

REPORT NUMBER: MCW-DOT-09SN02

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

2009 TOYOTA YARIS 3-DOOR LIFTBACK

NHTSA NUMBER: M95109

**PREPARED BY:
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FINAL REPORT

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Prepared by:_____

Date:

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16. Abstract A 55/28 km/h 90° Moving Deformable Barrier (MDB) New Car Assessment Program (NCAP) side impact was conducted on the subject 2009 Toyota Yaris 3-door liftback 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 28 October 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 °C. The target vehicle's maximum post test static crush was 230 mm at level 2. The test vehicle's occupant performance is as follows: <table border="1" data-bbox="149 1218 1505 1491"> <thead> <tr> <th></th> <th><u>Units</u></th> <th><u>DRIVER</u></th> <th><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left upper rib (LUR) acceleration</td> <td>G</td> <td>38.1</td> <td>84.1</td> </tr> <tr> <td>Left lower rib (LLR) acceleration</td> <td>G</td> <td>49.5</td> <td>86.6</td> </tr> <tr> <td>Lower spine (T₁₂) acceleration</td> <td>G</td> <td>52.0</td> <td>72.4</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td></td> <td>50.8</td> <td>79.5</td> </tr> <tr> <td>Pelvis (PEV) acceleration</td> <td>G</td> <td>69.9</td> <td>80.9</td> </tr> <tr> <td>HIC</td> <td></td> <td>176.6</td> <td>318.7</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.							<u>Units</u>	<u>DRIVER</u>	<u>PASS.</u>	Left upper rib (LUR) acceleration	G	38.1	84.1	Left lower rib (LLR) acceleration	G	49.5	86.6	Lower spine (T ₁₂) acceleration	G	52.0	72.4	Thoracic Trauma Index (TTI)		50.8	79.5	Pelvis (PEV) acceleration	G	69.9	80.9	HIC		176.6	318.7
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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																														
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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'09 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 Toyota Motor Corporation.

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 2009 Toyota Yaris 3-door liftback 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 1276.3 kg test vehicle was impacted by the 1356.7 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 28 October 2008.

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 058 and 137 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

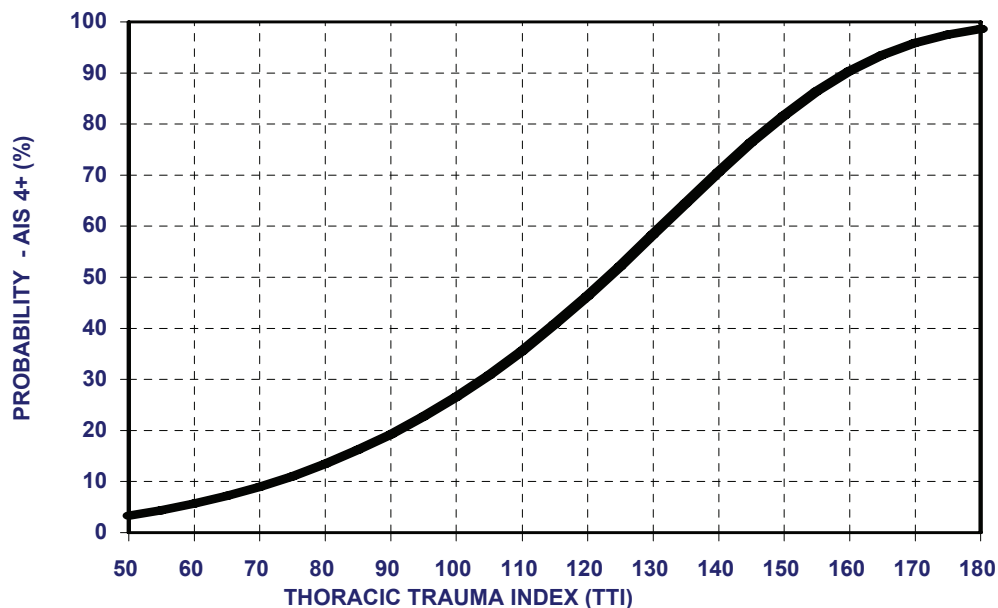
The test vehicle sustained a maximum static crush of 230 mm at level 2, 1200 mm rearward of the vertical impact line.

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	176.6	318.7
T1 (ms)	40.9	34.0
T2 (ms)	69.2	65.0
TTI	50.8	79.5
Maximum pelvic acceleration (G)	69.9	80.9

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	Yes	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	2009	Air conditioning	Yes
Make	Toyota	Anti-lock brakes	Yes
Model	Yaris	AM/FM radio	Yes
Body style	3-door liftback	All wheel drive	No
NHTSA number	M9 5109	Combo bag	No
MCW test ID	09sn02	Console	Yes
VIN	JTDJT903195223805	Cruise/speed control	Yes
Color	Carminc	Curtain bag	Yes - front and rear
Build date	September 2009	Disc brakes	Yes – front only
Engine No. of cylinders	4	Frontal bag	Yes
Engine Displacement (L)	1.5	Power brakes	Yes
Engine Placement	Lateral	Power door locks	Yes
Transmission	Manual 5 speed	Power steering	Yes
Final drive	Front wheel drive	Power windows	Yes
Delivery date	October 20, 2008	Torso bag	Yes - front only
Odometer reading	26 miles	Tilt steering wheel	Yes

CERTIFICATION LABEL INFORMATION			
Manufacturer	Toyota Motor Corporation	GVWR (kg)	1445
		GAWR front (kg)	830
Date of manufacture	September 2009	GAWR rear (kg)	830

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

CARGO CAPACITY CALCULATION			
	Units	Value	Reference label
Vehicle maximum capacity	kg	383	(A)
Number of occupants (7) X 68.04 kg	kg	340.2	(B)
Cargo capacity (RCLW) †	kg	42.8	(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	322.2	361.8	366.8
Right front	kg	325.9	344.1	335.0
Left rear	kg	217.7	308.6	312.7
Right rear	kg	210.0	261.8	268.2
Total front	kg	648.2	705.9	701.8
% Total front	%	60.2	55.3	54.7
Total rear	kg	427.7	570.4	580.9
%Total rear	%	39.8	44.7	45.3
Total	kg	1075.9	1276.3	1282.7

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	1075.9	(D)
Maximum cargo capacity (RCLW)	kg	42.8	(C)
Mass of SID HIII's (1 or 2)	kg	163.7	(E)
Test vehicle target mass (TVTW)	kg	1276.3	(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)	27.3 kg
Location	trunk
<u>Components removed from test vehicle</u> Non-struck side front and rear door glasses, Non-struck side front and rear door interior panels Non-struck side rear tail-light	

IMPACT LOCATION ON TEST VEHICLE	
Wheelbase	2460 mm
Nominal impact point	290 mm rearward of front axle
Actual impact point	273 mm rearward of front axle

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

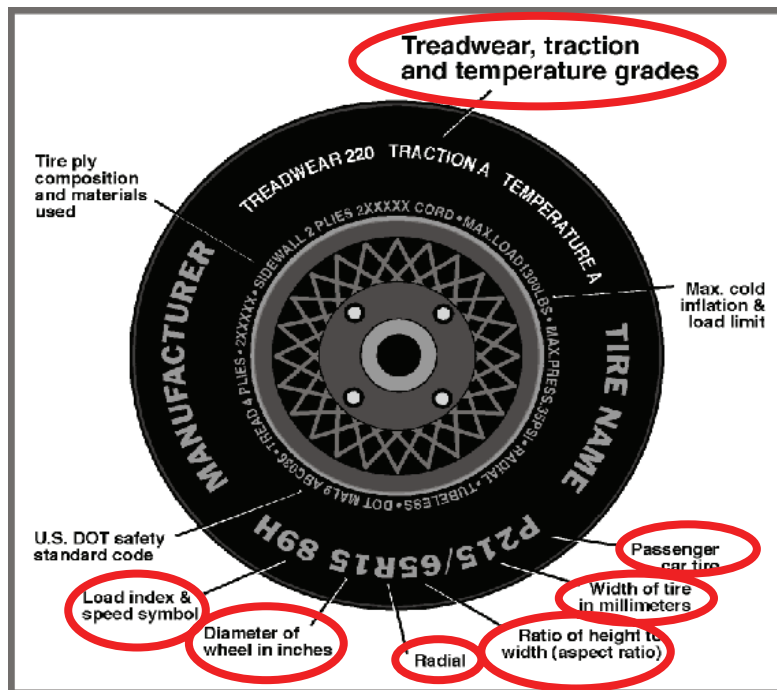
TEST VEHICLE ATTITUDES				
	Units	As delivered	As tested	Fully loaded
Left front	mm	678	661	661
Right front	mm	685	677	677
Left rear	mm	690	645	641
Right rear	mm	695	659	657
CG (X)	mm	977.9	1099.4	1114.1

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

CG (X) measured rearward from front axle centerline

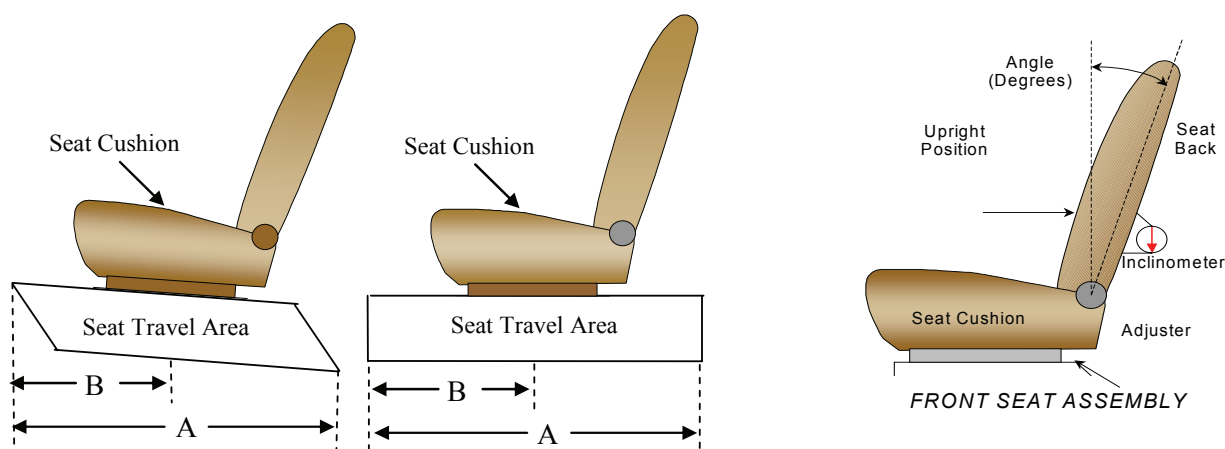
AUTOMATIC DOOR LOCK (ADL) INFORMATION				
	Left front	Left rear	Right front	Right rear
ADL present	No	N/a	No	N/a
ADL deactivated	N/a	N/a	N/a	N/a
Deactivation method	N/a			
Door lock status	Unlocked	N/a	Unlocked	N/a

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	P185/60R15	P185/60R15
Tire size on vehicle	P185/60R15	P185/60R15
Tire manufacturer	Bridgestone	Bridgestone
Tire name	RE92	RE92
Tire type	Tubeless Steelbelted M+S	Tubeless Steelbelted M+S
Tire width (mm)	185	185
Ratio of height to width (aspect ratio)	60	60
Radial	Radial	Radial
Wheel diameter (inches)	15	15
Load index & speed symbol	84T	84T
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	Manual/adjustable	Fixed
Fore/aft total travel (mm)	240	N/a
Number of detents	17	N/a
Test position	9 th notch from full forward	As positioned

‡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	1.4°	Non-adjustable
Test position	7 th notch from full forward	As positioned

‡Full upright = notch 0

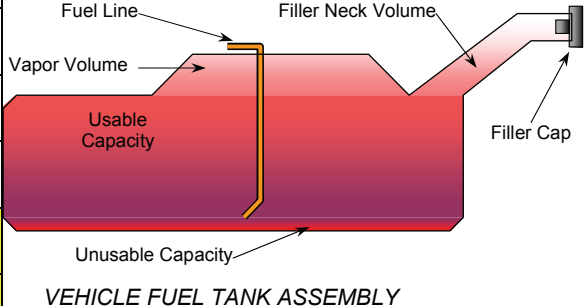
Seat belt position

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	No	No
Total travel (mm)	N/a	N/a
Test position	N/a	As positioned

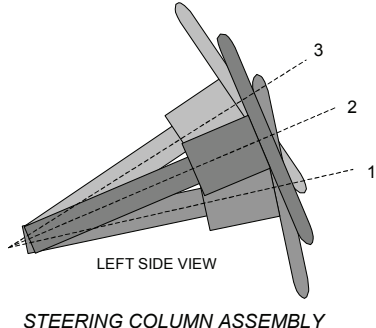
DATA SHEET NO. 3
TEST VEHICLE INFORMATION (CONTINUED)

Fuel tank information

STODDARD INFORMATION			
Description	Units	Value	
Usable capacity of standard equipment fuel tank	L	42.0	
Usable capacity of optional equipment fuel tank	L	0.0	
Usable capacity of vehicle used for certification testing to requirements	L	42.0	
Amount of stoddard added for test	L	39.3	
% Usable capacity (92%-94%)	%	93.6	
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.		

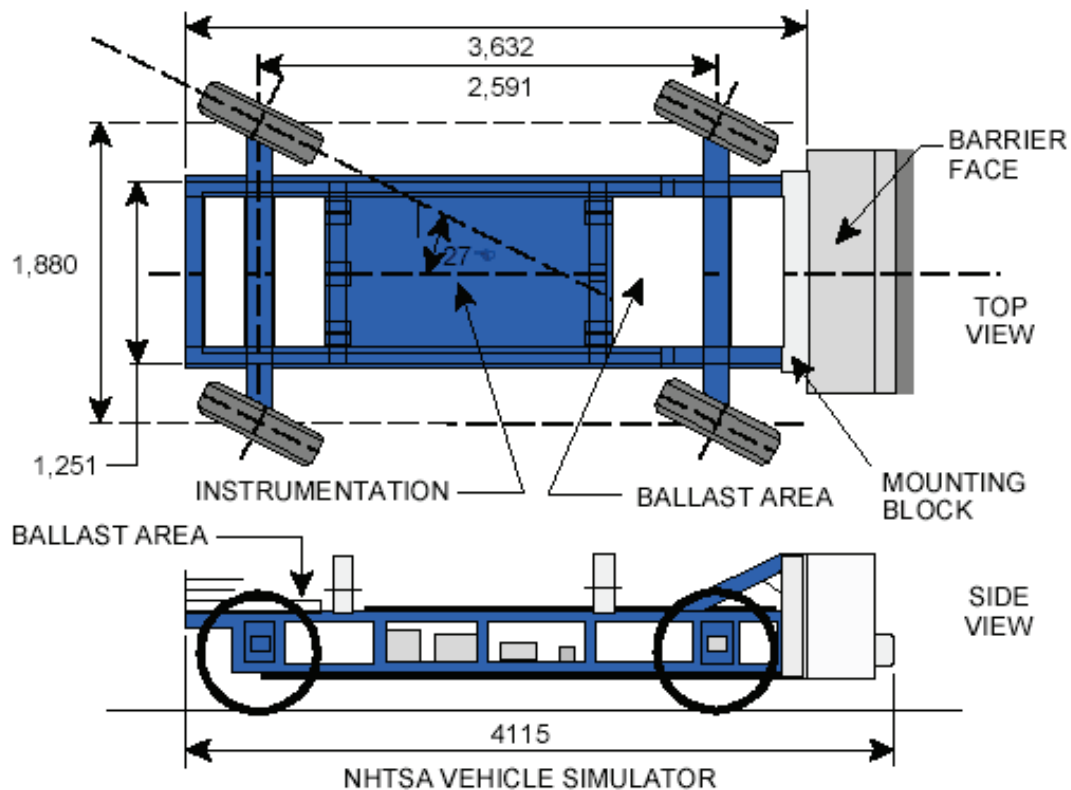
Steering wheel information

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	38.4°	
Steering wheel fore/aft travel	Fixed	
Number of detents	N/a	
Test position	Steering wheel positioned 37.0° 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

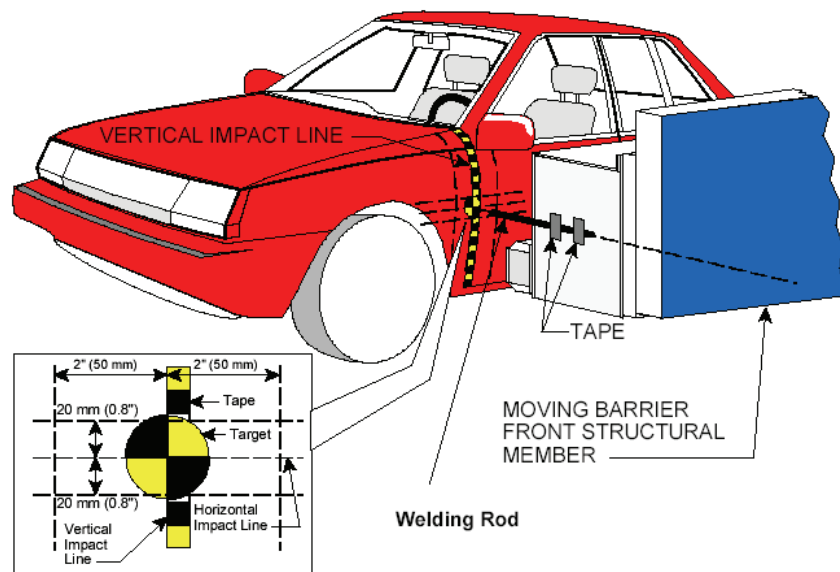
MDB SPECIFICATIONS				
	Units	Specification	Range	Value
Overall Width of Framework Carriage	mm	1251	1226-1276	1245
Overall Length w/Impactor Face	mm	4115	4090-4140	4101
Overall Length w/o Impactor Face	mm	3632	3607-3657	3617
Longitudinal Cg from Front Axle	mm	1123	1098-1148	1135
Track Width	mm	1880	1855-2005	1864
Mass	kg	1361	1356.5-1365.5	1356.7
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	412.8
Right front	kg	347.9
Left rear	kg	269.4
Right rear	kg	326.6
Total front	kg	760.7
% Total front	%	56.1
Total rear	kg	596.0
%Total rear	%	43.9
Total	kg	1356.7

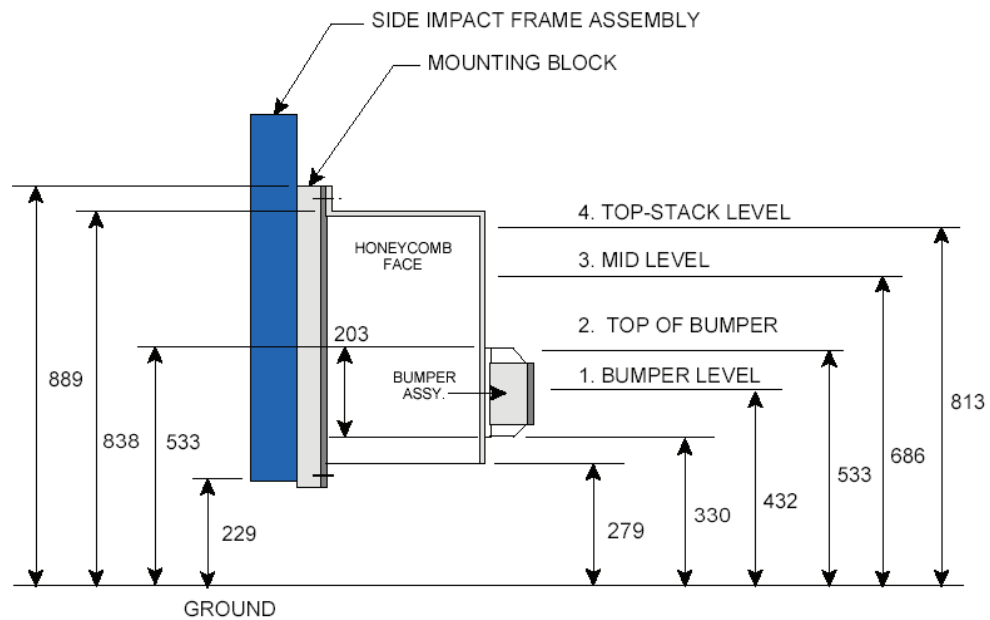
IMPACT SPEED				
	Units	Specification	Range	Value
Primary speed trap	kmh	61.9	61.1-62.7	38.4
Redundant speed trap	kmh	61.9	61.1-62.7	38.3



IMPACT POINT INFORMATION		
Vertical impact line is	290 mm rearward of front axle	
Actual impact is	273 mm rearward of front axle	
Measurement	Value	Tolerance
Impact point distance from vertical impact line	17 mm forward	+/- 50 mm
Impact point distance from horizontal impact line	5 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	278	276
Bottom of bumper	mm	330	327-333	330	332
Top of bumper	mm	533	530-536	531	533
Top of barrier	mm	838	835-841	836	839



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/058	SID HIII/137
Head contact	To side curtain airbag; top to roof rail	To roof rail; chin to side curtain airbag
Upper torso contact	To seat mounted side airbag	To left rear door panel 35 mm below window sill
Lower torso contact	To seat mounted side airbag	To left rear door panel 155 mm below window sill
Left leg contact	To left front door along bottom of armrest	To left rear door panel along bottom of armrest 435 mm below window sill
Left knee contact	To left front door panel 250 mm below window sill	To left rear door panel along bottom of armrest 400 mm below window sill

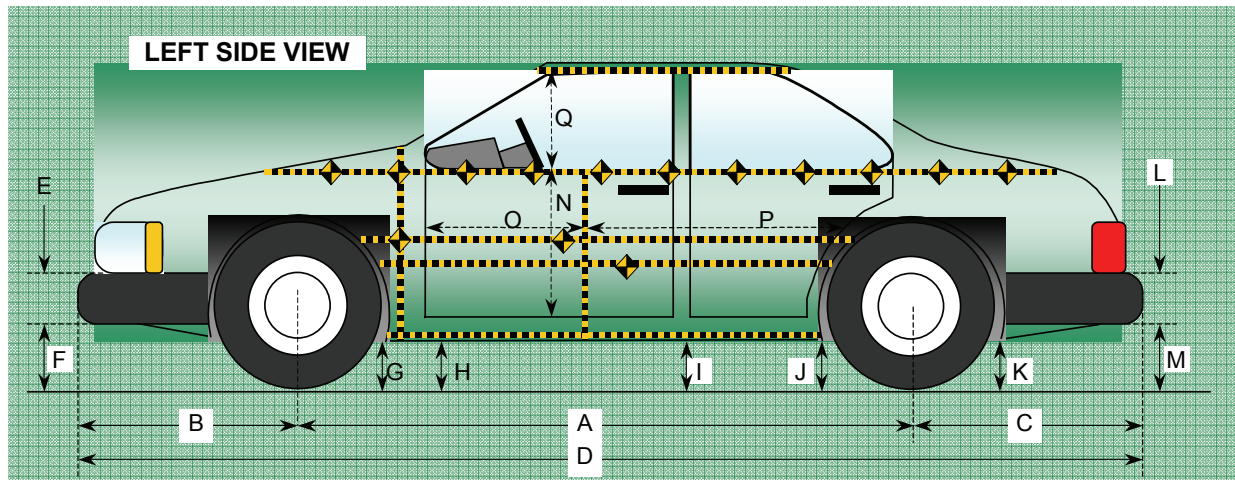
POST TEST DOOR OPENING AND SEAT TRACK INFORMATION		
Description	Front	Rear
Locked/unlocked doors	Unlocked	N/a
Left side door opening	Closed/latched/inoperable	N/a
Right side door opening	Closed/latched/operable	N/a
Seat movement	12 mm of seat crush	125 mm of seat crush
Seat back failure	None	None

POST TEST STRUCTURAL OBSERVATIONS	
Critical areas of performance	Observations/conclusions
Pillar performance	Lower interior panel of b-pillar separated from upper b-pillar below d-ring
Sill separation	Max separation of 61 mm at 600 mm line on driver's door
Windshield damage	No damage
Window damage	Front and rear struck side windows shattered at impact
Other notable effects	None noted

DATA SHEET NUMBER 5
POST TEST OBSERVATIONS (CONTINUED)

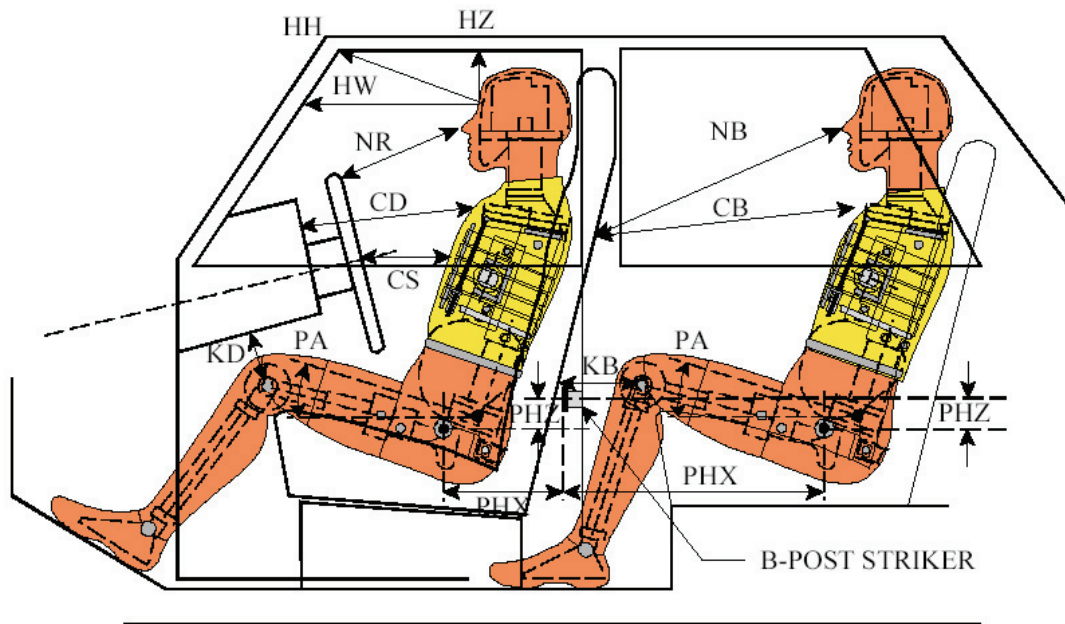
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION				
Restraint Type	Left front (Driver) occupant Location 01		Left rear (Passenger) occupant Location 04	
	Installed	Operation	Installed	Operation
Front airbag	Yes - steering wheel	Did not deploy	No	N/a
Side airbag	Yes - seat back	Deployed	No	N/a
Head airbag	No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

DATA SHEET NUMBER 6
VEHICLE PRE AND POST MEASUREMENTS



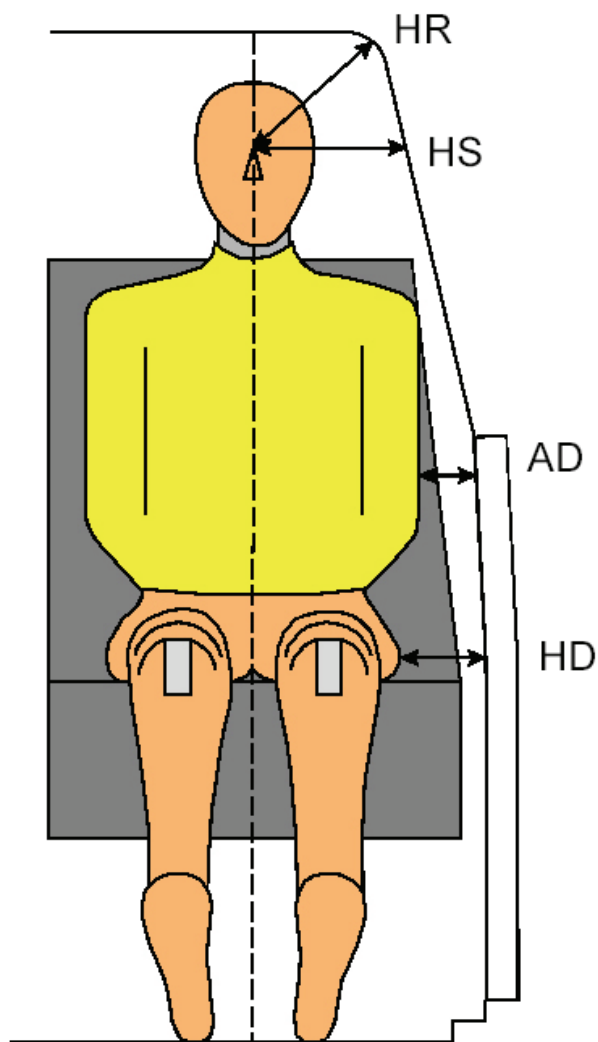
VEHICLE DIMENSIONS				
Code	Description	Pre test	Post test	Change
		mm	mm	mm
A	Wheelbase	2460	2409	-51
B	Front axle to front side of vehicle	467	466	-1
C	Rear axle to rear side of vehicle	427	475	48
D	Total length at centerline	3835	3821	-14
E	Front bumper thickness	285	285	0
F	Front bumper bottom to ground	258	247	-11
G	Sill height at front wheel well	269	282	13
H	Sill height at front door leading edge	245	318	73
I	Sill height at b-pillar	265	308	43
J1	Sill height at rear wheel well	198	186	-12
J2	Pinch weld height at rear wheel well	273	281	8
K	Sill height aft of rear wheel well	333	292	-41
L	Rear bumper thickness	242	242	0
M	Rear bumper bottom to ground	362	327	-35
N	Sill height to window bottom sill	783	714	-69
O	Front door leading edge to impact C/L	1270	1258	-12
P	Rear door trailing edge to impact C/L	723	684	-39
Q	Front window opening	487	490	3
R	Right side length	3354	3359	5
S	Left side length	3354	3350	-4
T	Vehicle width at b-pillar	1685	1496	-189

DATA SHEET NUMBER 7
SID HIII LONGITUDINAL CLEARANCES



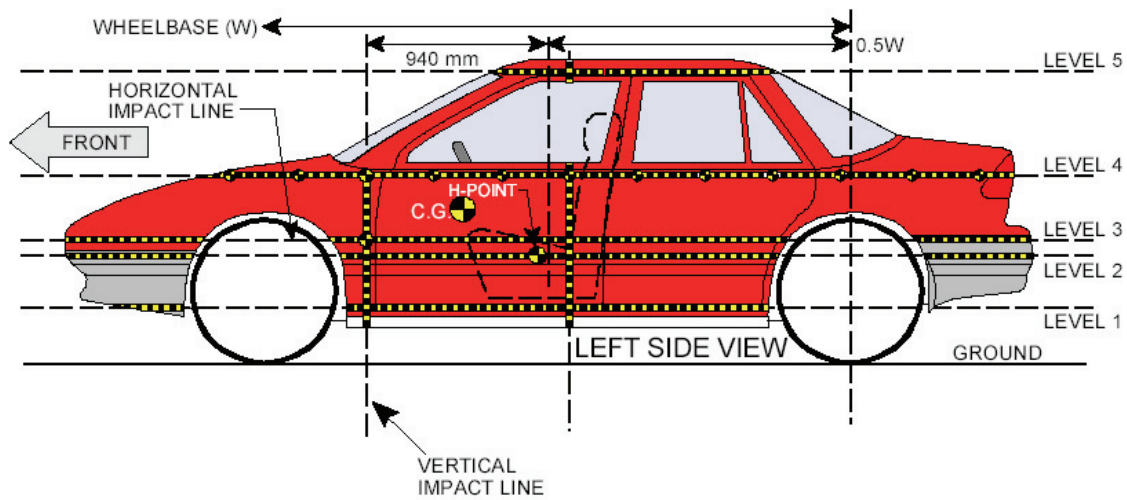
SID HIII LONGITUDINAL CLEARANCE MEASUREMENTS					
Driver code	Pass. code	Measurement description	Units	Left front seat	Left rear seat
		ATD serial number	-	058	137
HH	-	Head to header	mm	386	N/a
HW	-	Head to windshield	mm	662	N/a
HZ	HZ	Head to roof	mm	183	139
NR	NB	Nose to rim/nose to seatback	mm	448	650
CD	CB	Chest to dash or seatback	mm	591	529
CS	-	Chest to steering wheel	mm	338	N/a
KDL	KBL	Left knee to dash or seatback length	mm	150	229
KDA	KBA	Left knee to dash or seatback angle	°	15.5	29.1
KDR	KBR	Right Knee to dash or seatback length	mm	148	234
KDA	KDA	Right knee to dash or seatback angle	°	15.9	26.8
PA	PA	Pelvic angle	°	24.1	23.1
PHX	PHX	H-Point to striker (x-axis)	mm	399	-486
PHZ	PHZ	H-Point to striker (z-axis)	mm	-208	-177

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	-	058	137
HR	Head to side header	mm	205	150
HS	Head to side window	mm	327	183
-	Shoulder to door	mm	100	61
AD	Arm to door	mm	105	92
HD	H-point to door	mm	139	151

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	1396	11	1050 & 1350
4	Window sill	928	92	1500
3	Mid-door	601	223	1650
2	Driver H-point	554	230	1200
1	Axle centerline or sill top	253	108	1350
Maximum static crush		230 mm at level 2 1200 mm rearward from vertical impact line		

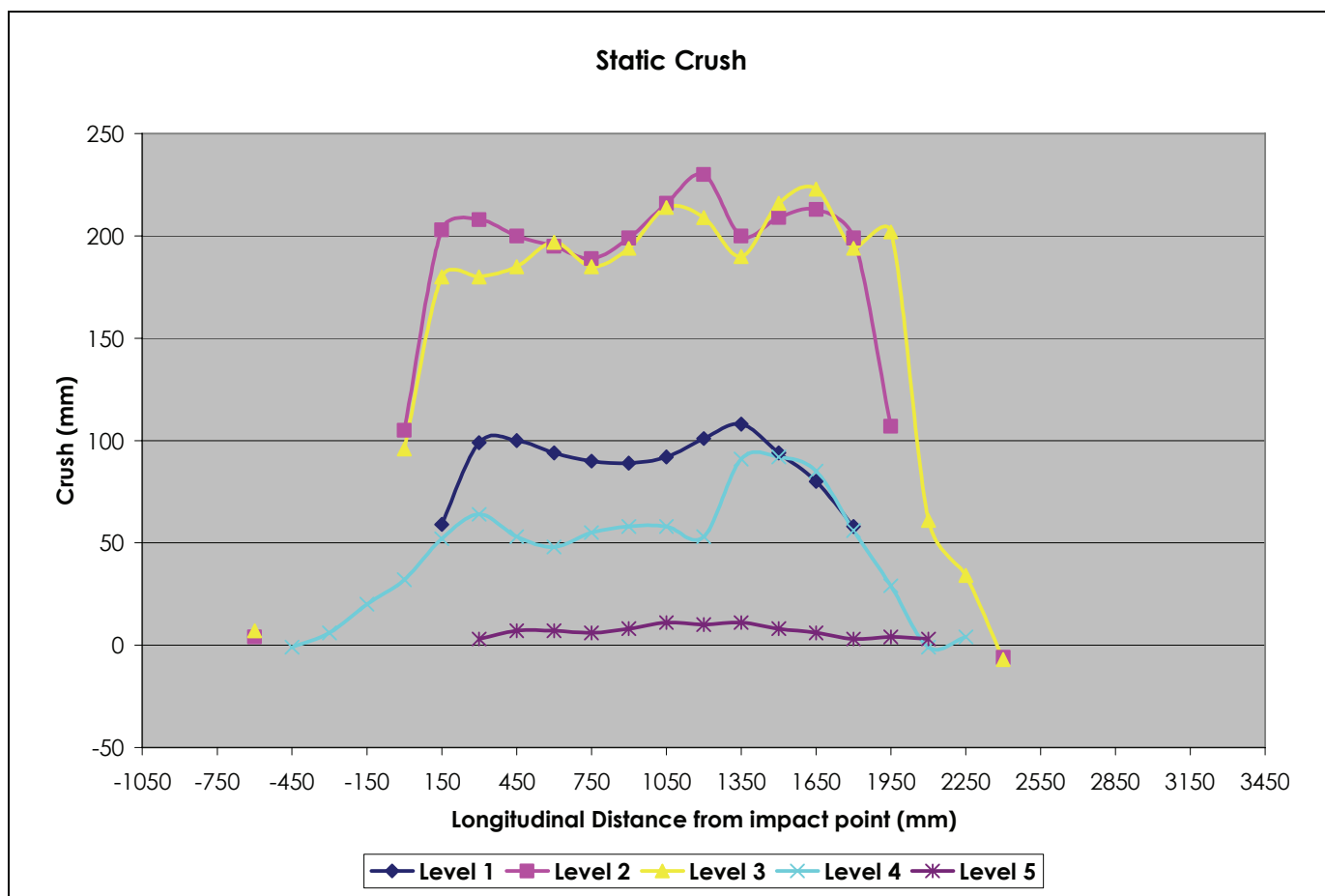
Height measurements taken 750 mm rearward from vertical impact line.

DATA SHEET 10
VEHICLE STATIC CRUSH PROFILE

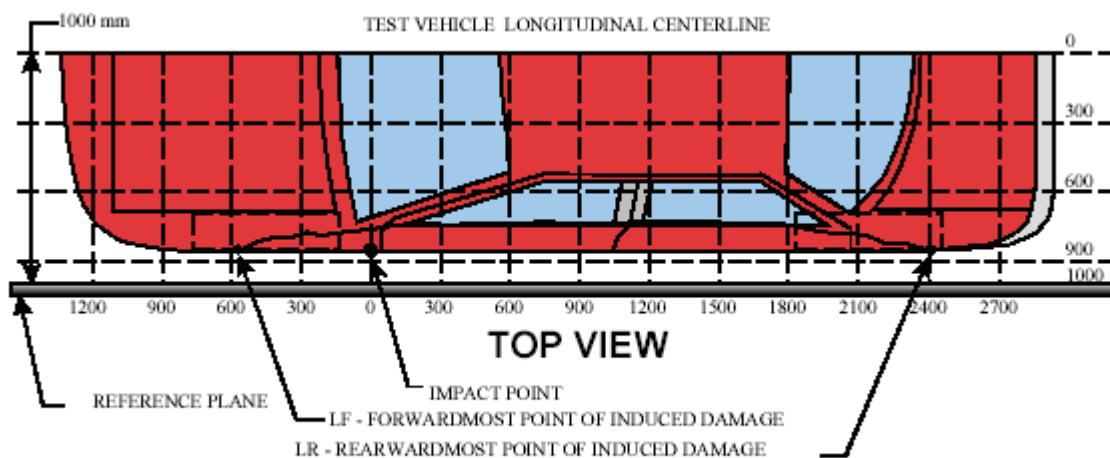
Note: All dimensions are in millimeters with a tolerance of ± 3 mm

TEST VEHICLE STATIC CRUSH																
Level		1			2			3			4			5		
Height		253			554			601			928			1396		
		Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush
DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT	-1050															
	-900	2														
	-750															
	-600				235	239	4	237	244	7						
	-450										290	289	-1			
	-300										283	289	6			
	-150										285	305	20			
	0				226	331	105	228	324	96	293	325	32			
	150	260	319	59	244	447	203	245	425	180	298	350	52			
	300	266	365	99	246	454	208	245	425	180	302	366	64	465	468	3
	450	265	365	100	244	444	200	243	428	185	302	355	53	483	490	7
	600	263	357	94	246	441	195	238	435	197	305	353	48	505	512	7
	750	261	351	90	240	429	189	237	422	185	305	360	55	524	530	6
	900	260	349	89	239	438	199	235	429	194	308	366	58	536	544	8
	1050	260	352	92	238	454	216	234	448	214	310	368	58	545	556	11
	1200	261	362	101	238	468	230	234	443	209	316	369	53	555	565	10
	1350	262	370	108	238	438	200	234	424	190	320	411	91	564	575	11
	1500	264	358	94	239	448	209	235	451	216	324	416	92	569	577	8
	1650	266	346	80	239	452	213	236	459	223	329	414	85	575	581	6
	1800	256	314	58	235	434	199	237	431	194	337	393	56	581	584	3
	1950				223	330	107	233	435	202	347	376	29	587	591	4
	2100							233	294	61	362	361	-1	595	598	3
	2250							243	277	34	382	386	4			
	2400				245	239	-6	274	267	-7						
	2550															
	2700															
	2850															
3000																
	3150															
	3330															

DATA SHEET 10
VEHICLE STATIC CRUSH PROFILE

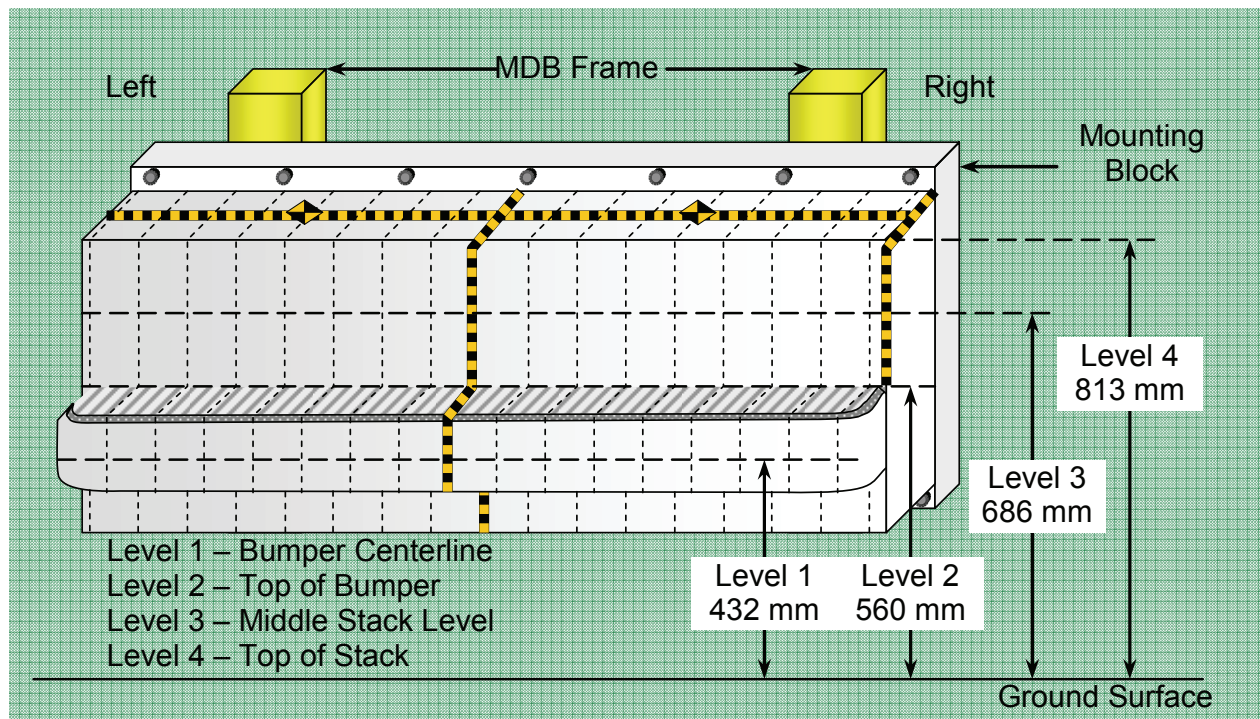


DATA SHEET 11
VEHICLE DAMAGE PROFILE DISTANCES (DPD)



DPD MEASUREMENTS				
	DPD measurement (mm)	Pre test (mm)	Post test (mm)	Crush (mm)
1	-300	237	237	0
2	210	242	453	211
3	720	249	428	179
4	1230	257	458	201
5	1740	263	459	196
6	2250	272	272	0

DATA SHEET 12
DEFORMABLE BARRIER STATIC CRUSH

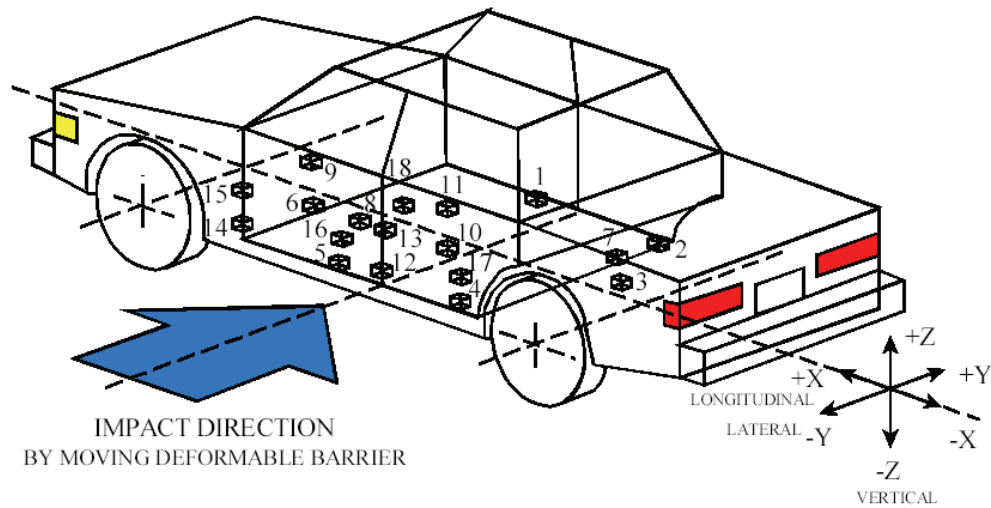


DEFORMABLE BARRIER FACE SUMMARY		
Barrier face manufacturer		Plascore
Serial number		A0908086
Level	Description	Maximum crush
1	Center of bumper	152
2	Top of bumper	78
3	Middle of stack	111
4	Top of stack	141
Maximum post test intrusion is 152 mm at level 1		

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	53	34	25	41	63	52	32	24	25	25	28	27	45	53	66	91	141
3	35	25	24	37	56	34	18	12	11	11	12	13	16	21	31	51	111
2	78	64	55	52	42	37	35	31	32	29	29	31	31	32	34	39	50
1	152	139	123	123	120	112	102	96	97	93	93	92	91	90	93	111	105

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	2102	680	169
2	Right sill at rear seat	1287	684	161
3	Rear floor pan above axle	621	63	-61
4	Left sill at rear door	1284	-669	161
5	Left sill at front door	2103	-676	174
6	Left front door C/L	†	†	†
7	Rear occupant compartment	1337	356	78
8	Left front door mid-rear	†	†	†
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	1471	-647	-163
13	Left middle b-pillar	1457	-642	-358
14	Left lower a-pillar	2643	-750	-162
15	Left middle a-pillar	2645	-751	-346
16	Front seat track	2068	-584	37
17	Rear seat track or structure	1328	-333	81
18	Vehicle CG	1922	25	-36

Origin

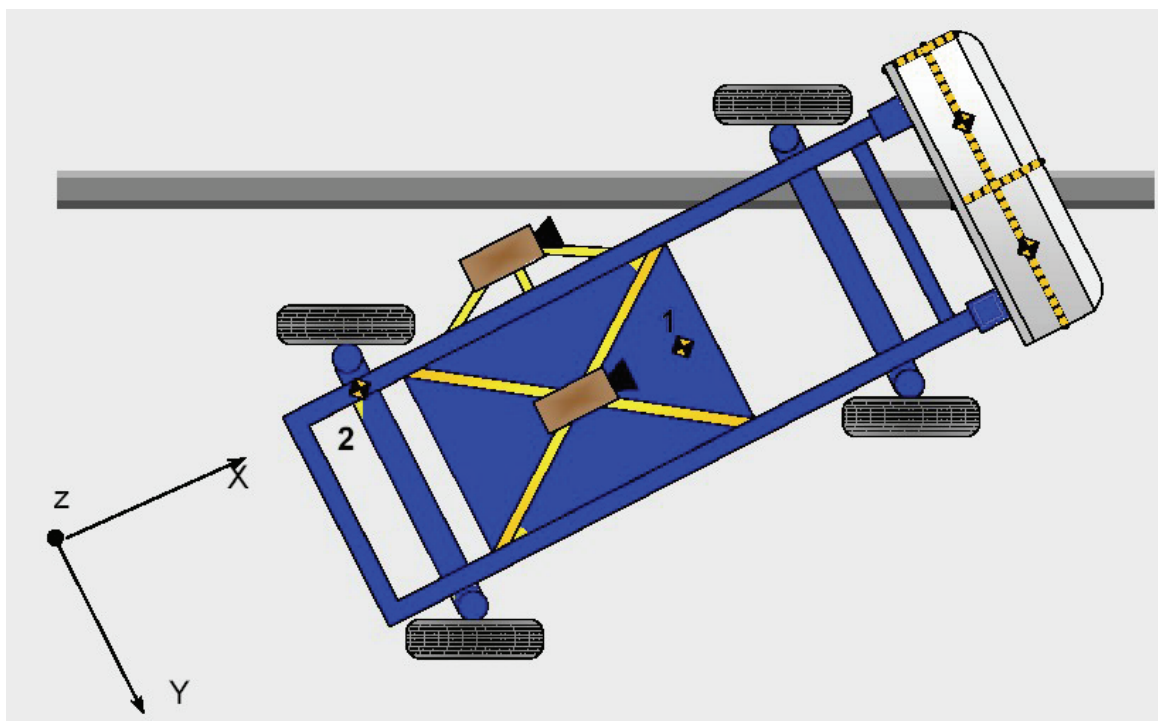
X Rear bumper
Y Midline of vehicle
Z Top of rear bumper

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

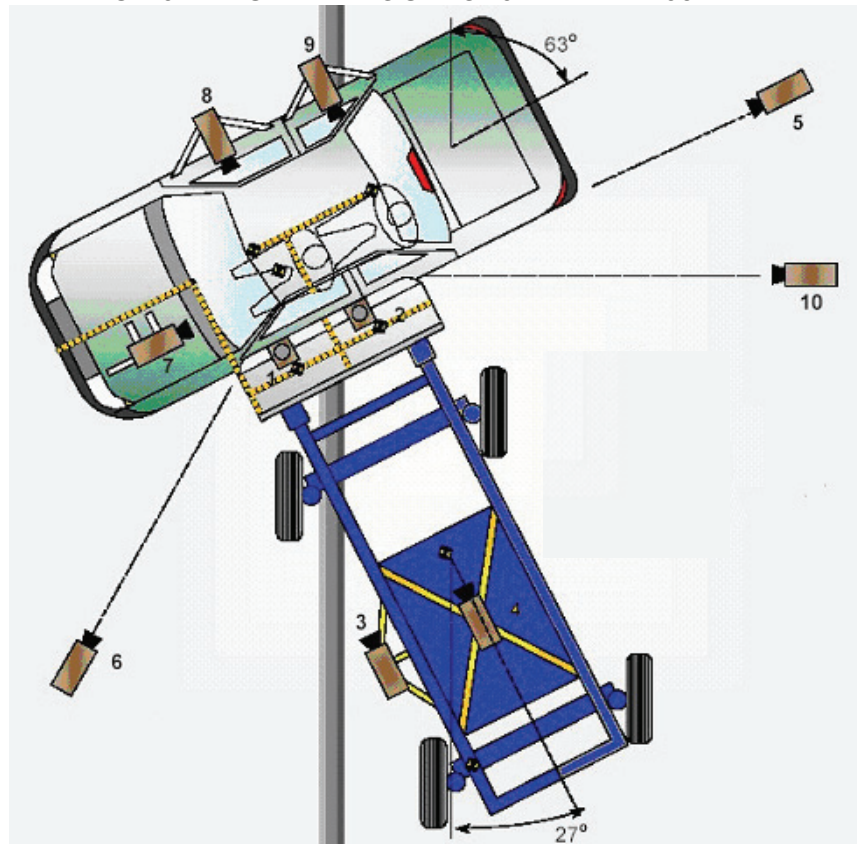
Origin

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	-323	-671	-4904	90	12.5	1000
2	Overhead close-up view of impact plane	-660	-204	-4547	90	16	1000
3	MDB onboard close-up view of impact point	-2035	-108	-97	0.5	25.4	1000
4	MDB onboard view of driver dummy	-2266	803	-896	4.3	13	1000
5	Right side ground level overall view	-801	12797	-967	5.1	50	1000
6	Left side ground level overall view	-1603	-3553	-1097	9.6	25	1000
7	Test vehicle onboard driver front view	-481	461	-435	8.5	25	1000
8	Test vehicle onboard driver side view	1622	889	-299	8.5	12.5	1000
9	Test vehicle onboard passenger side view	1684	1698	-358	7.2	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

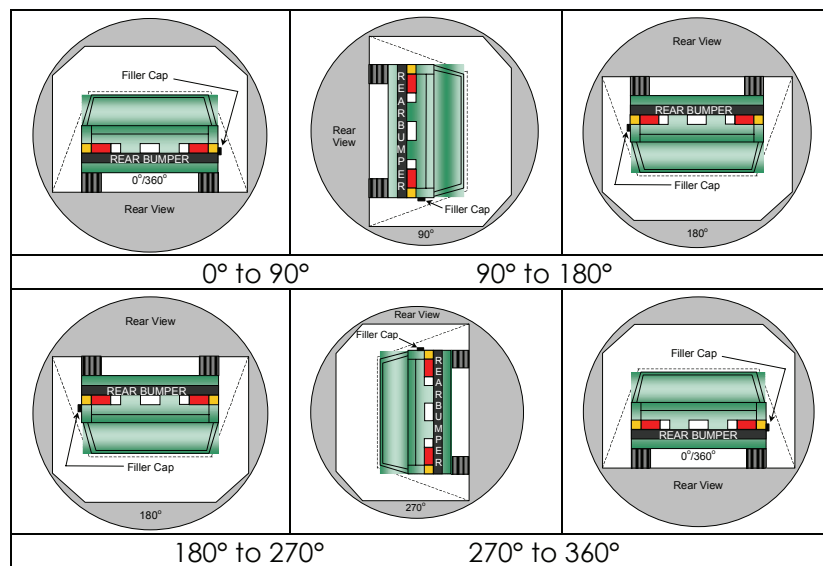
+(Z) Down

DATA SHEET 16
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 19° C Test Time: 2:00 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°	64	300	364
90° to 180°	65	300	365
180° to 270°	66	300	366
270° to 360°	66	300	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 door	A-17
A-28	Post test front $\frac{3}{4}$ view of left side door	A-17
A-29	Pre test rear $\frac{3}{4}$ view of left side door	A-18
A-30	Post test rear $\frac{3}{4}$ view of left side door	A-18
A-31	Pre test driver, left side view	A-19
A-32	Post test driver, left side view	A-19
A-33	Pre test driver shoulder clearance	A-20
A-34	Post test driver shoulder clearance	A-20
A-35	Pre test driver, right side view	A-21
A-36	Post test driver, right side view	A-21
A-37	Post test driver contact locations (1)	A-22
A-38	Post test driver contact locations (2)	A-22
A-39	Pre test passenger, left side view	A-23
A-40	Post test passenger, left side view	A-23
A-41	Pre test passenger shoulder clearance	A-24
A-42	Post test passenger shoulder clearance	A-24
A-43	Pre test passenger, right side view	A-25
A-44	Post test passenger, right side view	A-25

Figure	Photograph Description	Page
A-45	Post test passenger contact locations (1)	A-26
A-46	Post test passenger contact locations (2)	A-26
A-47	Pre test front view of MDB barrier face	A-27
A-48	Post test front view of MDB barrier face	A-27
A-49	Pre test overhead view of MDB barrier face	A-28
A-50	Post test overhead view of MDB barrier face	A-28
A-51	Pre test right side view of MDB barrier face	A-29
A-52	Post test right side view of MDB barrier face	A-29
A-53	Pre test left side view of MDB barrier face	A-30
A-54	Post test left side view of MDB barrier face	A-30
A-55	FMVSS301 0 degrees	A-31
A-56	FMVSS301 90 degrees	A-31
A-57	FMVSS301 180 degrees	A-32
A-58	FMVSS301 270 degrees	A-32
A-59	FMVSS301 360 degrees	A-33
A-60	Impact	A-33



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

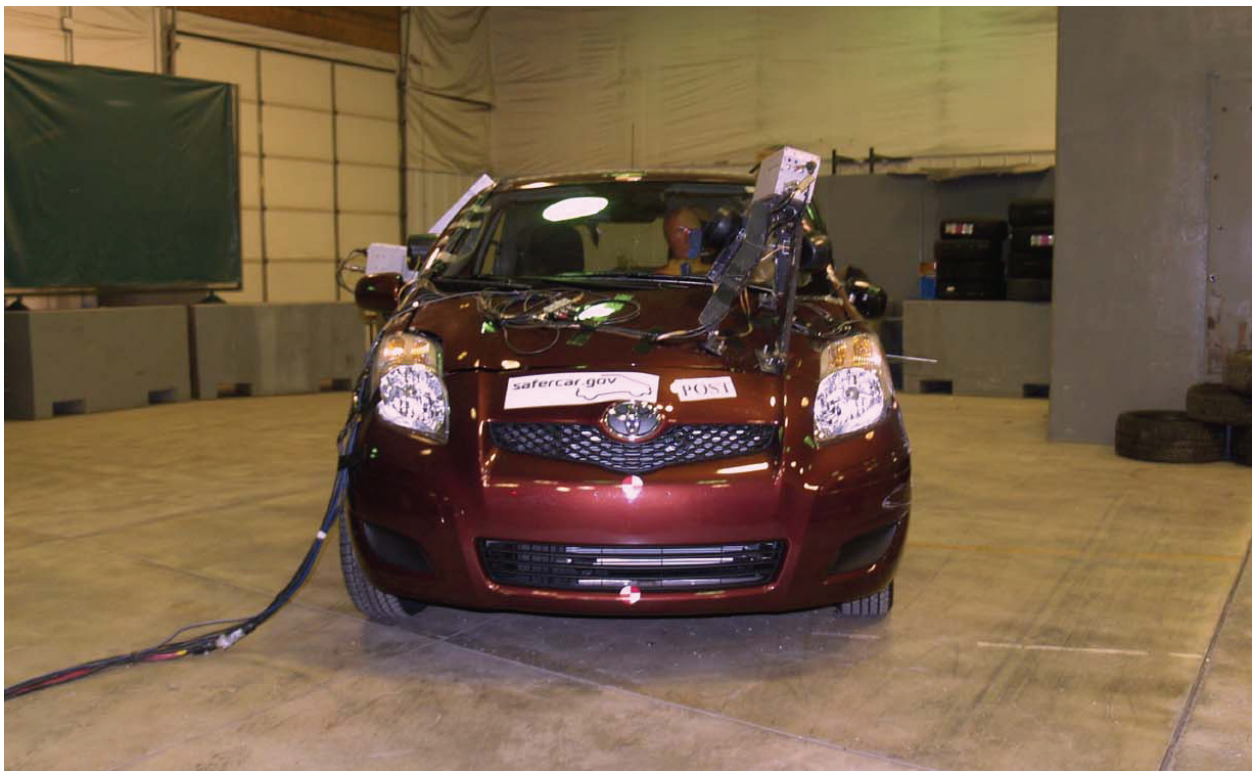


Figure A-6: Post test front view of test vehicle



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

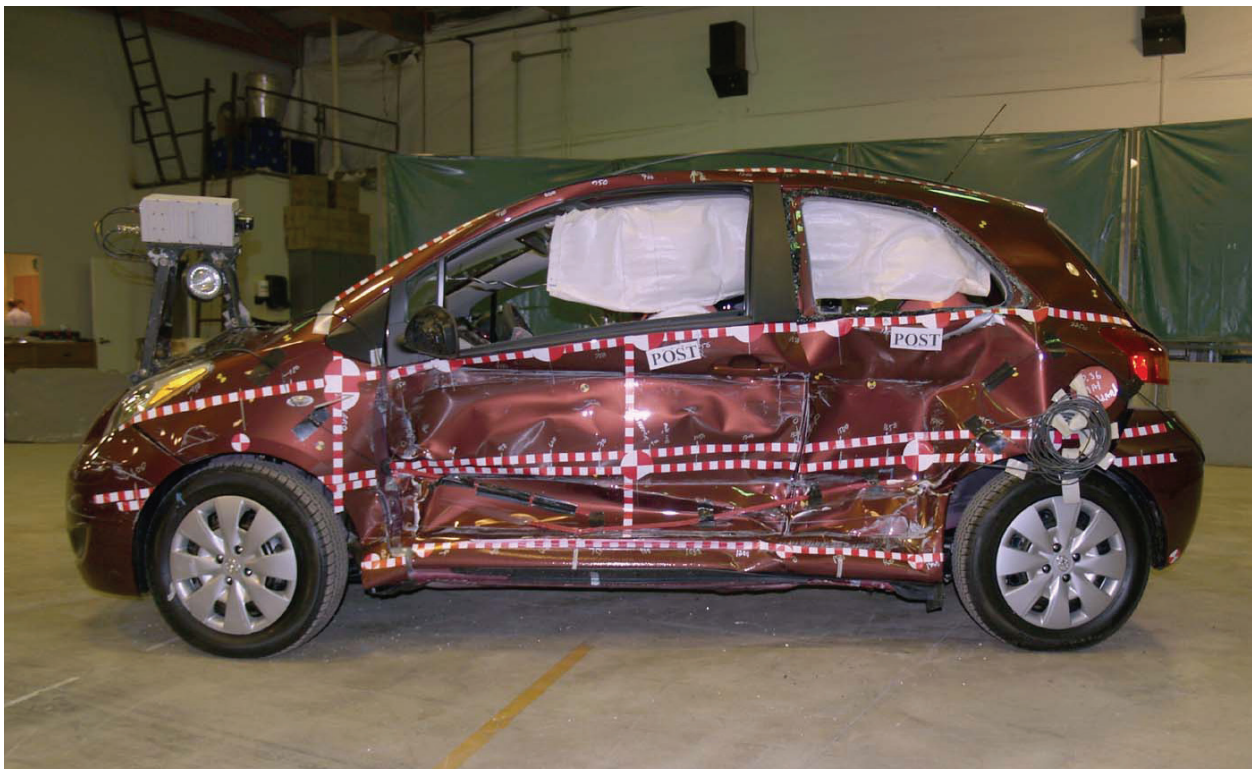


Figure A-10: Post test left side view of test vehicle



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

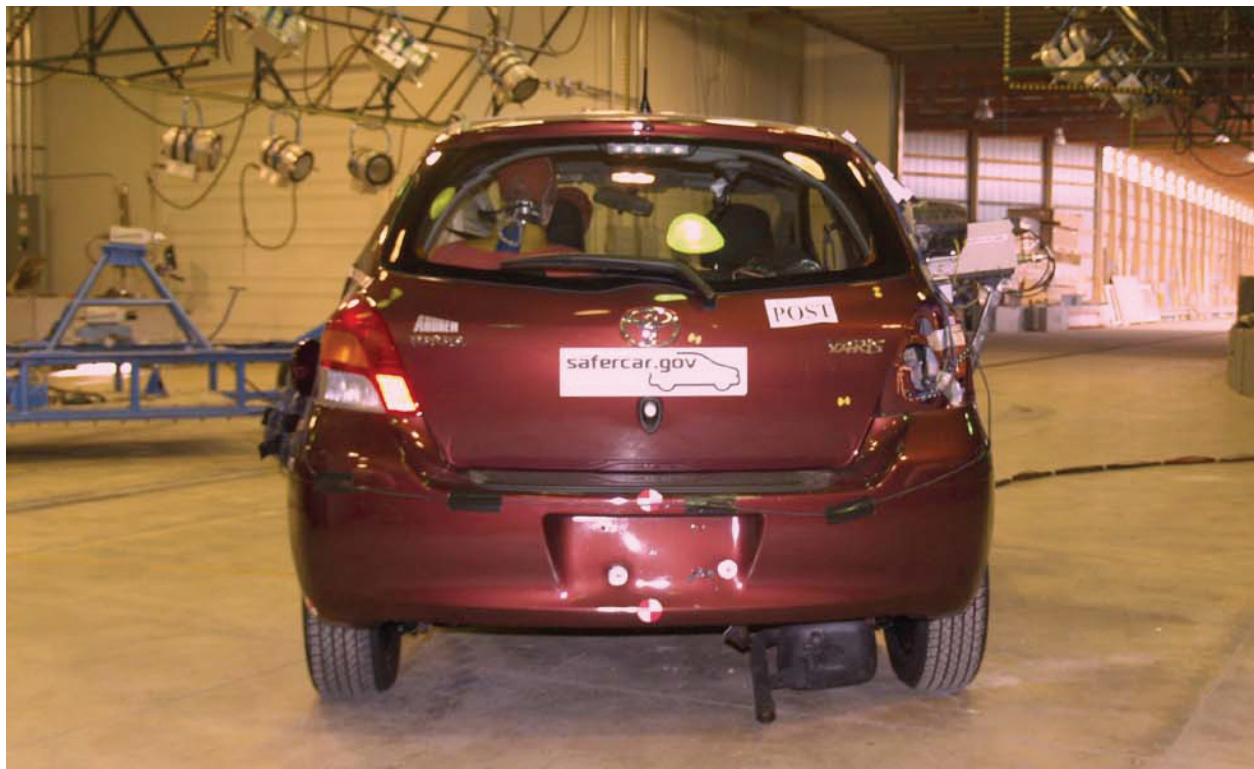


Figure A-14: Post test rear view of test vehicle



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

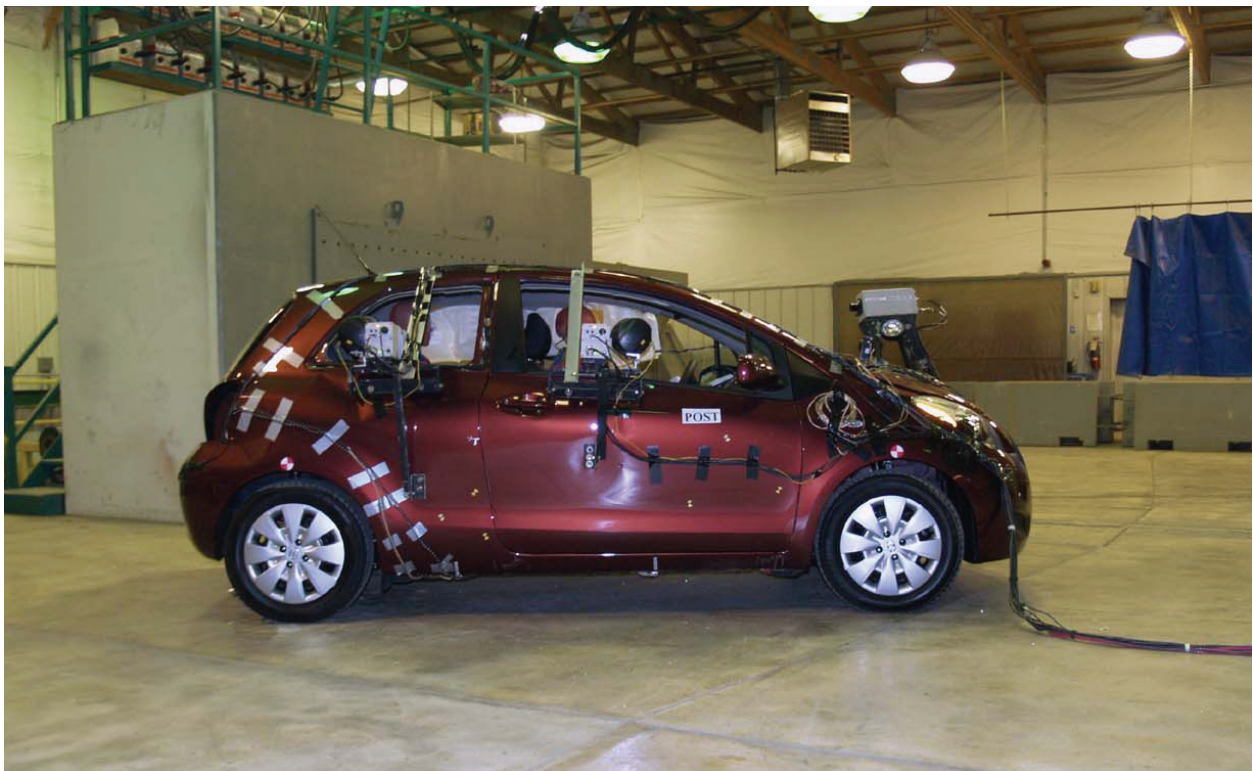


Figure A-18: Post test right side view of test vehicle



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

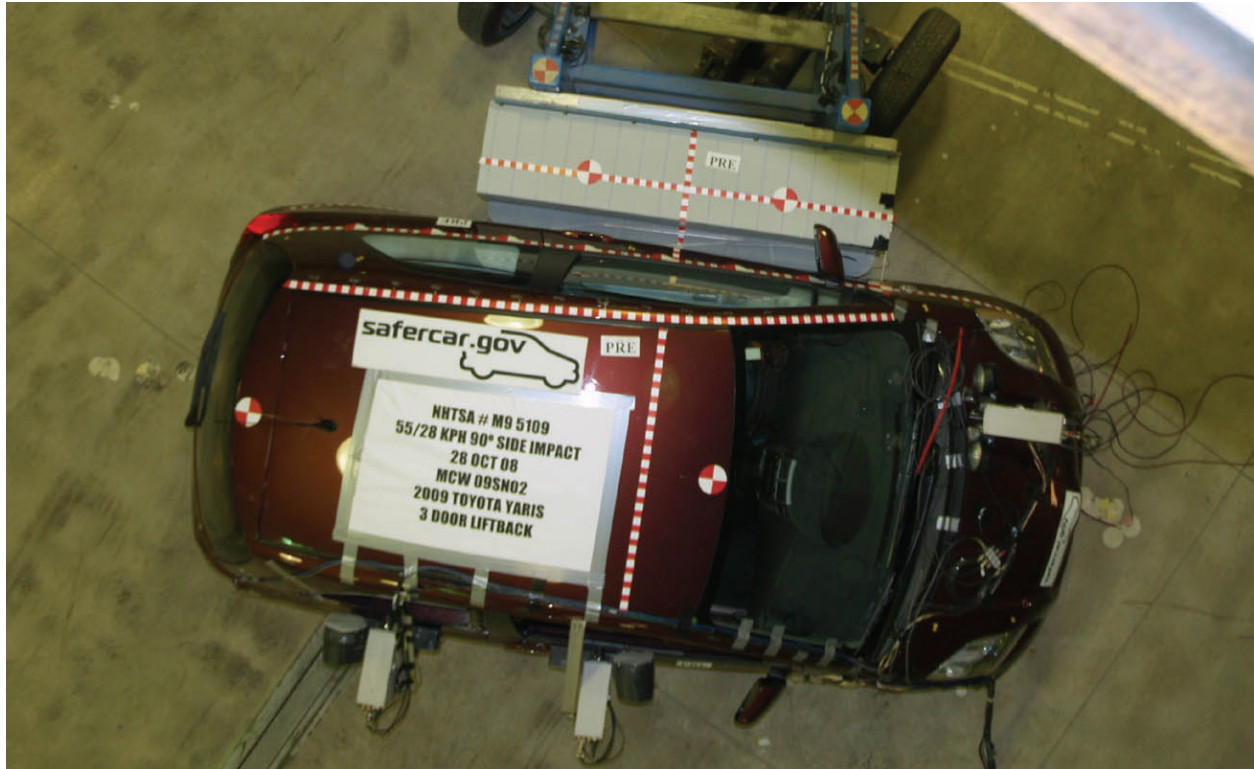


Figure A-21: Pre test overhead view

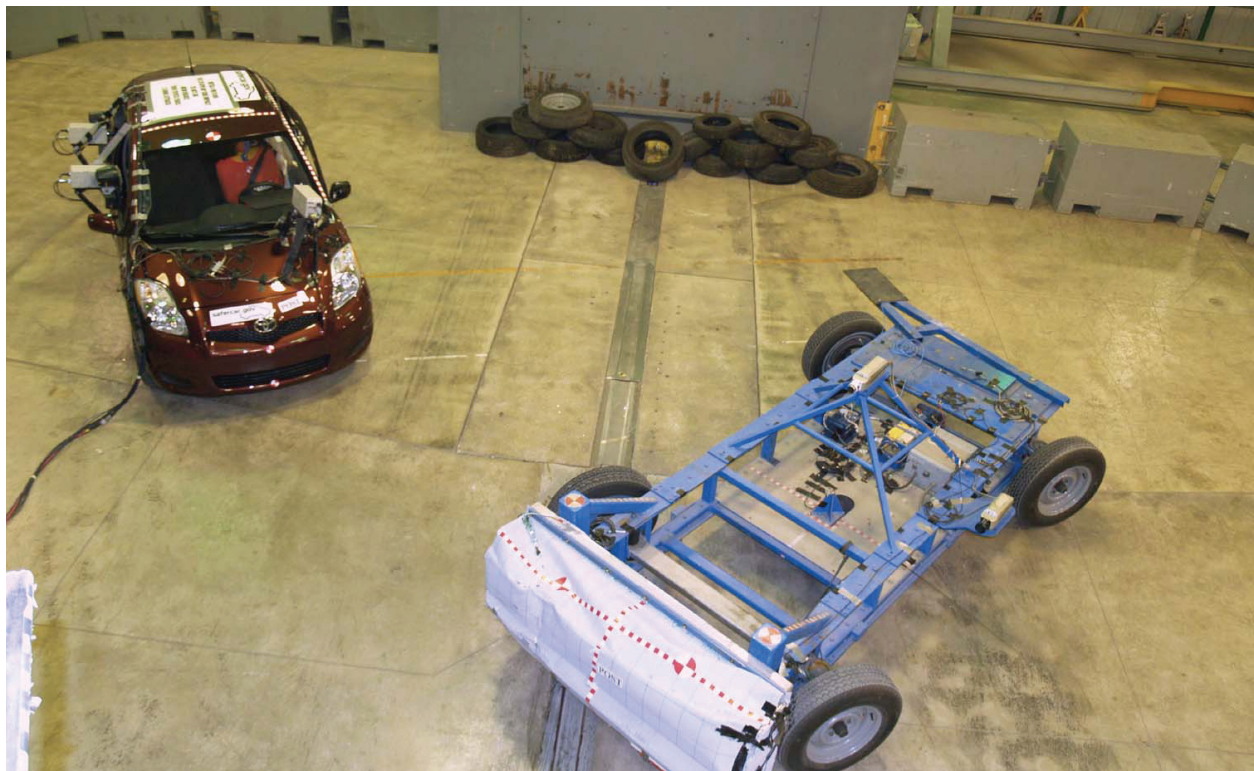


Figure A-22: Post test overhead view



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

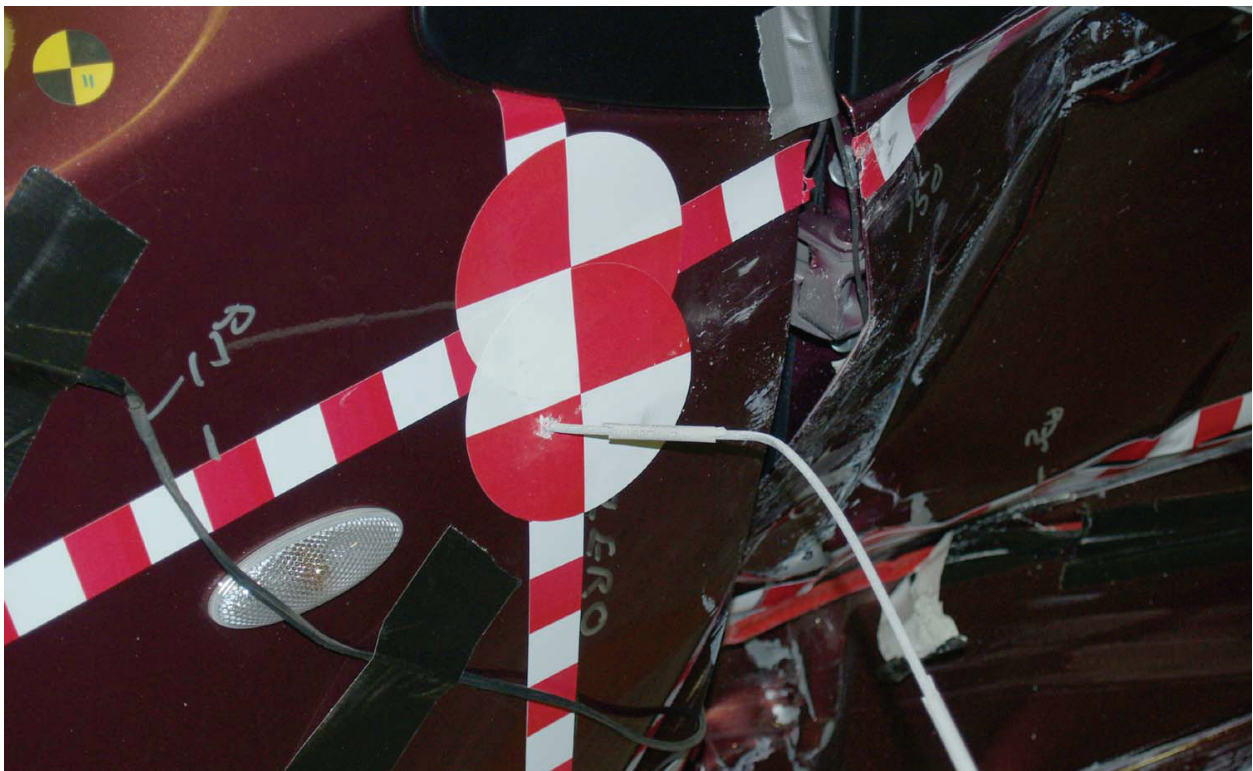


Figure A-26: Post test impact point



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



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



Figure A-29: Pre test rear 3/4 view of left side door

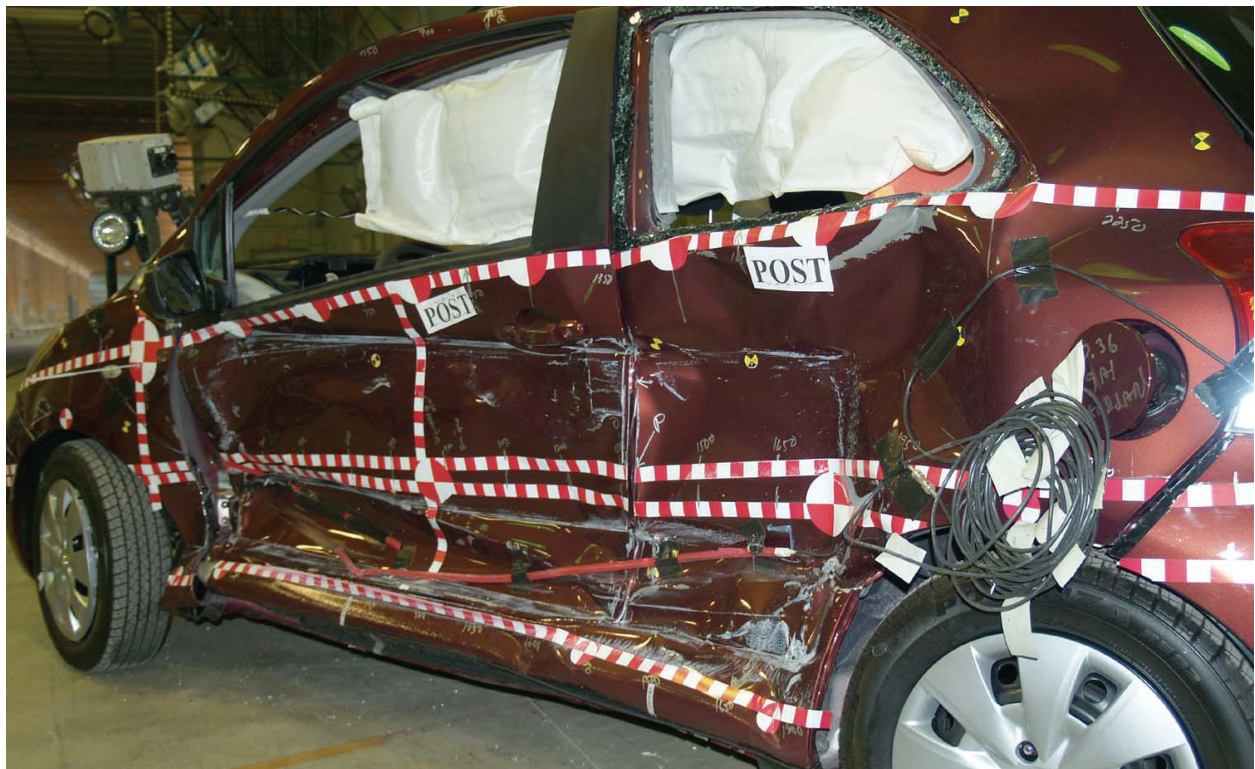


Figure A-30: Post test rear 3/4 view of left side door



Figure A-31: Pre test driver left side view



Figure A-32: Post test driver left side view



Figure A-33: Pre test driver shoulder clearance



Figure A-34: Post test driver shoulder clearance



Figure A-35: Pre test driver right side view



Figure A-36: Post test driver right side view



Figure A-37: Post test driver contact locations (1)



Figure A-38: Post test driver contact locations (2)



Figure A-39: Pre test passenger left side view



Figure A-40: Post test passenger left side view



Figure A-41: Pre test passenger shoulder clearance



Figure A-42 Post test passenger shoulder clearance



Figure A-43: Pre test passenger right side view



Figure A-44: Post test passenger right side view



Figure A-45: Post test passenger contact locations (1)



Figure A-46: Post test passenger contact locations (2)



Figure A-47: Pre test front view of MDB barrier face

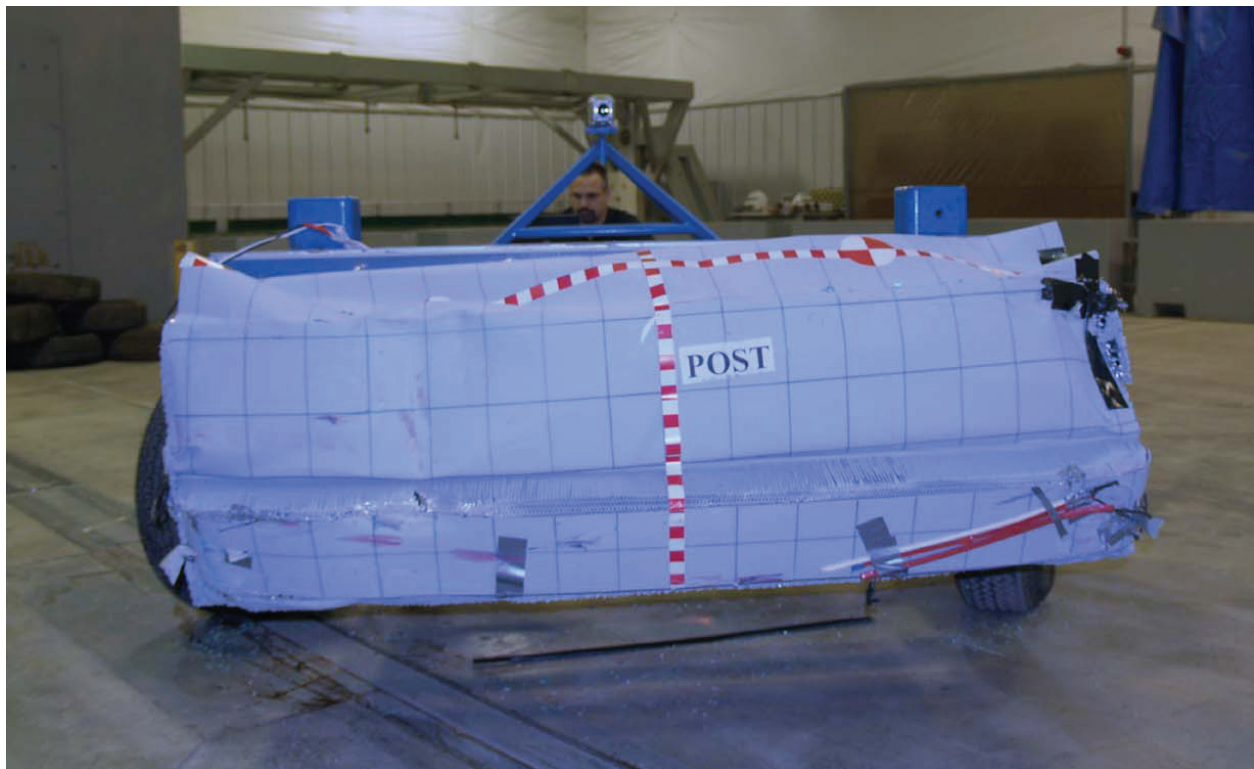


Figure A-48: Post test front view of MDB barrier face

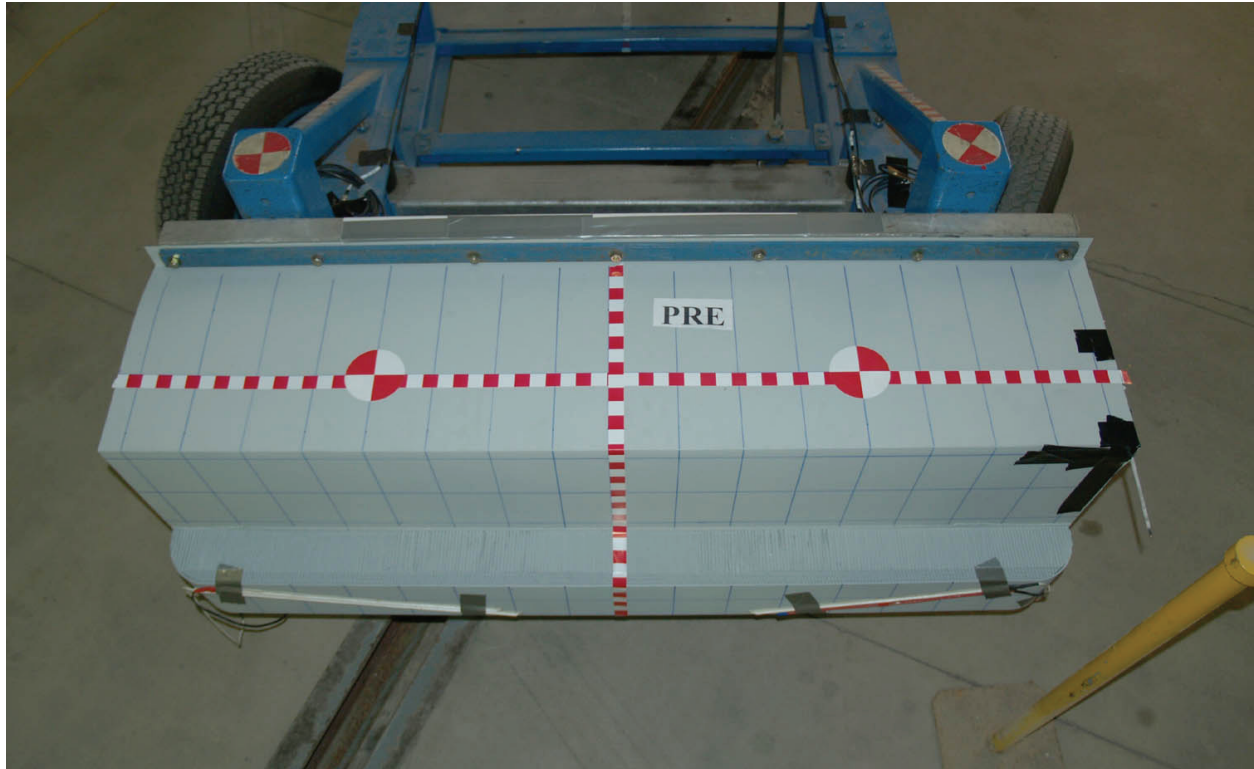


Figure A-49: Pre test overhead view of MDB barrier face

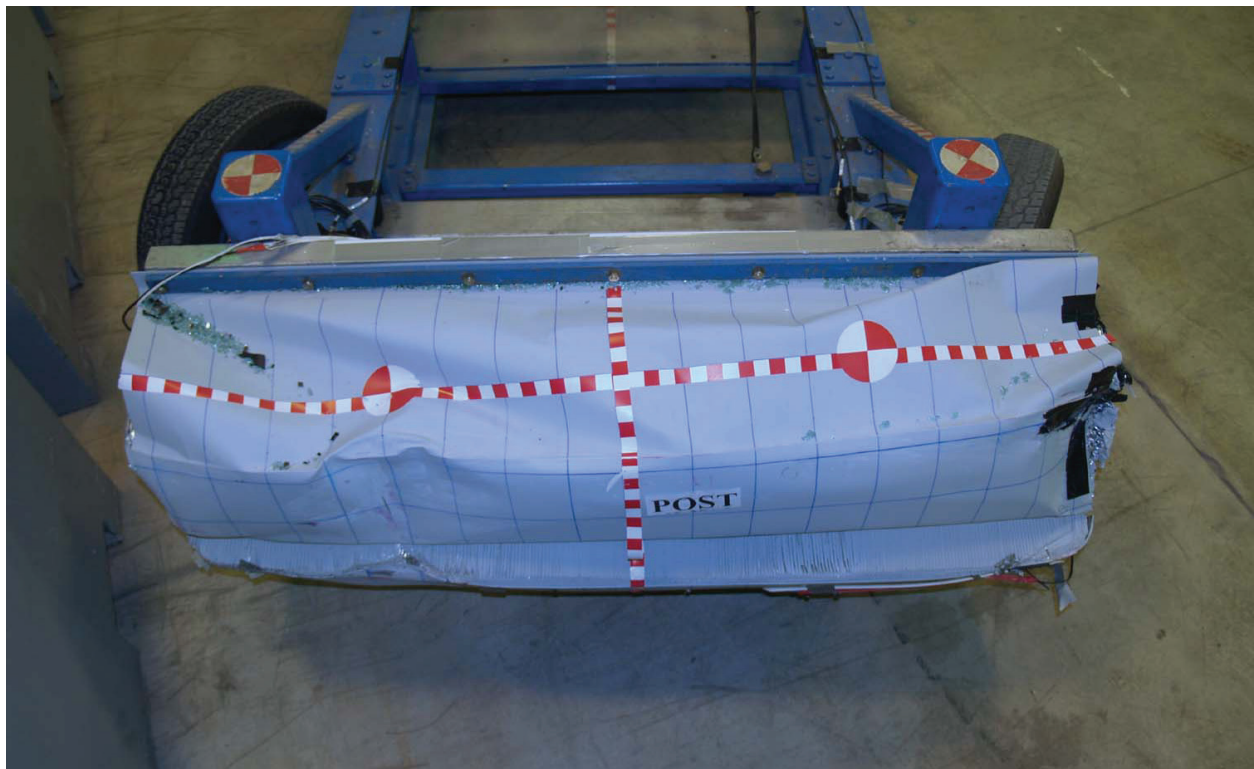


Figure A-50: Post test overhead view of MDB barrier face



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



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



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



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



Figure A-55: FMVSS 301 0 degrees

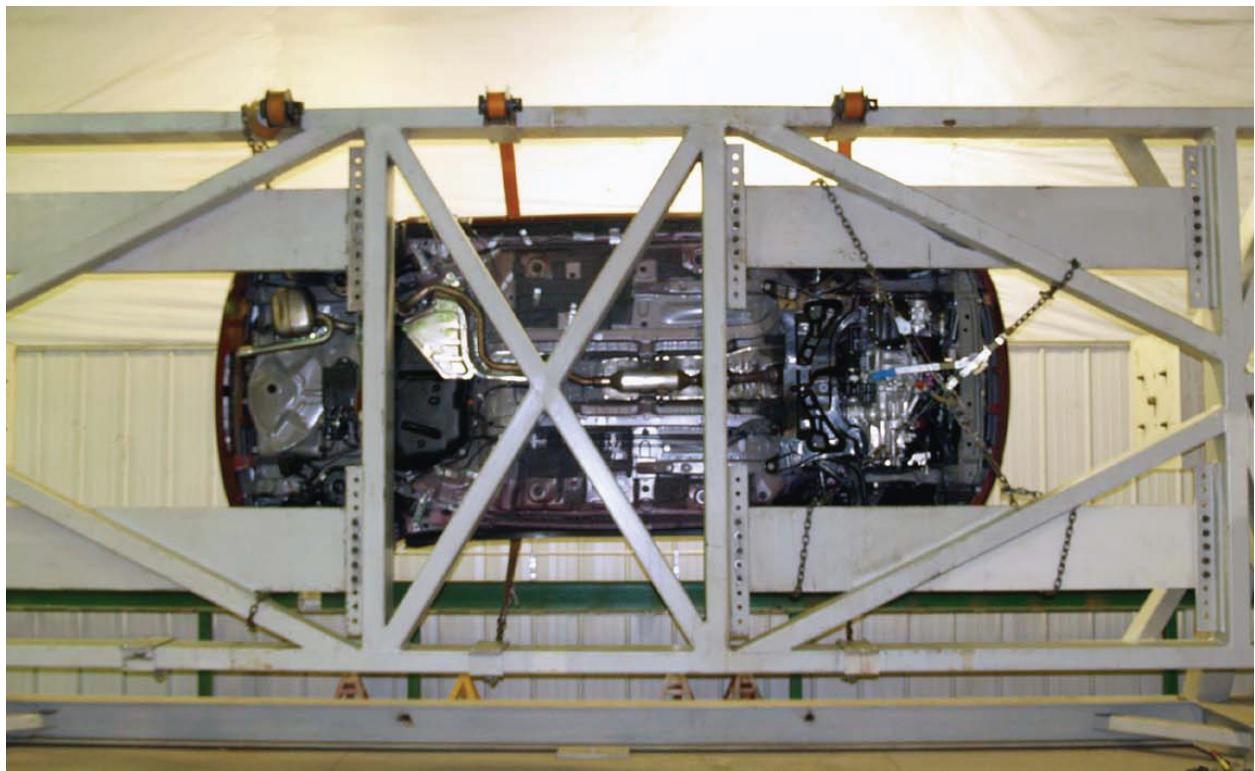


Figure A-56: FMVSS 301 90 degrees



Figure A-57: FMVSS 301 180 degrees



Figure A-58: FMVSS 301 270 degrees



Figure A-59: FMVSS 301 360 degrees



Figure A-60: 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 acceleration (P) – FIR100	B-4
B-2	Driver lower rib acceleration (P) – FIR100	B-5
B-3	Driver lower spine acceleration (P) – FIR100	B-6
B-4	Driver pelvis acceleration (P) – FIR100	B-7
B-5	Passenger upper rib acceleration (P) – FIR100	B-8
B-6	Passenger lower rib acceleration (P) – FIR100	B-9
B-7	Passenger lower spine acceleration (P) – FIR100	B-10
B-8	Passenger pelvis acceleration (P) – 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

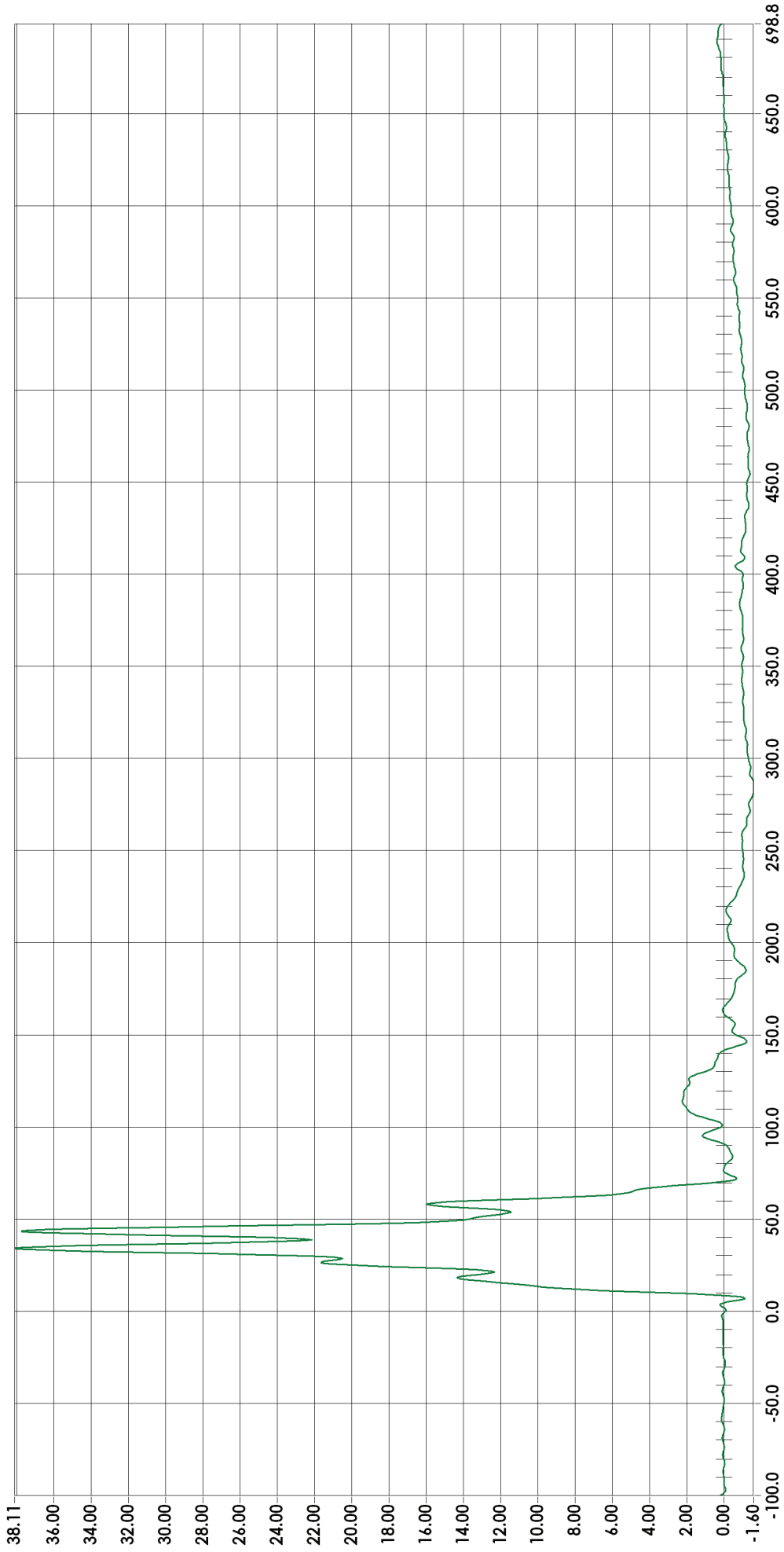
Vehicle left lower b-pillar (y) acceleration
Vehicle left middle b-pillar (y) acceleration
Vehicle left lower a-pillar (y) acceleration
Vehicle left middle a-pillar (y) acceleration
Vehicle front seat track (y) acceleration
Vehicle rear seat track/structure (y) acceleration
Vehicle center of gravity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

Test ID	09SN02
Date	10-28-2008
Description	2009 Toyota Yaris 3- Door Liftback Side NCAP Test

Filter Class	CFC1000
Sampling Rate (Hz)	1600
Number of Points	1280
Pretrigger Points	160
Sensor Location	RBLU
Sensor Mnf & Model	NA NA
Serial Number	NA



Driver upper rib acceleration (P) - FIR100 YL



Max	38.11	G's	at	34.38	msec
Min	-1.60	G's	at	286.25	msec

09SN02 Plot 068

Time (msec)

G's

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5000 West National Ave
Research 151
Milwaukee, WI 53295

Test ID	09SN02
Date	10-28-2008
Description	2009 Toyota Yaris 3- Door Liftback Side NCAP Test

Filter Class	CFC1000
Sampling Rate (Hz)	1600
Number of Points	1280
Pretrigger Points	160
Sensor Location	RBLL
Sensor Mnf & Model	NA NA
Serial Number	NA



Driver lower rib acceleration (P) - FIR100 YL



Max	49.39	G's	at	33.12	msec
Min	-5.35	G's	at	73.12	msec

09SN02 Plot 069

Time (msec)

G's

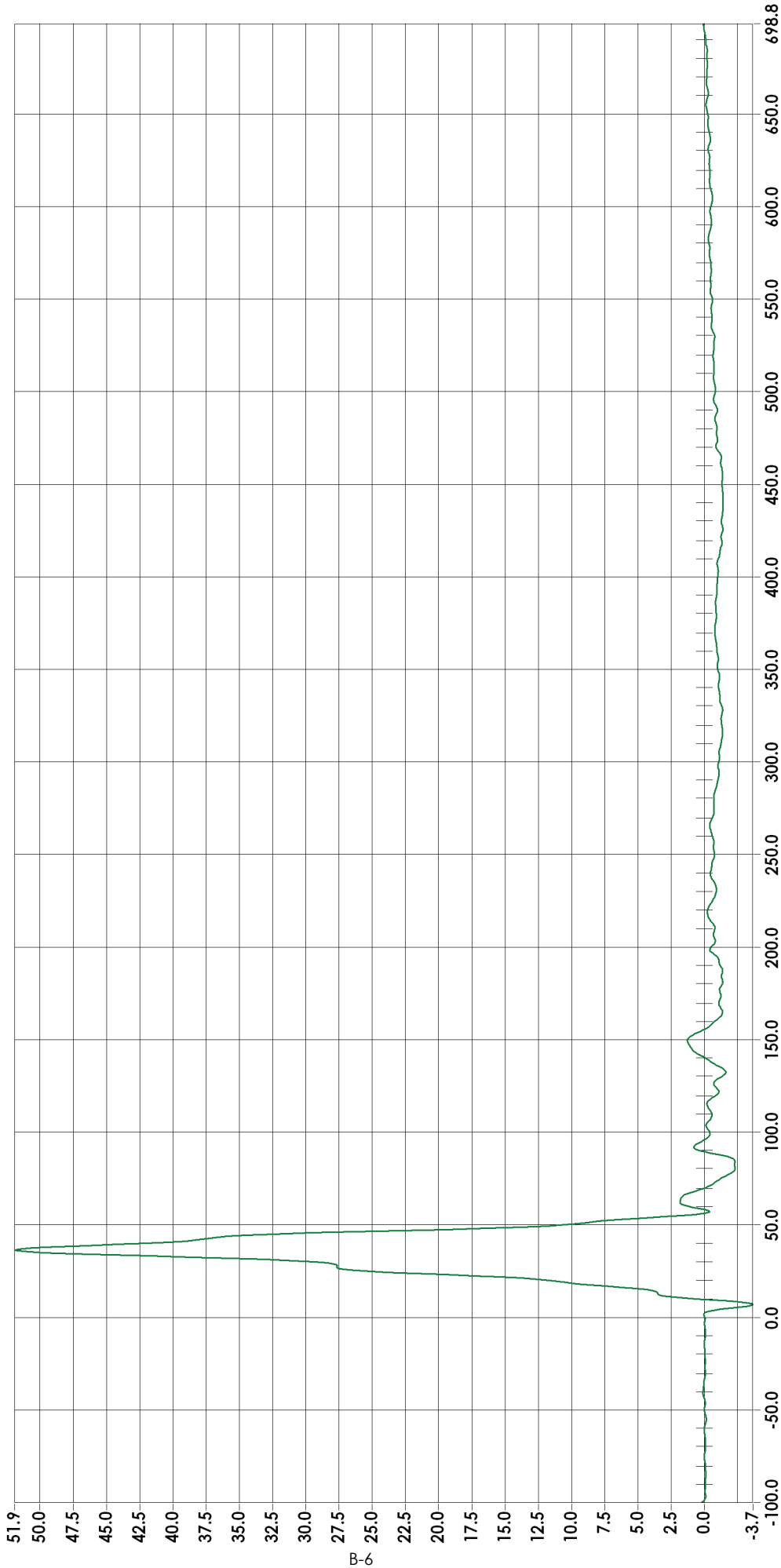
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295

Test ID	09SN02
Date	10-28-2008
Description	2009 Toyota Yaris 3- Door Liftback Side NCAP Test

Filter Class	CFC1000	Sensor Location	SPNL
Sampling Rate (Hz)	1600	Sensor Mnf & Model	NA NA
Number of Points	1280	Serial Number	NA
Pretrigger Points	160		



Driver lower spine acceleration (P) - FIR100 YL



Max	51.91	G's	at	36.25	msec
Min	-3.66	G's	at	6.88	msec

09SN02 Plot 070

Time (msec)

G's

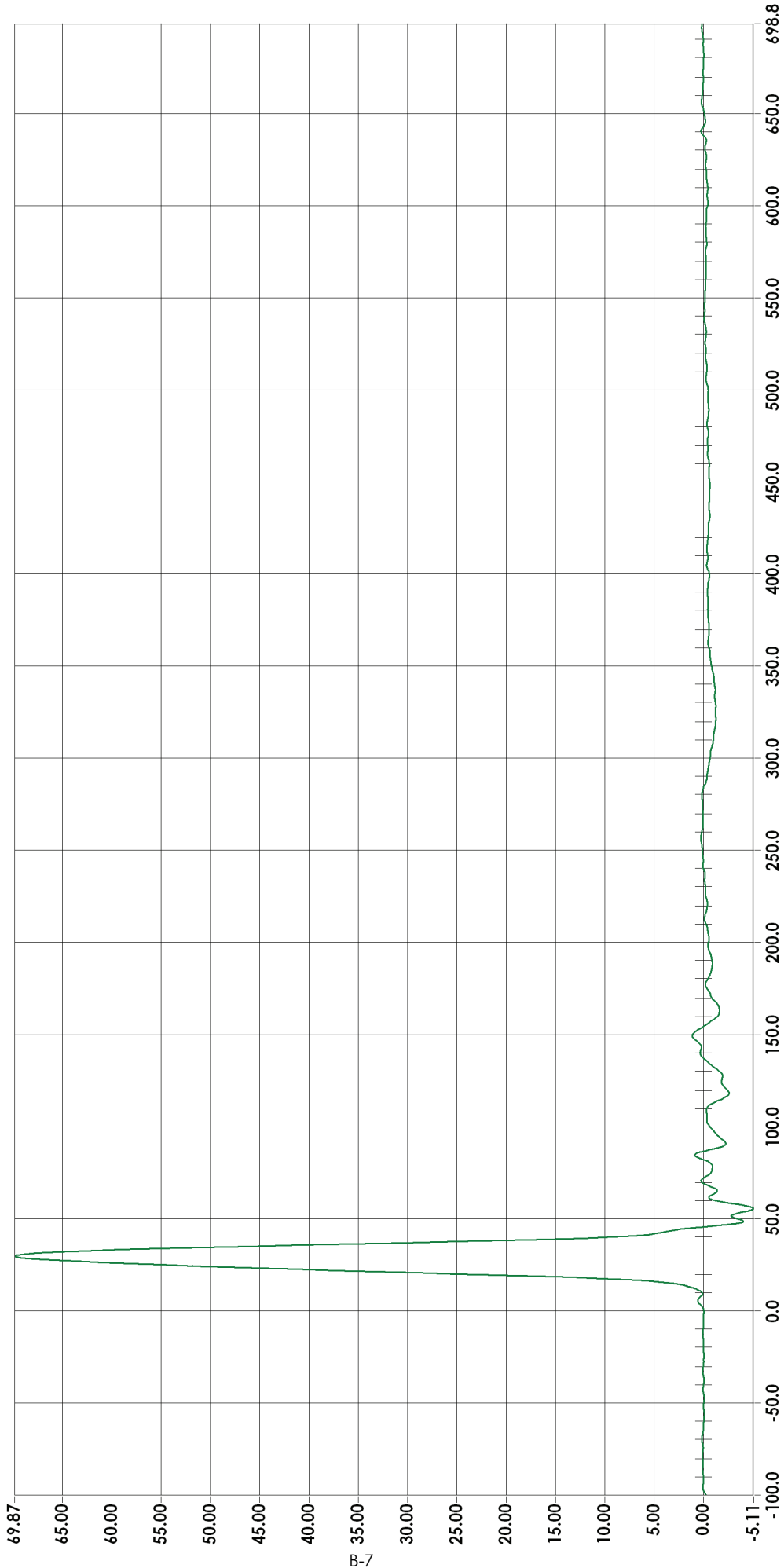
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295

Test ID	09SN02
Date	10-28-2008
Description	2009 Toyota Yaris 3- Door Liftback Side NCAP Test

Filter Class	CFC1000	Sensor Location	PVCN
Sampling Rate (Hz)	1600	Sensor Mnf & Model	NA NA
Number of Points	1280	Serial Number	NA
Pretrigger Points	160		



Driver pelvis acceleration (P) - FIR100 YL



Max	69.87	G's	at	30.00	msec
Min	-5.11	G's	at	55.62	msec

09SN02 Plot 071

Time (msec)

G's

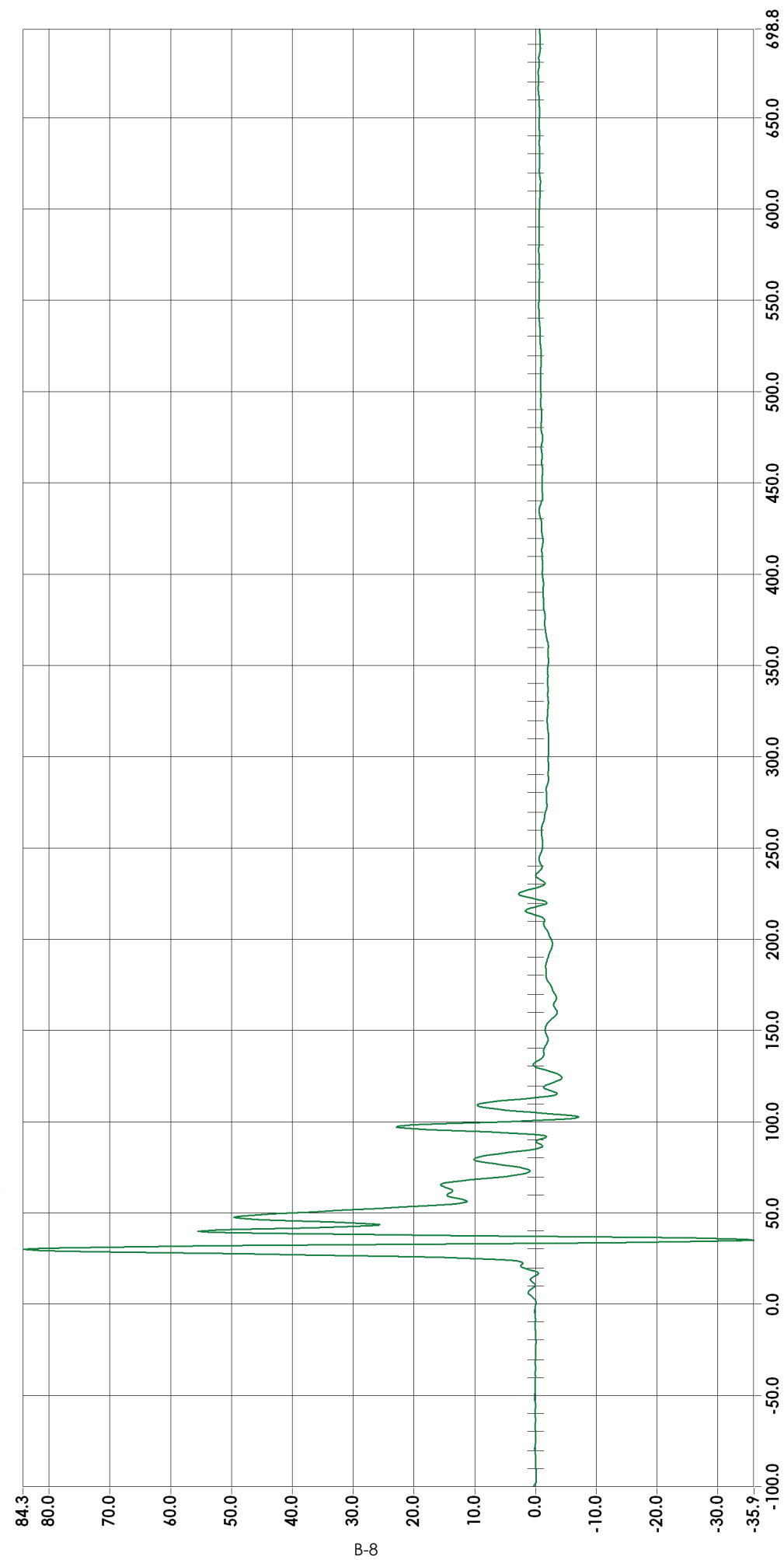
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295

Test ID	09SN02
Date	10-28-2008
Description	2009 Toyota Yaris 3- Door Liftback Side NCAP Test

Filter Class	CFC1000	Sensor Location	RBLU
Sampling Rate (Hz)	1600	Sensor Mnf & Model	NA NA
Number of Points	1280	Serial Number	NA
Pretrigger Points	160		



Passenger upper rib acceleration (P) - FIR100 YL



Max	84.28	G's	at	30.00	msec
Min	-35.95	G's	at	35.00	msec

09SN02 Plot 072

Time (msec)

G's

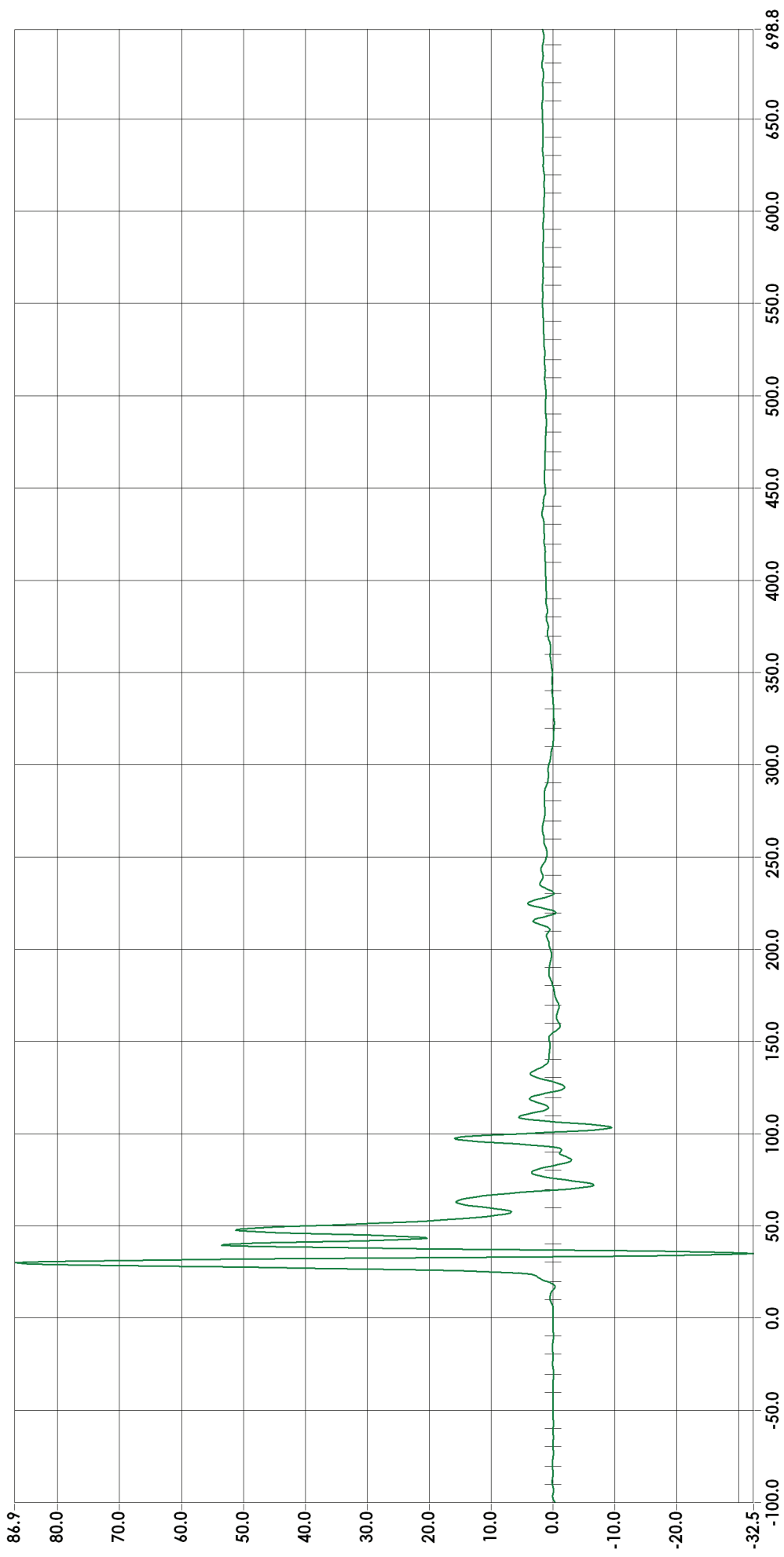
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295

Test ID	09SN02
Date	10-28-2008
Description	2009 Toyota Yaris 3- Door Liftback Side NCAP Test

Filter Class	CFC1000
Sampling Rate (Hz)	1600
Number of Points	1280
Pretrigger Points	160
Sensor Location	RBLL
Sensor Mnf & Model	NA NA
Serial Number	NA



Passenger lower rib acceleration (P) - FIR100 YL



Max	86.95	G's	at	30.00	msec
Min	-32.47	G's	at	35.00	msec

09SN02 Plot 073

Time (msec)

G's

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Test ID	09SN02	Filter Class	CFC1000
Date	10-28-2008	Sampling Rate (Hz)	1600
Description	2009 Toyota Yaris 3- Door Liftback Side NCAP Test	Number of Points	1280
		Pretigger Points	160
		Sensor Location	SPNL
		Sensor Mnf & Model	NA NA
		Serial Number	NA

Passenger lower spine acceleration (P) - FIR100 YL



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Max	72.10	G's	at	34.38	msec
Min	-10.10	G's	at	66.25	msec

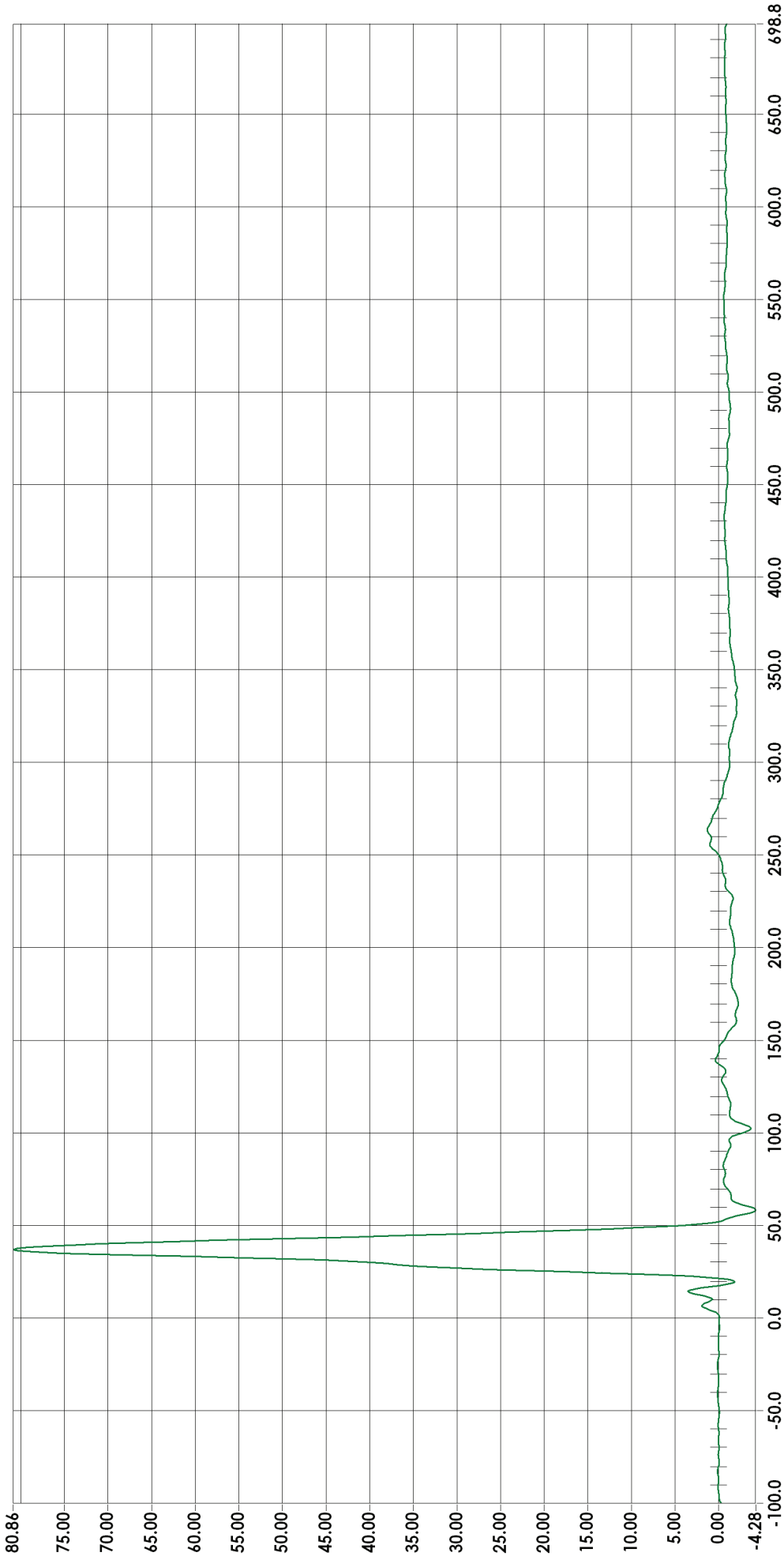
09SN02 Plot 074

Test ID	09SN02
Date	10-28-2008
Description	2009 Toyota Yaris 3- Door Liftback Side NCAP Test

Filter Class	CFC1000	Sensor Location	PVCN
Sampling Rate (Hz)	1600	Sensor Mnf & Model	NA NA
Number of Points	1280	Serial Number	NA
Pretrigger Points	160		



Passenger pelvis acceleration (P) - FIR100 YL



Max	80.86	G's	at	36.88	msec
Min	-4.28	G's	at	58.12	msec

09SN02 Plot 075

Time (msec)

G's

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Research 151
Milwaukee, WI 53295

APPENDIX C
DUMMY CALIBRATION DATA

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

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial Number 058

Test 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

SID Serial Number 137

Test Sequences 1 and 2

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/058		SID HIII/137	
		PRE	POST	PRE	POST
MEASUREMENTS					
Date	-	19Sept08	06Nov08	23Sept08	06Nov08
Sequential Test Number	-	2	3	1	2
Temperature (°C)	18.9-25.5	20.9	21.6	21.6	21.0
Relative Humidity (%)	10-70	49.3	41.3	55.1	39.7
SH – Seated Height (mm)	889-909	905	909	908	906
RH – Rib Height (mm)	501-521	515	520	517	508
HP – Hip Pivot Height (mm)	99	99/99	99/99	99/99	99/99
RD – Rib From Back Line (mm)	229-241	230	230	240	240
KH – Knee Pivot from Back Line (mm)	511-526	525/525	522/524	525/525	525/525
KV – Knee Pivot to Floor (mm)	490-505	505/505	505/505	500/500	505/505
HW – Hip Width (mm)	356-391	358	356	356	360
THORAX IMPACTS					
Date	-	17Oct08	06Nov08	17Oct08	06Nov08
Sequential Test Number	-	2	3	1	2
Temperature (°C)	18.9-25.5	20.1	21.3	20.1	21.3
Relative Humidity (%)	10-70	38.2	40.6	38.2	40.6
Probe Speed (m/s)	4.21-4.33	4.27	4.27	4.22	4.22
Upper Rib Acceleration (G)	37-46	40.0	42.6	43.6	40.8
Lower Rib Acceleration (G)	37-46	38.5	42.2	42.3	39.7
Lower Spine Acceleration (G)	15-22	18.8	20.6	21.9	21.7
PELVIS IMPACTS					
Date	-	19Sept08	06Nov08	17Oct08	06Nov08
Sequential Test Number	-	2	3	1	2
Temperature (°C)	18.9-25.5	21.5	21.3	20.3	21.3
Relative Humidity (%)	10-70	50.3	40.6	37.9	40.6
Probe Speed (m/s)	4.21-4.33	4.25	4.27	4.22	4.27
Pelvis Acceleration (G)	40-60	42.5	47.5	40.9	43.9
THORACIC SHOCK ABSORBER					
Shock Absorber ID Number	-	31310164	31310164	524	524
Damper Setting	1-10	5	5	5.5	5.5
Date	-	03Sept08	04Sept08	03Sept08	04Sept08
Sequential Test Number	-	1	2	1	2
Temperature	18.9-25.5	20.0	22.5	20.0	21.0
Relative Humidity	10-70	45.2	40.4	45.7	38.7
Probe Speed (m/s) Low	3.05	3.09	3.10	3.03	3.01
Force (N)	836 – 1125	901.7	882.0	1122.7	1121.7
Displacement (mm)	30 – 35	30.8	31.5	30.3	32.2
Probe Speed (m/s) Middle	4.27	4.30	4.30	4.28	4.31
Force (N)	1730 – 2099	1771.7	1748.6	2087.0	2049.2
Displacement (mm)	32 – 37	34.2	34.9	35.5	35.2
Probe Speed (m/s) High	6.10	6.07	6.09	6.05	6.07
Force (N)	3741 – 4448	3788.3	3849.4	4251.3	4178.8
Displacement (mm)	33 - 40	35.8	36.1	37.5	36.1

TEST PARAMETER	SPEC	SID HIII/058		SID HIII/137	
		PRE	POST	PRE	POST
ABDOMINAL COMPRESSION					
Date	-	17Sept08	31Oct08	17Sept08	31Oct08
Sequential Test Number	-	2	3	1	2
Temperature (°C)	18.9-25.5	22.3	22.2	22.4	22.2
Relative Humidity (%)	10-70	50.1	30.1	49.8	33.1
Force at 13 mm (N)	104-162	148.9	152.0	125.2	131.9
Force at 19 mm (N)	163-221	204.2	207.7	174.5	183.4
Force at 25 mm (N)	222-280	261.7	263.2	233.3	244.7
Force at 33 mm (N)	325-391	360.0	363.9	331.4	345.4
LUMBAR FLEXION					
Date	-	16Sept08	31Oct08	16Sept08	31Oct08
Sequential Test Number	-	2	3	1	2
Temperature (°C)	18.9-25.5	19.7	21.8	20.6	22.2
Relative Humidity (%)	10-70	50.8	30.7	50.6	31.0
Force at 0° (N)	0-26.7	0	0	19.1	21.6
Force at 0° (N)	97.8-151.2	119.3	110.2	107.8	139.5
Force at 0° (N)	151.2-204.6	181.2	153.4	163.2	171.7
Force at 0° (N)	204.6-258	221.5	208.1	207.1	215.1
Return Angle	12° Maximum	7.1	8.1	7.7	5.2
HYBRID III LATERAL NECK					
Date	-	19Sept08	03Nov08	19Sept08	03Nov08
Sequential Test Number	-	2	3	1	2
Temperature (°C)	18.9-25.5	21.2	22.2	22.5	22.0
Relative Humidity (%)	10-70	48.7	39.4	50.6	40.9
Pendulum Speed (m/s)	6.89-7.13	7.07	7.07	6.91	6.91
Pendulum Pulse 10ms (m/s)	1.96-2.55	2.25	2.03	2.42	2.17
Pendulum Pulse 20ms (m/s)	4.12-5.10	4.88	4.52	4.85	4.56
Pendulum Pulse 30ms (m/s)	5.73-7.01	7.00	6.76	6.94	6.71
Pendulum Pulse 40 –70 ms (m/s)	6.27-7.64	7.00	7.28	7.02	7.05
Max Head rotation (deg)	66-82	81.7	80.5	77.7	76.4
Head angle crosses zero (ms)	58-67	60.2	62.9	62.2	61.9
Peak Moment (Nm)	73-88	86.4	83.4	80.8	80.7
Moment crosses zero (ms)	49-63	54.2	62.2	53.3	54.9
Max rotation wrt pk. moment (ms)	2-15	7.76	14.0	5.12	6.32
HYBRID III LATERAL HEAD DROP					
Date	-	16Sept08	30Oct08	16Sept08	30Oct08
Sequential Test Number	-	2	3	1	2
Temperature (°C)	18.9-25.5	19.0	21.9	22.1	21.8
Relative Humidity (%)	10-70	51.0	25.4	50.2	29.5
Resultant Max (G)	120-150	131.9	132.3	134.1	128.8
Longitudinal Max (G)	<15	14.0	10.8	2.73	3.80

**DUMMY INSPECTION LIST
PRE AND POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

		SID H3 058		SID H3 137	
		PRE	POST	PRE	POST
	Date	28Oct08	29Oct08	28Oct08	29Oct08
	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