: **1/6/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P51681	9/20/2010
Endevco	7264-2000	P51949	12/3/2010
Endevco	7264-2000	P51695	9/20/2010

Test ID: **Head Drop**

Test Time: **12:45:06 PM**

Test Date: **1/6/2011**

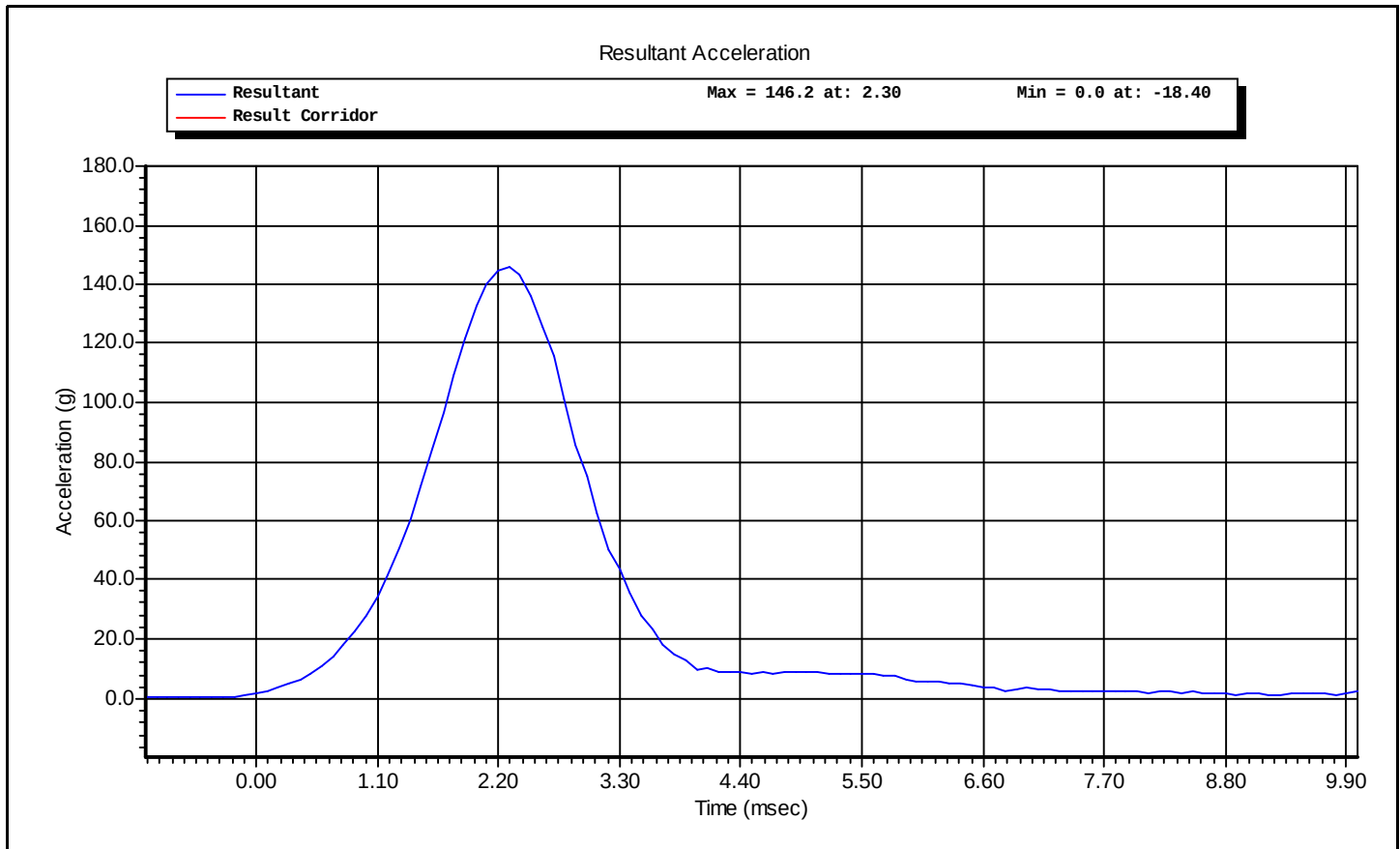


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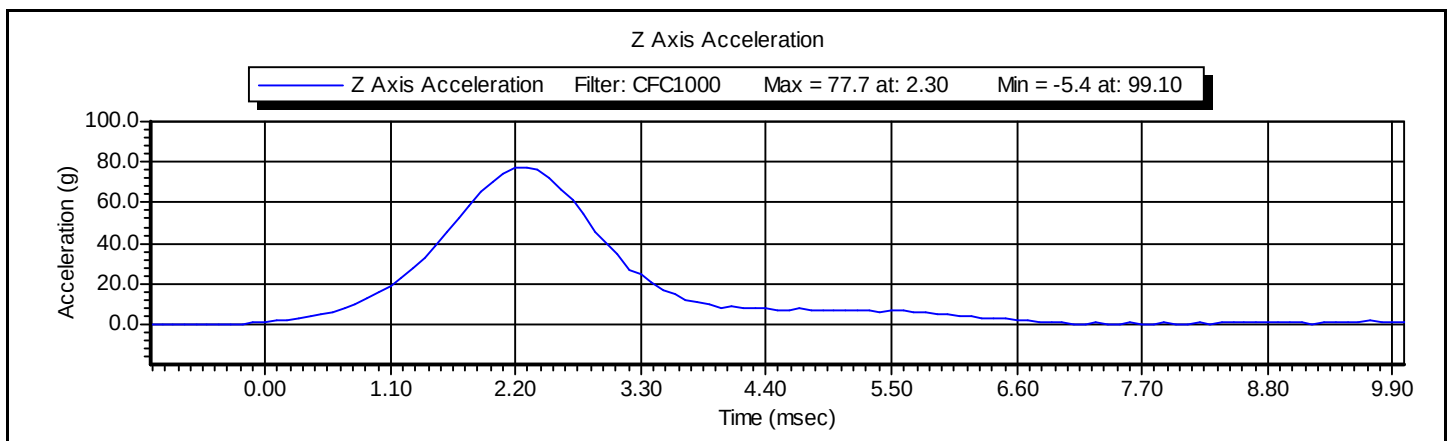
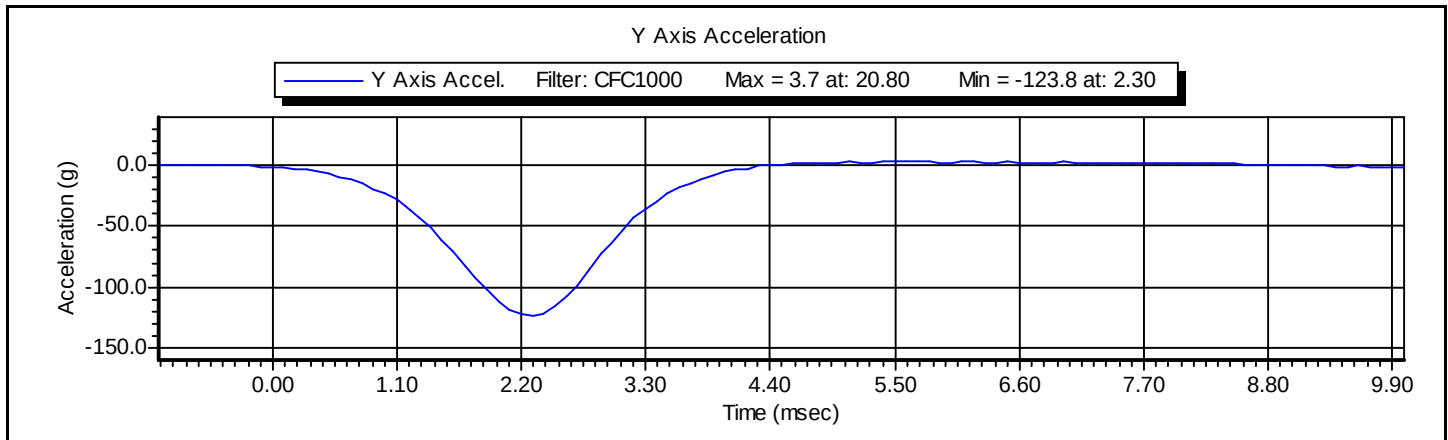
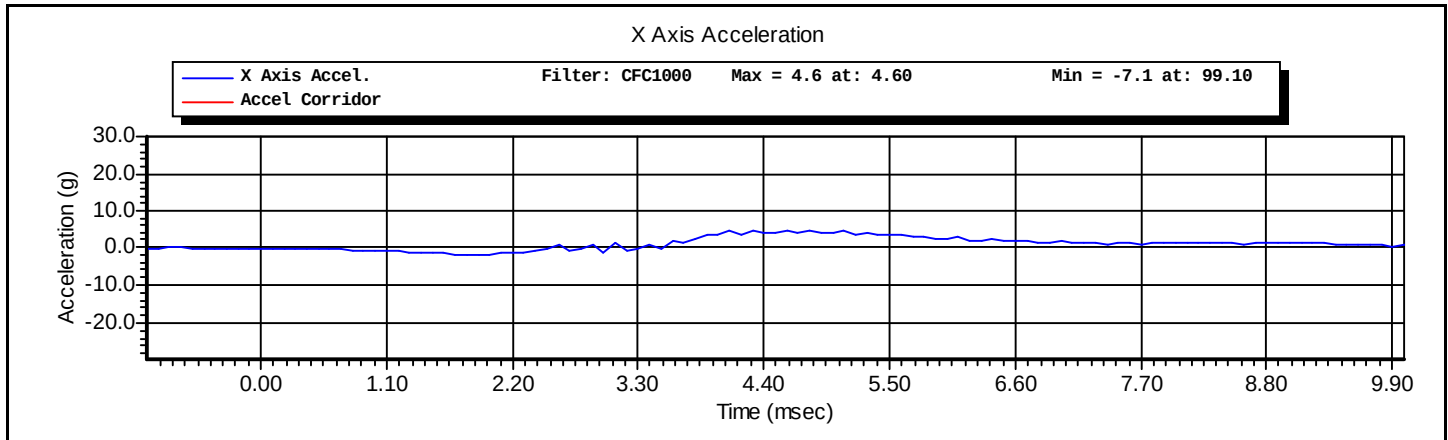
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	1/6/2011
Test Number:	1	Test Time:	12:45:06 PM



Test ID: **Head Drop**

Test Time: **12:45:06 PM**

Test Date: **1/6/2011**





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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:	1/6/2011
Test Number:	1	Test Time:	10:00:40 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.9 deg C P
Humidity	10 -- 70	25 %RH P
Velocity	3.30 -- 3.50	3.42 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	51.2 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	58.4 ms P
Decay to Zero Degrees	53.0 -- 88.0	58.4 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: **10:00:40 AM**

Test Date: **1/6/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Neck Flexion**

Test Time: **10:00:40 AM**

Test Date: **1/6/2011**



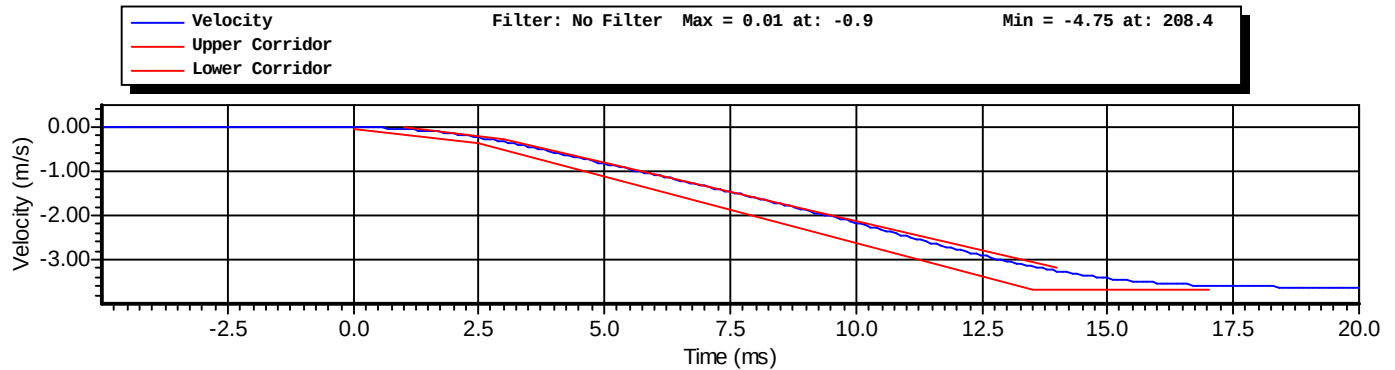
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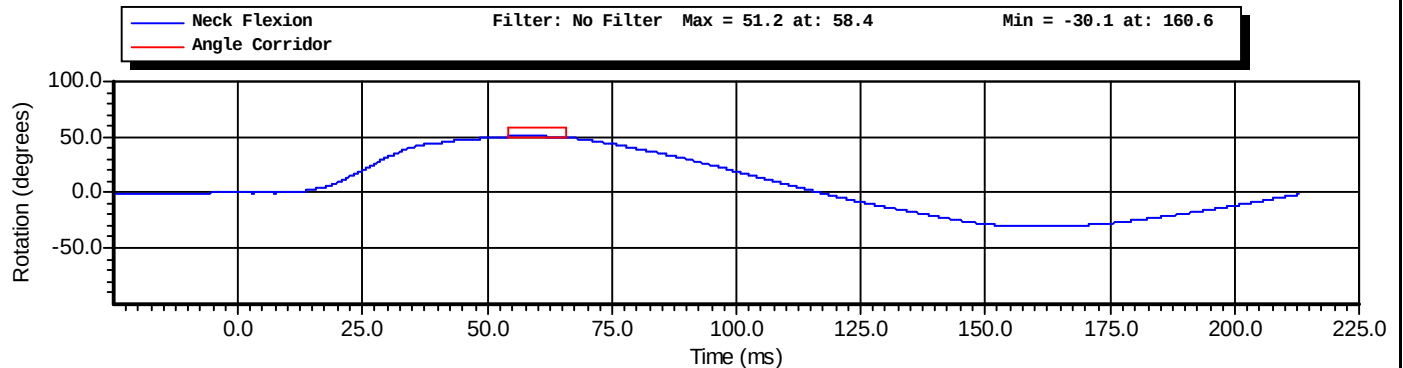
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	1/6/2011
Test Number:	1	Test Time:	10:00:40 AM

Pendulum Velocity



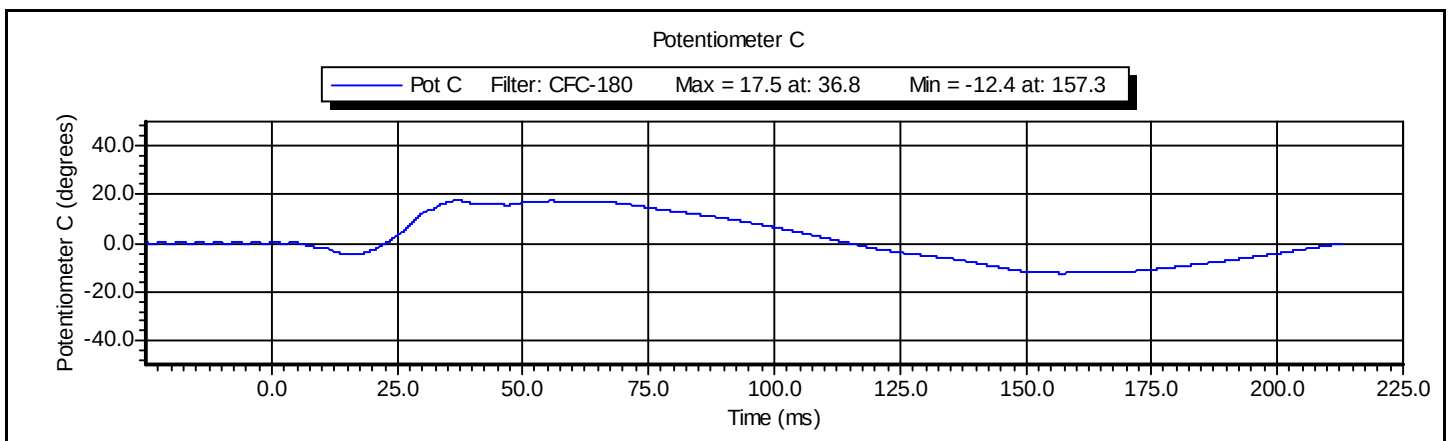
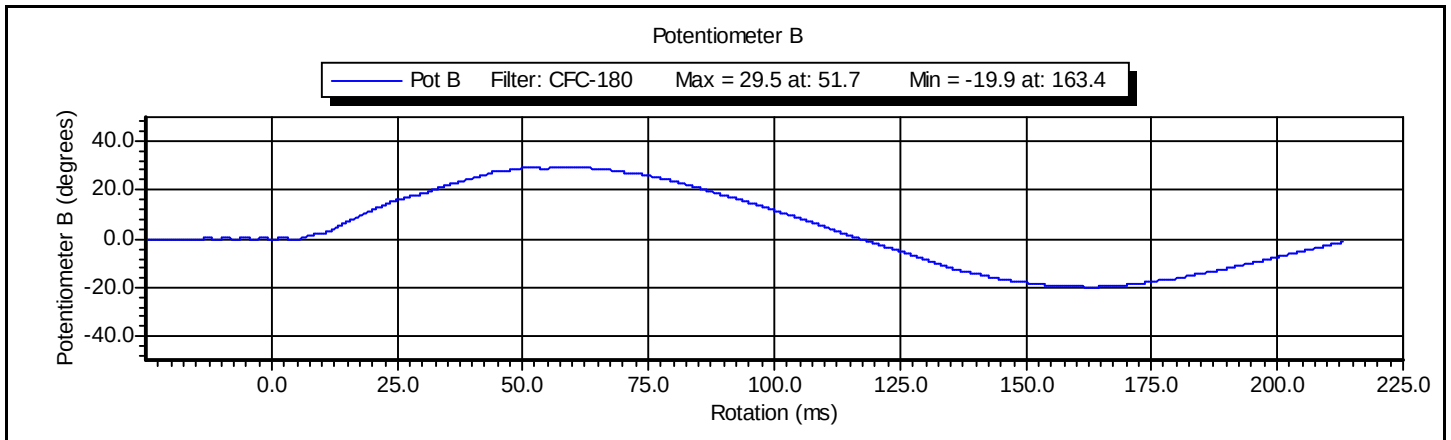
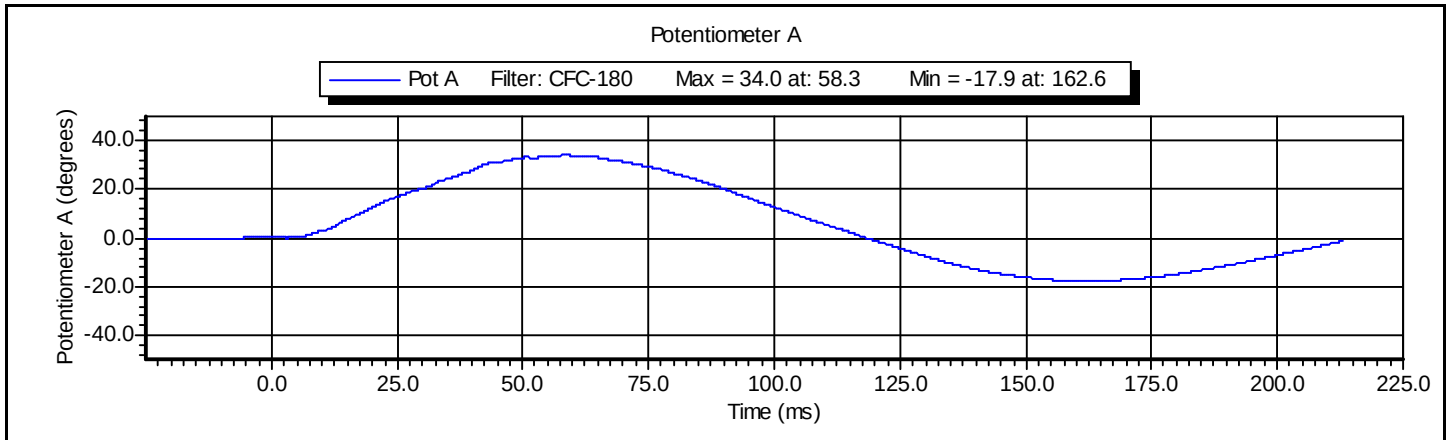
Neck Flexion Angle



Test ID: Neck Flexion

Test Time: 10:00:40 AM

Test Date: 1/6/2011





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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:	1/5/2011
Test Number:	1	Test Time:	7:37:46 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.69 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder**

Test Time: **7:37:46 PM**

Test Date: **1/5/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Shoulder**

Test Time: **7:37:46 PM**

Test Date: **1/5/2011**

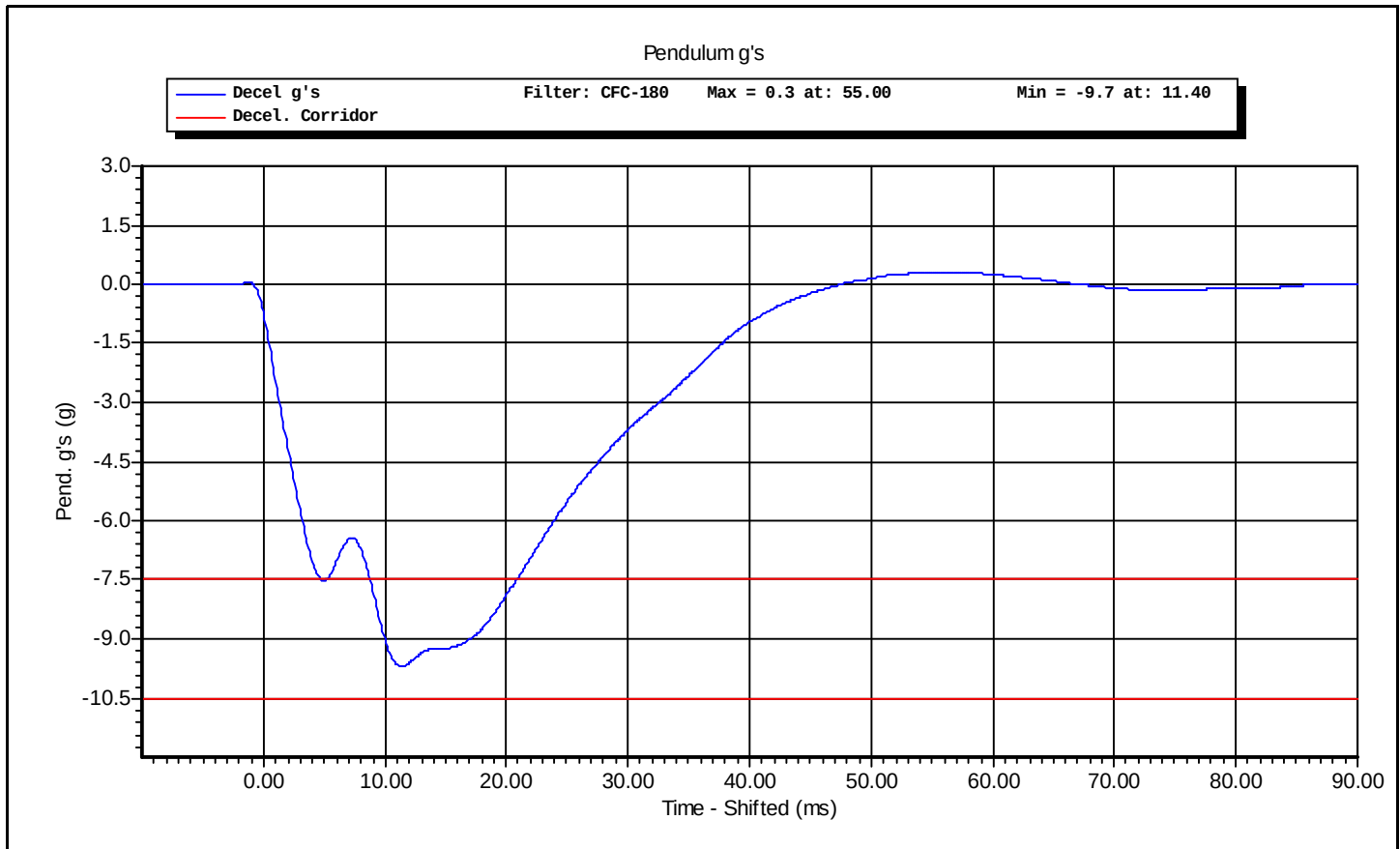


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	1/5/2011
Test Number:	1	Test Time:	7:37:46 PM



Test ID: **Shoulder**

Test Time: **7:37:46 PM**

Test Date: **1/5/2011**



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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:	1/5/2011
Test Number:	1	Test Time:	5:06:20 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	28 %RH P
Velocity	3.90 -- 4.10	4.08 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.48 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	10.5 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.59 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	11.2 ms P

All test parameters are within specifications

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

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

Test ID: **Abdomen**

Test Time: **5:06:20 PM**

Test Date: **1/5/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Denton	2631	LC-1524	4/22/2010
Denton	2631	LC-1523	4/22/2010
Denton	2631	LC-1530	4/22/2010

Test ID: **Abdomen**

Test Time: **5:06:20 PM**

Test Date: **1/5/2011**

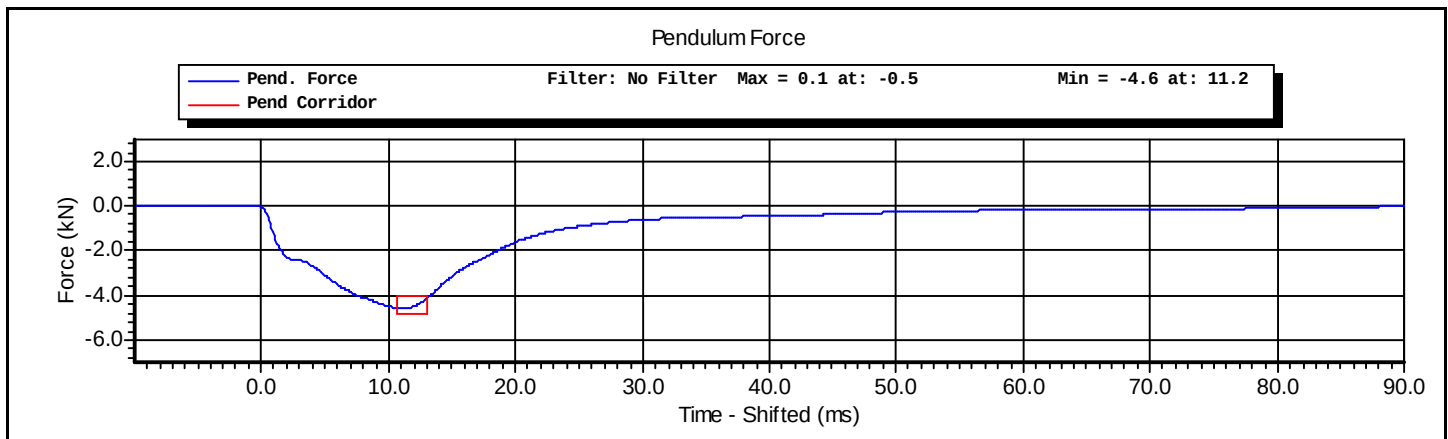
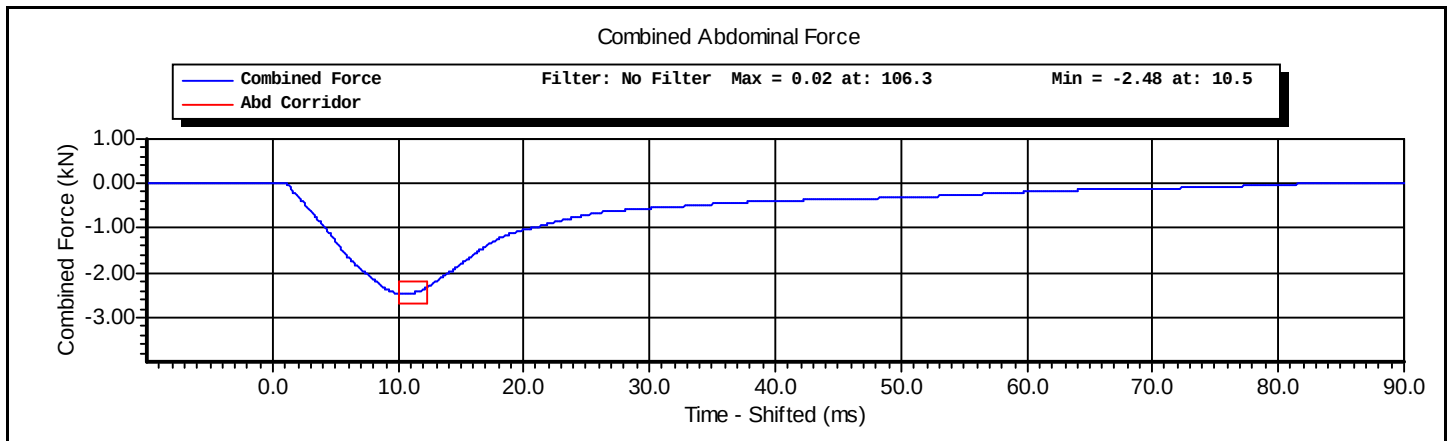


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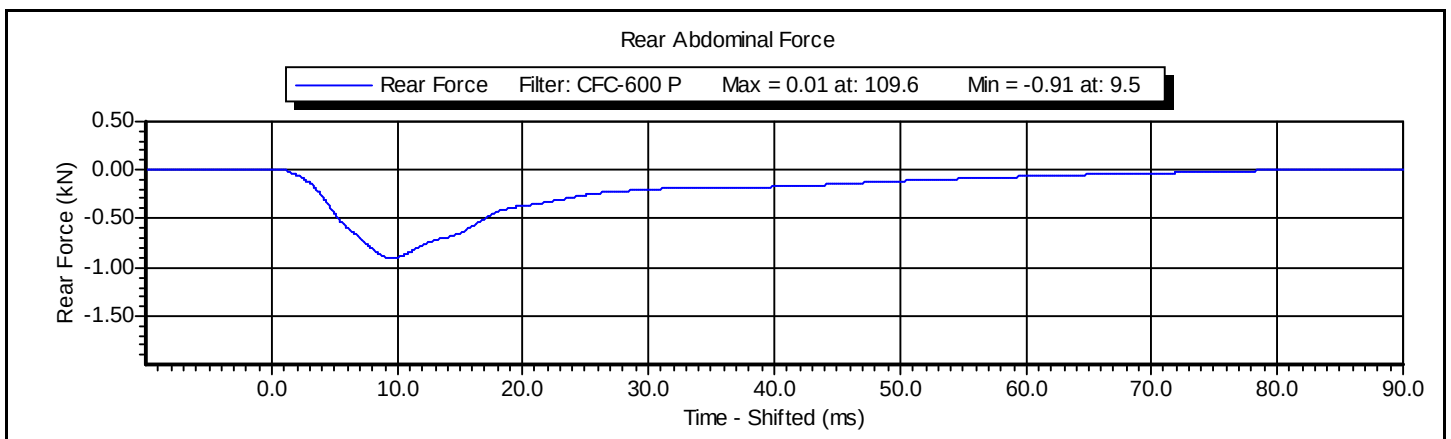
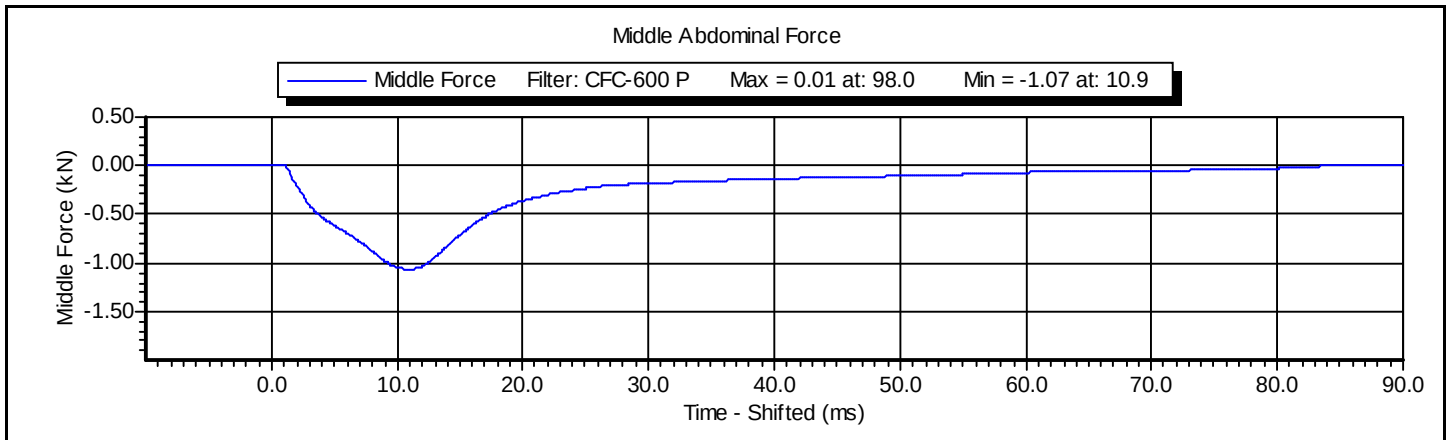
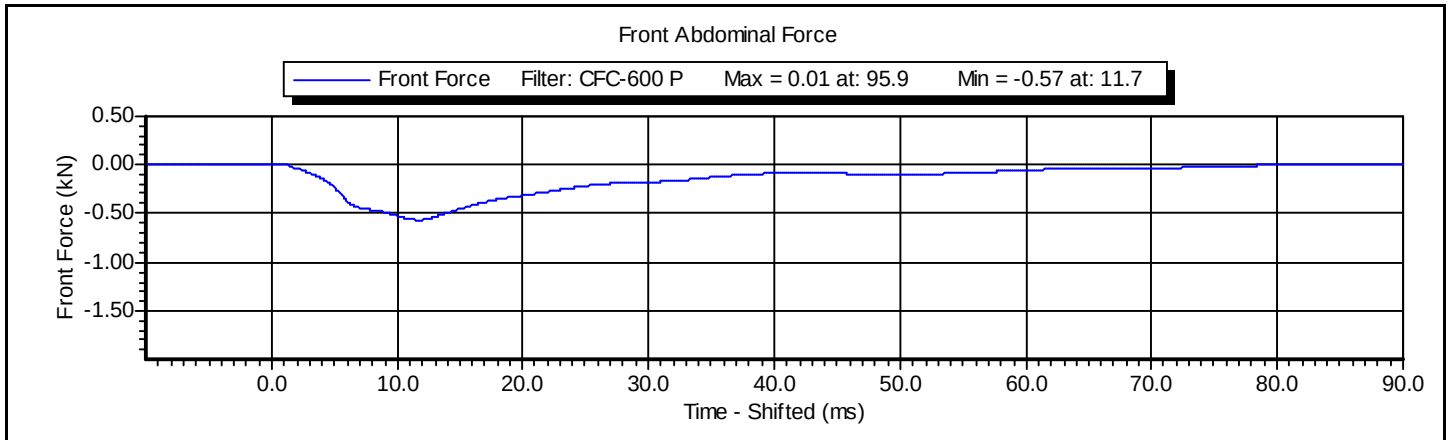
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	1/5/2011
Test Number:	1	Test Time:	5:06:20 PM



Test ID: **Abdomen**

Test Time: **5:06:20 PM**

Test Date: **1/5/2011**





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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:	1/5/2011
Test Number:	1	Test Time:	5:54:20 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	24.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-48.76 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: **5:54:20 PM**

Test Date: **1/5/2011**



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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	P32222	11/17/2010

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

Test Time: **5:54:20 PM**

Test Date: **1/5/2011**

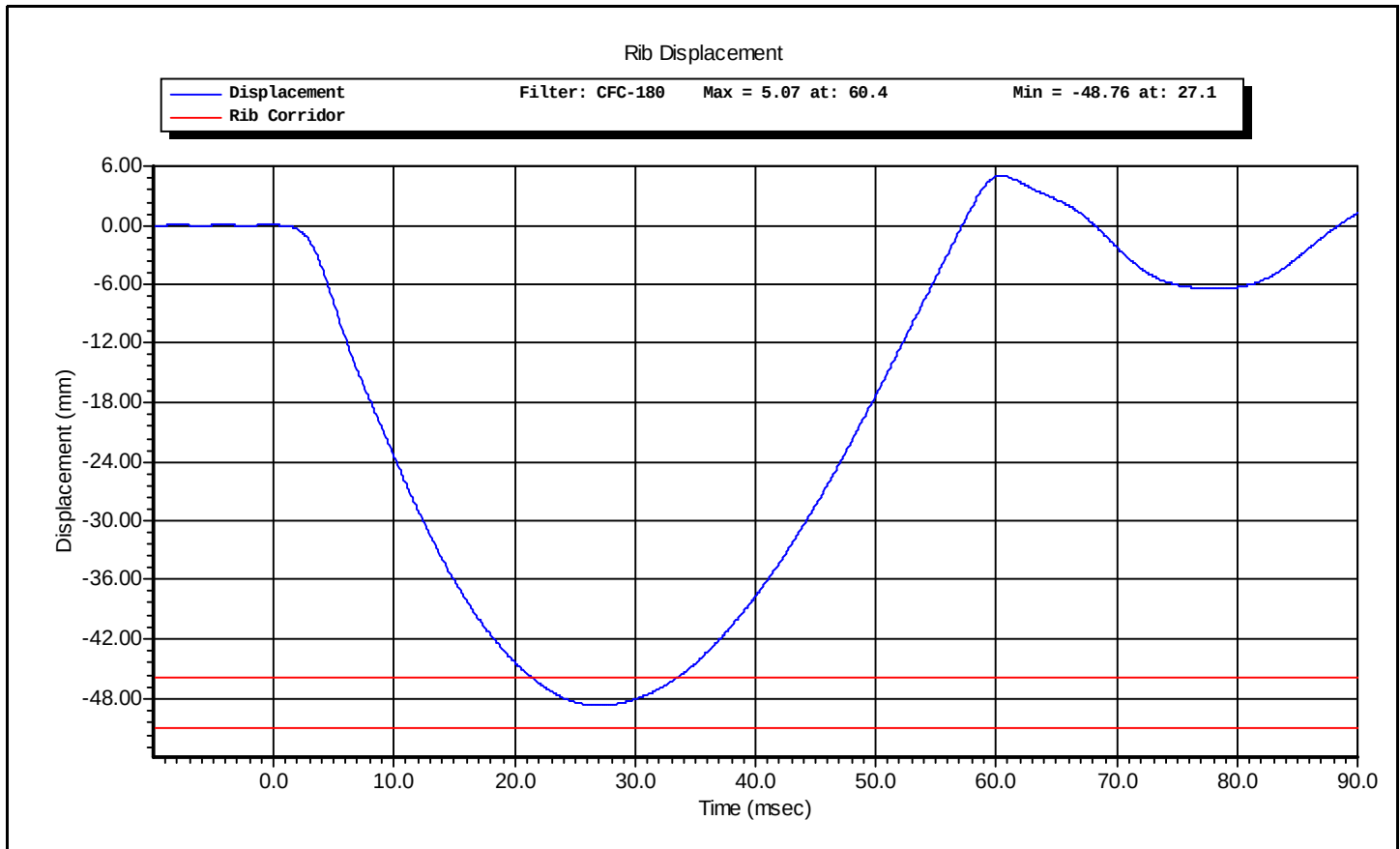


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	1/5/2011
Test Number:	1	Test Time:	5:54:20 PM



Test ID: Upper Rib 4 m/s

Test Time: 5:54:20 PM

Test Date: 1/5/2011



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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:	1/5/2011
Test Number:	1	Test Time:	6:00:28 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	24.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-38.02 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: **6:00:28 PM**

Test Date: **1/5/2011**



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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	P32222	11/17/2010

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

Test Time: **6:00:28 PM**

Test Date: **1/5/2011**

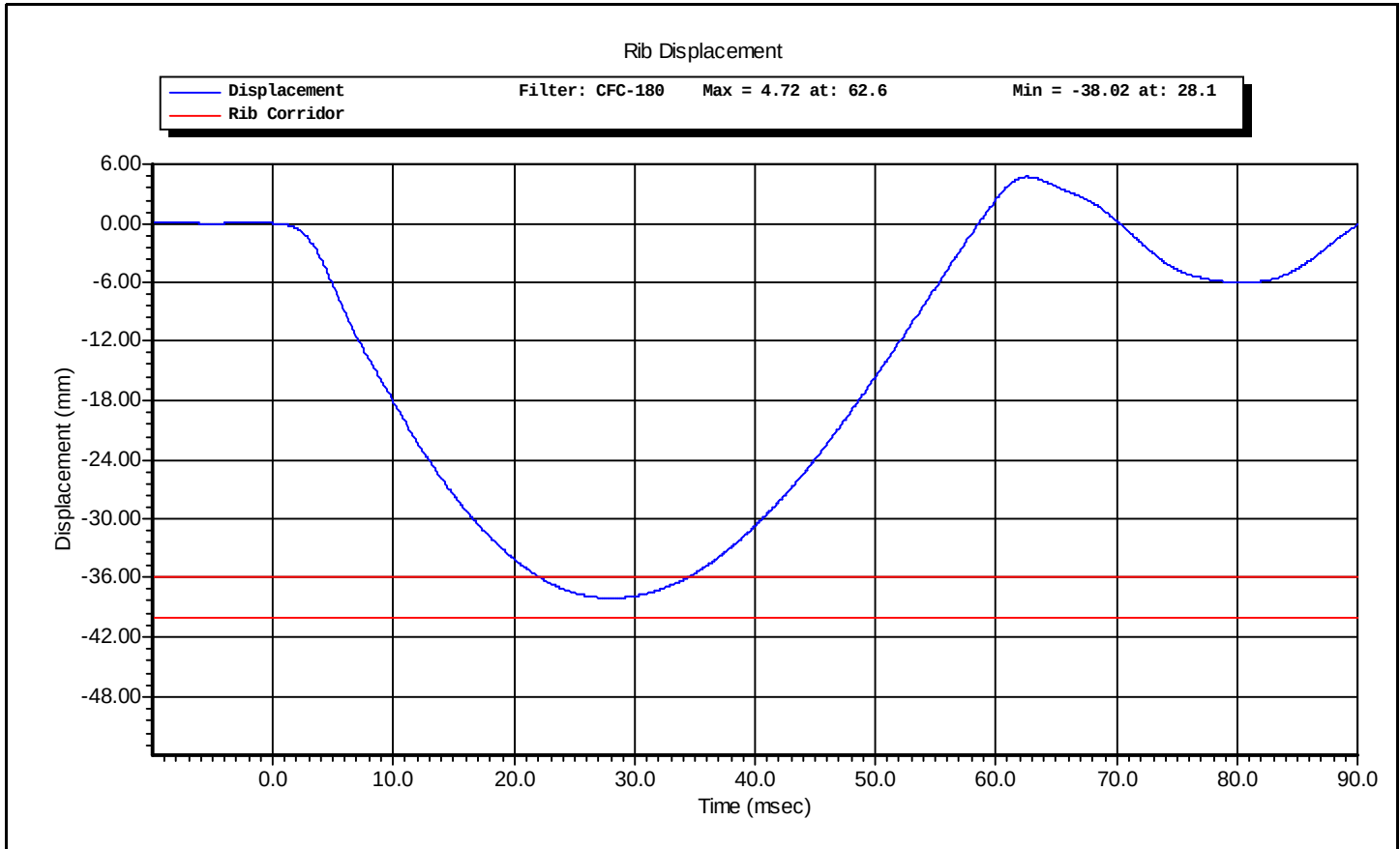


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	1/5/2011
Test Number:	1	Test Time:	6:00:28 PM



Test ID: Upper Rib 3 m/s

Test Time: 6:00:28 PM

Test Date: 1/5/2011



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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:	1/5/2011
Test Number:	1	Test Time:	5:43:42 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	24.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-48.12 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: **5:43:42 PM**

Test Date: **1/5/2011**



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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	P32222	11/17/2010

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

Test Time: **5:43:42 PM**

Test Date: **1/5/2011**

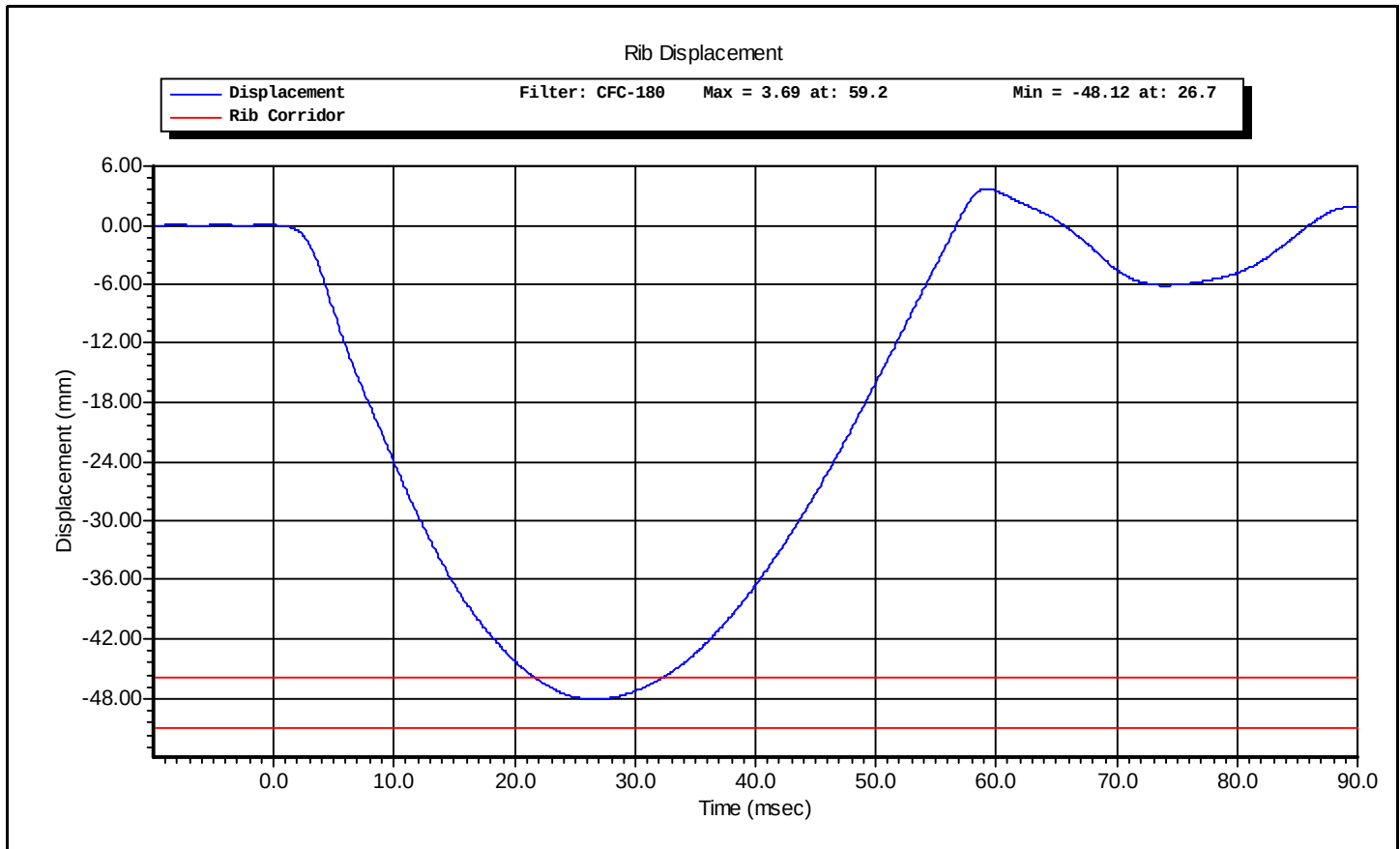


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	1/5/2011
Test Number:	1	Test Time:	5:43:42 PM



Test ID: Middle Rib 4 m/s Test Time: 5:43:42 PM

Test Date: 1/5/2011



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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:	1/5/2011
Test Number:	1	Test Time:	5:51:09 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	24.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-37.44 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: **5:51:09 PM**

Test Date: **1/5/2011**



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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	P32222	11/17/2010

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

Test Time: **5:51:09 PM**

Test Date: **1/5/2011**

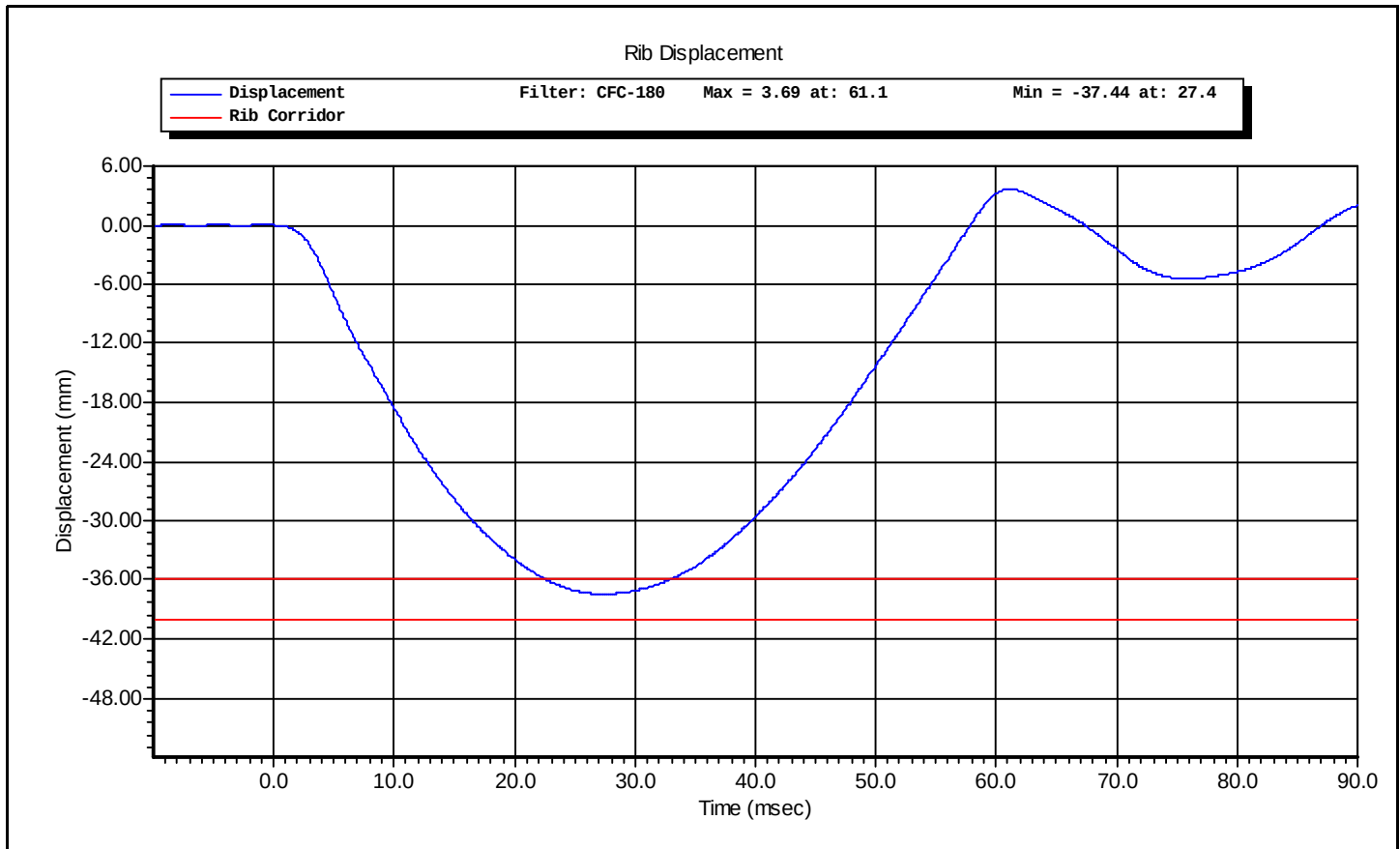


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	1/5/2011
Test Number:	1	Test Time:	5:51:09 PM



Test ID: Middle Rib 3 m/s Test Time: 5:51:09 PM

Test Date: 1/5/2011



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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 Lower 4 m/s	Test Date:	1/5/2011
Test Number:	1	Test Time:	5:28:52 PM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-48.28 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 Lower 4 m/s**

Test Time: **5:28:52 PM**

Test Date: **1/5/2011**



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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	P32222	11/17/2010

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

Test Time: **5:28:52 PM**

Test Date: **1/5/2011**

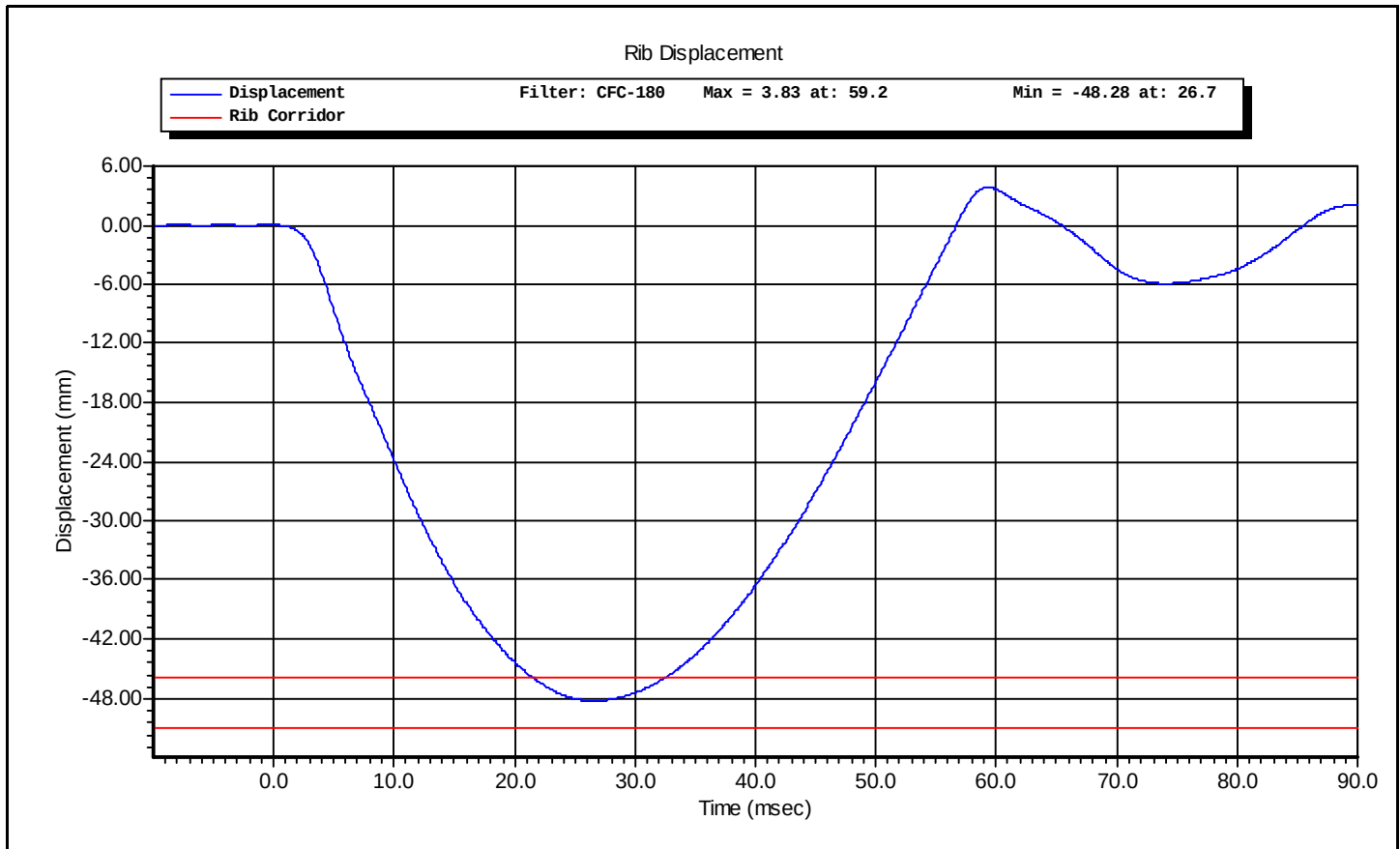


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Rib Lower 4 m/s	Test Date:	1/5/2011
Test Number:	1	Test Time:	5:28:52 PM



Test ID: Rib Lower 4 m/s Test Time: 5:28:52 PM

Test Date: 1/5/2011



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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:	Rib Lower 3 m/s	Test Date:	1/5/2011
Test Number:	1	Test Time:	5:38:40 PM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.45 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: **Rib Lower 3 m/s**

Test Time: **5:38:40 PM**

Test Date: **1/5/2011**



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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	P32222	11/17/2010

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

Test Time: **5:38:40 PM**

Test Date: **1/5/2011**

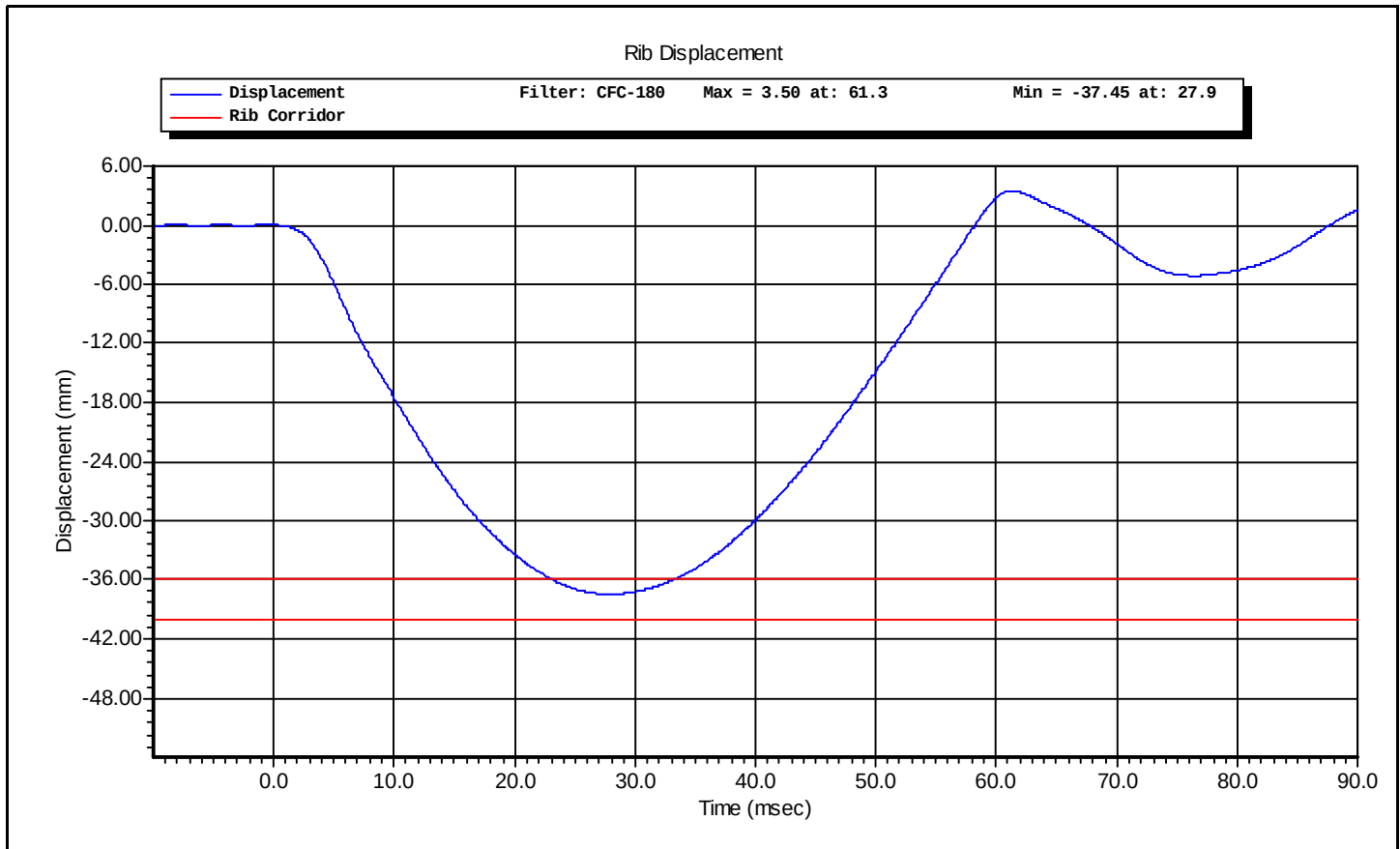


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Rib Lower 3 m/s	Test Date:	1/5/2011
Test Number:	1	Test Time:	5:38:40 PM



Test ID: Rib Lower 3 m/s Test Time: 5:38:40 PM

Test Date: 1/5/2011



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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:	1/5/2011
Test Number:	1	Test Time:	7:24:42 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	22.0 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	5.40 -- 5.60	5.50 m/s P
Upper Rib Displacement	34.0 -- 41.0	37.4 mm P
Middle Rib Displacement	37.0 -- 45.0	41.4 mm P
Lower Rib Displacement	37.0 -- 44.0	41.5 mm P
Impactor Force	5100 -- 6200	5672 N P

All test parameters are within specifications

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

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

Test ID: **Thorax**

Test Time: **7:24:42 PM**

Test Date: **1/5/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Thorax**

Test Time: **7:24:42 PM**

Test Date: **1/5/2011**

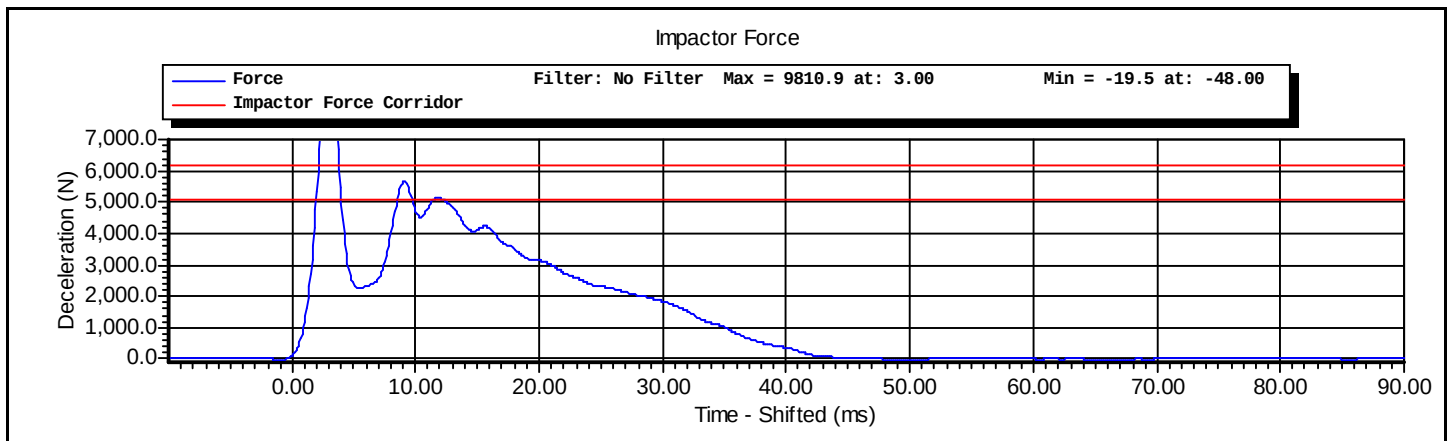
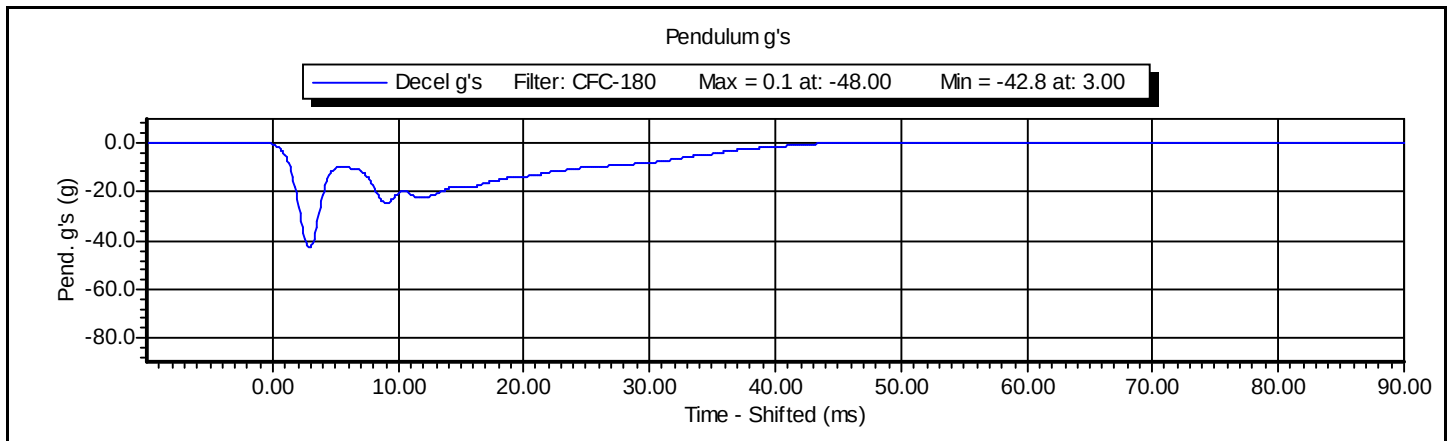


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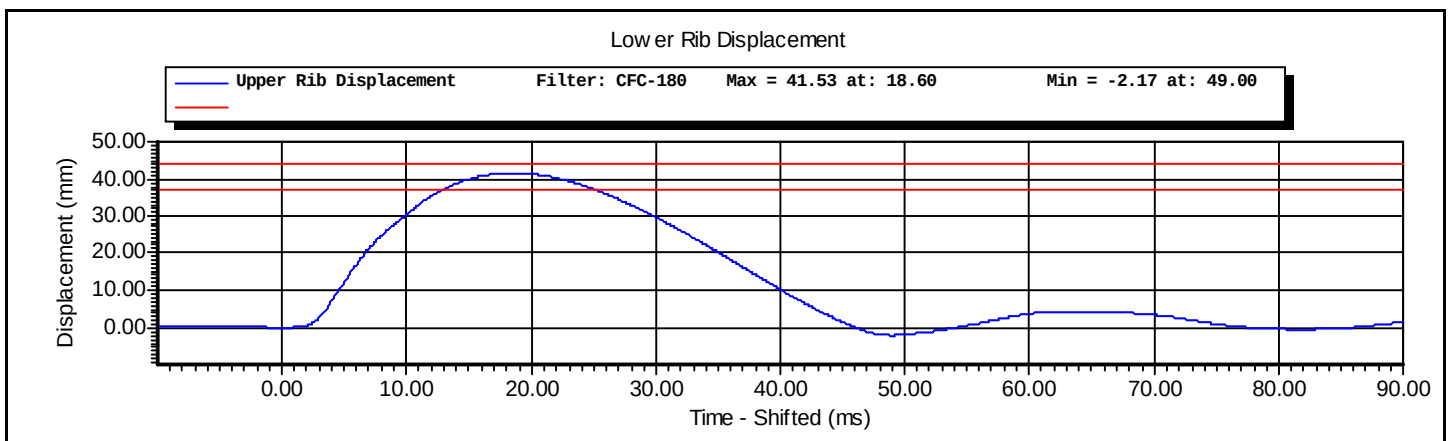
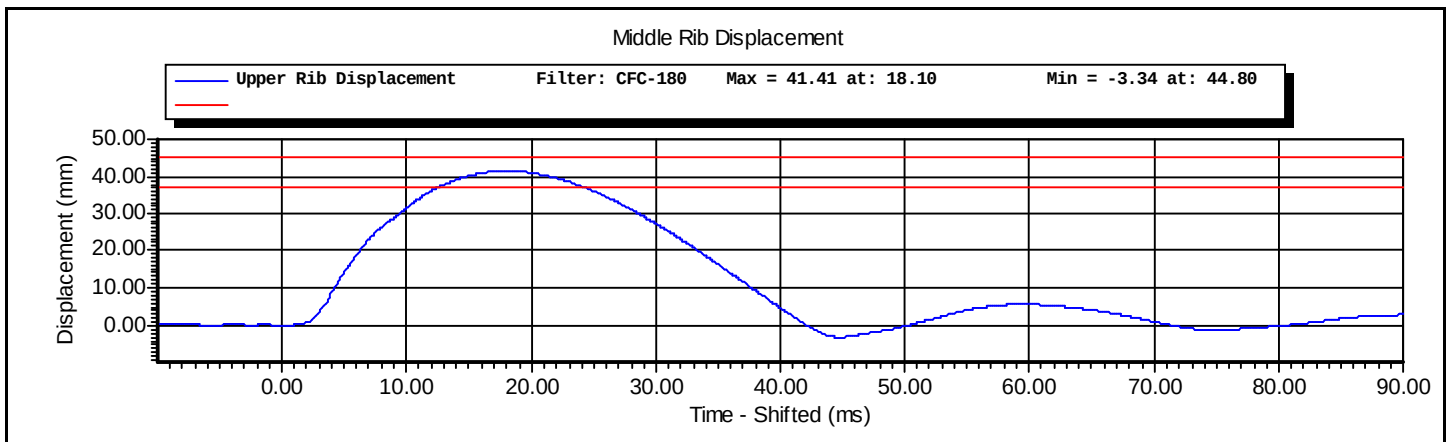
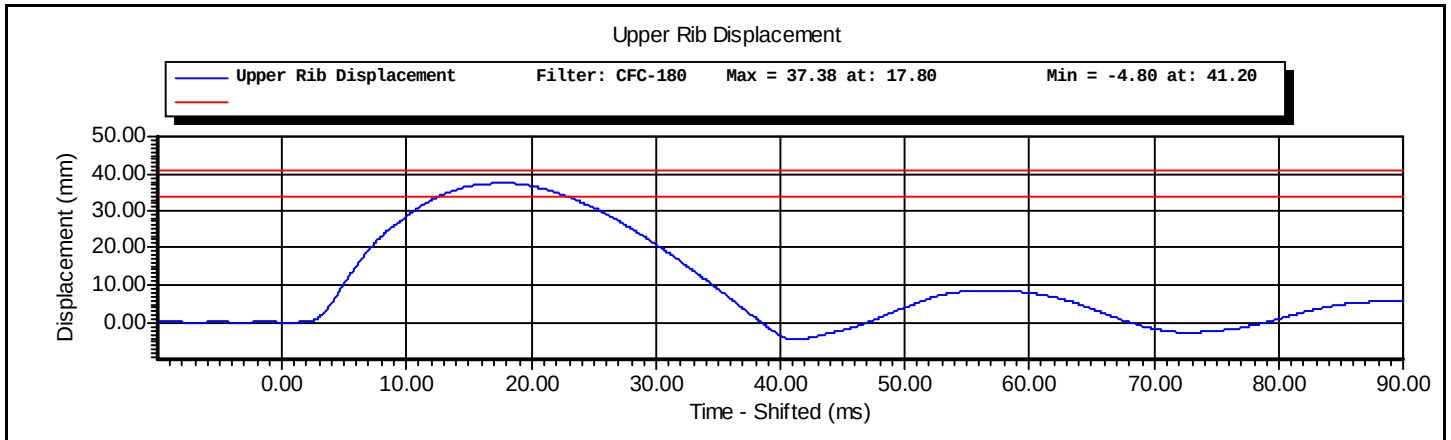
Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	1/5/2011
Test Number:	1	Test Time:	7:24:42 PM



Test ID: Thorax

Test Time: 7:24:42 PM

Test Date: 1/5/2011





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VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Spine Flexion	Test Date:	1/5/2011
Test Number:	1	Test Time:	8:27:38 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.0 deg C	P
Humidity	10	--	70	28 %RH	P
Velocity	5.95	--	6.15	6.15 m/s	P
Maximum Headform Flexion Angle	45.0	--	55.0	47.2 degrees	P
Time at Maximum Headform Flexion Angle	39.0	--	53.0	42.2 ms	P
Decay to Zero Degrees	37.0	--	57.0	37.1 ms	P
Velocity Corridor		--			P

All test parameters are within specifications

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

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

Test ID: **Spine Flexion**

Test Time: **8:27:38 PM**

Test Date: **1/5/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
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Test ID: **Spine Flexion**

Test Time: **8:27:38 PM**

Test Date: **1/5/2011**



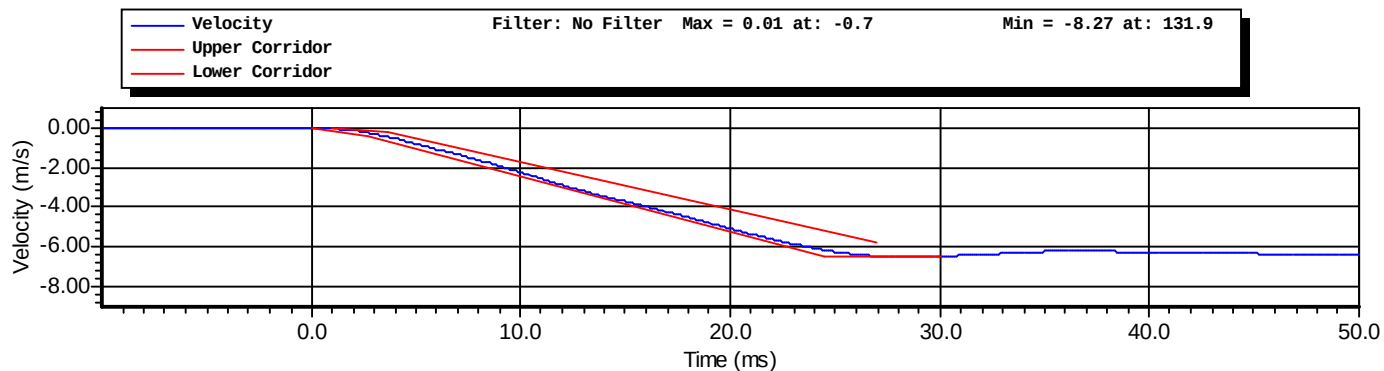
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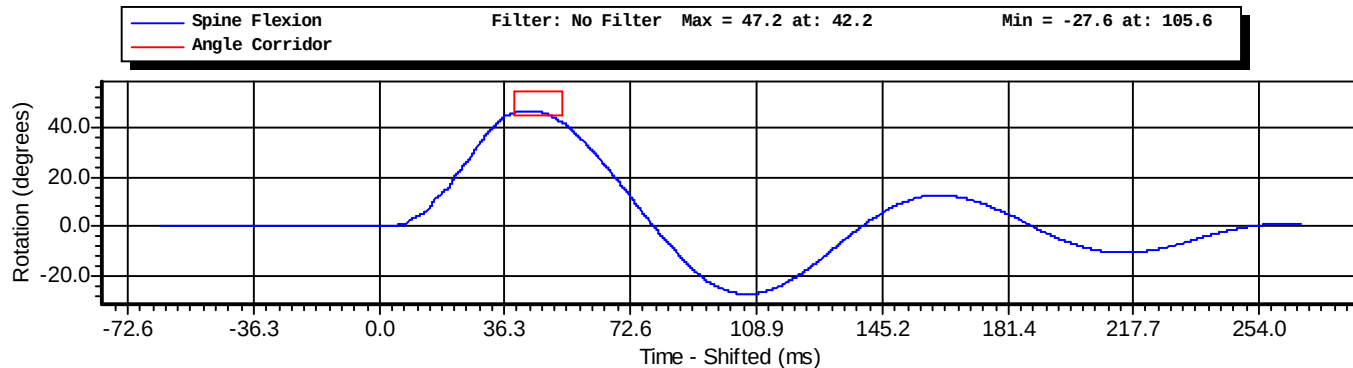
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Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Spine Flexion	Test Date:	1/5/2011
Test Number:	1	Test Time:	8:27:38 PM

Pendulum Velocity



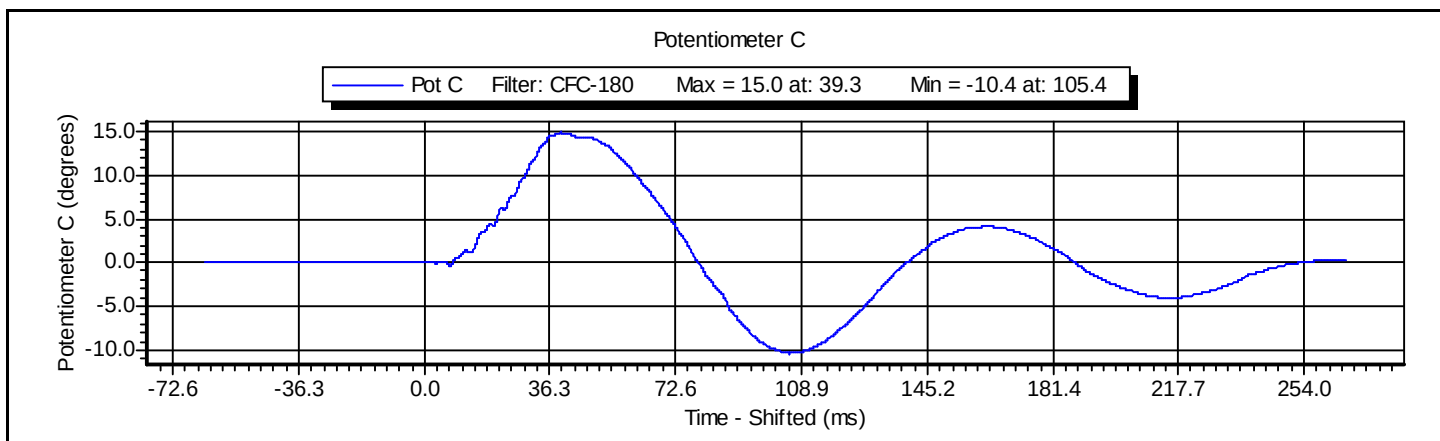
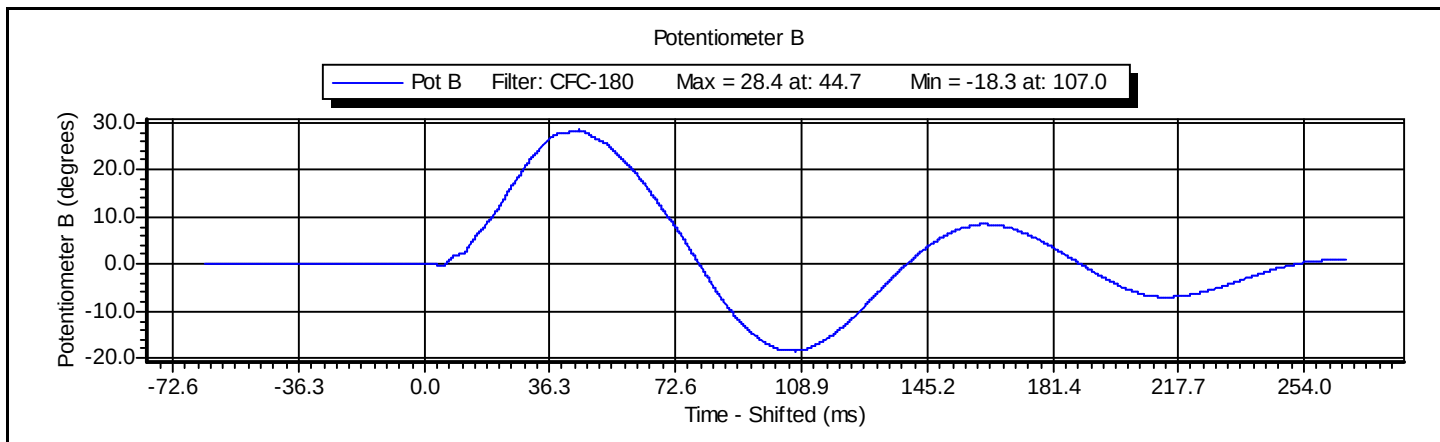
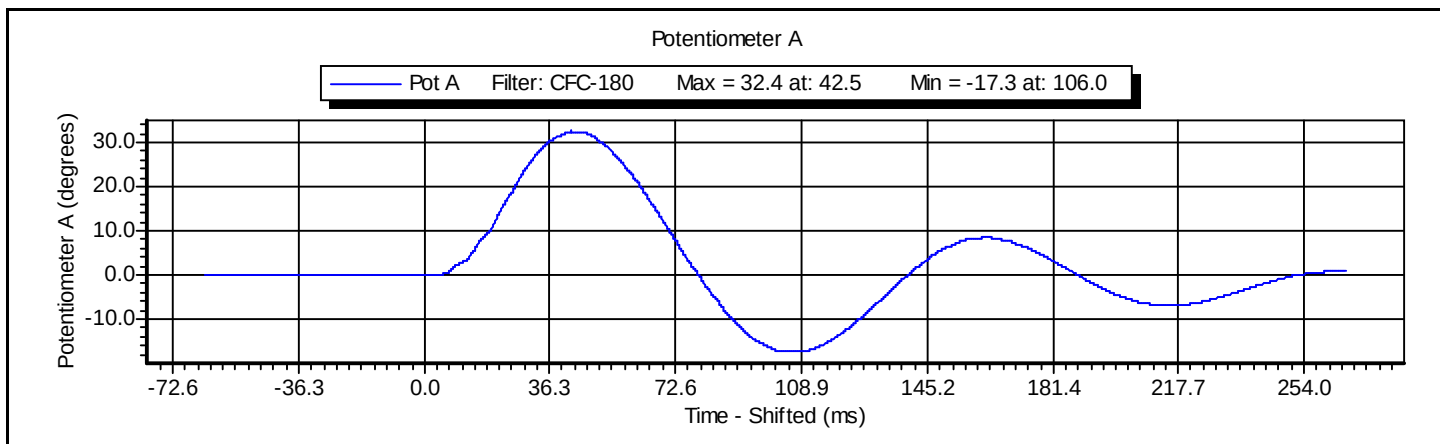
Spine Flexion Angle



Test ID: **Spine Flexion**

Test Time: **8:27:38 PM**

Test Date: **1/5/2011**





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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:	1/5/2011
Test Number:	1	Test Time:	4:00:30 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.1 deg C	P
Humidity	10	--	70	25 %RH	P
Velocity	4.20	--	4.40	4.38 m/s	P
Peak Pendulum Force	-5.40	--	-4.70	-5.24 kN	P
Time at Peak Pendulum Force	11.80	--	16.10	13.46 ms	P
Peak Pubic Symphysis Force	-1.59	--	-1.23	-1.36 kN	P
Time at Peak Pubic Symphysis Force	12.20	--	17.00	14.56 ms	P

All test parameters are within specifications

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

Test ID: **Pelvis**

Test Time: **4:00:30 PM**

Test Date: **1/5/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Pelvis**

Test Time: **4:00:30 PM**

Test Date: **1/5/2011**



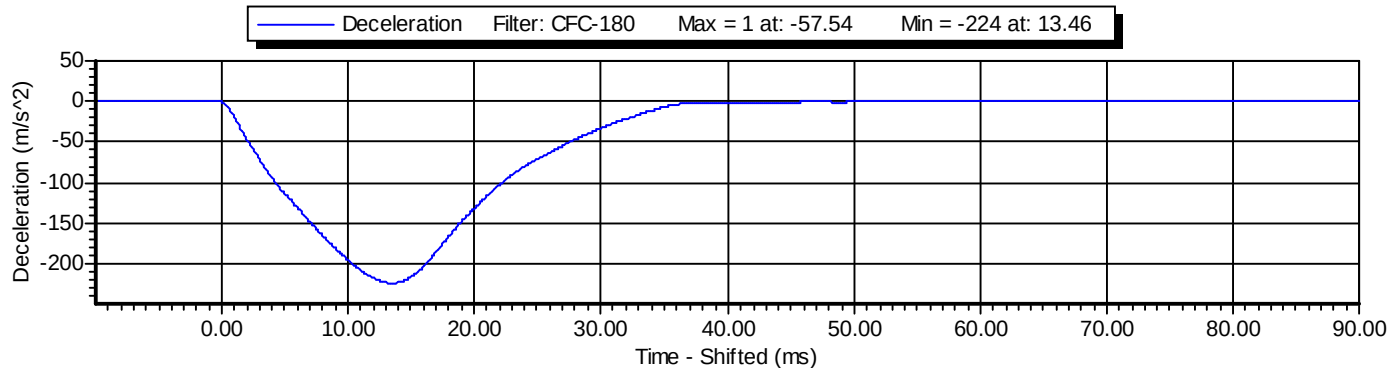
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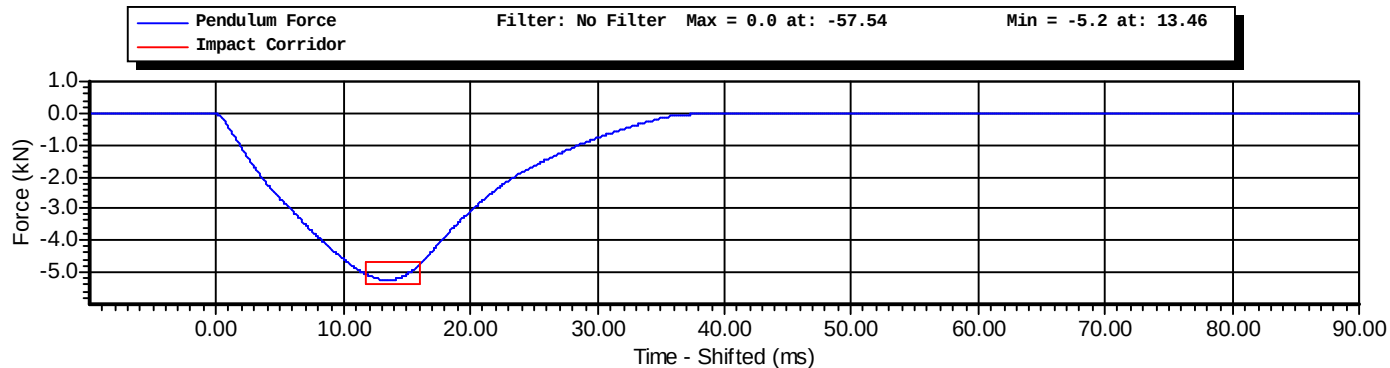
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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	1/5/2011
Test Number:	1	Test Time:	4:00:30 PM

Pendulum Accelerometer



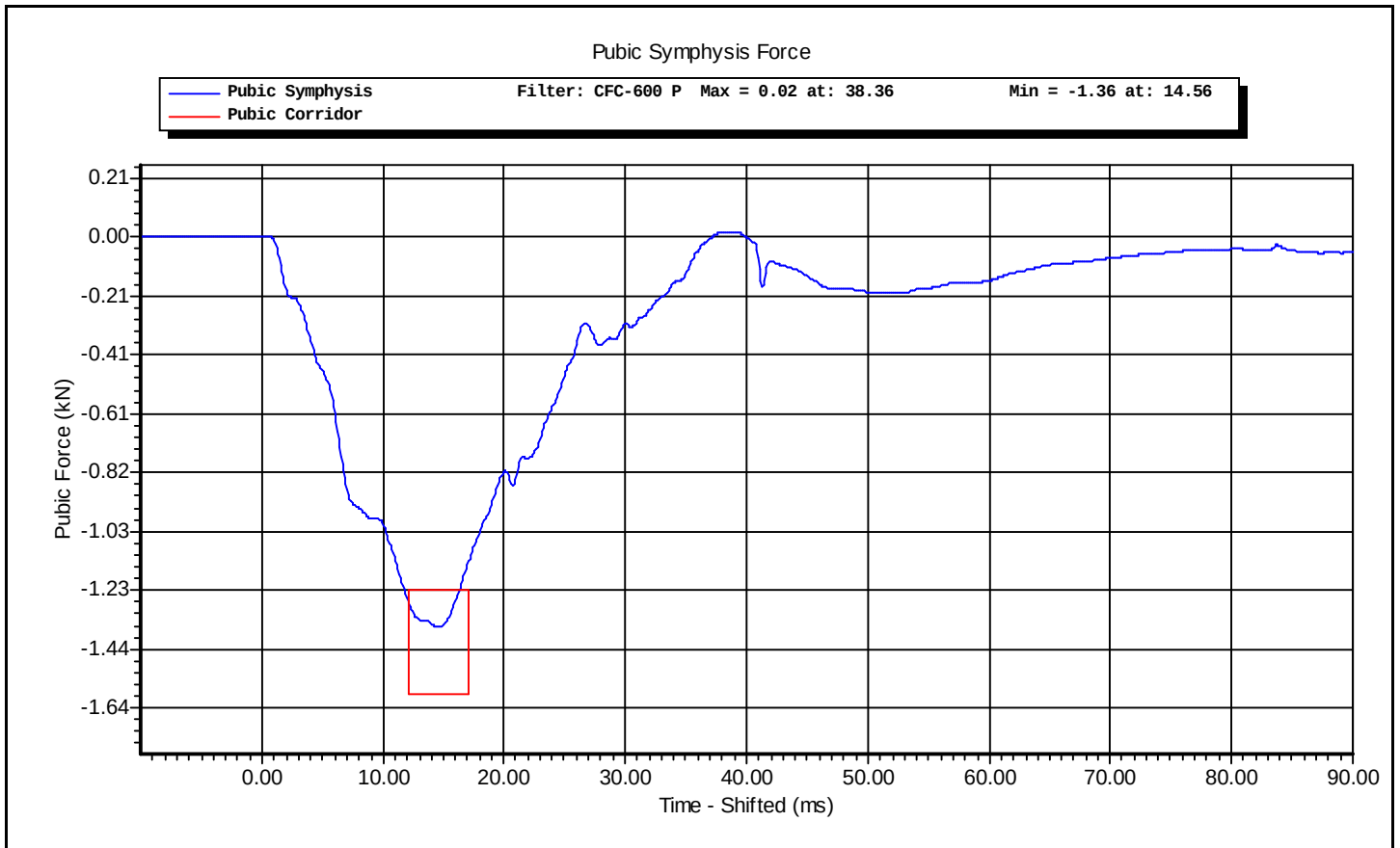
Pendulum Force



Test ID: **Pelvis**

Test Time: **4:00:30 PM**

Test Date: **1/5/2011**



CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

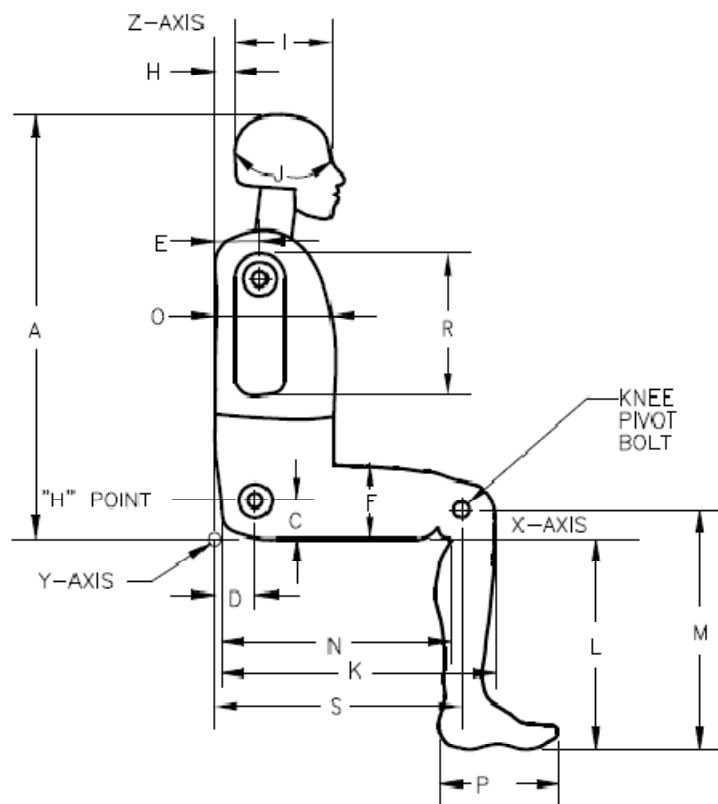
NHTSA ATD S/N 300

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	779	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	83	Yes
D	H-Point from Seat Back	141.0 - 151.0	143	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	98	Yes
F	Thigh Clearance	119.0 - 135.0	122	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	43	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	525	Yes
L	Popliteal Height	343.0 - 369.0	352	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	397	Yes
N	Buttock Popliteal Length	416.0 - 442.0	433	Yes
O	Chest Depth without Jacket	195.0 - 211.0	204	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	315	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to Seat back	478.0 - 493.0	483	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	349	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	866	Yes
Z	Waist Circumference	761.0 - 791.0	777	Yes

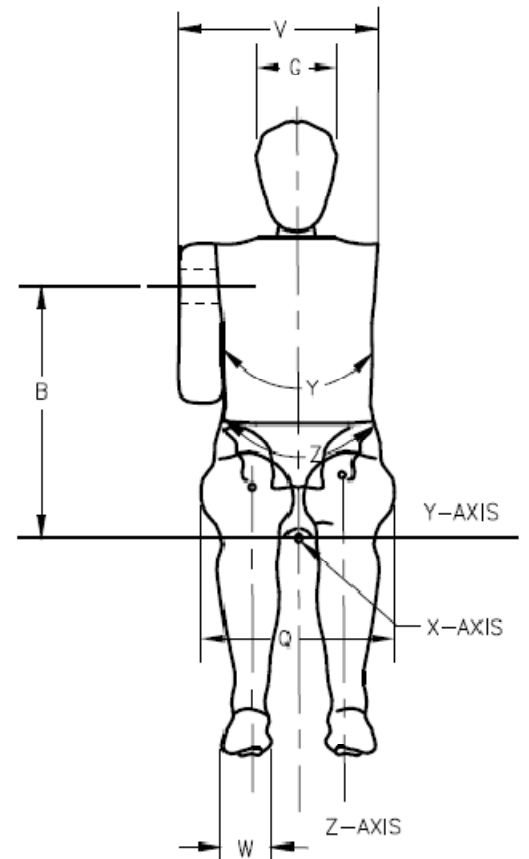
Technician: AR

Date: 12/22/2010

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:	12/22/2010
Test Number:	1	Test Time:	11:47:20 AM

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	25 %RH P
Resultant Acceleration	115.0 -- 137.0	130.0 g P
Oscillation	0.0 -- 15.0	2.3 % P
Fore-Aft Acceleration	-15.0 -- 15.0	-7.0 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **11:47:20 AM**

Test Date: **12/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66926	10/25/2010
Endevco	7264-2000	P66931	10/25/2010
Endevco	7264-2000	P66943	10/25/2010

Test ID: **Head Drop**

Test Time: **11:47:20 AM**

Test Date: **12/22/2010**

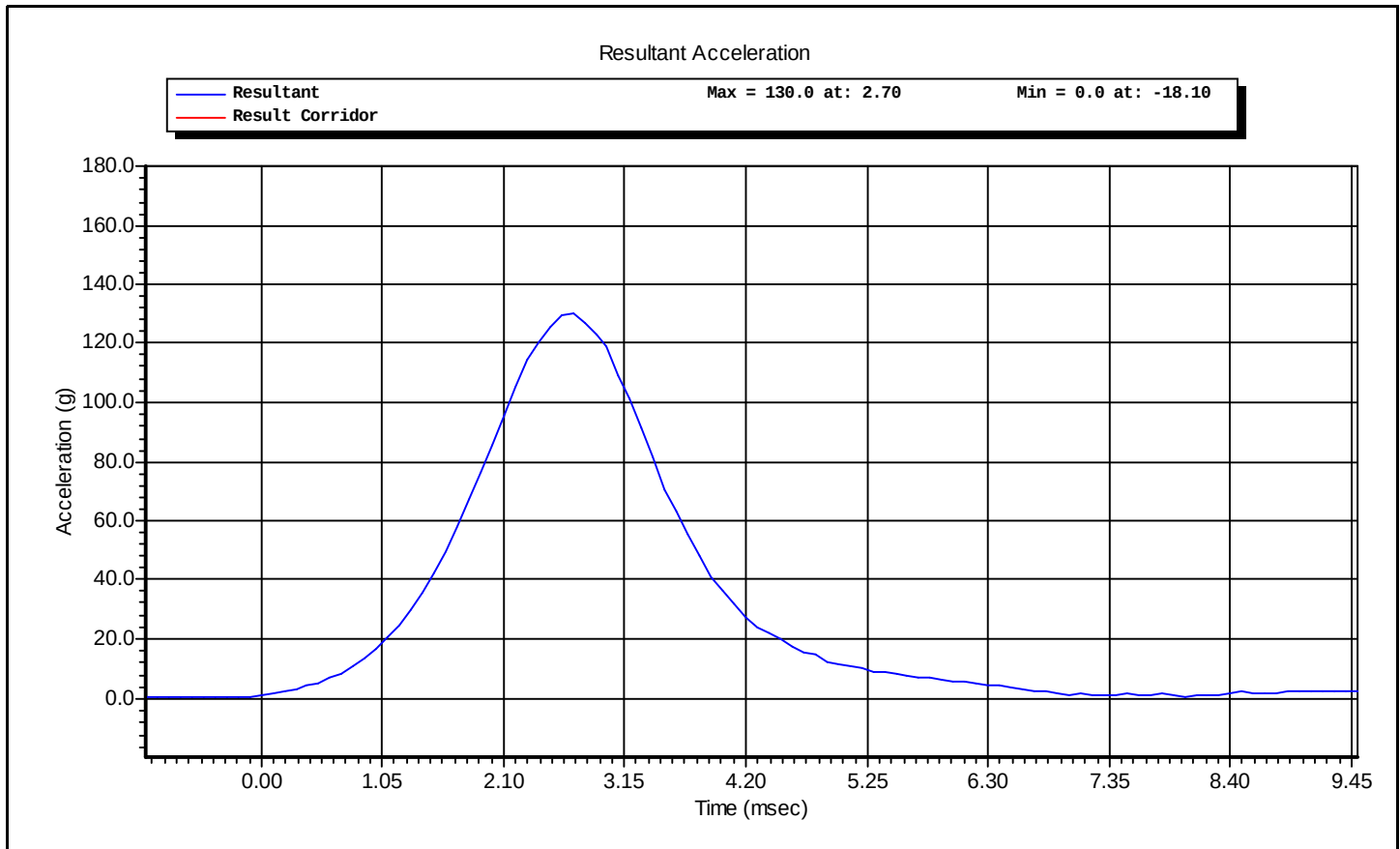


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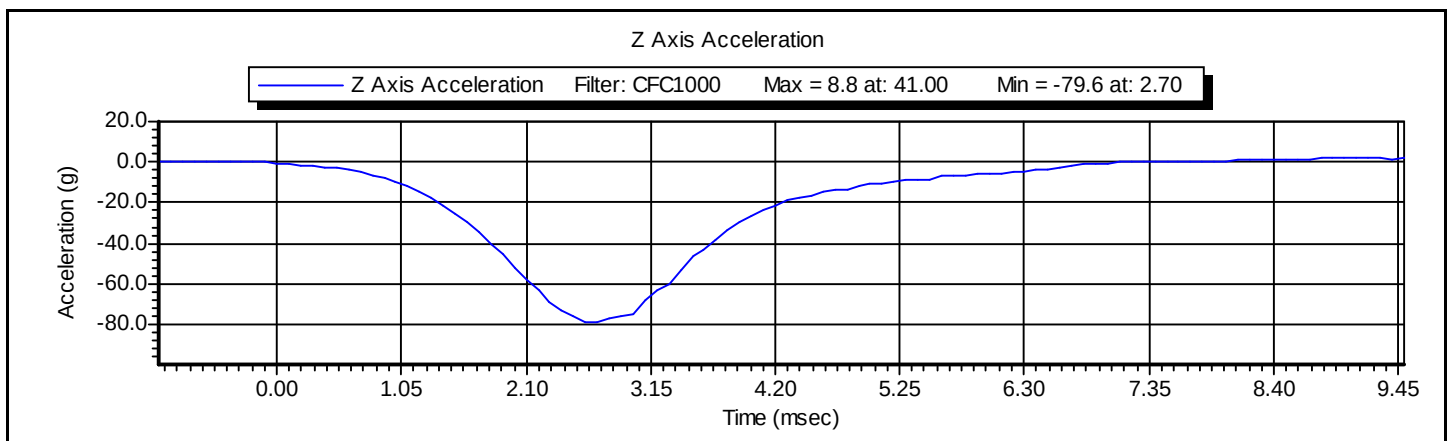
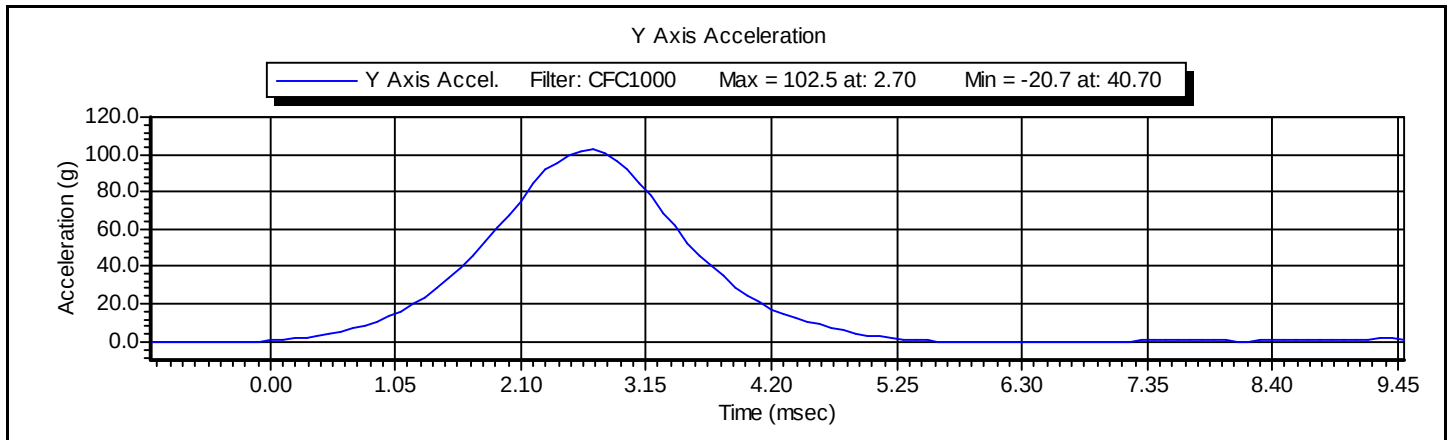
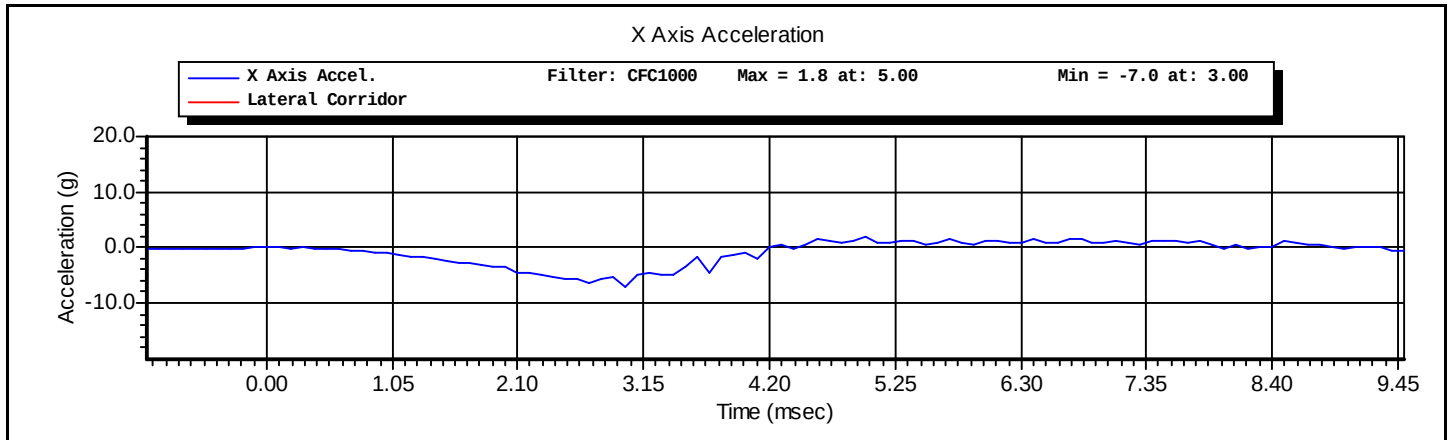
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	12/22/2010
Test Number:	1	Test Time:	11:47:20 AM



Test ID: **Head Drop**

Test Time: **11:47:20 AM**

Test Date: **12/22/2010**





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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:	12/22/2010
Test Number:	1	Test Time:	4:15:32 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	25 %RH P
Velocity	5.51 -- 5.63	5.55 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.26 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.35 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.54 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.44 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.84 m/s P
Max D Plane Rotation	71.0 -- 81.0	73.5 degrees P
Time at Max Rotation	50.0 -- 70.0	62.4 ms P
Moment about OC	-44.0 -- -36.0	-38.2 Nm P
Moment Decay to Zero	102.0 -- 126.0	116.0 ms P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **4:15:32 PM**

Test Date: **12/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
Denton	1716A	LC-576 Fy	2/15/2010
Denton	1716A	LC-576 Mx	2/15/2010
DentonATD	78051-342	184	4/30/2010
DentonATD	78051-342	174	4/30/2010
DentonATD	78051-342	185	4/30/2010

Test ID: **Neck Flexion**

Test Time: **4:15:32 PM**

Test Date: **12/22/2010**



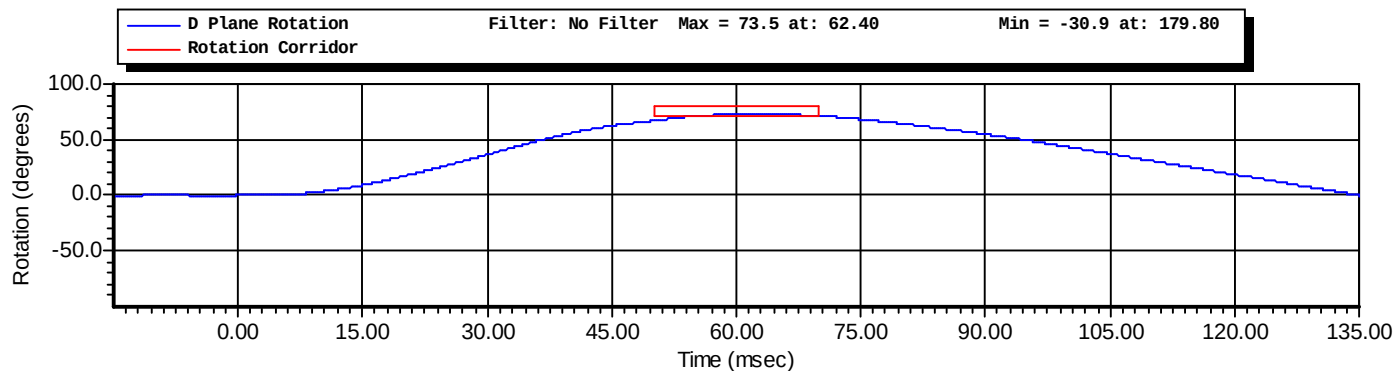
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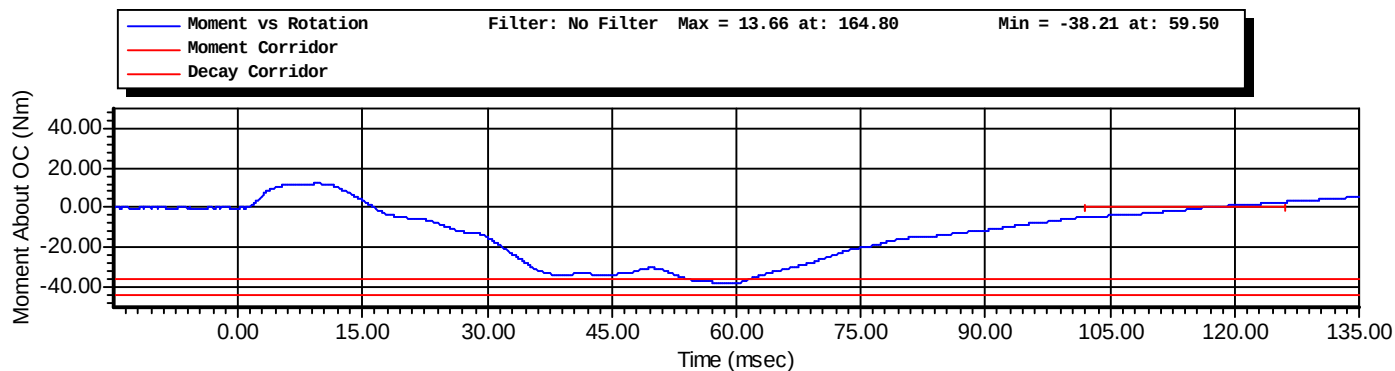
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	12/22/2010
Test Number:	1	Test Time:	4:15:32 PM

D Plane Rotation



Moment About Occipital Condyle

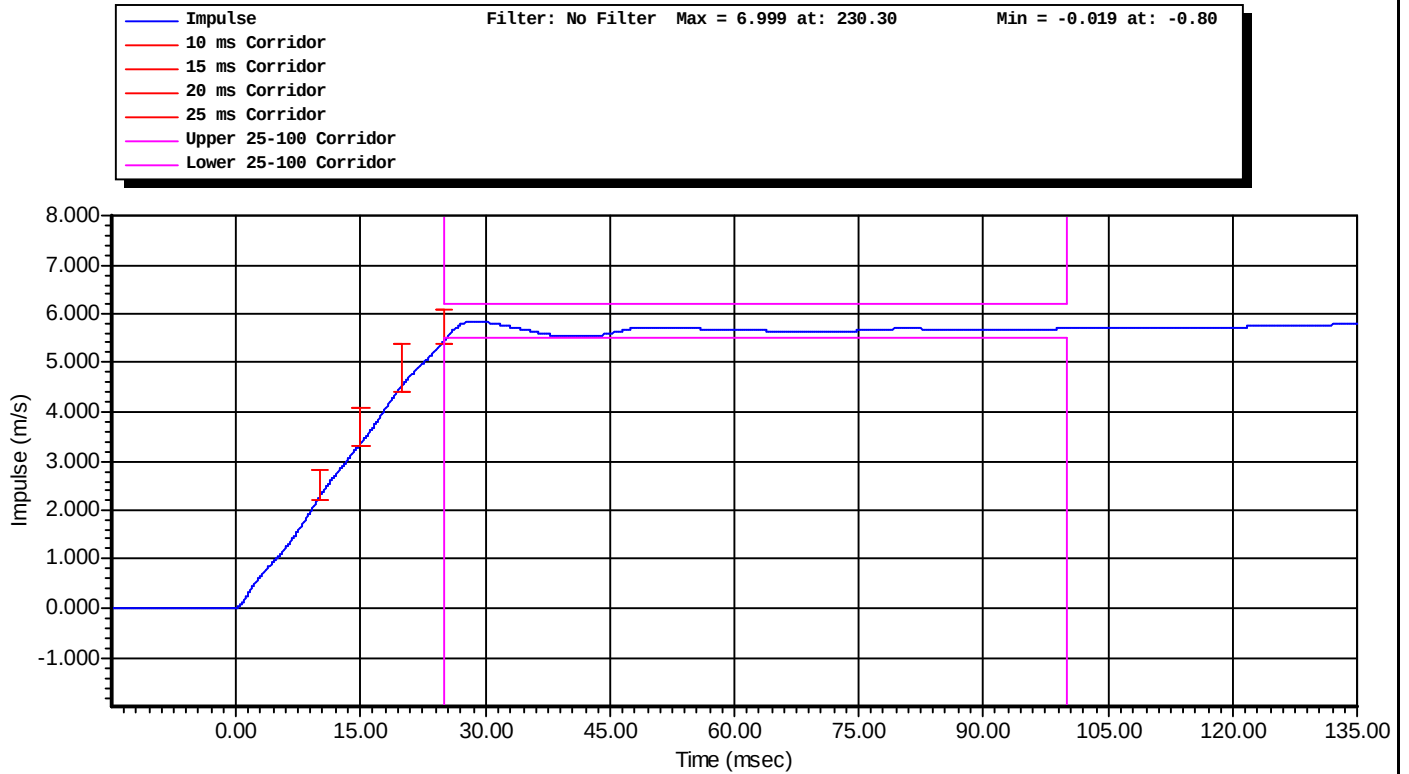


Test ID: Neck Flexion

Test Time: 4:15:32 PM

Test Date: 12/22/2010

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:	12/22/2010
Test Number:	1	Test Time:	7:18:24 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	4.20 -- 4.40	4.34 m/s P
Probe Acceleration	13.0 -- 18.0	16.6 g P
Shoulder Deflection	28.0 -- 37.0	33.0 mm P
T1 Acceleration	17.0 -- 22.0	19.9 g P

All test parameters are within specifications

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

Test ID: **Shoulder**

Test Time: **7:18:24 PM**

Test Date: **12/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Servo	180-3885	DS-1063	4/7/2010
Endevco	7264-2000	P58884	10/19/2010

Test ID: **Shoulder**

Test Time: **7:18:24 PM**

Test Date: **12/22/2010**

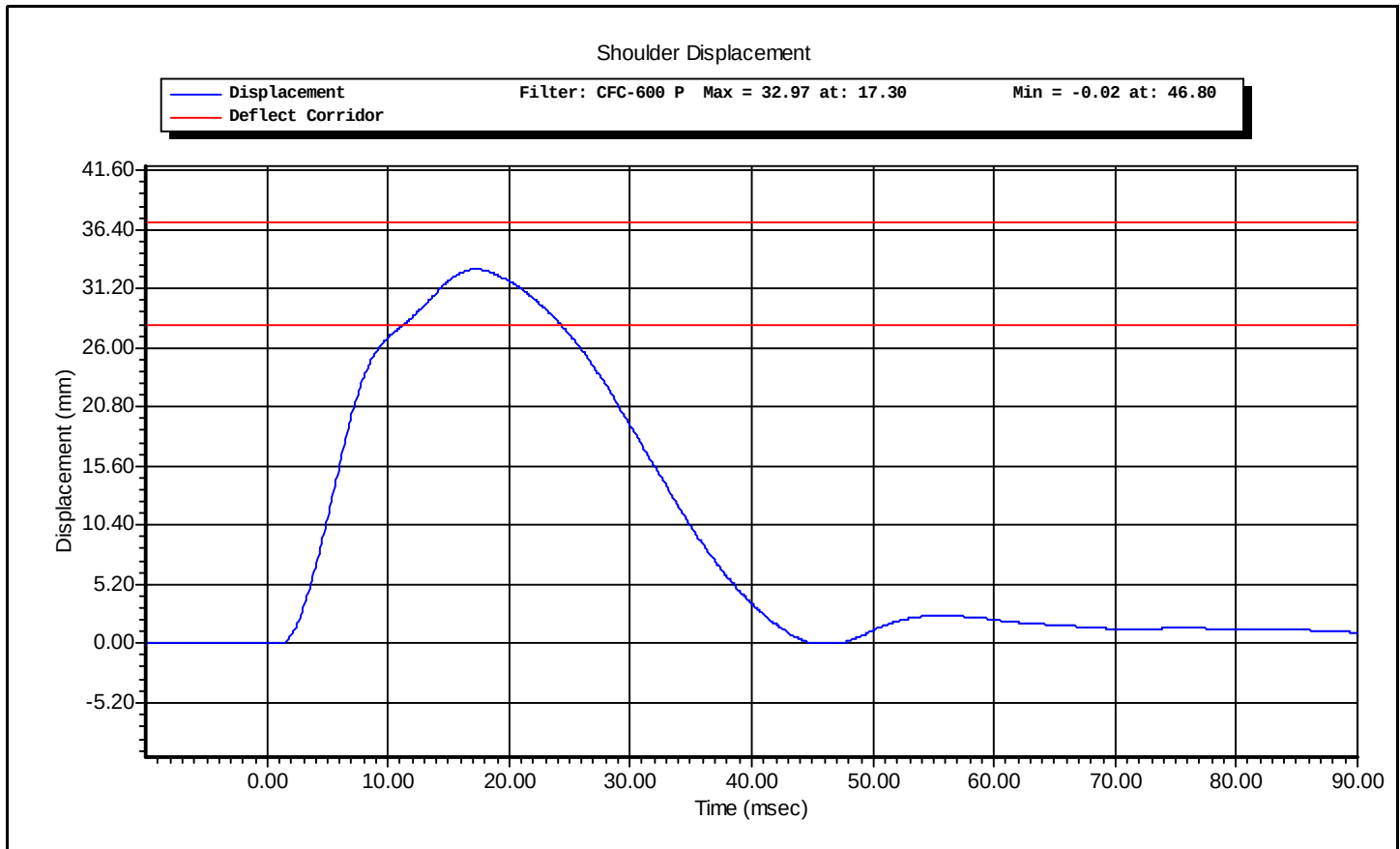


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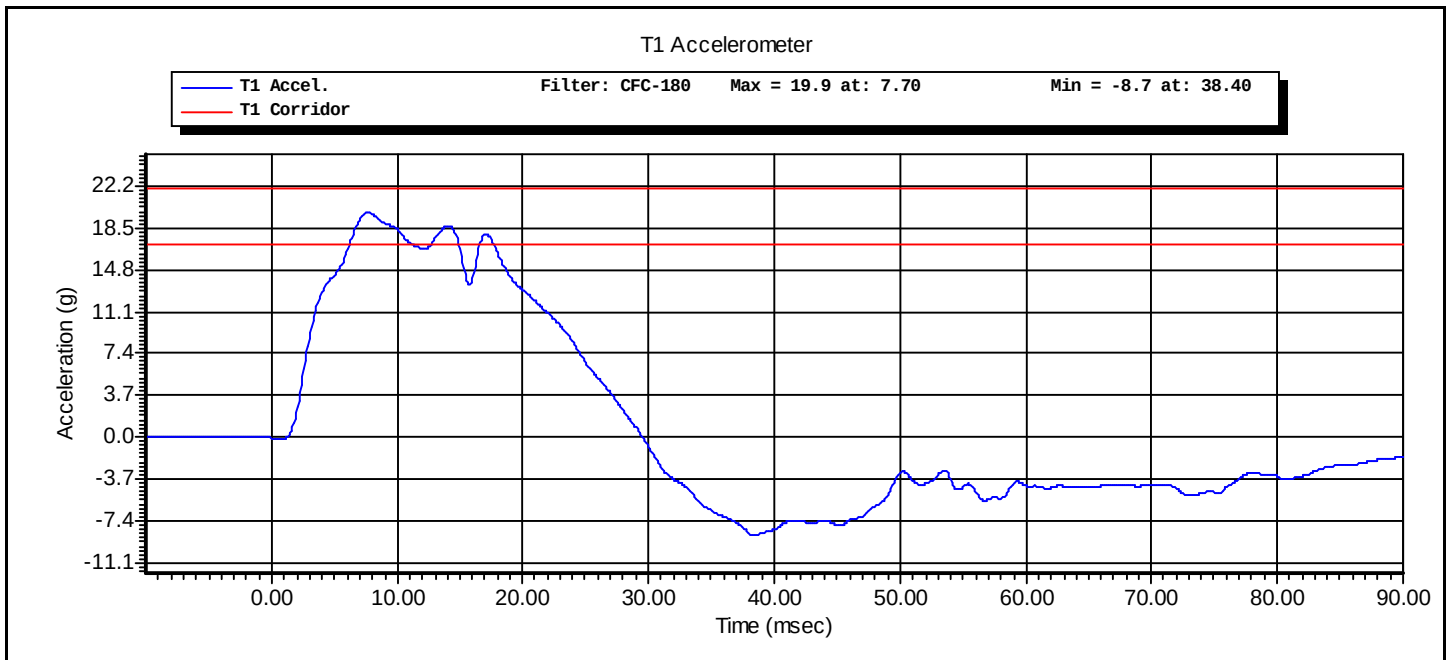
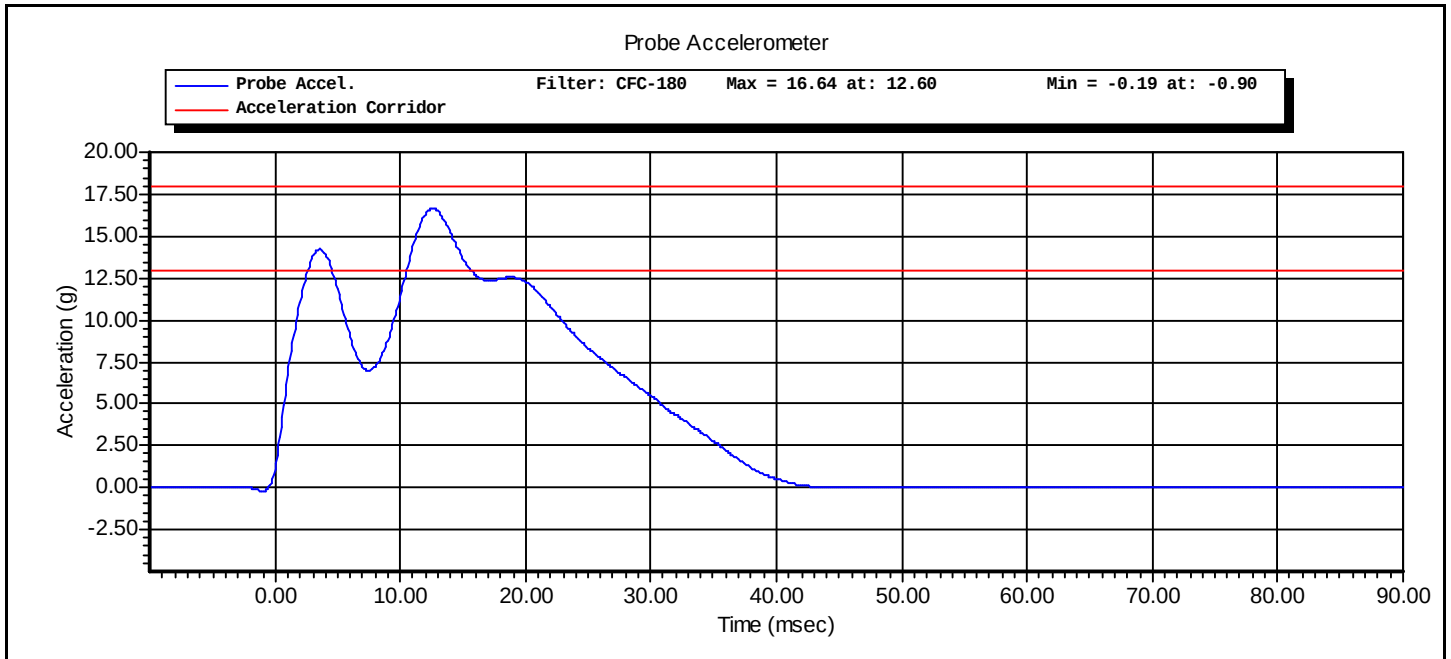
Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	12/22/2010
Test Number:	1	Test Time:	7:18:24 PM



Test ID: **Shoulder**

Test Time: **7:18:24 PM**

Test Date: **12/22/2010**





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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:	12/22/2010
Test Number:	1	Test Time:	8:01:57 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	28 %RH	P
Velocity	4.20	--	4.40	4.35 m/s	P
Probe Acceleration	14.0	--	18.0	16.0 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	34.8 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	41.4 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	42.3 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	15.3 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: **8:01:57 PM**

Test Date: **12/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P58884	10/19/2010
Endevco	7264-2000	P64147	10/8/2010

Test ID: **Thorax Without Arm** Test Time: **8:01:57 PM**

Test Date: **12/22/2010**

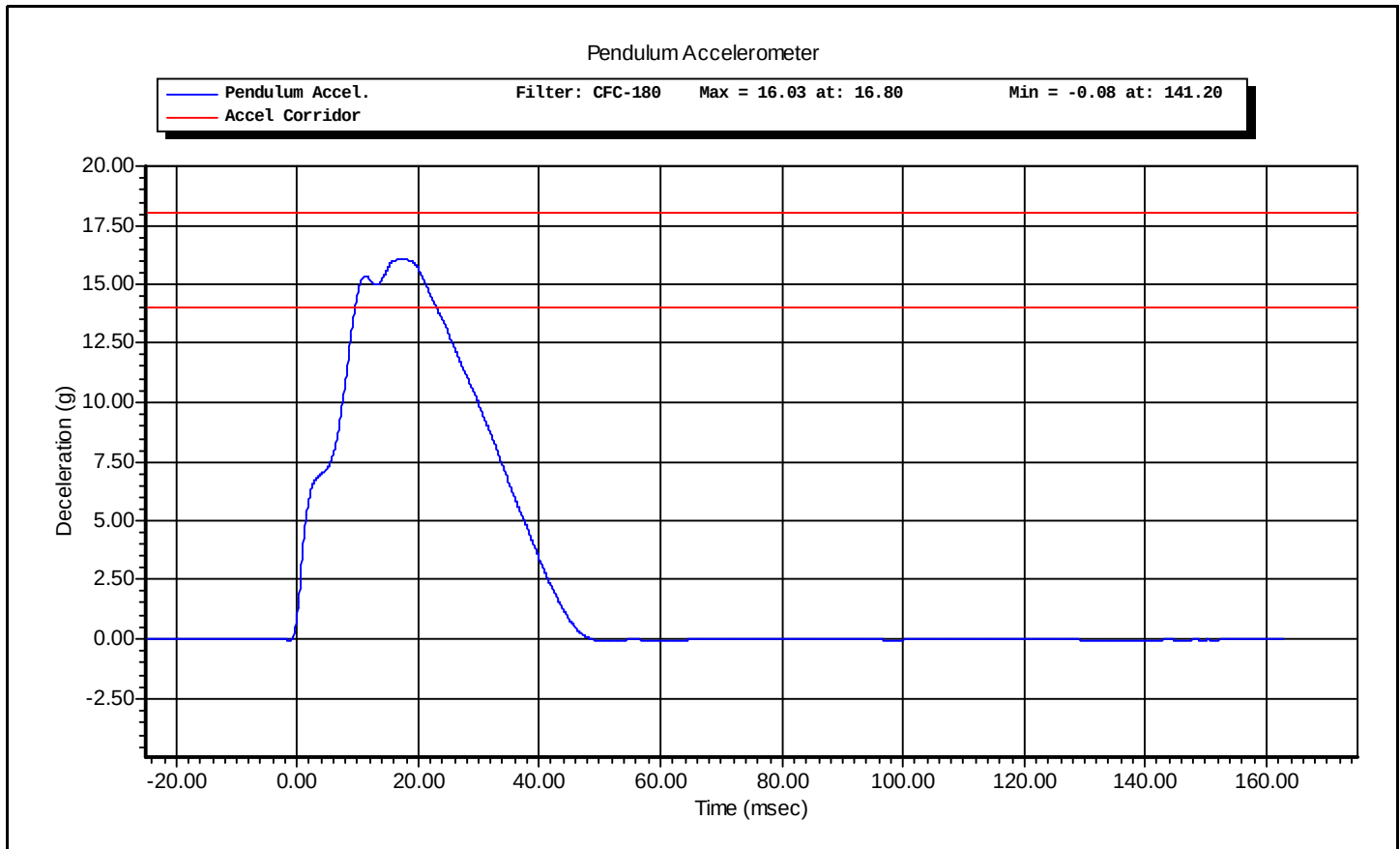


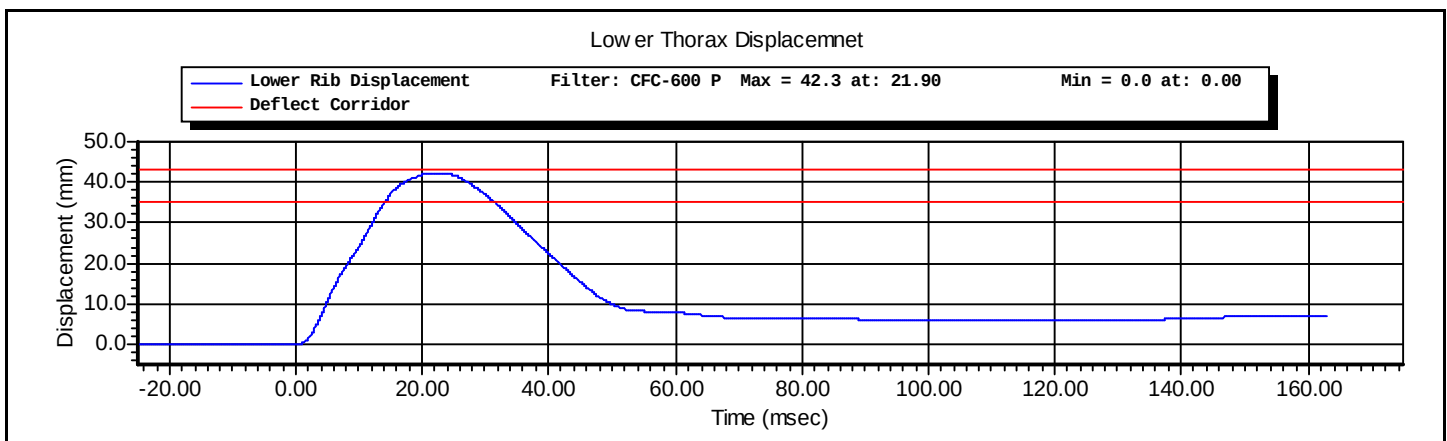
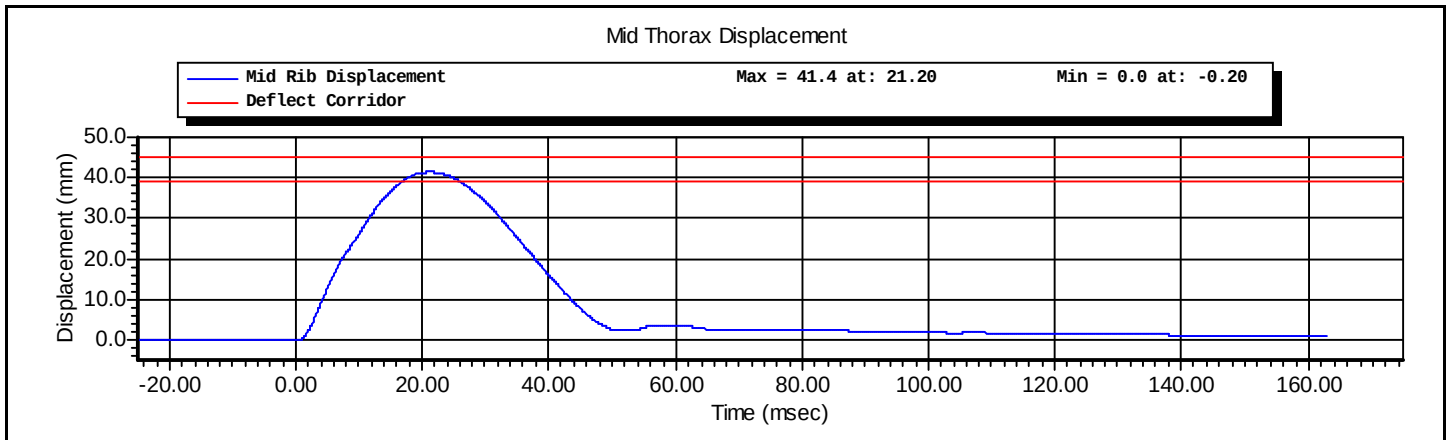
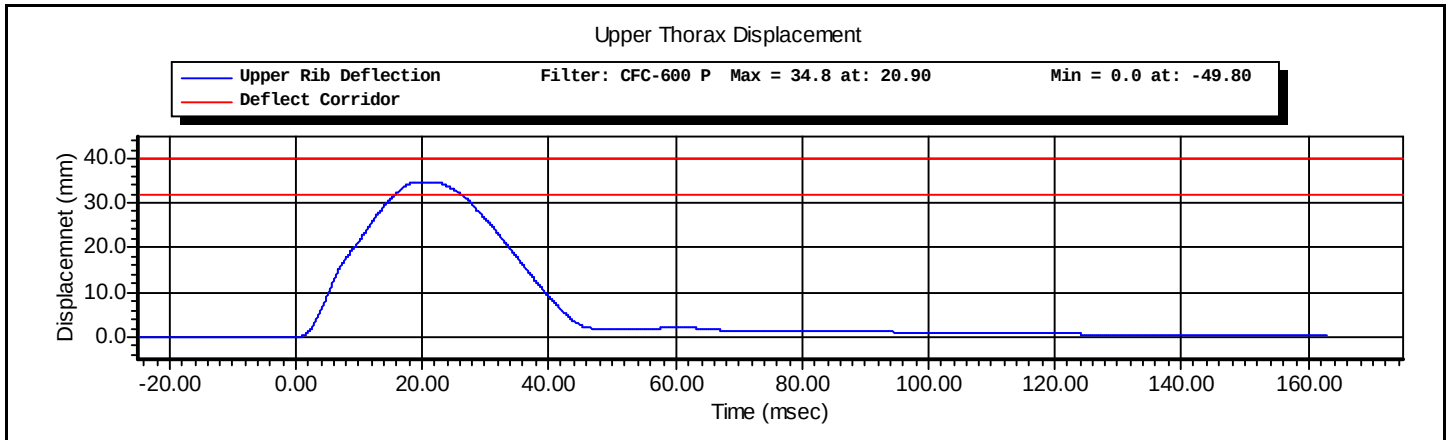
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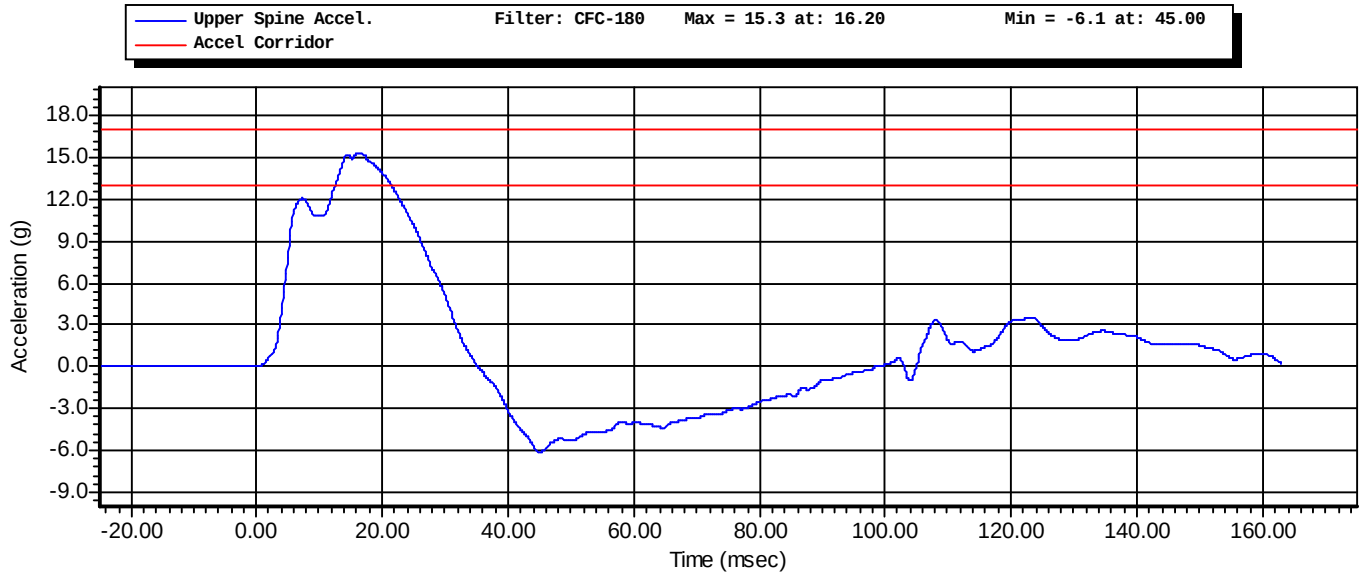
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	12/22/2010
Test Number:	1	Test Time:	8:01:57 PM

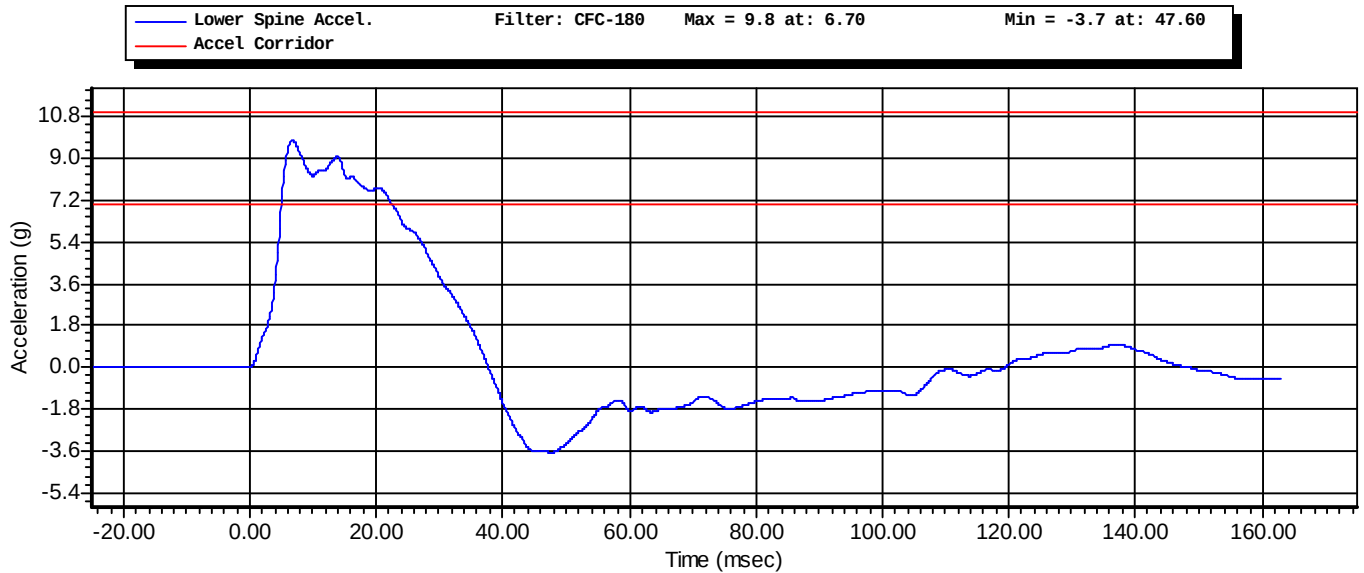




Upper Spine Acceleration



Lower Spine Acceleration





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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	12/22/2010
Test Number:	1	Test Time:	8:34:34 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	28 %RH	P
Velocity	6.60	--	6.80	6.65 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	33.0 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	27.2 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	31.8 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	33.9 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	38.5 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	33.6 g	P
Shoulder Deflection	31.0	--	40.0	36.3 mm	P

All test parameters are within specifications

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

Test ID: **Thorax With Arm** Test Time: **8:34:34 PM**

Test Date: **12/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P58884	10/19/2010
Endevco	7264-2000	P64147	10/8/2010
Servo	180-3885	DS-1063	4/7/2010

Test ID: **Thorax With Arm** Test Time: **8:34:34 PM**

Test Date: **12/22/2010**



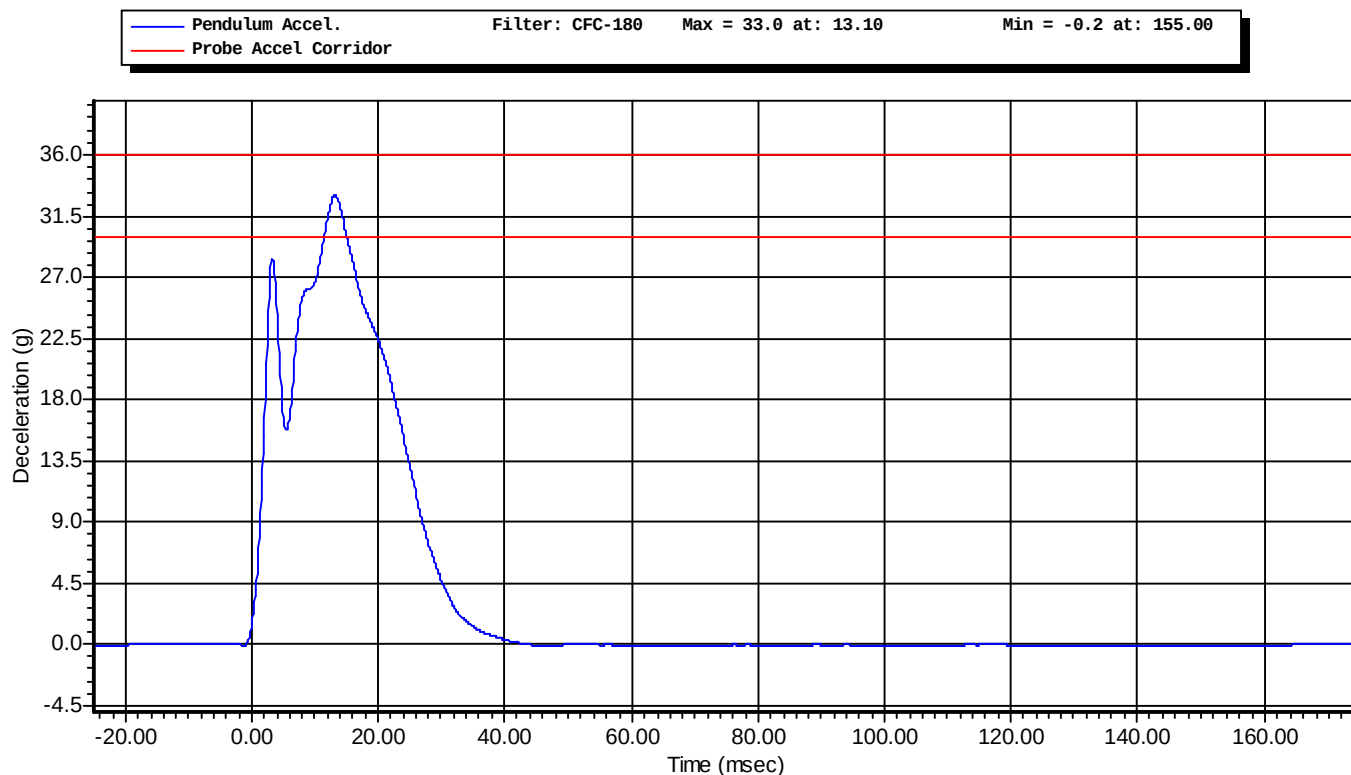
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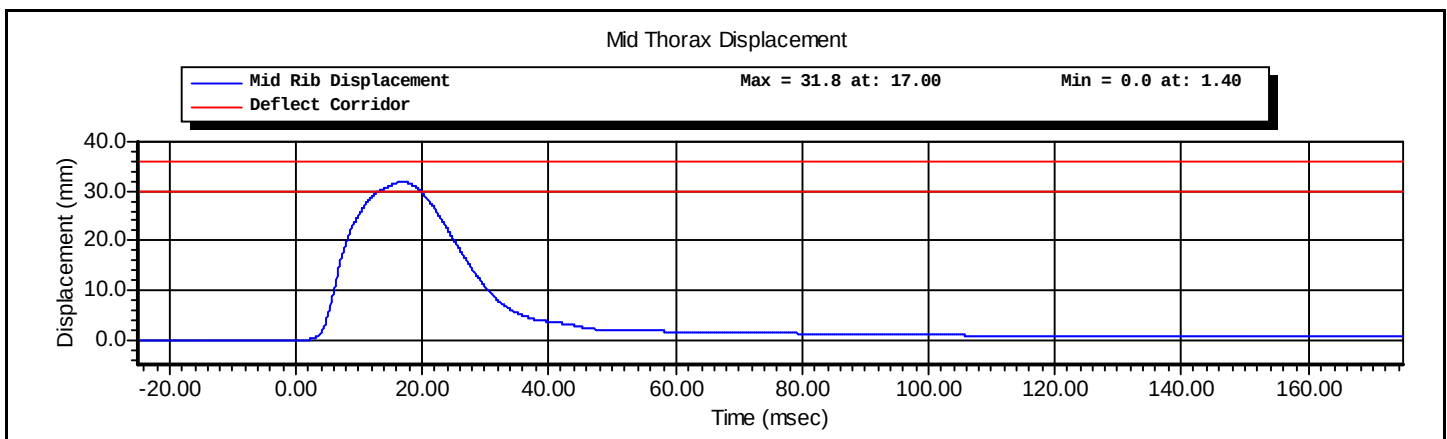
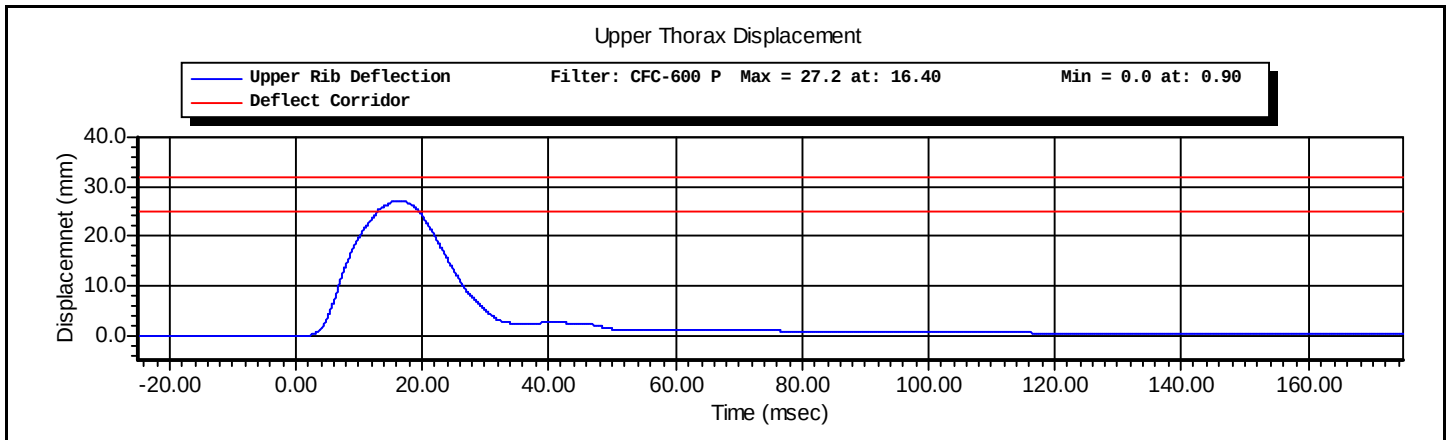
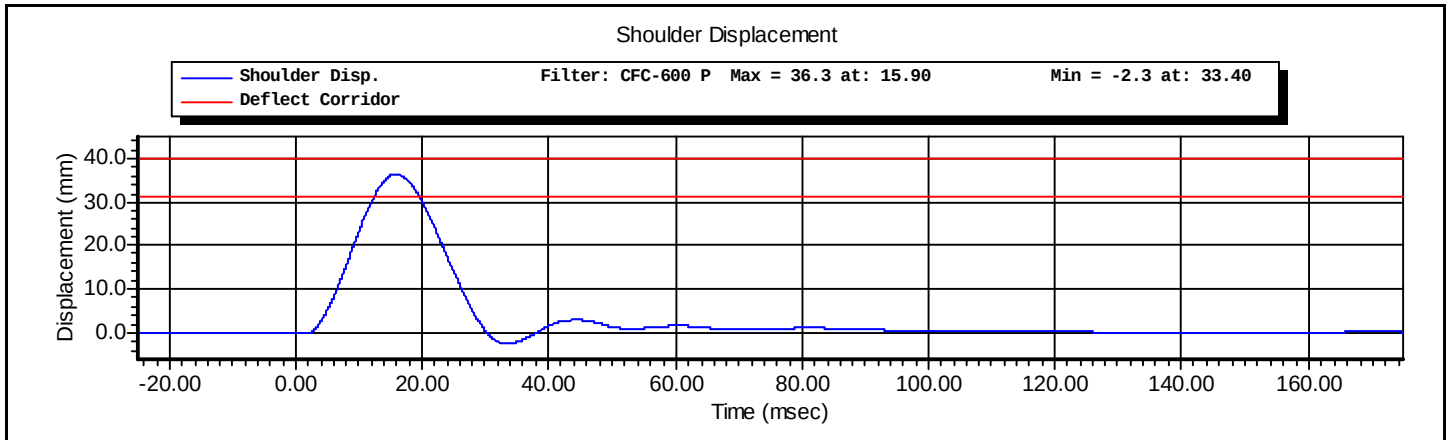
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	12/22/2010
Test Number:	1	Test Time:	8:34:34 PM

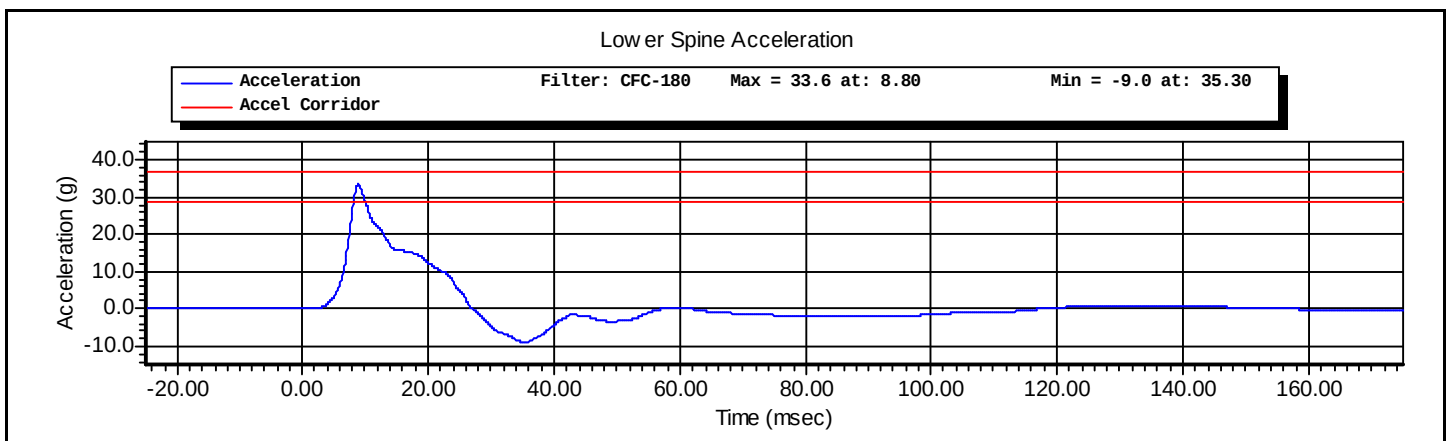
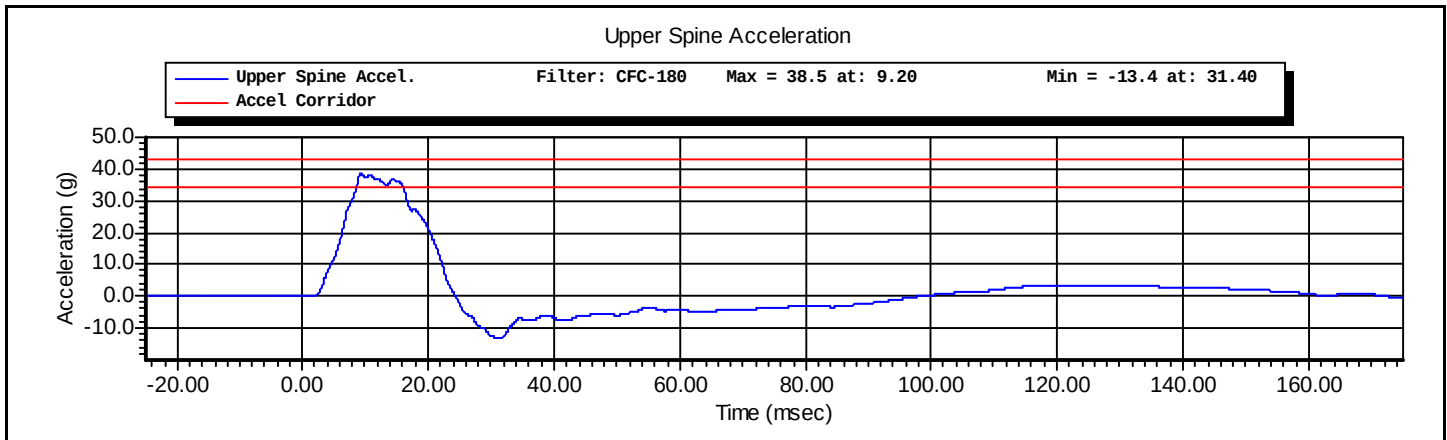
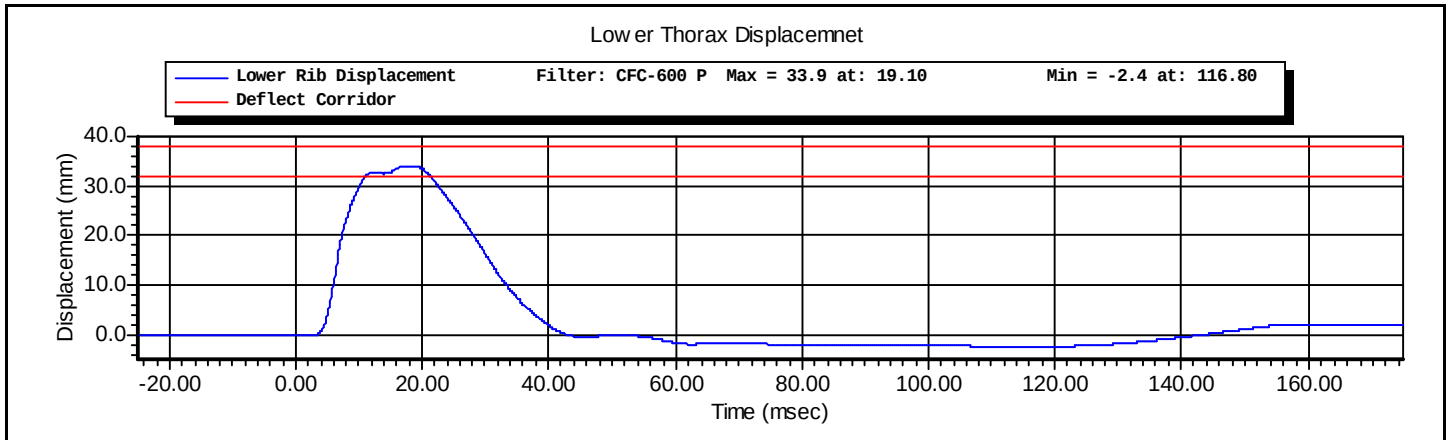
Pendulum Accelerometer



Test ID: Thorax With Arm Test Time: 8:34:34 PM

Test Date: 12/22/2010







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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	12/22/2010
Test Number:	1	Test Time:	6:05:13 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	28 %RH	P
Velocity	4.20	--	4.40	4.34 m/s	P
Probe Acceleration	12.0	--	16.0	15.4 g	P
Upper Abdominal Rib Deflection	36.0	--	47.0	39.4 mm	P
Lower Abdominal Rib Deflection	33.0	--	44.0	35.7 mm	P
Lower Spine Acceleration - T12	9.0	--	14.0	11.8 g	P

All test parameters are within specifications

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

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

Test ID: **Abdomen**

Test Time: **6:05:13 PM**

Test Date: **12/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Servo	180-3885	DS-1162	4/7/2010
Servo	180-3885	DS-1622	9/24/2010
Endevco	7264-2000	P64147	10/8/2010

Test ID: **Abdomen**

Test Time: **6:05:13 PM**

Test Date: **12/22/2010**



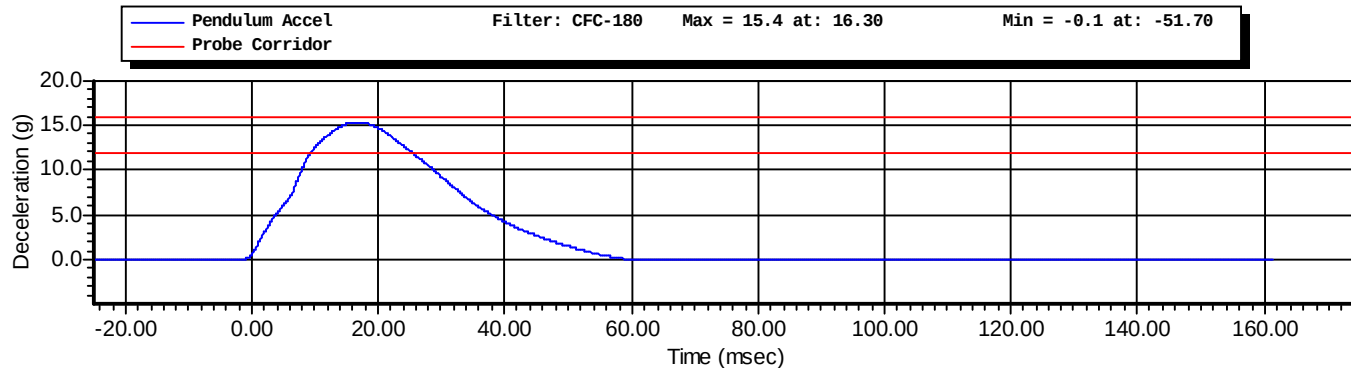
www.calspan.com

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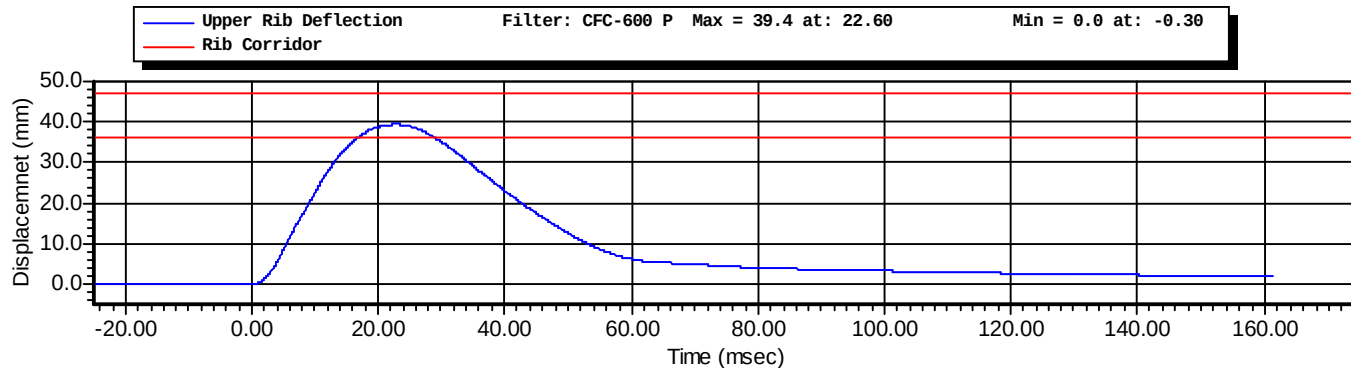
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	12/22/2010
Test Number:	1	Test Time:	6:05:13 PM

Pendulum Accelerometer



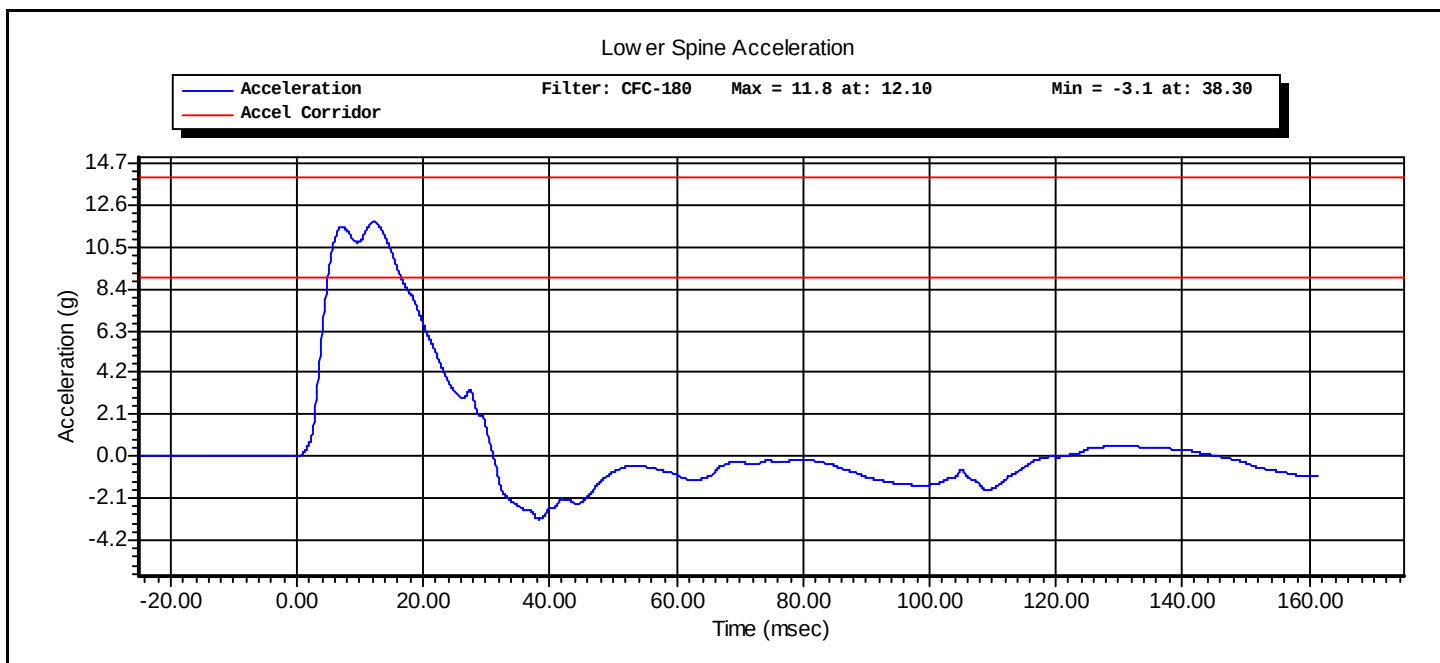
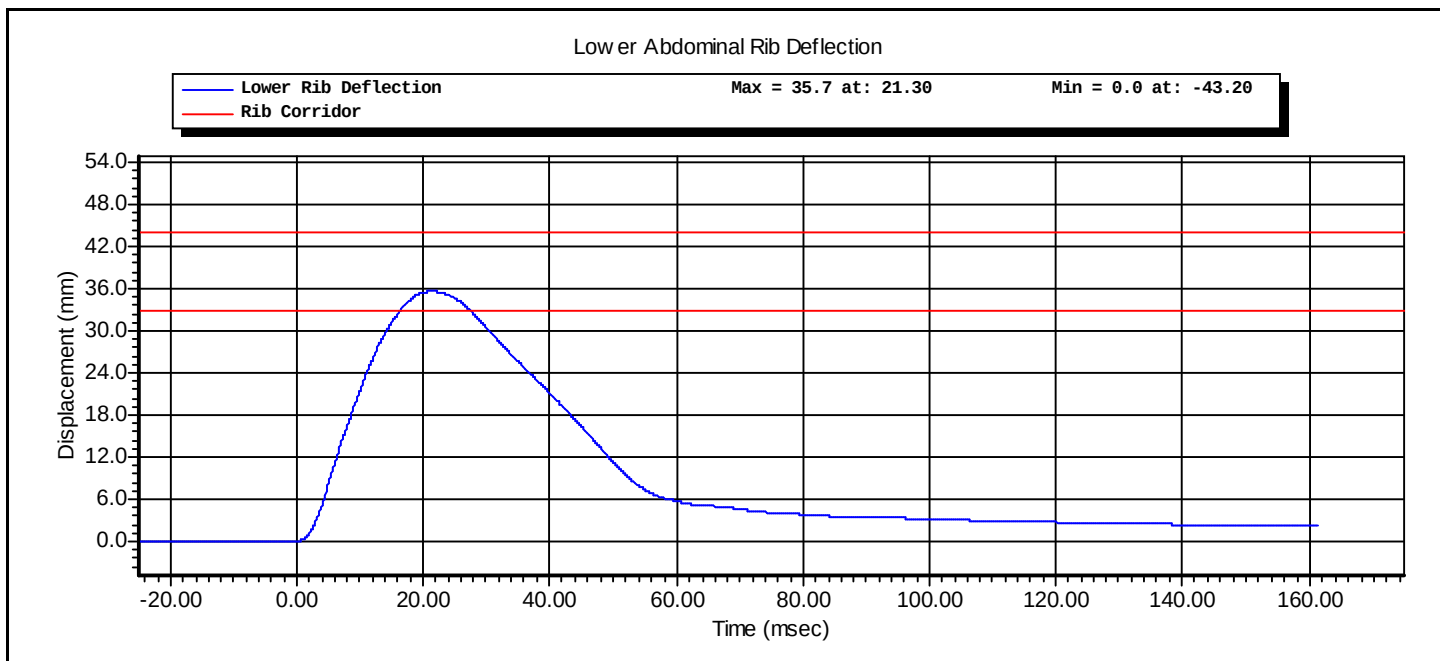
Upper Abdominal Rib Deflection



Test ID: **Abdomen**

Test Time: **6:05:13 PM**

Test Date: **12/22/2010**





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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:	Pelvis Iliac	Test Date:	12/23/2010
Test Number:	1	Test Time:	9:01:23 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10 -- 70	31 %RH P
Velocity	4.20 -- 4.40	4.38 m/s P
Peak Probe Acceleration	36.0 -- 45.0	40.0 g P
Peak Pelvis Acceleration	28.0 -- 39.0	31.7 g P
Peak Iliac Force	4.10 -- 5.10	4.30 kN P

All test parameters are within specifications

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

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

Test ID: **Pelvis Iliac**

Test Time: **9:01:23 AM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Endevco	7264-2000	P51671	12/13/2010
DentonATD	3228J	LC-279 Fy	4/12/2010

Test ID: **Pelvis Iliac**

Test Time: **9:01:23 AM**

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

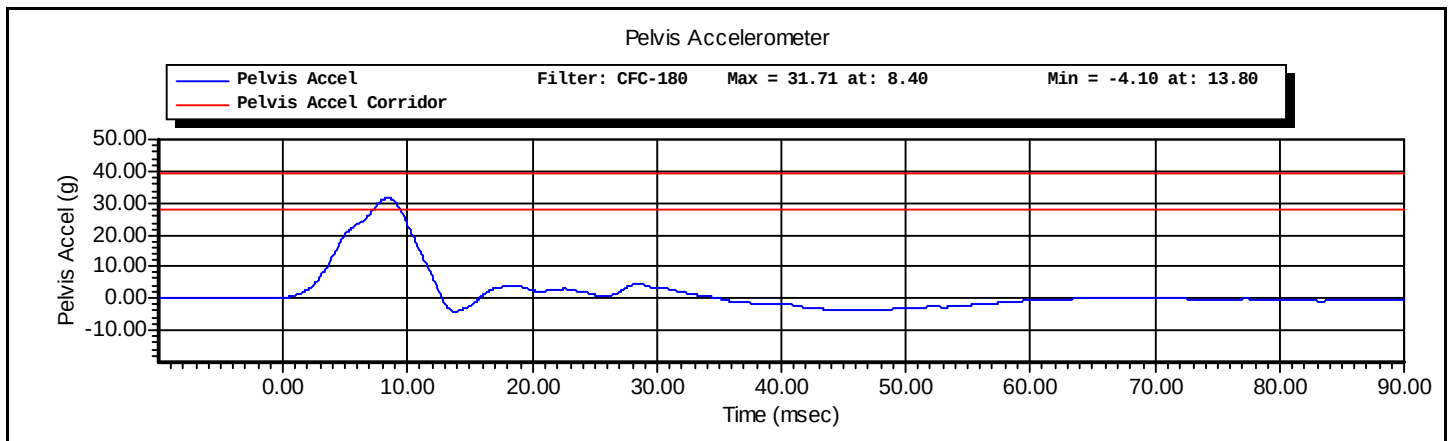
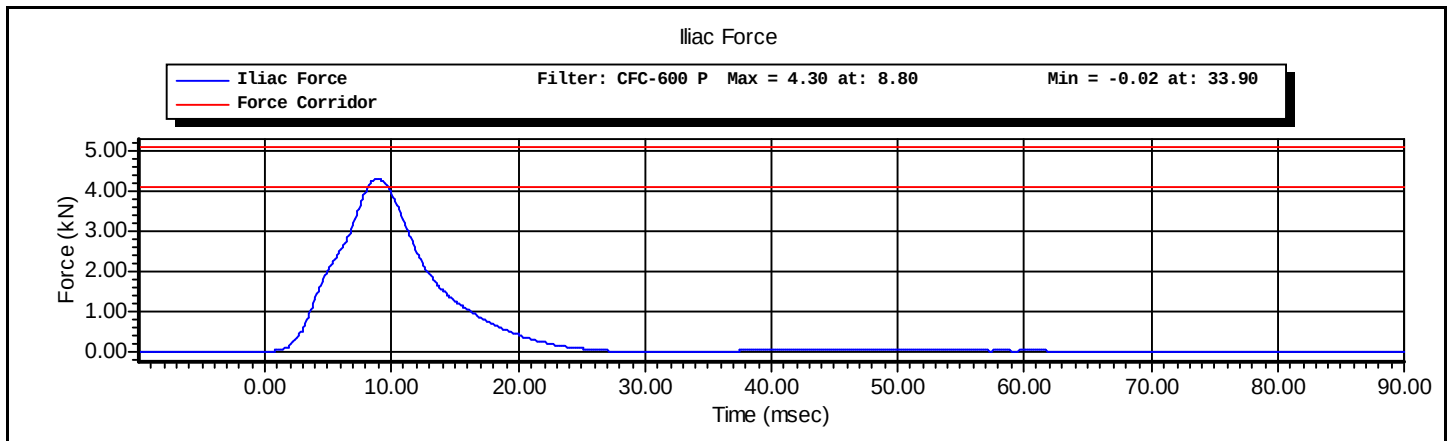


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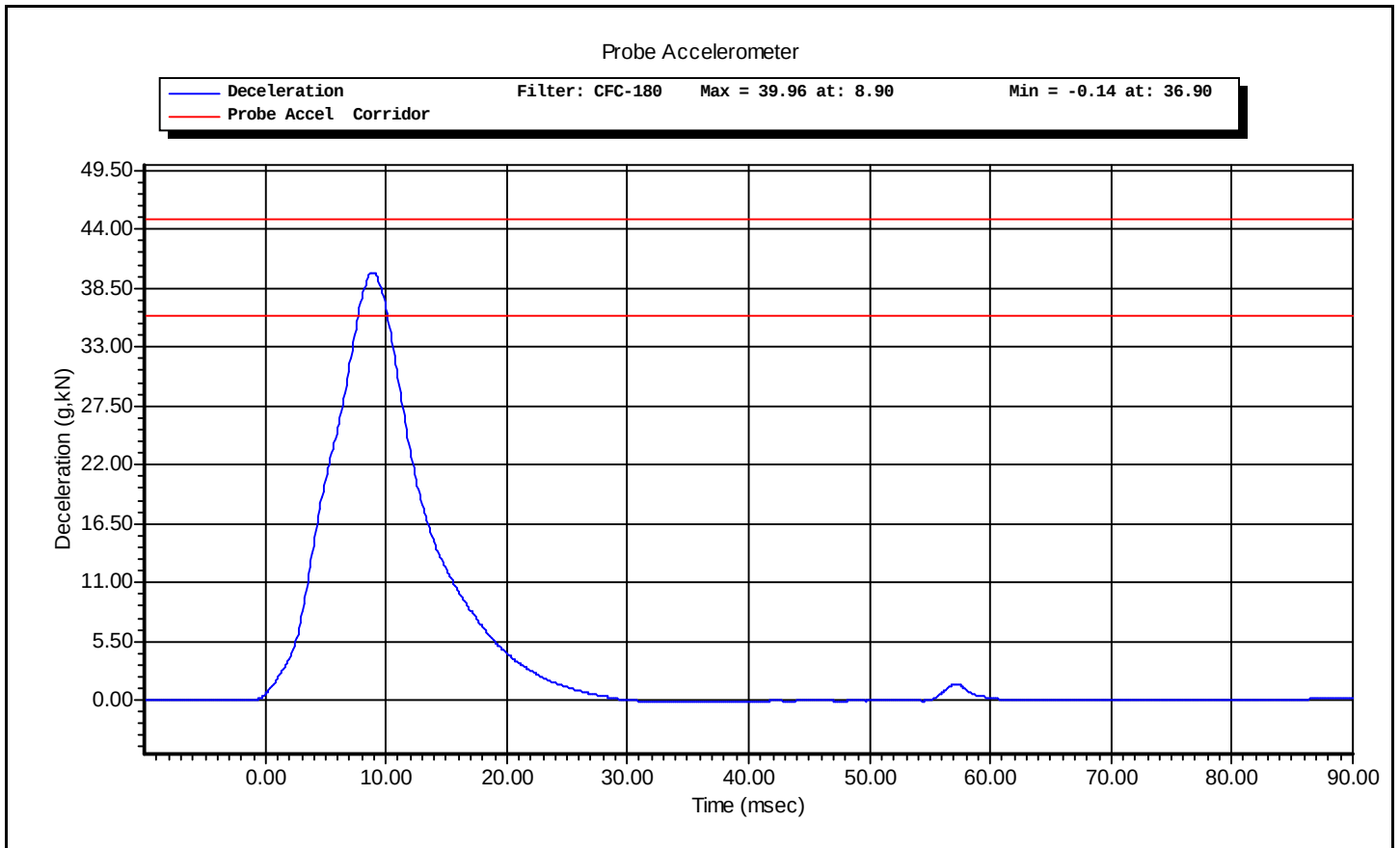
Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Iliac	Test Date:	12/23/2010
Test Number:	1	Test Time:	9:01:23 AM



Test ID: **Pelvis Iliac**

Test Time: **9:01:23 AM**

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





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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	12/22/2010
Test Number:	1	Test Time:	9:05:45 PM

Comments:

Pelvis Flesh SN 1034

Pelvis Plug Used For Certification:

FTSS S/N 14064

Force @ 3mm = 1615N

Pelvis Plug Used For Full Scale Test:

FTSS S/N 12173

Force @ 3mm = 1614N

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	30 %RH	P
Velocity	6.60	--	6.80	6.62 m/s	P
Peak Probe Acceleration	38.0	--	47.0	45.7 g	P
Peak Pelvis Acceleration	34.0	--	42.0	41.9 g	P
Peak Acetabulum Force	3.60	--	4.30	4.02 kN	P

All test parameters are within specifications

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

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

Test ID: **Pelvis Acetabulum** Test Time: **9:05:45 PM**

Test Date: **12/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Endevco	7264-2000	P51671	12/13/2010
DentonATD	3249J	LC-275a	4/12/2010
Endevco	7264-2000	P47300	12/13/2010

Test ID: **Pelvis Acetabulum** Test Time: **9:05:45 PM**

Test Date: **12/22/2010**



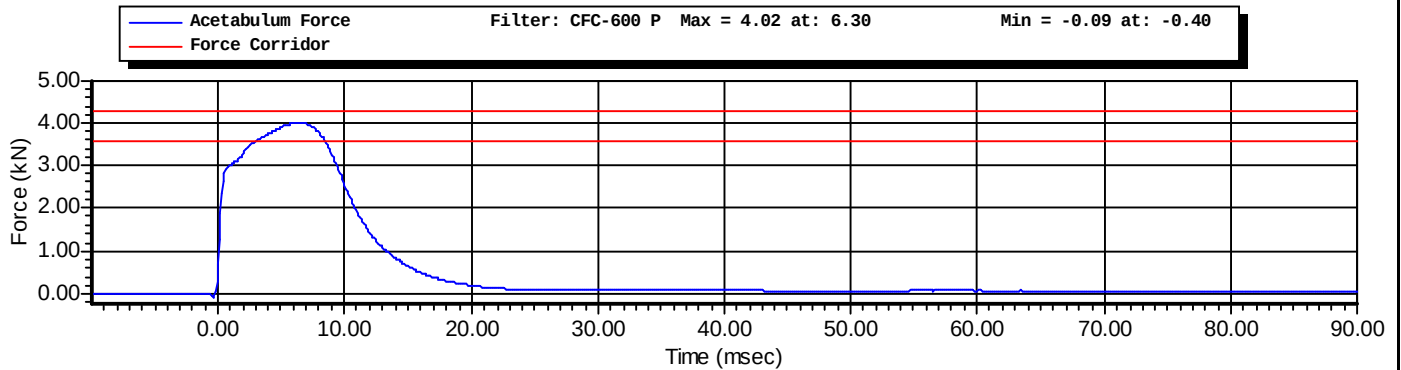
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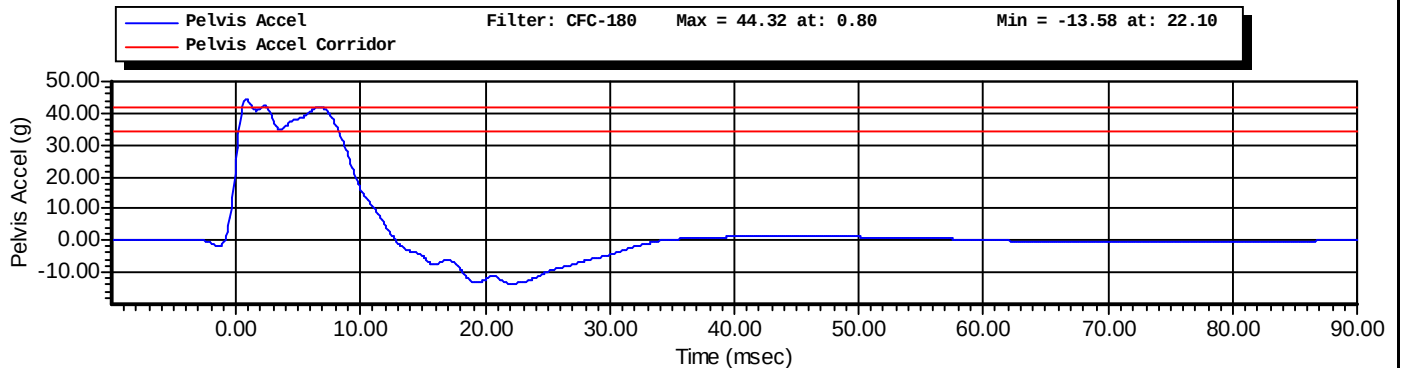
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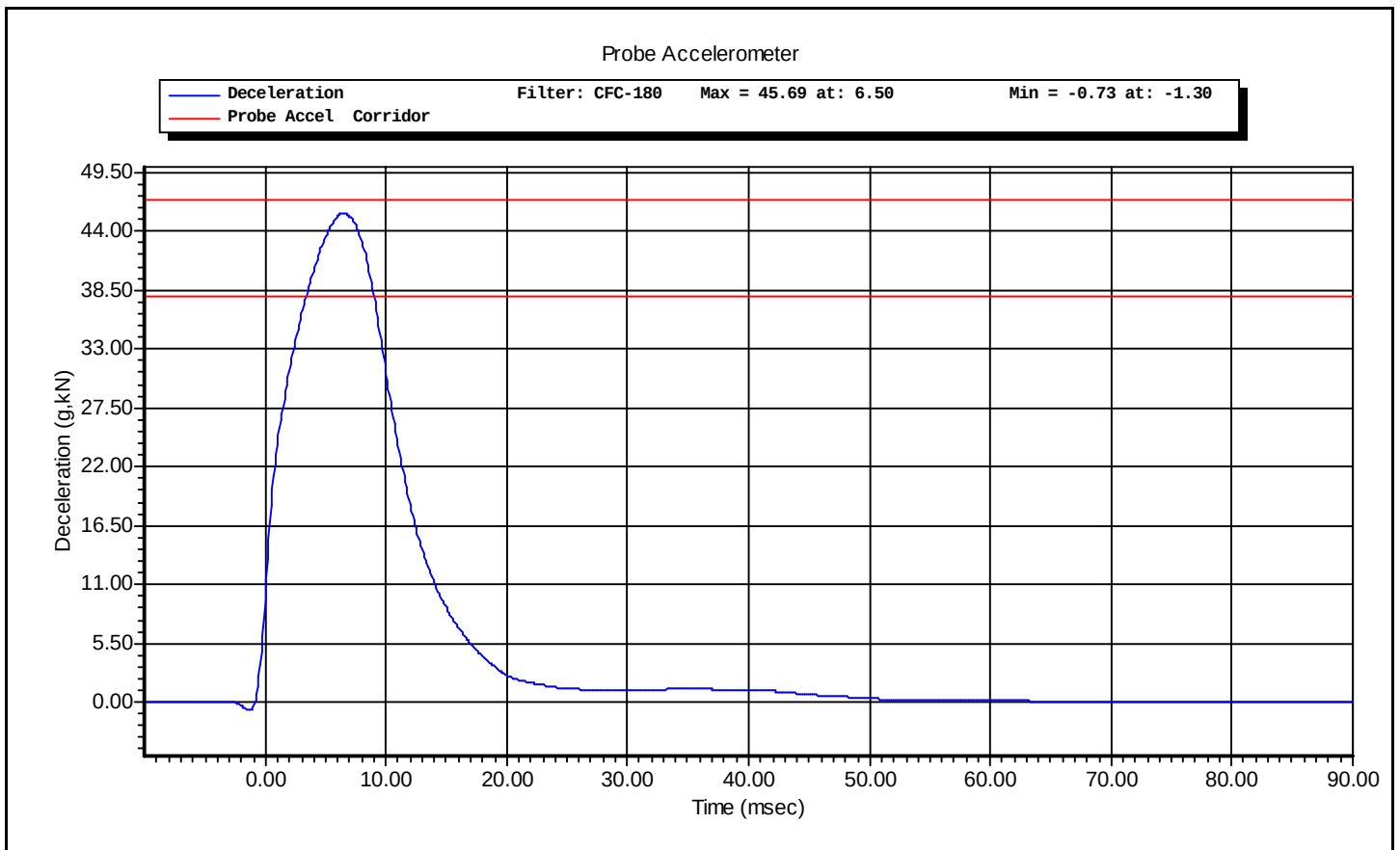
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Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	12/22/2010
Test Number:	1	Test Time:	9:05:45 PM

Acetabulum Force

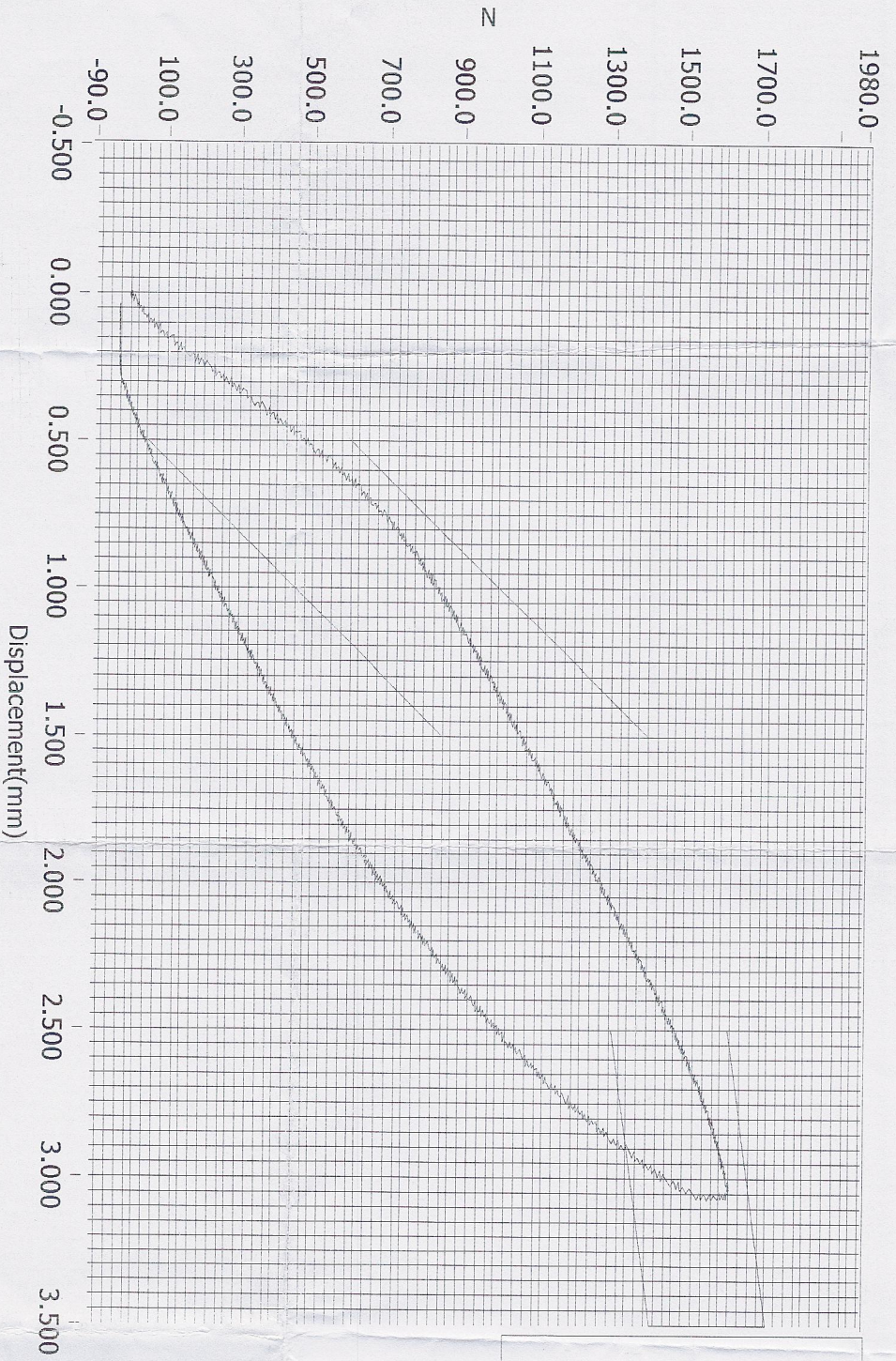


Pelvis Accelerometer





Resultant Data - SIDIIs Plug Compression



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

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

14064

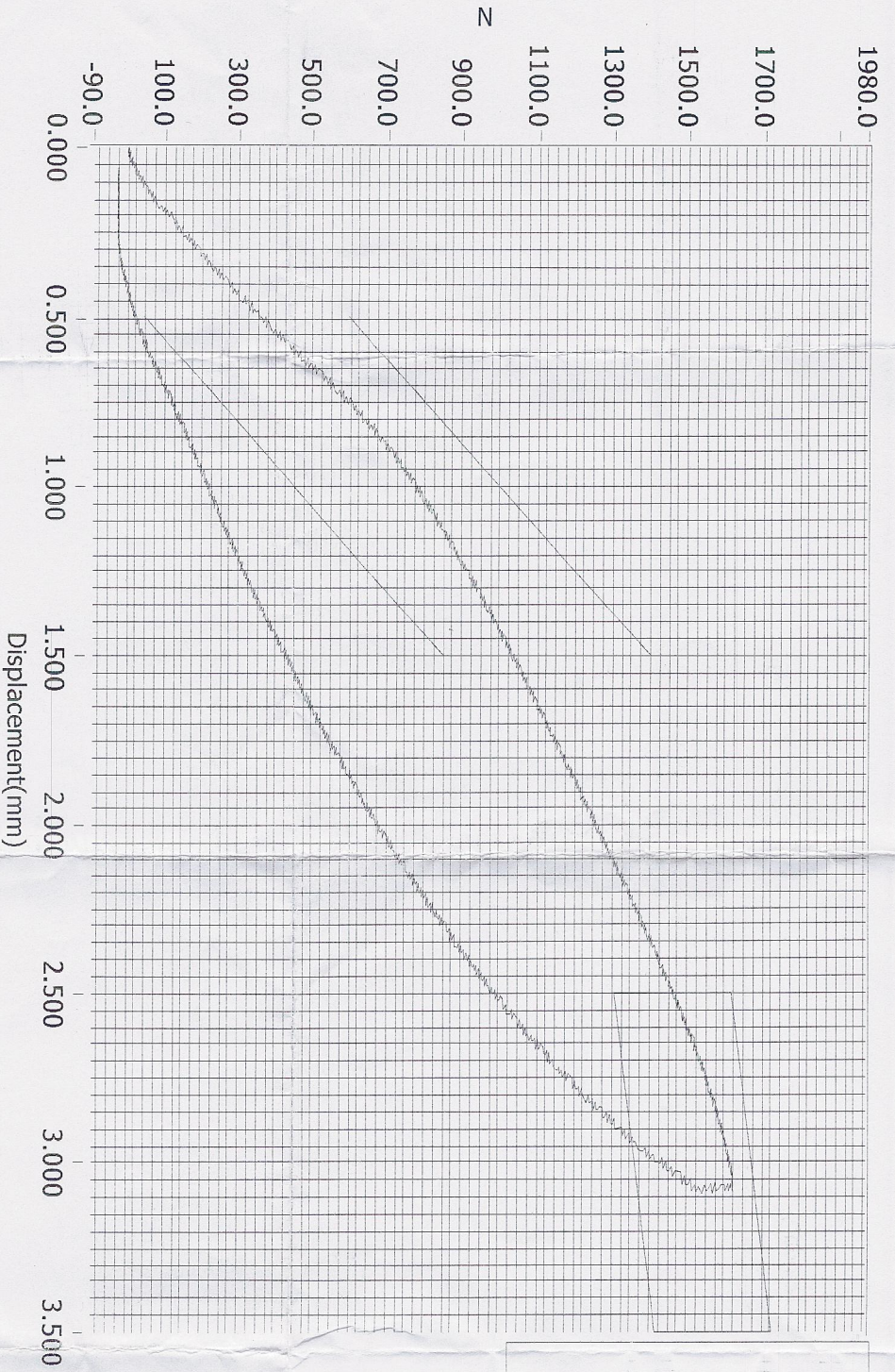
SIDIIs

Current Date : 8/30/2007

Current Time : 10:05:53

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

12173

SIDIIs

Current Date : 7/3/2007

Current Time : 13:55:09

FS

CALIBRATION TEST RESULTS

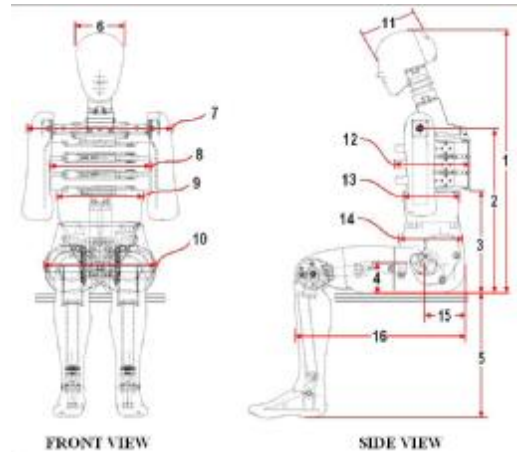
POST-TEST

ES2-re No: 033

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

NHTSA SN F033



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	911	Pass
2	Seat to Shoulder Joint	558-572	565	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	100	Pass
5	Sole to Seat, Sitting	433-451	445	Pass
6	Head Width	152-158	158	Pass
7	Shoulder/Arm Width	461-479	470	Pass
8	Thorax Width	322-332	327	Pass
9	Abdomen Width	273-287	284	Pass
10	Pelvis Lap Width	359-373	369	Pass
11	Head Depth	196-206	198	Pass
12	Thorax Depth	262-272	270	Pass
13	Abdomen Depth	194-204	200	Pass
14	Pelvis Depth	235-245	237	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	153	Pass
16	Back of Buttocks to Front Knee	597-615	605	Pass

Technician: DS

Date: 01/18/2011



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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:	1/13/2011
Test Number:	1	Test Time:	10:59:38 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	16 %RH P
Resultant Acceleration	125 -- 155	139 g P
Oscillation	0.0 -- 15.0	6.1 % P
Fore-Aft Acceleration	-15.00 -- 15.00	4.14 g P

All test parameters are within specifications

Technician: **Don Schenk** Signature: _____

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

Test ID: **Head drop**

Test Time: **10:59:38 AM**

Test Date: **1/13/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P51681	9/20/2010
Endevco	7264-2000	P51949	12/3/2010
Endevco	7264-2000	P51695	9/20/2010

Test ID: **Head drop**

Test Time: **10:59:38 AM**

Test Date: **1/13/2011**

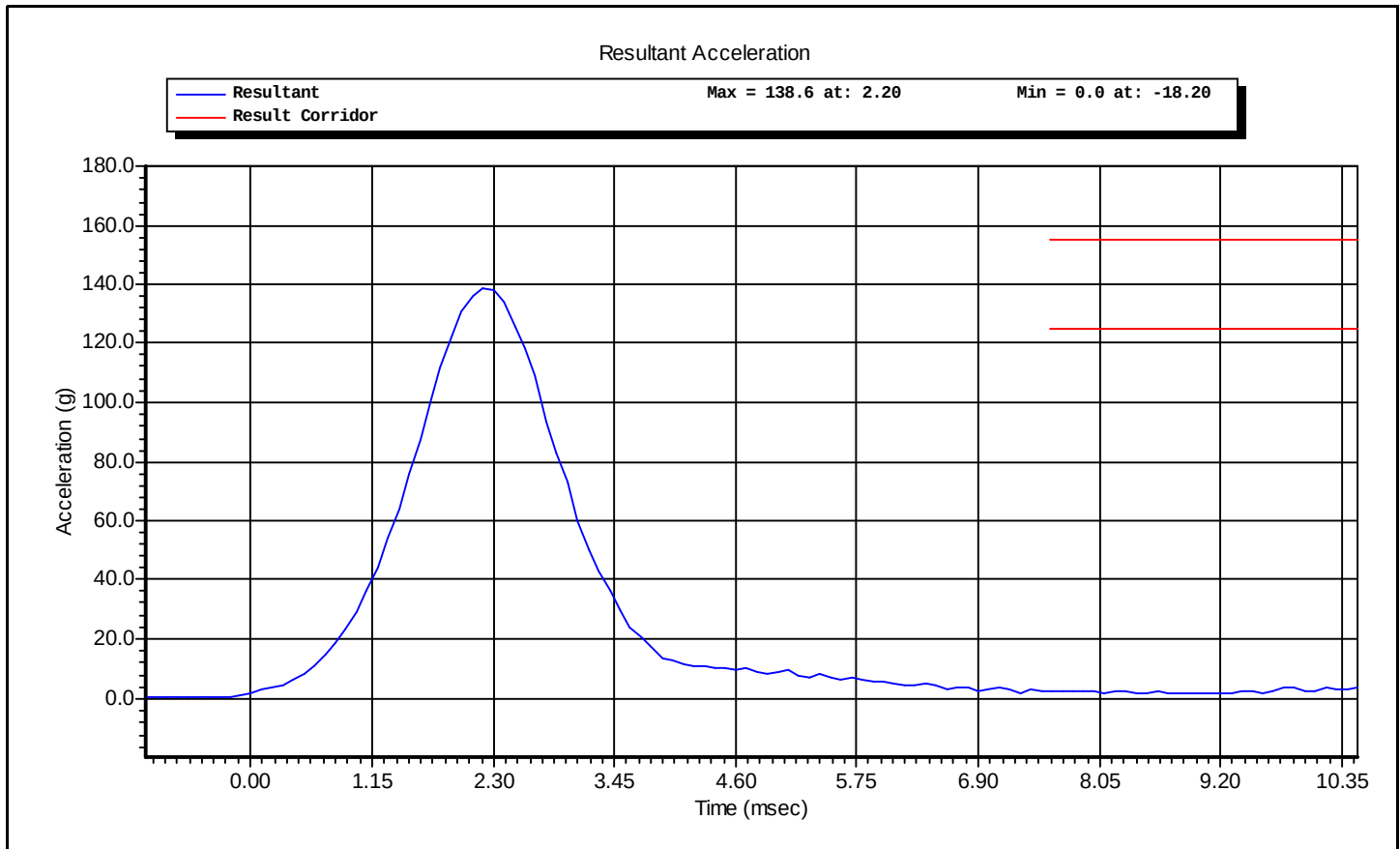


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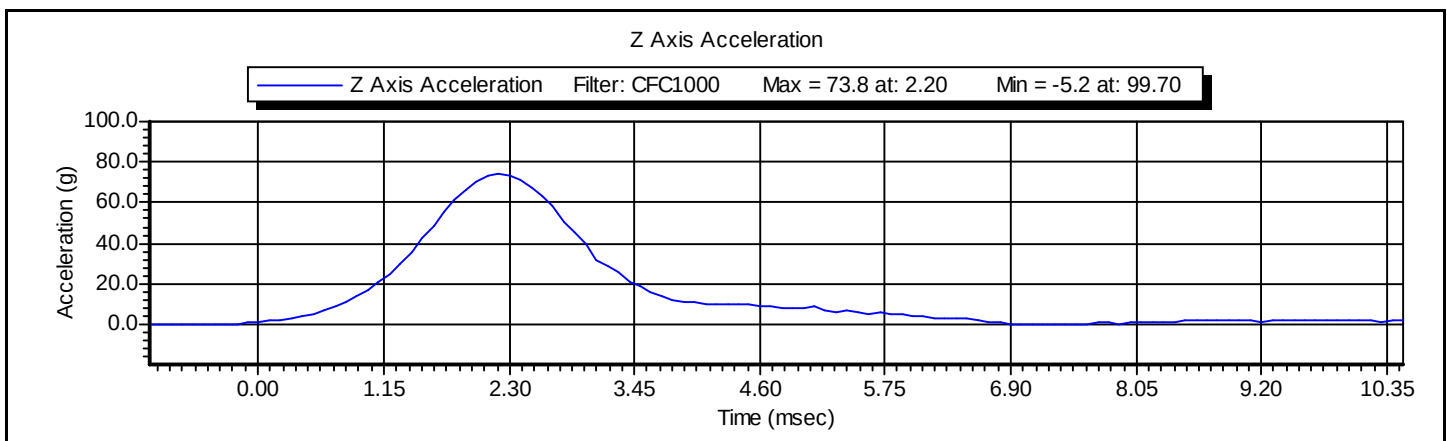
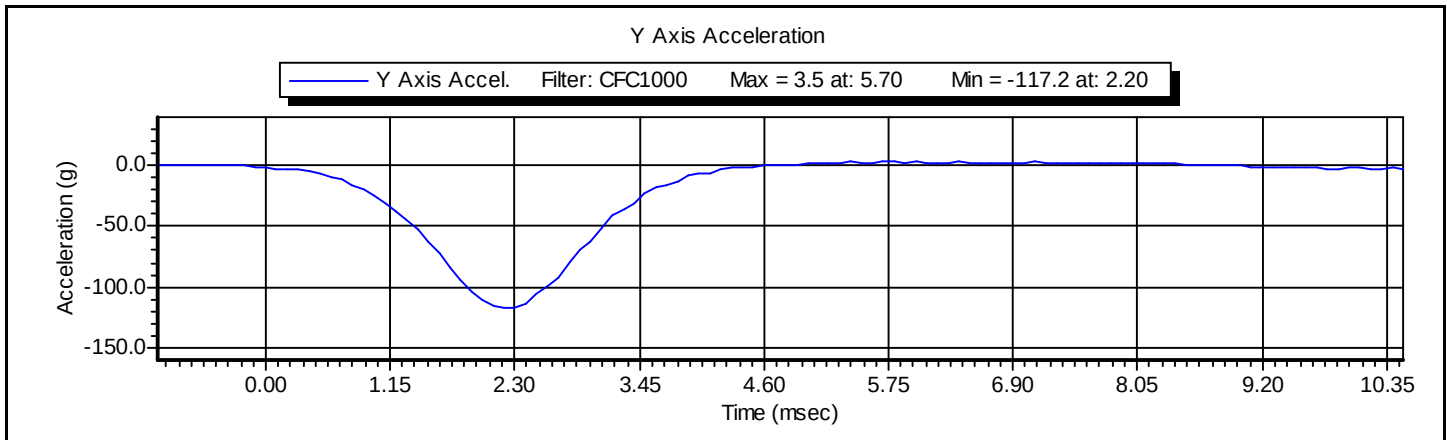
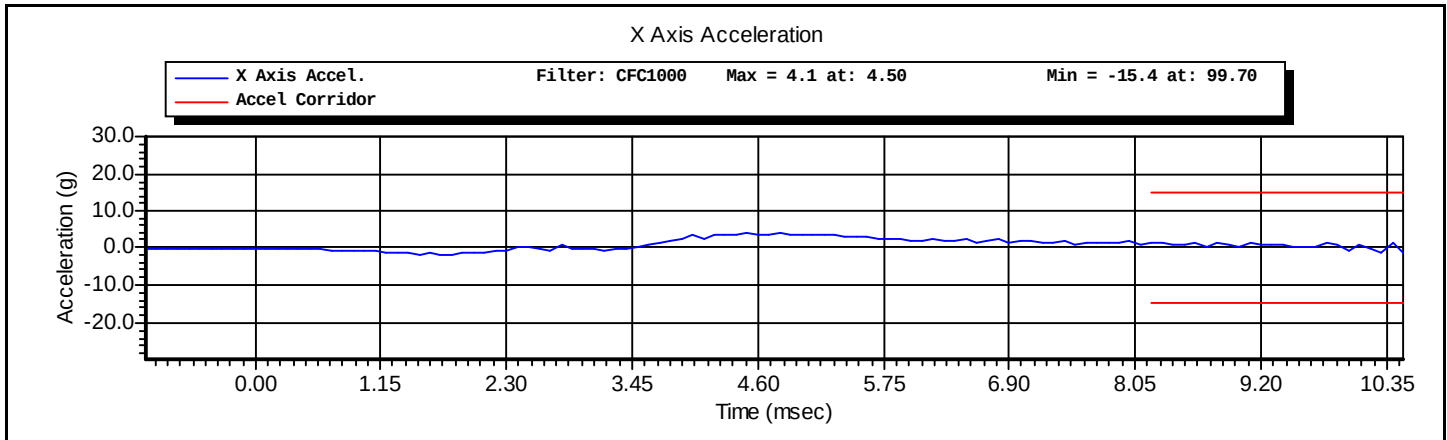
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head drop	Test Date:	1/13/2011
Test Number:	1	Test Time:	10:59:38 AM



Test ID: Head drop

Test Time: 10:59:38 AM

Test Date: 1/13/2011





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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:	1/13/2011
Test Number:	1	Test Time:	12:05:19 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	19 %RH P
Velocity	3.30 -- 3.50	3.42 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	51.7 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	58.6 ms P
Decay to Zero Degrees	53.0 -- 88.0	59.2 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **Don Schenk** Signature: _____

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

Test ID: **Neck Flexion**

Test Time: **12:05:19 PM**

Test Date: **1/13/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/21/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Neck Flexion**

Test Time: **12:05:19 PM**

Test Date: **1/13/2011**



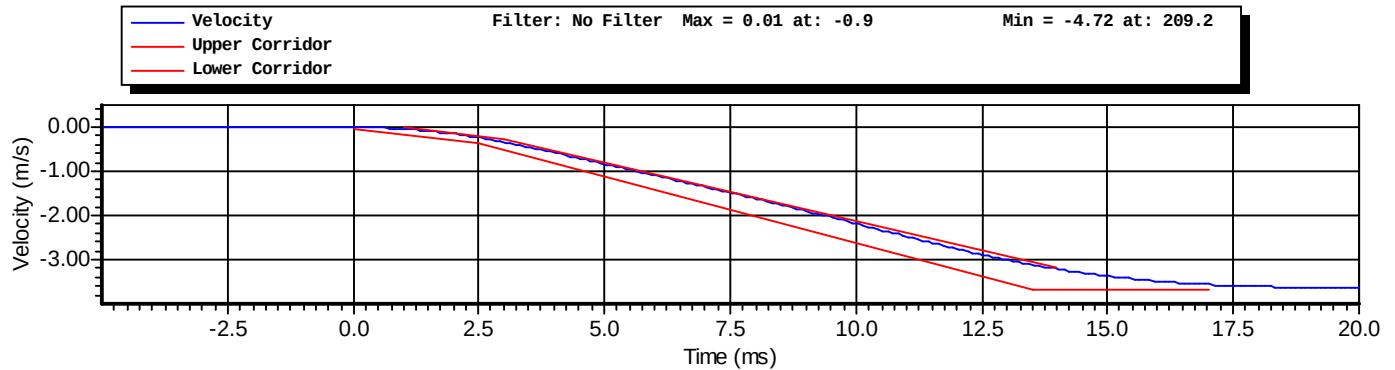
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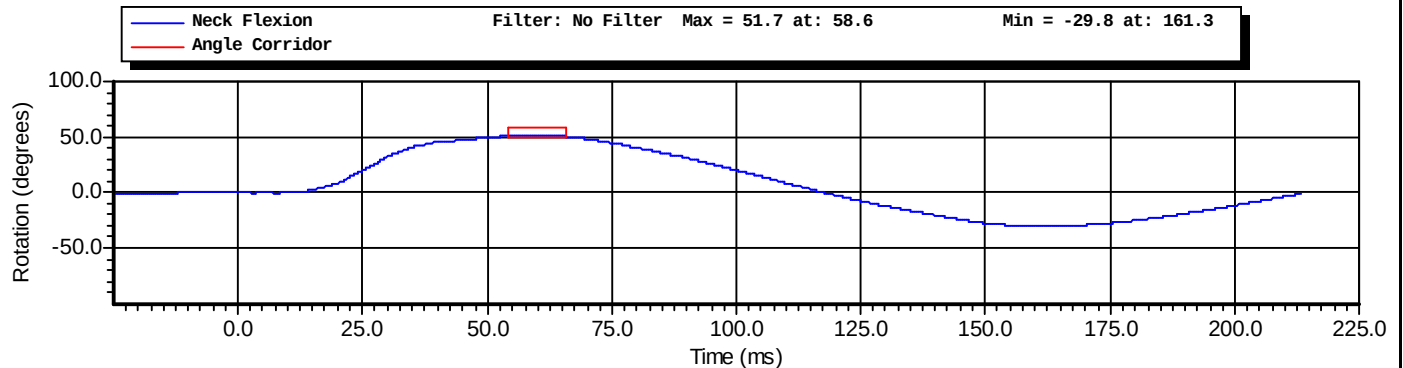
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Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	1/13/2011
Test Number:	1	Test Time:	12:05:19 PM

Pendulum Velocity



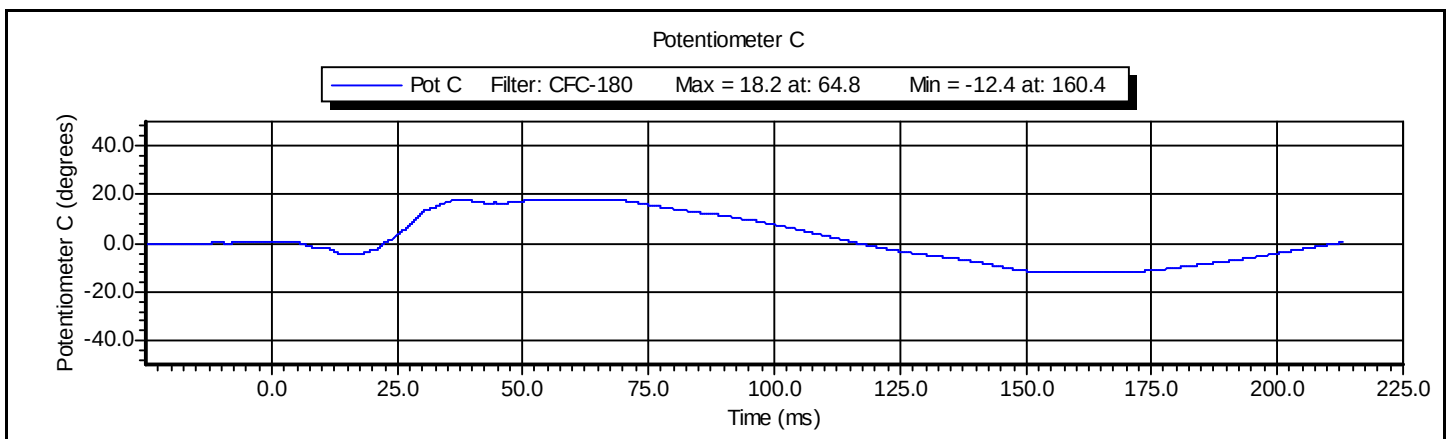
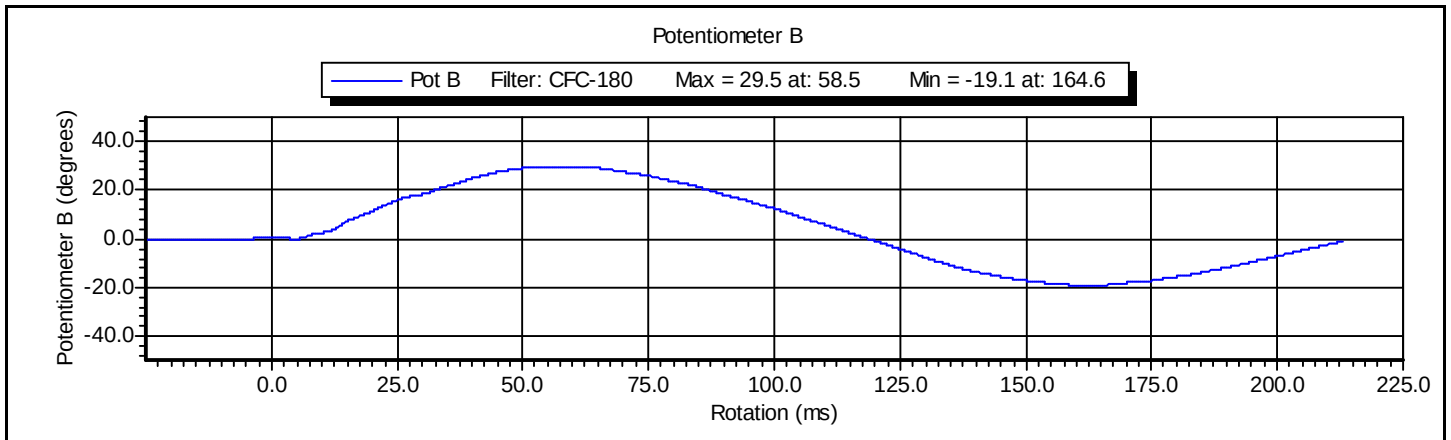
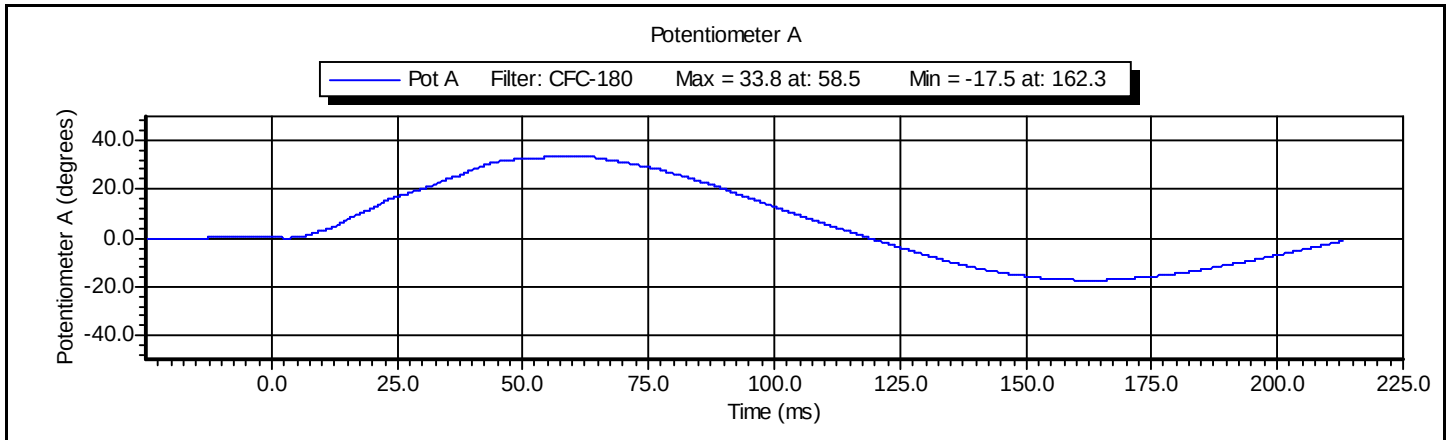
Neck Flexion Angle



Test ID: Neck Flexion

Test Time: 12:05:19 PM

Test Date: 1/13/2011





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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:	1/14/2011
Test Number:	1	Test Time:	2:34:23 PM

Component Part Number	Component Serial Number
960715-313	

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10.0 -- 70.0	26.0 %RH P
Velocity	4.20 -- 4.40	4.35 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.97 g P

All test parameters are within specifications

Technician: **Don Schenk** Signature: _____

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

Test ID: **Shoulder**

Test Time: **2:34:23 PM**

Test Date: **1/14/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7264-2000	P66930	10/5/2010

Test ID: **Shoulder**

Test Time: **2:34:23 PM**

Test Date: **1/14/2011**

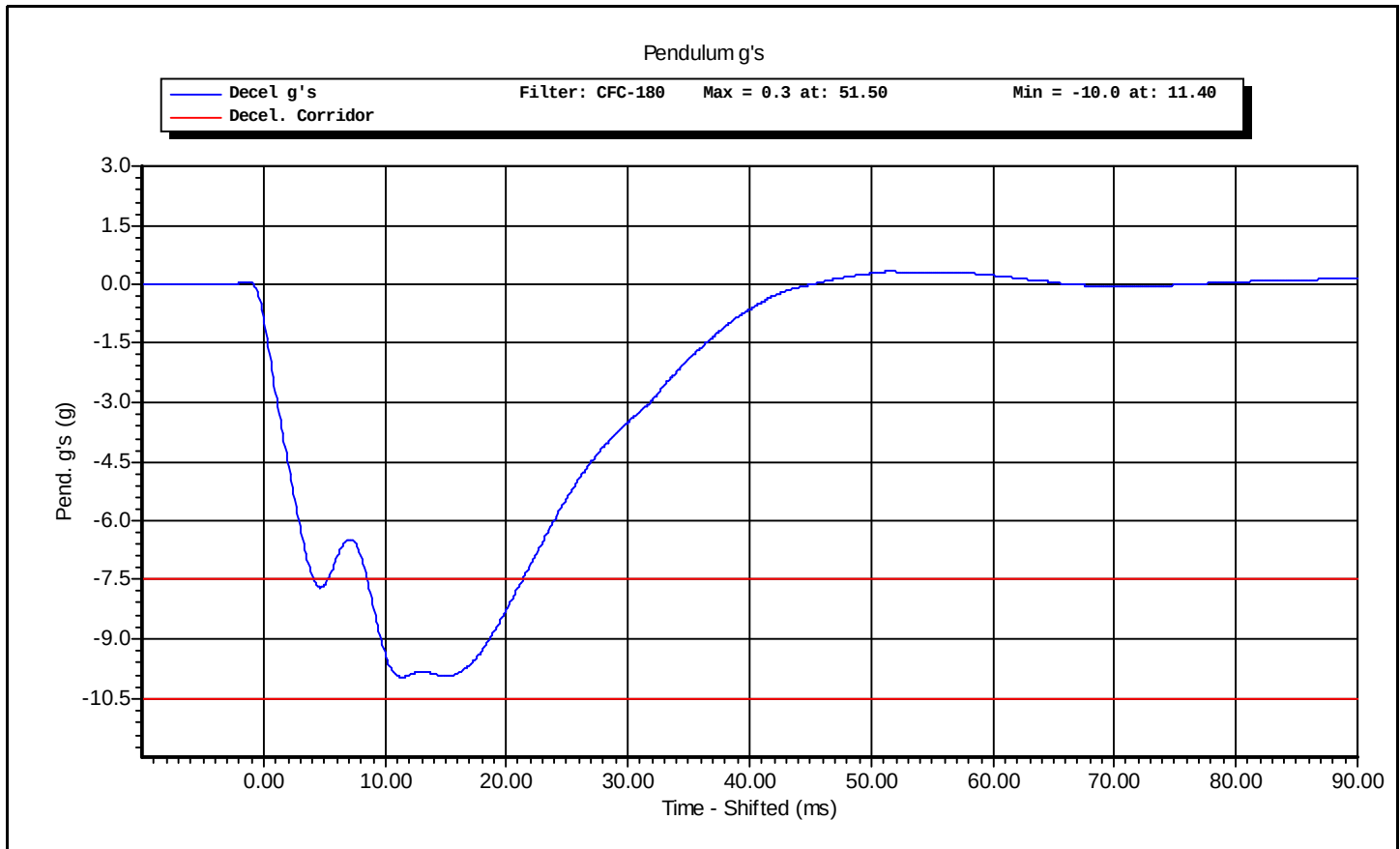


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	1/14/2011
Test Number:	1	Test Time:	2:34:23 PM



Test ID: **Shoulder**

Test Time: **2:34:23 PM**

Test Date: **1/14/2011**



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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 4.0ms	Test Date:	1/13/2011
Test Number:	1	Test Time:	2:57:45 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	18.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-48.72 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **Don Schenk** Signature: _____

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

Test ID: **Upper Rib 4.0ms**

Test Time: **2:57:45 PM**

Test Date: **1/13/2011**



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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	1/11/2011
Endevco	7264-2000	P32222	11/17/2010

Test ID: **Upper Rib 4.0ms**

Test Time: **2:57:45 PM**

Test Date: **1/13/2011**

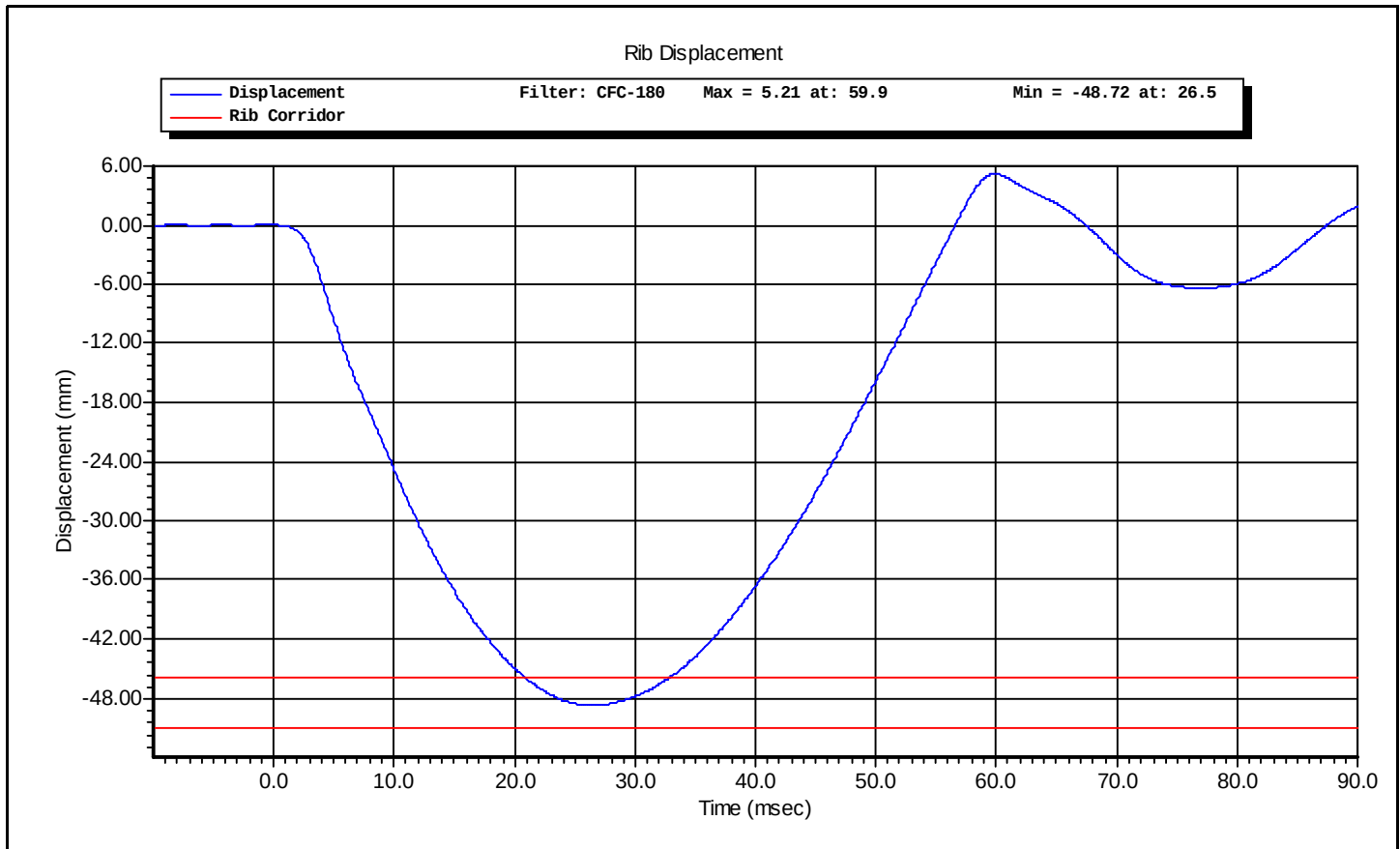


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4.0ms	Test Date:	1/13/2011
Test Number:	1	Test Time:	2:57:45 PM



Test ID: **Upper Rib 4.0ms** Test Time: **2:57:45 PM**

Test Date: **1/13/2011**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:04:18 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	18.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.90 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **Don Schenk** Signature: _____

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

Test ID: **Upper Rib 3.0 m/s** Test Time: **3:04:18 PM**

Test Date: **1/13/2011**



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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	1/11/2011
Endevco	7264-2000	P32222	11/17/2010

Test ID: **Upper Rib 3.0 m/s** Test Time: **3:04:18 PM**

Test Date: **1/13/2011**

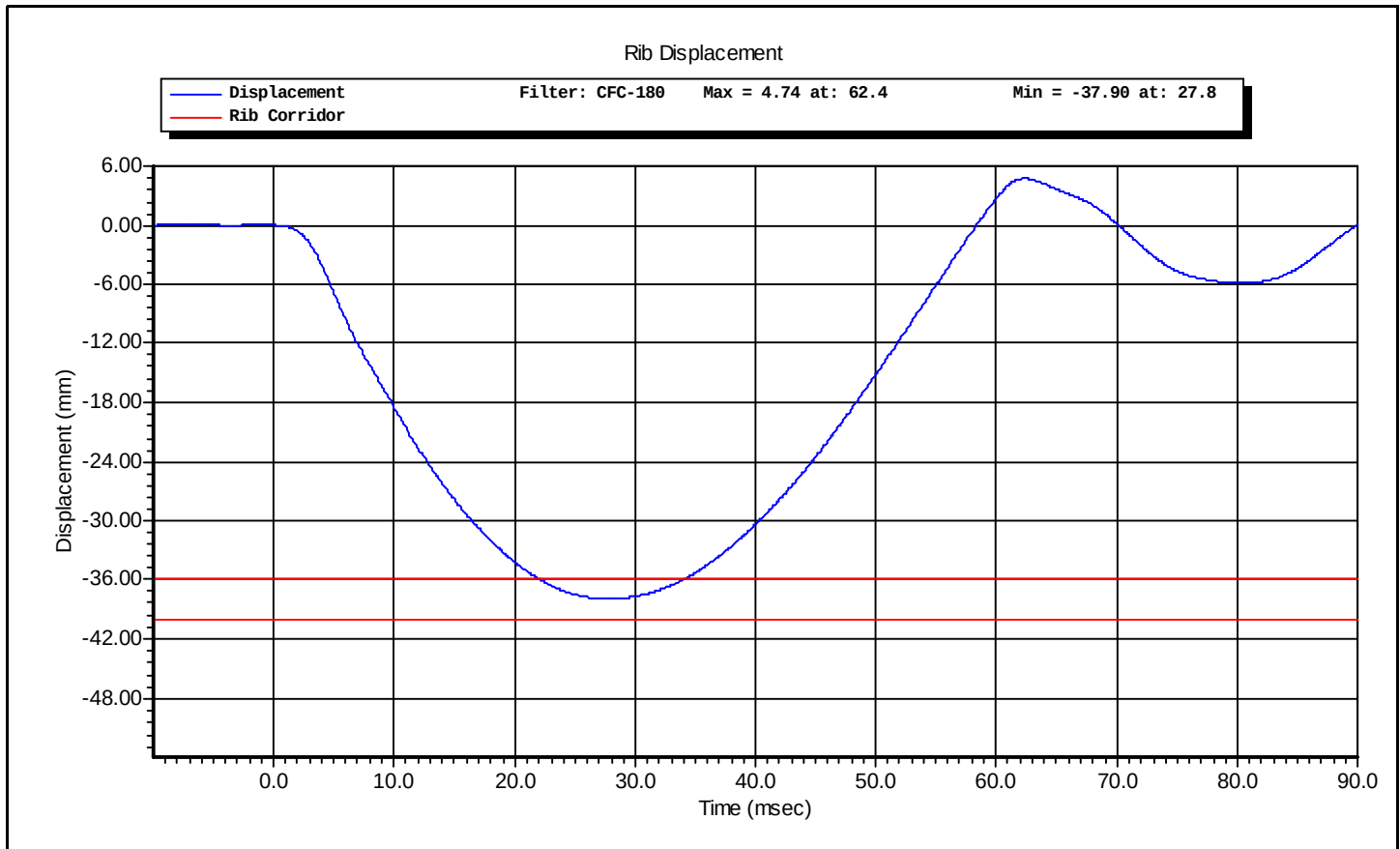


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:04:18 PM



Test ID: Upper Rib 3.0 m/s Test Time: 3:04:18 PM

Test Date: 1/13/2011



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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 4.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:11:22 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	18.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-48.11 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **Don Sheck** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Middle Rib 4.0 m/s** Test Time: **3:11:22 PM**

Test Date: **1/13/2011**



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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	1/11/2011
Endevco	7264-2000	P32222	11/17/2010

Test ID: **Middle Rib 4.0 m/s** Test Time: **3:11:22 PM**

Test Date: **1/13/2011**

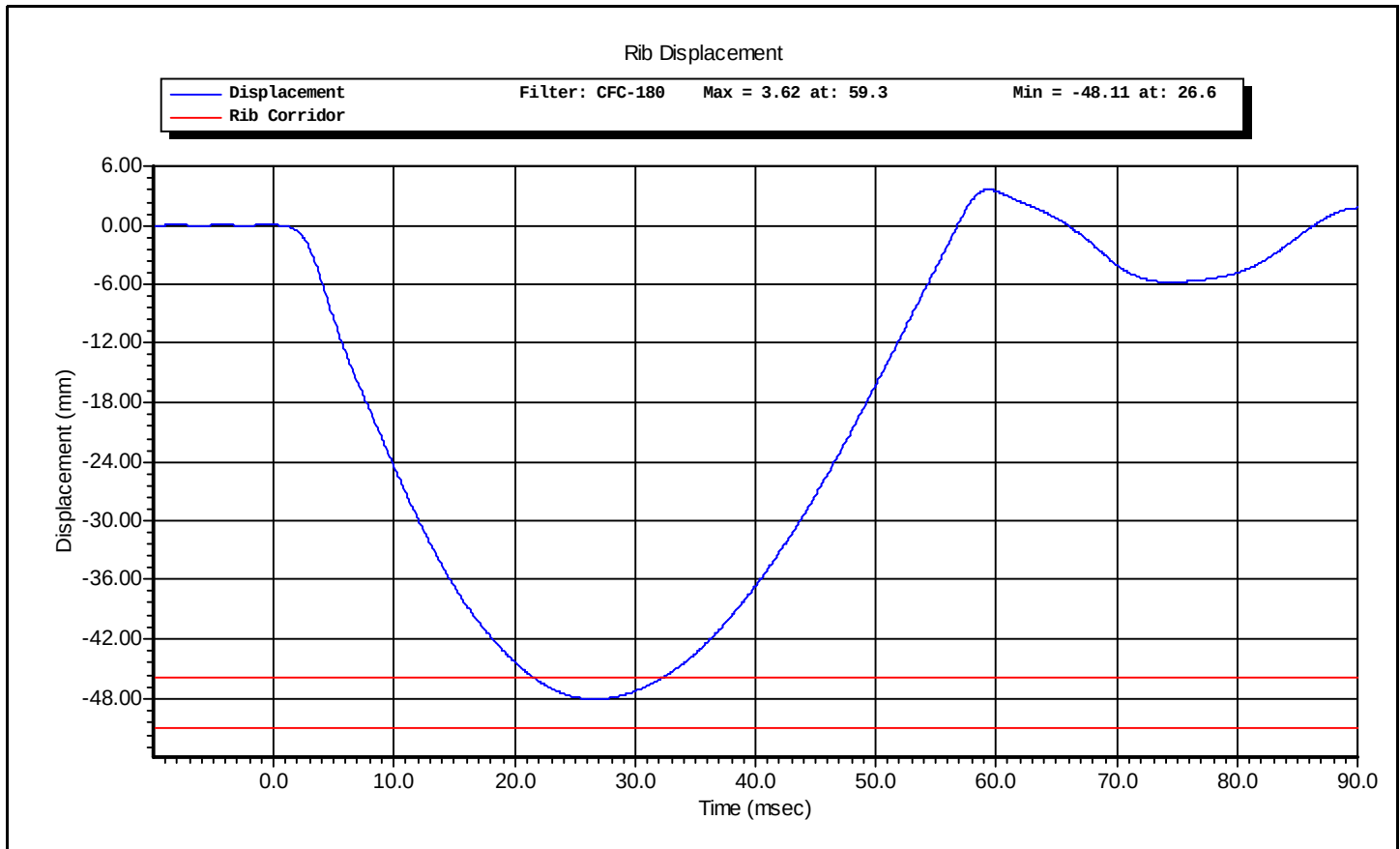


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:11:22 PM



Test ID: Middle Rib 4.0 m/s Test Time: 3:11:22 PM

Test Date: 1/13/2011



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:17:58 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	18.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.34 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **Don Schek** Signature: _____

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

Test ID: **Middle Rib 3.0 m/s** Test Time: **3:17:58 PM**

Test Date: **1/13/2011**



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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	1/11/2011
Endevco	7264-2000	P32222	11/17/2010

Test ID: **Middle Rib 3.0 m/s** Test Time: **3:17:58 PM**

Test Date: **1/13/2011**

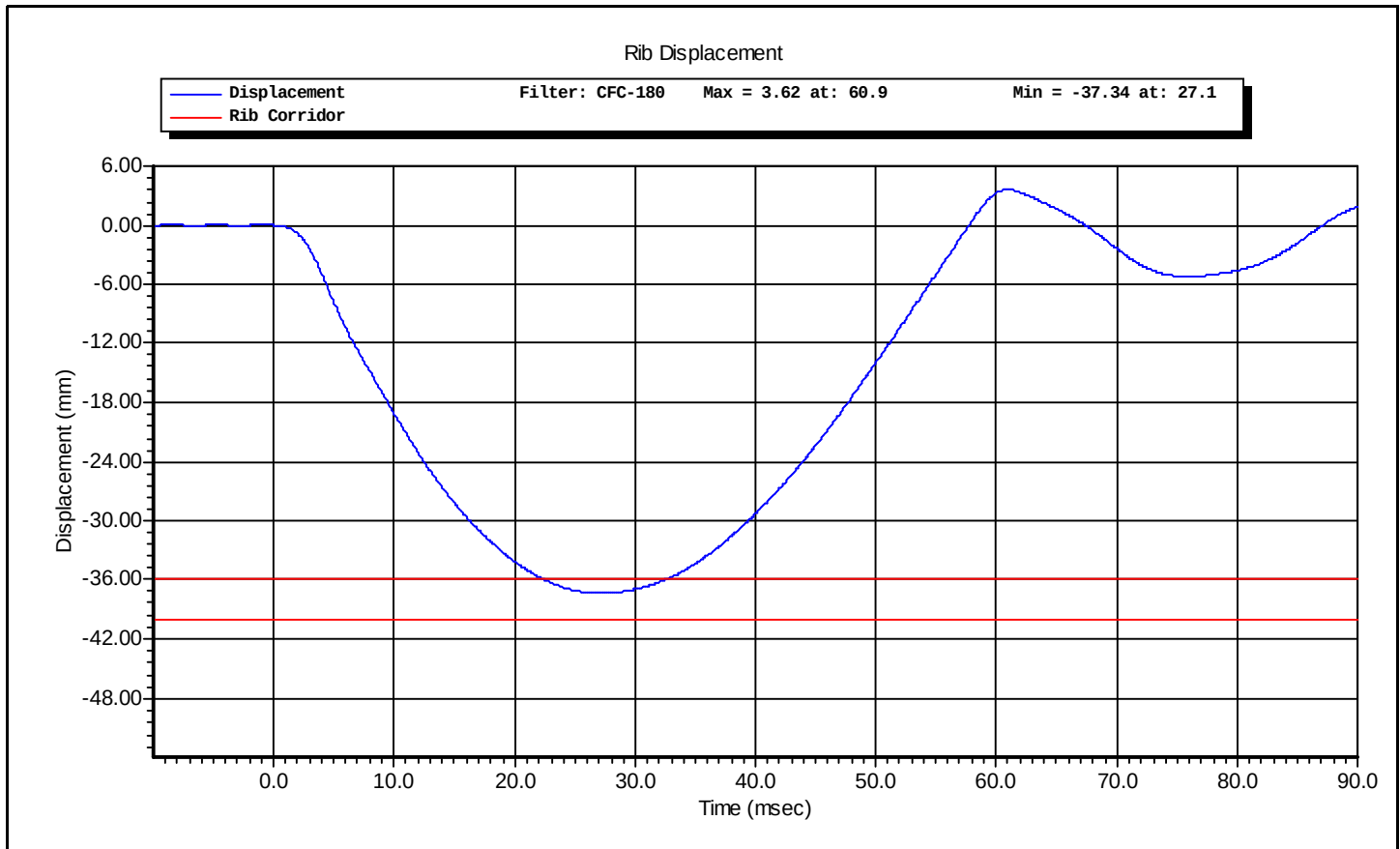


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:17:58 PM



Test ID: Middle Rib 3.0 m/s Test Time: 3:17:58 PM

Test Date: 1/13/2011



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:22:49 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	18.0 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Rib Displacement	-51.00 -- -46.00	-47.66 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **Don Schek** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Lower Rib 4.0 m/s** Test Time: **3:22:49 PM**

Test Date: **1/13/2011**



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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	1/11/2011
Endevco	7264-2000	P32222	11/17/2010

Test ID: **Lower Rib 4.0 m/s** Test Time: **3:22:49 PM**

Test Date: **1/13/2011**

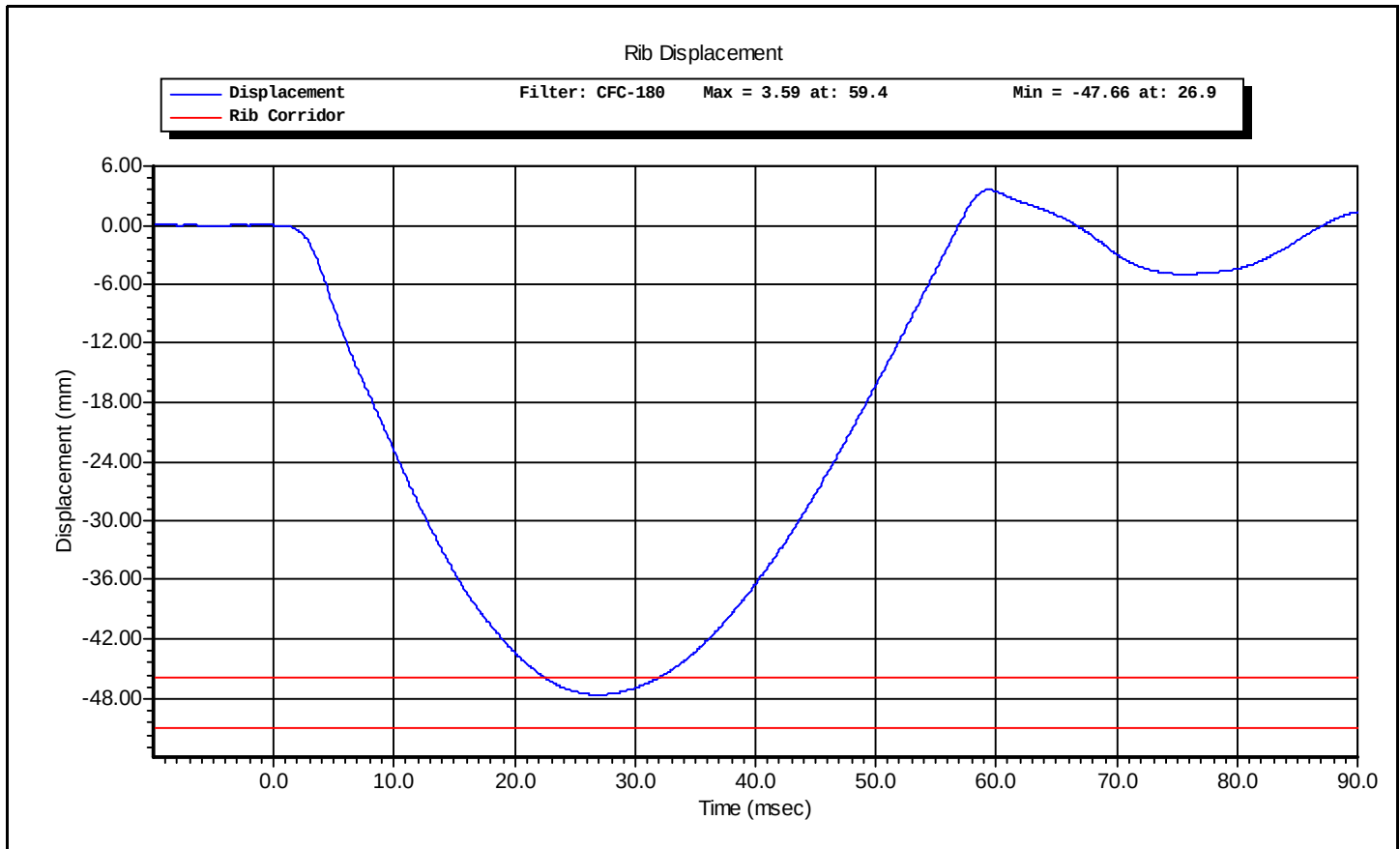


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:22:49 PM



Test ID: Lower Rib 4.0 m/s Test Time: 3:22:49 PM

Test Date: 1/13/2011



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:30:23 PM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	18.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-37.46 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **Don Schek** Signature: _____

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

Test ID: **Lower Rib 3.0 m/s** Test Time: **3:30:23 PM**

Test Date: **1/13/2011**



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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	1/11/2011
Endevco	7264-2000	P32222	11/17/2010

Test ID: **Lower Rib 3.0 m/s** Test Time: **3:30:23 PM**

Test Date: **1/13/2011**

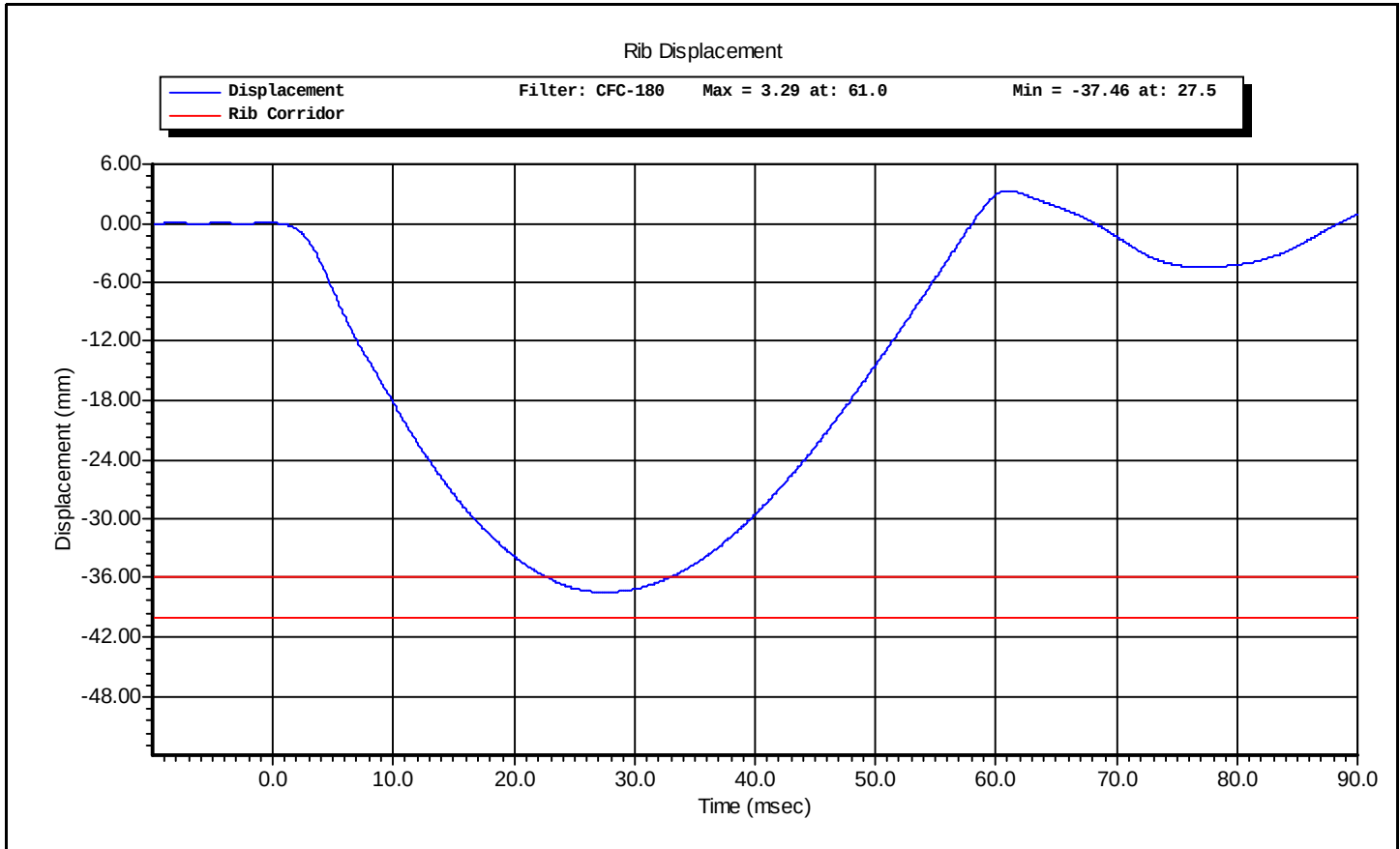


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3.0 m/s	Test Date:	1/13/2011
Test Number:	1	Test Time:	3:30:23 PM



Test ID: Lower Rib 3.0 m/s Test Time: 3:30:23 PM

Test Date: 1/13/2011



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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:	1/14/2011
Test Number:	1	Test Time:	3:00:57 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	21.7 deg C P
Humidity	10.0 -- 70.0	26.0 %RH P
Velocity	5.40 -- 5.60	5.50 m/s P
Upper Rib Displacement	34.0 -- 41.0	36.1 mm P
Middle Rib Displacement	37.0 -- 45.0	41.3 mm P
Lower Rib Displacement	37.0 -- 44.0	41.3 mm P
Impactor Force	5100 -- 6200	5547 N P

All test parameters are within specifications

Technician: **Don Schenk** Signature: _____

Supervisor: **D Travale** Signature: _____

Test ID: **Thorax**

Test Time: **3:00:57 PM**

Test Date: **1/14/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7264-2000	P66930	10/5/2010
Honeywell	MLT-38000	DS-179	4/23/2010
Honeywell	MLT-38000	DS-185	4/23/2010
Honeywell	MLT-38000	DS-178	4/23/2010

Test ID: **Thorax**

Test Time: **3:00:57 PM**

Test Date: **1/14/2011**

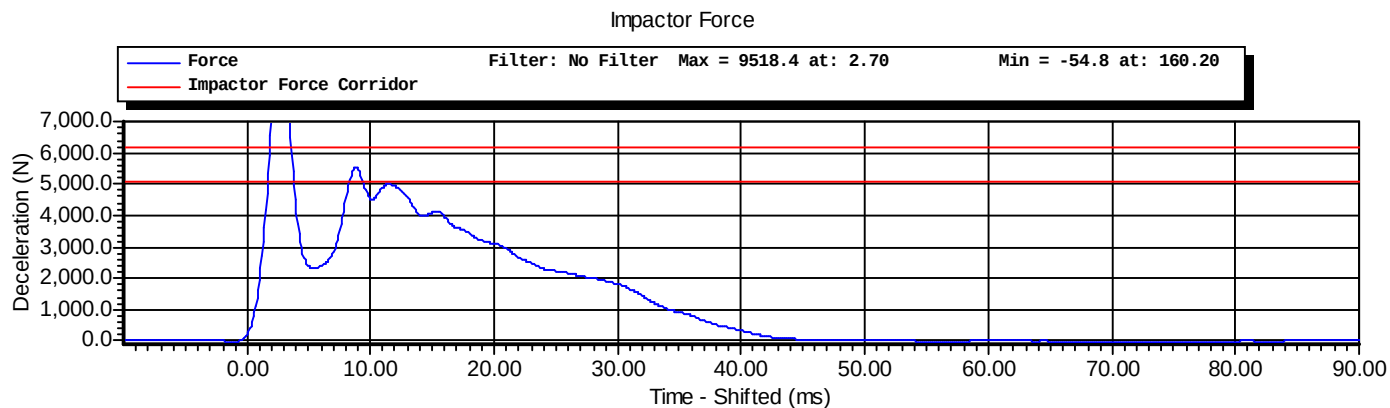
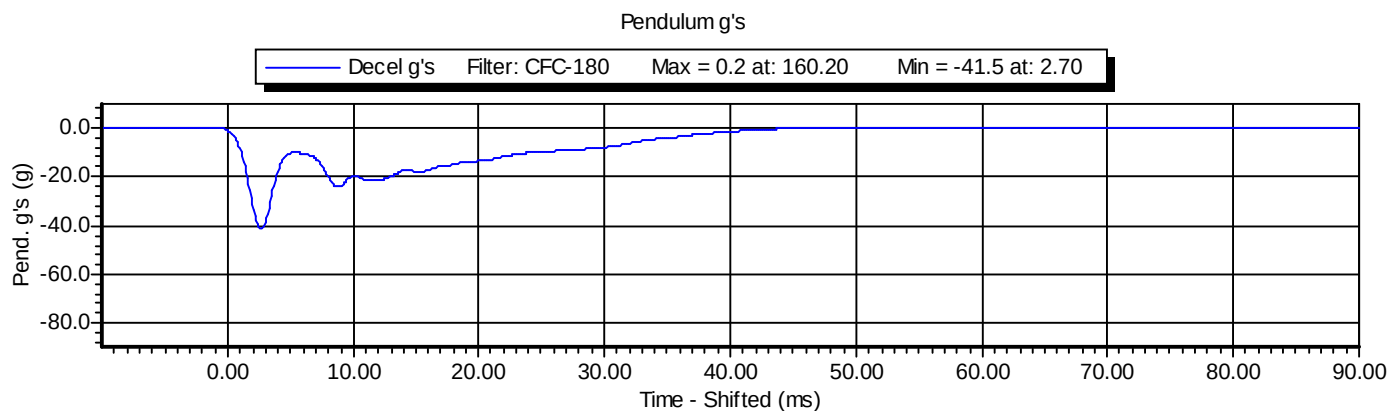


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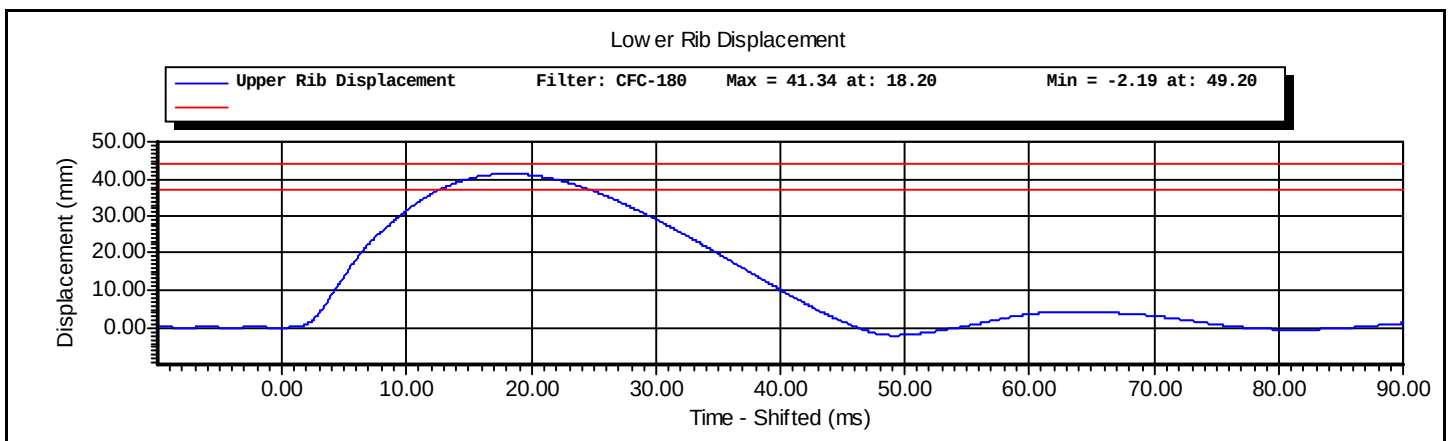
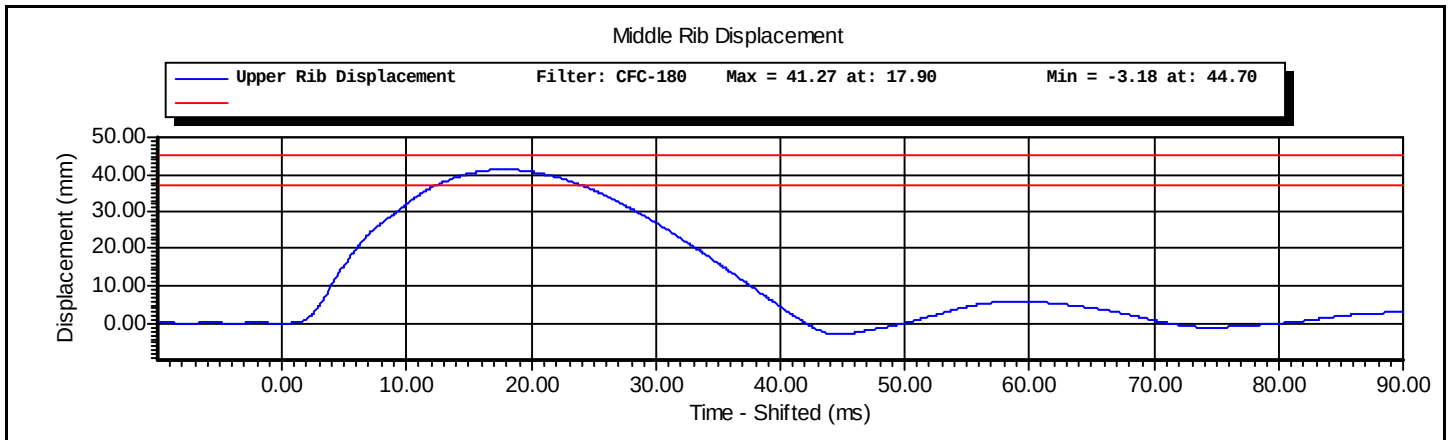
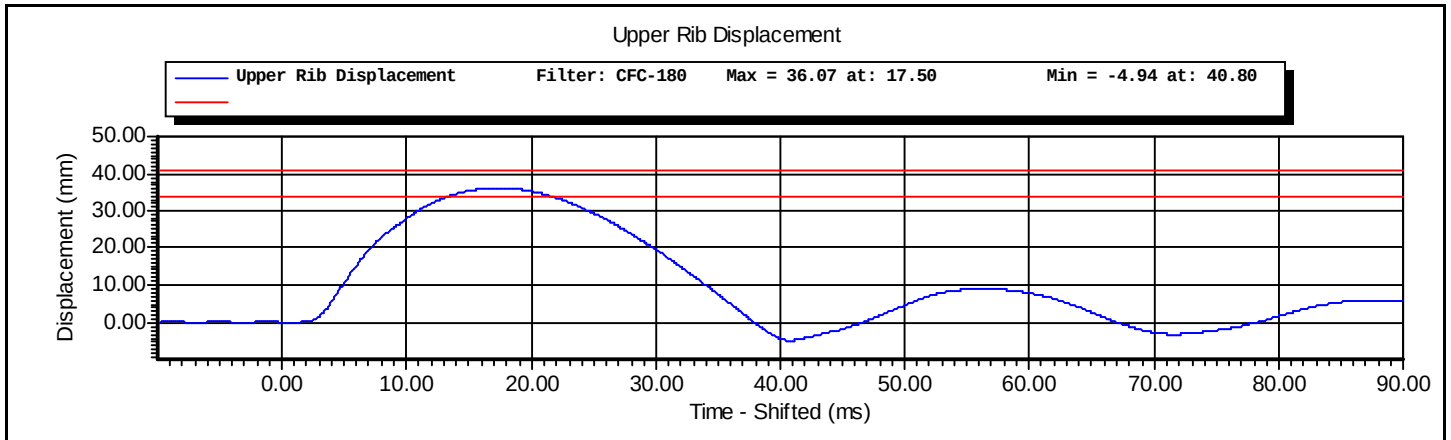
Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	1/14/2011
Test Number:	1	Test Time:	3:00:57 PM



Test ID: Thorax

Test Time: 3:00:57 PM

Test Date: 1/14/2011





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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:	1/17/2011
Test Number:	3	Test Time:	12:59:30 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	16 %RH P
Velocity	3.90 -- 4.10	4.08 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.59 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	10.2 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.69 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	10.8 ms P

All test parameters are within specifications

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

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

Test ID: **Abdomen**

Test Time: **12:59:30 PM**

Test Date: **1/17/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7264-2000	P66930	10/5/2010
Denton	2631	LC-1524	4/22/2010
Denton	2631	LC-1523	4/22/2010
Denton	2631	LC-1530	4/22/2010

Test ID: **Abdomen**

Test Time: **12:59:30 PM**

Test Date: **1/17/2011**

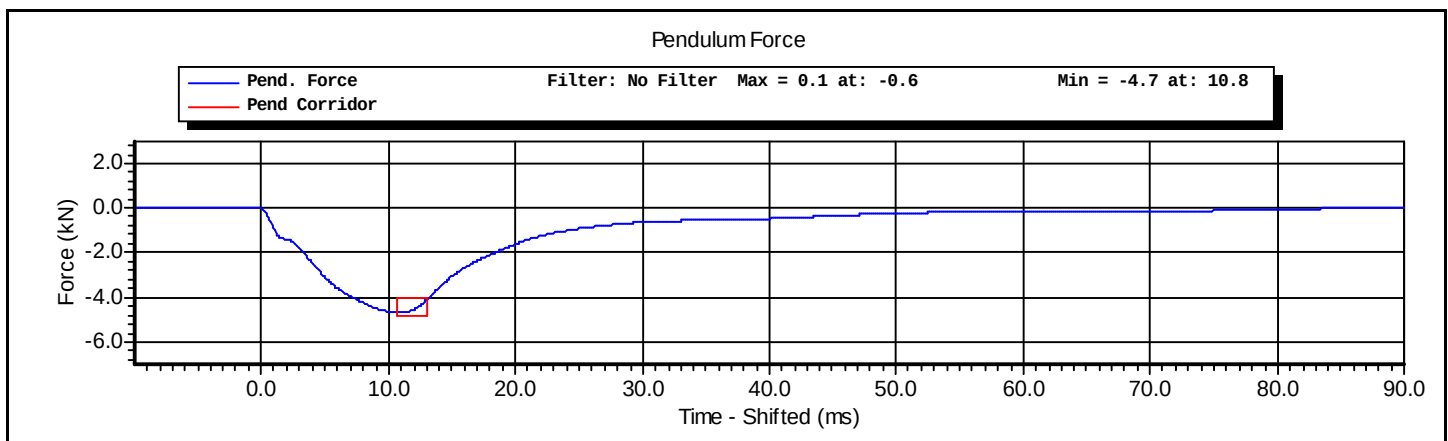
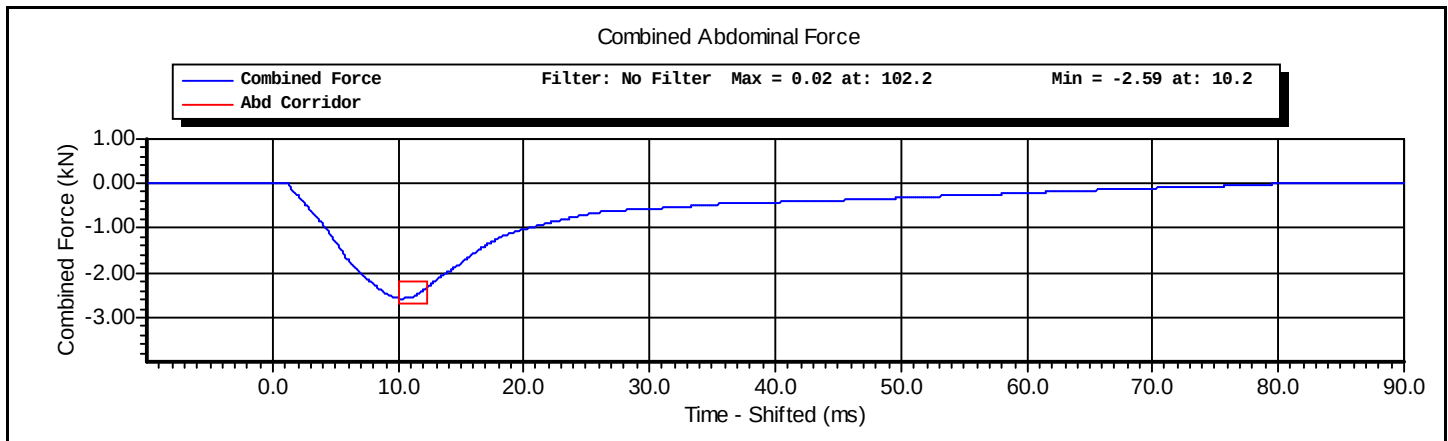


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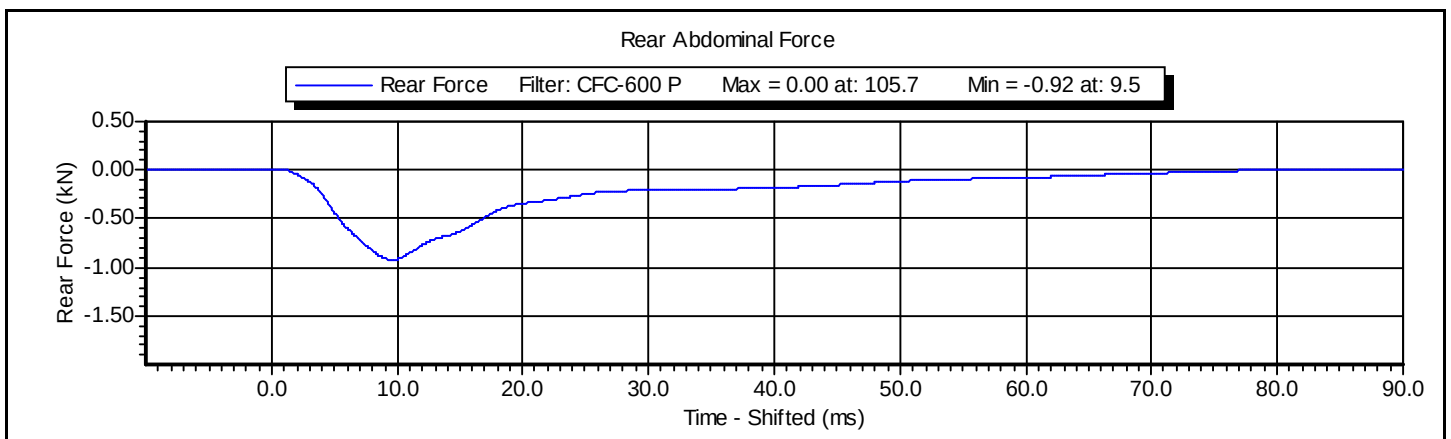
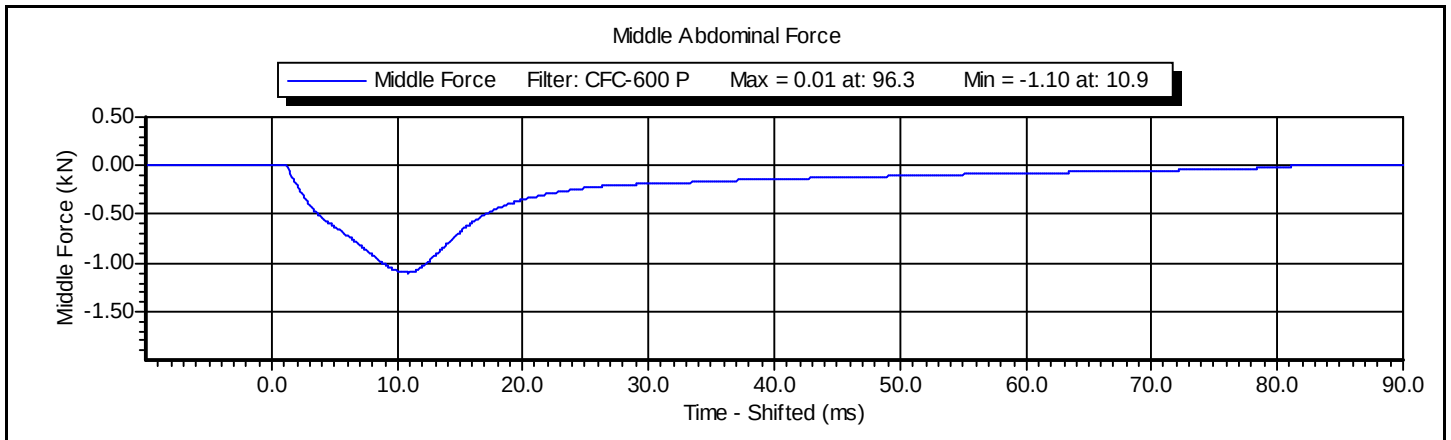
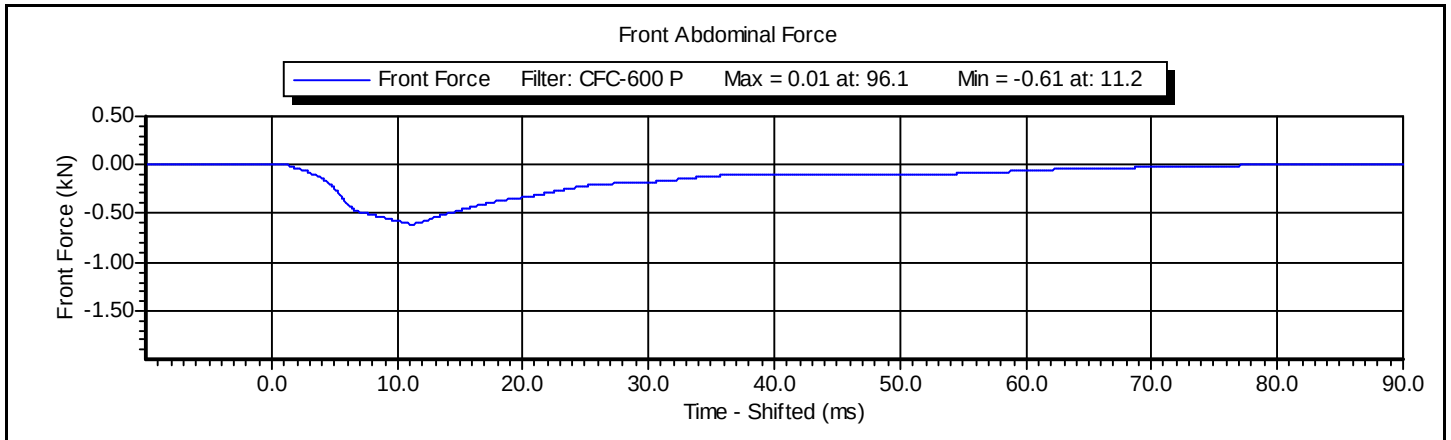
Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	1/17/2011
Test Number:	3	Test Time:	12:59:30 PM



Test ID: **Abdomen**

Test Time: **12:59:30 PM**

Test Date: **1/17/2011**





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VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Spine Flexion	Test Date:	1/13/2011
Test Number:	2	Test Time:	2:08:37 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	18 %RH P
Velocity	5.95 -- 6.15	6.15 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	48.6 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	44.5 ms P
Decay to Zero Degrees	37.0 -- 57.0	38.6 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **Don Schenk** Signature: _____

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

Test ID: **Spine Flexion**

Test Time: **2:08:37 PM**

Test Date: **1/13/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/21/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Spine Flexion**

Test Time: **2:08:37 PM**

Test Date: **1/13/2011**



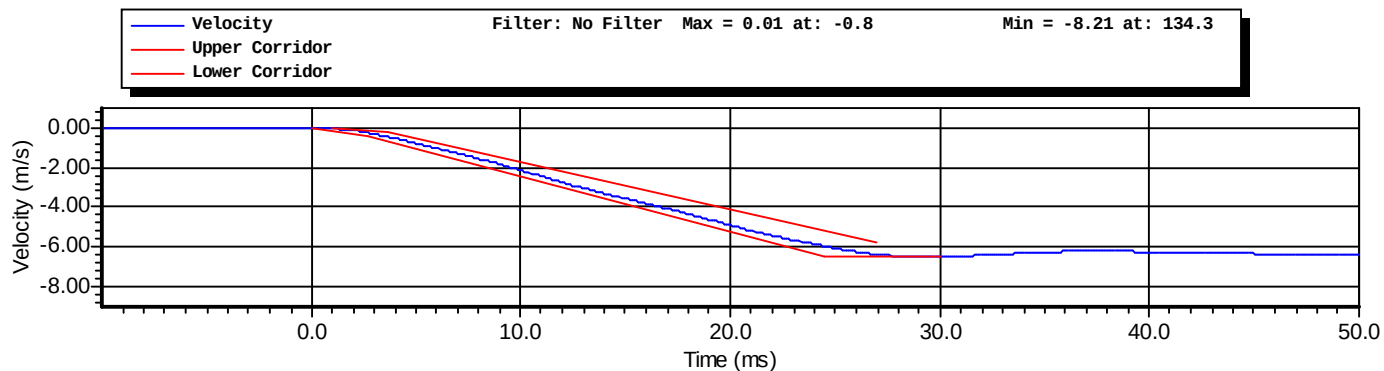
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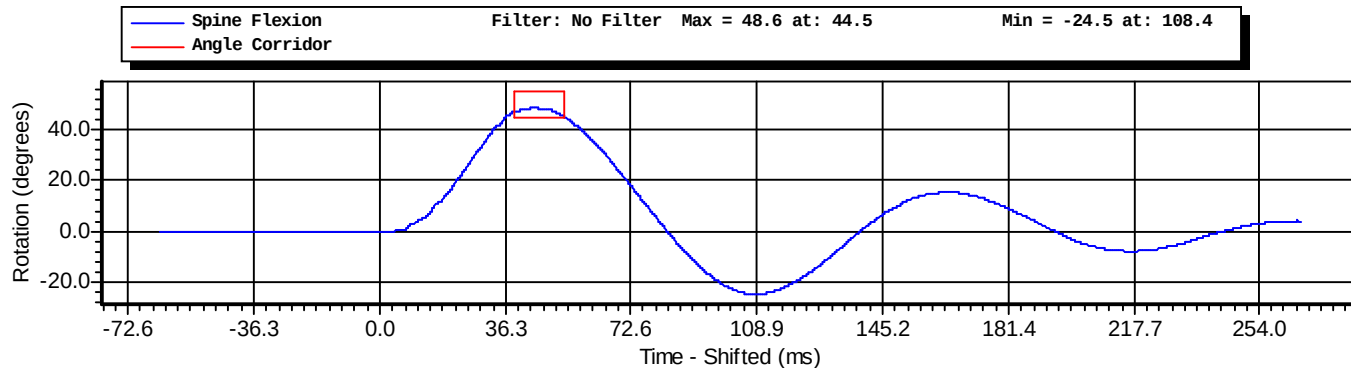
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Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Spine Flexion	Test Date:	1/13/2011
Test Number:	2	Test Time:	2:08:37 PM

Pendulum Velocity



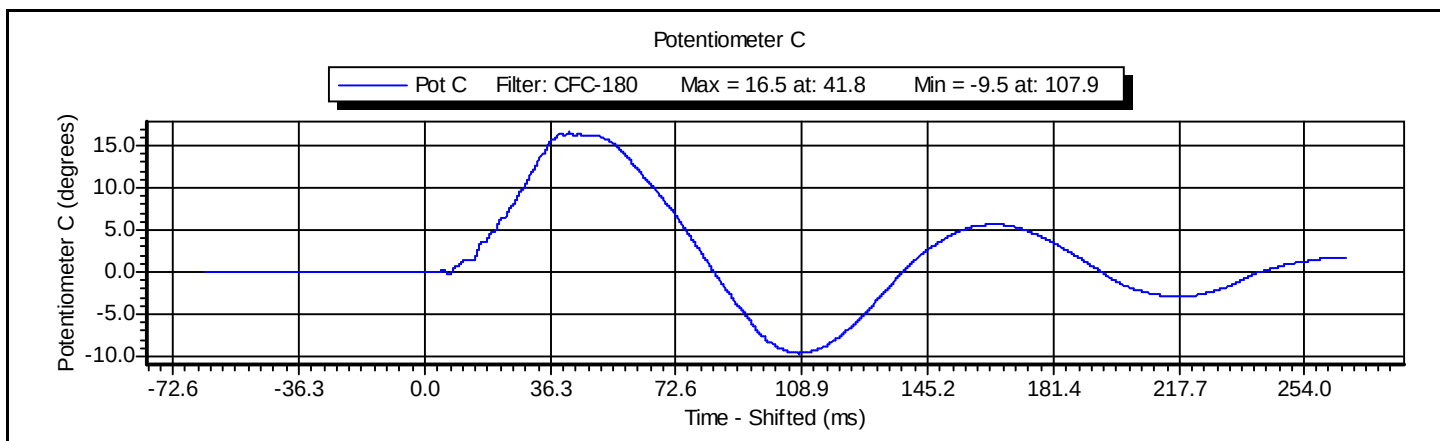
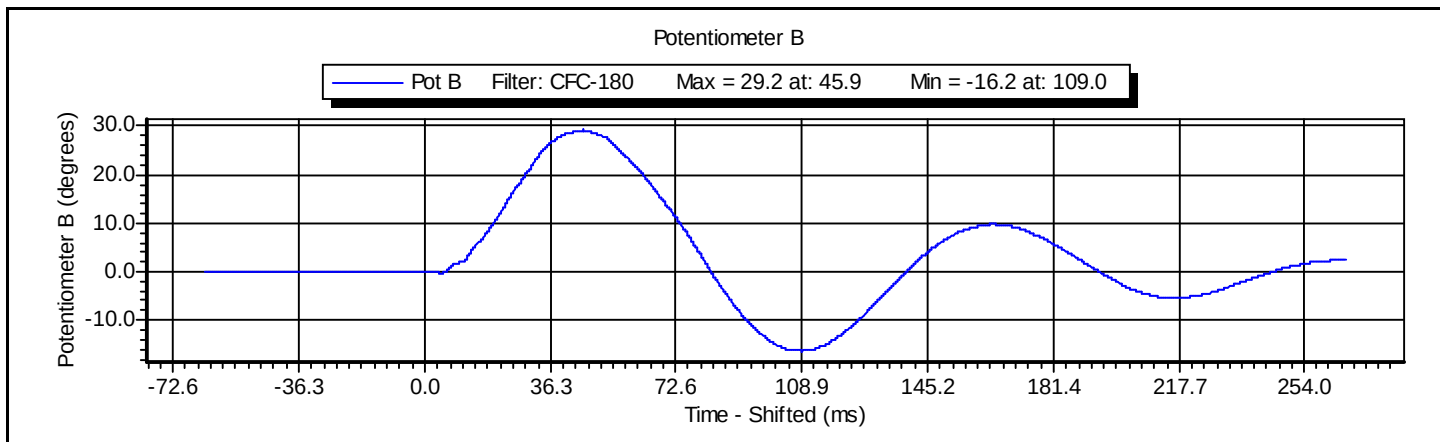
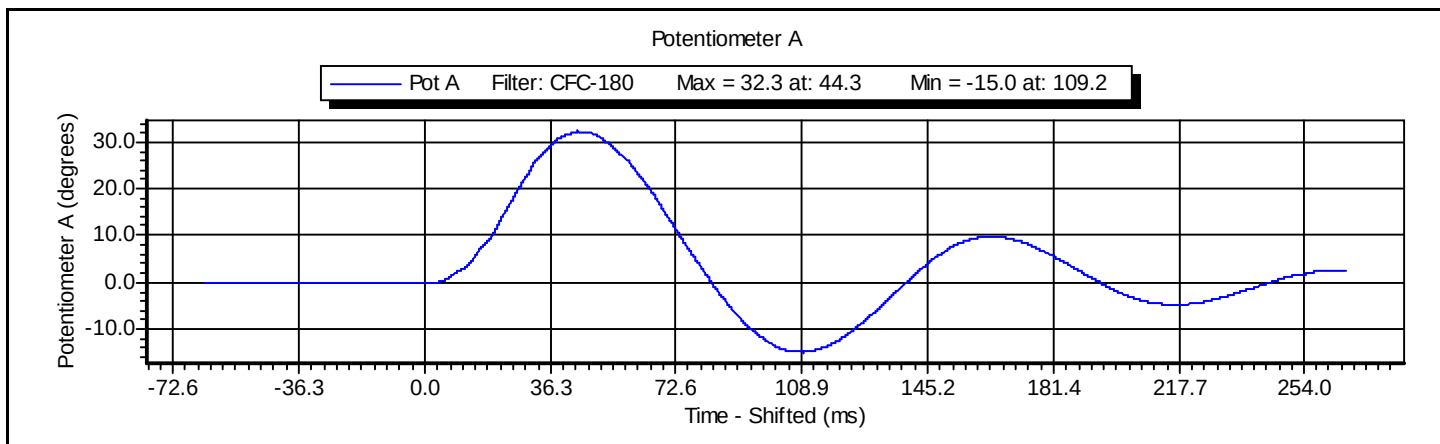
Spine Flexion Angle



Test ID: **Spine Flexion**

Test Time: **2:08:37 PM**

Test Date: **1/13/2011**





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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:	1/18/2011
Test Number:	1	Test Time:	8:49:51 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10 -- 70	26 %RH P
Velocity	4.20 -- 4.40	4.36 m/s P
Peak Pendulum Force	-5.40 -- -4.70	-5.21 kN P
Time at Peak Pendulum Force	11.80 -- 16.10	11.86 ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	-1.45 kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	12.66 ms P

All test parameters are within specifications

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

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

Test ID: **Pelvis**

Test Time: **8:49:51 AM**

Test Date: **1/18/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7264-2000	P66930	10/5/2010
Denton	3096	LC-456Fy	4/22/2010

Test ID: **Pelvis**

Test Time: **8:49:51 AM**

Test Date: **1/18/2011**



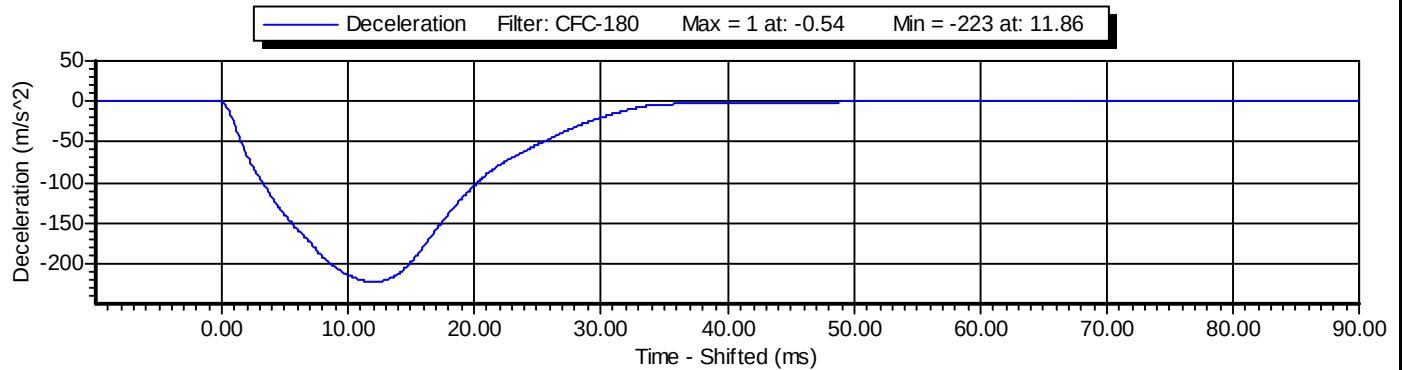
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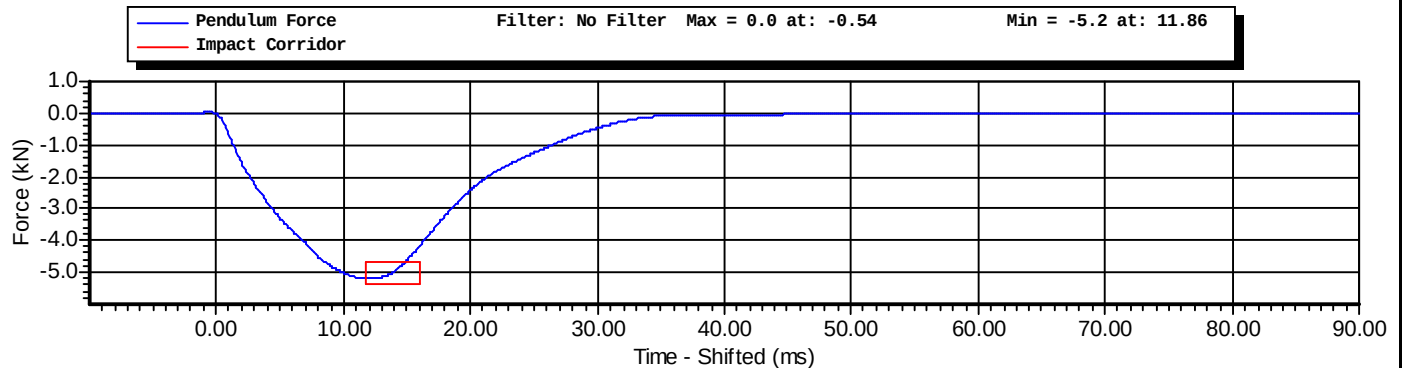
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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	1/18/2011
Test Number:	1	Test Time:	8:49:51 AM

Pendulum Accelerometer



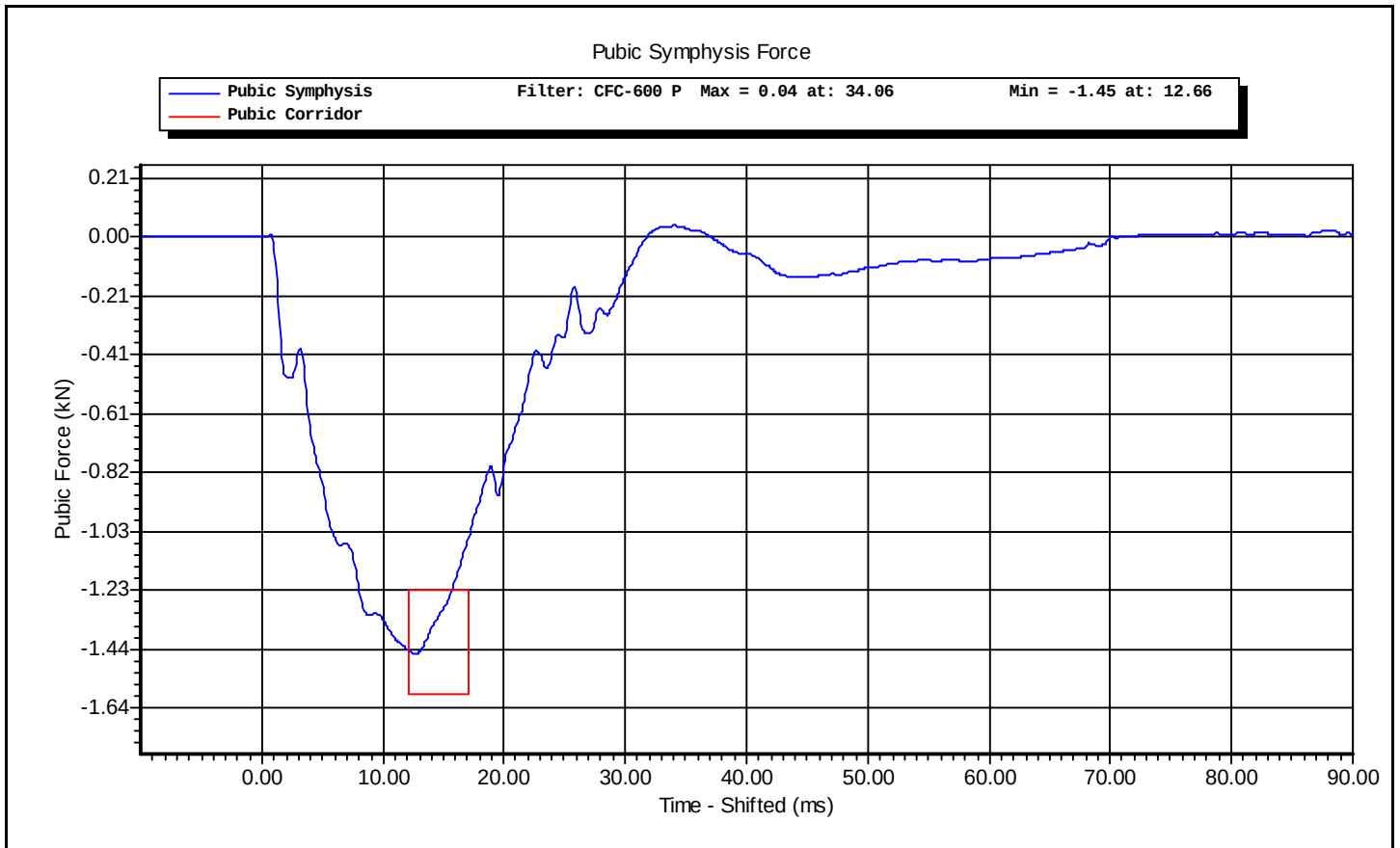
Pendulum Force



Test ID: **Pelvis**

Test Time: **8:49:51 AM**

Test Date: **1/18/2011**



CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

