REPORT NUMBER: MCW-DOT-07SN02

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

2006 TOYOTA SIENNA 4-DOOR MPV

NHTSA NUMBER: Y75100

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FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
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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 2006 Sienna 4-door MPV 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 20 October 2006. The impact velocity of the Moving Deformable Barrier (MDB) was 61.8 km/h, and the ambient temperature at the struck side of the vehicle was 20 °C. The target vehicle's maximum post test static crush was 290 mm at level .2 The test vehicle's occupant performance is as follows:

	Units	DRIVER	PASS.
Left upper rib (LUR) acceleration	G	26.0	33.2
Left lower rib (LLR) acceleration	G	32.3	40.4
Lower spine (T_{12}) acceleration	G	39.9	44.6
Thoracic Trauma Index (TTI)		36	42
Pelvis (PEV) acceleration	G	49	74
HIC		34.0	210.1

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.

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: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NPO-230) 400 Seventh Street, S.W. Washington, D.C. 20590	
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TABLE OF CONTENTS

SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY'07 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 2007 Toyota 6 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 2145 kg test vehicle was impacted by the 1360.8 kg MDB traveling at a speed of 61.8 km/h (measured inline with the guidance system.) The test was conducted at the Medical College of Wisconsin on 20 October 2006.

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

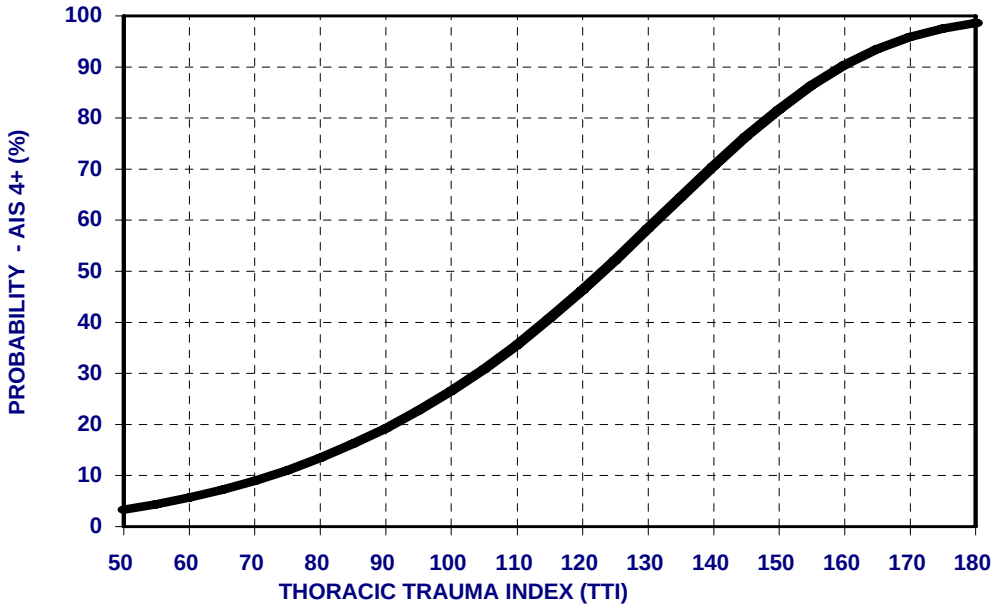
The test vehicle sustained a maximum static crush of 290 mm at level 2, 1200 mm rearward of the vertical impact line.

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	34.0	210.1
T1 (ms)	43.6	70.2
T2 (ms)	79.6	95.7
TTI	36	42
Maximum pelvic acceleration (G)	49	74

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	Deployed	Yes	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	
Year	2006
Make	Toyota
Model	Sienna
Body style	4-door MPV
NHTSA number	Y75100
MCW test ID	07SN02
VIN	5TDZA23C96S533007
Color	Red
Build date	July 2006
Engine No. of cylinders	6
Engine Displacement (L)	3.3
Engine Placement	Lateral
Transmission	Automatic 5 speed
Final drive	Front wheel drive
Delivery date	October 9, 2006
Odometer reading	45 miles

VEHICLE OPTIONS	
Air conditioning	Yes
Anti-lock brakes	Yes
AM/FM radio	Yes
All wheel drive	No
Clock	Yes
Console	No
Cruise/speed control	No
Disc brakes, front	Yes
Disc brakes, rear	No
Power brakes	Yes
Power door locks	Yes
Power steering	Yes
Power windows	Yes
Rear window defroster	Yes
Roof rack	Yes
Tilt steering wheel	Yes

CERTIFICATION LABEL INFORMATION			
Manufacturer	Toyota Motor Manufacturing	GVWR (kg)	2580
		GAWR front(kg)	1290
Date of manufacture	July 2006	GAWR rear (kg)	1290

SEAT INFORMATION			
	Number of occupants	**Seat type**	**Seat back type**
Front	2	Bucket	Adjustable
Back	3	Bucket	Adjustable
Third	3	Contoured bench	Fixed
Total	7		

CARGO CAPACITY CALCULATION			
	Units	**Value**	**Reference label**
Vehicle maximum capacity	kg	567.0	(A)
Number of occupants (7) X 68.04 kg	kg	476.3	(B)
Cargo capacity (RCLW) †	kg	90.7	(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	566.5	610.1	612.9
Right front	kg	523.9	557.9	560.2
Left rear	kg	399.2	507.1	508.2
Right rear	kg	410.5	469.9	470.5
Total front	kg	1090.4	1168.0	1173.1
% Total front	%	57.4	54.5	54.5
Total rear	kg	809.7	977.0	978.7
%Total rear	%	42.6	45.5	45.5
Total	kg	1900.1	2145.0	2151.8

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	1900.1	(D)
Maximum cargo capacity (RCLW)	kg	90.7	(C)
Mass of SID HIII's (1 or 2)	kg	161.0	(E)
Test vehicle target mass (TVTW)	kg	2151.8	(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)	22.7 kg
Location	Above spare tire
Components removed from test vehicle Non-struck front and rear door glasses Non-struck front and rear door interior panels	

IMPACT LOCATION ON TEST VEHICLE	
Wheelbase	3032 mm
Nominal impact point	508 mm rearward of front axle
Actual impact point	501 mm rearward of front axle

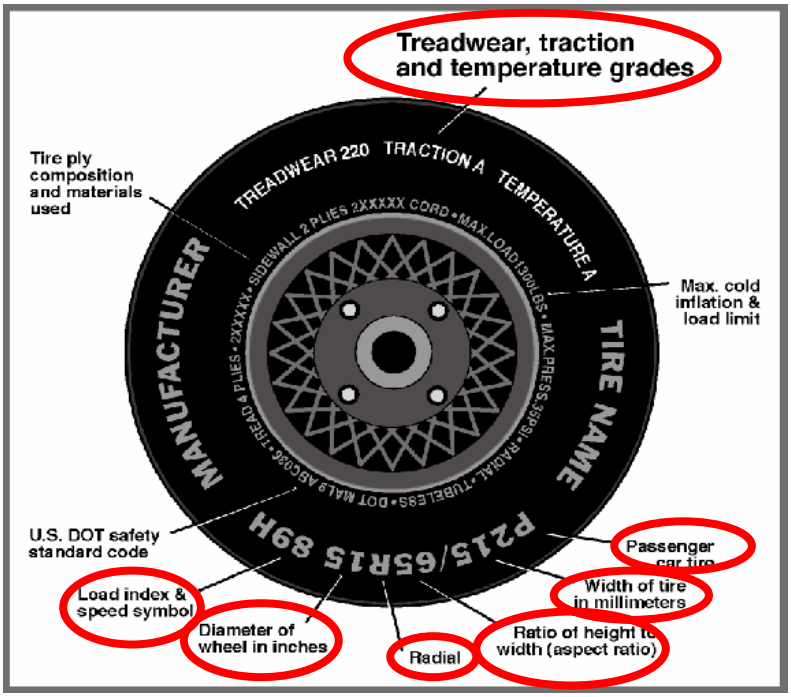
DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA (CONTINUED)

TEST VEHICLE ATTITUDES				
	Units	**As delivered**	**As tested**	**Fully loaded**
Left front	mm	805	780	777
Right front	mm	807	784	779
Left rear	mm	792	758	757
Right rear	mm	790	767	765
CG (X)	mm	1292	1380	1380

As tested attitudes must be between as delivered and fully loaded attitudes
CG (X) measured rearward from front axle centerline

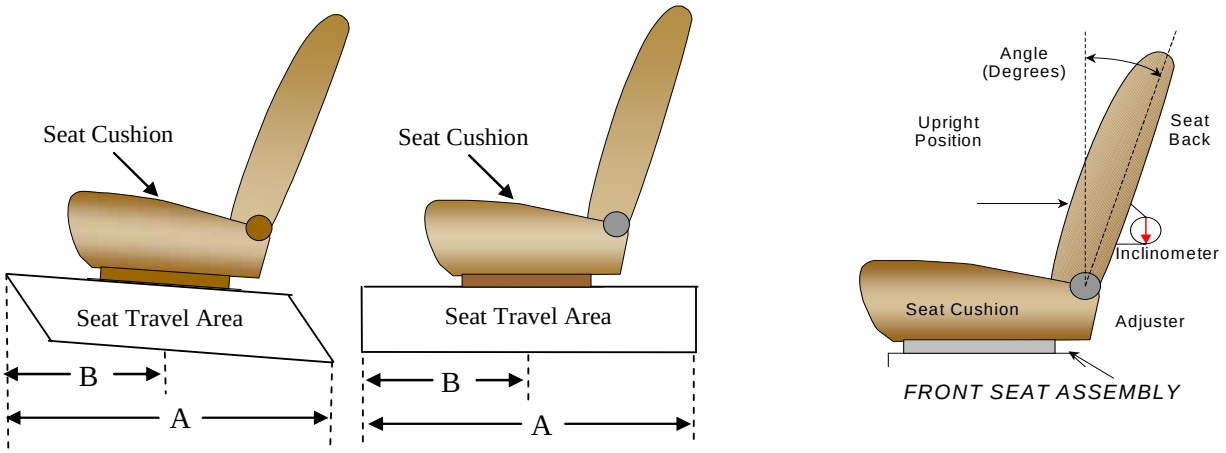
AUTOMATIC DOOR LOCK (ADL) INFORMATION				
	Left front	**Left rear**	**Right front**	**Right rear**
ADL present	Yes	Yes	Yes	Yes
ADL deactivated	No	No	No	No
Deactivation method	N/a			
Door lock status	Locked	Locked	Locked	Locked

DATA SHEET NO. 2
TEST VEHICLE TIRE INFORMATION



TIRE INFORMATION		
Measured Parameter	**Front**	**Rear**
Maximum tire pressure (kPa)	350	350
Cold / test pressure (kPa)	241	241
Recommended tire size	P215/65R16	P215/65R16
Tire size on vehicle	P215/65R16	P215/65R16
Tire manufacturer	Dunlop	Dunlop
Tire name	SP4000	SP4000
Tire type	Passenger	Passenger
Tire width (mm)	215	215
Ratio of height to width (aspect ratio)	65	65
Radial	Radial	Radial
Wheel diameter (inches)	16	16
Load index & speed symbol	96T	96T
Tread wear	340	340
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	Manual adjustable
Fore/aft total travel (mm)	250	150
Number of detents	17	11
Test position	8th notch‡ from full forward	5th notch‡ from full forward

‡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	4.5°	11.4°
Test position	6th notch‡ from full upright	5th notch‡ from full upright

‡Full upright = notch 0

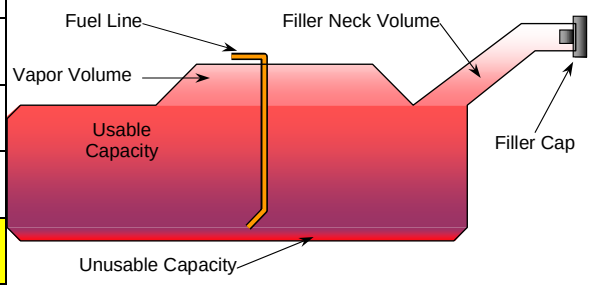
Seat belt position

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	Yes
Total travel (mm)	65	65
Test position	2nd from highest	2nd from highest

DATA SHEET NO. 3
TEST VEHICLE INFORMATION (continued)

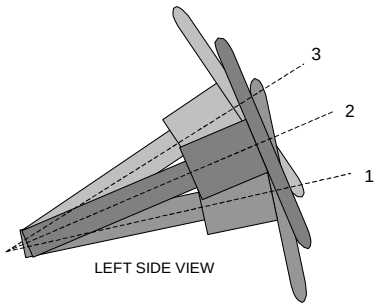
Fuel tank information

STODDARD INFORMATION			
Description	**Units**	**Value**	
Usable capacity of standard equipment fuel tank	L	79.0	
Usable capacity of optional equipment fuel tank	L	0	
Usable capacity of vehicle used for certification testing to requirements	L	79.0	
Amount of stoddard added for test	L	73.5	
% Usable capacity (92%-94%)	%	93	
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.		

VEHICLE FUEL TANK ASSEMBLY

Steering wheel information

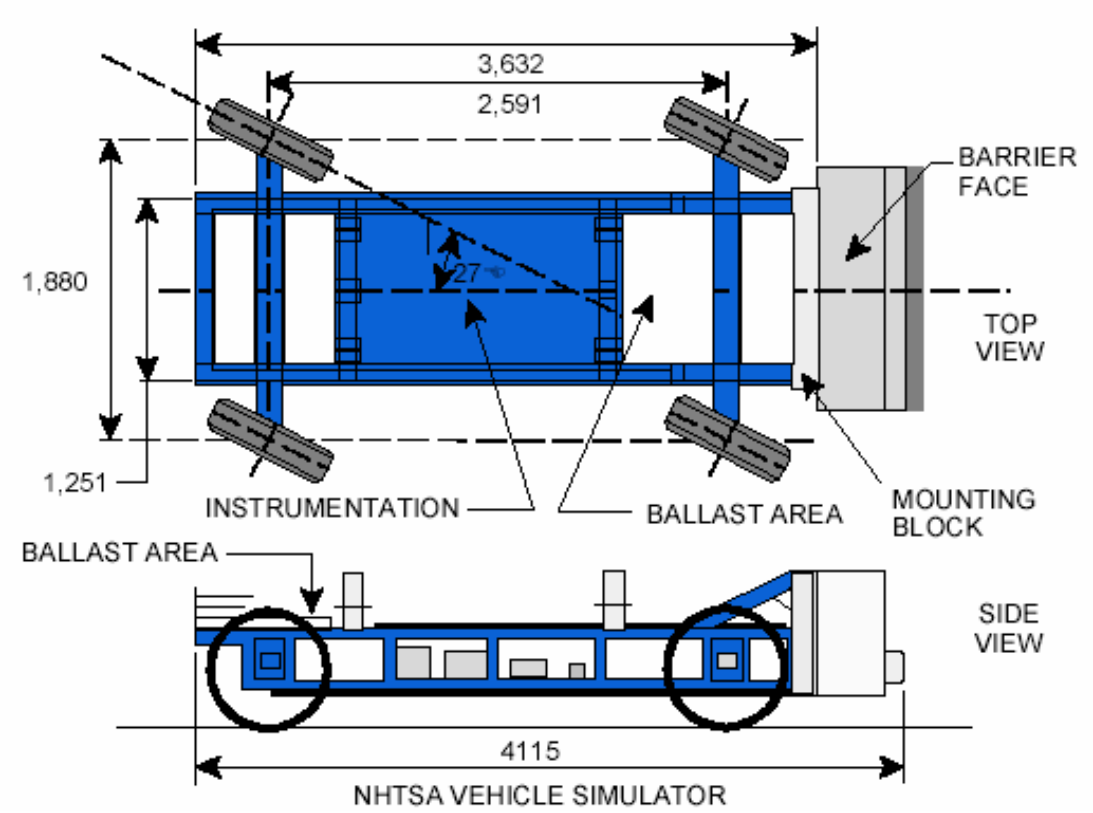
Steering wheel and column adjustments are placed according to the manufacturer's specifications.

ADJUSTABLE STEERING COLUMN		
Adjustable column	Yes	
Steering wheel angle in upper most position	29.8°	
Steering wheel fore/aft travel	50 mm	
Number of detents	N/a	
Test position	Steering wheel positioned 28.3 relative to side sill panel. The steering column also had a telescope adjustment and it was set in the mid position	

STEERING COLUMN ASSEMBLY

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

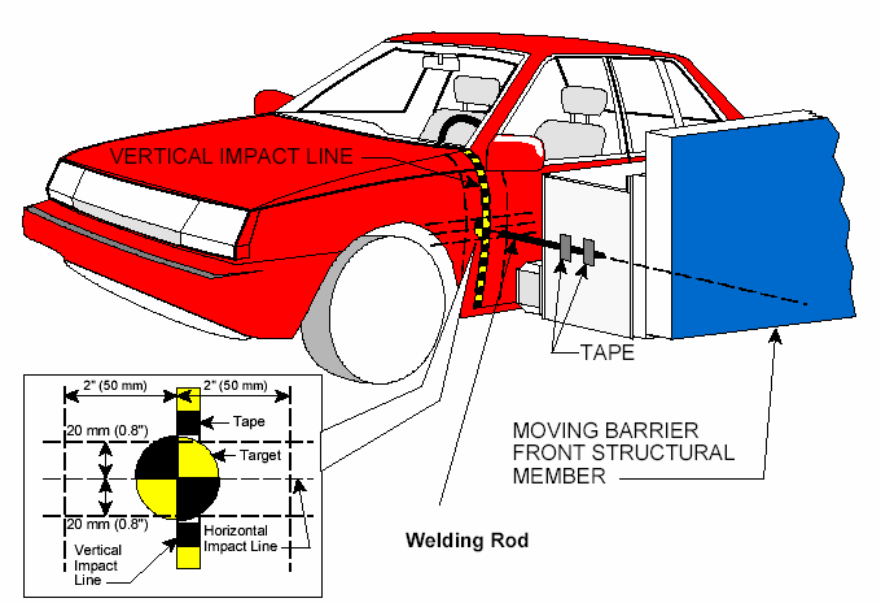
MDB SPECIFICATIONS				
	Units	**Specification**	**Range**	**Value**
Overall Width of Framework Carriage	mm	1251	1226-1276	1245
Overall Length w/Impactor Face	mm	4115	4090-4140	4101
Overall Length w/o Impactor Face	mm	3632	3607-3657	3617
Longitudinal Cg from Front Axle	mm	1123	1098-1148	1135
Track Width	mm	1880	1855-2005	1864
Mass	kg	1361	1356.5-1365.5	1360.8
MOI (X)	kg-m²	508	483-533	496
MOI (Y)	kg-m²	2263	2150-2376	2227
MOI (Z)	kg-m²	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	458.4
Right front	kg	307.8
Left rear	kg	228.7
Right rear	kg	365.9
Total front	kg	766.2
% Total front	%	56.3
Total rear	kg	594.6
%Total rear	%	43.7
Total	kg	1360.8

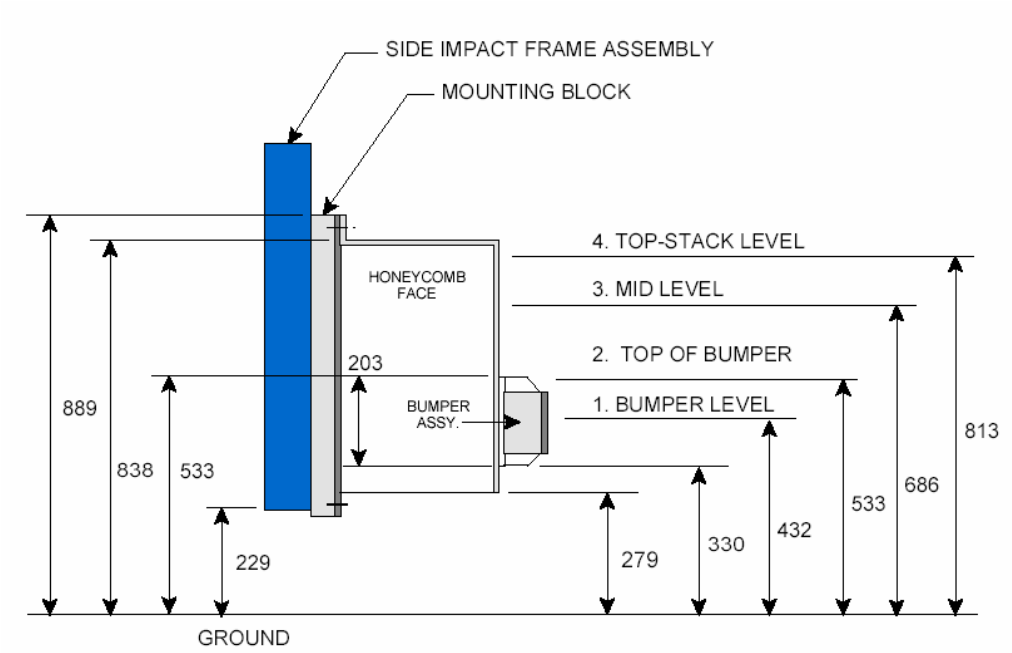
IMPACT SPEED				
	Units	Specification	Range	Value
Primary speed trap	kmh	61.9	61.1-62.7	61.8
Redundant speed trap	kmh	61.9	61.1-62.7	61.6



IMPACT POINT INFORMATION		
Vertical impact line is	508 mm rearward of front axle	
Actual impact is	501 mm rearward of front axle	
Measurement	**Value**	**Tolerance**
Impact point distance from vertical impact line	7 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	276	276
Bottom of bumper	mm	330	327-333	330	329
Top of bumper	mm	533	530-536	530	534
Top of barrier	mm	838	835-841	835	835



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 air bag	To side curtain air bag and c-pillar
Upper torso contact	To seat mounted side air bag	To left rear door panel at window sill
Lower torso contact	To seat mounted side air bag	To left rear door panel 160 mm below window sill
Left leg contact	To left front door panel 120 mm below arm rest	To left rear door panel 315 mm below window sill
Left knee contact	To left front door panel 30 mm below arm rest	To left rear door panel 220 mm below window sill

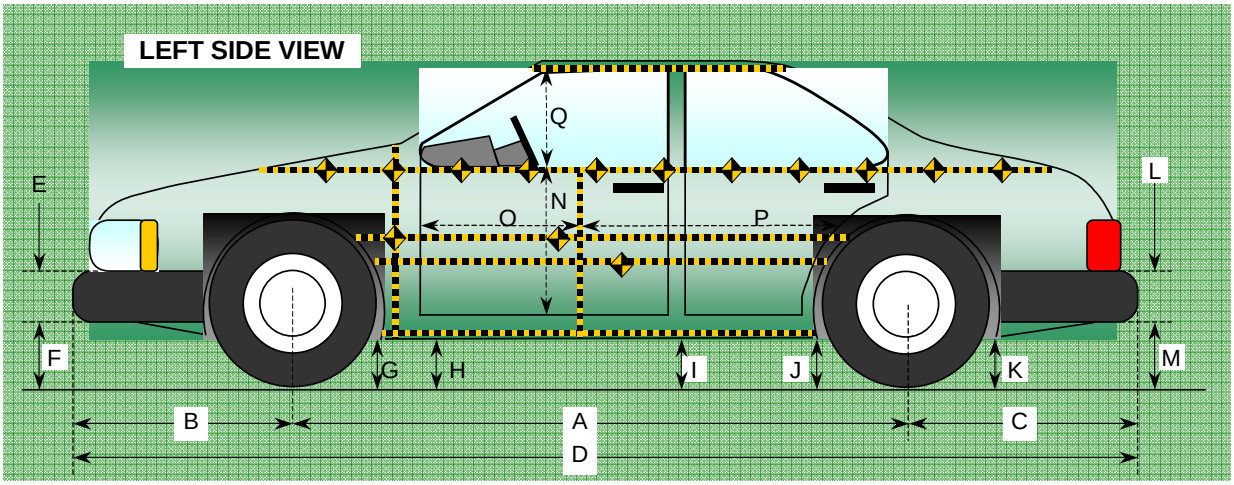
POST TEST DOOR OPENING AND SEAT TRACK INFORMATION		
Description	**Front**	**Rear**
Locked/unlocked doors	Locked	Locked
Left side door opening	Closed/latched/inoperable	Closed/latched/inoperable
Right side door opening	Closed/latched/operable	Closed/latched/operable
Seat movement	~10 mm of seat crush	~30 mm of seat crush
Seat back failure	None	None

POST TEST STRUCTURAL OBSERVATIONS	
Critical areas of performance	**Observations/conclusions**
Pillar performance	None
Sill separation	Sill separation 240 mm rearward of b-pillar
Windshield damage	Slight crack at the top of the driver's a-pillar
Window damage	Rear struck side door window shattered on impact
Other notable effects	90 mm gap between b-pillar and top of front door; 158 mm gap between c-pillar and top of rear door

DATA SHEET NUMBER 5
POST TEST OBSERVATIONS (continued)

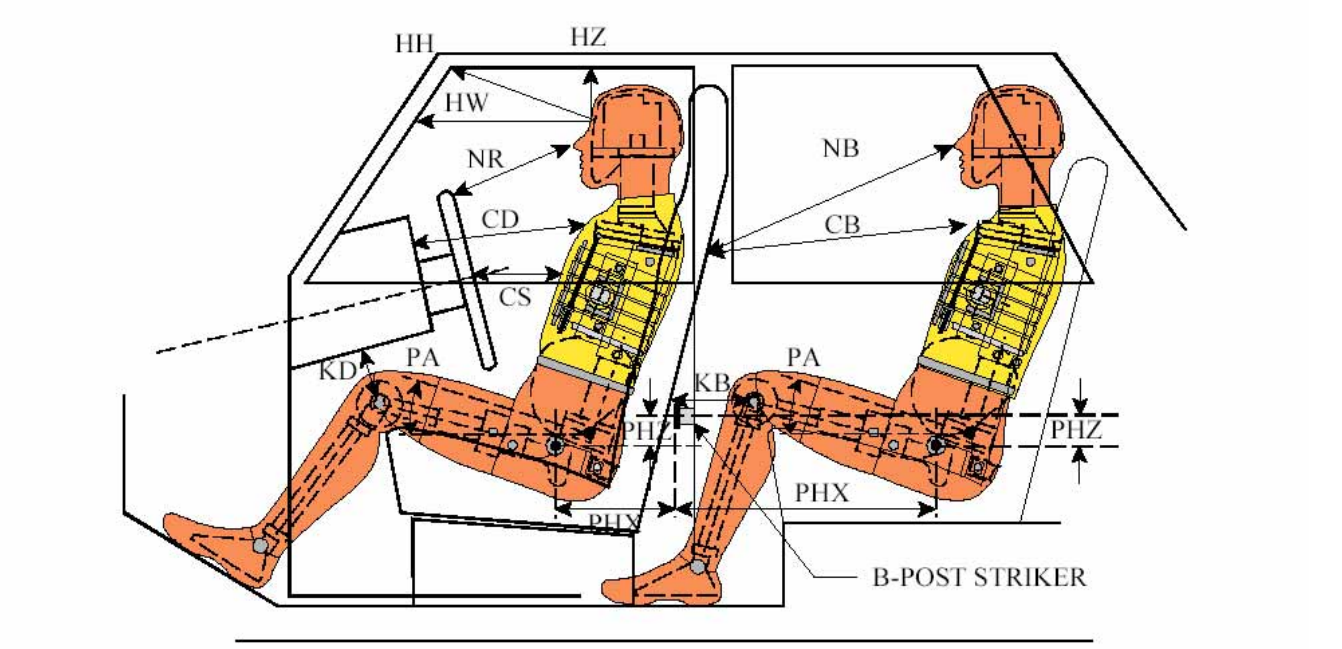
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION				
Restraint Type	**Left front (Driver) occupant Location 01**		**Left rear (passenger) occupant Location 04**	
	Installed	Operation	Installed	Operation
Front airbag	Yes – steering wheel	Did not deploy	No	N/a
Side airbag	Yes - seat back	Deployed	No	N/a
Head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

DATA SHEET NUMBER 6
VEHICLE PRE AND POST MEASURMENTS



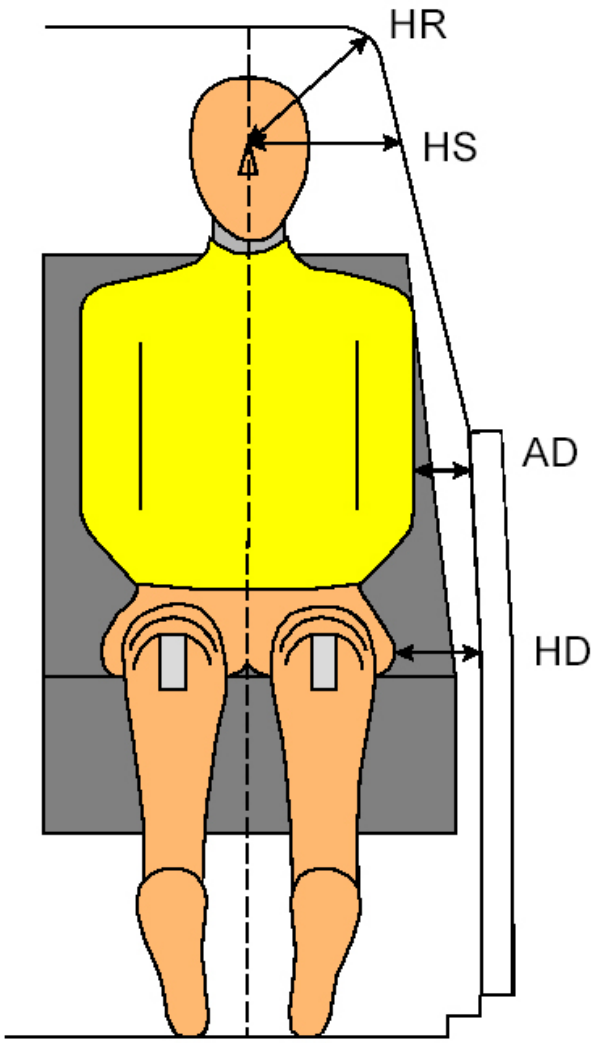
VEHICLE DIMENSIONS				
Code	**Description**	**Pre test**	**Post test**	**Change**
		mm	**mm**	**mm**
A	Wheelbase	3032	2994	-38
B	Front axle to front side of vehicle	683	724	41
C	Rear axle to rear side of vehicle	965	970	5
D	Total length at centerline	5107	5101	-6
E	Front bumper thickness	313	313	0
F	Front bumper bottom to ground	275	293	18
G	Sill height at front wheel well	265	265	0
H	Sill height at front door leading edge	266	300	34
I	Sill height at b-pillar	267	311	44
J1	Sill height at rear wheel well	210	228	18
J2	Pinch weld height at rear wheel well	265	286	21
K	Sill height aft of rear wheel well	269	277	8
L	Rear bumper thickness	201	201	0
M	Rear bumper bottom to ground	319	322	3
N	Sill height to window bottom sill	847	741	-106
O	Front door leading edge to impact C/L	1087	981	-106
P	Rear door trailing edge to impact C/L	1172	1105	-67
Q	Front window opening	514	515	1
R	Right side length	4680	4688	8
S	Left side length	4680	4652	-28
T	Vehicle width at b-pillar	1965	1703	-262

DATA SHEET NUMBER 7
SID HIII LONGITUDINAL CLEARANCES



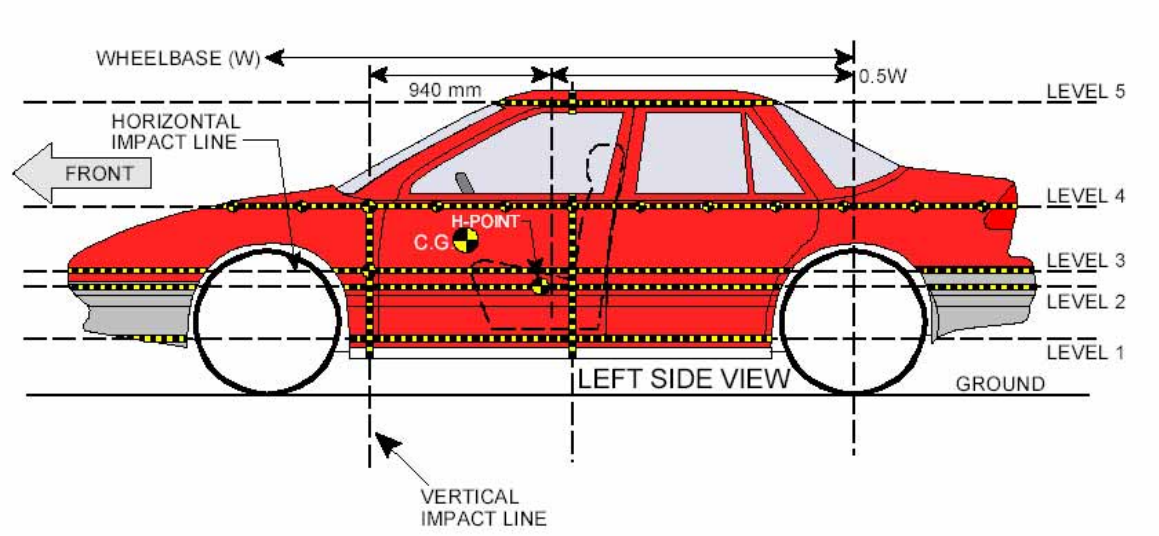
SID HIII LONGITUDINAL CLEARANCE MEASUREMENTS					
Driver code	**Pass. code**	**Measurement description**	**Units**	**Left front seat**	**Left rear seat**
		ATD serial number	-	056	058
HH	-	Head to header	mm	445	N/a
HW	-	Head to windshield	mm	762	N/a
HZ	HZ	Head to roof	mm	241	214
NR	NB	Nose to rim/nose to seatback	mm	504	625
CD	CB	Chest to dash or seatback	mm	587	551
CS	-	Chest to steering wheel	mm	389	N/a
KDL	KBL	Left knee to dash or seatback length	mm	142	275
KDA	KBA	Left knee to dash or seatback angle	°	3.7	6.9
KDR	KBR	Right Knee to dash or seatback length	mm	145	235
KDA	KDA	Right knee to dash or seatback angle	°	10.4	9.2
PA	PA	Pelvic angle	°	23.3	23.2
PHX	PHX	H-Point to striker (x-axis)	mm	249	476
PHZ	PHZ	H-Point to striker (z-axis)	mm	180	152

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	272	252
HS	Head to side window	mm	360	380
-	Shoulder to door	mm	145	191
AD	Arm to door	mm	158	208
HD	H-Point to door	mm	157	319

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	1651	9	1050
4	Window sill	1082	169	1200
3	Mid-door	685	285	1350
2	Driver H-point	738	290	1200
1	Axle centerline or sill top	289	145	1050
Maximum static crush		**290 mm at level 2 1200 mm rearward from vertical impact line**		

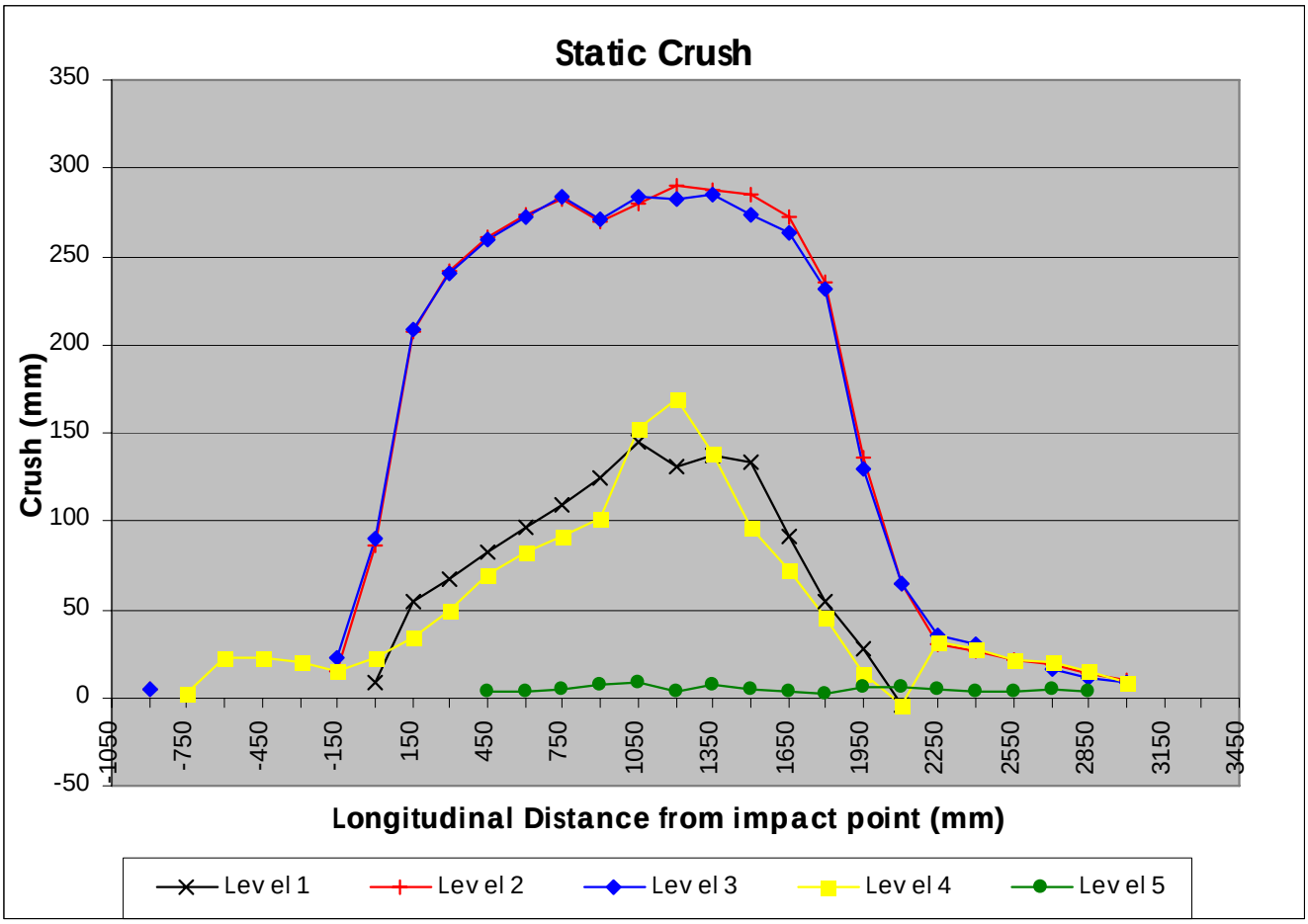
Height measurements taken 750 mm rearward from vertical impact line.

DATA SHEET 10
VEHICLE STATIC CRUSH PROFILE

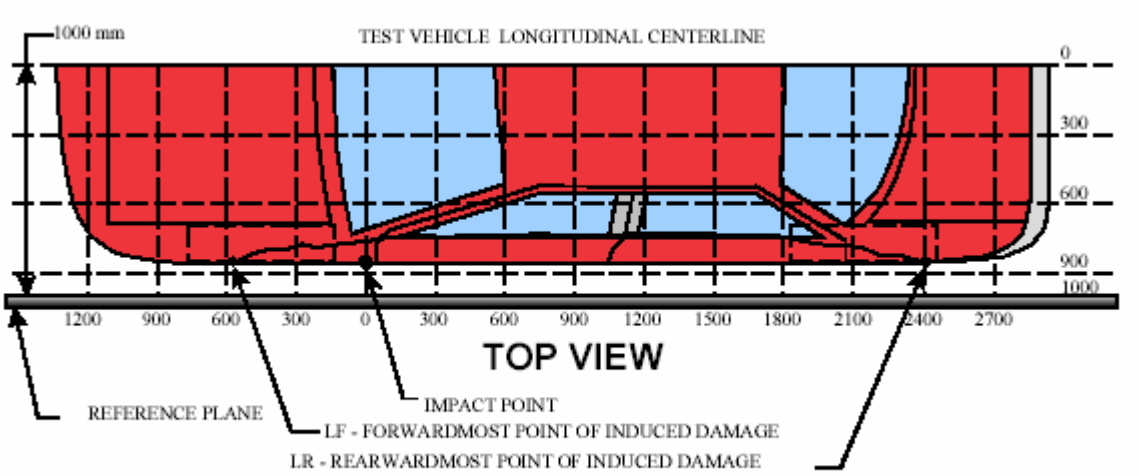
Note: All dimensions are in millimeters with a tolerance of ±3 mm

TEST VEHICLE STATIC CRUSH															
Level		1			2			3			4			5		
Height		289			738			685			1082			1651		
		Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush
DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT	-1050															
	-900				320	325	5	317	322	5						
	-750										398	400	2			
	-600										382	404	22			
	-450										374	397	23			
	-300										367	387	20			
	-150				290	305	15	290	313	23	362	377	15			
	0	326	334	8	290	376	86	289	379	90	361	383	22			
	150	337	392	55	288	495	207	288	497	209	364	398	34			
	300	338	405	67	286	528	242	287	528	241	360	410	50			
	450	338	420	82	285	546	261	286	546	260	355	425	70	593	597	4
	600	339	435	96	284	557	273	285	557	272	351	433	82	609	613	4
	750	339	448	109	283	565	282	283	567	284	349	440	91	618	623	5
	900	340	465	125	282	552	270	282	553	271	347	449	102	623	630	7
	1050	340	485	145	281	561	280	281	565	284	345	497	152	627	636	9
	1200	341	472	131	280	570	290	281	564	283	344	513	169	632	636	4
	1350	342	479	137	282	570	288	282	567	285	343	482	139	632	639	7
	1500	343	476	133	282	567	285	283	557	274	349	446	97	635	640	5
	1650	344	435	91	283	555	272	284	548	264	347	419	72	637	641	4
	1800	343	398	55	285	520	235	285	516	231	349	394	45	639	641	2
	1950	335	363	28	286	422	136	285	415	130	355	369	14	637	643	6
	2100	326	322	-4	286	351	65	285	350	65	353	349	-4	640	646	6
	2250				280	310	30	278	313	35	355	387	32	638	643	5
	2400				277	303	26	276	306	30	361	389	28	637	641	4
	2550				277	298	21				366	387	21	636	640	4
	2700				280	299	19	279	295	16	372	392	20	635	640	5
	2850				303	317	14	299	310	11	382	397	15	634	637	3
	3000				325	335	10	323	332	9	397	405	8			
	3150															
	3330															
	3450															

DATA SHEET 10
VEHICLE STATIC CRUSH PROFILE (continued)

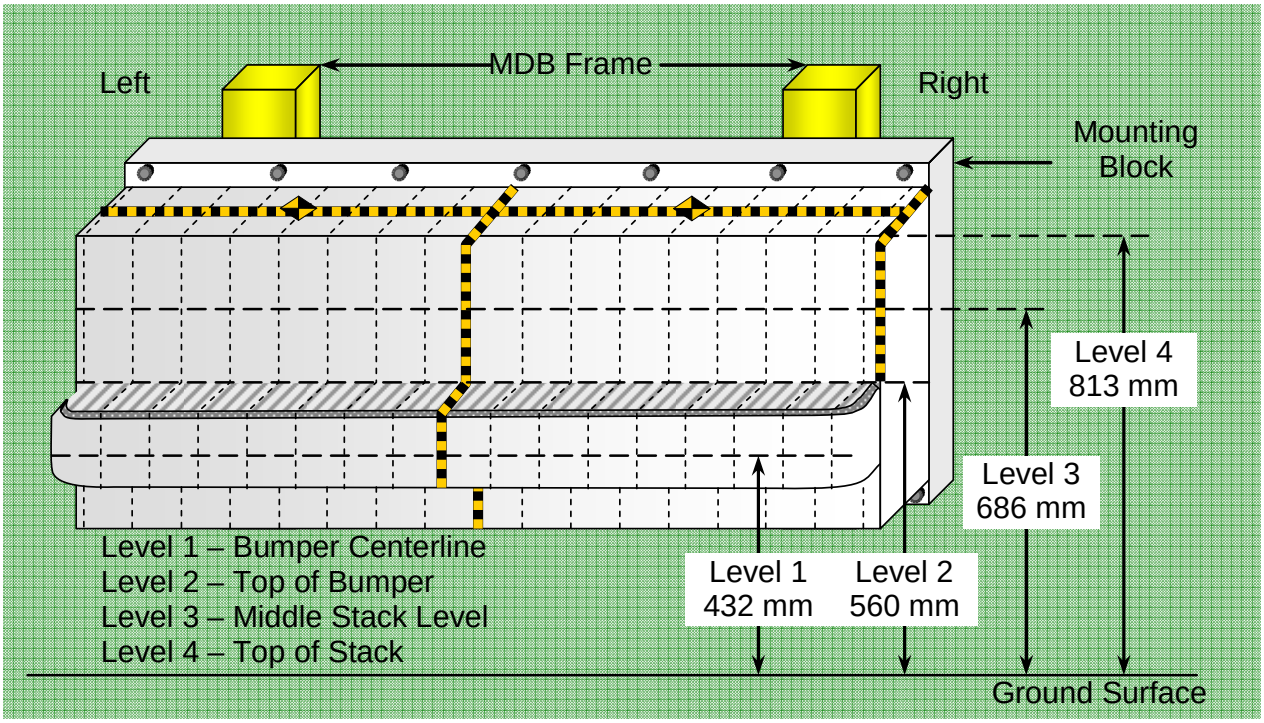


DATA SHEET 11
VEHICLE DAMAGE PROFILE DISTANCES (DPD)



DPD MEASUREMENTS				
	DPD measurement (mm)	**Pre test (mm)**	**Post test (mm)**	**Crush (mm)**
1	2550	97	97	0
2	1980	96	171	75
3	1410	97	370	273
4	840	95	357	262
5	270	94	324	230
6	-300	97	97	0

DATA SHEET 12
DEFORMABLE BARRIER STATIC CRUSH

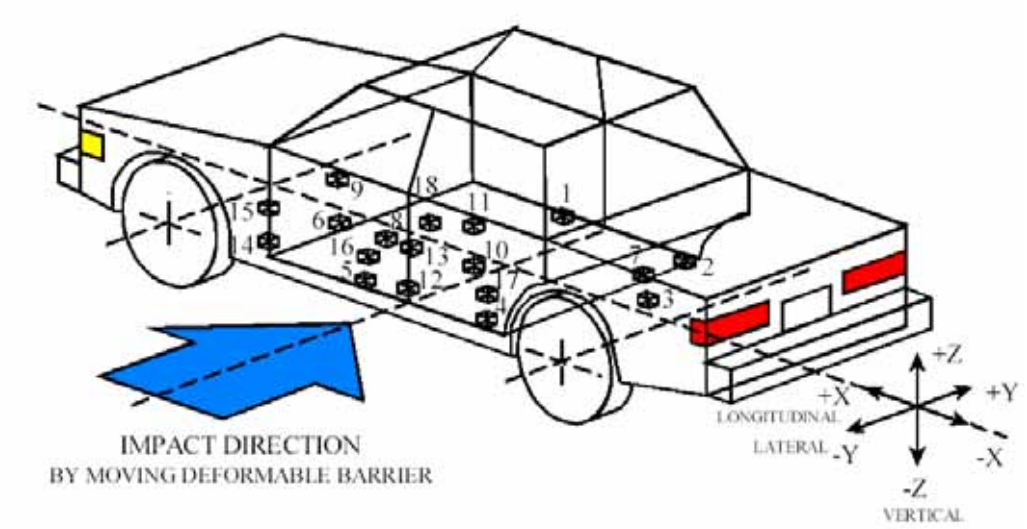


DEFORMABLE BARRIER FACE SUMMARY		
Barrier face manufacturer		Plascore
Serial number		186B0706-164A0806
Level	**Description**	**Maximum crush**
1	Center of bumper	209
2	Top of bumper	92
3	Middle of stack	97
4	Top of stack	108
Maximum post test intrusion is 209 mm at level 1		

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	101	75	52	34	30	38	53	78	70	60	59	59	62	70	79	97	108
3	97	73	48	37	37	41	50	57	65	45	29	28	30	35	45	56	78
2	87	91	88	82	78	74	70	65	67	68	72	72	74	78	83	78	92
1	209	189	179	164	161	164	165	162	158	160	161	161	162	162	167	169	170

all values in mm

DATA SHEET 13
VEHICLE ACCELEROMETER LOCATIONS

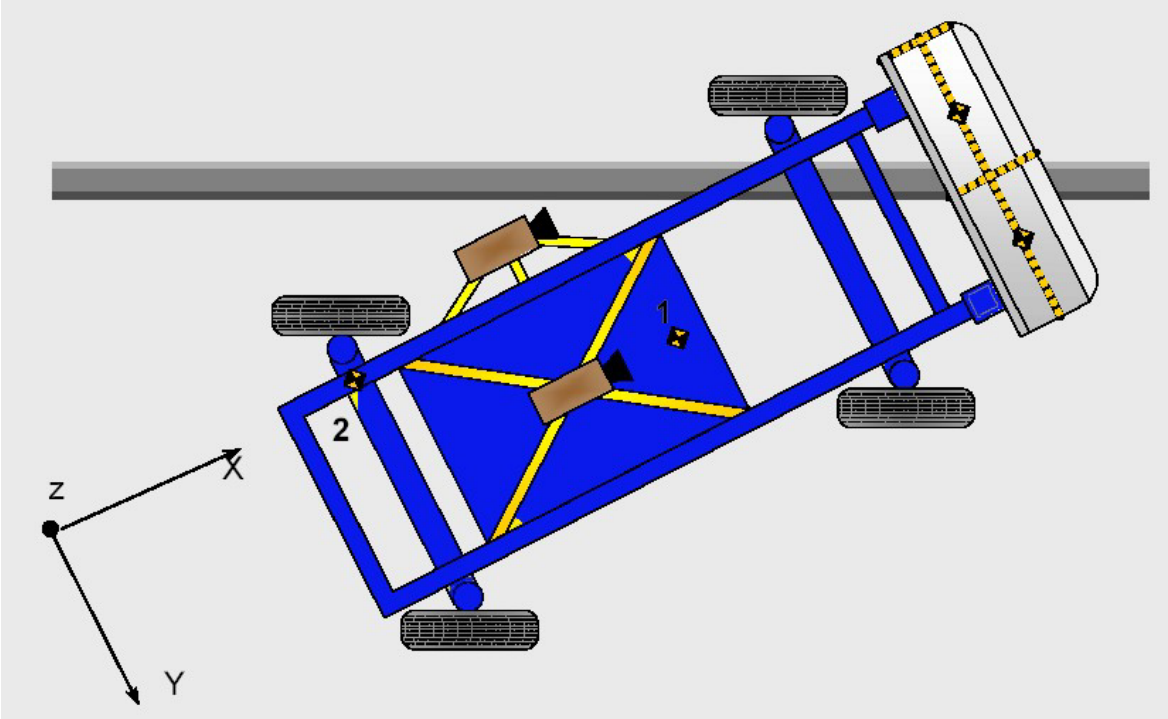


TEST VEHICLE ACCELEROMETER LOCATIONS				
Loc. no.	**Accelerometer location**	**Measurements (mm)**		
		X	**Y**	**Z**
1	Right sill at front seat	3050	827	188
2	Right sill at rear seat	2001	808	315
3	Rear floor pan above axle	836	341	271
4	Left sill at rear door	1905	-846	287
5	Left sill at front door	3010	-858	308
6	Left front door C/L	†	†	†
7	Rear occupant compartment	861	26	8
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	2555	-826	-131
13	Left middle b-pillar	2543	-827	-347
14	Left lower a-pillar	3643	-941	-112
15	Left middle a-pillar	3645	-922	-314
16	Front seat track	3114	-671	16
17	Rear seat track or structure	2199	-646	56
18	Vehicle CG	1225	850	109

Origin		Orientation	
X	Rear bumper	X	+(X) Forward
Y	Midline of vehicle	Y	+(Y) Right
Z	Top of rear bumper	Z	+(Z) Down

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

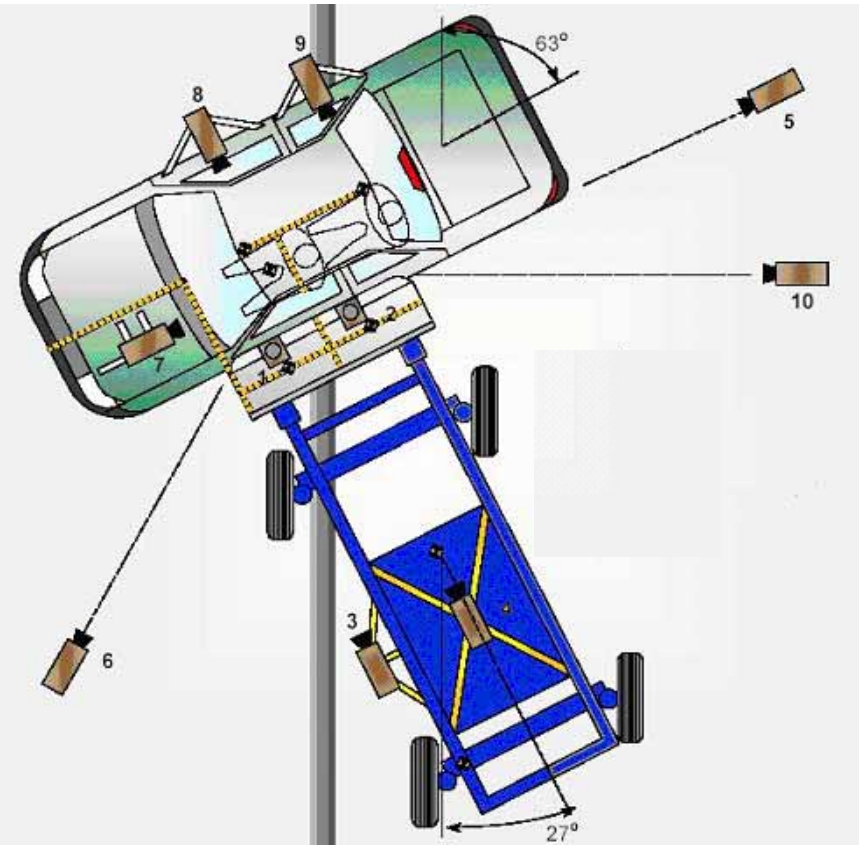
DATA SHEET 14
MDB ACCELEROMETER LOCATIONS



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

Origin		Orientation	
X	Rear structural member	X	+(X) Forward
Y	Midline of MDB	Y	+(Y) Right
Z	Middle of rear structural member	Z	+(Z) Down

DATA SHEET 15
HIGH-SPEED CAMERA LOCATIONS AND DATA SUMMARY



	View	Coordinates †			Angle	Lens	Rate
		X	Y	Z			
		mm	mm	mm	°	mm	fps
1	Overhead view of test vehicle	-249	-640	4812	90	10	1000
2	Overhead close-up view of impact plane	-550	-125	4340	90	16	1000
3	MDB onboard close-up view of impact point	-1542	-1026	25	0	25	1000
4	MDB onboard view of driver dummy	-1415	-1891	780	5	13	1000
5	Right side ground level overall view	-2311	-699	879	7	55	1000
6	Left side ground level overall view	668	-1184	848	10	12.5	1000
7	Test vehicle onboard driver front view				15	25	1000
8	Test vehicle onboard driver side view				10	12.5	1000
9	Test vehicle onboard passenger side view				10	12.5	1000
10	Real-time film coverage of test	-	-	-	-	-	-

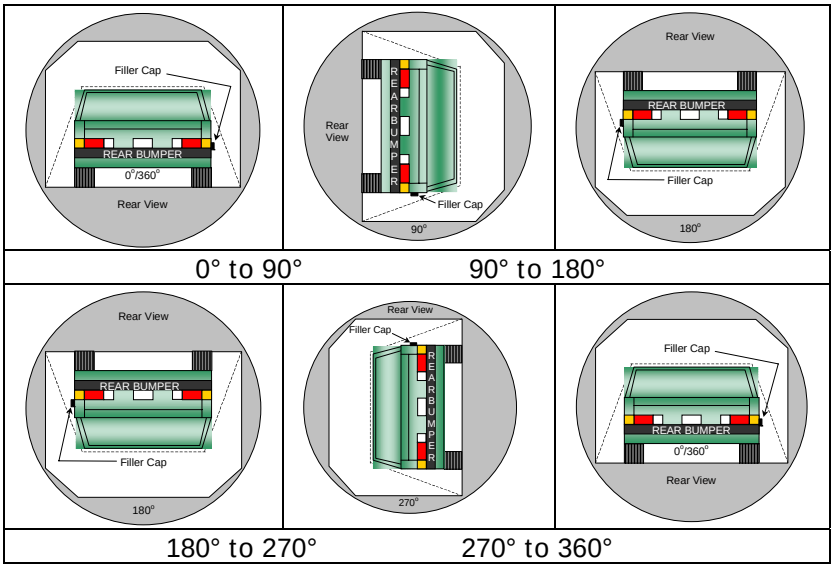
Origin		Orientation	
X	Impact Point	X	+(X) Forward
Y	Impact Point	Y	+(Y) Right
Z	Impact Point	Z	+(Z) Down

DATA SHEET 16
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 20° C Test Time: 4:22 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	302	366
90° to 180°	63	300	363
180° to 270°	65	300	365
270° to 360°	63	301	364

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 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

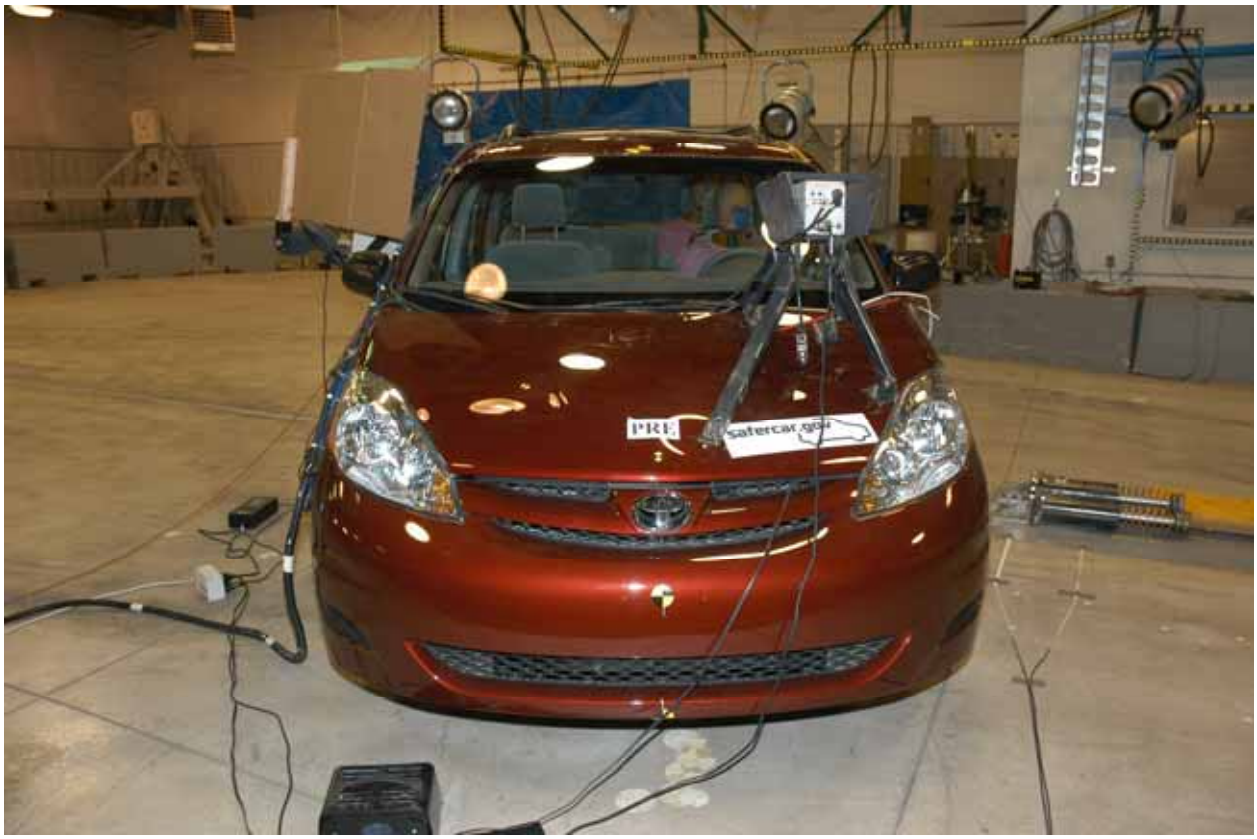


Figure A-5: Pre test front view of test vehicle

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

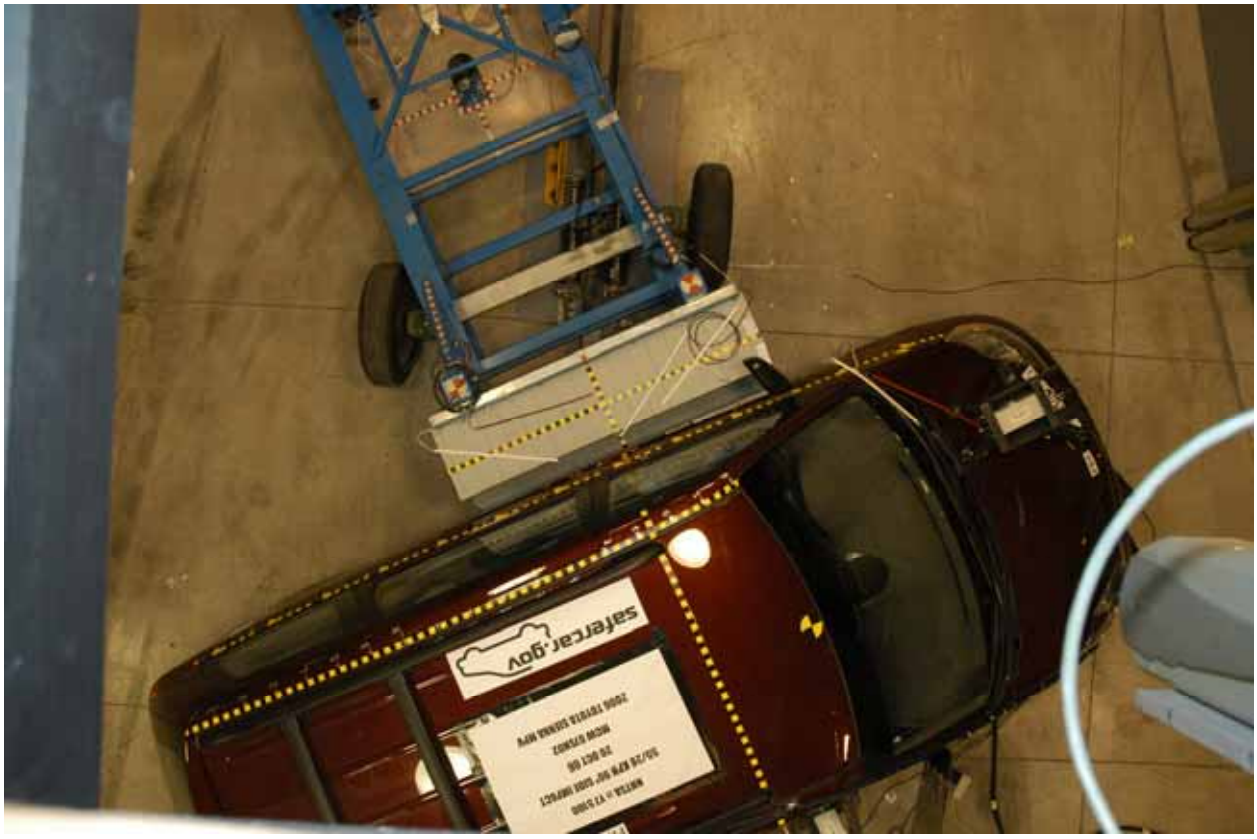


Figure A-21: Pre test overhead view

Figure A-22: Post test overhead view

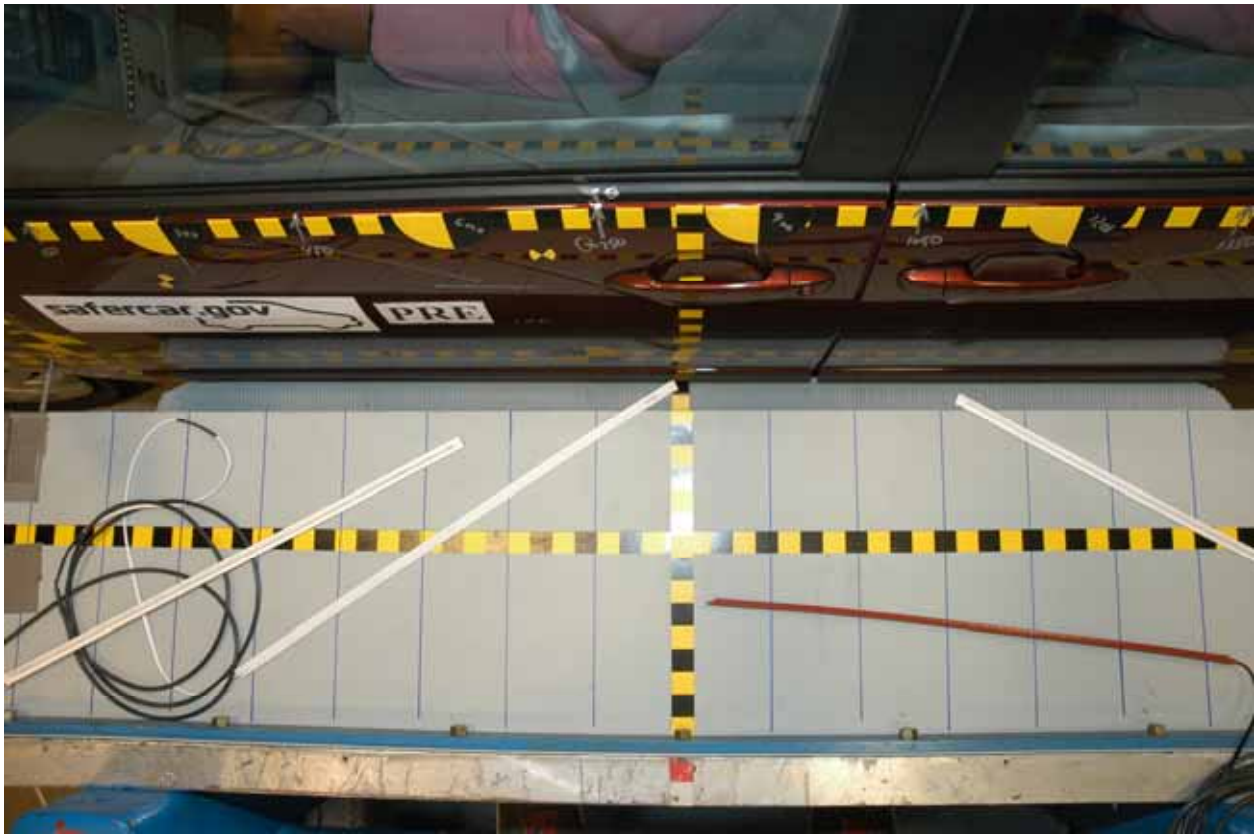


Figure A-23: Pre test overhead close-up view

Figure A-24: Post test overhead 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

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

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

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

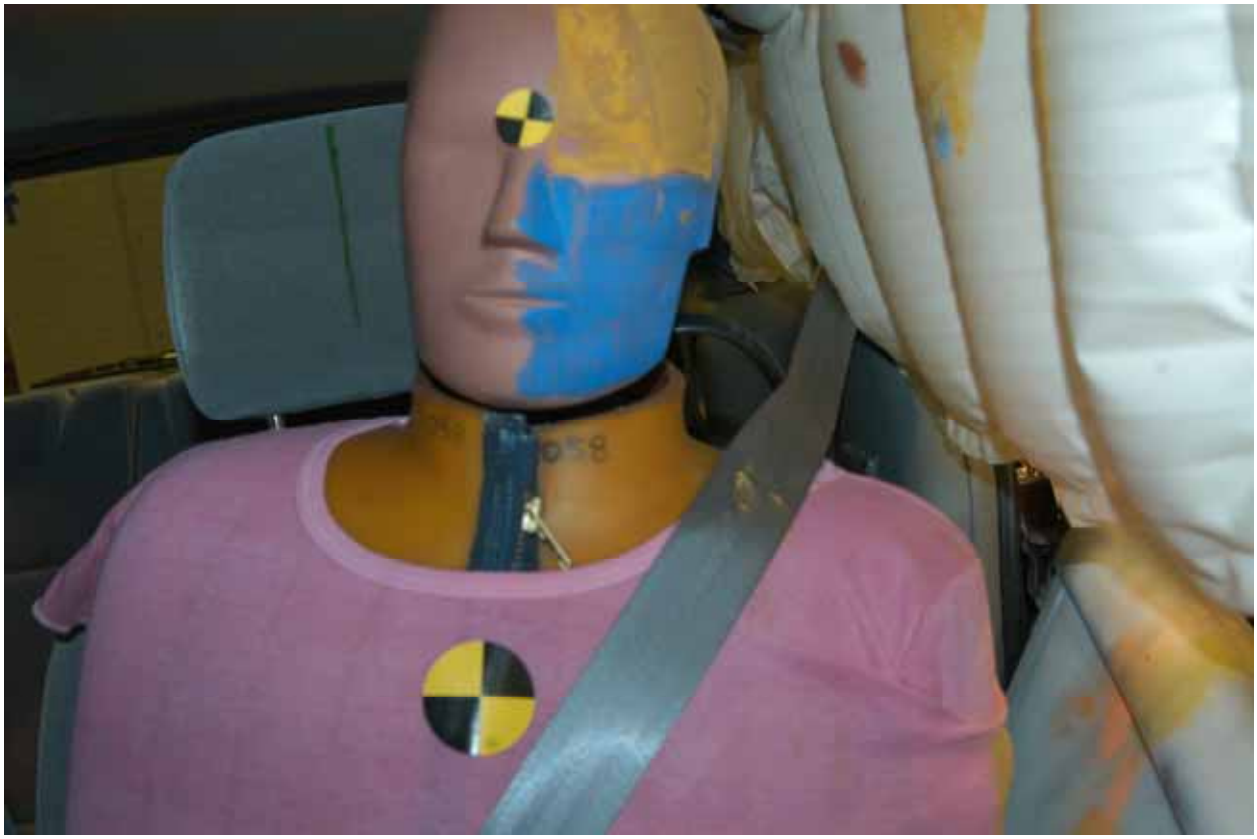


Figure A-46: Post test passenger shoulder clearance

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

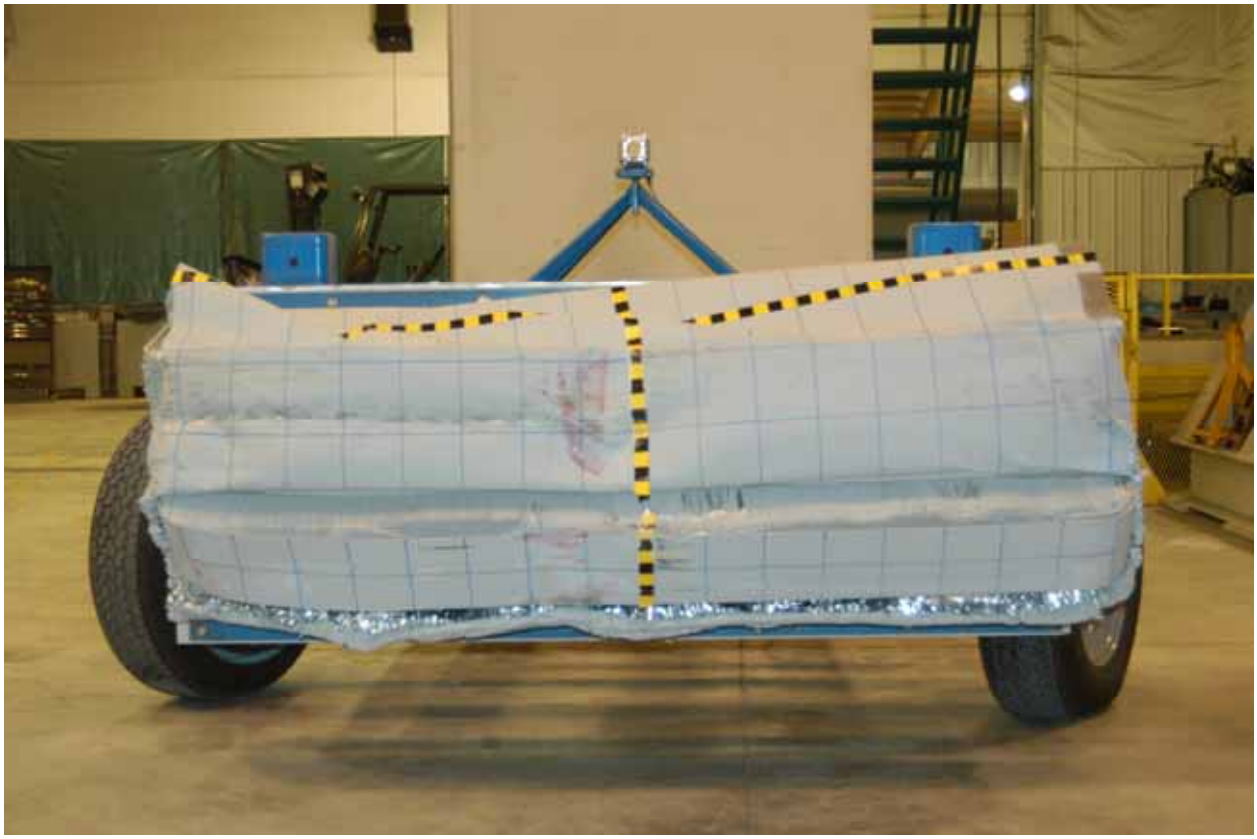


Figure A-52: Post test front view of MDB barrier face

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

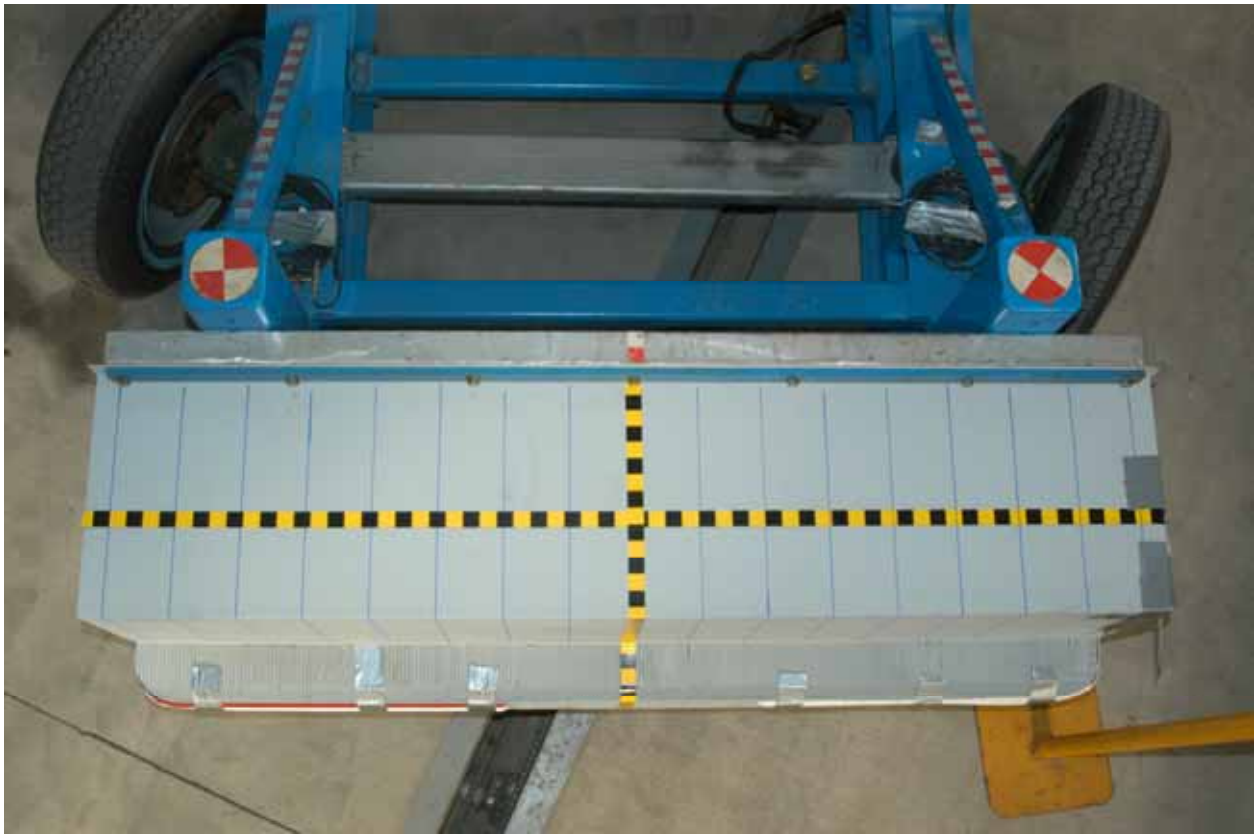


Figure A-57: Pre test overhead view of MDB barrier face

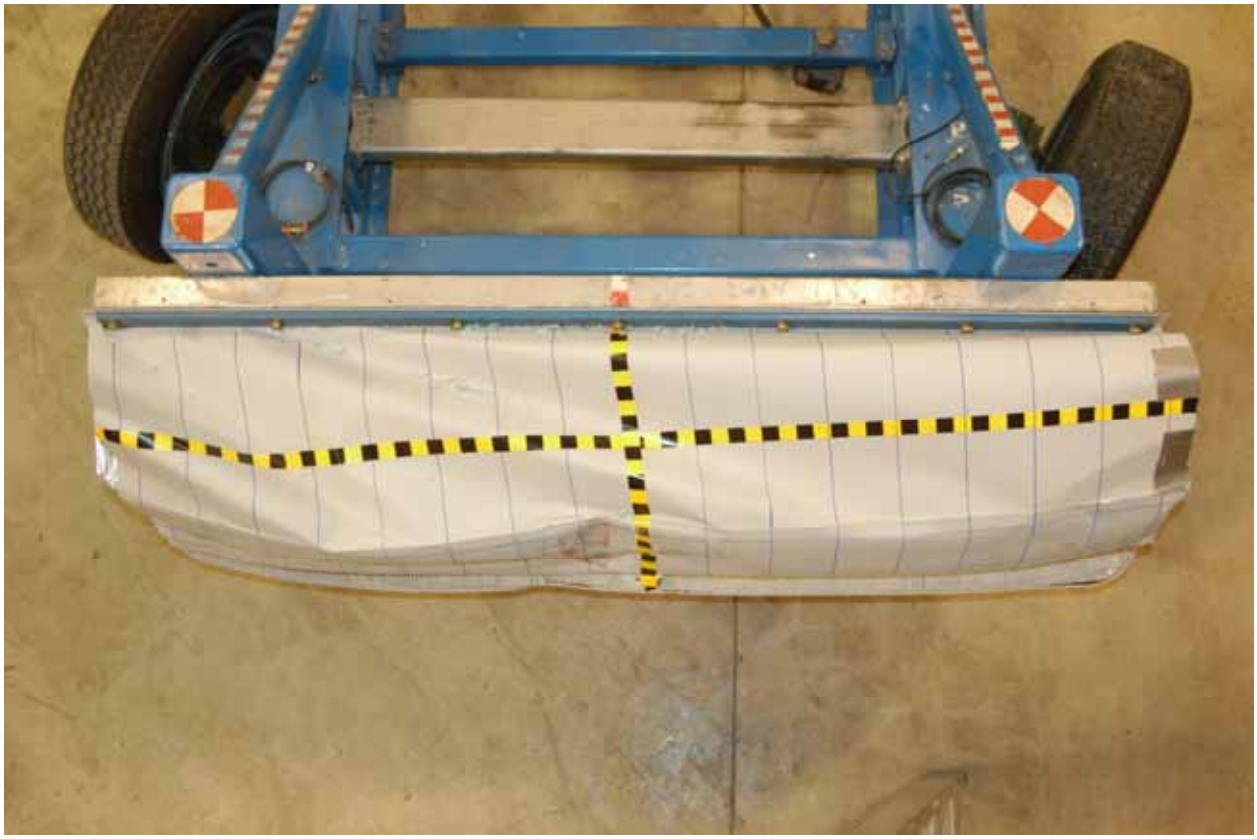


Figure A-58: Post test left side view of MDB barrier face

Figure A-59: FMVSS 301 0 degrees

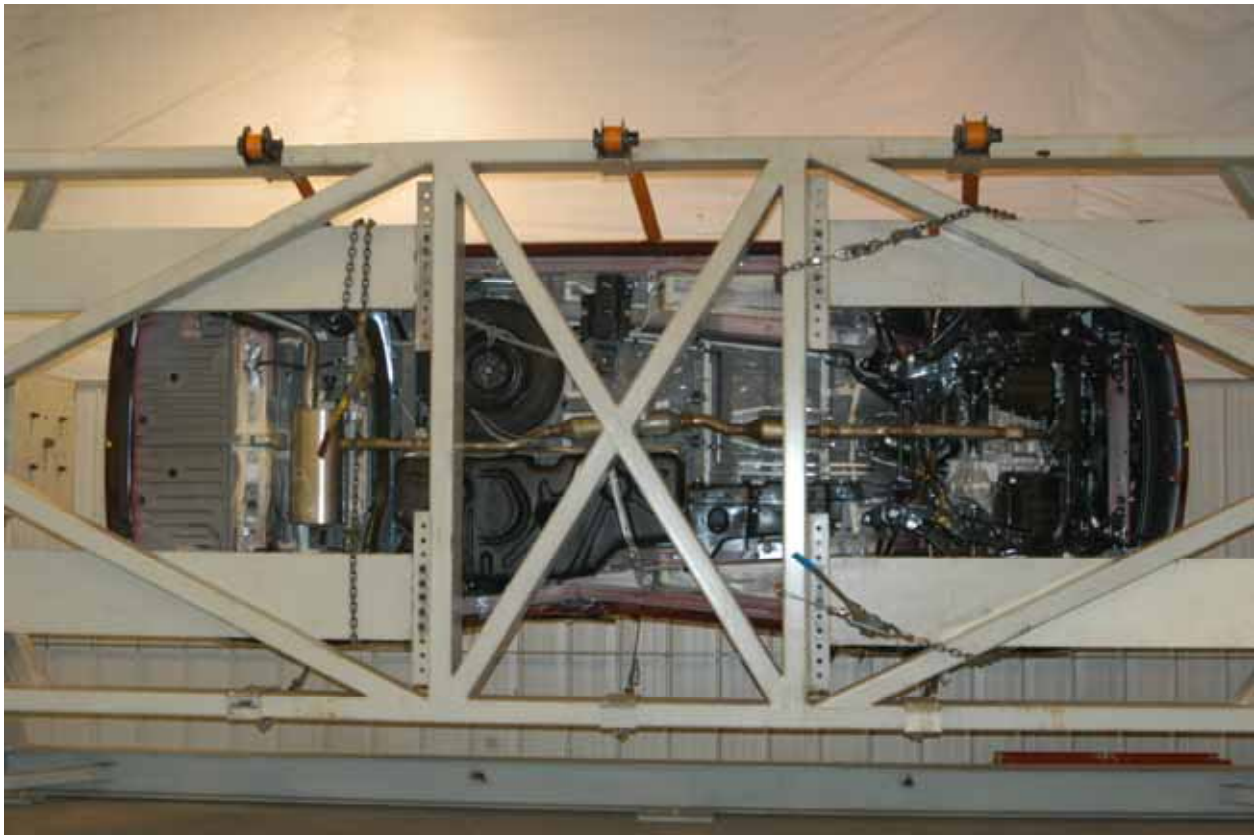


Figure A-60: FMVSS 301 90 degrees

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

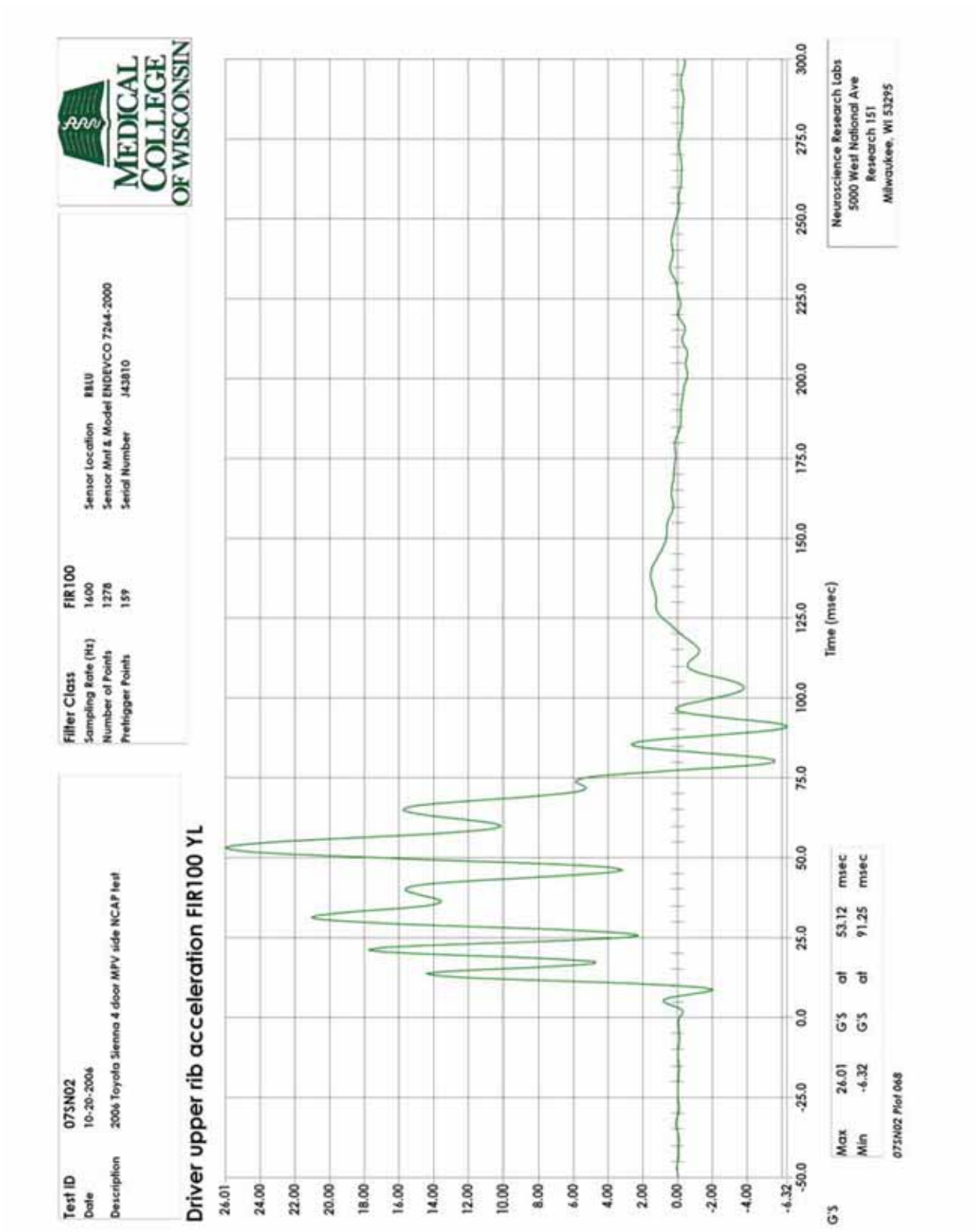
APPENDIX B
SID/HIII, VEHICLE AND MDB RESPONSE DATA

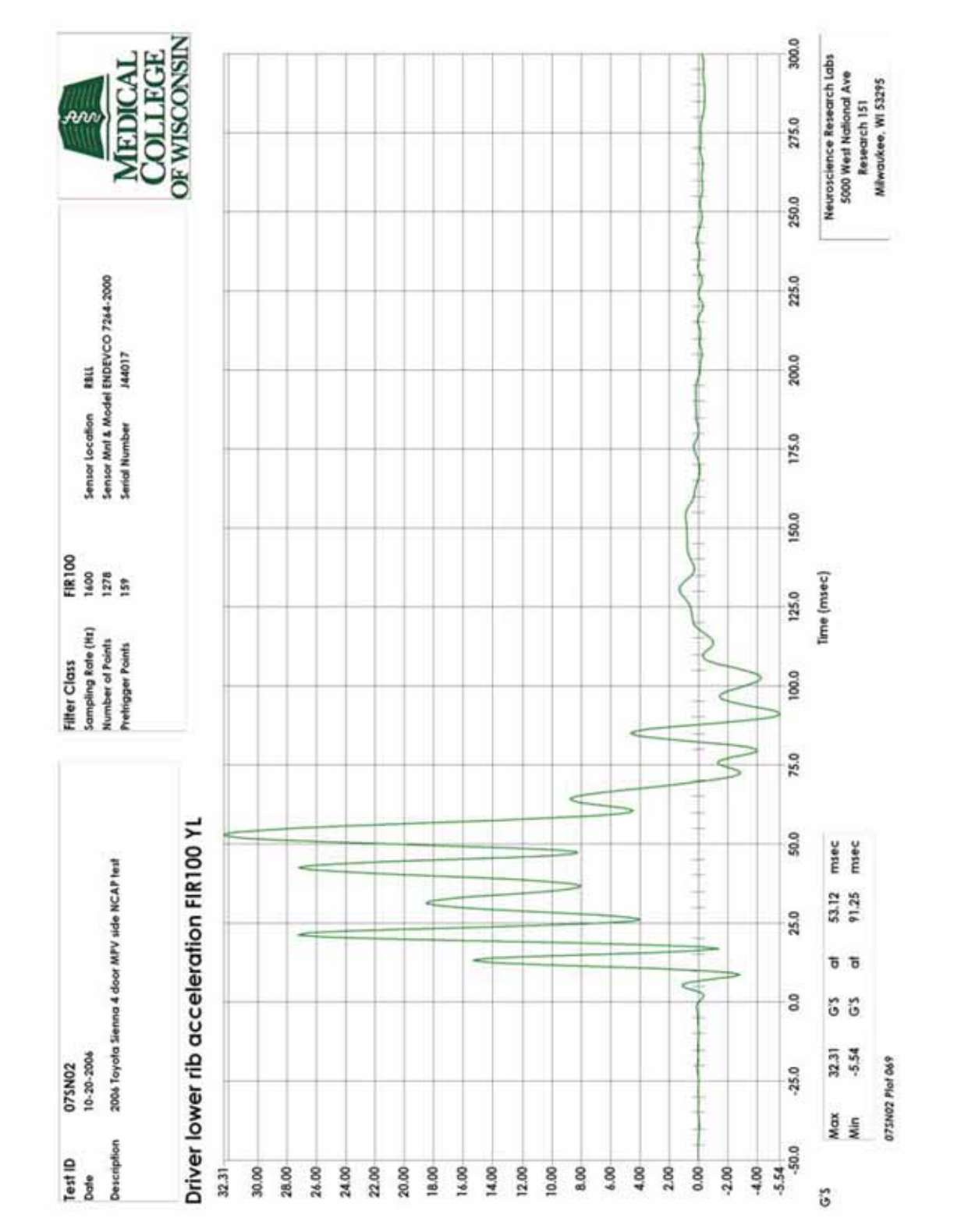
The following plots are provided in the test report

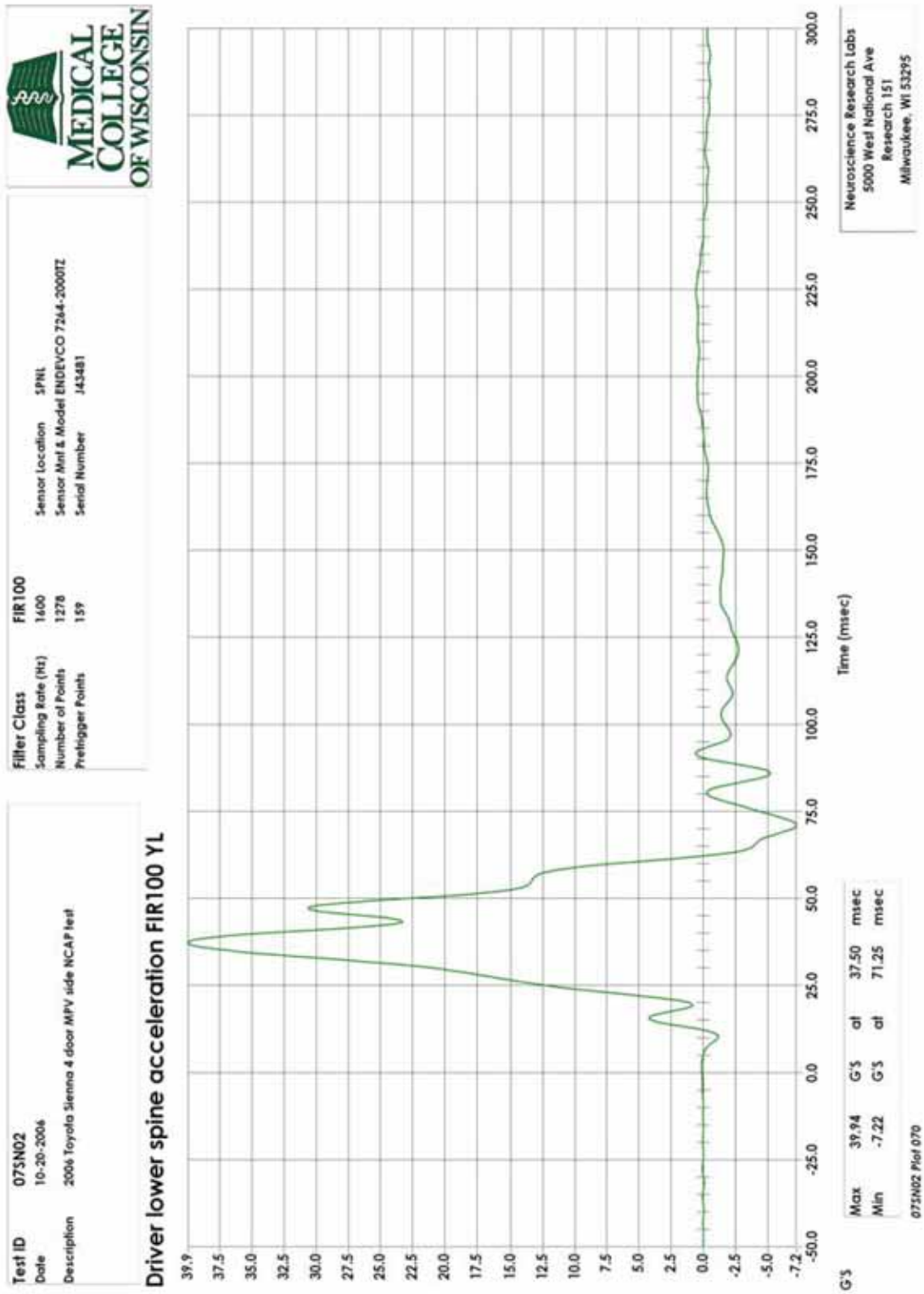
The following dummy, vehicle, and MDB response data can be found in the R&D section of the NHTSA website at: www-nrd.nhtsa.dot.gov/database/nrd-11/veh_db.html.

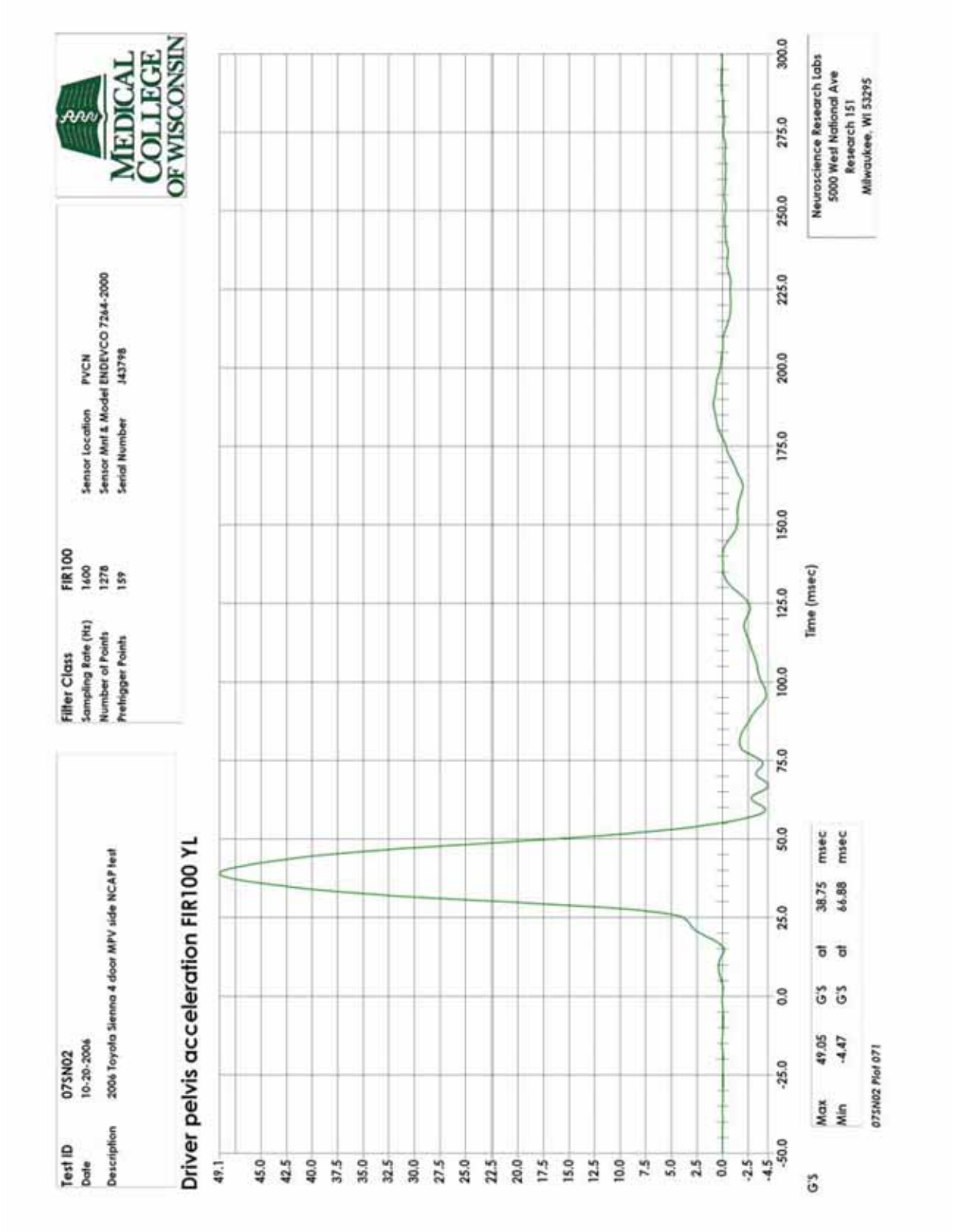
Description
Driver head (x) acceleration
Driver head (y) acceleration
Driver head (z) acceleration
Driver upper neck (x) force
Driver upper neck (y) force
Driver upper neck (z) force
Driver upper neck (x) moment
Driver upper neck (y) moment
Driver upper neck (z) moment
Driver upper rib (y) acceleration – 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

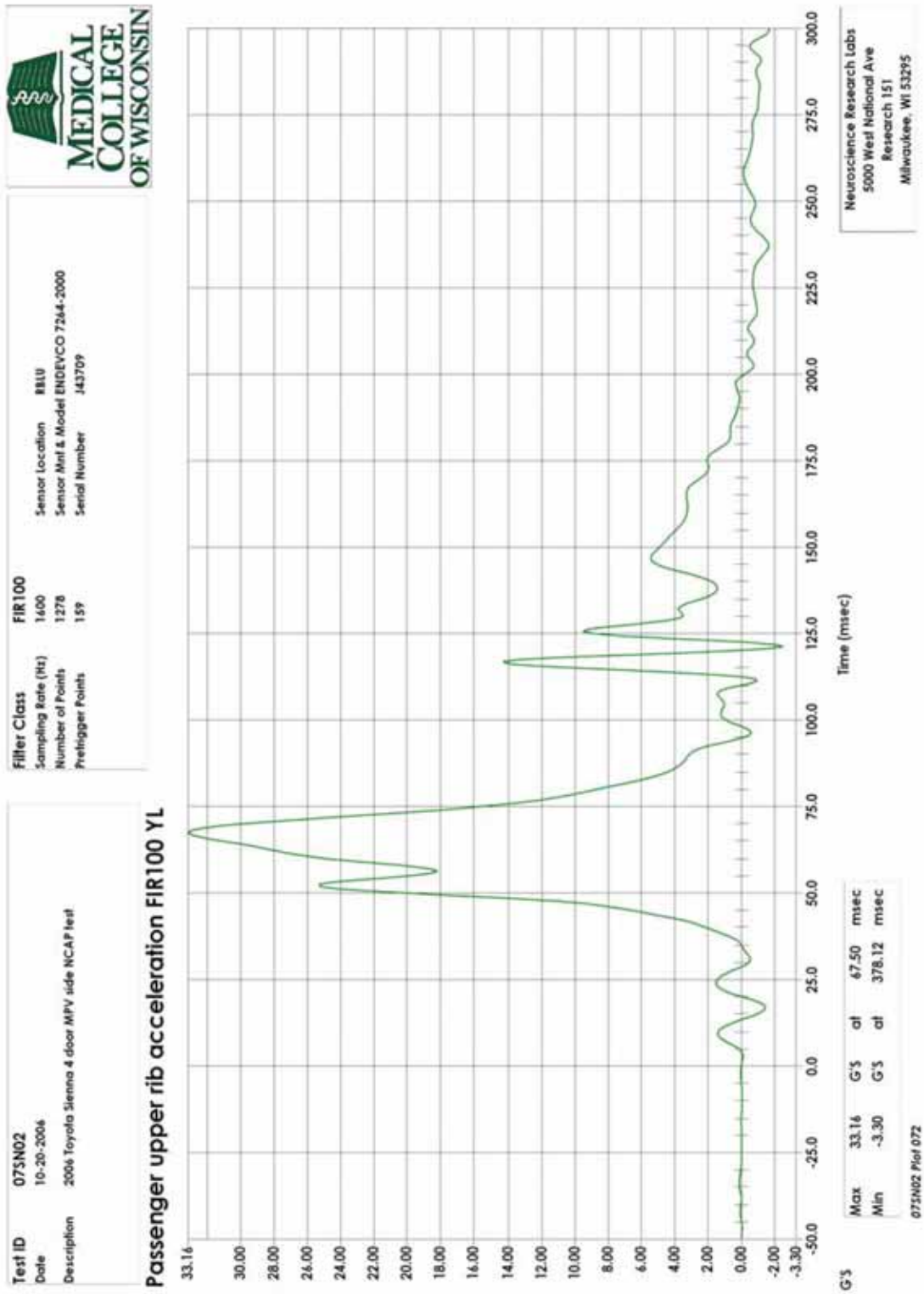
Vehicle left lower b-pillar (y) acceleration
Vehicle left middle b-pillar (y) acceleration
Vehicle left lower a-pillar (y) acceleration
Vehicle left middle a-pillar (y) acceleration
Vehicle front seat track (y) acceleration
Vehicle rear seat track/structure (y) acceleration
Vehicle center of gravity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

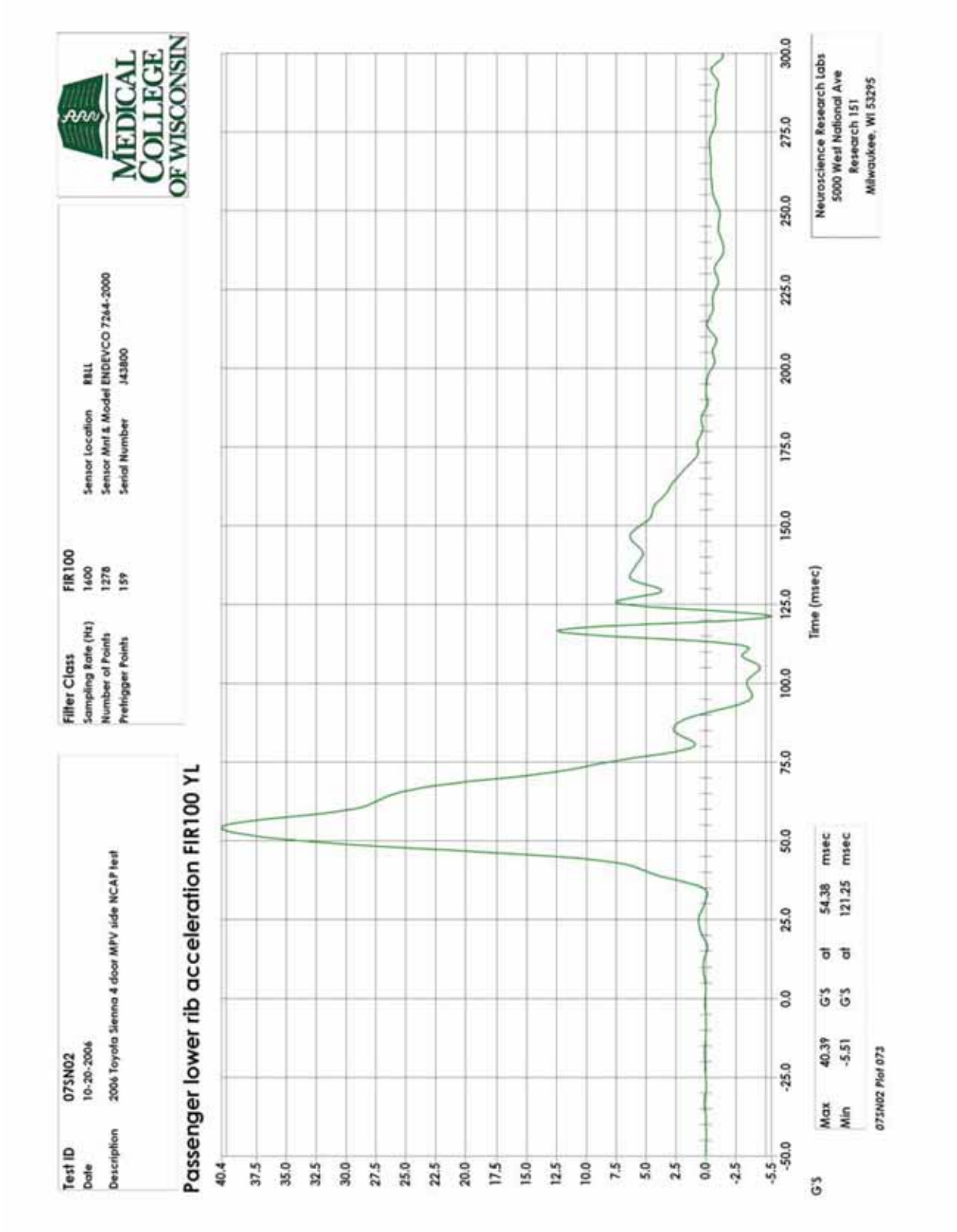

MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN02
Date 10-20-2006
Description 2006 Toyota Sienna 4 door MPV side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Prelnigger Points 159
Sensor Location RBLU
Sensor Mnf & Model ENDEVCO 7244-2000
Serial Number J43810
Driver upper rib acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G'S
Time (msec)
Max 26.01 G'S at 53.12 msec
Min -6.32 G'S at 91.25 msec
07SN02 Plot 068

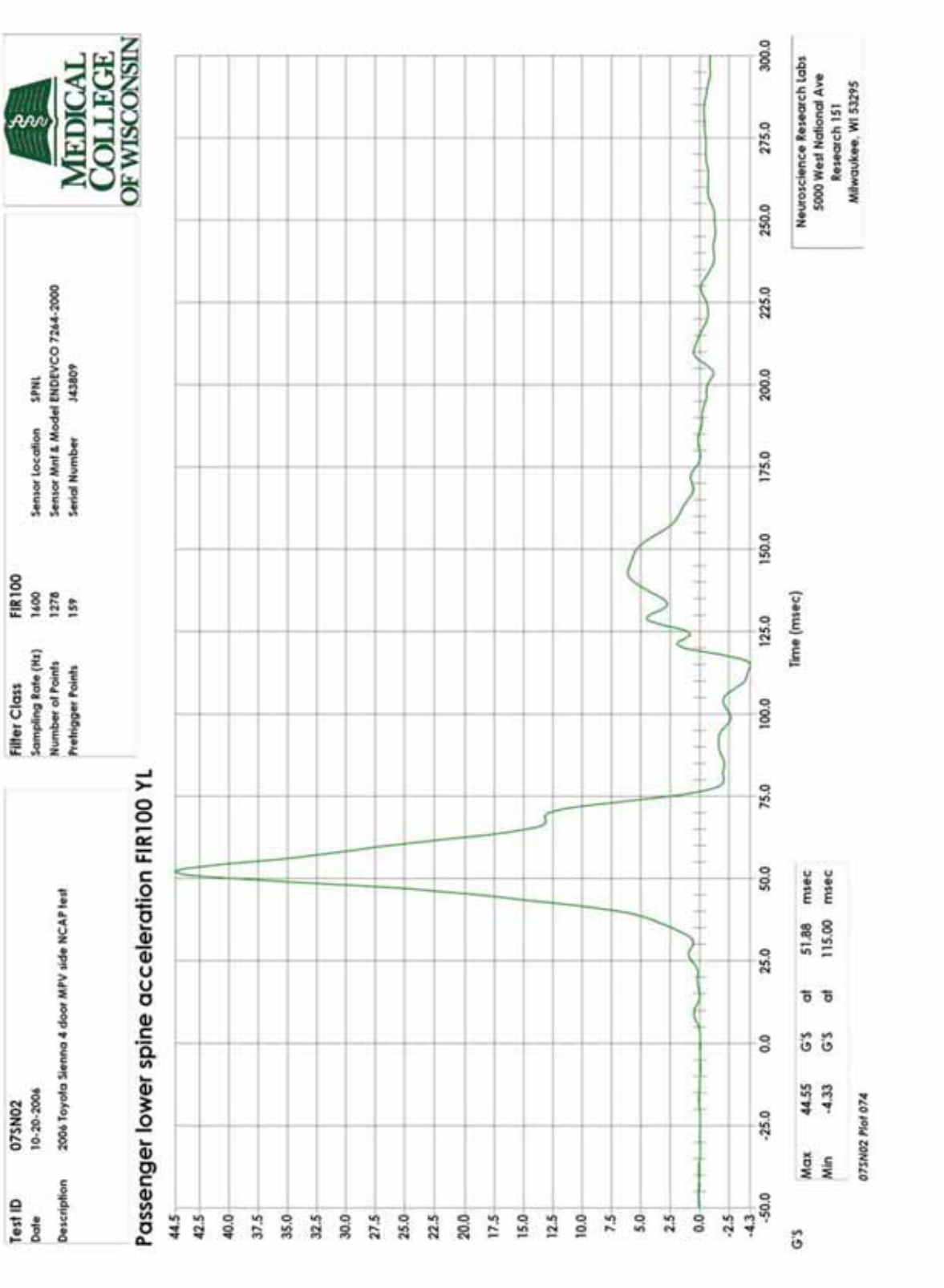

MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN02
Date 10-20-2006
Description 2006 Toyota Sienna 4 door MPV side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Pretrigger Points 159
Sensor Location RBLL
Sensor Mnf & Model ENDEVCO 7264-2000
Serial Number J44017
Driver lower rib acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G'S
Time (msec)
Max 32.31 G'S at 53.12 msec
Min -5.54 G'S at 91.25 msec
07SN02 Plot 069

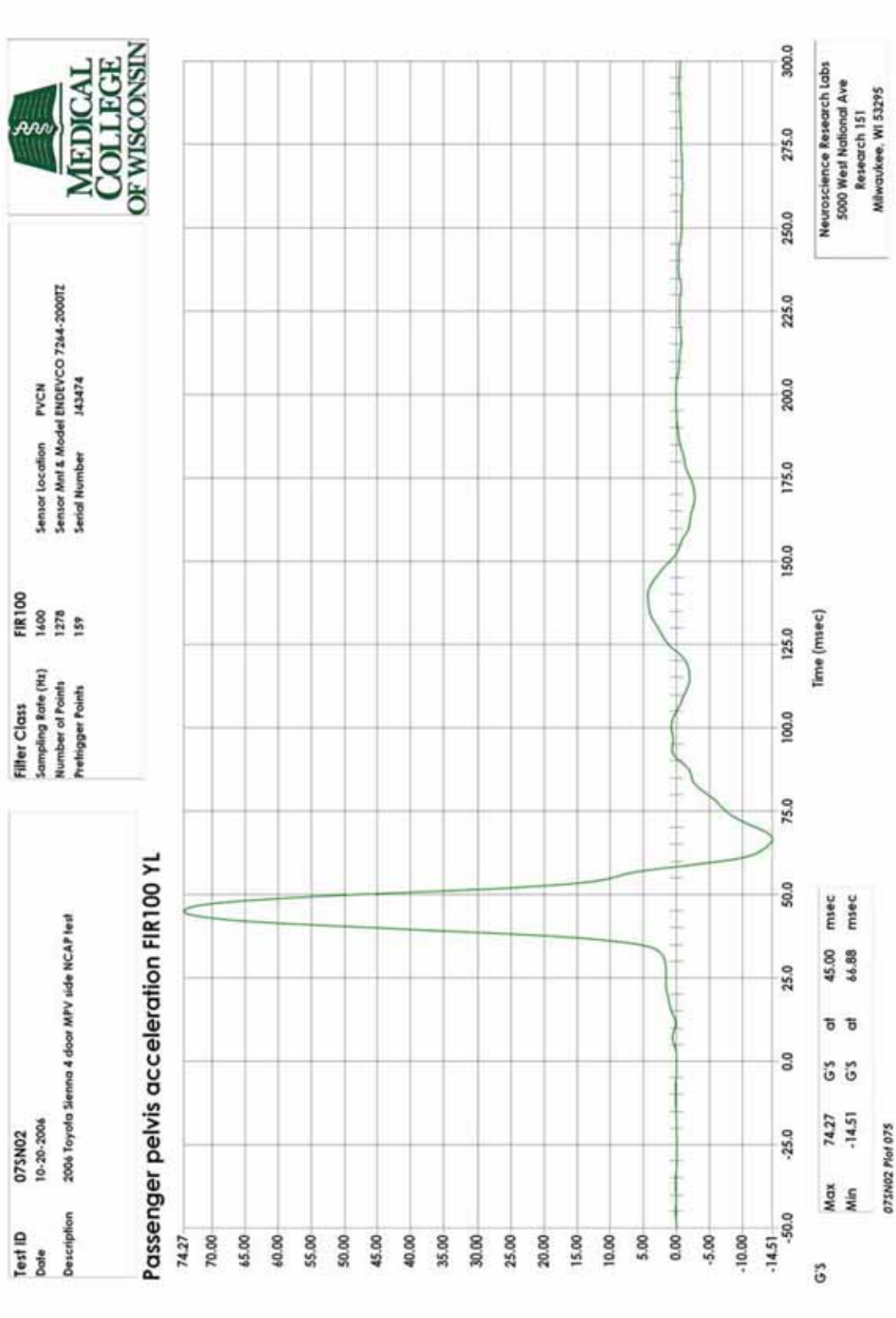

MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN02
Date 10-20-2006
Description 2006 Toyota Sienna 4 door MPV side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Prehigger Points 159
Sensor Location SPNL
Sensor Mnf & Model ENDEVCO 7264-2000TZ
Serial Number J43481
Driver lower spine acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G's
Time (msec)
Max 39.94 G's at 37.50 msec
Min -7.22 G's at 71.25 msec
07SN02 Plot 070


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN02
Date 10-20-2006
Description 2006 Toyota Sienna 4 door MPV side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Pretrigger Points 159
Sensor Location PVCN
Sensor Mnf & Model ENDEVCO 7264-2000
Serial Number J43798
Driver pelvis acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G's
Time (msec)
Max 49.05 G's at 38.75 msec
Min -4.47 G's at 66.88 msec
07SN02 Plot 071


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN02
Date 10-20-2006
Description 2006 Toyota Sienna 4 door MPV side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Prefrigger Points 159
Sensor Location RILU
Sensor Mnf & Model ENDEVCO 7264-2000
Serial Number J43709
Passenger upper rib acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G'S
Time (msec)
Max 33.16 G'S at 67.50 msec
Min -3.30 G'S at 378.12 msec
07SN02 Plot 072


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN02
Date 10-20-2006
Description 2006 Toyota Sienna 4 door MPV side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Pretrigger Points 159
Sensor Location RBLL
Sensor Mnf & Model ENDEVCO 7264-2000
Serial Number J43800
Passenger lower rib acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G's
Time (msec)
Max 40.39 G's at 54.38 msec
Min -5.51 G's at 121.25 msec
07SN02 Plot 073


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN02
Date 10-20-2006
Description 2006 Toyota Sienna 4 door MPV side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Pretrigger Points 159
Sensor Location SPNL
Sensor Mnf & Model ENDEVICO 7264-2000
Serial Number 143809
Passenger lower spine acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G's
Time (msec)
Max 44.55 G's at 51.88 msec
Min -4.33 G's at 115.00 msec
07SN02 Plot 074


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN02
Date 10-20-2006
Description 2006 Toyota Sienna 4 door MPV side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Pretrigger Points 159
Sensor Location PVCN
Sensor Mnf & Model ENDEVCO 7264-2000TZ
Serial Number 143474
Passenger pelvis acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G's
Time (msec)
Max 74.27 G's at 45.00 msec
Min -14.51 G's at 66.88 msec
07SN02 Plot 075

APPENDIX C

DUMMY CALIBRATION DATA

VERIFICATION TEST RESULTS SUMMARY
PRE AND POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial Number 056 Test Sequences 1 and 2

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

SID Serial Number 058 Test Sequences 1 and 2

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

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	-	13Oct06	08Nov06	13Oct06	08Nov06
Sequential Test Number	-	2	3	2	3
Temperature (°C)	18.9-25.5	19.1	23.6	19.0	21.2
Relative Humidity (%)	10-70	27.2	30.8	26.8	27.9
SH – Seated Height (mm)	889-909	908	902	906	908
RH – Rib Height (mm)	501-521	504	502	507	519
HP – Hip Pivot Height (mm)	99	99/99	99/99	99/99	99/99
RD – Rib From Back Line (mm)	229-241	229	229	229	229
KH – Knee Pivot from Back Line (mm)	511-526	517/516	515/519	517/520	515/516
KV – Knee Pivot to Floor (mm)	490-505	499/496	502/505	502/498	497/504
HW – Hip Width (mm)	356-391	365	374	361	367
THORAX IMPACTS					
Date	-	14Oct06	08Nov06	14Oct06	08Nov06
Sequential Test Number	-	2	3	2	3
Temperature (°C)	18.9-25.5	19.7	23.0	19.7	23.9
Relative Humidity (%)	10-70	29.7	27.0	29.4	29.9
Probe Speed (m/s)	4.21-4.33	4.27	4.27	4.27	4.27
Upper Rib Acceleration (G)	37-46	40.3	42.5	42.3	45.8
Lower Rib Acceleration (G)	37-46	39.0	41.8	39.9	40.8
Lower Spine Acceleration (G)	15-22	19.2	20.6	21.2	21.9
PELVIS IMPACTS					
Date	-	14Oct06	08Nov06	14Oct06	08Nov06
Sequential Test Number	-	2	3	2	3
Temperature (°C)	18.9-25.5	19.6	23.8	19.0	23.8
Relative Humidity (%)	10-70	30.1	28.2	29.4	30.2
Probe Speed (m/s)	4.21-4.33	4.27	4.27	4.27	4.27
Pelvis Acceleration (G)	40-60	51.5	41.6	47.2	42.2
THORACIC SHOCK ABSORBER					
Shock Absorber ID Number	-	1746	N/a	31310164	N/a
Damper Setting	1-10	5	N/a	5	N/a
Date	-	27Sep06	N/a	27Sep06	N/a
Sequential Test Number	-	1	N/a	1	N/a
Temperature	18.9-25.5	20.5	N/a	20.5	N/a
Relative Humidity	10-70	48.1	N/a	47.6	N/a
Probe Speed (m/s) Low	3.05	3.05	N/a	3.06	N/a
Force (N)	836 – 1125	1012.6	N/a	894.2	N/a
Displacement (mm)	30 – 35	30.1	N/a	30.3	N/a
Probe Speed (m/s) Middle	4.27	4.27	N/a	4.27	N/a
Force (N)	1730 – 2099	1858.0	N/a	1755.4	N/a
Displacement (mm)	32 – 37	32.6	N/a	34.4	N/a
Probe Speed (m/s) High	6.10	6.10	N/a	6.10	N/a
Force (N)	3741 – 4448	4047.9	N/a	4098.3	N/a
Displacement (mm)	33 - 40	36.3	N/a	36.5	N/a

TEST PARAMETER	SPEC	SID HIII/056		SID HIII/058	
		PRE	POST	PRE	POST
ABDOMINAL COMPRESSION					
Date	-	12Oct06	27Oct06	12Oct06	27Oct06
Sequential Test Number	-	2	3	2	3
Temperature (°C)	18.9-25.5	20.1	22.9	20.5	22.8
Relative Humidity (%)	10-70	29.4	30.2	28.9	30.2
Force at 13 mm (N)	104-162	134.1	161.9	140.0	157.1
Force at 19 mm (N)	163-221	195.5	216.7	193.4	205.8
Force at 25 mm (N)	222-280	271.2	265.0	259.0	268.1
Force at 33 mm (N)	325-391	390.6	373.5	366.4	268.4
LUMBAR FLEXION					
Date	-	12Oct06	26Oct06	11Oct06	26Oct06
Sequential Test Number	-	2	3	2	3
Temperature (°C)	18.9-25.5	20.9	21.9	21.2	21.7
Relative Humidity (%)	10-70	29.4	28.2	40.7	29.4
Force at 0° (N)	0-26.7	0		0	0
Force at 0° (N)	97.8-151.2	140.5	148.3	101.7	134.2
Force at 0° (N)	151.2-204.6	178.2	170.4	157.8	193.4
Force at 0° (N)	204.6-258	207.8	218.6	221.0	209.3
Return Angle	12° Maximum	7.4	5.8	6.9	3.2
HYBRID III LATERAL NECK					
Date	-	10Oct06	30Oct06	11Oct06	31Oct06
Sequential Test Number	-	2	3	2	3
Temperature (°C)	18.9-25.5	20.1	22.5	20.5	23.65
Relative Humidity (%)	10-70	40.7	25.5	41.6	24.5
Pendulum Speed (m/s)	6.89-7.13	7.09	7.09	7.07	7.07
Pendulum Pulse 10ms (m/s)	1.96-2.55	2.13	1.96	1.97	2.11
Pendulum Pulse 20ms (m/s)	4.12-5.10	4.42	4.30	4.34	4.50
Pendulum Pulse 30ms (m/s)	5.73-7.01	6.50	6.65	6.73	6.63
Pendulum Pulse 40 –70 ms (m/s)	6.27-7.64	6.68	7.14	7.23	6.73
Max Head rotation (deg)	66-82	75.0	80.2	72.7	74.9
Head angle crosses zero (ms)	58-67	58.3	61.5	64.1	62.0
Peak Moment (Nm)	73-88	75.0	75.8	74.6	84.3
Moment crosses zero (ms)	49-63	49.4	59.9	58.2	59.2
Max rotation wrt pk. moment (ms)	2-15	9.6	3.9	6.2	9.8
HYBRID III LATERAL HEAD DROP					
Date	-	09Oct06	25Oct06	09Oct06	25Oct06
Sequential Test Number	-	2	3	2	3
Temperature (°C)	18.9-25.5	20.6	21.3	20.5	21.0
Relative Humidity (%)	10-70	43.9	25.9	43.9	26.4
Resultant Max (G)	120-150	129.4	120.8	140.1	148.2
Longitudinal Max (G)	<15	4.0	3.9	4.8	5.1

DUMMY INSPECTION LIST
PRE AND POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

		SID H3 056		SID H3 058	
		PRE	POST	PRE	POST
	Date	05Oct06	21Oct06	05Oct06	21Oct06
	Performed By	Mark Meyer	Mark Meyer	Mark Meyer	Mark Meyer
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