

REPORT NUMBER: SPNCAP-KAR-13-030

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

**NISSAN MOTOR CO., LTD
2013 NISSAN SENTRA S 4-DOOR SEDAN**

NHTSA No: QD5200

**PREPARED BY:
KARCO ENGINEERING, LLC.
9270 HOLLY ROAD
ADELANTO, CA 92301**



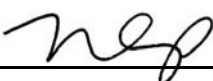
JANUARY 17, 2013

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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Approval Date: January 17, 2013

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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4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of a 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200				5. Report Date January 17, 2013																												
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				11. Contract or Grant No. DTNH22-09-D-00122																												
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				14. Sponsoring Agency Code NVS-111																												
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16. Abstract A 32.2 km/h (20 mph) 75 deg. oblique impact Side NCAP Test was conducted on the subject 2013 Nissan Sentra S 4-door sedan in accordance with the specifications of the Office of Crash Worthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on January 3, 2013. The impact velocity was 32.14 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 10.5 deg. C. The target vehicle's maximum post-test static crush was 440 mm located at level 3. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (ES-2re)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>201.7</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82</td> <td>42.1</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetabular and Iliac Forces)</td> <td>N</td> <td>5525</td> <td>2290</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>22</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45</td> <td>17</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches. The opposite doors did not open during the side impact event.						Measurement Description	Driver ATD (ES-2re)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	201.7	Resultant Lower Spine Acceleration	g	82	42.1	Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	2290	Maximum Thoracic Rib Deflection	mm	38	22	Maximum Abdominal Rib Deflection	mm	45	17
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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 Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave., SE Room W43-410 Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																												
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2013 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-09-D-00122. The purpose of this test is to generate comparative side impact performance in a 2013 Nissan Sentra S 4-door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2012.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2013 Nissan Sentra S 4-door sedan. The subject vehicle was towed into the rigid pole at an angle of 74.5° and a velocity of 32.14 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on January 3, 2013. Pre- 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 September 2012. Camera locations and other pertinent camera information are included in this report.

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

- Primary and Redundant Head CG tri-axial accelerometers
- Thorax upper, middle and lower rib displacement potentiometers
- Abdomen upper and lower rib displacement potentiometers
- Lower spine (12) tri-axial accelerometers
- Iliac load cell
- Acetabulum load cell

Appendix B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report. Appendix D contains the test equipment and instrumentation calibration data.

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Units	Passenger ATD (SID-IIs)	
		IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	201.7
Lower Spine (T12) Resultant Acceleration	g	82	42.1
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2290
Maximum Thoracic Rib Deflection	mm	38*	22
Maximum Abdominal Rib Deflection	mm	45*	17

*Proposed IARV

Supplemental restraint information is given below:

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

GENERAL COMMENTS

Both the front and rear doors on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. Both doors on the non-struck side remained closed and latched. There were no ATD values that exceeded limits.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13

CONVERSION FACTORS

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.574
Pressure	Tire Pressures	lbf/in ²	kPa	6.895
Temperature	General Use	°F	°C	$=(T_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	QD5200
Model Year	2013
Make	Nissan
Model	Sentra S
Body Style	4-Door Sedan
VIN	3N1AB7AP0DL627263
Body Color	Graphite Blue
Odometer Reading (km / mi)	185 / 115
Engine Displacement (L)	1.8
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Manual
Transmission Speeds	6
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	No
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	Yes

Does Owner's Manual provide instructions to turn off automatic door locks?

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., LTD
Date of Manufacture	Oct-12
Vehicle Type	Passenger Car

GVWR (kg)	1690.7
GAWR Front (kg)	884.8
GAWR Rear (kg)	814.9

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				390.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				49.8	A-B

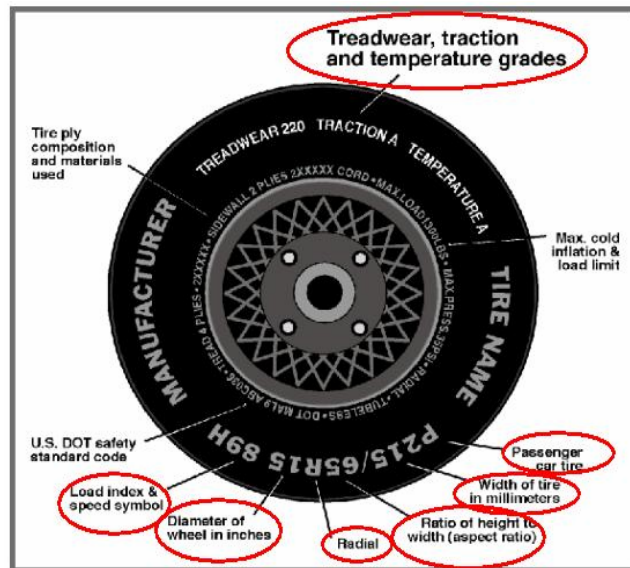
VEHICLE SEAT TYPE

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

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	P205/55R16	P205/55R16
Tire Size on Vehicle	P205/55R16	P205/55R16
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Turanza EL 400	Turanza EL 400
Treadware	300	300
Traction Grade	B	B
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 1 Nylon, 2 Steel	1 Polyester, 1 Nylon, 2 Steel
Load Index/Speed Symbol	89H	89H
Tire Material	Polyester, Nylon, Steel	Polyester, Nylon, Steel
DOT Safety Code Left	V6T2 PM7 4412	V6T2 PM7 4412
DOT Safety Code Right	V6T2 PM7 4412	V6T2 PM7 4412

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	245	255	245	250
Tire Placard	kPa	230	230	230	230
Owner's Manual	kPa	230	230	230	230
As Tested	kPa	230	230	230	230

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	392.0	263.5		415.0	298.0		397.0	318.0	
Right	kg	377.5	260.5		392.0	281.5		380.5	297.0	
Ratio	%	59.5%	40.5%	100.0%	58.2%	41.8%	100.0%	55.8%	44.2%	100.0%
Total	kg	769.5	524.0	1293.5	807.0	579.5	1386.5	777.5	615.0	1392.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1293.5	A
Actual Weight of 1 P572 O ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	49.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1392.3	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 -9.0 kg)? ☒ Yes ☐ No

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-0.1	0.6	0.8	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.2	0.5	0.9	Yes
Front Bumper-Line Angle (left-to-right)**	°	-0.1	-0.1	-0.5	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.8	-1.1	-1.2	Yes
Vehicle CG (Aft of Front Axle)	mm	1094	1128	1192	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	10	22	21	

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

***The "As Tested" vehicle attitude angle measurements must be within "As Delivered" and the "Fully Loaded" vehicle attitude measurements at each location. Indicate "Yes" or "No" for "Meets Requirement"

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

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Non-Struck Side Outboard Mirror	1.0
Non-Struck Side Front Pass. Speaker	0.5
Non-Struck Side Windows	6.0
Non-Struck Side Door Panels	6.0
Non-Struck Side Window Trim	1.5
Spare Tire & Tools	14.5
Wheel Covers	2.0
Trunk Trim	3.0
Trunk Carpeting and Floormats	4.5
Ballast / Equipment Added	75.8

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

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13

SEAT POSITIONING

The driver's seat is set to the forward most position where the ATD will not contact any interior panels at the mid-height and mid-angle position. The front center seat (if applicable) and right front passenger's seat should be set in a similar manner as the driver's seat. The struck side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rearmost, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	1.5	0.0	0.8
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

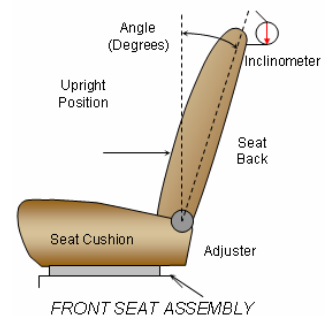
Seat	As Tested SCRL Angle	As Tested SCRP Height	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	0.8	38	Max	30	34	38
			Mid	30	34	38
			Min	30	34	38
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

DATA SHEET NO. 2 ... (CONTINUED)**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA**Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13**SEAT FORE/AFT POSITION**

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	239	25	0	0
Front Passenger Seat	240	25	0	0
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

SEAT BACK ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The right front passenger seat back is set to the same angle as the driver's seat.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	75.1	37	4.0	3
Front Passenger Seat	71.8	37	4.0	3
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. The positions are marked H, M1, ... , L from top to bottom.

	Total No. of Positions	Placed in Position
Driver Seat	4	H

HEAD RESTRAINT ADJUSTMENT

The driver's head restraint is adjusted to the lowest and most full forward in-use position.

	Total No. of Positions	Placed in Position
Driver Seat	5	Full Down

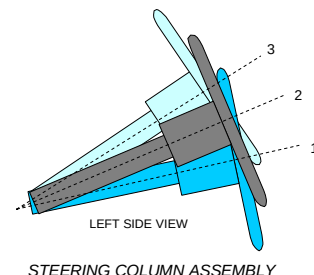
DATA SHEET NO. 2 ... (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13

STEERING COLUMN ADJUSTMENT

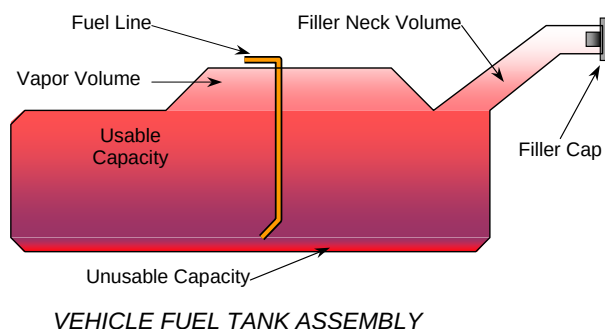
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion.



	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	23.0	119
Geometric Center - Position 2	25.3	104
Uppermost - Position 3	27.6	89
Telescoping Steering Wheel Travel		30
Test Position	25.3	104

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel for one second after the ignition is switched to "on" and will remain running while the engine is running.



FUEL TANK CAPACITY

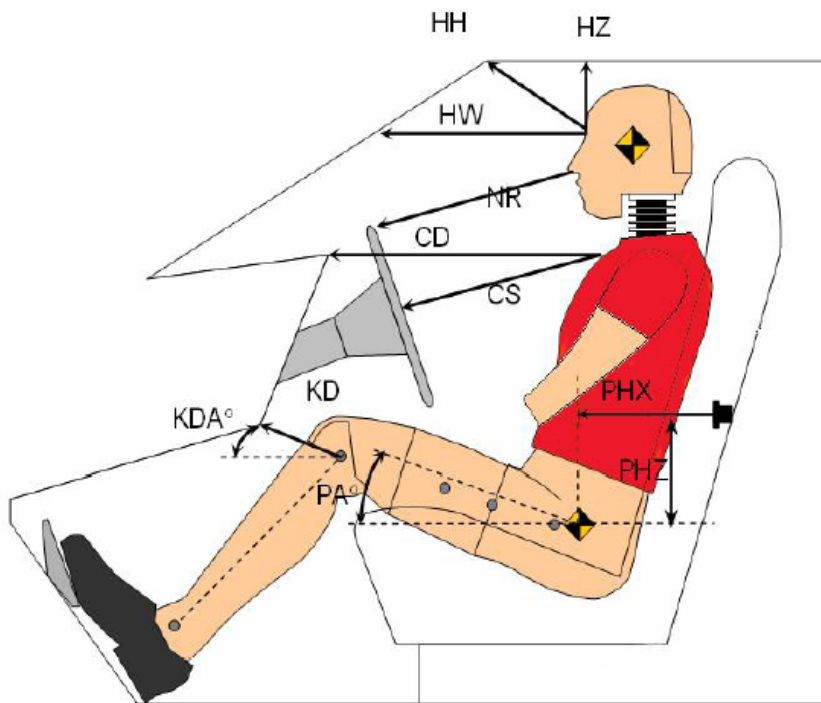
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	49.96
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	46.46
Actual amount of Solvent Used in Test	46.46
1/3 of Usable Capacity	16.65

Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated in the Form No. 1? ☒ Yes ☐ No

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13



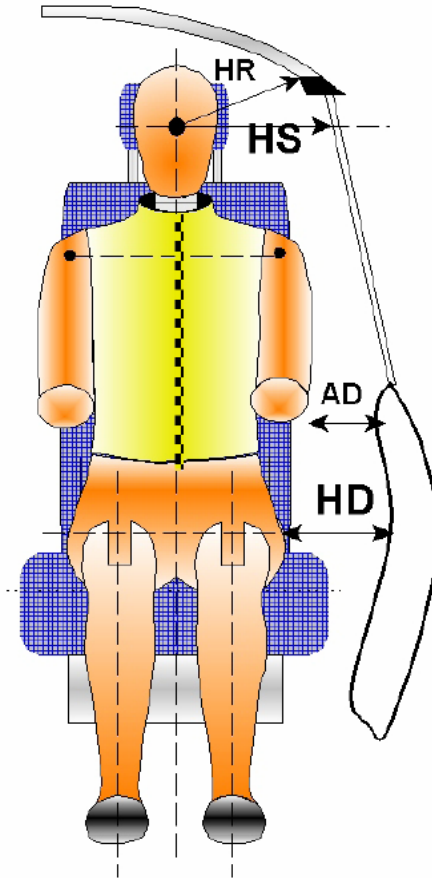
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	253	
HW	Head to Windshield	613	
HZ	Head to Roof	184	
NR	Nose to Rim	219	
CD	Chest to Dash	401	
CS	Chest to Steering Wheel	153	
KD(L)/KDA(L)°	Left Knee to Dash	115	39.3
KD(R)/KDA(R)°	Right Knee to Dash	125	47.6
PAX°	Pelvic Tilt Angle (x-axis)		19.0
PAY°	Pelvic Tilt Angle (y-axis)		0.3
PHX	Hip Point to Striker (x-axis)	390	
PHZ	Hip Point to Striker (z-axis)	115	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
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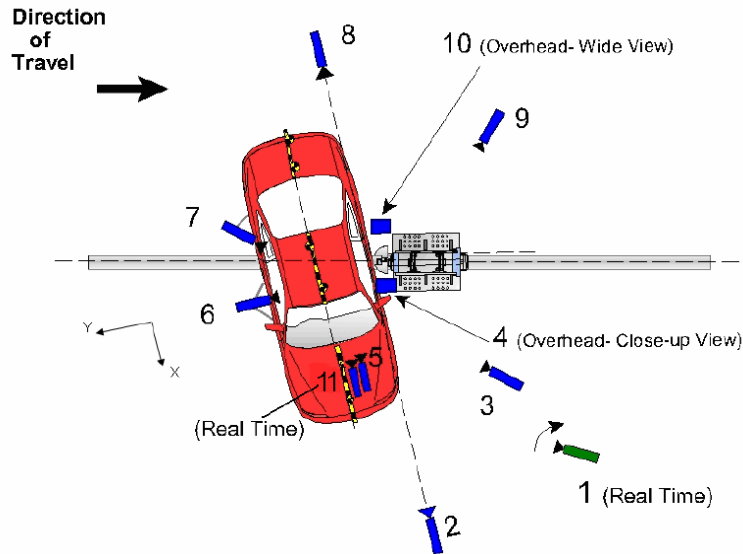
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	249
HS	Head to Side Window	mm	372
AD	Arm to Door	mm	162
HD	H-Point to Door	mm	195

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13



CAMERA LOCATIONS AND DATA

Camera No.	View	Coordinates (m)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real Time Pan View of Impact	8.89	46.57	-3.04		30
2	Front Ground Level - Impact View	8.34	-0.05	-0.93	24	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	8.5	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	12.5	1000
5	On-Board - Dummy Front View	1.31	0.51	-1.39	35	1000
6	On-Board - Dummy Side View	-0.15	1.52	-1.09	14	1000
7	On-Board - Dummy Rear Oblique View	-1.03	1.50	-1.14	20	1000
8	Rear Ground Level - Impact View	-6.12	-6.23	-0.96	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	1.28	0.51	-1.38		30

Reference from Point of Impact for X and Y; from Ground for Z):

+X = Forward of Vehicle, +Y = Right of Vehicle, +Z = Down

*All measurements accurate to ± 6 mm

INSTRUMENTATION

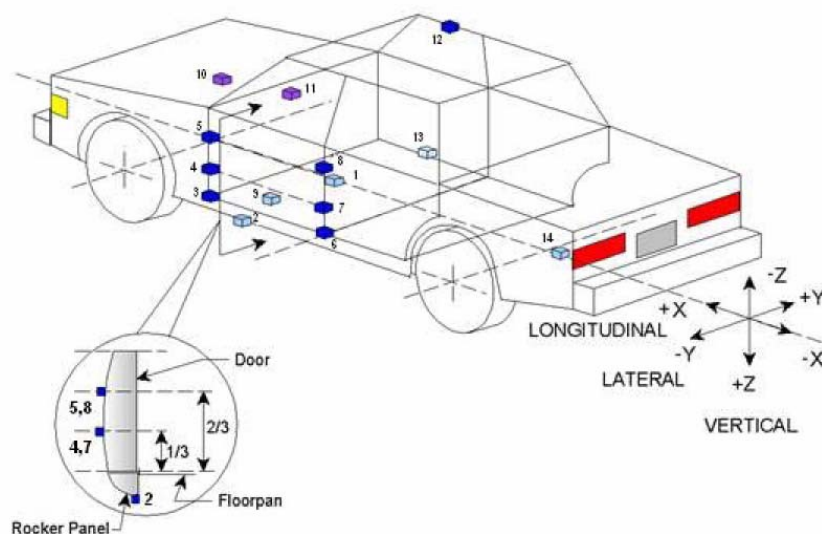
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200

Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

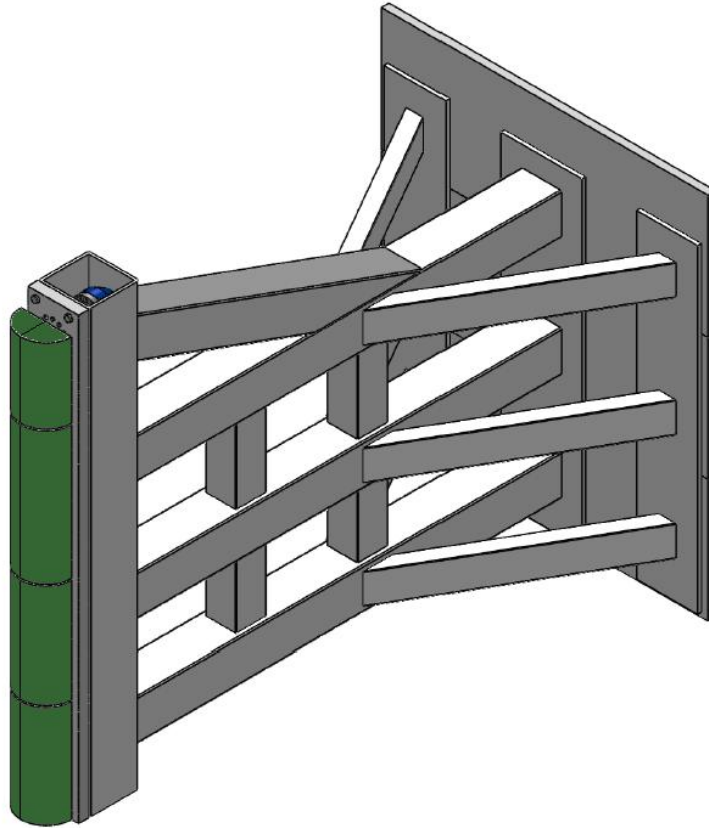
Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1910	0	-294
2	Left Floor Sill	2620	-768	-283
3	A-Pillar Sill	3190	-759	-492
4	A-Pillar Low	3190	-759	-693
5	A-Pillar Mid	3190	-759	-852
6	B-Pillar Sill	2090	-706	-310
7	B-Pillar Low	2090	-706	-604
8	B-Pillar Mid	2090	-706	-847
9	Driver Seat Track	2468	-535	-338
10	Engine Top	3872	82	-868
11	Firewall	3579	-103	-923
12	Right Roof	2285	553	-1448
13	Right Floor Sill	2133	706	-344
14	Rear Floorpan	1093	130	-525

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

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13



RIGID POLE LOAD CELL LOCATIONS

ID	Units	Height From Ground
1	mm	87
2	mm	468
3	mm	648
4	mm	978
5	mm	1168
6	mm	1651
7	mm	1816
8	mm	2057

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

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Side Header
Left Shoulder	Seat, Torso/Pelvis Airbag
Upper Torso	Seat, Torso/Pelvis Airbag
Lower Torso	Seat, Torso/Pelvis Airbag
Left Hip	Seat, Torso/Pelvis Airbag
Left Knee	Door Panel, Right Knee

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	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	n/a	n/a	n/a	n/a	n/a

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	No Separation
Windshield Damage	Broken
Side Window Damage	Left Front Window Broken
Other Notable Effects	None

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

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	No		No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other				

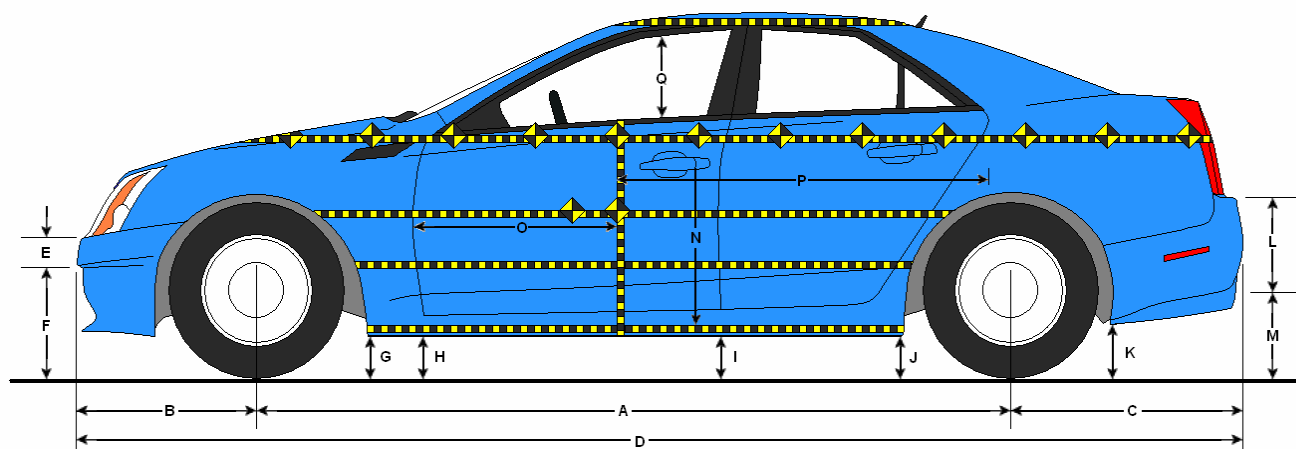
IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1001
Actual Impact Point (Aft of Front Axle)	mm		995
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	6
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	74.5
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.14
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.17

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

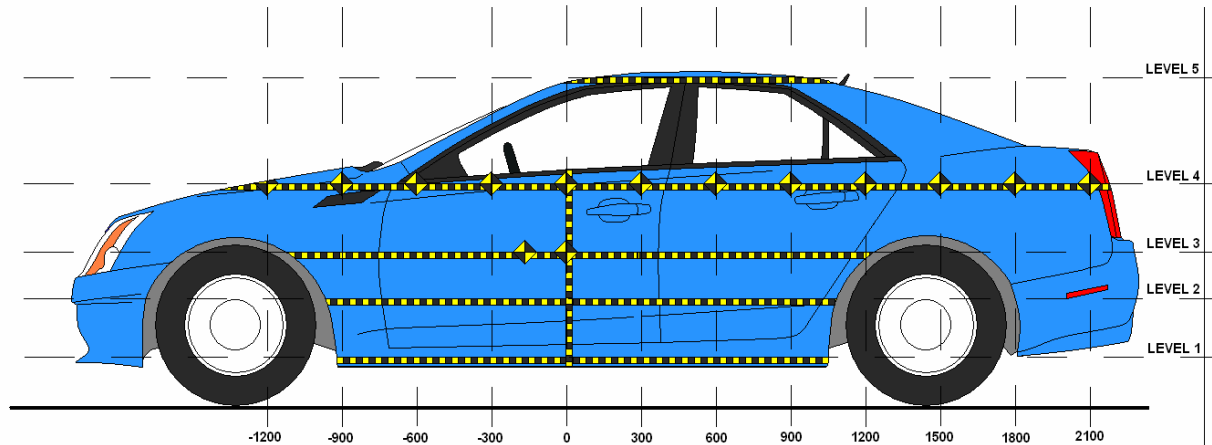
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2700	2643	-57
B	Front Axle to FSOV	906	919	13
C	Rear Axle to RSOV	1017	1031	14
D	Total Length at Centerline	4618	4594	-24
E	Front Bumper Thickness	99	98	-1
F	Front Bumper Bottom to Ground	410	446	36
G	Sill Height at Front Wheel Well	209	215	6
H	Sill Height at Front Door Leading Edge	209	215	6
I	Sill Height at B-Pillar	216	240	24
J1	Sill Height at Rear Wheel Well	223	255	32
J2	Pinch Weld Height at Rear Wheel Well	179	204	25
K	Sill Height Aft of Rear Wheel Well	280	319	39
L	Rear Bumper Thickness	183	183	0
M	Rear Bumper Bottom to Ground	401	439	38
N	Sill Height to Bottom of Front Window Sill	616	674	58
O	Front Door Leading Edge to Impact CL	531	429	-102
P	Rear Door Trailing Edge to Impact CL	1563	1449	-114
Q	Front Window Opening	427	445	18
R	Right Side Length	3096	3110	14
S	Left Side Length	3096	3000	-96
T	Vehicle Width at B-Pillar	1752	1633	-119

All measurements in mm with tolerance of $\pm 3\text{mm}$

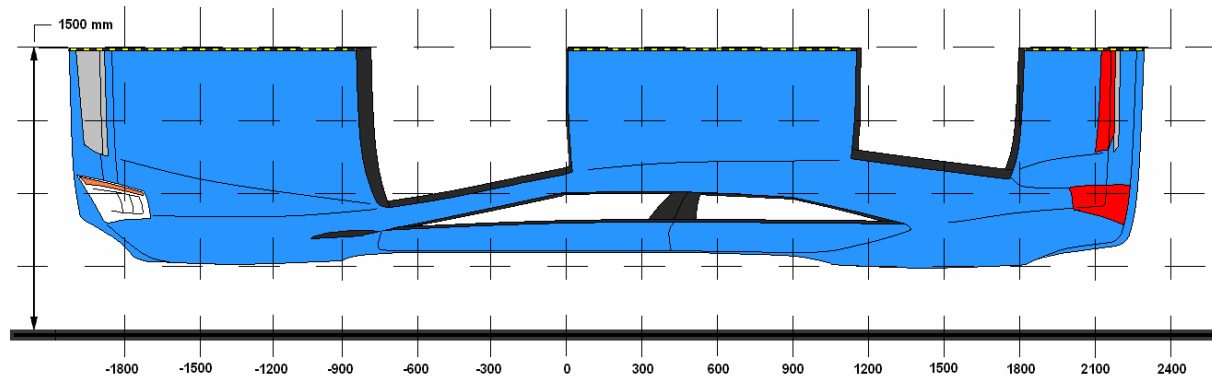
DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13



LEFT SIDE VIEW



OVERHEAD VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	258	405	0
2	Occupant H-Point	572	438	0
3	Mid-Door	638	440	0
4	Window Sill	912	385	150
5	Window Top	1407	230	150

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13

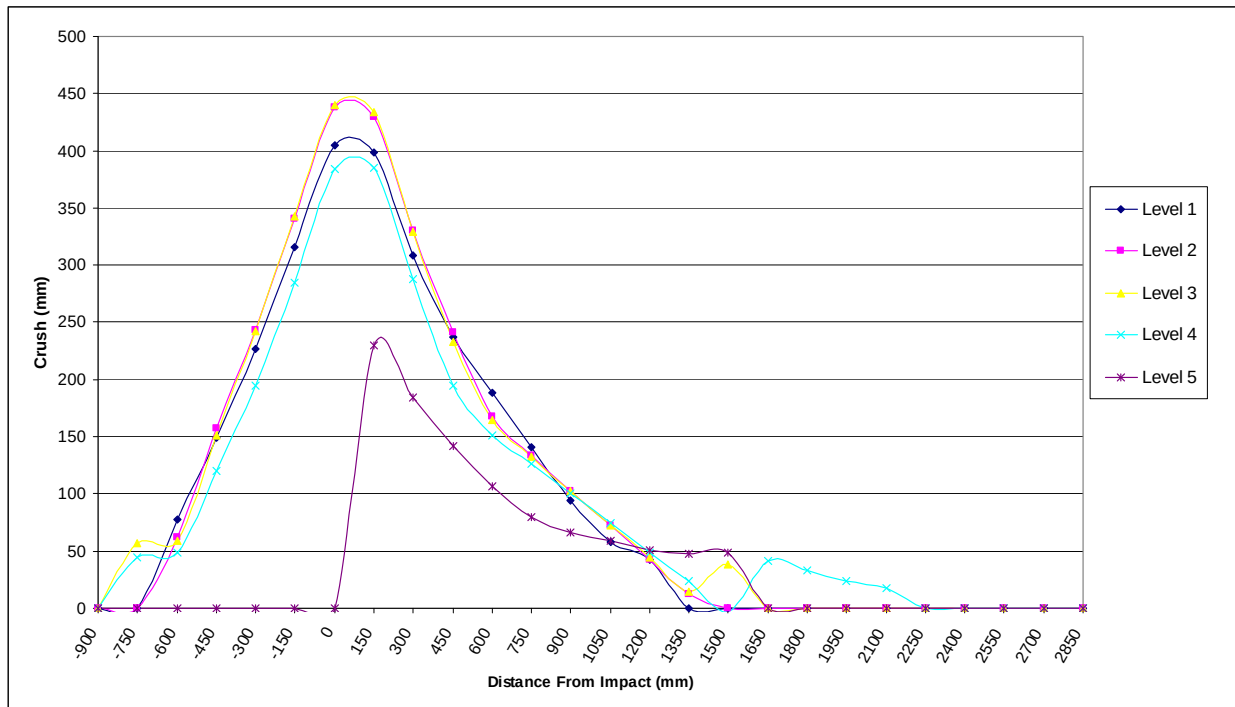
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750			619	708				676	753				57	45	
-600	640	625	629	710		718	687	688	759		78	62	59	49	
-450	659	635	637	710		808	792	788	830		149	157	151	120	
-300	660	636	637	705		887	879	879	900		227	243	242	195	
-150	660	634	634	700		976	975	977	985		316	341	343	285	
0	660	632	631	690		1065	1070	1071	1074		405	438	440	384	
150	661	630	629	684	897	1060	1060	1063	1069	1127	399	430	434	385	230
300	661	628	627	677	895	970	958	956	965	1079	309	330	329	288	184
450	660	626	625	672	898	897	867	858	867	1040	237	241	233	195	142
600	662	626	624	667	899	850	794	789	818	1006	188	168	165	151	107
750	661	627	624	666	903	802	761	757	792	983	141	134	133	126	80
900	661	627	624	667	904	755	729	726	767	970	94	102	102	100	66
1050	662	627	624	667	906	720	699	696	742	965	58	72	72	75	59
1200	654	625	623	669	912	696	667	667	718	963	42	42	44	49	51
1350		620	621	670	919		632	635	694	967		12	14	24	48
1500			621	671	931			659	668	980			38	-3	49
1650				677					718					41	
1800				681					714					33	
1950				689					713					24	
2100				698					716					18	
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	2013 Nissan Sentra S 4-Door Sedan	NHTSA No.	QD5200
Test Program:	NCAP Side Pole Impact Test	Test Date:	1/3/13

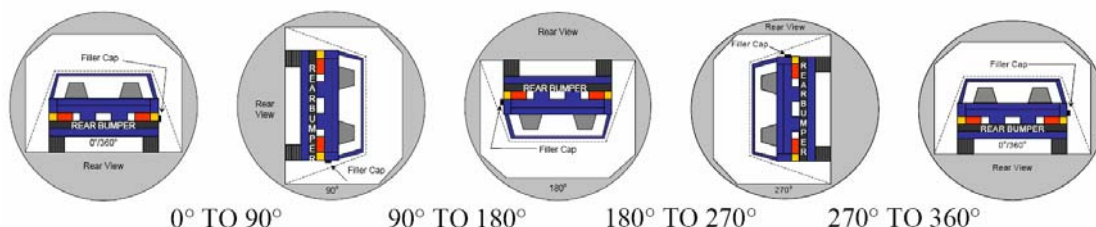


DATA SHEET NO. 11

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13
 Temperature at Time of Impact: 10.5° C Test Time: 12:47 PM

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
 (Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
 (Maximum allowable = 1 oz./minute)
- D. Spillage Details: No spillage occurred



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	83	300	383
90° To 180°	79	302	381
180° To 270°	82	300	382
270° To 360°	81	300	381

FMVSS 301 SPILLAGE TABLE

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

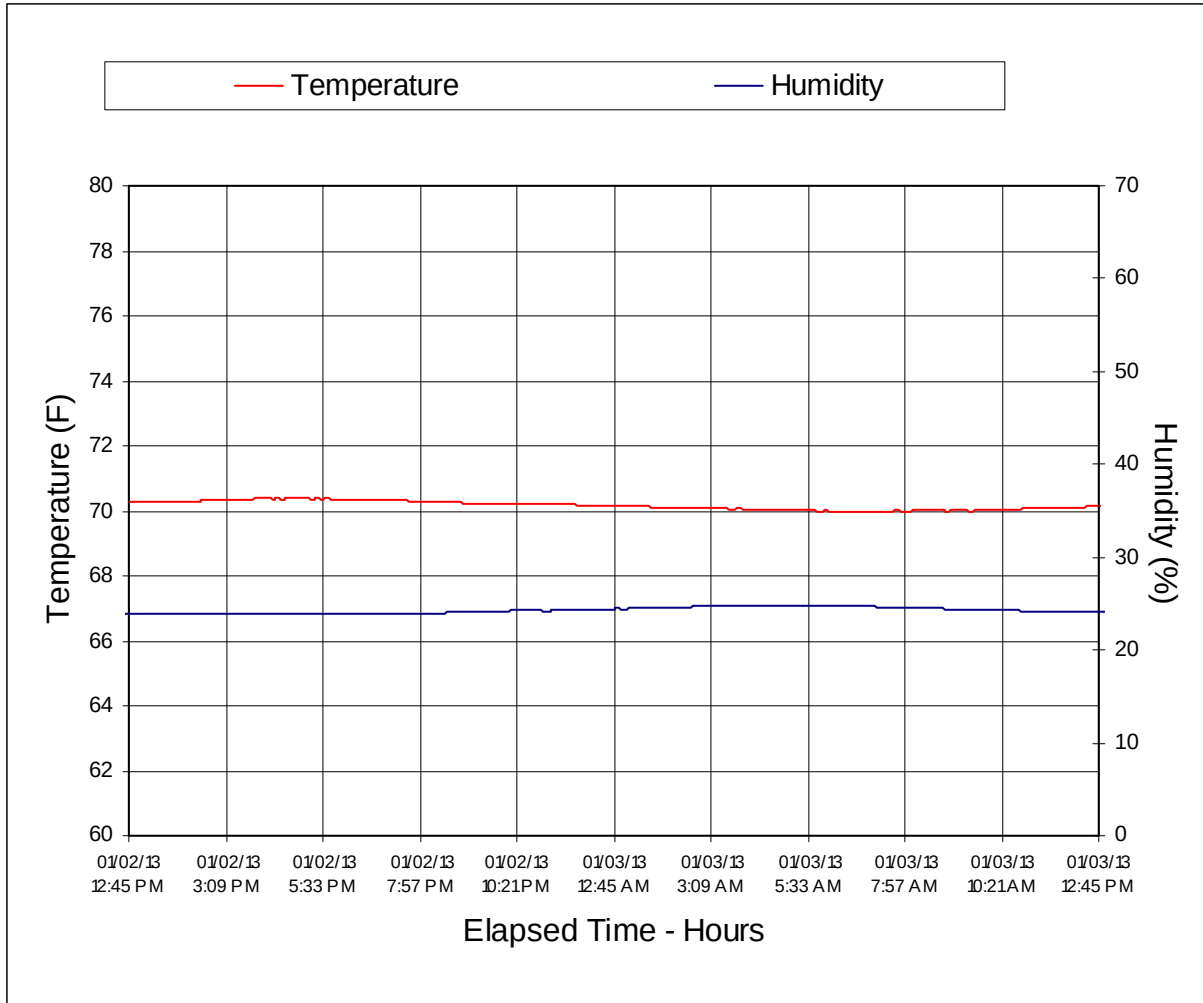
SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan NHTSA No. QD5200
Test Program: NCAP Side Pole Impact Test Test Date: 1/3/13



APPENDIX A
PHOTOGRAPHS

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FIGURE 1. As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 2. As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 3. Pre-Test Frontal View of Test Vehicle



FIGURE 4. Post-Test Frontal View of Test Vehicle



FIGURE 5. Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 6. Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle

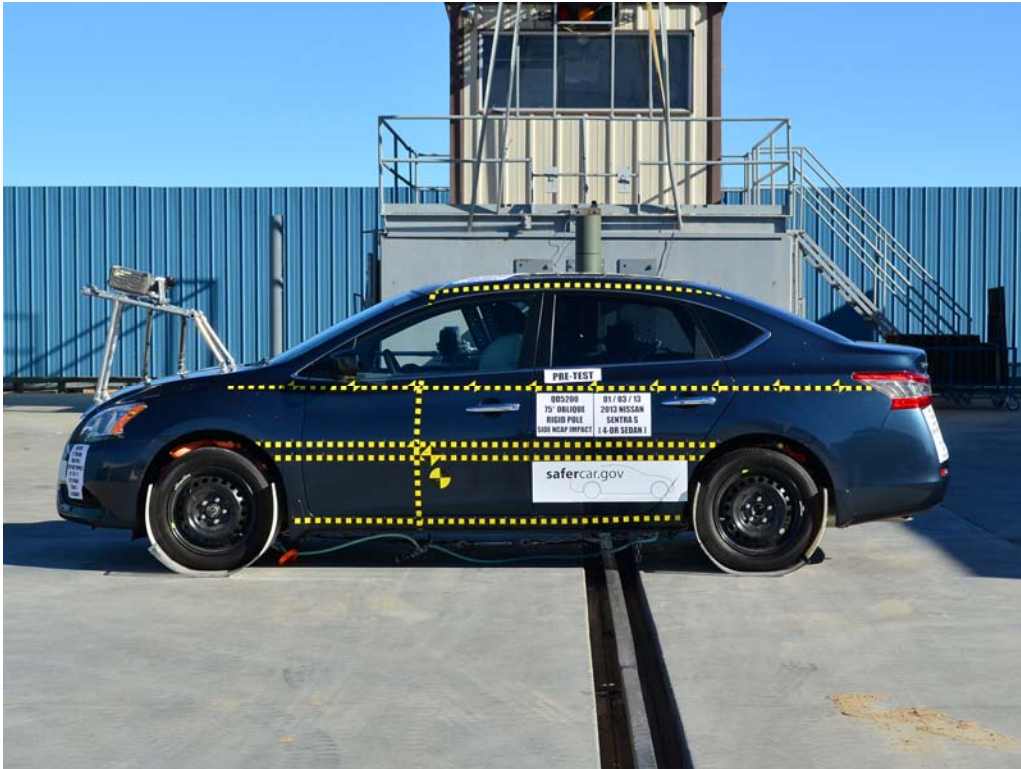


FIGURE 7. Pre-Test Left Side View of Test Vehicle

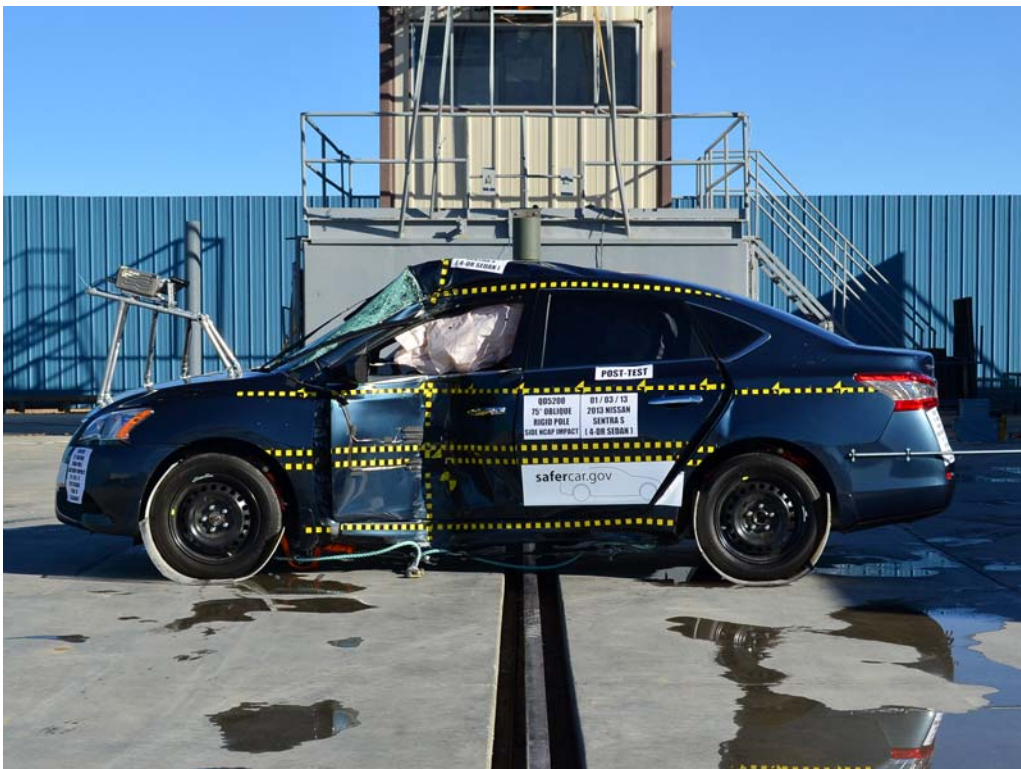


FIGURE 8. Post-Test Left Side View of Test Vehicle



FIGURE 9. Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 10. Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 11. Pre-Test Rear View of Test Vehicle



FIGURE 12. Post-Test Rear View of Test Vehicle



FIGURE 13. Pre-Test Right Side View of Test Vehicle



FIGURE 14. Post-Test Right Side View of Test Vehicle



FIGURE 15. Pre-Test Overhead View of Test Area

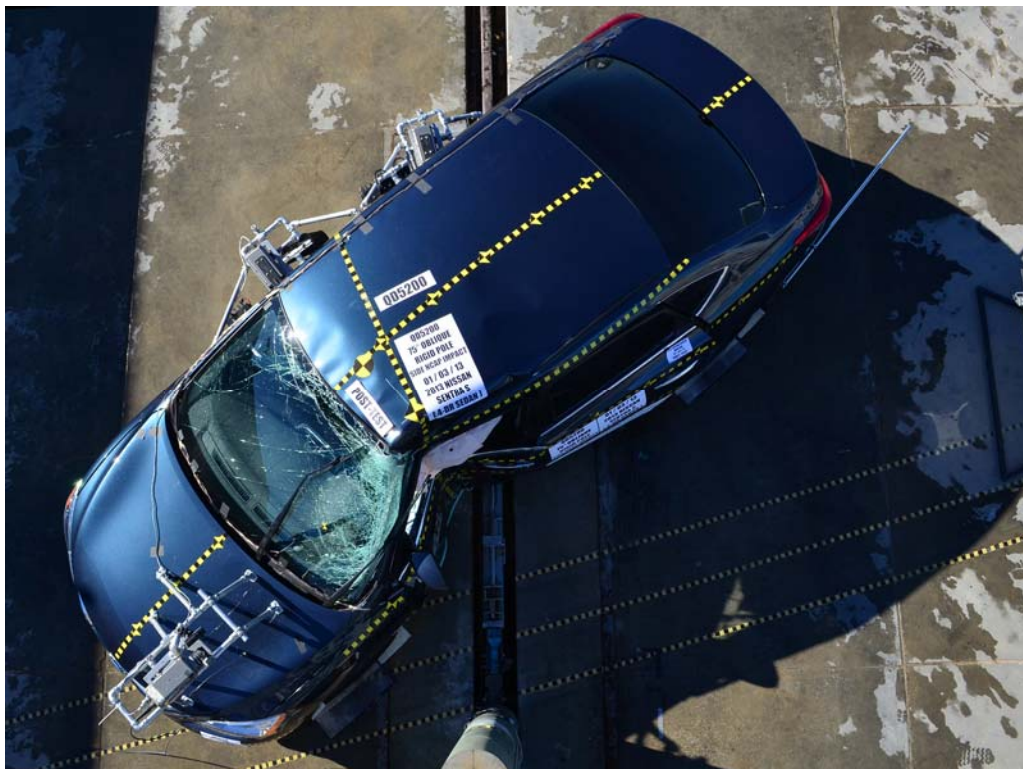


FIGURE 16. Post-Test Overhead View of Test Area



FIGURE 17. Pre-Test Left Side View of Pole
Positioned Against Side of Vehicle

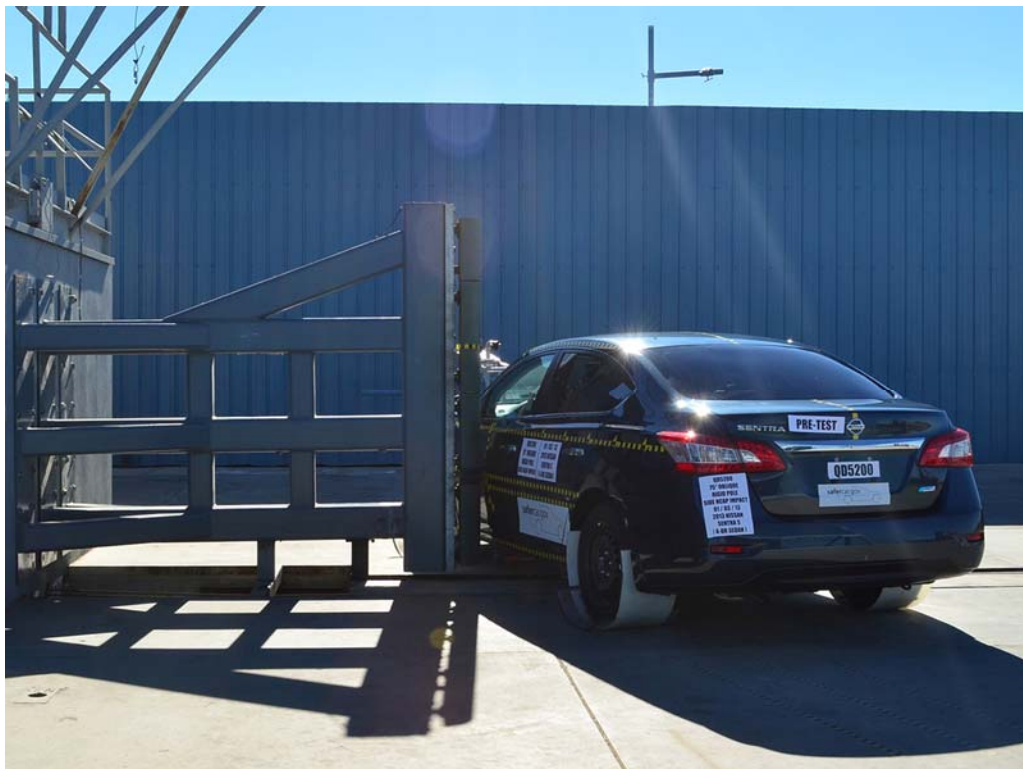


FIGURE 18. Pre-Test Right Side View of Pole
Positioned Against Side of Vehicle



FIGURE 19. Pre-Test Close-Up View of Impact Point Target



FIGURE 20. Post-Test Close-Up View of Impact Point Target
Showing Impact Location



FIGURE 21. Pre-Test Front Close-Up View of Dummy Head and Chest

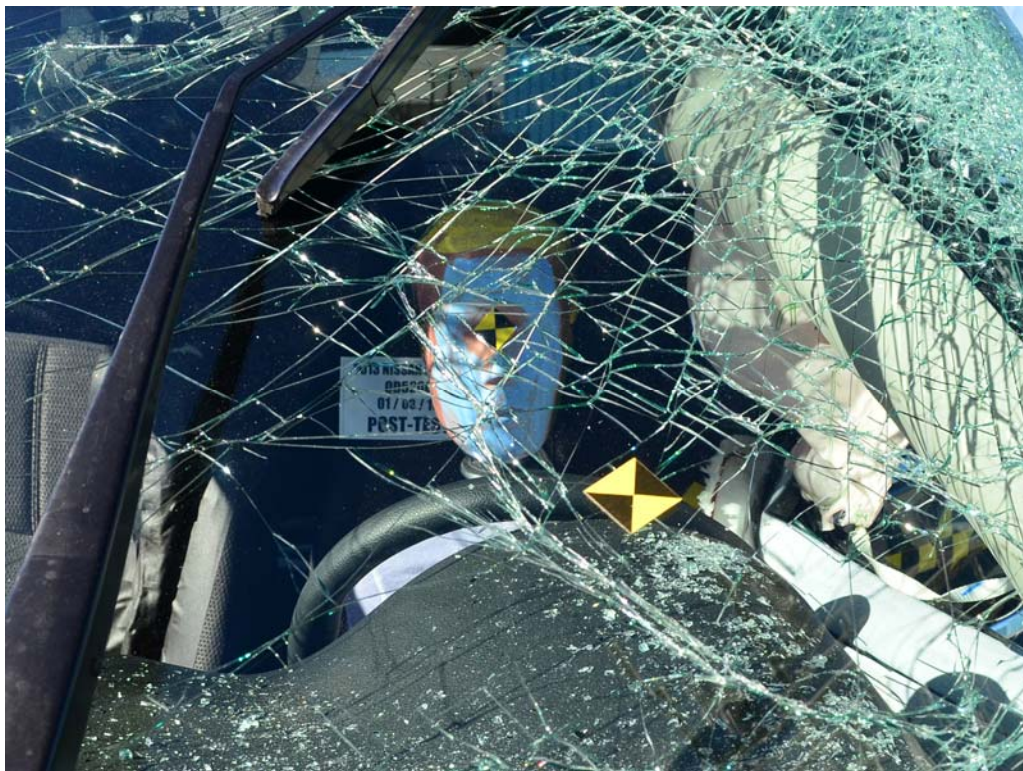


FIGURE 22. Post-Test Front Close-Up View of Dummy



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



FIGURE 24. Pre-Test Left Side View of Dummy Shoulder and Door Top View



FIGURE 25. Post-Test Left Side View of Dummy Shoulder and Door Top View



FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy Positioning



FIGURE 27. Pre-Test Frontal Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint



FIGURE 28. Pre-Test Overhead View of Seat Pan Prior to Dummy Positioning



FIGURE 29. Pre-Test Overhead View of Dummy Thighs on Seat Pan



FIGURE 30. Pre-Test Left Side View of Dummy's Neck
Showing Position of Adjustable Neck Bracket



FIGURE 31. Pre-Test View of Dummy's Head Showing Dummy's Head Is Level



FIGURE 32. Pre-Test Placement of Dummy's Feet



FIGURE 33. Pre-Test View of Belt Anchorage for Dummy



FIGURE 34. Pre-Test Left Side View of Steering Wheel



FIGURE 35. Pre-Test View of Disengaged Parking Brake

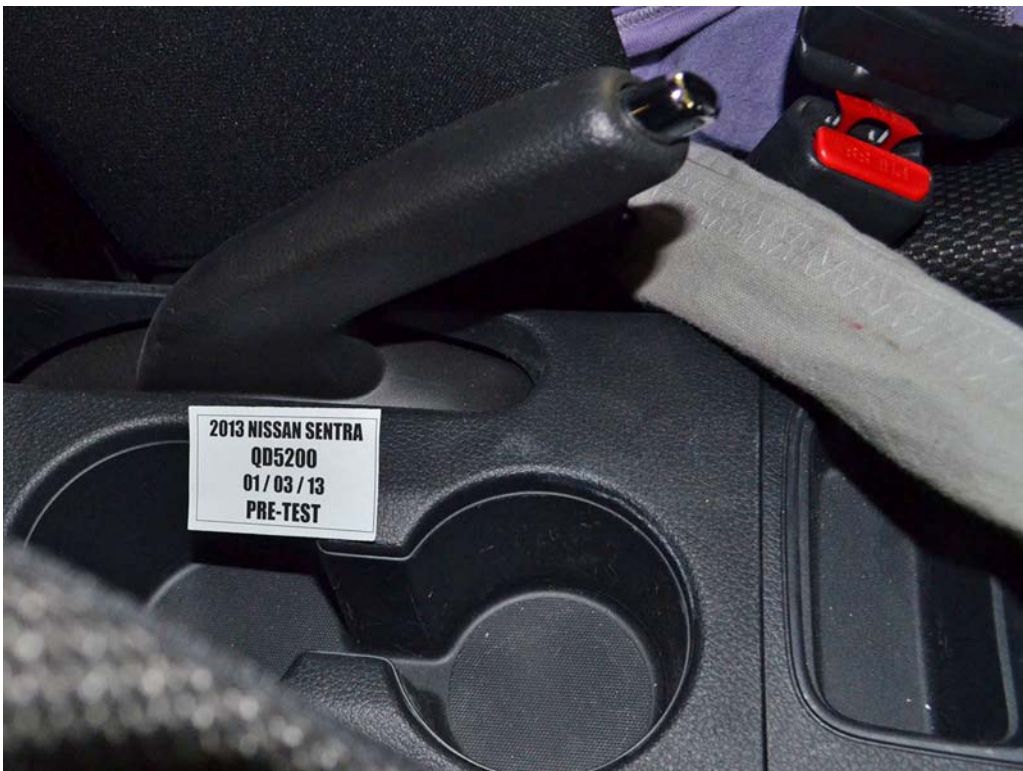


FIGURE 36. Pre-Test View of Parking Brake

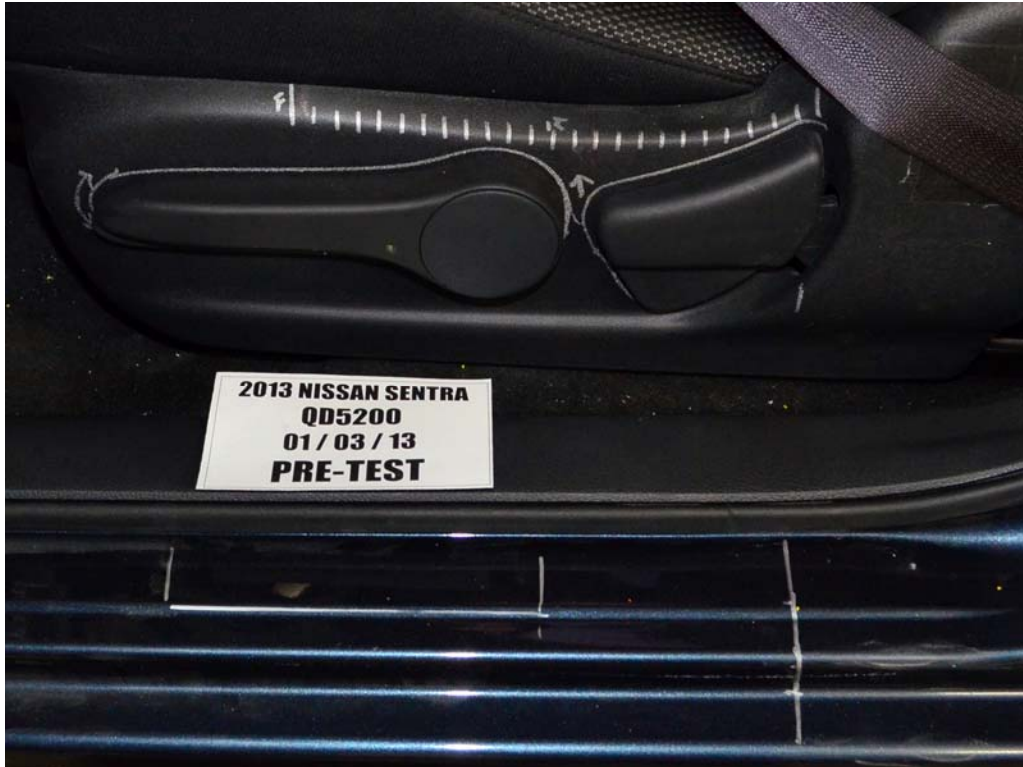


FIGURE 37. Pre-Test Close-Up Left Side View of Driver Seat Track

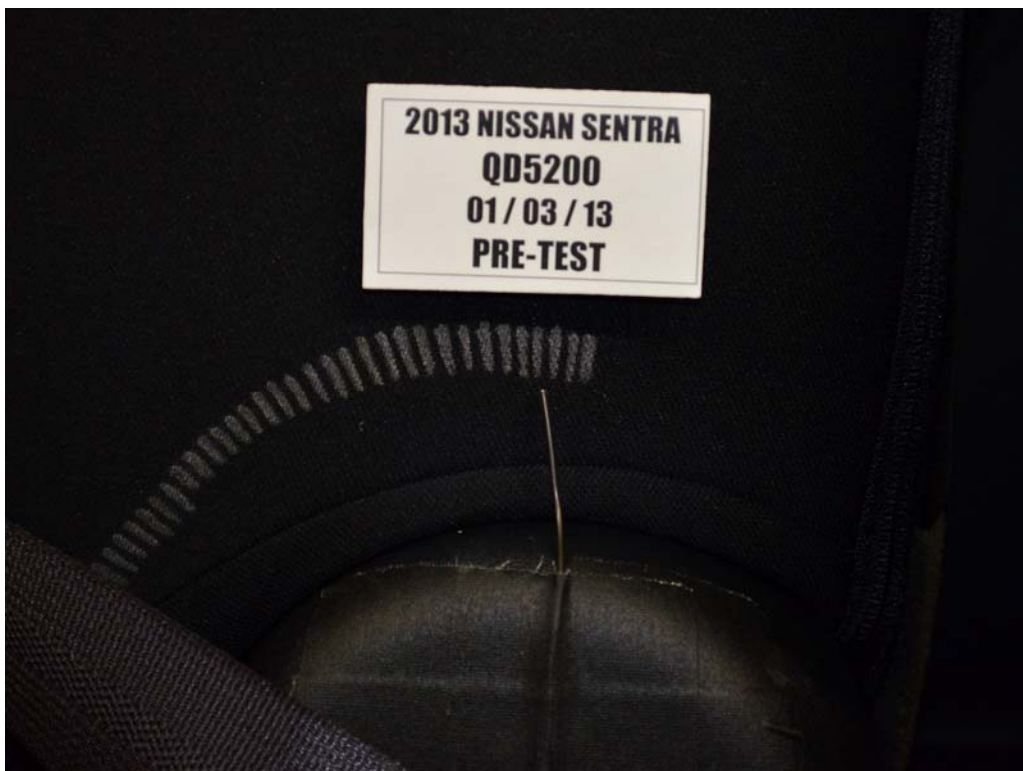


FIGURE 38. Pre-Test Close-Up Left Side View of Driver Seat Back



FIGURE 39. Pre-Test Close-Up View of Driver Seat Back or Head Restraint



FIGURE 40. Pre-Test Dummy and Door Clearance View



FIGURE 41. Post-Test Dummy and Door Clearance View



FIGURE 42. Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



FIGURE 43. Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment



FIGURE 44. Pre-Test Inner Door Panel View



FIGURE 45. Post-Test Inner Door Panel View
Showing Dummy Contact Locations



FIGURE 46. Post-Test Dummy Close-Up Head Contact with Vehicle Interior View

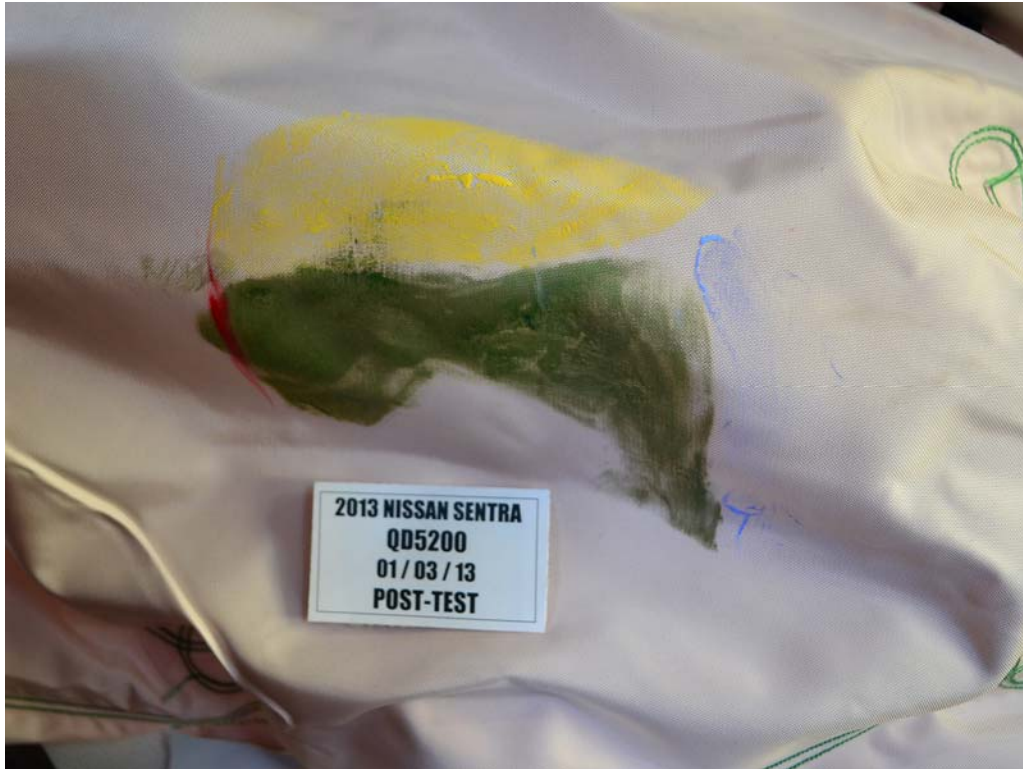


FIGURE 47. Post-Test Dummy Close-Up Head Contact with Side Airbag View



FIGURE 48. Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



FIGURE 49. Post-Test Dummy Close-Up Torso Contact with Side Airbag View



FIGURE 50. Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View



FIGURE 51. Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View



FIGURE 52. Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View



FIGURE 53. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



FIGURE 54. Post-Test View of Fuel Filler Cap or Fuel Filler Neck



FIGURE 55. Close-Up View of Vehicle's Certification Label

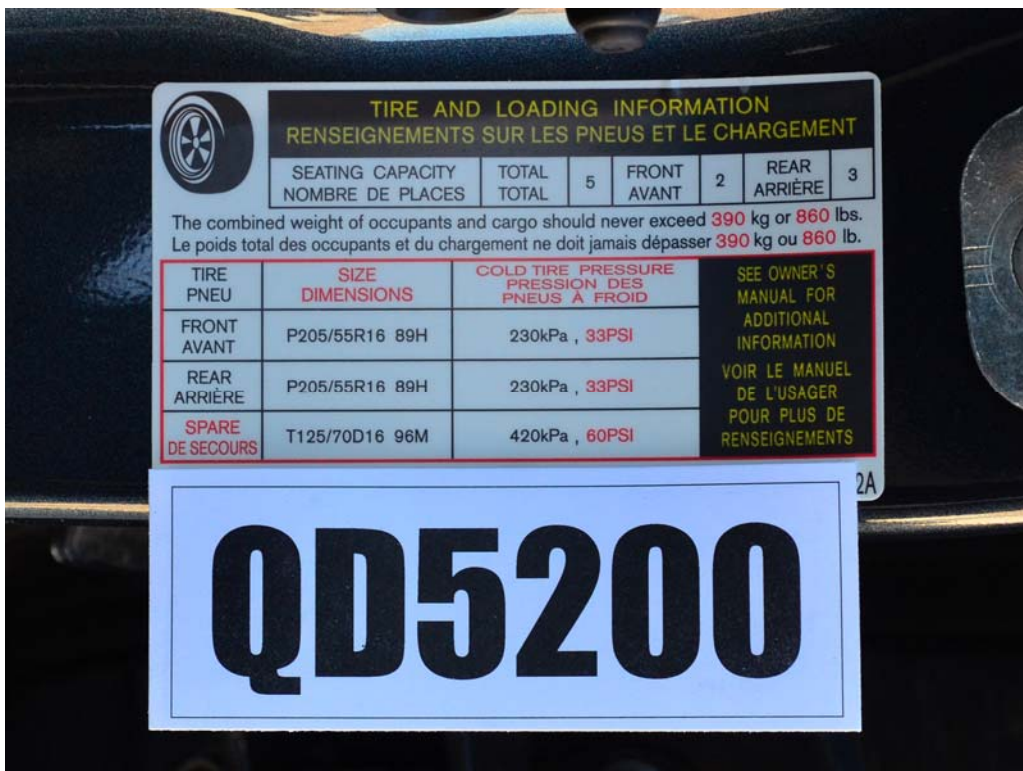


FIGURE 56. Close-Up View of Vehicle's Tire Information Placard or Label



FIGURE 57. Pre-Test Pole Barrier Front View



FIGURE 58. Post-Test Pole Barrier Front View



FIGURE 59. Pre-Test Pole Barrier Side View



FIGURE 60. Post-Test Pole Barrier Side View

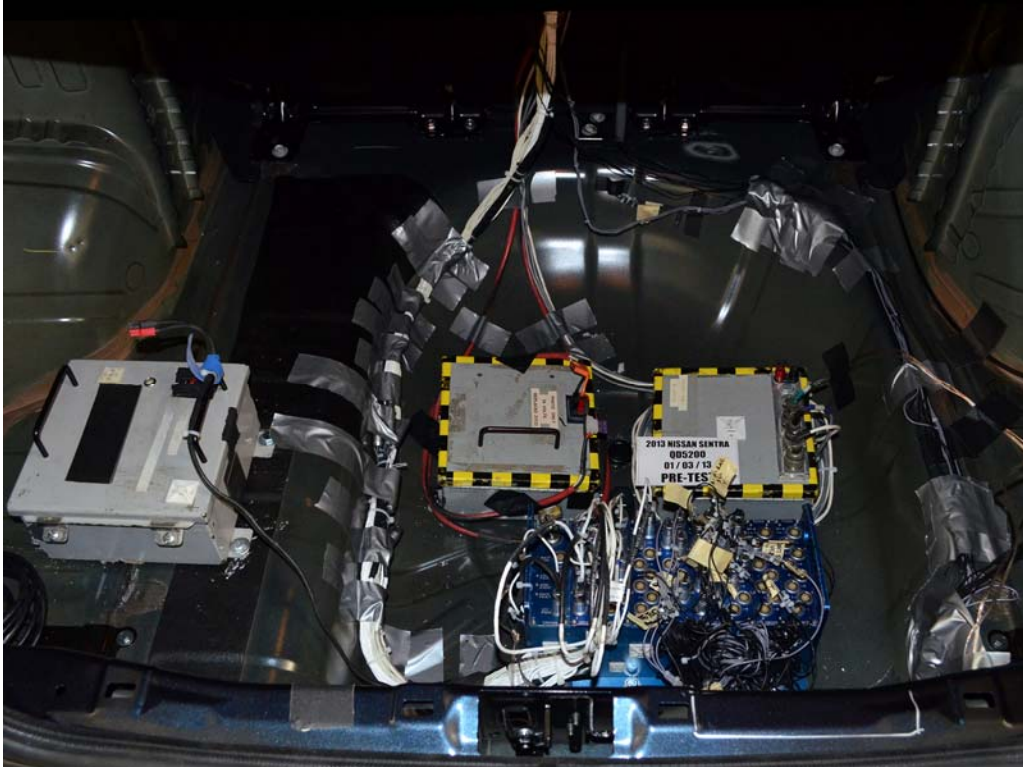


FIGURE 61. Pre-Test Ballast View



FIGURE 62. Post-Test Primary and Redundant Speed Trap Read-Out

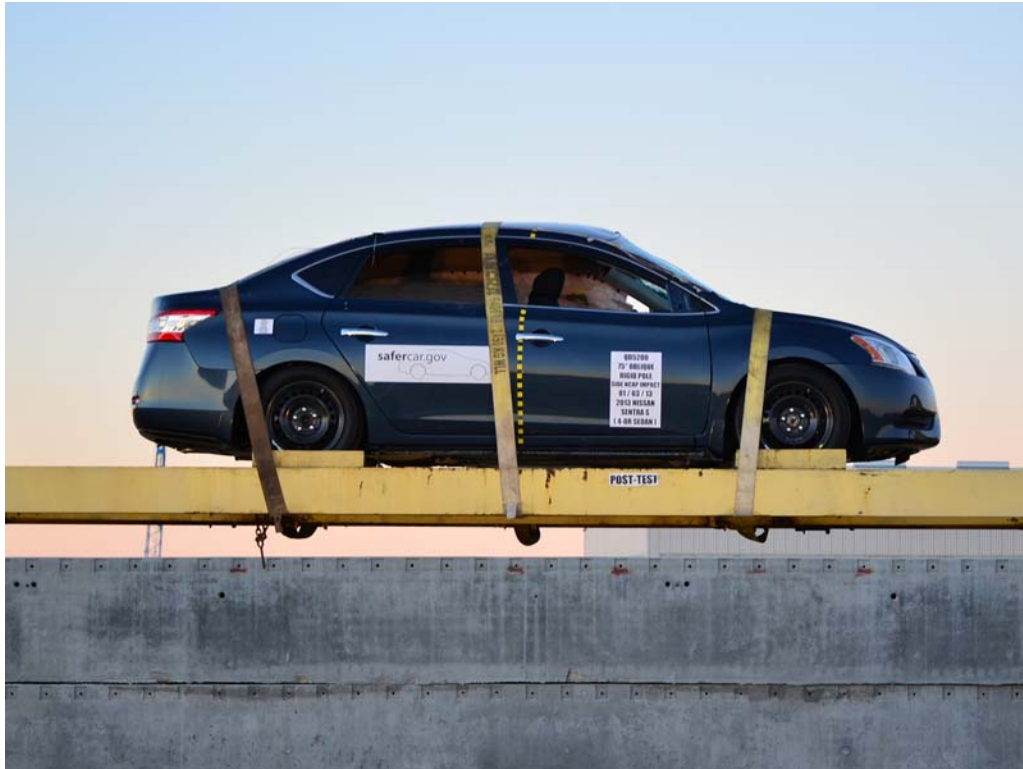


FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees



FIGURE 64. FMVSS No. 301 Static Rollover 90 Degrees



FIGURE 65. FMVSS No. 301 Static Rollover 180 Degrees

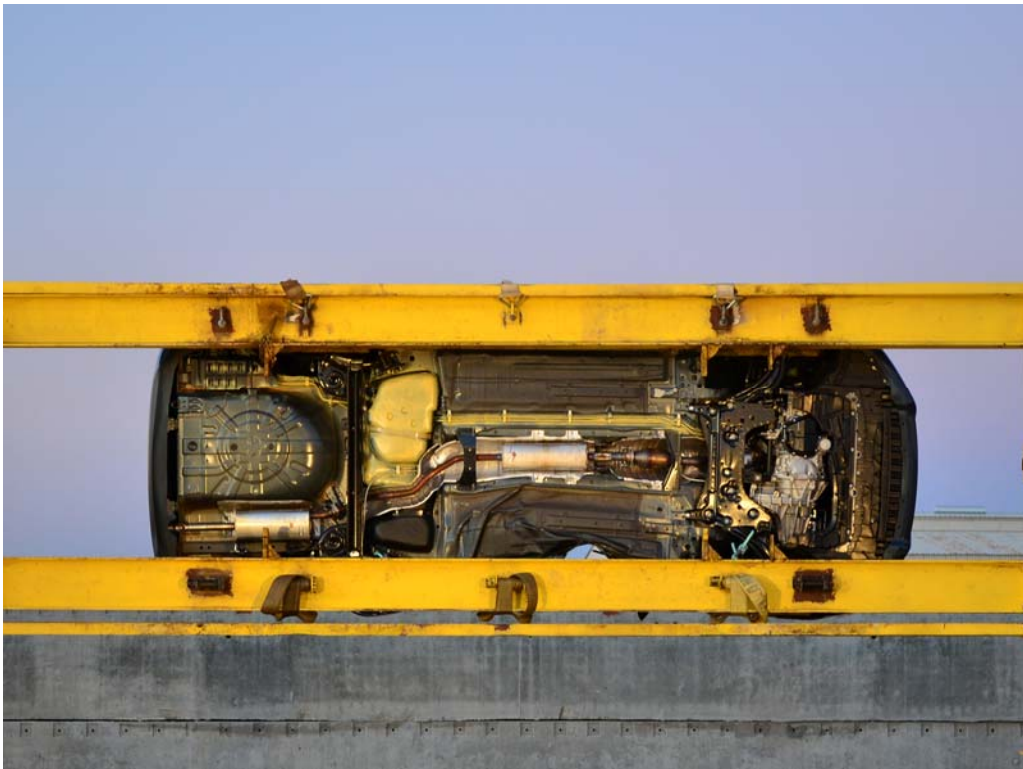


FIGURE 66. FMVSS No. 301 Static Rollover 270 Degrees

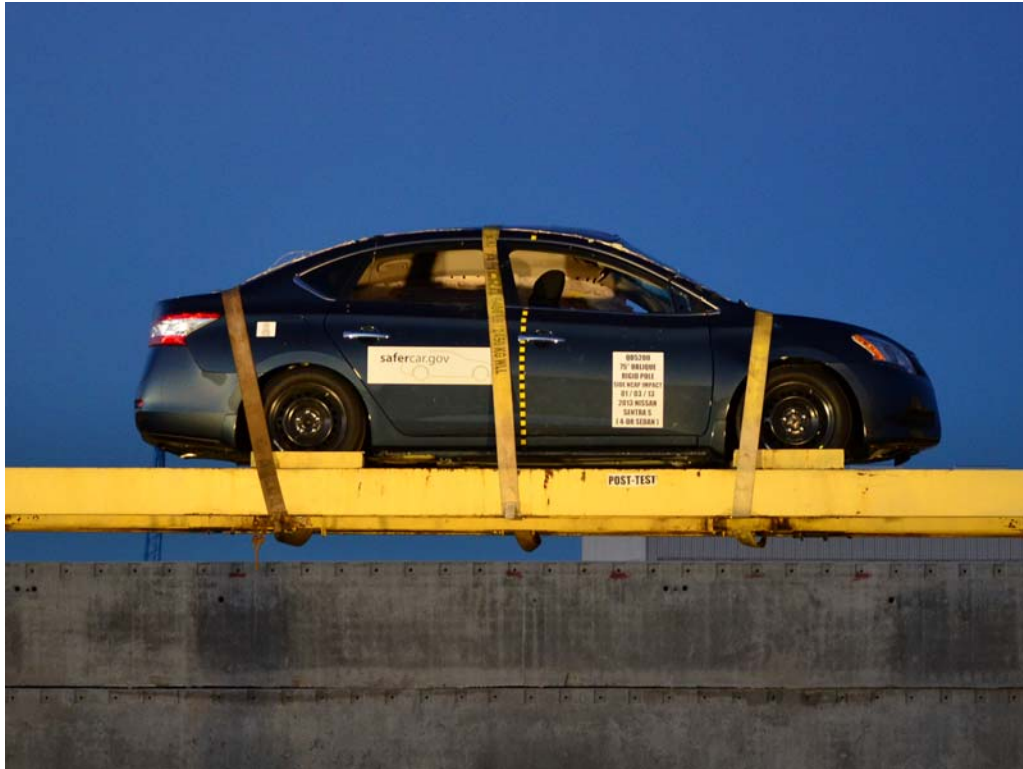


FIGURE 67. FMVSS No. 301 Static Rollover 360 Degrees



FIGURE 68. Impact Event

2013 SENTRA S

THE MOST INNOVATIVE SENTRA EVER

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
 1.8-Liter DOHC 4-Cylinder Engine
 6-Speed Manual Transmission
 Eco and Sport Drive Modes
 Front and Rear Stabilizer Bars
 Power-Assisted Vented Front Disc / Rear Drum Brakes
 10" Steel Wheels w/ Full Wheel Covers

SAFETY & SECURITY
 Driver & Front Passenger, Side-Impact, & Curtain Air Bags
 Lower Anchors and Tethers for Children (LATCH)
 Anti-Lock Braking System (ABS)
 Vehicle Dynamic Control (VDC)
 Electronic Brake Force Distribution (EBD)
 Tire Pressure Monitoring System (TPMS)

COMFORT & CONVENIENCE
 Air Conditioning w/ In-Cabin Monitor
 6-Way Adjustable Driver's Seat
 Power Windows w/ Driver's One-Touch Auto Up/Down Feature
 Power Door Lock w/ Auto-Locking Feature
 Remote Keyless Entry
 AM/FM/CD/USB Audio System w/ 4 Speakers
 60/40 Split Fold-Down Rear Seats

EXTERIOR
 Halogen Headlights w/ LED Accents
 LED Taillights
 Dual Body-Color Power Outside Mirrors

Manufacturer's Suggested Retail Base Price: \$15,990.00

Options Included by Manufacturer:
 SPLASH GUARDS 160.00
 CARPETED FLOOR MATS AND TRUNK MAT 170.00

DESTINATION CHARGES: 790.00

TOTAL: \$17,110.00

Fuel Economy and Environment

Fuel Economy Mid-Size range from 13 to 36 MPG. The best vehicle rates 112 MPG.

30 MPG
combined city/hwy **27** city **36** highway

3.3 gallons per 100 miles

You Save \$2,600
in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,800

Fuel Economy & Greenhouse Gas Rating Smog Rating

1 2 3 4 5

This vehicle emits 202 grams CO₂ per mile. The best emits 0 grams per mile (battery only). Producing and distributing fuel also creates emissions, learn more at fuel-economy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and costs \$11,892 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.55 per gallon. Emissions in miles per gallon are equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel-economy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score To Be Rated
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.	Driver To Be Rated	Passenger To Be Rated
Side Crash Based on the risk of injury in a side impact.	Front seat To Be Rated	Rear seat To Be Rated
Rollover 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 1-800-327-4236

Security+Plus Vehicle Protection Plan
The only service agreement backed by Nissan! Ask your dealer for details, or call 1-800-NISSAN-1 for more information

DELIVERY

VEHICLE COLORS:
 EXT: GRAPHITE BLUE
 INT: CHARCOAL

FINAL ASSEMBLY POINT:
 AQUAS/ABV JMEIX

TRANSPORT METHOD:
 TRUCK

DEALER:
 DOWNEY NISSAN
 7550 FIRST ONE BLVD
 DOWNEY CA 90241

VIN: 3N1AB7AP0DL627263
EMS: 50 STATE EMISSIONS
MDL: 12063-627263 **RAQ-G**
OPT: D-892C03L92

20121024231938RF5154

FIGURE 69. Monroney Label

HEAD RESTRAINTS

WARNING
 Head restraints supplement the other vehicle safety systems. They may provide additional protection against injury in certain rear-end collisions. Adjust the head restraints properly, as specified in this section. Check the adjustment after someone else uses the seat. Do not attach anything to the head restraint stalks or remove the head restraint. Do not use the seat if the head restraint has been removed. If the head restraint was removed, reinstall and properly adjust the head restraint before an occupant uses the seating position. Failure to follow these instructions can reduce the effectiveness of the head restraints. This may increase the risk of serious injury or death in a collision.

The illustration shows the seating position equipped with head restraints. All of the head restraints are adjustable.

▲ Indicates the seating position is equipped with a head restraint.

Components

1. Head restraint
2. Adjustment notches
3. Lock knob
4. Stalks

Adjustment

Adjust the head restraint so the center is level with the center of the seat occupant's ears.

To raise the head restraint, pull it up.

To lower, push and hold the lock knob and push the head restraint down.

Removal

Use the following procedure to remove the adjustable head restraints.

1. Pull the head restraint up to the highest position.
2. Push and hold the lock knob.
3. Remove the head restraint from the seat.
4. Store the head restraint properly so it is not loose in the vehicle.
5. Reinstall and properly adjust the head restraint before an occupant uses the seating position.

Install

1. Align the head restraint stalks with the holes in the seat. Make sure the head restraint is facing the correct direction. The stalk with the adjustment notches (1) must be installed in the hole with the lock knob (2).
2. Push and hold the lock knob and push the head restraint down.
3. Properly adjust the head restraint before an occupant uses the seating position.

FIGURE 70. Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head Acceleration (X) Primary vs. Time	B-1
2	Driver Head Acceleration (Y) Primary vs. Time	B-1
3	Driver Head Acceleration (Z) Primary vs. Time	B-1
4	Driver Head Resultant Acceleration Primary vs. Time	B-1
5	Driver Lower Spine T12 Acceleration (X) vs. Time	B-2
6	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-2
7	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-2
8	Driver Lower Spine T12 Resultant Acceleration vs. Time	B-2
9	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-3
10	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-3
11	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-3

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 Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
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)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)

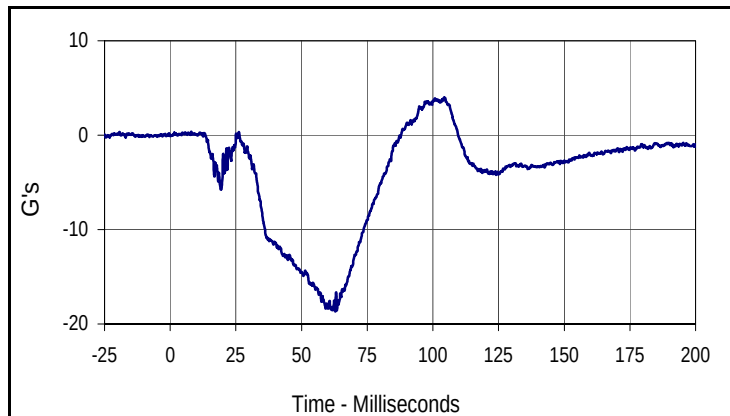
Left B-Pillar Sill Acceleration
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (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)

Pole Instrumentation Data

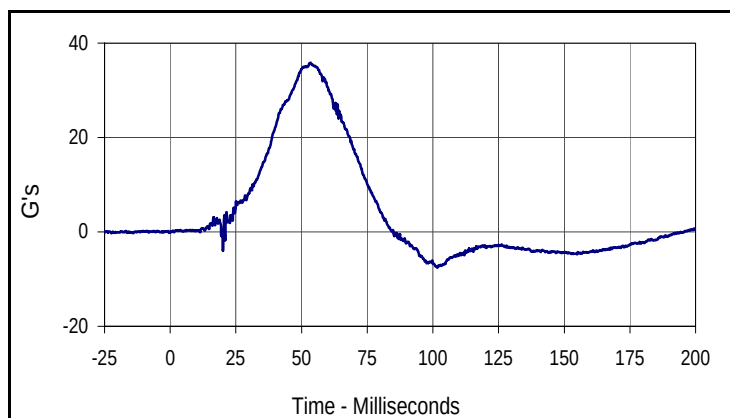
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

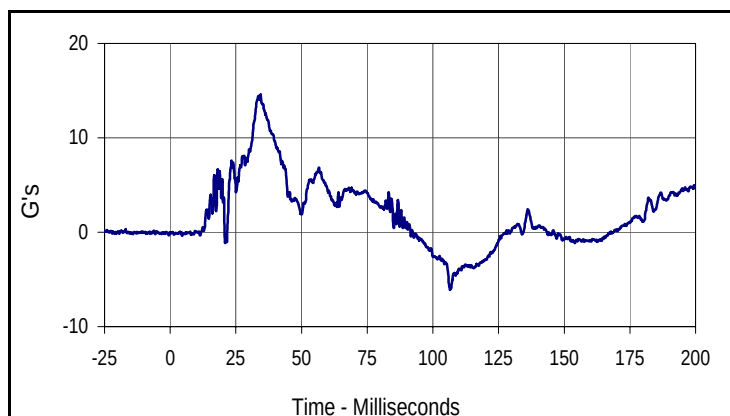
Test Date: 1/3/13
 NHTSA No.: QD5200



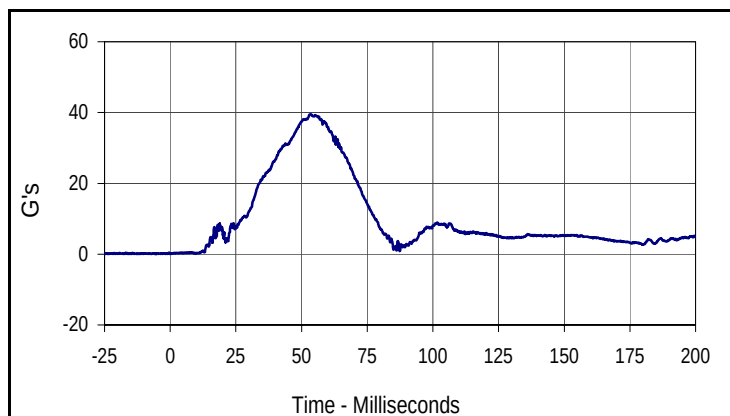
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
4.0	104.6	-18.7	62.8



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
35.8	53.4	-7.6	101.7



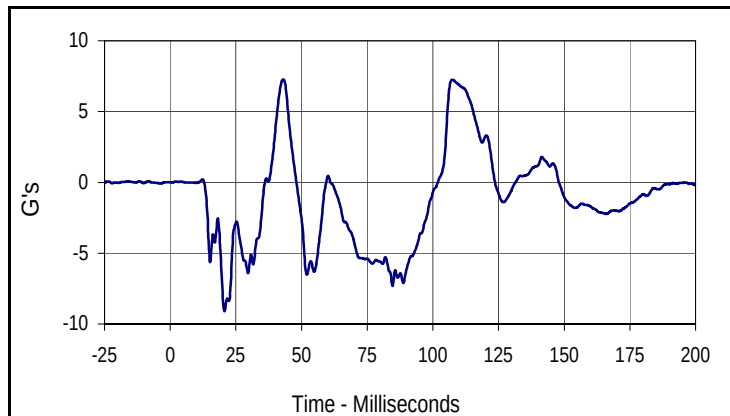
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
14.6	34.4	-6.1	106.6



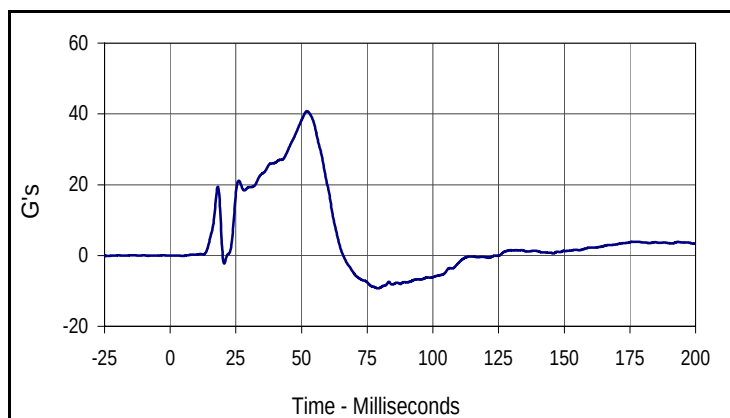
Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
39.5	53.4	0.0	0.4

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

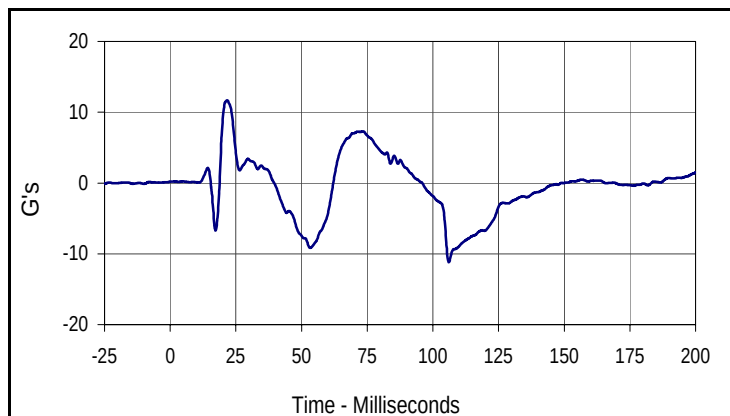
Test Date: 1/3/13
 NHTSA No.: QD5200



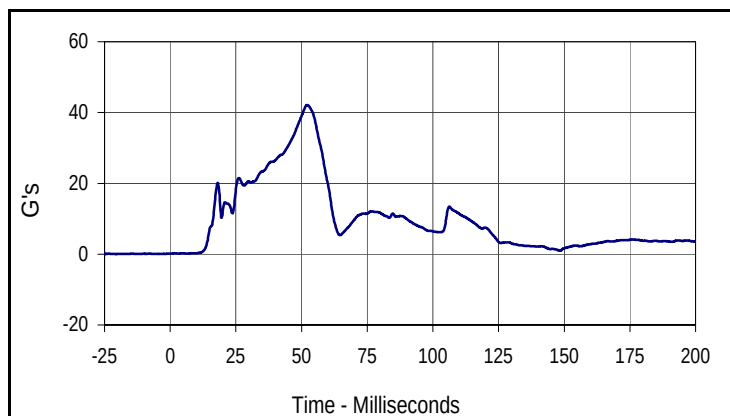
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
7.3	43.1	-9.1	20.6



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
40.8	52.1	-9.3	79.0



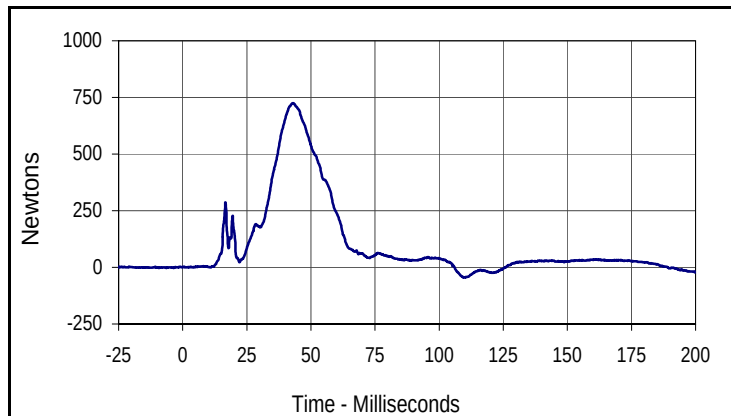
Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
11.7	21.7	-11.2	106.1



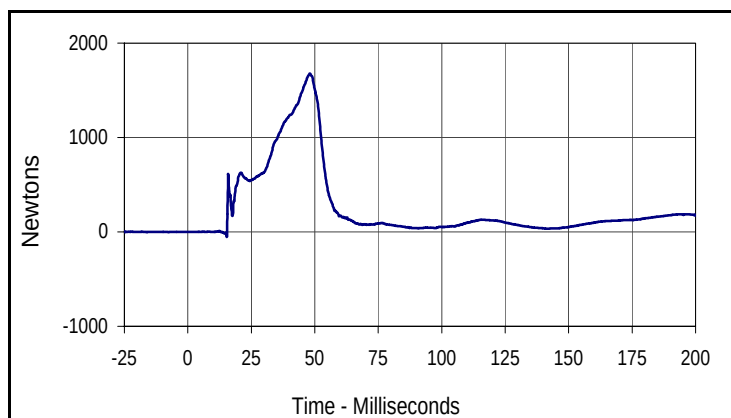
Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
008	RES	180	G's
Max	Time	Min	Time
42.1	52.2	0.2	3.2

Test Vehicle: 2013 Nissan Sentra S 4-Door Sedan
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

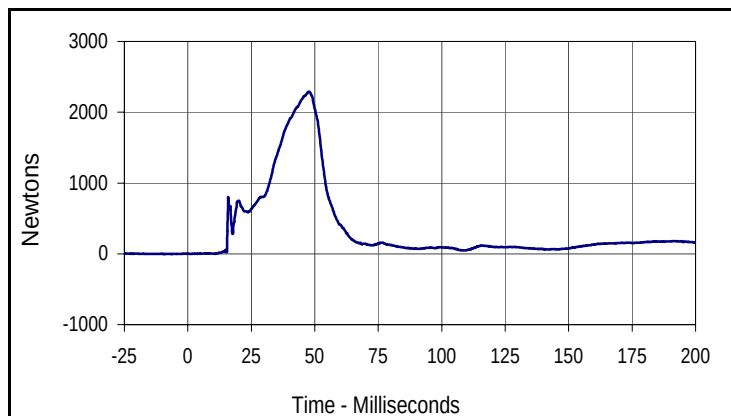
Test Date: 1/3/13
 NHTSA No.: QD5200



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
724.8	43.0	-45.0	110.1



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtons
Max	Time	Min	Time
1676.8	48.1	-53.1	15.3



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	SUM	600	Newtons
Max	Time	Min	Time
2289.8	47.8	-0.8	1.3

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
PRE-TEST / ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: SID IIs External Measurements
 ATD Serial No.: 299

Test Date: 12/21/12
 Test I.D.: N/A



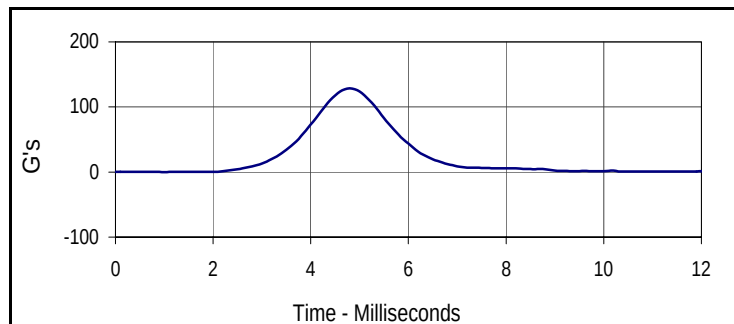
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	184	Pass
J	Head Circumference	mm	541 - 551	545	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	202	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 - 323	315	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	481	Pass
V	Shoulder Width	mm	341 - 357	352	Pass
W	Foot Width	mm	78 - 94	86	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	872	Pass
Z	Waist Circumference	mm	760 - 791	774	Pass
Overall Test Results					Pass

Test Program: SID IIs Head Drop Test
 ATD Serial No.: 299

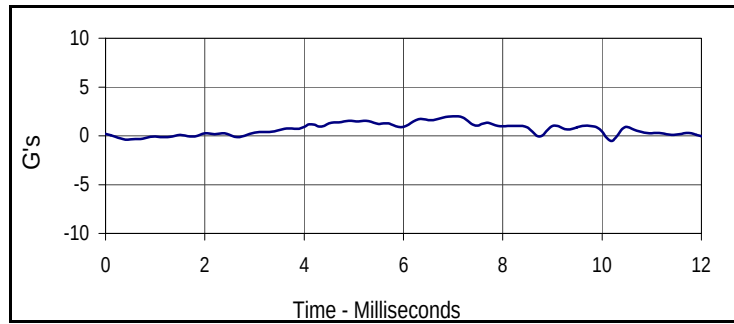
Test Date: 12/21/12
 Test I.D.: 299HD053



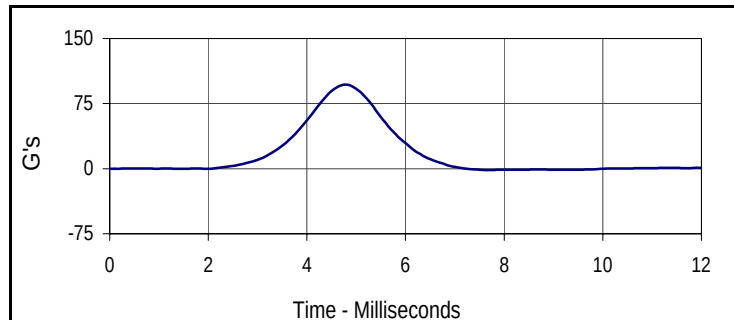
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	250	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.4	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.5	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Peak Head Resultant Acceleration		G's	115 to 137	128.5	Pass
Peak Head X Acceleration		G's	<15	2.0	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	2.2	Pass
Overall Test Results				Pass	



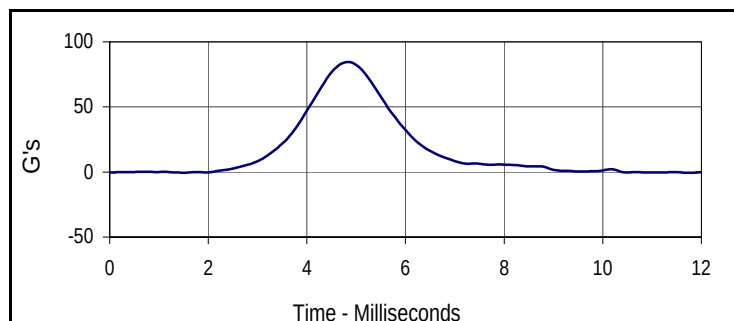
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
128.5	4.8	0.1	1.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.0	7.1	-0.4	0.4



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
96.8	4.8	-1.6	7.6



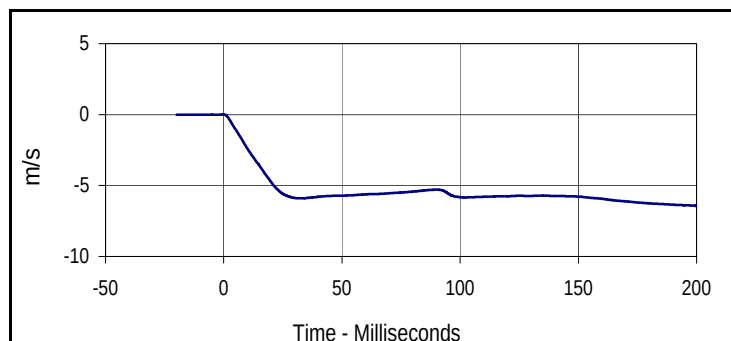
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
84.6	4.8	-0.6	11.8

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 299

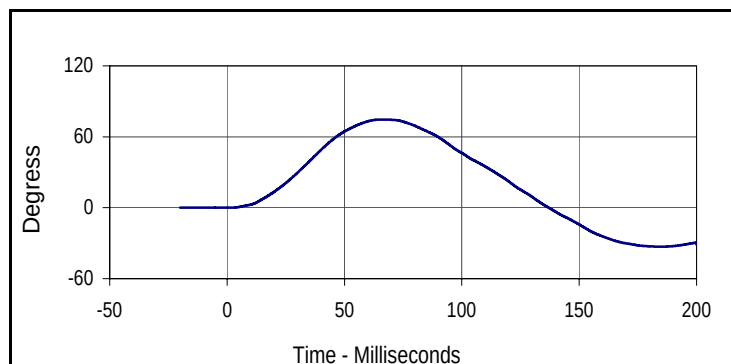
Test Date: 12/21/12
 Test I.D.: 299NB053



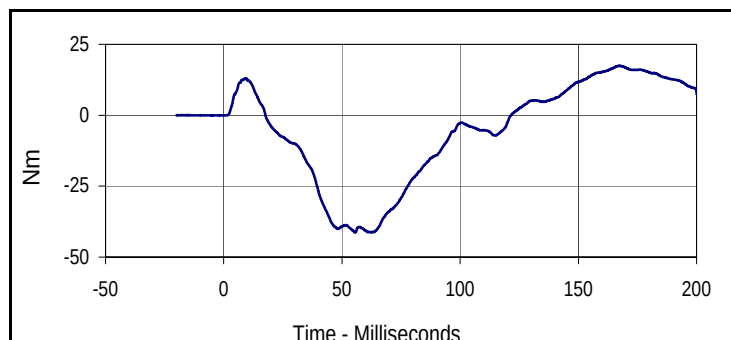
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	295	Pass
Temperature During Soak	Max	20.6 to 22.2	21.4	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.9	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.52	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.40	Pass
	15 msec	-3.30 to -4.10	-3.58	Pass
	20 msec	-4.40 to -5.40	-4.74	Pass
	25 msec	-5.40 to -6.10	-5.59	Pass
	25-100 msec	-5.50 to -6.20	-5.90	Pass
D-Plane Rotation	Max	71 to 81	74.6	Pass
	Time	50 to 70	65.5	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-41.3	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	121.5	Pass
Overall Test Results			Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.3	-6.4	199.9



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
74.6	65.5	-32.9	184.6



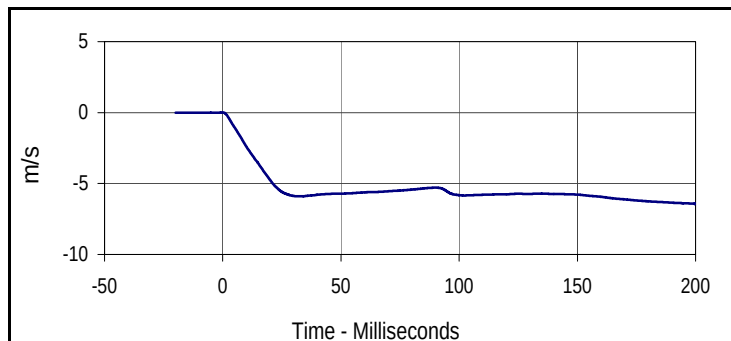
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
17.4	167.2	-41.3	55.4

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 299

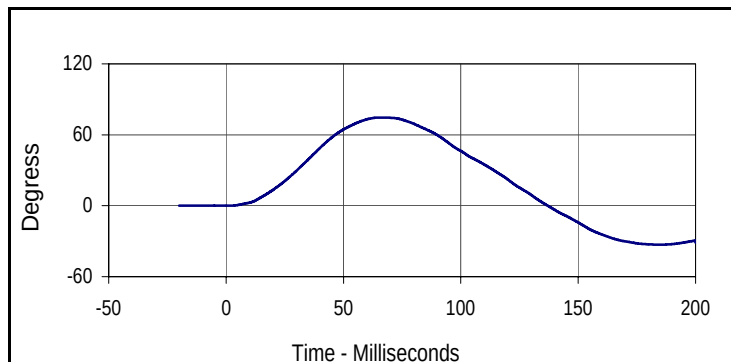
Test Date: 12/21/12
 Test I.D.: 299NB053



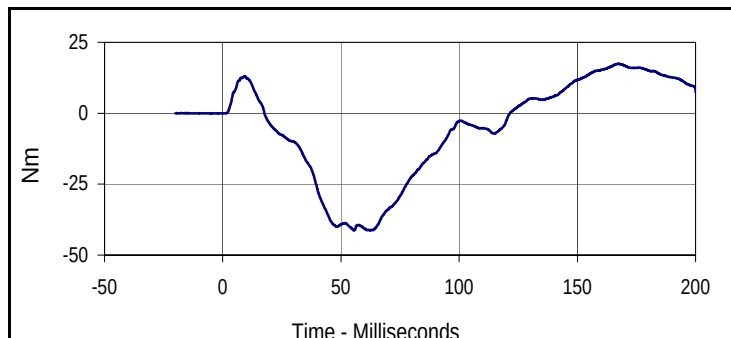
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	295	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.4	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.5	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.52	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.40	Pass
	15 msec	m/s	-3.30 to -4.10	-3.58	Pass
	20 msec	m/s	-4.40 to -5.40	-4.74	Pass
	25 msec	m/s	-5.40 to -6.10	-5.59	Pass
	25-100 msec	m/s	-5.50 to -6.20	-5.90	Pass
D-Plane Rotation	Max	Degrees	71 to 81	74.6	Pass
	Time	msec	50 to 70	65.5	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-41.3	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	121.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.3	-6.4	199.9



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
74.6	65.5	-32.9	184.6



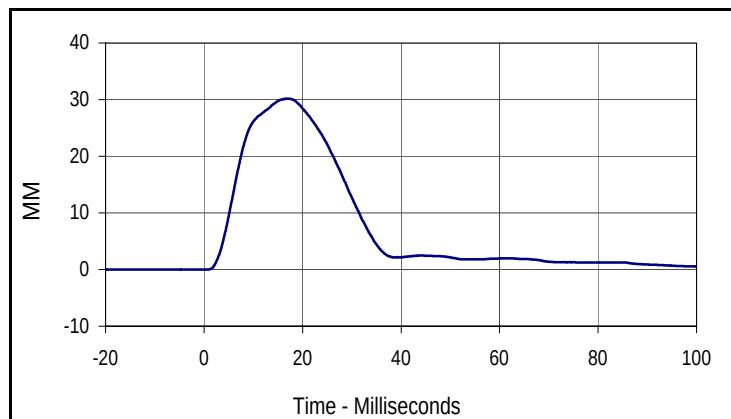
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
17.4	167.2	-41.3	55.4

Test Program: SID IIs Shoulder Impact Test
 ATD Serial No.: 299

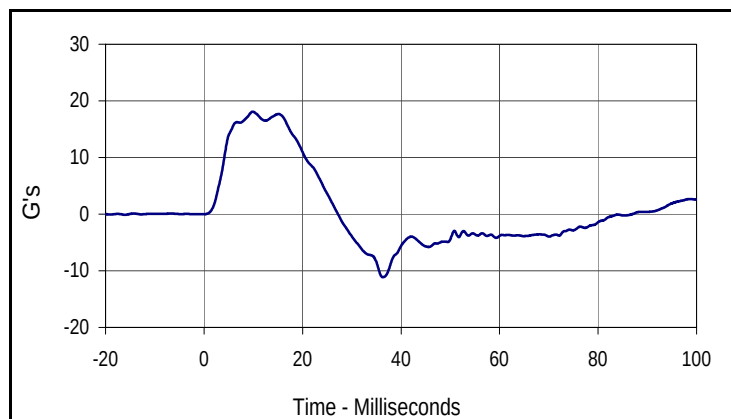
Test Date: 12/21/12
 Test I.D.: 299SH053



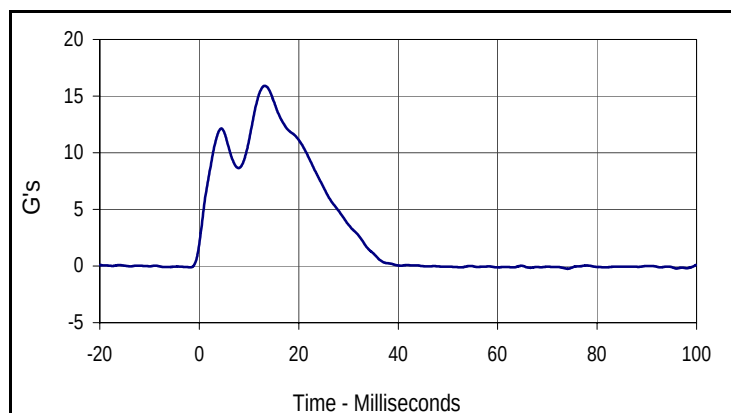
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	350	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.4	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.5	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.6	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.25	Pass
Peak Shoulder Deflection		mm	28 to 37	30.2	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	18.1	Pass
Peak Impactor Acceleration		G's	13 to 18	15.9	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.2	17.0	0.0	0.7



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.1	9.9	-11.1	36.3



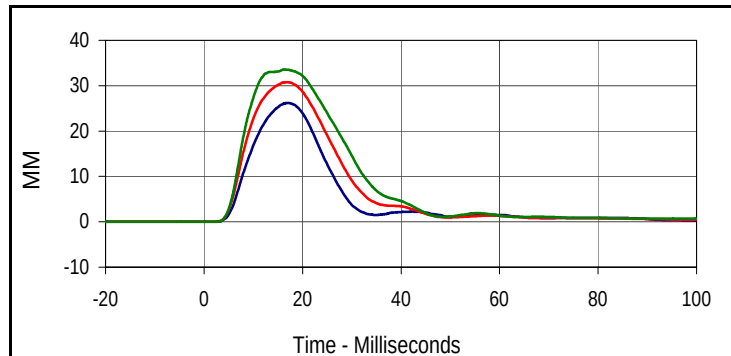
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.9	13.2	-0.2	74.1

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 299

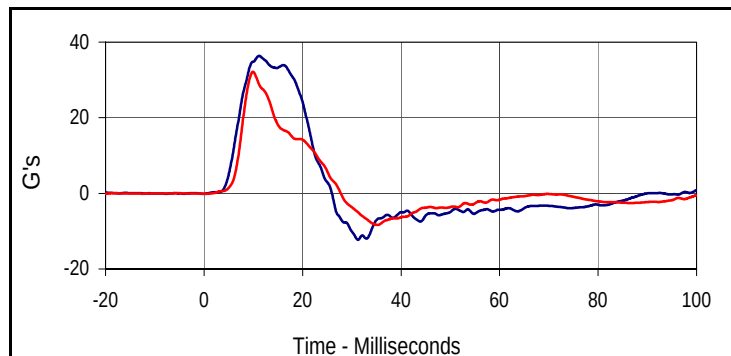
Test Date: 12/21/12
 Test I.D.: 299TWA053



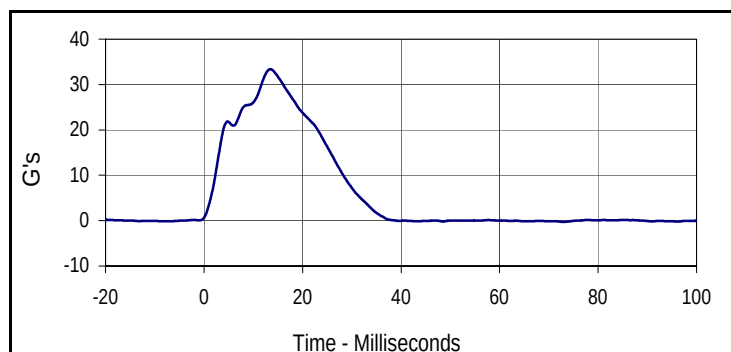
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	375	Pass
Temperature During Soak	Max	20.6 to 22.2	21.4	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.8	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.71	Pass
Peak Shoulder Deflection	mm	31 to 40	34.4	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	26.2	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	30.7	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	33.6	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	36.4	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.1	Pass
Peak Impactor Acceleration	G's	30 to 36	33.4	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
26.2	17.1	0.0	-3.7
Middle Thorax Deflection			
Max	Time	Min	Time
30.7	16.8	0.0	-6.7
Lower Thorax Deflection			
Max	Time	Min	Time
33.6	16.3	0.0	-12.7



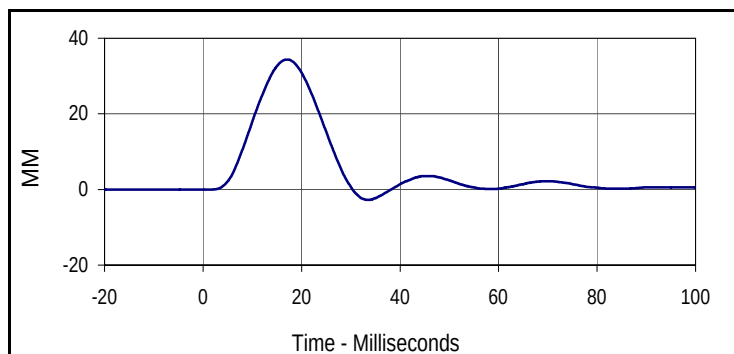
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.4	11.2	-12.3	31.2
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.1	9.9	-8.4	35.2



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.4	13.5	-0.3	72.9

Test Program: SID IIs Thorax with Arm Impact Test
ATD Serial No.: 299

Test Date: 12/21/12
Test I.D.: 299TWA053



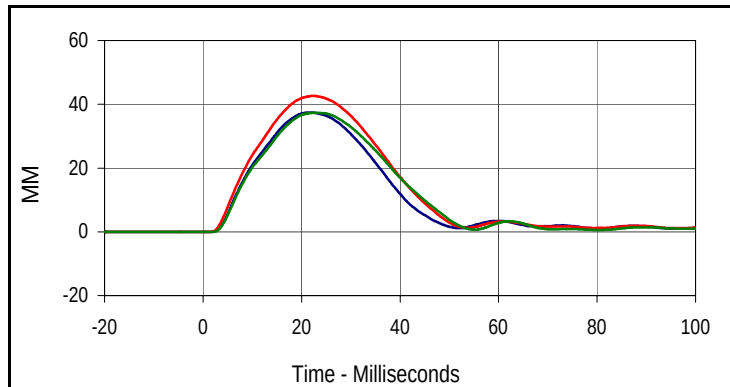
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
34.4	17.0	-2.8	33.5

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 299

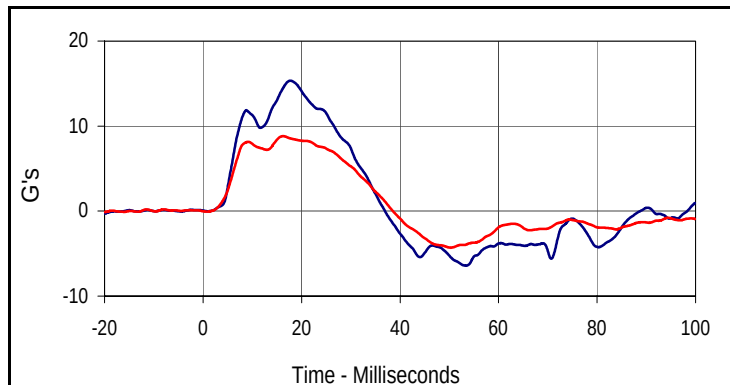
Test Date: 12/21/12
 Test I.D.: 299TWOA053



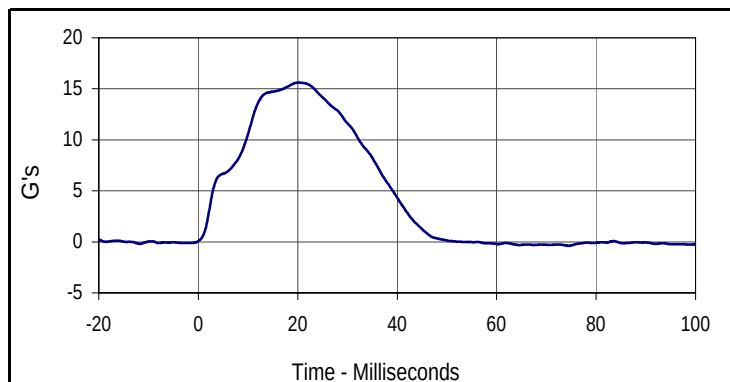
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	400	Pass
Temperature During Soak	Max	18.9 to 25.6	21.4	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.36	Pass
Peak Upper Thorax Rib Deflection	mm	32 to 40	37.4	Pass
Peak Middle Thorax Rib Deflection	mm	39 to 45	42.7	Pass
Peak Lower Thorax Rib Deflection	mm	35 to 43	37.3	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	15.3	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	8.8	Pass
Peak Impactor Acceleration	G's	14 to 18	15.6	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
37.4	21.7	0.0	-10.8
Middle Thorax Deflection			
Max	Time	Min	Time
42.7	22.4	0.0	-6.0
Lower Thorax Deflection			
Max	Time	Min	Time
37.3	23.0	0.0	-2.2



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.3	17.7	-6.4	53.3
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
8.8	16.2	-4.3	50.3



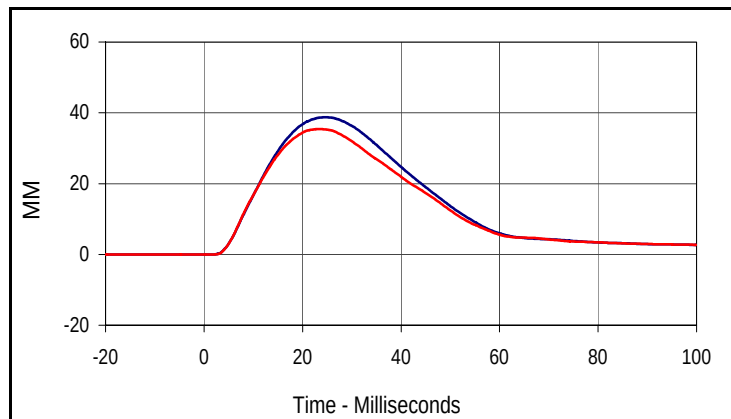
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.6	20.1	-0.4	74.4

Test Program: SID IIs Abdomen Impact Test
 ATD Serial No.: 299

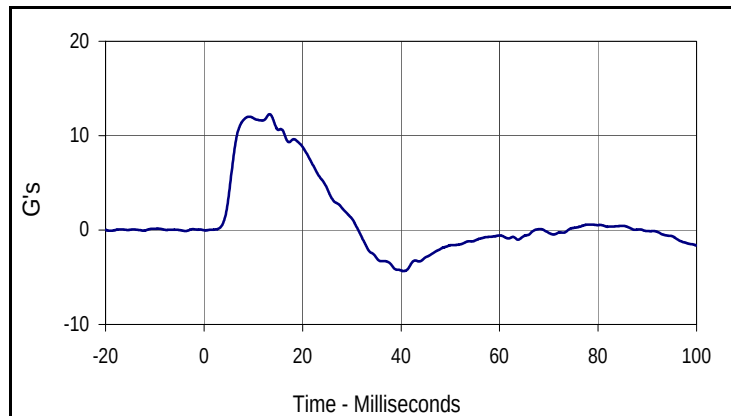
Test Date: 12/21/12
 Test I.D.: 299ABD053



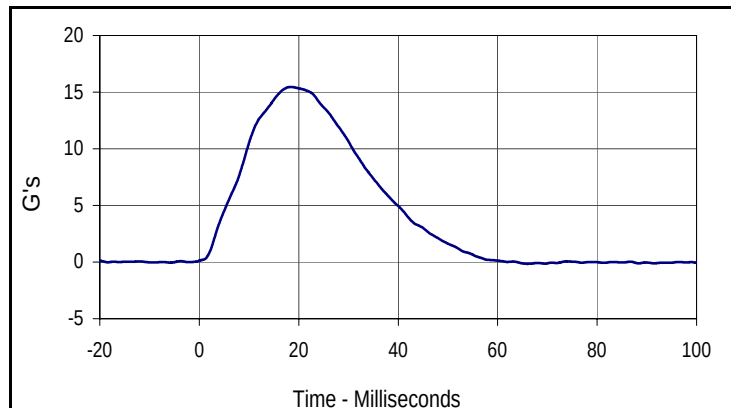
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	425	Pass
Temperature During Soak	Max	20.6 to 22.2	21.4	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.31	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	38.7	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	35.4	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	12.3	Pass
Peak Impactor Acceleration	G's	12 to 16	15.5	Pass
Overall Test Results			Pass	



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.7	24.6	0.0	-14.4
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
35.4	23.2	0.0	-6.5



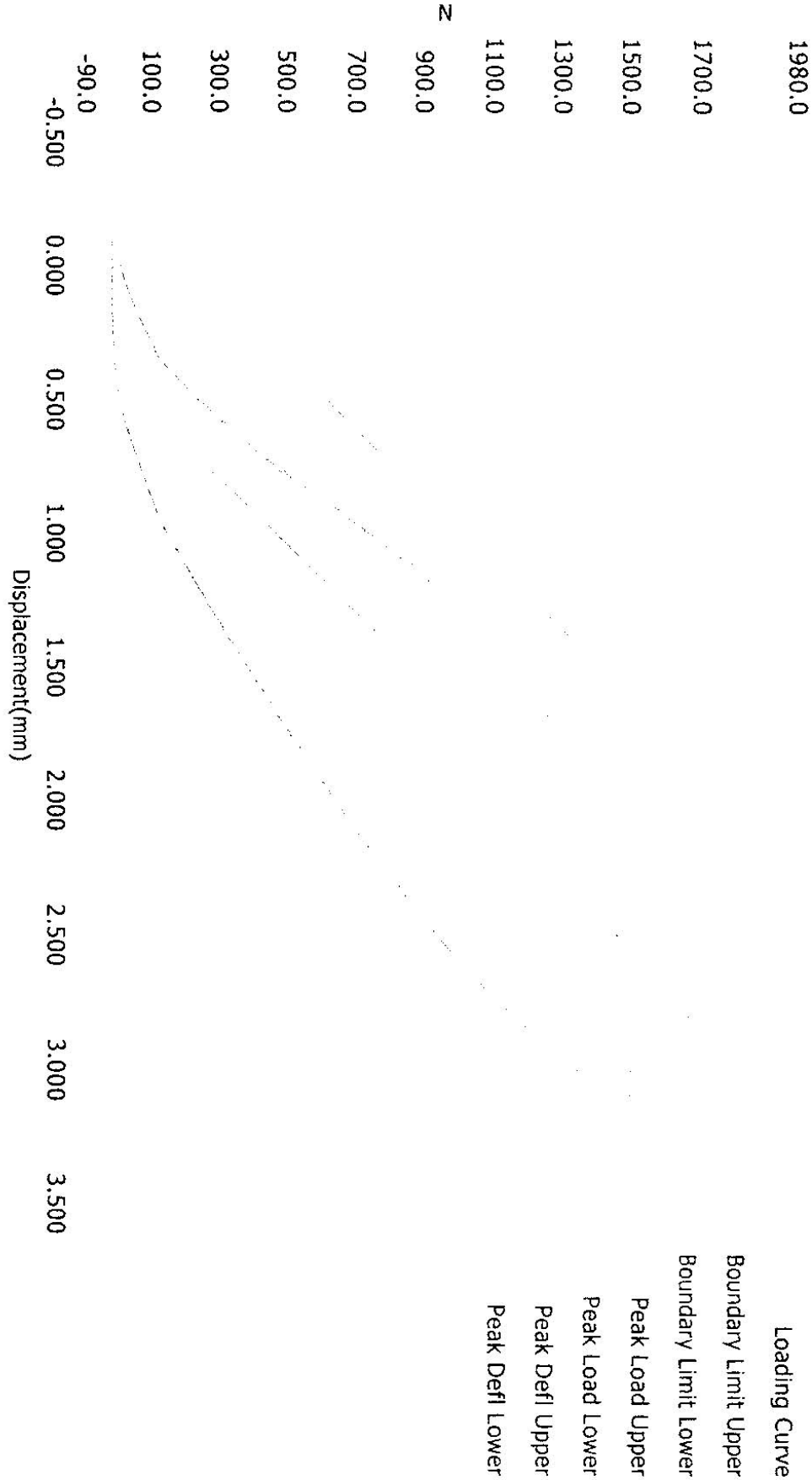
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.3	13.3	-4.3	40.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.5	18.5	-0.2	66.0

QD5200 PRE TEST

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
45982	N/A	SIDIIs	8:56 PM

Current Date : 9/20/2011

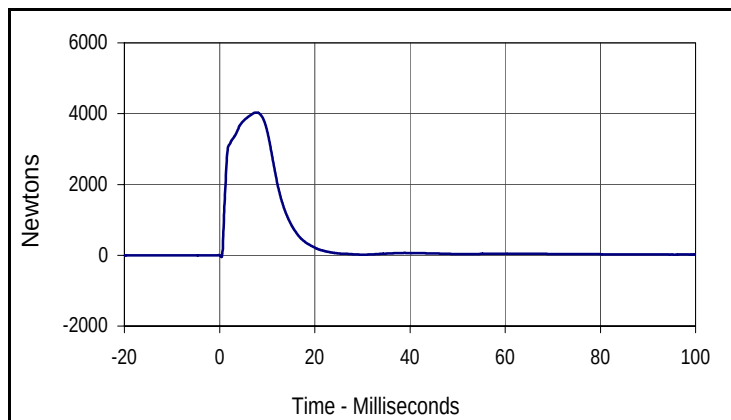
Current Time : 20:57:15

Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 299

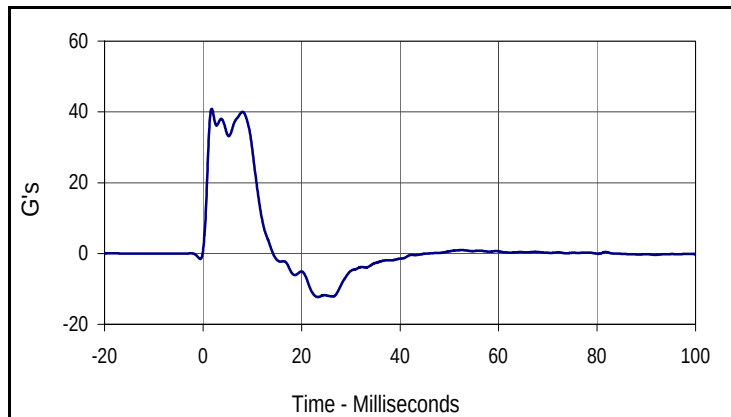
Test Date: 12/21/12
 Test I.D.: 299ACET053



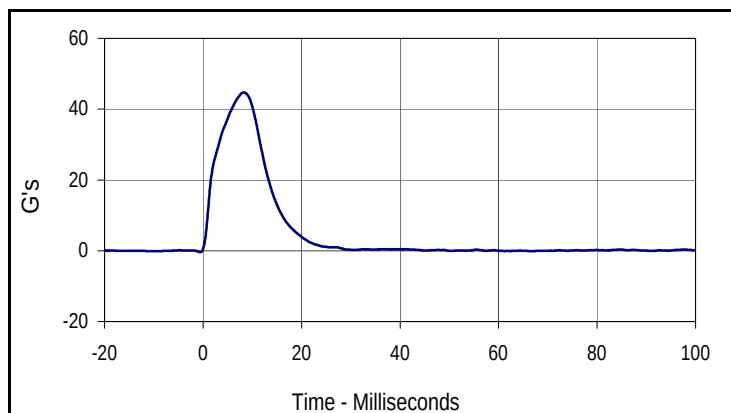
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	450	Pass
Temperature During Soak	Max	20.6 to 22.2	21.4	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.9	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.76	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	4032.3	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	40.0	Pass
Peak Impactor Acceleration	G's	38 to 47	44.7	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4032.3	7.7	-49.1	0.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
40.9	1.8	-12.3	23.3



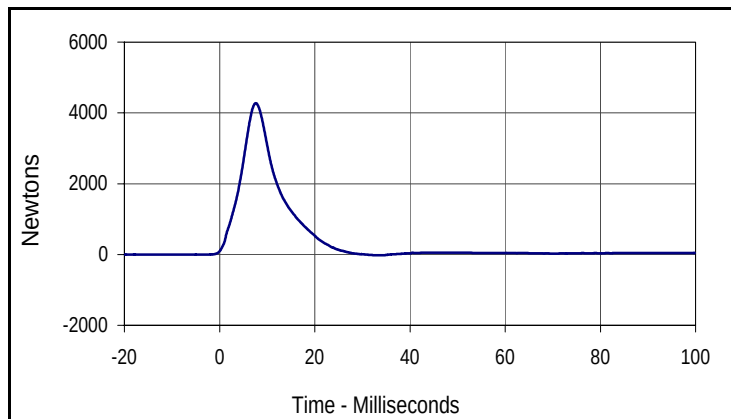
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
44.7	8.2	-0.4	-0.6

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 299

Test Date: 12/21/12
 Test I.D.: 299PL053



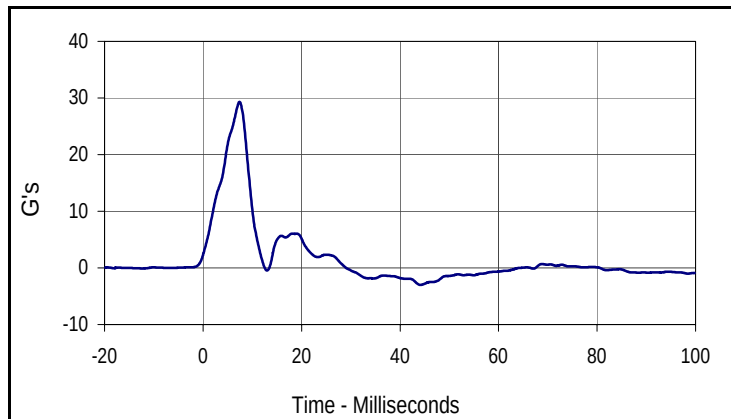
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	505	Pass
Temperature During Soak	Max	20.6 to 22.2	21.4	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.32	Pass
Peak Iliac Force	Newtons	4100 to 5100	4275.6	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	29.3	Pass
Peak Impactor Acceleration	G's	36 to 45	40.1	Pass
Overall Test Results			Pass	



Curve Description

Pelvis Iliac Force

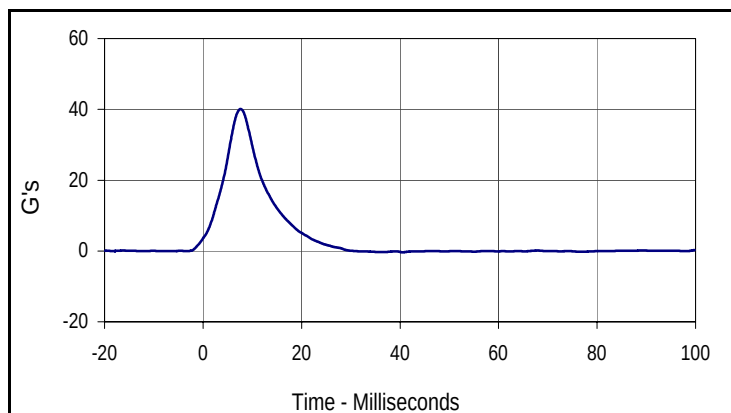
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4275.6	7.6	-24.3	33.9



Curve Description

Pelvis Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
29.3	7.4	-3.0	44.1



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.1	7.6	-0.4	40.5

APPENDIX C
POST-TEST / ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: SID IIs External Measurements
 ATD Serial No.: 299

Test Date: 1/4/13
 Test I.D.: N/A



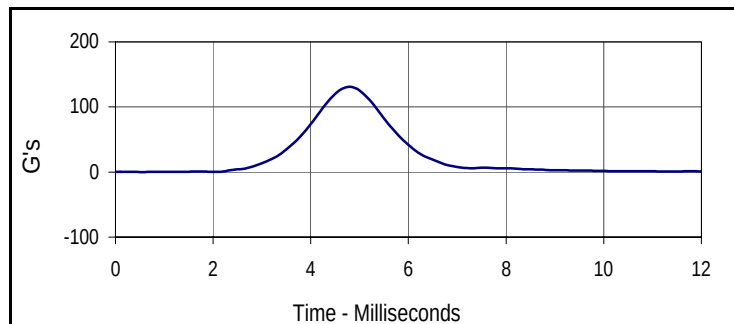
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	31	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	184	Pass
J	Head Circumference	mm	541 - 551	545	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	202	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 - 323	315	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	481	Pass
V	Shoulder Width	mm	341 - 357	352	Pass
W	Foot Width	mm	78 - 94	86	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	872	Pass
Z	Waist Circumference	mm	760 - 791	774	Pass
Overall Test Results					Pass

Test Program: SID IIs Head Drop Test
 ATD Serial No.: 299

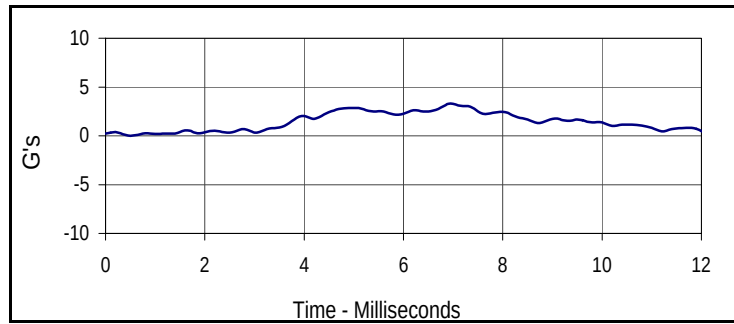
Test Date: 1/4/13
 Test I.D.: 299HD054



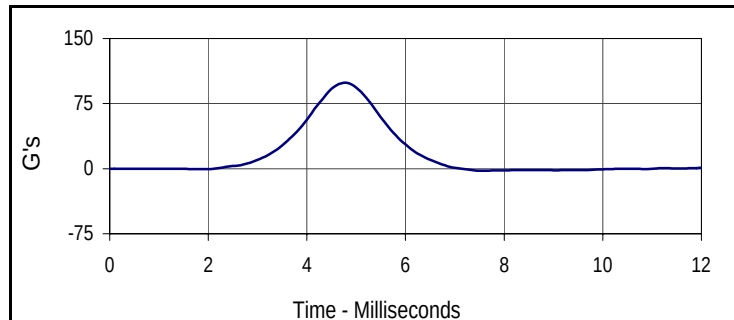
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	360	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.6	Pass
Peak Head Resultant Acceleration	G's	115 to 137	131.0	Pass
Peak Head X Acceleration	G's	<15	3.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	2.2	Pass
Overall Test Results				Pass



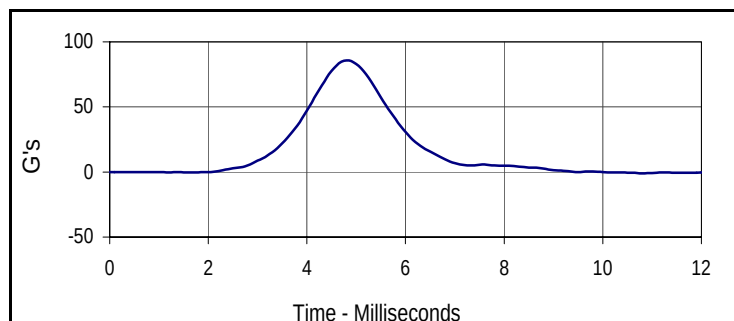
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
131.0	4.8	0.0	0.5



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.3	7.0	0.0	0.5



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
98.9	4.8	-2.5	7.6



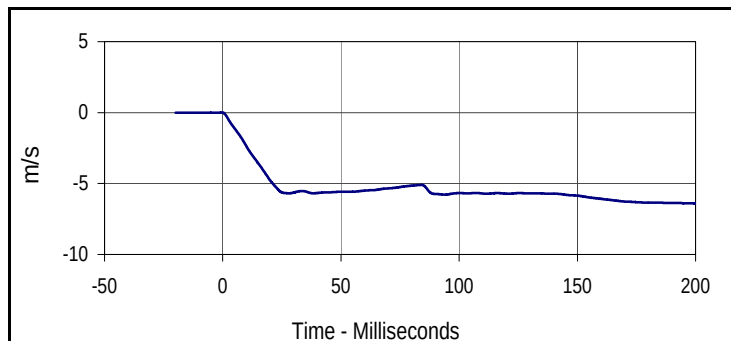
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
85.8	4.8	-1.0	10.8

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 299

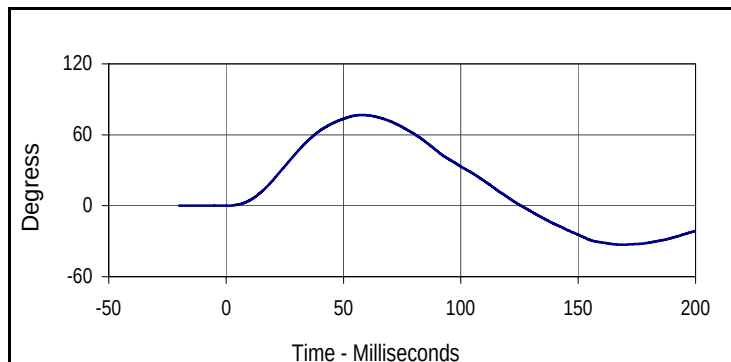
Test Date: 1/4/13
 Test I.D.: 299NB054



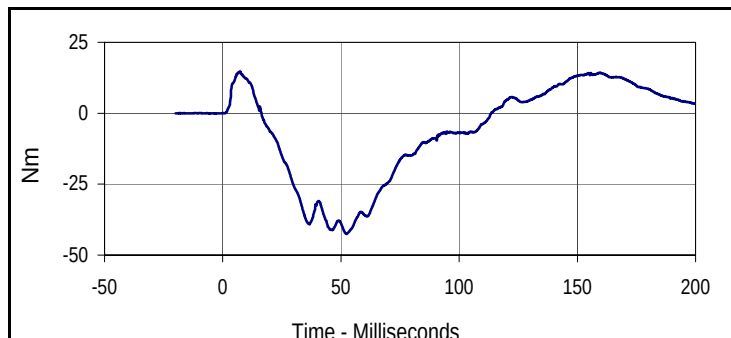
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	405	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.5	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.54	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.37	Pass
	15 msec	-3.30 to -4.10	-3.56	Pass
	20 msec	-4.40 to -5.40	-4.77	Pass
	25 msec	-5.40 to -6.10	-5.63	Pass
	25-100 msec	-5.50 to -6.20	-5.78	Pass
D-Plane Rotation	Max	71 to 81	76.7	Pass
	Time	50 to 70	58.0	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-42.6	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	113.5	Pass
Overall Test Results			Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.5	-6.4	200.0



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
76.7	58.0	-33.0	168.7



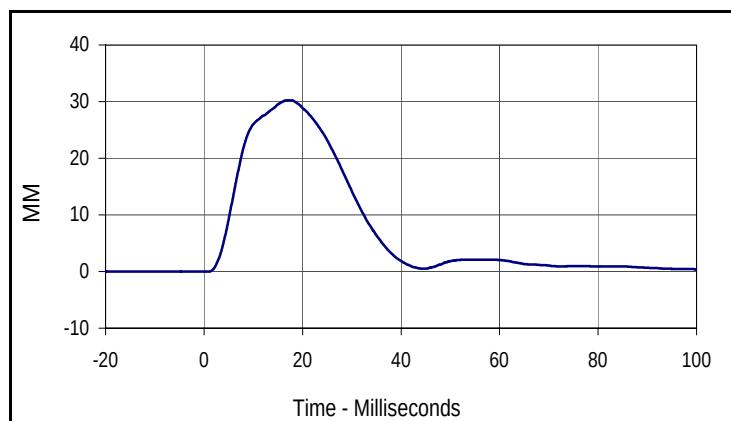
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
14.8	7.4	-42.6	52.4

Test Program: SID IIs Shoulder Impact Test
 ATD Serial No.: 299

Test Date: 1/4/13
 Test I.D.: 299SH054



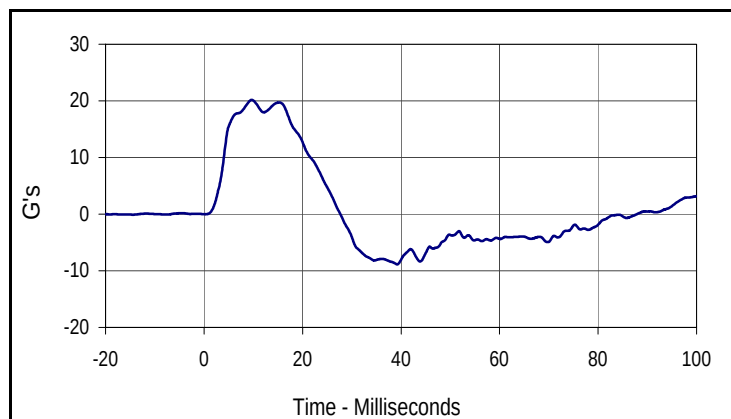
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	460	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		28.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.3	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.32	Pass
Peak Shoulder Deflection		mm	28 to 37	30.2	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	20.2	Pass
Peak Impactor Acceleration		G's	13 to 18	17.4	Pass
Overall Test Results				Pass	



Curve Description

Shoulder Deflection

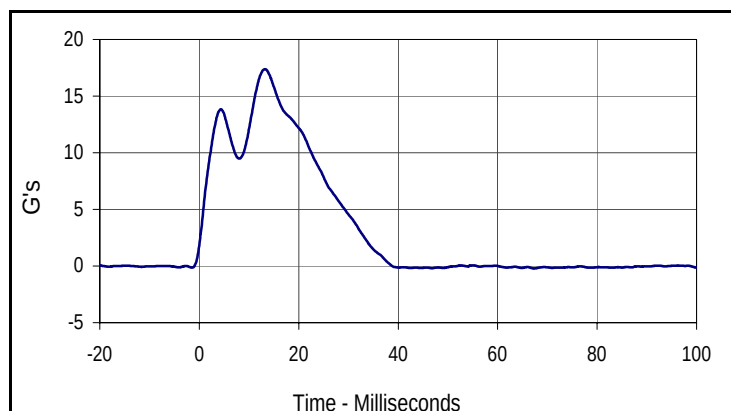
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.2	17.1	0.0	-3.2



Curve Description

Upper Spine Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
20.2	9.6	-8.9	39.2



Curve Description

Impactor Acceleration

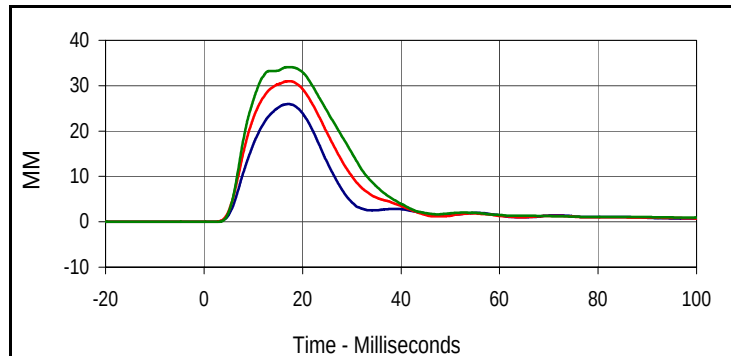
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
17.4	13.2	-0.2	67.3

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 299

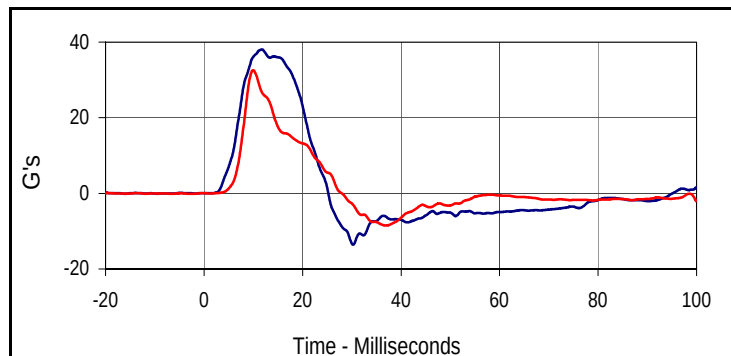
Test Date: 1/4/13
 Test I.D.: 299TWA054



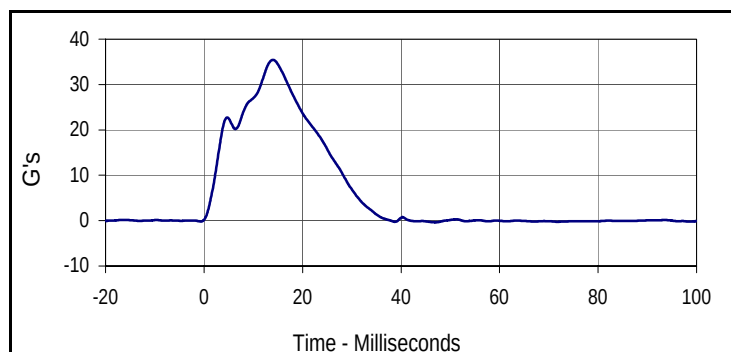
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	485	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.9	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.68	Pass
Peak Shoulder Deflection	mm	31 to 40	32.2	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	26.0	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	31.0	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	34.1	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	38.1	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.6	Pass
Peak Impactor Acceleration	G's	30 to 36	35.4	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
26.0	17.1	0.0	-2.0
Middle Thorax Deflection			
Max	Time	Min	Time
31.0	17.3	0.0	0.2
Lower Thorax Deflection			
Max	Time	Min	Time
34.1	16.9	0.0	-10.8



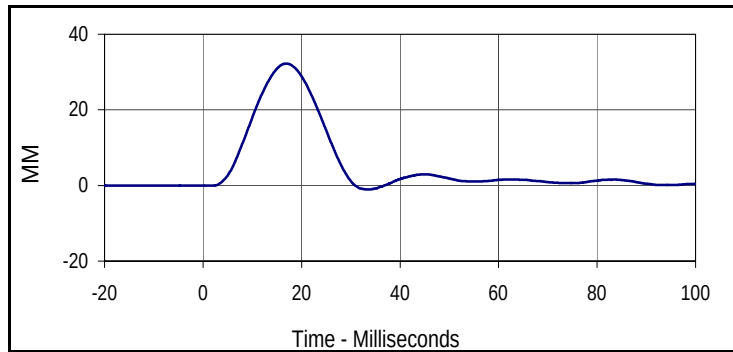
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
38.1	11.8	-13.6	30.3
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.6	10.0	-8.5	37.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
35.4	14.0	-0.4	47.0

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 299

Test Date: 1/4/13
 Test I.D.: 299TWA054



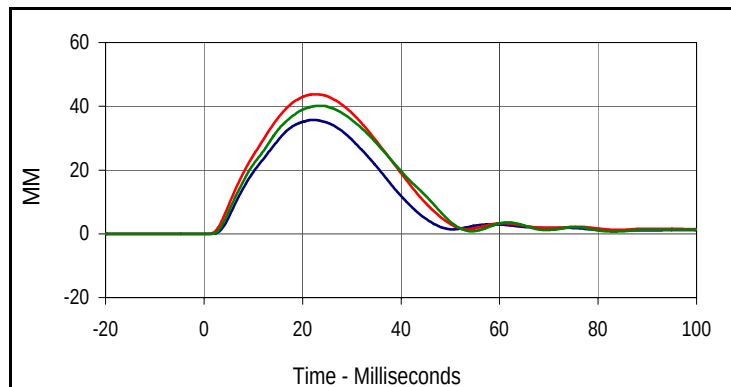
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
32.2	17.0	-1.1	33.6

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 299

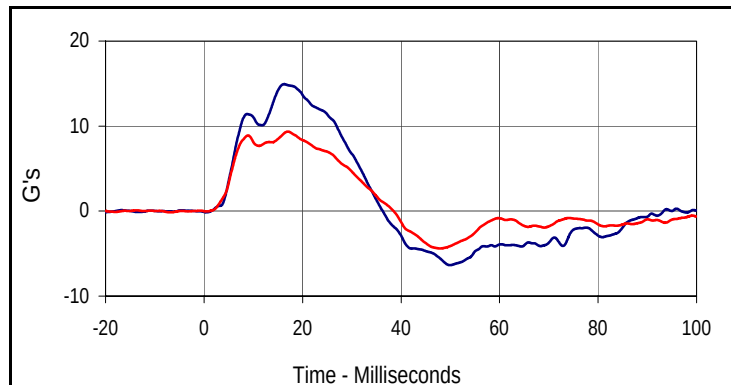
Test Date: 1/4/13
 Test I.D.: 299TWOA054



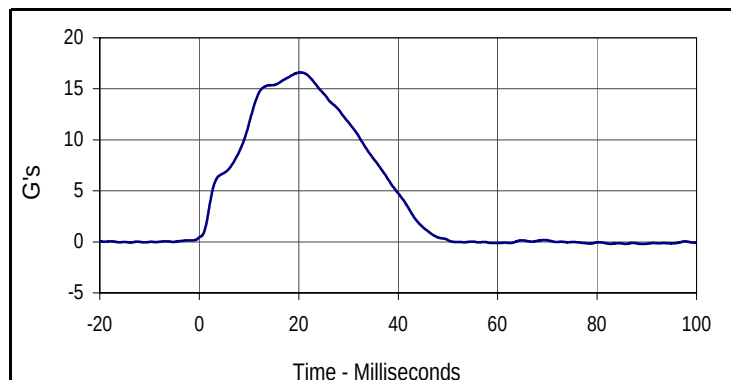
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	510	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		28.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.8	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.38	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	35.7	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	43.8	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	40.2	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	14.9	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.4	Pass
Peak Impactor Acceleration		G's	14 to 18	16.6	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
35.7	22.3	0.0	-19.0
Middle Thorax Deflection			
Max	Time	Min	Time
43.8	22.4	0.0	-20.0
Lower Thorax Deflection			
Max	Time	Min	Time
40.2	23.7	0.0	-10.1



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.9	16.3	-6.4	49.9
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.4	17.0	-4.4	48.0



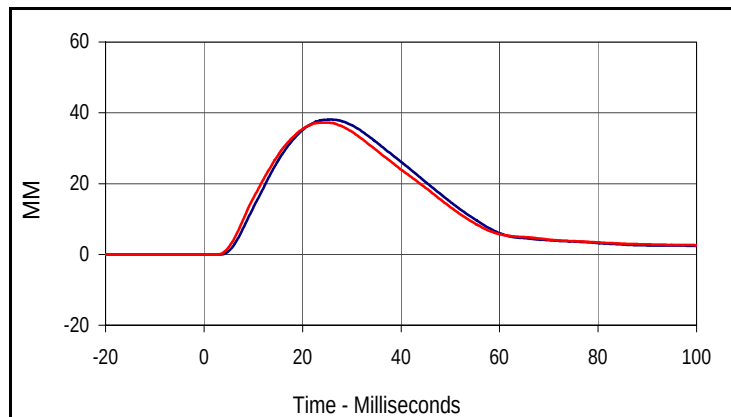
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.6	20.4	-0.2	89.0

Test Program: SID IIs Abdomen Impact Test
 ATD Serial No.: 299

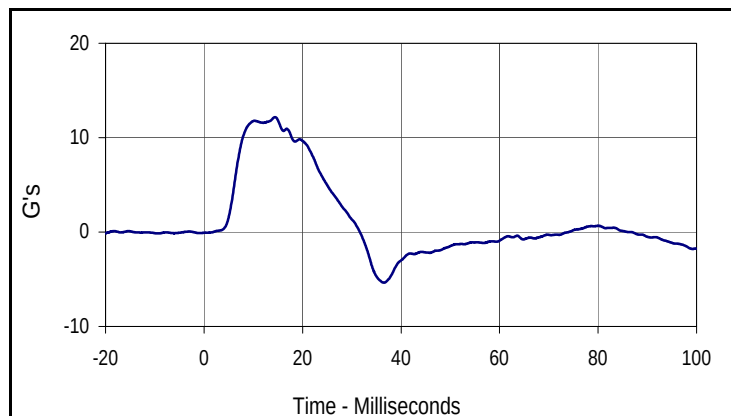
Test Date: 1/4/13
 Test I.D.: 299ABD054



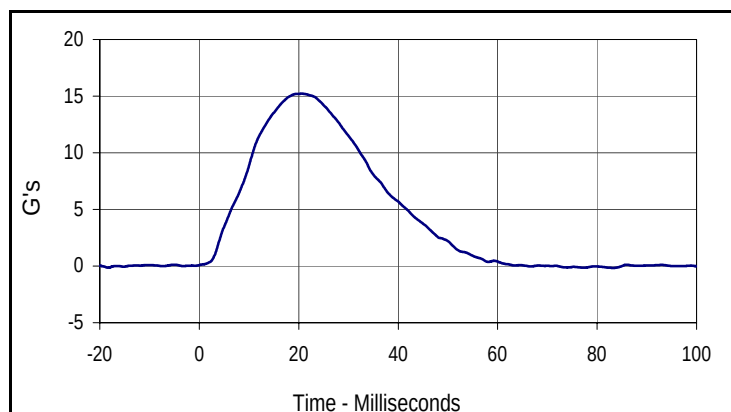
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	535	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.7	Pass
	Min °C		20.8	Pass
Humidity During Soak	Max %	10.0 to 70.0	31.0	Pass
	Min %		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.5	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.37	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	38.1	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	37.2	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	12.2	Pass
Peak Impactor Acceleration	G's	12 to 16	15.2	Pass
Overall Test Results			Pass	



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.1	25.7	0.0	-17.7
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
37.2	24.2	0.0	-19.4



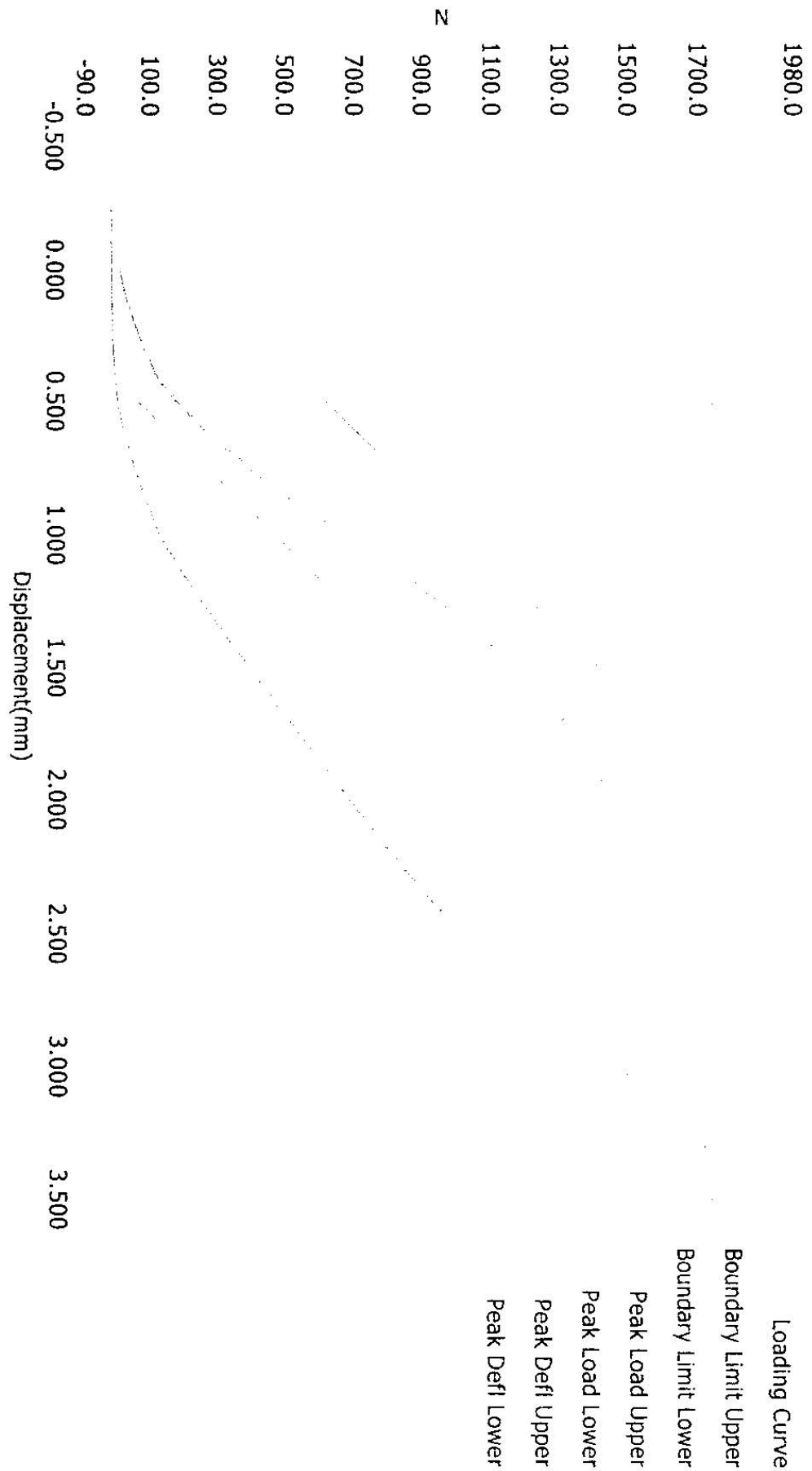
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.2	14.4	-5.4	36.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	20.6	-0.2	83.2

QD5200 POST TEST

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

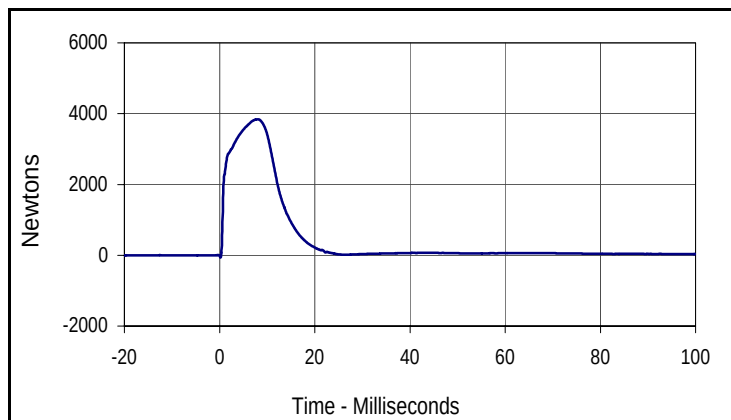
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<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIs	

Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 299

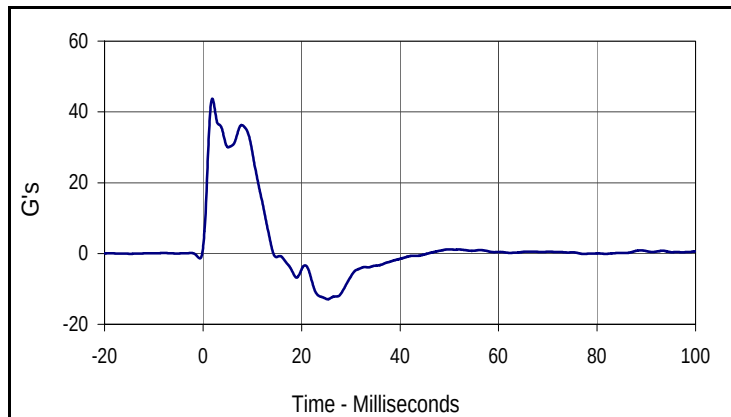
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 Test I.D.: 299ACET054



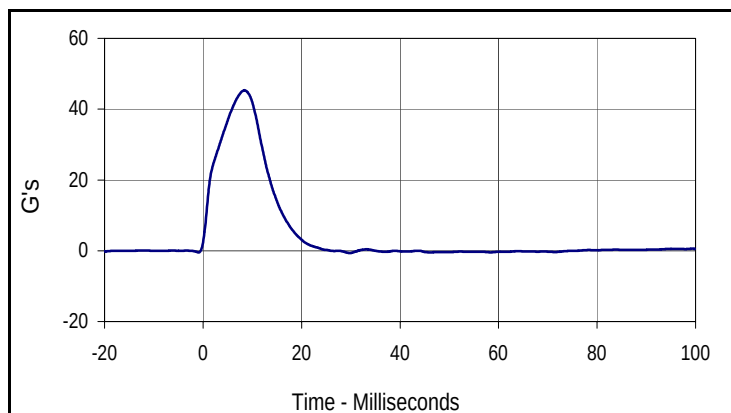
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	560	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.6	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.69	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3843.9	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	36.3	Pass
Peak Impactor Acceleration	G's	38 to 47	45.3	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3843.9	8.0	-61.2	0.2



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
43.7	1.9	-12.9	25.3



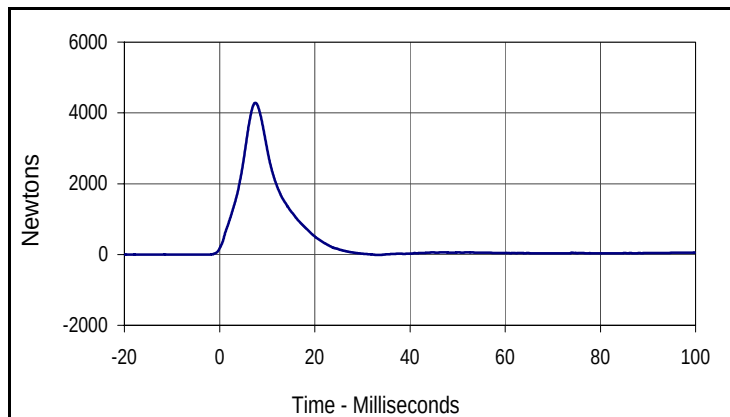
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.3	8.4	-0.7	29.8

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 299

Test Date: 1/4/13
 Test I.D.: 299PL054



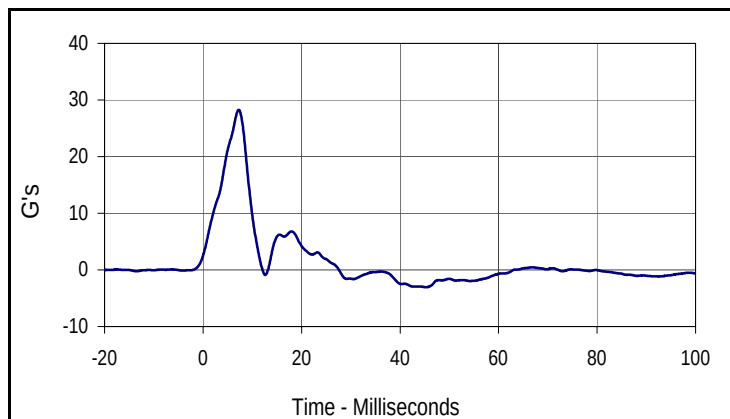
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	615	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.5	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.33	Pass
Peak Iliac Force	Newtons	4100 to 5100	4284.6	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	28.3	Pass
Peak Impactor Acceleration	G's	36 to 45	39.4	Pass
Overall Test Results			Pass	



Curve Description

Pelvis Iliac Force

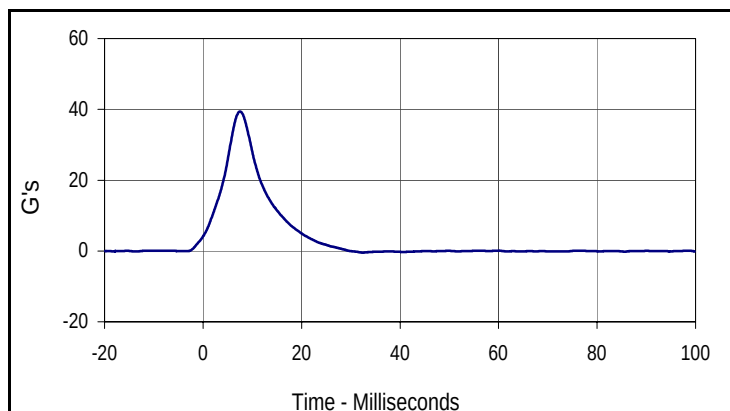
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4284.6	7.5	-10.7	32.9



Curve Description

Pelvis Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
28.3	7.3	-3.1	45.3



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.4	7.5	-0.4	32.5

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N 299			
			Serial Number	Manufacturer	Calibration	
Head Accelerometers			X	P51926	Endevco	10/2/12
			Y	P51929	Endevco	10/2/12
			Z	P51934	Endevco	10/2/12
Displacement Potentiometers	Shoulder		Y	1074	FTSS	10/5/12
	Thoracic Rib	Upper	Y	1143	FTSS	10/5/12
		Middle	Y	1160	FTSS	10/5/12
		Lower	Y	1213	FTSS	10/5/12
	Abdominal Rib	Upper	Y	1218	FTSS	10/5/12
		Lower	Y	1234	FTSS	10/5/12
Lower Spine Accelerometers (T12)			X	P63999	Endevco	10/3/12
			Y	P58872	Endevco	10/3/12
			Z	P58795	Endevco	10/3/12
Acetabulum Load Cell			Y	272	Denton	5/24/12
Iliac Wing Load Cell			Y	284	Denton	5/24/12
Pelvis Plug (Struck Side)				46002	FTSS	9/20/11
Pelvis Plug (Non-Struck Side)				45944	FTSS	9/20/11

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	Ketx5a	ICSensor	8/20/12
Vehicle Center of Gravity	Y	Ketx5b	ICSensor	8/20/12
Vehicle Center of Gravity	Z	Ketx5c	ICSensor	8/20/12
Left Floor Sill	Y	13722	Endevco	10/22/12
A-Pillar Sill	Y	13473	Endevco	8/17/12
A-Pillar Low	Y	13480	Endevco	8/17/12
A-Pillar Mid	Y	13478	Endevco	8/17/12
B-Pillar Sill	Y	13481	Endevco	8/17/12
B-Pillar Low	Y	13470	Endevco	8/20/12
B-Pillar Mid	Y	13651	Endevco	9/24/12
Driver Seat	Y	13708	Endevco	10/22/12
Engine Top	X	13747	Endevco	10/22/12
Engine Top	Y	13704	Endevco	10/20/12
Firewall	Y	13674	Endevco	0/20/12
Right Roof	Y	13710	Endevco	10/22/12
Right Floor Sill	Y	13317	Endevco	6/18/12
Rear Floorpan	X	13341	Endevco	6/18/12
Rear Floorpan	Y	13381	Endevco	7/9/12

TABLE 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	131822A	Interface	9/17/12
Load Cell 2	132304A	Interface	9/17/12
Load Cell 3	19477	Interface	9/18/12
Load Cell 4	19325	Interface	9/18/12
Load Cell 5	131827A	Interface	9/18/12
Load Cell 6	132302A	Interface	9/18/12
Load Cell 7	19267	Interface	9/19/12
Load Cell 8	19321	Interface	9/19/12