

REPORT NUMBER: SPNCAP-CAL-12-015

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

**CHRYSLER GROUP LLC
2012 Jeep Liberty Sport 4x2
Utility Vehicle**

NHTSA NUMBER: MC0336

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



February 14, 2012

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
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This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-09-D-00126.

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FINAL REPORT ACCEPTANCE BY OCWS:

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

COTR, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards
Date: _____

Technical Report Documentation Page

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				14. Sponsoring Agency Code NVS-111																												
15. Supplementary Notes																																
16. Abstract A 32.2 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2012 Jeep Liberty Sport 4x2 Utility Vehicle in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. This test was conducted at the Calspan Corporation Crash Test Facility in Buffalo, New York, on 12/5/2011. The impact velocity was 32.41 km/h, and the ambient temperature at the struck (driver's) side of the vehicle was 10°C. The test vehicle post-test maximum crush was 433 mm at level 2. The test vehicle's occupant performance is as follows:																																
		<table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>1,821.81</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>88.72</td> </tr> <tr> <td>Total Pelvic Force</td> <td>N</td> <td>5525</td> <td>5,060.75</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>31.67</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45</td> <td>56.20</td> </tr> </tbody> </table>				Measurement Description	Driver ATD (SID-IIs)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	1,821.81	Resultant Lower Spine Acceleration	Gs	82	88.72	Total Pelvic Force	N	5525	5,060.75	Maximum Thoracic Rib Deflection	mm	38	31.67	Maximum Abdomen Rib Deflection	mm	45	56.20
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The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.																																
17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs				18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, 1200 New Jersey Ave. SE Washington, D.C. 20590																												
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SECTION 1 PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the MY 2012 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00126. The purpose of this test is to generate comparative side impact performance in a 2012 Jeep Liberty Sport 4x2 Utility Vehicle manufactured by Chrysler Group LLC. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated August 2011.

SECTION 2 SUMMARY OF NCAP SIDE IMPACT TEST

A rigid pole side test was conducted on a 2012 Jeep Liberty Sport 4x2 Utility Vehicle. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.41 km/h. The test was conducted by Calspan Corporation Transportation Research Group on 12/5/2011. Pre-test and post test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated August 2011. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) Dummy was instrumented accordingly:

- Head CG Triaxial Accelerometers
- Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
- Abdomen Upper and Lower Rib Displacement Potentiometers
- Lower Spine Triaxial Accelerometers
- Illiic Load Cell
- Acetabulum Load Cell

Appendix B contains the dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report.

The following table summarizes the results of the test:

Measurement Description	Driver ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	1,821.81
Resultant Lower Spine Acceleration	Gs	82	88.72
Total Pelvic Force	N	5525	5,060.75
Maximum Thoracic Rib Deflection	mm	38	31.67
Maximum Abdomen Rib Deflection	mm	45	56.20

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1	
	Mounted	Deployed
Frontal Airbag	Yes	No
Knee Airbag	No	No
Curtain Airbag	Yes	Yes
Seat Belt Pretensioner	Yes	Yes
Seat Belt Load Limiter	Yes	Yes

GENERAL COMMENTS:

1. Time zero flash in videos is delayed by 5 ms due to the placement of the contact strip and the vehicle's contour. The video frame counter correctly shows the actual time zero at frame count zero.
2. Camera No. 10 does not have a time stamp due to an internal malfunction. This camera needs to be sent back to the manufacturer after NCAP testing to be fixed.

**SECTION 3
OCCUPANT AND VEHICLE INFORMATION**

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

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC0336	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Jeep	Automatic Door Locks (ADL)	Yes
Model	Liberty Sport 4x2	Power Window Auto-Reverse	No
Body Style	Utility Vehicle	Other Optional Feature	--
VIN	1C4PJLAK0CW109122	Driver Front Airbag	Yes
Body Color	Charcoal gray	Driver Curtain Airbag	Yes
Odometer Reading	163 / 101	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.7	Driver Torso Airbag	No
Type/No. Cylinders	V6	Driver Torso/Pelvis Airbag	No
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	4-Speed	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Front Wheel Drive	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioners	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioners	No
Power Seats	No	Driver Load Limiters	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiters	No
All-Wheel Drive (AWD)	No	Other Safety Restraint	No

Does owner's manual provide instructions to turn off automatic door locks? No

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler Group LLC	GVWR (kg)	2,541
Date of Manufacture	8/11	GAWR Front (kg)	1,248
Vehicle Type	Liberty Sport 4x2	GAWR Rear (kg)	1,452

VEHICLE SEATING AND WEIGHT CAPACITY DATA

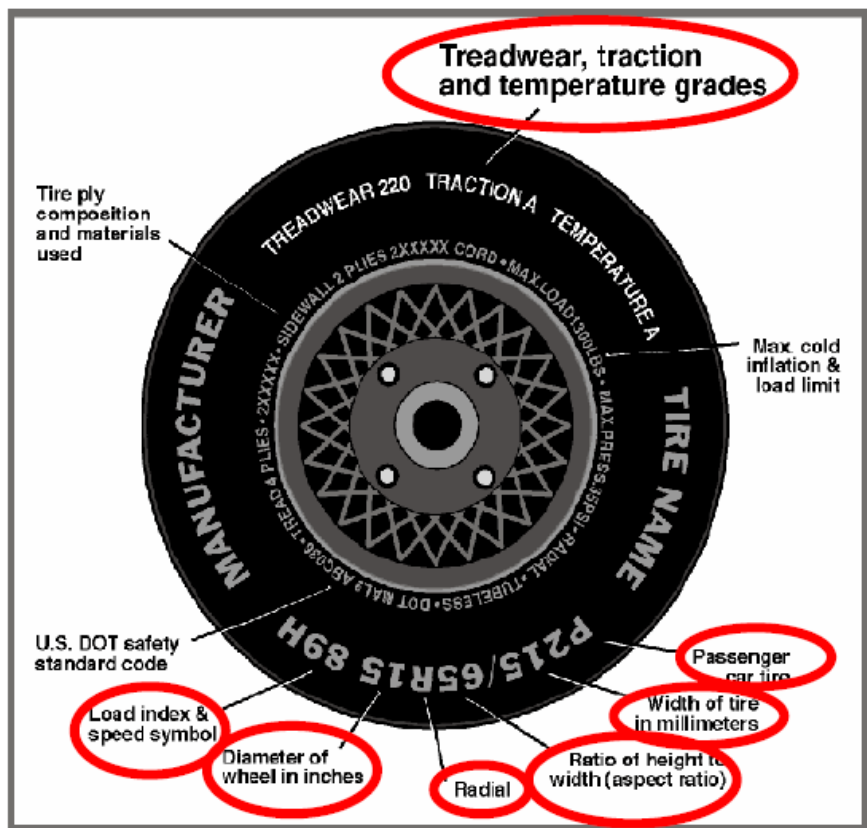
	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Vehicle Capacity Weight (VCW) (kg)				430.0	(A)
DSC X 68.04 kg				340.2	(B)
Rated Cargo and Luggage Weight (RCLW)				89.8*	(A-B)

VEHICLE SEAT TYPE

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

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

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	228	228
Recommended Tire Size	P225/75R16	P225/75R16

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure	300	300
Tire Size on Vehicle	P225/75R16	P225/75R16
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Wrangler ST	Wrangler ST
Tire Type	Passenger	Passenger
Tire Width (mm)	225	225
Aspect Ratio	75	75
Radial	Yes	Yes
Wheel Diameter (mm)	744	744
Load Index/Speed Symbol	101S	101S
Treadwear	640	640
Traction Grade	B	B
Temperature Grade	B	B
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	228	228	228	228
Tire Placard	kPa	228	228	228	228
Owner's Manual	kPa	228	228	228	228
As Tested	kPa	228	228	228	228

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	478	449.5		482	512		488.5	517	
Right	kg	440	428		443	484		442.5	485.5	
Ratio	%	51	49		48	52		48	52	
Total	kg	918	877.5	1,795.5	925	996	1,921	931	1,002	1,933

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1,795.5	(A)
Actual Weight of 1 P572V ATD (SID-ILs) Dummy	kg	44.1	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	89.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1,929.4	(A+B+C)

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e., Calculated Test Vehicle Target Weight – 4.5 kg to - 9 kg)? YES NO

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast (if any)	57.0

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	Deg.	-0.8	-0.6	-0.6	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg.	-0.6	-0.3	-0.3	Yes
Front Bumper Angle (left-to-right)**	Deg.	-0.1	-0.2	-0.2	Yes
Rear Bumper Angle (left-to-right)**	Deg.	-0.3	-0.3	-0.3	Yes
Vehicle CG (Aft of Front Axle)	mm	1,318	1,398	1,398	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	26	27	32	

*ND=Nose Down (-), NU=Nose Up (+)

** LD=Left Down (-), LU=Left Up (+)

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for Meets Requirement"

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

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011

SEAT POSITIONING

The driver's seat, front seat center (if applicable), and right front passenger's seat should be set to the forward-most, mid-height, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	-	No Angle Adjustment	-
Front Passenger Seat	-	No Angle Adjustment	-
Front Center Seat*			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed

*if applicable

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward -Most
Driver Seat	No Height or Angle Adjustment		Max			
			Mid			
			Min			
Front Passenger Seat	No Height or Angle Adjustment		Max			
			Mid			
			Min			
Front Center Seat*	N/A	N/A	Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Non-Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Rear Center Seat*	Fixed	Fixed	Max			
			Mid			
			Min			

*if applicable

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

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011

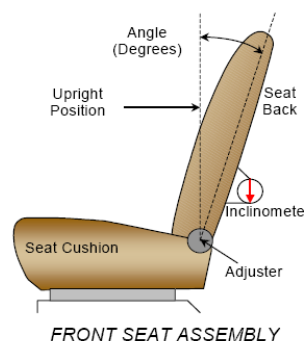
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detents*
Driver Seat	230	0 to 23	40	4
Front Passenger Seat	230	0 to 23	40	4
Front Center Seat*				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear	Fixed	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed	Fixed

*if applicable

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck-side rear passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1 for the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back is set to match the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/Seated	3 to 25	-	6.4	-
Front Passenger Seat	3 to 25	-	6.4	-
Front Center Seat*				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed	Fixed

*if applicable

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. For this test position four is the lowermost position.

	Total # of Positions	Placed in Position #
Driver Seat	5	4

HEAD RESTRAINT ADJUSTMENT

Head restraints are adjusted to the lowest and most full forward in-use position.

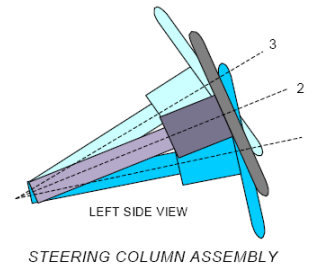
	Total # of Positions	Placed in Position #
Driver Seat	5	4

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

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel geometric locus it describes when it moves through its full range of motion.

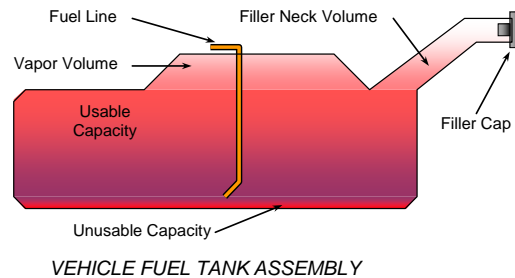


	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	69.9	
Geometric Center, Position No. 2	66.8	
Uppermost, Position No. 3	63.6	
Telescoping Steering Wheel Travel		N/A
Test Position	66.8	

FUEL PUMP

Describe the fuel pump type, details about how it operates, and the location of the fuel filler neck.

The electric fuel pump operates with the ignition in the 'on' position and the engine running. The fuel filler neck is located above the left rear wheel well.



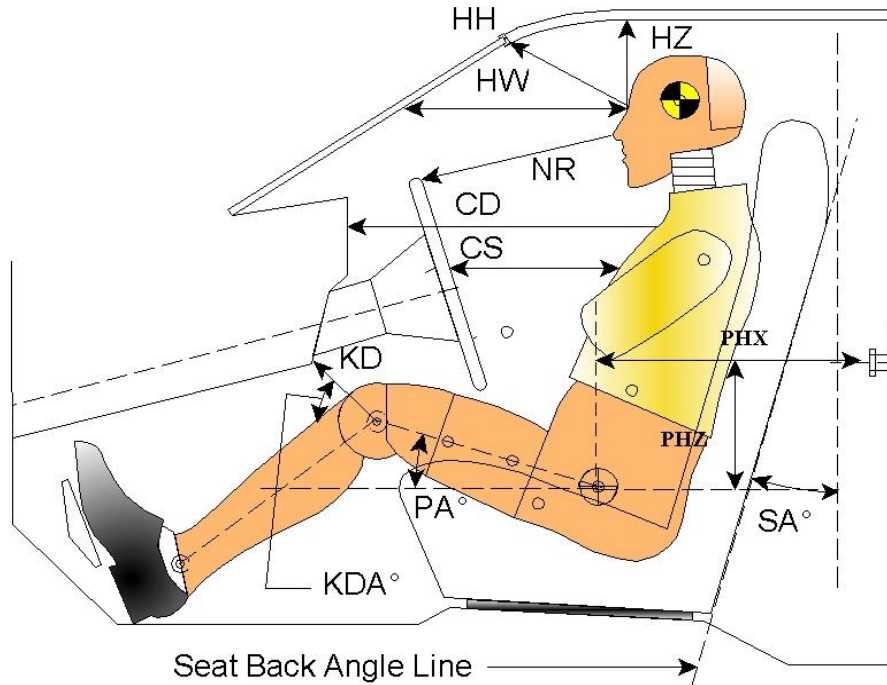
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	73.8
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of Standard Tank (see Owner's Manual)	73.8
Usable Capacity of Optional Tank (see Owner's Manual)	
93% of Usable Capacity	68.5
Actual Amount of Solvent Used in Test	68.5
1/3 of Usable Capacity	6.5

Is the Actual Amount of Solvent Used in the test equal to 93% ±1% of the Usable Capacity stated on Form No. 1? YES NO

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011

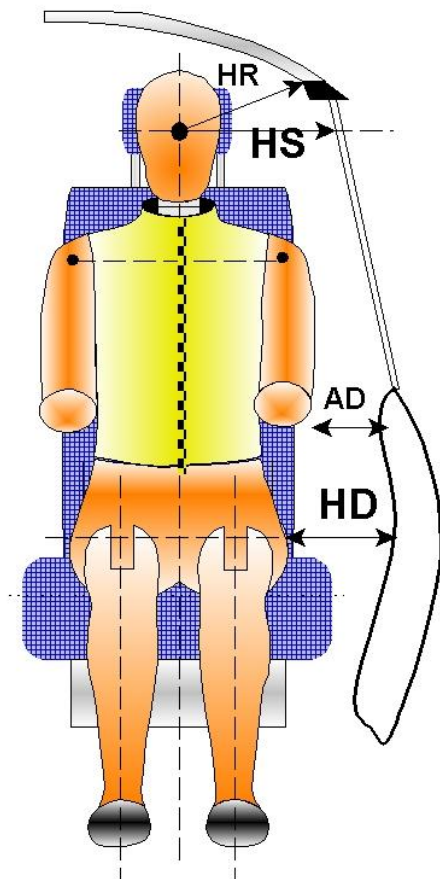


DUMMY ID# 8012

Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	317	
HW	Head to Windshield	472	
HZ	Head to Roof Liner	211	
NR	Nose to Rim	265	
CD	Chest to Dashboard	437	
CS	Chest to Steering Wheel	190	
KDL/KDAL°	Left Knee to Dash	79	19.6
KDR/KDAR°	Right Knee to Dash	79	19.2
PAX°	Pelvic Tilt Angle (X-Axis)		20.1
PAY°	Pelvic Tilt Angle (Y-Axis)		0.4
PHX	Hip Point to Striker (X-Axis)	347	
PHZ	Hip Point to Striker (Z-Axis)	99	

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

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011

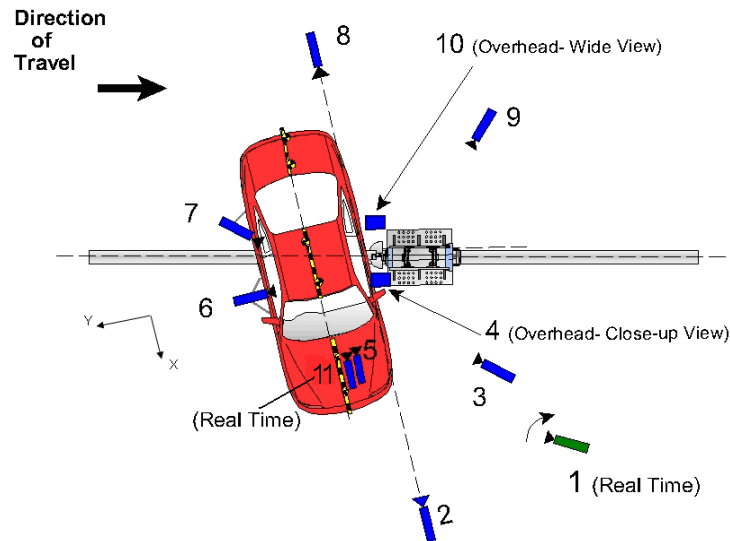


DUMMY ID# 8012

Code	Measurement Description	Length (mm)
HR	Head To Side Header	243
HS	Head to Side Window	380
AD	Arm to Door	125
HD	Hip Point to Door	138

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date 12/5/2011



REFERENCE (from Point of Impact for X and Y; from Ground for Z):
 + X = Forward of vehicle, + Y = Right of vehicle, + Z = Down

Camera No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real time (24-30 fps) pan view of impact				zoom	30
2	Front ground level - impact view	1909	6162	968	24	1000
3	Impact side 45° - forward pole view	2472	2171	1610	24	1000
4	Overhead Close-up view of impact	0	0	5150	28	1000
5	Onboard – dummy front view				12.5	500
6	Onboard – dummy side view				12.5	500
7	Onboard – dummy rear oblique view				12.5	500
8	Rear ground level – impact view	1814	-6707	1038	24	1000
9	Impact side 45° - rearward pole view	2924	-3439	1396	24	1000
10	Overhead wide-view of impact	300	0	5150	14	1000
11	Real-time (24-30 fps) – dummy front view				zoom	30

* All measurements accurate to ± 6 mm.

NOTE: Vehicle is at a 75° angle to the rigid pole.

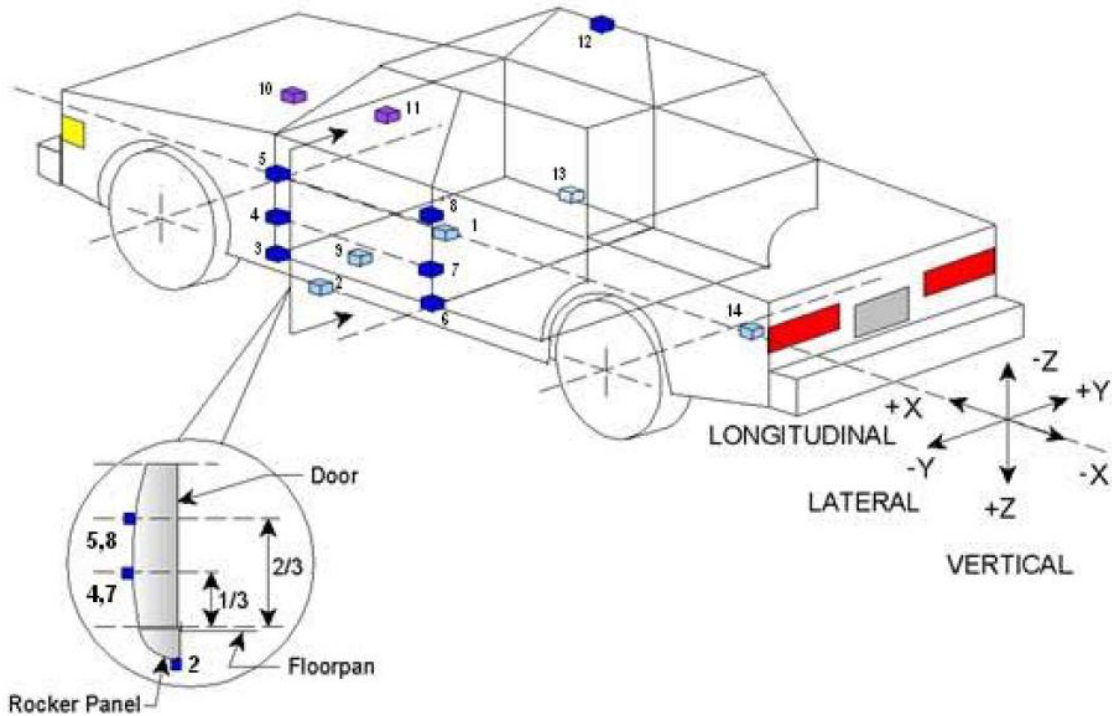
If applicable, explain why camera(s) did not operate as intended: Time zero flash in videos is delayed by 5 ms due to the placement of the contact strip and vehicle contour. The frame counter correctly shows the actual time zero at frame count zero.

INSTRUMENTATION

	Number of Channels
Driver Dummy	16
Vehicle Structure	18
Pole Load Cells	6
TOTAL	40

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

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011



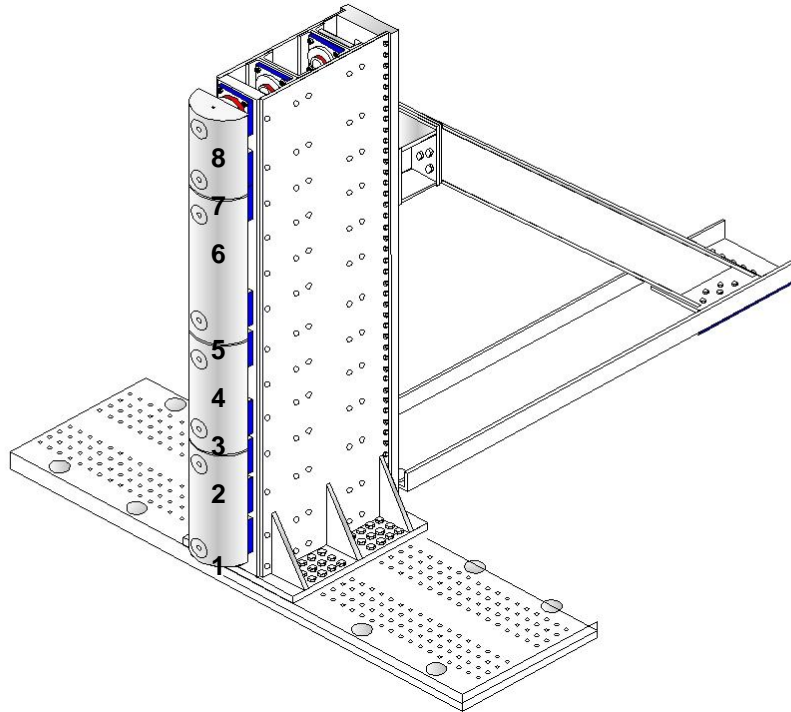
	Accelerometer/Sensor Location			
	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2,597	-29	801
2	Left Floor Sill	2,812	-620	478
3	A Pillar Sill	3,059	-623	483
4	A Pillar Low	3,059	-630	666
5	A Pillar Mid	2,901	-676	1,223
6	B Pillar Sill	2,035	-621	473
7	B Pillar Low	2,032	-666	573
8	B Pillar Mid	2,033	-667	1,083
9	Driver Seat Track	2,262	-538	593
10	Engine Top	3,709	-19	945
11	Firewall	3,389	3	1,100
12	Right Roof	2,166	537	1,758
13	Right Floor Sill	2,714	673	570
14	Rear Floorpan	675	97	721

Reference: X – Test Vehicle Rear Bumper (+ forward)
 Y – Test Vehicle Centerline (+ to right)
 Z – Ground Plane (+ down)

**DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA**

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011

FOIL 300K RIGID POLE



Load Cell Locations	
ID	Height From Ground (mm)
1	200
2	590
3	750
4	1075
5	1260
6	1740
7	1920
8	2300

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

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date 12/5/2011

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag and vehicles interior headliner
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag and Head rest
Left Shoulder	Driver's Side Door and Curtain Airbag
Upper Torso	Driver's Side Door
Lower Torso	Driver's Side Door
Left Hip	Driver's Side Door
Left Knee	Driver's Side Door

POST TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	N/A	N/A	N/A	N/A	
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	
Disengaged from Latched Position	No	No	No	No	
Latch Separated from Striker	No	No	No	No	
Jammed Shut	Yes	Yes	No	No	
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	

* Indicate "Yes", "No", or "N/A".

POST TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	NR	No	No	No
Seat Disengagement from Floor Pan	No	No	No	No
Seat Back Movement from Initial Position	NR	No	No	No
Seat Back Collapse	No	No	No	No

* Indicate "Yes", "No", or "N/A", or "NR" (Not Recoverable).

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Slight deformation along the A-Pillar
Sill Separation	None
Windshield Damage	Glass cracked along Driver's A-Pillar causing some separation between the windshield and vehicle
Side Window Damage	Driver's side window shattered during impact
Other Notable Effects	None

**DATA SHEET NO. 8 (CONTINUED)
POST-TEST OBSERVATIONS**

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date 12/5/2011

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

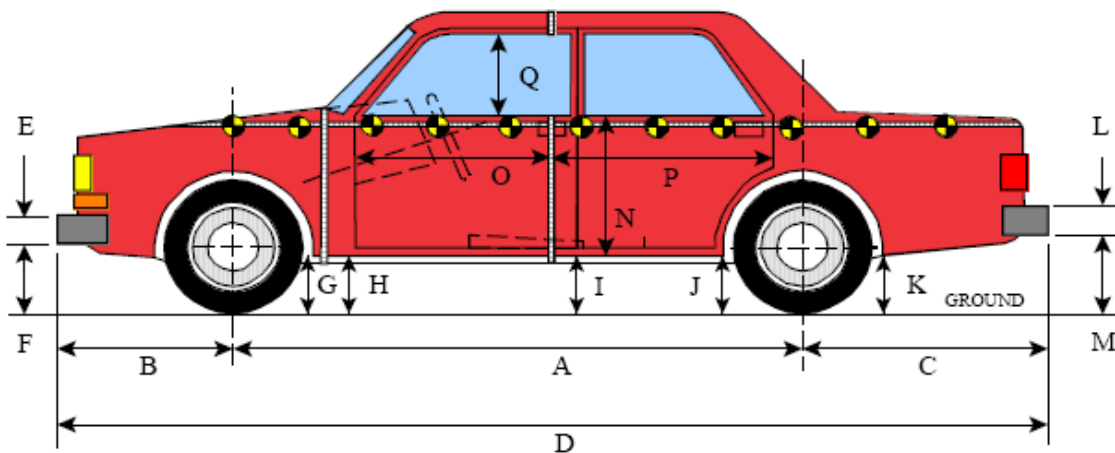
Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No	No		
Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	No
Seat Belt Load Limiter	Yes	Yes	No	No

VEHICLE SPEED, VEHICLE ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1244
Actual Impact Point (Aft of Front Axle)	mm		1222
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 of Intended Impact Point	22
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	75
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.4
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.4

**DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011



LEFT SIDE VIEW

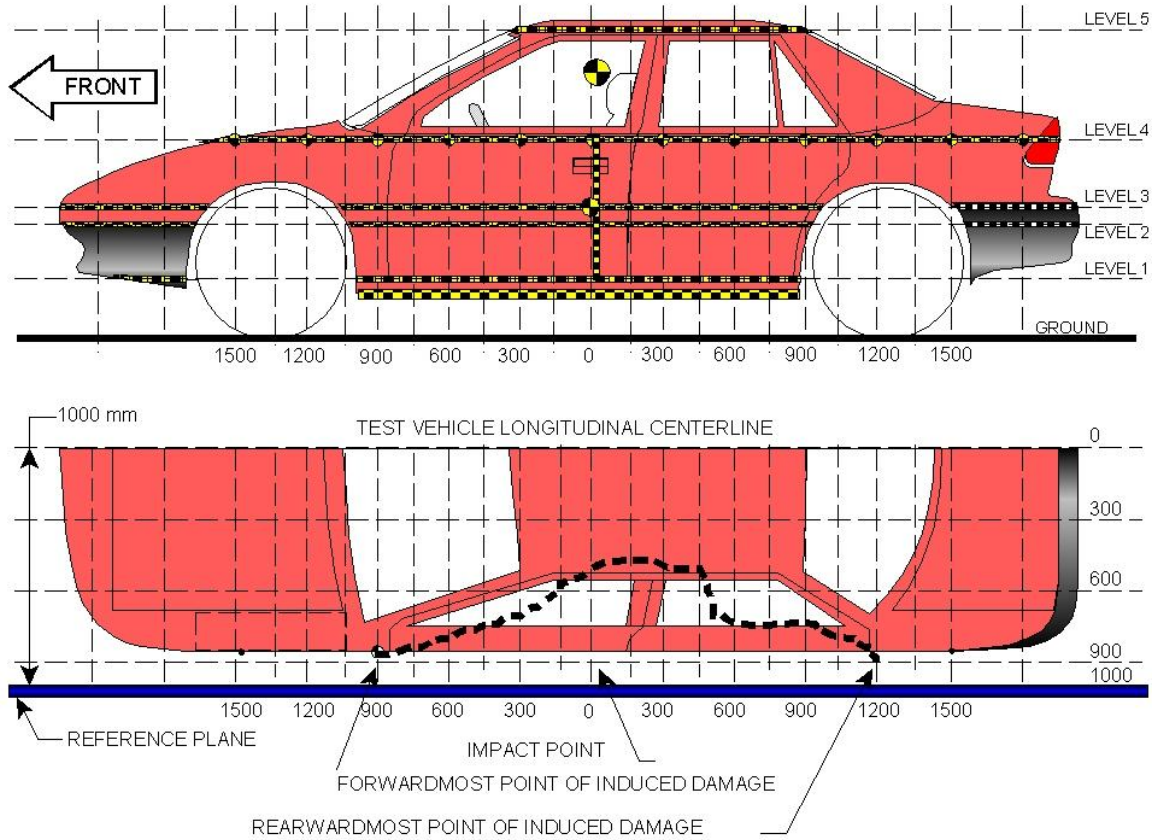
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Vehicle Wheelbase	2,696	2,684	-12
B	Front Axle to FSOV	748	730	-18
C	Rear Axle to RSOV	1,051	1,040	-11
D	Total Length at Centerline	4,496	4,454	-42
E	Front Bumper Thickness	120	120	0
F	Front Bumper Bottom to Ground	490	543	-53
G	Sill Height at Front Wheel Well	257	251	6
H	Sill Height at Front Door Leading	336	343	-7
I	Sill Height at B-Pillar	345	333	12
J1	Sill Height at Rear Wheel Well	346	356	-10
J2	Pinch Weld Height at Rear Wheel	341	346	-5
K	Sill Height Aft of Rear Wheel Well	375	398	-23
L	Rear Bumper Thickness	160	160	0
M	Rear Bumper Bottom to Ground	541	560	-19
N	Sill Height to Bottom of Front Window	751	744	-7
O	Front Door Leading Edge to Impact	615	481	-134
P	Rear Door Trailing Edge to Impact CL	1,360	1,224	-136
Q	Front Window Opening	479	485	6
R	Right Side Length	4,430	4,426	-4
S	Left Side Length	4,427	4,357	-70
T	Vehicle Width at B-Pillars	1,767	1,566	-201

**DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011



NOTE: All measurements are in millimeters (mm)

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	459	408	0
2	Occupant Hip Point	641	433	0
3	Mid-Door	817	416	0
4	Window Sill	1,138	382	0
5	Window Top	1,705	186	150

NOTE: The above measurements should be taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011

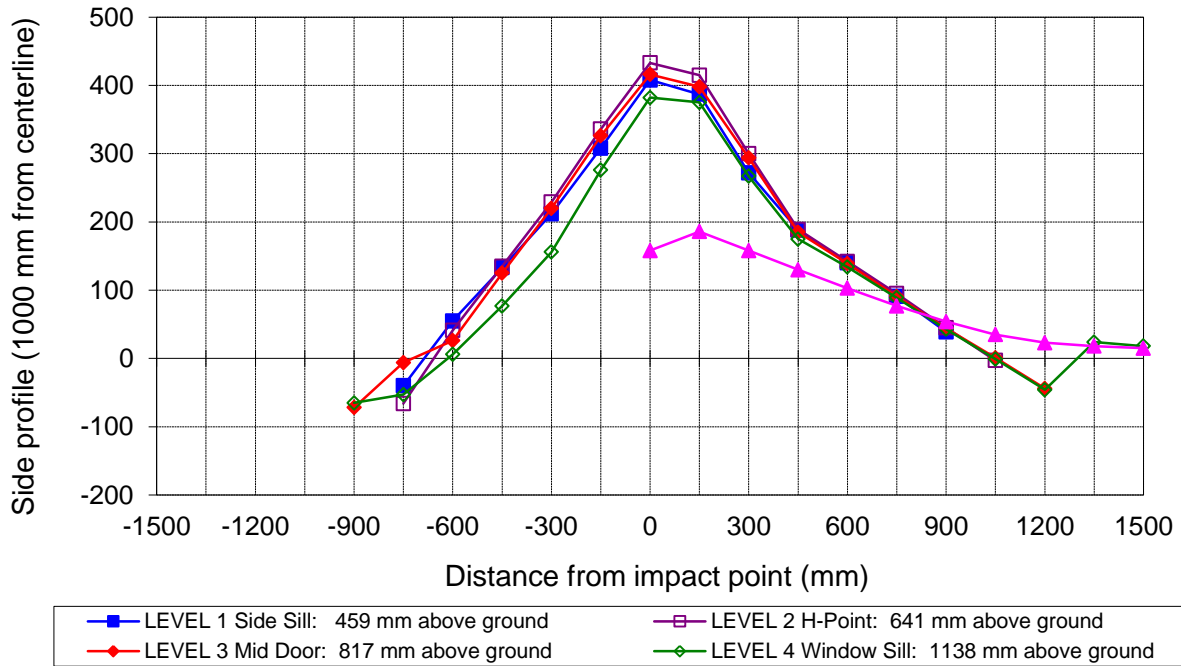
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500															
-1350															
-1200															
-1050															
-900			-905	-798				-977	-863				-72	-65	
-750	-870	-877	-840	-812		-910	-943	-846	-865		-40	-66	-6	-53	
-600	-833	-856	-847	-822		-778	-815	-821	-816		55	41	26	6	
-450	-840	-870	-854	-829		-707	-735	-729	-752		133	135	125	77	
-300	-846	-876	-860	-831		-634	-647	-640	-675		212	229	220	156	
-150	-851	-881	-865	-839		-543	-545	-539	-563		308	336	326	276	
0	-854	-886	-869	-846	-584	-446	-453	-453	-464	-426	408	433	416	382	158
150	-857	-889	-873	-850	-657	-470	-474	-475	-475	-471	387	415	398	375	186
300	-860	-892	-876	-855	-665	-588	-592	-582	-588	-507	272	300	294	267	158
450	-861	-886	-878	-857	-669	-673	-697	-693	-682	-539	188	189	185	175	130
600	-861	-894	-878	-860	-672	-721	-752	-739	-726	-569	140	142	139	134	103
750	-860	-895	-877	-860	-674	-769	-800	-786	-771	-597	91	95	91	89	77
900	-866	-884	-877	-859	-675	-827	-839	-833	-816	-621	39	45	44	43	54
1050		-902	-894	-858	-676		-905	-893	-859	-641		-3	1	-1	35
1200			-911	-856	-676			-955	-902	-653			-44	-46	23
1350				-851	-673				-827	-655				24	18
1500				-846	-672				-828	-657				18	15

NOTE: Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to test based on an estimated impact point. The final distance to impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy’s head.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date: 12/5/2011



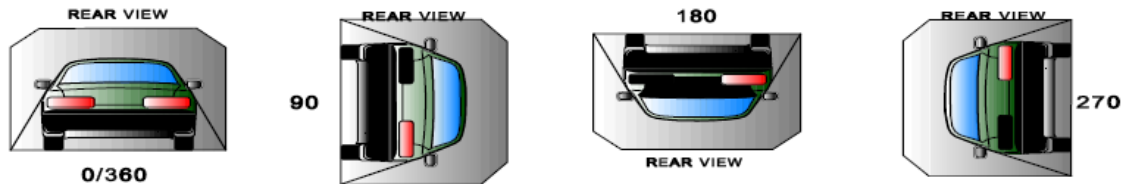
**DATA SHEET NO. 11
FMVSS NO. 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2012 Jeep Liberty Sport 4x2 NHTSA No: MC0336
 Test Program: Side Pole NCAP Test Date 12/5/2011

Test Time: 4:20 PM Temperature: 10°C

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

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0 to 90	69	300	369
90 to 180	65	300	365
180 to 270	65	300	365
270 to 360	70	300	370

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

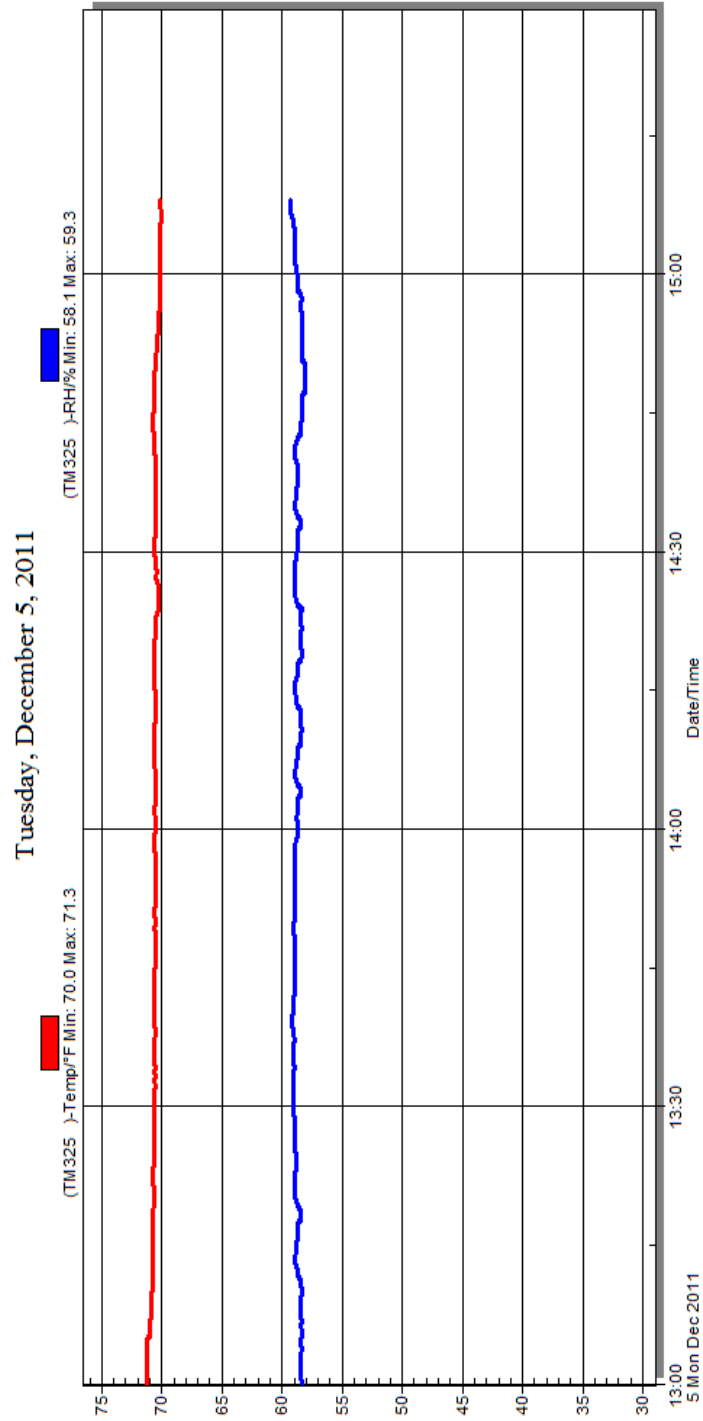
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0		
90 to 180	0	0		
180 to 270	0	0		
270 to 360	0	0		

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 12
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle:	2012 Jeep Liberty Sport 4x2	NHTSA No:	MC0336
Test Program:	Side Pole NCAP	Test Date	12/5/2011



**APPENDIX A
PHOTOGRAPHS**

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



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



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



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



Figure A-5: Pre-Test Left Front ¾ View of Test Vehicle



Figure A-6: Post-Test Left Front ¾ View 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 ¾ View of Test Vehicle



Figure A-10: Post-Test Left Rear ¾ View of Test Vehicle



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



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



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



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



Figure A-15: Pre-Test Overhead View of Test Area

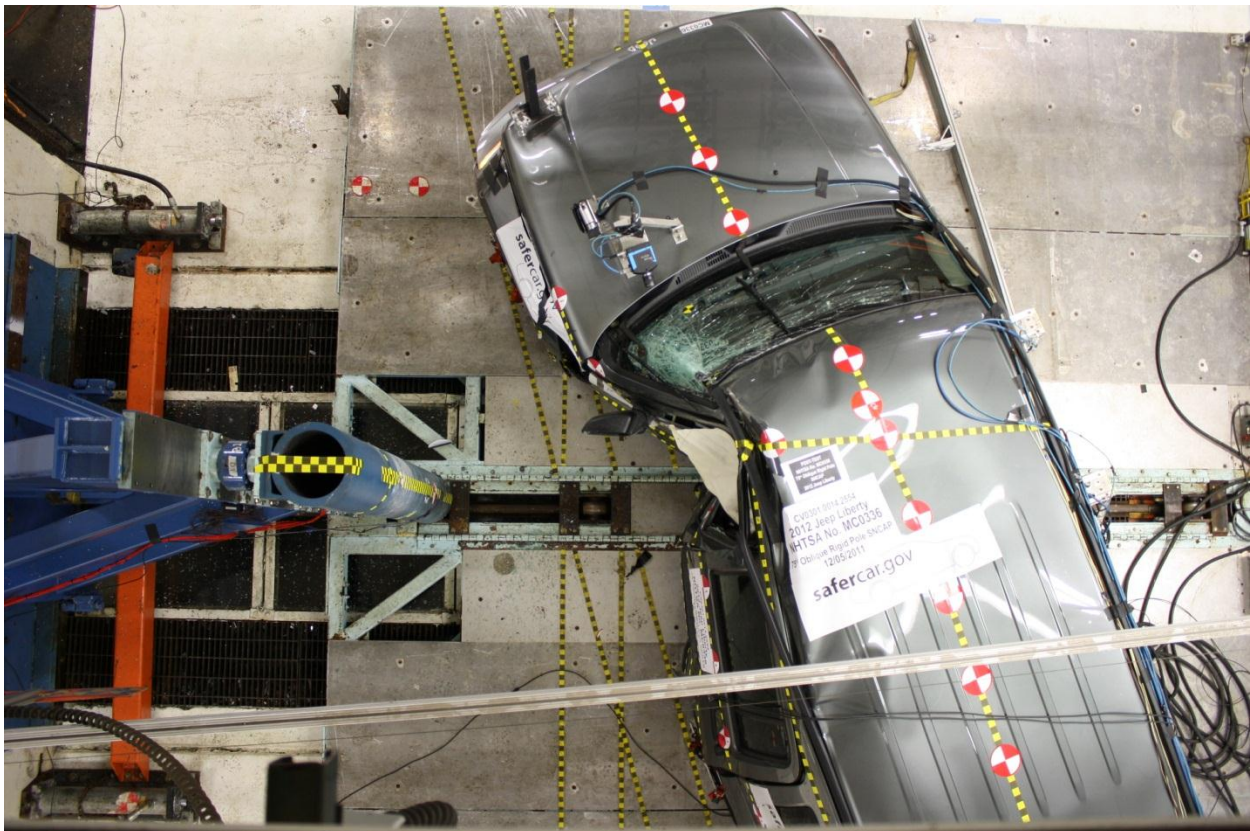


Figure A-16: Post-Test Overhead View of Test Area



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



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

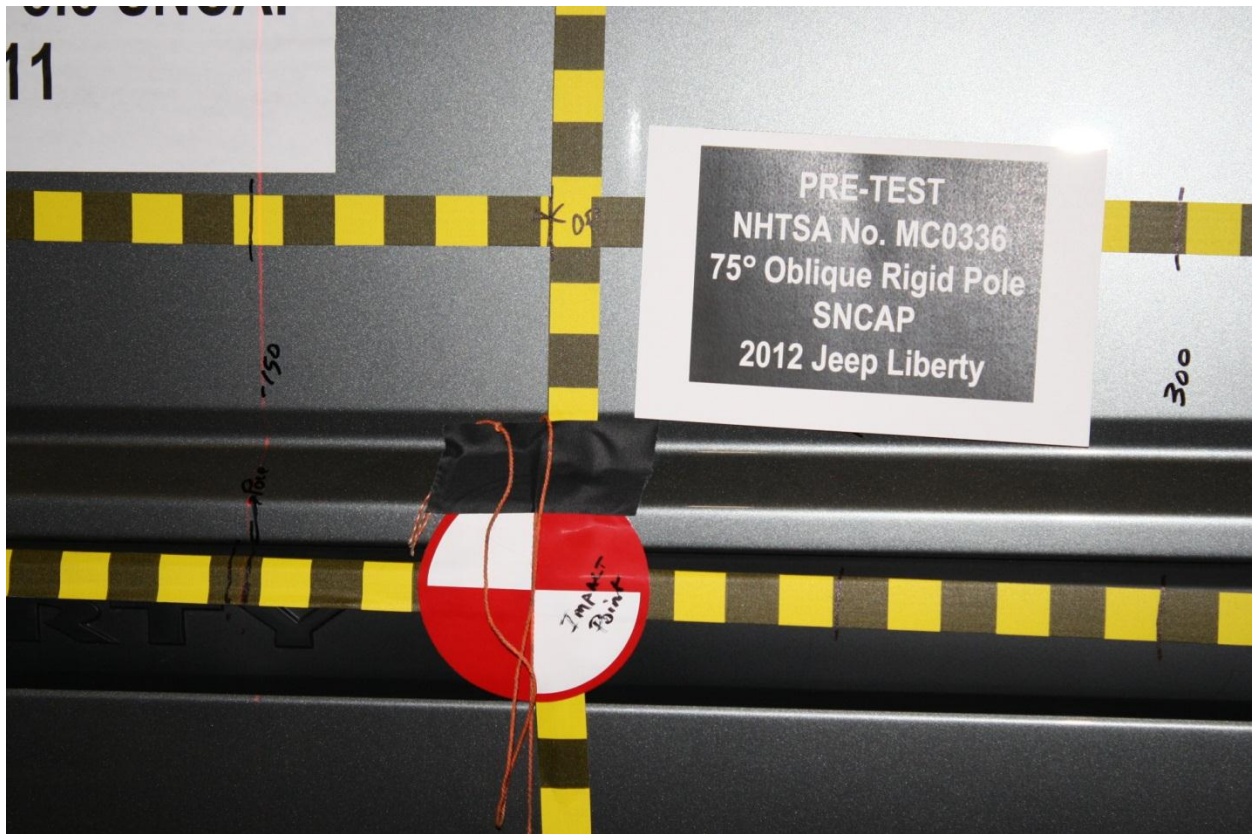


Figure A-19: Pre-Test Close-Up View of Impact Point Target



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



Figure A-21: Pre-Test Front Close-Up View of Dummy Head and Chest



Figure A-22: Post-Test Front Close-Up View of Dummy



Figure A-23. Pre-Test Left Side View of Dummy Showing Belt and Chalking



Figure A-24: Pre-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-25: Post-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-26: Pre-Test Front View of Seat Back Prior to Dummy Positioning



Figure A-27: Pre-Test Front Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint



Figure A-28: Pre-Test Front View of Seat Pan Prior to Dummy Positioning



Figure A-29: Pre-Test Overhead View of Dummy Thighs on Seat Pan



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



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



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



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



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

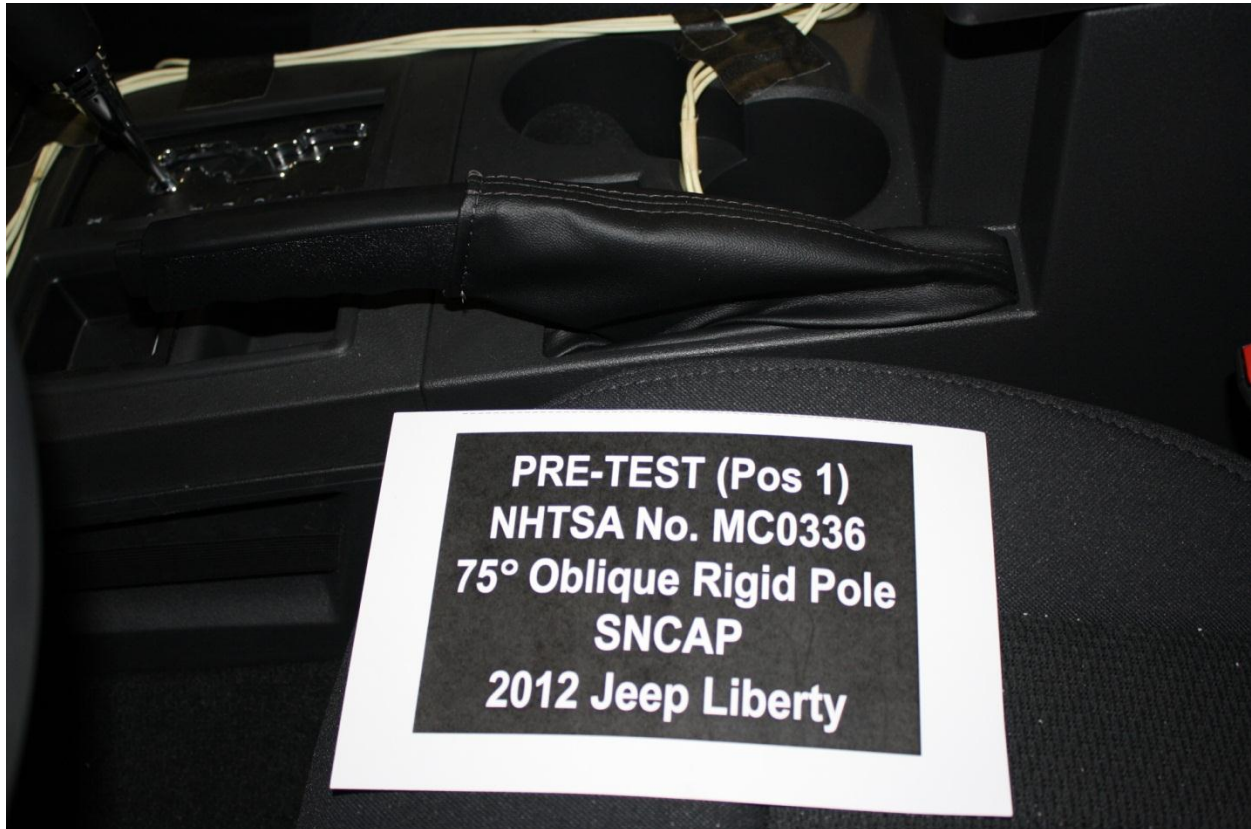


Figure A-35: Pre-Test View of Disengaged Parking Brake



Figure A-36: Pre-Test View of Parking Brake



Figure A-37: Pre-Test Close-Up Left Side View of Driver Seat Track



Figure A-38: Pre-Test Close-Up Left Side View of Driver Seat Back



Figure A-39: Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Figure A-40: Pre-Test Dummy and Door Clearance View



Figure A-41: Post-Test Dummy and Door Clearance View



Figure A-42: Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-43: Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-44: Post-Test Inner Door Panel View



Figure A-45: Post-Test Inner Door Panel View Showing Dummy Contact Location

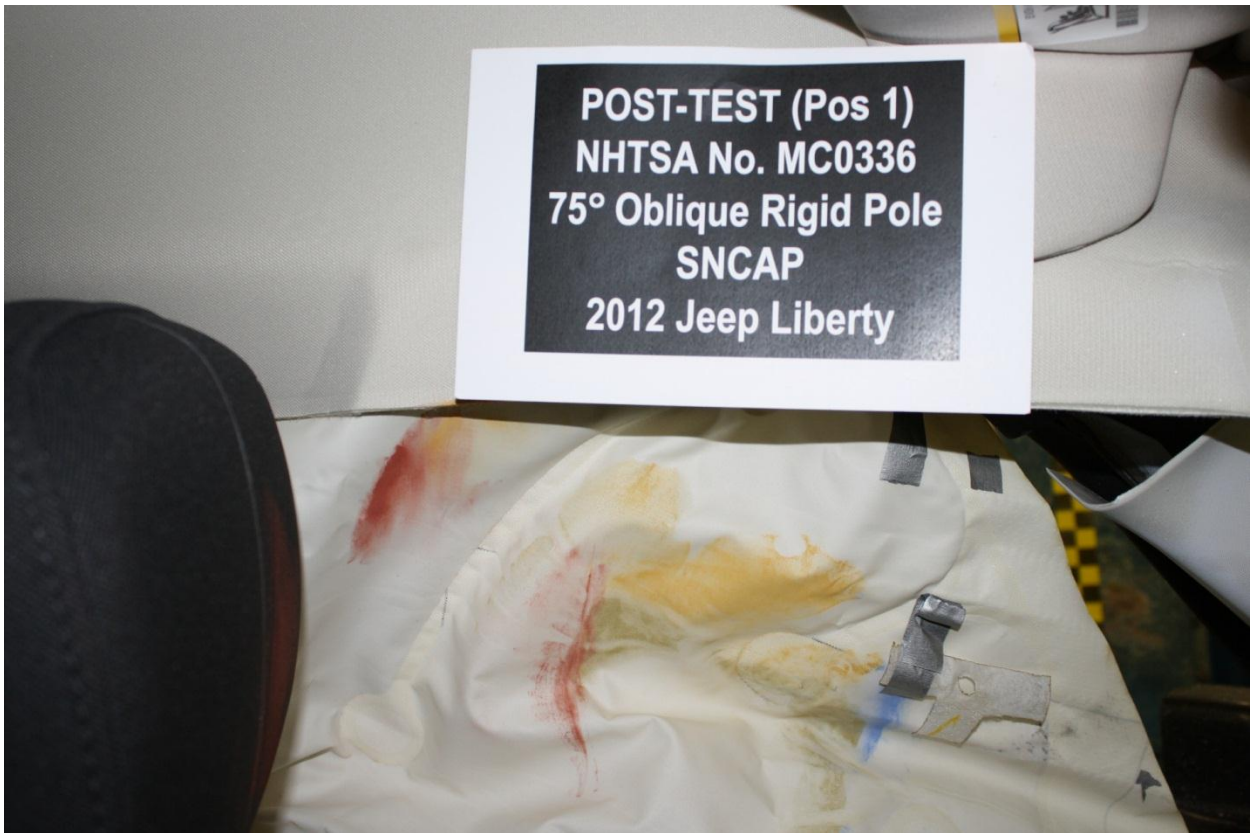


Figure A-46: Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



Figure A-47: Post-Test Dummy Close-Up Head Contact with Side Airbag View



Figure A-48: Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View

Photo Not Applicable

No Torso Airbag

Figure A-49: Post-Test Dummy Close-Up Torso Contact with Side Airbag View



Figure A-50: Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View

Photo Not Applicable

No Pelvic Airbag

Figure A-51: Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View



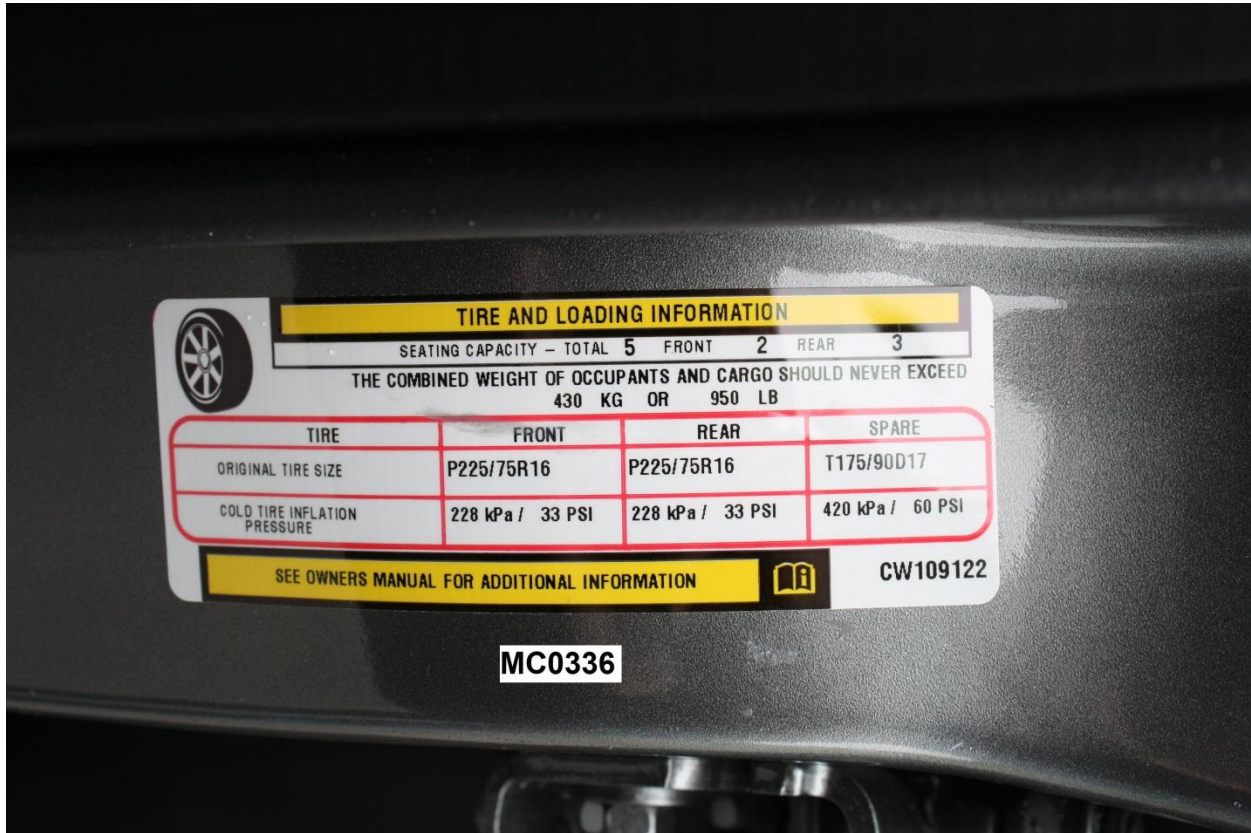
Figure A-52: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-53: Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-54: Close-Up View of Vehicle's Certification Label



MC0336

Figure A-55: Close-Up View of Vehicle's Tire Information Placard or Label

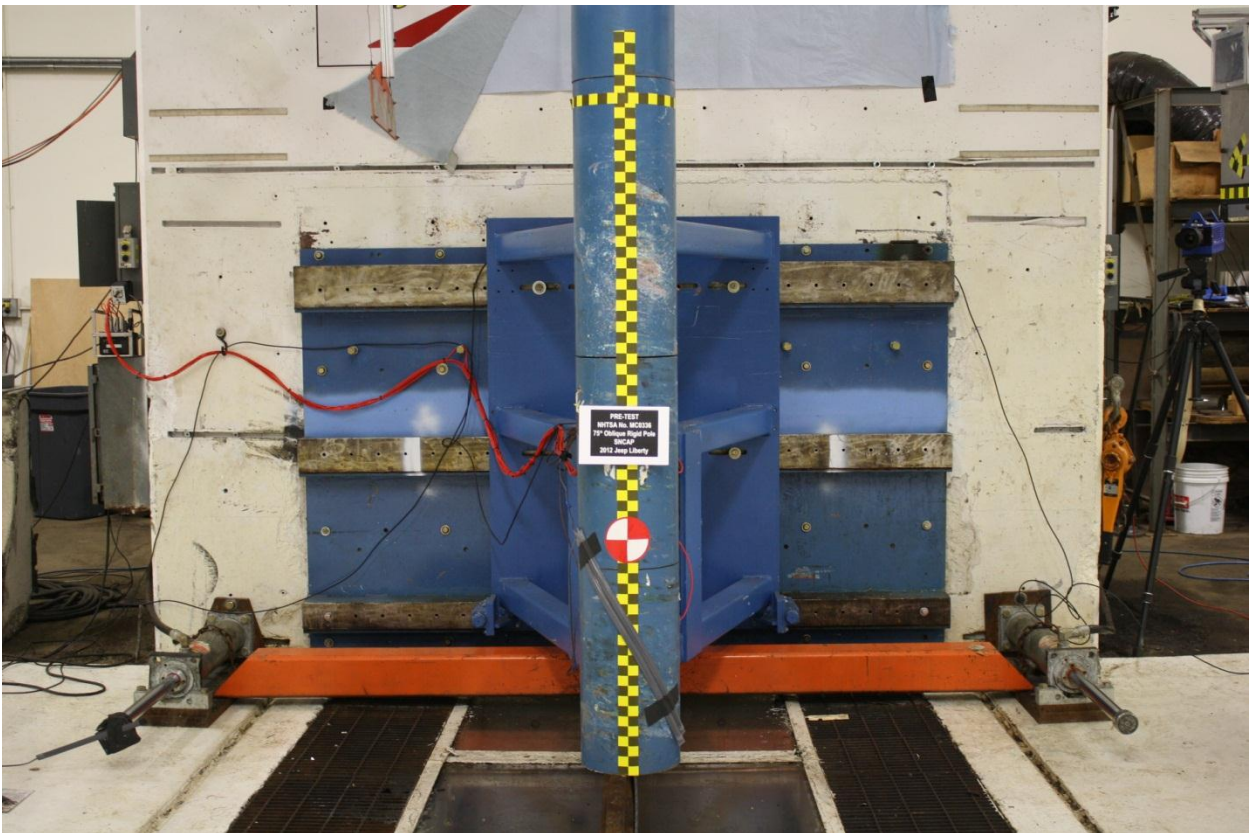


Figure A-56: Pre-Test Pole Barrier Front View

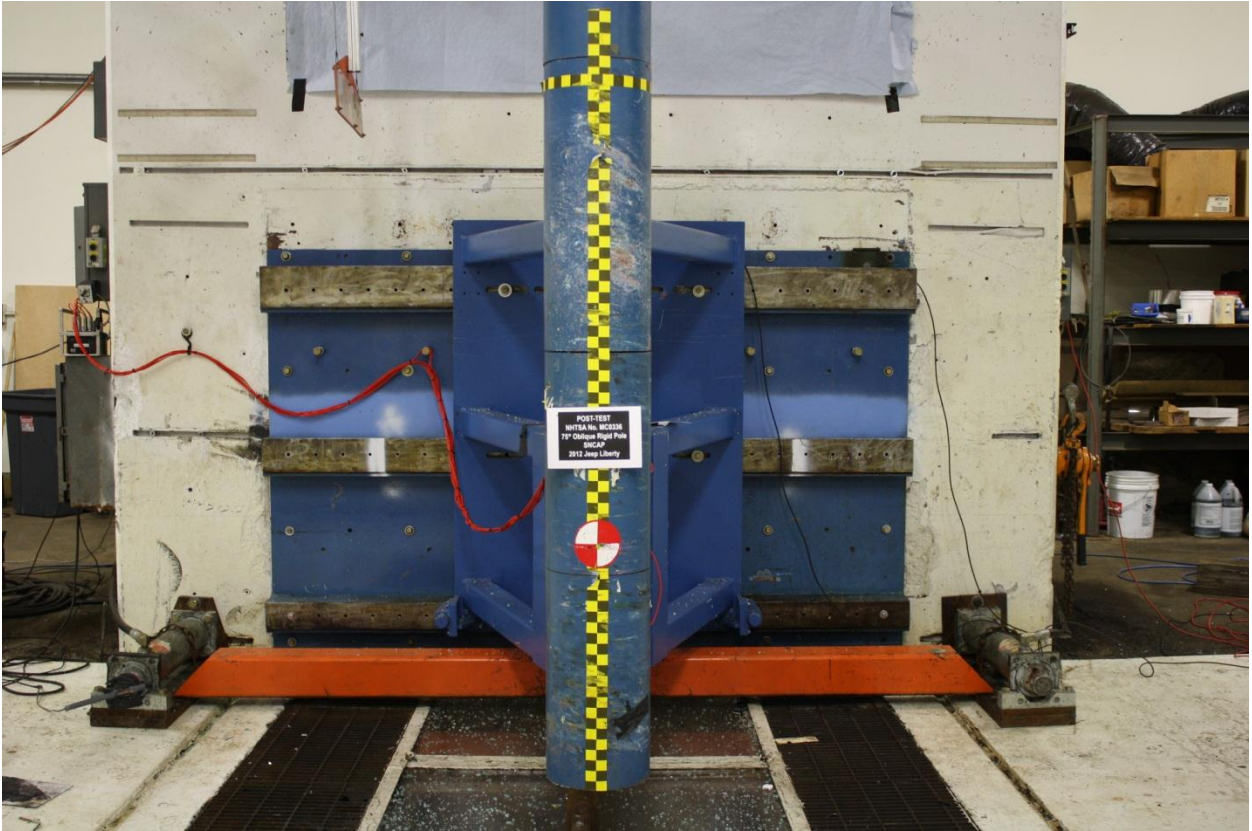


Figure A-57: Post-Test Pole Barrier Front View

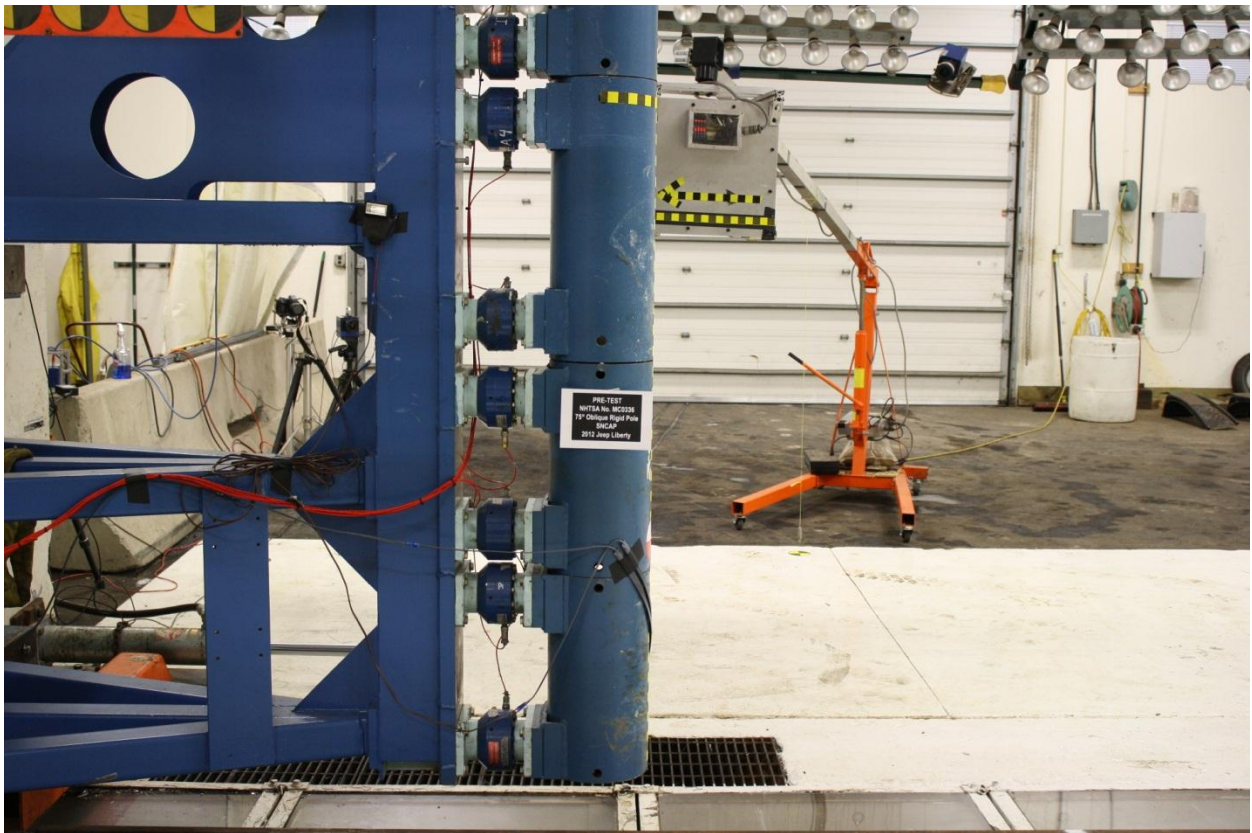


Figure A-58: Pre-Test Pole Barrier Side View



Figure A-59: Post-Test Pole Barrier Side View



Figure A-60: Pre-Test Ballast View



Figure A-61: Post-Test Primary and Redundant Speed Trap Read-Out

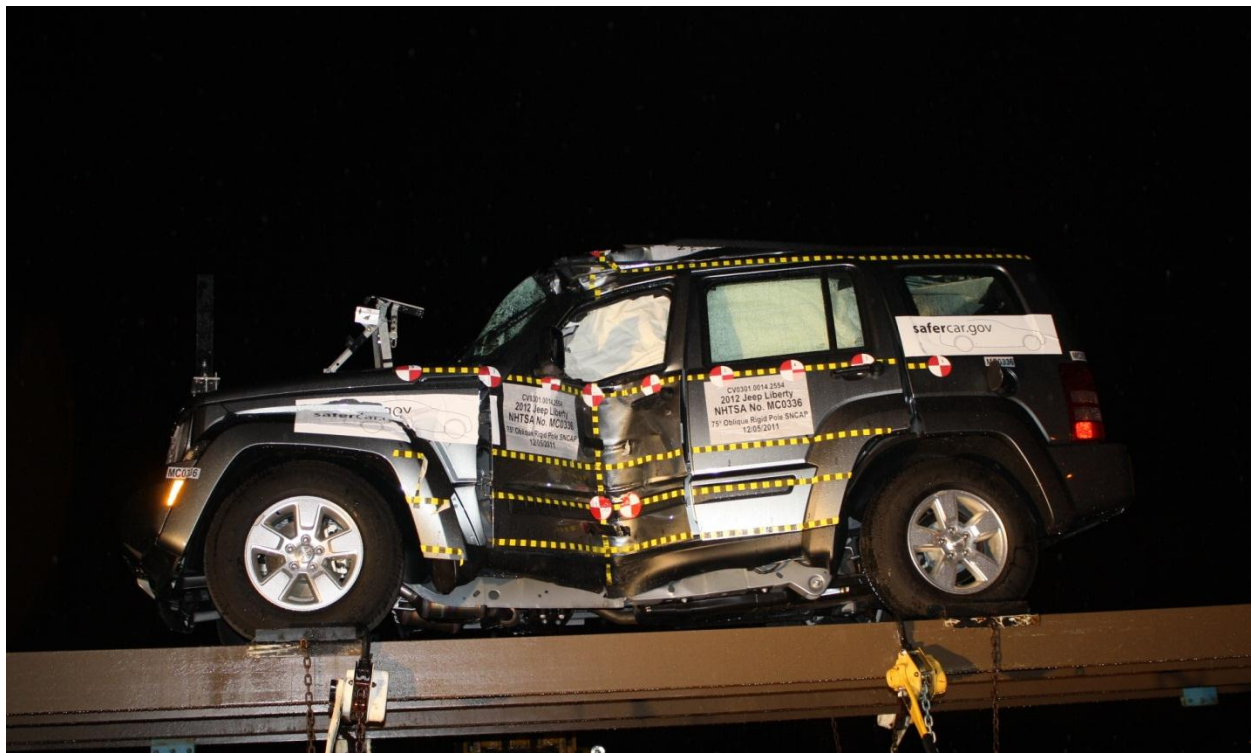


Figure A-62: FMVSS No. 301 Static Rollover 0 Degrees

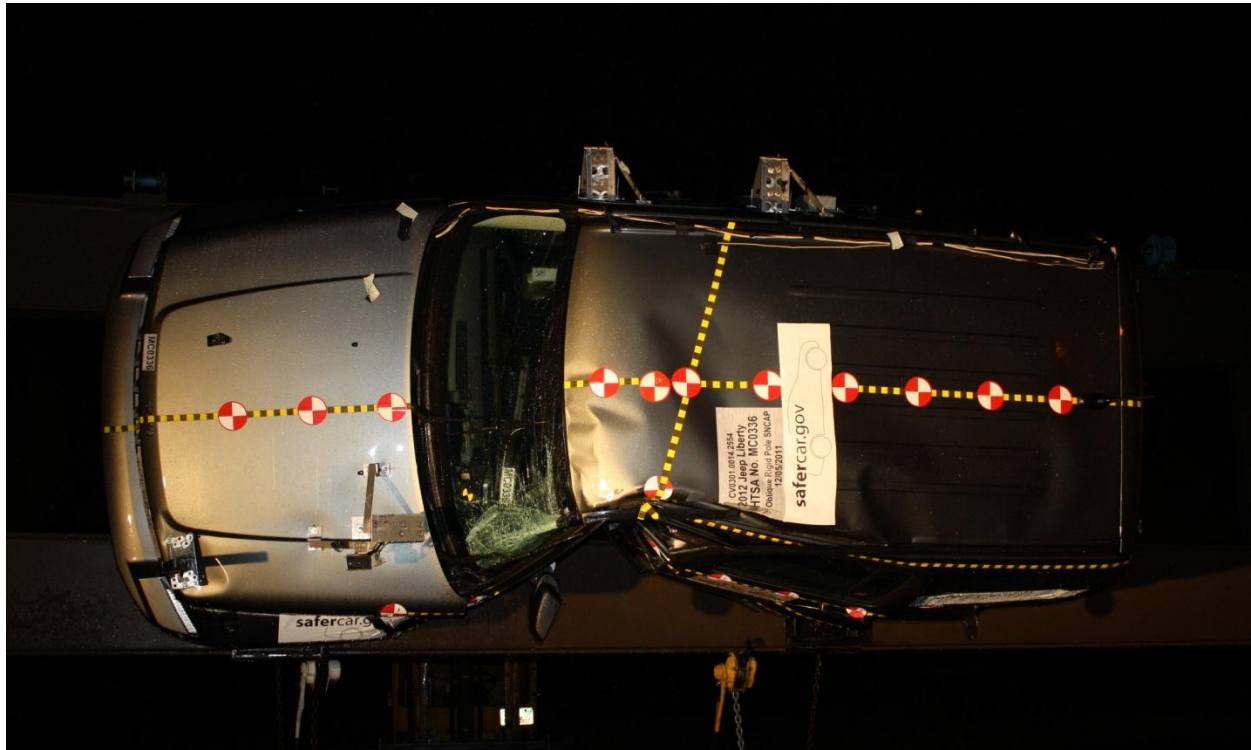


Figure A-63: FMVSS No. 301 Static Rollover 90 Degrees



Figure A-64: FMVSS No. 301 Static Rollover 180 Degrees

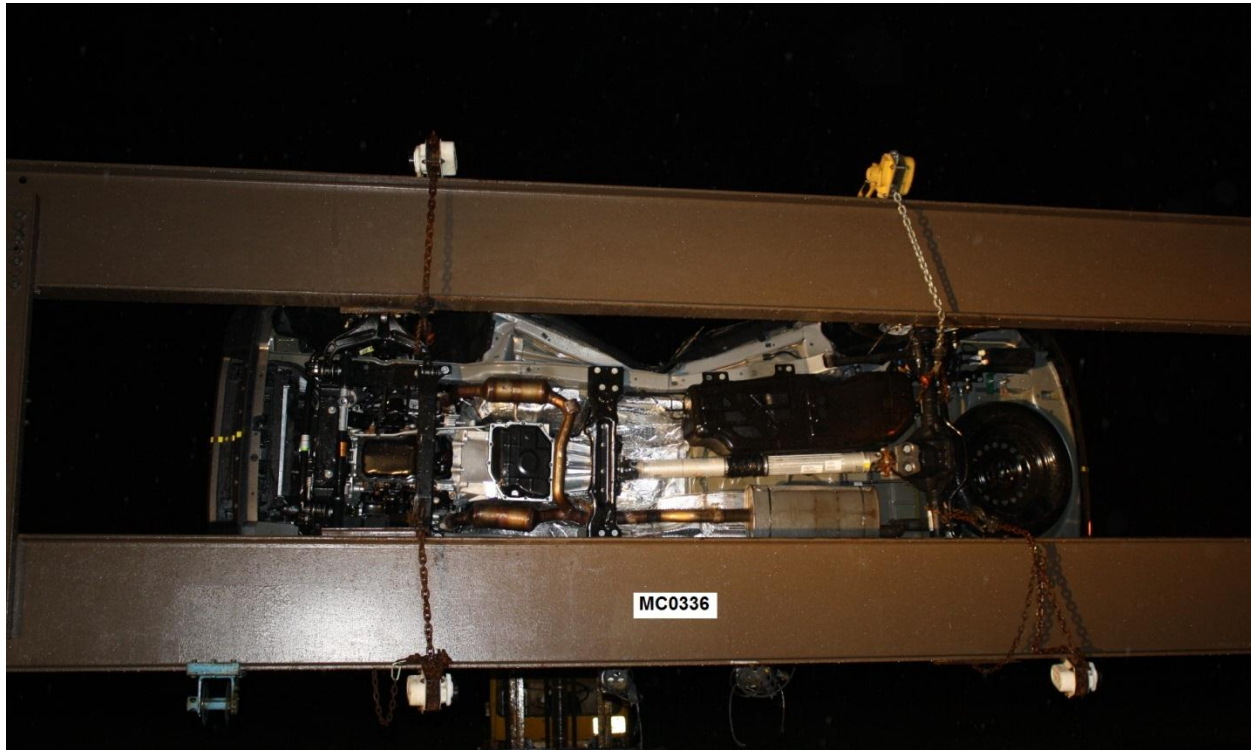


Figure A-65: FMVSS No. 301 Static Rollover 270 Degrees

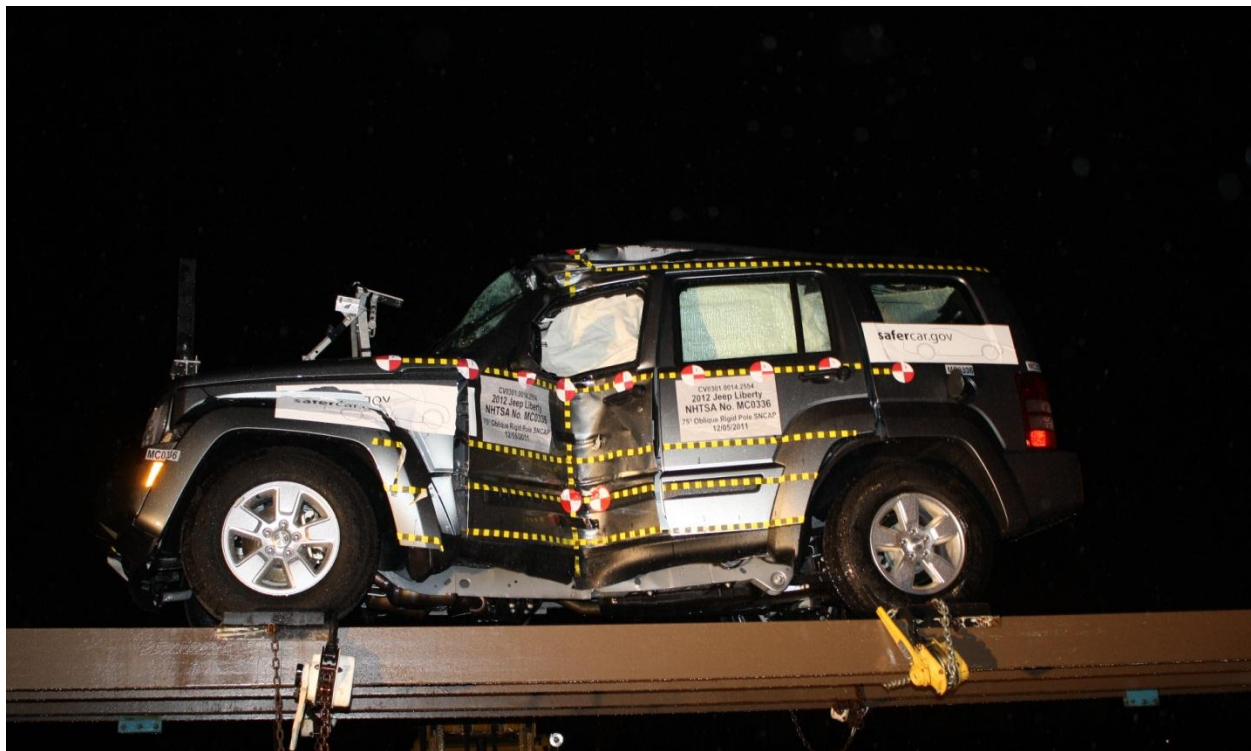


Figure A-66: FMVSS No. 301 Static Rollover 360 Degrees



Figure A-67: Impact Event

Jeep. 2012 MODEL YEAR LIBERTY SPORT 4X2

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: **\$23,360**

JEOP LIBERTY SPORT 4X2
 Exterior Color: Mineral Gray Metallic Clear Coat Exterior Paint
 Interior Color: Dark Slate Gray Interior Color
 Interior: Premium Cloth Bucket Seats
 Engine: 3.7-Liter V6 Engine
 Transmission: 4-Speed Automatic Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL/SAFETY FEATURES

- Brake Assist
- Electronic Stability Control
- Electronic Roll Mitigation
- Hill Start Assist
- All Speed Traction Control
- AntiLock 4-Wheel Disc Brakes
- Active Head Restraints
- Advanced Multistage Front Airbags
- LATCH-Ready Child Seat Anchor System
- Rear Door Child Protection Locks
- Supplemental Side-Curtain Front and Rear Airbags
- 19.5-Gallon Fuel Tank
- Compact Spare Tire
- Enhanced Accident Response System
- Power Windows with Driver's One-Touch-Down Feature
- Speed Control
- Speed-Sensitive Power Locks
- Rear Window Wiper / Washer
- Sentry Key Thet Deterrent System
- Solar Control Glass
- Tire Pressure Monitor with Warning Lamp

INTERIOR FEATURES

- Air Conditioning
- Cabin Air Filtration System
- Front Passenger-Side Fold-Flat Seat
- Rear 60 / 40 Split-Folding Reclining Seat
- Media Center 130 CD/MP3
- Audio Jack Input for Mobile Devices
- SiriusXM Satellite Radio w/ 1-Yr Radio Subscription

For More Information, Call 1-888-639-7474

Assembly Plant/Part of Entry: TOLEDO, OHIO, U.S.A.
 VIN: 1C4PJLAK0CW-109122 LA 0001 5914

For more information visit: www.jeep.com Chrysler Group LLC
 or call 1-877-IAM-JEEP

EPA Fuel Economy Estimates

These estimates reflect new EPA methods beginning with 2008 models.

<p>CITY MPG</p> <p style="font-size: 2em; font-weight: bold;">16</p> <p style="font-size: x-small;">Expected range for most drivers 13 to 19 MPG</p>	<p>Estimated Annual Fuel Cost</p> <p style="font-size: 1.5em; font-weight: bold;">\$3,086</p> <p style="font-size: x-small;">based on 15,000 miles at \$3.70 per gallon</p>	<p>HIGHWAY MPG</p> <p style="font-size: 2em; font-weight: bold;">22</p> <p style="font-size: x-small;">Expected range for most drivers 16 to 26 MPG</p>
<p>Combined Fuel Economy</p> <p style="font-size: 1.5em; font-weight: bold;">18</p> <p style="font-size: x-small;">This vehicle 10 All SUVs 32</p>		

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

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

GOVERNMENT SAFETY RATINGS

<p>Frontal Crash</p> <p style="font-size: 1.5em; font-weight: bold;">★★★★★</p> <p style="font-size: x-small;">Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.</p>	<p>Driver Passenger</p> <p style="font-size: 1.5em; font-weight: bold;">★★★★★</p> <p style="font-size: x-small;">Not Rated</p>	<p>Not Rated</p> <p style="font-size: 1.5em; font-weight: bold;">Not Rated</p>
<p>Side Crash</p> <p style="font-size: 1.5em; font-weight: bold;">★★★★★</p> <p style="font-size: x-small;">Star ratings based on the risk of injury in a side impact.</p>	<p>Front seat</p> <p style="font-size: 1.5em; font-weight: bold;">★★★★★</p> <p style="font-size: x-small;">Not Rated</p>	<p>Not Rated</p> <p style="font-size: 1.5em; font-weight: bold;">Not Rated</p>

Rollover ★★★

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 1-888-327-4236

The safety ratings shown are based on Federal Government tests of particular vehicles equipped with certain features and options. The performance of this vehicle may differ.

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS COUNTRY:
 U.S., CANADIAN PARTS CONTENT: 76 %
 NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
 TOLEDO, OHIO, U.S.A.
COUNTRY OF ORIGIN:
 ENGINE: UNITED STATES
 TRANSMISSION: UNITED STATES

WARRANTY COVERAGE

5-year or 100,000-mile Powertrain Limited Warranty.
 3-year or 36,000-mile Basic Limited Warranty.
 24-hour towing assistance; certain restrictions apply.
 Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

5 YEAR / 100,000 MILE
POWERTRAIN WARRANTY

TOTAL PRICE: * \$24,155

DESTINATION CHARGE \$795

Figure A-68: Monroney Label

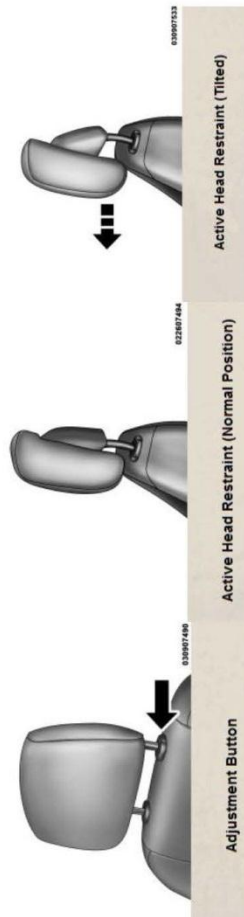
Active Head Restraints – Front Seats

Active Head Restraints are passive, deployable components, and vehicles with this equipment cannot be readily identified by any markings, only through visual inspection of the head restraint. The head restraint will be split in two halves, with the front half being soft foam and trim, the back half being decorative plastic.

When AHRs deploy during a rear impact, the front half of the head restraint extends forward to minimize the gap between the back of the occupant's head and the AHR. This system is designed to help prevent or reduce the extent of injuries to the driver and front passenger in certain types of rear impacts. Refer to "Occupant Restraints" in "Things To Know Before Starting Your Vehicle" for further information.

To raise the head restraint, pull upward on the head restraint. To lower the head restraint, press the adjustment button, located at the base of the head restraint, and push downward on the head restraint.

For comfort the Active Head Restraints can be tilted forward and backward. To tilt the head restraint closer to the back of your head, pull forward on the bottom of the head restraint. Push rearward on the bottom of the head restraint to move the head restraint away from your head.



Note:

- The head restraints should only be removed by qualified technicians, for service purposes only. If either of the head restraints require removal, see your authorized dealer.
- In the event of deployment of an Active Head Restraint, refer to "Occupant Restraints/Resetting Active Head Restraints (AHR)" in "Things To Know Before Starting Your Vehicle" for further information.

Warning!

- Do not place items over the top of the Active Head Restraint, such as coats, seat covers or portable DVD players. These items may interfere with the operation of the Active Head Restraint in the event of a collision and could result in serious injury or death.
- Active Head Restraints may be deployed if they are struck by an object such as a hand, foot or loose cargo. To avoid accidental deployment of the Active Head Restraint ensure that all cargo is secured, as loose cargo could contact the Active Head Restraint during sudden stops. Failure to follow this warning could cause personal injury if the Active Head Restraint is deployed.

Figure A-69: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

No.		Page
	Driver Dummy Instrumentation Plots	
1	Driver Head Acceleration (X) Primary vs. Time	B-5
2	Driver Head Acceleration (Y) Primary vs. Time	B-5
3	Driver Head Acceleration(Z) Primary vs. Time	B-6
4	Driver Head Resultant Primary vs. Time	B-6
5	Driver Lower Spine T12 Acceleration (X) vs. Time	B-7
6	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-7
7	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-8
8	Driver Lower Spine Y12 Resultant Acceleration vs. Time	B-8
9	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-9
10	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-9
11	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-10

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

Additional Driver Dummy Instrumentation Data

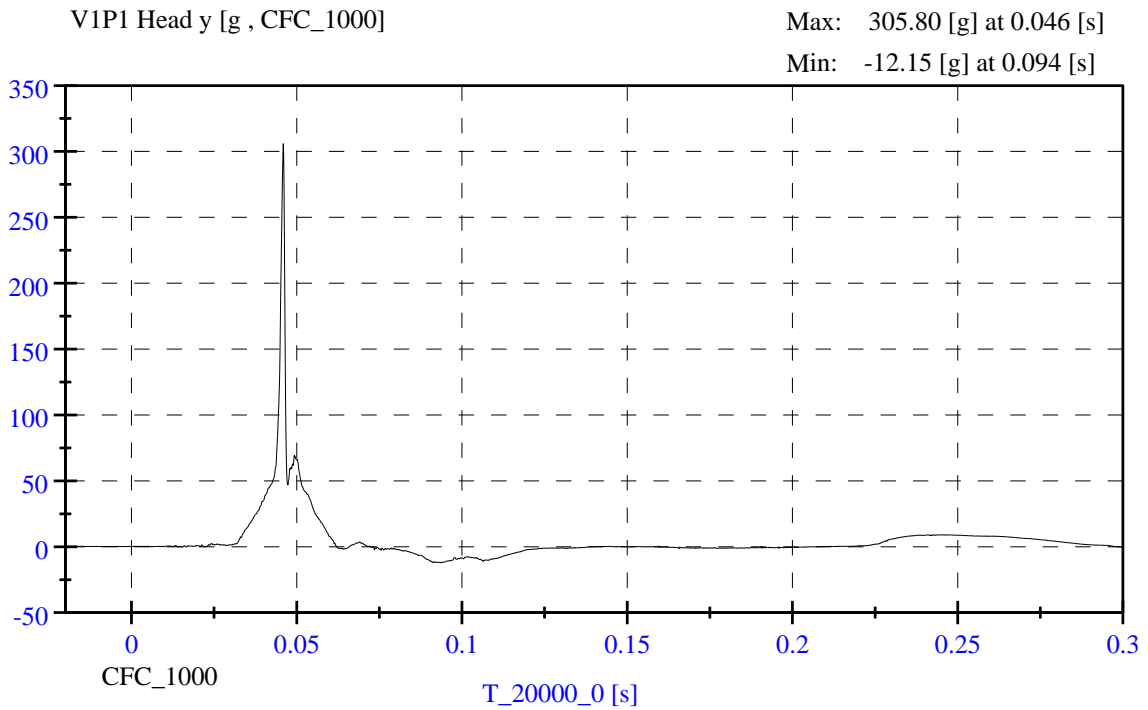
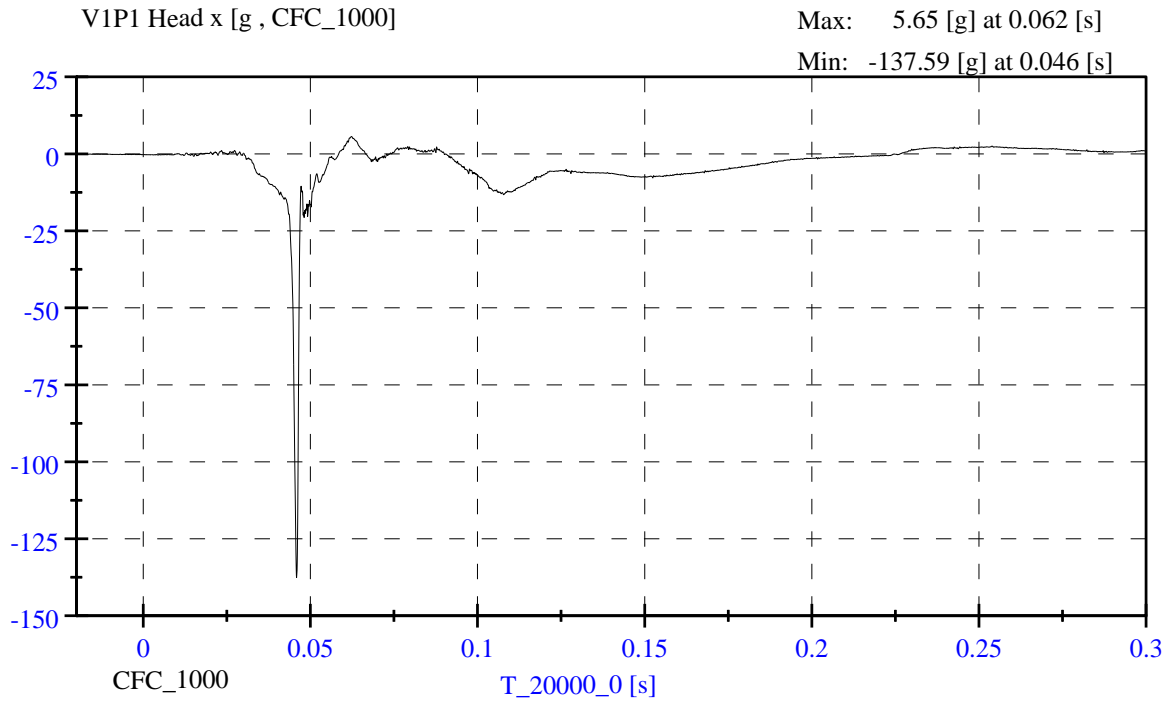
Driver Head Acceleration (X) Redundant
Driver Head Acceleration (Y) Redundant
Driver Head Acceleration (Z) Redundant
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver Lower Abdomen Rib Deflection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

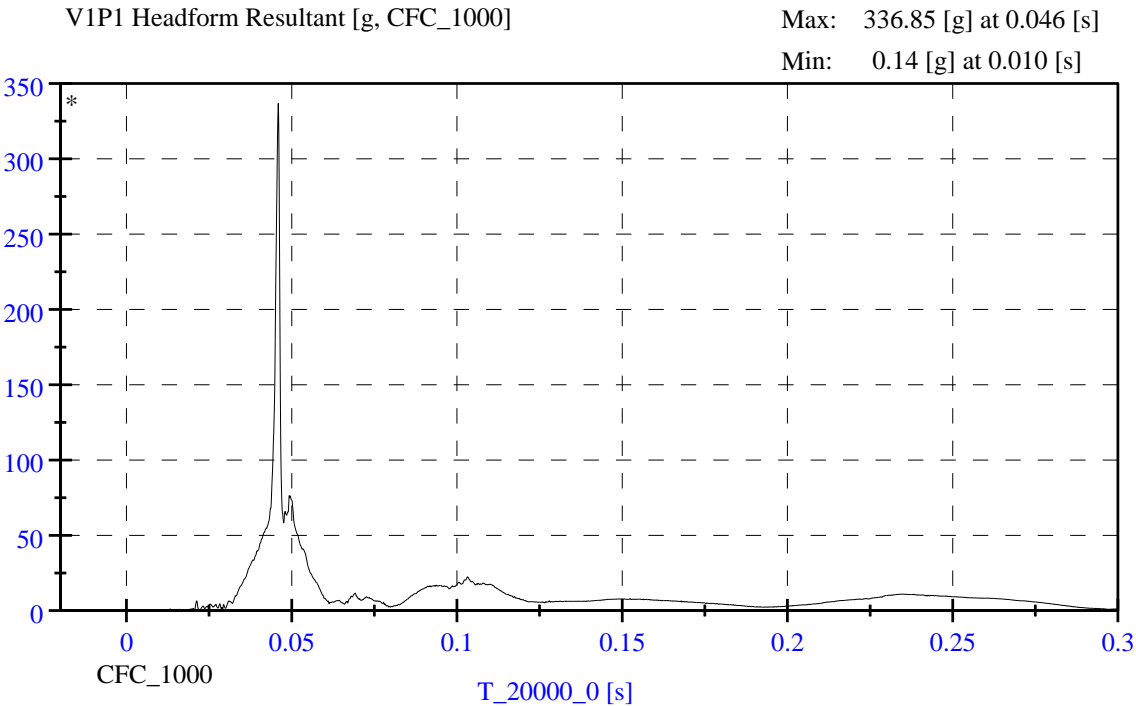
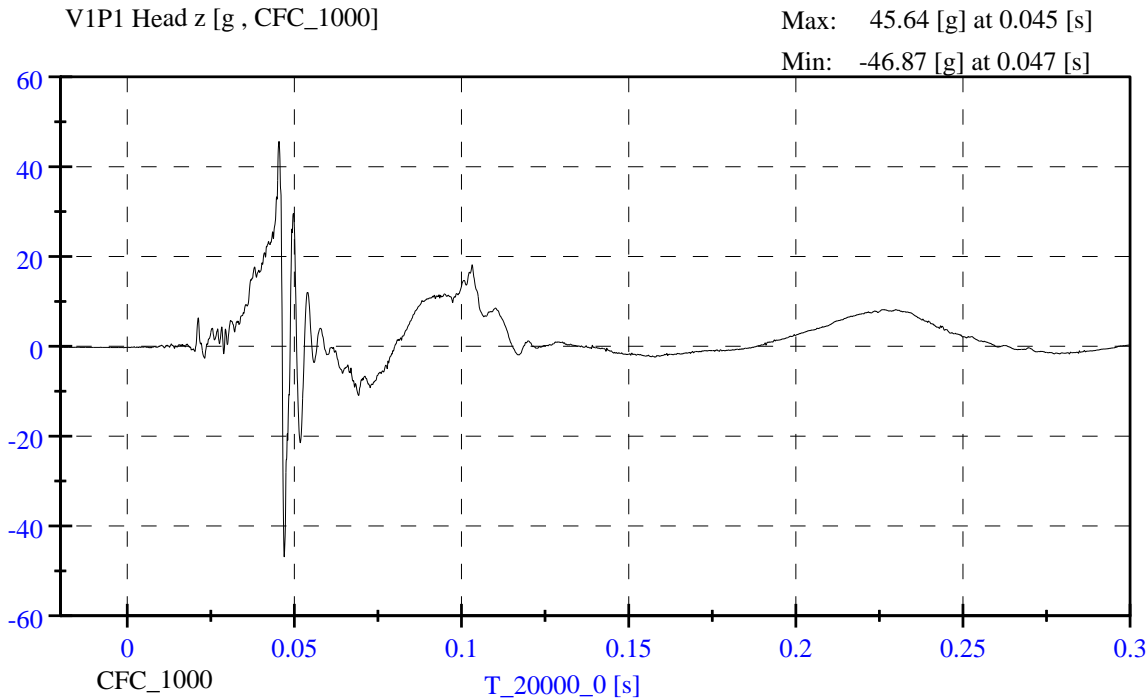
Vehicle Instrumentation Data

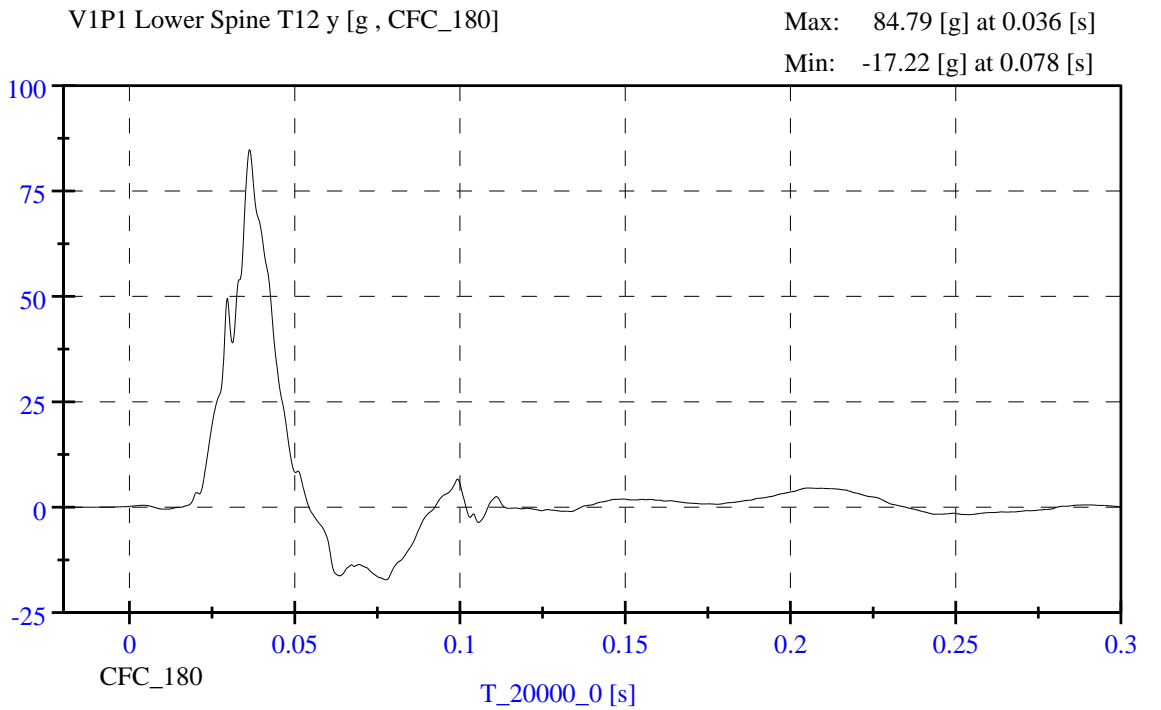
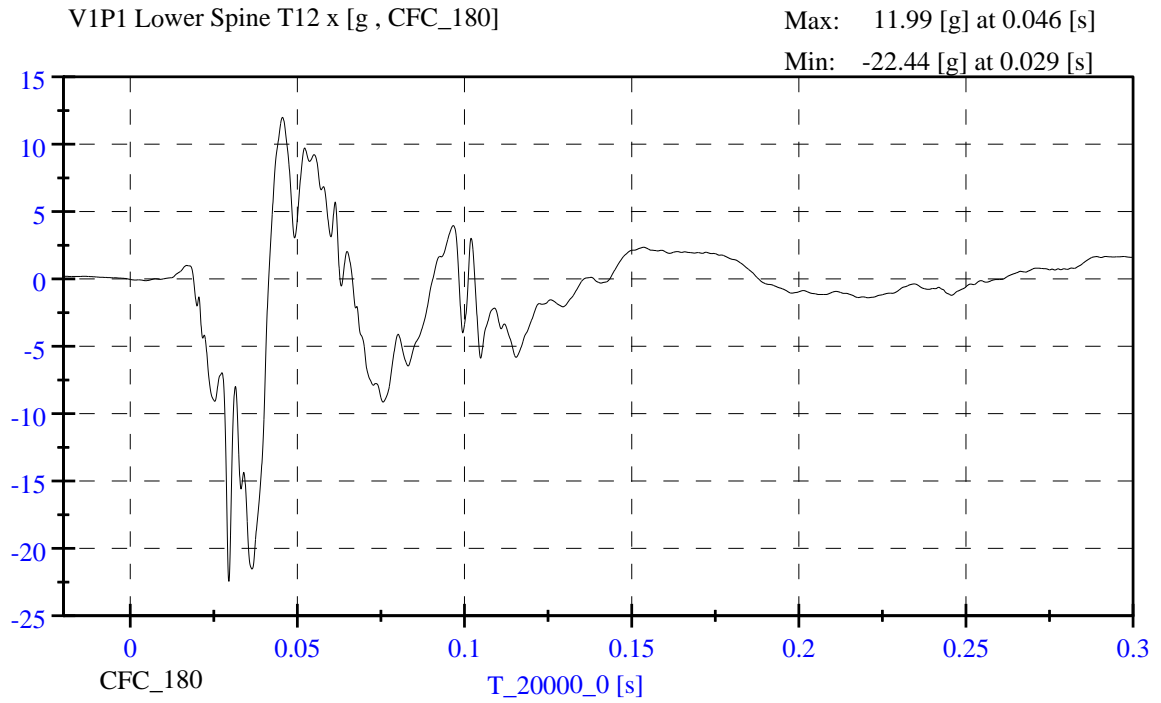
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Vehicle Center of Gravity Angular Rate About X (Roll)
Vehicle Center of Gravity Angular Rate About Y (Pitch)
Vehicle Center of Gravity Angular Rate About Z (Yaw)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy H-Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)
Driver Side Airbag Timing
Driver Side Curtain Airbag Timing

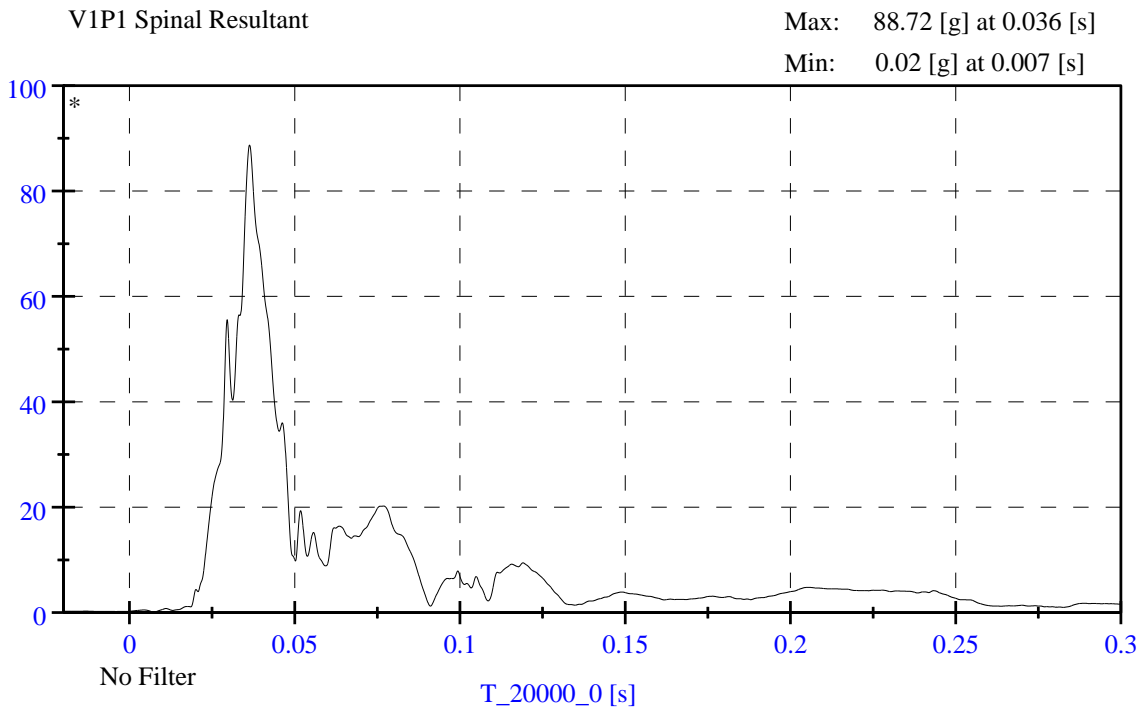
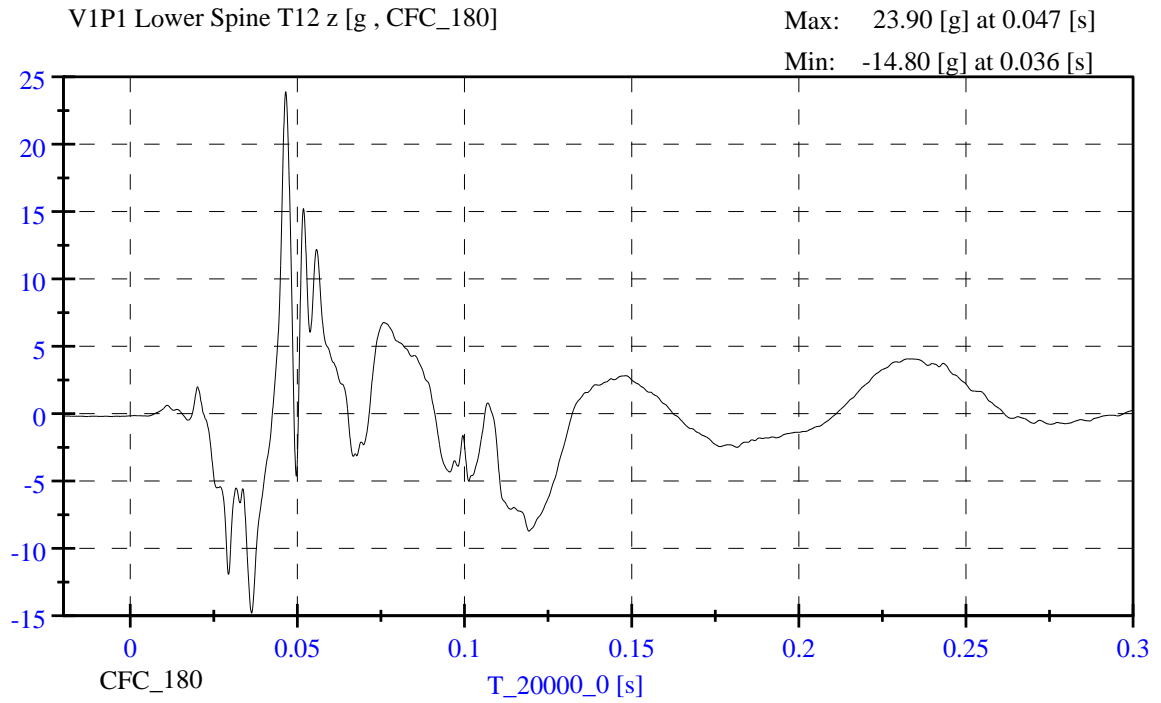
Pole Instrumentation Data

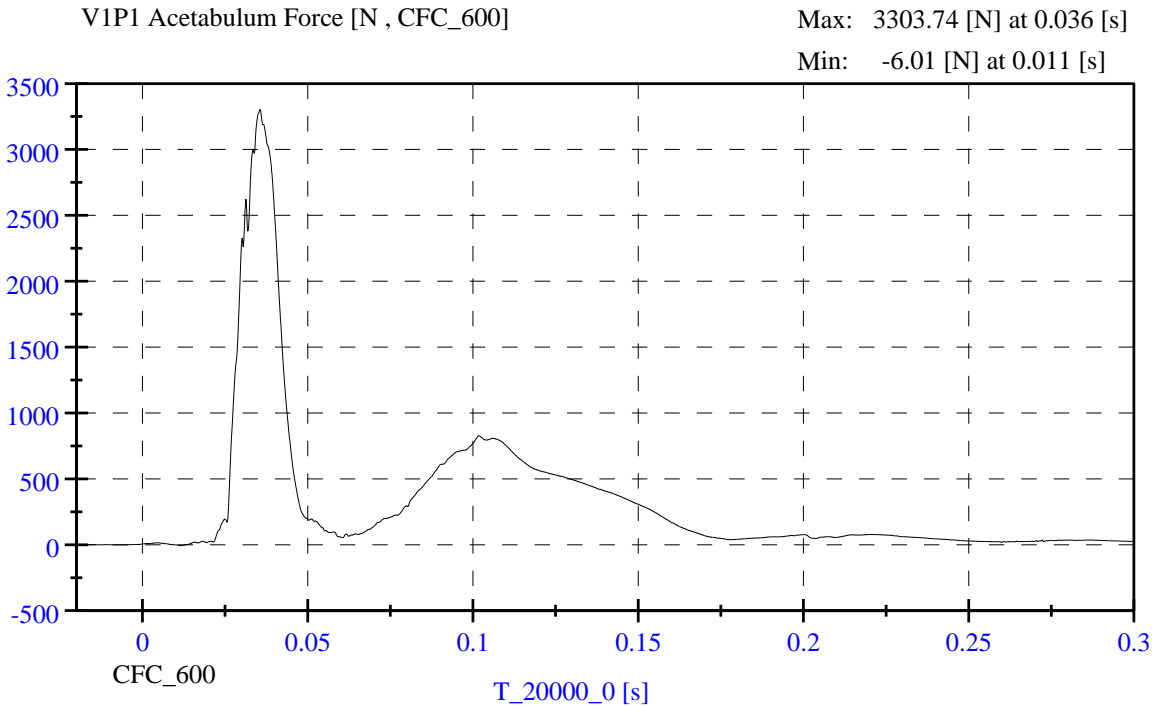
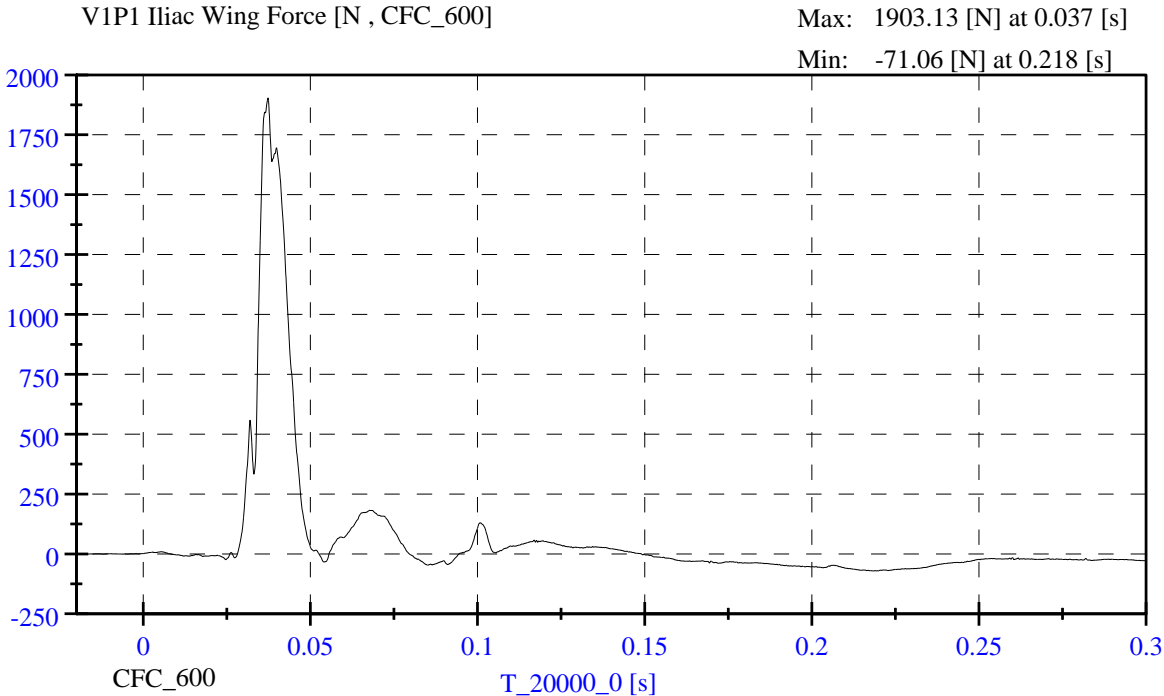
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

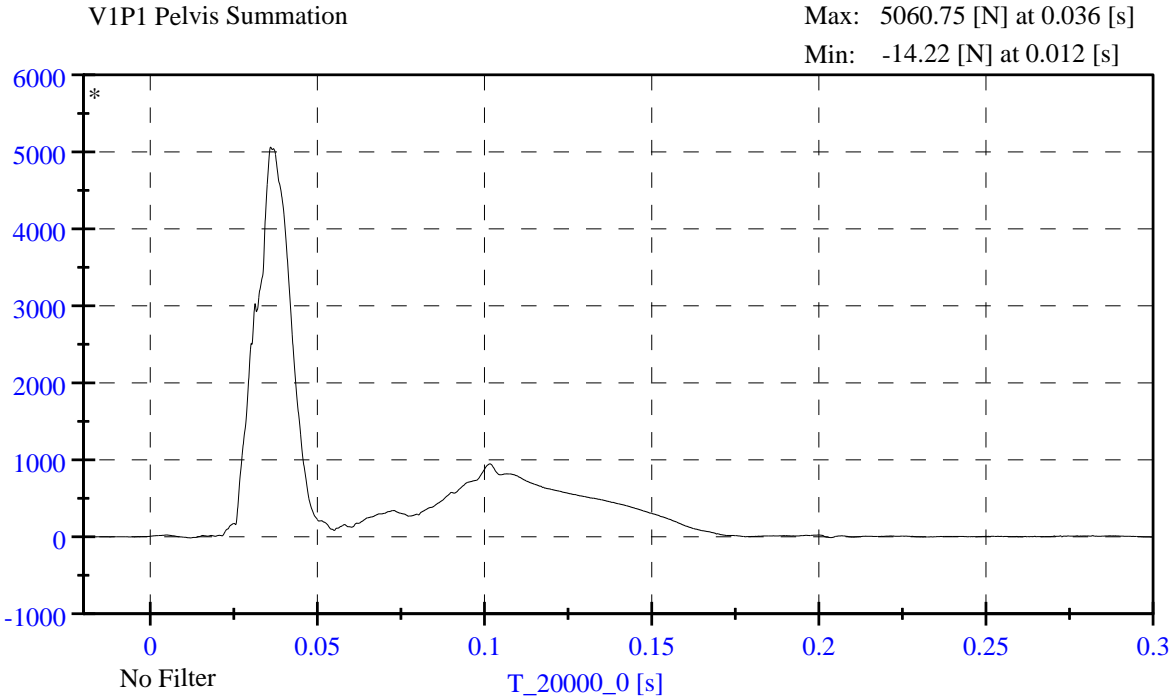












**APPENDIX C
DUMMY CALIBRATION DATA**

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 8012

CONFIGURED FOR LEFT SIDE IMPACT



SID-IIsD External Measurements

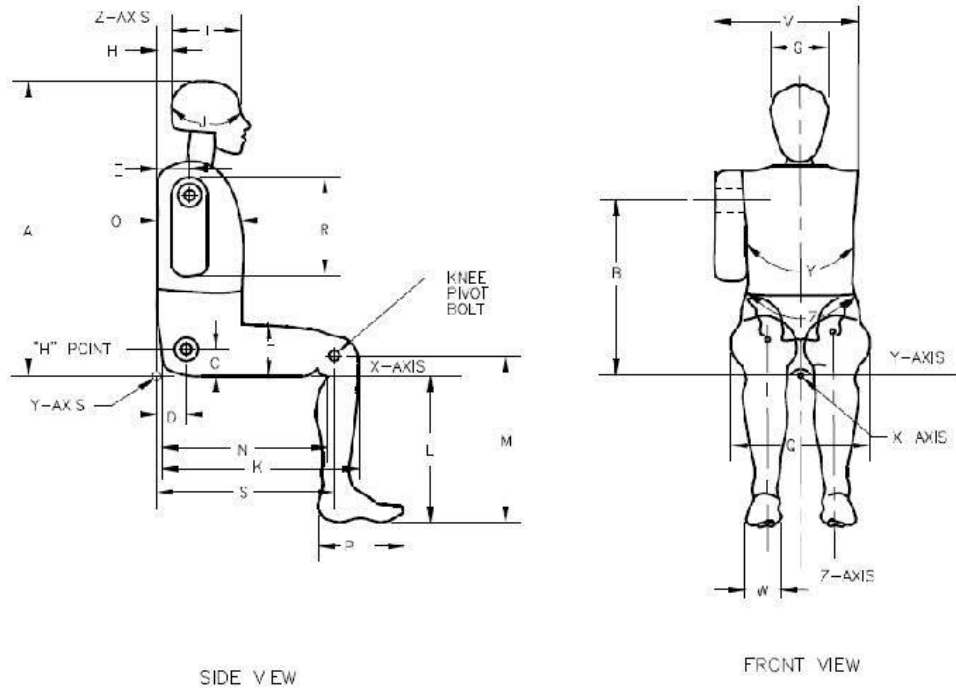
NHTSA ATD S/N DG8012

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	444	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	148	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	98	Yes
F	Thigh Clearance	119.0 - 135.0	132	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	43	Yes
I	Head Depth	178.0 - 188.0	187	Yes
J	Head Circumference	541.0 - 551.0	548	Yes
K	Buttock to Knee Length	514.0 - 540.0	530	Yes
L	Popliteal Height	343.0 - 369.0	359	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	204	Yes
P	Foot Length (right)	216.0 - 232.0	223	Yes
Q	Hip Breadth	313.0 - 323.0	315	Yes
R	Arm Length	249.0 - 259.0	257	Yes
S	Knee Joint to Seat back	478.0 - 493.0	490	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	351	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	872	Yes
Z	Waist Circumference	761.0 - 791.0	782	Yes

Technician : AR

Date: 11/30/2011

SID-11sD External Dimension Reference Diagram





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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	DG 8012		
Test ID:		Test Date:	11/30/2011
Test Number:	1	Test Time:	1:36:53 PM

Component Part Number	Component Serial Number
Head Skin - 180-1002	1362

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	34 %RH P
Resultant Acceleration	115.0 -- 137.0	125.0 g P
Oscillation	0.0 -- 15.0	5.1 % P
Fore-Aft Acceleration	-15.0 -- 15.0	3.6 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **1:36:53 PM**

Test Date: **11/30/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66931	6/13/2011
Endevco	7264-2000	P66926	6/13/2011
Endevco	7264-2000	P66943	6/13/2011

Test ID:

Test Time: **1:36:53 PM**

Test Date: **11/30/2011**

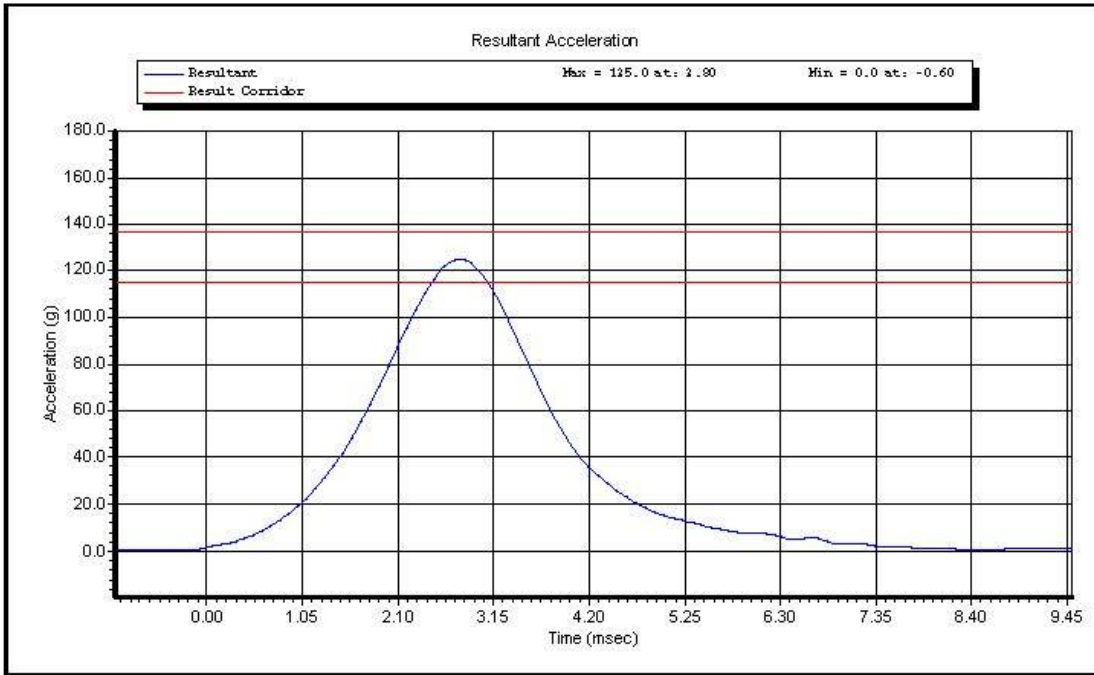


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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG 8012		
Test ID:		Test Date:	11/30/2011
Test Number:	1	Test Time:	1:36:53 PM



Test ID:

Test Time: **1:36:53 PM**

Test Date: **11/30/2011**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

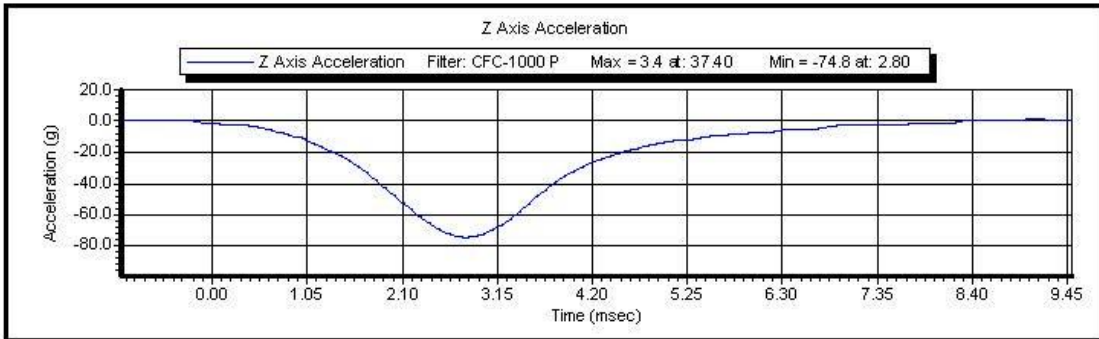
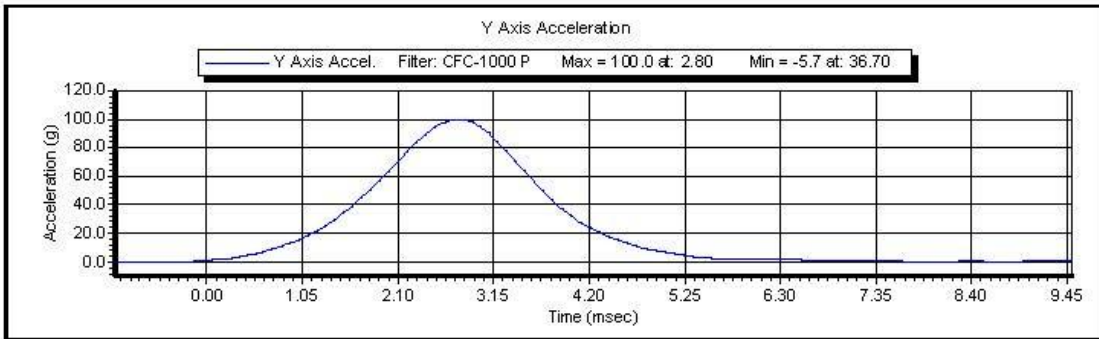
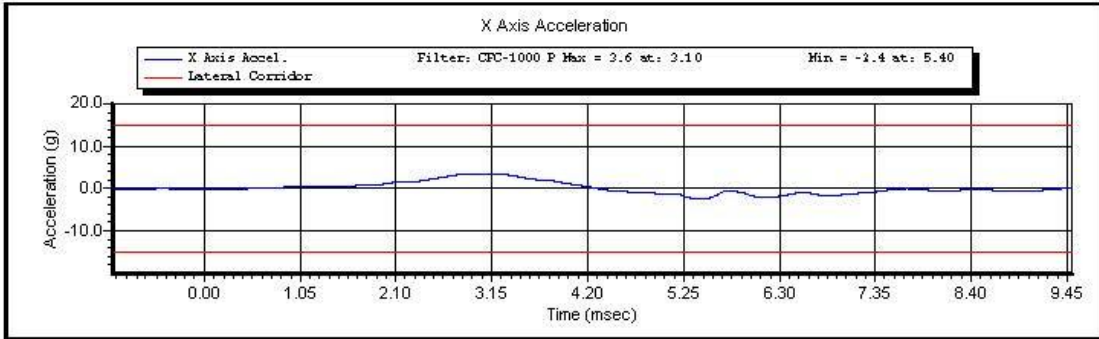
1 of 2



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Test ID:

Test Time: 1:36:53 PM

Test Date: 11/30/2011

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2 of 2



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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	11/30/2011
Test Number:	1	Test Time:	3:56:30 PM

Component Part Number	Component Serial Number
Neck - 180-2000	DG7061

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	32 %RH P
Velocity	5.51 -- 5.63	5.59 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.42 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.49 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.73 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.69 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.78 m/s P
Max D Plane Rotation	71.0 -- 81.0	73.8 degrees P
Time at Max Rotation	50.0 -- 70.0	60.4 ms P
Moment about OC	-44.0 -- -36.0	-41.3 Nm P
Moment Decay to Zero	102.0 -- 126.0	112.5 ms P

All test parameters are within specifications

Technician: **SZito**
Supervisor: **D. Travale**

Test ID:

Test Time: **3:56:30 PM**

Test Date: **11/30/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
Denton	1716A	LC-2192Fy	8/31/2011
Denton	1716A	LC-2192Mx	8/31/2011
DentonATD	78051-342	184	5/8/2011
DentonATD	78051-342	174	5/8/2011
DentonATD	78051-342	185	5/8/2011

Test ID:

Test Time: 3:56:30 PM

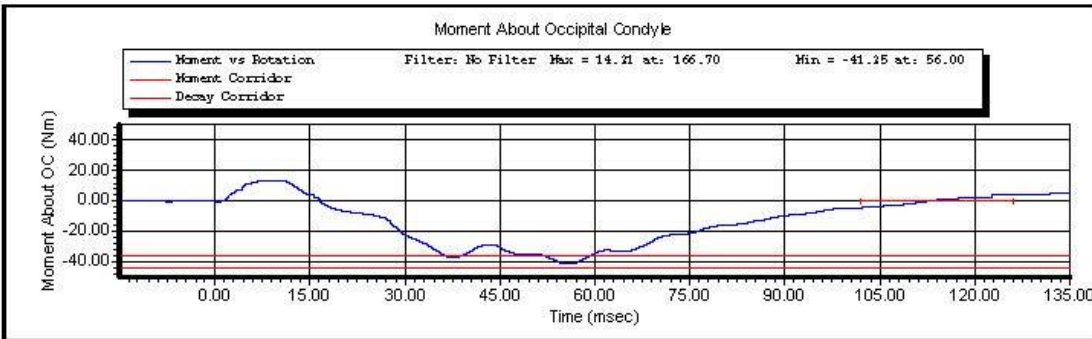
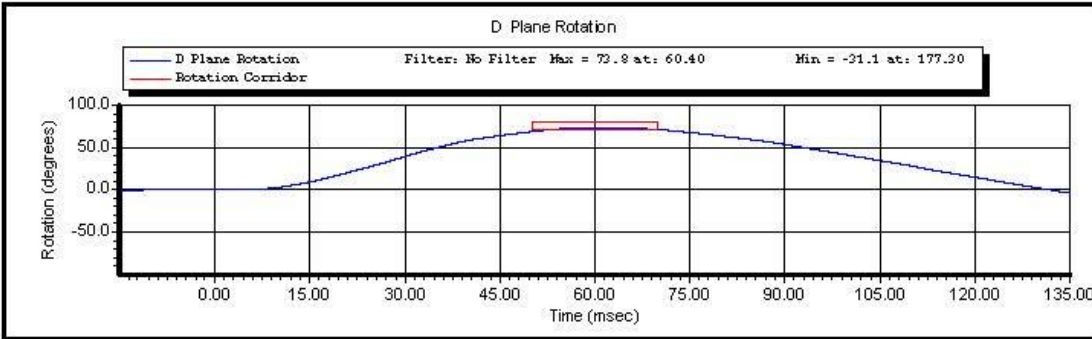
Test Date: 11/30/2011

Copyright 2006 Denton ATD, Inc. LabPac II Version: 1.8.5.0

2 of 2



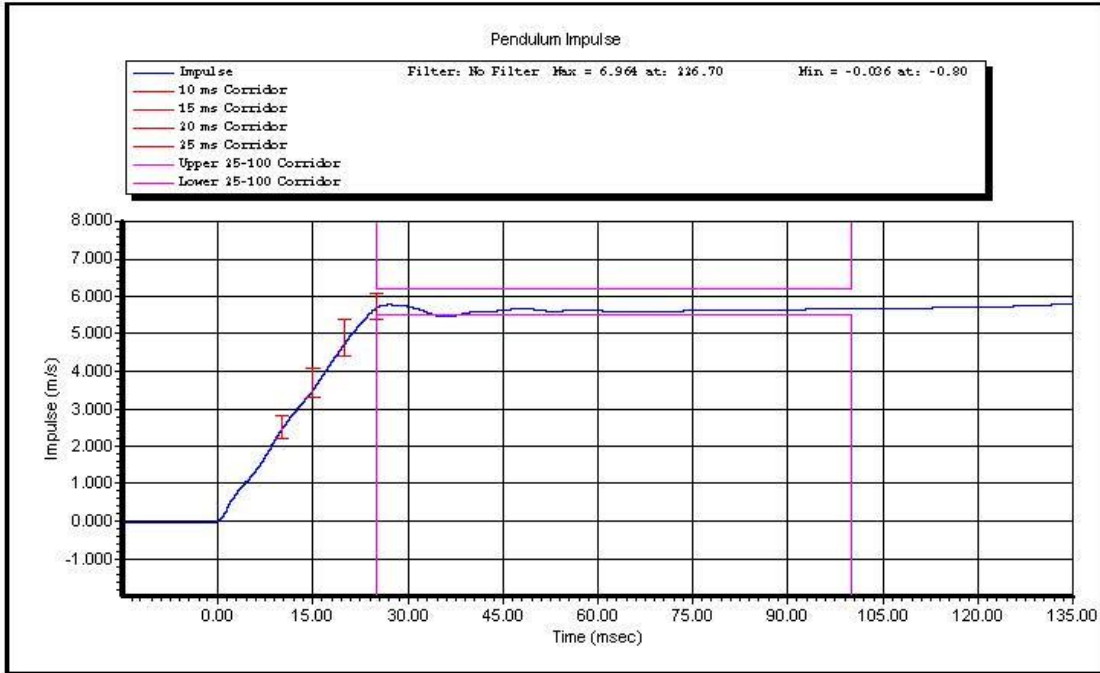
Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	11/30/2011
Test Number:	1	Test Time:	3:56:30 PM



Test ID:

Test Time: **3:56:30 PM**

Test Date: **11/30/2011**



Test ID:

Test Time: 3:56:30 PM

Test Date: 11/30/2011

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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:			
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	12:35:19 PM

Component Part Number	Component Serial Number
Left Arm 180-6011-1	DG3210
Shoulder Rib 180-3355	DG6997

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.80 deg C P
Humidity	10.0 -- 70.0	30.0 %RH P
Velocity	4.20 -- 4.40	4.37 m/s P
Probe Acceleration	13.0 -- 18.0	15.7 g P
Shoulder Deflection	28.0 -- 37.0	29.4 mm P
T1 Acceleration	17.0 -- 22.0	19.2 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

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

Test Date: **12/1/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	AF5B3	11/18/2011
FTSS	180-3881-1	DS-1845	9/1/2011
Endevco	7264-2000	P63561	10/3/2011

Test ID:

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

Test Date: **12/1/2011**

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2 of 2

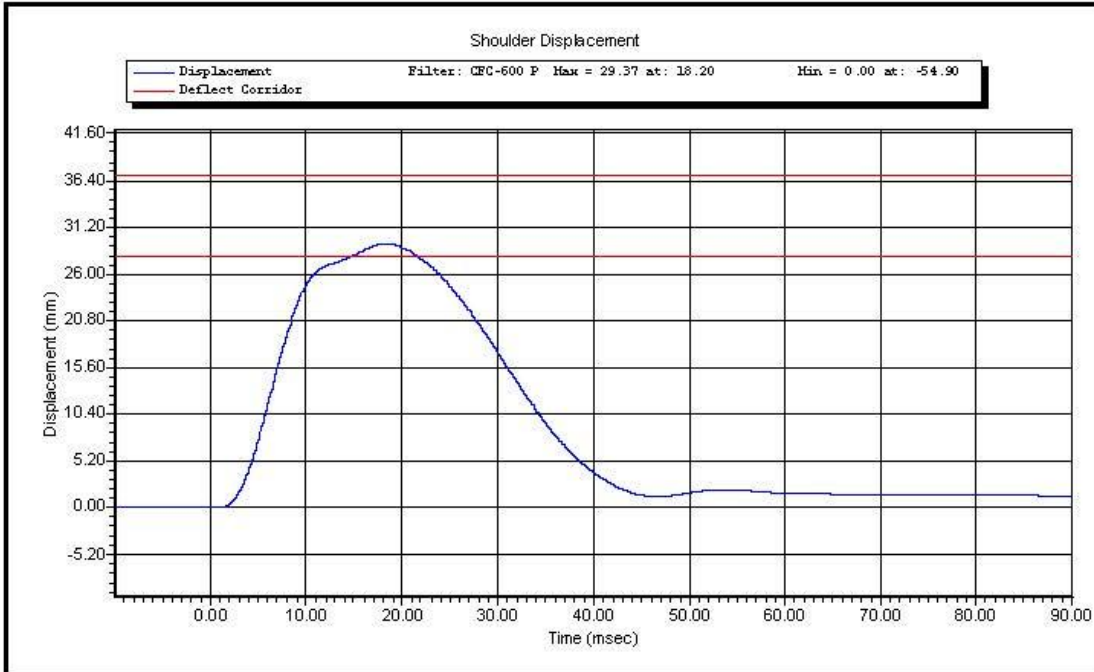


Calspan - Transportation Research Group

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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-11s		
ATD Serial Number:			
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	12:35:19 PM



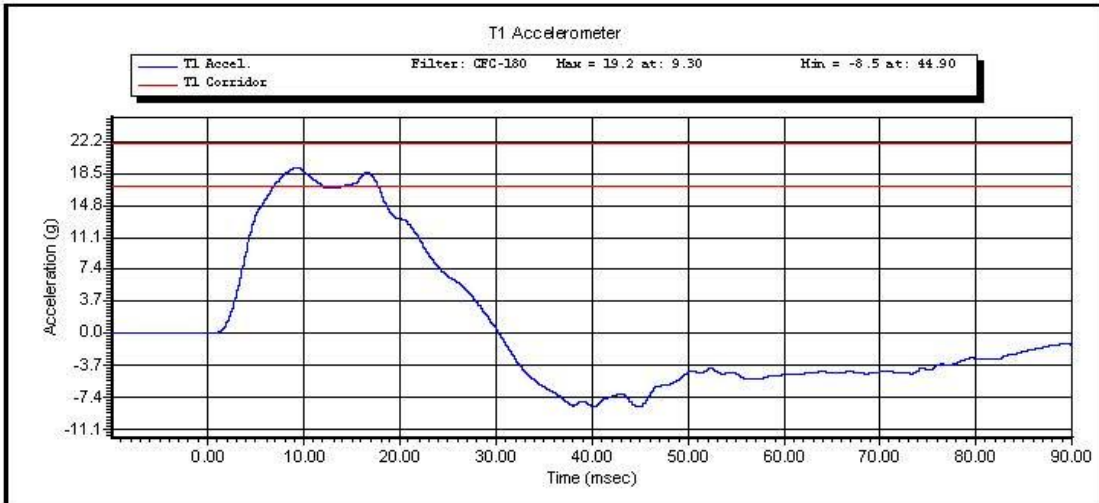
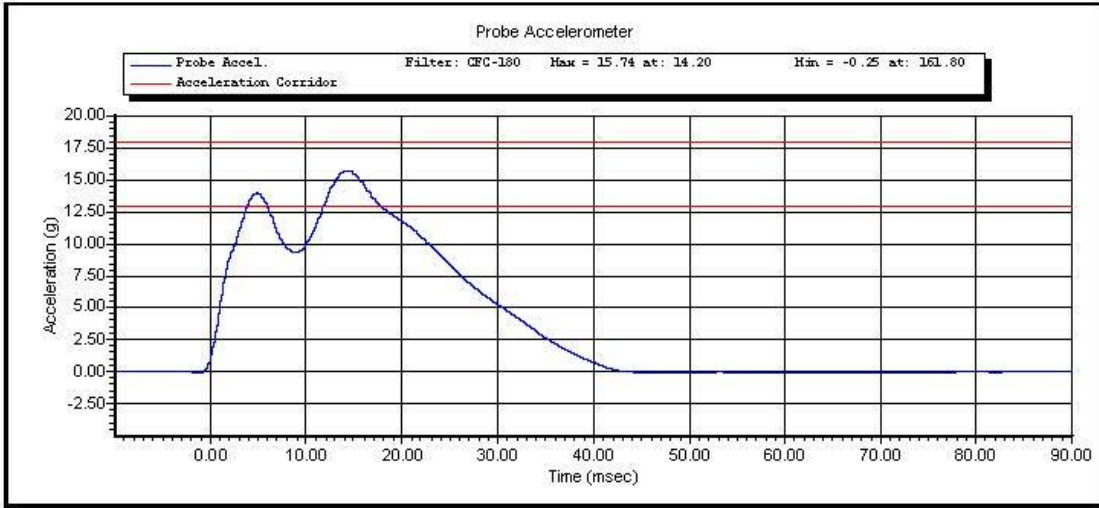
Test ID:

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

Test Date: **12/1/2011**

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1 of 2



Test ID:

Test Time: 12:35:19 PM

Test Date: 12/1/2011

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2 of 2



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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	1:14:01 PM

Component Part Number	Component Serial Number
Thorax Ribs 1, 2, 3 180-3362	DG6080, DG6081, DG7543
Shoulder Rib 180-3355	DG6997
Left Arm 180-6011-1	DG3210

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	30 %RH P
Velocity	6.60 -- 6.80	6.70 m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	31.3 g P
Upper Thorax Rib Deflection	25.0 -- 32.0	28.4 mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	32.8 mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	35.3 mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	39.1 g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	30.6 g P
Shoulder Deflection	31.0 -- 40.0	33.7 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **1:14:01 PM**

Test Date: **12/1/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	AH5M8	11/8/2011
FTSS	180-3881-1	DS-1849	9/1/2011
FTSS	180-3881-1	DS-1857	9/1/2011
FTSS	180-3881-1	DS-1859	9/1/2011
Endevco	7264-2000	P63561	10/3/2011
Endevco	7264-2000	P58796	10/5/2011
FTSS	180-3881-1	DS-1845	9/1/2011

Test ID:

Test Time: **1:14:01 PM**

Test Date: **12/1/2011**

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2 of 2

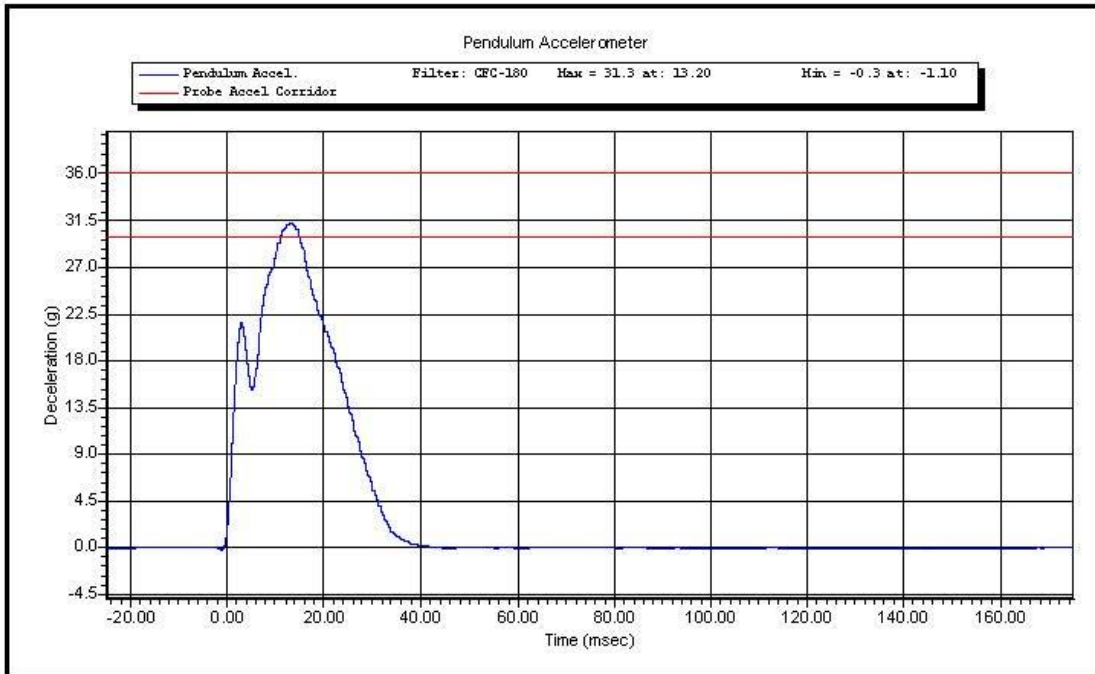


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Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	1:14:01 PM



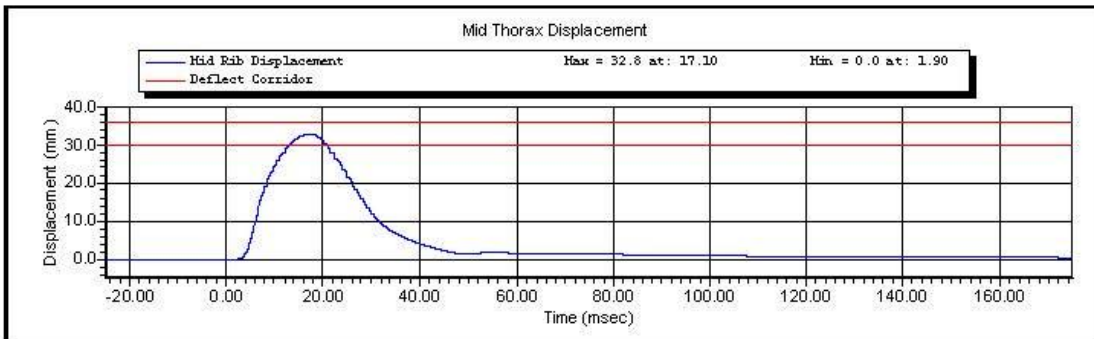
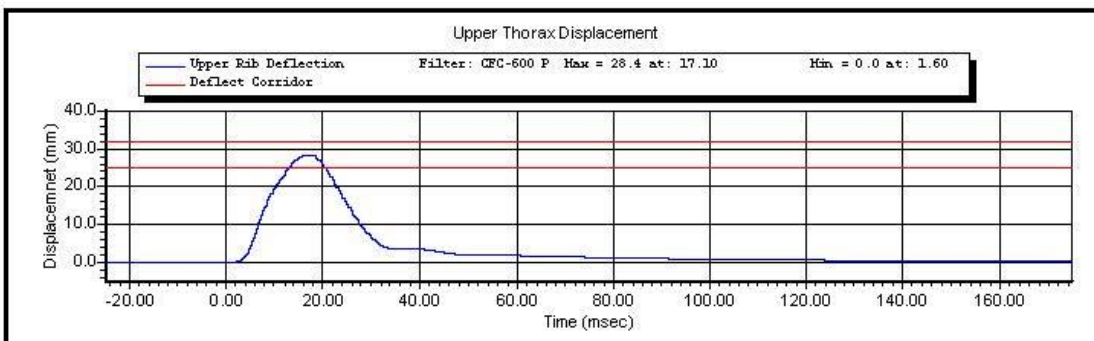
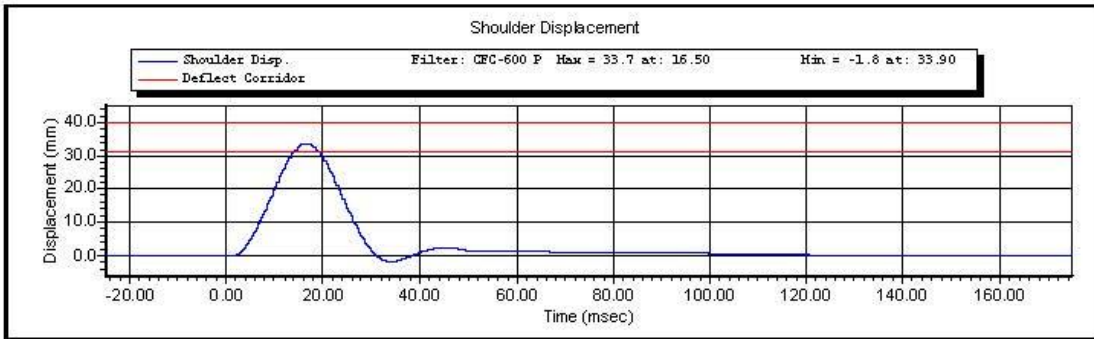
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Test Date: **12/1/2011**

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1 of 3



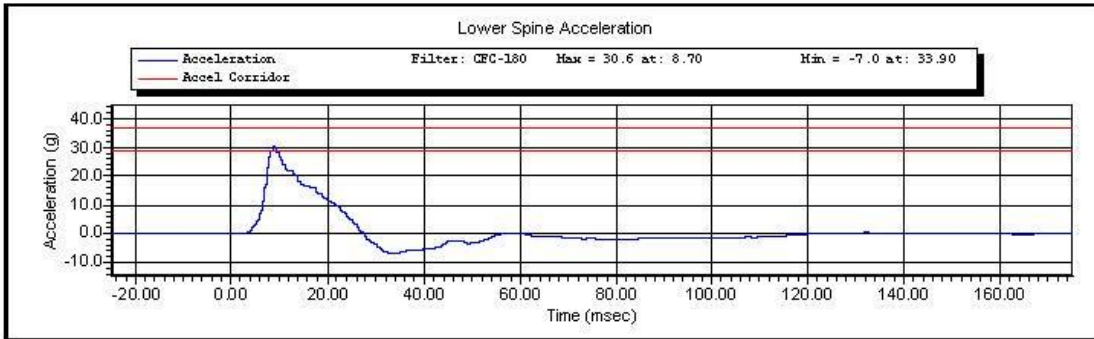
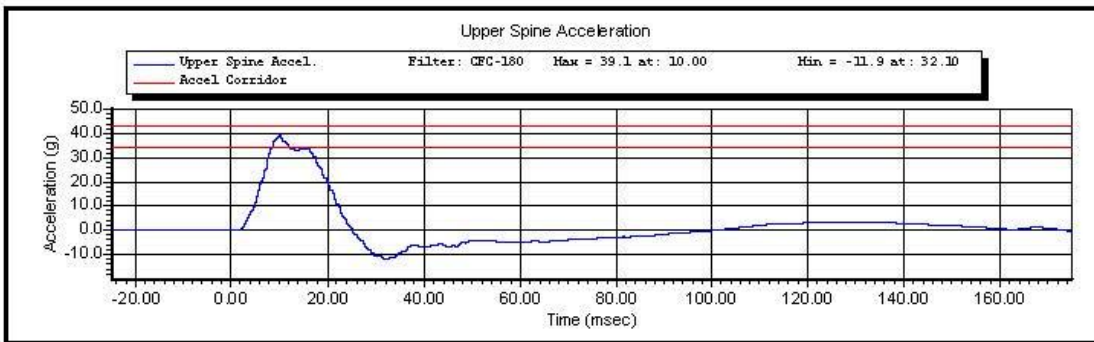
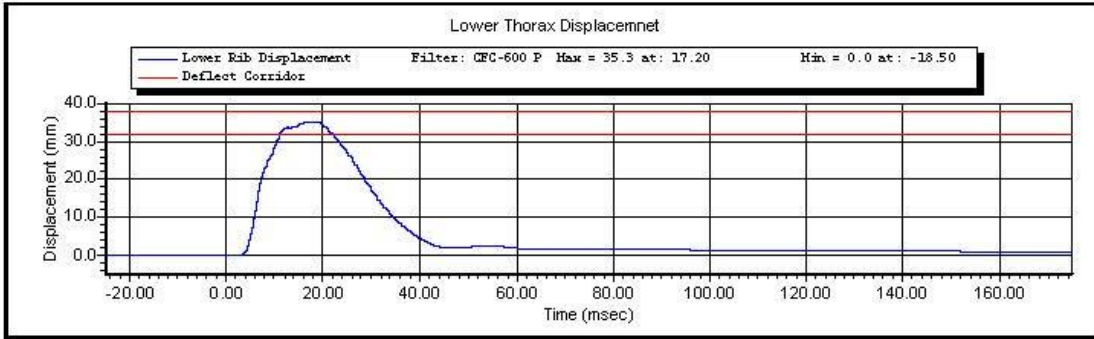
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Test Time: **1:14:01 PM**

Test Date: **12/1/2011**

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2 of 3



Test ID:

Test Time: 1:14:01 PM

Test Date: 12/1/2011

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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	1:45:06 PM

Component Part Number	Component Serial Number
Shoulder Rib 180-3355	DG6997

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	30 %RH P
Velocity	4.20 -- 4.40	4.37 m/s P
Probe Acceleration	14.0 -- 18.0	16.1 g P
Upper Thorax Rib Deflection	32.0 -- 40.0	35.7 mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	42.8 mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	41.5 mm P
Upper Spine Acceleration T1	13.0 -- 17.0	15.6 g P
Lower Spine Acceleration T12	7.0 -- 11.0	10.0 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **1:45:06 PM**

Test Date: **12/1/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	AH5M8	11/8/2011
FTSS	180-3881-1	DS-1849	9/1/2011
FTSS	180-3881-1	DS-1857	9/1/2011
FTSS	180-3881-1	DS-1859	9/1/2011
Endevco	7264-2000	P63561	10/3/2011
Endevco	7264-2000	P58796	10/5/2011

Test ID:

Test Time: 1:45:06 PM

Test Date: 12/1/2011

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2 of 2

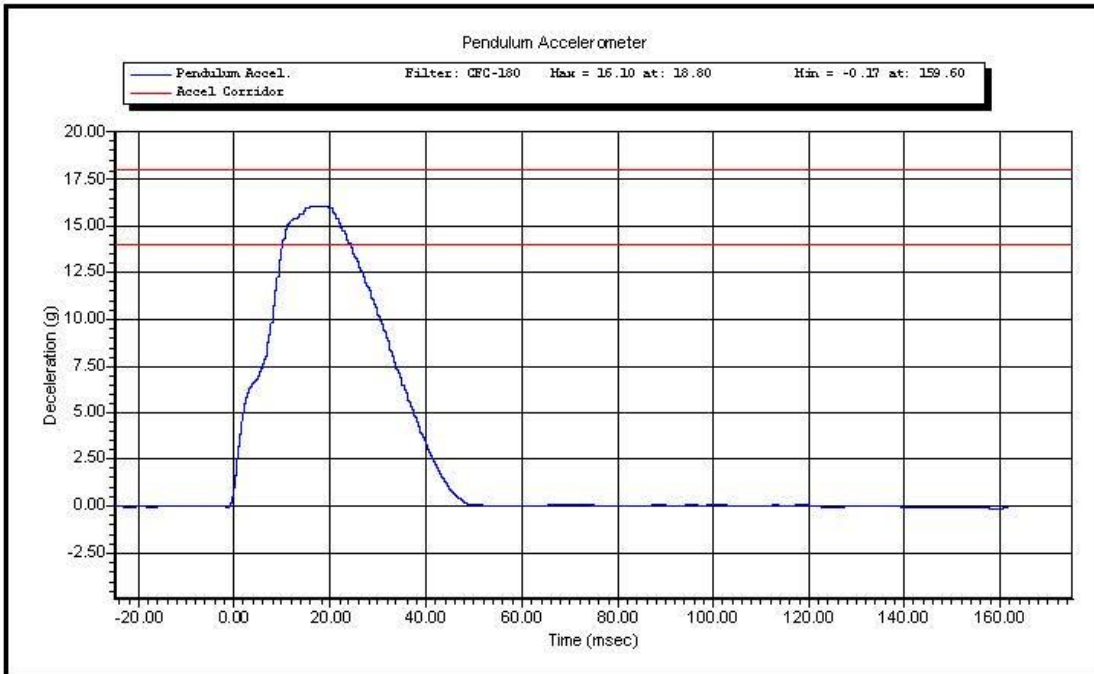


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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	1:45:06 PM



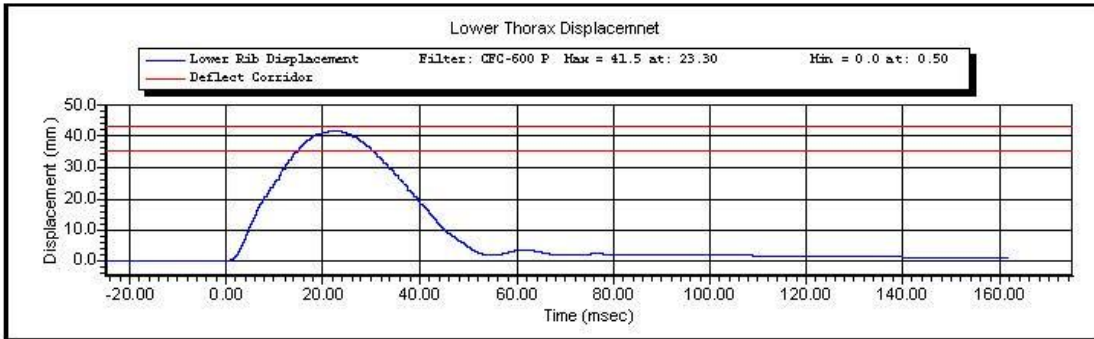
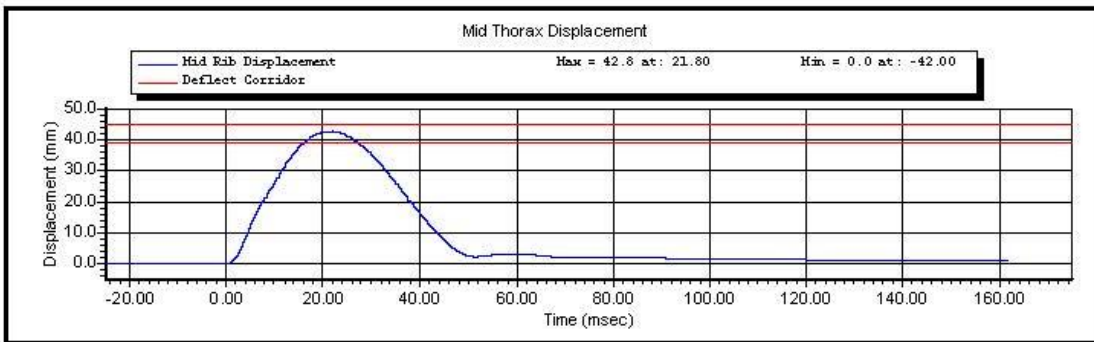
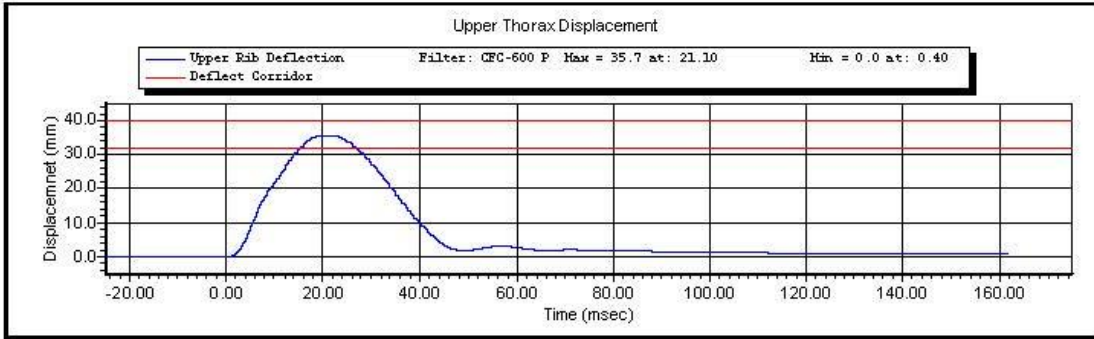
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Test Time: **1:45:06 PM**

Test Date: **12/1/2011**

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1 of 3



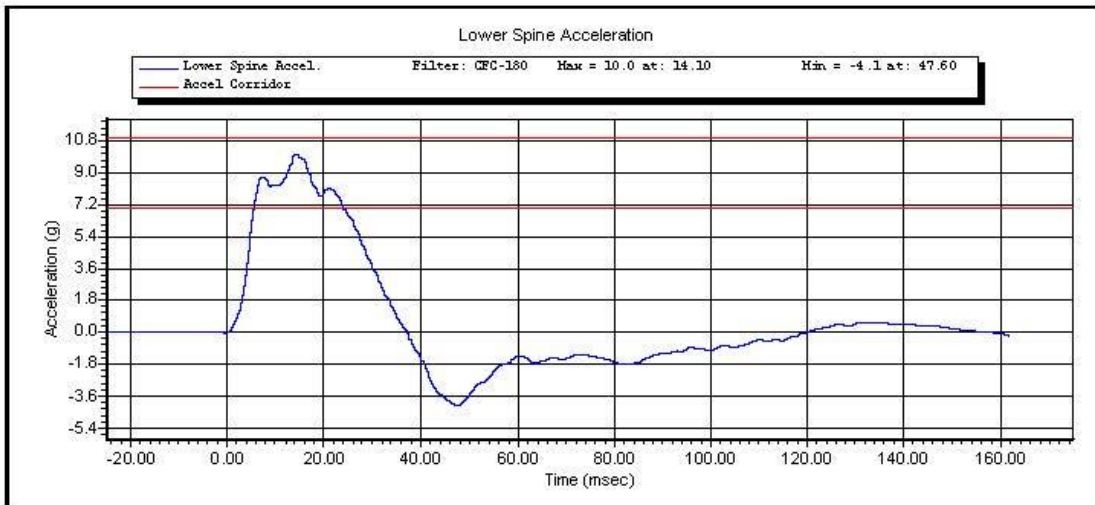
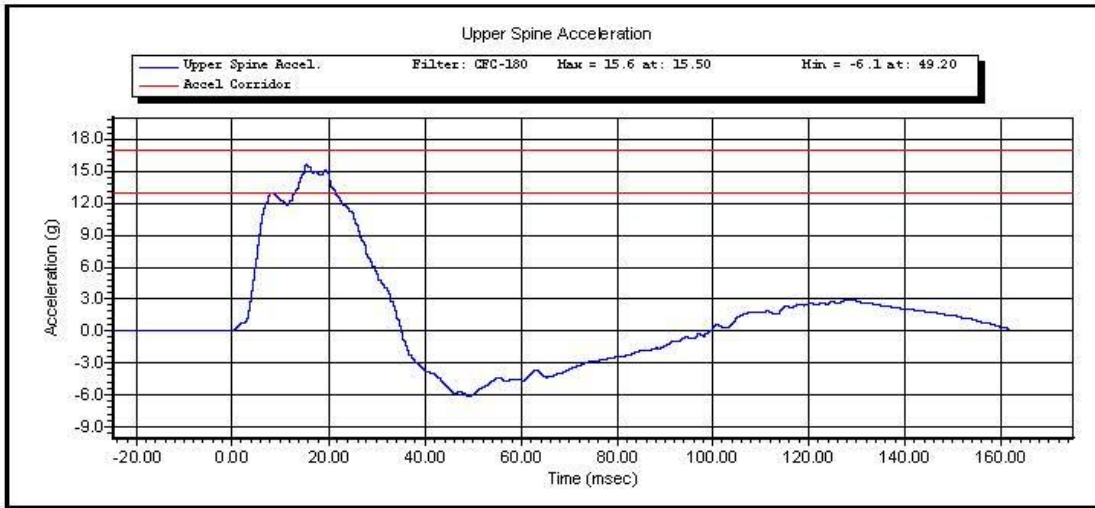
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Test Time: 1:45:06 PM

Test Date: 12/1/2011

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2 of 3



Test ID:

Test Time: 1:45:06 PM

Test Date: 12/1/2011

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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	3:08:36 PM

Component Part Number	Component Serial Number
Thorax Ribs 4, 5	1761, DG7012

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	31 %RH P
Velocity	4.20 -- 4.40	4.37 m/s P
Probe Acceleration	12.0 -- 16.0	14.6 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	44.2 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	41.3 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	10.1 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **3:08:36 PM**

Test Date: **12/1/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	AF5B3	11/18/2011
FTSS	180-3881-1	DS-1860	9/1/2011
FTSS	180-3881-1	DS-1861	9/1/2011
Endevco	7264-2000	P64147	11/1/2011

Test ID:

Test Time: **3:08:36 PM**

Test Date: **12/1/2011**

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2 of 2

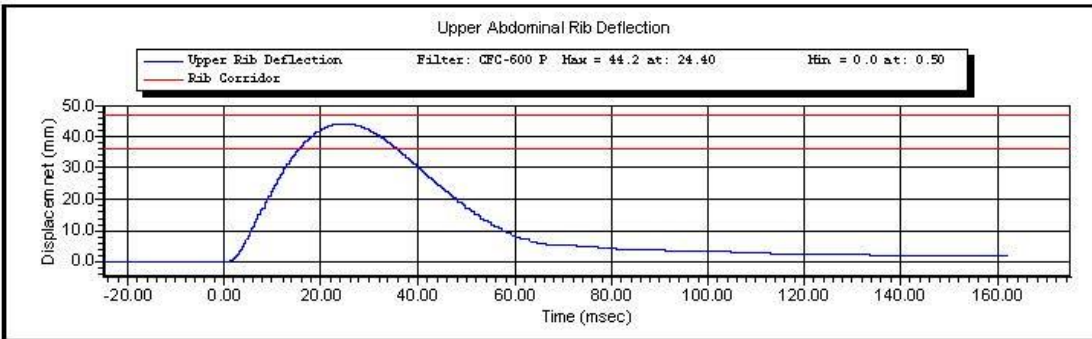
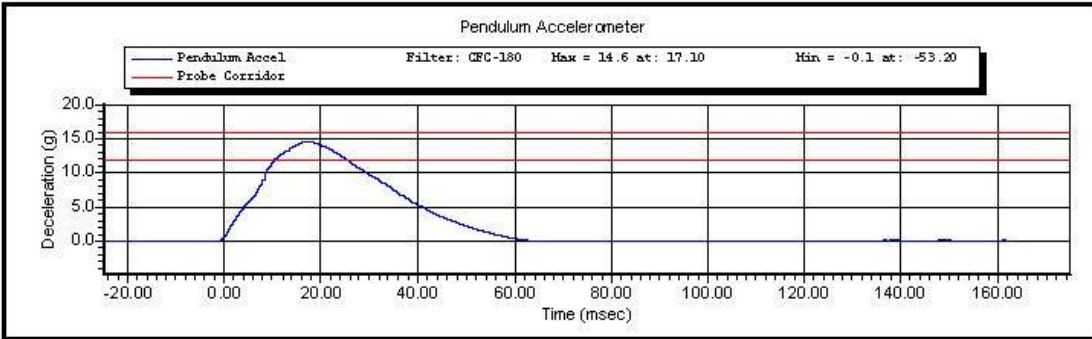


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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	3:08:36 PM



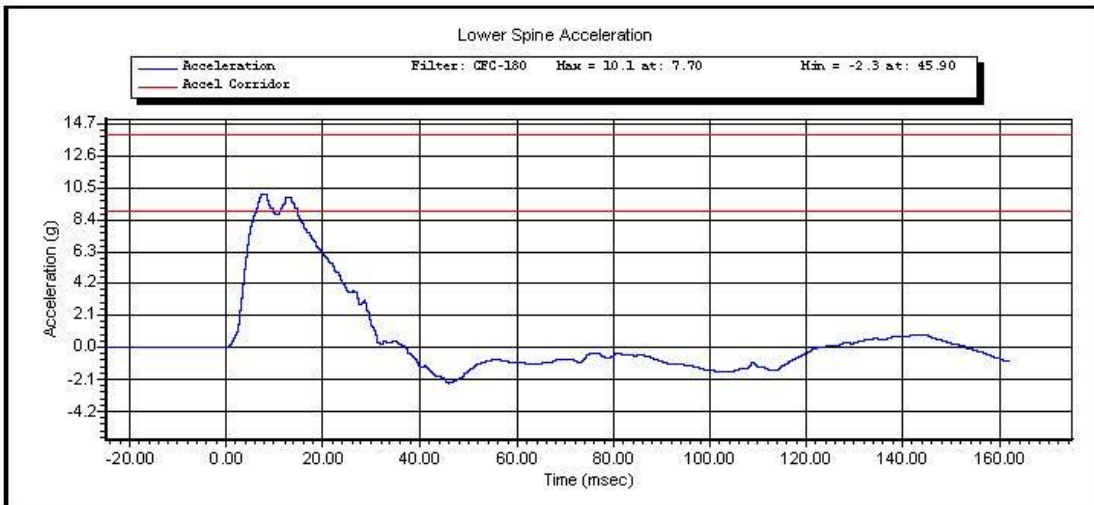
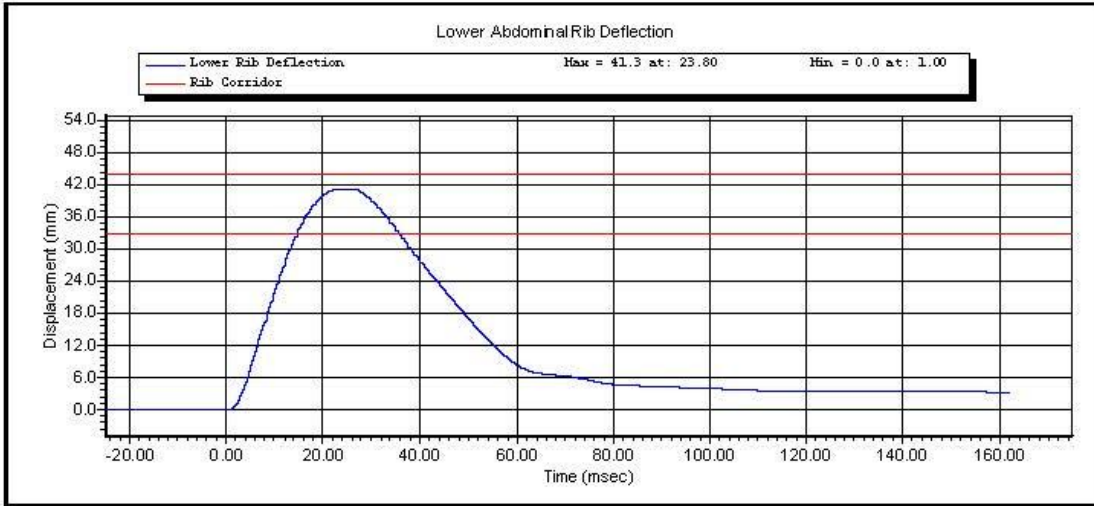
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1 of 2



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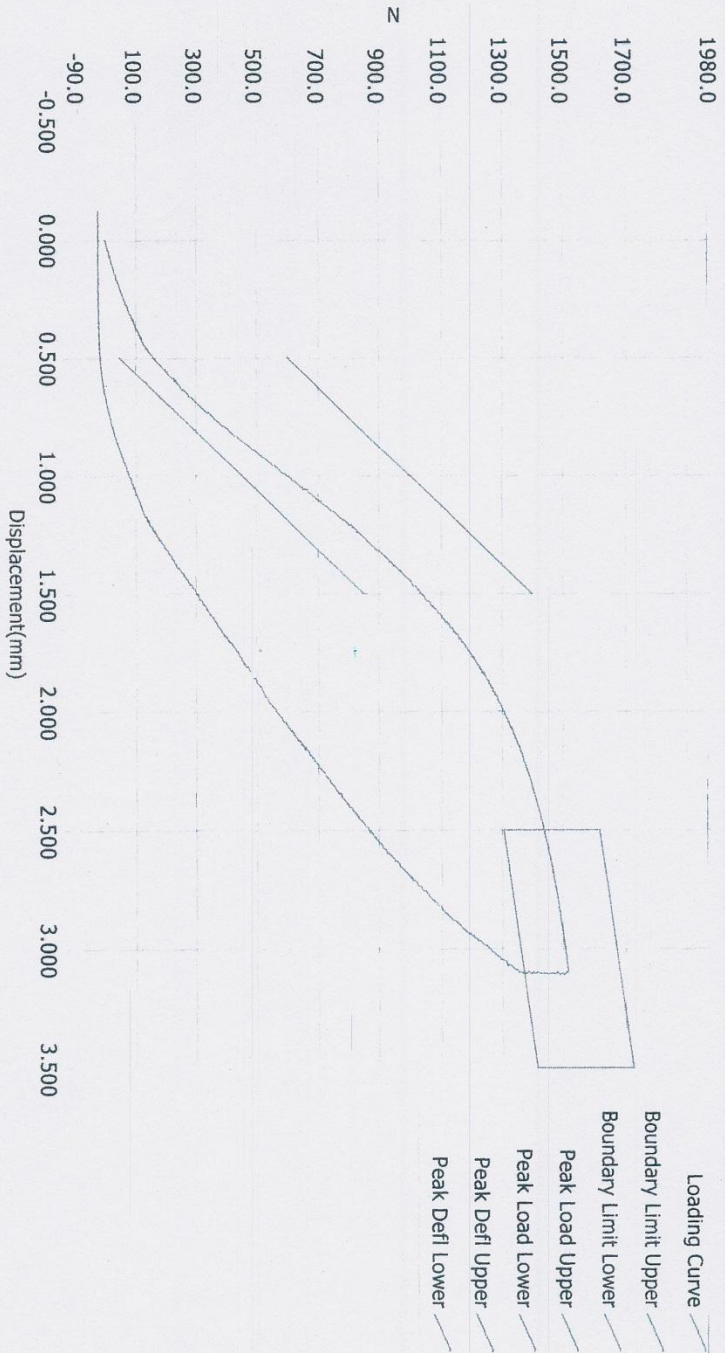
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Test Date: 12/1/2011

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2 of 2

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

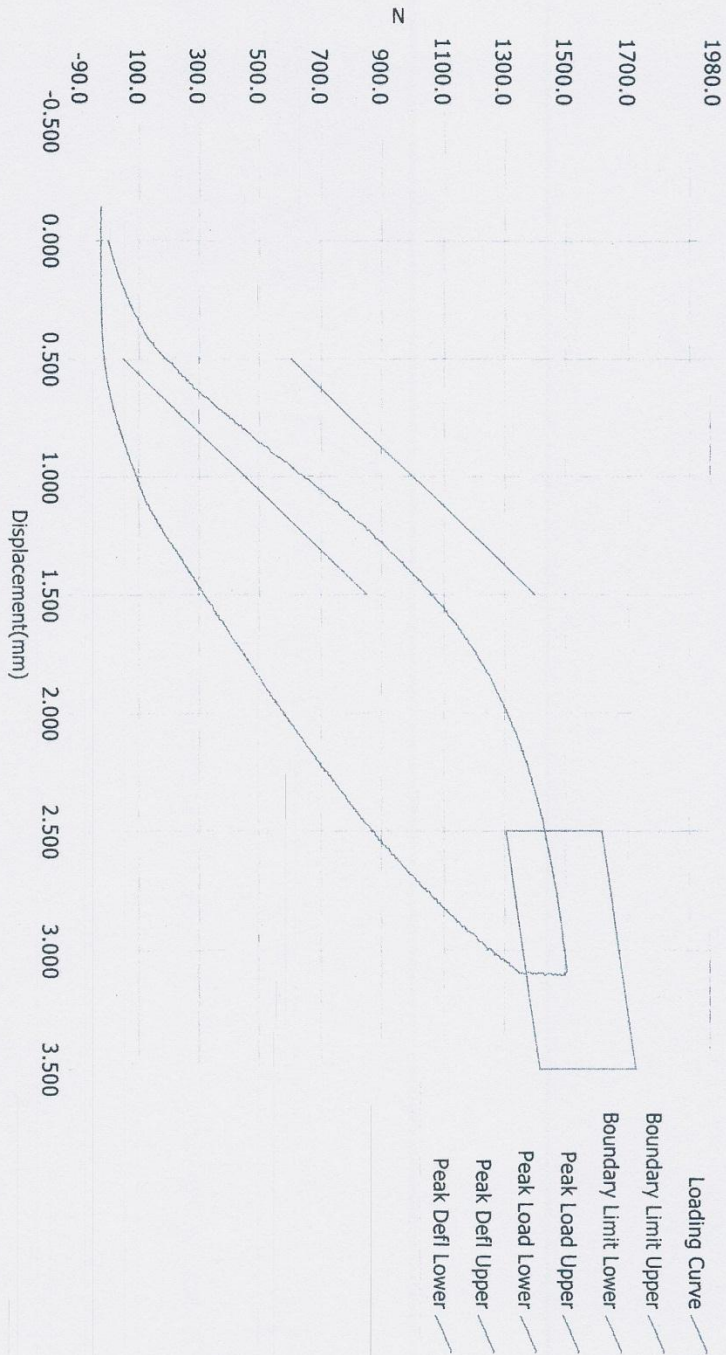
Test ID	Part Serial Number	Test Date	Test Time
46449	46449	9/22/2011	8:17 PM
Cert ID	ATD Serial Number	ATD Type	
N/A	N/A	SIDIIs	

Current Date : 9/22/2011

Current Time : 20:17:34

C

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
46447	46447	9/22/2011	8:14 PM
Cat ID	ATD Serial Number	ATD Type	
N/A	N/A	SIDIIs	

Current Date : 9/22/2011

Current Time : 20:14:46



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/2/2011
Test Number:	1	Test Time:	3:52:42 PM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh	DG3207
Humanetics Cert Plug - 1505N	46449
Humanetics Test Plug - 1498N	46447

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	29 %RH P
Velocity	6.60 -- 6.80	6.61 m/s P
Peak Probe Acceleration	38.0 -- 47.0	46.0 g P
Peak Pelvis Acceleration	34.0 -- 42.0	40.8 g P
Peak Acetabulum Force	3.60 -- 4.30	3.82 kN P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **3:52:42 PM**

Test Date: **12/2/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	AF5B3	11/18/2011
Endevco	7264-2000	P51875	9/29/2011
DentonATD	3249J	LC-267Fy	10/30/2011

Test ID:

Test Time: 3:52:42 PM

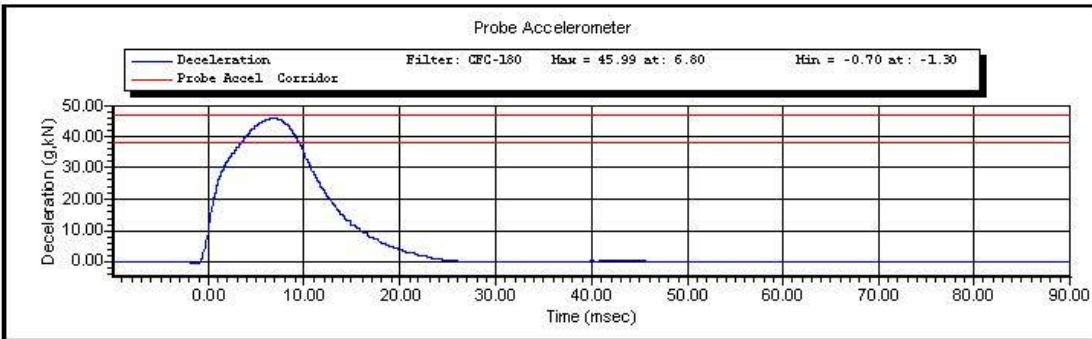
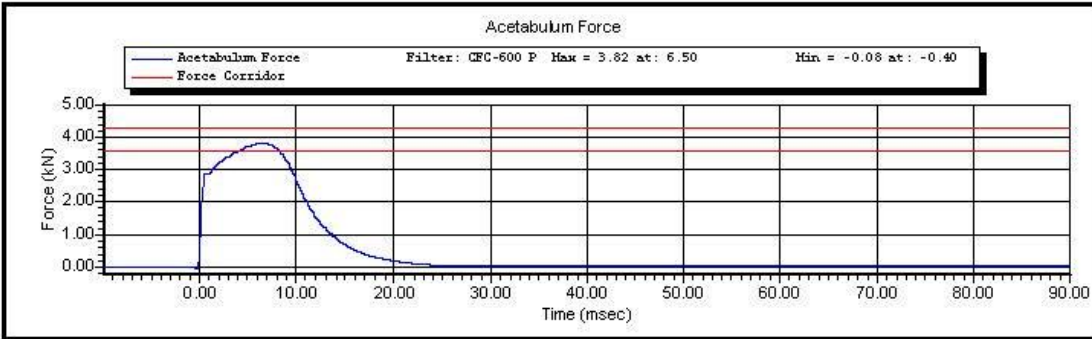
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2 of 2



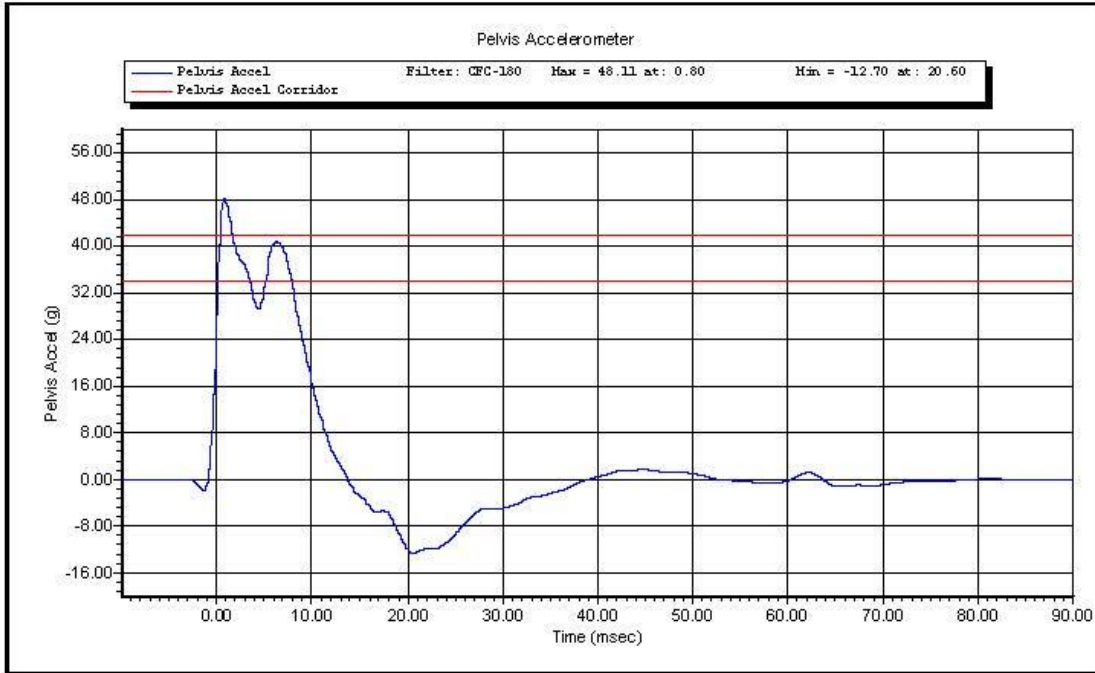
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Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/2/2011
Test Number:	1	Test Time:	3:52:42 PM



Test ID:

Test Time: **3:52:42 PM**

Test Date: **12/2/2011**



Test ID:

Test Time: 3:52:42 PM

Test Date: 12/2/2011

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2 of 2



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	9:09:43 AM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh	DG3207

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.1 deg C P
Humidity	10 -- 70	29 %RH P
Velocity	4.20 -- 4.40	4.37 m/s P
Peak Probe Acceleration	36.0 -- 45.0	44.4 g P
Peak Pelvis Acceleration	28.0 -- 39.0	36.6 g P
Peak Iliac Force	4.10 -- 5.10	5.02 kN P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **9:09:43 AM**

Test Date: **12/1/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	AF5B3	11/18/2011
Endevco	7264-2000	P51875	9/29/2011
DentonATD	3228J	LC-281Fy	8/31/2011

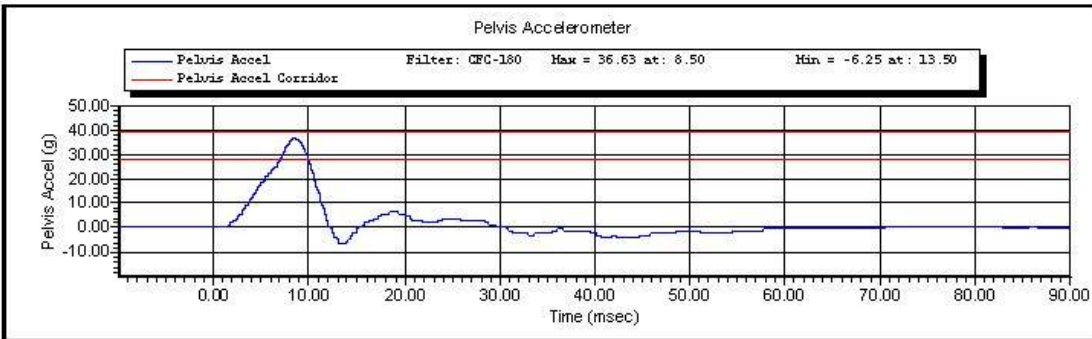
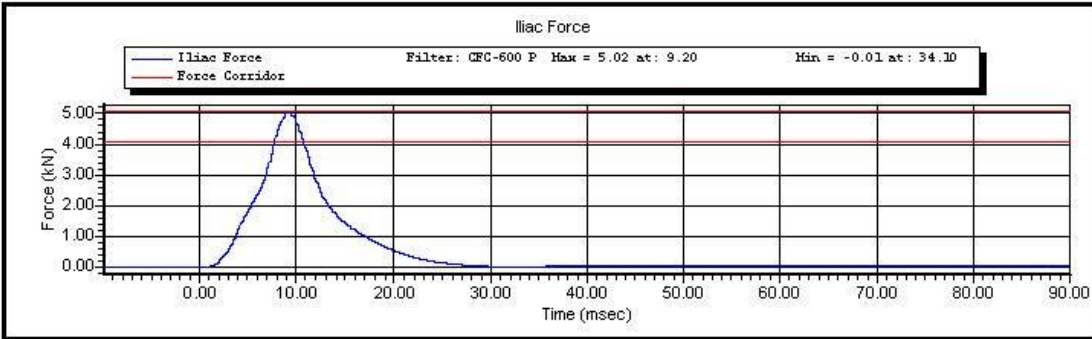
Test ID:

Test Time: **9:09:43 AM**

Test Date: **12/1/2011**



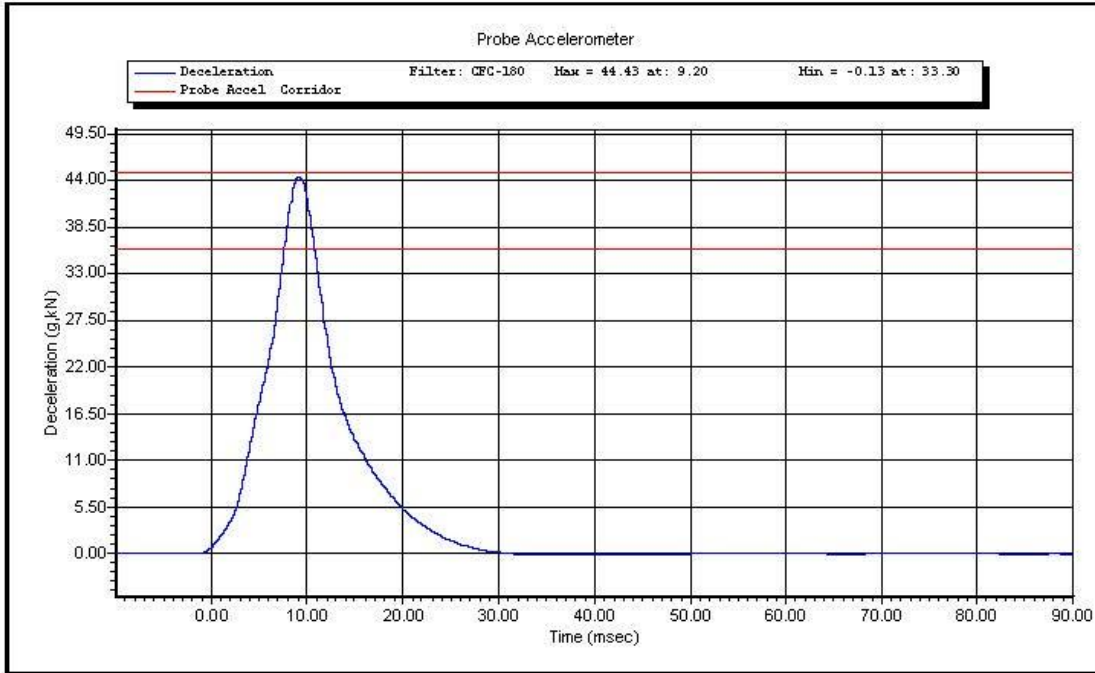
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Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/1/2011
Test Number:	1	Test Time:	9:09:43 AM



Test ID:

Test Time: **9:09:43 AM**

Test Date: **12/1/2011**



Test ID:

Test Time: 9:09:43 AM

Test Date: 12/1/2011

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CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 8012

CONFIGURED FOR LEFT SIDE IMPACT



SID-IIsD External Measurements

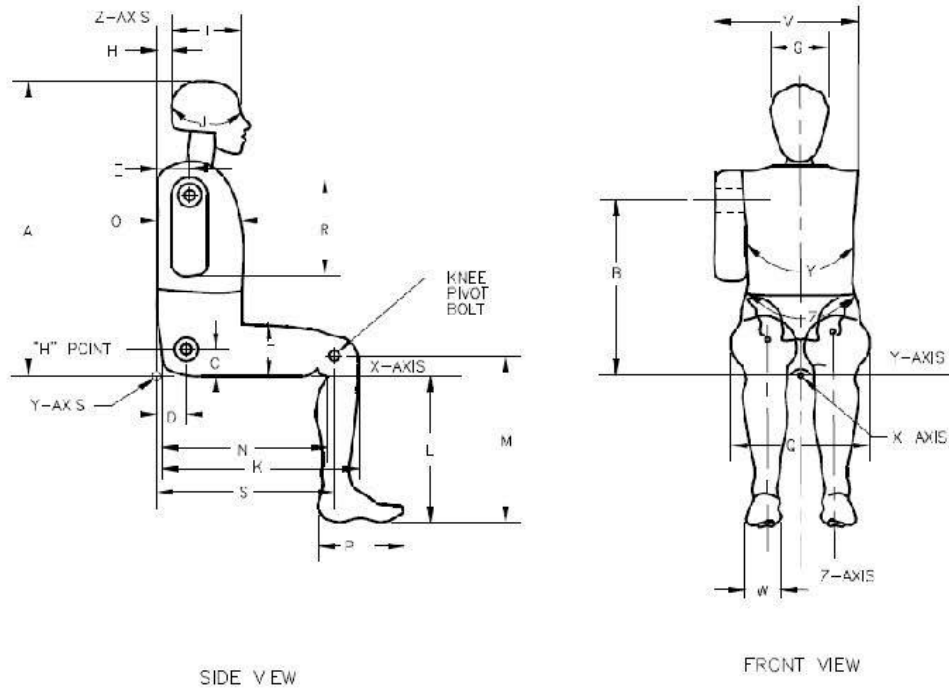
NHTSA ATD S/N DG8012

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	444	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	148	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	98	Yes
F	Thigh Clearance	119.0 - 135.0	132	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	43	Yes
I	Head Depth	178.0 - 188.0	187	Yes
J	Head Circumference	541.0 - 551.0	548	Yes
K	Buttock to Knee Length	514.0 - 540.0	530	Yes
L	Popliteal Height	343.0 - 369.0	359	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	204	Yes
P	Foot Length (right)	216.0 - 232.0	223	Yes
Q	Hip Breadth	313.0 - 323.0	315	Yes
R	Arm Length	249.0 - 259.0	257	Yes
S	Knee Joint to Seat back	478.0 - 493.0	490	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	351	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	872	Yes
Z	Waist Circumference	761.0 - 791.0	782	Yes

Technician : AR

Date: 12/12/2011

SID-11sD External Dimension Reference Diagram





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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/12/2011
Test Number:	1	Test Time:	11:15:30 AM

Component Part Number	Component Serial Number
Head Skin - 180-1002	1362

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	17 %RH P
Resultant Acceleration	115.0 -- 137.0	124.7 g P
Oscillation	0.0 -- 15.0	8.3 % P
Fore-Aft Acceleration	-15.0 -- 15.0	-6.2 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **11:15:30 AM**

Test Date: **12/12/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P71271	8/12/2011
Endevco	7264-2000	P71281	8/12/2011
Endevco	7264-2000	P71298	8/12/2011

Test ID:

Test Time: **11:15:30 AM**

Test Date: **12/12/2011**

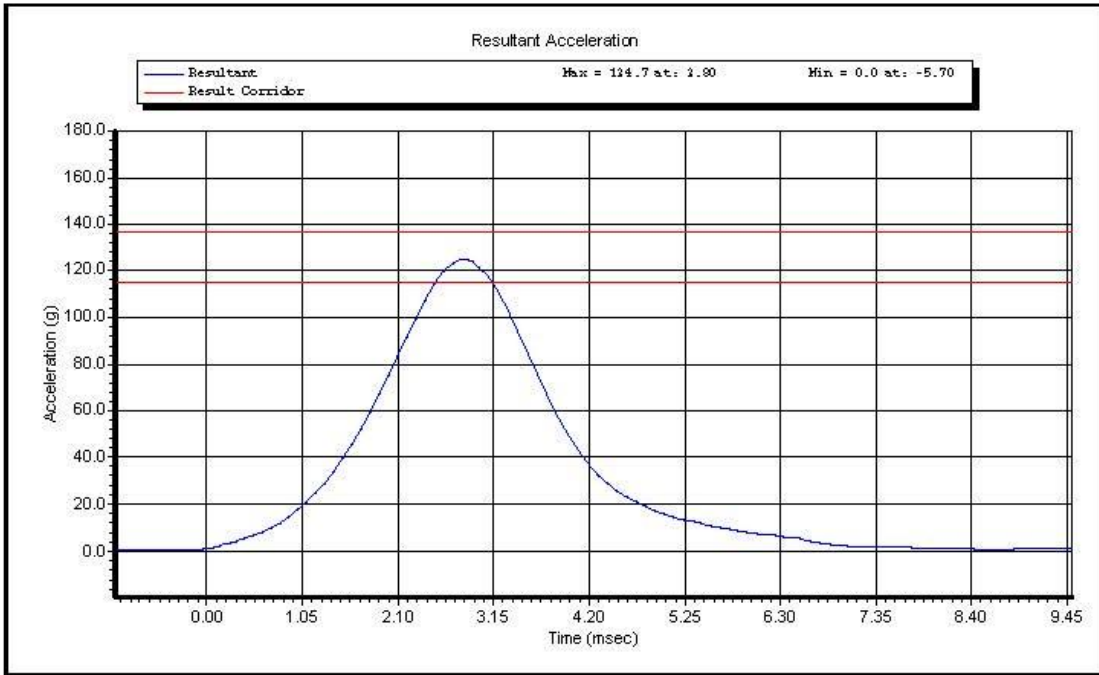


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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/12/2011
Test Number:	1	Test Time:	11:15:30 AM



Test ID:

Test Time: **11:15:30 AM**

Test Date: **12/12/2011**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

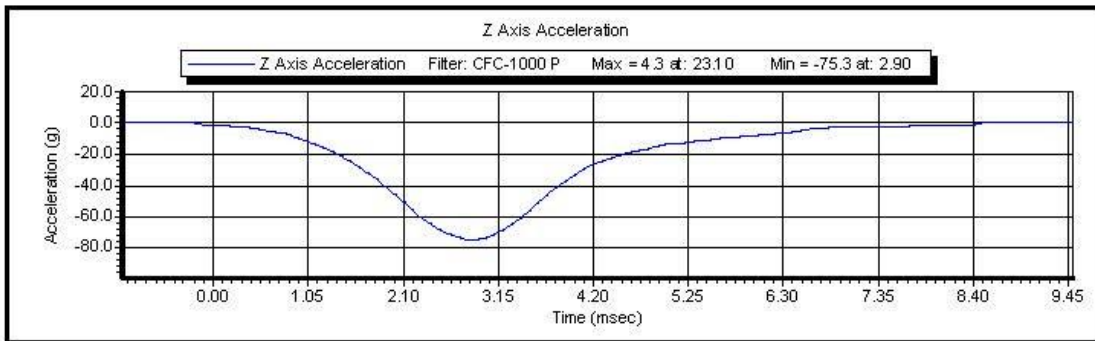
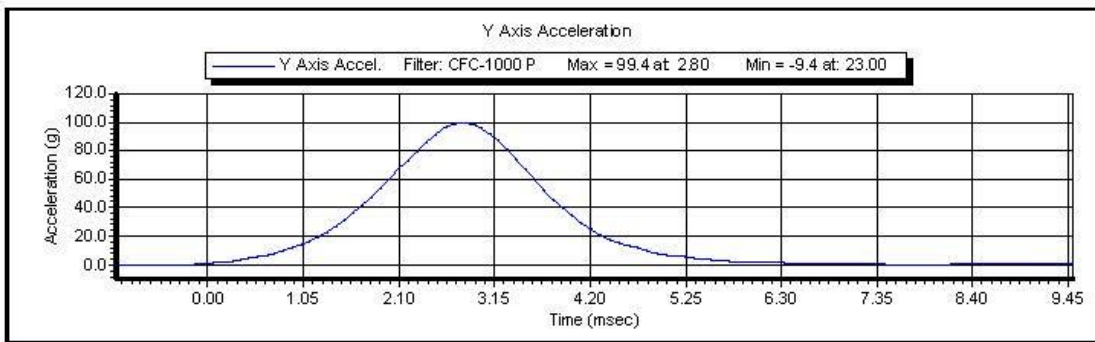
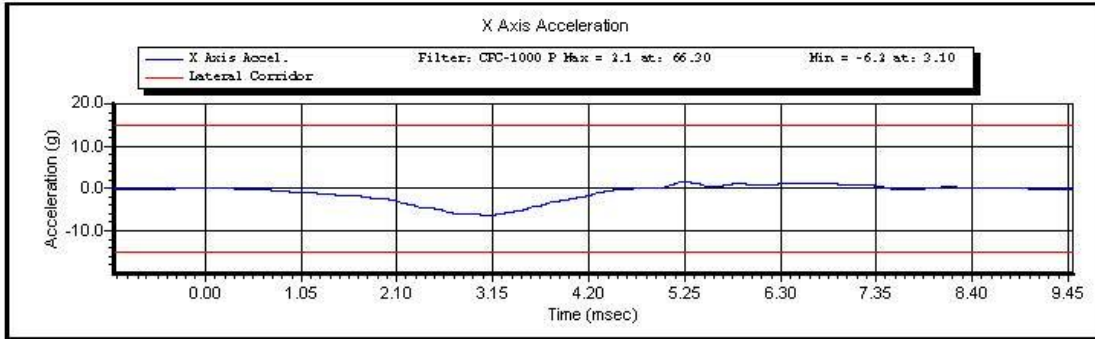
1 of 2



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Test ID:

Test Time: 11:15:30 AM

Test Date: 12/12/2011

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2 of 2



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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/13/2011
Test Number:	2	Test Time:	11:23:20 AM

Component Part Number	Component Serial Number
Neck - 180-2000	DG7061

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	22 %RH P
Velocity	5.51 -- 5.63	5.59 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.33 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.48 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.80 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.60 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.77 m/s P
Max D Plane Rotation	71.0 -- 81.0	74.1 degrees P
Time at Max Rotation	50.0 -- 70.0	61.7 ms P
Moment about OC	-44.0 -- -36.0	-41.6 Nm P
Moment Decay to Zero	102.0 -- 126.0	113.2 ms P

All test parameters are within specifications

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

Test ID:

Test Time: **11:23:20 AM**

Test Date: **12/13/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
Denton	1716A	LC-2192Fy	8/31/2011
Denton	1716A	LC-2192Mx	8/31/2011
DentonATD	78051-342	184	5/8/2011
DentonATD	78051-342	174	5/8/2011
DentonATD	78051-342	185	5/8/2011

Test ID:

Test Time: 11:23:20 AM

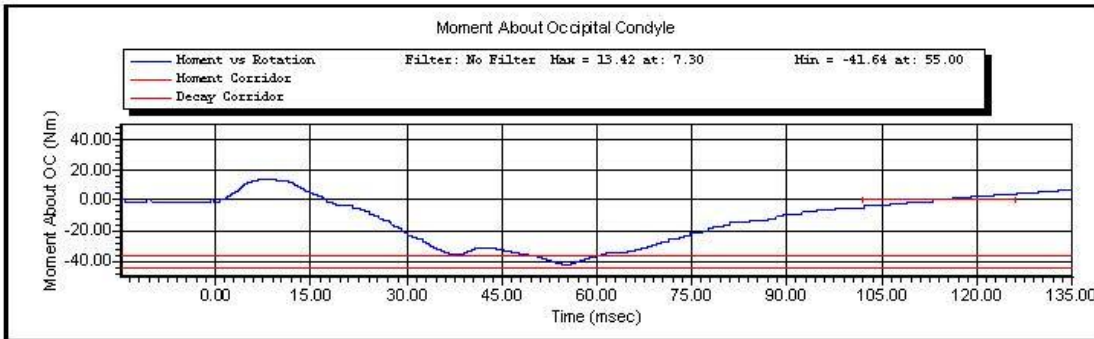
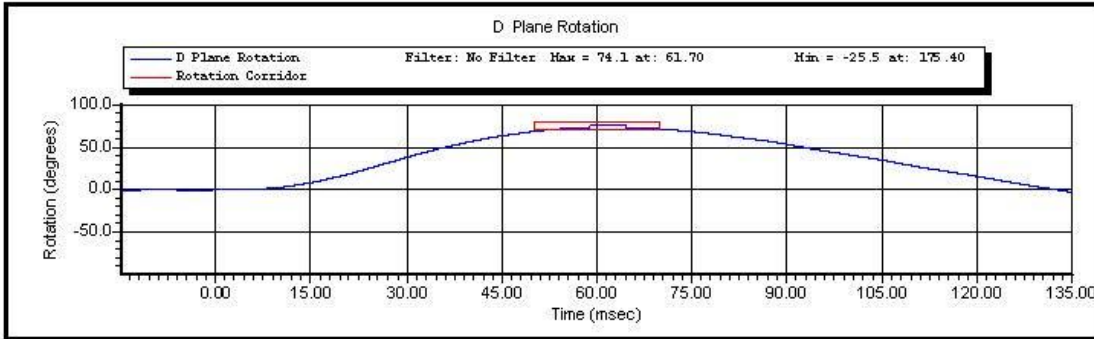
Test Date: 12/13/2011

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2 of 2



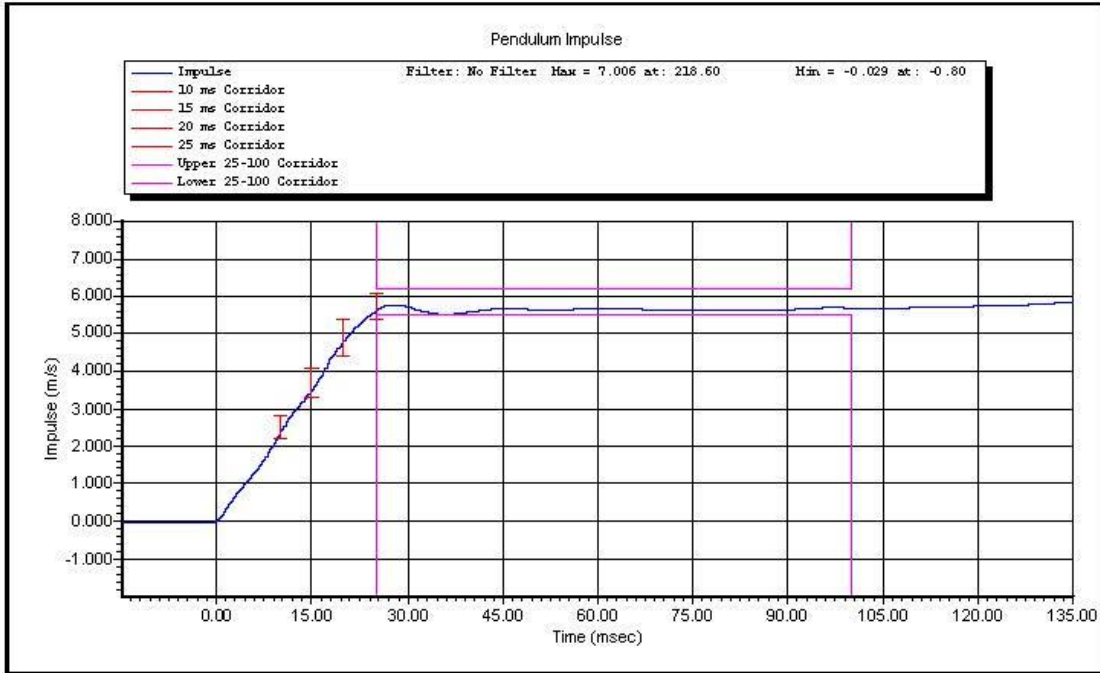
Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/13/2011
Test Number:	2	Test Time:	11:23:20 AM



Test ID:

Test Time: **11:23:20 AM**

Test Date: **12/13/2011**



Test ID:

Test Time: 11:23:20 AM

Test Date: 12/13/2011

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2 of 2



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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/13/2011
Test Number:	1	Test Time:	3:05:57 PM

Component Part Number	Component Serial Number
Left Arm 180-6011-1	DG3210
Shoulder Rib 180-3355	DG6997

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.70 deg C P
Humidity	10.0 -- 70.0	27.2 %RH P
Velocity	4.20 -- 4.40	4.39 m/s P
Probe Acceleration	13.0 -- 18.0	15.7 g P
Shoulder Deflection	28.0 -- 37.0	29.0 mm P
T1 Acceleration	17.0 -- 22.0	19.3 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **3:05:57 PM**

Test Date: **12/13/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7264-2000	P66927	12/10/2011
FTSS	180-3881-1	DS-1845	9/1/2011
Endevco	7264-2000	P63561	10/3/2011

Test ID:

Test Time: 3:05:57 PM

Test Date: 12/13/2011

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2 of 2

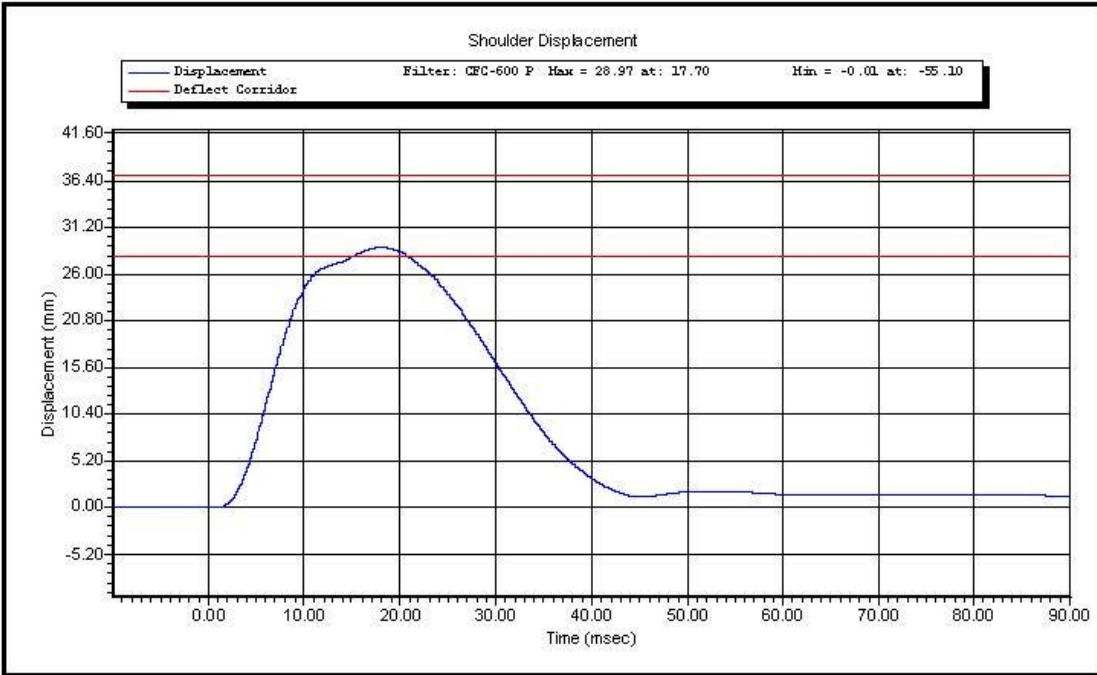


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Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/13/2011
Test Number:	1	Test Time:	3:05:57 PM



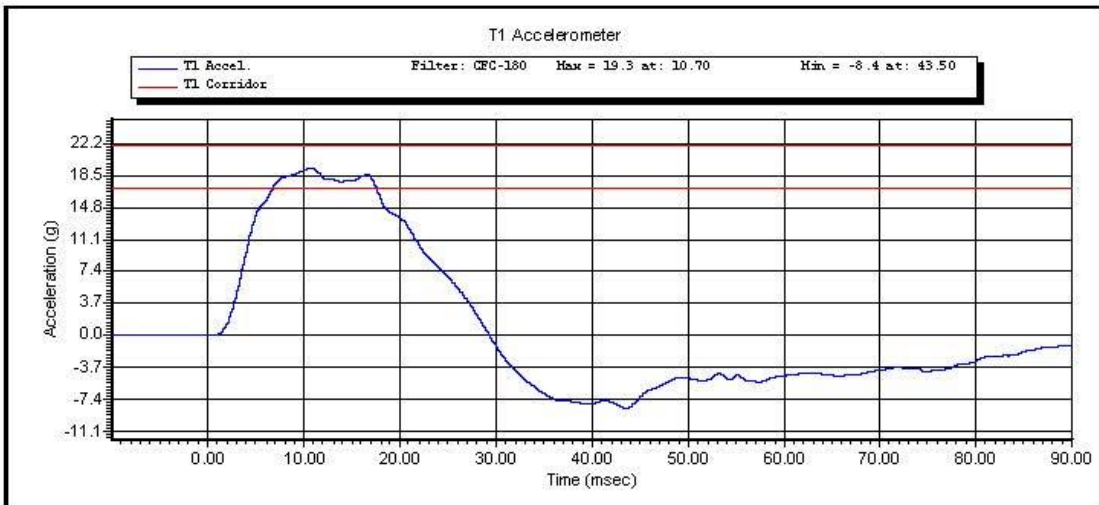
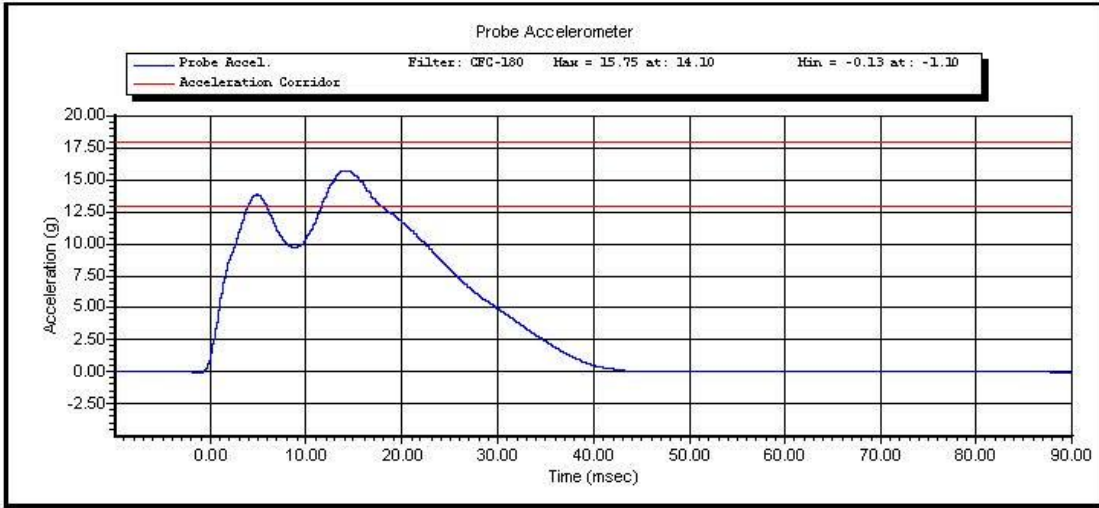
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Test Time: **3:05:57 PM**

Test Date: **12/13/2011**

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1 of 2



Test ID:

Test Time: 3:05:57 PM

Test Date: 12/13/2011

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2 of 2



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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/14/2011
Test Number:	1	Test Time:	8:16:58 PM

Component Part Number	Component Serial Number
Thorax Ribs 1, 2, 3 180-3362	DG6080, DG6081, DG7543
Shoulder Rib 180-3355	DG6997
Left Arm 180-6011-1	DG3210

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.9 deg C P
Humidity	10 -- 70	33 %RH P
Velocity	6.60 -- 6.80	6.72 m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	32.7 g P
Upper Thorax Rib Deflection	25.0 -- 32.0	28.2 mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	32.9 mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	35.6 mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	40.1 g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	32.4 g P
Shoulder Deflection	31.0 -- 40.0	34.5 mm P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **8:16:58 PM**

Test Date: **12/14/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	AGHF5	12/14/2011
FTSS	180-3881-1	DS-1849	9/1/2011
Servo	180-3885	DS-1063	10/31/2011
FTSS	180-3881-1	DS-1859	9/1/2011
Endevco	7264-2000	P63561	10/3/2011
Endevco	7264-2000	P58796	10/5/2011
FTSS	180-3881-1	DS-1845	9/1/2011

Test ID:

Test Time: **8:16:58 PM**

Test Date: **12/14/2011**

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2 of 2

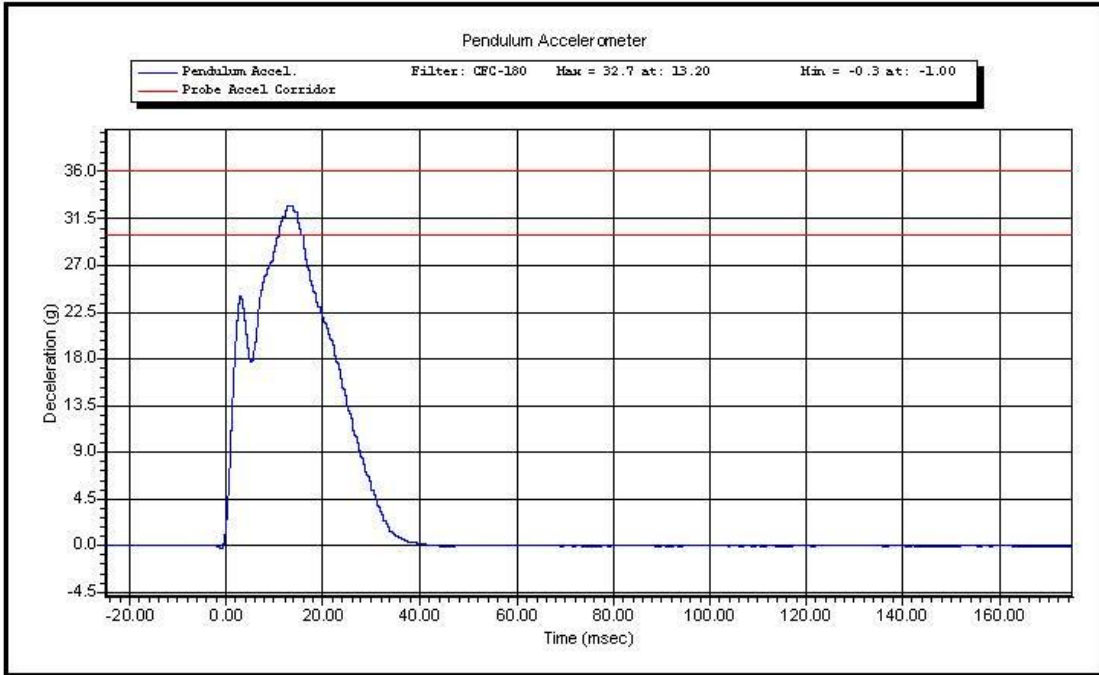


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Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/14/2011
Test Number:	1	Test Time:	8:16:58 PM



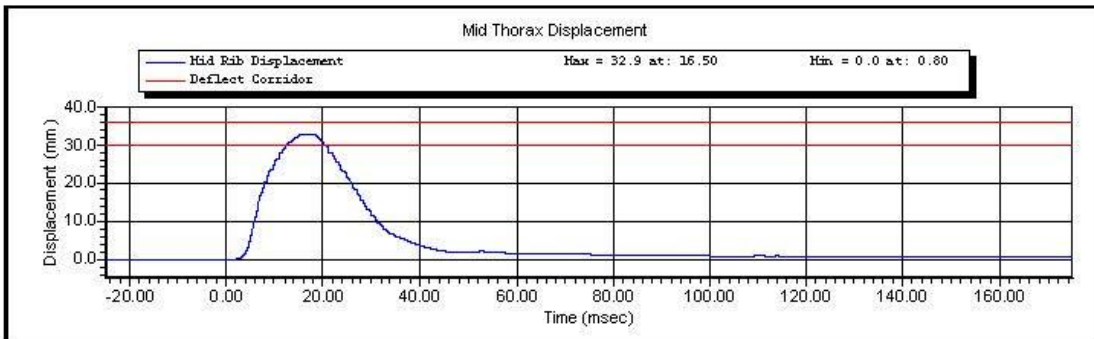
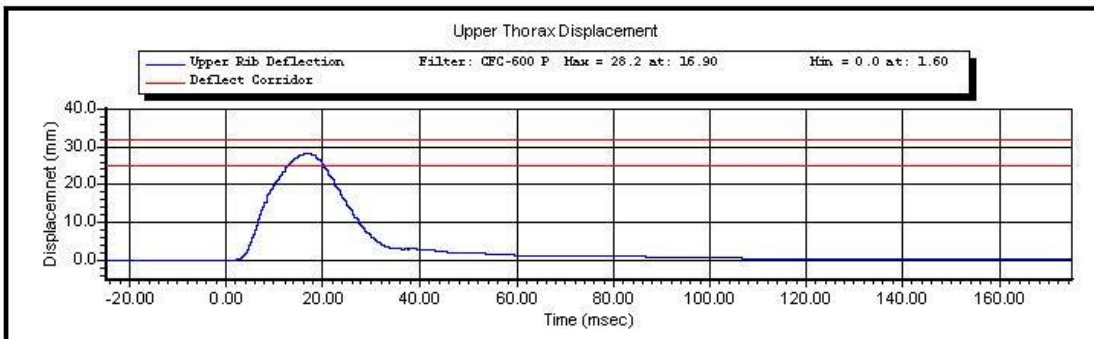
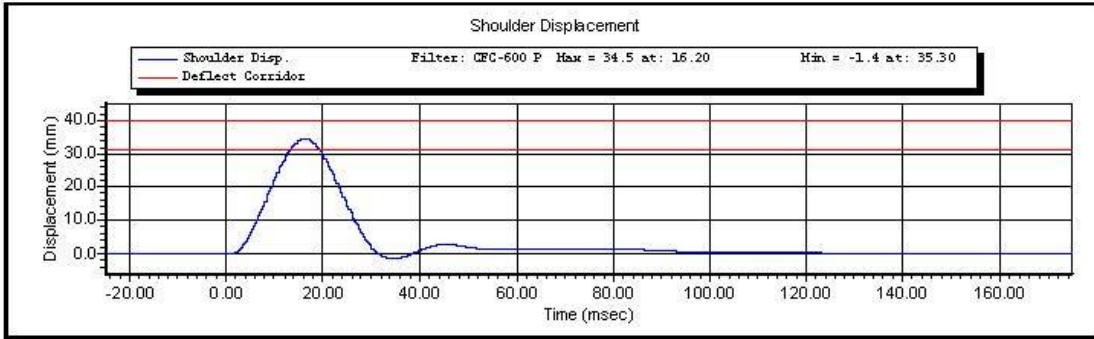
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Test Date: **12/14/2011**

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1 of 3



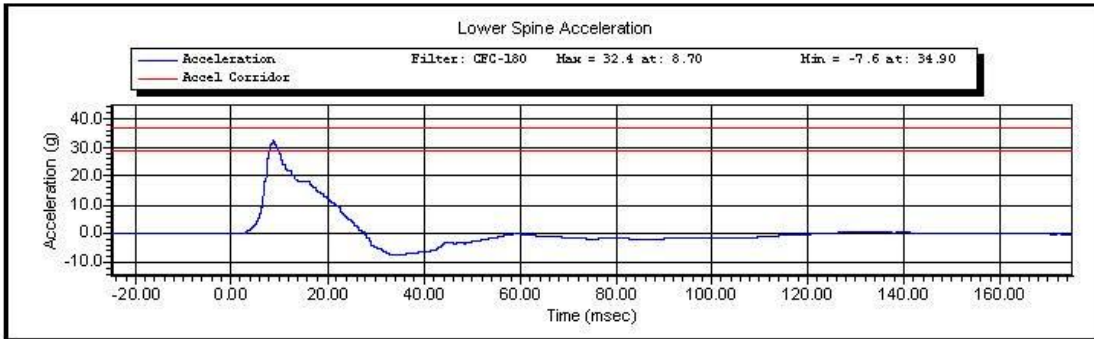
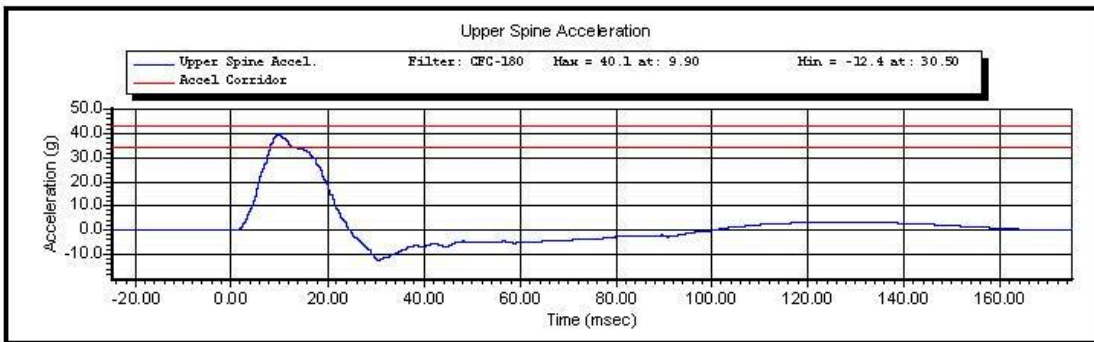
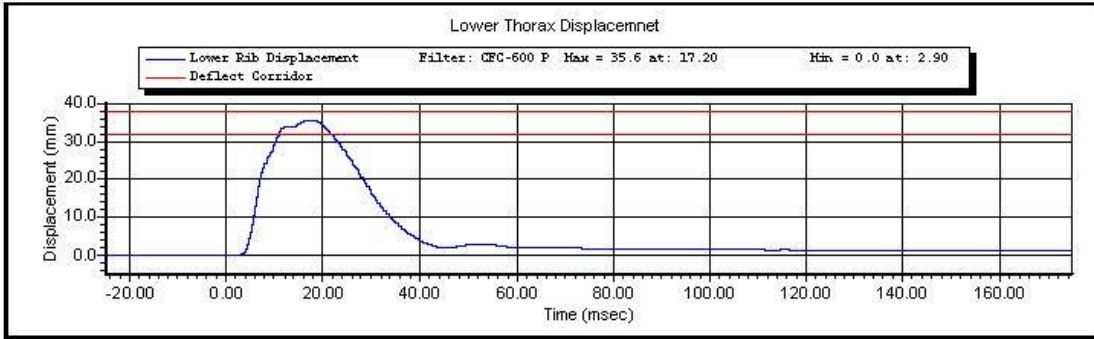
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Test Date: 12/14/2011

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2 of 3



Test ID:

Test Time: 8:16:58 PM

Test Date: 12/14/2011

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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/14/2011
Test Number:	1	Test Time:	7:39:51 PM

Component Part Number	Component Serial Number
Thorax Ribs 1, 2, 3 180-3362	DG6080, DG6081, DG7543

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.9 deg C P
Humidity	10 -- 70	32 %RH P
Velocity	4.20 -- 4.40	4.29 m/s P
Probe Acceleration	14.0 -- 18.0	16.5 g P
Upper Thorax Rib Deflection	32.0 -- 40.0	36.5 mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	41.6 mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	39.2 mm P
Upper Spine Acceleration T1	13.0 -- 17.0	15.3 g P
Lower Spine Acceleration T12	7.0 -- 11.0	10.3 g P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **7:39:51 PM**

Test Date: **12/14/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	AGHF5	12/14/2011
FTSS	180-3881-1	DS-1849	9/1/2011
Servo	180-3885	DS-1063	10/31/2011
FTSS	180-3881-1	DS-1859	9/1/2011
Endevco	7264-2000	P63561	10/3/2011
Endevco	7264-2000	P58796	10/5/2011

Test ID:

Test Time: 7:39:51 PM

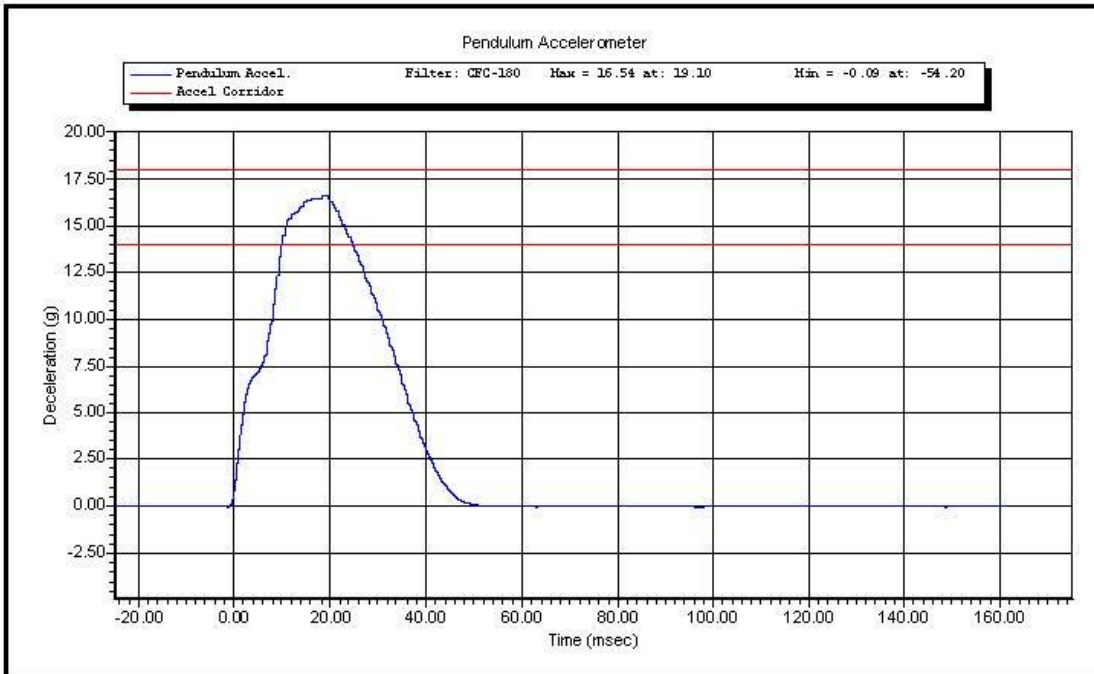
Test Date: 12/14/2011

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2 of 2



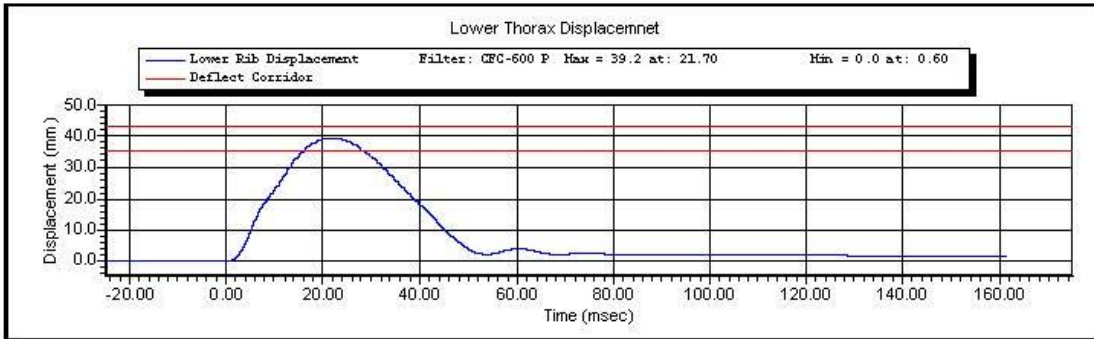
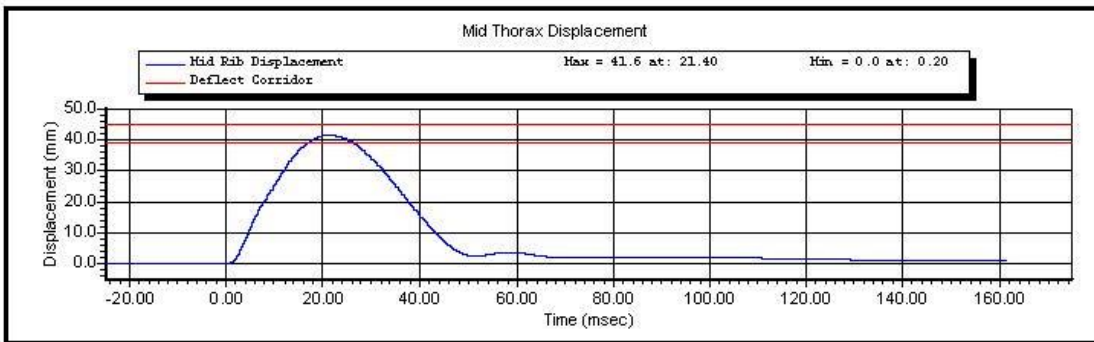
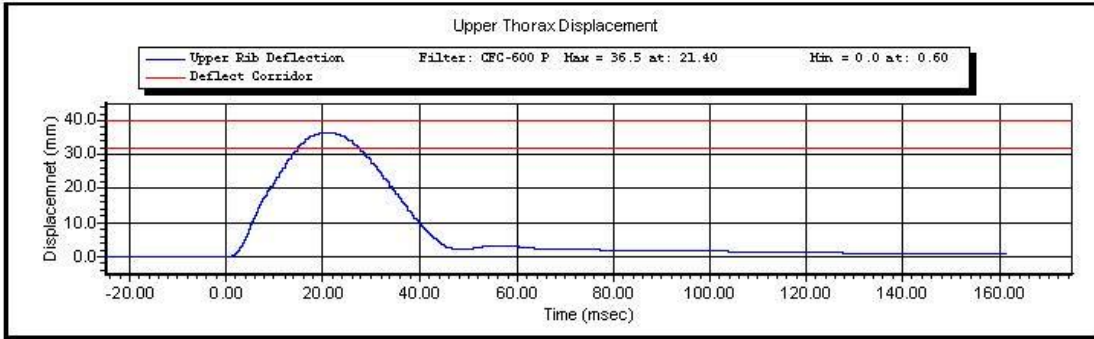
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/14/2011
Test Number:	1	Test Time:	7:39:51 PM



Test ID:

Test Time: **7:39:51 PM**

Test Date: **12/14/2011**



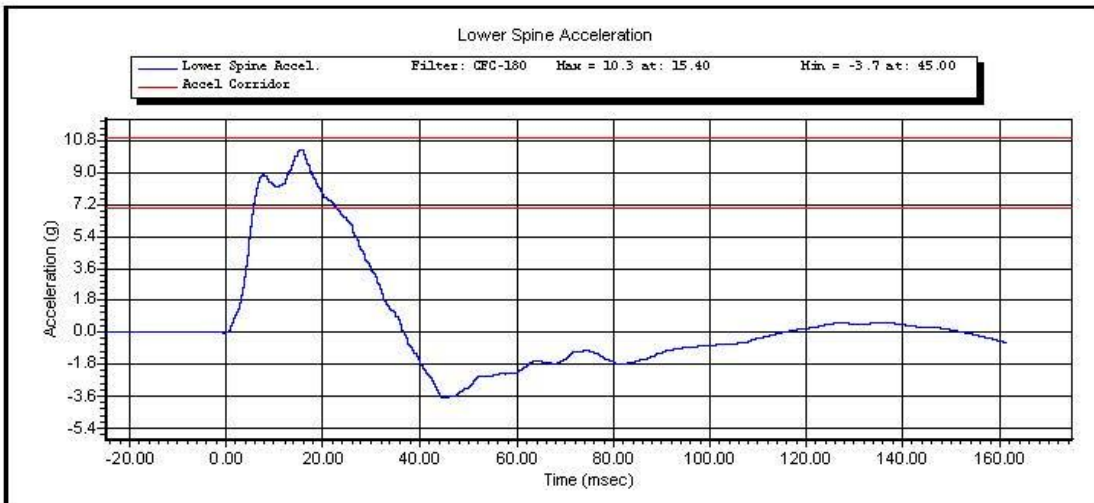
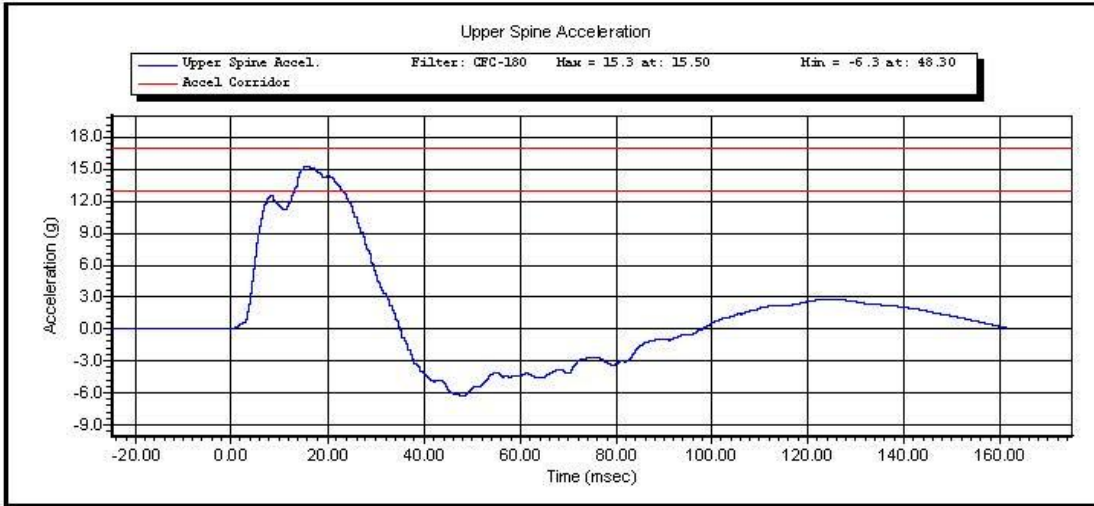
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2 of 3



Test ID:

Test Time: 7:39:51 PM

Test Date: 12/14/2011

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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/14/2011
Test Number:	1	Test Time:	9:02:40 AM

Component Part Number	Component Serial Number
Thorax Ribs 4, 5	1761, DG7012

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	26 %RH P
Velocity	4.20 -- 4.40	4.37 m/s P
Probe Acceleration	12.0 -- 16.0	14.2 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	44.2 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	42.4 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	10.7 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **9:02:40 AM**

Test Date: **12/14/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7264-2000	P66927	12/10/2011
FTSS	180-3881-1	DS-1860	9/1/2011
FTSS	180-3881-1	DS-1861	9/1/2011
Endevco	7264-2000	P58796	10/5/2011

Test ID:

Test Time: 9:02:40 AM

Test Date: 12/14/2011

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2 of 2

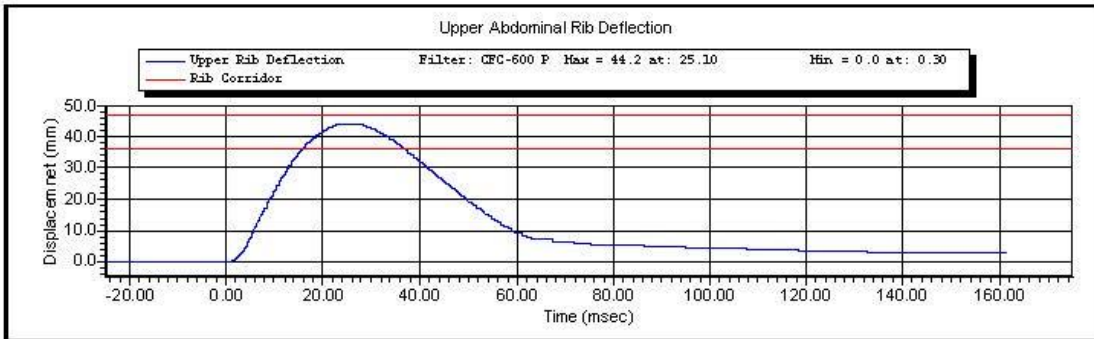
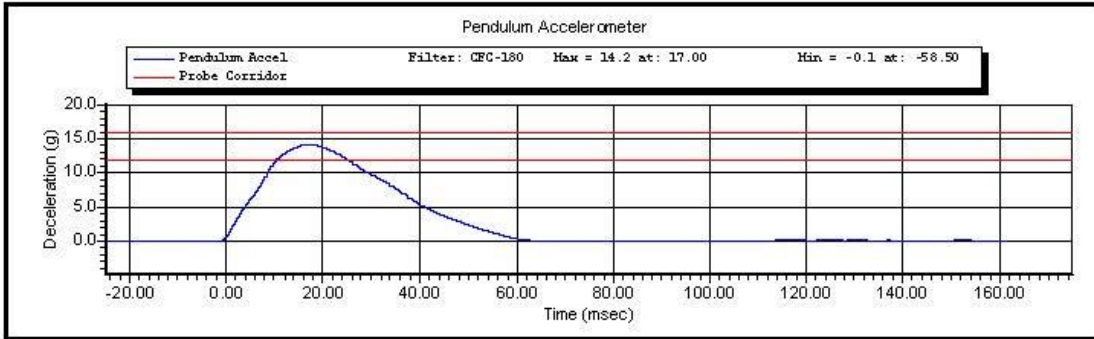


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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/14/2011
Test Number:	1	Test Time:	9:02:40 AM



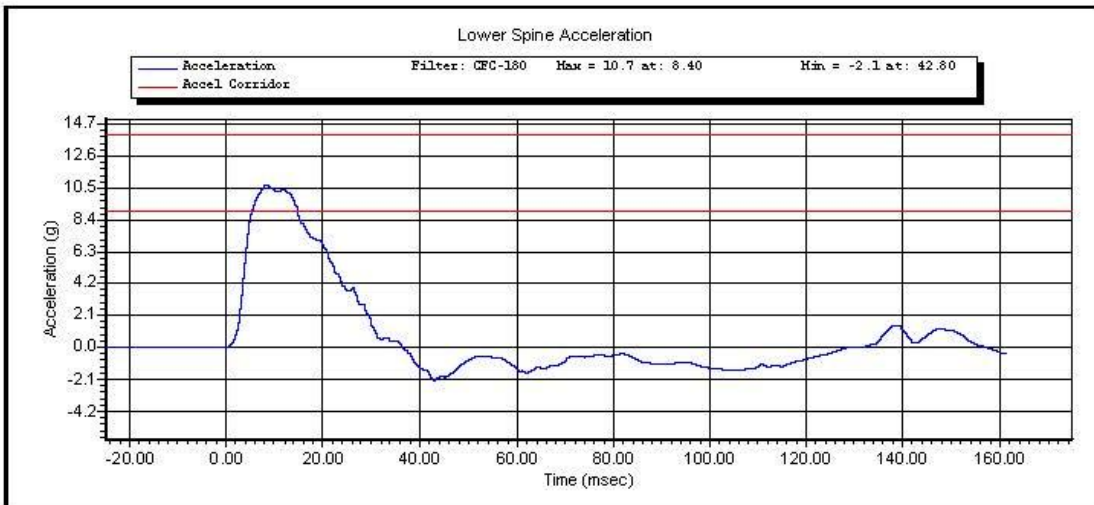
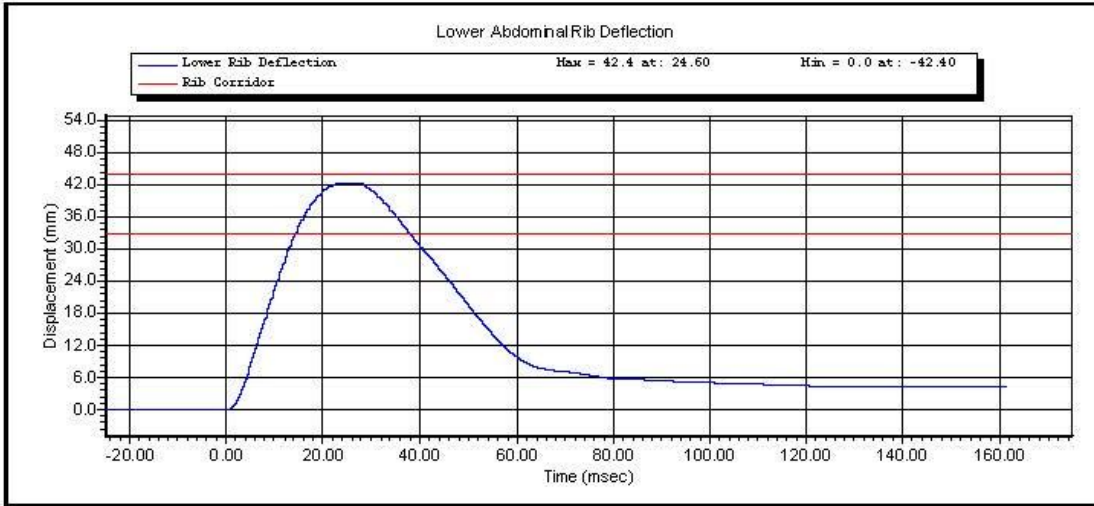
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Test Date: **12/14/2011**

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1 of 2



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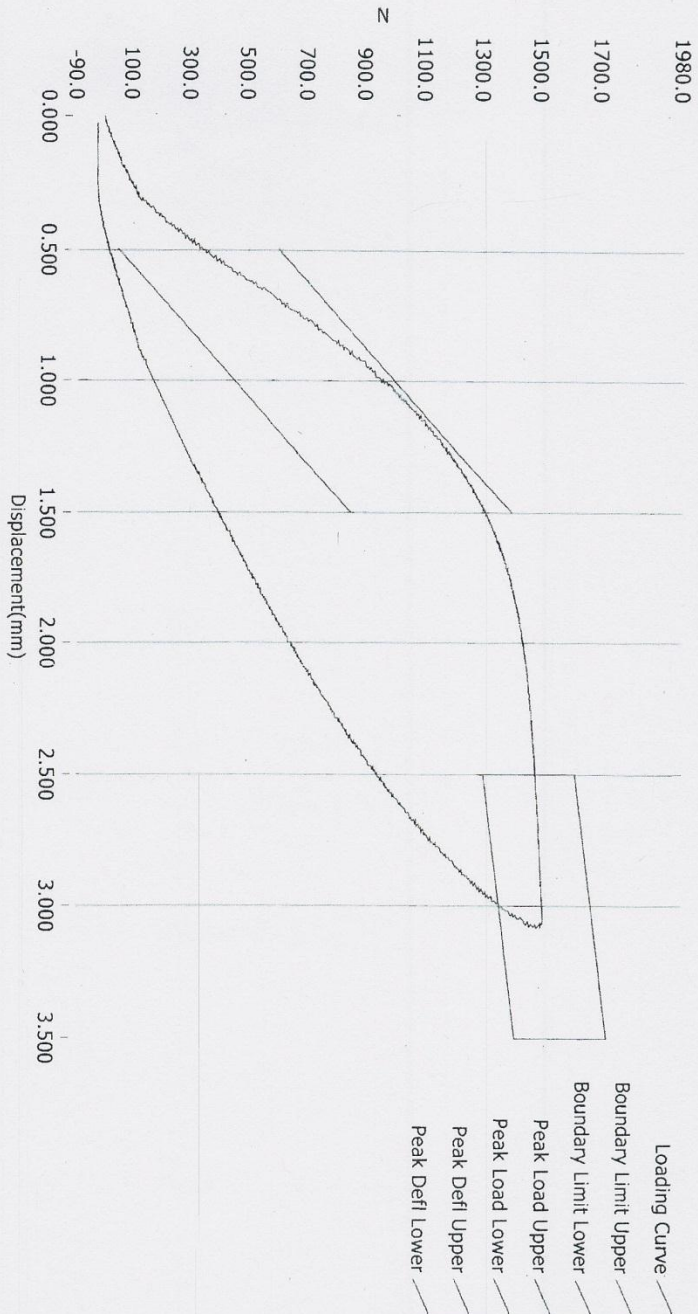
Test Time: 9:02:40 AM

Test Date: 12/14/2011

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2 of 2

Resultant Data - SIDIIS Plug Compression



ATD Calibration Lab

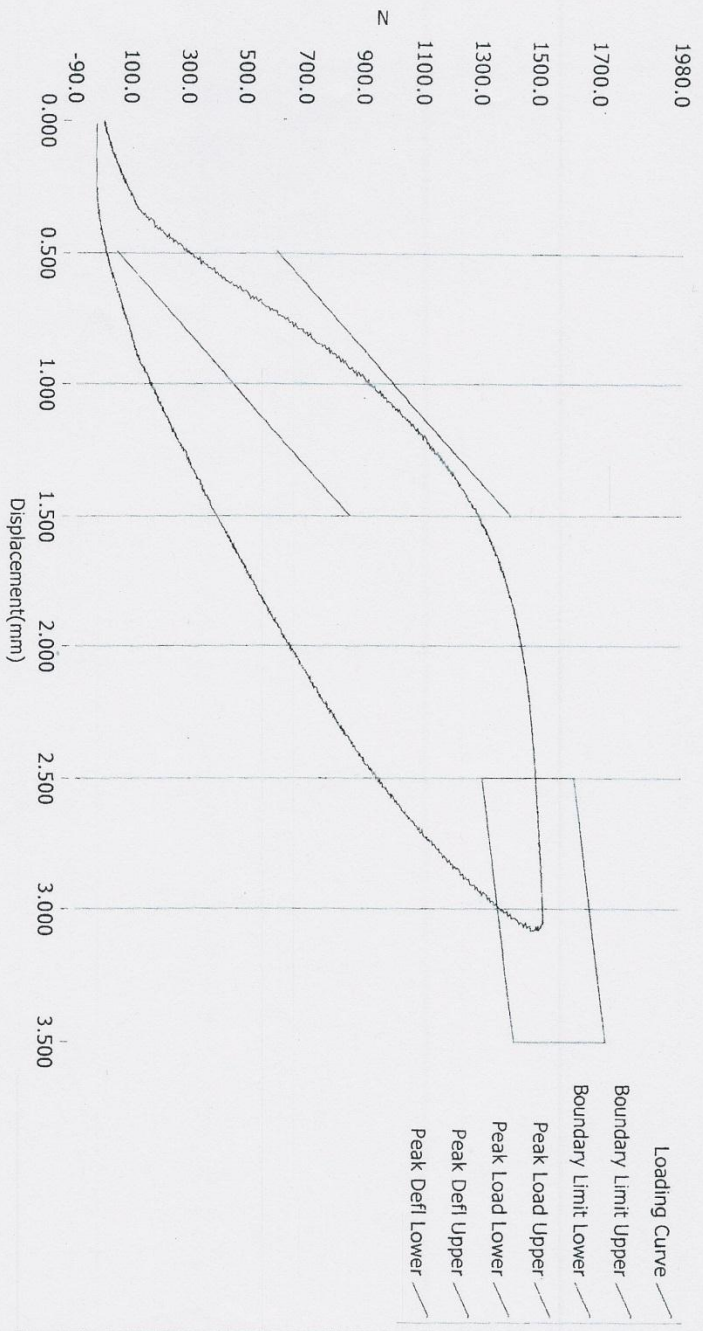
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	36285	SIDIIS	9/22/2010 11:13 AM

Current Date : 9/22/2010

Current Time : 11:15:08

CERT

Resultant Data - SIDIIS Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
Cert ID	ATD Serial Number	9/22/2010	1:50 PM
36326	SIDIIS		

Current Date : 9/22/2010

Current Time : 14:01:08



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/14/2011
Test Number:	1	Test Time:	9:31:09 AM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh	DG3207
Humanetics Cert Plug	36326
Humanetics Test Plug	36285

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.2 deg C P
Humidity	10 -- 70	27 %RH P
Velocity	6.60 -- 6.80	6.61 m/s P
Peak Probe Acceleration	38.0 -- 47.0	45.1 g P
Peak Pelvis Acceleration	34.0 -- 42.0	41.3 g P
Peak Acetabulum Force	3.60 -- 4.30	3.77 kN P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **9:31:09 AM**

Test Date: **12/14/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7264-2000	P66927	12/10/2011
Endevco	7264-2000	P51875	9/29/2011
DentonATD	3249J	LC-267Fy	10/30/2011

Test ID:

Test Time: **9:31:09 AM**

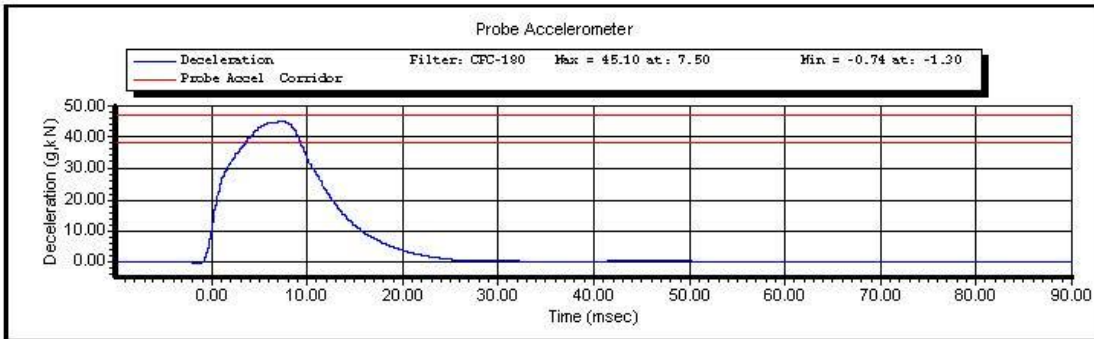
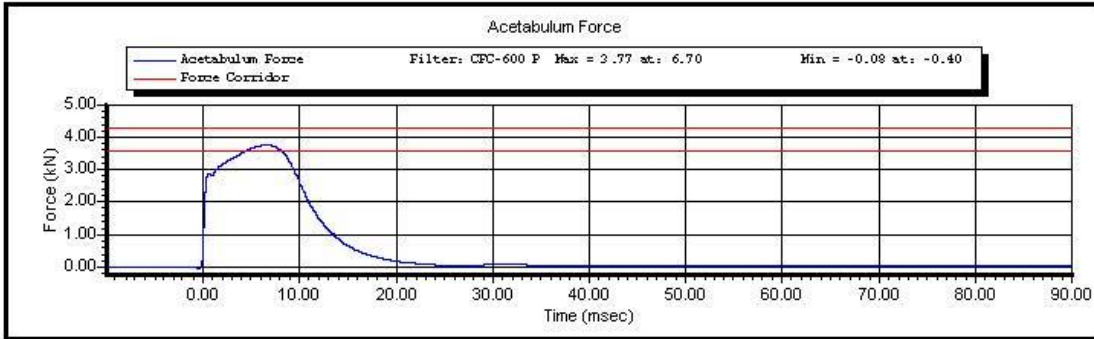
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2 of 2



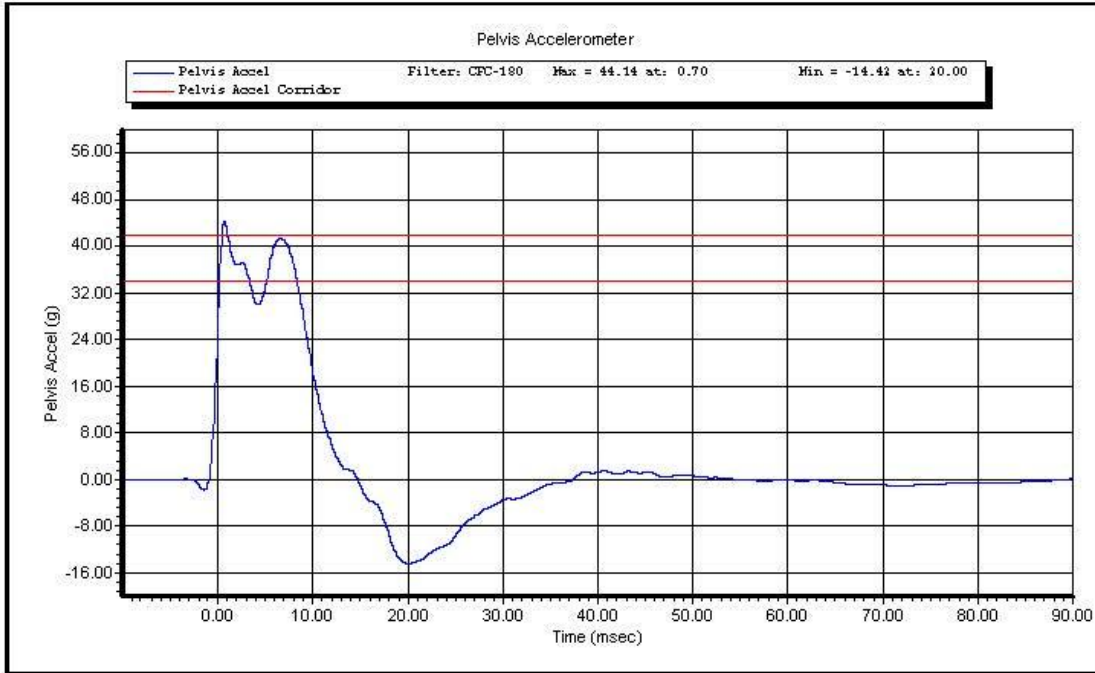
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Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/14/2011
Test Number:	1	Test Time:	9:31:09 AM



Test ID:

Test Time: **9:31:09 AM**

Test Date: **12/14/2011**



Test ID:

Test Time: **9:31:09 AM**

Test Date: **12/14/2011**

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2 of 2



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/13/2011
Test Number:	1	Test Time:	2:22:21 PM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh	DG3207

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	31 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Peak Probe Acceleration	36.0 -- 45.0	44.6 g P
Peak Pelvis Acceleration	28.0 -- 39.0	35.1 g P
Peak Iliac Force	4.10 -- 5.10	5.04 kN P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **2:22:21 PM**

Test Date: **12/13/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7264-2000	P66927	12/10/2011
Endevco	7264-2000	P51875	9/29/2011
DentonATD	3228J	LC-281Fy	8/31/2011

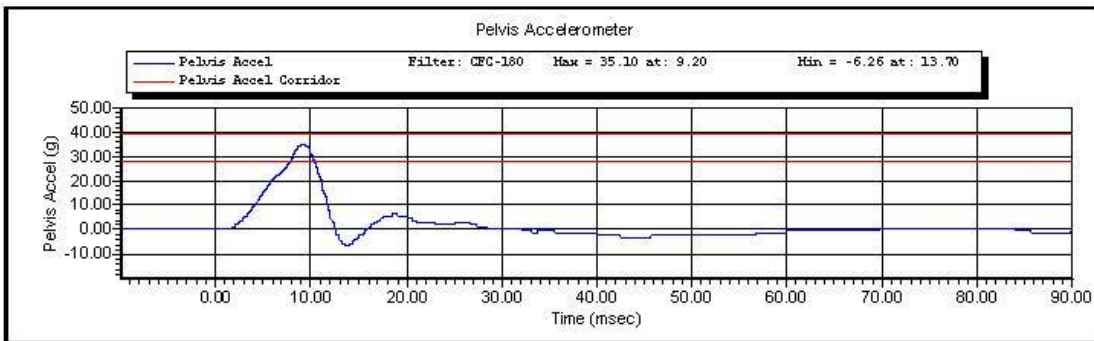
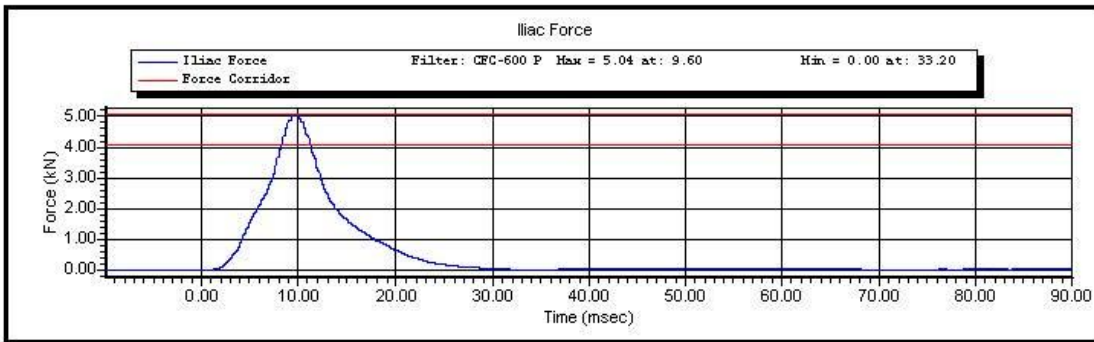
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Test Time: 2:22:21 PM

Test Date: 12/13/2011



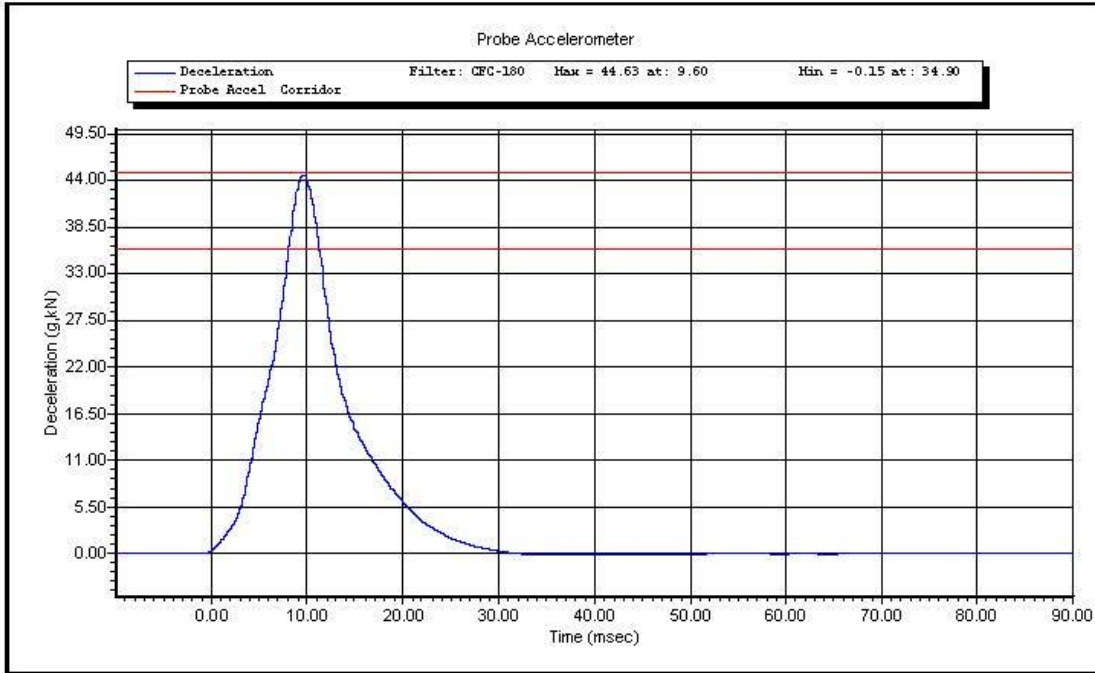
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Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	DG8012		
Test ID:		Test Date:	12/13/2011
Test Number:	1	Test Time:	2:22:21 PM



Test ID:

Test Time: **2:22:21 PM**

Test Date: **12/13/2011**



Test ID:

Test Time: 2:22:21 PM

Test Date: 12/13/2011

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Appendix D
Test Equipment and Instrumentation Calibration Data

Table 1 – Dummy Instrumentation

				SID-IIs S/N		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	P49185	Endevco	11/3/2011
			Y	P58839	Endevco	10/17/2011
			Z	P51991	Endevco	10/17/2011
Head Accelerometers Redundant			RX	P68058	Endevco	10/17/2011
			RY	P51885	Endevco	10/17/2011
			RZ	P68059	Endevco	10/17/2011
Displacement Potentiometer	Thoracic Rib	Upper	Y	1849	Denton	9/1/2011
		Middle	Y	1857	Denton	9/1/2011
		Lower	Y	1859	Denton	9/1/2011
	Abdominal Rib	Upper	Y	1860	Denton	9/1/2011
		Lower	Y	1861	Denton	9/1/2011
Lower Spine Accelerometers (T12)			X	P52100	Endevco	10/5/2011
			Y	P58796	Endevco	10/5/2011
			Z	P50098	Endevco	10/5/2011
Acetabulum Load Cell			Y	267Fy	Denton	11/30/2011
Lilac Wing Load Cell			Y	281Fy	Denton	8/31/2011

Table 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A081433	MS	10/4/2011
Vehicle Center of Gravity	Y	A005869	MS	10/4/2011
Vehicle Center of Gravity	Z	A081445	MS	10/4/2011
Left Floor Sill	Y	A016518	MS	10/4/2011
A-Pillar Sill	Y	A081452	MS	10/4/2011
A-Pillar Low	Y	A081429	MS	10/4/2011
A-Pillar Mid	Y	A081442	MS	10/4/2011
B-Pillar Sill	Y	A081460	MS	10/4/2011
B-Pillar Low	Y	A081463	MS	10/4/2011
B-Pillar Mid	Y	A079084	MS	10/4/2011
Driver Seat	Y	A081420	MS	10/4/2011
Engine Top	X	A032569	MS	10/4/2011
Engine Top	Y	A035443	MS	10/4/2011
Firewall	Y	A081417	MS	10/4/2011
Right Roof	Y	A081444	MS	10/4/2011
Right Floor Sill	Y	A081464	MS	10/4/2011
Rear Floorpan	X	A081461	MS	10/4/2011
Rear Floorpan	Y	A081425	MS	10/4/2011

Tale 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	18880	Interface	9/22/2011
Load Cell 2	18850	Interface	9/22/2011
Load Cell 3	46979	Interface	9/22/2011
Load Cell 4	18857	Interface	9/22/2011
Load Cell 5	18844	Interface	9/22/2011
Load Cell 6	46933	Interface	9/22/2011
Load Cell 7	18866	Interface	9/22/2011
Load Cell 8	46949	Interface	9/22/2011