

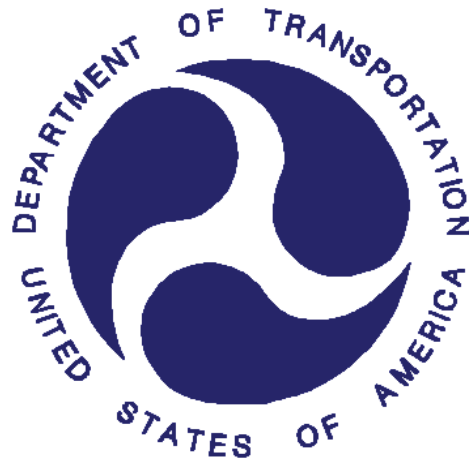
REPORT NUMBER: MCW-DOT-08SN03

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

2008 NISSAN ALTIMA 4-DOOR SEDAN

NHTSA NUMBER: M85204

**PREPARED BY:
MEDICAL COLLEGE OF WISCONSIN
5000 WEST NATIONAL AVENUE
RESEARCH 151
MILWAUKEE, WISCONSIN 53295**



TEST DATE: 11 SEPTEMBER 2007

REPORT DATE: 19 OCTOBER 2007

FINAL REPORT

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

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-03-D-42005.

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

Prepared by:_____

Date:

Reviewed by:_____

Date:

Technical Report Documentation Page

1. Report No. MCW-DOT-08SN03		2. Government Accession No.		3. Recipient's Catalog No.																													
4. Title and Subtitle Final report of New Car Assessment Program (NCAP) Side Impact Testing of a 2008 Nissan Altima 4-door sedan NHTSA number: M85204				5. Report Date 19 October 2007																													
				6. Performing Organization Code																													
7. Author(s) John Humm, Mark Meyer, Michael Schlick, and Frank Pintar				8. Performing Organization Report No.																													
9. Performing Organization Name and Address Medical College of Wisconsin 5000 W. National Ave. Research 151 Milwaukee, WI 53295				10. Work Unit No.																													
				11. Contract or Grant No. DTNH22-03-D-42005																													
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Rulemaking, Office of Crashworthiness Standards NVS-111 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590				13. Type of Report and Period Covered:																													
				14. Sponsoring Agency Code NVS-111																													
15. Supplementary Notes																																	
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier (MDB) New Car Assessment Program (NCAP) side impact was conducted on the subject 2008 Nissan Altima 4-door sedan to obtain new car assessment and research data indicant of FMVSS No. 214D performance. The test was conducted at the Medical College of Wisconsin (MCW) in Milwaukee, Wisconsin on 11 September 2008. The impact velocity of the Moving Deformable Barrier (MDB) was 61.9 km/h, and the ambient temperature at the struck side of the vehicle was 19.8 °C. The target vehicle's maximum post test static crush was 327 mm at level 2. The test vehicle's occupant performance is as follows: <table border="1" data-bbox="154 1239 1299 1501"> <thead> <tr> <th></th> <th>Units</th> <th>DRIVER</th> <th>PASS.</th> </tr> </thead> <tbody> <tr> <td>Left upper rib (LUR) acceleration</td> <td>G</td> <td>38.2</td> <td>47.4</td> </tr> <tr> <td>Left lower rib (LLR) acceleration</td> <td>G</td> <td>42.7</td> <td>61.2</td> </tr> <tr> <td>Lower spine (T₁₂) acceleration</td> <td>G</td> <td>43.1</td> <td>51.3</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td></td> <td>43</td> <td>56</td> </tr> <tr> <td>Pelvis (PEV) acceleration</td> <td>G</td> <td>48.3</td> <td>75.1</td> </tr> <tr> <td>HIC</td> <td></td> <td>195.6</td> <td>390.3</td> </tr> </tbody> </table> The 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.							Units	DRIVER	PASS.	Left upper rib (LUR) acceleration	G	38.2	47.4	Left lower rib (LLR) acceleration	G	42.7	61.2	Lower spine (T ₁₂) acceleration	G	43.1	51.3	Thoracic Trauma Index (TTI)		43	56	Pelvis (PEV) acceleration	G	48.3	75.1	HIC		195.6	390.3
	Units	DRIVER	PASS.																														
Left upper rib (LUR) acceleration	G	38.2	47.4																														
Left lower rib (LLR) acceleration	G	42.7	61.2																														
Lower spine (T ₁₂) acceleration	G	43.1	51.3																														
Thoracic Trauma Index (TTI)		43	56																														
Pelvis (PEV) acceleration	G	48.3	75.1																														
HIC		195.6	390.3																														
17. Key Words New Car Assessment Program (NCAP) Side impact Side Impact Hybrid III Dummy (SID/HIII) Occupant side impact protection			18. Distribution Statement Copies of this report are available from: U.S. Department of Transportation National Highway Traffic Safety Administration Rulemaking, Office of Crashworthiness Standards, NVS-111 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590																														
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 83	22. Price																														

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u> <u>No.</u>
1	Purpose and test procedure	1
2	Summary of NCAP side impact test	2
<u>Data Sheet</u>		<u>Page</u> <u>No.</u>
1	General test and vehicle parameter data	5
2	Test vehicle tire information	8
3	Test vehicle information	9
4	Moving Deformable Barrier (MDB) summary of results	11
5	Post test observations	14
6	Vehicle pre test and post test measurements	16
7	SID/HIII longitudinal clearance dimensions	17
8	SID/HIII lateral clearance dimensions	18
9	Vehicle side measurements	19
10	Vehicle exterior crush profiles	20
11	Vehicle damage profile distances	22
12	Deformable barrier honeycomb face static crush	23
13	Vehicle accelerometer locations	24
14	MDB accelerometer locations	25
15	High speed camera locations and data	26
16	Summary of FMVSS 301 data	27
<u>Appendix</u>		
A	Photographs	A
B	SID/HIII configuration and performance verification data	B
C	Dummy calibration data	C

SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY'08 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-03-D-42005. The purpose of this test was to evaluate side impact protection of a manufactured by Nissan Motor Company.

TEST PROCEDURE

The side impact test was conducted in accordance with the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

SECTION 2

SUMMARY OF NCAP SIDE IMPACT TEST

A 2008 Nissan Altima 4-door sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) modeling a 90° impact as if the test vehicle were moving forward at 28 km/h perpendicular to and across the path of the MDB traveling forward at 55 km/h. Here the test vehicle was stationary and positioned 27° from perpendicular to the MDB tow road guidance system and the MDB was towed 27° ("crabbed") from the guidance system. [See p 26.] The 1683.6 kg test vehicle was impacted by the 1361.4 kg MDB traveling at a speed of 61.9 km/h (measured inline with the guidance system.) The test was conducted at the Medical College of Wisconsin on 11 September 2007.

Two (2) 50th percentile adult male Hybrid III-Side Impact Dummies (SID/HIIIs) were placed in designated seating positions within the test vehicle: one (1) driver, and one (1) left rear passenger; serial numbers 056 and 058 respectively. Each SID/HIII was instrumented in the following locations:

- Left upper rib uni-axial (Y) accelerometers (primary and redundant)
- Left lower rib uni-axial (Y) accelerometers (primary and redundant)
- Lower thoracic spine uni-axial (Y) accelerometers (primary and redundant)
- Pelvis uni-axial (Y) accelerometers (primary and redundant)
- Head center of gravity tri-axial (X, Y, Z) accelerometers (primary and redundant)
- Upper neck tri-axial (X, Y, Z) force load cells and tri-axial (X, Y, Z) moment load cells

The test vehicle was instrumented with twenty-one (21) structural accelerometers and the MDB was instrumented with six (6) accelerometers. All data channels were recorded with a fully self contained on-board DTS TDAS Pro Data Acquisition System. The data were digitally sampled at 12.5 kHz and processed according to SAEJ211-1(March 1995).

One (1) real-time video camera and nine (9) high-speed video cameras were used to document the impact event. The pre test and post test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

All of the above was conducted in accordance to the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002.

2.2 GENERAL COMMENTS

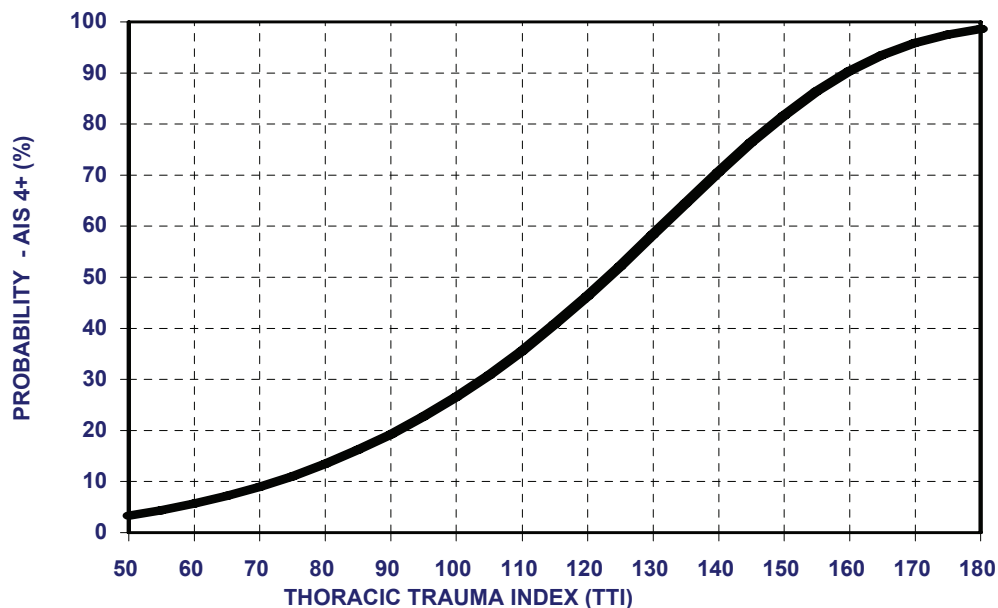
The test vehicle sustained a maximum static crush of 327 mm at level 2, 1500 mm rearward of the vertical impact line.

Test summaries, post test observations, vehicle, MDB, camera, and occupant measurements are presented in datasheets 1-16. Appendix A contains the still photograph prints. Appendix B contains selected driver and passenger SID/HIII's response data traces. Appendix C contains the SID/HIII's configuration and performance verification data.

OCCUPANT SUMMARY		
Injury criteria	Driver (P1)	Left rear passenger (P4)
HIC36	195.6	390.3
T1 (ms)	43.6	51.3
T2 (ms)	67.3	63.9
TTI	43	56
Maximum pelvic acceleration (G)	48.3	75.1

Head Injury Criterion (HIC) is the standardized calculation using resultant head acceleration to assess head injury. Generally, a higher HIC represents an increase in the likelihood of a serious head injury. HIC36 specifies a time 'window' of 36 milliseconds over which the integral is calculated. T1 and T2 represent the time of the lower and upper bounds of the window in which the HIC is calculated.

The Thoracic Trauma Index (TTI) is computed from the crash test dummy's accelerations at the upper rib, lower rib, and lower spine to quantify the risk of a serious thorax injury during a typical near side impact crash. The injury risk curve is shown below. The vertical axis of the curve is the probability of sustaining an Abbreviated Injury Scale (AIS) level 4 or greater injury. AIS is an anatomical scoring system used to assess a 'threat to life' associated with a specific injury; injuries are ranked on a scale of 1 to 6, with 1 being 'minor', 4 'severe' and 6 an 'unsurvivable' injury. A lower TTI corresponds to a decreased probability of a severe thorax injury. (www.trauma.org)



The maximum pelvic acceleration is used to assess the likelihood of injury to the pelvis during a side impact crash. Higher pelvic accelerations correspond to an increase in the likelihood of sustaining a severe pelvis injury.

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION				
Restraint type	Left front (driver) occupant Location 01		Left rear (passenger) occupant Location 04	
	Installed	Operation	Installed	Operation
Front airbag	Yes – steering wheel	Did not deploy	No	N/a
Side airbag	Yes - seat back	Deployed	No	N/a
Head airbag	No	N/a	No	N/a
Curtain airbag	Yes – side header	Deployed	Yes – side header	Deployed
Seat belt pretensioner	Yes	Deployed	No	N/a
Seat belt load limiter	Yes	N/a	No	N/a

These test data and report can be found in detail on the NHTSA website at www.nhtsa.dot.gov.

A brief summary of the crash test can be located at www.safercar.gov

TEST NOTES

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

VEHICLE INFORMATION		VEHICLE OPTIONS	
Year	2008	Air conditioning	Yes
Make	Nissan	Anti-lock brakes	Yes
Model	Altima	AM/FM radio	Yes
Body style	4-door sedan	All wheel drive	No
NHTSA number	M8 5204	Combo bag	No
MCW test ID	08SN03	Console	Yes
VIN	1N4AL21E68C113145	Cruise/speed control	Yes
Color	Silver	Disc brakes	Yes – front and rear
Build date	August 2007	Frontal bag	Yes
Engine No. of cylinders	4	Head bag	Yes – front and rear
Engine Displacement (L)	2.5	Power brakes	Yes
Engine Placement	Lateral	Power door locks	Yes
Transmission	Automatic with O/D	Power steering	Yes
Final drive	Front wheel drive	Power windows	Yes
Delivery date	August 16, 2007	Torso bag	Yes – front only
Odometer reading	26 miles	Tilt steering wheel	Yes

CERTIFICATION LABEL INFORMATION			
Manufacturer	Nissan Motor Company	GVWR (kg)	1945
		GAWR front (kg)	1019
Date of manufacture	August 2007	GAWR rear (kg)	995

SEAT INFORMATION			
	Number of occupants	Seat type	Seat back type
Front	2	Bucket	Adjustable
Back	3	Bench	Fixed
Third	0		
Total	5		

CARGO CAPACITY CALCULATION			
	Units	Value	Reference label
Vehicle maximum capacity	kg	408.6	(A)
Number of occupants (7) X 68.04 kg	kg	340.9	(B)
Cargo capacity (RCLW) †	kg	67.7	(C) = (A)-(B) †

† Note if RCLW is > 136.1 kg (300 lbs), use 136.1 kg

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

TEST VEHICLE MASS INFORMATION				
	Units	As delivered	As tested	Fully loaded
Left front	kg	443.2	479.1	481.4
Right front	kg	430.5	446.8	447.7
Left rear	kg	296.4	395	397.3
Right rear	kg	291.4	362.7	364.1
Total front	kg	873.7	925.9	929.1
% Total front	%	59.8	55.0	55.0
Total rear	kg	587.8	757.7	761.4
%Total rear	%	40.2	45.0	45.0
Total	kg	1461.5	1683.6	1690.5

As delivered mass is vehicle mass with maximum fluids

Fully loaded mass is the as delivered mass + 1 or 2 ATD's + RCLW

As tested mass is the mass of test vehicle with 1 or 2 ATD's + instrumentation + ballast (if necessary)

CALCULATION OF TEST VEHICLE TARGET MASS			
	Units	Value	Reference label
As delivered test vehicle mass	kg	1461.5	(D)
Maximum cargo capacity (RCLW)	kg	67.6	(C)
Mass of SID HIII's (1 or 2)	kg	161.4	(E)
Test vehicle target mass (TVTW)	kg	1690.5	(D) + (C) + (E)

As tested mass must be 4.5 kg to 9 kg less than the test vehicle target mass

BALLAST INFORMATION	
Mass of ballast added (kg)	1.1 kg
Location	Air cleaner
<u>Components removed from test vehicle</u> Non-struck front and rear door glasses	

IMPACT LOCATION ON TEST VEHICLE	
Wheelbase	2772 mm
Nominal impact point	446 mm rearward of front axle
Actual impact point	452 mm rearward of front axle

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

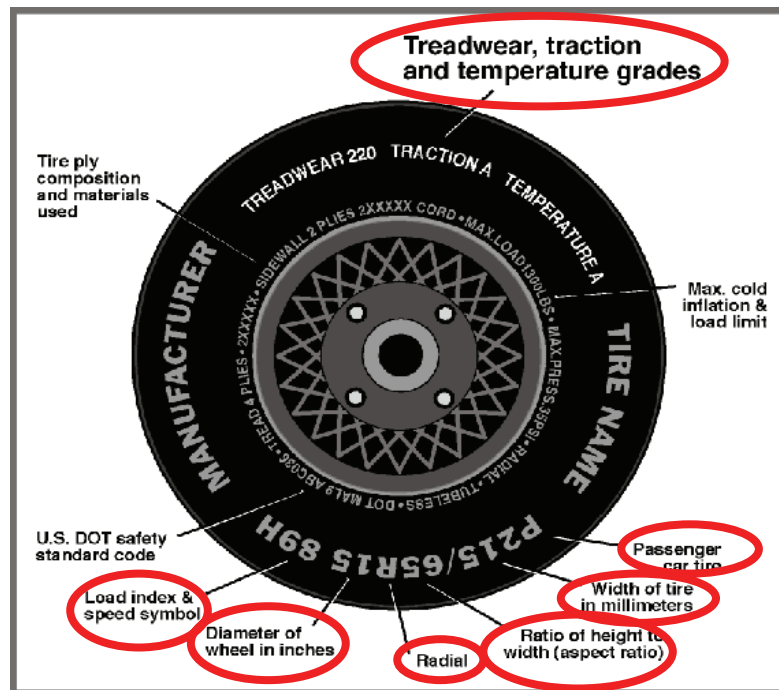
TEST VEHICLE ATTITUDES				
	Units	As delivered	As tested	Fully loaded
Left front	mm	740	730	728
Right front	mm	743	732	731
Left rear	mm	722	680	677
Right rear	mm	729	695	694
CG (X)	mm	1114.8	1247.5	1248.5

As tested attitudes must be between as delivered and fully loaded attitudes

CG (X) measured rearward from front axle centerline

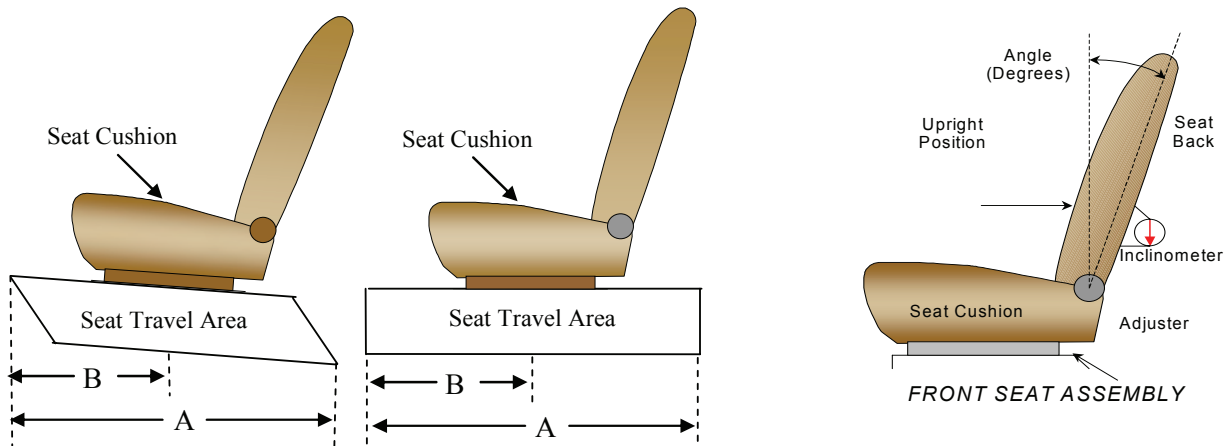
AUTOMATIC DOOR LOCK (ADL) INFORMATION				
	Left front	Left rear	Right front	Right rear
ADL present	Yes	Yes	Yes	Yes
ADL deactivated	No	No	No	No
Deactivation method	N/a			
Door lock status	Unlocked	Unlocked	Unlocked	Unlocked

DATA SHEET NO. 2
TEST VEHICLE TIRE INFORMATION



TIRE INFORMATION		
Measured Parameter	Front	Rear
Maximum tire pressure (kPa)	300	300
Cold / test pressure (kPa)	220	220
Recommended tire size	P215/60R16	P215/60R16
Tire size on vehicle	P215/45ZR17	P215/45ZR17
Tire manufacturer	Yokohama	Yokohama
Tire name	S32A	S32A
Tire type	All season radial	All season radial
Tire width (mm)	215	215
Ratio of height to width (aspect ratio)	45	45
Radial	Radial	Radial
Wheel diameter (inches)	17	17
Load index & speed symbol	M+S	M+S
Tread wear	160	160
Traction grade	A	A
Temperature grade	A	A

DATA SHEET NO. 3 TEST VEHICLE INFORMATION



Seat fore/aft positions

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position with vertical adjustment at the lowest position obtainable for both the driver and passenger.

SEAT FORE/AFT POSITION		
	Left front seat	Left rear seat
Type	Powered - bucket	Fixed - bench
Fore/aft total travel (mm)	260	N/a
Number of detents	N/a	N/a
Test position	Mid position 130 mm from full forward	N/a

‡Full forward = notch 0

Seat back position

The driver and passenger seat back is positioned according to the manufacturers designated angle.

SEAT BACK POSITION		
	Left front seat	Left rear seat
Seat back angle @ head rest post	7.0°	Fixed
Test position	7.0° from full forward	N/a

‡Full upright = notch 0

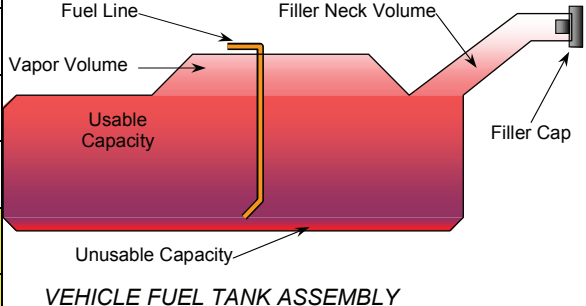
Seat belt position

The adjustable anchorage locations are positioned according to the manufacture's specifications.

SEAT BELT ADJUSTABLE ANCHORAGE (D-RING)		
	Left Front Seat	Left Rear Seat
Adjustable anchor present	Yes	No
Total travel (mm)	75	N/a
Test position	Highest position	N/a

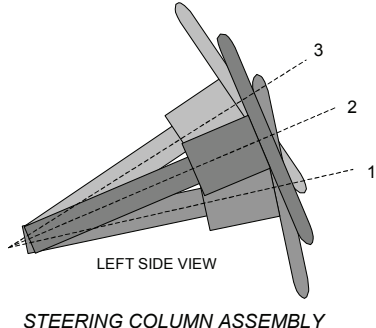
DATA SHEET NO. 3
TEST VEHICLE INFORMATION (continued)

Fuel tank information

STODDARD INFORMATION			
Description	Units	Value	
Usable capacity of standard equipment fuel tank	L	75.7	
Usable capacity of optional equipment fuel tank	L	0	
Usable capacity of vehicle used for certification testing to requirements	L	75.7	
Amount of stoddard added for test	L	70.4	
% Usable capacity (92%-94%)	%	93.0	
Operational instructions	None		
Electric fuel pump present	Yes		
Operating condition of test vehicle for fuel pump operation	The fuel pump is activated when the ignition is turned on.		

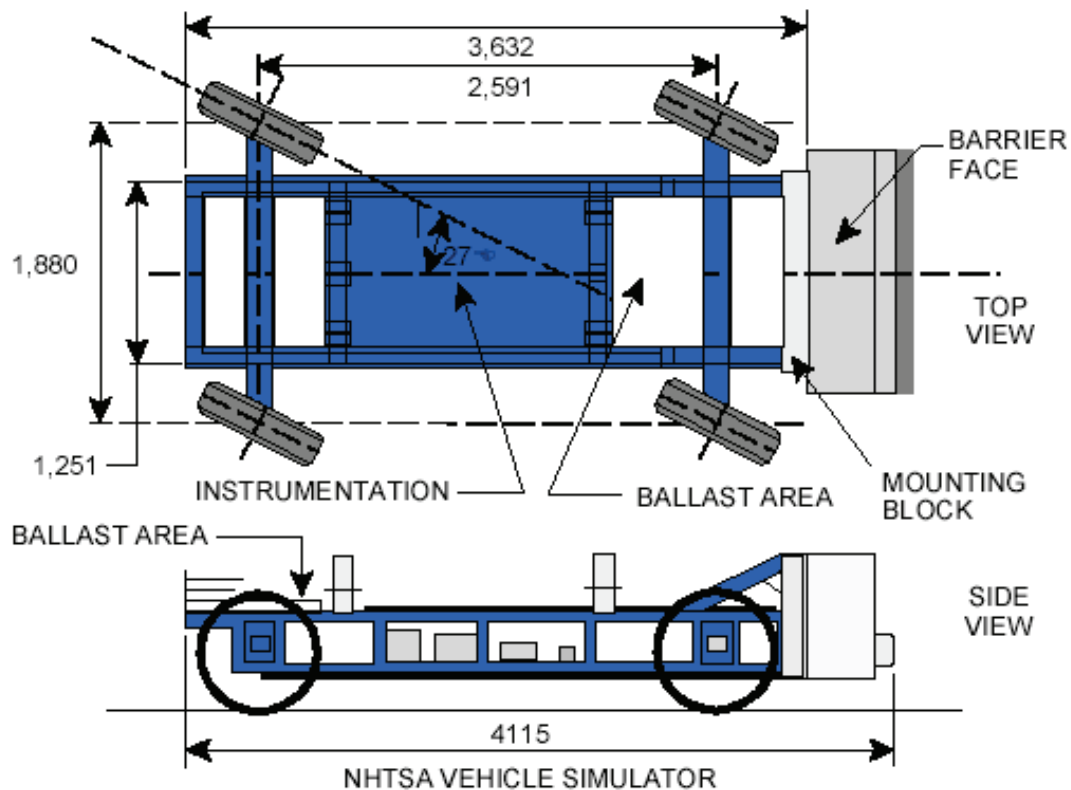
Steering wheel information

Steering wheel and column adjustments are placed according to the manufacturer's specifications.

ADJUSTABLE STEERING COLUMN		
Adjustable column	Yes	
Steering wheel angle in upper most position	30.9°	
Steering wheel fore/aft travel	40 mm	
Number of detents	None	
Test position	Steering wheel positioned 22.5° relative to side sill panel. The steering column also had a telescope adjustment and it was set in the mid position	

DATA SHEET NO. 4
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

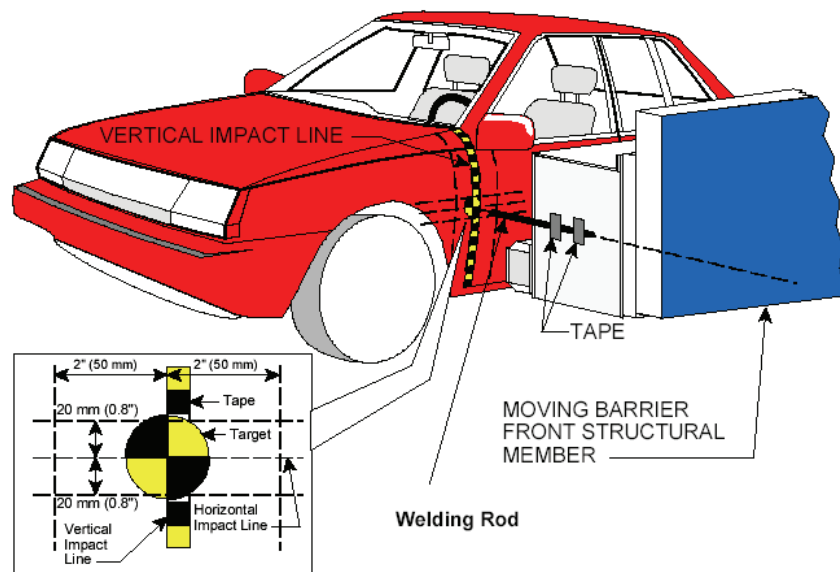
MDB SPECIFICATIONS				
	Units	Specification	Range	Value
Overall Width of Framework Carriage	mm	1251	1226-1276	1245
Overall Length w/Impactor Face	mm	4115	4090-4140	4101
Overall Length w/o Impactor Face	mm	3632	3607-3657	3617
Longitudinal Cg from Front Axle	mm	1123	1098-1148	1135
Track Width	mm	1880	1855-2005	1864
Mass	kg	1361	1356.5-1365.5	1361.4
MOI (X)	kg-m ²	508	483-533	496
MOI (Y)	kg-m ²	2263	2150-2376	2227
MOI (Z)	kg-m ²	2572	2443-2701	2609



DATA SHEET NO. 4
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS (Continued)

MDB MASS INFORMATION		
	Units	As tested
Left front	kg	606.4
Right front	kg	157.3
Left rear	kg	79.5
Right rear	kg	518.2
Total front	kg	763.7
% Total front	%	56.1
Total rear	kg	597.7
%Total rear	%	43.9
Total	kg	1361.4

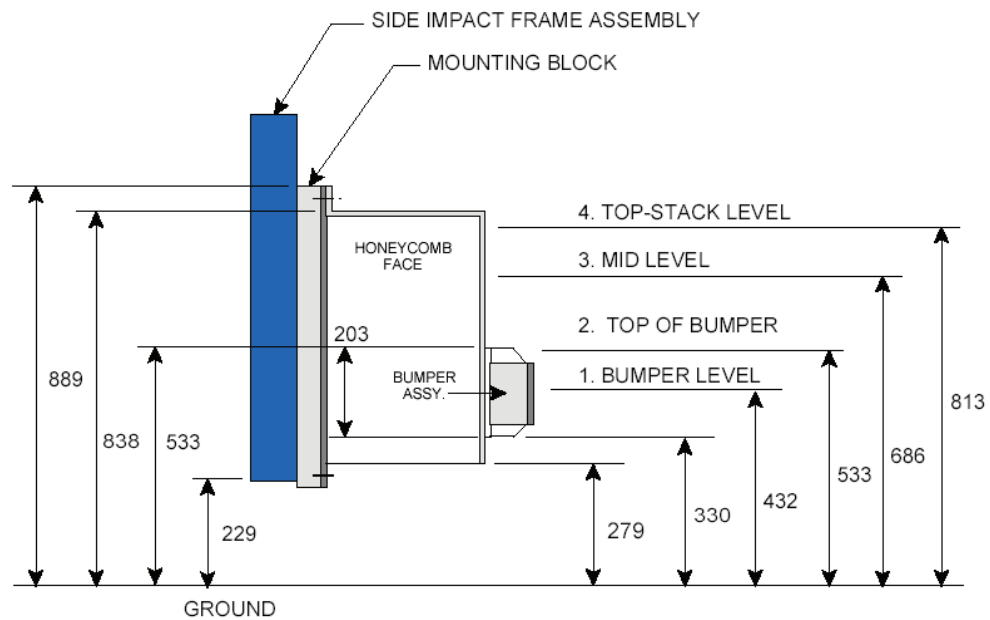
IMPACT SPEED				
	Units	Specification	Range	Value
Primary speed trap	kmh	61.9	61.1-62.7	61.9
Redundant speed trap	kmh	61.9	61.1-62.7	61.7



IMPACT POINT INFORMATION		
Vertical impact line is	446 mm rearward of front axle	
Actual impact is	452 mm rearward of front axle	
Measurement	Value	Tolerance
Impact point distance from vertical impact line	6 mm rearward	+/- 50 mm
Impact point distance from horizontal impact line	6 mm below	+/- 20 mm

DATA SHEET NO. 4
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS (Continued)

HONEYCOMB FACE CLEARANCE					
	Units	Specification	Range	Left	Right
Bottom of barrier	mm	279	276-282	281	279
Bottom of bumper	mm	330	327-333	329	330
Top of bumper	mm	533	530-536	533	535
Top of barrier	mm	838	835-841	836	837



RIGHT SIDE VIEW

**DATA SHEET NUMBER 5
POST TEST OBSERVATIONS**

TEST DUMMY INFORMATION AND CONTACT POINTS		
Description	Left front seat	Left rear seat
Dummy type / serial no.	SID HIII/056	SID HIII/058
Head contact	To side curtain airbag	Top of head to side sill; lower head to side curtain airbag
Upper torso contact	To seat mounted side airbag and top of window sill	To side curtain airbag
Lower torso contact	To seat mounted side airbag	To left rear door panel between armrest and seatpan
Left leg contact	To left front door panel 175 mm below arm rest	To left rear door panel 150 mm below armrest
Left knee contact	To left front door panel 360 mm below window sill	To left rear door panel 150 mm below armrest

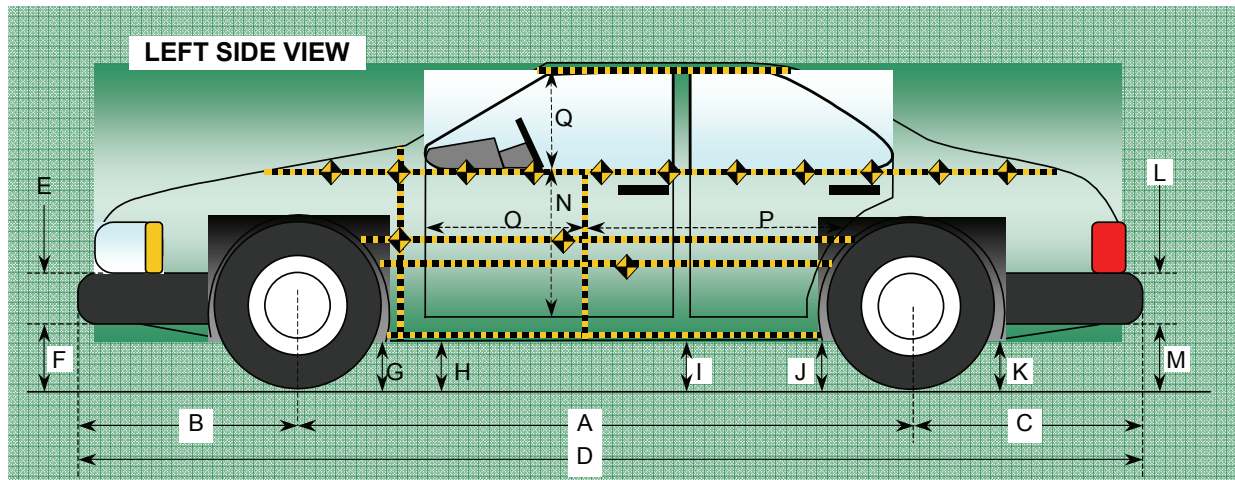
POST TEST DOOR OPENING AND SEAT TRACK INFORMATION		
Description	Front	Rear
Locked/unlocked doors	Unlocked	Unlocked
Left side door opening	Closed/latched/inoperable	Closed/latched/operable
Right side door opening	Closed/latched/inoperable	Closed/latched/operable
Seat movement	~110 mm of seat crush	~159 mm of seat crush
Seat back failure	None	None

POST TEST STRUCTURAL OBSERVATIONS	
Critical areas of performance	Observations/conclusions
Pillar performance	B-pillar separated at top of front seat back
Sill separation	Max sill separation on front door ~109 mm at mid door; max sill separation at rear door ~41 at c-pillar
Windshield damage	Cracked along a-pillar; max length of crack ~ 650 mm inboard
Window damage	Front and rear struck side windows shattered at impact
Other notable effects	None

DATA SHEET NUMBER 5
POST TEST OBSERVATIONS (continued)

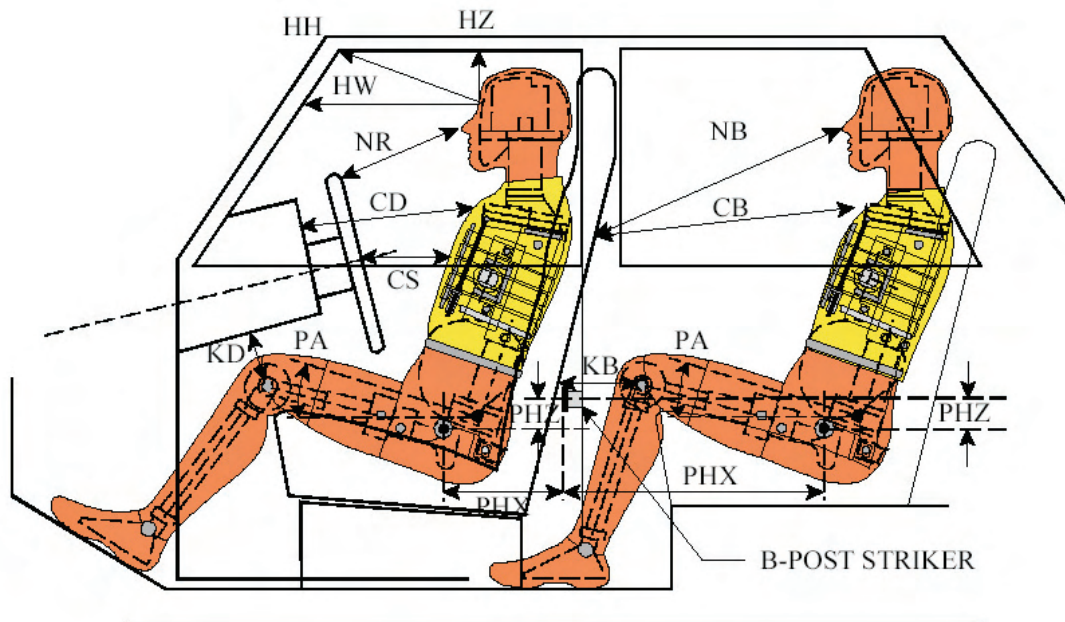
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION				
Restraint Type	Left front (Driver) occupant Location 01		Left rear (passenger) occupant Location 04	
	Installed	Operation	Installed	Operation
Front airbag	Yes - steering wheel	Did not deploy	No	N/a
Side airbag	Yes - seat back	Deployed	No	N/a
Head airbag	No	N/a	No	N/a
Curtain airbag	Yes - side header	Deployed	Yes - side header	Deployed
Seat belt pretensioner	Yes	Deployed	Yes	Deployed
Seat belt load limiter	Yes	N/a	Yes	N/a

DATA SHEET NUMBER 6
VEHICLE PRE AND POST MEASUREMENTS



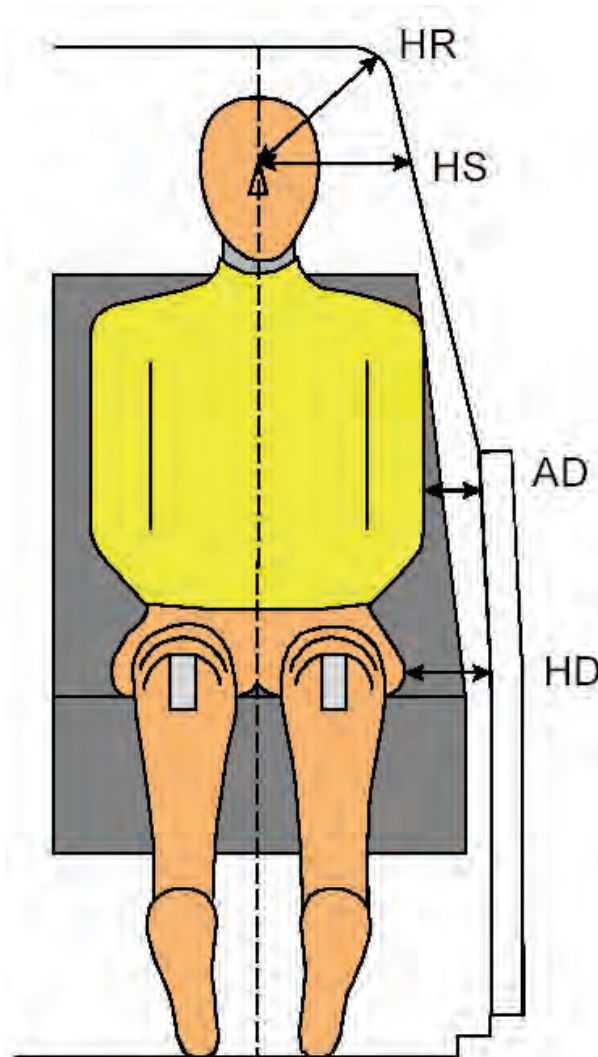
VEHICLE DIMENSIONS				
Code	Description	Pre test	Post test	Change
		mm	mm	mm
A	Wheelbase	2772	2733	-39
B	Front axle to front side of vehicle	714	722	8
C	Rear axle to rear side of vehicle	917	919	2
D	Total length at centerline	4823	4810	-13
E	Front bumper thickness	243	243	0
F	Front bumper bottom to ground	279	294	15
G	Sill height at front wheel well	214	202	-12
H	Sill height at front door leading edge	230	234	4
I	Sill height at b-pillar	222	225	3
J1	Sill height at rear wheel well	191	149	-42
J2	Pinch weld height at rear wheel well	214	178	-36
K	Sill height aft of rear wheel well	286	236	-50
L	Rear bumper thickness	297	297	0
M	Rear bumper bottom to ground	288	232	-56
N	Sill height to window bottom sill	732	615	-117
O	Front door leading edge to impact C/L	1165	1101	-64
P	Rear door trailing edge to impact C/L	872	780	-92
Q	Front window opening	461	447	-14
R	Right side length	4403	4405	2
S	Left side length	4403	4374	-29
T	Vehicle width at b-pillar	1787	1543	-244

DATA SHEET NUMBER 7
SID HIII LONGITUDINAL CLEARANCES



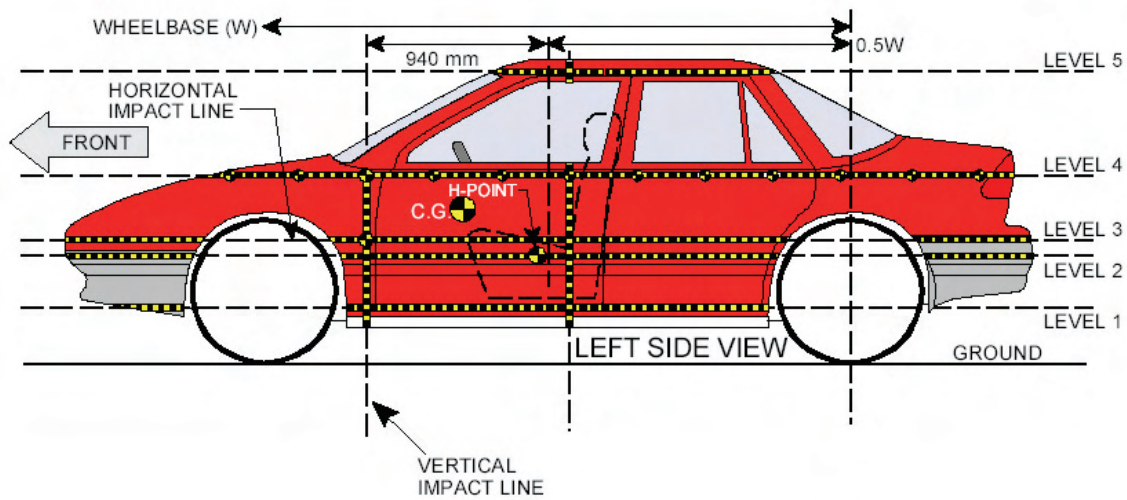
SID HIII LONGITUDINAL CLEARANCE MEASUREMENTS					
Driver code	Pass. code	Measurement description	Units	Left front seat	Left rear seat
		ATD serial number	-	056	058
HH	-	Head to header	mm	447	N/a
HW	-	Head to windshield	mm	752	N/a
HZ	HZ	Head to roof	mm	207	147
NR	NB	Nose to rim/nose to seatback	mm	486	626
CD	CB	Chest to dash or seatback	mm	596	556
CS	-	Chest to steering wheel	mm	370	N/a
KDL	KBL	Left knee to dash or seatback length	mm	200	201
KDA	KBA	Left knee to dash or seatback angle	°	19.9	31.4
KDR	KBR	Right Knee to dash or seatback length	mm	180	198
KDA	KDA	Right knee to dash or seatback angle	°	18.1	32.6
PA	PA	Pelvic angle	°	23.3	23.8
PHX	PHX	H-Point to striker (x-axis)	mm	219	321
PHZ	PHZ	H-Point to striker (z-axis)	mm	180	313

DATA SHEET NUMBER 8
SID HIII LATERAL CLEARANCES



SID HIII LATERAL CLEARANCE MEASUREMENTS				
Code	Measurement description	Units	Left front seat	Left rear seat
-	ATD serial number	-	056	058
HR	Head to side header	mm	230	162
HS	Head to side window	mm	323	282
-	Shoulder to door	mm	112	97
HD	H-point to door	mm	164	150

DATA SHEET 9 VEHICLE SIDE MEASUREMENTS



VEHICLE STATIC CRUSH SUMMARY				
Level	Description	Height above ground (mm)	Maximum static crush (mm)	Longitudinal (X) distance from impact point (mm)
5	Window top	1335	51	1200
4	Window sill	929	179	1350
3	Mid-door	598	304	450
2	Driver H-point	467	327	1500
1	Axle centerline or sill top	255	58	150
Maximum static crush		327 mm at level 2 1500 mm rearward from vertical impact line		

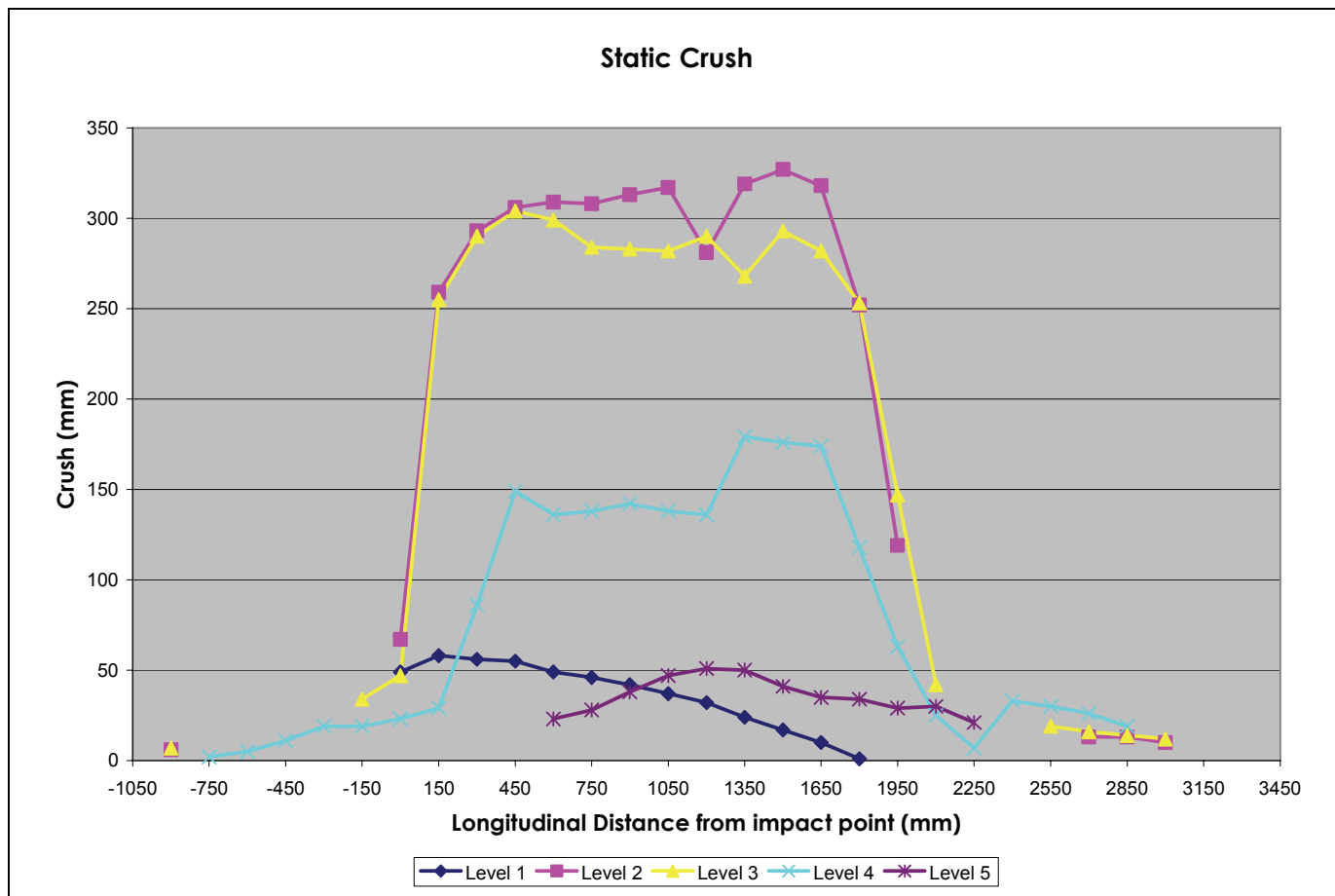
Height measurements taken 750 mm rearward from vertical impact line.

DATA SHEET 10
VEHICLE STATIC CRUSH PROFILE

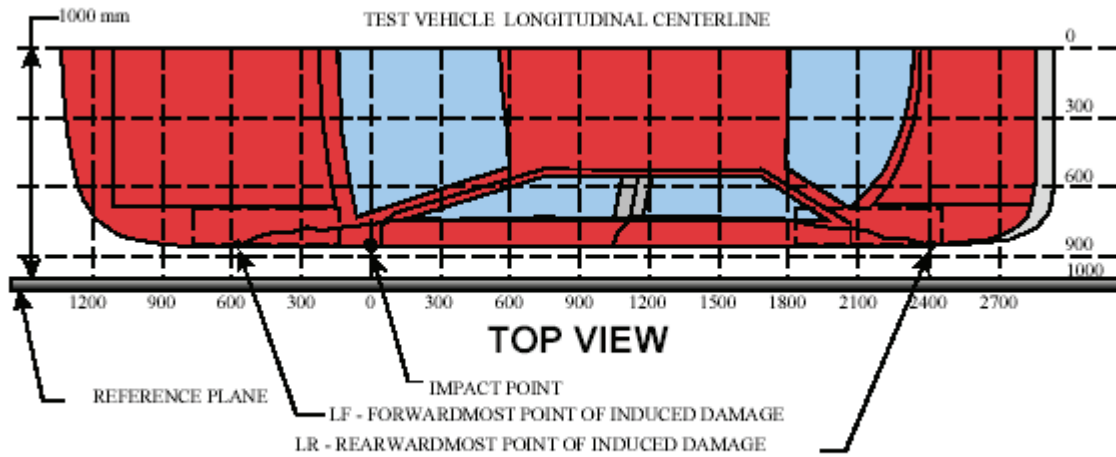
Note: All dimensions are in millimeters with a tolerance of ± 3 mm

TEST VEHICLE STATIC CRUSH																
Level	1			2			3			4			5			
Height	255			467			598			929			1335			
	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	
DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT	-1050															
	-900			183	189	6	195	202	7							
	-750									313	315	2				
	-600									295	300	5				
	-450									285	296	11				
	-300									276	295	19				
	-150						161	195	34	273	292	19				
	0	174	223	49	168	235	67	166	213	47	265	288	23			
	150	205	263	58	168	427	259	167	422	255	260	289	29			
	300	204	260	56	167	460	293	167	457	290	257	343	86			
	450	203	258	55	167	473	306	168	472	304	253	402	149			
	600	203	252	49	168	477	309	168	467	299	253	389	136	430	453	23
	750	203	249	46	169	477	308	169	453	284	253	391	138	457	485	28
	900	203	245	42	169	482	313	169	452	283	254	396	142	478	516	38
	1050	203	240	37	170	487	317	170	452	282	255	393	138	492	539	47
	1200	203	235	32	170	451	281	170	460	290	256	392	136	500	551	51
	1350	203	227	24	171	490	319	171	439	268	263	442	179	500	550	50
	1500	203	220	17	172	499	327	171	464	293	267	443	176	499	540	41
	1650	202	212	10	172	490	318	172	454	282	271	445	174	498	533	35
	1800	188	189	1	170	422	252	172	425	253	276	394	118	490	524	34
	1950				164	283	119	168	315	147	283	346	63	480	509	29
	2100							160	202	42	290	315	25	470	500	30
	2250										295	302	7	460	481	21
	2400										300	333	33			
	2550							158	177	19	309	339	30			
	2700				162	175	13	171	187	16	320	346	26			
	2850				194	207	13	197	211	14	332	351	19			
	3000				220	230	10	221	233	12						
	3150															
	3330															

DATA SHEET 10
VEHICLE STATIC CRUSH PROFILE

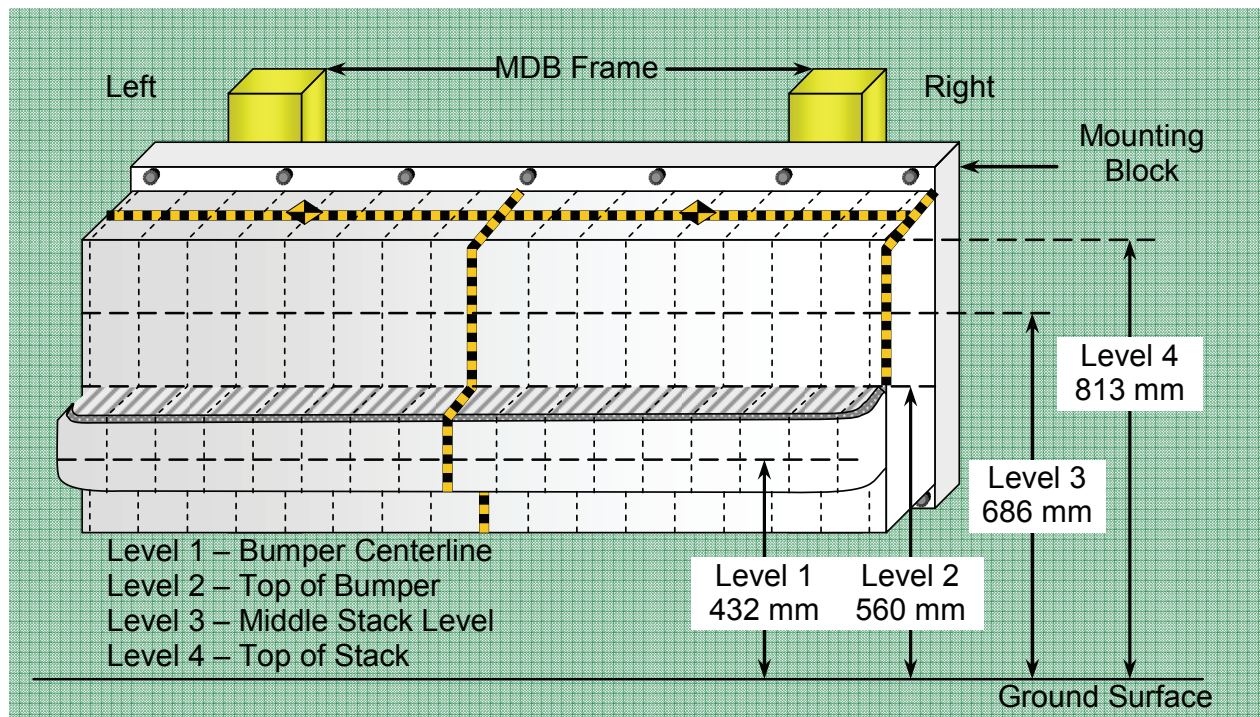


DATA SHEET 11
VEHICLE DAMAGE PROFILE DISTANCES (DPD)



DPD MEASUREMENTS				
	DPD measurement (mm)	Pre test (mm)	Post test (mm)	Crush (mm)
1	-150	180	180	0
2	360	180	468	288
3	870	180	481	301
4	1380	176	486	310
5	1890	175	330	155
6	2400	173	173	0

DATA SHEET 12
DEFORMABLE BARRIER STATIC CRUSH

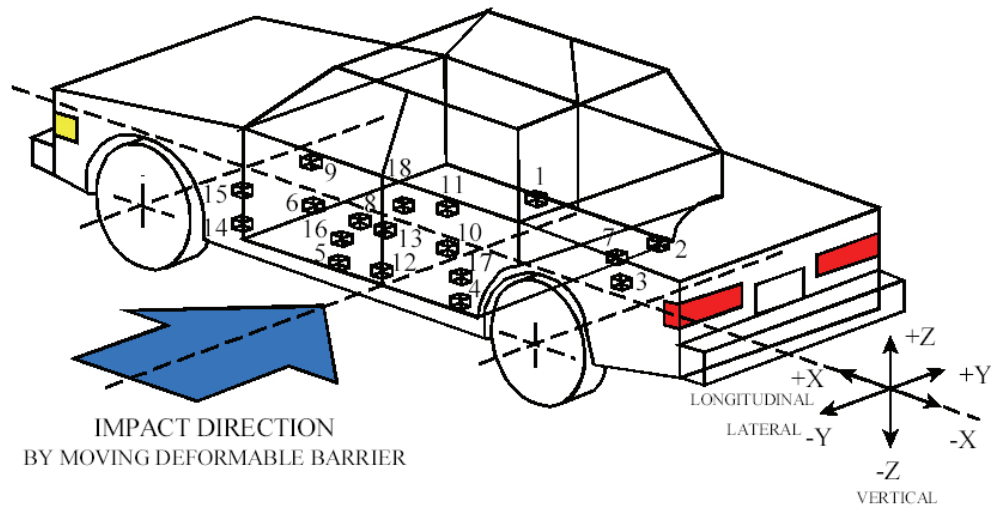


DEFORMABLE BARRIER FACE SUMMARY		
Barrier face manufacturer		Plascore
Serial number		012B0407-145A0307
Level	Description	Maximum crush
1	Center of bumper	126
2	Top of bumper	48
3	Middle of stack	94
4	Top of stack	134
Maximum post test intrusion is 134 mm at level 4		

BARRIER STATIC CRUSH																	
	Distance left of center								C _L	Distance right of center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
4	79	30	12	9	22	47	44	32	24	16	12	12	13	20	49	91	134
3	94	43	34	20	16	40	55	41	24	9	9	9	11	13	18	33	84
2	48	43	25	19	25	37	44	45	40	32	30	36	30	32	34	37	46
1	126	108	92	89	93	103	107	108	100	95	96	96	97	96	96	105	114

all values in mm

DATA SHEET 13
VEHICLE ACCELEROMETER LOCATIONS



TEST VEHICLE ACCELEROMETER LOCATIONS				
Loc. no.	Accelerometer location	Measurements (mm)		
		X	Y	Z
1	Right sill at front seat	x	y	z
2	Right sill at rear seat	2801	721	386
3	Rear floor pan above axle	1795	725	395
4	Left sill at rear door	746	-16	80
5	Left sill at front door	1792	-730	394
6	Left front door C/L	2803	-729	390
7	Rear occupant compartment	†	†	†
8	Left front door mid-rear	1918	359	286
9	Left front door upper C/L	†	†	†
10	Left rear door mid-rear	†	†	†
11	Left rear door upper C/L	†	†	†
12	Left lower b-pillar	†	†	†
13	Left middle b-pillar	2288	-703	15
14	Left lower a-pillar	2205	-711	-158
15	Left middle a-pillar	3285	-734	43
16	Front seat track	3272	-710	-55
17	Rear seat track or structure	2756	-640	264
18	Vehicle CG	1925	-403	194

Origin

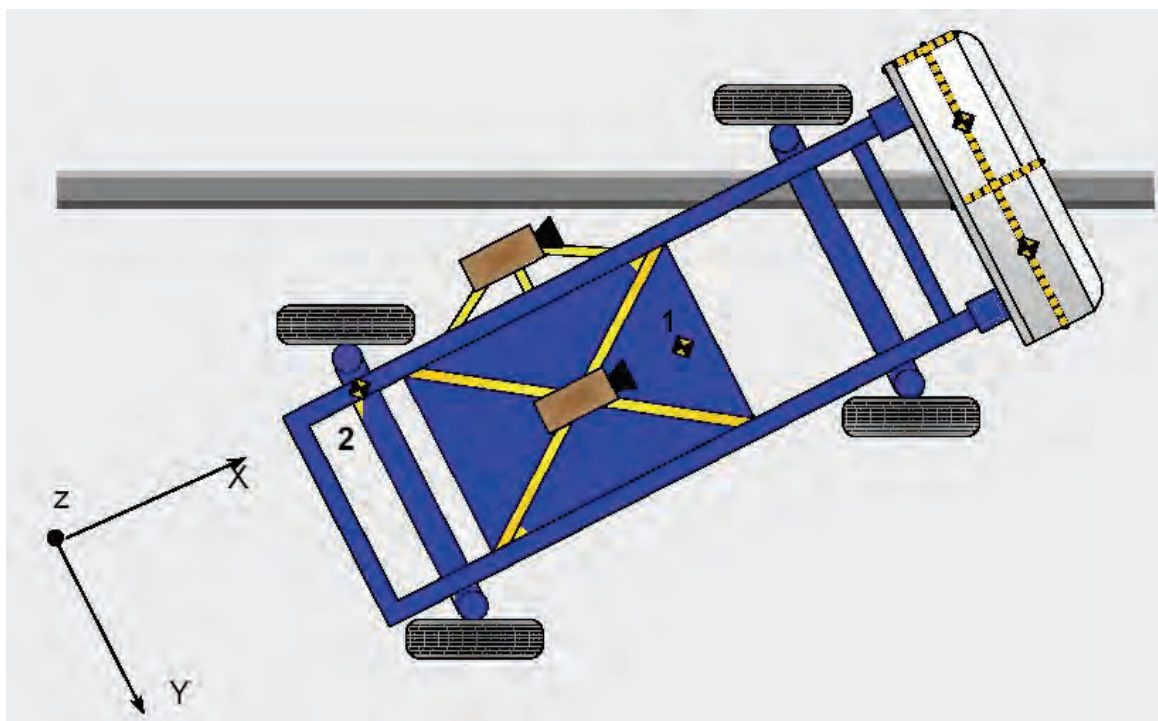
X Rear bumper
 Y Midline of vehicle
 Z Top of rear bumper

Orientation

X +(X) Forward
 Y +(Y) Right
 Z +(Z) Down

† Front and rear door accelerometers not installed as per NCAP policy (02Nov05)

DATA SHEET 14
MDB ACCELEROMETER LOCATIONS



MDB ACCELEROMETER LOCATIONS			
Location	Measurements (mm)		
	X	Y	Z
Center of gravity	1113	-1	311
Right rear	2812	-614	585

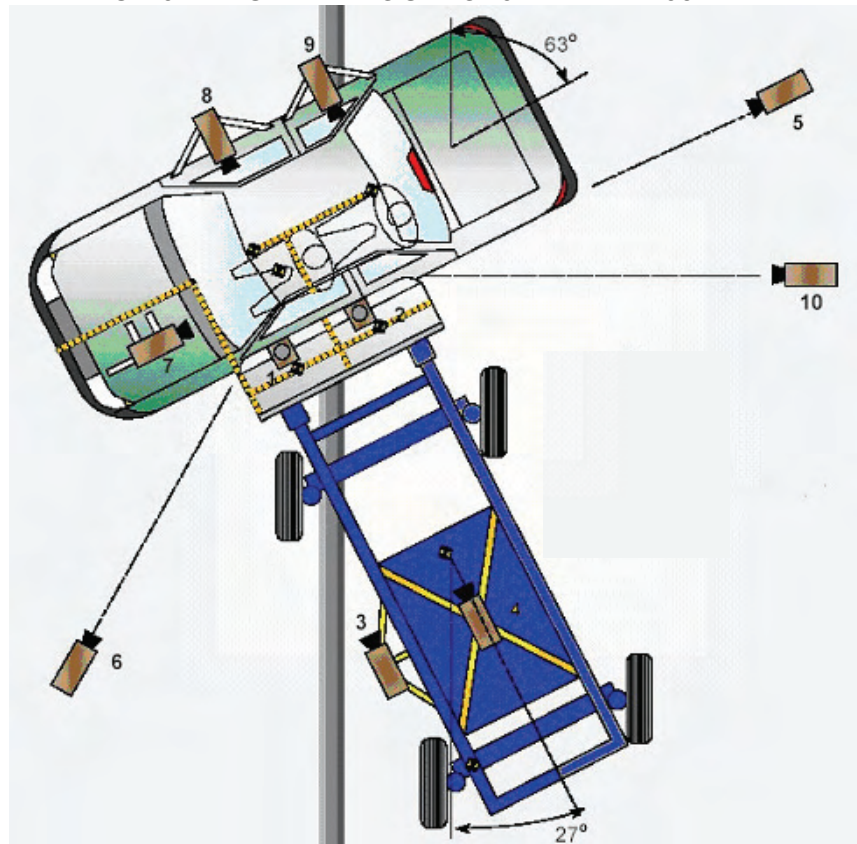
Origin

X Rear structural member
Y Midline of MDB
Z Middle of rear structural member

Orientation

X +(X) Forward
Y +(Y) Right
Z +(Z) Down

DATA SHEET 15
HIGH-SPEED CAMERA LOCATIONS AND DATA SUMMARY



	View	Coordinates †			Angle °	Lens mm	Rate fps
		X	Y	Z			
		mm	mm	mm			
1	Overhead view of test vehicle	-249	-640	-4910	90	12.5	1000
2	Overhead close-up view of impact plane	-550	-125	-4438	90	16	1000
3	MDB onboard close-up view of impact point †	-1547	-1021	-123	0.9	25.4	1000
4	MDB onboard view of driver dummy †	-1420	-1886	-878	3.8	13	1000
5	Right side ground level overall view	-560	11495	-976	5.5	50	1000
6	Left side ground level overall view	-1715	-3806	-945	11.2	25	1000
7	Test vehicle onboard driver front view	-446	-552	-468	7.8	25	1000
8	Test vehicle onboard driver side view	1646	887	-328	8.9	12.5	1000
9	Test vehicle onboard passenger side view	1649	1742	-331	9	12.5	1000
10	Real-time film coverage of test	-	-	-	-	-	-

Origin

X

Y

Z

Impact Point

Impact Point

Impact Point

Orientation

X

Y

Z

+(X) Forward

+(Y) Right

+(Z) Down

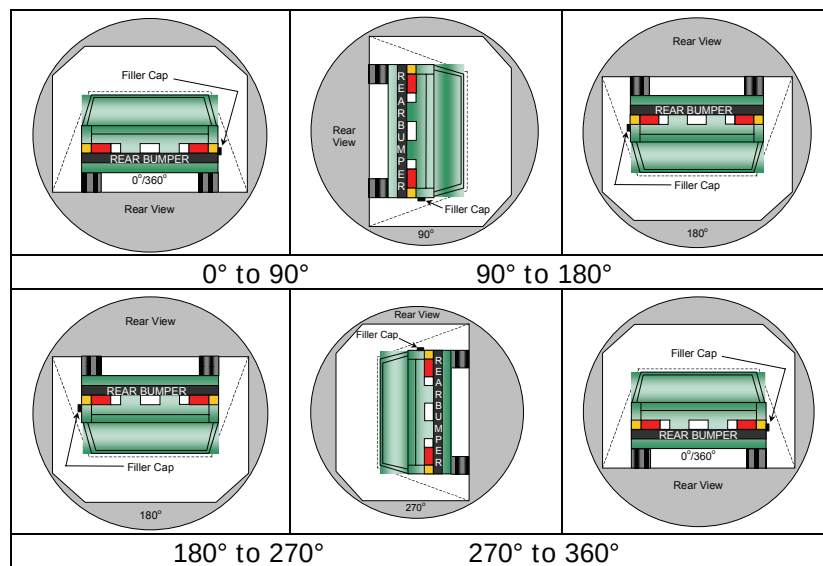
† Cameras triggered pre-impact

DATA SHEET 16
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 19.8° CTest Time: 2:15 pm

STODDARD SOLVENT SPILLAGE MEASUREMENTS				
Period	Description	Maximum allowable spillage	Spillage	
			Amount	Location
A	From impact until vehicle motion ceases	1 oz	0	N/a
B	5 minutes after vehicle motion ceases	5 oz	0	N/a
C	Next 25 minutes	1 oz/minute	0	N/a

FMVSS 301 STATIC ROLLOVER



FMVSS301 STATIC ROLLOVER DATA			
Test phase	Rotation time (sec.)	Hold time (sec.)	Total time (sec.)
Tolerance	60-180	>= 300	-
0° to 90°	66	300	366
90° to 180°	64	300	364
180° to 270°	65	300	365
270° to 360°	66	301	366

DATA SHEET 16
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA (CONTINUED)

FMVSS301 STATIC ROLLOVER - SPILLAGE				
	First five minutes (oz)	Sixth minute (oz)	Seventh minute (oz)	Eighth minute (oz)
Max allowable leakage	5.0	1.0	1.0	1.0
0° to 90°	0	0	0	N/a
90° to 180°	0	0	0	N/a
180° to 270°	0	0	0	N/a
270° to 360°	0	0	0	N/a

SPILLAGE LOCATION(s)	
0° to 90°	N/a
90° to 180°	N/a
180° to 270°	N/a
270° to 360°	N/a

APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure	Photograph Description	Page
A-1	Left front $\frac{3}{4}$, as delivered	A-4
A-2	Right rear $\frac{3}{4}$, as delivered	A-4
A-3	Manufacturer's label	A-5
A-4	Tire placard	A-5
A-5	Pre test front view of test vehicle	A-6
A-6	Post test front view of test vehicle	A-6
A-7	Pre test left front $\frac{3}{4}$ view of test vehicle	A-7
A-8	Post test left front $\frac{3}{4}$ view of test vehicle	A-7
A-9	Pre test left side view of test vehicle	A-8
A-10	Post test left side view of test vehicle	A-8
A-11	Pre test left rear $\frac{3}{4}$ view of test vehicle	A-9
A-12	Post test left rear $\frac{3}{4}$ view of test vehicle	A-9
A-13	Pre test rear view of test vehicle	A-10
A-14	Post test rear view of test vehicle	A-10
A-15	Pre test right rear $\frac{3}{4}$ view of test vehicle	A-11
A-16	Post test right rear $\frac{3}{4}$ view of test vehicle	A-11
A-17	Pre test right side view of test vehicle	A-12
A-18	Post test right side view of test vehicle	A-12
A-19	Pre test right front $\frac{3}{4}$ view of test vehicle	A-13
A-20	Post test right front $\frac{3}{4}$ view of test vehicle	A-13
A-21	Pre test overhead view	A-14
A-22	Post test overhead view	A-14
A-23	Pre test overhead close-up	A-15
A-24	Post test overhead close-up	A-15
A-25	Pre test impact point	A-16
A-26	Post test impact point	A-16
A-27	Pre test front $\frac{3}{4}$ view of left side doors	A-17
A-28	Post test front $\frac{3}{4}$ view of left side doors	A-17
A-29	Pre test rear $\frac{3}{4}$ view of left side doors	A-18
A-30	Post test rear $\frac{3}{4}$ view of left side doors	A-18
A-31	Pre test left front door	A-19
A-32	Post test left front door	A-19
A-33	Pre test left rear door	A-20
A-34	Post test left rear door	A-20
A-35	Pre test driver, left side view	A-21
A-36	Post test driver, left side view	A-21
A-37	Pre test driver shoulder clearance	A-22
A-38	Post test driver shoulder clearance	A-22
A-39	Pre test driver, right side view	A-23
A-40	Post test driver, right side view	A-23
A-41	Post test driver contact locations (1)	A-24
A-42	Post test driver contact locations (2)	A-24
A-43	Pre test passenger, left side view	A-25
A-44	Post test passenger, left side view	A-25
A-45	Pre test passenger shoulder clearance	A-26
A-46	Post test passenger shoulder clearance	A-26

Figure	Photograph Description	Page
A-47	Pre test passenger, right side view	A-27
A-48	Post test passenger, right side view	A-27
A-49	Post test passenger contact locations (1)	A-28
A-50	Post test passenger contact locations (2)	A-28
A-51	Pre test front view of MDB barrier face	A-29
A-52	Post test front view of MDB barrier face	A-29
A-53	Pre test right side view of MDB barrier face	A-30
A-54	Post test right side view of MDB barrier face	A-30
A-55	Pre test left side view of MDB barrier face	A-31
A-56	Post test left side view of MDB barrier face	A-31
A-57	Pre test overhead view of MDB barrier face	A-32
A-58	Post test overhead view of MDB barrier face	A-32
A-59	FMVSS301 0 degrees	A-33
A-60	FMVSS301 90 degrees	A-33
A-61	FMVSS301 180 degrees	A-34
A-62	FMVSS301 270 degrees	A-34
A-63	FMVSS301 360 degrees	A-35
A-64	Impact	A-35



Figure A-1: Left front 3/4 view, as delivered



Figure A-2: Right rear 3/4 view, as delivered



Figure A-3: Manufacturer's label



Figure A-4: Tire placard



Figure A-5: Pre test front view of test vehicle



Figure A-6: Post test front view of test vehicle



Figure A-7: Pre test left front 3/4 view of test vehicle



Figure A-8: Post test left front 3/4 view of test vehicle



Figure A-9: Pre test left side view of test vehicle



Figure A-10: Post test left side view of test vehicle



Figure A-11: Pre test left rear 3/4 view of test vehicle



Figure A-12: Post test left rear 3/4 view of test vehicle



Figure A-13: Pre test rear view of test vehicle



Figure A-14: Post test rear view of test vehicle



Figure A-15: Pre test right rear 3/4 view of test vehicle

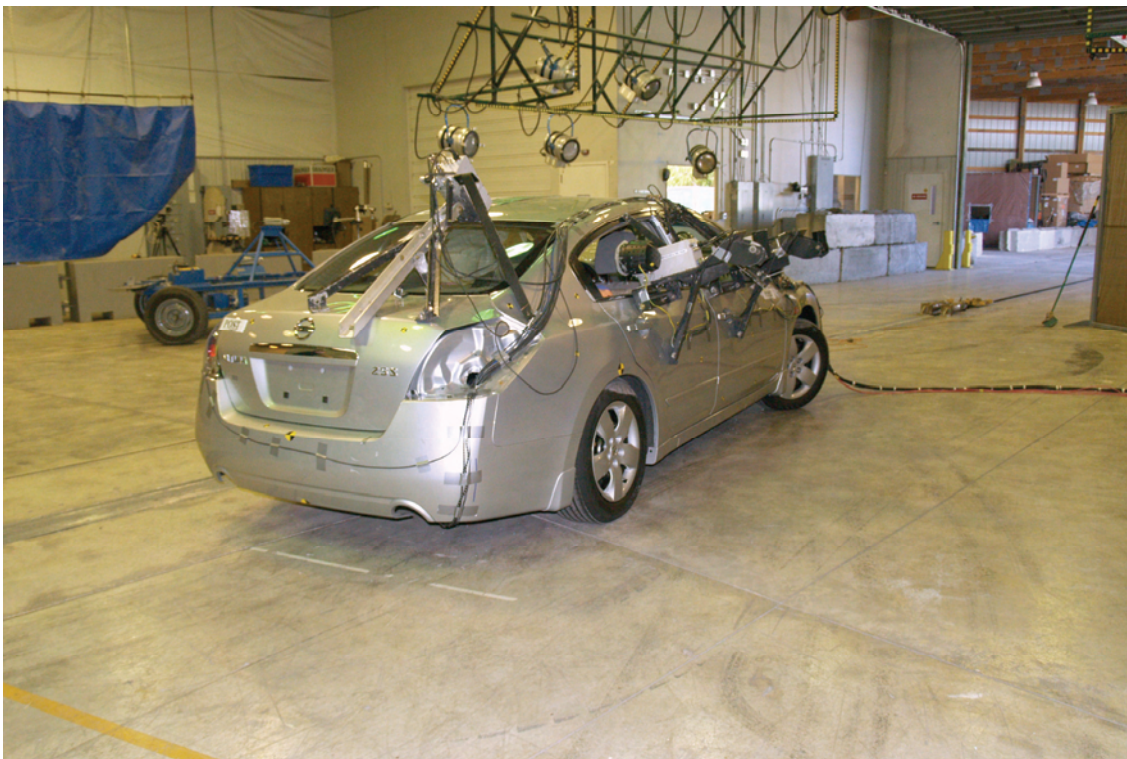


Figure A-16: Post test right rear 3/4 view of test vehicle



Figure A-17: Pre test right side view of test vehicle



Figure A-18: Post test right side view of test vehicle



Figure A-19: Pre test right front 3/4 view of test vehicle



Figure A-20: Post test right front 3/4 view of test vehicle



Figure A-21: Pre test overhead view

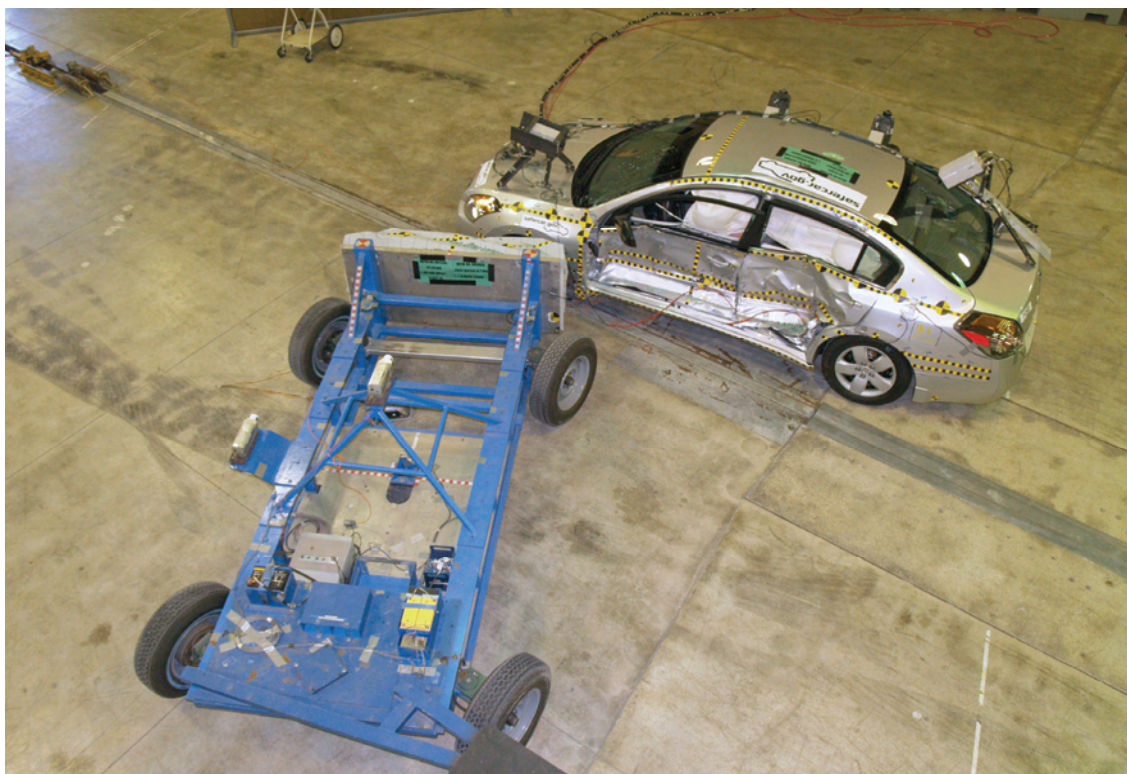


Figure A-22: Post test overhead view

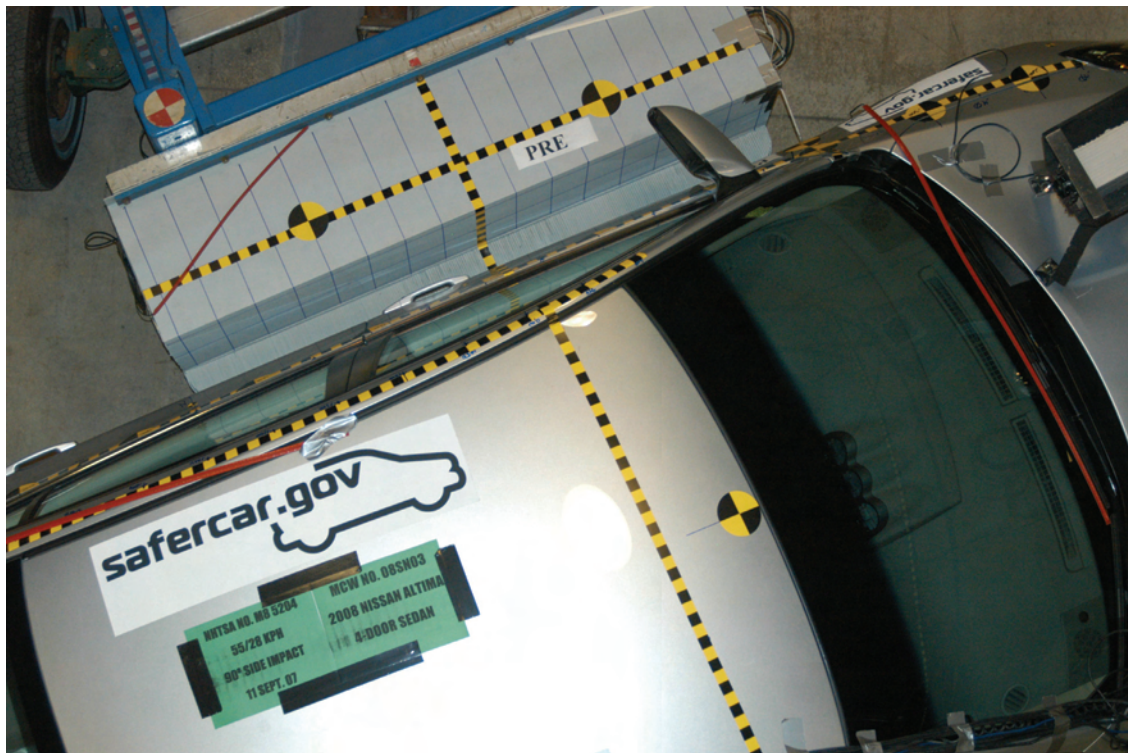


Figure A-23: Pre test overhead close-up view

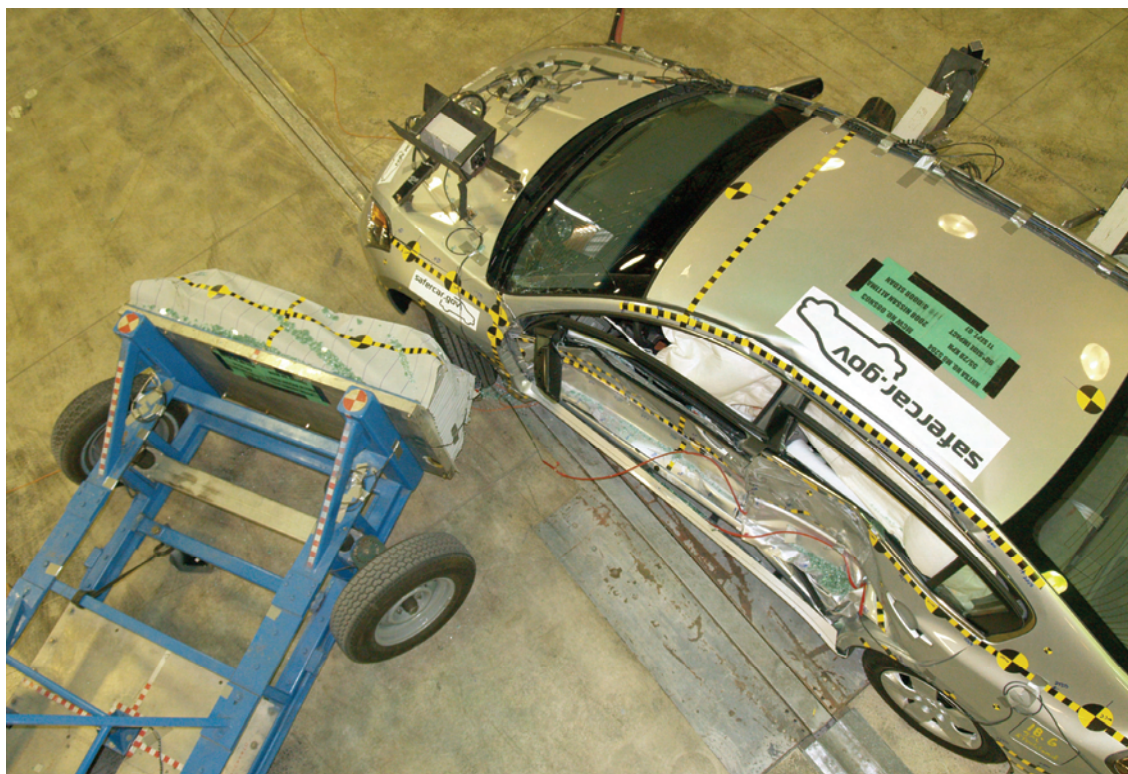


Figure A-24: Post test overhead close-up view



Figure A-25: Pre test impact point



Figure A-26: Post test impact point



Figure A-27: Pre test front 3/4 view of left side doors



Figure A-28: Post test front 3/4 view of left side doors



A-18



Figure A-31: Pre test left front door



Figure A-32: Post test left front door



Figure A-33: Pre test left rear door



Figure A-34: Post test left rear door



Figure A-35: Pre test driver left side view



Figure A-36: Post test driver left side view



Figure A-37: Pre test driver shoulder clearance



Figure A-38: Post test driver shoulder clearance



Figure A-39: Pre test driver right side view



Figure A-40: Post test driver right side view



Figure A-41: Post test driver contact locations (1)



Figure A-42: Post test driver contact locations (2)



Figure A-43: Pre test passenger left side view



Figure A-44: Post test passenger left side view



Figure A-45: Pre test passenger shoulder clearance



Figure A-46: Post test passenger shoulder clearance



Figure A-47: Pre test passenger right side view



Figure A-48: Post test passenger right side view



Figure A-49: Post test passenger contact locations (1)



Figure A-50: Post test passenger contact locations (2)

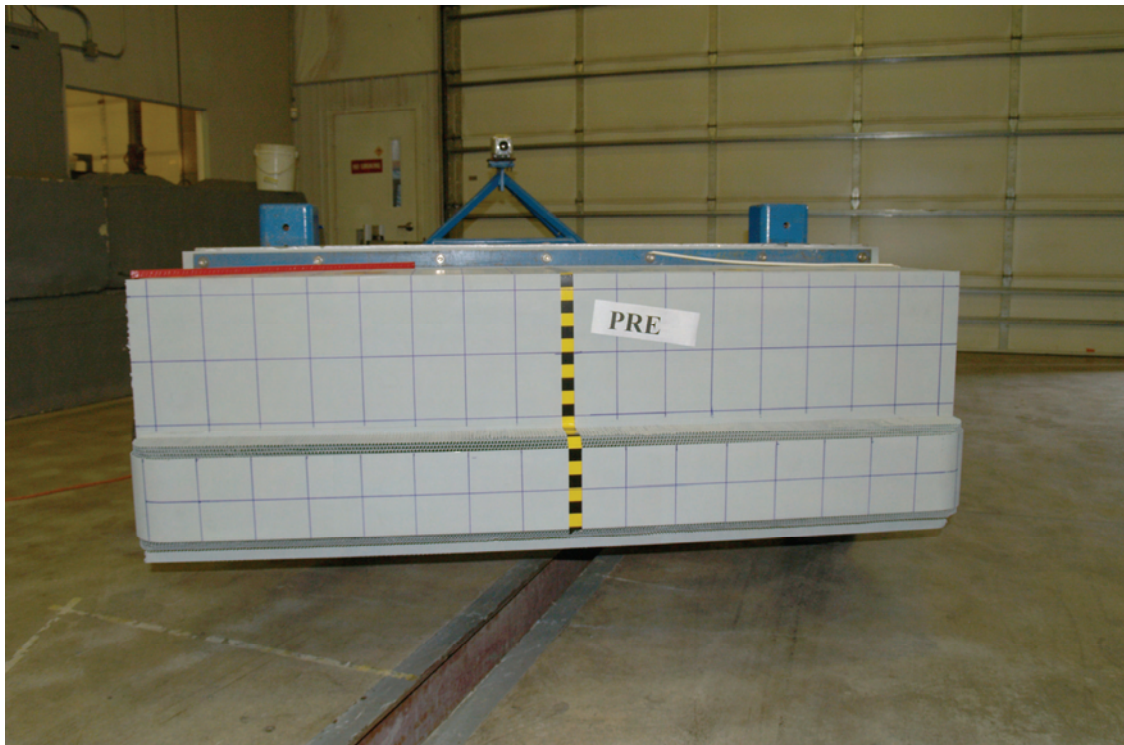


Figure A-51: Pre test front view of MDB barrier face



Figure A-52: Post test front view of MDB barrier face



Figure A-53: Pre test right side view of MDB barrier face



Figure A-54: Post test right side view of MDB barrier face



Figure A-55: Pre test left side view of MDB barrier face



Figure A-56: Post test left side view of MDB barrier face



Figure A-57: Pre test overhead view of MDB barrier face

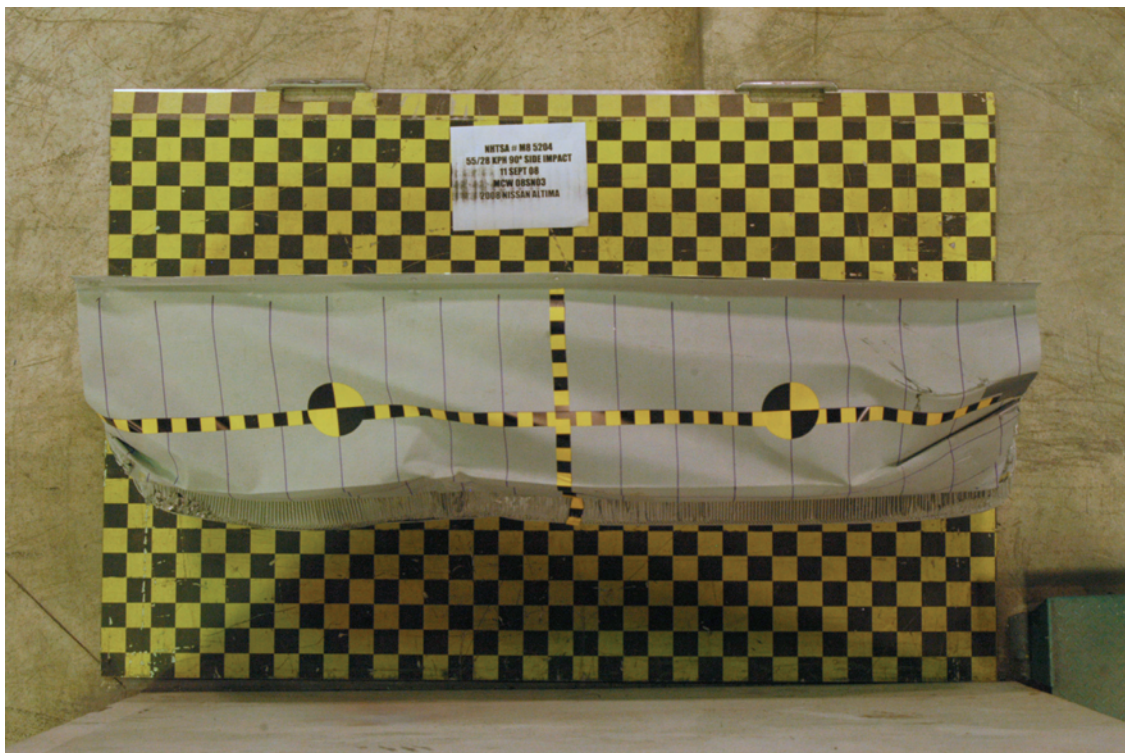


Figure A-58: Post test overhead view of MDB barrier face



Figure A-59: FMVSS 301 0 degrees

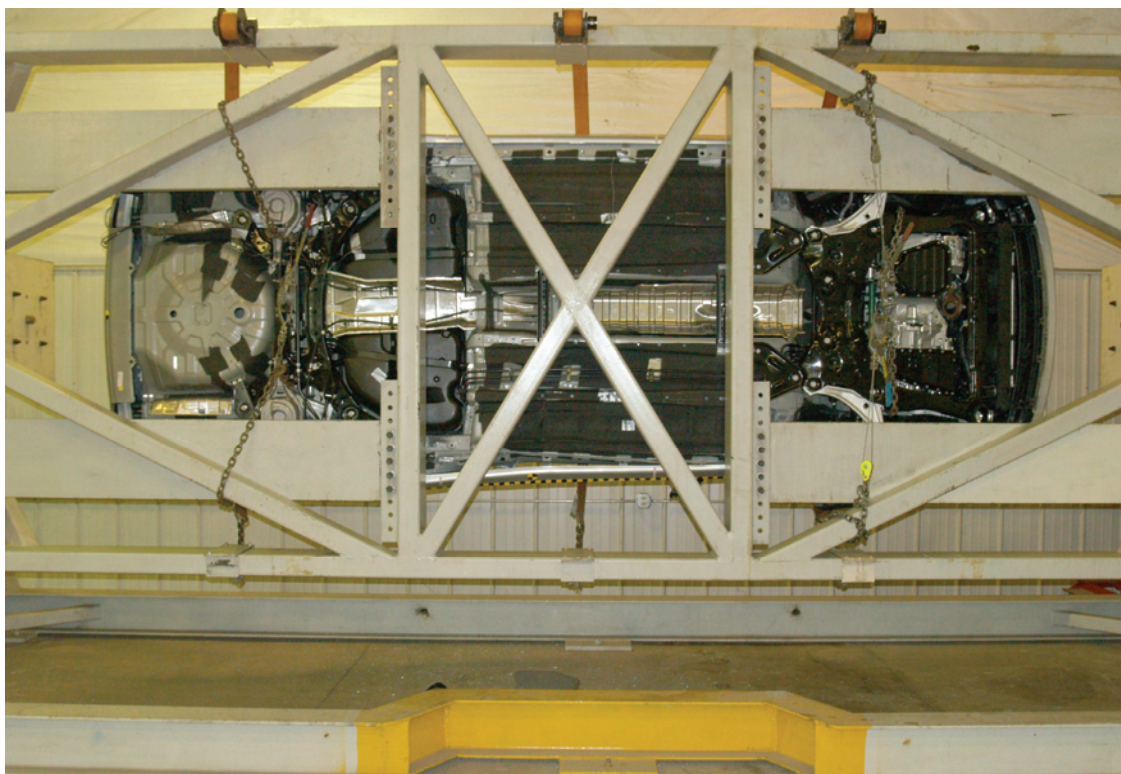


Figure A-60: FMVSS 301 90 degrees



Figure A-61: FMVSS 301 180 degrees



Figure A-62: FMVSS 301 270 degrees



Figure A-63: FMVSS 301 360 degrees



Figure A-64: Impact

APPENDIX B
SID/HIII, VEHICLE AND MDB RESPONSE DATA

The following plots are provided in the test report

Data Plot	Description	Page
B-1	Driver upper rib(y) acceleration - primary – FIR100	B-4
B-2	Driver lower rib(y) acceleration - primary – FIR100	B-5
B-3	Driver lower spine (y) acceleration - primary – FIR100	B-6
B-4	Driver pelvis (y) acceleration - primary – FIR100	B-7
B-5	Passenger upper rib(y) acceleration - primary – FIR100	B-8
B-6	Passenger lower rib(y) acceleration - primary – FIR100	B-9
B-7	Passenger lower spine (y) acceleration - primary – FIR100	B-10
B-8	Passenger pelvis (y) acceleration - primary – FIR100	B-11

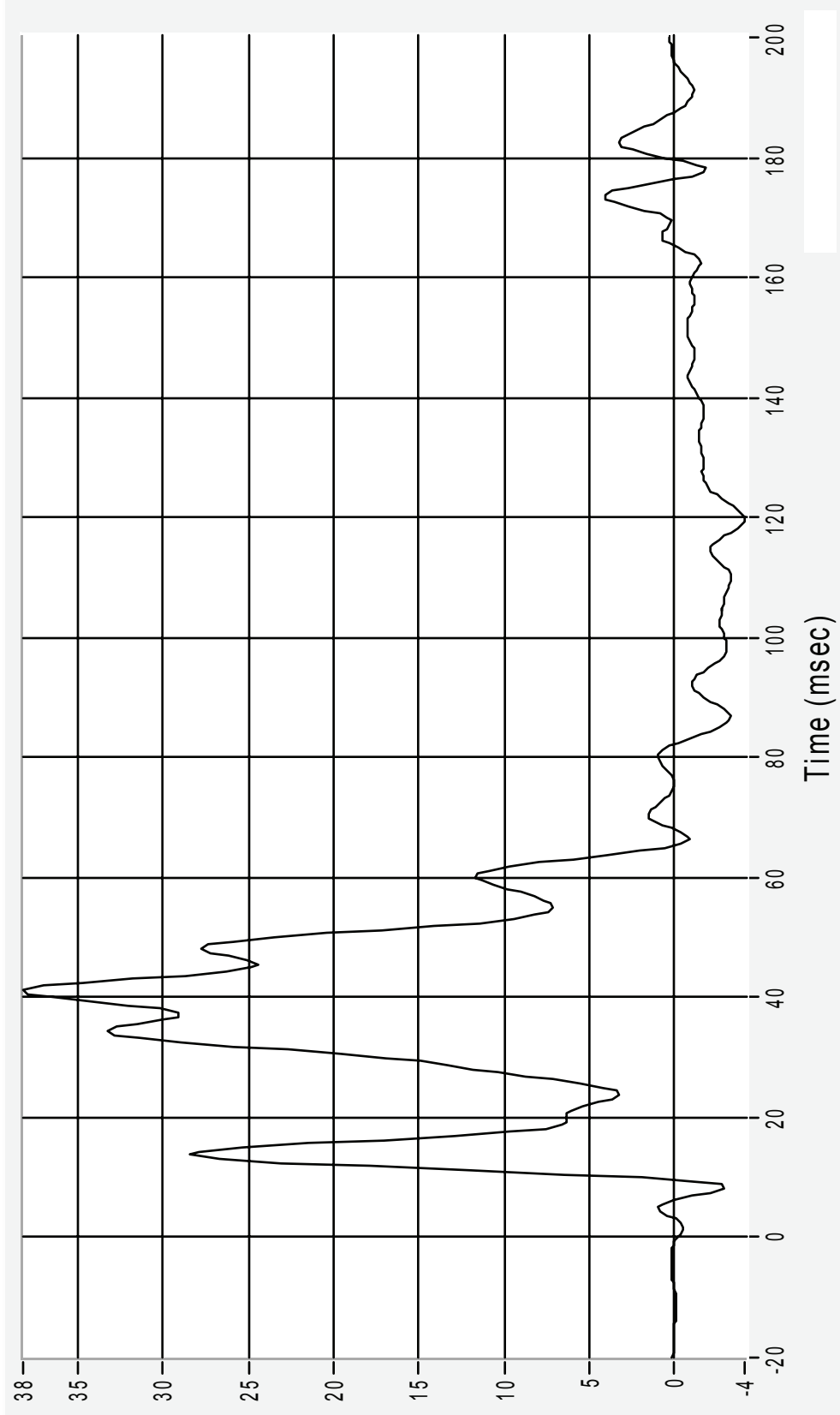
The following dummy, vehicle, and MDB response data can be found in the R&D section of the NHTSA website at: www-nrd.nhtsa.dot.gov/database/nrd-11/veh_db.html.

Description
Driver head (x) acceleration
Driver head (y) acceleration
Driver head (z) acceleration
Driver upper neck (x) force
Driver upper neck (y) force
Driver upper neck (z) force
Driver upper neck (x) moment
Driver upper neck (y) moment
Driver upper neck (z) moment
Driver upper rib (y) acceleration – redundant
Driver lower rib (y) acceleration – redundant
Driver lower spine (y) acceleration – redundant
Driver pelvis (y) acceleration – redundant
Passenger head (x) acceleration
Passenger head (y) acceleration
Passenger head (z) acceleration
Passenger upper neck (x) force
Passenger upper neck (y) force
Passenger upper neck (z) force
Passenger upper neck (x) moment
Passenger upper neck (y) moment
Passenger upper neck (z) moment
Passenger upper rib (y) acceleration – redundant
Passenger lower rib (y) acceleration – redundant
Passenger lower spine (y) acceleration – redundant
Passenger pelvis (y) acceleration – redundant
Vehicle right side sill at front seat (x) acceleration
Vehicle right side sill at front seat (y) acceleration
Vehicle right side sill at front seat (z) acceleration
Vehicle right side sill at rear seat (x) acceleration
Vehicle right side sill at rear seat (y) acceleration
Vehicle right side sill at rear seat (z) acceleration
Vehicle rear floor pan above axle (x) acceleration
Vehicle rear floor pan above axle (y) acceleration
Vehicle rear floor pan above axle (z) acceleration
Vehicle left side sill at rear seat (y) acceleration
Vehicle left side sill at front seat (y) acceleration
Vehicle right rear occupant compartment (y) acceleration

Vehicle left lower b-pillar (y) acceleration
Vehicle left middle b-pillar (y) acceleration
Vehicle left lower a-pillar (y) acceleration
Vehicle left middle a-pillar (y) acceleration
Vehicle front seat track (y) acceleration
Vehicle rear seat track/structure (y) acceleration
Vehicle center of gravity (x) acceleration
Vehicle center of gravity (y) acceleration
Vehicle center of gravity (z) acceleration
MDB center of gravity (x) acceleration
MDB center of gravity (y) acceleration
MDB center of gravity (z) acceleration
MDB rear (x) acceleration
MDB rear (y) acceleration

Driver Upper Rib (Y) Acceleration
 Acceleration (G's) FIR100

Max	38.2	G	at	41.2	msec
Min	-4.1	G	at	120.0	msec

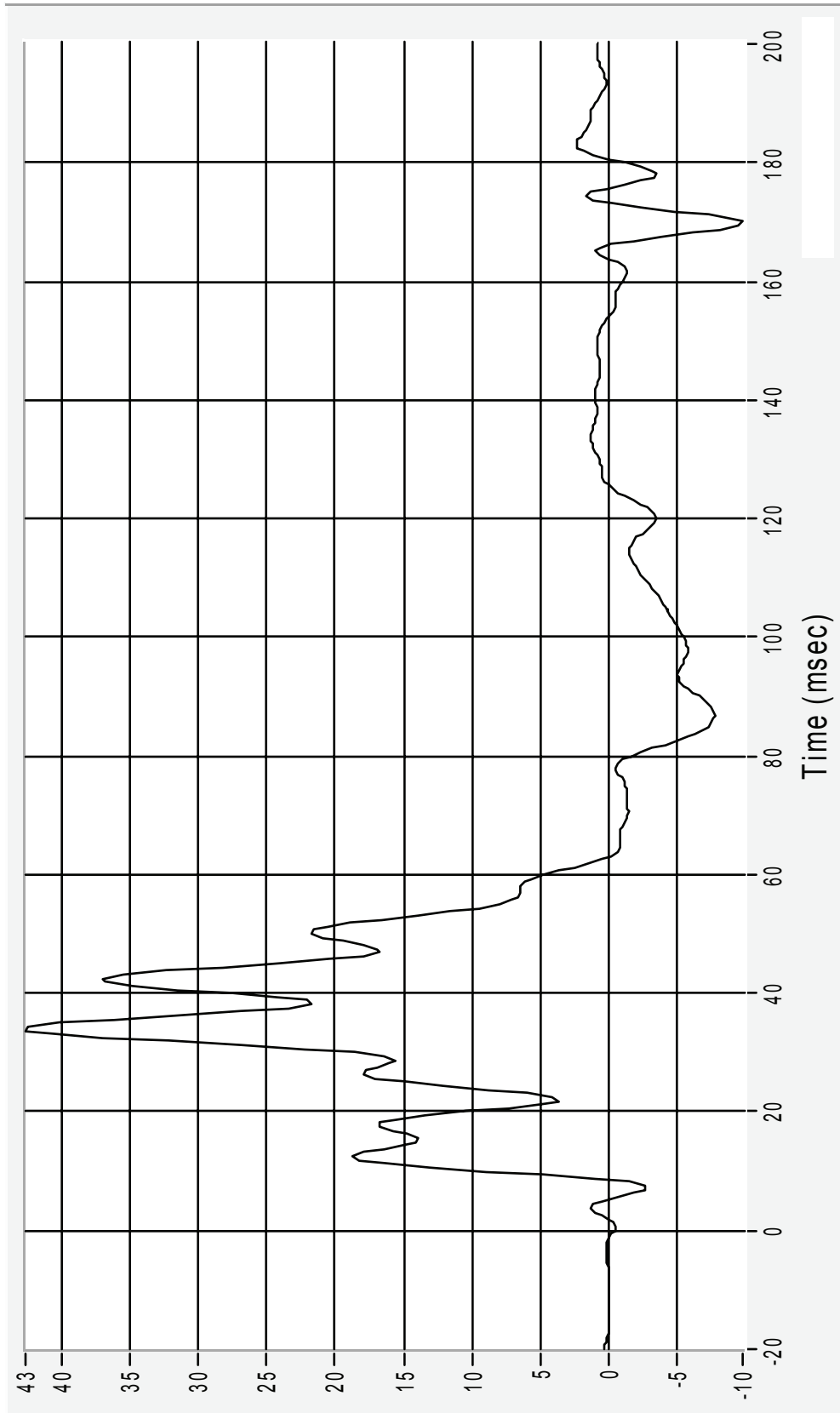


Medical College of Wisconsin
 Vehicle Crashworthiness Lab

08SN03 - 2008 NISSAN ALTIMA 4-DOOR SEDAN
 11 September 2007

Driver Lower Rib (Y) Acceleration
 Acceleration (G's) FIR100

Max	42.7	G	at	33.8	msec
Min	-9.8	G	at	170.0	msec

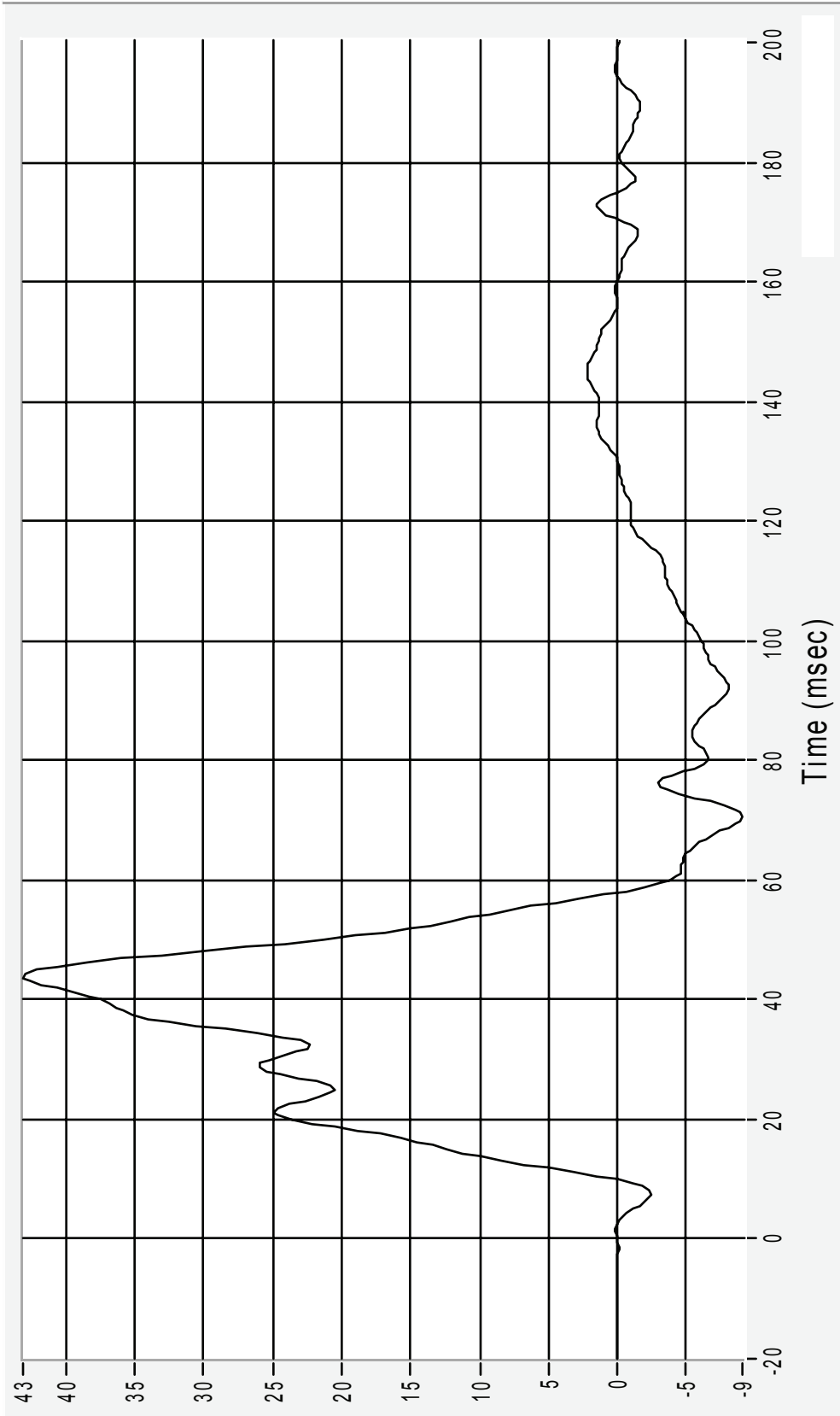


Medical College of Wisconsin
 Vehicle Crashworthiness Lab

08SN03 - 2008 NISSAN ALTIMA 4-DOOR SEDAN
 11 September 2007

Driver Lower Spine (Y) Acceleration
 Acceleration (G's) FIR100

Max	43.1	G	at	43.8	msec
Min	-9.1	G	at	70.6	msec



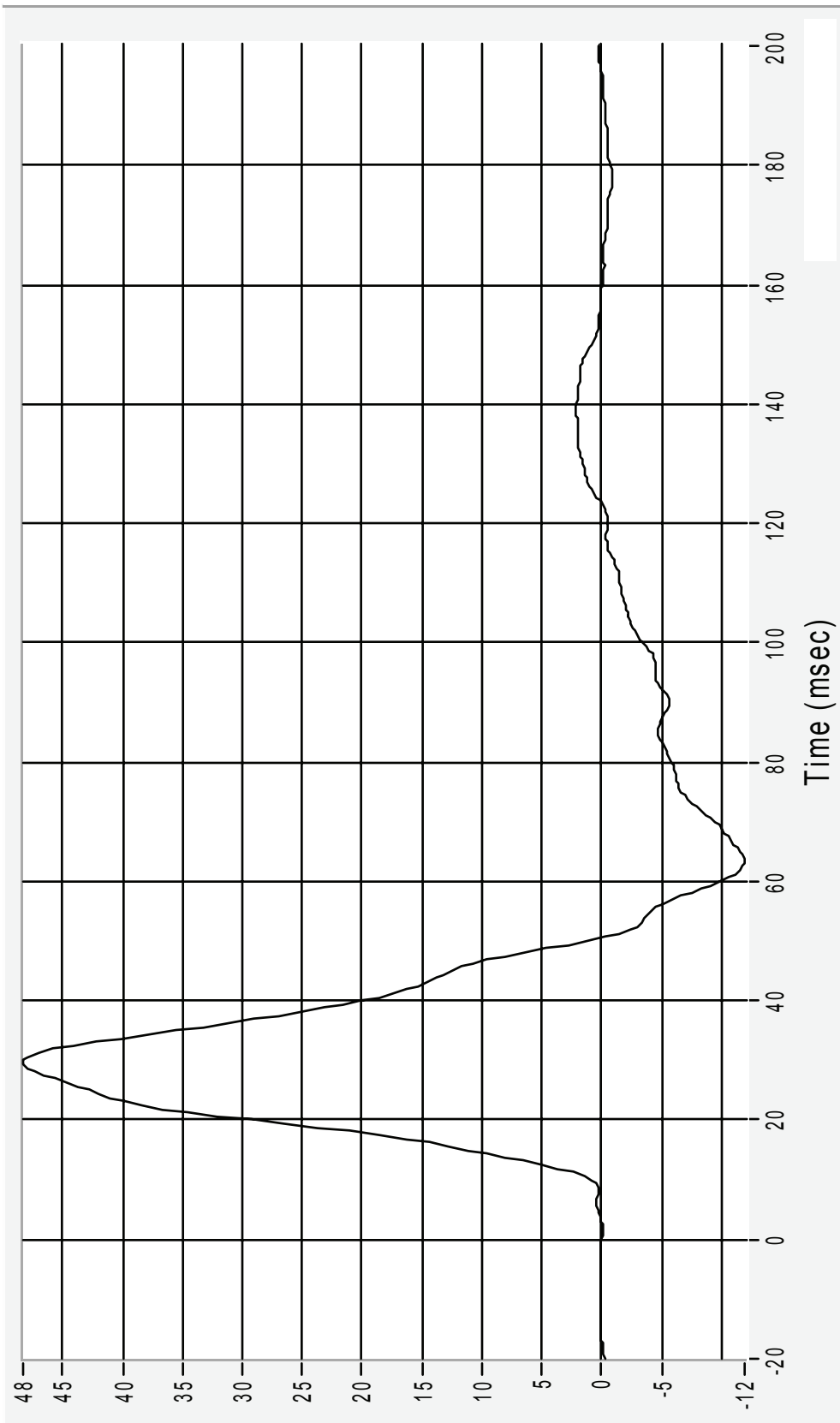
08SN03 - 2008 NISSAN ALTIMA 4-DOOR SEDAN

11 September 2007

Medical College of Wisconsin
 Vehicle Crashworthiness Lab

Driver Pelvic (Y) Acceleration
 Acceleration (G's) FIR100

Max	48.3	G	at	29.4	msec
Min	-12.0	G	at	63.1	msec

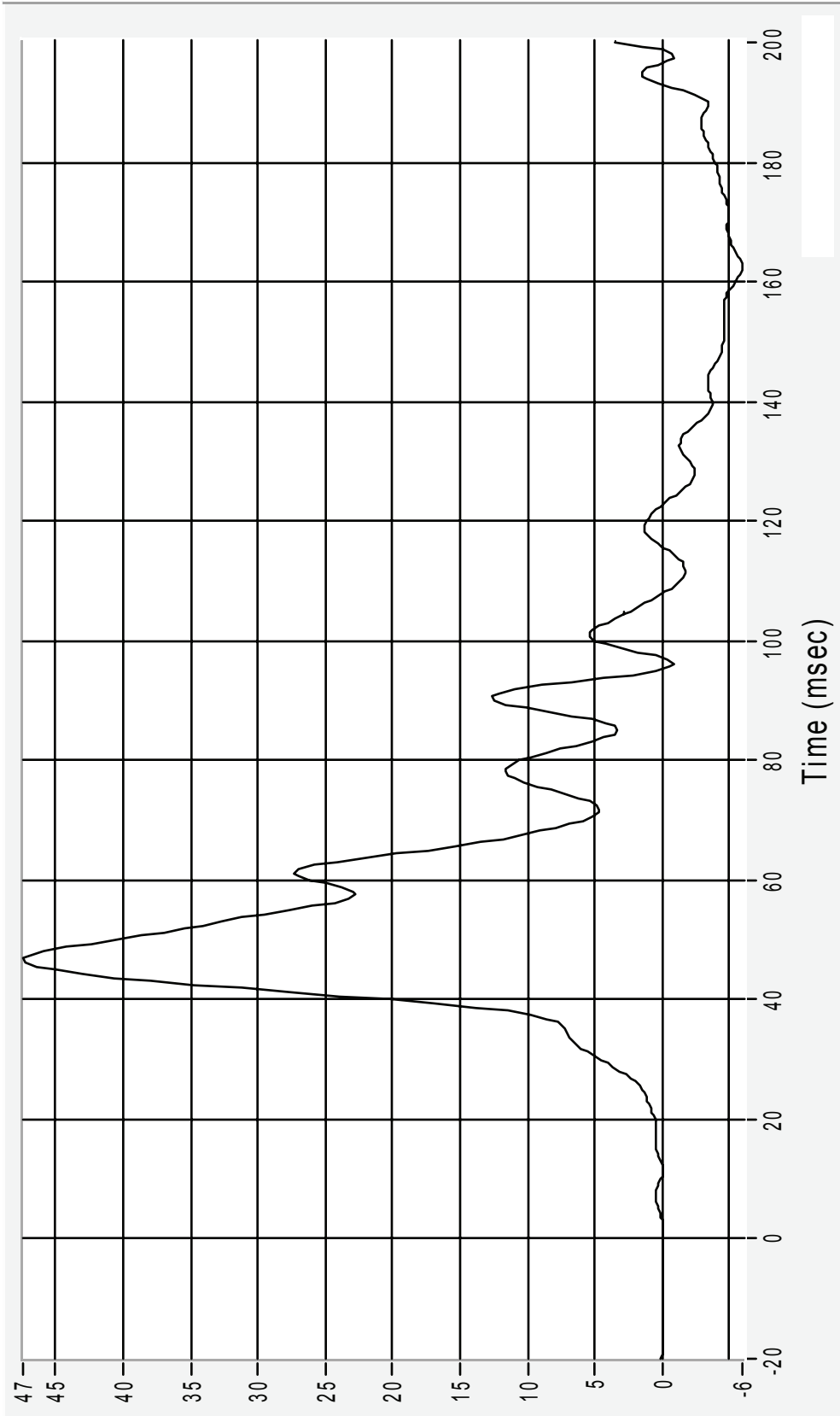


08SN03 - 2008 NISSAN ALTIMA 4-DOOR SEDAN

11 September 2007

Medical College of Wisconsin
 Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Acceleration
 Acceleration (G's) FIR100 Max 47.4 G at 46.9 msec
 Min -5.9 G at 162.5 msec

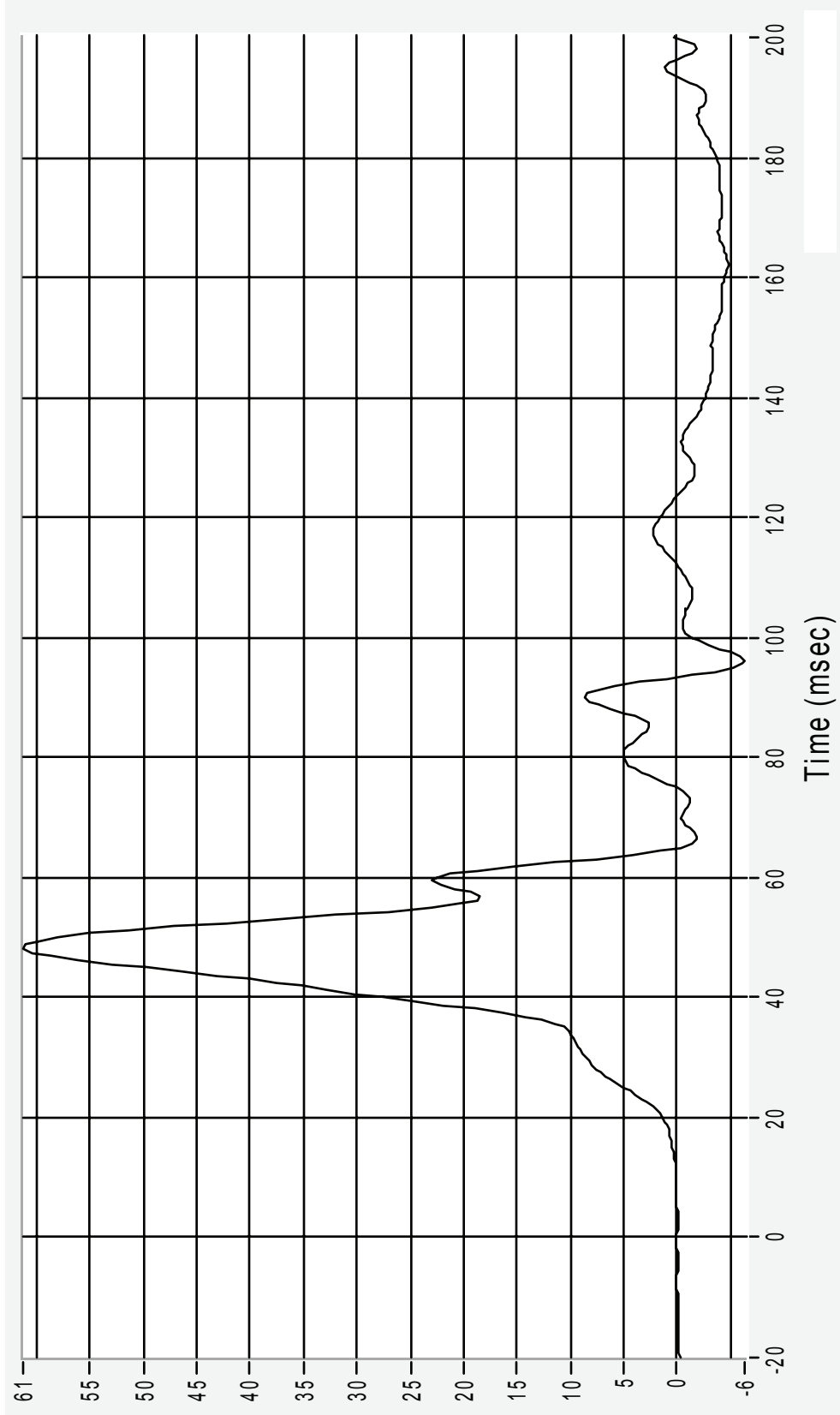


Medical College of Wisconsin
 Vehicle Crashworthiness Lab

08SN03 - 2008 NISSAN ALTIMA 4-DOOR SEDAN
 11 September 2007

Passenger Lower Rib (Y) Acceleration
 Acceleration (G's) FIR100

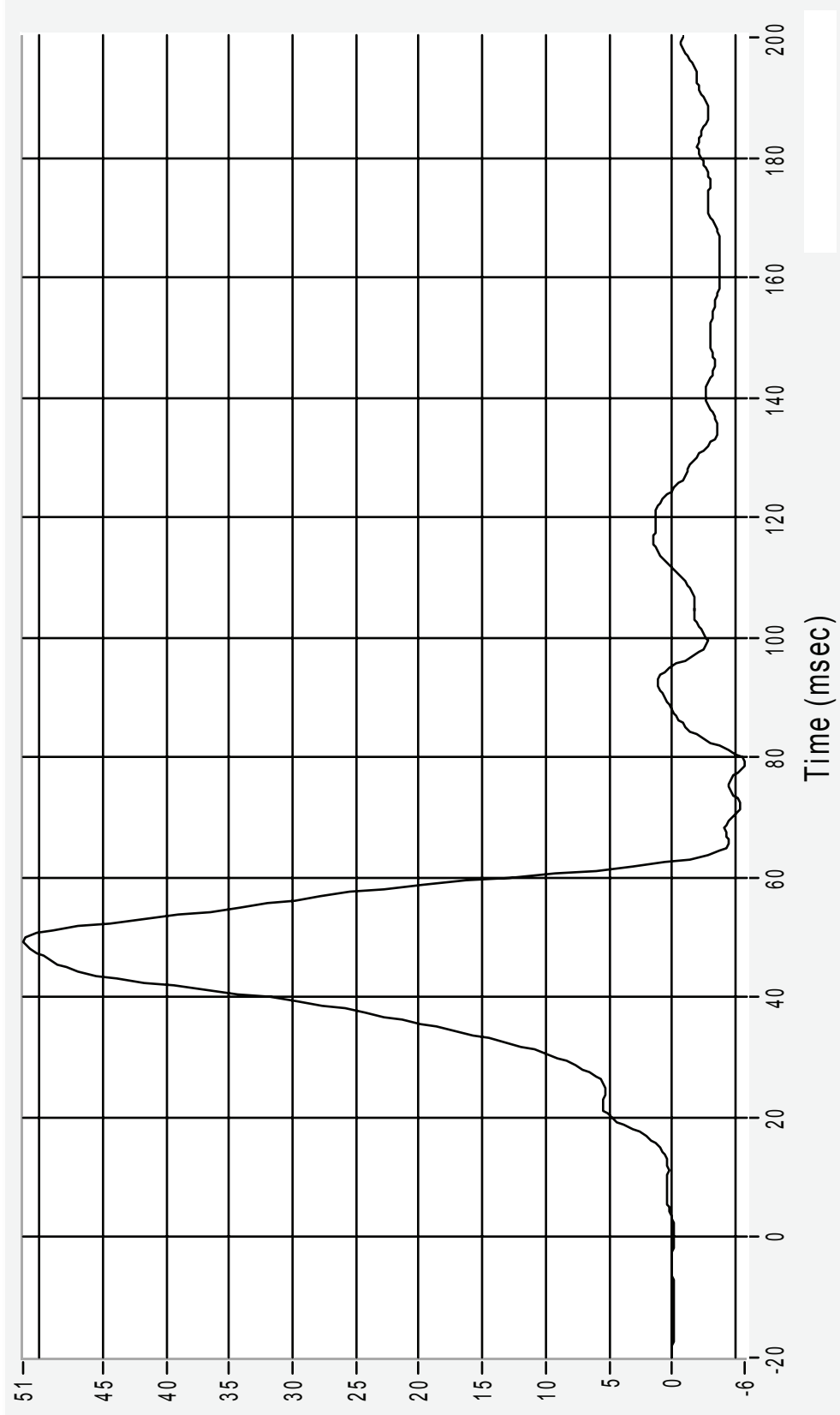
Max	61.2	G	at	48.1	msec
Min	-6.3	G	at	96.2	msec



Medical College of Wisconsin
 Vehicle Crashworthiness Lab

08SN03 - 2008 NISSAN ALTIMA 4-DOOR SEDAN
 11 September 2007

Passenger Lower Spine (Y) Acceleration
 Acceleration (G's) FIR100 Max 51.3 G at 49.4 msec
 Min -5.7 G at 78.8 msec

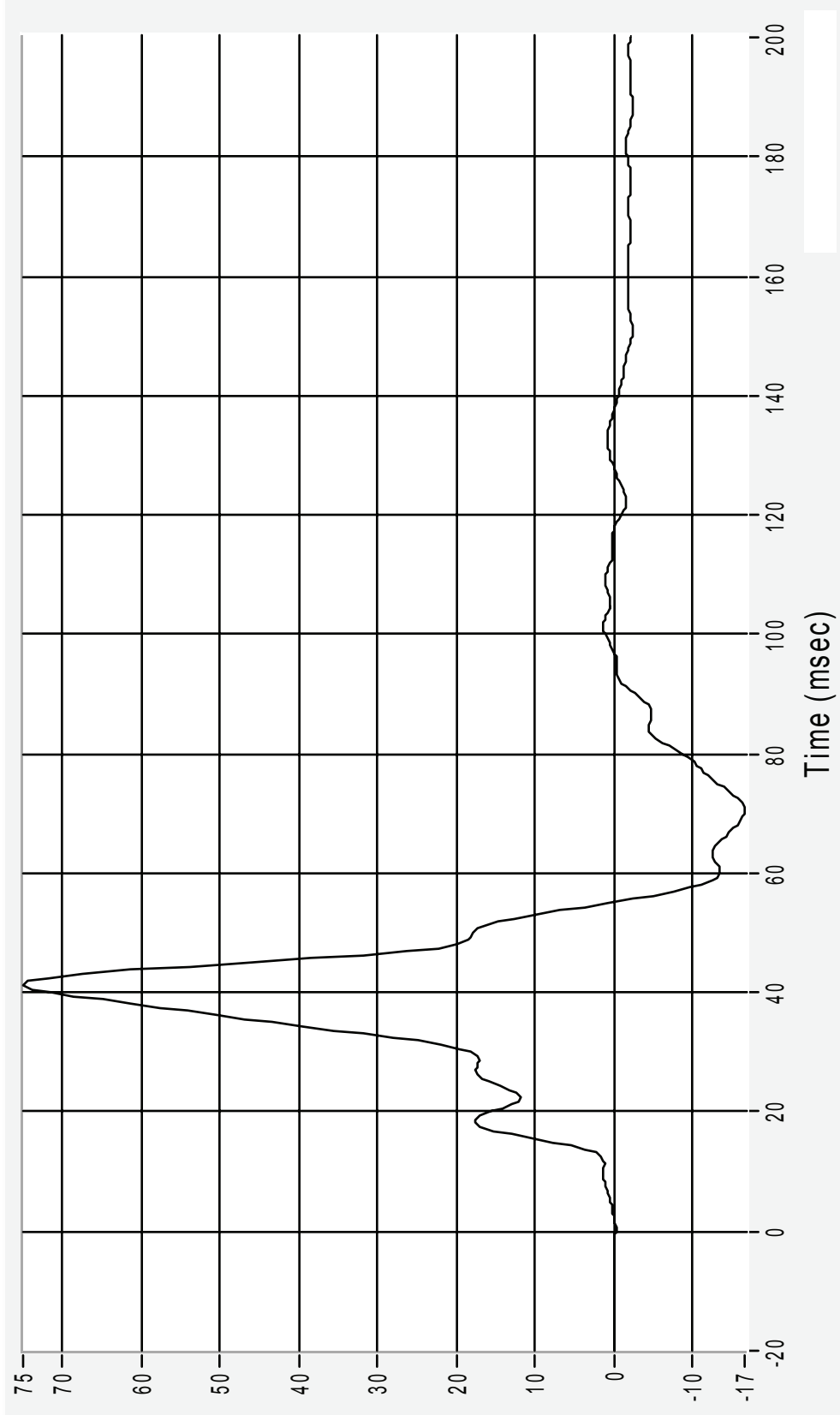


Medical College of Wisconsin
 Vehicle Crashworthiness Lab

08SN03 - 2008 NISSAN ALTIMA 4-DOOR SEDAN
 11 September 2007

Passenger Pelvic (Y) Acceleration
 Acceleration (G's) FIR100

Max	75.0	G	at	41.2	msec
Min	-16.6	G	at	70.6	msec



Medical College of Wisconsin
 Vehicle Crashworthiness Lab

08SN03 - 2008 NISSAN ALTIMA 4-DOOR SEDAN
 11 September 2007

APPENDIX C
DUMMY CALIBRATION DATA

**VERIFICATION TEST RESULTS SUMMARY
PRE AND POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial Number 056Test Sequences 3 and 4

TEST	PRE		POST	
	COMMENTS	BY	COMMENTS	BY
EXTERNAL DIMENSIONS	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
THORACIC SHOCK ABSORBER TEST	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
LATERAL THORAX IMPACT TEST	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
LATERAL PELVIS IMPACT TEST	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
ABDOMINAL COMPRESSION	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
LUMBAR FLEXION	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
HYBRID III LATERAL NECK TEST	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
HYBRID III LATERAL HEAD DROP	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski

SID Serial Number 058Test Sequences 2 and 3

TEST	PRE		POST	
	COMMENTS	BY	COMMENTS	BY
EXTERNAL DIMENSIONS	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
THORACIC SHOCK ABSORBER TEST	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
LATERAL THORAX IMPACT TEST	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
LATERAL PELVIS IMPACT TEST	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
ABDOMINAL COMPRESSION	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
LUMBAR FLEXION	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
HYBRID III LATERAL NECK TEST	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski
HYBRID III LATERAL HEAD DROP	Pass all requirements	Mike Rawski	Pass all requirements	Mike Rawski

SUMMARY
SID H3 PRE AND POST VERIFICATION
CONFIGURED FOR LEFT SIDE IMPACT

TEST PARAMETER	SPEC	SID HIII/056		SID HIII/058	
		PRE	POST	PRE	POST
MEASUREMENTS					
Date	-	6Sept07	21Sept07	4 Sept07	24Sept07
Sequential Test Number	-	3	4	2	3
Temperature (°C)	18.9-25.5	20.8	21.2	20.3	20.7
Relative Humidity (%)	10-70	44.5	56.2	50.4	46.9
SH – Seated Height (mm)	889-909	906	905	909	908
RH – Rib Height (mm)	501-521	510	507	517	520
HP – Hip Pivot Height (mm)	99	99/99	99/99	99/99	99/99
RD – Rib From Back Line (mm)	229-241	232	231	229	230
KH – Knee Pivot from Back Line (mm)	511-526	525/520	525/523	525/520	525/526
KV – Knee Pivot to Floor (mm)	490-505	502/495	505/501	500/500	505/505
HW – Hip Width (mm)	356-391	359	364	356	356
THORAX IMPACTS					
Date	-	7Sept07	24Sept07	4Sept07	24Sept07
Sequential Test Number	-	3	4	2	3
Temperature (°C)	18.9-25.5	20.4	20.6	21.9	21.3
Relative Humidity (%)	10-70	54.3	51.7	56.7	48.7
Probe Speed (m/s)	4.21-4.33	4.27	4.22	4.23	4.22
Upper Rib Acceleration (G)	37-46	41.8	44.2	43.8	44.4
Lower Rib Acceleration (G)	37-46	41.3	43.3	37.7	38.8
Lower Spine Acceleration (G)	15-22	21.7	20.8	20.3	21.1
PELVIS IMPACTS					
Date	-	4Sept07	24Sept07	4Sept07	24Sept07
Sequential Test Number	-	3	4	2	3
Temperature (°C)	18.9-25.5	20.5	20.7	22.2	21.1
Relative Humidity (%)	10-70	52.3	51.5	56.9	47.6
Probe Speed (m/s)	4.21-4.33	4.28	4.22	4.23	4.22
Pelvis Acceleration (G)	40-60	45.1	51.8	43.6	46.3
THORACIC SHOCK ABSORBER					
Shock Absorber ID Number	-	1746		31310164	
Damper Setting	1-10	6		5	
Date	-	11July07		12July07	
Sequential Test Number	-	1		1	
Temperature	18.9-25.5	19.7		19.1	
Relative Humidity	10-70	33.7		40.5	
Probe Speed (m/s) Low	3.05	3.05		3.05	
Force (N)	836 – 1125	1082.6		901.0	
Displacement (mm)	30 – 35	30.0		30.4	
Probe Speed (m/s) Middle	4.27	4.27		4.27	
Force (N)	1730 – 2099	1746.4		1793.9	
Displacement (mm)	32 – 37	33.0		33.9	
Probe Speed (m/s) High	6.10	6.10		6.10	
Force (N)	3741 – 4448	3848.6		3833.1	
Displacement (mm)	33 - 40	35.4		36.2	

TEST PARAMETER	SPEC	SID HIII/056		SID HIII/058	
		PRE	POST	PRE	POST
ABDOMINAL COMPRESSION					
Date	-	5Sept07	17Sept07	24Aug07	17Sept07
Sequential Test Number	-	3	4	2	3
Temperature (°C)	18.9-25.5	21.7	21.0	22.2	21.9
Relative Humidity (%)	10-70	51.7	42.6	62.9	46.1
Force at 13 mm (N)	104-162	133.4	127.3	128.3	131.1
Force at 19 mm (N)	163-221	180.1	176.2	186.0	179.3
Force at 25 mm (N)	222-280	241.5	235.8	266.6	235.4
Force at 33 mm (N)	325-391	359.8	339.6	389.0	332.2
LUMBAR FLEXION					
Date	-	4Sept07	13Sept07	23Aug07	13Sept07
Sequential Test Number	-	3	4	2	3
Temperature (°C)	18.9-25.5	21.5	21.4	20.5	21.7
Relative Humidity (%)	10-70	45.2	43.7	49.3	43.4
Force at 0° (N)	0-26.7	10.1	16.8	0	0
Force at 0° (N)	97.8-151.2	141.2	99.6	115.7	101.7
Force at 0° (N)	151.2-204.6	166.5	156.1	173.6	152.3
Force at 0° (N)	204.6-258	212.3	219.5	219.5	226.5
Return Angle	12° Maximum	0.2	5.7	1.5	3.5
HYBRID III LATERAL NECK					
Date	-	5Sept07	19Sept07	27Aug07	21Sept07
Sequential Test Number	-	3	4	2	3
Temperature (°C)	18.9-25.5	20.0	21.3	21.7	21.2
Relative Humidity (%)	10-70	57.1	54.7	51.2	48.1
Pendulum Speed (m/s)	6.89-7.13	6.97	6.94	6.98	7.13
Pendulum Pulse 10ms (m/s)	1.96-2.55	2.01	1.97	2.02	2.25
Pendulum Pulse 20ms (m/s)	4.12-5.10	4.27	4.30	4.60	5.01
Pendulum Pulse 30ms (m/s)	5.73-7.01	6.35	6.40	6.86	6.63
Pendulum Pulse 40 –70 ms (m/s)	6.27-7.64	7.33	7.06	6.98	6.57
Max Head rotation (deg)	66-82	75.8	75.2	78.5	81.8
Head angle crosses zero (ms)	58-67	66.9	62.3	61.4	63.0
Peak Moment (Nm)	73-88	84.2	85.1	75.8	76.3
Moment crosses zero (ms)	49-63	53.8	53.3	55.0	54.7
Max rotation wrt pk. moment (ms)	2-15	0.16	4.48	4.32	4.32
HYBRID III LATERAL HEAD DROP					
Date	-	4Sept07	13Sept07	23Aug07	13Sept07
Sequential Test Number	-	3	4	2	3
Temperature (°C)	18.9-25.5	21.3	20.2	21.6	21.2
Relative Humidity (%)	10-70	43.3	44.3	58.6	43.7
Resultant Max (G)	120-150	121.0	129.7	130.4	129.3
Longitudinal Max (G)	<15	13.1	4.03	5.43	7.04

**DUMMY INSPECTION LIST
PRE AND POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

		SID H3 056		SID H3 058	
		PRE	POST	PRE	POST
	Date	11Sept07	12Sept07	11Sept07	12Sept07
	Performed By	Mike Rawski	Mike Rawski	Mike Rawski	Mike Rawski
PART	INSPECTION	RESULT	RESULT	RESULT	RESULT
Skin	Visual	Pass	Pass	Pass	Pass
Head	Visual, Ballast, Accelerometer Mount	Pass	Pass	Pass	Pass
Neck	Visual and Palpated, Cable Torque	Pass	Pass	Pass	Pass
Spine Box	Visual, Ballast, Weldment, Accelerometer Mount	Pass	Pass	Pass	Pass
Rib Cage	Visual, Palpated, Measured, Stiffness	Pass	Pass	Pass	Pass
Sternum	Visual	Pass	Pass	Pass	Pass
Lumbar Spine	Visual	Pass	Pass	Pass	Pass
Abdomen	Visual	Pass	Pass	Pass	Pass
Pelvis	Visual, Palpated, Accelerometer Mount	Pass	Pass	Pass	Pass
Upper Legs	Visual	Pass	Pass	Pass	Pass
Knees	Visual, Stops, Inserts	Pass	Pass	Pass	Pass
Lower Legs	Visual, Range of Motion	Pass	Pass	Pass	Pass
Ankles	Visual, Range of Motion	Pass	Pass	Pass	Pass
Feet	Visual, Range of Motion	Pass	Pass	Pass	Pass
Joints	1 to 2 G Range	Pass	Pass	Pass	Pass
Other		N/a	N/a	N/a	N/a