

REPORT NUMBER: NCAP-CAL-11-005

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

**Ford Motor Company
2011 Ford Taurus SEL
4-Door Sedan**

NHTSA NUMBER: MB0222

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




Test Date: July 19, 2010


FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
1200 NEW JERSEY AVE SE, ROOM W43-410
WASHINGTON, D.C. 20590**

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: 
Vincent M. Paolini, Project Engineer

Date: September 2, 2010

Approved by: 
David Travale, Program Manager
Transportation Sciences Center

Date: September 2, 2010

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

1. <i>Report No.</i> NCAP-CAL-11-005	2. <i>Government Accession No.</i>	3. <i>Recipient's Catalog No.</i>																																													
4. <i>Title and Subtitle</i> Final Report of New Car Assessment Program Side Impact Testing of 2011 Ford Taurus SEL 4-Door Sedan NHTSA No.: MB0222		5. <i>Report Date</i> July 19, 2010																																													
7. <i>Author(s)</i> Vincent M. Paolini, Project Engineer		6. <i>Performing Organization Code</i> CAL																																													
9. <i>Performing Organization Name and Address</i> Calspan Corporation Transportation Sciences Center P.O. Box 400 Buffalo, New York 14225		8. <i>Performing Organization Report No.</i> tr2453																																													
12. <i>Sponsoring Agency Name and Address</i> U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590		10. <i>Work Unit No.</i>																																													
		11. <i>Contract or Grant No.</i> DTNH22-09-D-00126																																													
		13. <i>Type of Report and Period Covered:</i> <i>Final Report</i> July 19, 2010																																													
		14. <i>Sponsoring Agency Code</i> NPS-10																																													
15. <i>Supplementary Notes</i>																																															
16. <i>Abstract</i> A 55/28 kph 90 ⁰ Impact Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2011 Ford Taurus SEL 4-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 July 19, 2010. The impact velocity of the Moving Deformable Barrier (MDB) was 61.6 km/h, and the ambient temperature at the struck side (driver side) of the vehicle was 21.7°C. The target vehicle's maximum post test static crush was 253 mm at level 3. The test vehicle's performance was as follows:																																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th colspan="3" 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;">103.2</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">44</td> <td style="text-align: center;">30</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;">771</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;">1498</td> </tr> <tr> <th style="width: 50%;"></th> <th colspan="3" 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> <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;">283.5</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;">30.1</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;">4046</td> </tr> </tbody> </table>					Driver ATD (ES-2re)			Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	103.2	Maximum Thorax Rib Deflection	mm	44	30	Total Abdominal Force	N	2500	771	Pubic Symphysis Force	N	6000	1498		Passenger ATD (SID-IIs)			Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	283.5	Lower Spine Resultant Acceleration	G	82	30.1	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4046
	Driver ATD (ES-2re)																																														
Measurement Description	Units	Threshold	Result																																												
Head Injury Criteria (HIC ₃₆)	N/A	1000	103.2																																												
Maximum Thorax Rib Deflection	mm	44	30																																												
Total Abdominal Force	N	2500	771																																												
Pubic Symphysis Force	N	6000	1498																																												
	Passenger ATD (SID-IIs)																																														
Measurement Description	Units	Threshold	Result																																												
Head Injury Criteria (HIC ₃₆)	N/A	1000	283.5																																												
Lower Spine Resultant Acceleration	G	82	30.1																																												
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4046																																												
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. <i>Key Words</i> New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. <i>Distribution Statement</i> 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																																													
19. <i>Security Class. (of this report)</i> Unclassified	20. <i>Security Class. (of this page)</i> Unclassified	21. <i>No. of Pages</i> 263	22. <i>Price</i>																																												

TABLE OF CONTENTS

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

PURPOSE

This moving deformable barrier side impact test is part of the FY 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 Ford Taurus SEL 4-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 Ford Taurus SEL 4-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 61.6 km/h (38.3 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Calspan Corporation Transportation Sciences Center on July 19, 2010. Pretest and post- test photographs of the test vehicle, the MDB and the dummies (ES-2re and SID-IIs) are included in this report.

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

The Dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Head Accelerometers

Thorax Rib 1 to Rib 3 Potentiometers

Abdomen Forward, Middle, and Rear Load Cells

Pubic Load Cell

Lower Spine Accelerometers

PASSENGER ATD (SID-IIs)

Head Accelerometers

Thorax Upper, Middle, and Lower Rib Potentiometers

Abdomen Upper and Lower Rib Potentiometers

Acetabulum Load Cell

Iliac Load Cell

Lower Spine Accelerometers

Dummy injury values were recorded as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	103.2
Maximum Chest Deflection	mm	44	30
Total Abdominal Force	N	2500	771
Pubic Symphysis Force	N	6000	1498

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	283.5
Lower Spine Acceleration	G	82	30.1
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4046

Supplemental restraint information is given below:

SUPPLEMENTAL RESTRAINT INFORMATION

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

GENERAL COMMENTS

None

**SECTION 2
DATA SHEETS**

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

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB0222	Anti-Lock Brakes	Yes
Model Year	2011	All-Wheel Drive	No
Make	Ford	Power Steering	Yes
Model	Taurus SEL	Driver Front Airbag	Yes
Body Style	4-Door Sedan	Driver Curtain Airbag	Yes
VIN	1FAHP2EW8BG101634	Driver Head/Torso Airbag	No
Body Color	Black	Driver Torso Airbag	Yes
Delivery Date	6/29/2010	Driver Torso/Pelvis Airbag	No
Odometer Reading (km/mi)	73 mi	Driver Pelvis Airbag	No
Dealer	West-Herr Ford	Driver Knee Airbag	No
Transmission	6-Speed	Rear Pass. Curtain Airbag	Yes
Final Drive	Automatic	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	V6	Rear Pass. Torso Airbag	No
Engine Displacement (L)	3.5	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Lateral	Rear Pass. Pelvis Airbag	No
Roof Rack	No	Pretensioners	Yes
Sunroof/T-Top	No	Load Limiters	Yes
Tinted Glass	No	Automatic Door Locks	Yes
Traction Control	Yes	Bucket Seats	Yes
Power Brakes	Yes	Tilt Steering	Yes
Front Disc	Yes	Other	NA
Rear Disc	Yes	Other	NA

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	2386
Date of Manufacture	5/10	GAWR Front (kg)	1279
		GAWR Rear (kg)	1143

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				430.0	(A)
DSC x 68.04 (kg)				340.2	(B)
Cargo Weight (RCLW) (kg)				89.8	(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	-	-
Third row seat							

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

Test Vehicle: 2011 Ford Taurus SEL
 Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
 Test Date: July 19, 2010

VEHICLE TIRE INFORMATION



	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P235/55R18 99H	P235/55R18 99H
Tire Size on Vehicle	P235/55R18 99H	P235/55R18 99H
Tire Manufacturer	Michelin	Michelin
Tire Model	Pilot HX MXM4	Pilot HX MXM4
Treadwear	300	300
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester +1 Polyamide + 2 Steel	2 Polyester +1 Polyamide + 2 Steel
Load Index/Speed Symbol	99H	99H
Tire Material	-	-
DOT Safety Code Right	AP3J 002X 1610	AP3J 002X 1610
DOT Safety Code Left	AP3J 002X 1610	AP3J 002X 1610

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

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	559.5	350.5	910.0	598.0	455.0	1053.0	597.5	456.0	1053.5
Right	kg	538.0	352.0	890.0	540.0	418.0	958.0	537.0	433.0	970.0
Ratio	%	61.0	39.0		56.6	43.4		56.0	44.0	
Totals	kg	1097.5	702.5	1800.0	1138.0	873.0	2011.0	1134.5	889.0	2023.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1800.0	(A)
Sum of Actual Weight of 2 P572 ATDS Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	89.8	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	2019.1	(A+B+C)

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	LF	RF	RR	LR	CG (aft of front axle)
Fully Loaded	mm	775	775	775	771	
As Tested (Fully Loaded ± 10 mm at each wheel well)	mm	778	777	783	776	1248

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2874
Total Vehicle Length at Left Side	mm	4997
Total Vehicle Length at Centerline	mm	5157
Total Vehicle Length at Right Side	mm	4999
Weight of Ballast in Cargo Area	kg	64
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	67.0

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	497
Actual Impact Point Aft of Front Axle	mm	500

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

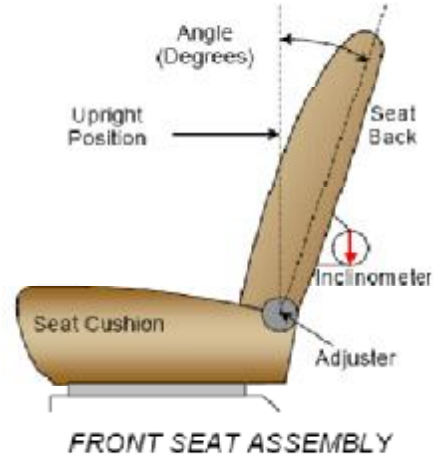
Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010

NORMAL DESIGN RIDING POSITION

Driver seat: An inclinometer was placed on the head restraint post and the seat was positioned to 18.6 degrees with the ATD in seat.

Passenger Seat: Fixed seat back



SEAT BACK ANGLES

	Degrees
Driver w/ Seated Dummy	18.6
Passenger w/ Seated Dummy	-

SEAT FORE/AFT POSITIONS

The front outboard seat was placed in the mid-travel position while maintaining the seat cushion mid-angle position. The seat height was placed in the lowest attainable position while maintaining mid-angle cushion position

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	272 mm	136 mm
Rear Seat	NA	NA

SEAT BELT UPPER ANCHORAGES

The driver seating position was placed in the highest position.

SEAT BELT UPPER ANCHORAGES

	Total # of Positions	Placed in Position #
Driver Seat	2	0
Rear Seat	NA	NA

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

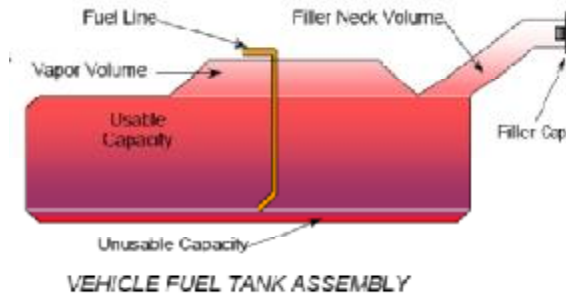
Test Vehicle: 2011 Ford Taurus SEL
 Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
 Test Date: July 19, 2010

FUEL TANK CAPACITY

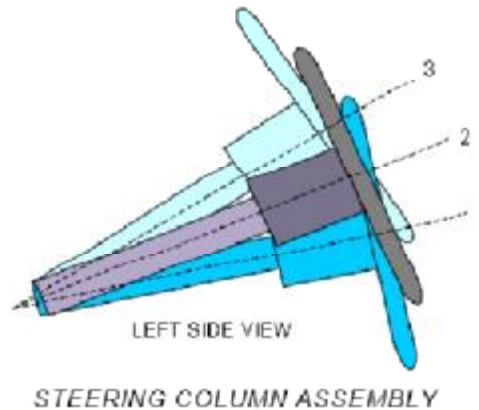
	Liters
Usable Capacity of "Standard Tank"	71.9
Usable Capacity of "Optional Tank"	NA
Usable Capacity Used for FMVSS 301	67.0
Actual Amount of Solvent Used	67.0

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



STEERING COLUMN ADJUSTMENT

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



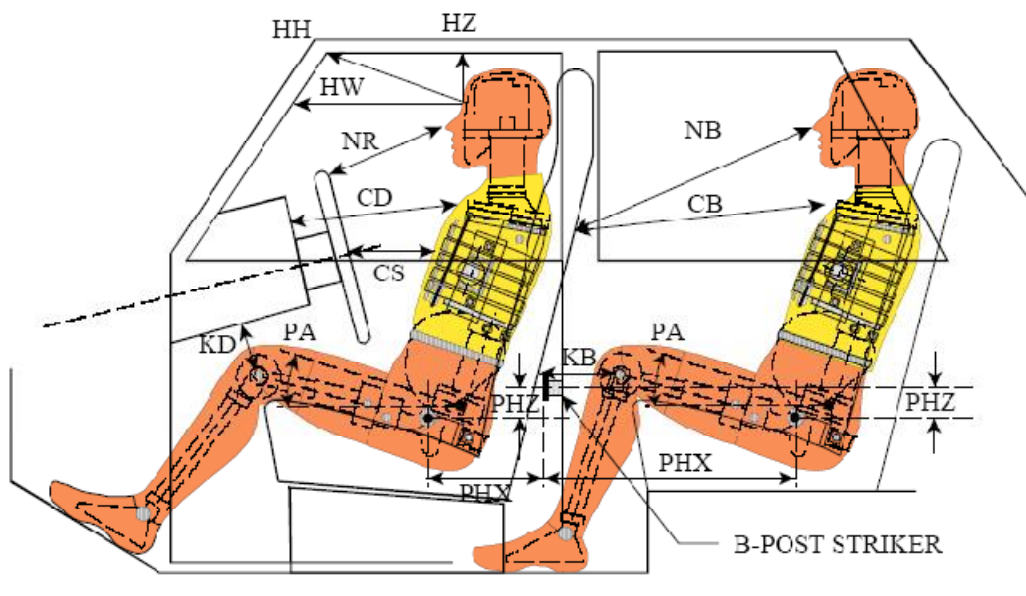
STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	21.5	
Geometric Center - Position 2	24.3	
Uppermost - Position 3	27.0	
Telescoping Steering Wheel Travel		50
Test Position	24.3	25

**DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



LEFT SIDE VIEW

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

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

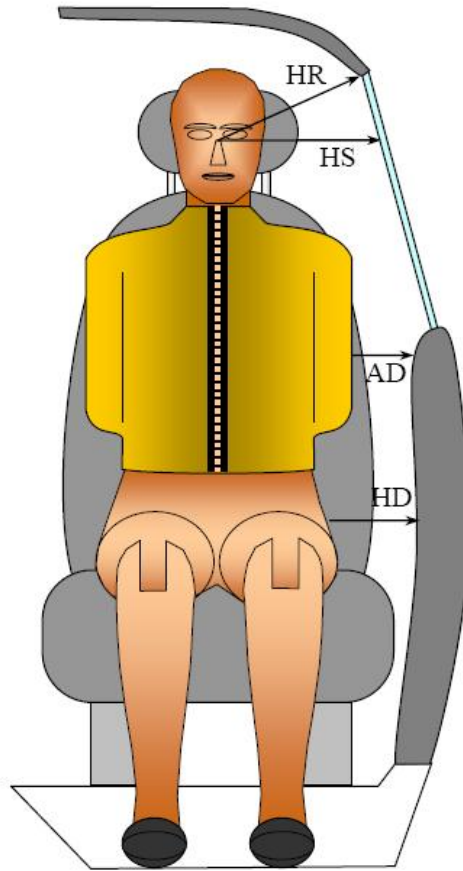
Driver Code	Pass. Code	Measurement Description	Driver S/N F033		Passenger S/N 300	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	417	12		
HW		Header to Windshield	676	0		
HZ	HZ	Head to Roof	195	90	265	90
NR	NB	Nose to Rim/Seat Back	455	12	574	13
CD	CB	Chest to Dash/Seat Back	596	6	551	6
CS		Chest to Steering Wheel	341	0		
KDL	KBL	Left Knee to Dash/Seat Back	151	24	286	21
KDR	KBR	Right Knee to Dash/Seat Back	120	20	291	22
PA	PA	Pelvic Angle		25.1		19.9
PHX	PHX	H-Point to Striker (X-Axis)	174		185	
PHZ	PHZ	H-Point to Striker (Z-Axis)	162		239	
SA	SA	Seat Back Angle		18.6 *		Fixed

* Measurement from the head restraint post

**DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



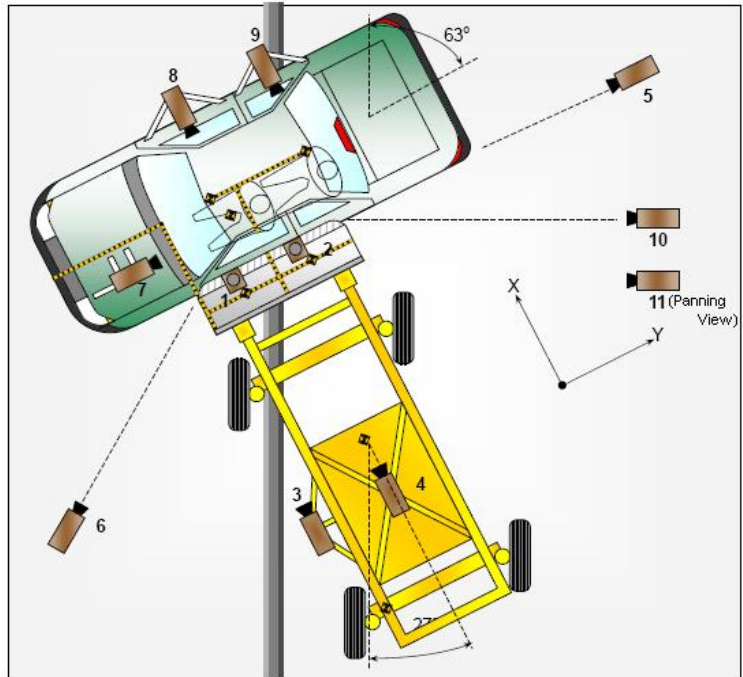
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Description	Units	Driver S/N 033	Passenger S/N 300
HR	Head to Side Header	mm	205	217
HS	Head to Side Window	mm	371	355
AD	Arm to Door	mm	106	146
HD	H-point to Door	mm	168	165

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

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



CAMERA LOCATIONS AND DATA

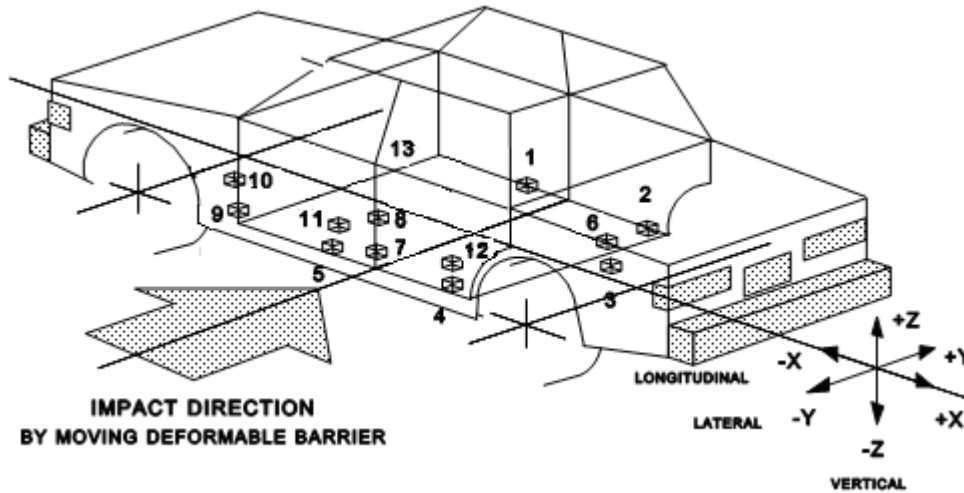
No.	Camera View	Location			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead Overall	900	1250	4880	-90	20	1000
2	Overhead Close-up	600	1130	4880	-90	28	1000
3	Left Impact Point (MDB)	-1470	0	-847	0	25	500
4	Side Overall (MDB)	-1140	838	-1587	-17	12.5	500
5	Rear	340	11200	910	-3	50	1000
6	Left Front	-1870	-1770	935	-2	28	1000
7	Driver Front (OB)	555	450	1380	-12	25	500
8	Driver Side (OB)	1590	760	960	-4	12.5	500
9	Passenger Side (OB)	1590	1765	990	-1	12.5	500
10	Real-time Left Rear	-	-	-	-	-	24
11	Real-time Inrun	-	-	-	-	-	24

*Reference: Impact Point projected to Ground
+X = To Front of MDB, +Y = To Right of MDB, +Z = Down
All measurements accurate to ± 6 mm.

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

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

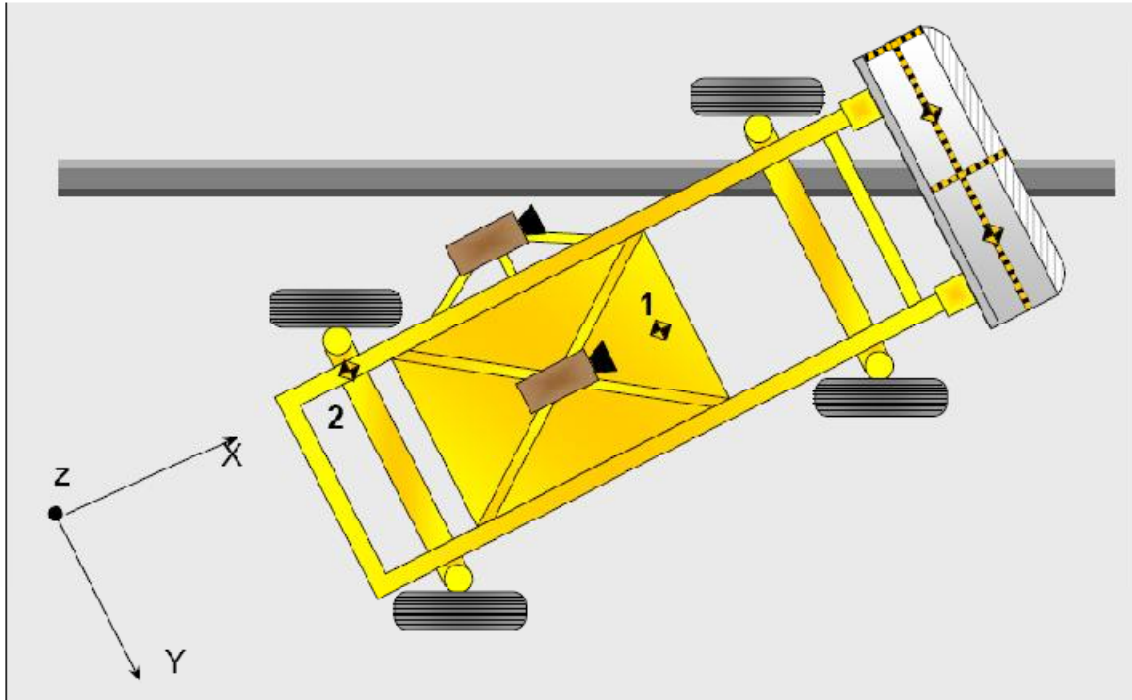
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3298	672	356
2	Right Sill at Rear Seat	2363	681	366
3	Rear Floorpan Above Axle	1173	-9	588
4	Left Sill at Rear Door	2347	-677	347
5	Left Sill at Front Door	3326	-666	350
6	Rt. Rear Occ. Compartment	2458	403	284
7	B-Post Lower	2517	-705	427
8	B-Post Middle	2460	-692	946
9	A-Post Lower	3475	-674	405
10	A-Post Middle	3455	-669	1099
11	Front Seat Track	2618	-560	349
12	Rear Seat Structure	1212	-531	726
13	Vehicle CG	2895	27	611

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

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



MDB ACCELEROMETER LOCATIONS

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

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

**DATA SHEET NO. 8
TEST VEHICLE SUMMARY OF RESULTS**

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	178	379
2	Occupant H-Point	mm	227	593
3	Mid Door	mm	253	714
4	Window Sill	mm	147	990
5	Window Top	mm	10	1477
	Maximum Penetration	mm	253	714

INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total No. of Contact Switches	5 *
Total	63

* 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 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010

MDB SPECIFICATIONS

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

MDB WEIGHTS

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

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.6
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.8
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.5

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Row	Vertical Location		From Centerline		Maximum Crush
	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	215
B	Top of Bumper	533	700	Right	160
C	Mid-Level	686	800	Left	115
D	Top of Stack	813	800	Left	118

MDB INSTRUMENTATION

Accelerometers	5
Contact Switches	2

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

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010

TEST DUMMY INFORMATION AND CONTACT

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

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

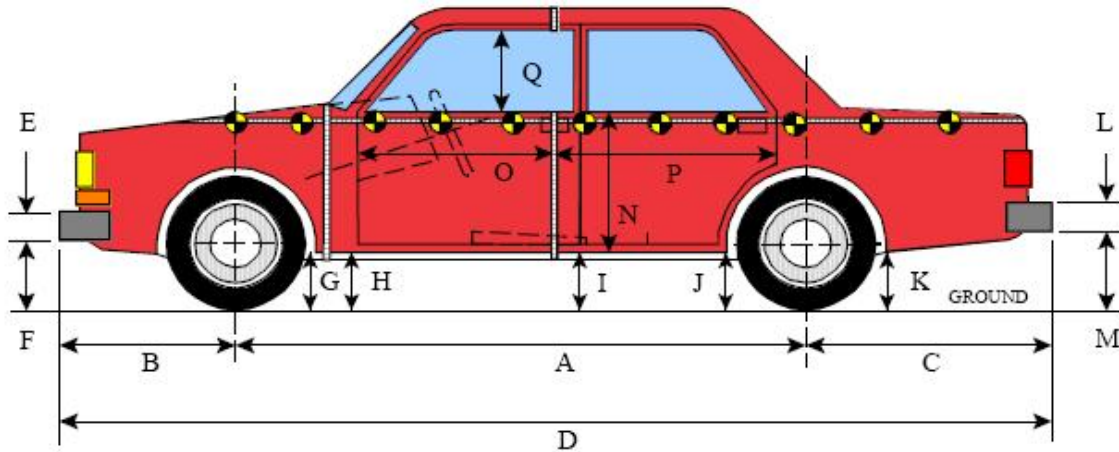
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	-3
Vertical Offset	mm	+/- 20	+1

**DATA SHEET NO. 11
VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



LEFT SIDE VIEW

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

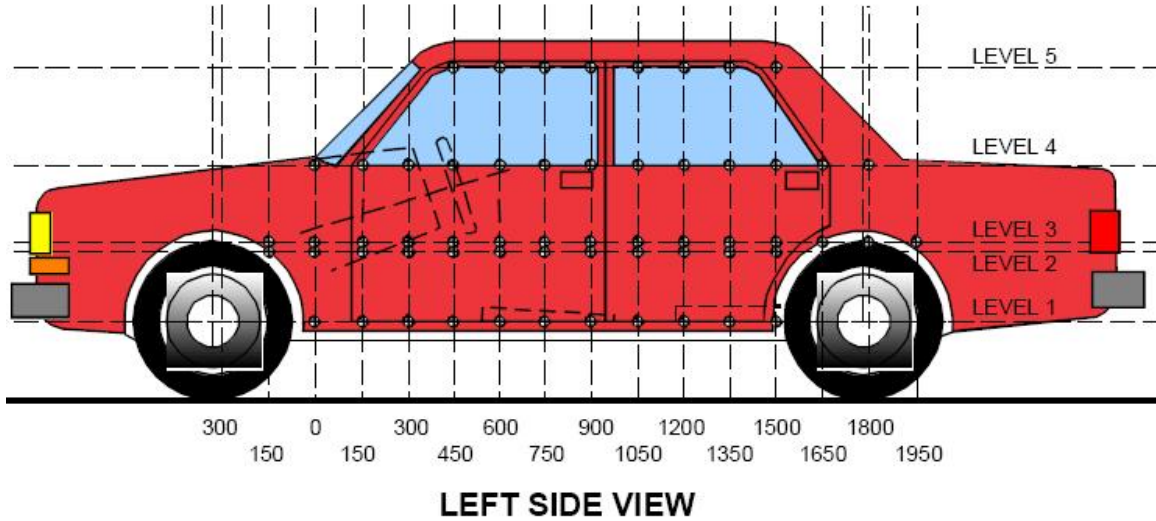
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2874	2874	0
B	Front Axle to FSOV	1035	1030	5
C	Rear Axle to RSOV	1248	1248	0
D	Total Length at Centerline	5157	5152	5
E	Front Bumper Thickness	85	85	0
F	Front Bumper Bottom to Ground	477	492	-15
G	Sill Height at Front Wheel Well	154	178	-24
H	Sill Height at Front Door Leading Edge	163	187	-24
I	Sill Height at B Pillar	229	194	35
J1	Sill Height at Rear Wheel Well	202	208	-6
J2	Pinch Weld Height at Rear Wheel Well	234	209	25
K	Sill Height Aft of Rear Wheel Well	221	235	-14
L	Rear Bumper Thickness	230	230	0
M	Rear Bumper Bottom to Ground	421	440	-19
N	Sill Height to Window Bottom Sill	751	717	34
O	Front Door Leading Edge to Impact CL	814	792	22
P	Rear Door Trailing Edge to Impact CL	1214	1125	89
Q	Front Window Opening	425	429	-4
R	Right Side Length	4999	4996	3
S	Left Side Length	4997	4995	2
T	Vehicle Width at B Post	1935	1758	177

DATA SHEET NO. 12
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	379
2	Occupant H-Point	593
3	Mid-Door	714
4	Window Sill	990
5	Window Top	1477

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 Ford Taurus SEL
 Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
 Test Date: July 19, 2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	--	942	912	--	--	--	945	923	--	--	--	-3	-11	--	--
-750	--	--	958	--	--	--	--	945	--	--	--	--	13	--	--
-600	--	--	--	738	--	--	--	--	748	--	--	--	--	-10	--
-450	--	--	--	801	--	--	--	--	802	--	--	--	--	-1	--
-300	--	--	--	838	--	--	--	--	839	--	--	--	--	-1	--
-150	--	962	935	863	--	--	929	930	862	--	--	33	5	1	--
0	953	953	953	880	--	944	936	930	878	--	9	17	23	2	--
150	948	947	939	895	--	862	838	836	861	--	86	109	103	34	--
300	948	947	940	903	--	810	782	770	851	--	138	165	170	52	--
450	950	948	943	910	--	796	771	741	833	--	154	177	202	77	--
600	955	949	944	916	--	792	762	724	807	--	163	187	220	109	--
750	959	949	946	920	573	788	758	711	808	571	171	191	235	112	2
900	962	950	947	909	628	784	723	709	808	626	178	227	238	101	2
1050	964	950	948	924	630	787	761	755	826	623	177	189	193	98	7
1200	965	950	948	925	630	812	774	735	811	621	153	176	213	114	9
1350	963	949	947	926	630	803	756	694	790	620	160	193	253	136	10
1500	958	947	946	925	631	794	746	693	778	621	164	201	253	147	10
1650	953	945	944	923	629	783	730	696	776	621	170	215	248	147	8
1800	948	946	944	920	625	800	728	712	778	622	148	218	232	142	3
1950	939	953	949	940	613	959	861	832	827	615	-20	92	117	113	-2
2100	--	--	961	933	494	--	--	932	907	498	--	--	29	26	-4
2250	--	--	--	906	--	--	--	--	893	--	--	--	--	13	--
2400	--	--	--	900	--	--	--	--	896	--	--	--	--	4	--
2550	--	--	--	891	--	--	--	--	894	--	--	--	--	-3	--
2700	--	--	950	879	--	--	--	960	888	--	--	--	-10	-9	--
2850	--	924	910	863	--	--	935	922	876	--	--	-11	-12	-13	--

MAXIMUM CRUSH DATA

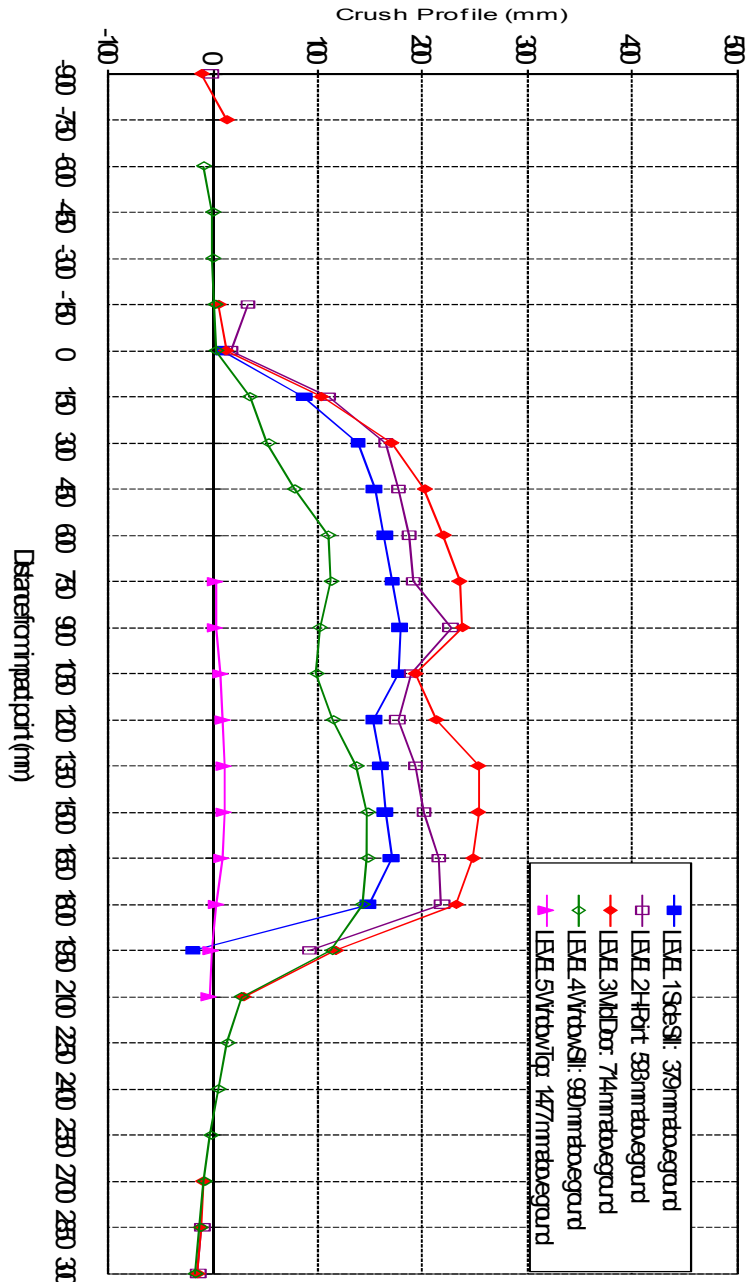
	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	178	227	253	147	10
Distance From Impact (mm)	900	900	1350	1500	1350

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 Ford Taurus SEL
 Test Program: Side NCAP MDB Impact

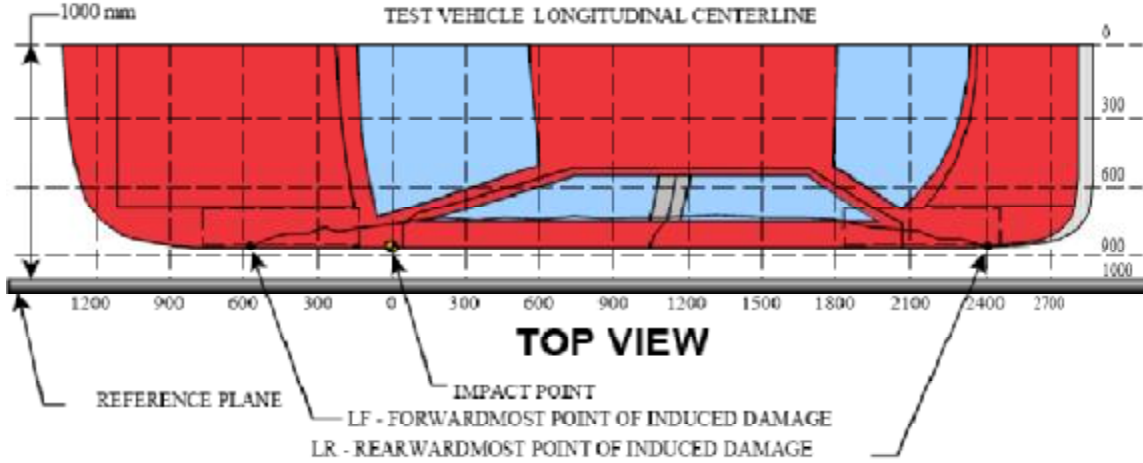
NHTSA No.: MB0222
 Test Date: July 19, 2010



**DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



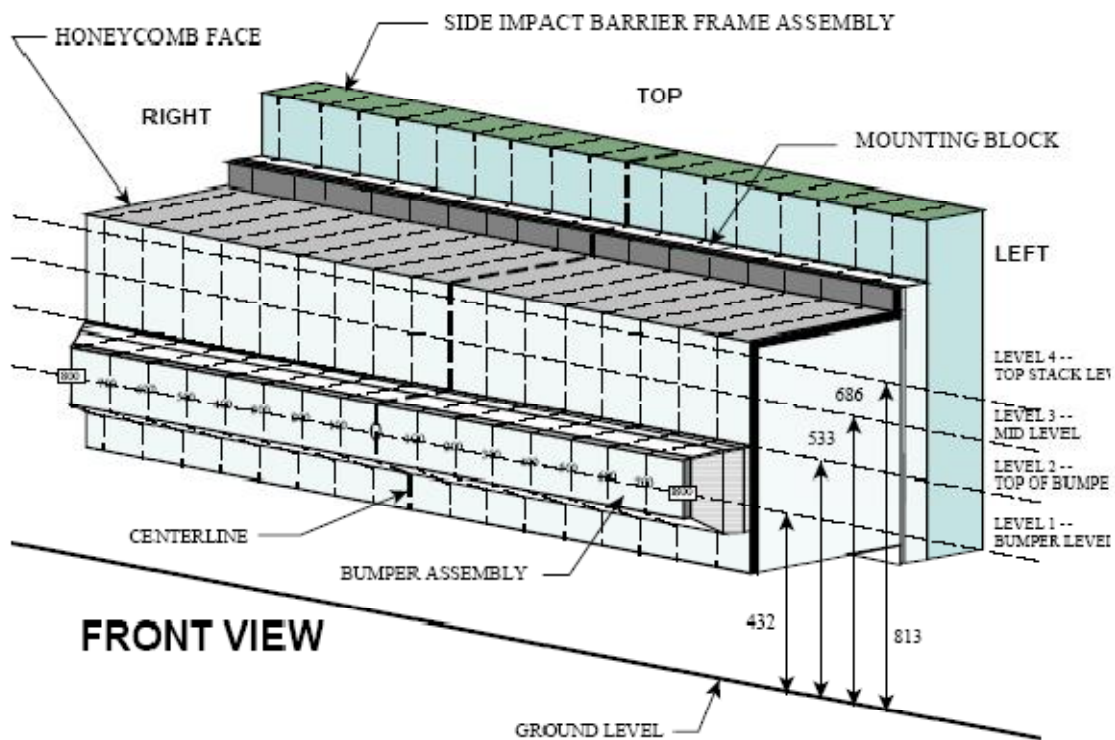
DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Maximum Static Crush (mm)
1	2400	4	100	104	4
2	1920	3	52	192	140
3	1440	3	54	307	253
4	960	3	53	273	220
5	0	3	57	262	205
6	0	2	47	64	17

**DATA SHEET NO. 14
EXTERIOR STATIC CRUSH FOR IMPACTOR FACE**

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	209	215	210	204	194	192	189	187	185	182	180	177	176	174	174	183	205
2	160	157	151	150	145	137	132	118	116	129	130	127	126	124	122	125	133
3	56	40	38	39	39	44	49	48	53	35	33	32	31	36	49	70	115
4	47	34	29	19	25	42	70	90	80	50	42	39	39	48	63	86	118

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

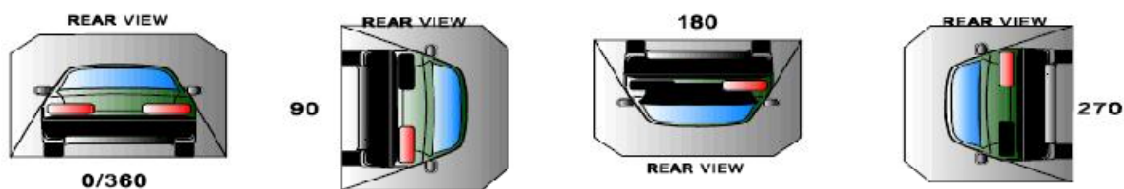
Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010

Test Time: 3:05 PM **Temperature:** 21.7° C

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

FMVSS NO. 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0 to 90	1:04	5:00	6:04
90 to 180	1:09	5:00	6:09
180 to 270	1:04	5:00	6:04
270 to 360	1:06	5:00	6:06

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

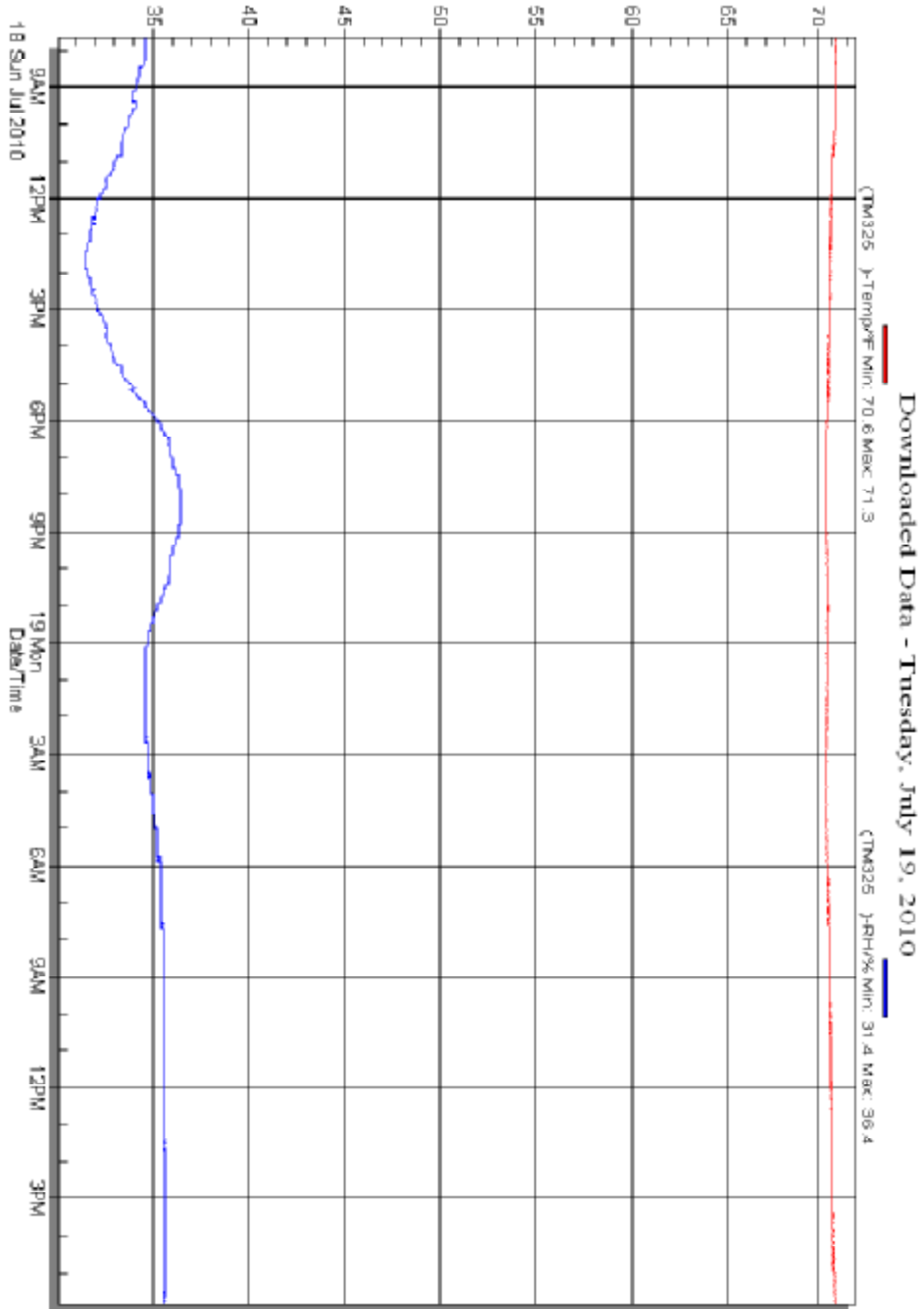
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 16
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Ford Taurus SEL
Test Program: Side NCAP MDB Impact

NHTSA No.: MB0222
Test Date: July 19, 2010



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

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

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

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



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



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



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



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



Figure A-5: Pre-Test Left Front 3/4 View of Test Vehicle



Figure A-6: Post-Test Left Front 3/4 View of Test Vehicle



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



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



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



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



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



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



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



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

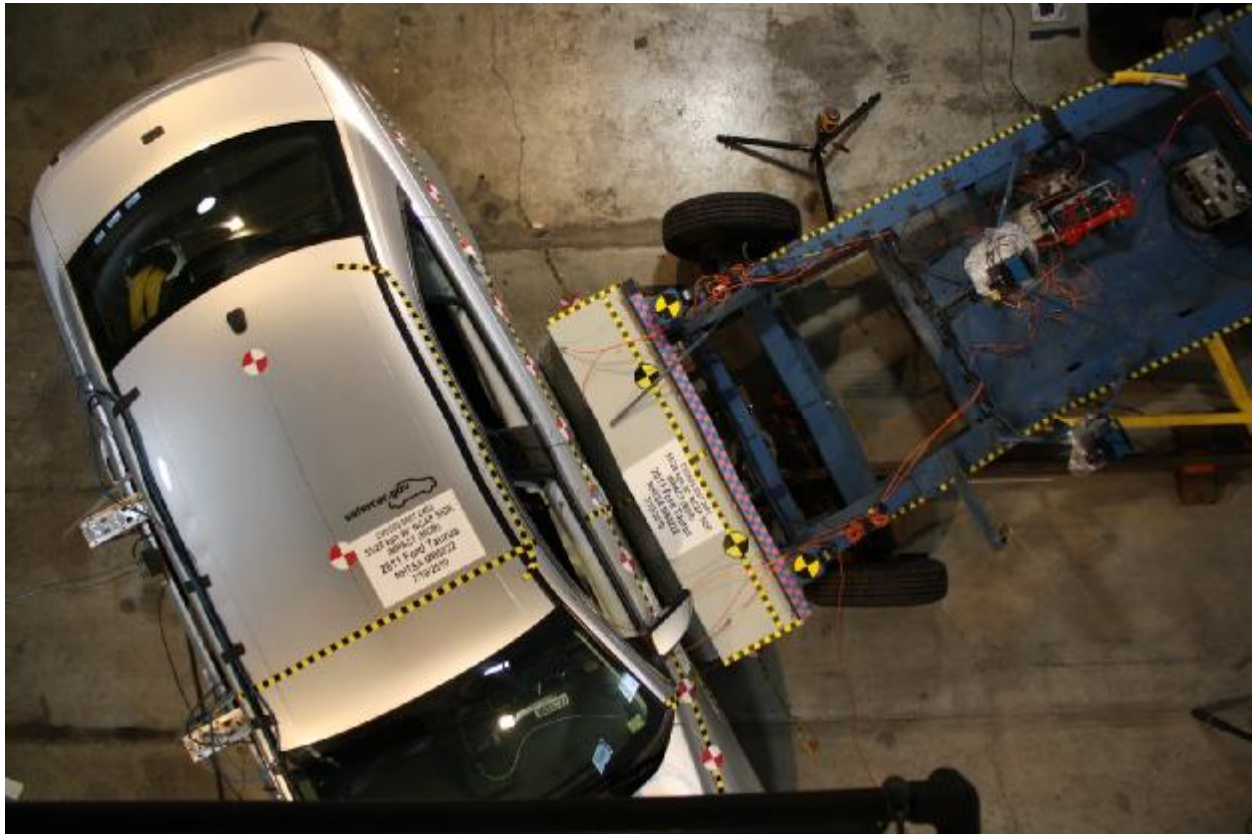


Figure A-15: Pre-Test Overhead View of the Test Vehicle and MDB

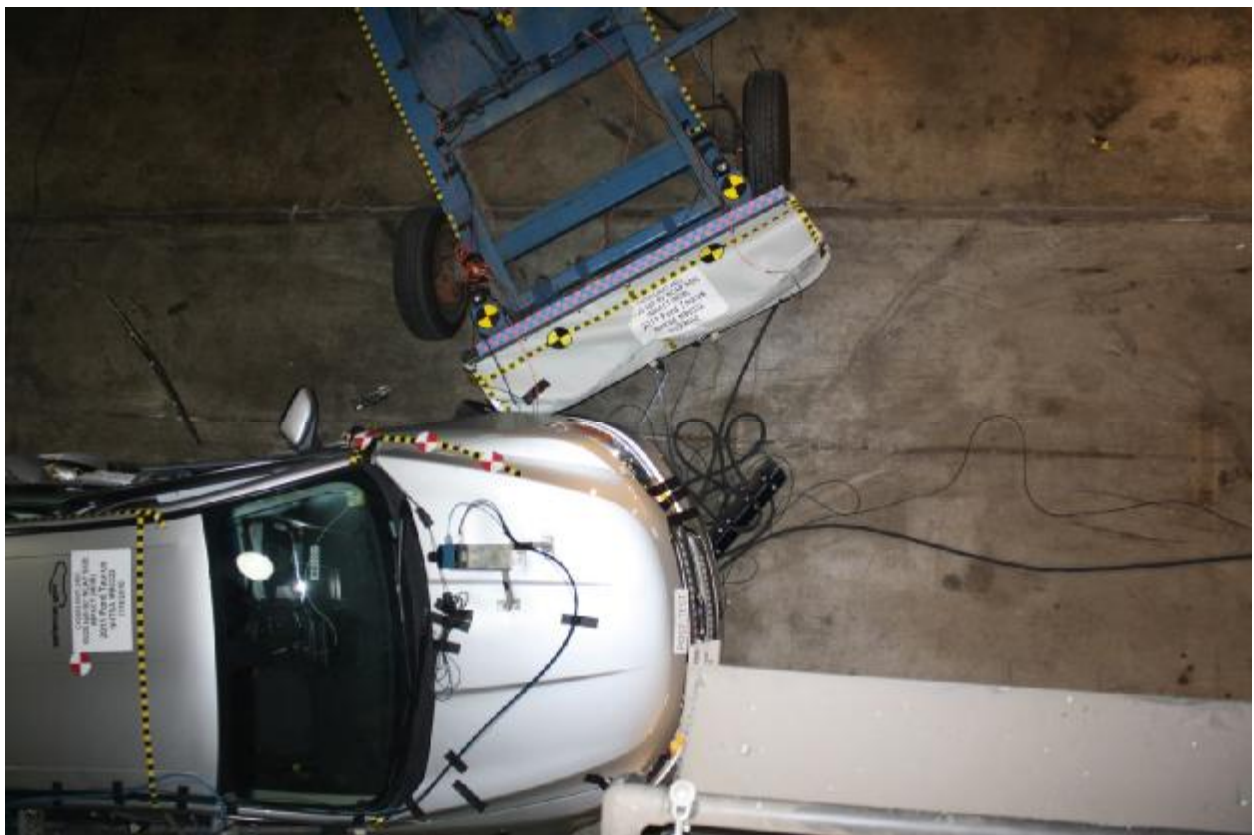


Figure A-16: Post-Test Overhead View of Test Vehicle and MDB



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



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



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

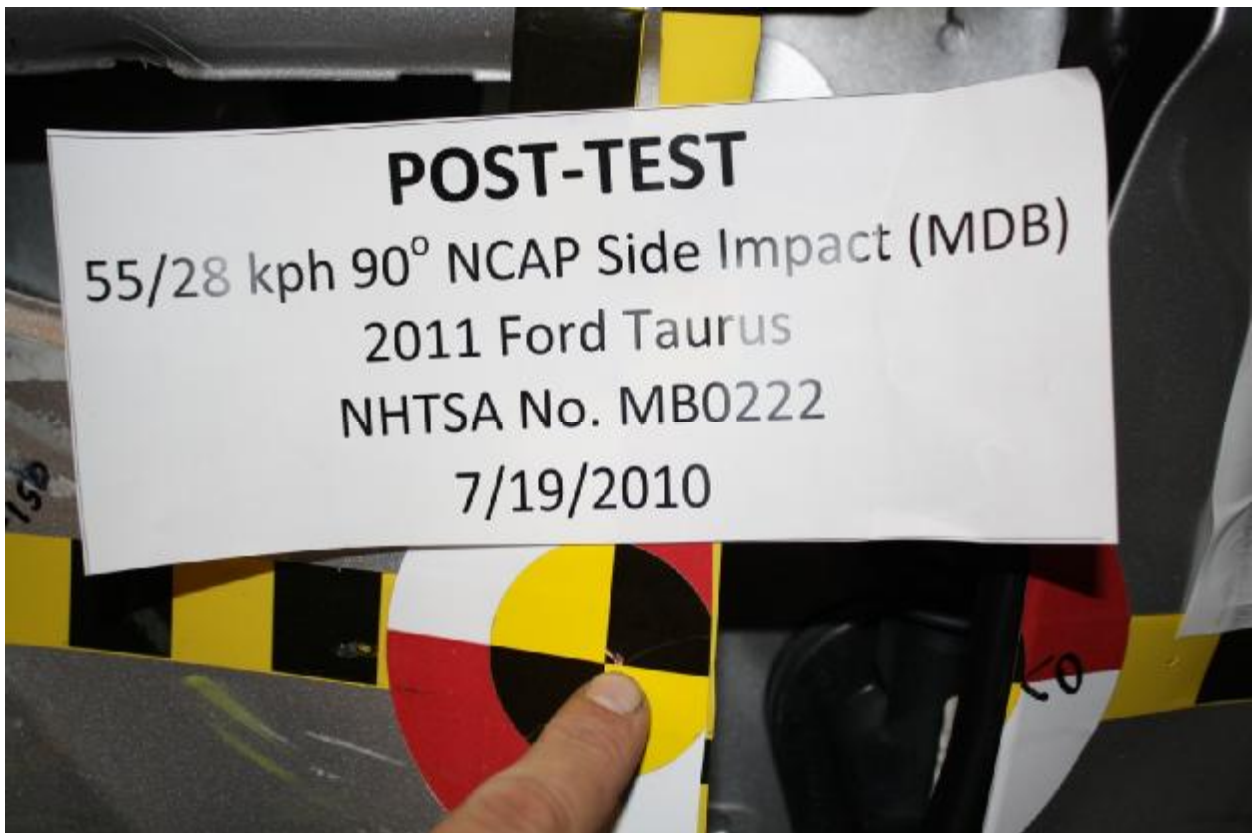


Figure A-20: Post-Test Close-up View of Impact Point Target

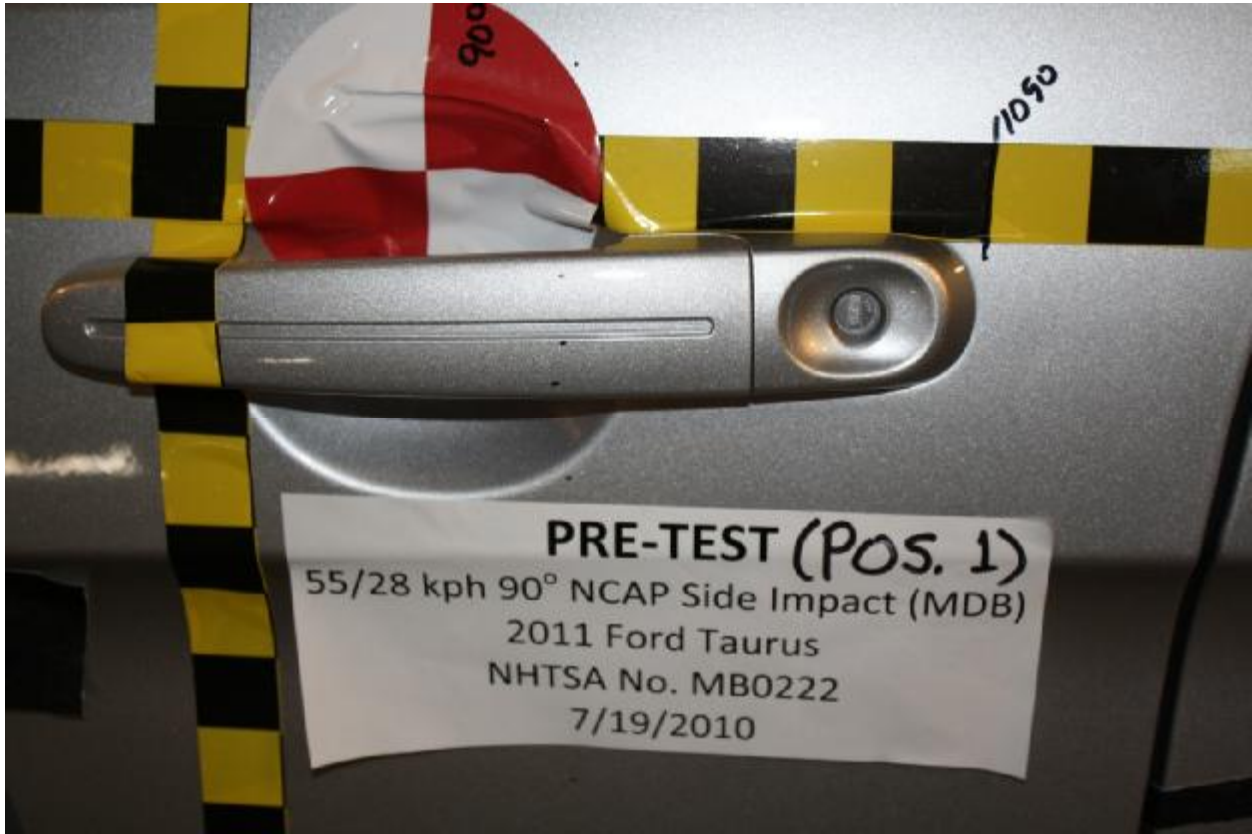


Figure A-21: Pre-Test Left Front Door Lath Close-up



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



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



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



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



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



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



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

Photograph Not Available

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

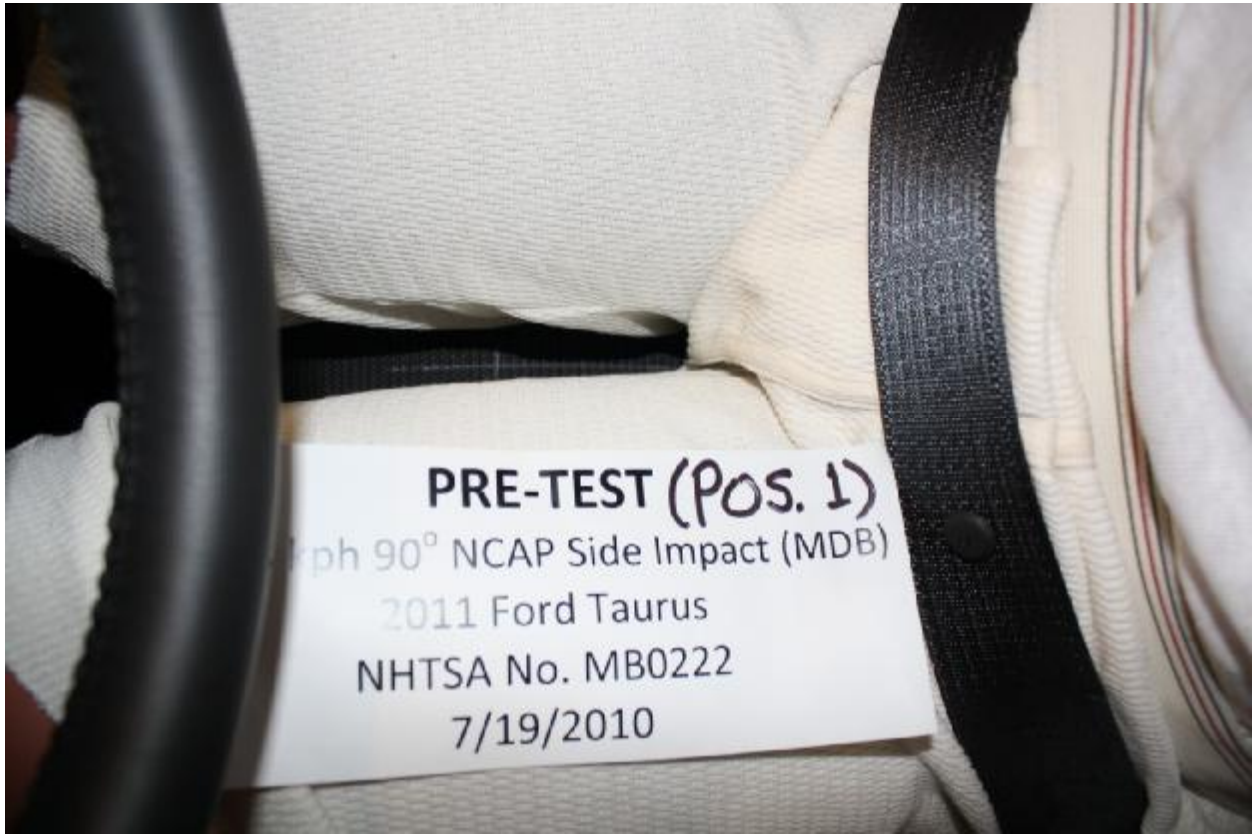


Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



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

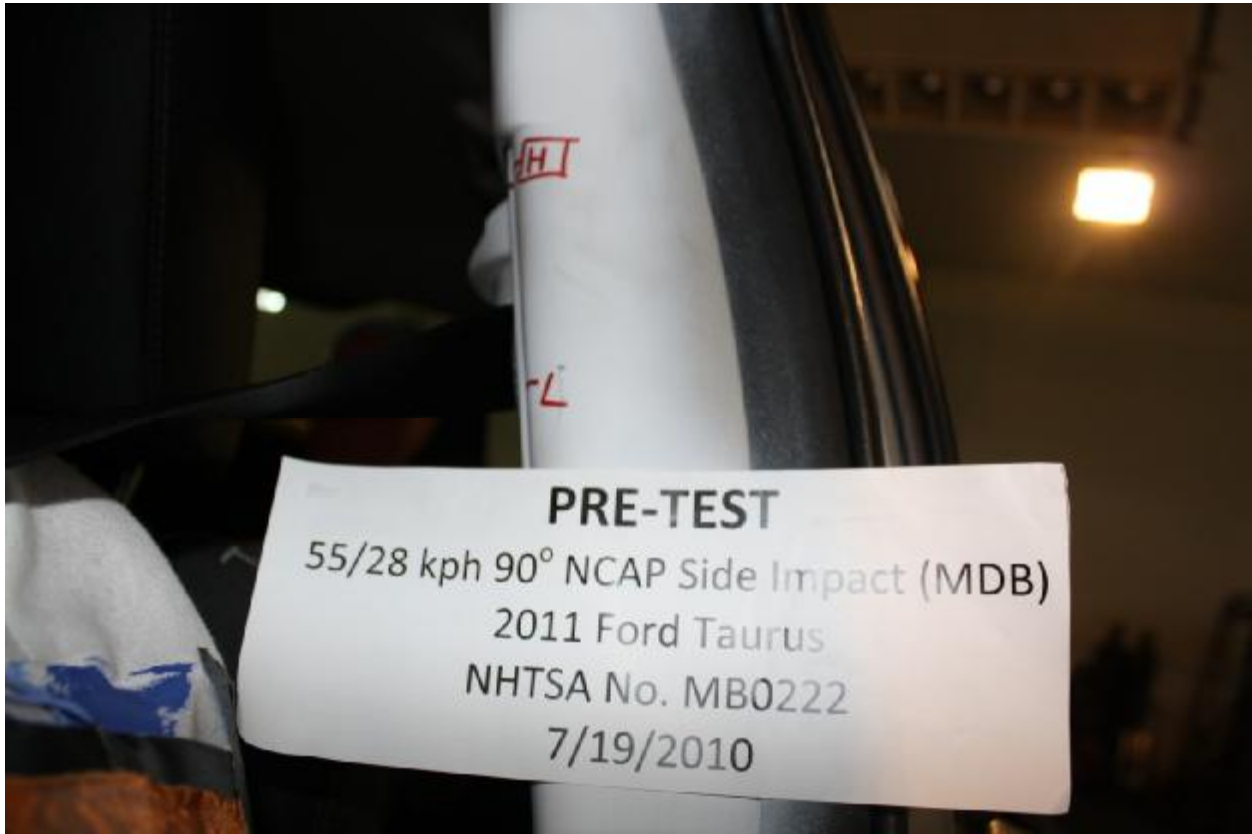


Figure A-35: Pre-Test View of Belt Anchorage for Driver Dummy to Show Position

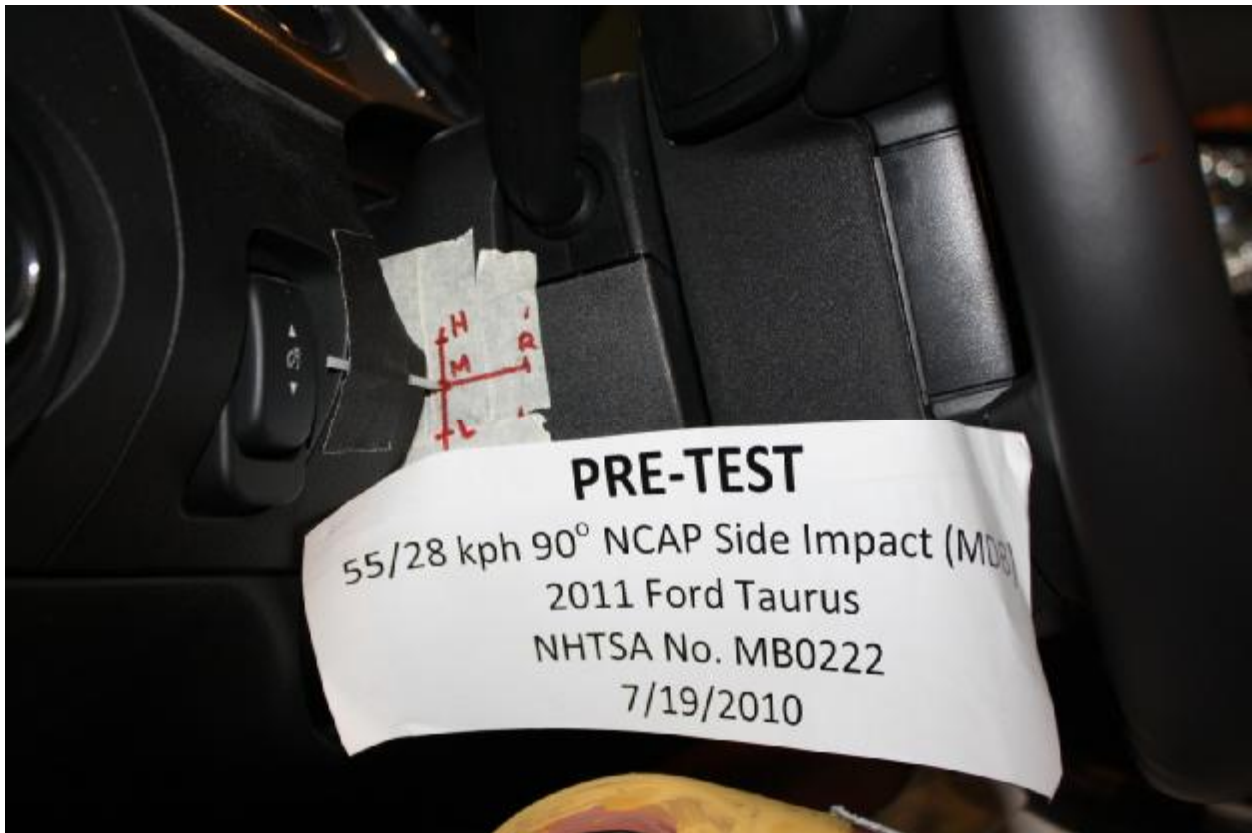


Figure A-36: Pre-Test Left Side View of Steering Wheel to Show Position



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

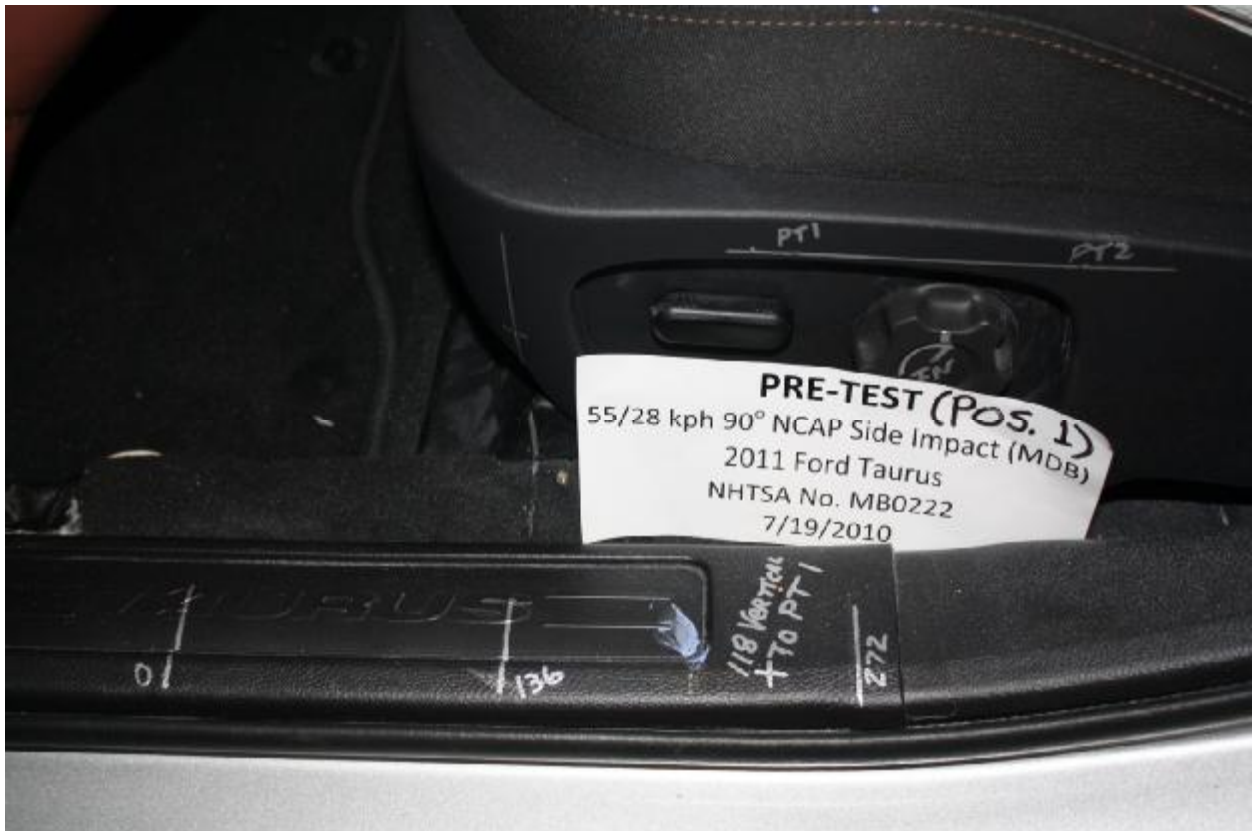


Figure A-38: Pre-test Close-up Left Side View of Driver Seat Track Showing Seat Positioning

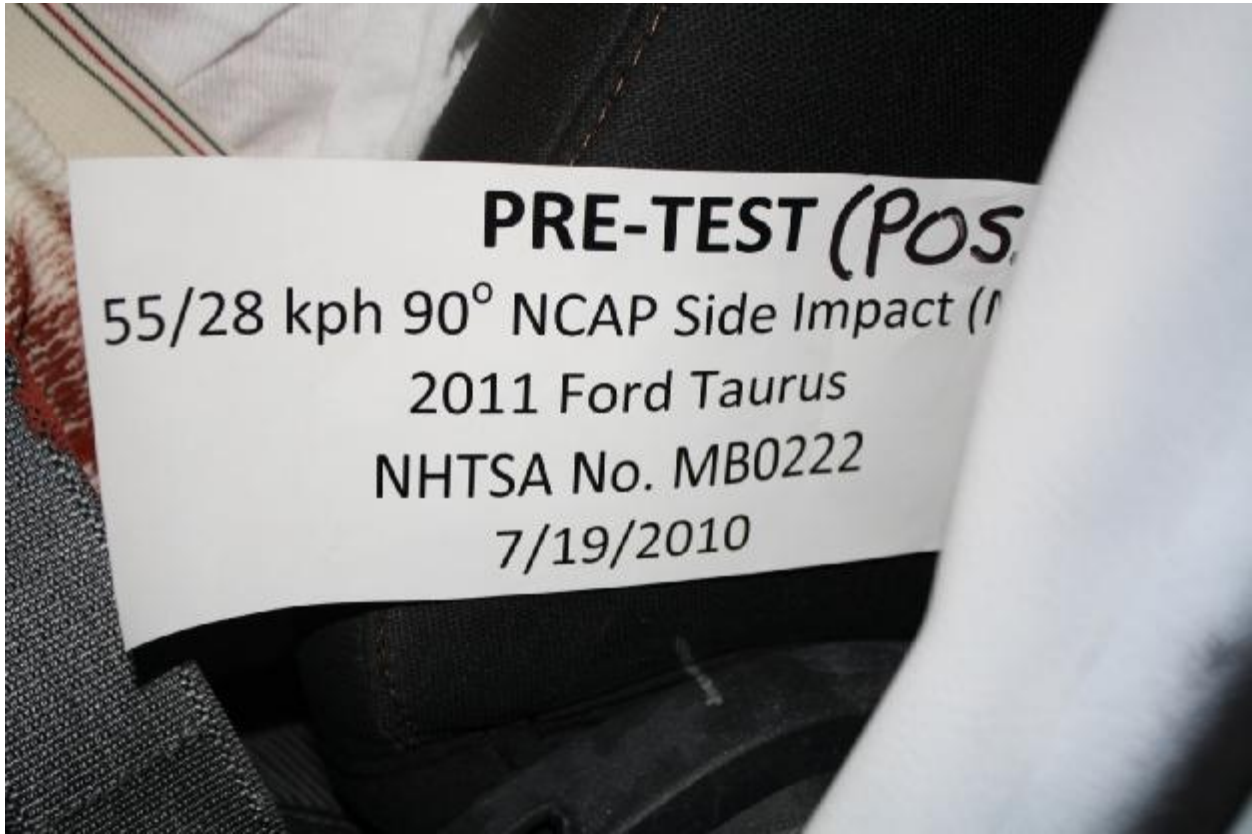


Figure A-39: Pre-test Close-up Left Side View of Driver Seat Back Showing Seat Back Positioning

Photograph Not Available

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

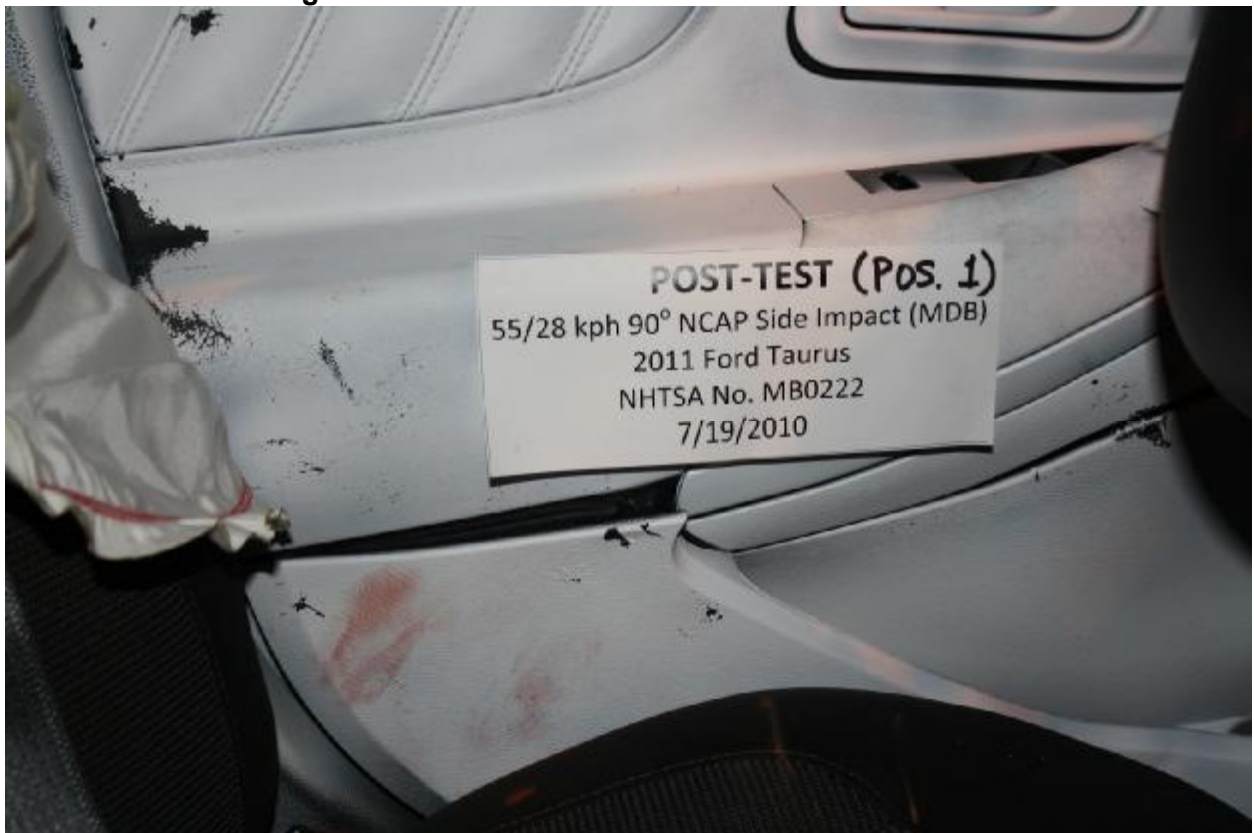


Figure A-46: Post-test Driver Inner Door Panel View Showing Driver Dummy Contact Locations

Photograph Not Available

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

Photograph Not Available

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

Photograph Not Available

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

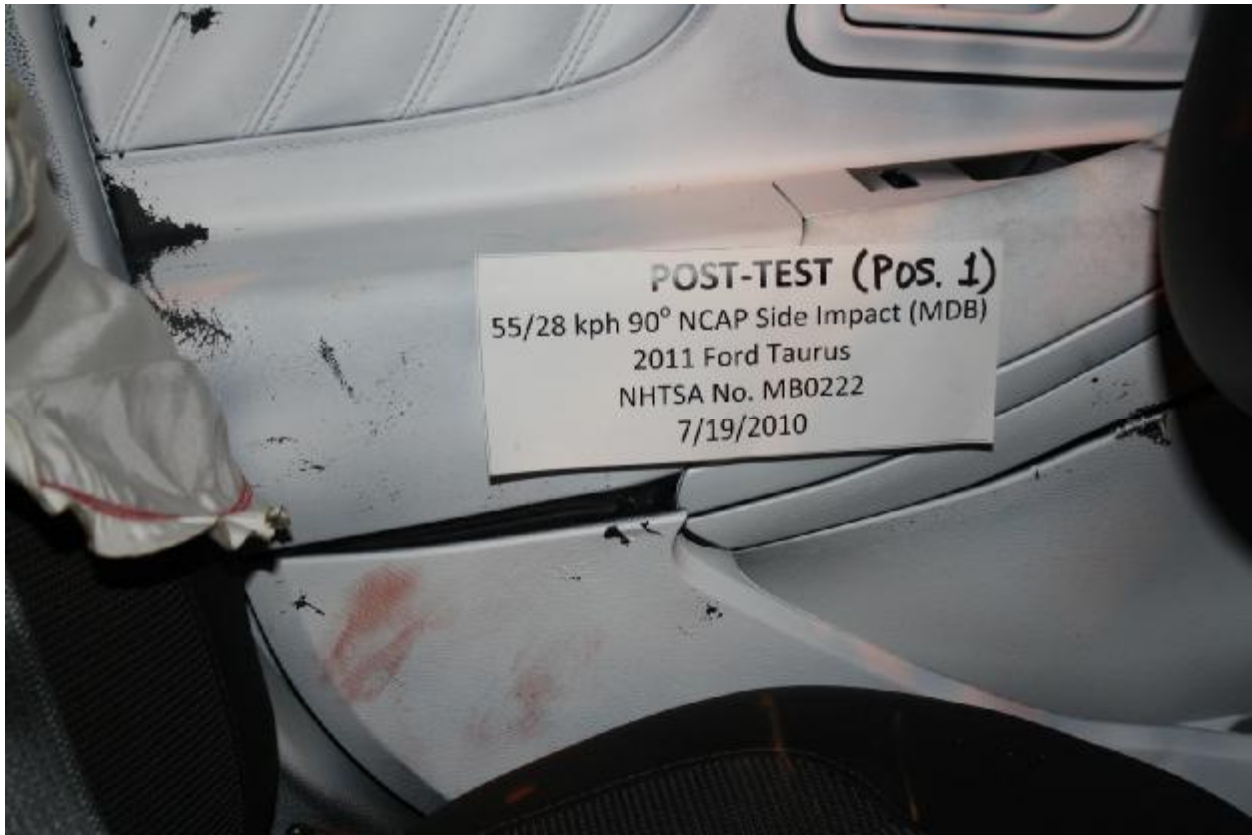


Figure A-51: Post-Test Driver Dummy Close-Up Pelvis Contact View

Photograph Not Available

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



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



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



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



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



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



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

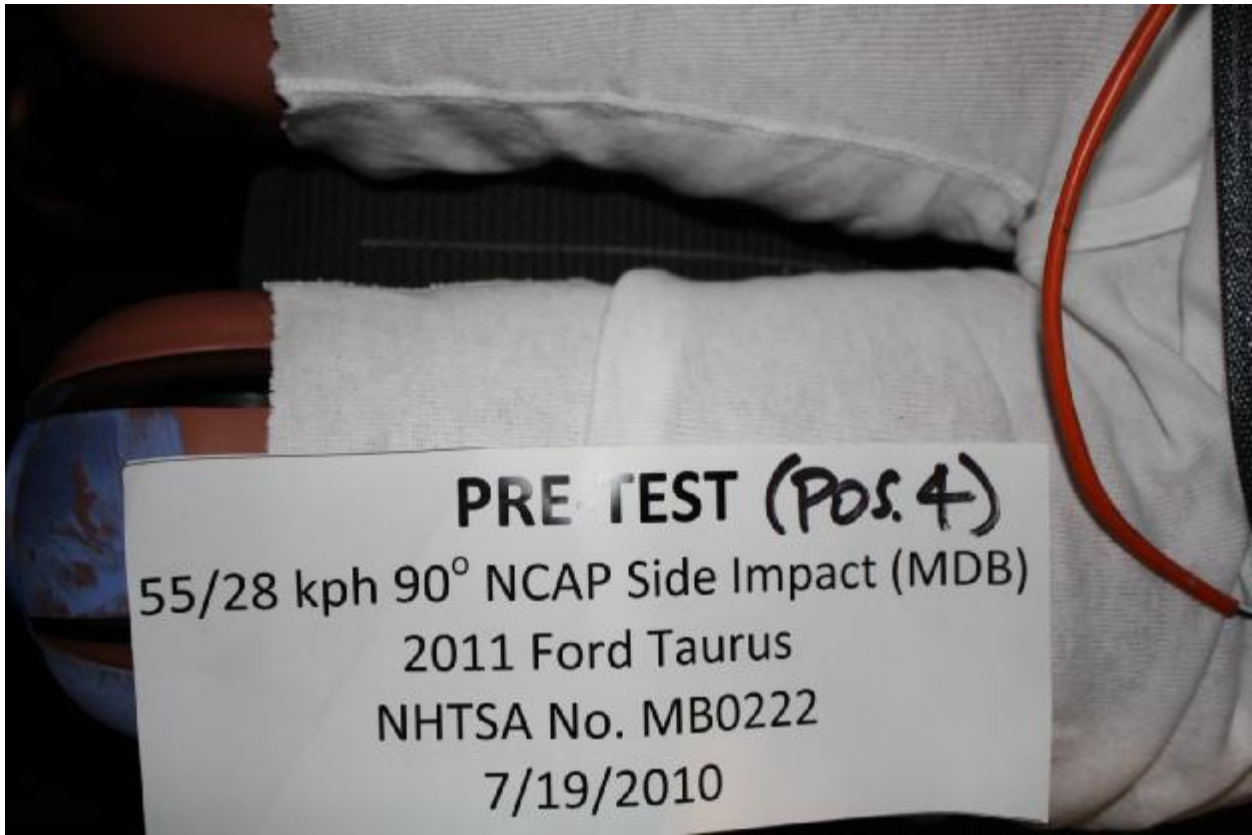


Figure A-59: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan

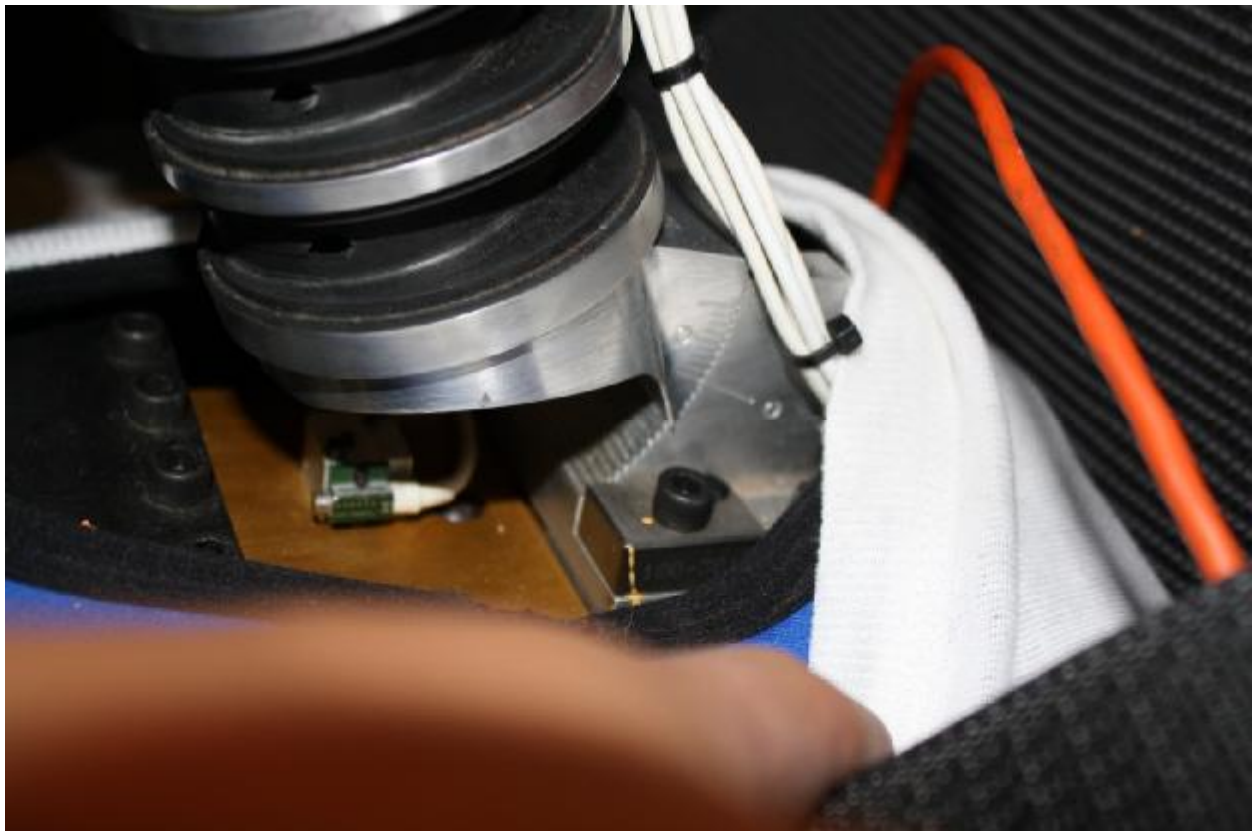


Figure A-60: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



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



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



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



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



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

Photograph Not Available

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



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



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



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



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



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

Photograph Not Available

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

Photograph Not Available

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



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

Photograph Not Available

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

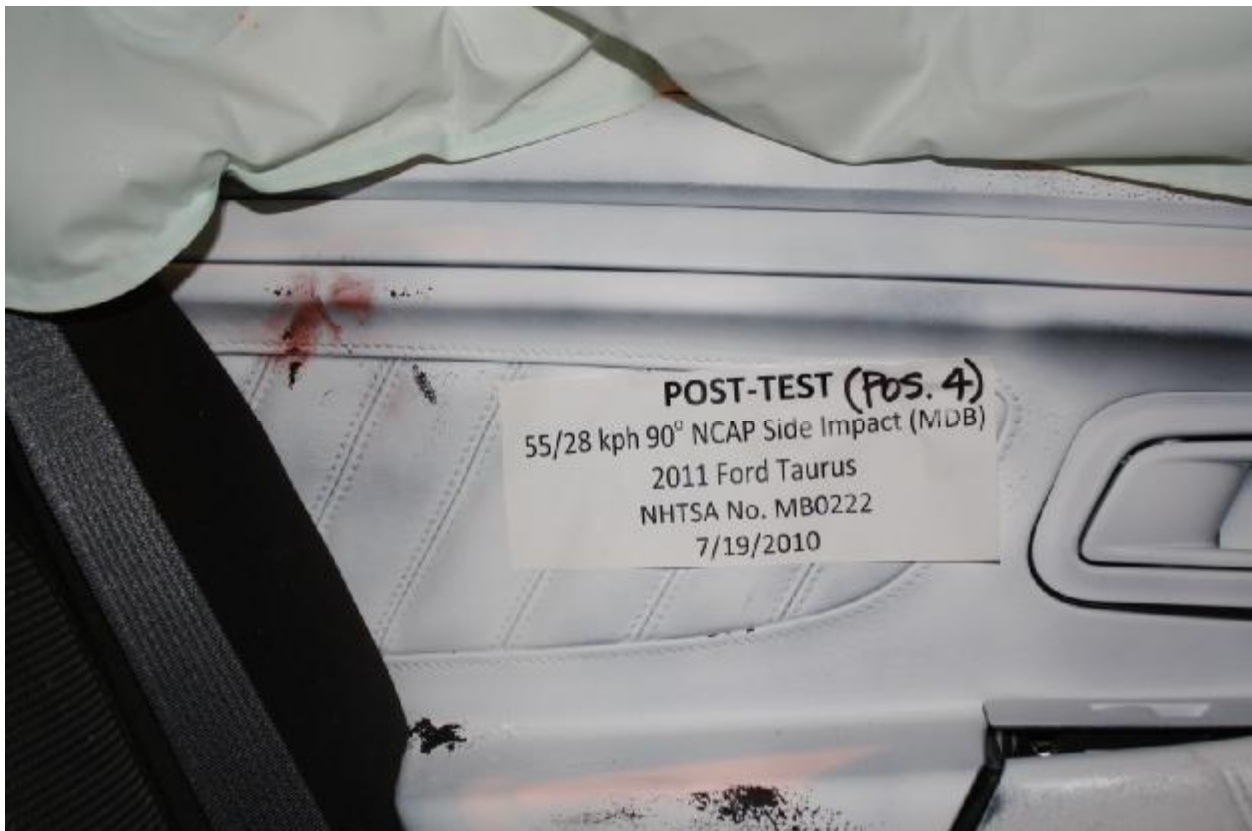


Figure A-76: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View



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

Photograph Not Available

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



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



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



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



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



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

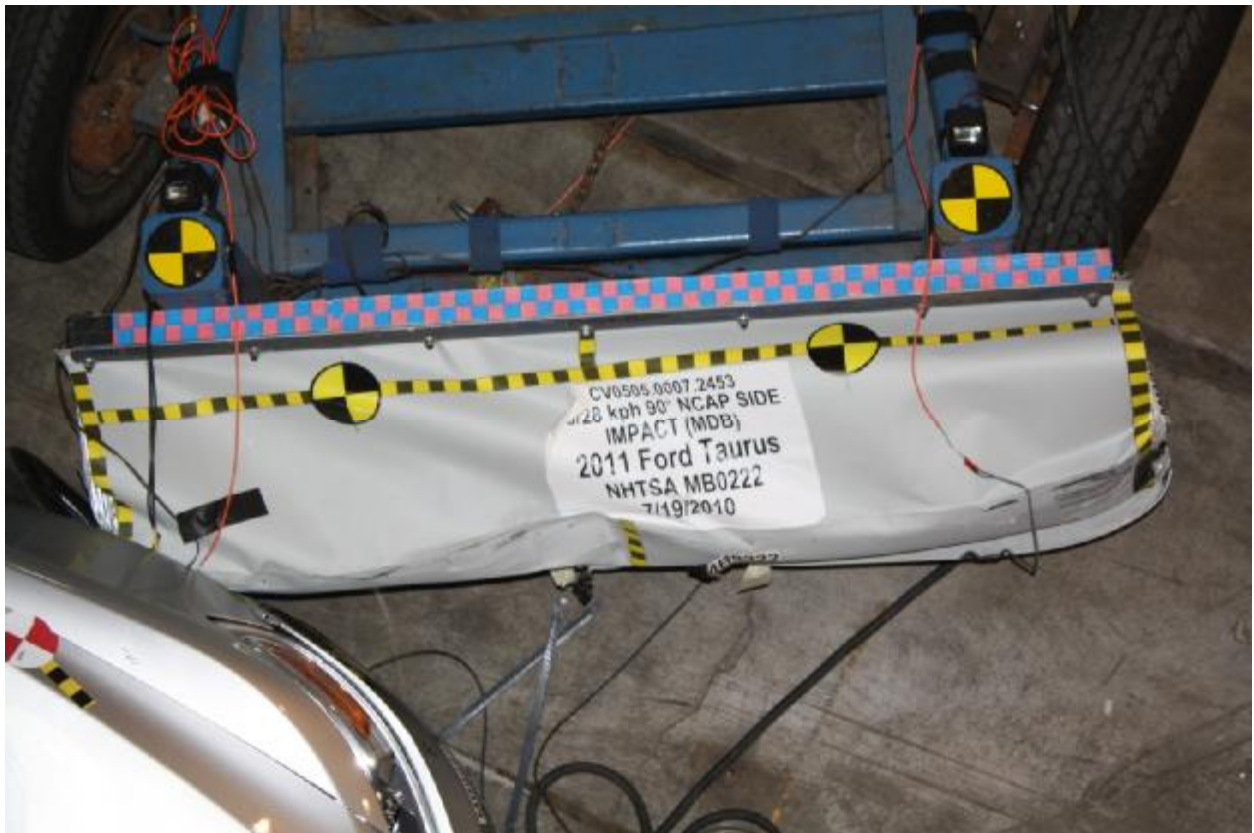


Figure A-84: Post-Test Top View of MDB Impactor Face



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



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



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



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



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



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



Figure A-91: Pre-Test Ballast View



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



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



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



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



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



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



Figure A-98: Impact Event (Impact Side)

Ford TAURUS 2011 SEL FWD 6-PASSENGER 3.5L V6 DURATEC ENGINE 6-SPEED AUTO TRANSMISSION EXTERIOR INGOT SILVER METALLIC INTERIOR CHARCOAL BLK CLOTH SEATING 7101634

STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE

EXTERIOR

- PROJECTOR BEAM HALOGEN HEADLAMPS
- SUPPLEMENTAL PARK LAMPS
- DUAL POWER HEATED MIRRORS
- 7-SPEAKER PREMIUM AUDIO
- 15" PANTHTO ALUMINUM WHEELS

INTERIOR

- 6-WAY POWER DRIVER'S SEAT
- 50/50 FOLD-DOWN REAR SEAT
- DUAL ZONE ELEC TEMP CTRL
- MESSAGE CENTER
- TELESCOPING LEATHER
- SHRIMP STEERING WHEEL
- MP3/CD PLAYER W/CLOCK
- 60/40 FOLD-DOWN SEAT
- DRIVING SAT SVC W/A AXIAL
- COKE LAMP & MAP LIGHTS
- E CUP/HANDLE HOLDERS

FUNCTIONAL

- FRONT WHEEL DRIVE
- ADVANCED TRAC W/ESC
- 4-WHEEL DISC BRAKES W/V ABS
- TRAXION CONTROL W/SLIPSHIFT
- ALUMI W/TH PADDLE SHIFTERS
- SAFETY ROPS, CARLESS FOLLER
- 19.0 GALLON FUEL TANK

SAFETY/SECURITY

- DOT REAR SEAT BELT SYS
- PERSONAL SAFETY SYSTEM
- FRONT SEAT SIDE AIRBAG
- SAFETY CANOPY - 2 ROWS
- PERIMETER ALARM
- TELE PRESSURE MONITOR SYS

WARRANTY

- 3-YR/50,000 BUMPER-TO-BUMPER
- 5-YR/100,000 POWERTRAIN
- 100,000 MILES ASSIST

PRICE INFORMATION

STANDARD VEHICLE PRICE **\$27,370.00**

INCLUDED ON THIS VEHICLE

- RAPID RESPONSE
- KEYLESS ENTRY
- REVERSE PARKING SYSTEM

700.00

OPTIONAL EQUIPMENT

- FRONT LICENSE PLATE BRACKET
- CALIFORNIA EMISSIONS SYSTEM

NO CHARGE

TOTAL OPTIONS 700.00

TOTAL VEHICLE & OPTIONS 28,070.00

DESTINATION & DELIVERY 825.00

EPA Fuel Economy Estimates

CITY MPG **18** Highway MPG **27**

Estimated Annual Fuel Cost **\$1,856**

based on 15,000 miles at \$2.50 per gallon

Expected range for most drivers 14 to 22 MPG

Expected range for most drivers 22 to 32 MPG

Combined Fuel Economy This Vehicle **21**

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

Rec'd 29 73 miles

TOTAL MSRP \$28,895.00

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver Passenger	Not Rated
Side Crash	Front seat Rear seat	Not Rated
Rollover	★★★★	

Star ratings based on the risk of injury in a frontal impact. Frontal ratings apply ONLY to cars. Side ratings based on the risk of injury in a side impact. Star ratings based on the risk of rollover in a single vehicle crash. Star ratings range from 1 to 5 stars (★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).

www.safercar.gov or call 1-888-327-4238

Figure A-99: Monroney Label

Seating and Safety Restraints

FRONT SEATING

WARNING: Reclining the seatback can cause an occupant to slide under the seat's safety belt, resulting in severe personal injuries in the event of a collision.

WARNING: Do not pile cargo higher than the seatback to reduce the risk of injury in a collision or station stop.

WARNING: Before returning the seatback to its original position, make sure that cargo or any objects are not trapped behind the seatback. After returning the seatback to its original position, pull on the seatback to ensure that it has fully latched. An unlatched seat may become dangerous in the event of a sudden stop or collision.

Adjustable head restraints

Your vehicle is equipped with front row outboard head restraints that are vertically adjustable.

WARNING: To minimize the risk of neck injury in the event of a crash, the driver and passenger occupants should not sit in and/or operate the vehicle, until the head restraint is placed in its proper position. The driver should never adjust the head restraint while the vehicle is in motion.

The adjustable head restraints consist of:

- a trimmed energy absorbing foam and structure (1),
- two steel stems (2),
- a guide sleeve adjust/release button (3),
- and a guide sleeve unlock/remove button (4).

Seating and Safety Restraints

To adjust the head restraint, do the following:

- Adjust the seatback to an upright, driving/riding position.
- Raise the head restraint by pulling up on the head restraint.
- Lower the head restraint by pressing and holding the guide sleeve adjust/release button and pushing down on the head restraint.

Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your head. For occupants of extremely tall stature, adjust the head restraint to its full up position.

WARNING: The adjustable head restraint is a safety device. Whenever possible, it should be installed and properly adjusted when the seat is occupied.

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

Photograph Not Available

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

APPENDIX B
DUMMY RESPONSE DATA

The following data plots shall be included in this appendix:

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

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

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

Driver & Passenger Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

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

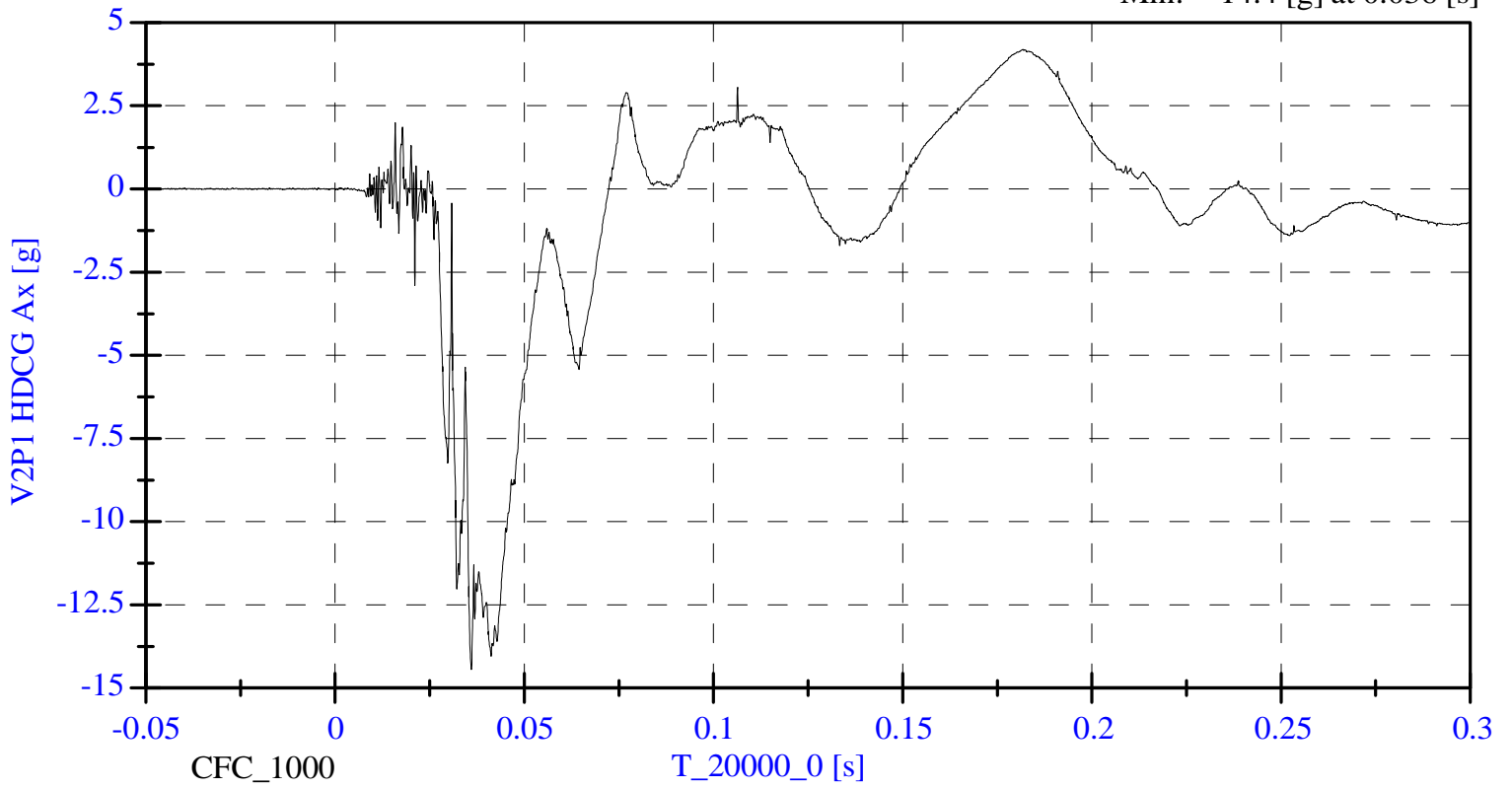
MDB Instrumentation Data

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

Max: 4.2 [g] at 0.182 [s]

Min: -14.4 [g] at 0.036 [s]

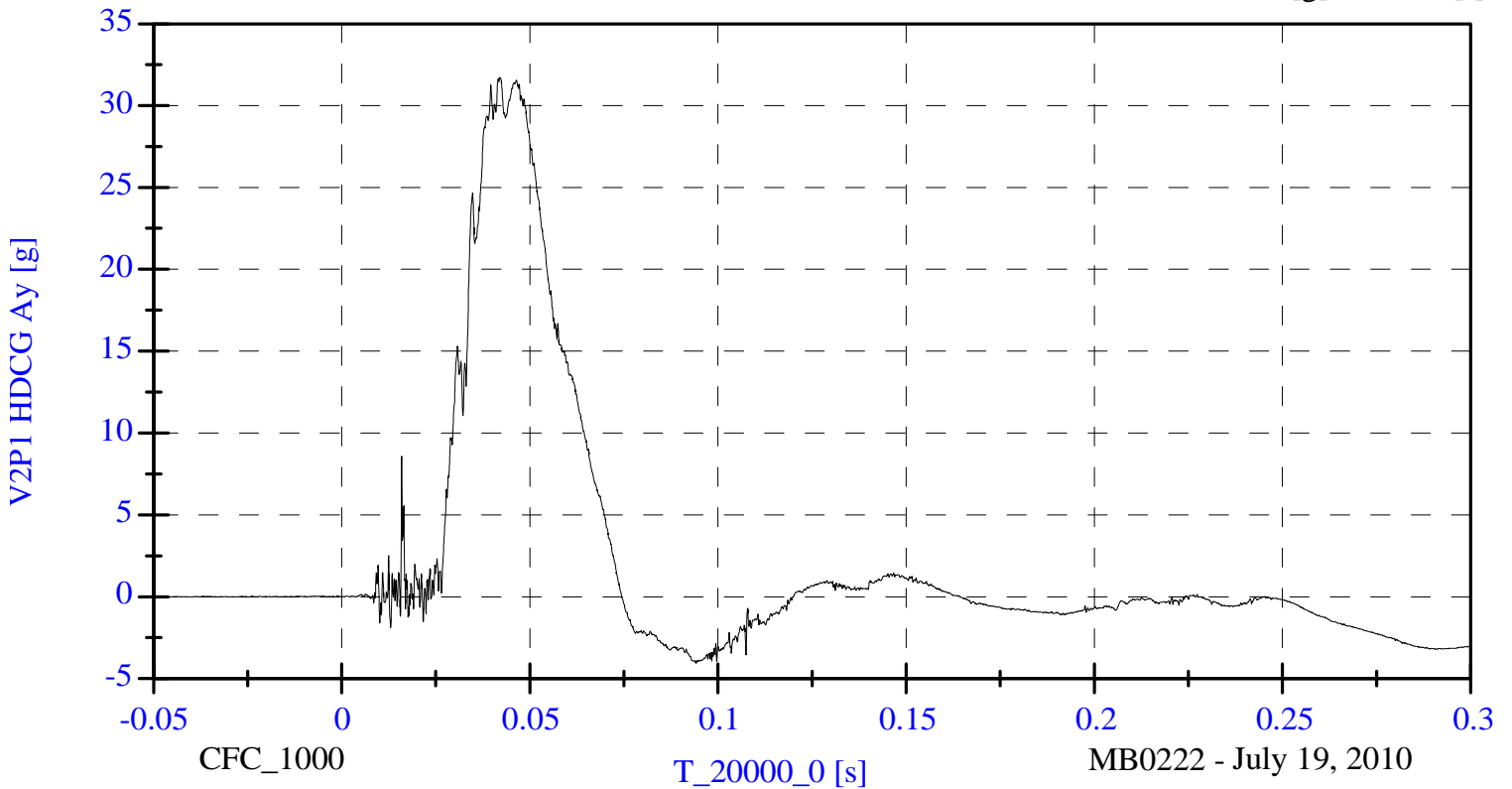
V2P1 Head x



Max: 31.7 [g] at 0.042 [s]

Min: -4.1 [g] at 0.094 [s]

V2P1 Head y

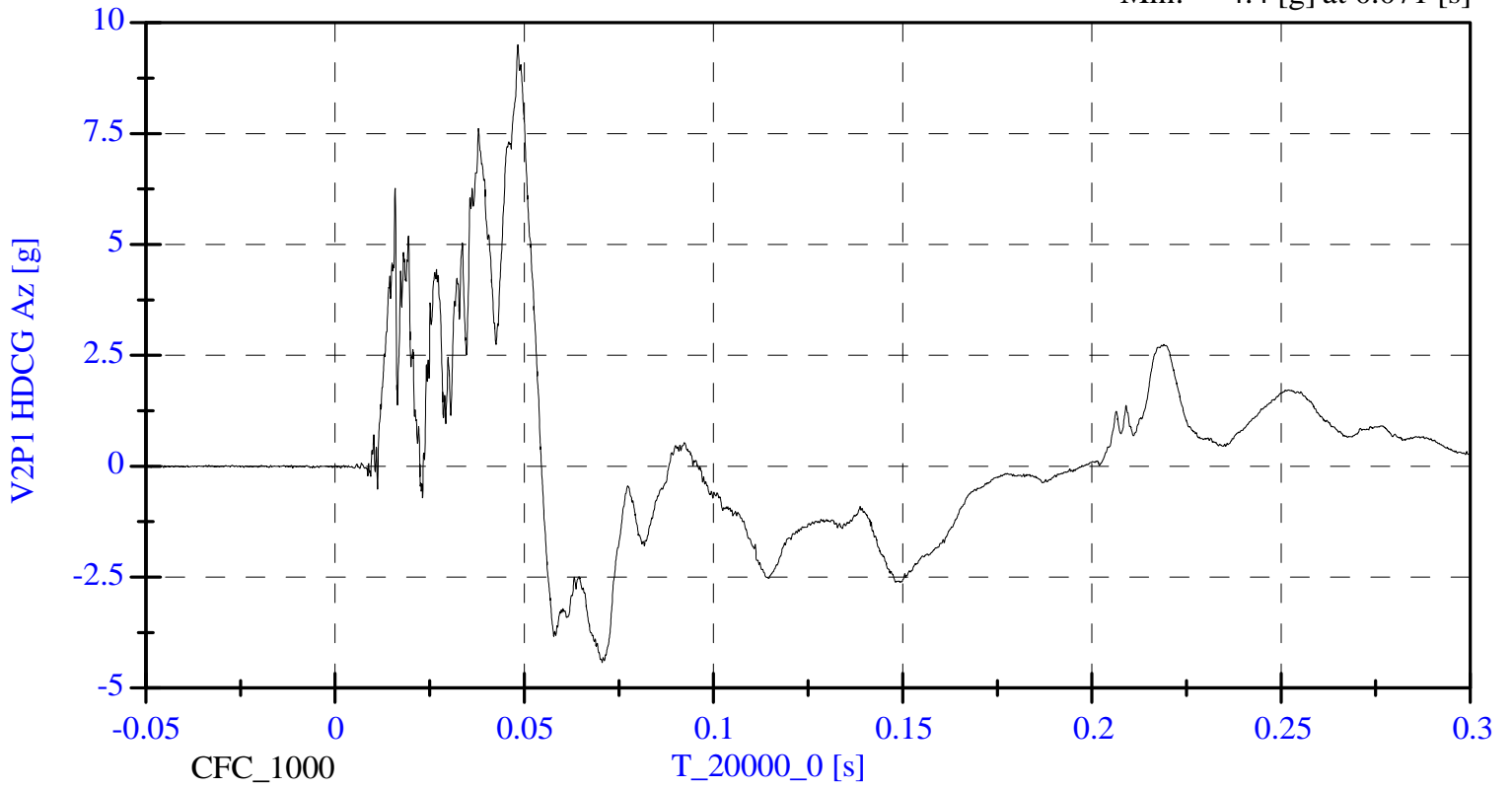


MB0222 - July 19, 2010

Max: 9.5 [g] at 0.048 [s]

Min: -4.4 [g] at 0.071 [s]

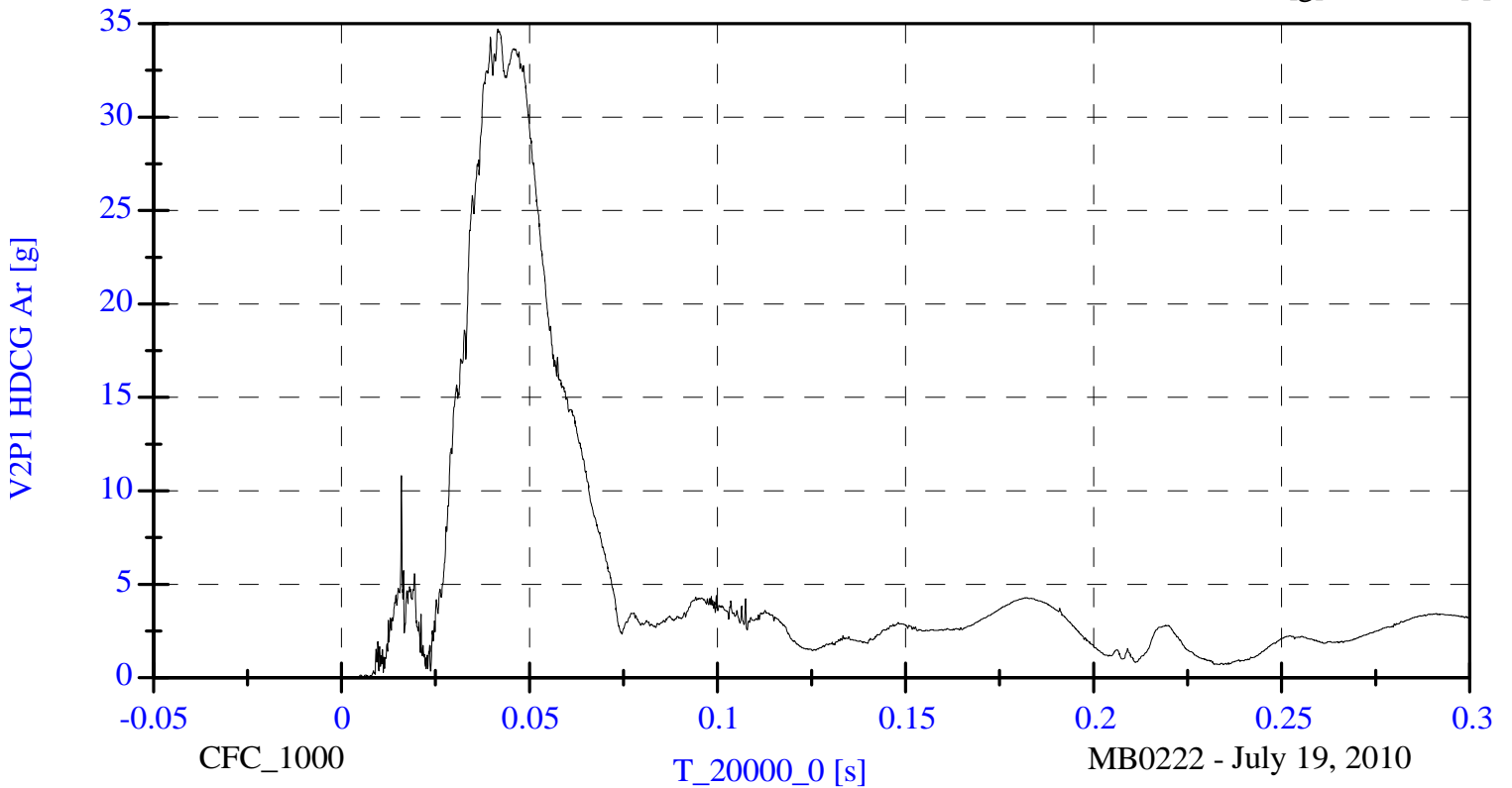
V2P1 Head z



Max: 34.7 [g] at 0.042 [s]

Min: 0.0 [g] at -0.018 [s]

V2P1 Head Resultant

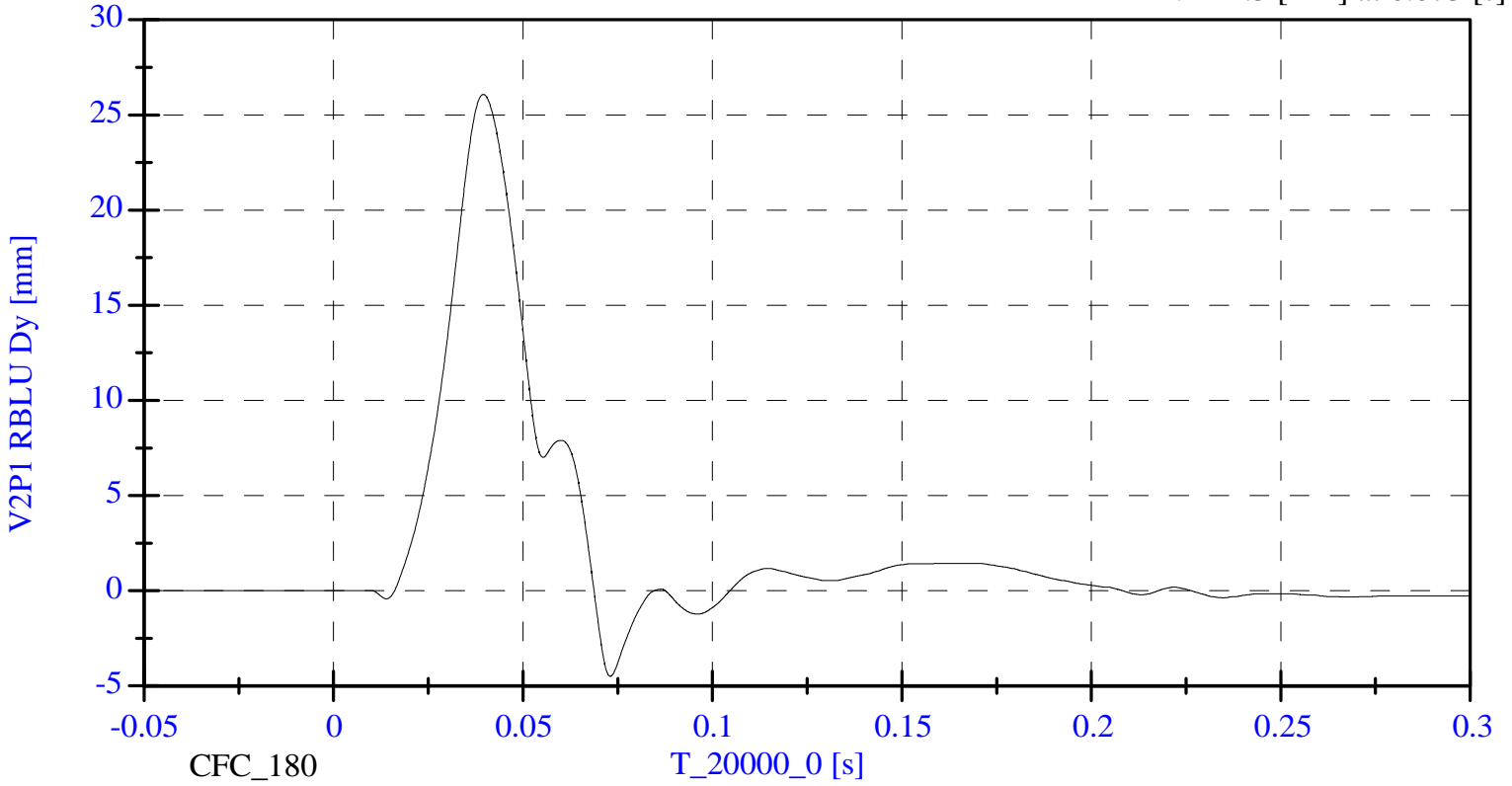


MB0222 - July 19, 2010

Max: 26.1 [mm] at 0.040 [s]

Min: -4.5 [mm] at 0.073 [s]

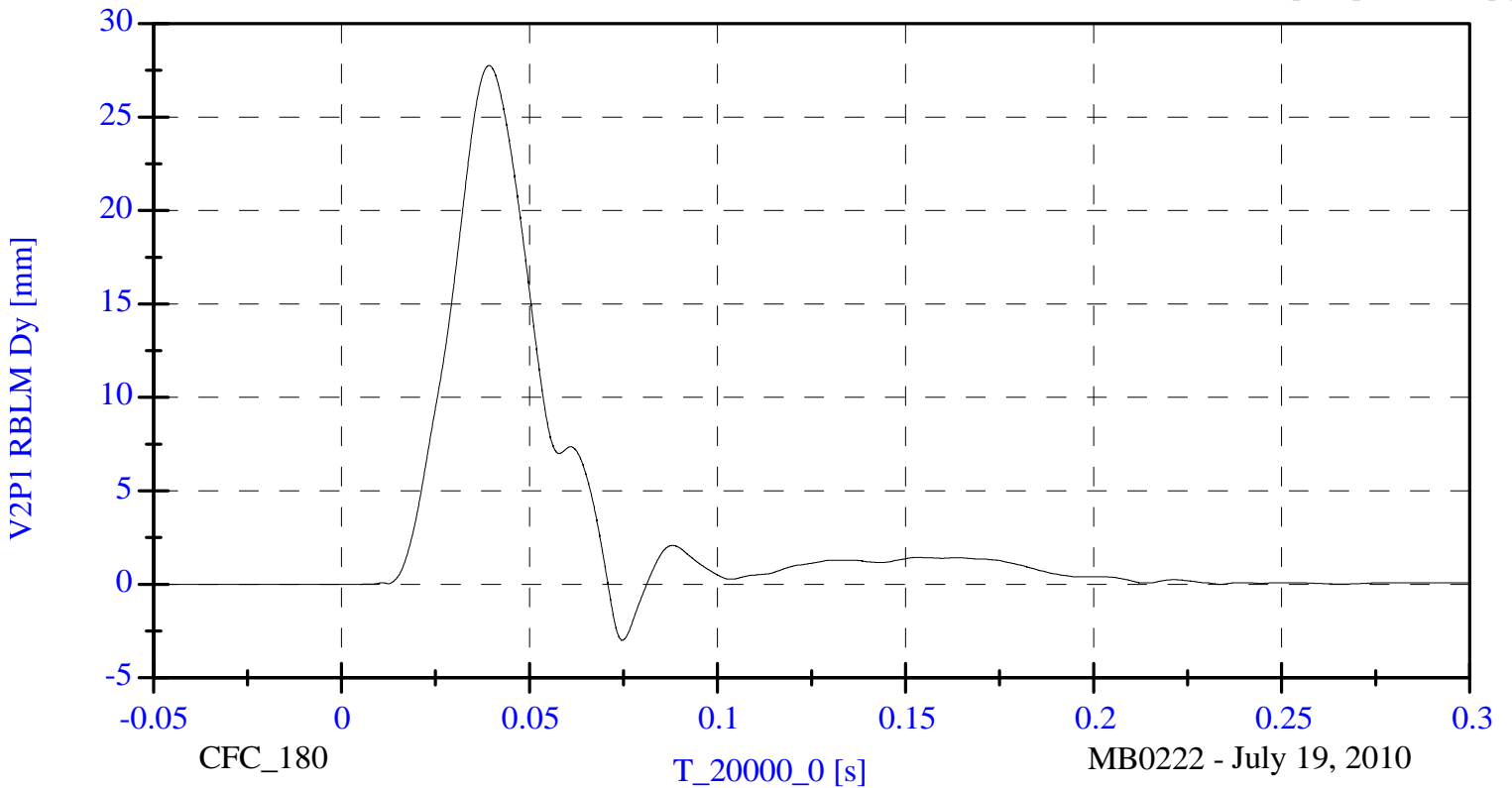
V2P1 Upper Thorax Rib Dy



Max: 27.8 [mm] at 0.039 [s]

Min: -3.0 [mm] at 0.075 [s]

V2P1 Middle Thorax Rib Dy

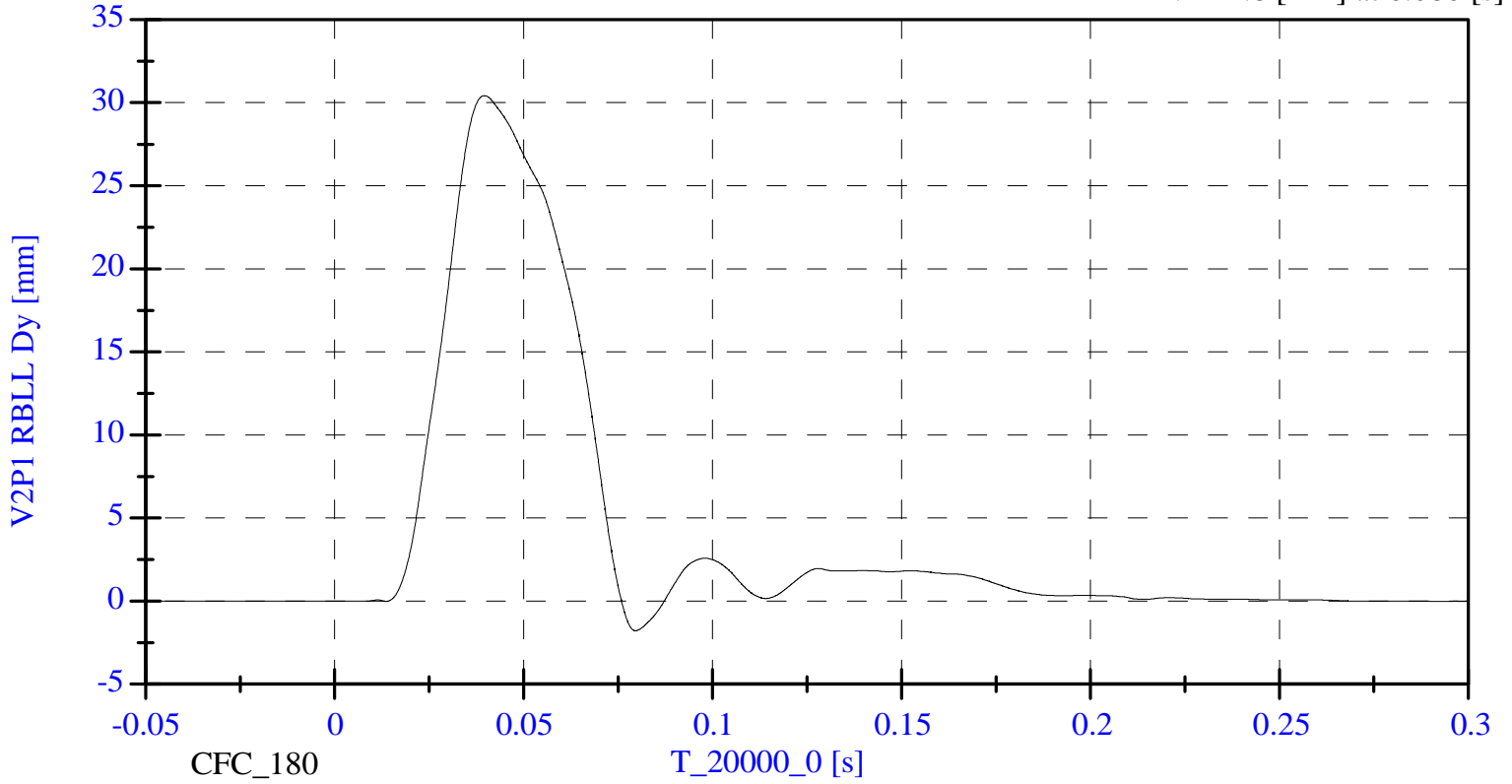


MB0222 - July 19, 2010

Max: 30.4 [mm] at 0.040 [s]

Min: -1.8 [mm] at 0.080 [s]

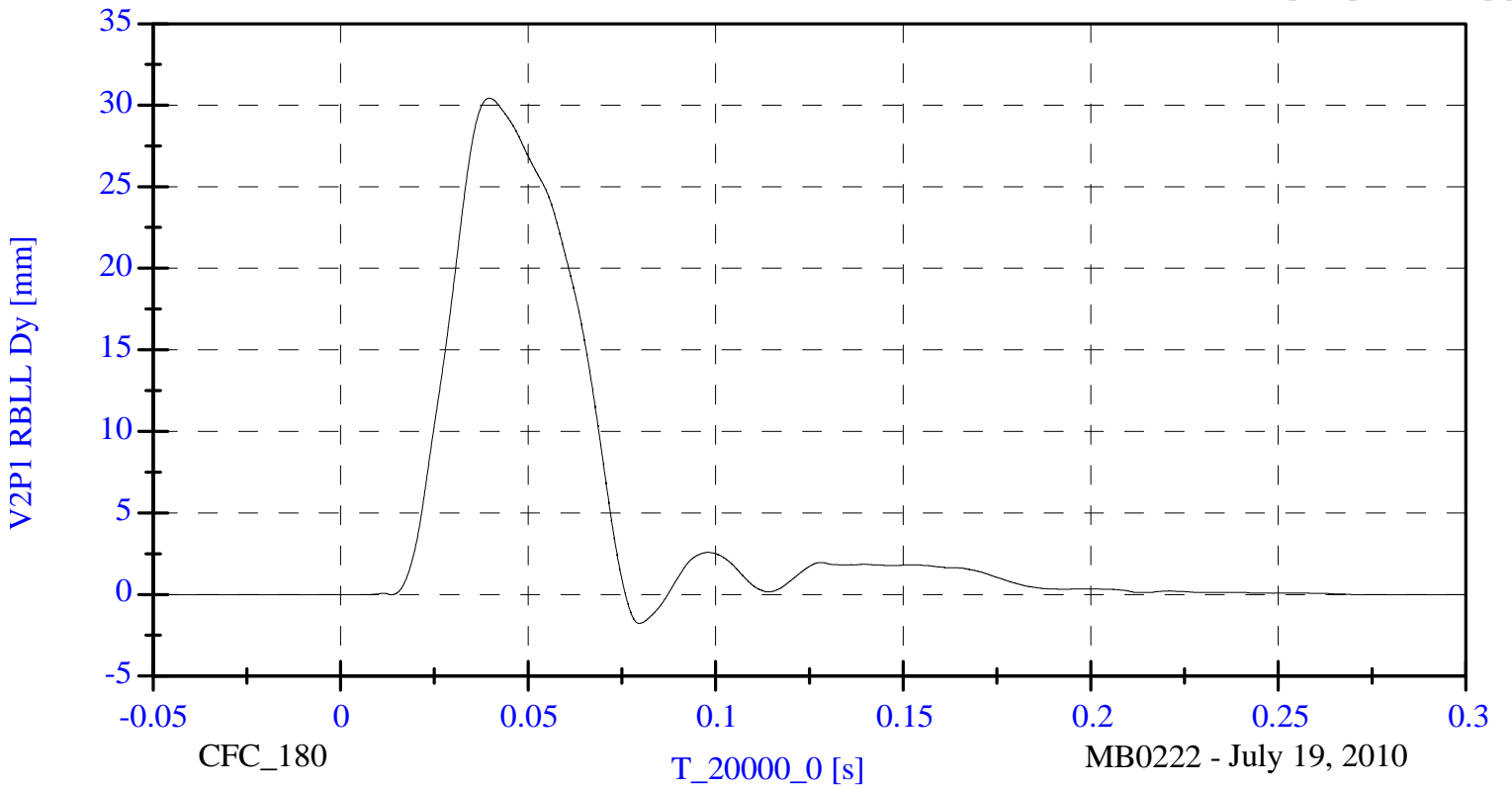
V2P1 Lower Thorax Rib Dy



Max: 30.4 [mm] at 0.040 [s]

Min: -1.8 [mm] at 0.080 [s]

V2P1 Lower Rib Dy Maximum

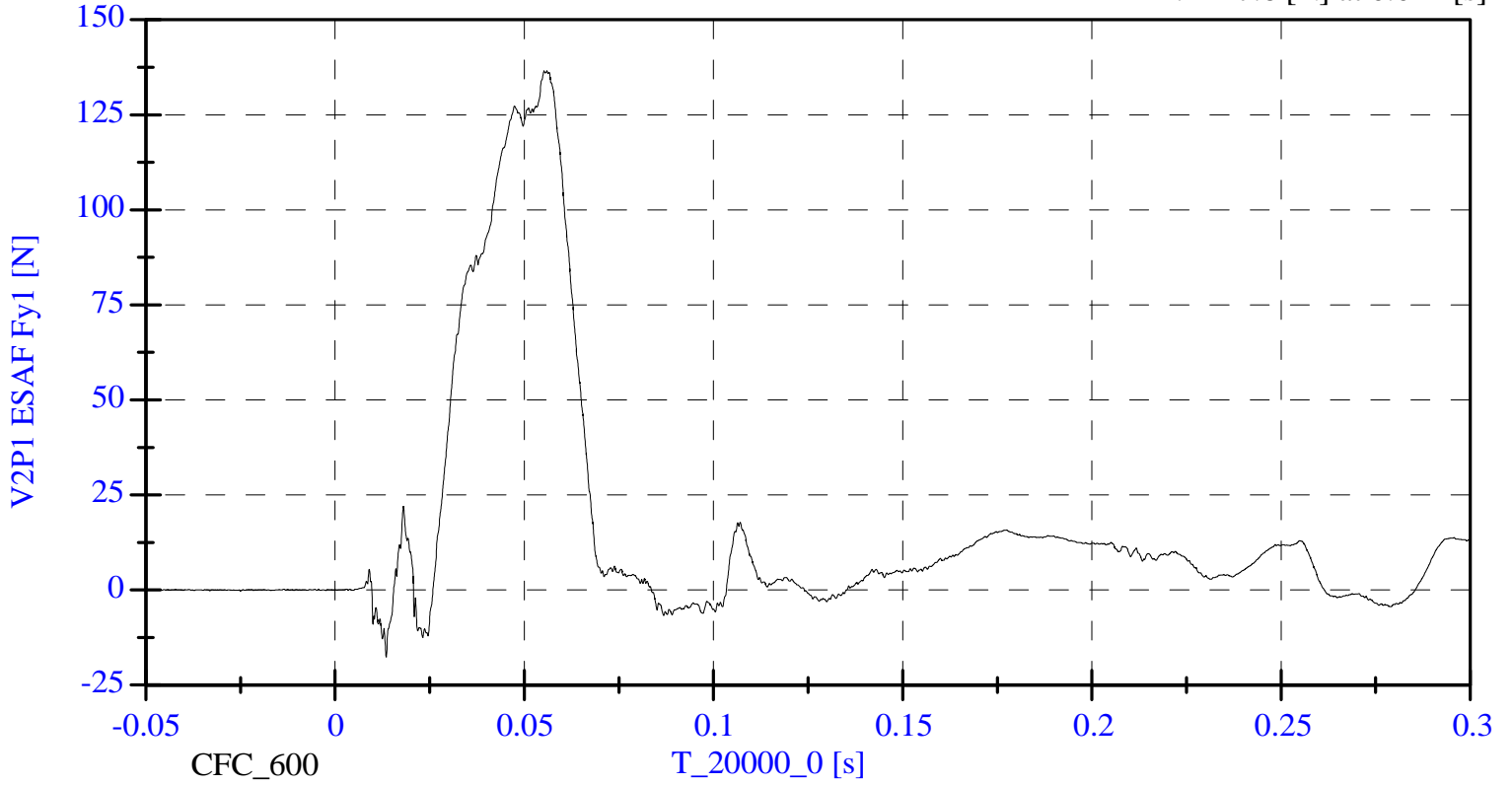


MB0222 - July 19, 2010

Max: 136.5 [N] at 0.055 [s]

Min: -17.6 [N] at 0.014 [s]

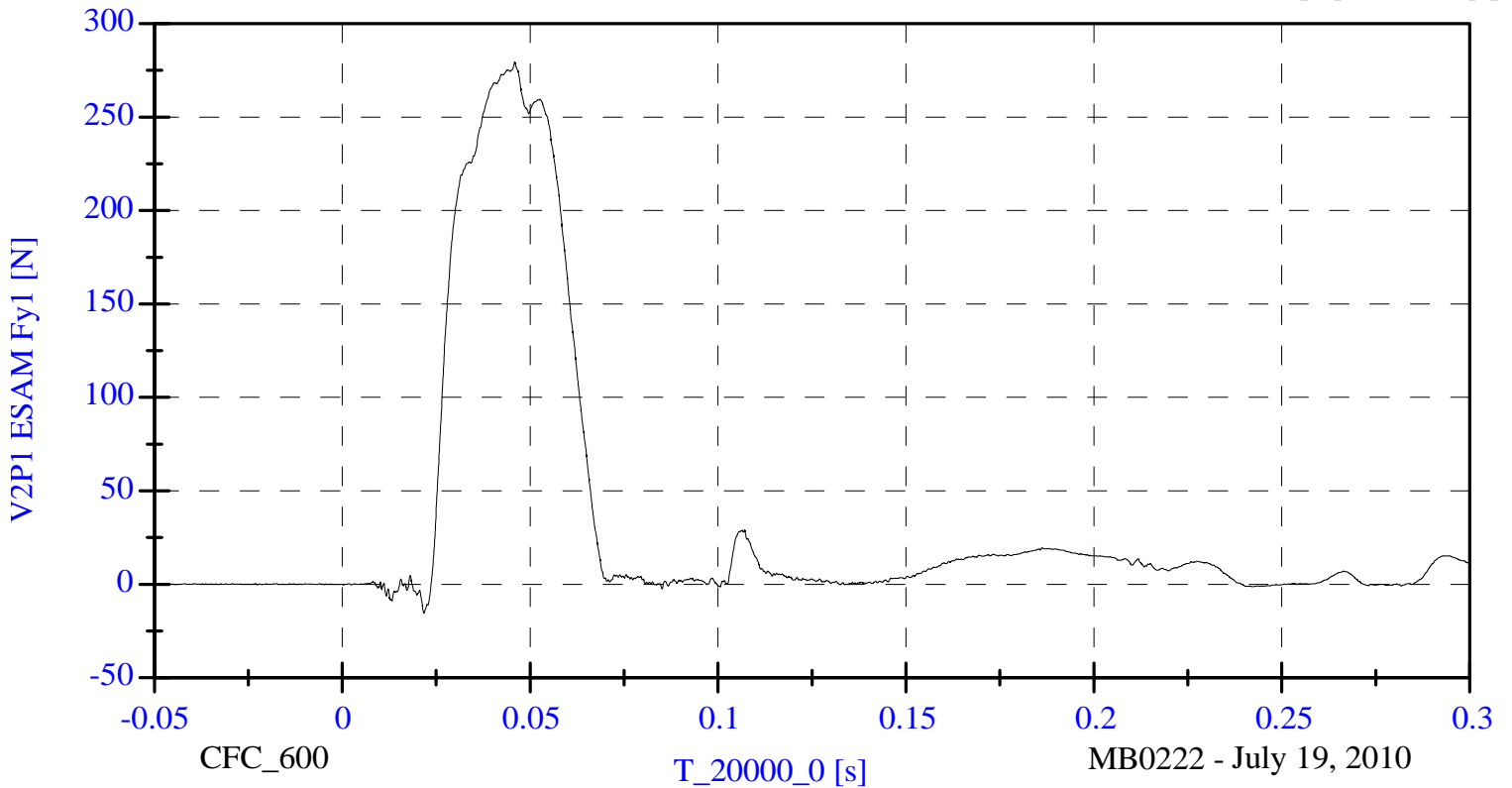
V2P1 Front Abdominal Fy



Max: 279.5 [N] at 0.046 [s]

Min: -15.4 [N] at 0.022 [s]

V2P1 Middle Abdominal Fy

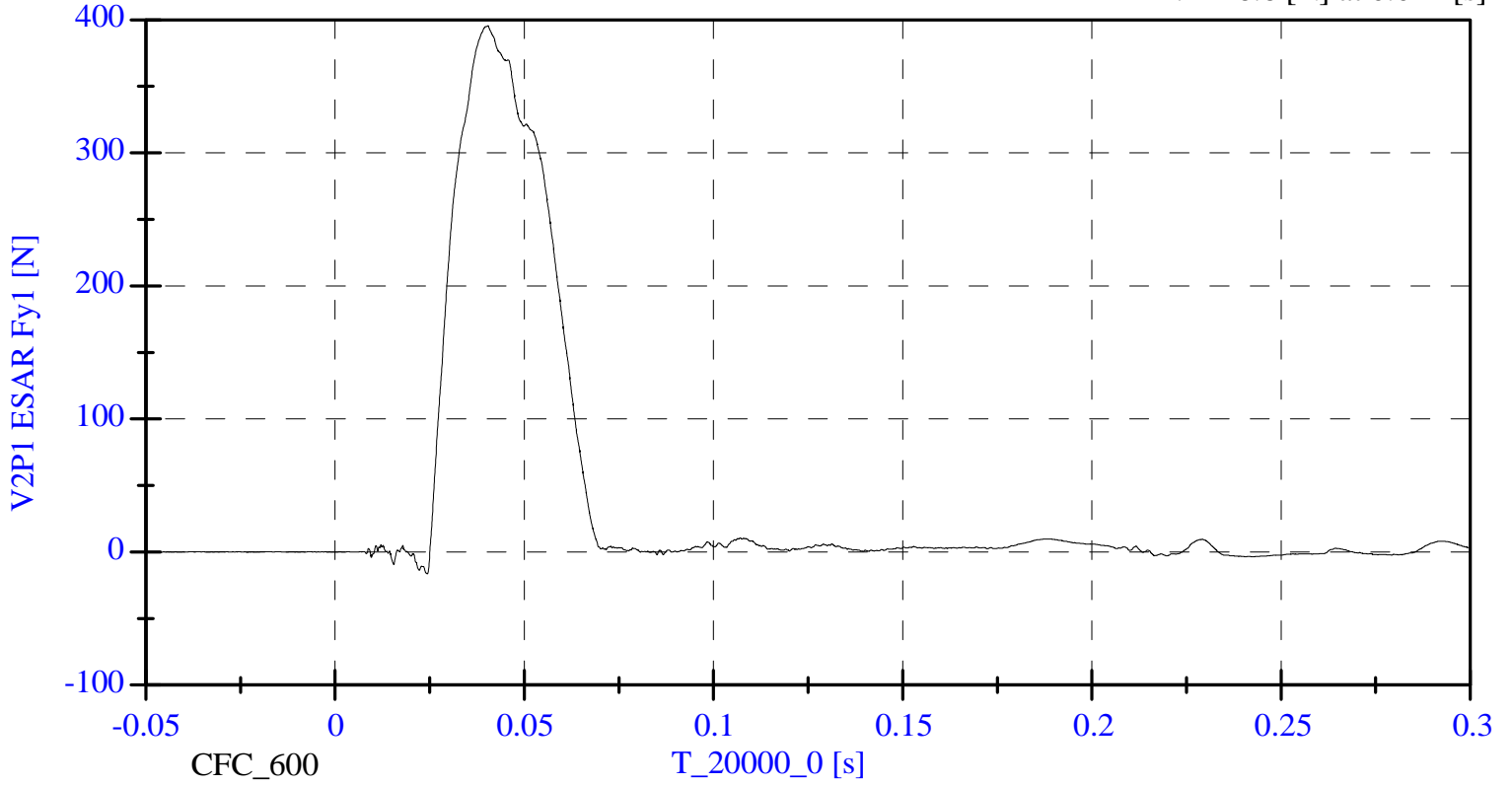


MB0222 - July 19, 2010

Max: 395.5 [N] at 0.040 [s]

Min: -16.6 [N] at 0.024 [s]

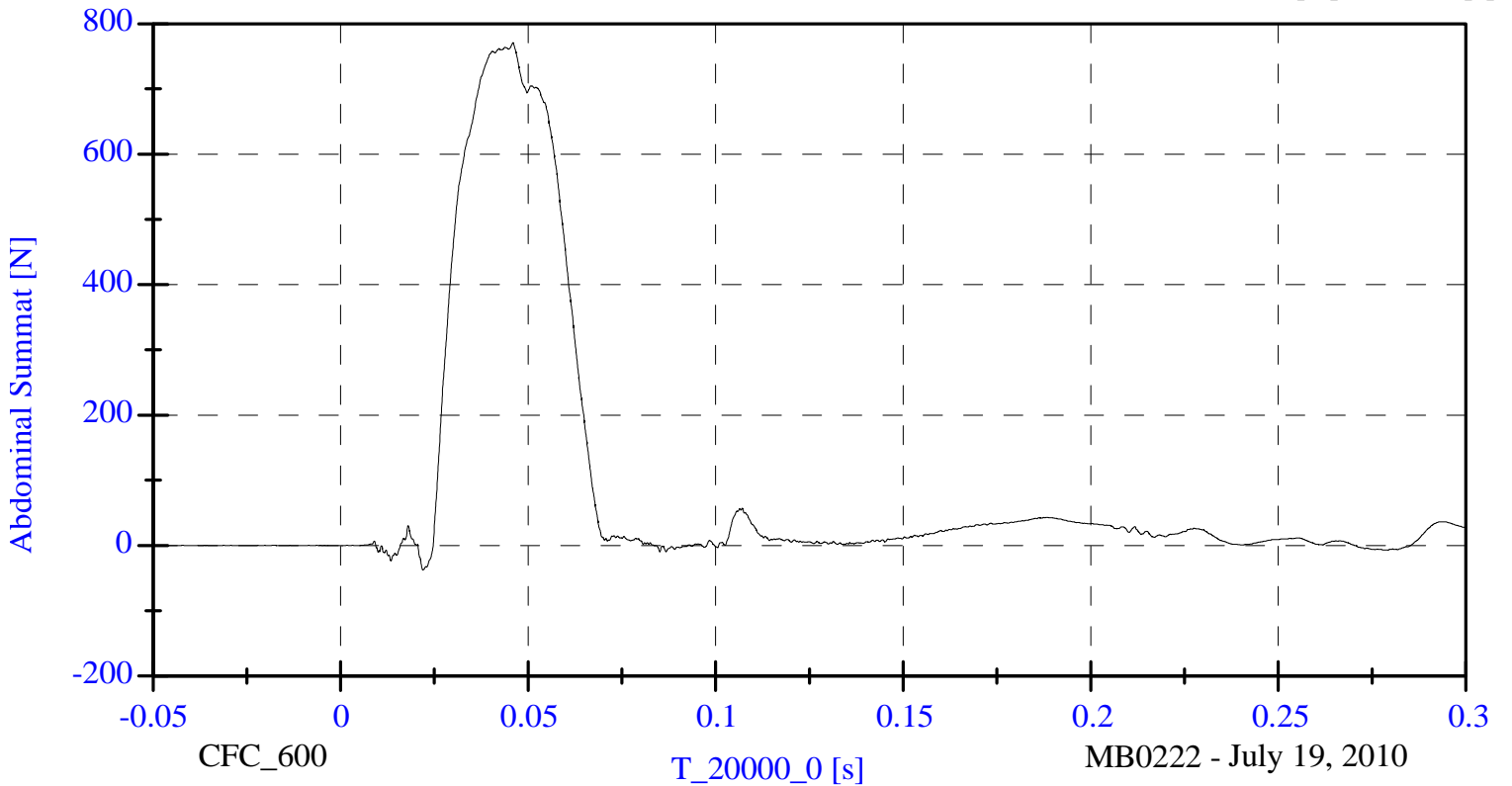
V2P1 Rear Abdominal Fy



Max: 770.8 [N] at 0.046 [s]

Min: -37.6 [N] at 0.022 [s]

V2P1 Total Abdominal Fy

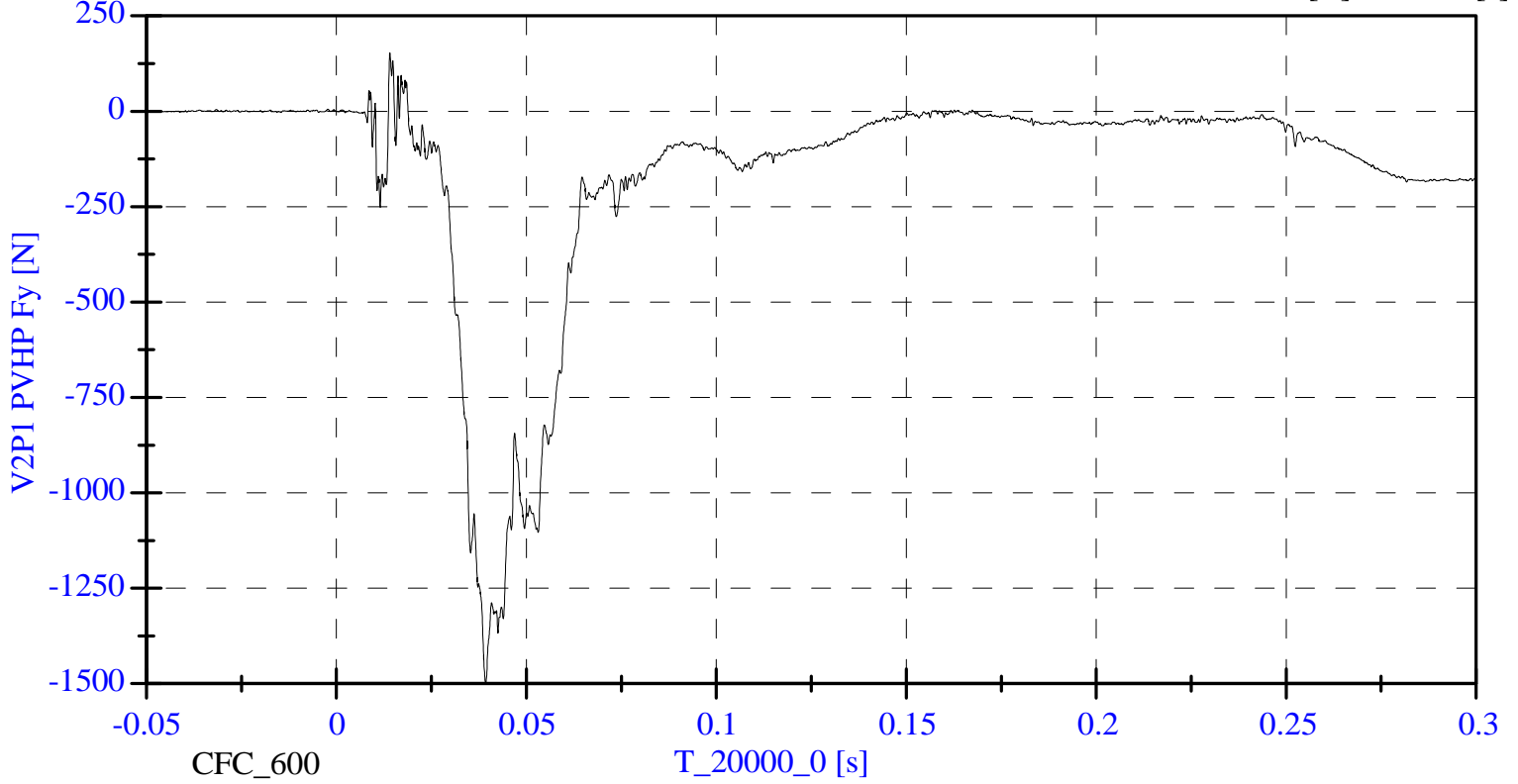


MB0222 - July 19, 2010

V2P1 Pubic Symphysis Fy

Max: 152.6 [N] at 0.014 [s]

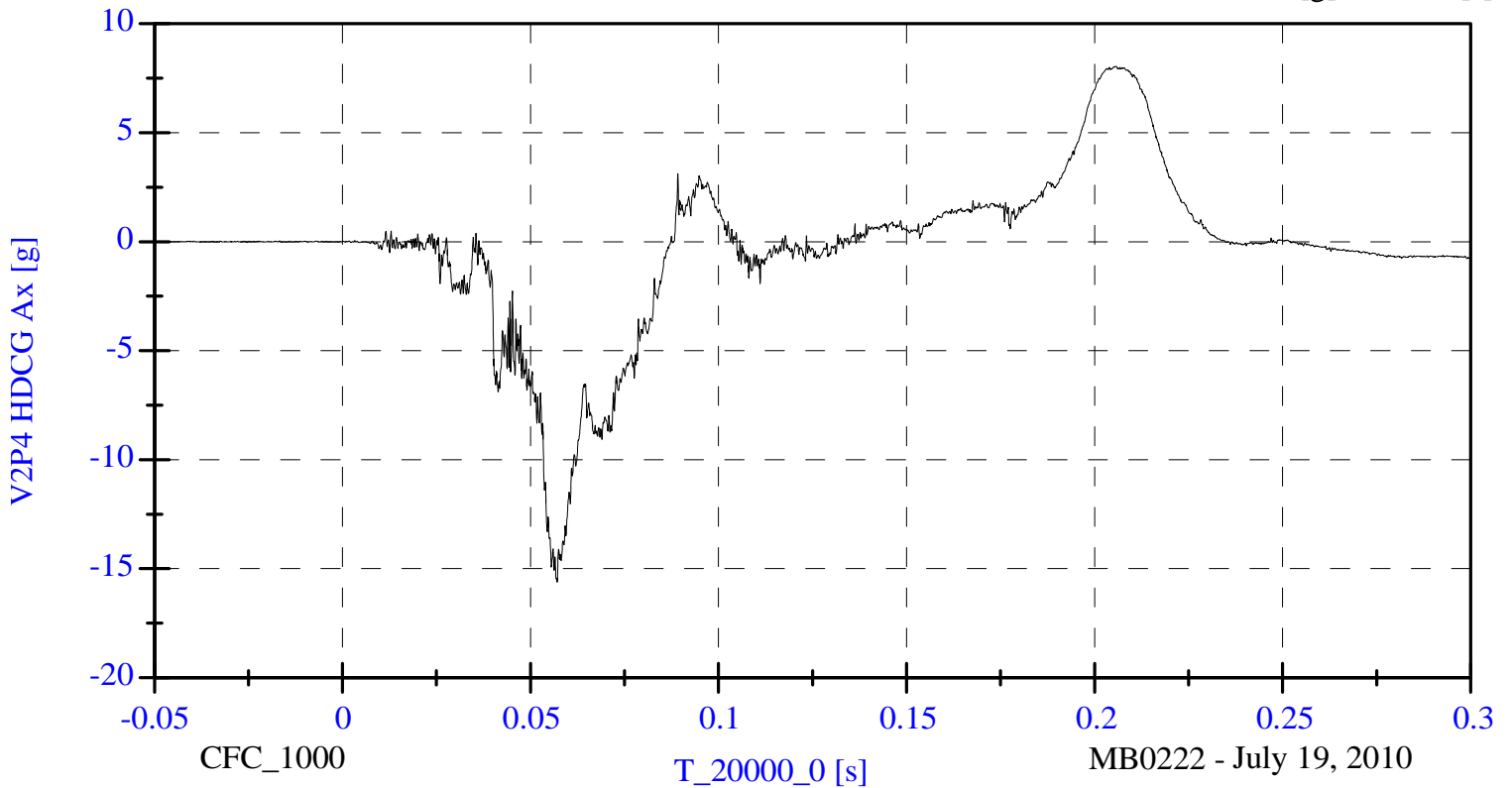
Min: -1498.2 [N] at 0.039 [s]



V2P4 Head x

Max: 8.0 [g] at 0.206 [s]

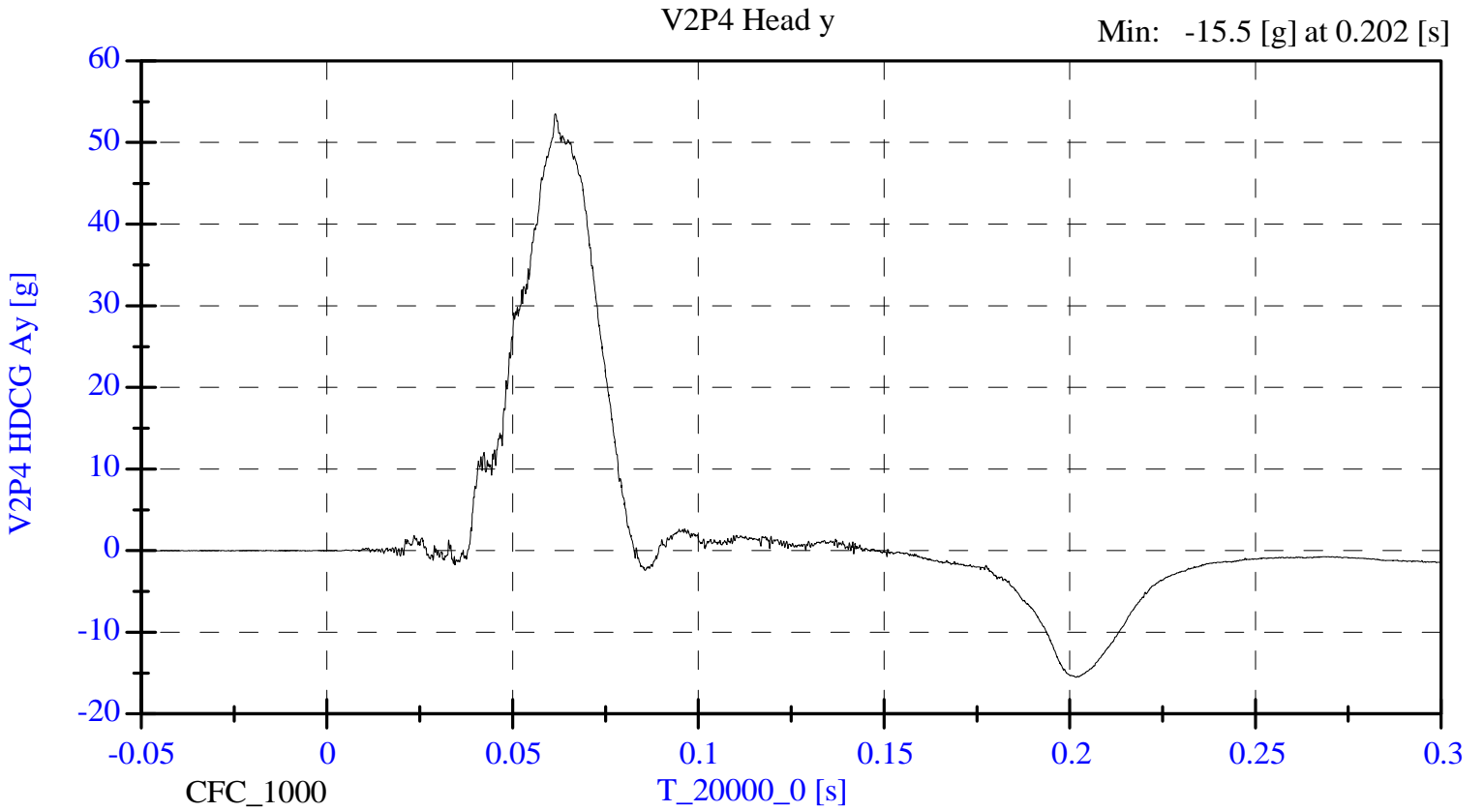
Min: -15.6 [g] at 0.057 [s]



MB0222 - July 19, 2010

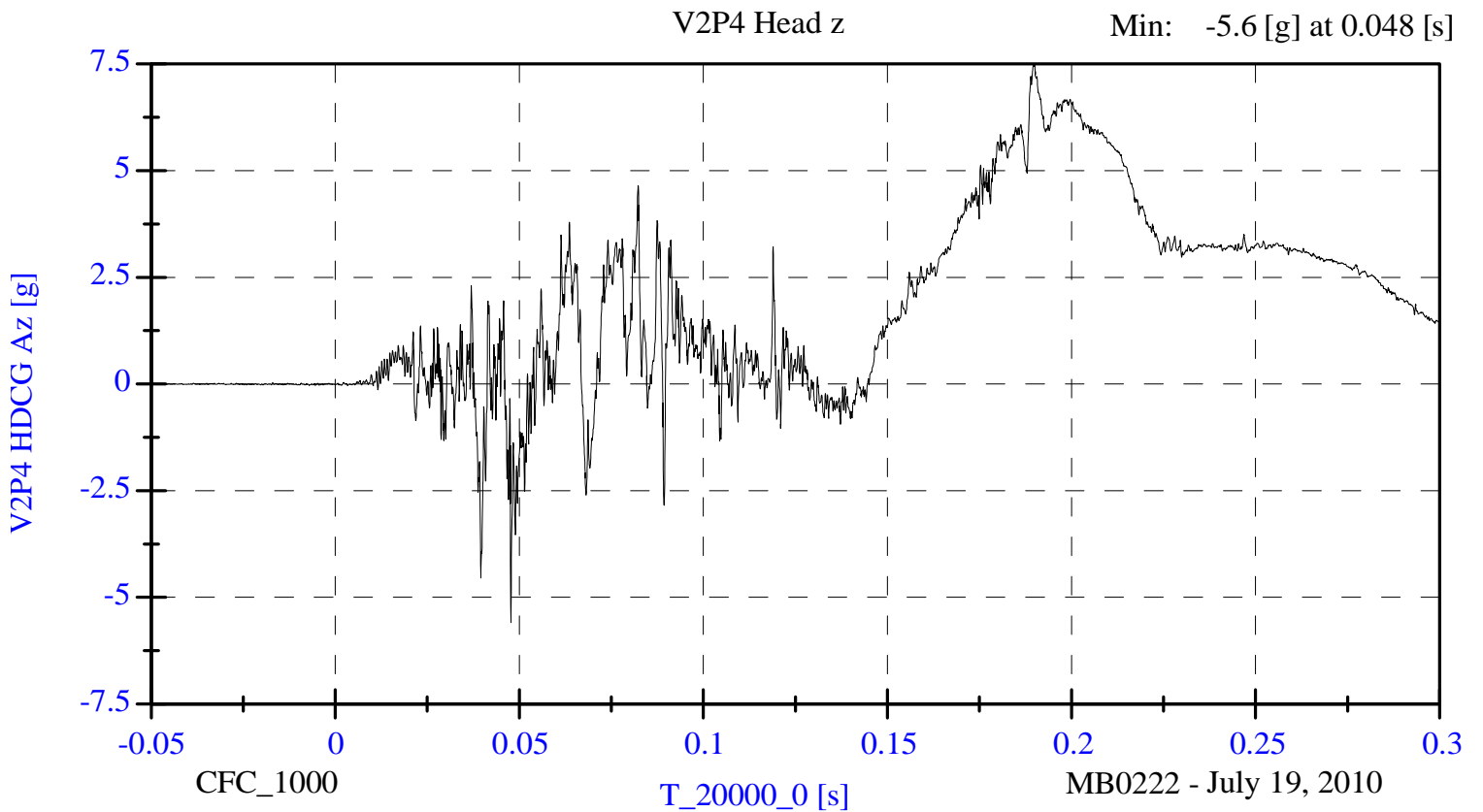
Max: 53.5 [g] at 0.061 [s]

Min: -15.5 [g] at 0.202 [s]



Max: 7.5 [g] at 0.190 [s]

Min: -5.6 [g] at 0.048 [s]

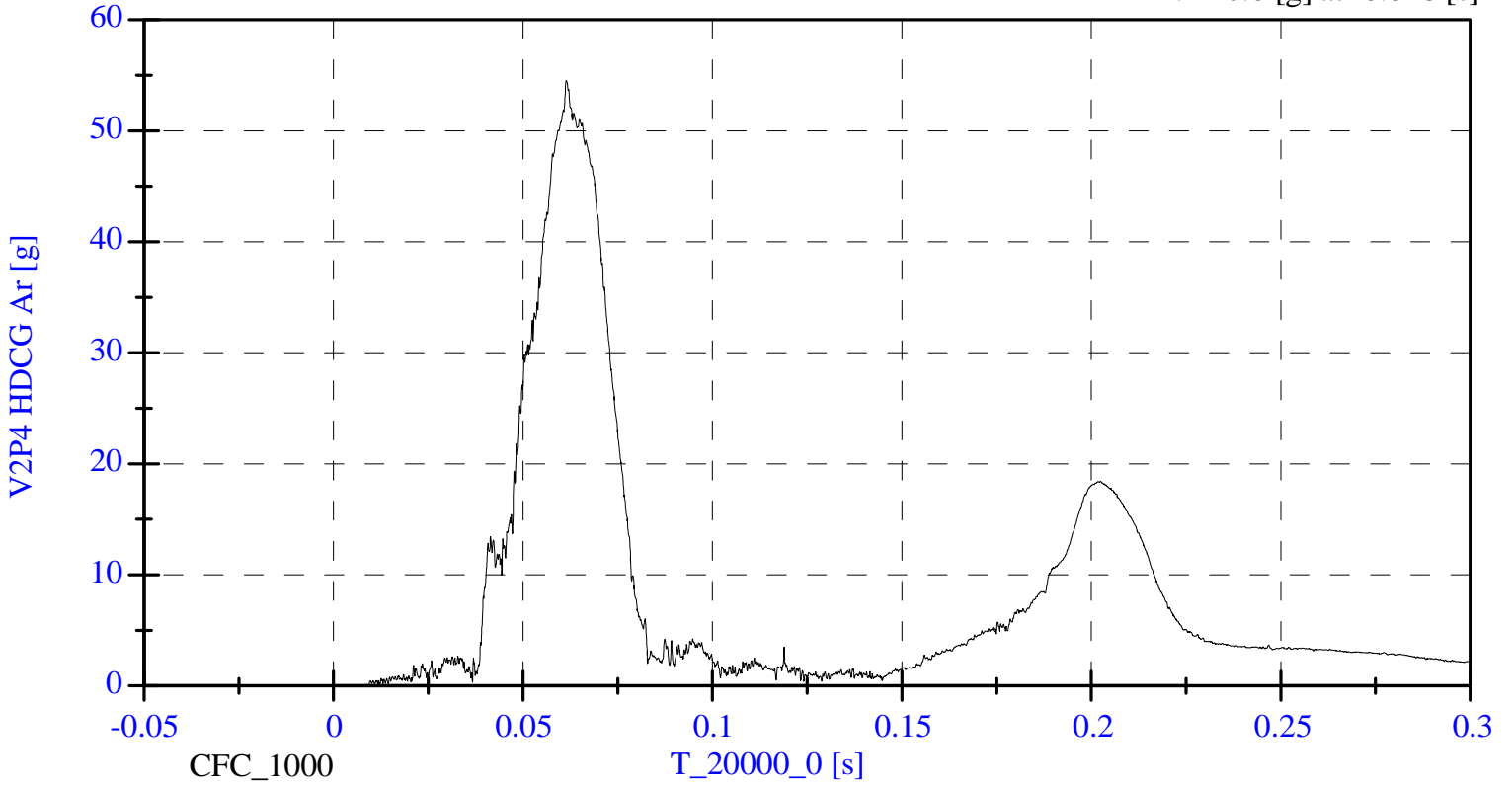


MB0222 - July 19, 2010

V2P4 Head Resultant

Max: 54.5 [g] at 0.061 [s]

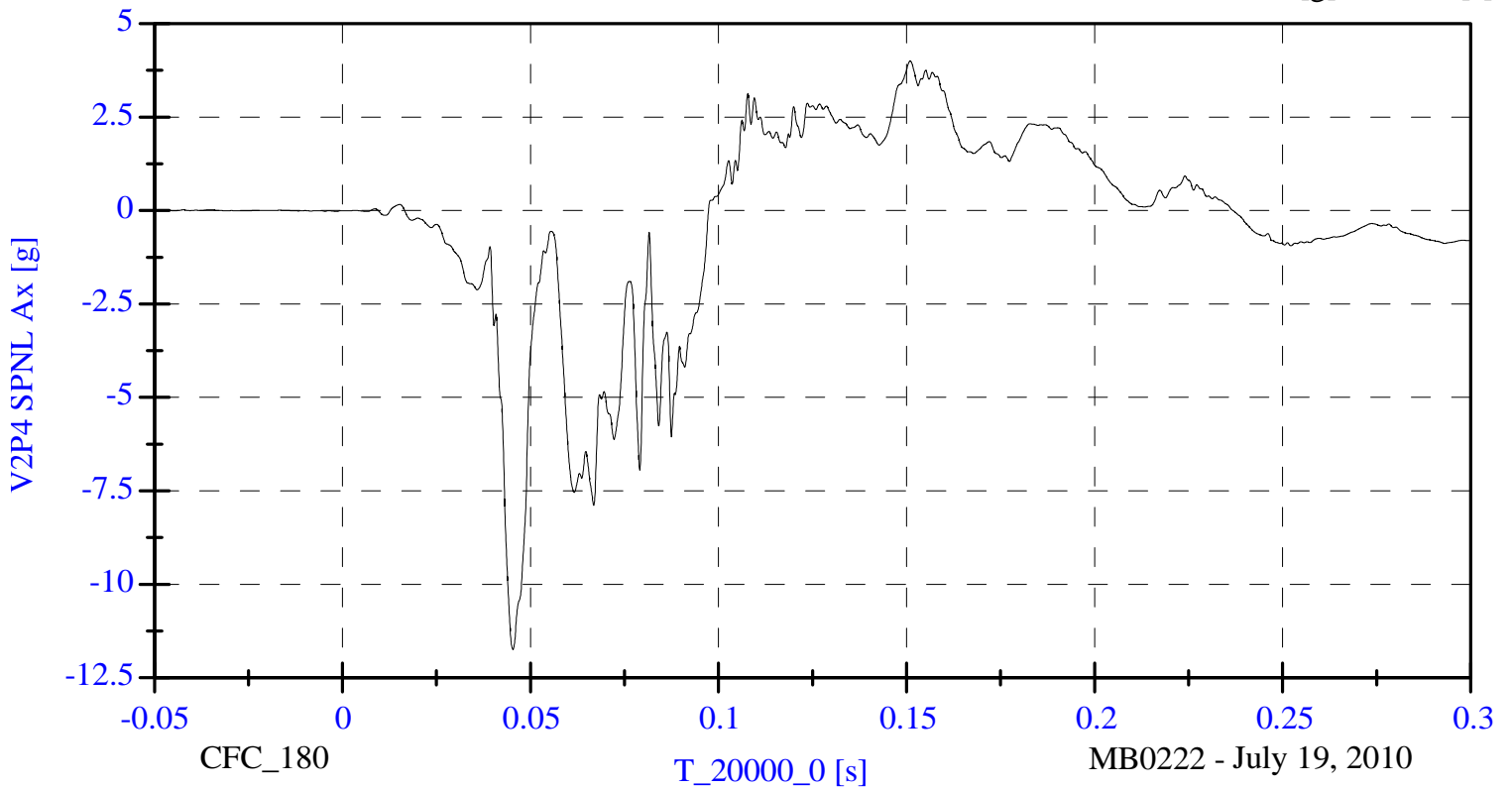
Min: 0.0 [g] at -0.028 [s]



V2P4 Lower Spine T12 x

Max: 4.0 [g] at 0.151 [s]

Min: -11.7 [g] at 0.045 [s]

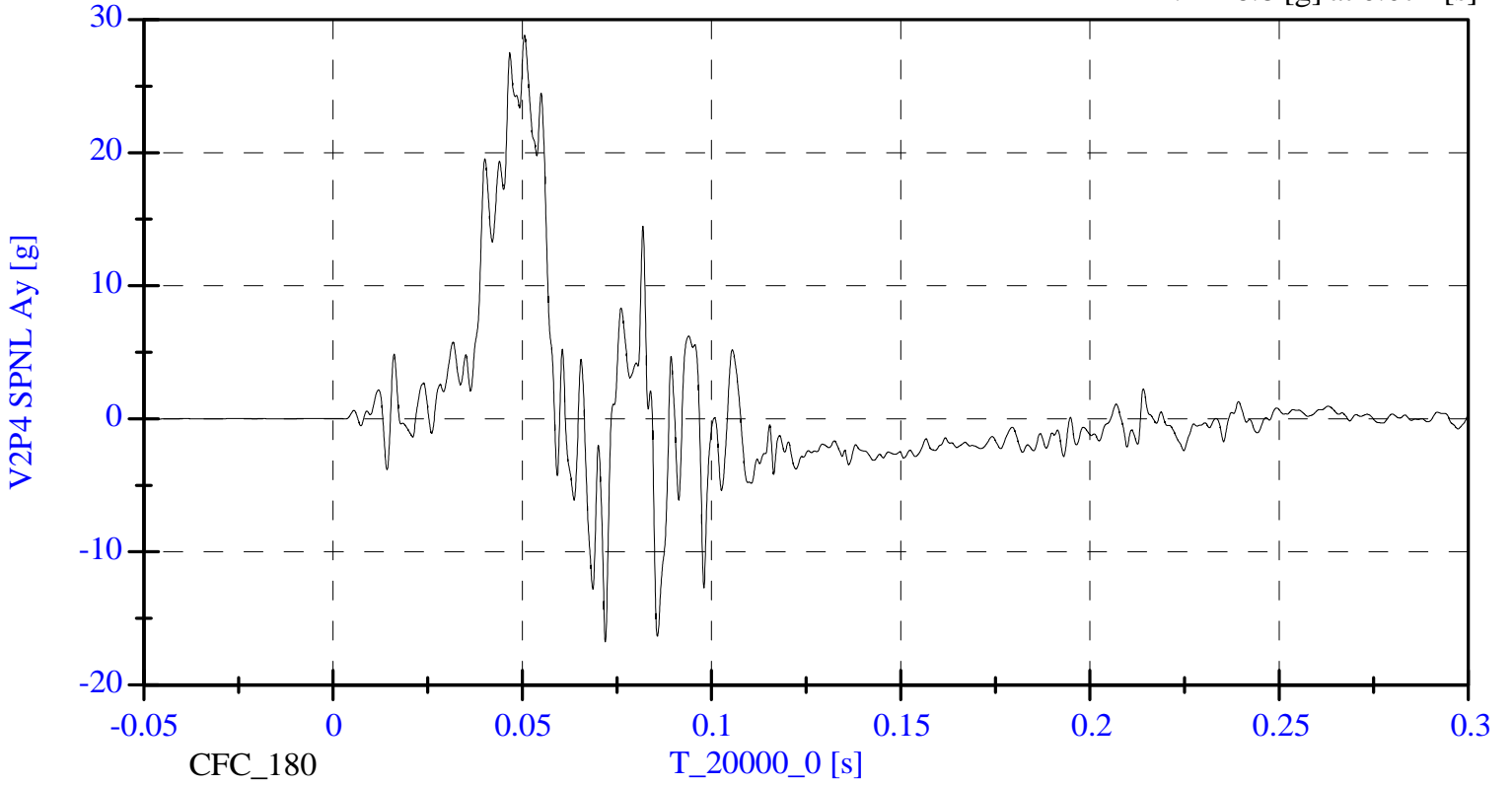


MB0222 - July 19, 2010

Max: 28.8 [g] at 0.051 [s]

Min: -16.8 [g] at 0.072 [s]

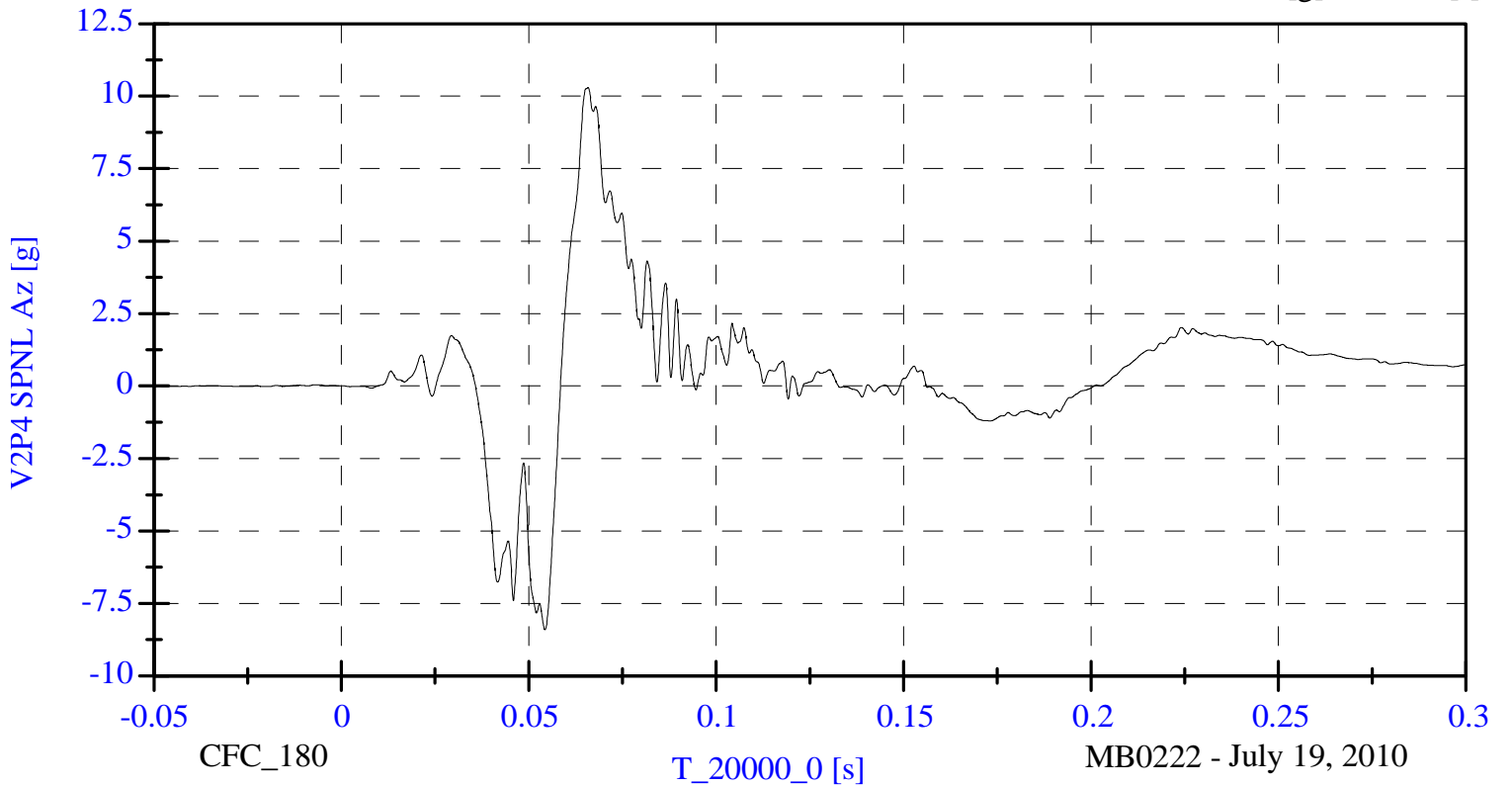
V2P4 Lower Spine T12 y



Max: 10.3 [g] at 0.066 [s]

Min: -8.4 [g] at 0.054 [s]

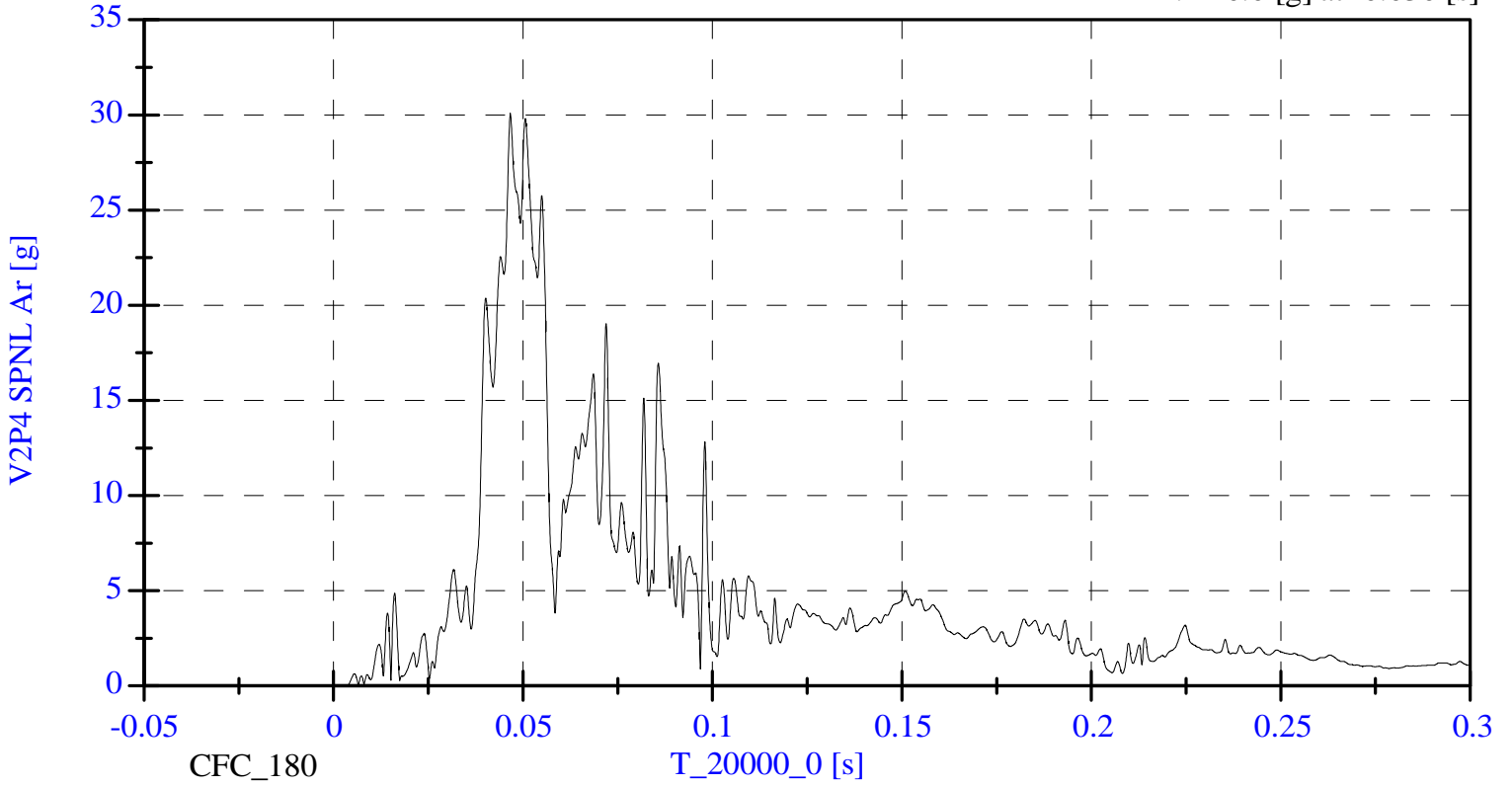
V2P4 Lower Spine T12 z



MB0222 - July 19, 2010

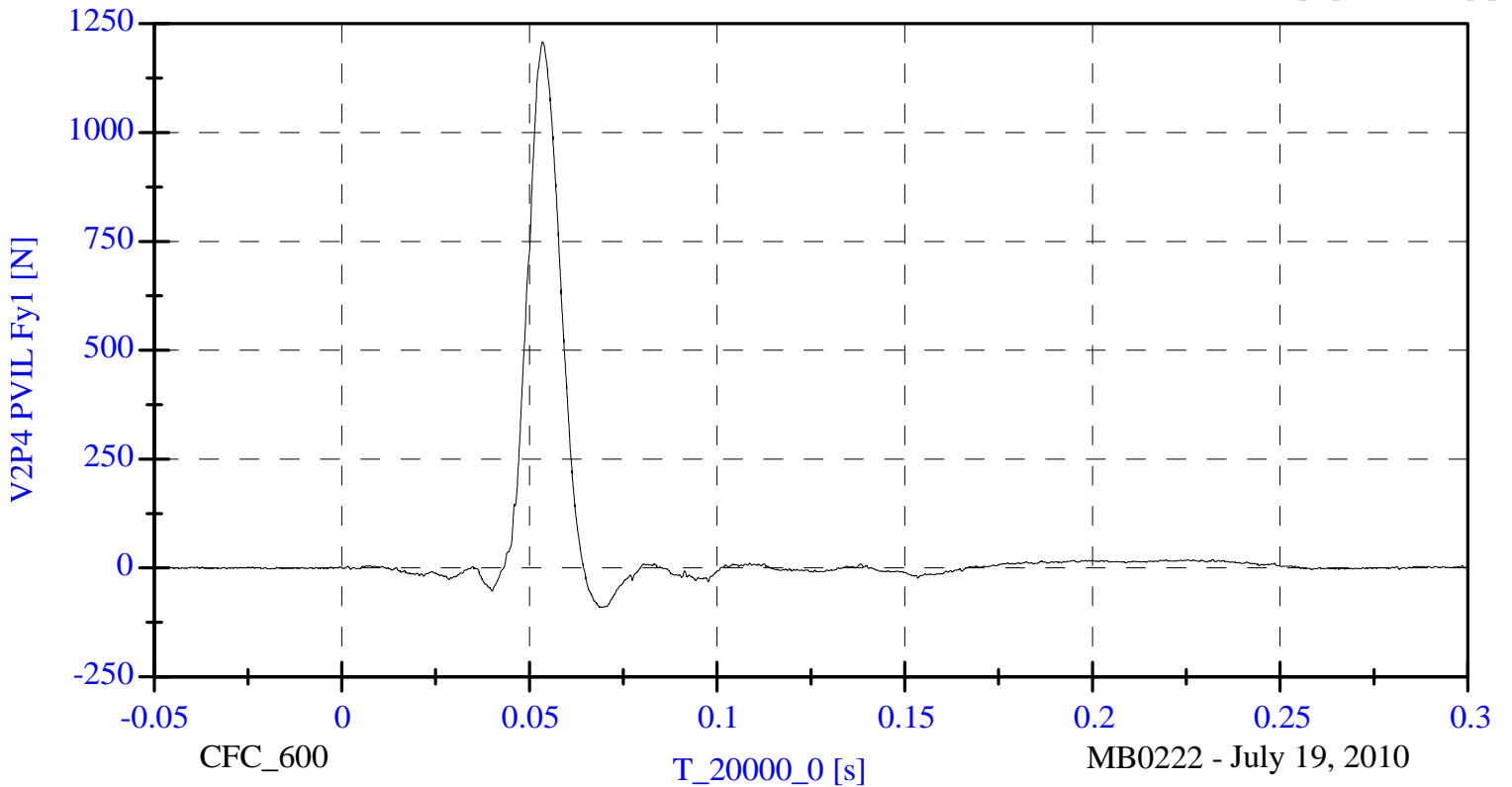
Max: 30.1 [g] at 0.047 [s]

V2P4 Lower Spine T12 Resultant
Min: 0.0 [g] at -0.030 [s]



Max: 1208.2 [N] at 0.053 [s]

V2P4 Left Iliac Wing Fy
Min: -90.5 [N] at 0.069 [s]

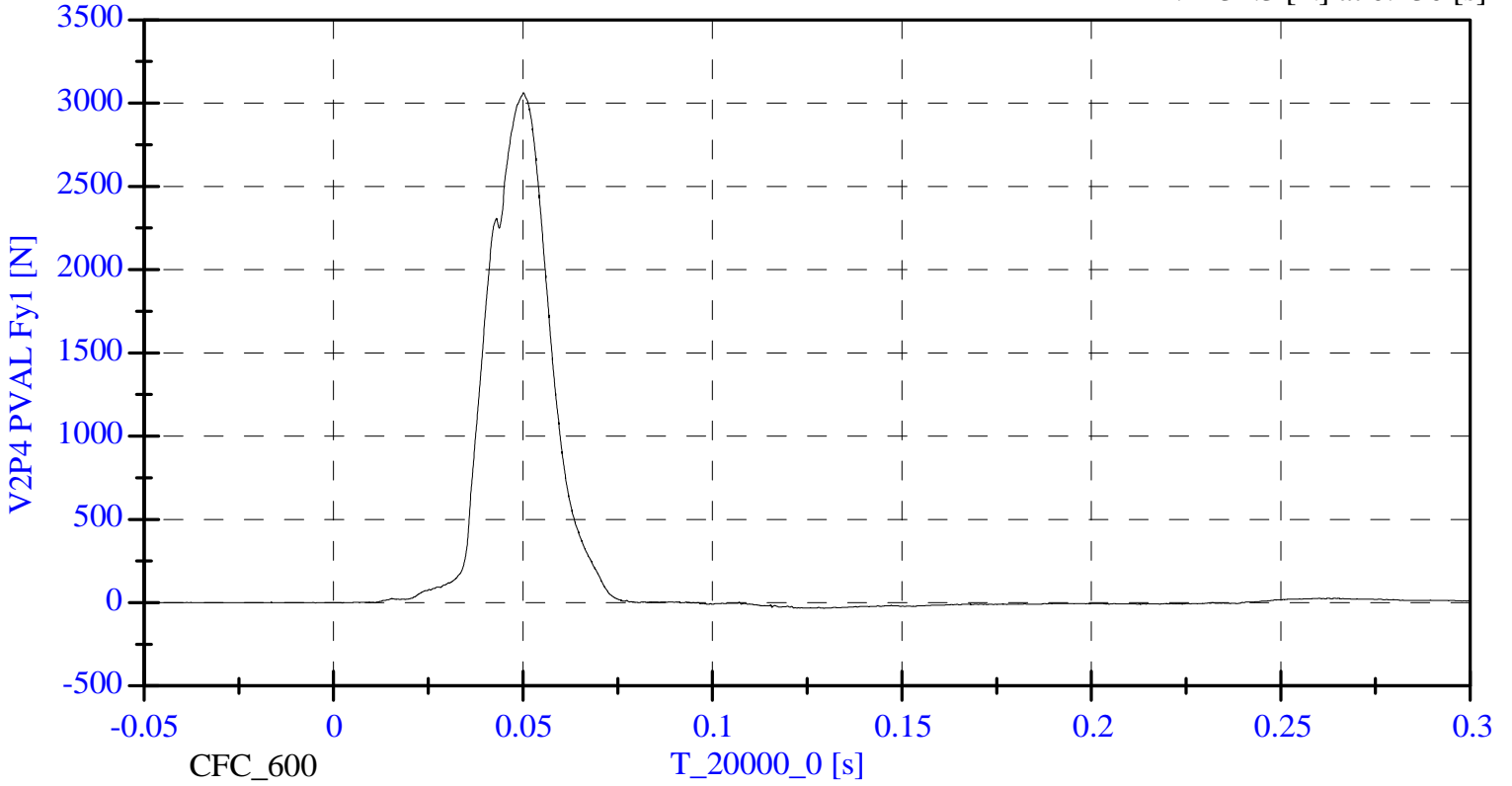


MB0222 - July 19, 2010

Max: 3062.5 [N] at 0.050 [s]

Min: -34.3 [N] at 0.130 [s]

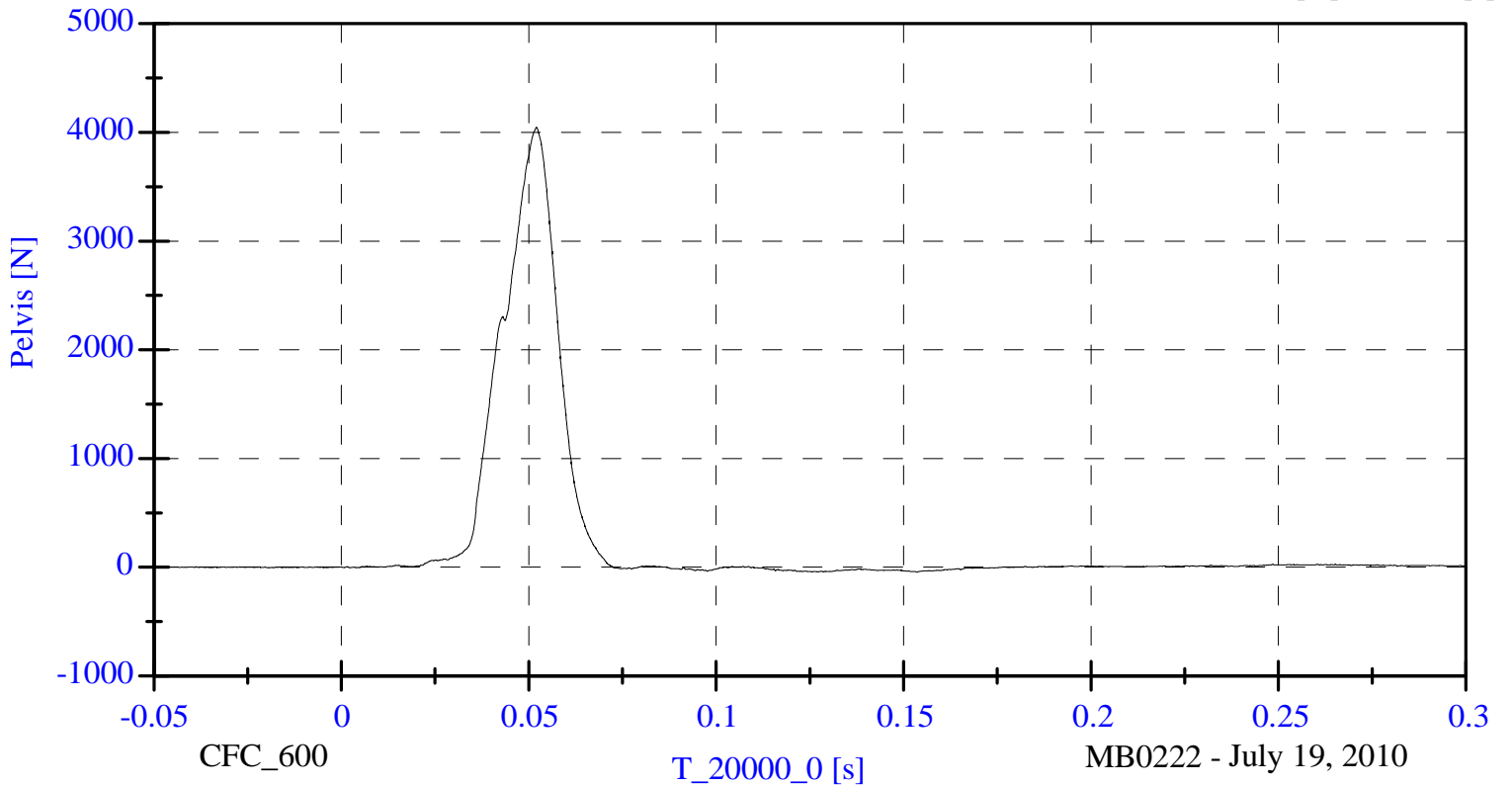
V2P4 Left Acetabulum Fy



Max: 4046.1 [N] at 0.052 [s]

Min: -46.4 [N] at 0.153 [s]

V2P4 Total Pelvic Fy



MB0222 - July 19, 2010

APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

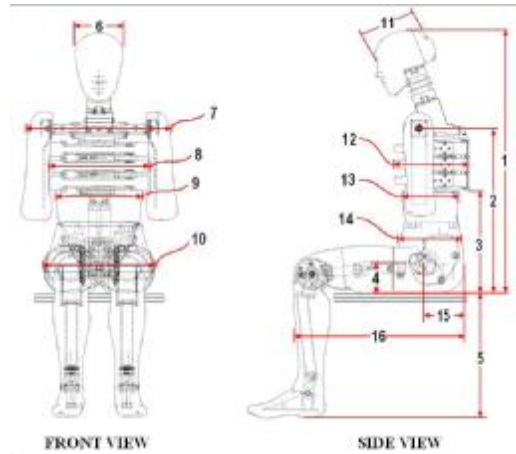
PRE-TEST

Es-2re No: F033

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

S/N F033



Dim. No.	Description	Specification (mm)	Result	Pass/Fail
1	Sitting Height	900-918	906	Pass
2	Seat to Shoulder Joint	558-572	570	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	101	Pass
5	Sole to Seat, Sitting	333-451	436	Pass
6	Head Width	152-158	153	Pass
7	Shoulder/Arm Width	461-479	466	Pass
8	Thorax Width	322-332	324	Pass
9	Abdomen Width	273-287	284	Pass
10	Pelvis Lap Width	359-373	368	Pass
11	Head Depth	196-206	202	Pass
12	Thorax Depth	262-272	267	Pass
13	Abdomen Depth	194-204	201	Pass
14	Pelvis Depth	235-245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	158	Pass
16	Back of Buttocks to Front Knee	597-615	603	Pass

Technician : A. Rudniski

Date: 06/30/2010



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	6/29/2010
Test Number:	1	Test Time:	4:45:14 PM

Component Part Number	Component Serial Number
455-2002	07085

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	43 %RH P
Velocity	3.30 -- 3.50	3.42 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	52.0 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	60.1 ms P
Decay to Zero Degrees	53.0 -- 88.0	57.5 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: **4:45:14 PM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Neck Flexion**

Test Time: **4:45:14 PM**

Test Date: **6/29/2010**



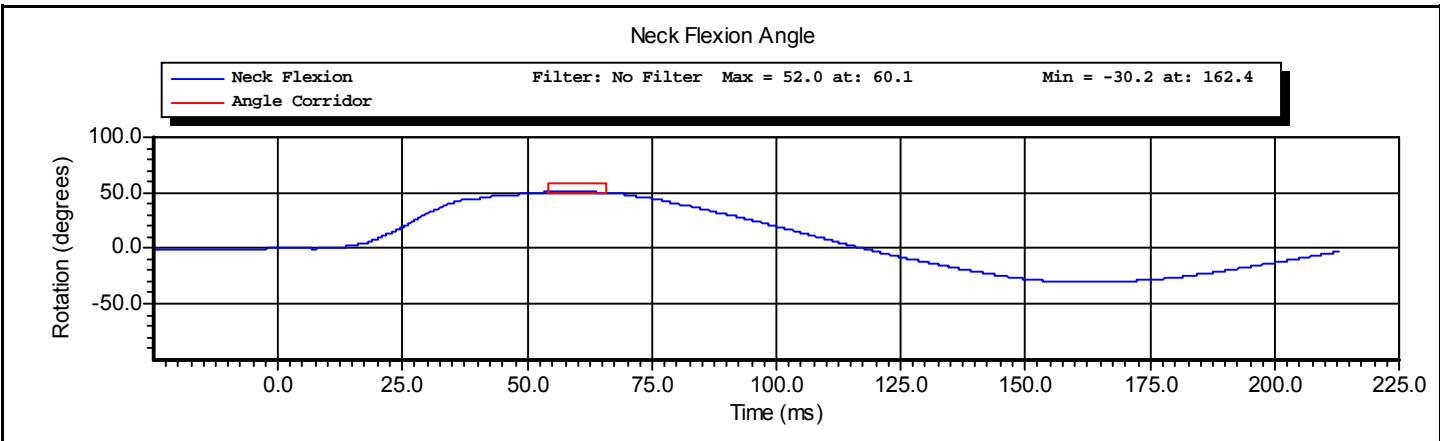
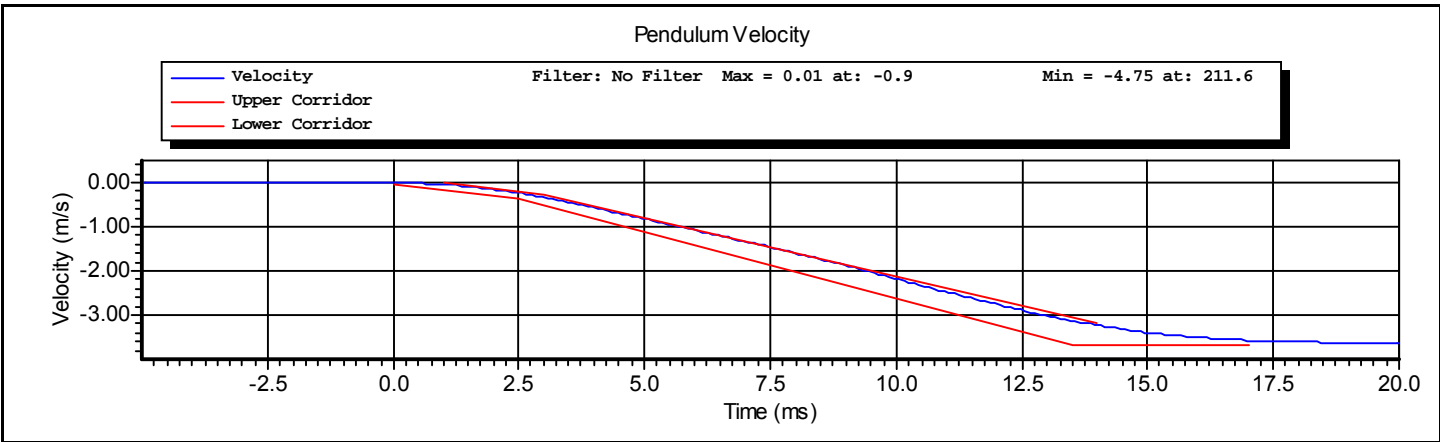
www.calspan.com

Calspan - Transportation Research Group

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:	6/29/2010
Test Number:	1	Test Time:	4:45:14 PM

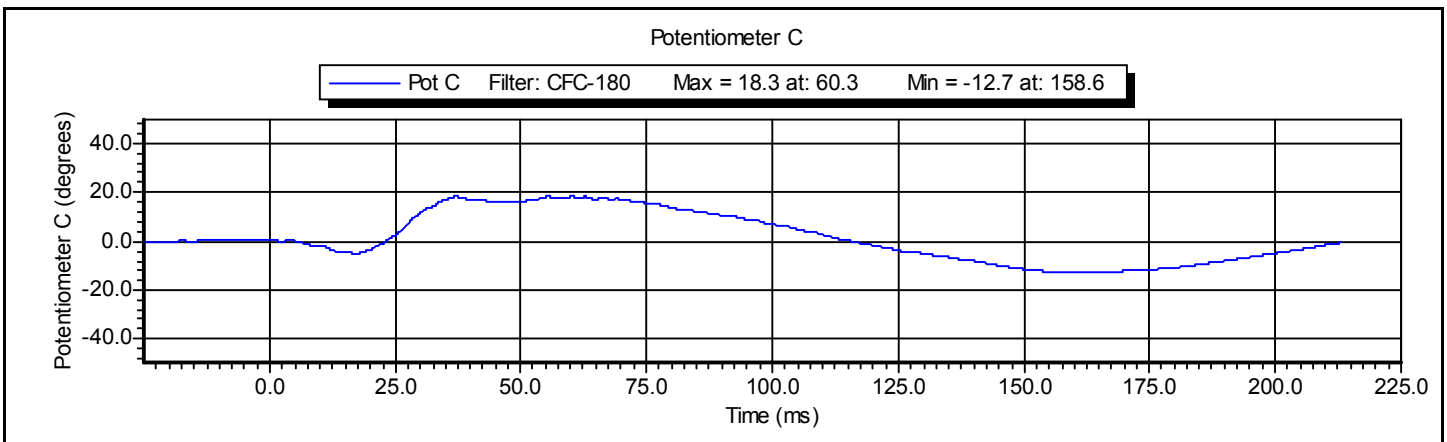
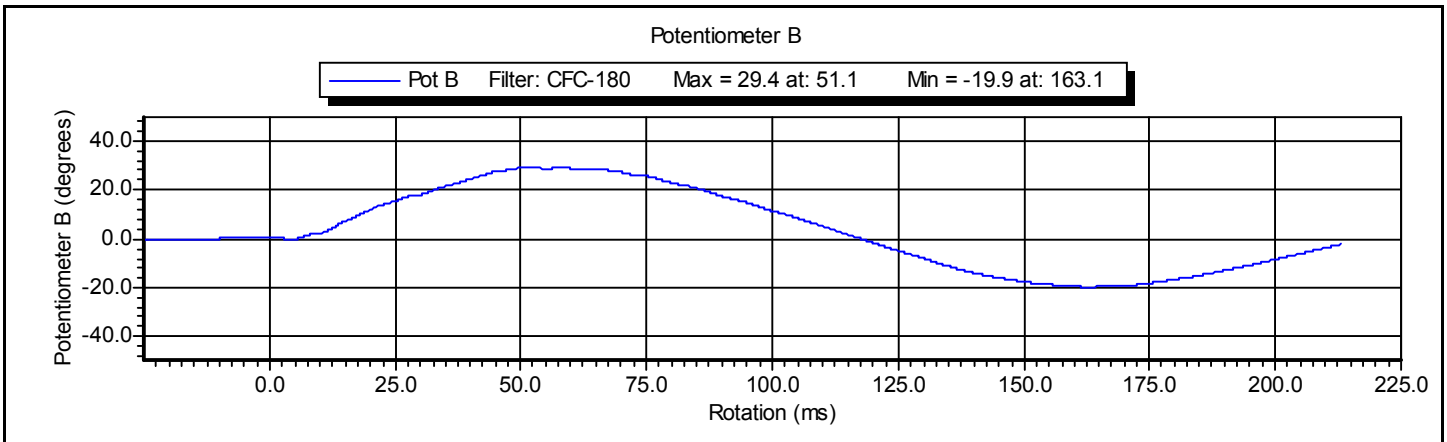
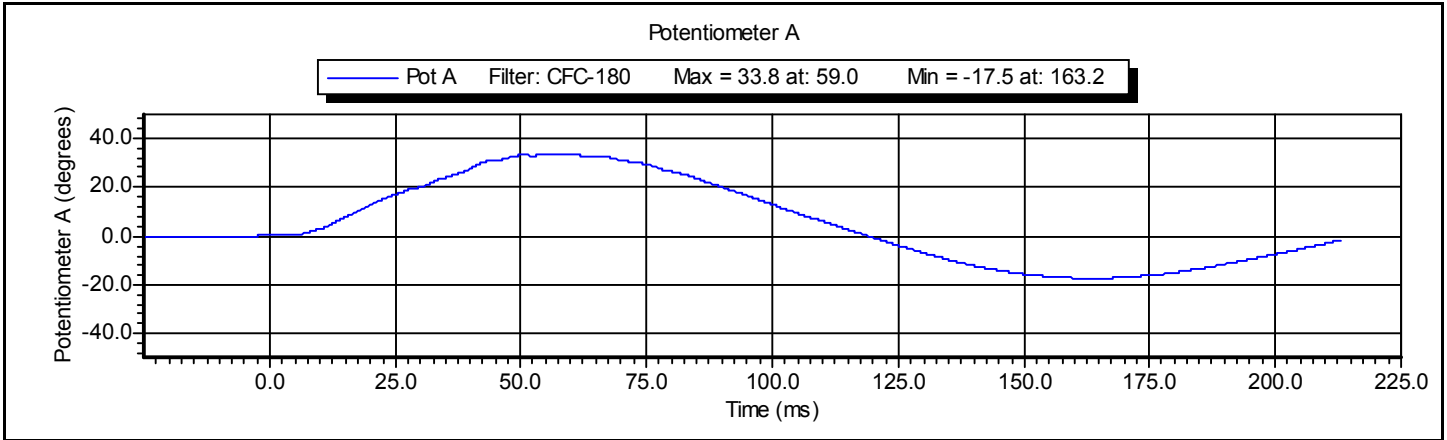
Component Part Number	Component Serial Number
455-2002	07085



Test ID: **Neck Flexion**

Test Time: **4:45:14 PM**

Test Date: **6/29/2010**





www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	9:41:07 AM

Component Part Number	Component Serial Number
960715-313	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	58.0 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.84 g P

All test parameters are within specifications

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

Test ID: **Shoulder**

Test Time: **9:41:07 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010

Test ID: **Shoulder**

Test Time: **9:41:07 AM**

Test Date: **6/29/2010**



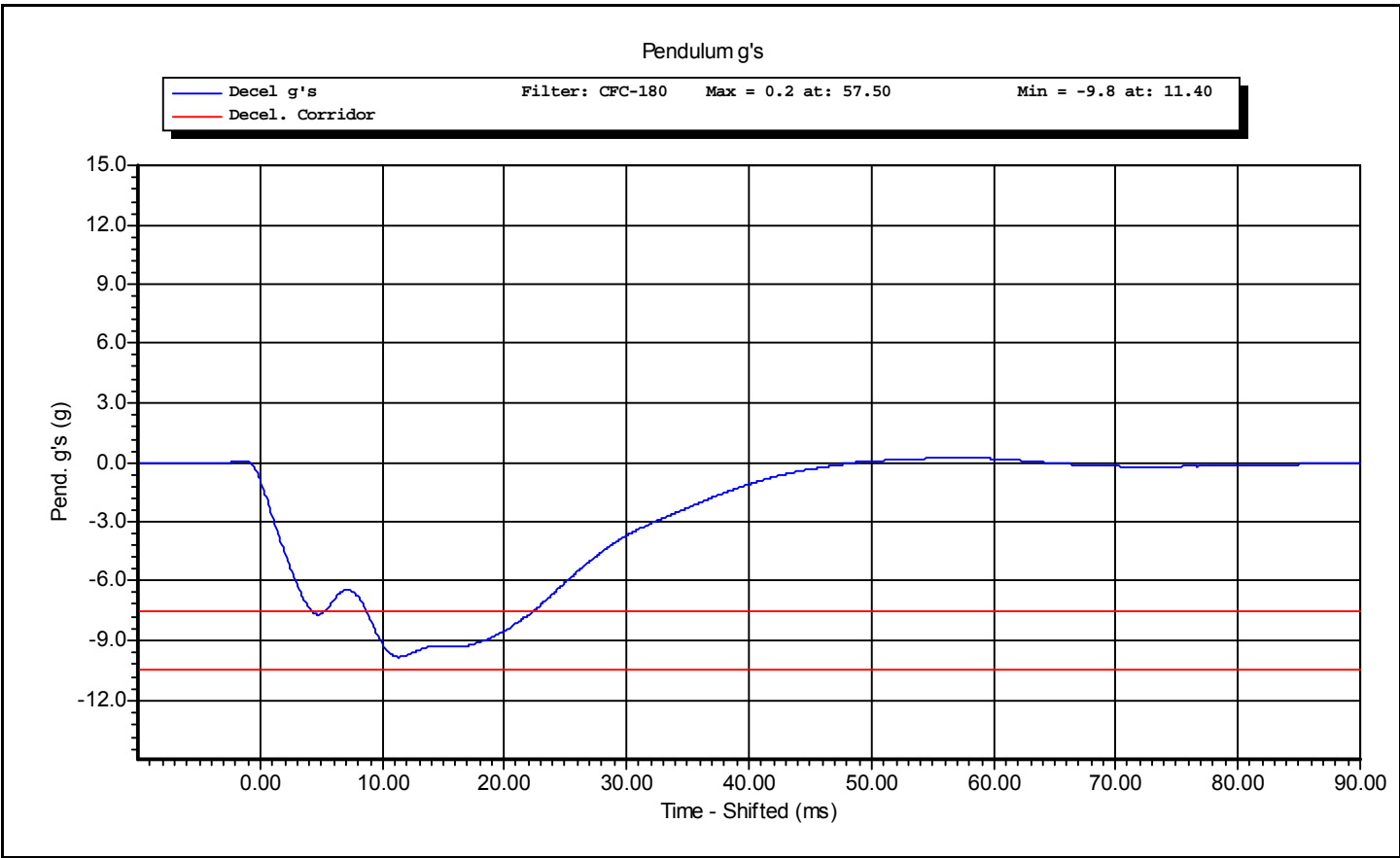
www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	9:41:07 AM

Component Part Number	Component Serial Number
960715-313	



Test ID: **Shoulder**

Test Time: **9:41:07 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	10:45:55 AM

Component Part Number	Component Serial Number
455-3100	UPPER

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	56.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-47.33 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: **10:45:55 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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	P23137	1/22/2010

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

Test Time: **10:45:55 AM**

Test Date: **6/29/2010**



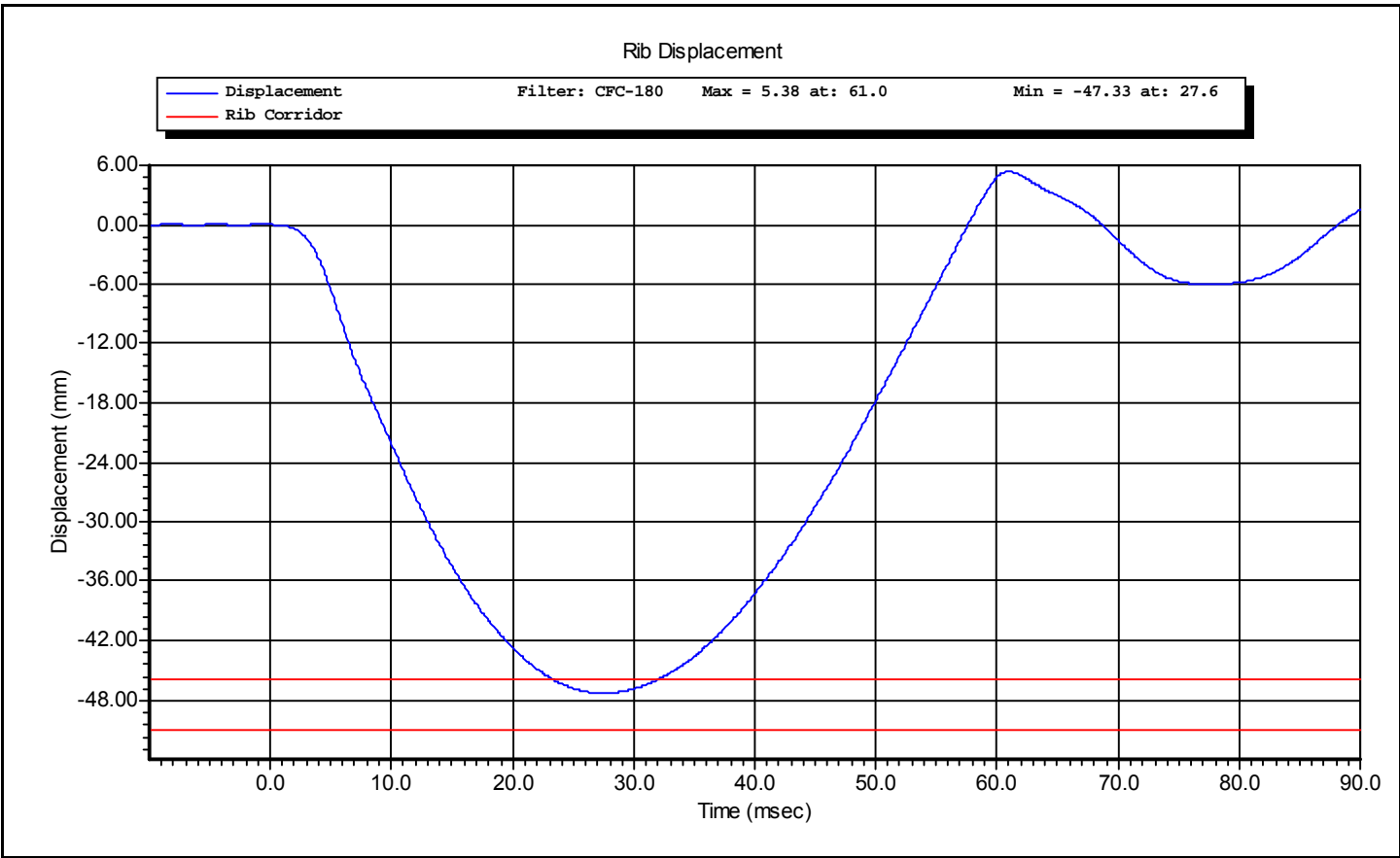
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	6/29/2010
Test Number:	1	Test Time:	10:45:55 AM

Component Part Number	Component Serial Number
455-3100	UPPER



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

Test Time: **10:45:55 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	10:54:20 AM

Component Part Number	Component Serial Number
455-3100	UPPER

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	56.0 %RH P
Velocity	2.90 -- 3.10	2.96 m/s P
Rib Displacement	-40.00 -- -36.00	-36.39 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: **10:54:20 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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	P23137	1/22/2010

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

Test Time: **10:54:20 AM**

Test Date: **6/29/2010**



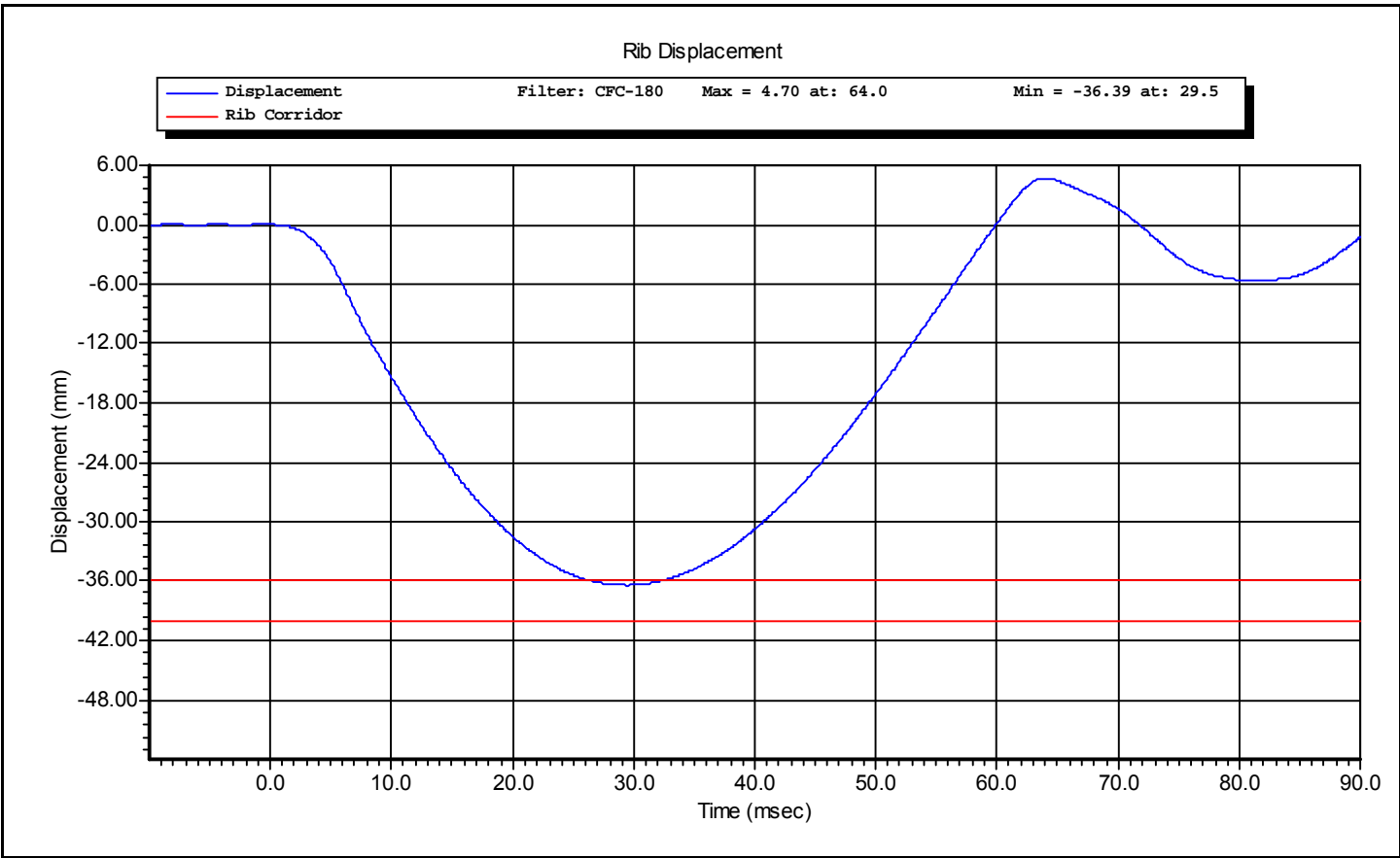
www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	10:54:20 AM

Component Part Number	Component Serial Number
455-3100	UPPER



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

Test Time: **10:54:20 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	11:06:01 AM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	56.0 %RH P
Velocity	3.90 -- 4.10	3.99 m/s P
Rib Displacement	-51.00 -- -46.00	-47.54 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: **11:06:01 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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	P23137	1/22/2010

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

Test Time: **11:06:01 AM**

Test Date: **6/29/2010**



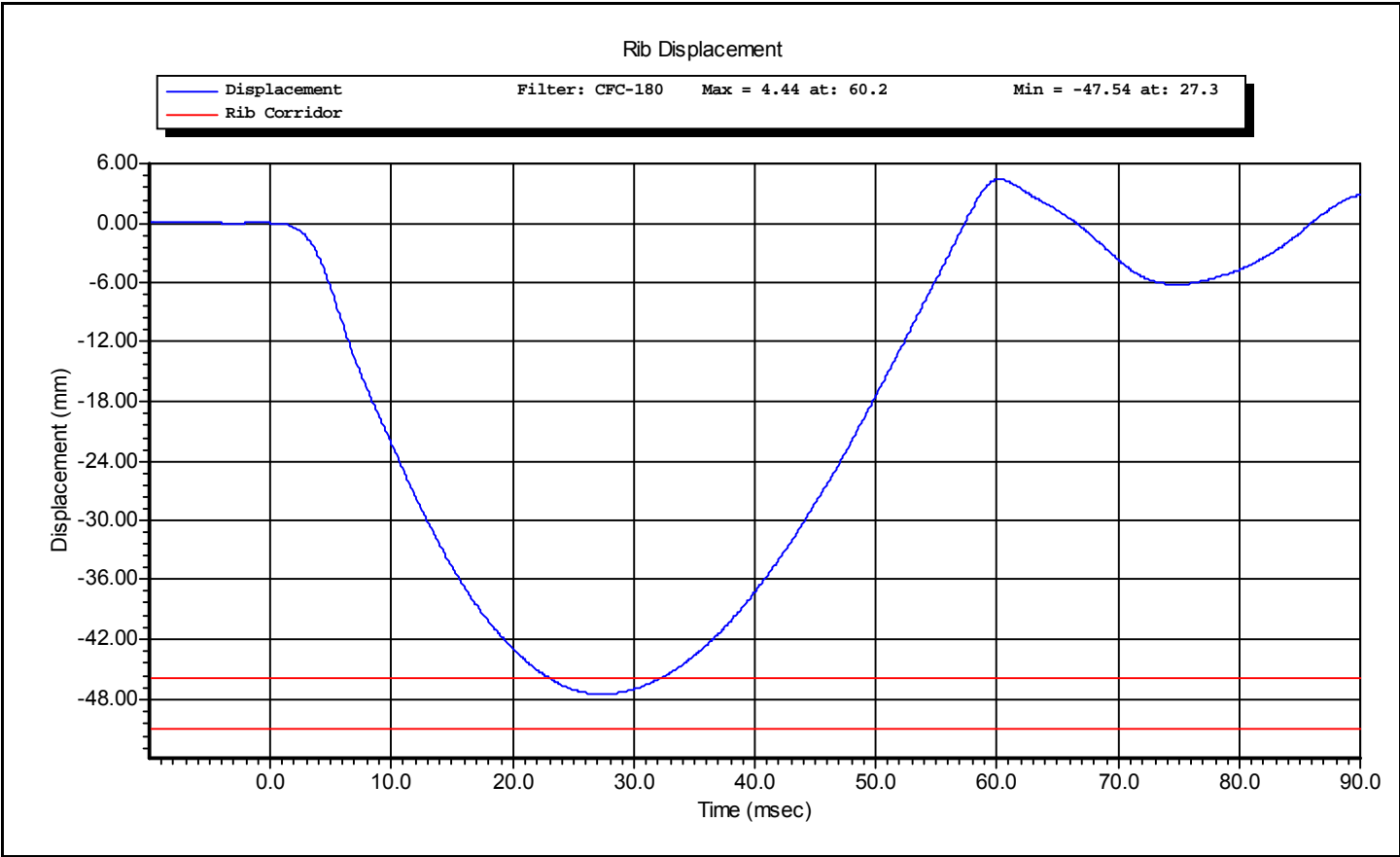
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	6/29/2010
Test Number:	1	Test Time:	11:06:01 AM

Component Part Number	Component Serial Number
455-3100	MIDDLE



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

Test Time: **11:06:01 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	11:17:04 AM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	56.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-36.81 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

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

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

Test Time: **11:17:04 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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	P23137	1/22/2010

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

Test Time: **11:17:04 AM**

Test Date: **6/29/2010**



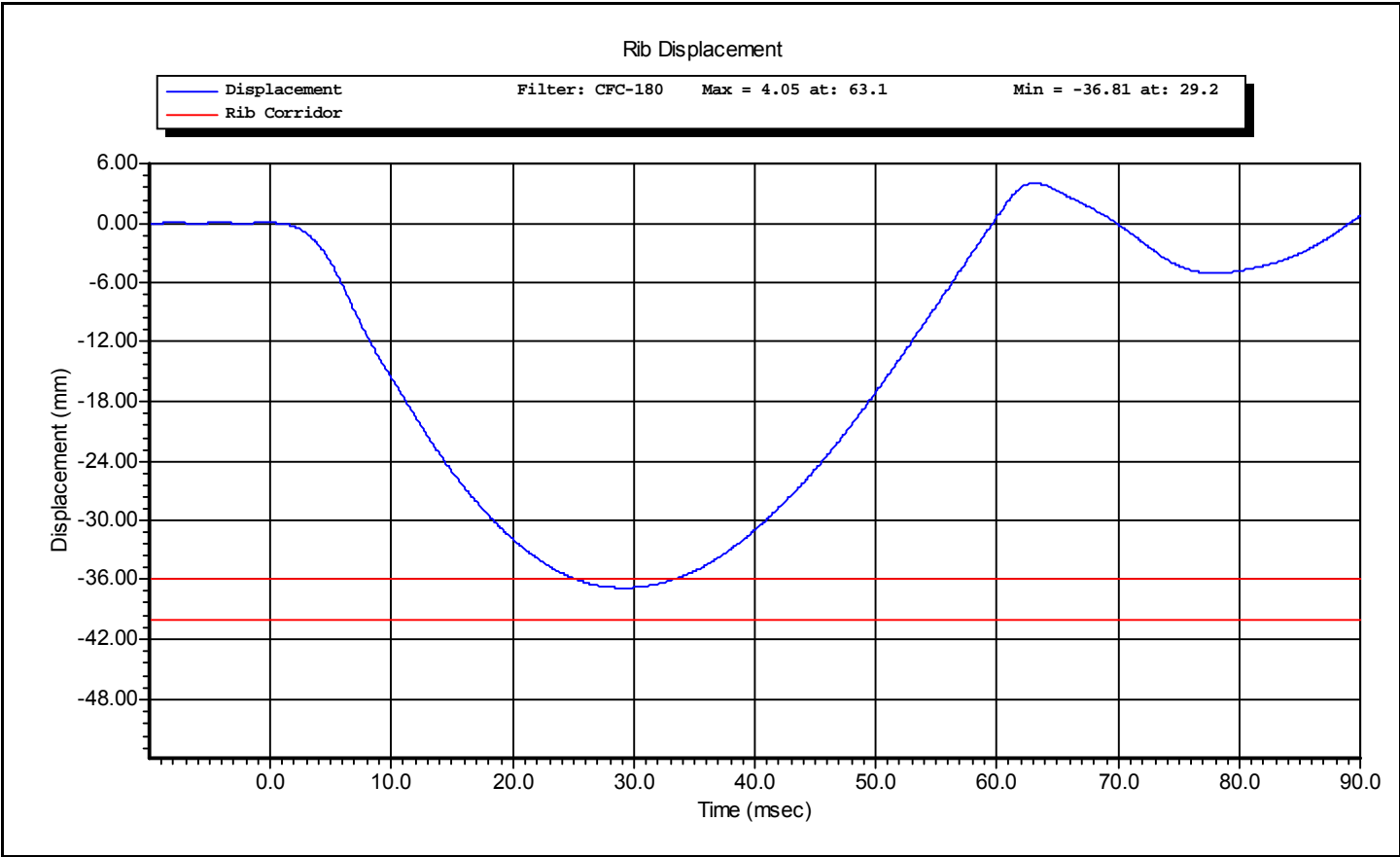
www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	11:17:04 AM

Component Part Number	Component Serial Number
455-3100	MIDDLE



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

Test Time: **11:17:04 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	6/29/2010
Test Number:	1	Test Time:	11:23:09 AM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	56.0 %RH P
Velocity	3.90 -- 4.10	3.99 m/s P
Rib Displacement	-51.00 -- -46.00	-47.57 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

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

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

Test Time: **11:23:09 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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	P23137	1/22/2010

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

Test Time: **11:23:09 AM**

Test Date: **6/29/2010**



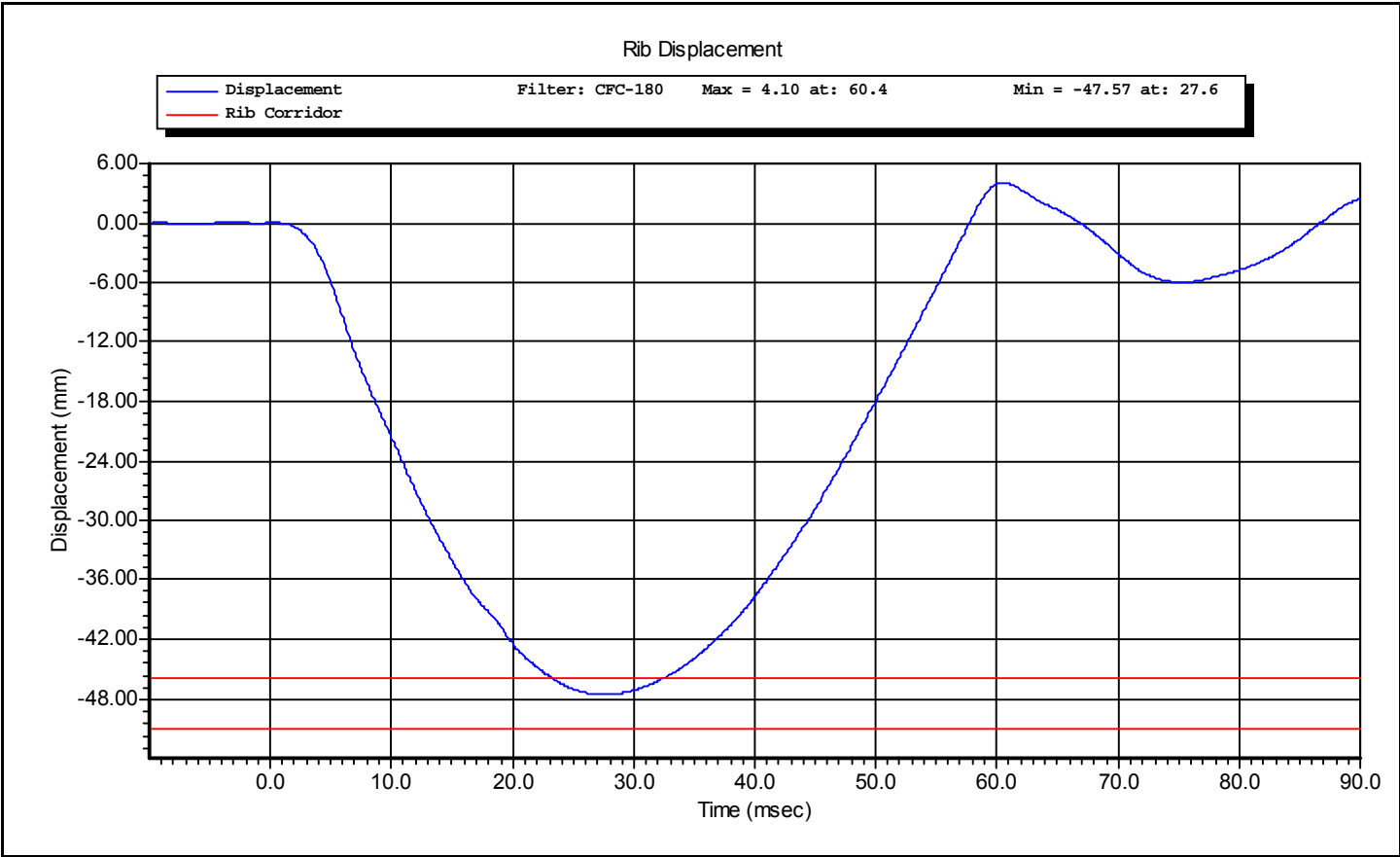
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	6/29/2010
Test Number:	1	Test Time:	11:23:09 AM

Component Part Number	Component Serial Number
455-3100	LOWER



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

Test Time: **11:23:09 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	6/29/2010
Test Number:	1	Test Time:	11:32:25 AM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	56.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-36.95 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

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

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

Test Time: **11:32:25 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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	P23137	1/22/2010

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

Test Time: **11:32:25 AM**

Test Date: **6/29/2010**



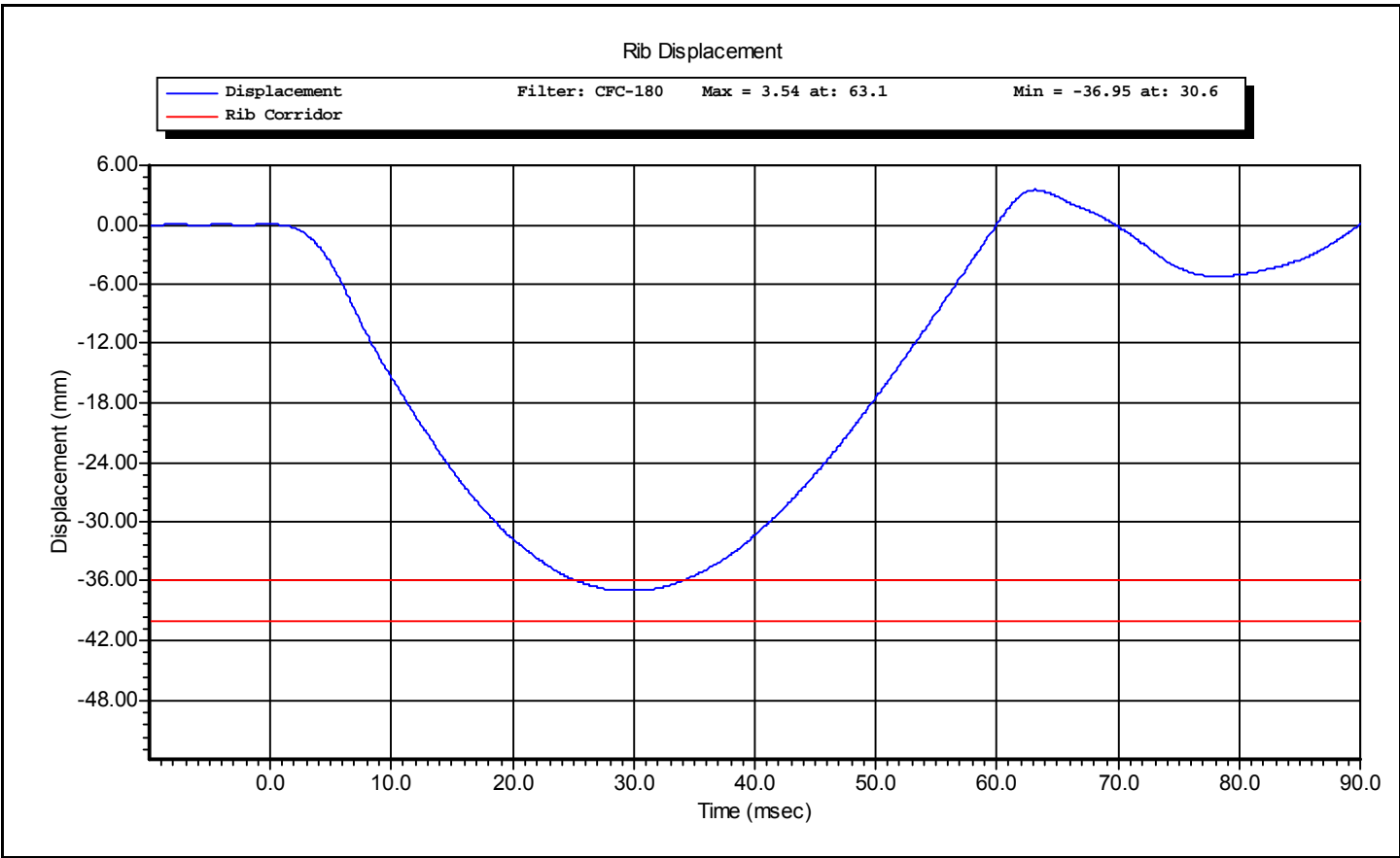
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	6/29/2010
Test Number:	1	Test Time:	11:32:25 AM

Component Part Number	Component Serial Number
455-3100	LOWER



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

Test Time: **11:32:25 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	1:25:34 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	53.0 %RH P
Velocity	5.40 -- 5.60	5.50 m/s P
Upper Rib Displacement	34.0 -- 41.0	37.2 mm P
Middle Rib Displacement	37.0 -- 45.0	40.7 mm P
Lower Rib Displacement	37.0 -- 44.0	40.1 mm P
Impactor Force	5100 -- 6200	5547 N P

All test parameters are within specifications

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

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

Test ID: **Thorax**

Test Time: **1:25:34 PM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
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: **1:25:34 PM**

Test Date: **6/29/2010**



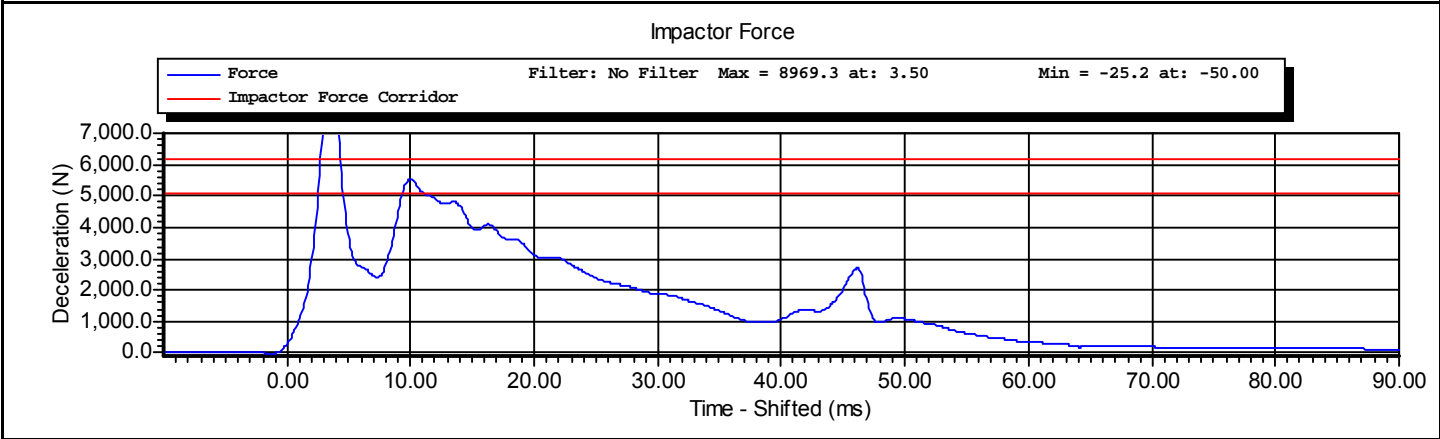
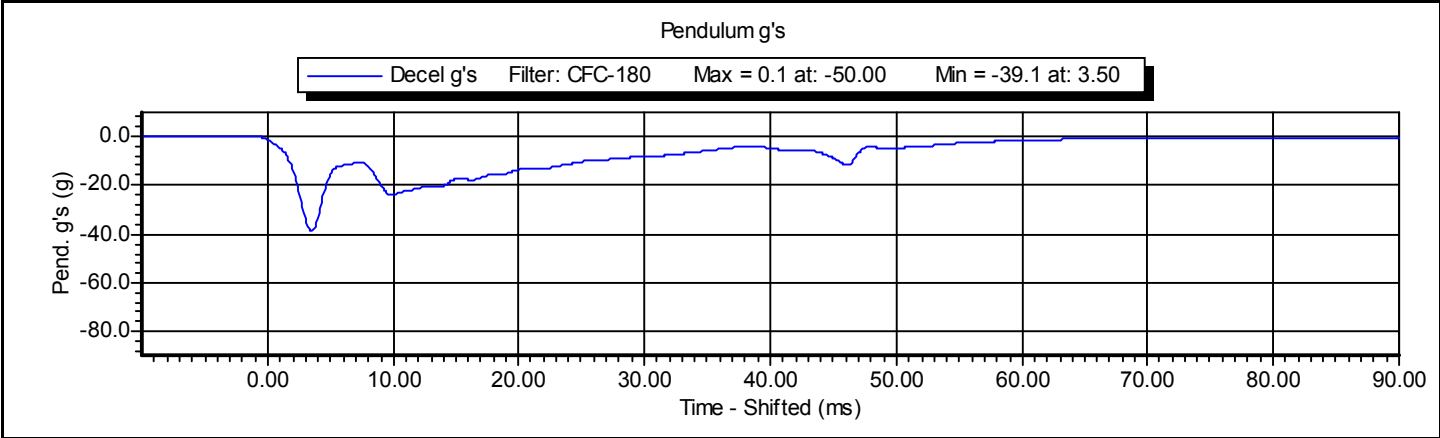
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	6/29/2010
Test Number:	1	Test Time:	1:25:34 PM

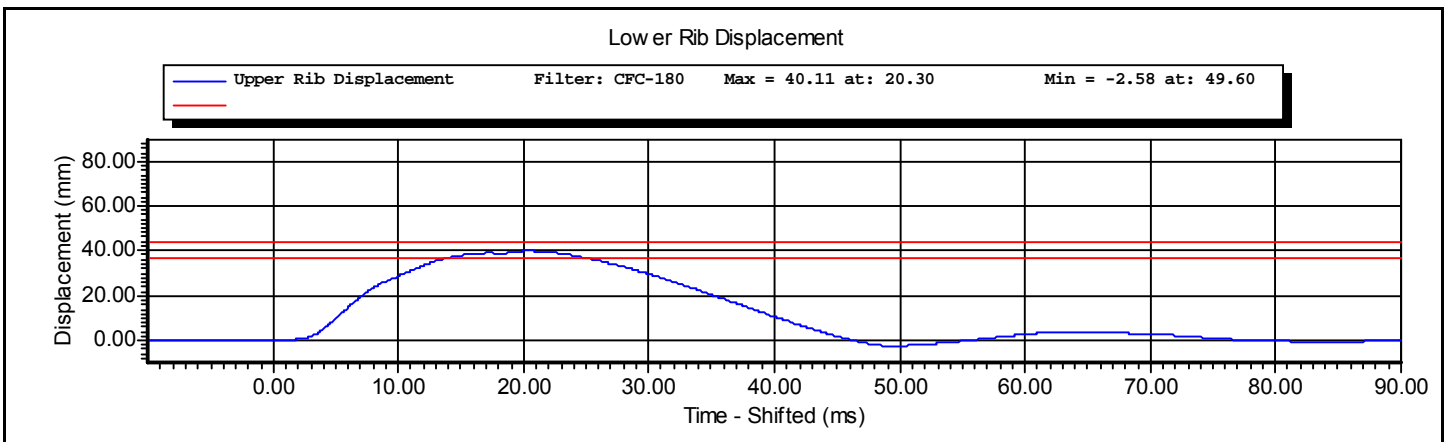
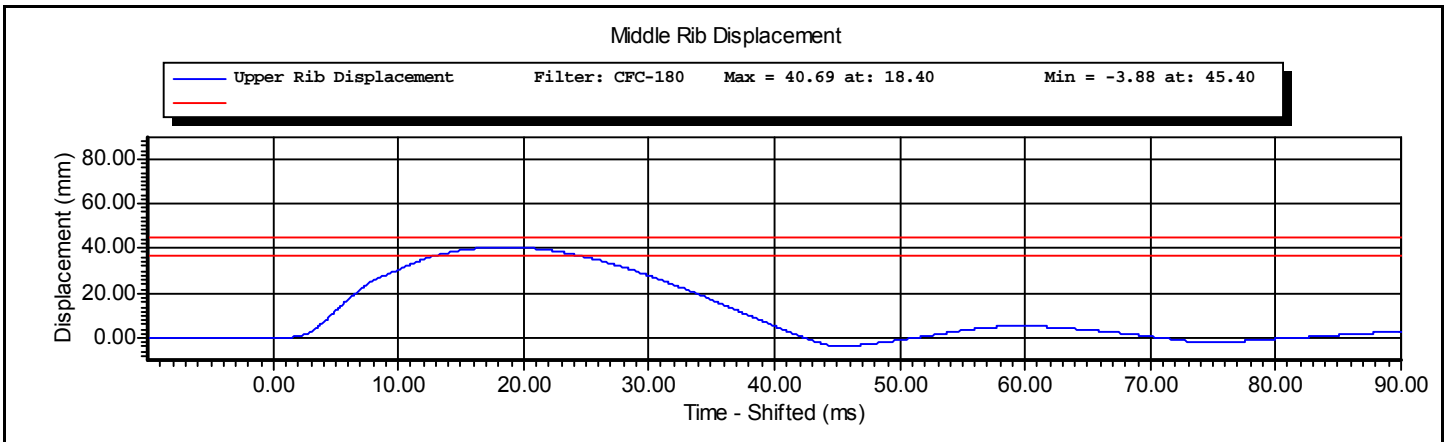
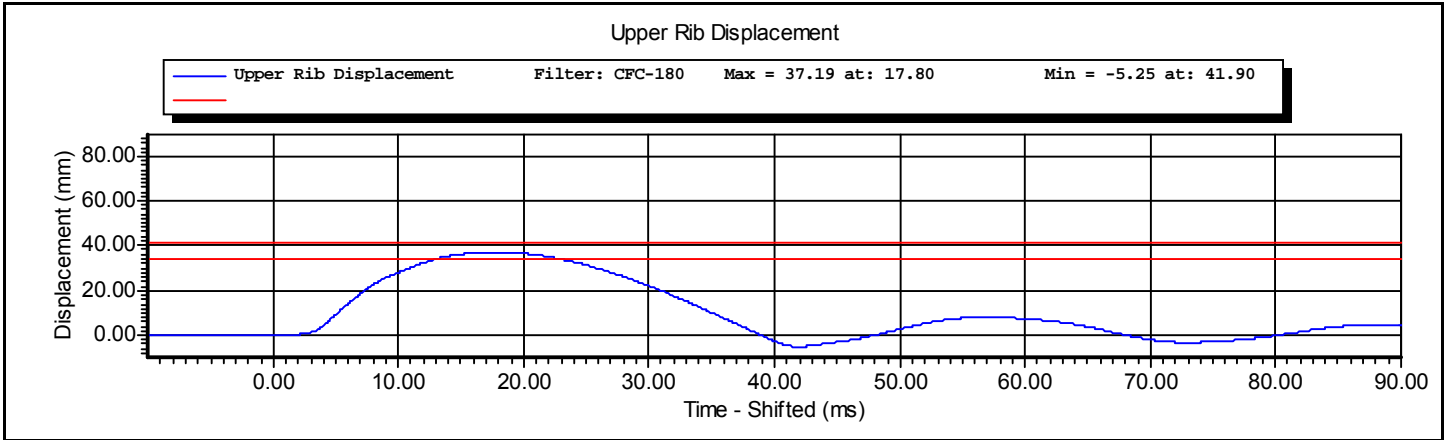
Component Part Number	Component Serial Number
Upper Rib - 175-4002	UPPER



Test ID: **Thorax**

Test Time: **1:25:34 PM**

Test Date: **6/29/2010**





www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	3	Test Time:	8:51:10 AM

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

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	58 %RH P
Velocity	3.90 -- 4.10	3.93 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.41 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	12.3 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.21 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	12.6 ms P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **8:51:10 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
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: **8:51:10 AM**

Test Date: **6/29/2010**



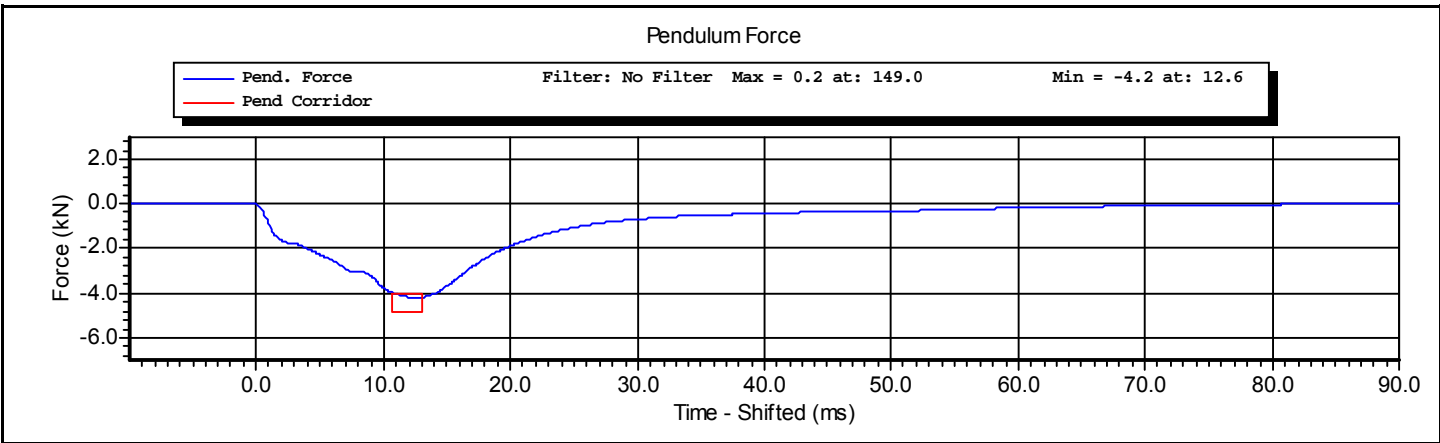
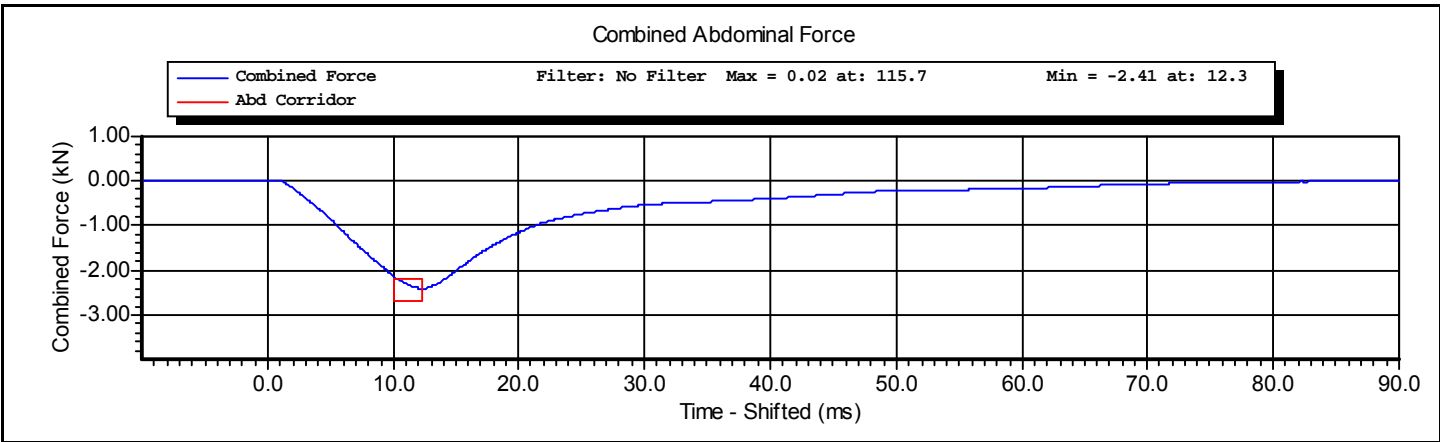
www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	3	Test Time:	8:51:10 AM

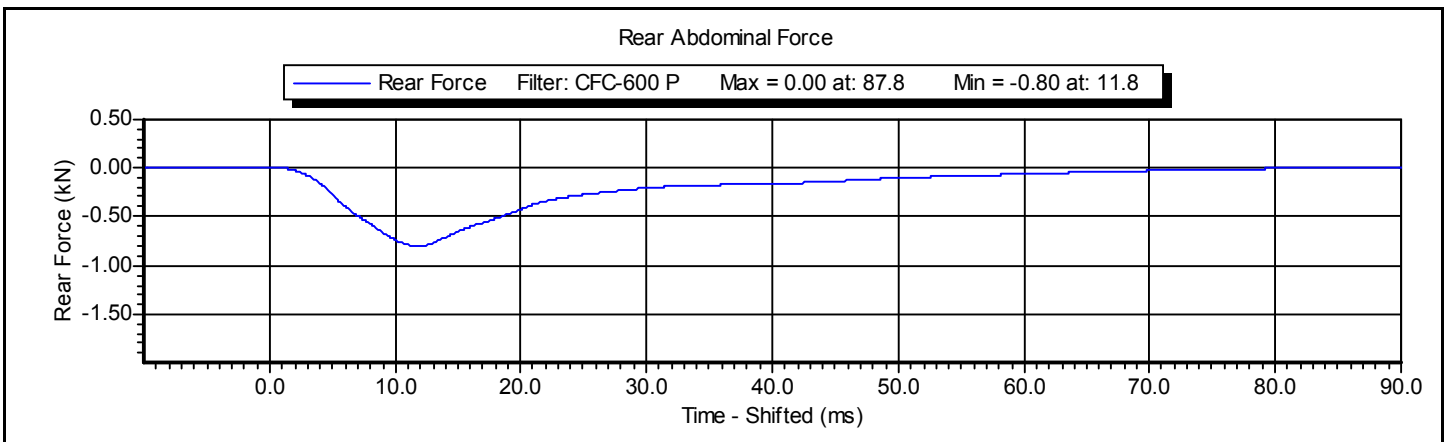
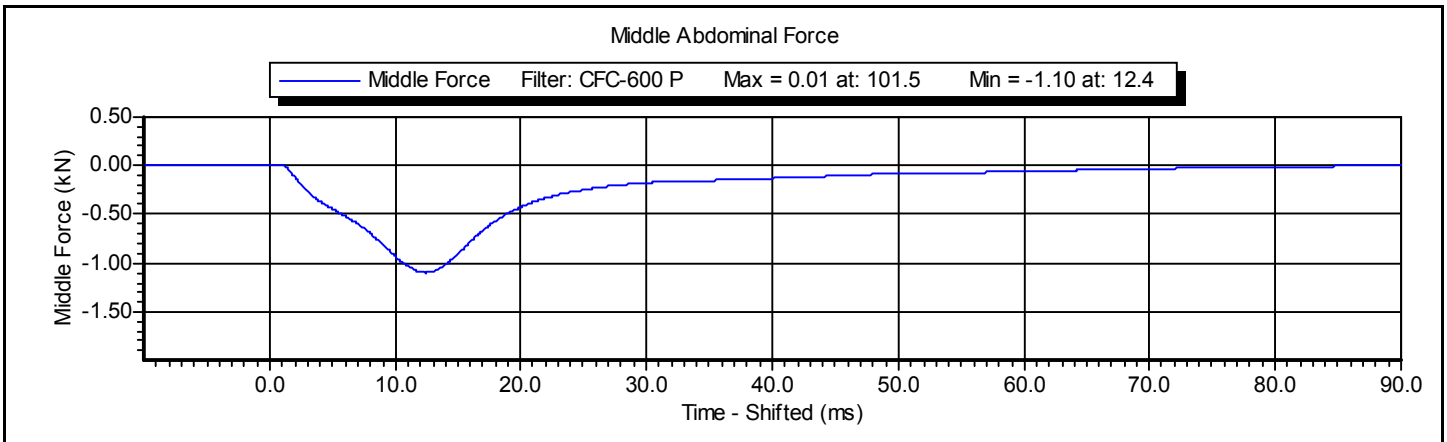
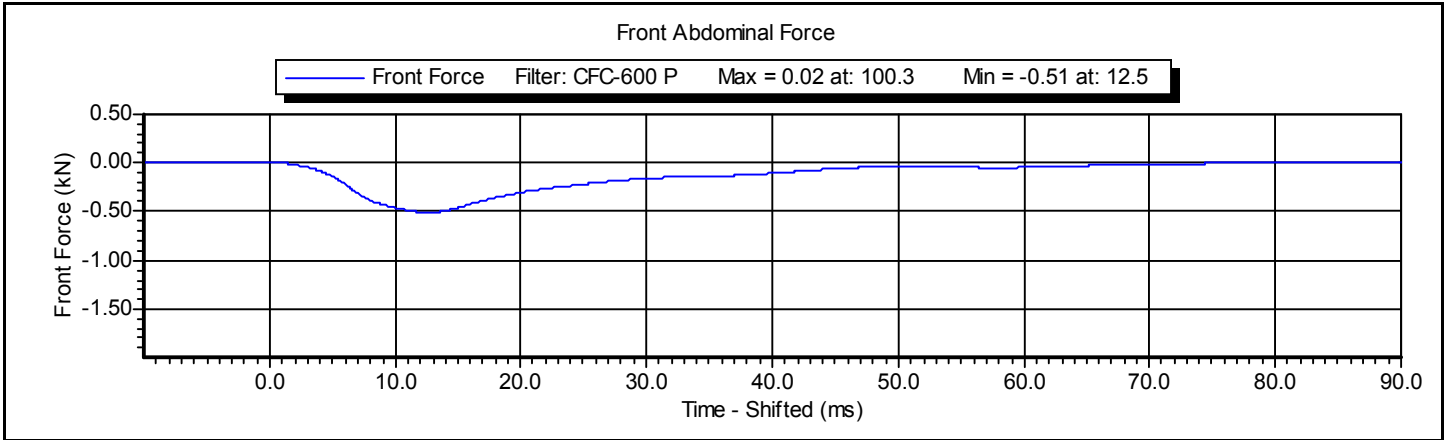
Component Part Number	Component Serial Number
455-4001	07/136



Test ID: **Abdomen**

Test Time: **8:51:10 AM**

Test Date: **6/29/2010**





www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	6/30/2010
Test Number:	1	Test Time:	9:00:50 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.1 deg C P
Humidity	10 -- 70	45 %RH P
Velocity	5.95 -- 6.15	6.14 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	48.9 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	41.6 ms P
Decay to Zero Degrees	37.0 -- 57.0	40.6 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

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

Test ID: **Lumbar Spine**

Test Time: **9:00:50 AM**

Test Date: **6/30/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Lumbar Spine**

Test Time: **9:00:50 AM**

Test Date: **6/30/2010**



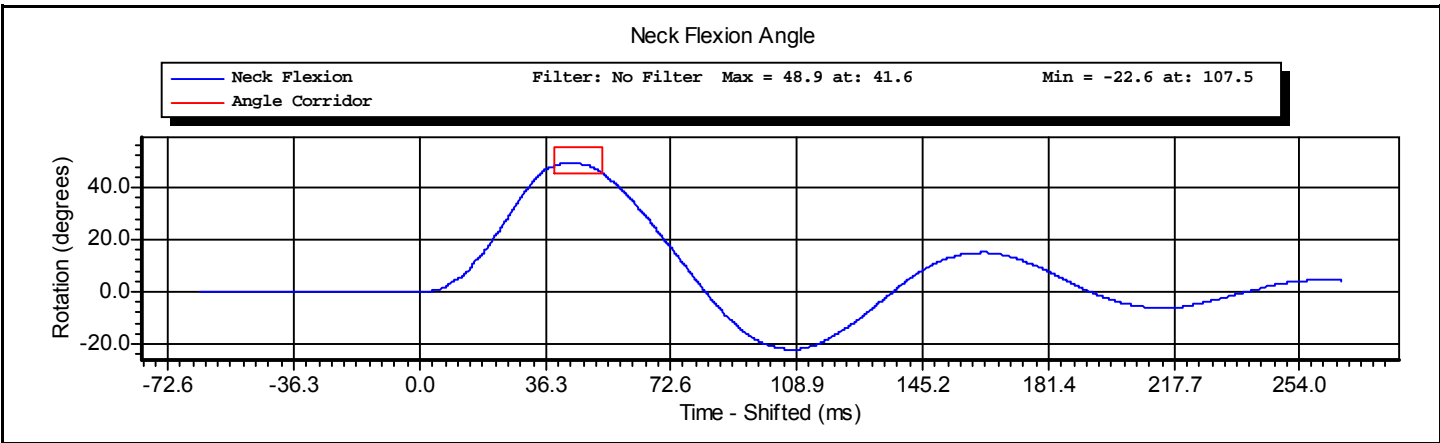
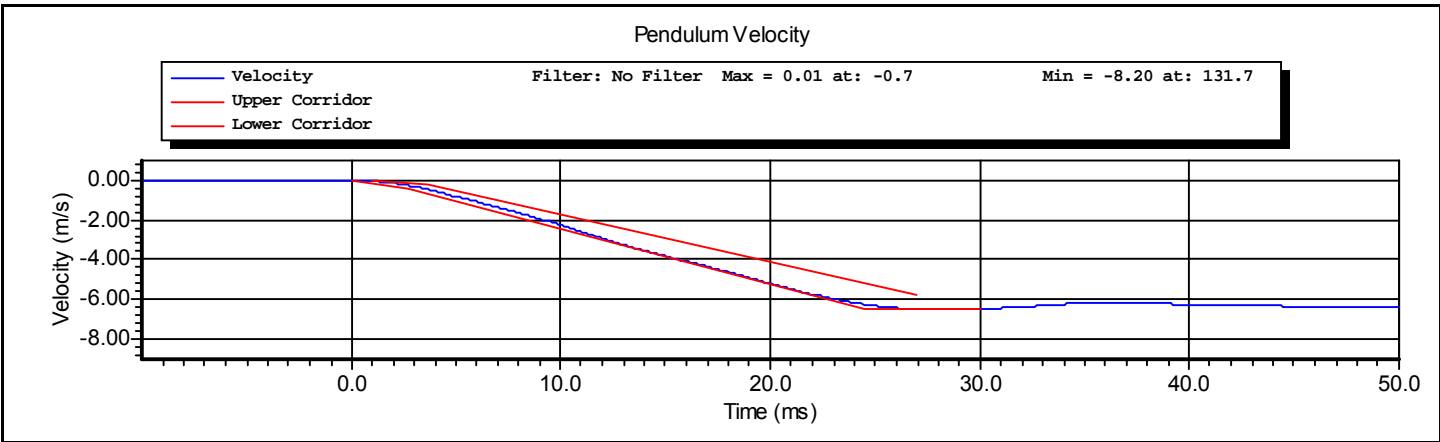
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	6/30/2010
Test Number:	1	Test Time:	9:00:50 AM

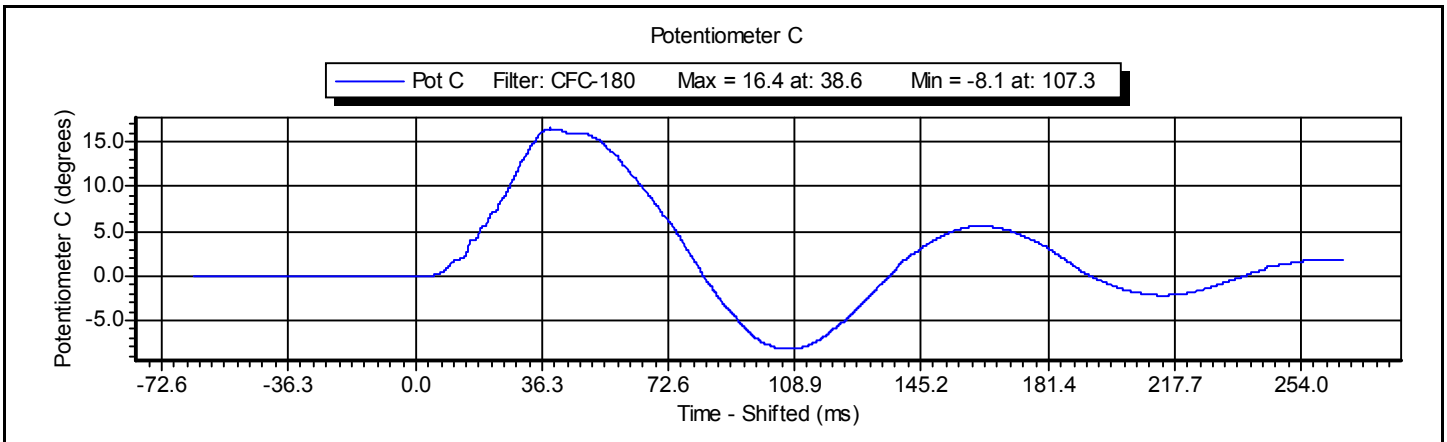
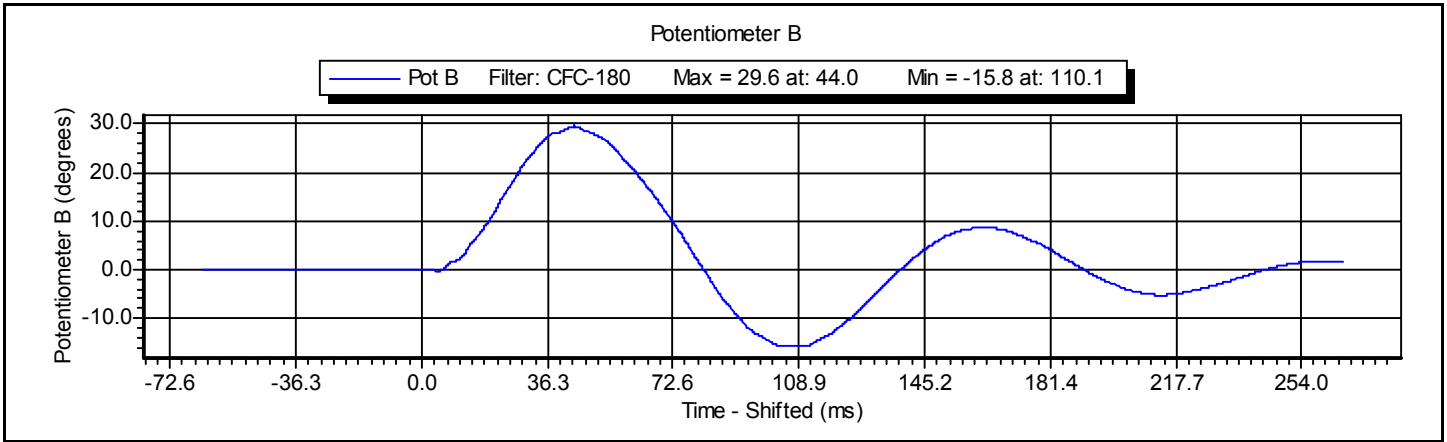
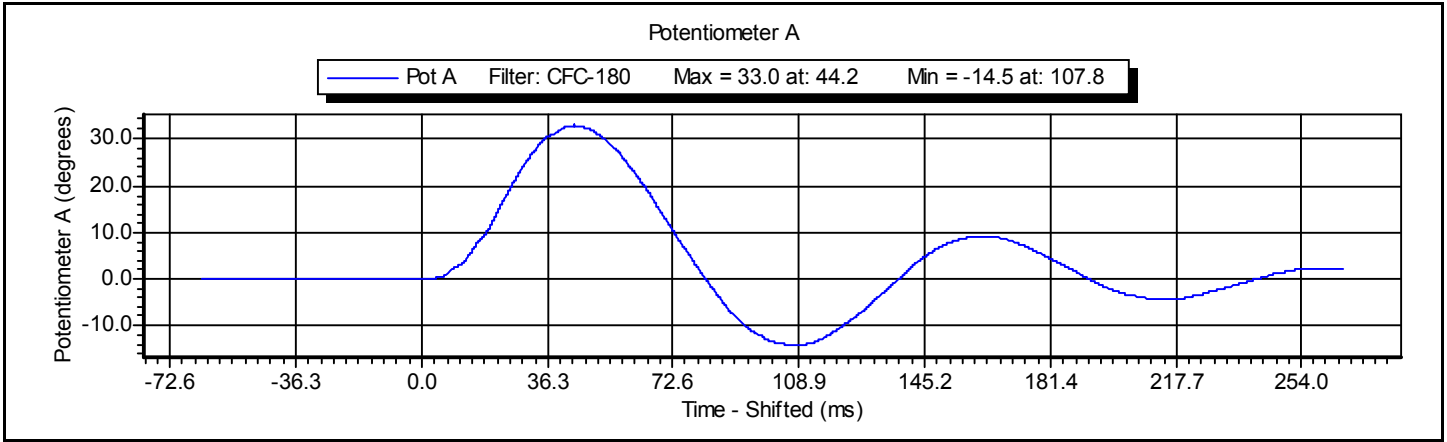
Component Part Number	Component Serial Number
175-5501	19-0545



Test ID: **Lumbar Spine**

Test Time: **9:00:50 AM**

Test Date: **6/30/2010**





www.calspan.com

Calspan - Transportation Research Group

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

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:	6/29/2010
Test Number:	1	Test Time:	9:25:36 AM

Component Part Number	Component Serial Number
455-4003	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	58 %RH P
Velocity	4.20 -- 4.40	4.31 m/s P
Peak Pendulum Force	-5.40 -- -4.70	-4.94 kN P
Time at Peak Pendulum Force	11.80 -- 16.10	14.28 ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	-1.45 kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	15.68 ms P

All test parameters are within specifications

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

Test ID: **Pelvis**

Test Time: **9:25:36 AM**

Test Date: **6/29/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Denton	3096	LC-456Fy	4/22/2010

Test ID: **Pelvis**

Test Time: **9:25:36 AM**

Test Date: **6/29/2010**



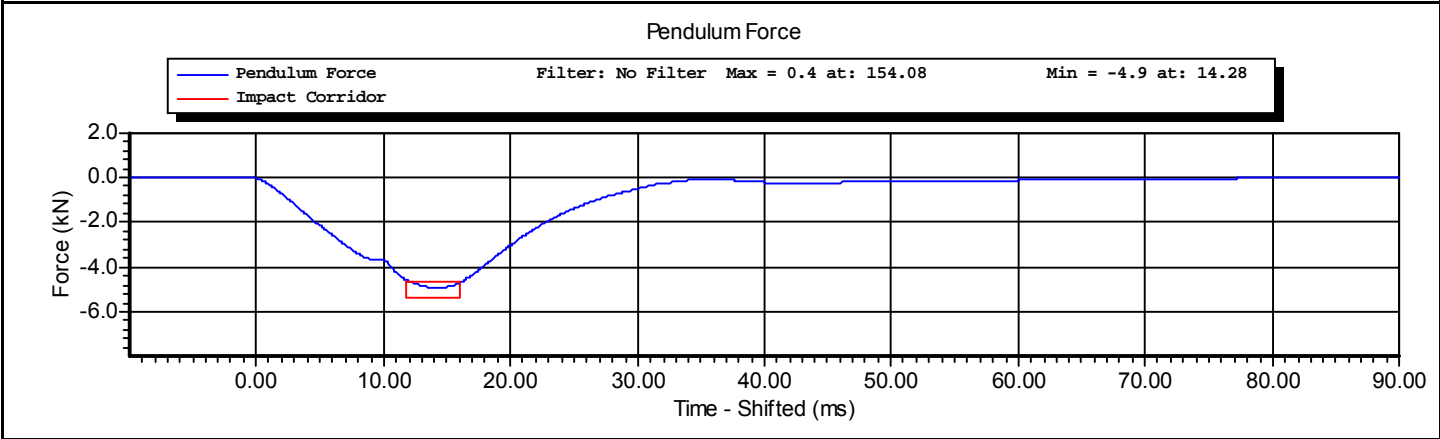
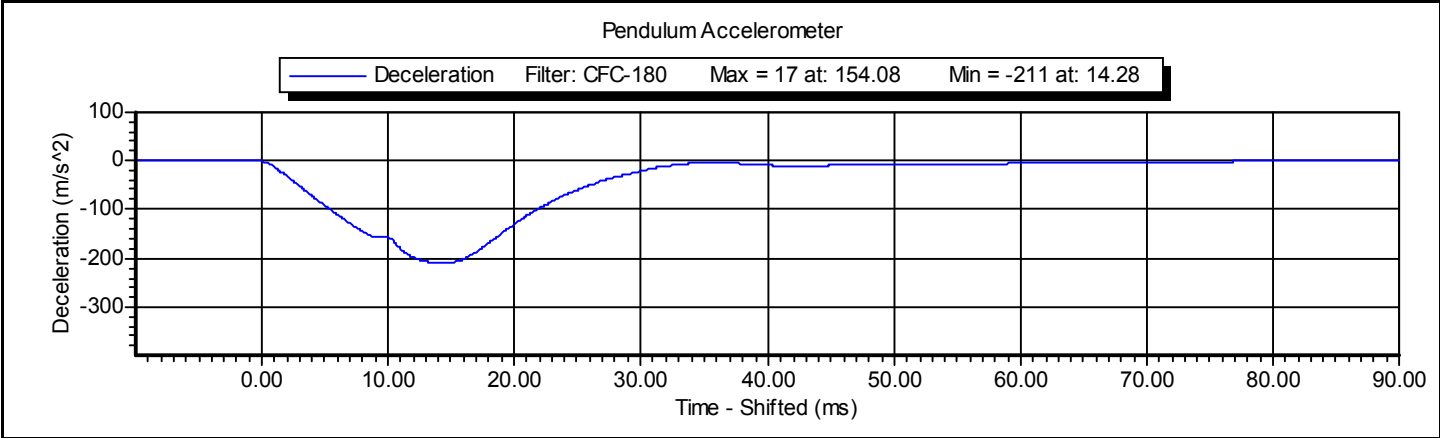
www.calspan.com

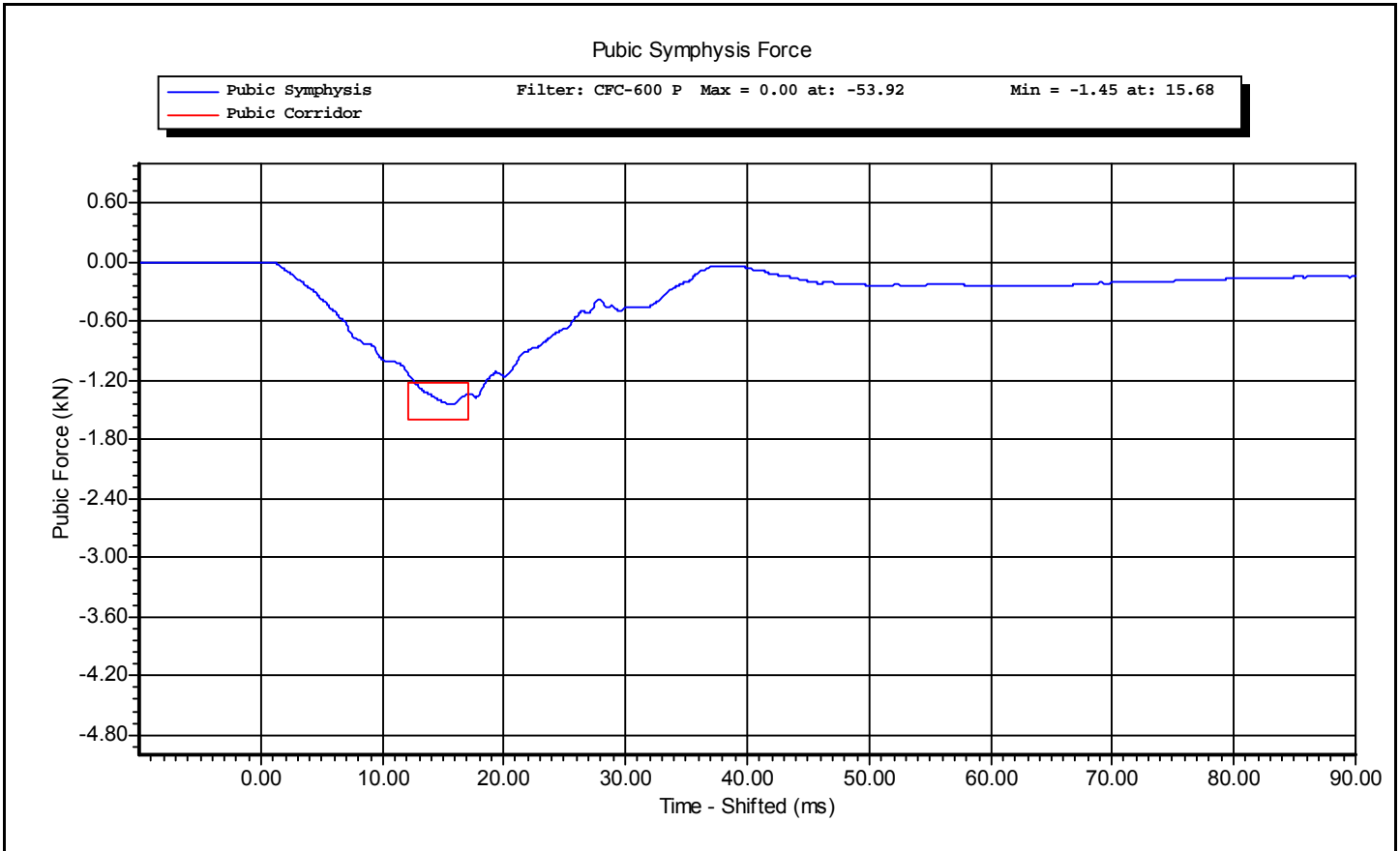
Calspan - Transportation Research Group

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

Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	6/29/2010
Test Number:	1	Test Time:	9:25:36 AM

Component Part Number	Component Serial Number
455-4003	





CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT



www.calspan.com

Calspan - Transportation Research Group

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

SID-IIsD External Measurements

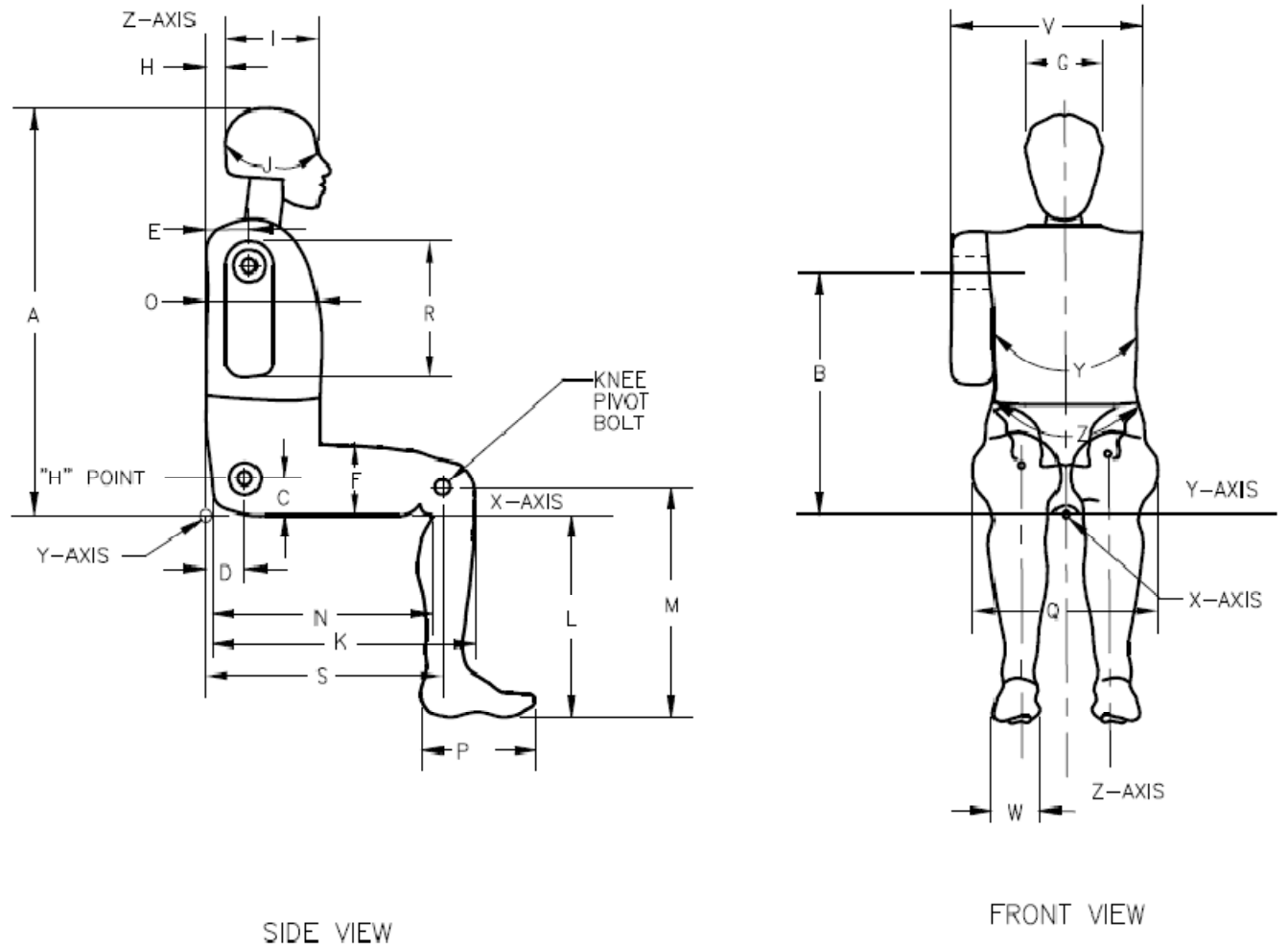
NHTSA ATD S/N 300

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

Technician: A. Rudniski

Date: 7/9/2010

SID-IIsD External Dimension Reference Diagram



Technician: A. Rudniski

Date: 7/9/2010



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	7/9/2010
Test Number:	1	Test Time:	1:46:25 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	62 %RH P
Resultant Acceleration	115.0 -- 137.0	130.1 g P
Oscillation	0.0 -- 15.0	2.0 % P
Fore-Aft Acceleration	-15.0 -- 15.0	5.9 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **1:46:25 PM**

Test Date: **7/9/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Head Drop**

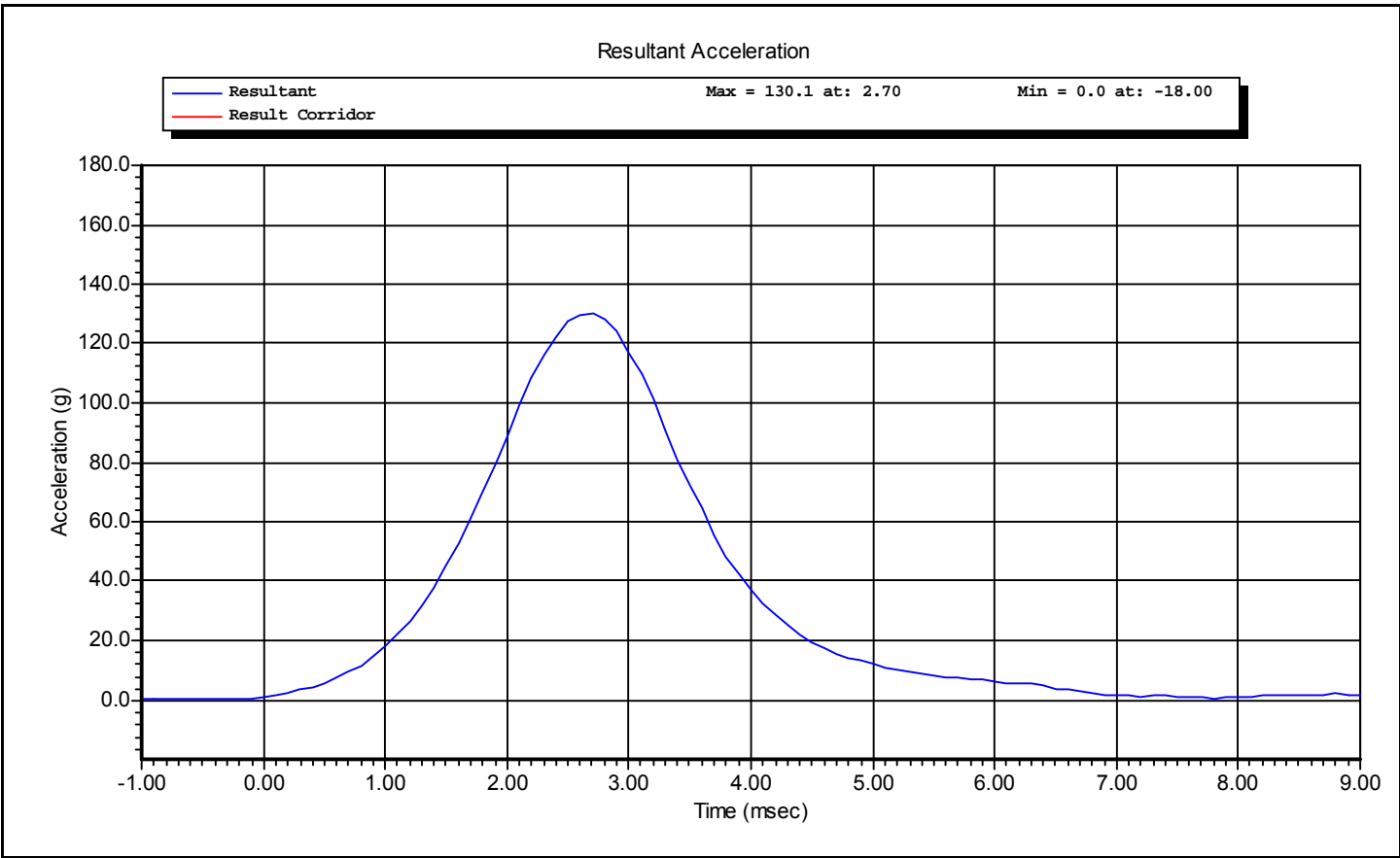
Test Time: **1:46:25 PM**

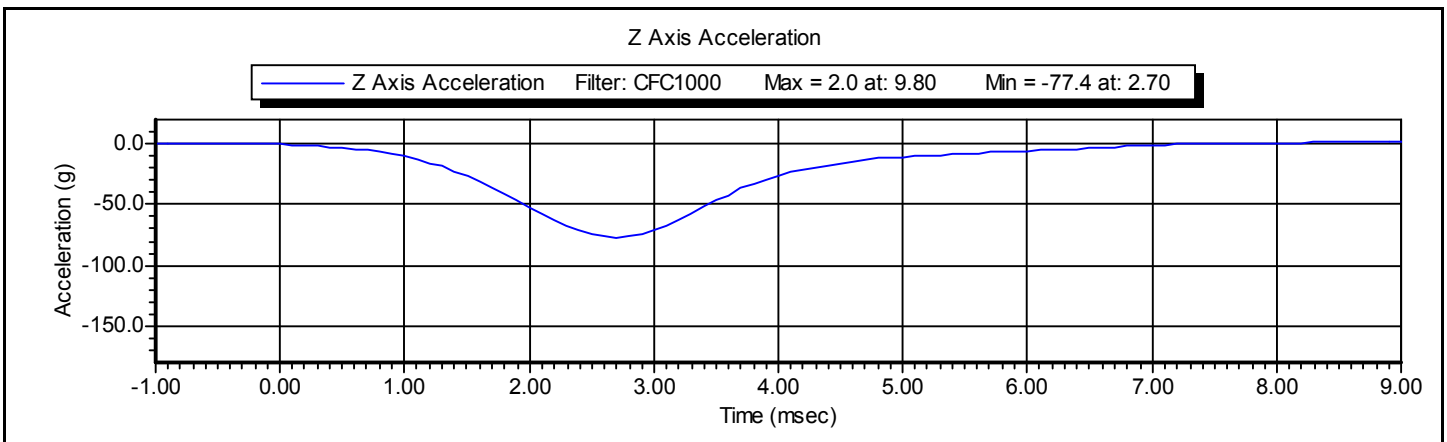
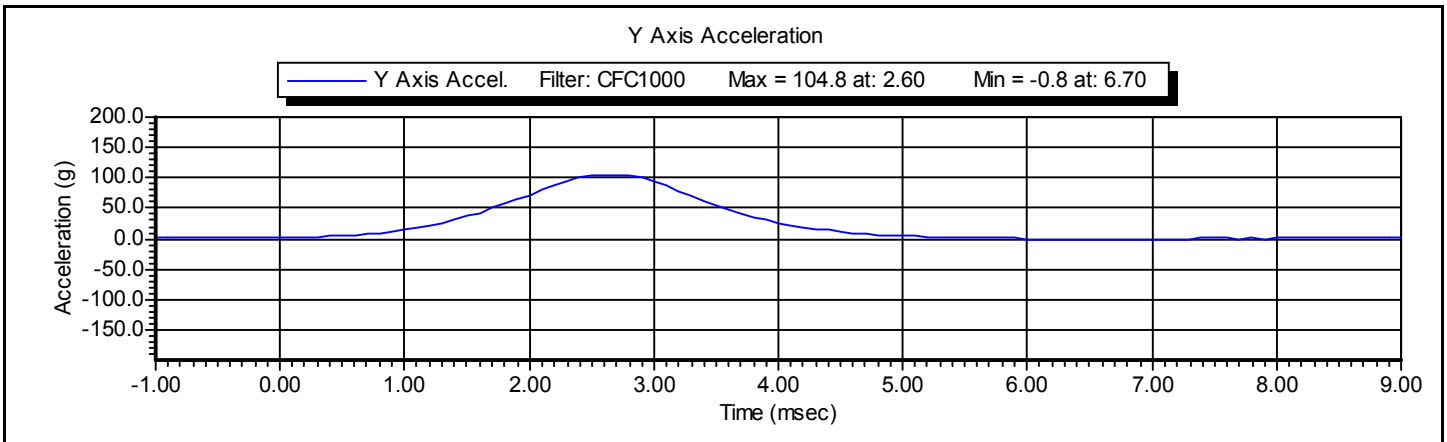
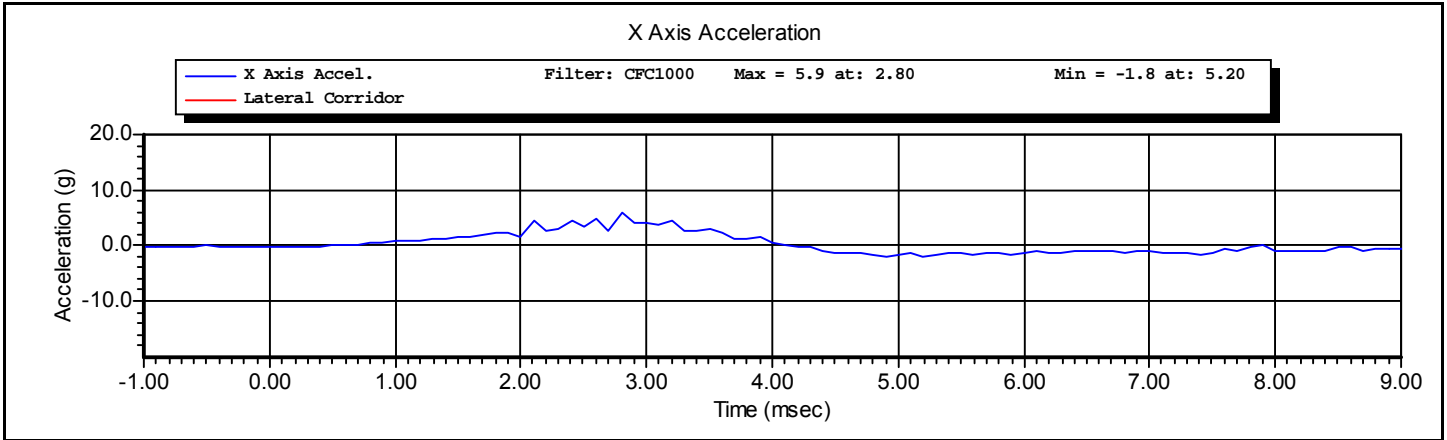
Test Date: **7/9/2010**



Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	7/9/2010
Test Number:	1	Test Time:	1:46:25 PM

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







www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	7/9/2010
Test Number:	1	Test Time:	3:07:35 PM

Component Part Number	Component Serial Number
Neck - 180-2001	787

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	61 %RH P
Velocity	5.51 -- 5.63	5.57 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.57 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.82 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	5.17 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.87 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.89 m/s P
Max D Plane Rotation	71.0 -- 81.0	76.1 degrees P
Time at Max Rotation	50.0 -- 70.0	61.5 ms P
Moment about OC	-44.0 -- -36.0	-43.0 Nm P
Moment Decay to Zero	102.0 -- 126.0	116.4 ms P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **3:07:35 PM**

Test Date: **7/9/2010**



www.calspan.com

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
Denton	1716A	LC-576 Fy	1/12/2010
Denton	1716A	LC-576 Mx	1/12/2010
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: **3:07:35 PM**

Test Date: **7/9/2010**



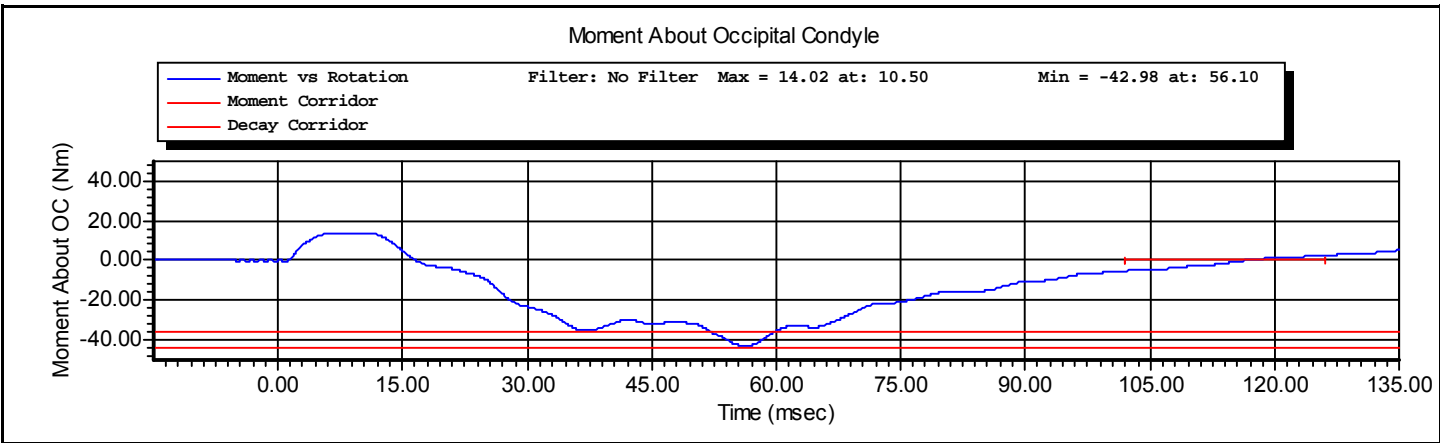
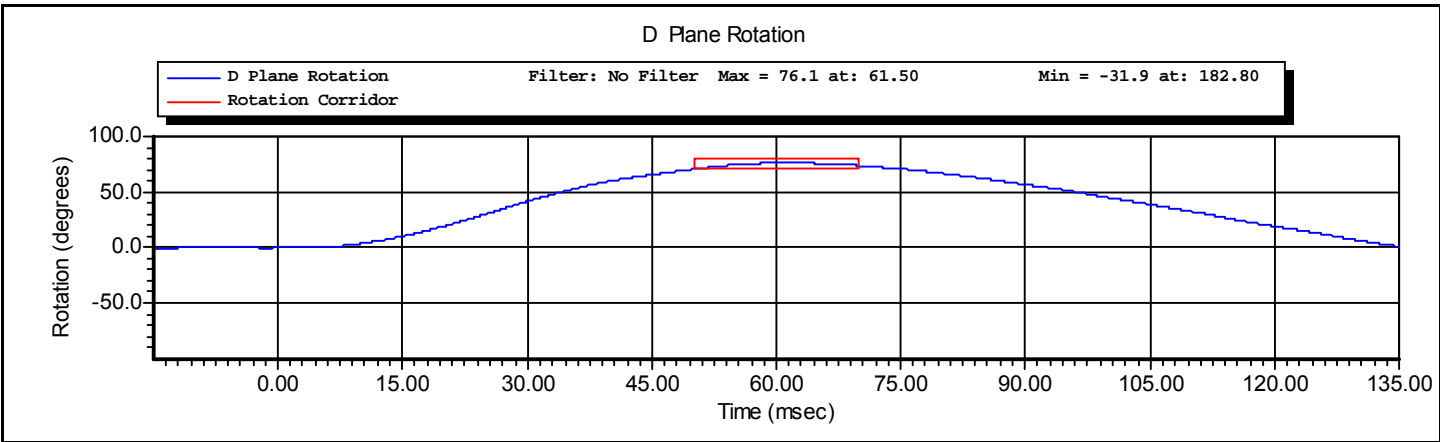
www.calspan.com

Calspan - Transportation Research Group

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-IIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	7/9/2010
Test Number:	1	Test Time:	3:07:35 PM

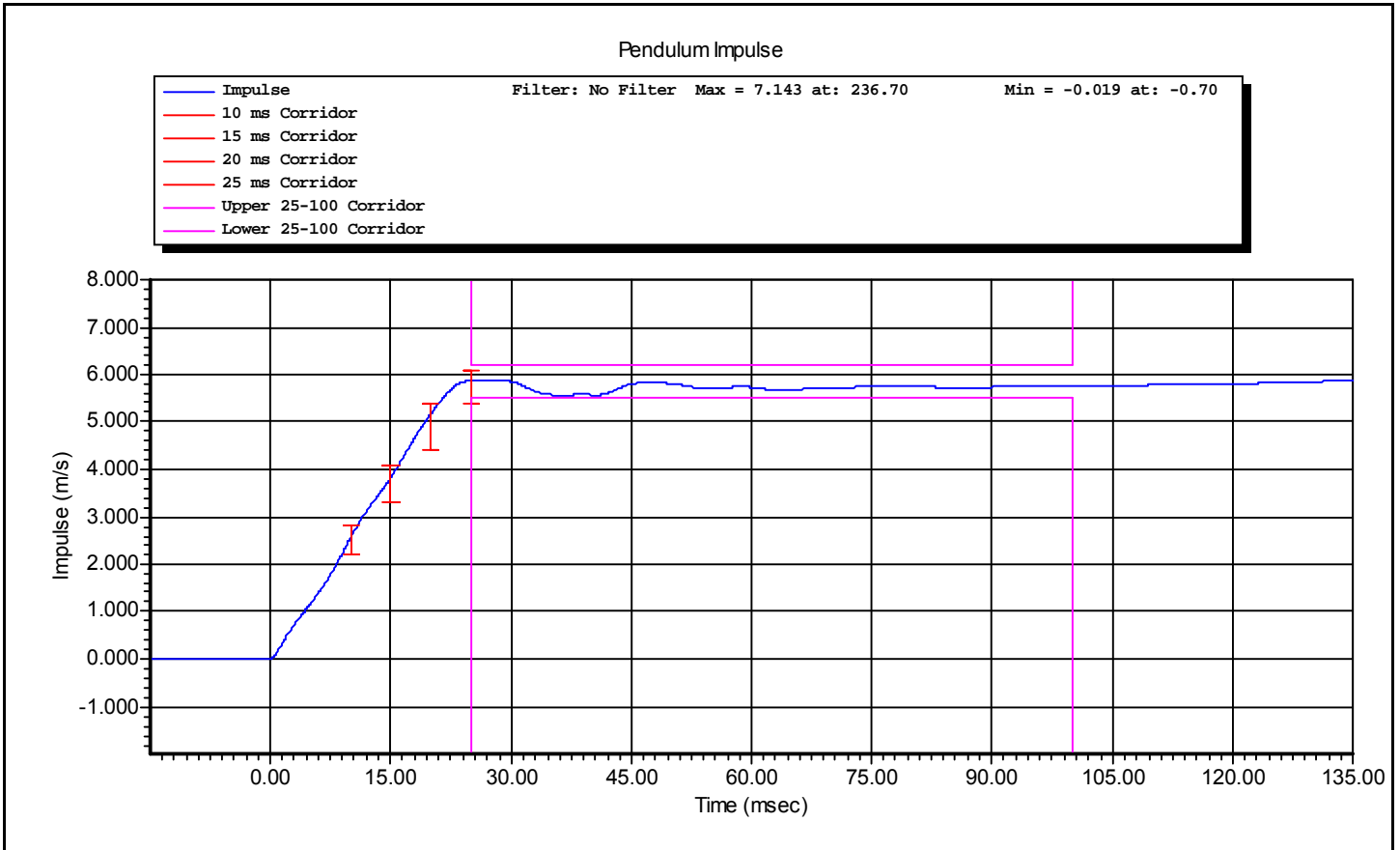
Component Part Number	Component Serial Number
Neck - 180-2001	787



Test ID: **Neck Flexion**

Test Time: **3:07:35 PM**

Test Date: **7/9/2010**





www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	7/10/2010
Test Number:	1	Test Time:	1:57:52 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	51.0 %RH P
Velocity	4.20 -- 4.40	4.38 m/s P
Probe Acceleration	13.0 -- 18.0	15.9 g P
Shoulder Deflection	28.0 -- 37.0	33.40 mm P
T1 Acceleration	17.0 -- 22.0	19.8 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder**

Test Time: **1:57:52 PM**

Test Date: **7/10/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Shoulder**

Test Time: **1:57:52 PM**

Test Date: **7/10/2010**



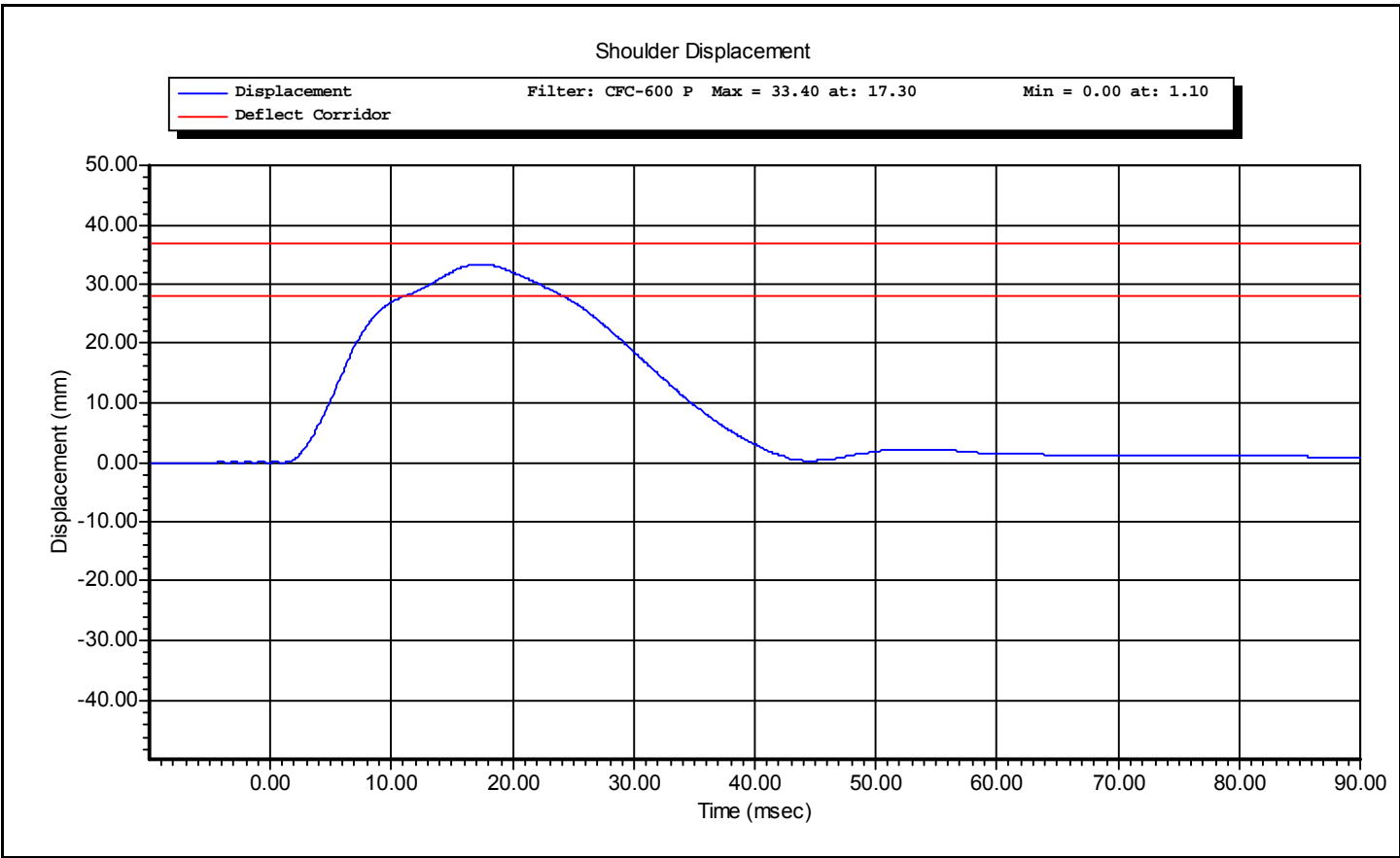
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	7/10/2010
Test Number:	1	Test Time:	1:57:52 PM

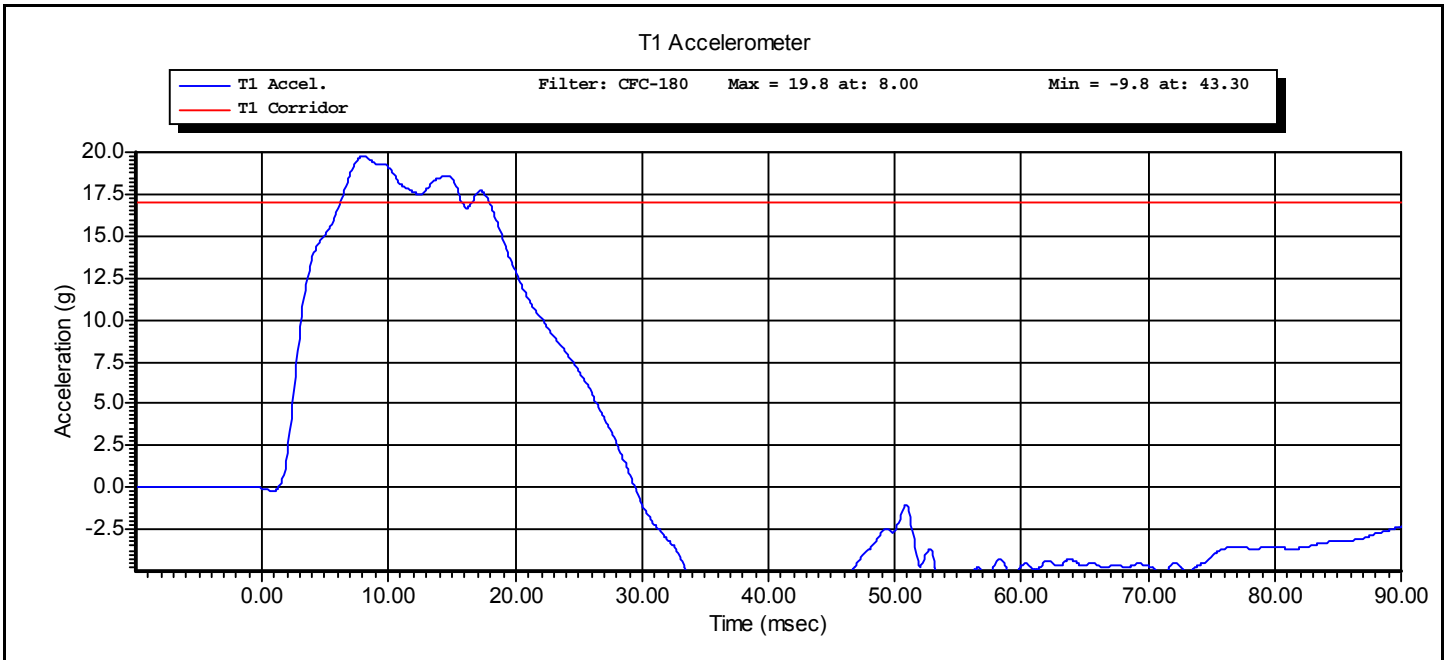
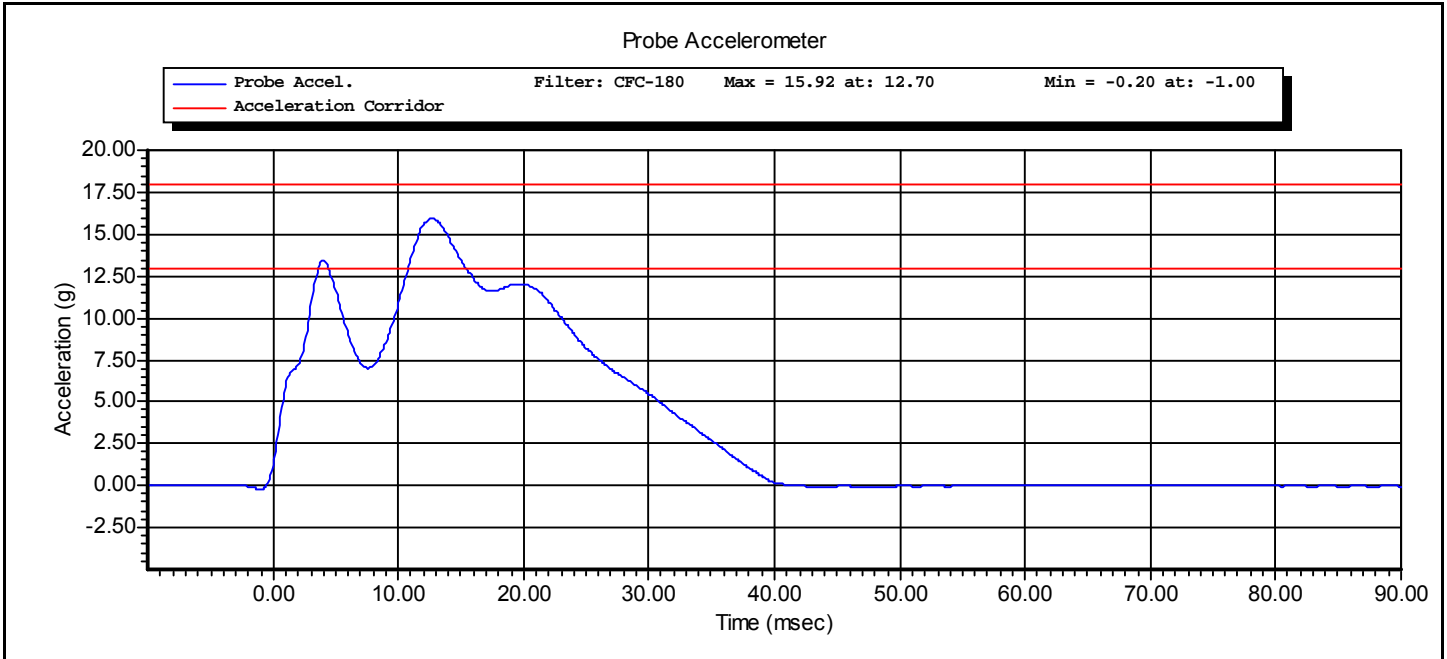
Component Part Number	Component Serial Number
-----------------------	-------------------------



Test ID: **Shoulder**

Test Time: **1:57:52 PM**

Test Date: **7/10/2010**





www.calspan.com

Calspan - Transportation Research Group

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

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:	7/10/2010
Test Number:	1	Test Time:	1:48:08 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	52 %RH P
Velocity	6.60 -- 6.80	6.67 m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	32.2 g P
Upper Thorax Rib Deflection	25.0 -- 32.0	26.8 mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	31.7 mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	33.3 mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	39.3 g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	33.2 g P
Shoulder Deflection	31.0 -- 40.0	37.6 mm P

All test parameters are within specifications

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

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

Test ID: **Thorax With Arm** Test Time: **1:48:08 PM** Test Date: **7/10/2010**



VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Thorax With Arm**

Test Time: **1:48:08 PM**

Test Date: **7/10/2010**



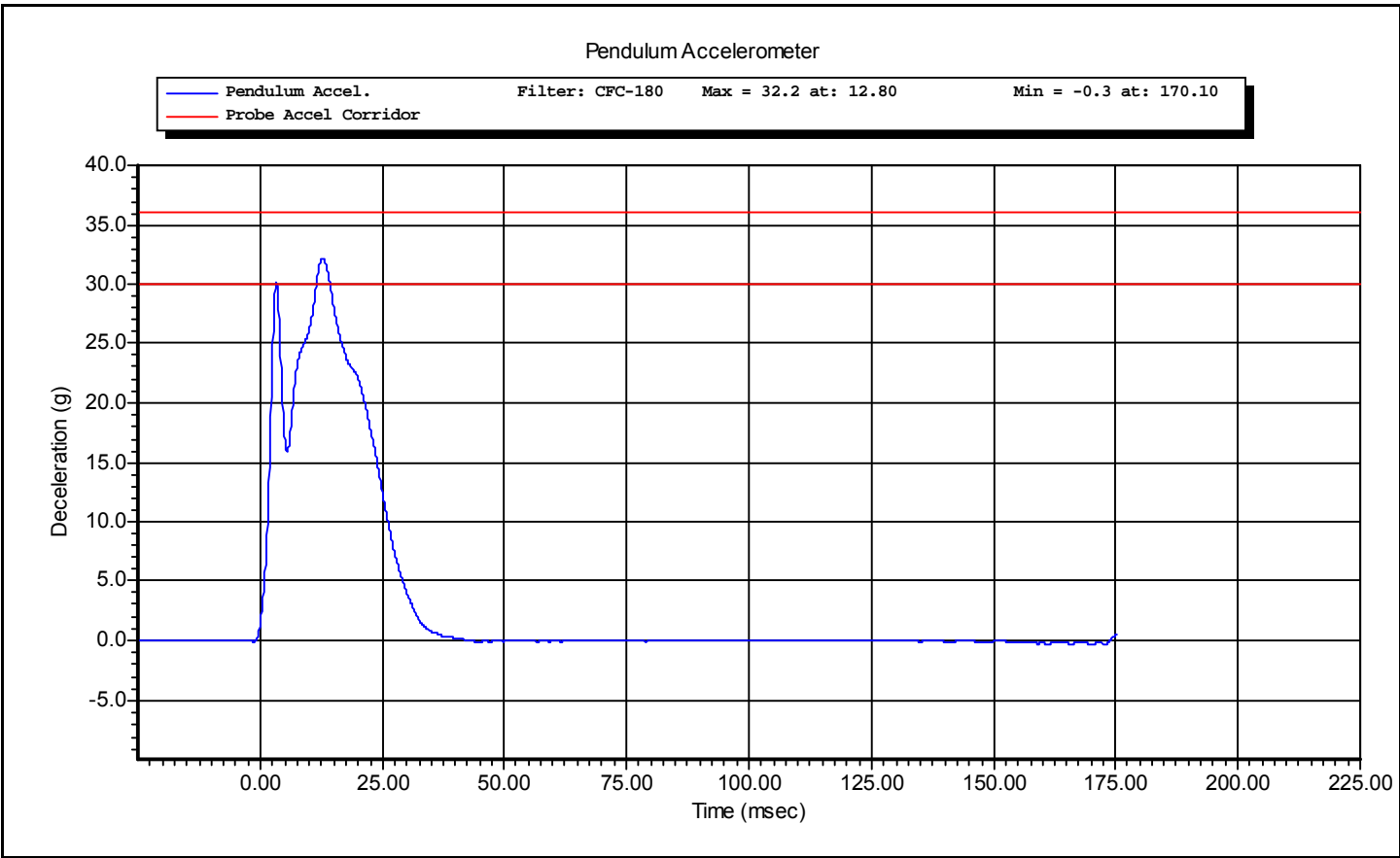
www.calspan.com

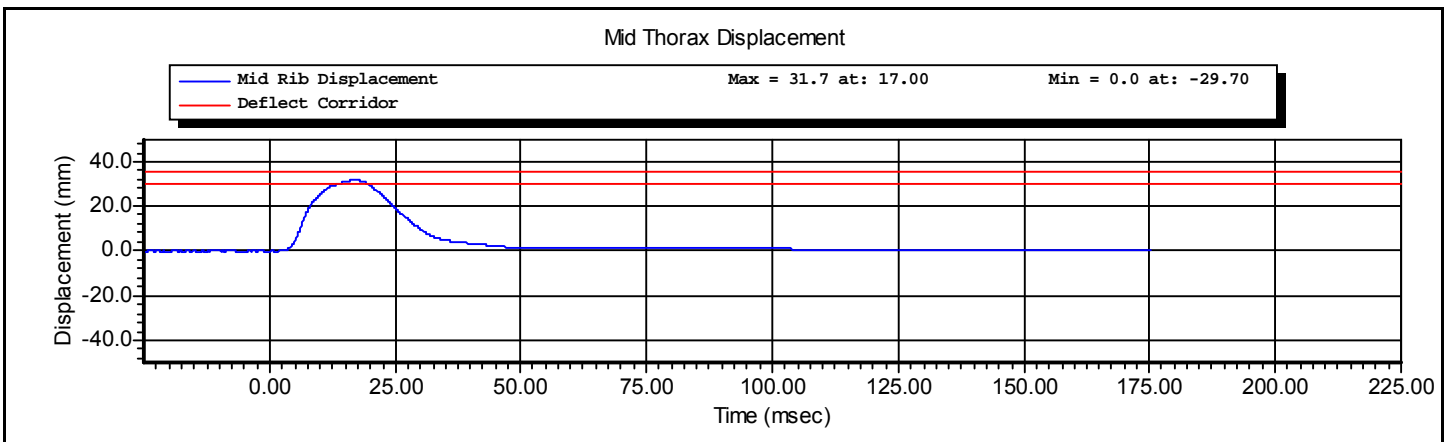
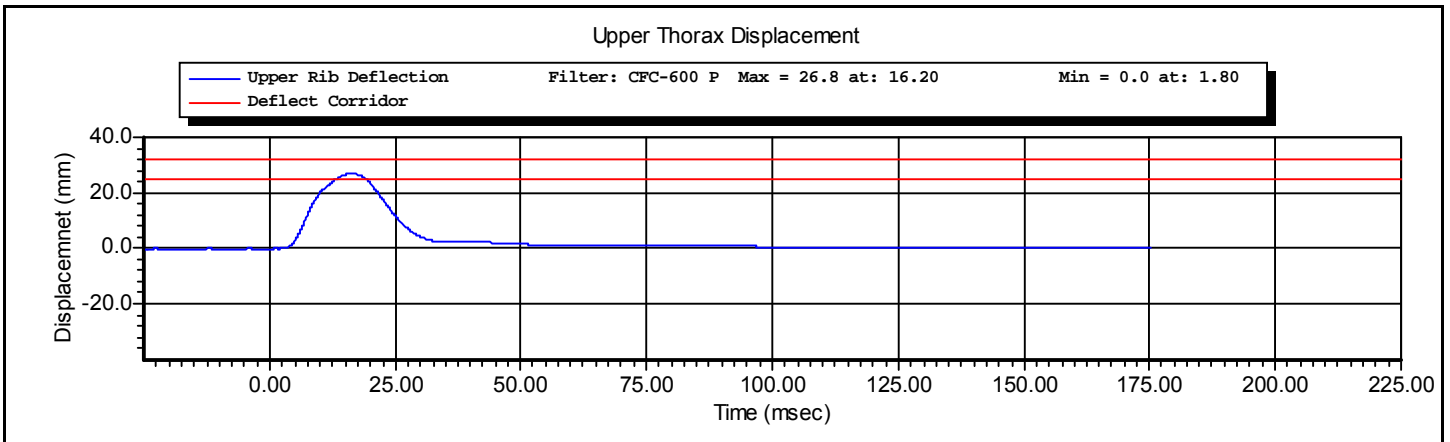
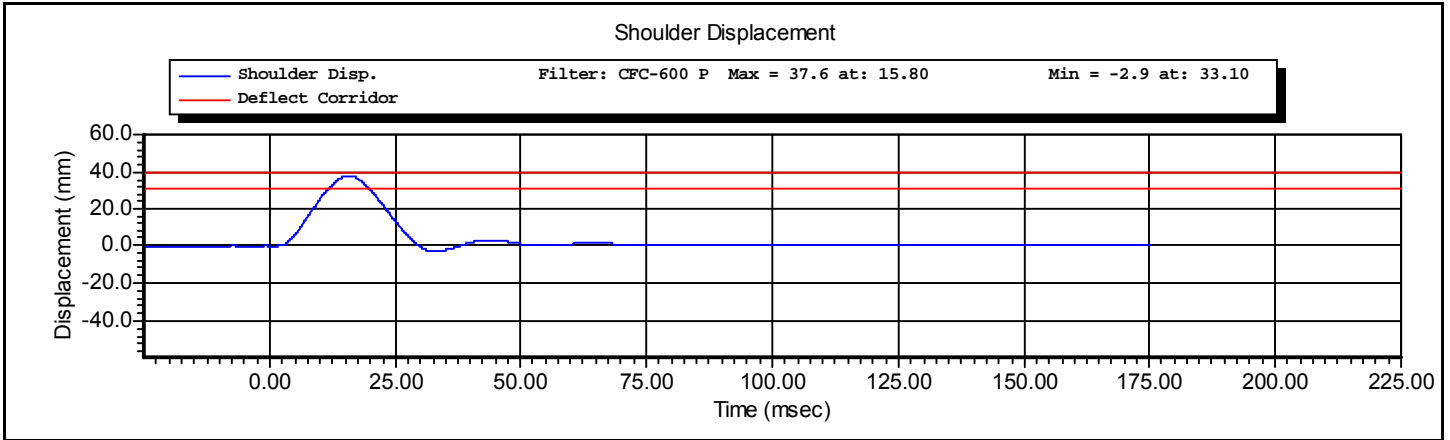
Calspan - Transportation Research Group

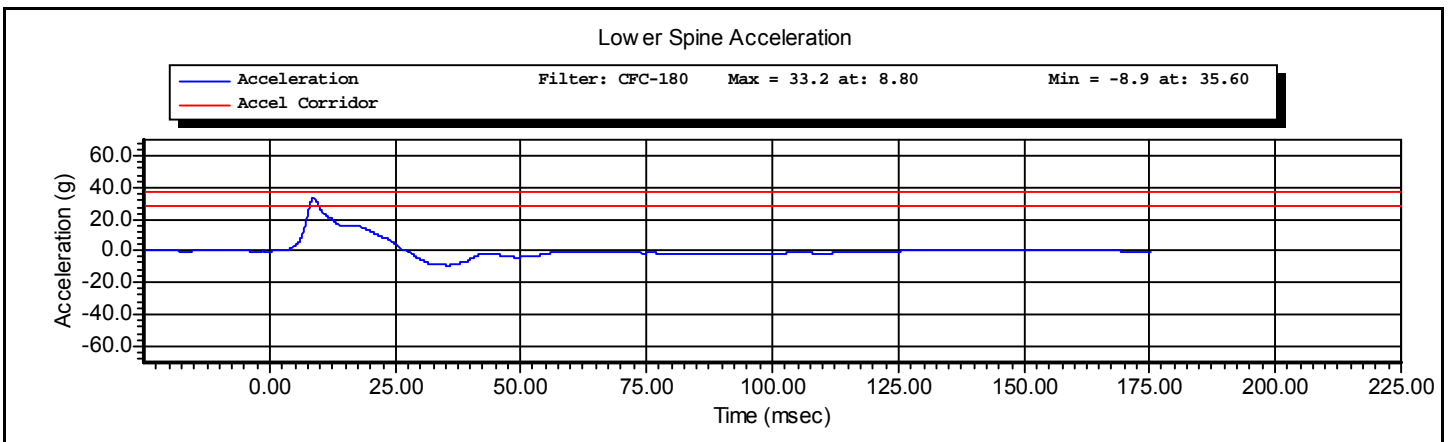
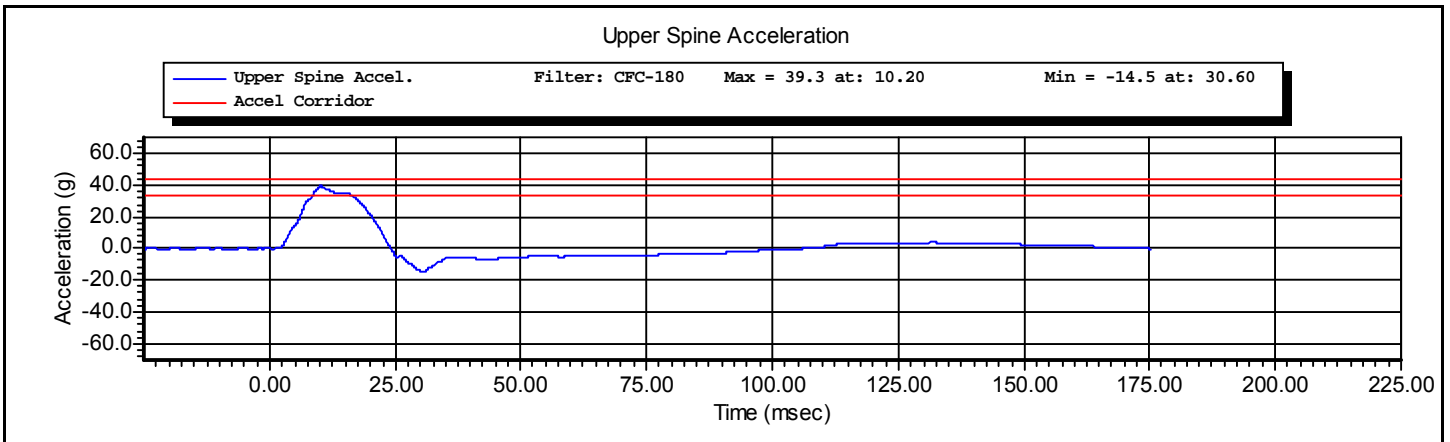
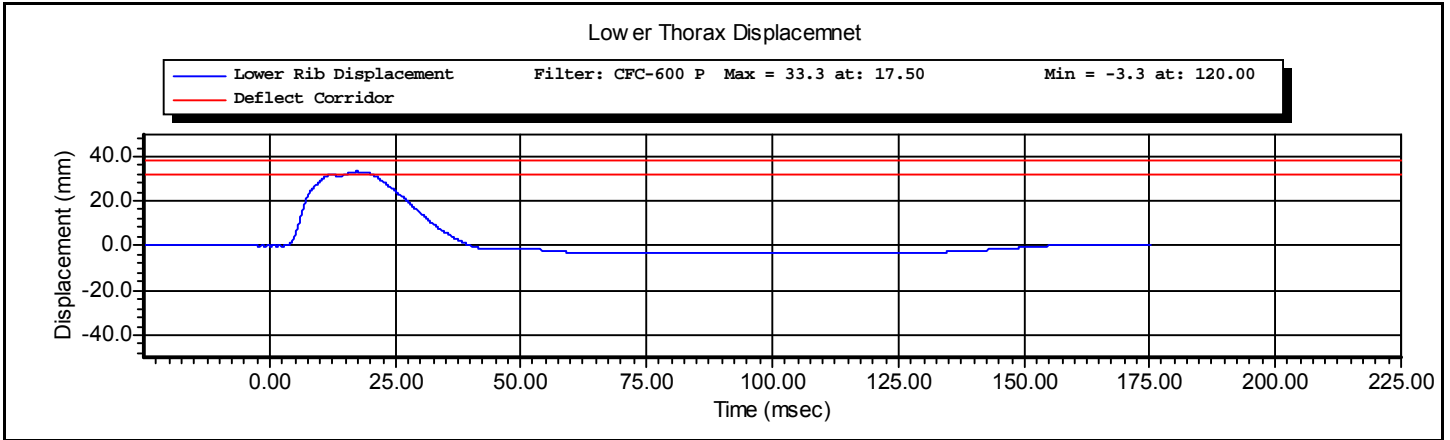
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	7/10/2010
Test Number:	1	Test Time:	1:48:08 PM

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









www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	7/10/2010
Test Number:	3	Test Time:	1:14:01 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	52 %RH P
Velocity	4.20 -- 4.40	4.36 m/s P
Probe Acceleration	14.0 -- 18.0	15.7 g P
Upper Thorax Rib Deflection	32.0 -- 40.0	35.4 mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	41.7 mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	38.5 mm P
Upper Spine Acceleration T1	13.0 -- 17.0	16.4 g P
Lower Spine Acceleration T12	7.0 -- 11.0	9.5 g P

All test parameters are within specifications

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

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

Test ID: **Thorax Without Arm** Test Time: **1:14:01 PM**

Test Date: **7/10/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Thorax Without Arm** Test Time: **1:14:01 PM**

Test Date: **7/10/2010**



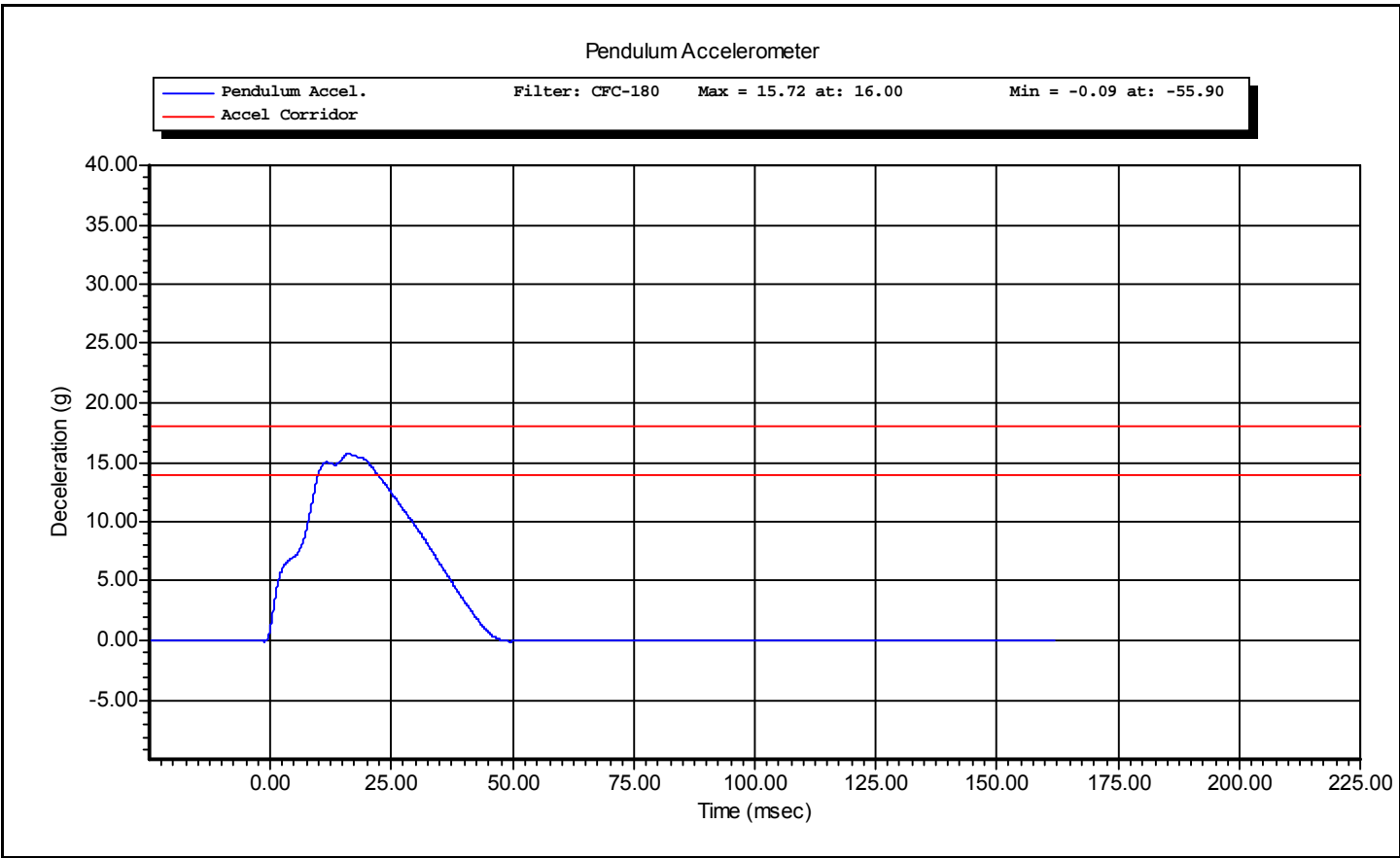
www.calspan.com

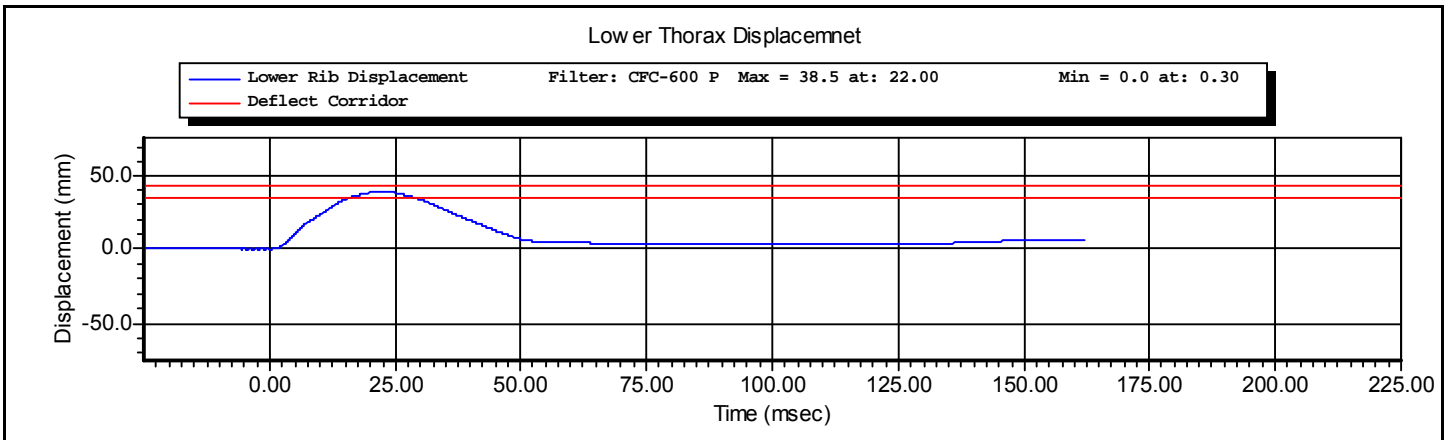
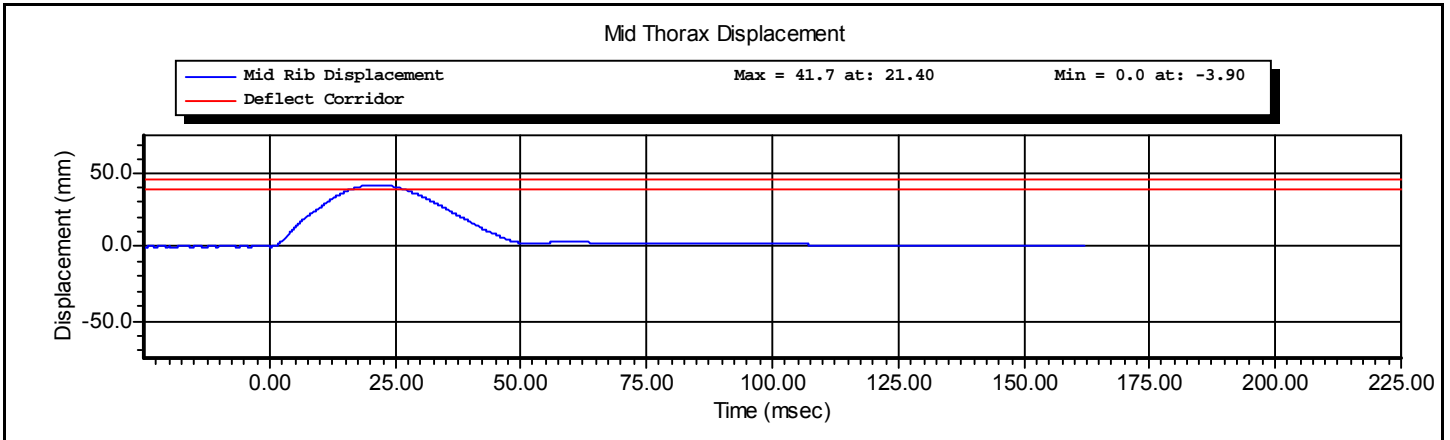
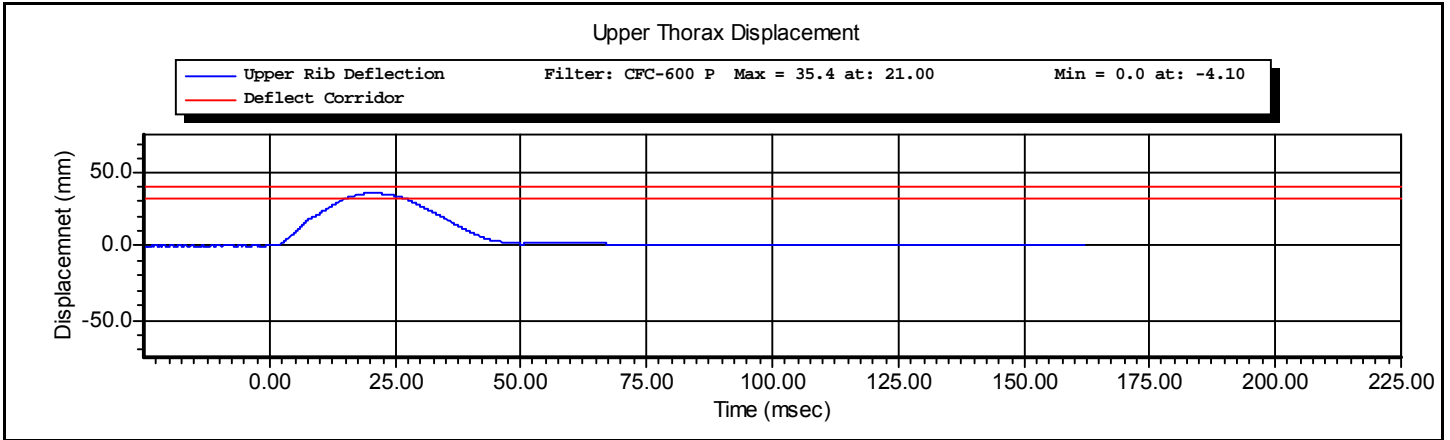
Calspan - Transportation Research Group

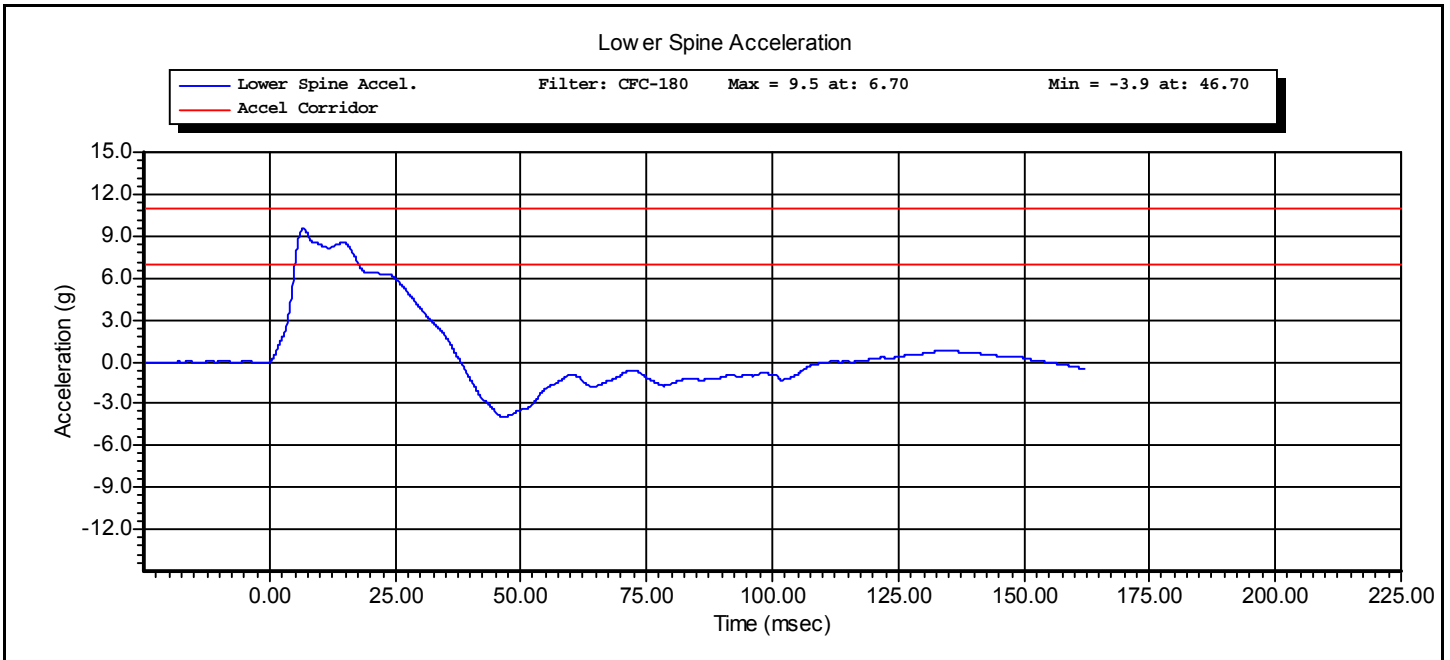
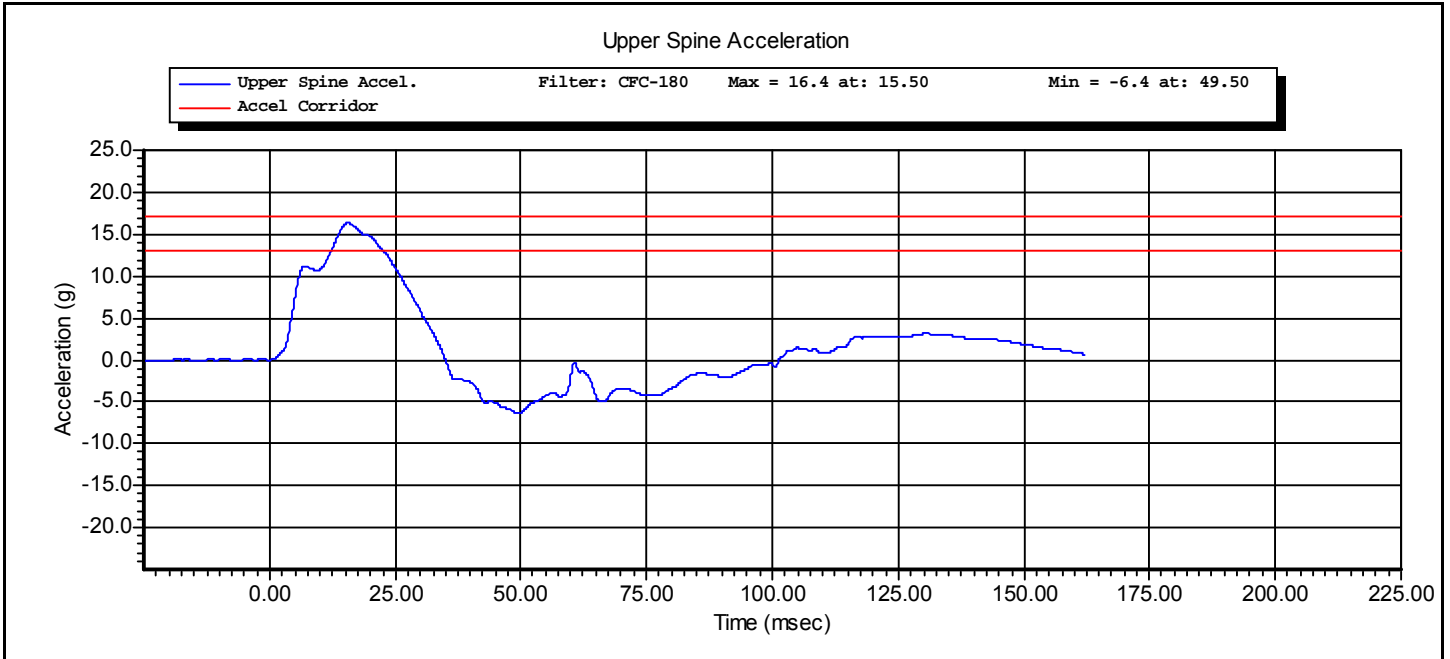
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	7/10/2010
Test Number:	3	Test Time:	1:14:01 PM

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









www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	7/10/2010
Test Number:	1	Test Time:	11:41:56 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	55 %RH P
Velocity	4.20 -- 4.40	4.39 m/s P
Probe Acceleration	12.0 -- 16.0	14.0 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	39.8 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	37.6 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	12.9 g P

All test parameters are within specifications

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

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

Test ID: **Abdomen**

Test Time: **11:41:56 AM**

Test Date: **7/10/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-1162	4/7/2010
Servo	180-3885	DS-1232	4/7/2010
Endevco	7264-2000	02I02I05-F22	4/7/2010

Test ID: **Abdomen**

Test Time: **11:41:56 AM**

Test Date: **7/10/2010**



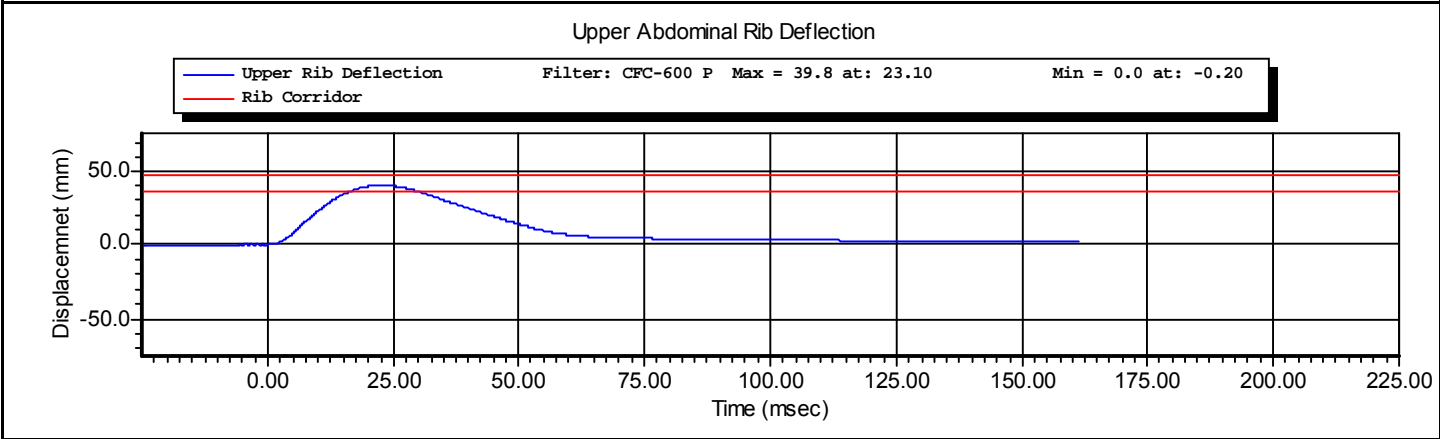
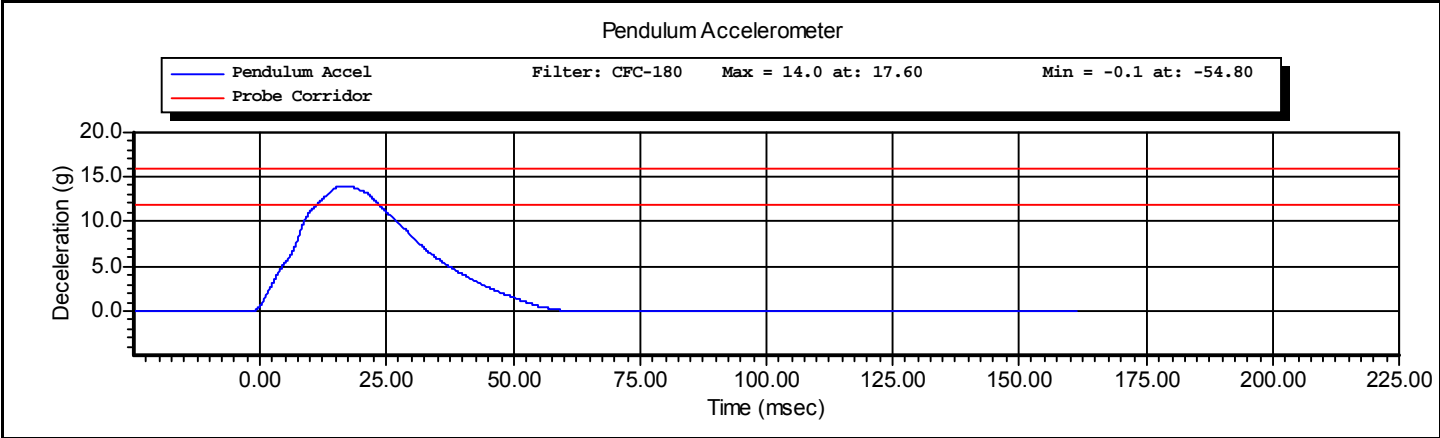
www.calspan.com

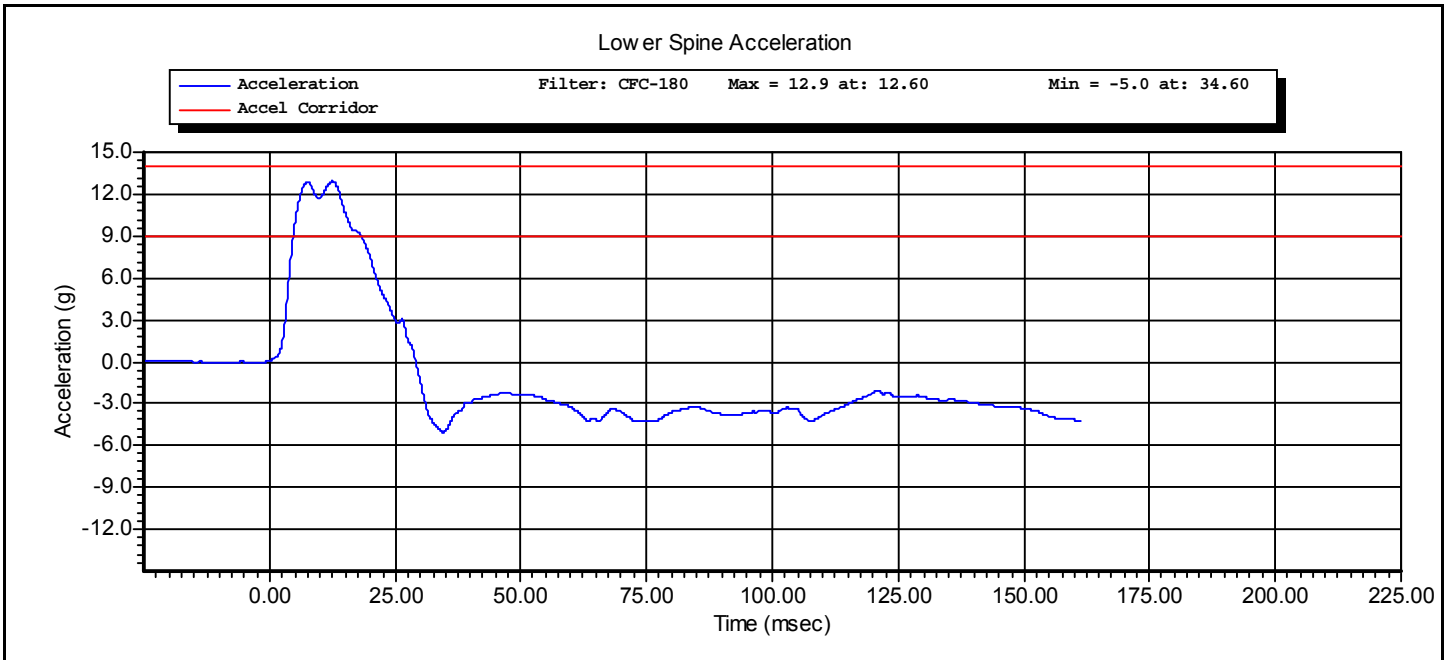
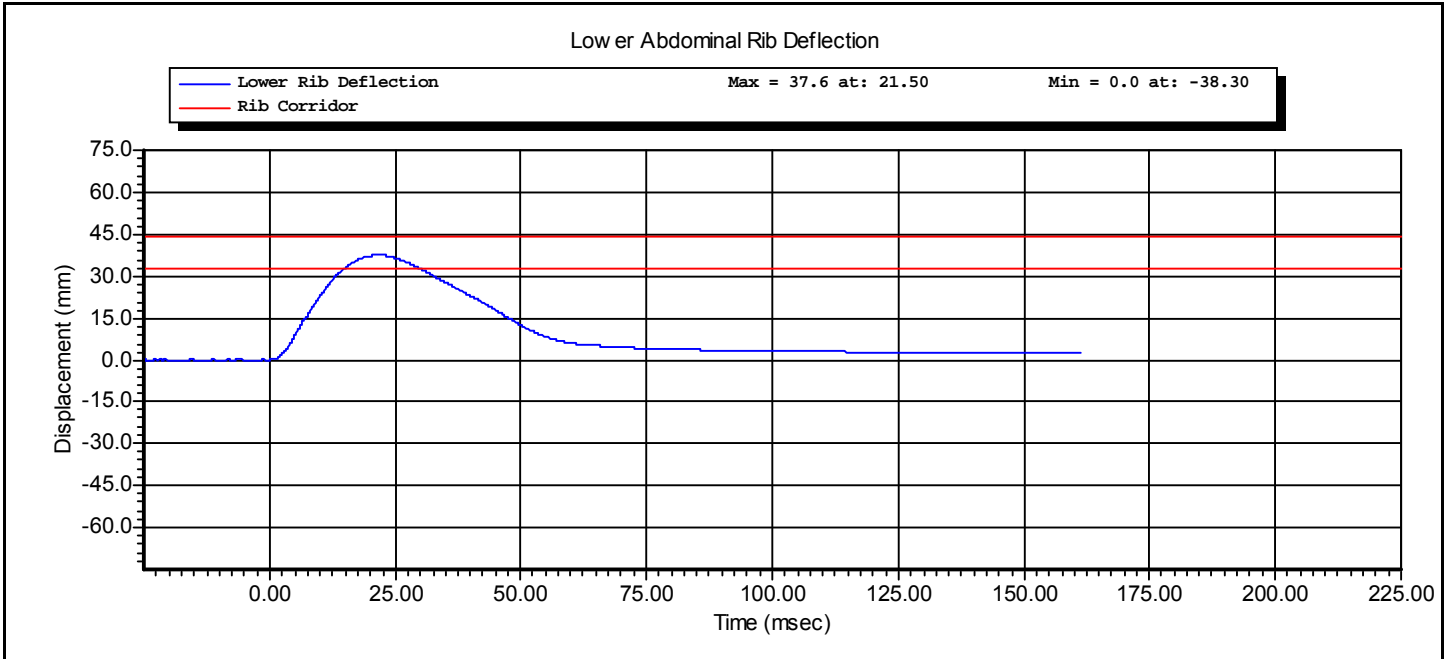
Calspan - Transportation Research Group

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

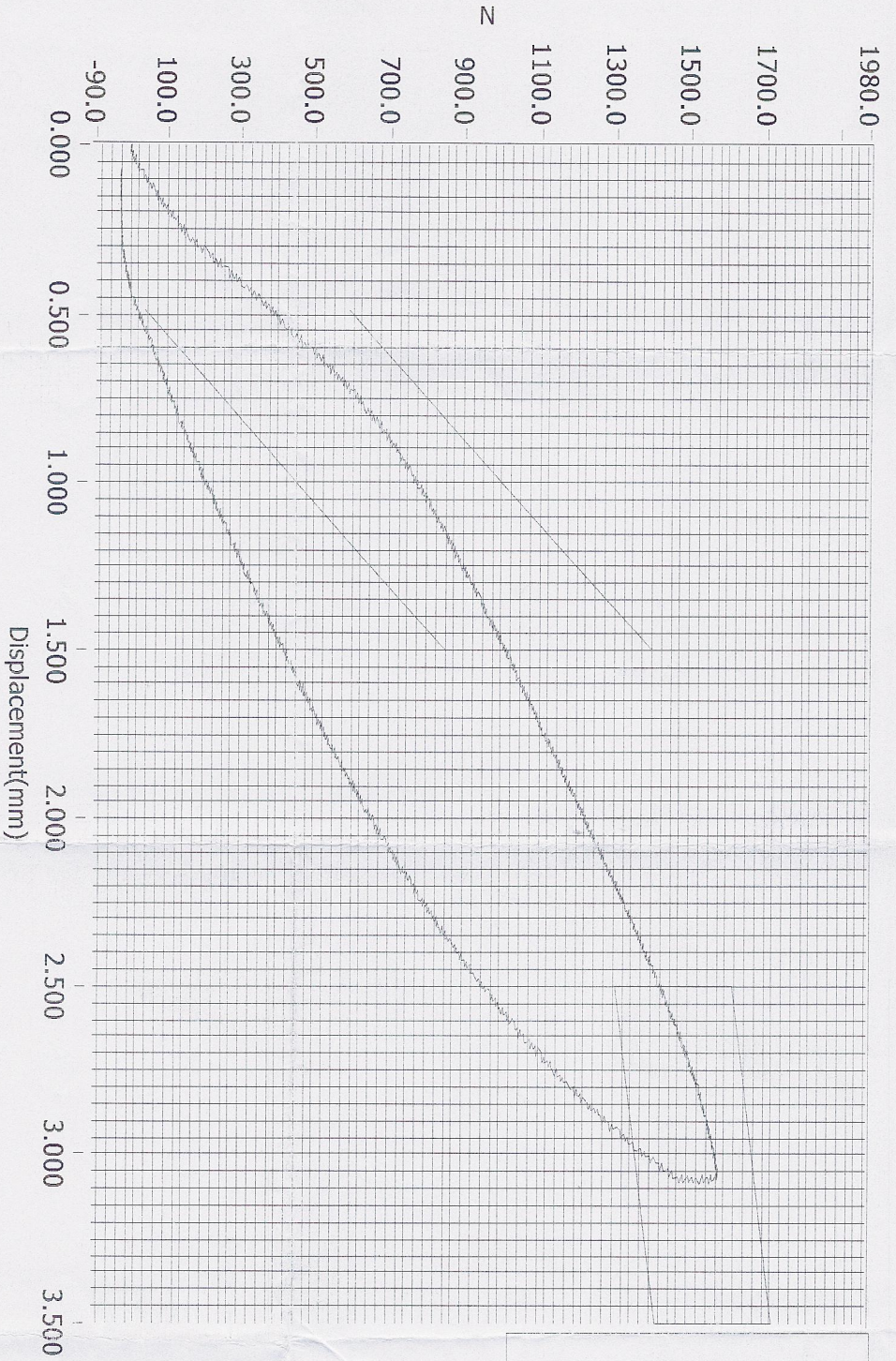
Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	7/10/2010
Test Number:	1	Test Time:	11:41:56 AM

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





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 >

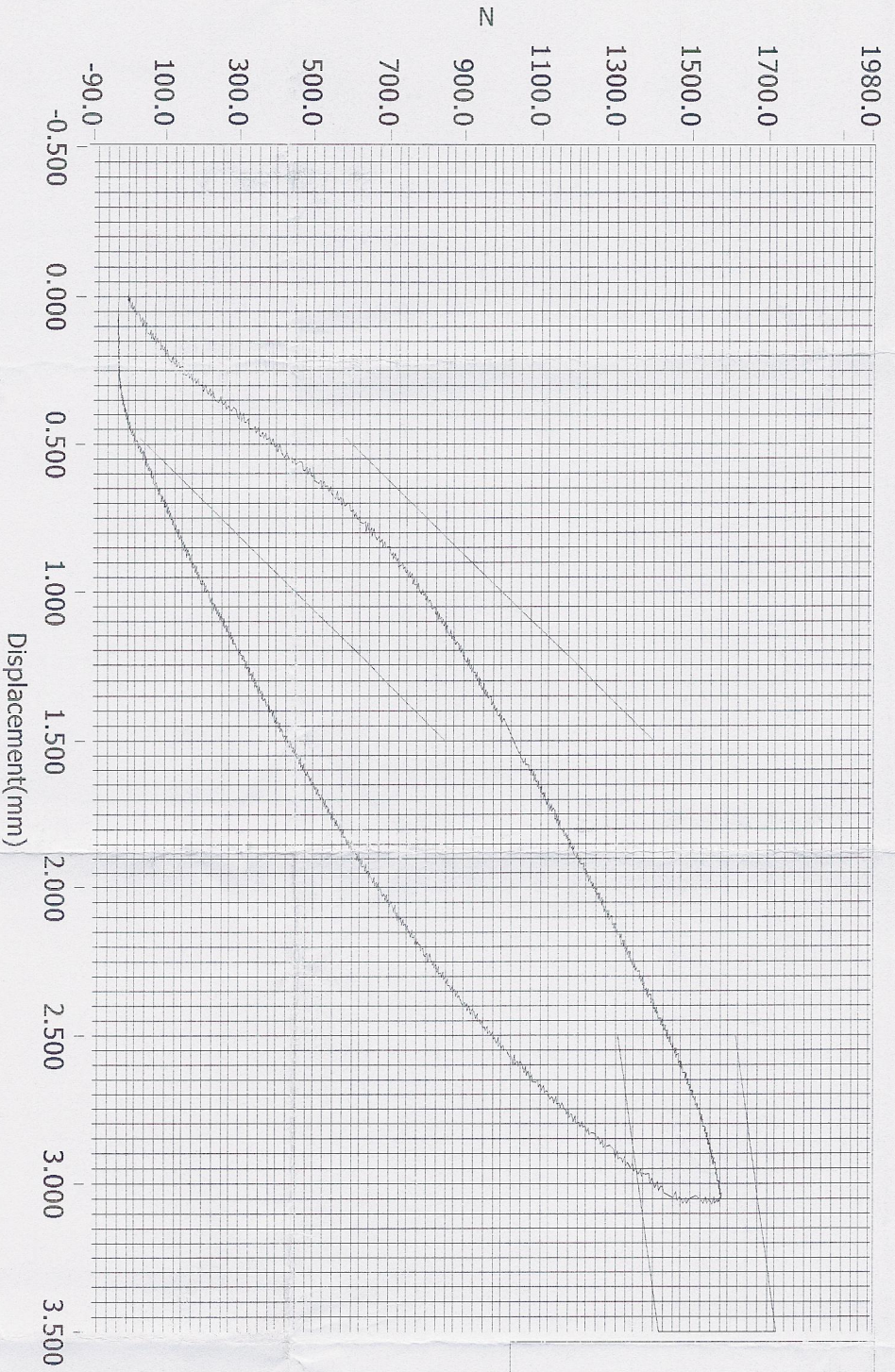
ATD Calibration Lab
Full Scale Test

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
		7/16/2007	12:09 PM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	12694	SIDIIs	

Current Date : 7/16/2007

Current Time : 12:10:05

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

Certification Test

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

12704

SIDIIs

7/16/2007

12:25 PM

Current Date : 7/16/2007

Current Time : 12:25:57



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	7/10/2010
Test Number:	3	Test Time:	3:02:26 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	50 %RH P
Velocity	6.60 -- 6.80	6.69 m/s P
Peak Probe Acceleration	38.0 -- 47.0	42.7 g P
Peak Pelvis Acceleration	34.0 -- 42.0	39.9 g P
Peak Acetabulum Force	3.60 -- 4.30	4.01 kN P

All test parameters are within specifications

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

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

Test ID: **Pelvis Acetabulum** Test Time: **3:02:26 PM**

Test Date: **7/10/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Pelvis Acetabulum** Test Time: **3:02:26 PM**

Test Date: **7/10/2010**



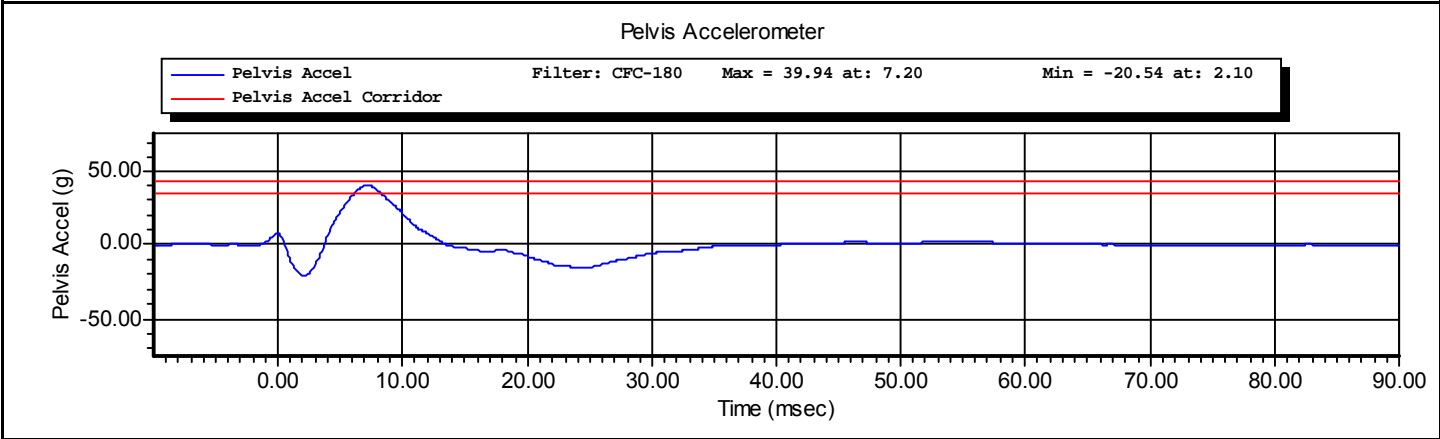
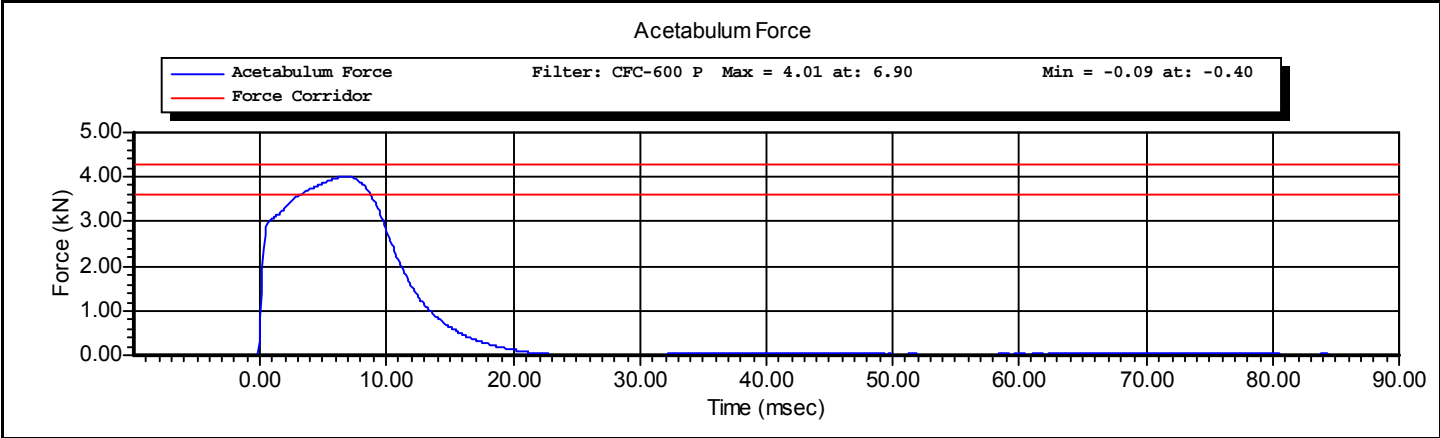
www.calspan.com

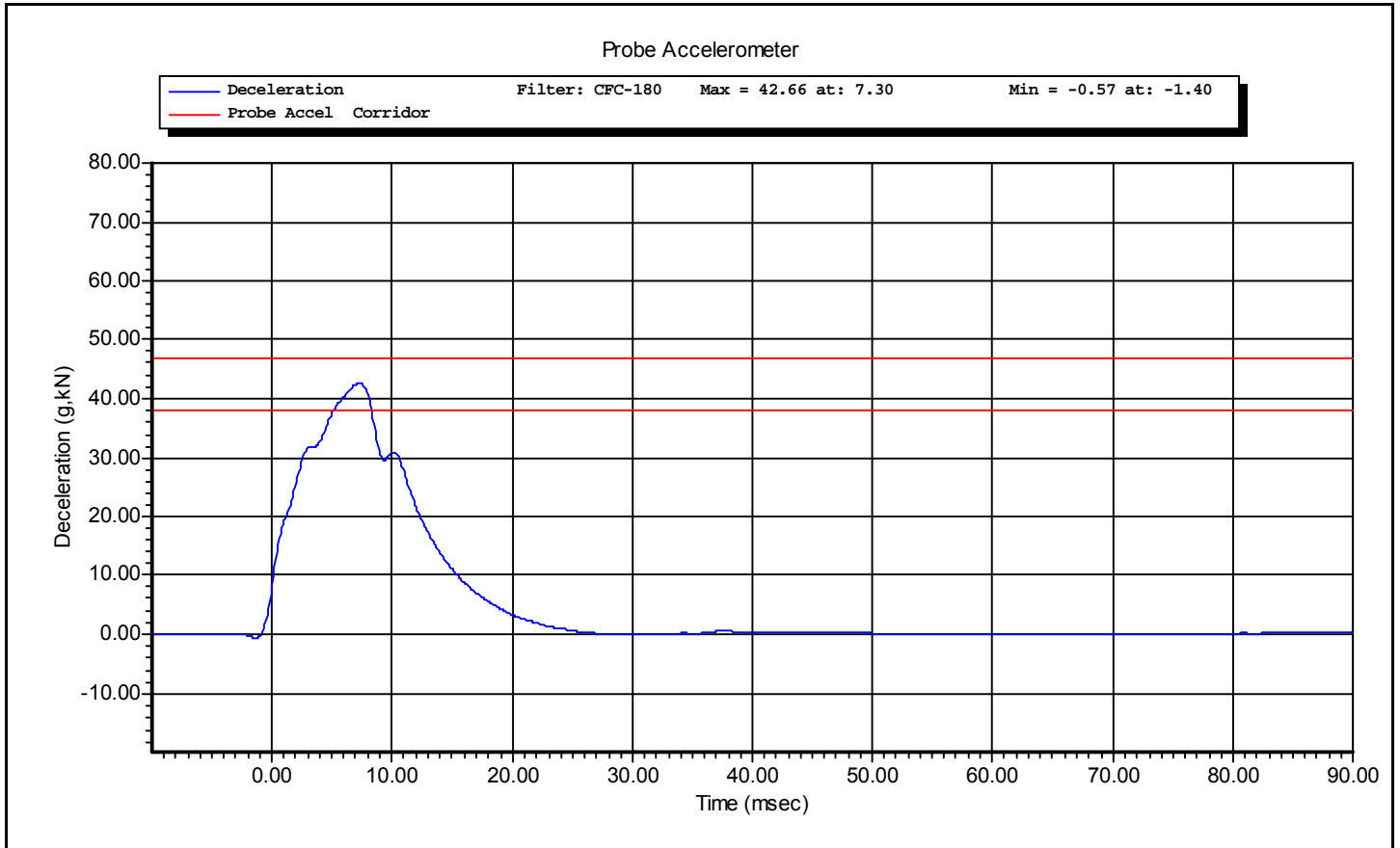
Calspan - Transportation Research Group

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

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	7/10/2010
Test Number:	3	Test Time:	3:02:26 PM

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







www.calspan.com

Calspan - Transportation Research Group

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

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:	7/10/2010
Test Number:	1	Test Time:	9:14:22 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	62 %RH P
Velocity	4.20 -- 4.40	4.29 m/s P
Peak Probe Acceleration	36.0 -- 45.0	39.1 g P
Peak Pelvis Acceleration	28.0 -- 39.0	33.6 g P
Peak Iliac Force	4.10 -- 5.10	4.43 kN P

All test parameters are within specifications

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

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

Test ID: **Pelvis Iliac**

Test Time: **9:14:22 AM**

Test Date: **7/10/2010**



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Pelvis Iliac**

Test Time: **9:14:22 AM**

Test Date: **7/10/2010**



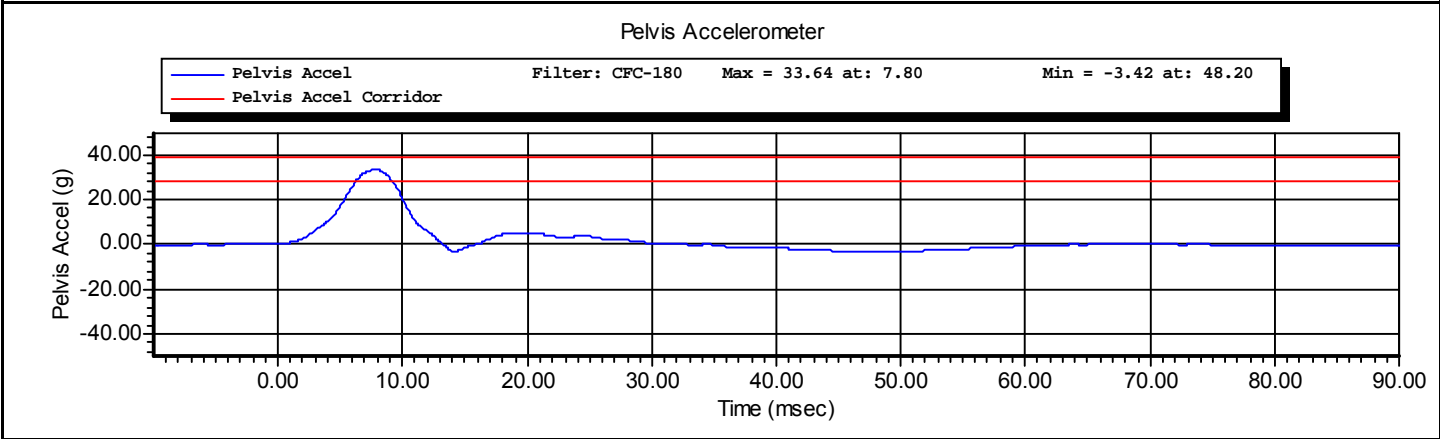
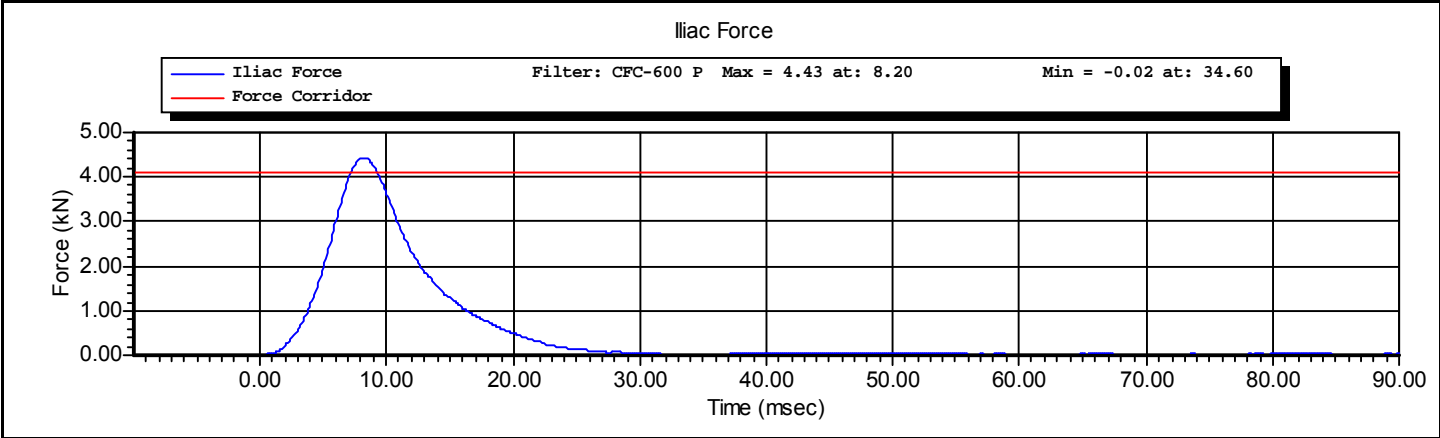
www.calspan.com

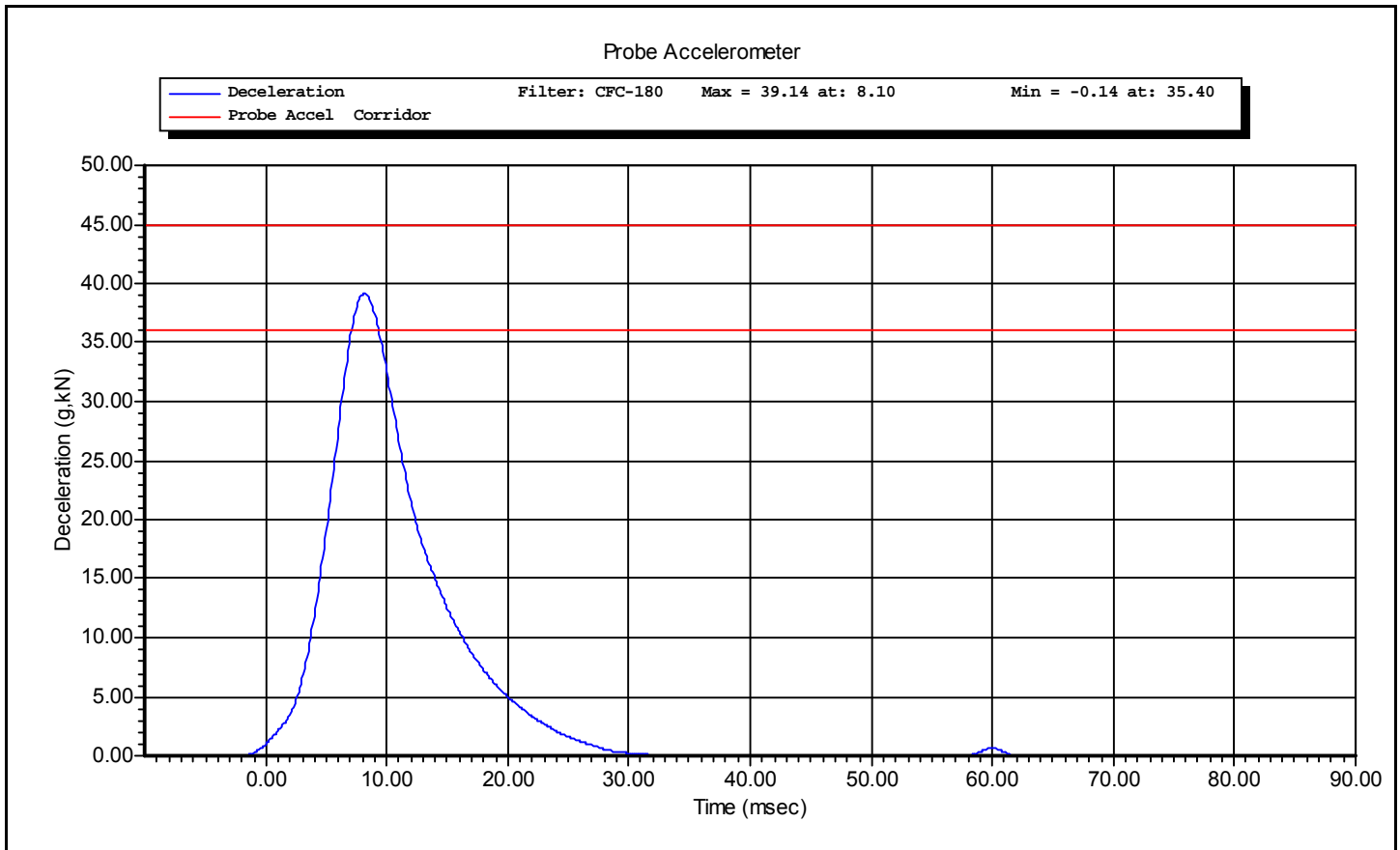
Calspan - Transportation Research Group

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

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Iliac	Test Date:	7/10/2010
Test Number:	1	Test Time:	9:14:22 AM

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





CALIBRATION TEST RESULTS

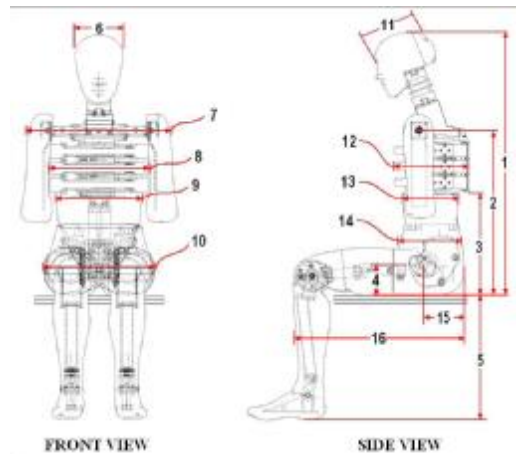
POST-TEST

ES2-re No: F033

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

NHTSA SN F033



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	906	Pass
2	Seat to Shoulder Joint	558-572	570	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	101	Pass
5	Sole to Seat, Sitting	333-451	436	Pass
6	Head Width	152-158	153	Pass
7	Shoulder/Arm Width	461-479	466	Pass
8	Thorax Width	322-332	324	Pass
9	Abdomen Width	273-287	284	Pass
10	Pelvis Lap Width	359-373	368	Pass
11	Head Depth	196-206	202	Pass
12	Thorax Depth	262-272	267	Pass
13	Abdomen Depth	194-204	201	Pass
14	Pelvis Depth	235-245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	158	Pass
16	Back of Buttocks to Front Knee	597-615	603	Pass

Technician: A. Rudniski

Date: 07/29/2010



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	7/29/2010
Test Number:	1	Test Time:	2:38:40 PM

Component Part Number	Component Serial Number
455-2002	07085

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

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Neck Flexion**

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

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



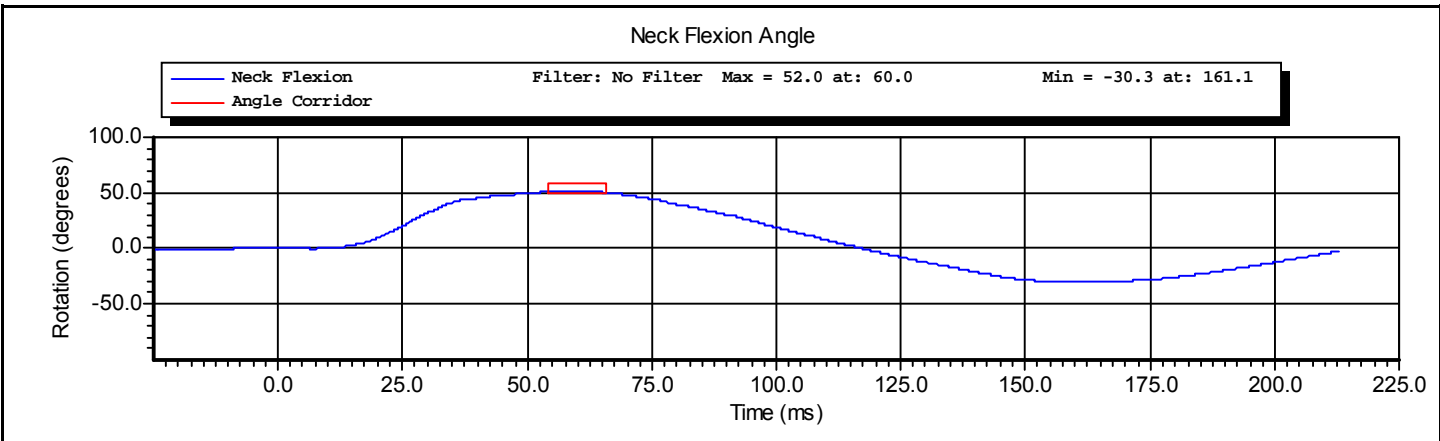
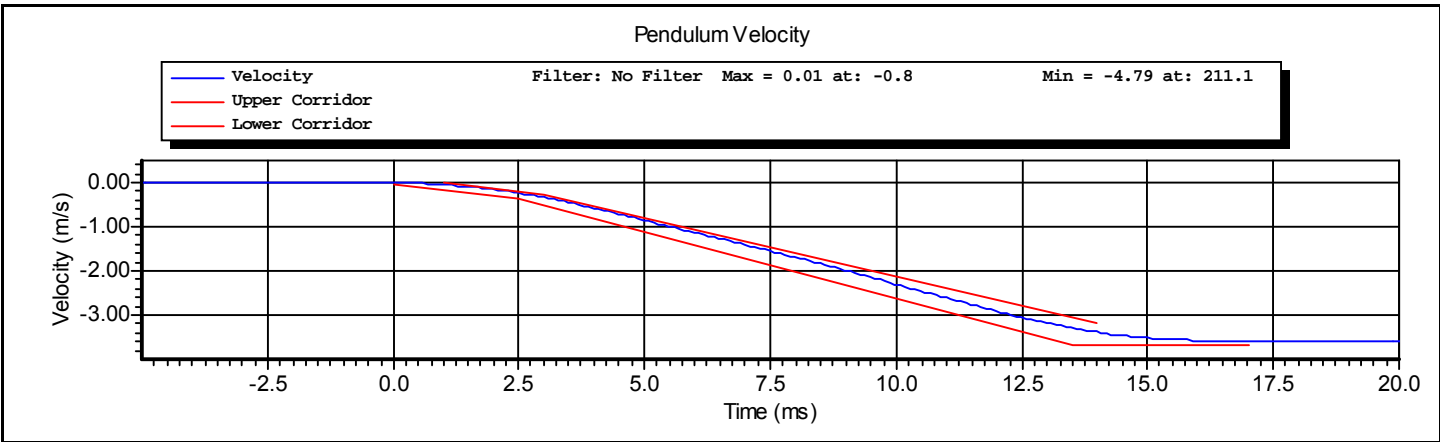
www.calspan.com

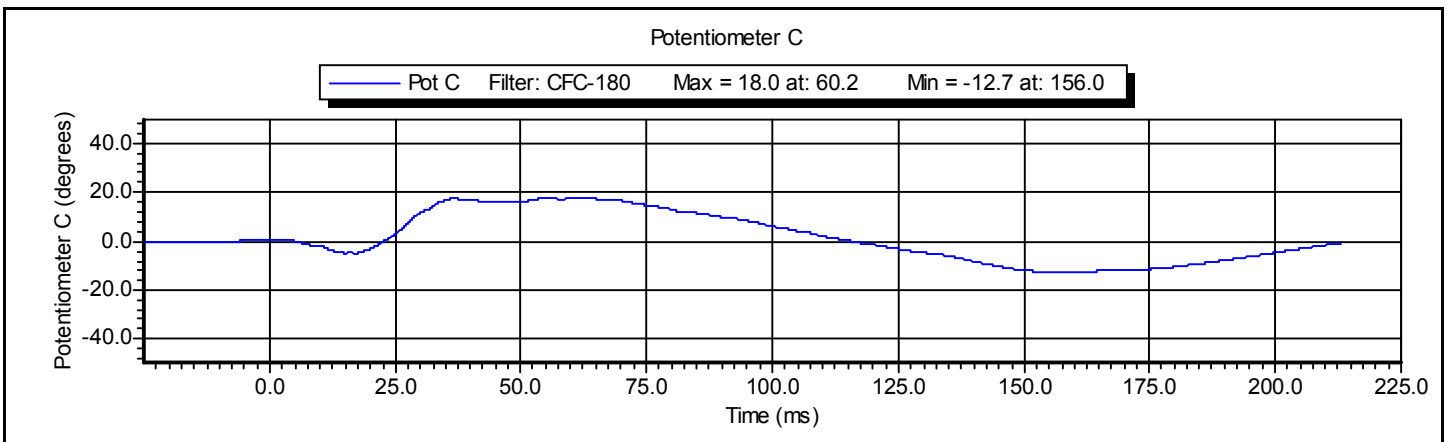
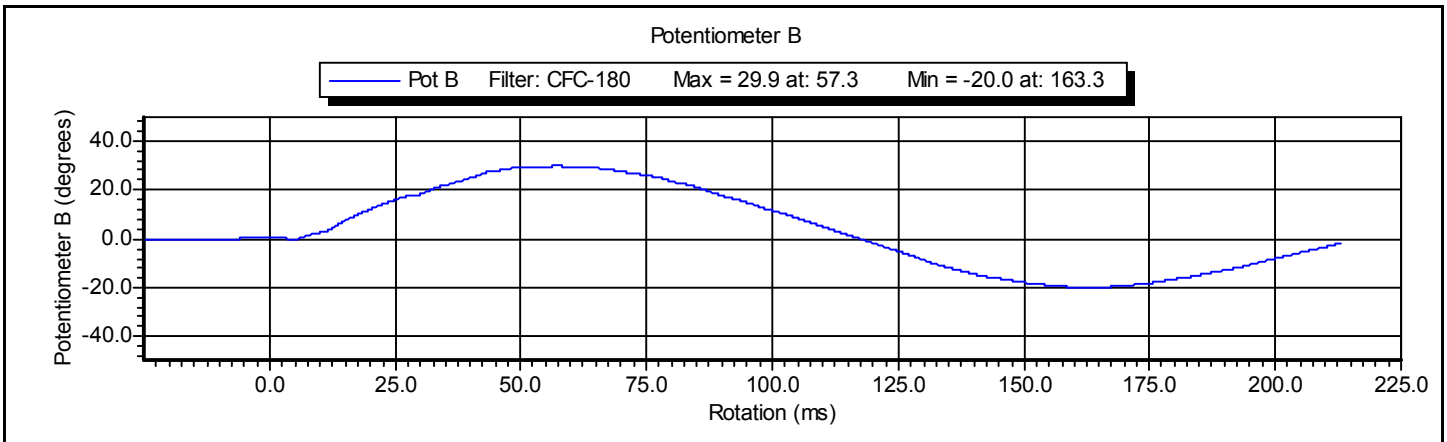
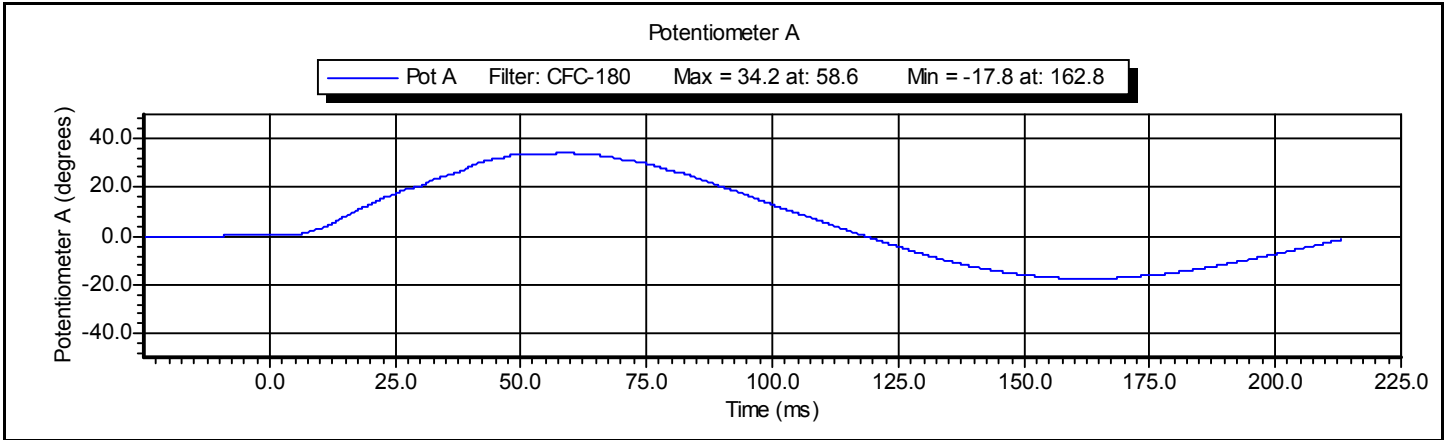
Calspan - Transportation Research Group

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

Component Part Number	Component Serial Number
455-2002	07085







www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

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

All test parameters are within specifications

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

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

Test ID: **Shoulder**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Shoulder**

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

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



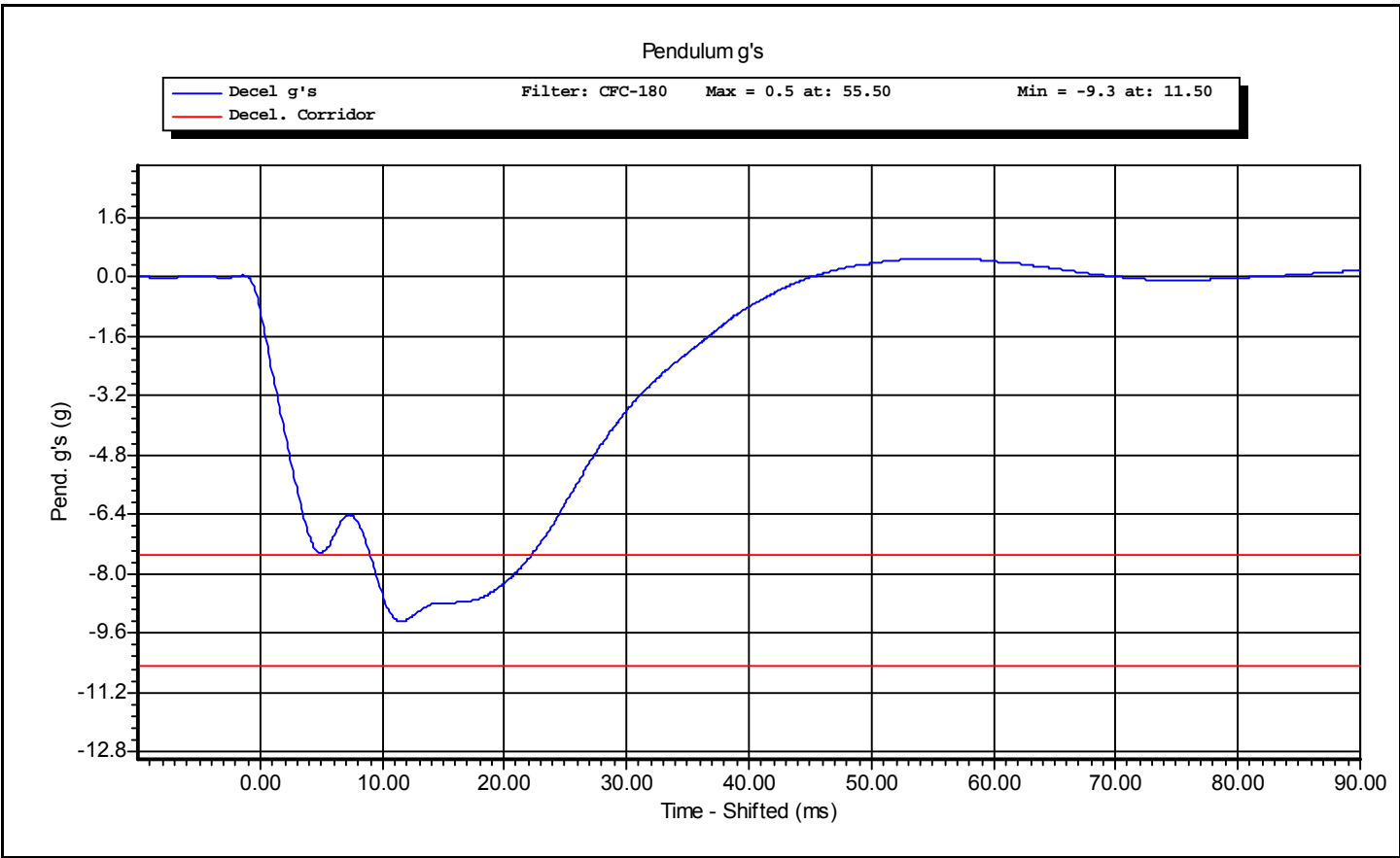
www.calspan.com

Calspan - Transportation Research Group

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

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

Component Part Number	Component Serial Number
960715-313	



Test ID: **Shoulder**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	7/30/2010
Test Number:	1	Test Time:	1:33:59 PM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	51.0 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Rib Displacement	-51.00 -- -46.00	-47.62 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

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

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

Test Time: **1:33:59 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

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

Test Time: **1:33:59 PM**

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



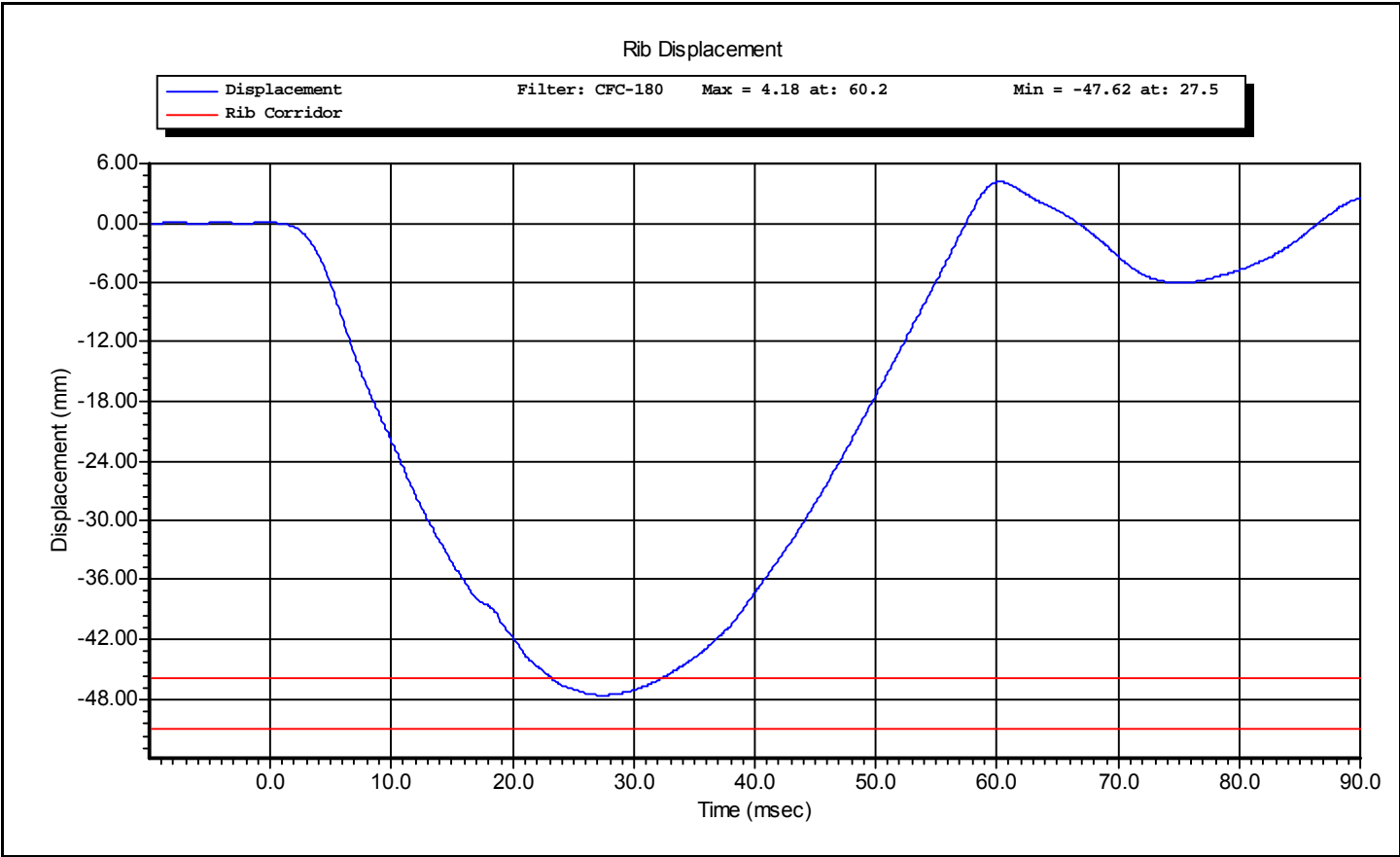
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	7/30/2010
Test Number:	1	Test Time:	1:33:59 PM

Component Part Number	Component Serial Number
455-3100	LOWER



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

Test Time: **1:33:59 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	51.0 %RH P
Velocity	2.90 -- 3.10	2.96 m/s P
Rib Displacement	-40.00 -- -36.00	-37.21 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

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

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

Test Time: **1:42:58 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

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

Test Time: **1:42:58 PM**

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



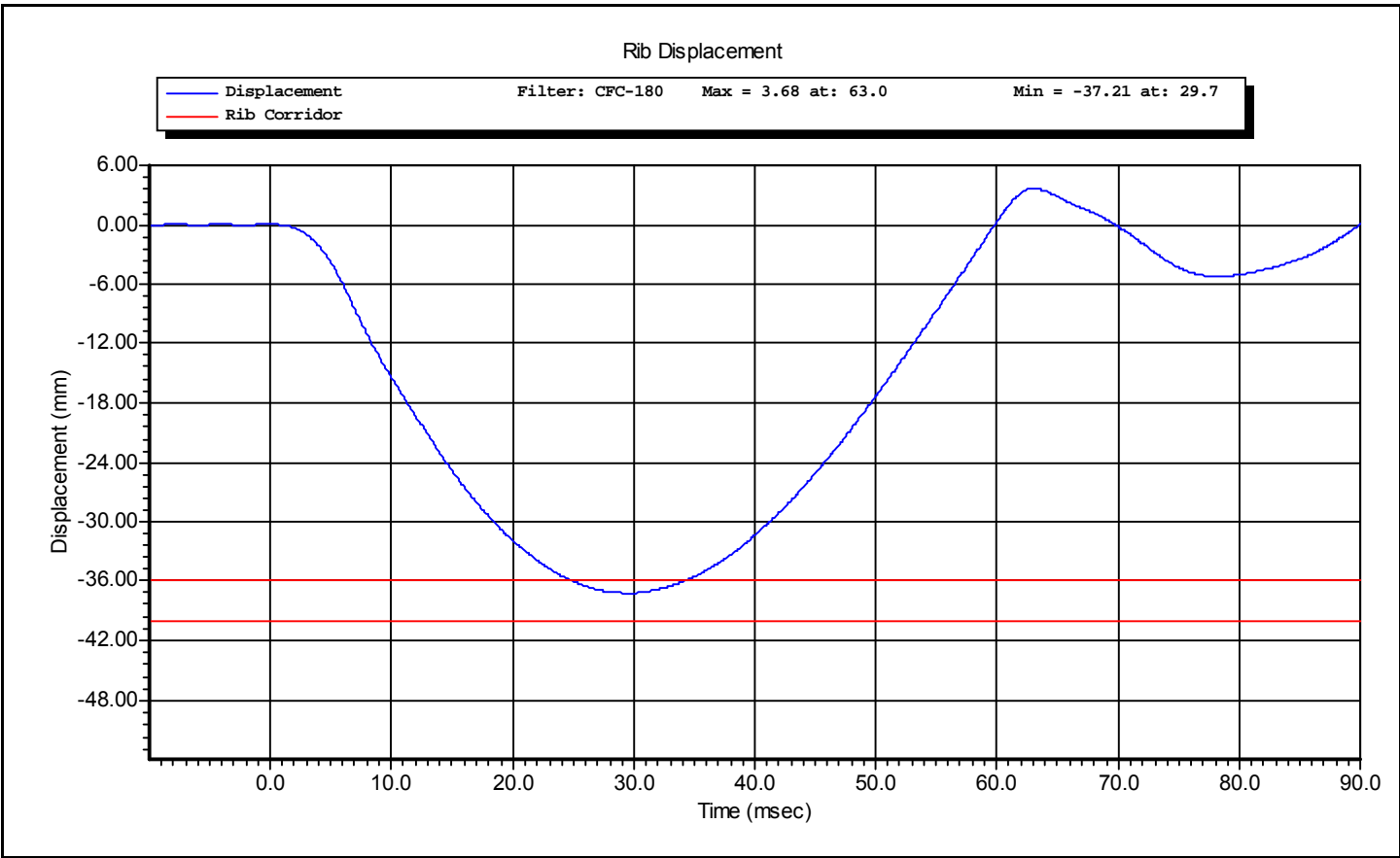
www.calspan.com

Calspan - Transportation Research Group

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

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

Component Part Number	Component Serial Number
455-3100	LOWER



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

Test Time: **1:42:58 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	7/30/2010
Test Number:	1	Test Time:	1:18:40 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	50.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-47.60 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

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

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

Test Time: **1:18:40 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

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

Test Time: **1:18:40 PM**

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



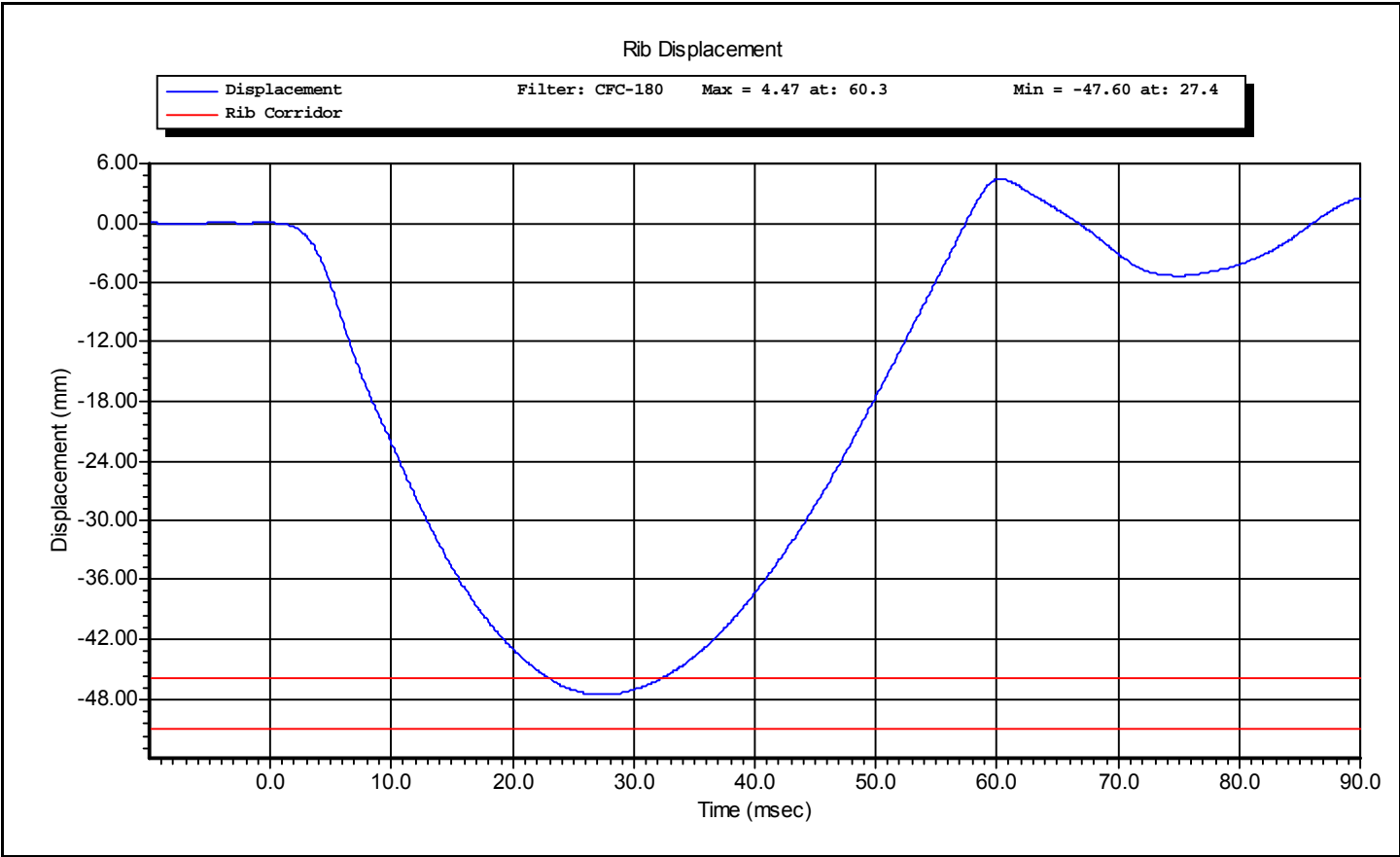
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	7/30/2010
Test Number:	1	Test Time:	1:18:40 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE



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

Test Time: **1:18:40 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	51.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-36.91 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

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

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

Test Time: **1:28:50 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

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

Test Time: **1:28:50 PM**

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



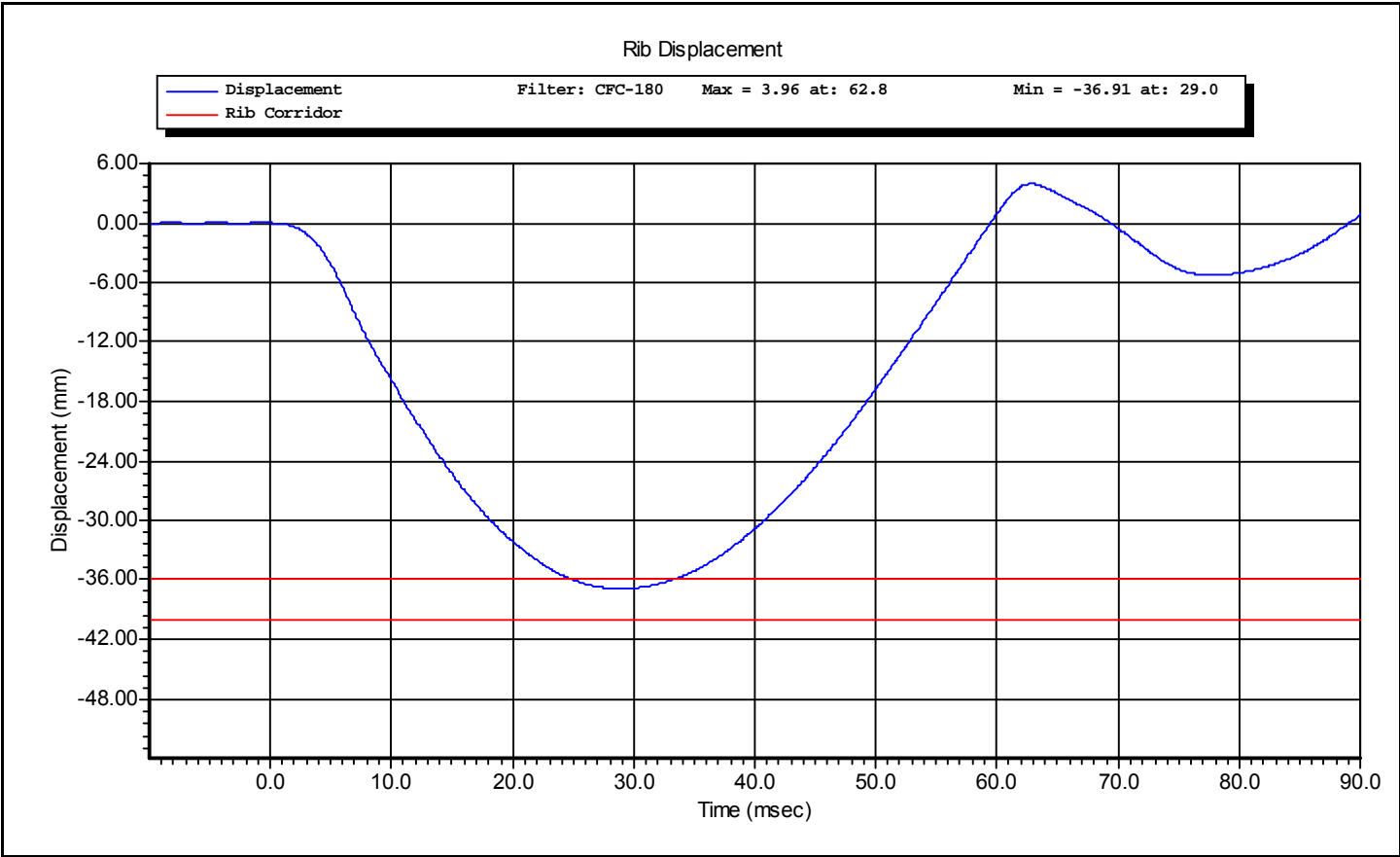
www.calspan.com

Calspan - Transportation Research Group

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

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

Component Part Number	Component Serial Number
455-3100	MIDDLE



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

Test Time: **1:28:50 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	7/30/2010
Test Number:	1	Test Time:	11:54:15 AM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	54.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-47.48 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

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

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

Test Time: **11:54:15 AM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

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

Test Time: **11:54:15 AM**

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



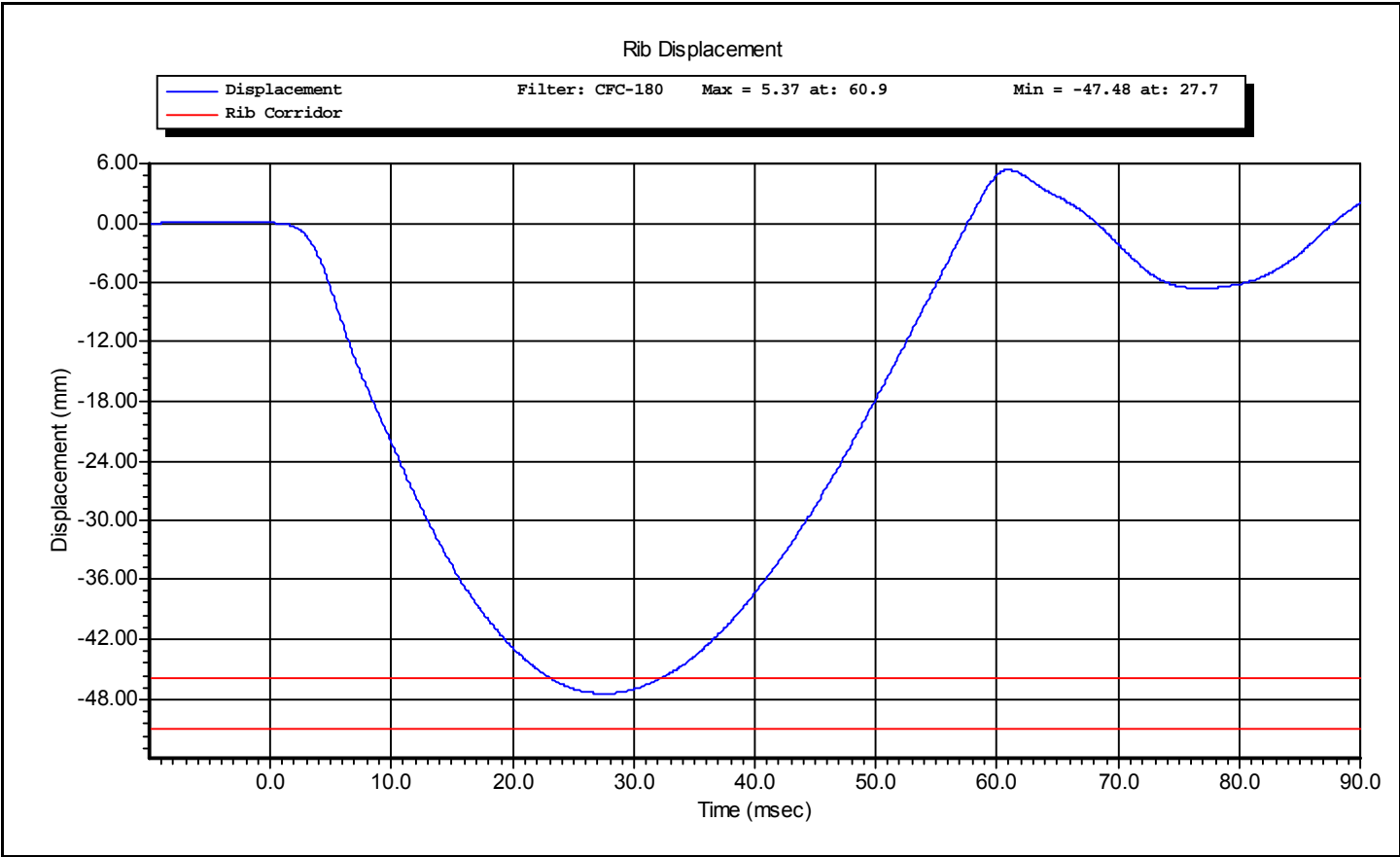
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	7/30/2010
Test Number:	1	Test Time:	11:54:15 AM

Component Part Number	Component Serial Number
455-3100	UPPER



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

Test Time: **11:54:15 AM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	50.0 %RH P
Velocity	2.90 -- 3.10	2.96 m/s P
Rib Displacement	-40.00 -- -36.00	-36.74 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

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

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

Test Time: **1:11:29 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

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

Test Time: **1:11:29 PM**

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



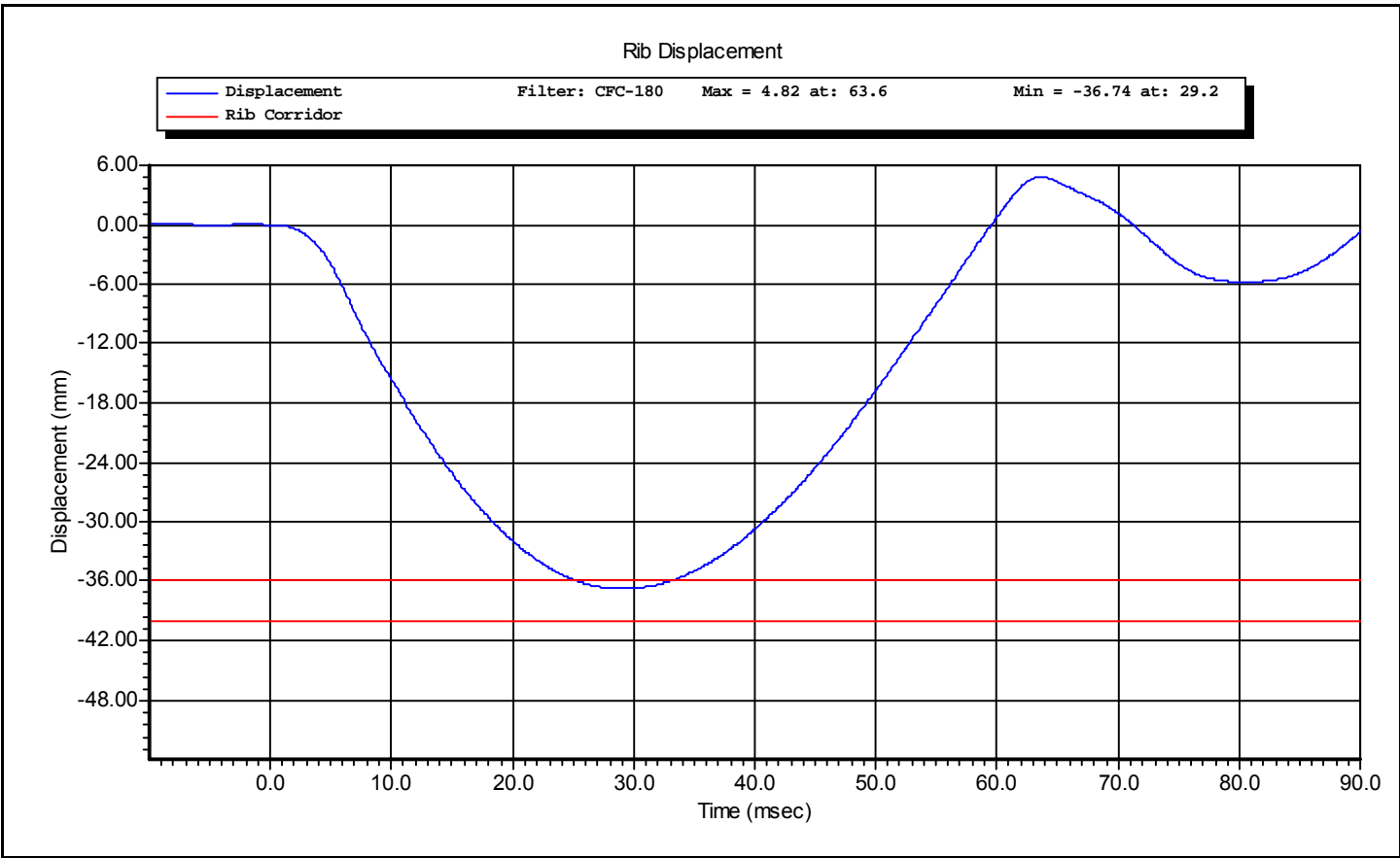
www.calspan.com

Calspan - Transportation Research Group

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

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

Component Part Number	Component Serial Number
455-3100	UPPER



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

Test Time: **1:11:29 PM**

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax Impact	Test Date:	7/30/2010
Test Number:	1	Test Time:	2:31:55 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	50.0 %RH P
Velocity	5.40 -- 5.60	5.49 m/s P
Upper Rib Displacement	34.0 -- 41.0	37.4 mm P
Middle Rib Displacement	37.0 -- 45.0	41.1 mm P
Lower Rib Displacement	37.0 -- 44.0	40.4 mm P
Impactor Force	5100 -- 6200	5500 N P

All test parameters are within specifications

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

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

Test ID: **Thorax Impact**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Honeywell	MLT-38000	DS-179	4/23/2010
Honeywell	MLT-38000	DS-185	4/23/2010
Honeywell	MLT-38000	DS-178	4/23/2010

Test ID: **Thorax Impact**

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

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



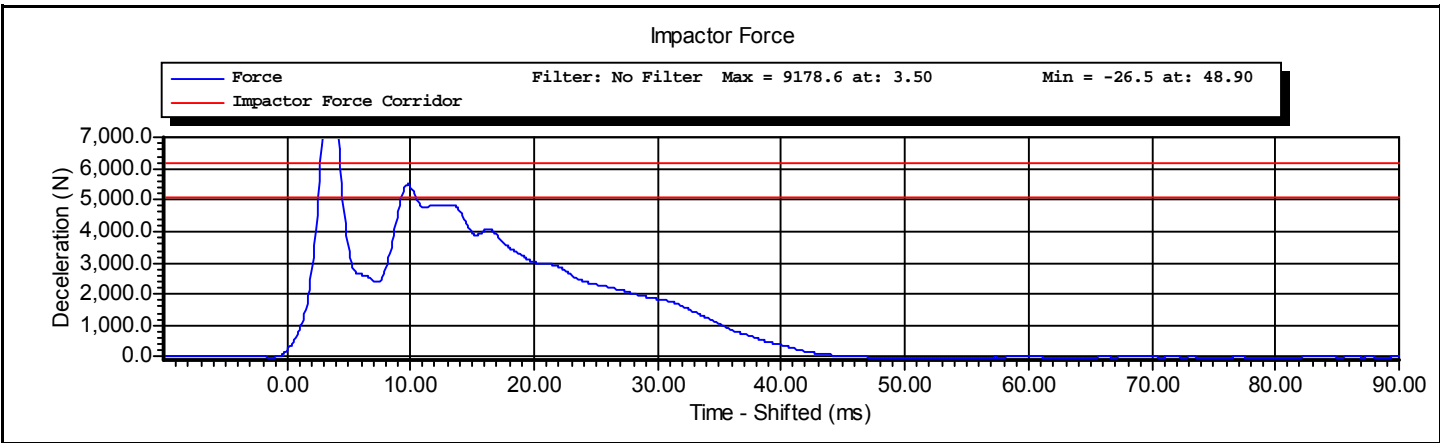
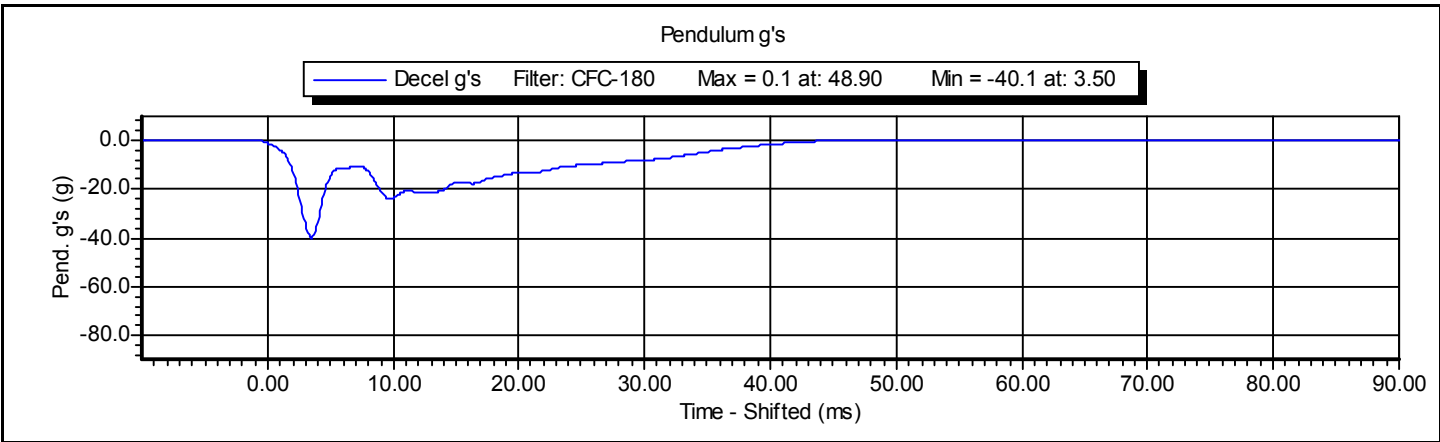
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax Impact	Test Date:	7/30/2010
Test Number:	1	Test Time:	2:31:55 PM

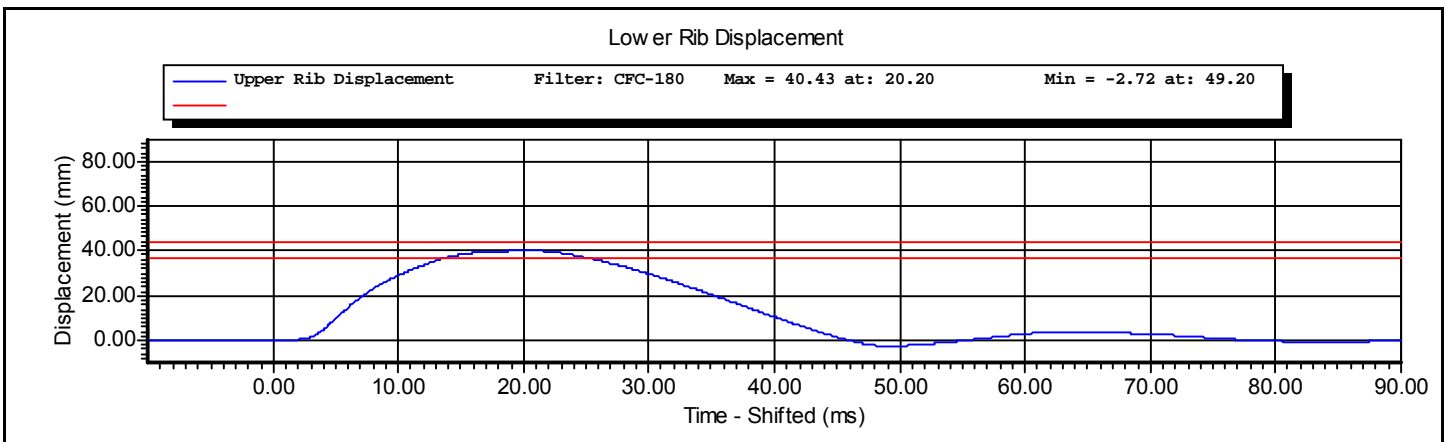
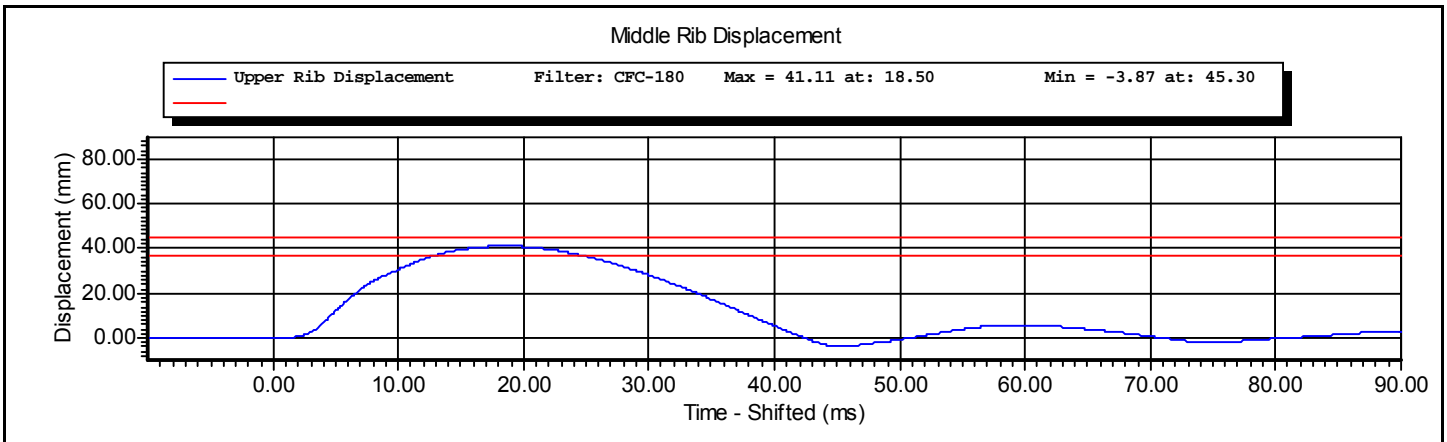
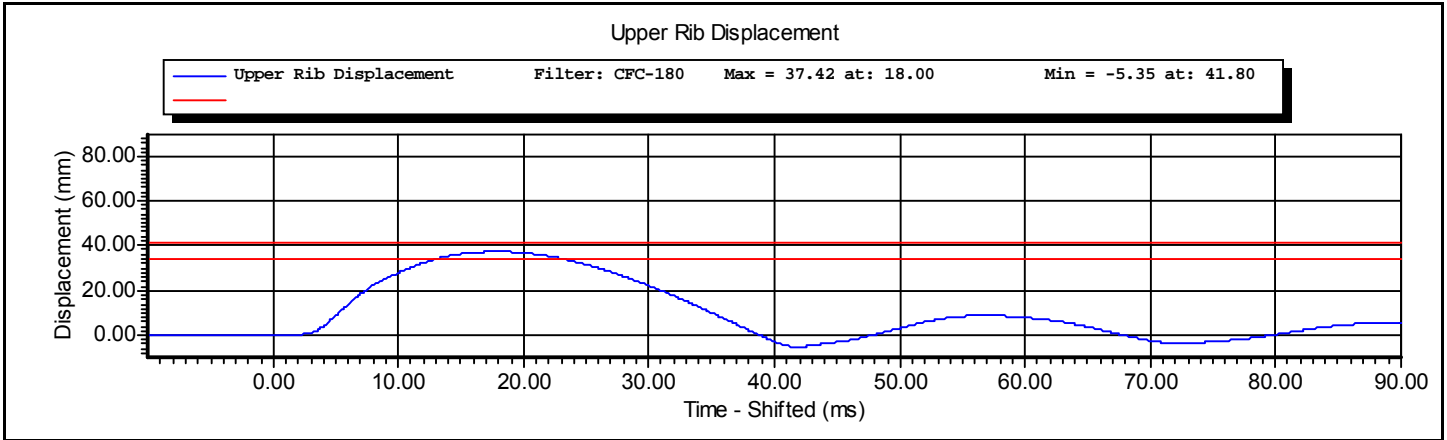
Component Part Number	Component Serial Number
Upper Rib - 175-4002	UPPER



Test ID: **Thorax Impact**

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

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





www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	56 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.43 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	11.9 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.17 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	12.4 ms P

All test parameters are within specifications

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

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

Test ID: **Abdomen**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010
Denton	2631	LC-1524	4/22/2010
Denton	2631	LC-1523	4/22/2010
Denton	2631	LC-1530	4/22/2010

Test ID: **Abdomen**

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

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



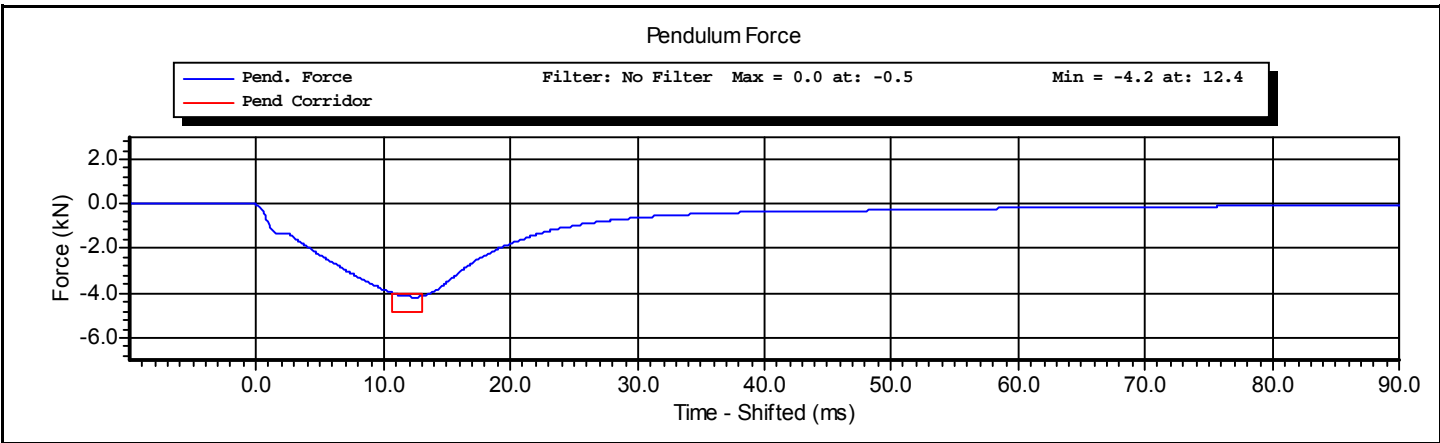
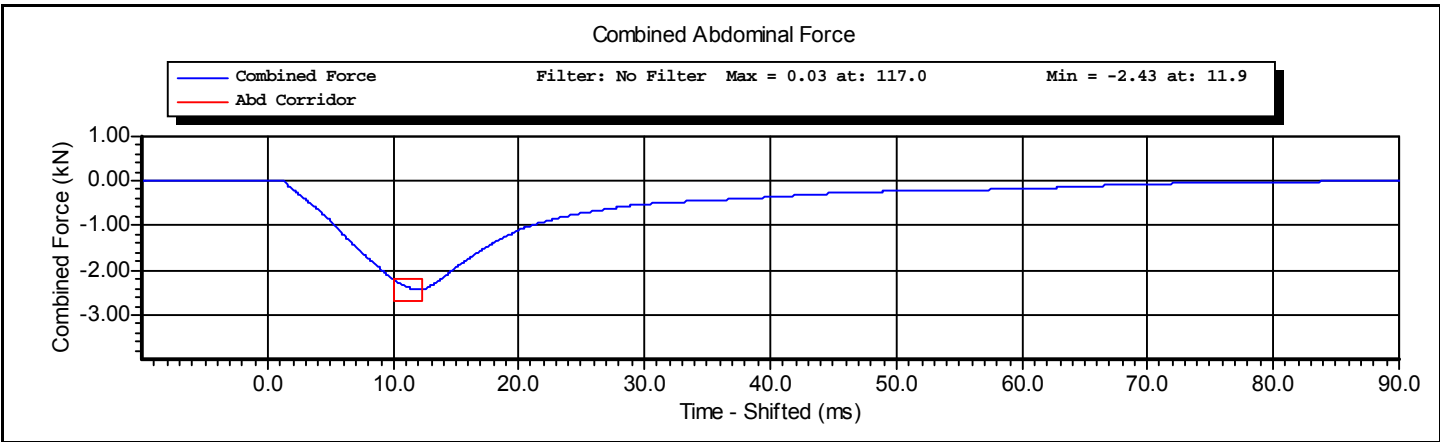
www.calspan.com

Calspan - Transportation Research Group

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

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

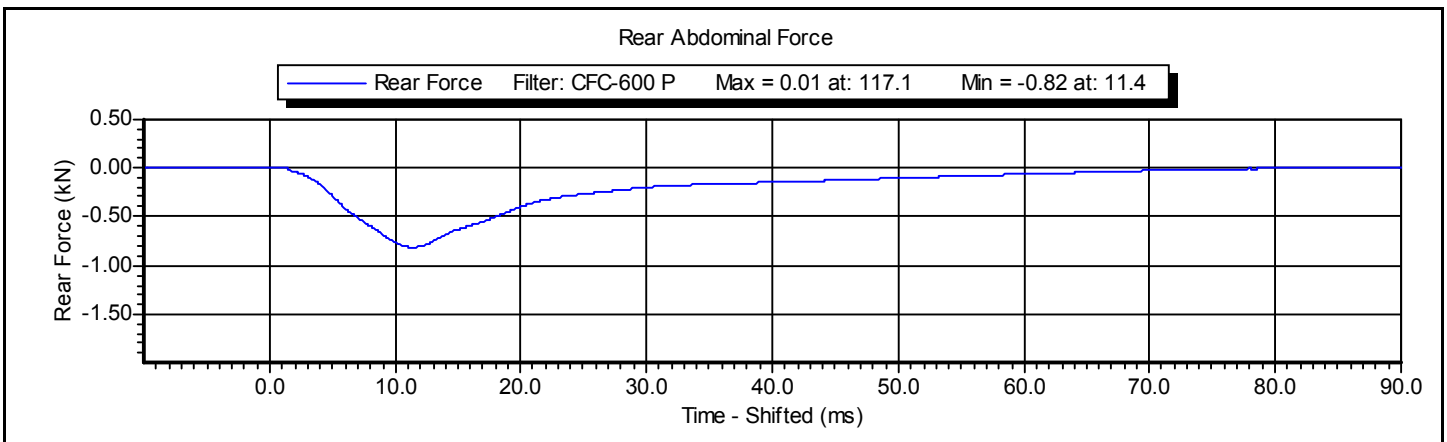
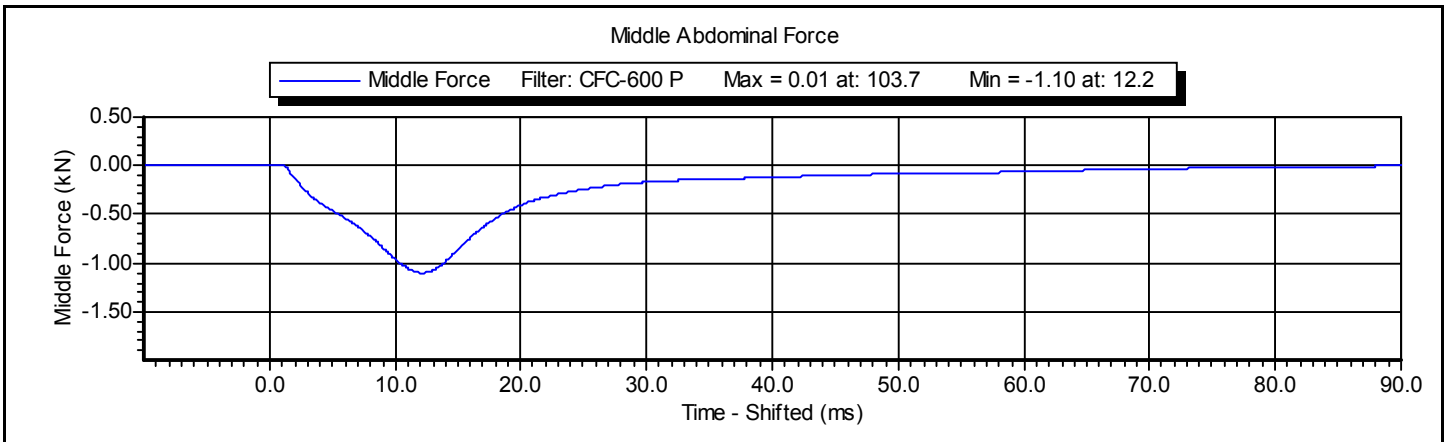
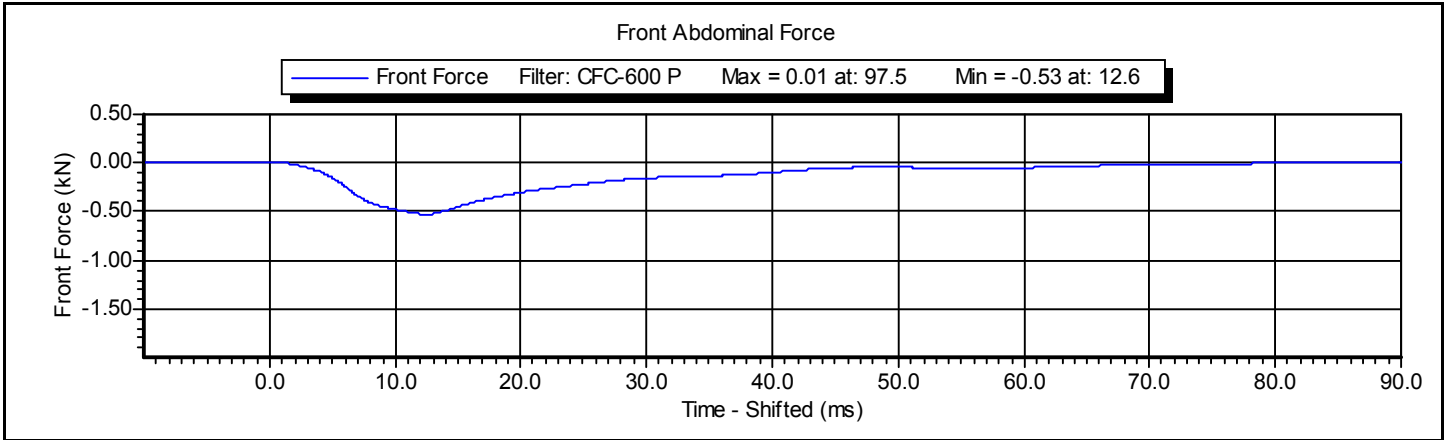
Component Part Number	Component Serial Number
455-4001	07/136



Test ID: **Abdomen**

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

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





www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	7/29/2010
Test Number:	1	Test Time:	3:51:21 PM

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

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

All test parameters are within specifications

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

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

Test ID: **Lumbar Spine**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Lumbar Spine**

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

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



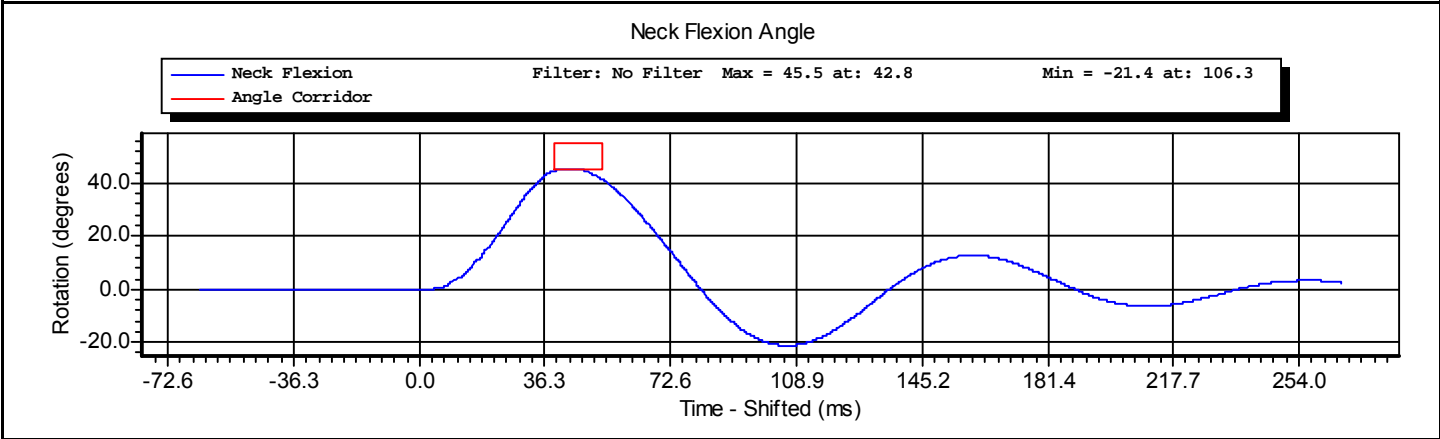
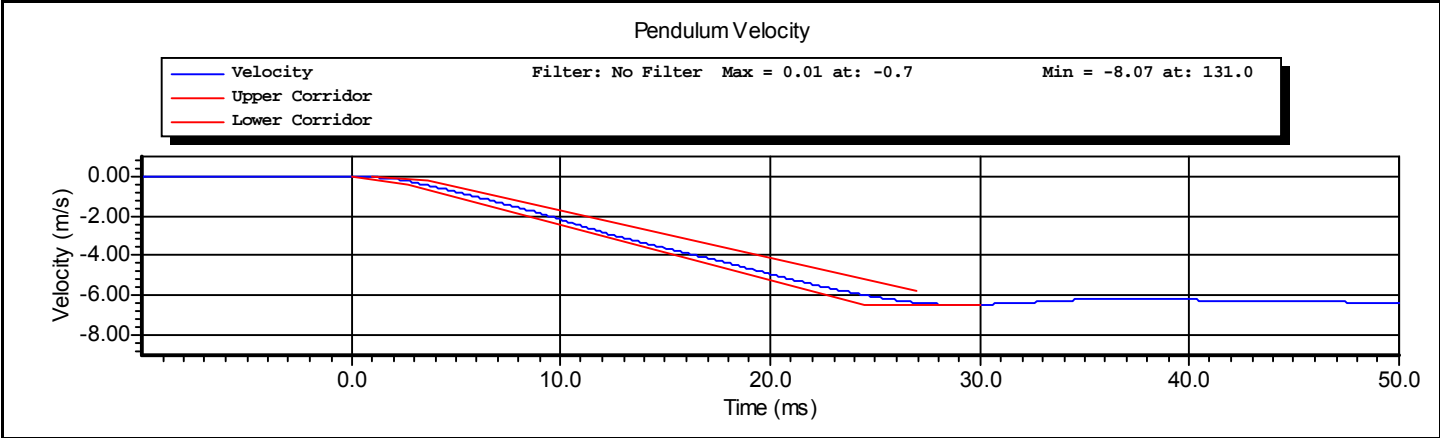
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	7/29/2010
Test Number:	1	Test Time:	3:51:21 PM

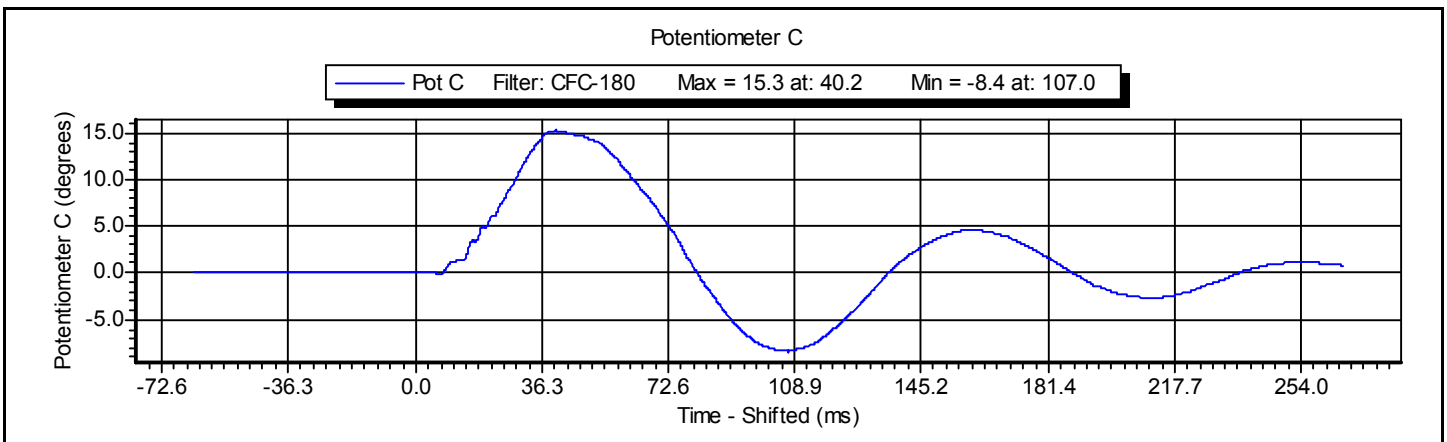
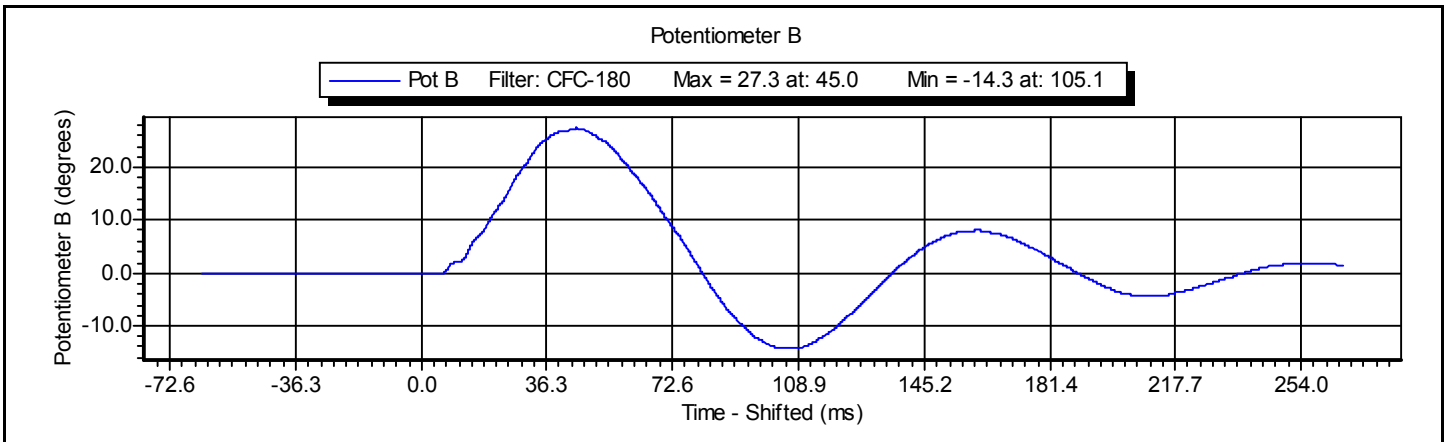
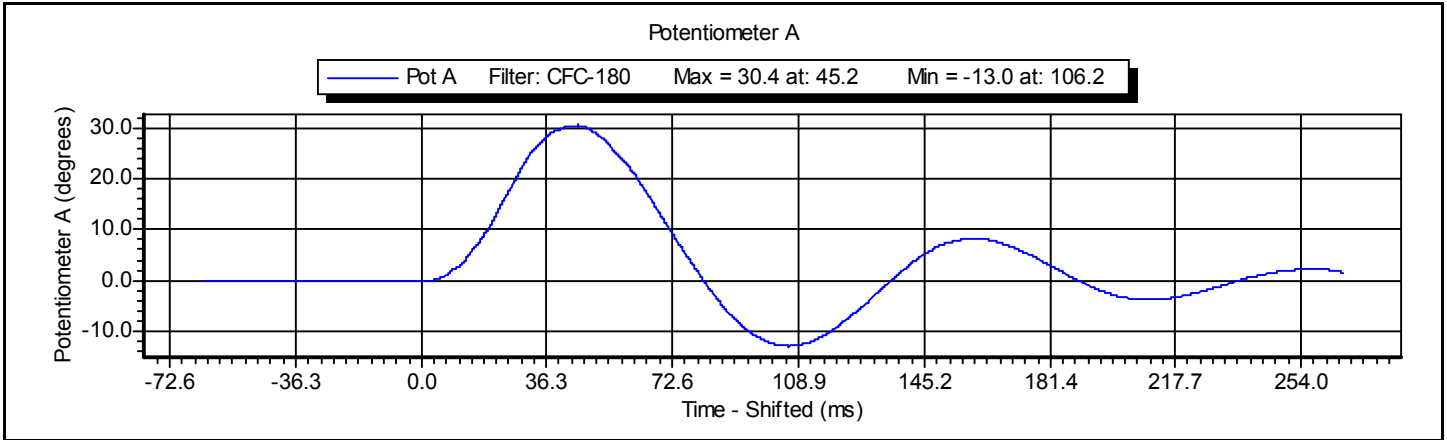
Component Part Number	Component Serial Number
175-5501	19-0545



Test ID: **Lumbar Spine**

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

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





www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

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

All test parameters are within specifications

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

Test ID: **Pelvis**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

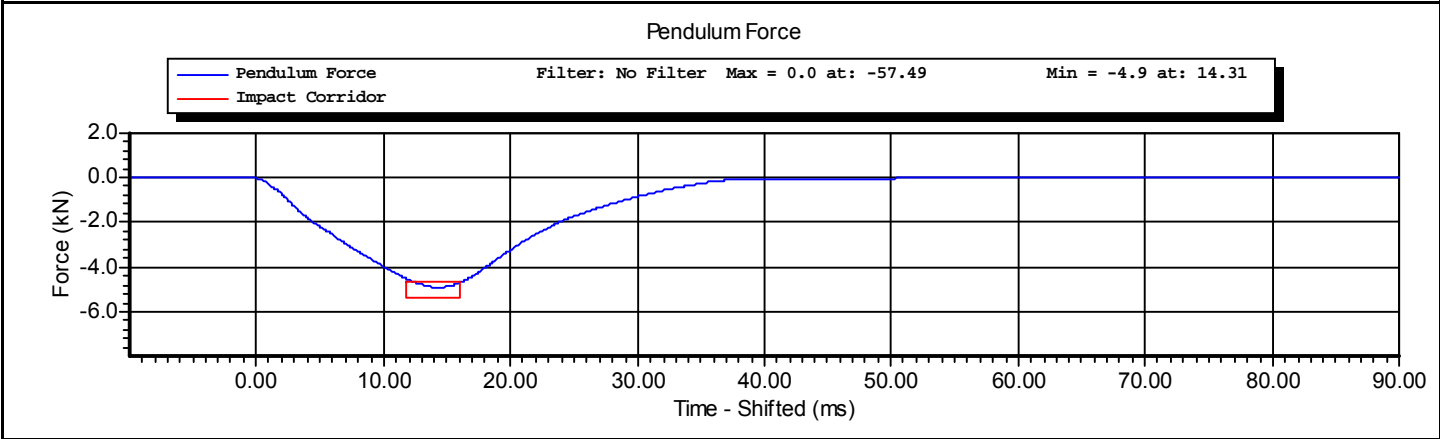
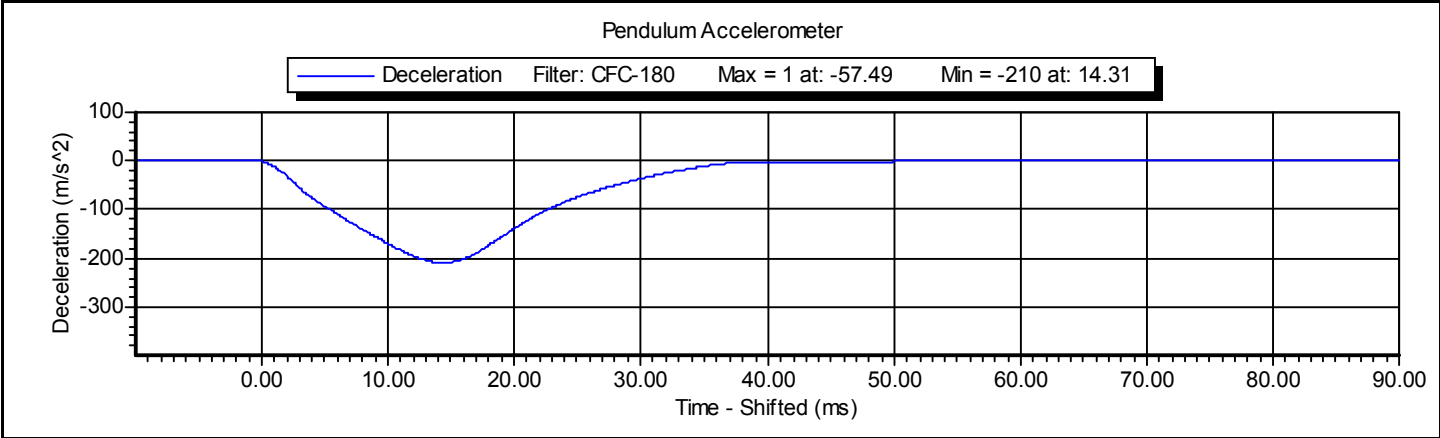
Test ID: **Pelvis**

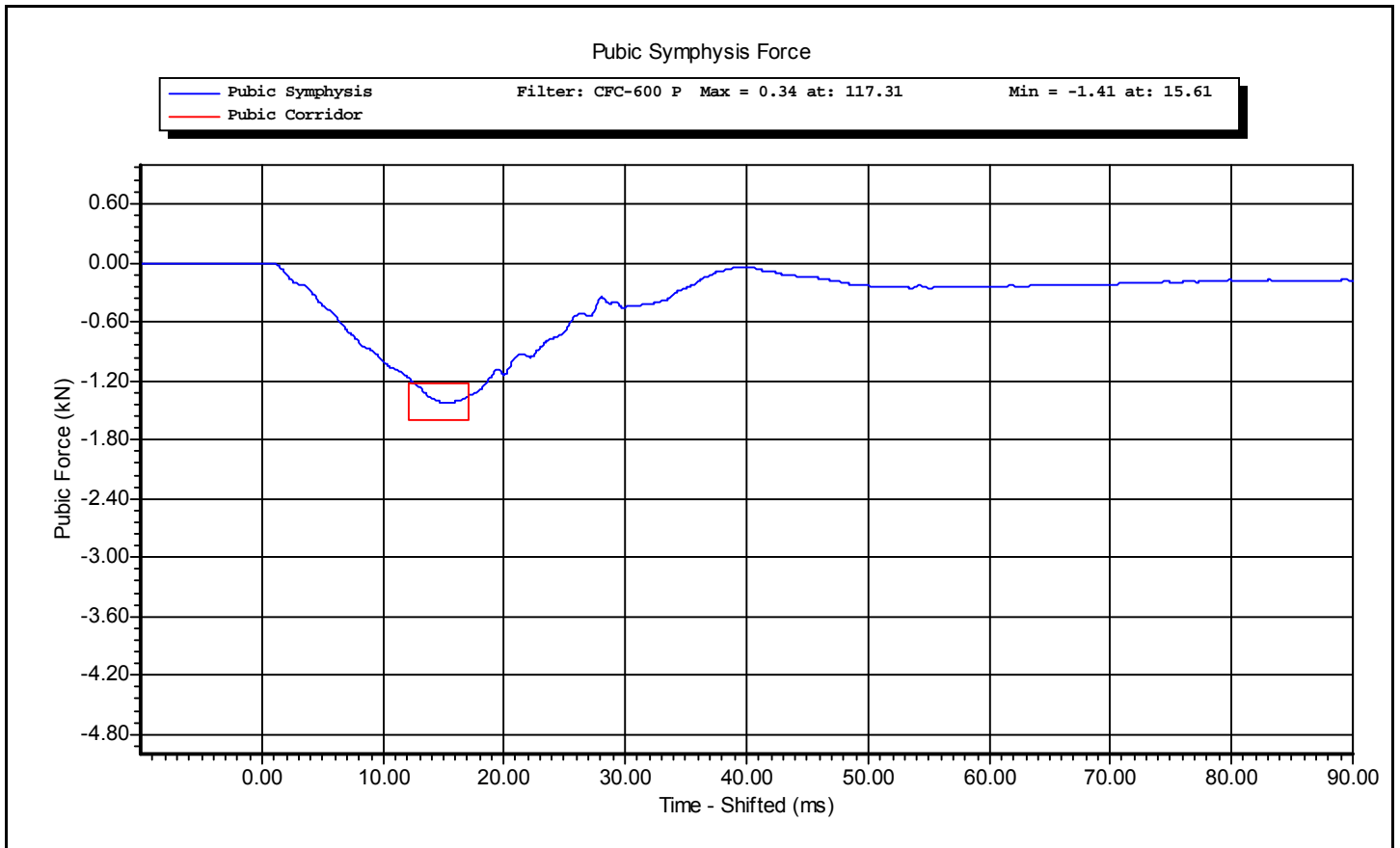
Test Time: **8:50:49 AM**

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

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

Component Part Number	Component Serial Number
455-4003	





CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT



www.calspan.com

Calspan - Transportation Research Group

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

SID-IIsD External Measurements

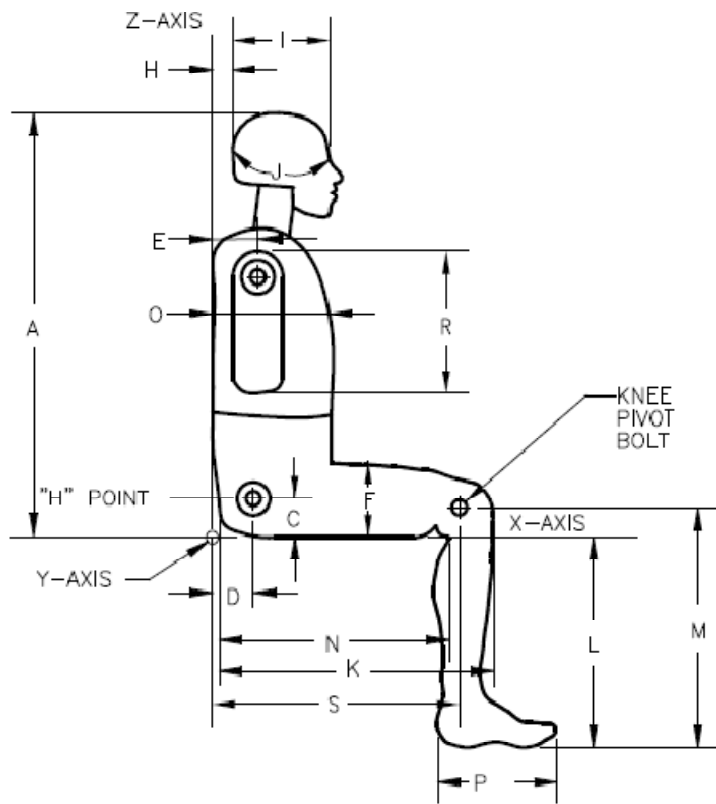
NHTSA ATD S/N 300

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

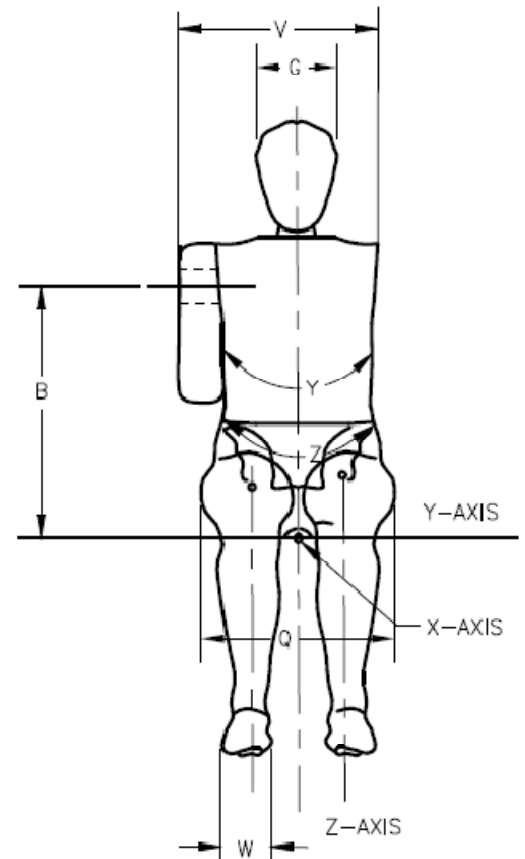
Technician: A. Rudniski

Date: 7/26/2010

SID-IIsD External Dimension Reference Diagram



SIDE VIEW



FRONT VIEW



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

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

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

All test parameters are within specifications

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

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

Test ID: **Head Drop**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Head Drop**

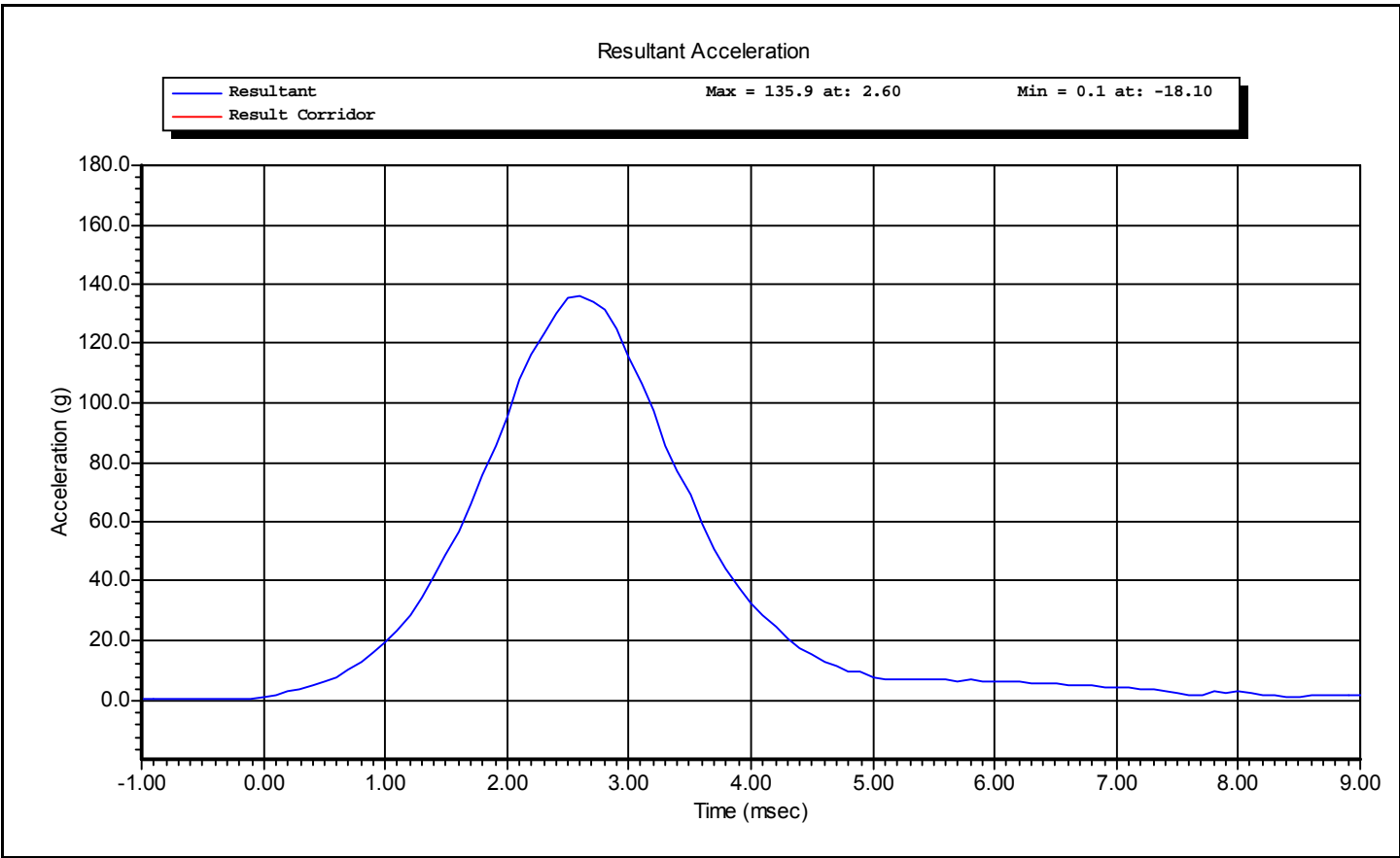
Test Time: **2:03:14 PM**

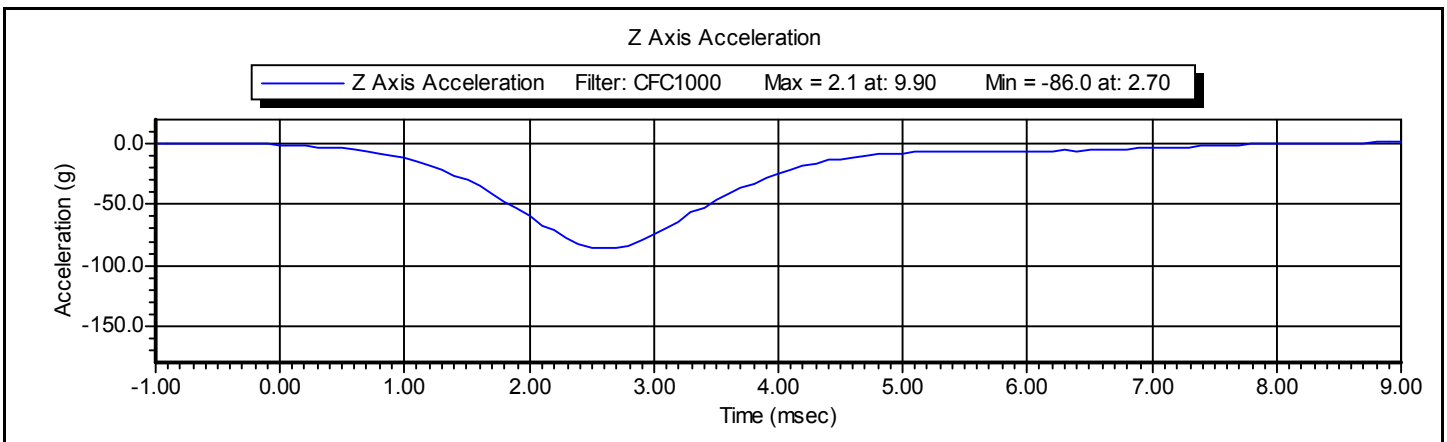
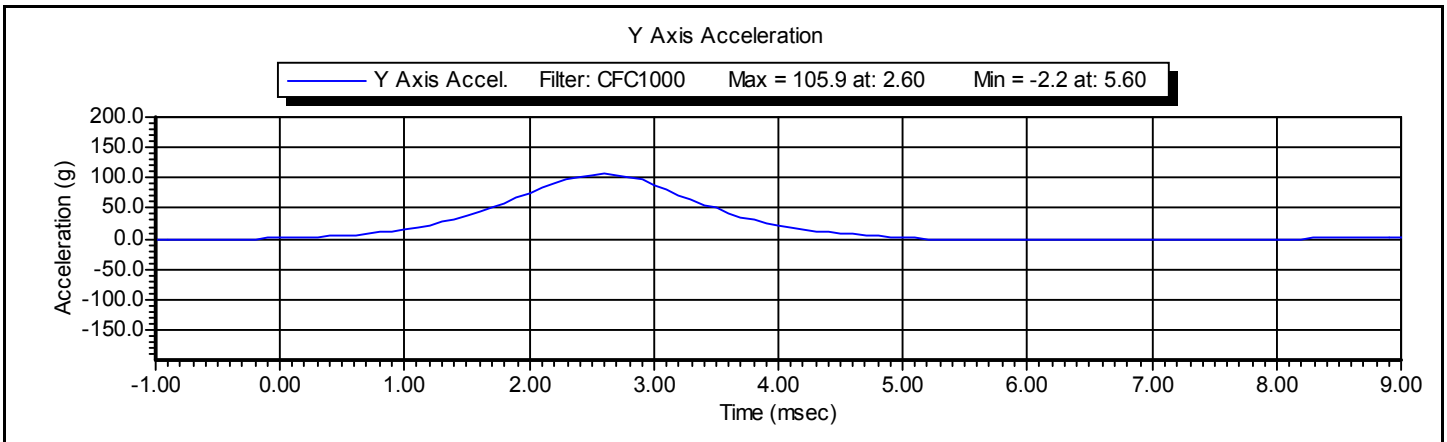
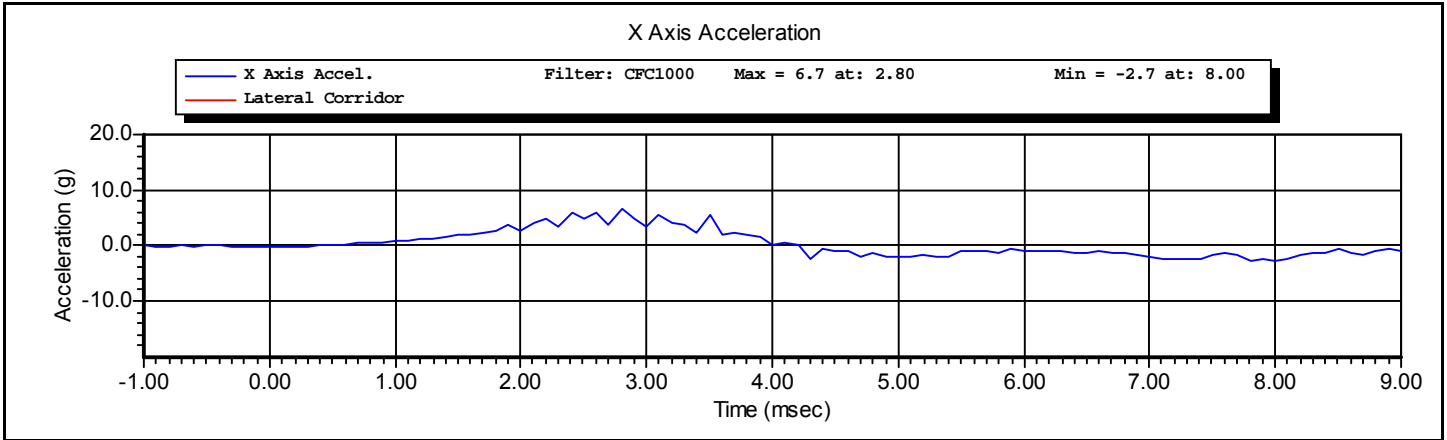
Test Date: **7/26/2010**



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

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







www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

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

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

All test parameters are within specifications

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

Test ID: **Neck Flexion**

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

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



www.calspan.com

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
Denton	1716A	LC-265 Fy	7/28/2009
Denton	1716A	LC-265 Mx	7/28/2009
DentonATD	78051-342	184	4/30/2010
DentonATD	78051-342	174	4/30/2010
DentonATD	78051-342	185	4/30/2010

Test ID: **Neck Flexion**

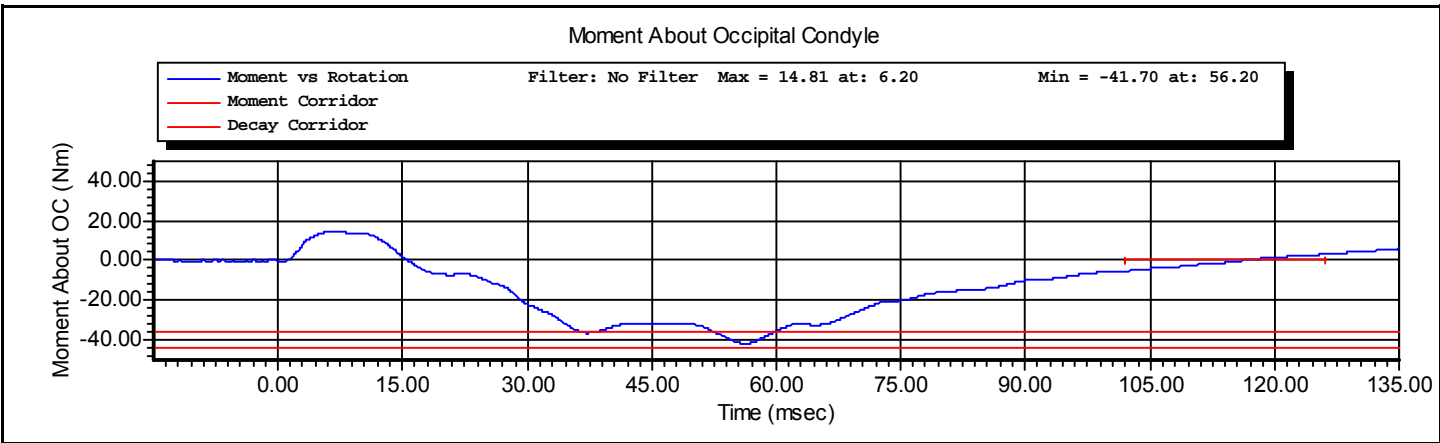
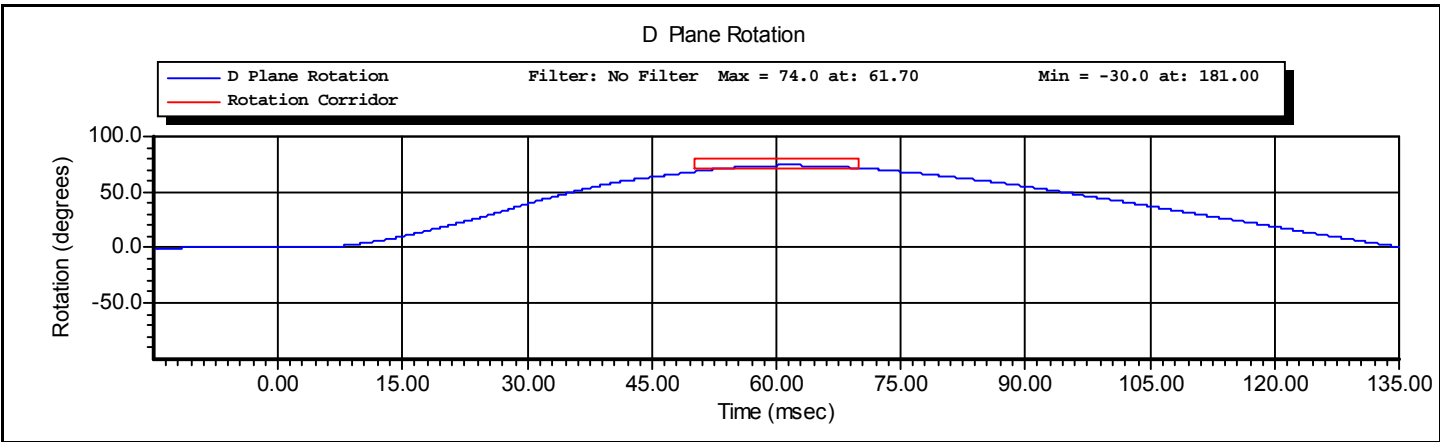
Test Time: **8:24:10 AM**

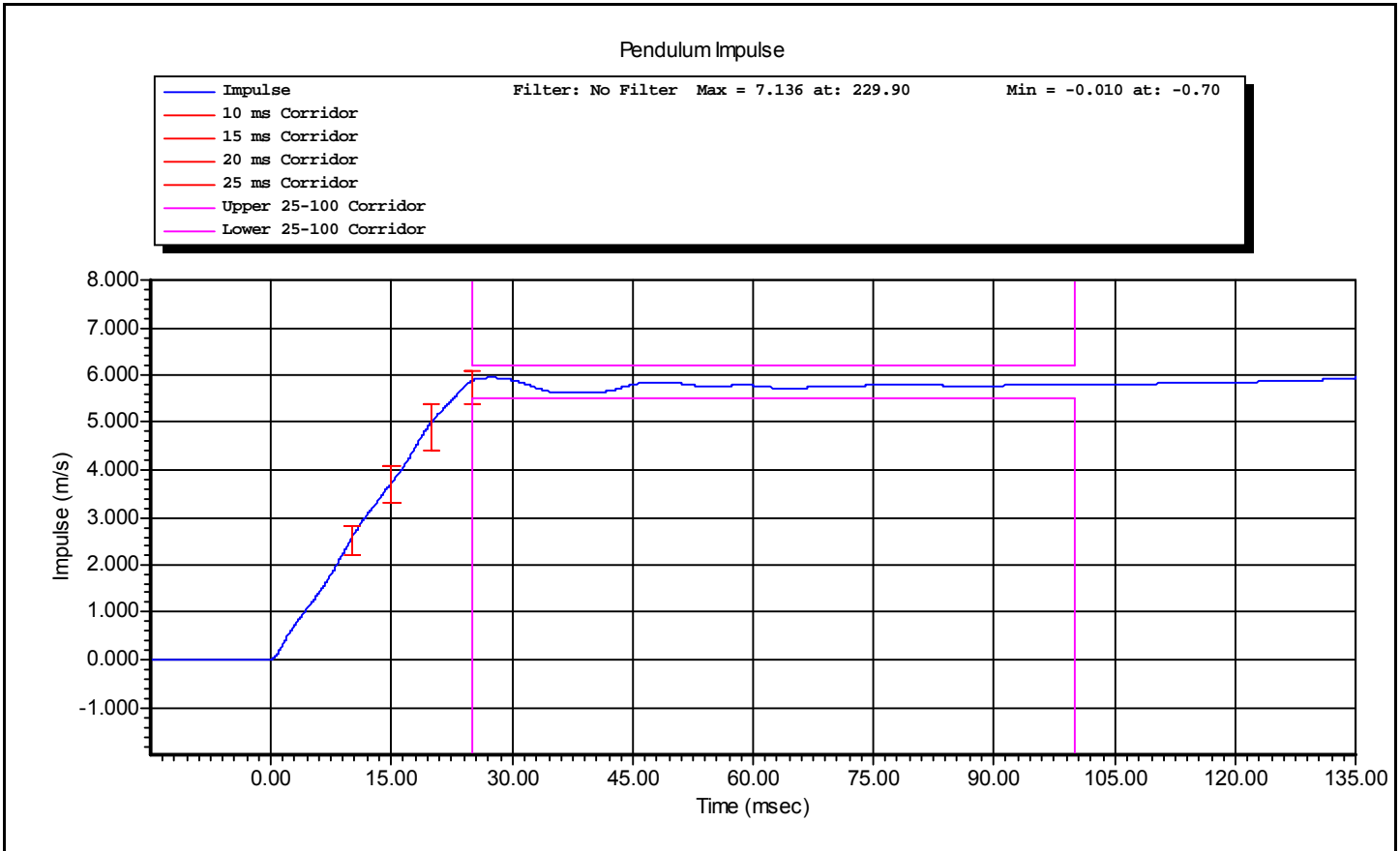
Test Date: **7/27/2010**



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

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







www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	56.0 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Probe Acceleration	13.0 -- 18.0	15.9 g P
Shoulder Deflection	28.0 -- 37.0	33.1 mm P
T1 Acceleration	17.0 -- 22.0	19.8 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Shoulder**

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

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



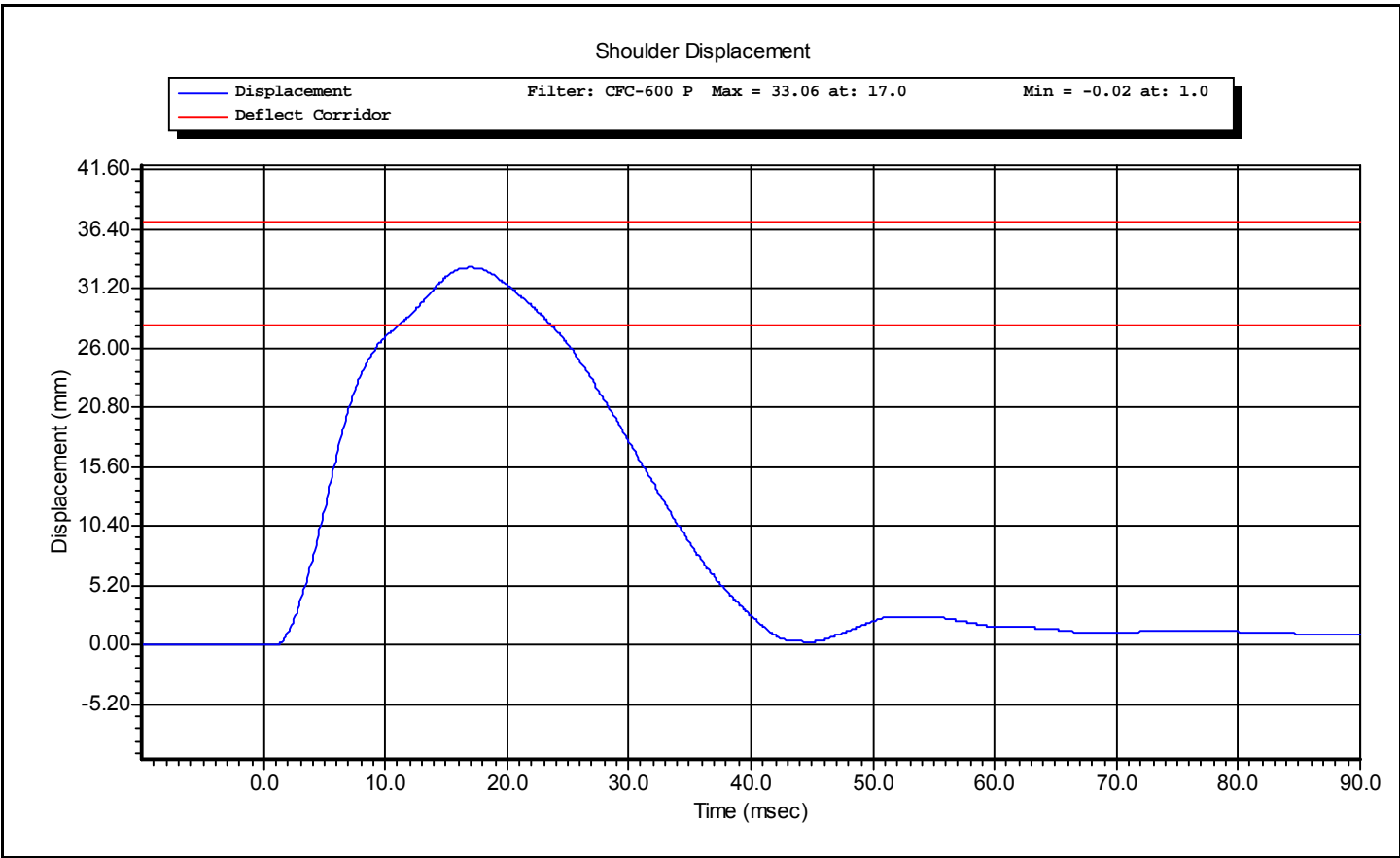
www.calspan.com

Calspan - Transportation Research Group

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

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

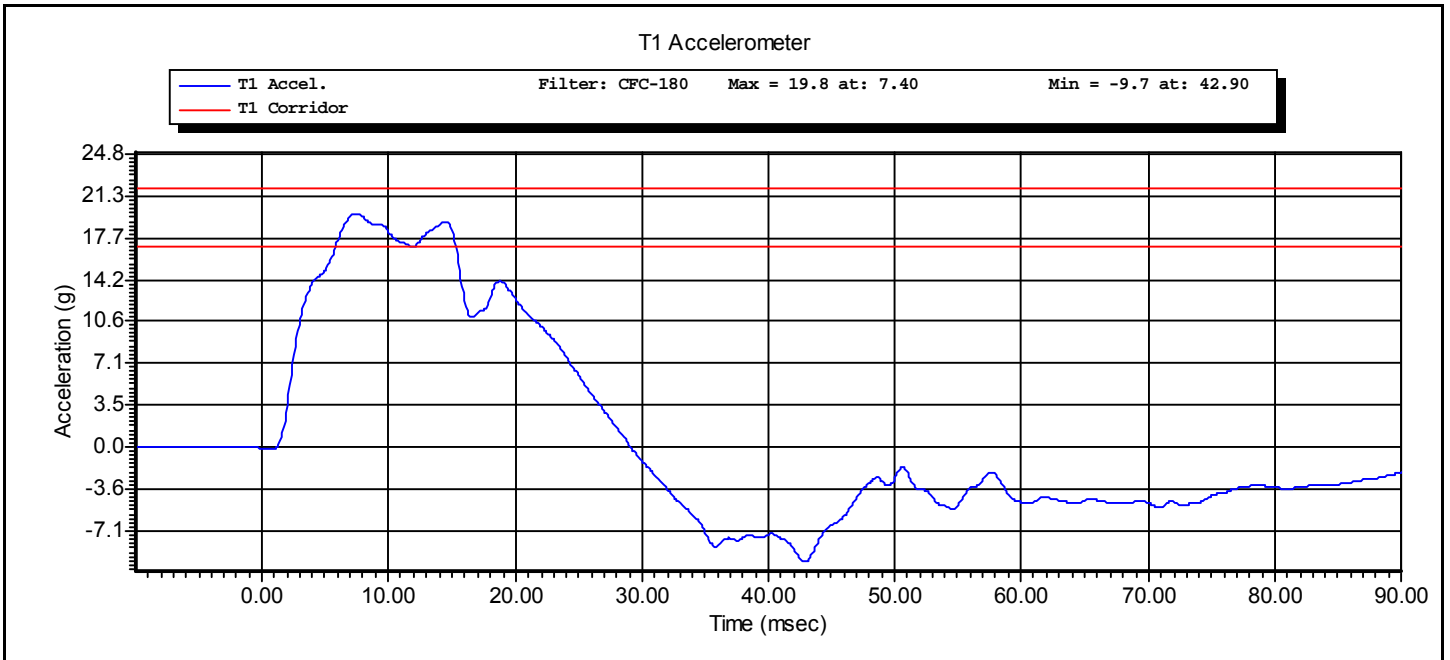
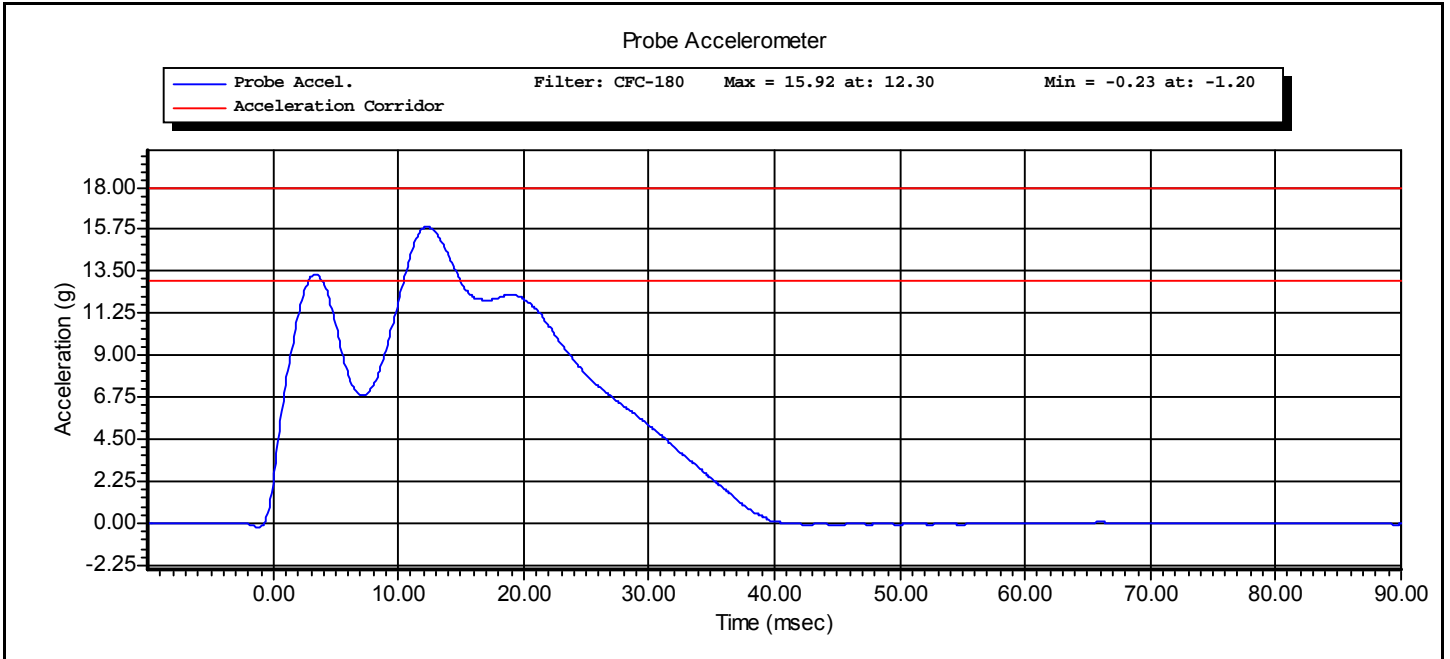
Component Part Number	Component Serial Number
-----------------------	-------------------------



Test ID: **Shoulder**

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

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





www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

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

All test parameters are within specifications

Technician: _____ Signature: _____

Supervisor: _____ Signature: _____

Test ID:

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

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



VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID:

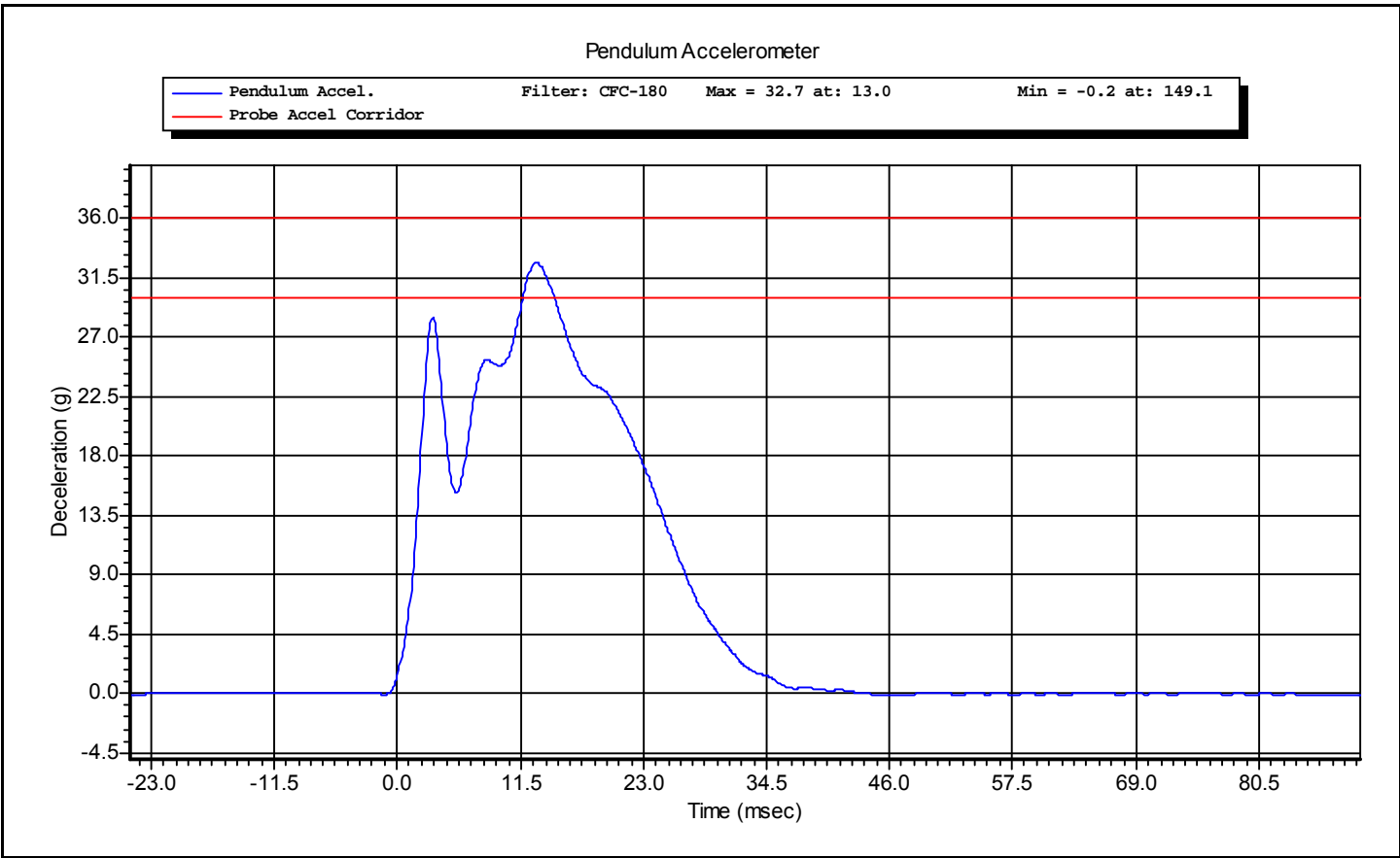
Test Time: **4:10:11 PM**

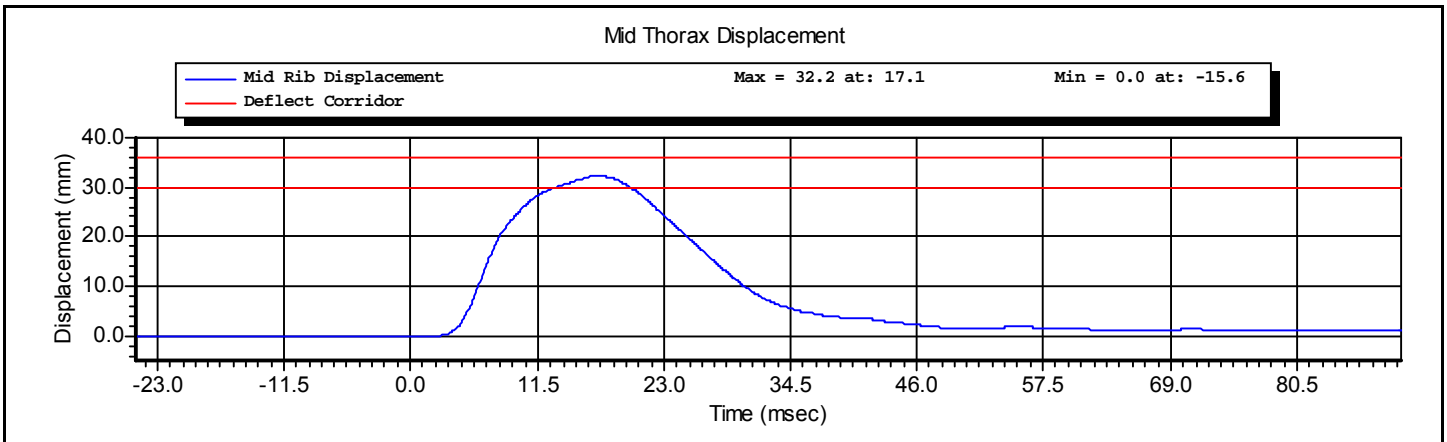
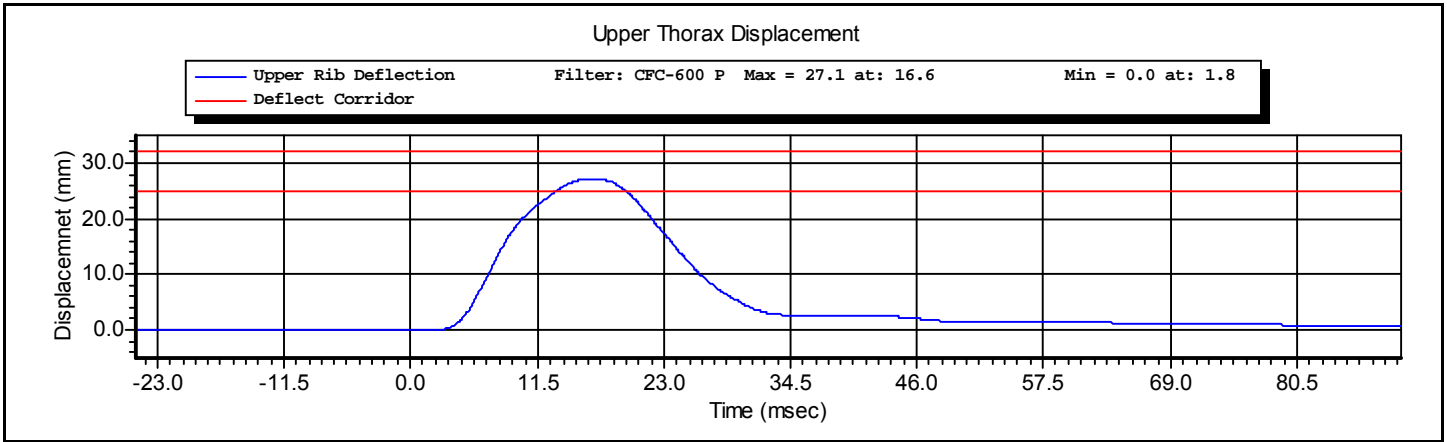
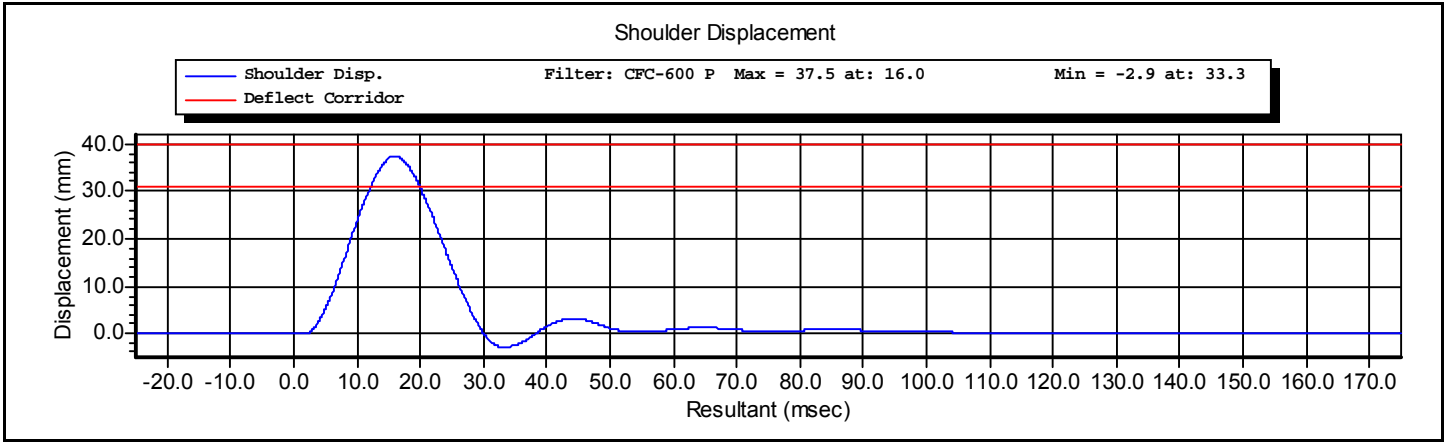
Test Date: **7/28/2010**

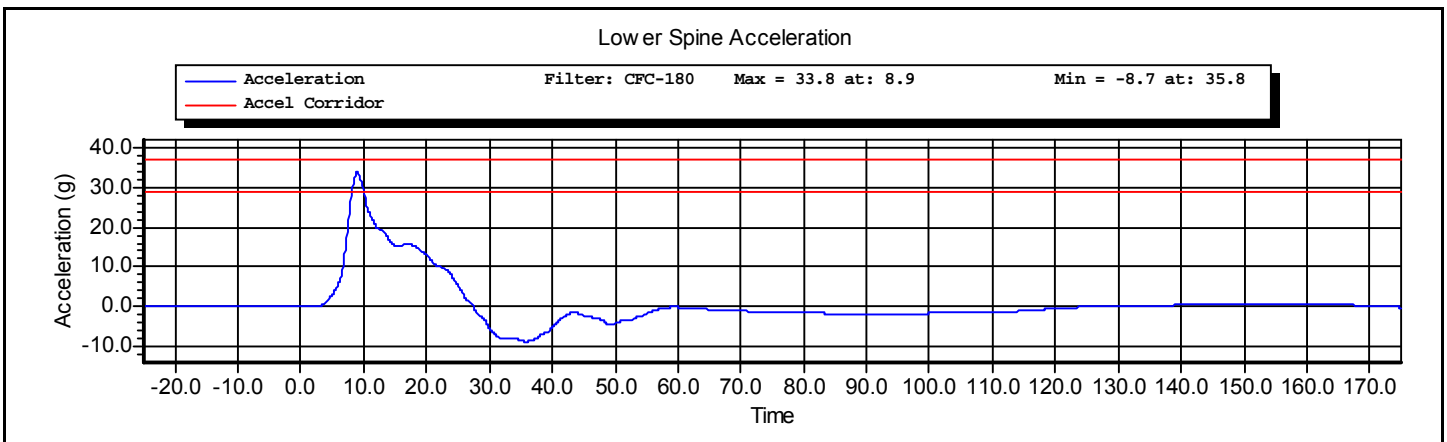
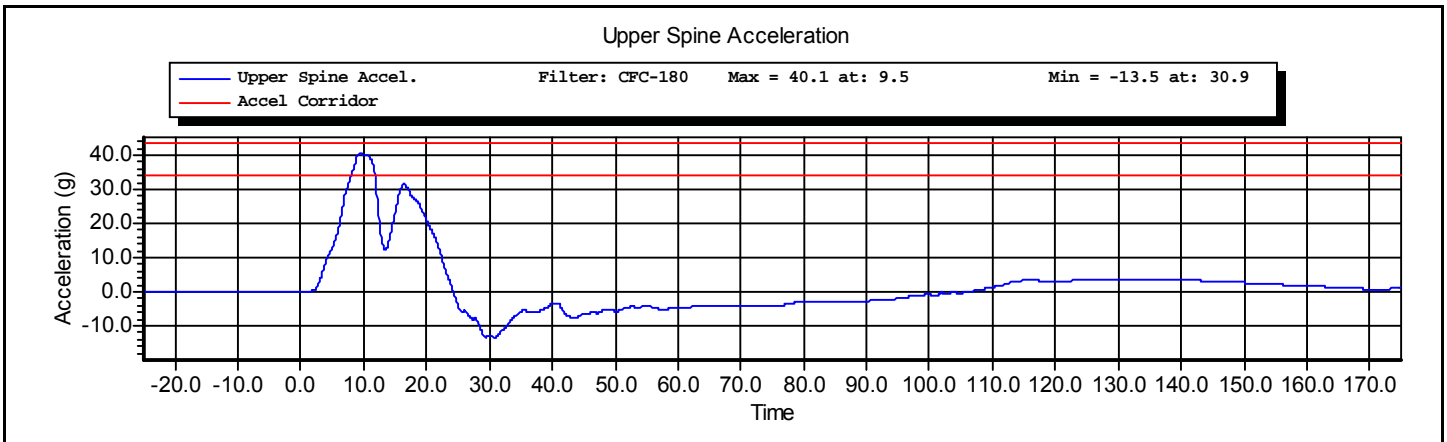
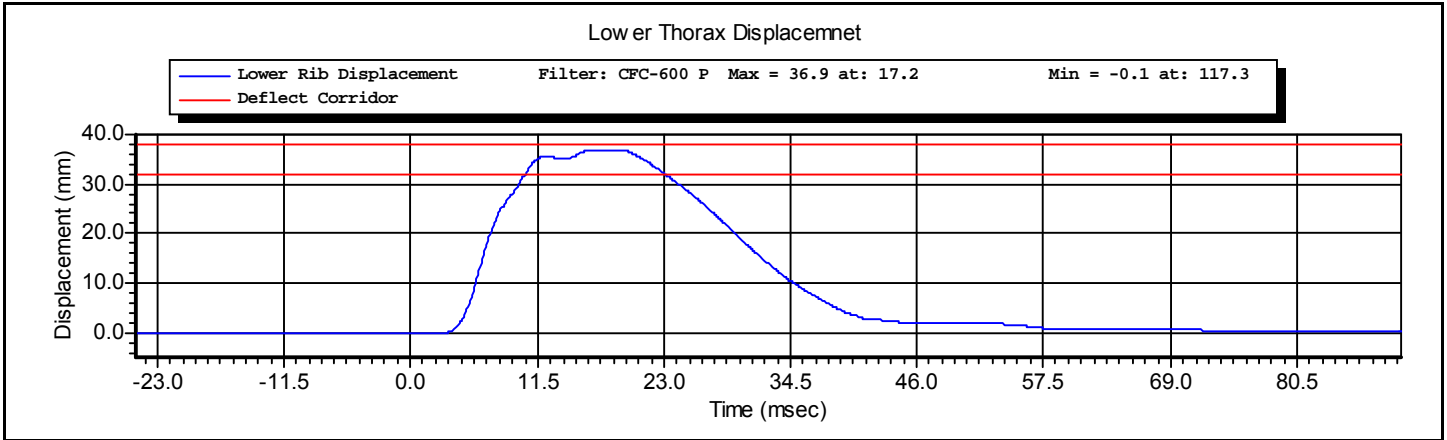


Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:			
Test ID:		Test Date:	7/28/2010
Test Number:	1	Test Time:	4:10:11 PM

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









www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

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

All test parameters are within specifications

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

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

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

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

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



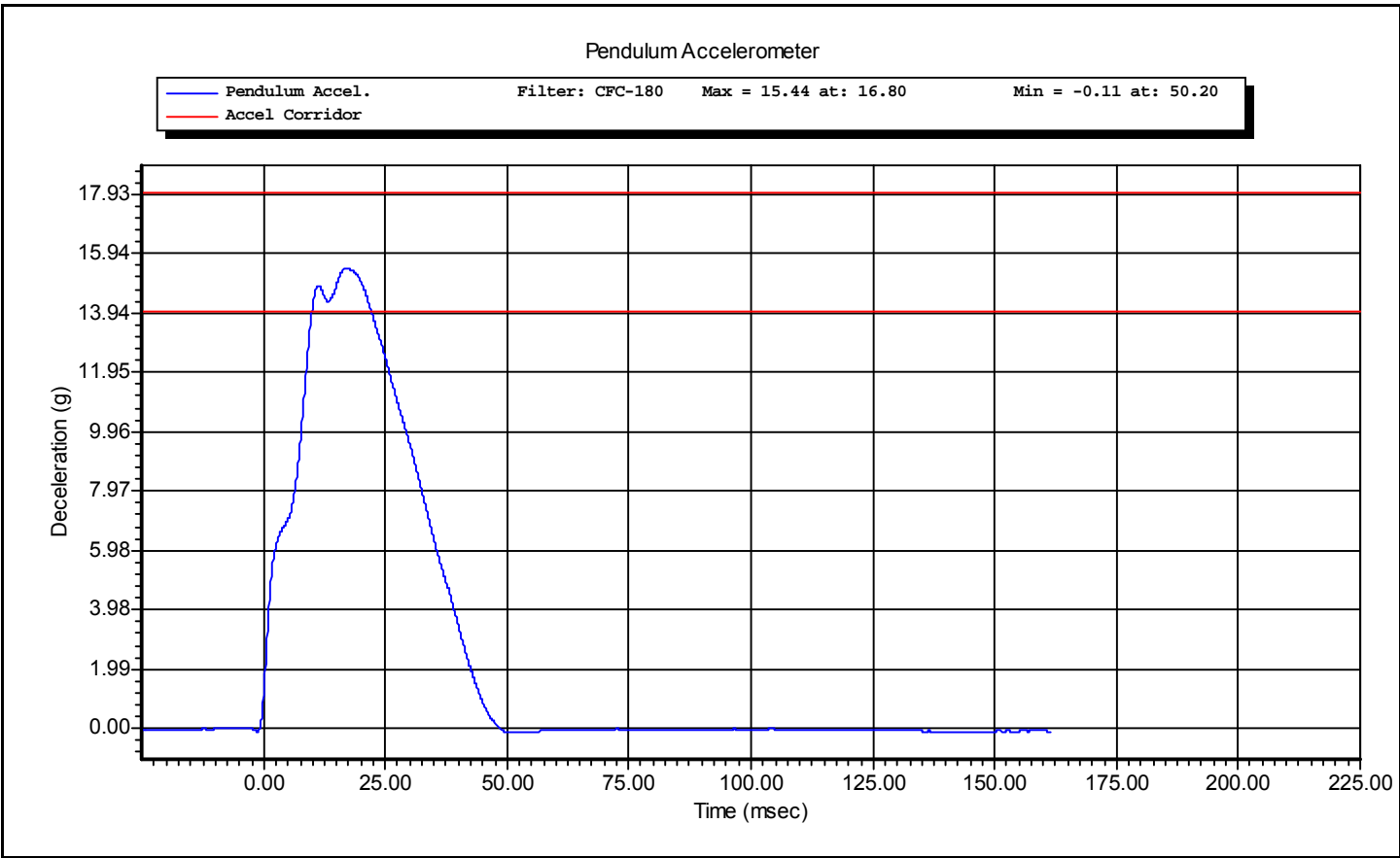
www.calspan.com

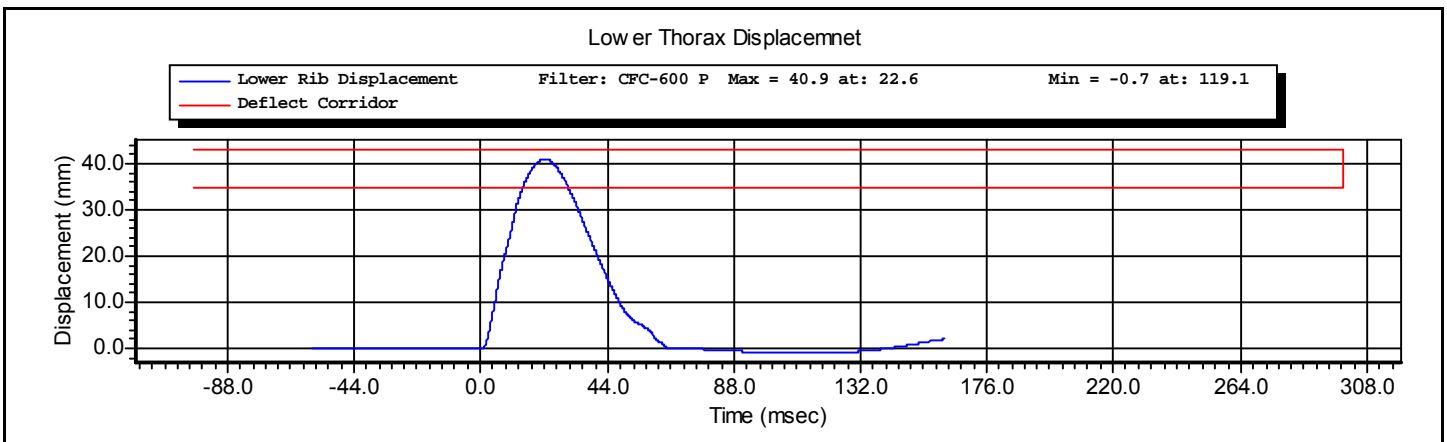
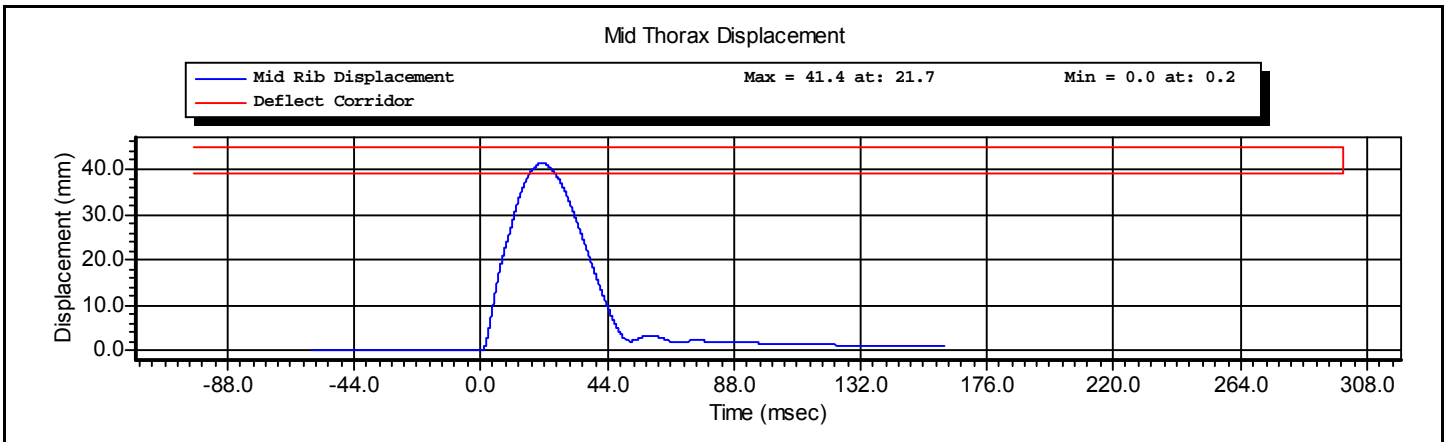
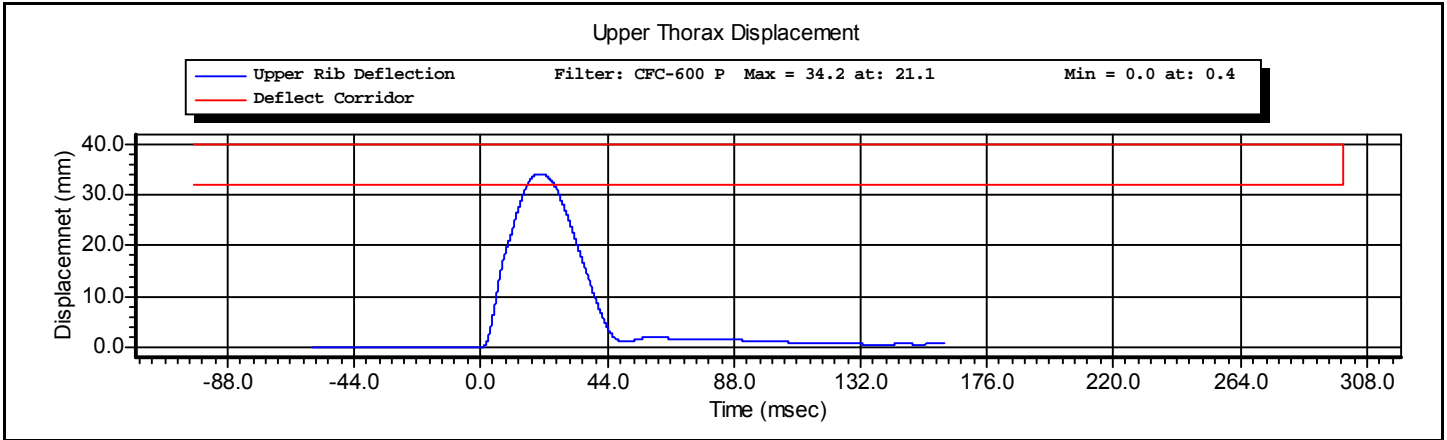
Calspan - Transportation Research Group

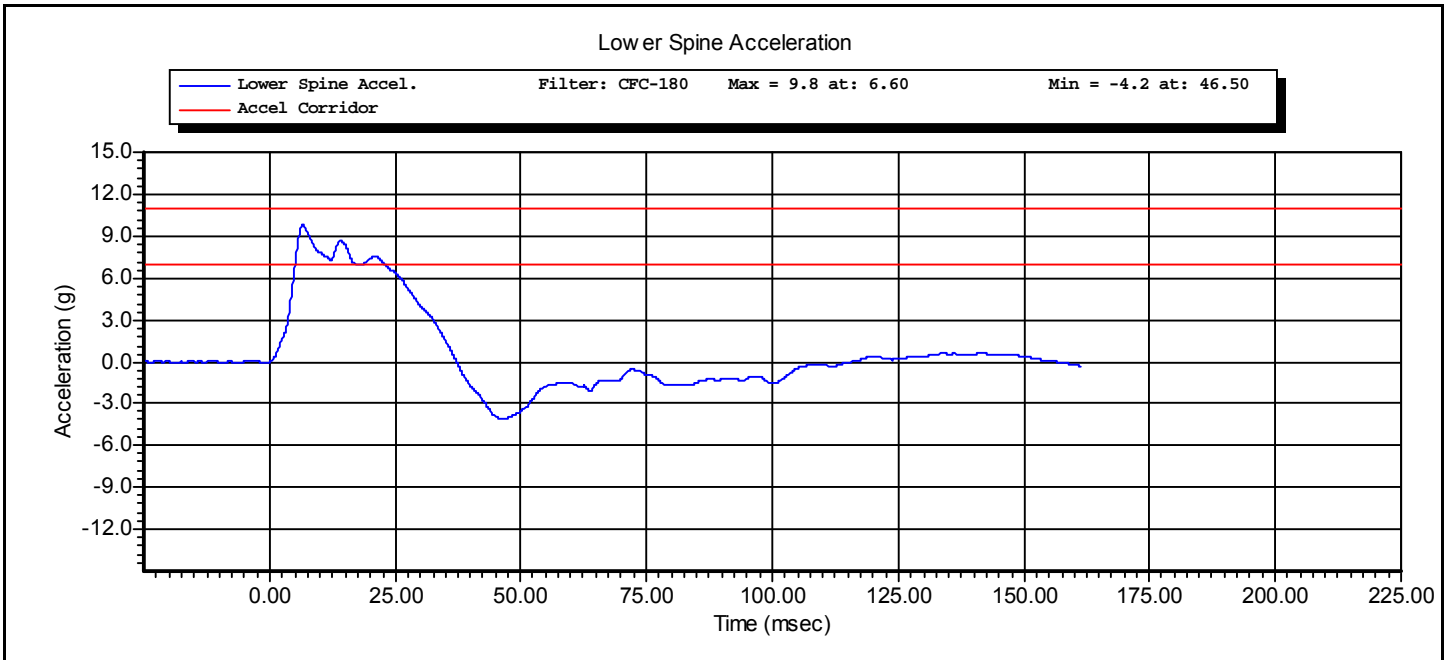
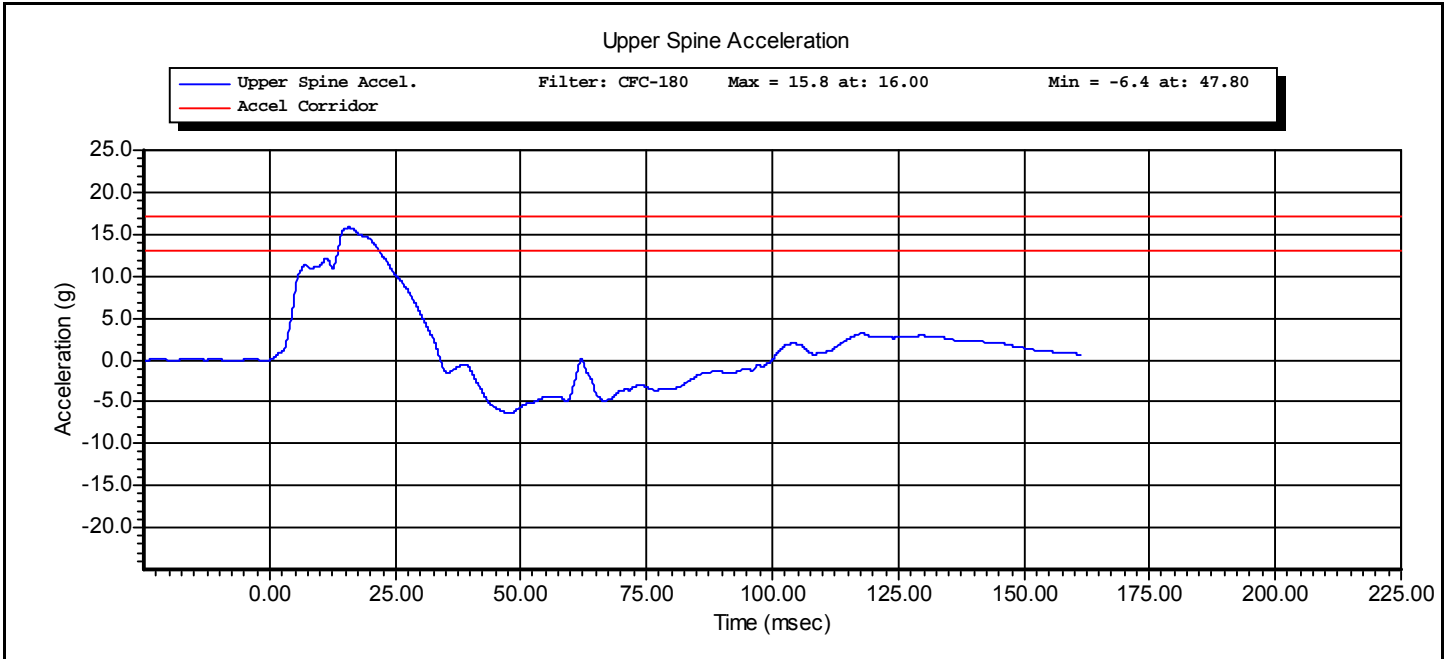
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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

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









www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

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

All test parameters are within specifications

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

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

Test ID: **Abdomen**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Abdomen**

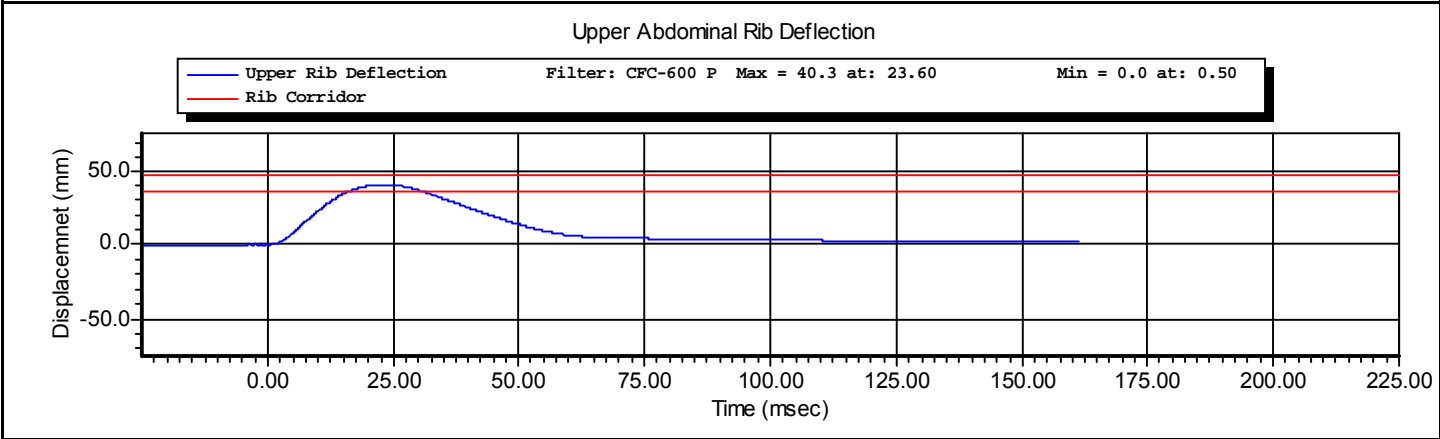
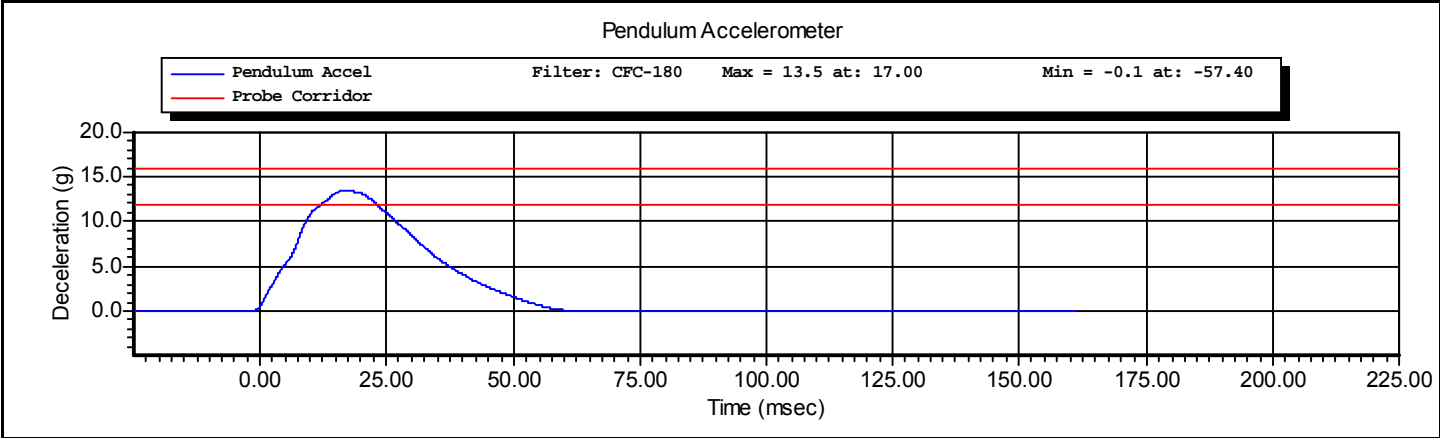
Test Time: **2:12:50 PM**

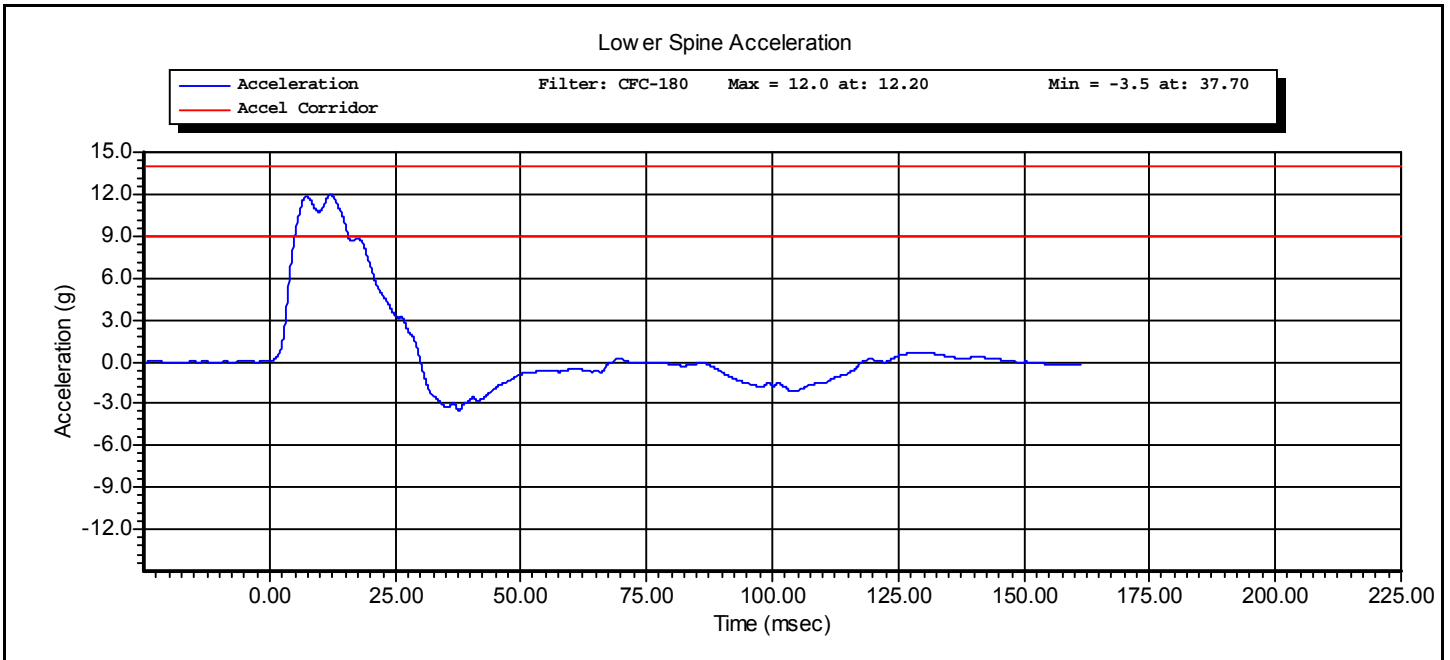
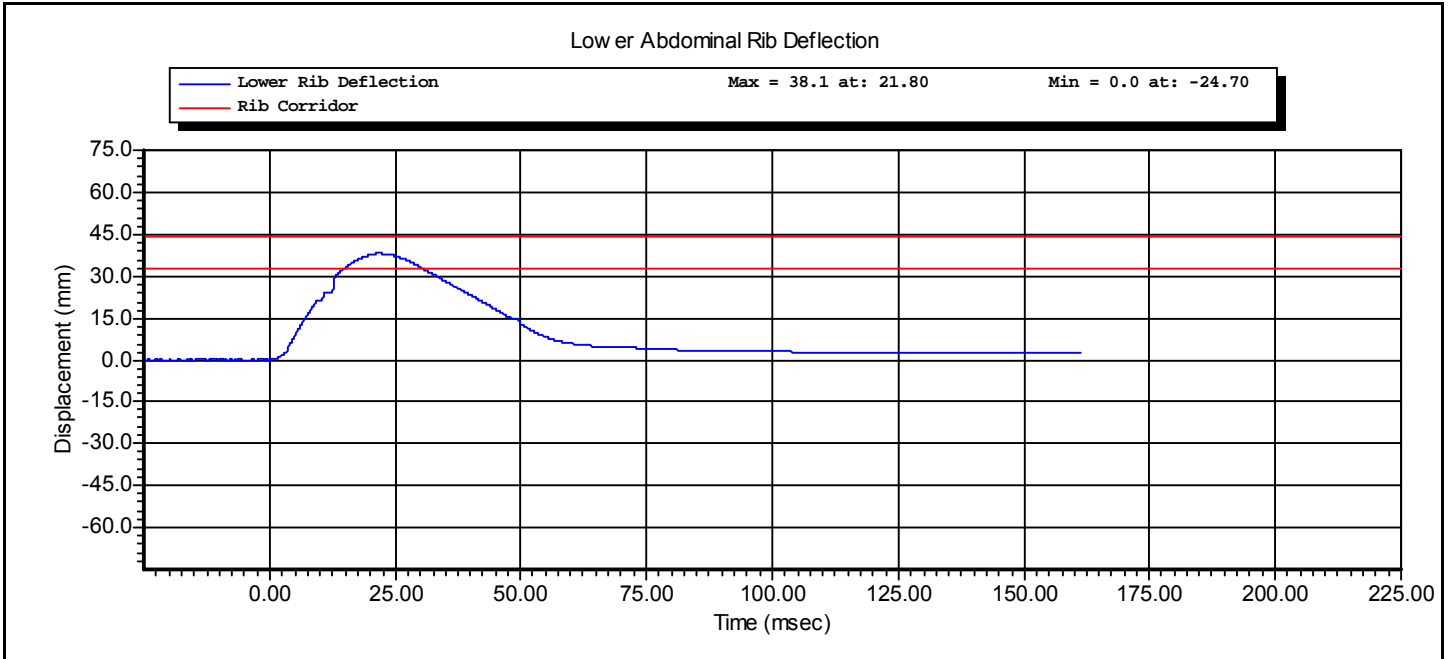
Test Date: **7/28/2010**



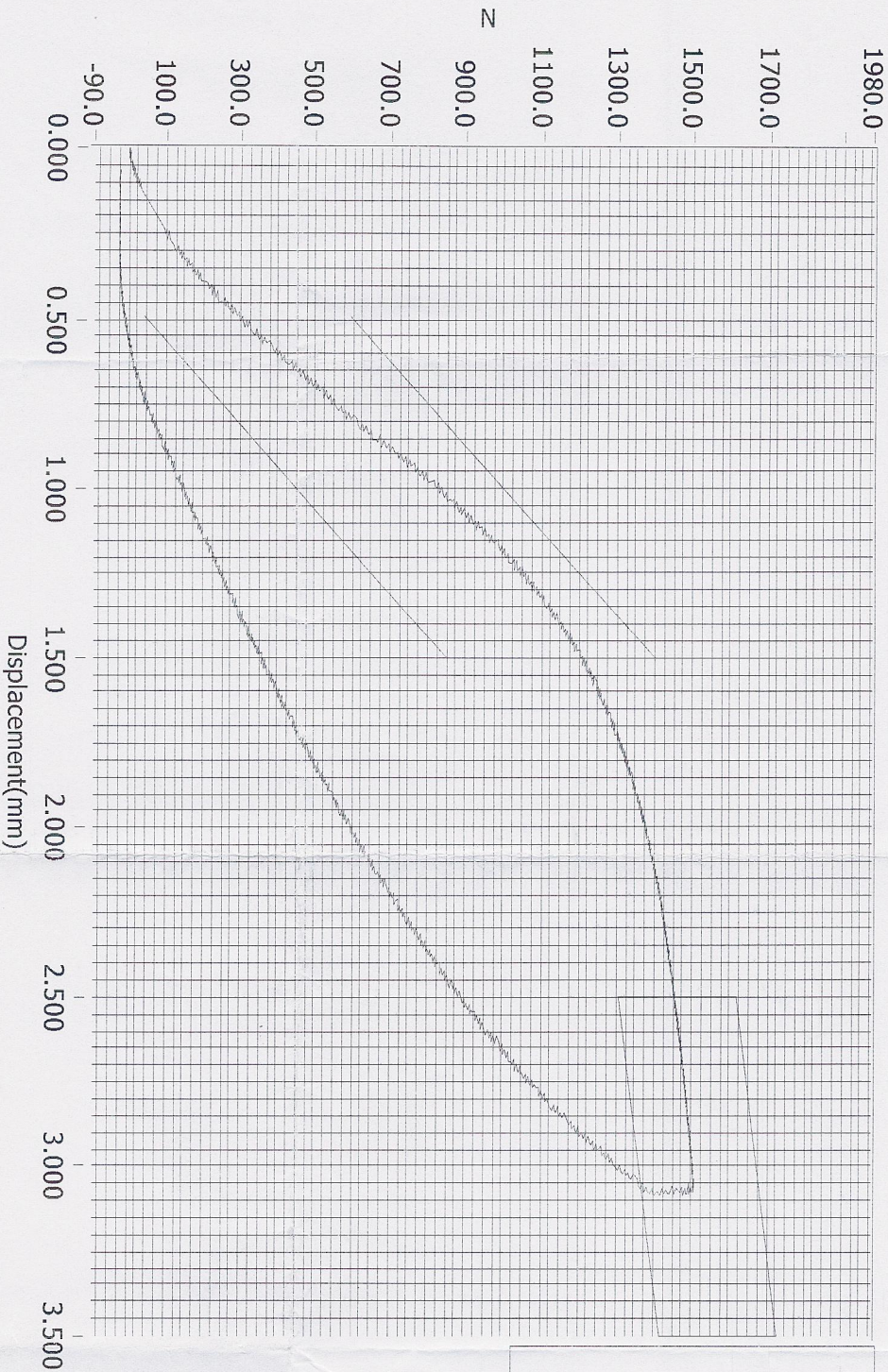
Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	7/28/2010
Test Number:	2	Test Time:	2:12:50 PM

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





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

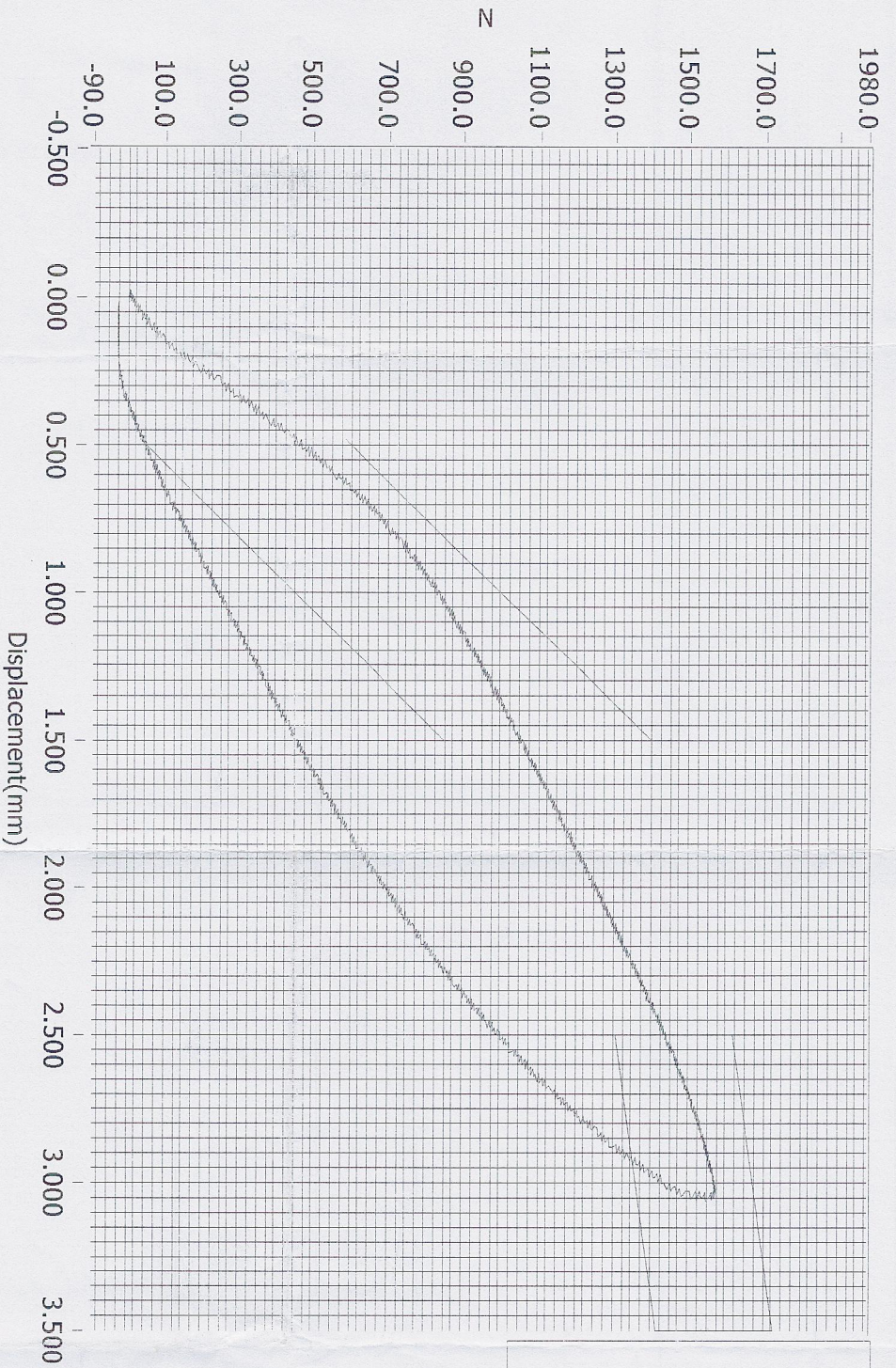
<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	12287	SIDIIs	

Current Date : 7/6/2007

Current Time : 08:13:17

C

Resultant Data - SIDIIS Plug Compression



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

ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
		8/30/2007	4:44 AM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	13972	SIDIIS	

Current Date : 8/30/2007

Current Time : 04:46:05

F S



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

Comments:

Pelvis Plug Used For Certification:
 FTSS S/N 12287
 Force @ 3mm = 1504N

Pelvis Plug Used For Full Scale Test:
 FTSS S/N 13972
 Force @ 3mm = 1568N

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

All test parameters are within specifications

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

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

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

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

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



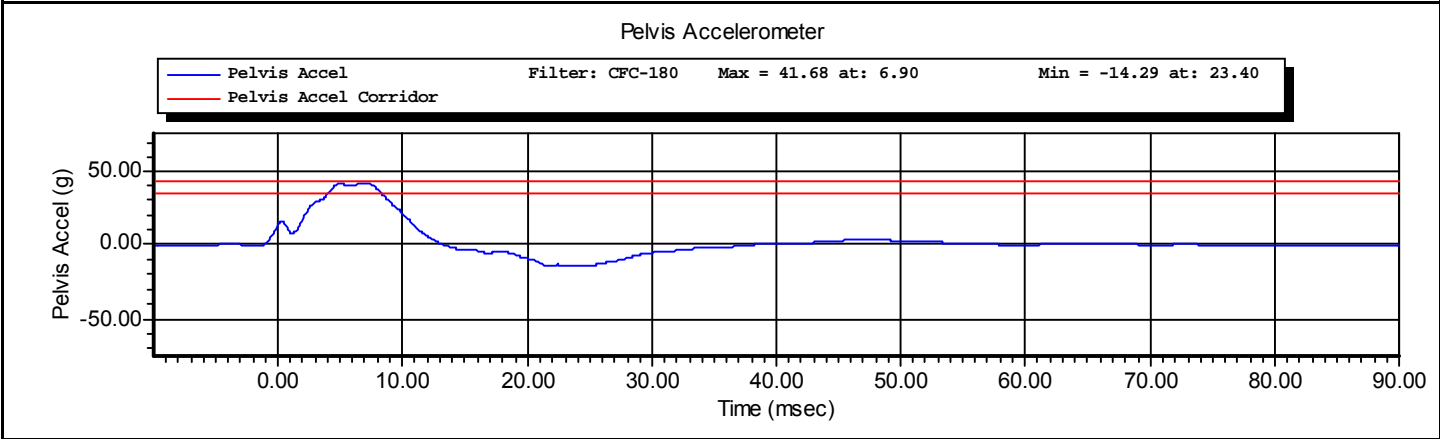
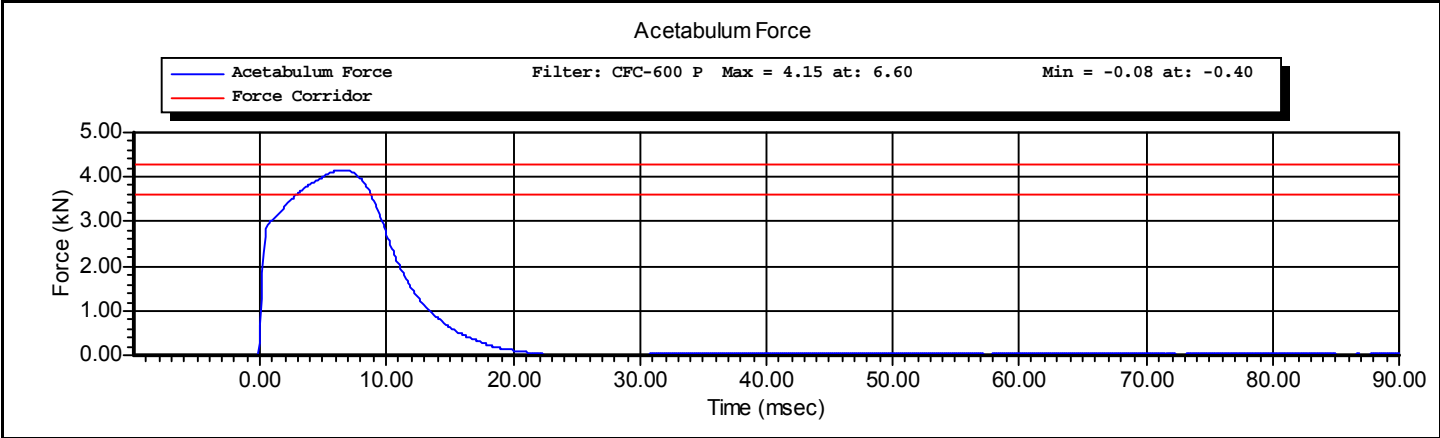
www.calspan.com

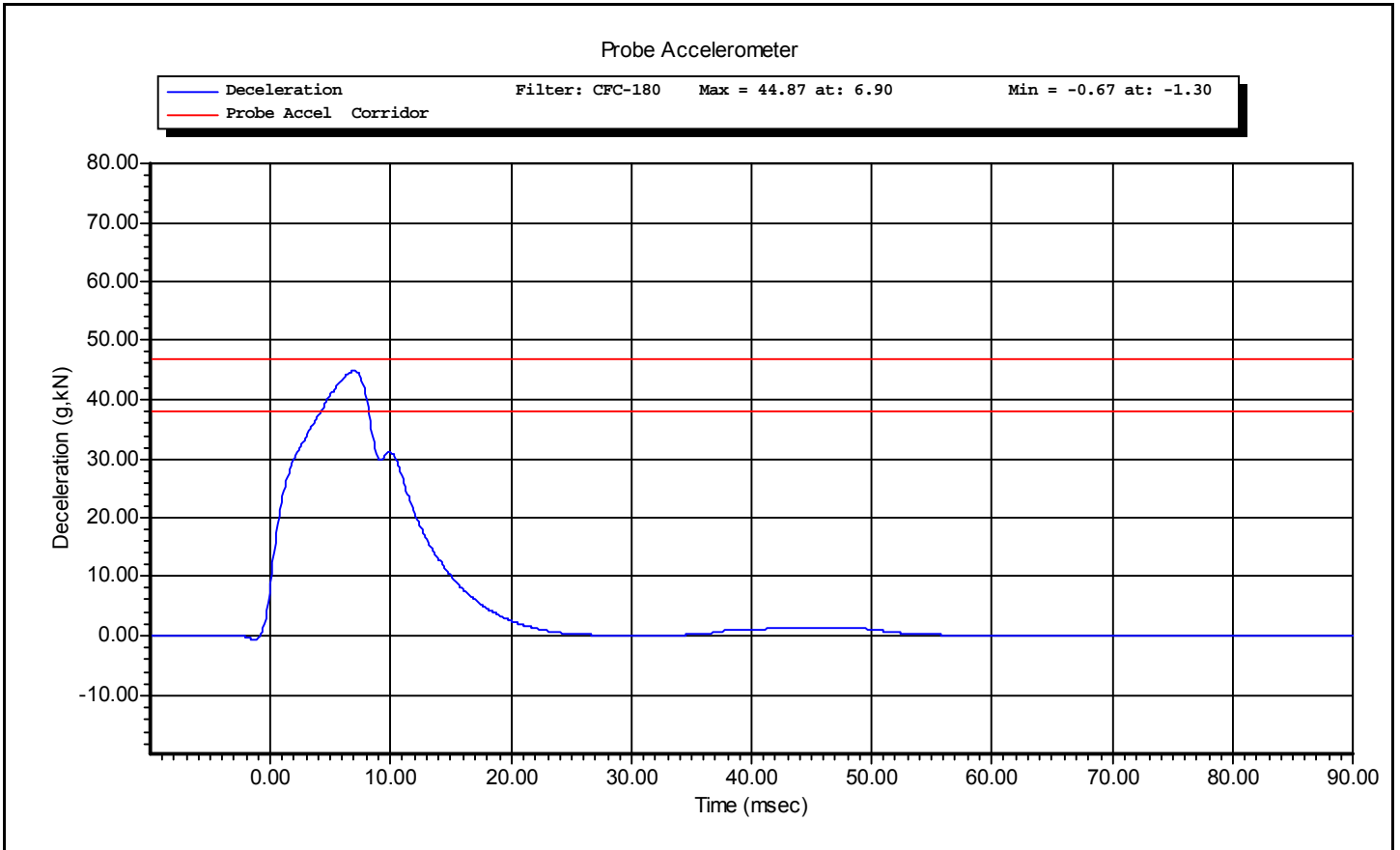
Calspan - Transportation Research Group

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

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

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







www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

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

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

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

All test parameters are within specifications

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

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

Test ID: **Iliac Pelvis**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Iliac Pelvis**

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

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



www.calspan.com

Calspan - Transportation Research Group

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

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

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

