REPORT NUMBER TR-P27012-01-NC

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

HYUNDAI MOTOR COMPANY
2007 HYUNDAI VERACRUZ
5-DOOR MPV

NHTSA NUMBER: U70501

Prepared By:
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MARCH 05, 2007

FINAL REPORT

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16. Abstract

A 55/28 km/h 90 deg. Moving Deformable Barrier Side Impact NCAP Test was conducted on the subject 2007 Hyundai Veracruz 5-Door MPV in accordance with the specifications of the Office of Crash Worthiness Standards Test Procedures for the generation of consumer information on vehicle side crash protection. The test was conducted at KARCO Engineering, LLC in Adelanto, CA, on March 05, 2007. The impact velocity of the Moving Deformable Barrier was 61.96 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 21.1 deg. C. The target vehicle's maximum post-test static crush was 262 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver SID/HIII	Pass. SID/HIII
Left Upper Rib (LUR) G's	26.2	34.7
Left Lower Rib (LLR) G's	29.1	42.2
Lower Spine (T_{12}) G's	19.8	36.5
Thoracic Trauma Index (TTI) G's	24.0	39.0
Pelvis (PEV) G's	37.4	65.6

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New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) Side Impact Dummy (SID/HIII)	Copies of this report are available from: National Highway Traffic Safety Admin. NHTSA Technical Reference Division 400 Seventh St., SW, Room 5108 Washington, DC 20590

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PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This Side Impact NCAP test is conducted as part of the FY' 2007 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract No. DTNH22-03-D-32005. The purpose of this test is to generate comparative side impact data on a 2007 Hyundai Veracruz 5-Door MPV manufactured by Hyundai Motor Company.

1.2 TEST PROCEDURE

The side impact test was conducted in accordance with the current National Highway Traffic Safety Administration (NHTSA), Office of Crashworthiness Standards (OCS), laboratory test procedure NCAP 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 SIDE IMPACT TEST

2.1 SUMMARY OF SIDE IMPACT NCAP TEST

A model year 2007 Hyundai Veracruz was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.96 km/h. The specified impact velocity range is from 61.14 to 62.75 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 2154 kg and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering, LLC in Adelanto, California, on March 05, 2007.

Two (2) real-time cameras and ten (10) high-speed video cameras were used to document the impact event. Camera locations and pertinent camera information is documented in the data sheets. Pre- and post-test photographs of the vehicle and SID/HIIIs can be found in Appendix A. Two 50th percentile adult male Side Impact Dummies, Hybrid III (SID/HIIIs) were placed in the driver's and left rear passenger designated seating positions according to the test procedure. Each SID/HIII is instrumented with contact switches on the pelvis, thorax and six-axis neck load cells, and fourteen accelerometers in the following locations:

- Left Upper Rib (LUR) uni-axial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uni-axial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uni-axial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uni-axial accelerometer (Y-axis primary and redundant)
- Head Center of Gravity (CG) tri-axial accelerometers (X, Y, and Z axes primary and redundant)

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front Driver		Left Rear (Passenger)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	No	
Side Torso Airbag	Yes	Yes	No	
Head Airbag	No		No	
Curtain Airbag	Yes	Yes	Yes	Yes

The test vehicle was instrumented with twenty-one (21) structural accelerometers and the MDB was instrumented with five (5) accelerometers and one (1) contact switch on the right bumper to compare left side to right side bumper impact timing. All data channels were recorded with the fully self contained on-board Data Acquisition System (DAS). The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

2.2 GENERAL COMMENTS

The driver and passenger doors remained closed during impact. The test vehicle sustained a maximum static crush of 262 mm at level 3, 1350 mm rearward of the left vertical impact point. The driver SID/Hybrid III, Serial No. 274 and the passenger SID/Hybrid III, Serial No. 275 were calibrated prior to this test. The SID/Hybrid III injury criteria is summarized as follows:

Measurement	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	G's	24.0	39.0
Peak Pelvic G's (PEV)	G's	37.4	65.6

Tests summaries and post-test observations are presented in Section 3. Appendix A contains the still photograph prints. Appendix B contains the driver and passenger SID/HIIIs, vehicle, and MDB response data traces. Appendix C contains the SID Configuration and performance verification data.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION SHEETS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressures	lbf/in^2	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	^oF	^oC	=(tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

* Based on the Recommended Practice in SAE J916, May 85

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	U70501	Anti-Lock Brakes	Yes
Make	Hyundai	All Wheel Drive	No
Model	Veracruz	Power Steering	Yes
Body Style	5-Door MPV	Driver Front Airbag	Yes
Vin No.	KM8NU13C57U007336	Driver Side Torso Airbag	Yes
Color	Blue	Driver Side Head Airbag	No
Delivery Date	2/28/2007	Driver Curtain/Airbag	Yes
Odometer (Miles)	35	Rear Pass. Airbag	No
Dealer	Hyundai Motor America	Rear Pass. Side Airbag	No
Transmission	6-Speed Automatic	Rear Pass. Head Airbag	No
Final Drive	Front	Rear Pass. Curtain/Airbag	Yes
Type/No. Cyl.	V6	Pre-Tensioners	Yes
Engine Disp. (L)	3.8	Load Limiters	Yes
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air Cond.	Yes
Sunroof/T-Top	No	AM/FM CD	Yes
Tinted Glass	Yes	Tilt Steering	Yes
Traction Control	No	Automatic Door Locks	No
Power Brakes	Yes	Power Windows	Yes
Front Disc	Yes	Power Seats	No
Rear Disc	Yes	Other	None

Does Owners Manual provide instructions to turn off automatic door locks.	N/A

DATA FROM CERTIFICATION LABEL

Manufactured By	Hyundai Motor Company	GVWR (kg)	2600
Date of Manufacture	Jan-07	GAWR Front (kg)	1465
		GAWR Rear (kg)	1450

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	Bench	
Number of Occupants	2	3	2	7
Capacity Weight (VCW) (kg)				650
Cargo Weight (RCLW) (kg)				50

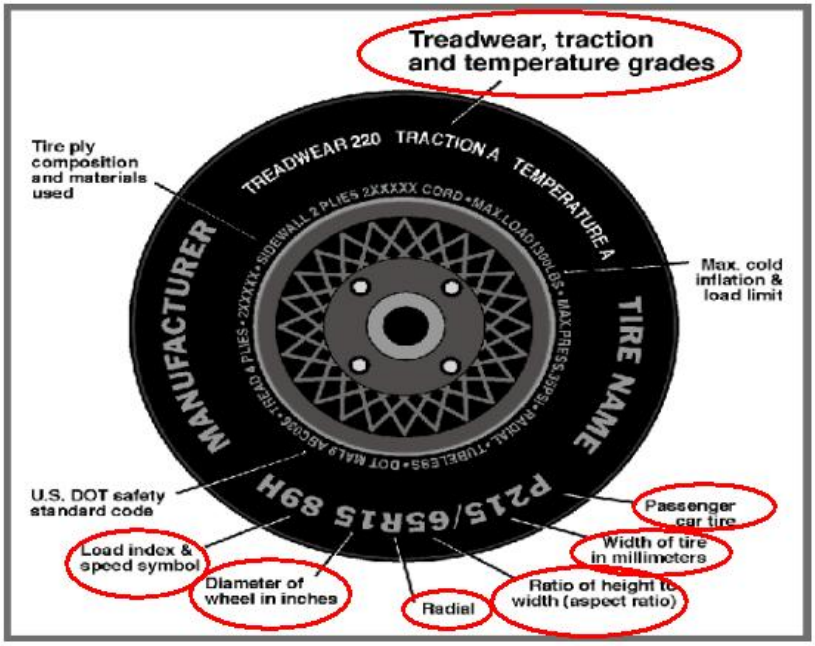
DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

Collect year, make, model, VIN, items circled in red, and tire manufacturer and tire name.



TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	308	308
Cold Pressure (kpa)	210	210
Recommended Tire Size	P245/65R17	P245/65R17
Tire Size on Vehicle	P245/65R17	P245/65R17
Tire Manufacturer	Kumho	Kumho
Treadwear	500	500
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Ply Polyester	2 Ply Polyester
Tire Plies Body	Steel 2 + Polyester 2 + Nylon	Steel 2 + Polyester 2 + Nylon
Load Index/Speed Symbol	105T	105T
Tire Material	Polyester + Steel + Nylon	Polyester + Steel + Nylon
DOT Safety Code Right	DOT H2J4 YP1H 3806	DOT H2J4 YP1H 3806
DOT Safety Code Left	DOT H2J4 YP1H 3806	DOT H2J4 YP1H 3806

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	553	417	970	620	483	1103
Right	kg	568	411	979	607	444	1051
Ratio	%	57.5	42.5	100	57.0	43.0	100
Totals	kg	1121	828	1949	1227	927	2154

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1949
Weight of 2 P572 ATD's	kg	161
Rated Cargo/Luggage Wt. (RCLW)	kg	50
Calculated Vehicle Target Wt. (TVTW)	kg	2160

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	864	864	881	884	1197
As Tested	mm	852	860	861	870	1213
Fully Loaded	mm	851	855	852	868	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2818
Total Vehicle Length at Left Side	mm	3240
Total Vehicle Length at Centerline	mm	4860
Total Vehicle Length at Right Side	mm	3240
Weight of Ballast In Cargo Area	kg	29
Amount of Stoddard Solvent in Fuel Tank	liters	72.49

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2818
Target Impact Point Aft of Front Axle	mm	469
Actual Impact Point Aft of Front Axle	mm	459

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

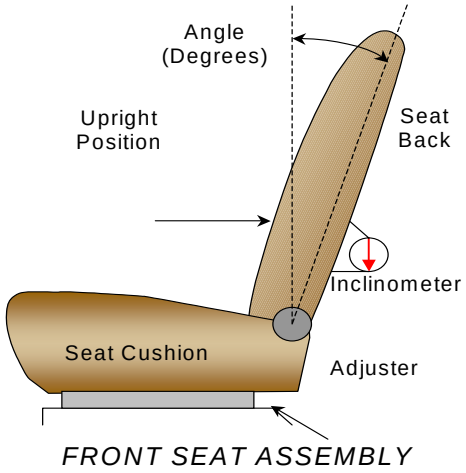
Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacturer's designated angle. The procedure is as follows: Seat back angle was measured at the headrest using a digital inclinometer.

SEAT BACK ANGLES

	Deg.
Driver Seat Back Angle	23.0 @ at seat back
Rear Seat Back Angle	23.0 @ at seat back

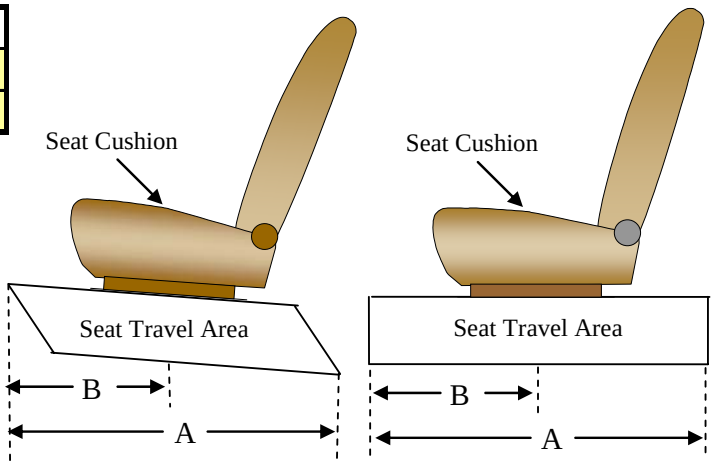


SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position at the highest vertical seat height to rearmost position at the lowest vertical seat height. The seat was set at the longitudinal mid position with the vertical adjustment at the lowest position obtainable for the driver and passenger.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	24 detents	11th detent
Rear Seat	24 detents	12th detent



SEAT BELT UPPER ANCHORAGE

Position number one (1) is the uppermost position

SEAT BELT UPPER ANCHORAGE

	Total # of Positions	Placed in Position #
Driver Seat	5	2
Rear Seat	Fixed	Fixed

DATA SHEET NO. 1…(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

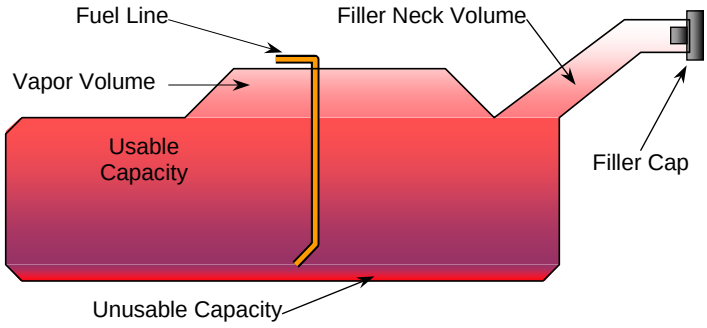
Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

.

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	77.97
Usable Capacity of "Optional" Tank	
Usable Capacity used for FMVSS 301	71.73 to 73.28
Actual Amount of Solvent used	72.49

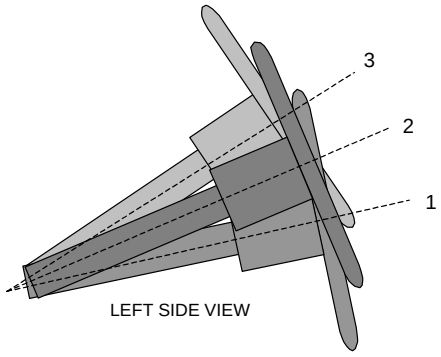
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately three (3) seconds with the ignition in the “ON” position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost positon No. 1	22.7	
Geometric center position No. 2	29.6	
Uppermost position No. 3	36.5	

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	553	417		620	483	
Right	kg	568	411		607	444	
Ratio	%	57.5	42.5		57.0	43.0	
Totals	kg	1121	828	1949	1227	927	2154

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	99	371
Level 2	Occupant H-Point	mm	260	696
Level 3	Mid Door	mm	262	760
Level 4	Window Sill	mm	118	1114
Level 5	Window top	mm	100	1672
N/A	Maximum Penetration	mm	262	

INSTRUMENTATION

Driver SID/Hybrid III Accelerometers	20
Passenger SID/Hybrid III Accelerometers	20
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total No. of Contact Switches	5
Total	71

CAMERA COVERAGE

High Speed, Vehicle On-Board	3
High Speed, Off-Board	4
High Speed, MDB On-Board	3
Real Time, Panning	2
Total	12

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

MDB SPECIFICATIONS (mm)

Measurement Description	Length
Overall Width of Framework Carriage	1252
Overall Length including Honeycomb Face	4115
Wheel Base of Framework Carriage	2590
C.G. location aft of Front Axle	1127

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	384	308	
Right	kg	385	284	
Ratio	%	56.5	43.5	
Totals	kg	769	592	1361

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.96
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.98
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.5

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE (mm)

Vertical Location			From Centerline		Max. Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	238
B	Top of Bumper	533	800	Right	136
C	Mid Level	686	800	Left	122
D	Top of Stack	813	800	Left	161

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	1
High Speed Cameras	2

DATA SHEET NO. 4

POST-TEST OBSERVATIONS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/Hybrid III	Rear Seat SID/Hybrid III
Dummy Type / Serial No.	P572F, SID / No. 274	P572F, SID / No. 275
Head Contact	Curtain Airbag	Curtain Airbag and Side Header
Upper Torso Contact	Side Airbag	Door Panel
Lower Torso Contact	Side Airbag	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	None	Left Knee

POST-TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Door remained closed and latched, jammed	Door remained closed and latched, jammed
Right Side Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Seat Movement	None	None
Seat Back Failure	None	None

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No separation
Sill Separation	Front & Rear passenger side sill separated
Windshield Damage	None
Window Damage	Rear window behind passenger side broke.
Other Notable Effects	None

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	No	No	
Side Torso Airbag	Yes	Yes	No	
Head Airbag	No		No	
Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes		No	
Seat Belt Load Limiter	Yes		No	

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	-10 (left)
Vertical Offset	mm	+/- 20	+6 (above)

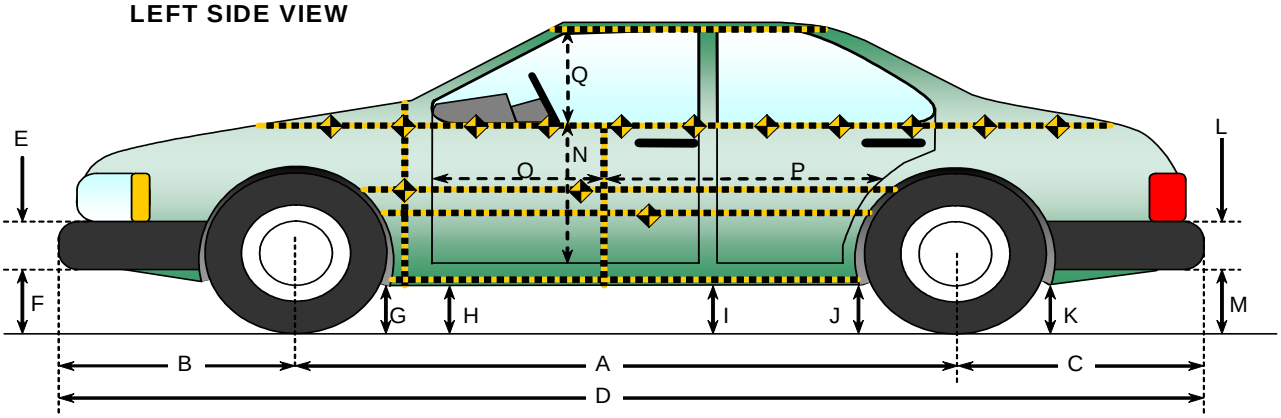
DATA SHEET NO. 5

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

LEFT SIDE VIEW



VEHICLE PRE AND POST-TEST MEASUREMENT INFORMATION

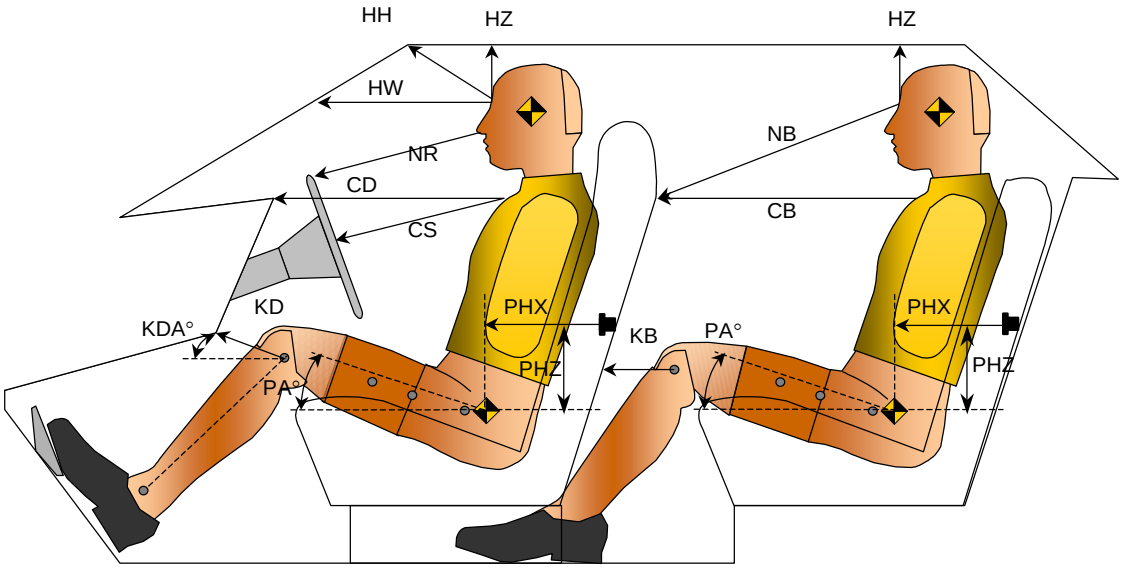
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2818	2795	-23
B	Front Axle to FSOV	962	902	-60
C	Rear Axle to RSOV	1062	1100	38
D	Total Length at Centerline	4860	4838	-22
E	Front Bumper Thickness	463	415	-48
F	Front Bumper Bottom to Ground	291	326	35
G	Sill Height at Front Wheel Well	276	277	1
H	Sill Height at Front Door Leading Edge	280	268	-12
I	Sill Height at "B" Pillar	292	241	-51
J1	Sill Height at Rear Wheel Well	270	236	-34
J2	Pinch Weld Height at Rear Wheel Well	280	326	46
K	Sill Height aft of Rear Wheel Well	306	344	38
L	Rear Bumper Thickness	300	298	-2
M	Rear Bumper Bottom to Ground	404	374	-30
N	Sill Height to Window Bottom Sill	770	745	-25
O	Front Door Leading Edge to Impact CL	800	795	-5
P	Rear Door Trailing Edge to Impact CL	1398	1355	-43
Q	Front Window Opening	435	435	0
R	Right Side Length	3240	3245	5
S	Left Side Length	3240	3205	-35
T	Vehicle Width at "B" Post	1910	1760	-150

DATA SHEET NO. 6

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07



LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length(mm)	Angle	Length(mm)	Angle
HH		Head to Header	370	18.0		
HW		Head to Windshield	500	0.0		
HZ	HZ	Head to Roof	155	90.0	210	90.0
NR	NB	Nose to Rim/Nose to Seat Back	452	16.0	700	22.0
CD	CB	Chest to Dash or Seat Back	570	1.0	610	3.2
CS		Chest to Steering Wheel	275	0.0		
KDL	KBL	Left Knee to Dash or Seat Back	130	15.0	254	0.0
KDR	KBR	Right Knee to Dash or Seat Back	128		255	
PA	PA	Pelvic Angle		22.5		23.0
PHX	PHX	H-Point to Striker (X-Axis)	279		425	
PHZ	PHZ	H-Point to Striker (Z-Axis)	150		218	

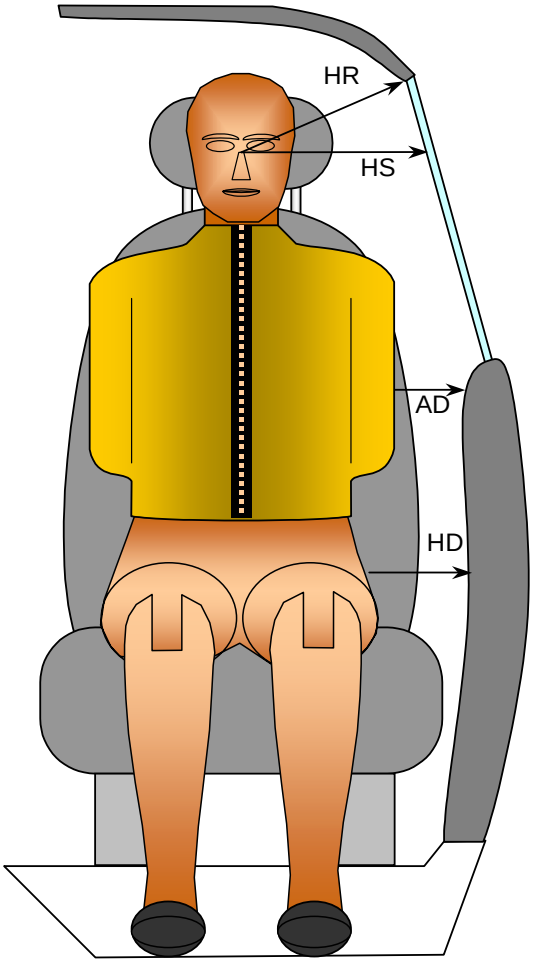
All Dimensions shown in millimeters

DATA SHEET NO. 7

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07



FRONT VIEW OF DUMMY

LATERAL CLEARANCE DIMENSION INFORMATION

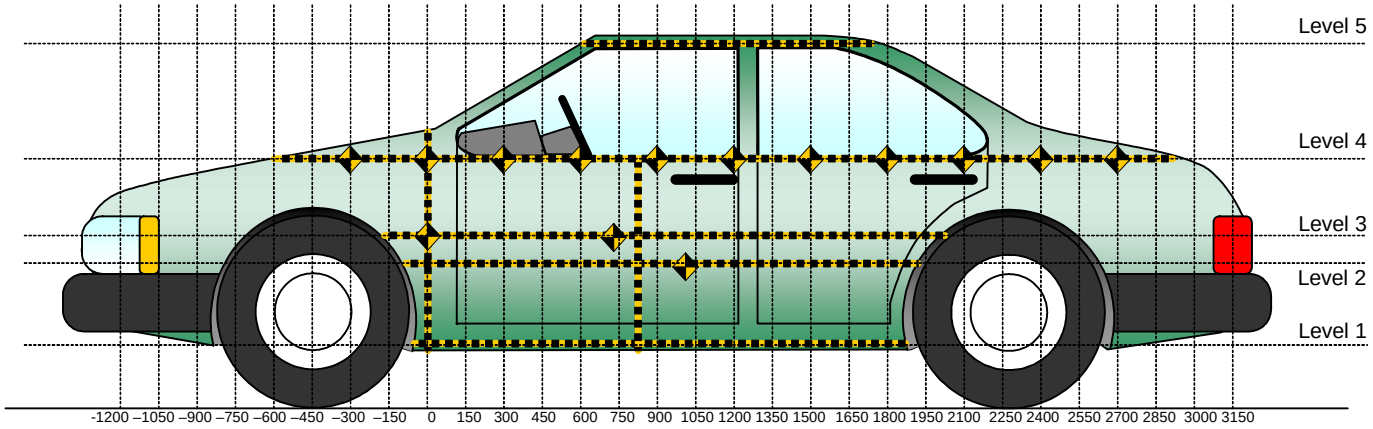
Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	265	260
HS	Head to Side Window	mm	329	320
AD	Arm to Door	mm	125	130
HD	H-Point to Door	mm	190	180

DATA SHEET NO. 8

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07



All Measurements Shown in mm

LEFT SIDE VIEW

Level	Measurement Description	Height Above Ground
1	Sill Top	371
2	Occupant H-Point	696
3	Mid Door	760
4	Window Sill	1114
5	Window Top	1672

All Dimensions shown in millimeters

DATA SHEET NO. 9

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150		455	450	560			484	483	605			29	33	45	
0	516	457	454	556		540	510	505	590		24	53	51	34	
150	523	462	463	557		615	615	630	575		92	153	167	18	
300	527	467	463	560		620	665	665	584		93	198	202	24	
450	527	468	464	555		619	675	671	592		92	207	207	37	
600	527	469	465	555	817	623	700	699	602	849	96	231	234	47	32
750	529	470	465	554	805	625	707	707	605	895	96	237	242	51	90
900	528	470	467	552	795	626	715	715	622	889	98	245	248	70	94
1050	529	470	468	550	795	627	718	715	637	895	98	248	247	87	100
1200	534	475	470	548	795	632	720	720	655	890	98	245	250	107	95
1350	535	475	470	546	795	632	729	732	664	890	97	254	262	118	95
1500	535	475	472	546	797	634	735	731	635	885	99	260	259	89	88
1650	537	478	472	542	797	634	735	731	616	885	97	257	259	74	88
1800	535	478	473	538	800	627	732	692	605	885	92	254	219	67	85
1950	525	475	470	540	800	610	660	572	584	885	85	185	102	44	85
2100		475	470	542	805		538	525	557	875		63	55	15	70
2250				542	810				555	885				13	75
2400				548	820				564	880				16	60
2550				552					560					8	
2700				565					570					5	
2850															
3000															

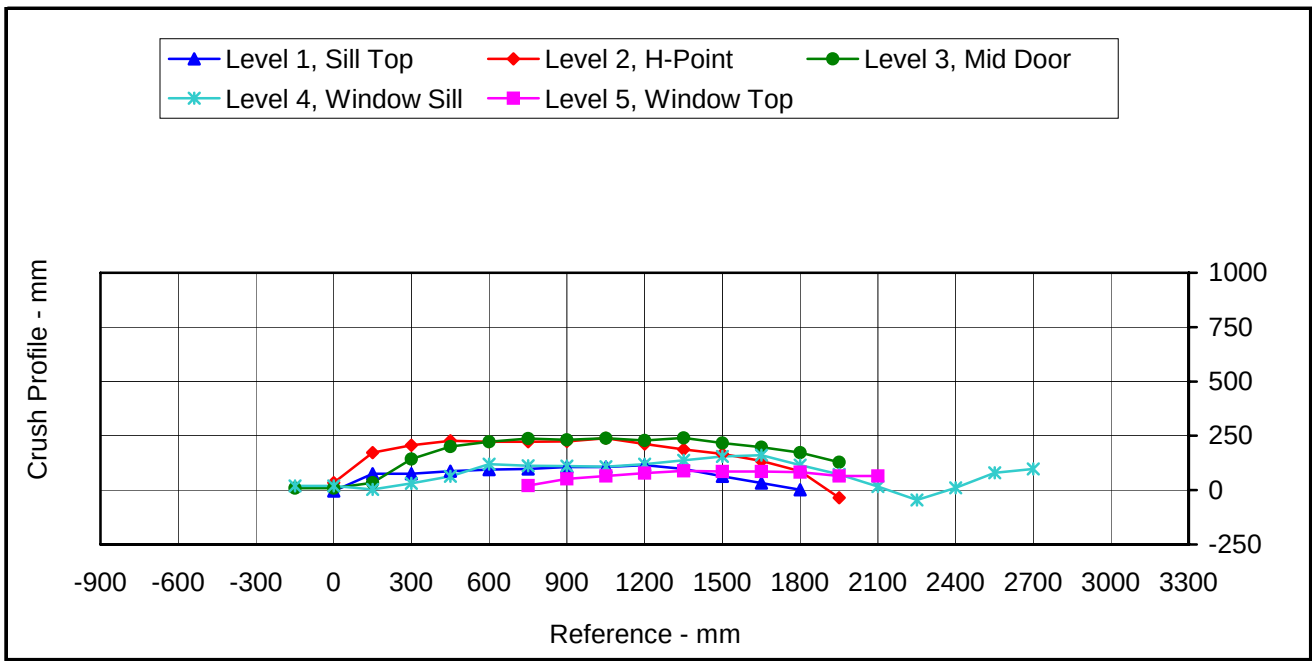
All Dimensions shown in millimeters

DATA SHEET NO. 9…(CONTINUED)

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07



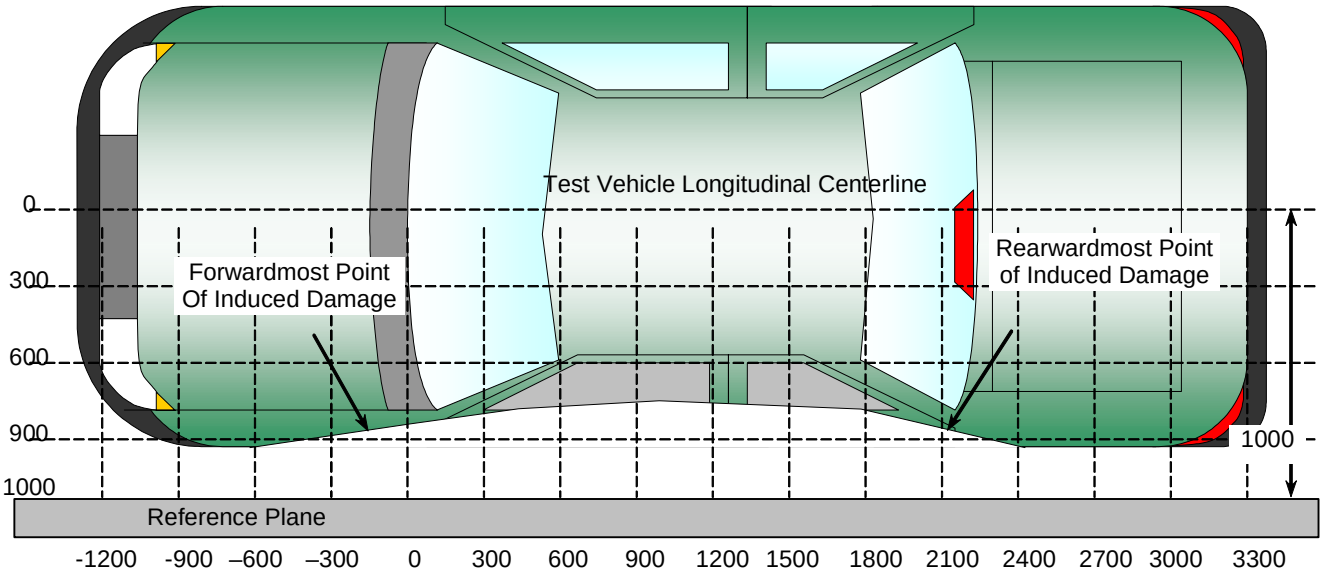
	Units	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush	mm	99	260	262	118	100
Distance from Impact	mm	1500	1500	1350	1350	1050

DATA SHEET NO. 10

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07



All Dimensions Shown in millimeters

TOP VIEW

DAMAGE PROFILE DISTANCES

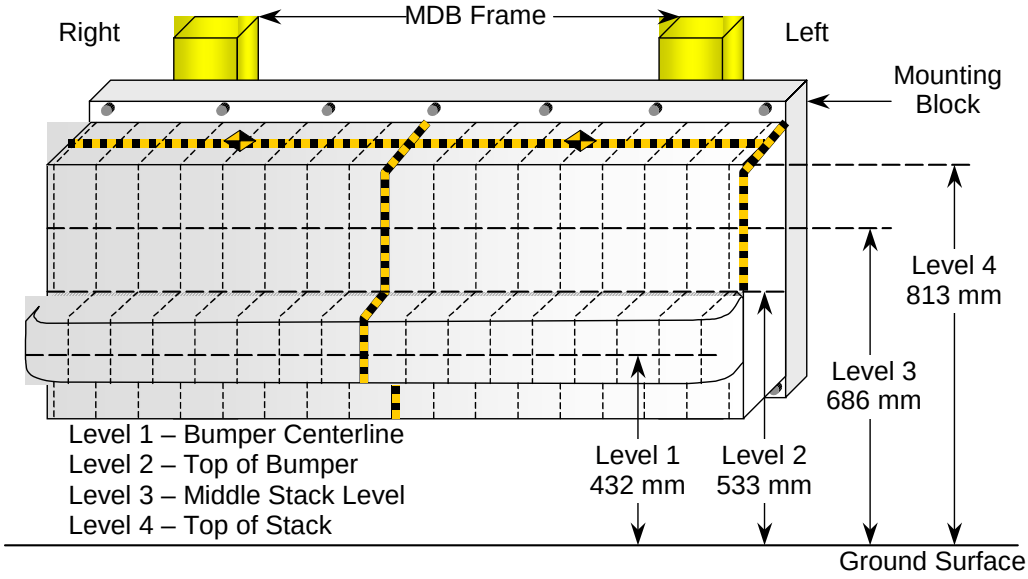
DPD	Distance From Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2100	3	470	525	55
2	1650	3	472	731	259
3	1200	3	470	720	250
4	750	3	465	707	242
5	300	3	463	665	202
6	-150	3	450	492	42

DATA SHEET NO. 11

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	756	733	720	709	702	697	694	693	699	693	691	691	691	693	696	696	711
2	756	750	736	726	718	714	709	710	698	698	706	714	721	722	722	724	728
3	713	693	676	671	676	675	677	668	660	653	655	656	661	671	691	713	742
4	706	692	672	660	659	659	668	696	664	673	673	672	681	696	711	736	781

All Dimensions in mm

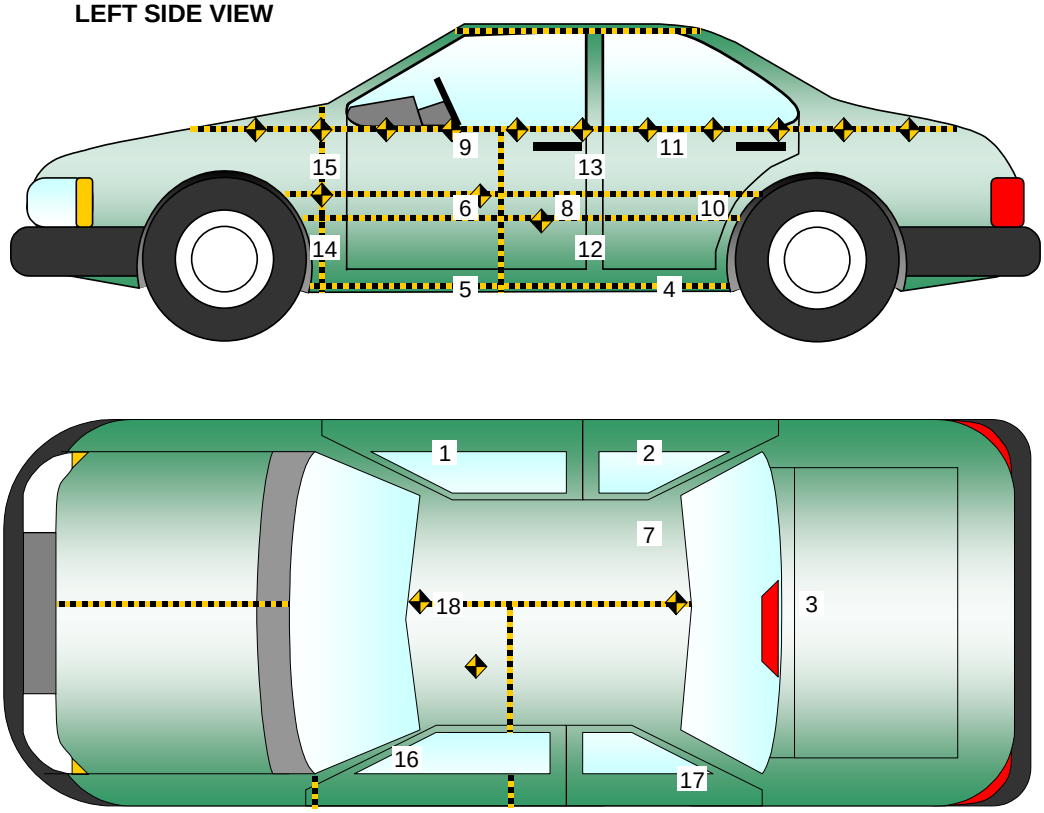
DATA SHEET NO. 12

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

LEFT SIDE VIEW



No.	Location
1	Right Sill at Front Seat
2	Right Sill at Rear Seat
3	Rear Floorpan Above Axle
4	Left Sill at Rear Door
5	Left Sill at Front Door
6	Left Front Door Centerline
7	Right Rear Occupant Compartment
8	Left Front Door Mid-Rear
9	Left Front Door Upper Centerline

No.	Location
10	Left Rear Door Mid-Rear
11	Left Rear Door Upper Centerline
12	Left Lower B-Post
13	Left Middle B-Post
14	Left Lower A-Post
15	Left Middle A-Post
16	Front Seat Track
17	Rear Seat Track or Structure
18	Vehicle CG

DATA SHEET NO. 12…(CONTINUED)
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 3/5/07

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)			
		X	Y	Z	
1	Right Sill at Front Seat	2942	790	510	
2	Right Sill at Rear Seat	1705	790	510	
3	Rear Floorpan Above Axle	363	0	648	
4	Left Sill at Rear Door	1714	-789	275	
5	Left Sill at Front Door	2619	-789	275	
6	Front Door Centerline				1
7	Rt. Rear Occ. Compartment	1300	615	325	
8	Front Door Mid-Rear				1
9	Front Door Upper Centerline				1
10	Rear Door Mid-Rear				1
11	Rear Door Upper Centerline				1
12	B-Post Lower	2253	-860	810	
13	B-Post Middle	2253	-860	1035	
14	A-Post Lower	3295	-855	690	
15	A-Post Middle	3295	-855	912	
16	Front Seat Track	2823	-600	560	
17	Rear Seat Structure				1
18	Vehicle CG	3160	280	498	

Reference Planes: X=From Rear Surface of Vehicle, Y=Vehicle Centerline, Z=Ground Plane

1.) Not installed

DATA SHEET NO. 13

MDB ACCELEROMETER LOCATIONS

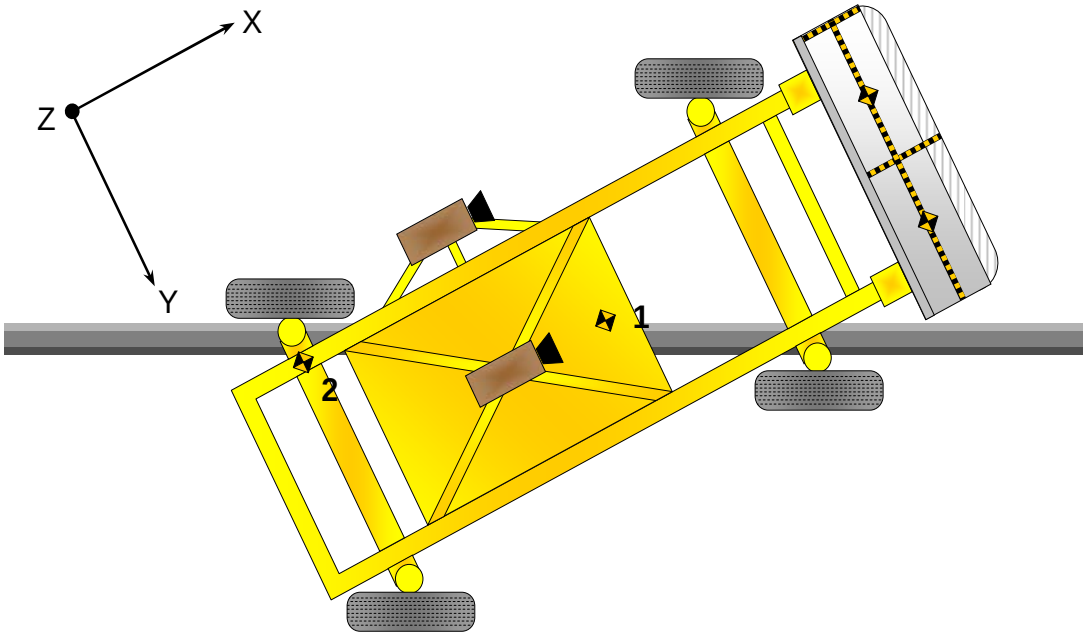
Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 3/5/07

MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Locations	Measurements (mm)		
		X	Y	Z
1	MDB CG	-1195	0	430
2	MDB Rear	-2642	-593	608

Reference Points: X - MDB Front Axle
Y - MDB Centerline
Z - Ground Plane

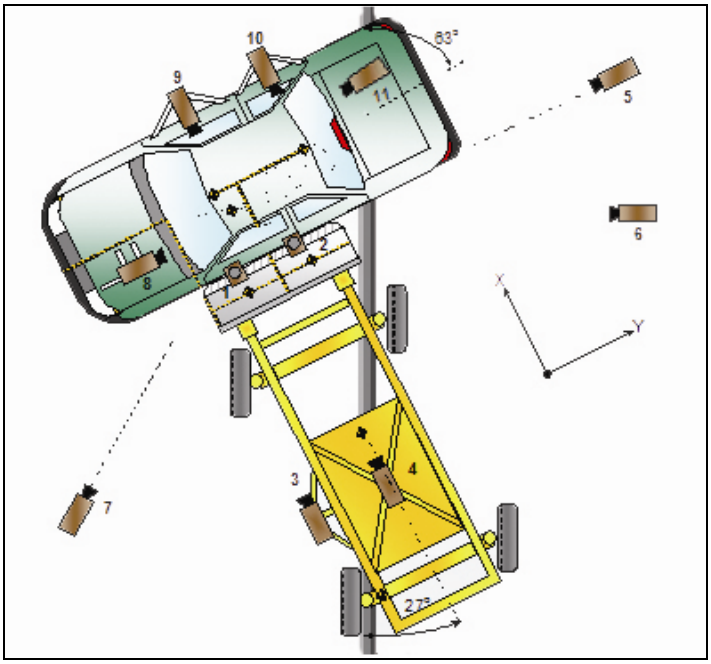


DATA SHEET NO. 14

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07



No.	Camera View	Location (mm)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X	Y	Z			
Doc	Real Time Inrun	-2484	-3958	-1506	-2		30
Doc	Real Time Left Front	-2266	3549	-1475	-2		30
1	Overhead Overall	1220	2287	-5486	-90	14mm	1000
2	Overhead Close Up	609	2287	-5102	-90	Zoom	1000
3	Left Impact Point (MDB)	-2134	0	-1143	-2	12mm	1000
4	Side Overall (MDB)	-3912	838	-1829	-4	12mm	1000
5	Rear	-102	14965	-1348	0	Zoom	1000
6	Left Rear (MDB)	-2137	-1302	-339	-4	Zoom	1000
7	Left Front	-2266	-3564	-1475	-2	24mm	1000
8	Driver Front (O.B.)	566	-248	-1348	-14	35mm	1000
9	Driver Side (O.B.)	2140	369	-1350	-2	20mm	1000
10	Passenger Side (O.B.)	2140	1001	-1350	-2	20mm	1000

X = Barrier Face Y = Monorail Centerline Z = Ground DNR = Did Not Run NTM = No Timing Marks

DATA SHEET NO. 15

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

Test Time: 1:08 PM Temperature: 21.1 Deg. C.

Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: 0.0 oz.
(Maximum Allowable = 1 ounce)

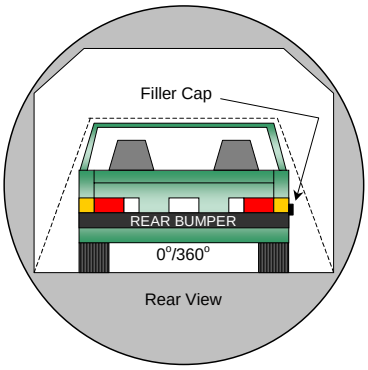
B. For the 5 minute period after motion ceases: 0.0 oz.
(Maximum Allowable = 5 ounces)

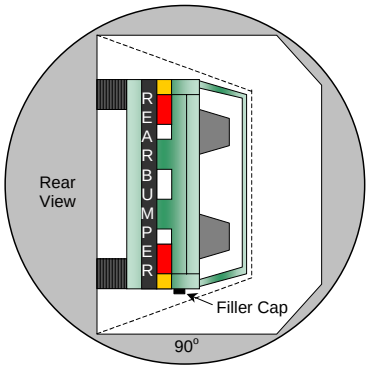
C. For the following 25 minutes: 0.0 oz.
(Maximum Allowable = 1 oz./minute)

D. Spillage Details: No leakage occurred

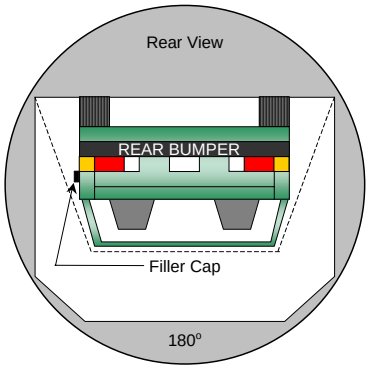
DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501
Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

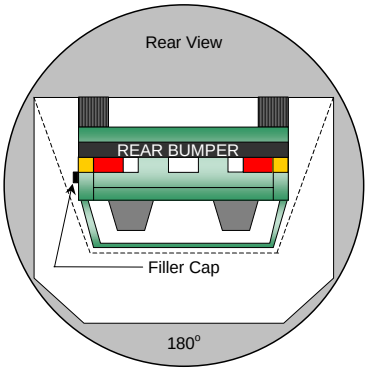




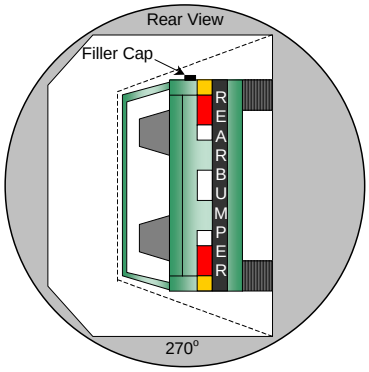
0° to 90°



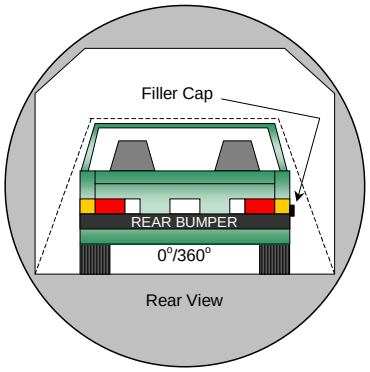
90° to 180°



180° to 270°



270° to 360°



1. The specified fixture rollover rate for each 90° of rotation is 60 to 120 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage locations.

   No solvent leakage occurred during static rollover testing.

DATA SHEET NO. 16…(CONTINUED)

FMVSS 301 STATIC ROLLOVER DATA SHEET

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	81	300	381
90° to 180°	82	300	382
180° to 270°	81	300	381
270° to 360°	80	300	380

FMVSS 301 SPILLAGE TABLE REQUIREMENT (oz.)

First 5 Minutes	5.0
Sixth Minute	1.0
Seventh Minute	1.0
Eighth Minute	1.0

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

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure A-1: Left Front ¾ View, as Received

Figure A-2: Right Rear ¾ View, as Received

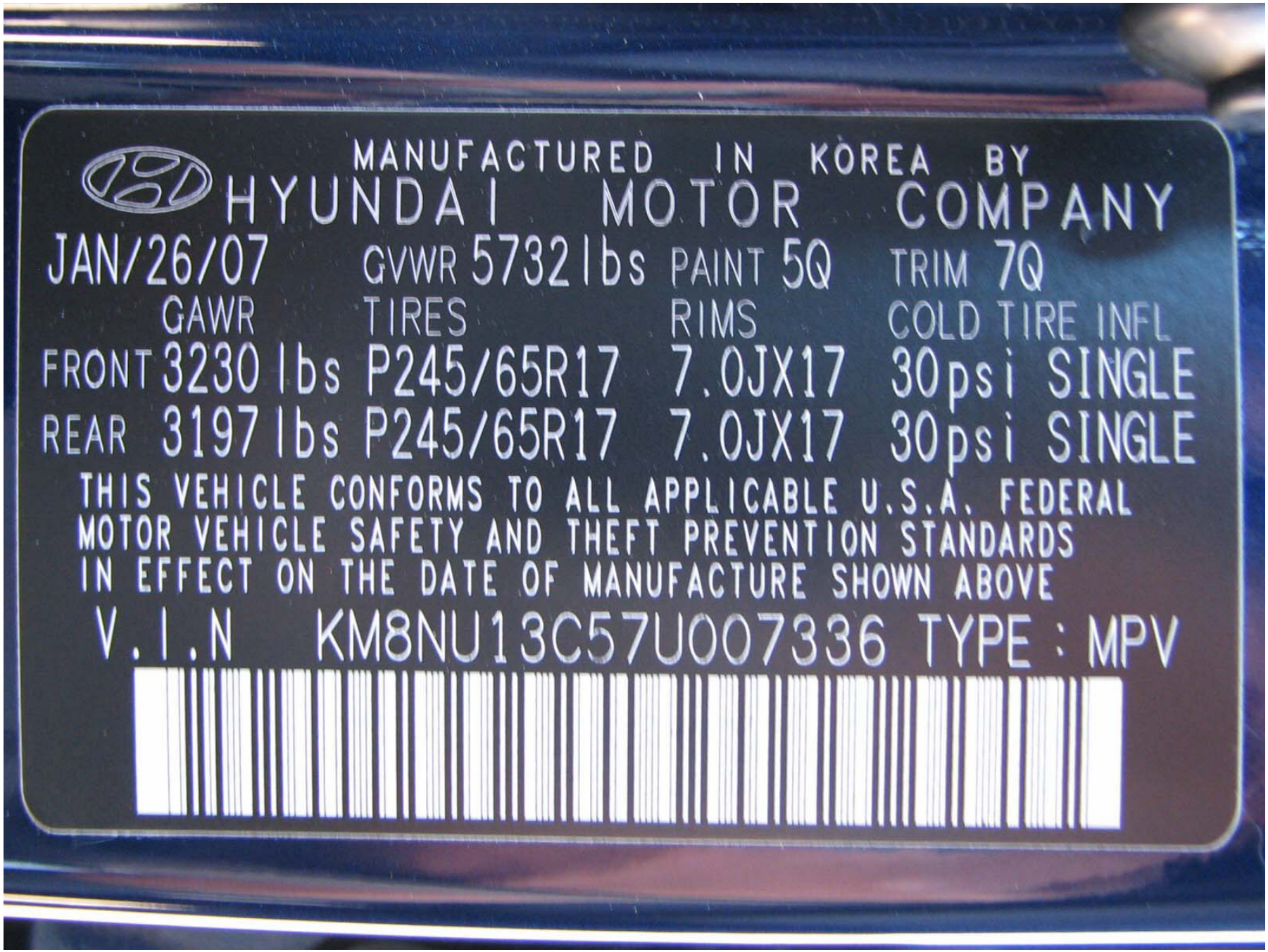


Figure A-3: Manufacturer's Label

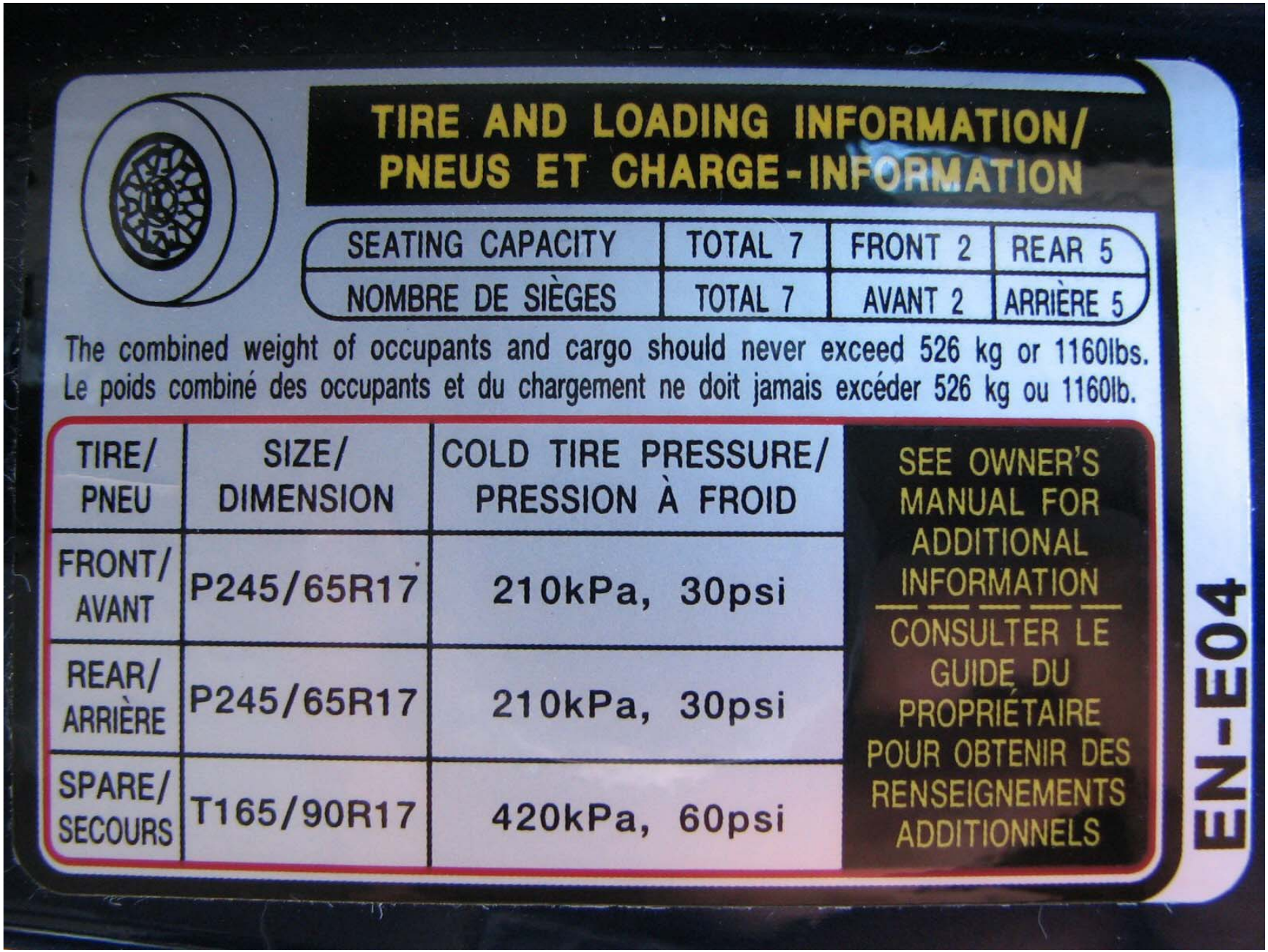


Figure A-4: Tire Placard

Figure A-5: Pre-Test Front View

Figure A-6: Post-Test Front View

Figure A-7: Pre-Test Left Front ¾ View

Figure A-8: Post-Test Left Front ¾ View

Figure A-9: Pre-Test Left Side View

Figure A-10: Post-Test Left Side View

Figure A-11: Pre-Test Left Rear ¾ View

Figure A-12: Post-Test Left Rear ¾ View

Figure A-13: Pre-Test Rear View

Figure A-14: Post-Test Rear View

Figure A-15: Pre-Test Right Rear ¾ View

Figure A-16: Post-Test Right Rear ¾ View

Figure A-17: Pre-Test Right Side View

Figure A-18: Post-Test Right Side View

Figure A-19: Pre-Test Right Front ¾ View

Figure A-20: Post-Test Right Front ¾ View

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

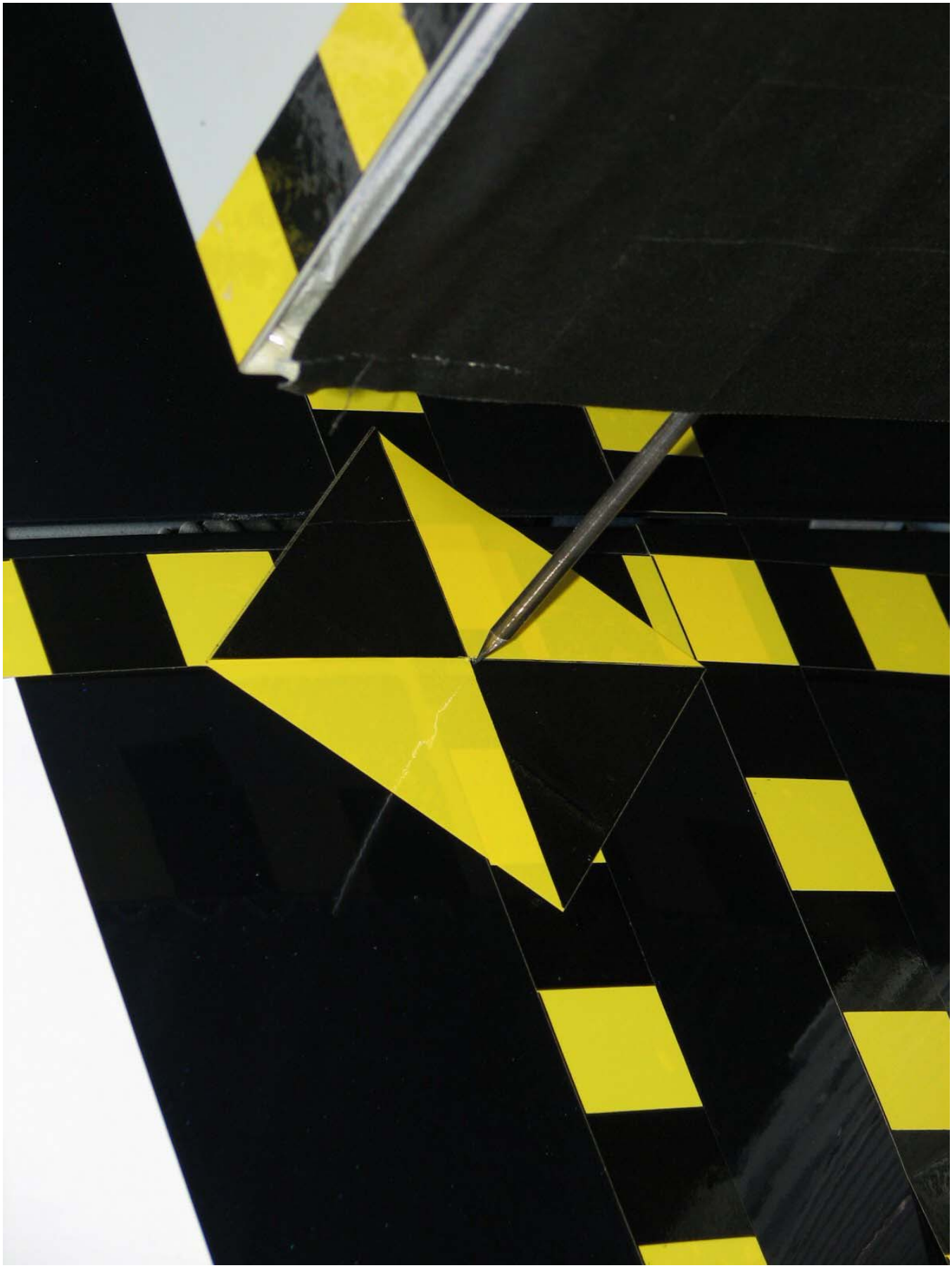


Figure A-25: Pre-Test Left Impact Point

Figure A-26: Post-Test Left Impact Point

Figure A-27: Pre-Test Front ¾ View of Left Side Door

Figure A-28: Post-Test Front ¾ View of Left Side Door

Figure A-29: Pre-Test Rear ¾ View of Left Side Door

Figure A-30: Post-Test Rear ¾ View of Left Side Door

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 Dummy (Door Open)

Figure A-36: Pre-Test Driver Dummy (Through Window)

Figure A-37: Post-Test Driver Dummy (Through Window)

Figure A-38: Pre-Test Driver Dummy Clearance From Door

Figure A-39: Post-Test Driver Dummy Clearance From Door

Figure A-40: Pre-Test Driver Dummy Right Side View

Figure A-41: Post-Test Driver Dummy Right Side View

Figure A-42: Pre-Test Front Door Panel (Interior)

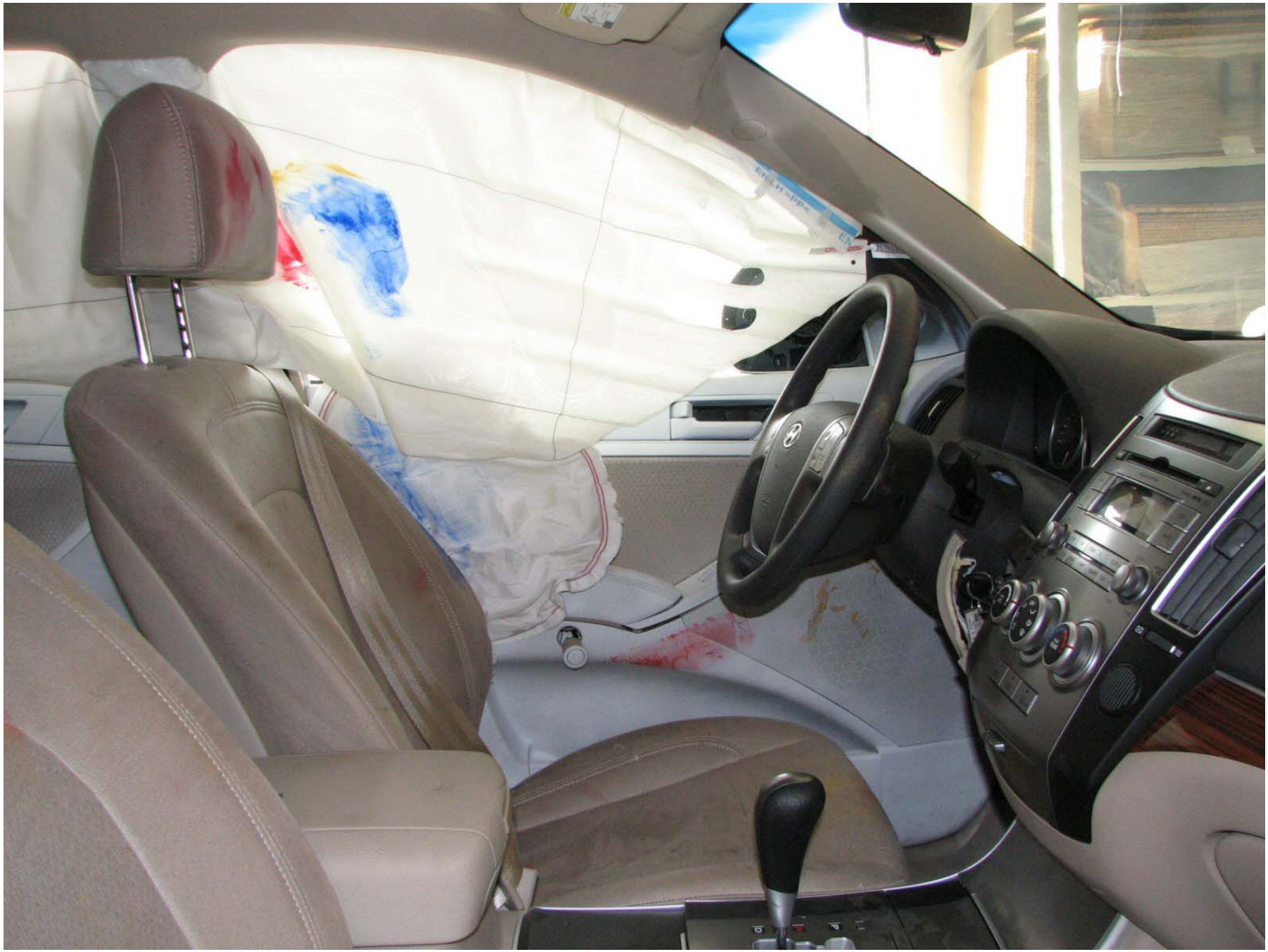


Figure A-43: Post-Test Front Door Panel (Interior)

Figure A-44: Pre-Test Passenger Dummy Left Side (Door Open)

Figure A-45: Pre-Test Passenger Dummy Left Side (Through Window)

Figure A-46: Post-Test Passenger Dummy Left Side (Through Window)

Figure A-47: Pre-Test Passenger Dummy Clearance From Door

Figure A-48: Post-Test Passenger Dummy Clearance From Door

Figure A-49: Pre-Test Passenger Dummy Right Side View

Figure A-50: Post-Test Passenger Dummy Right Side View

Figure A-51: Pre-Test Rear Door Panel (Interior)

Figure A-52: Post-Test Rear Door Panel (Interior)

Figure A-53: Pre-Test Front View of Deformable Barrier

Figure A-54: Post-Test Front View of Deformable Barrier

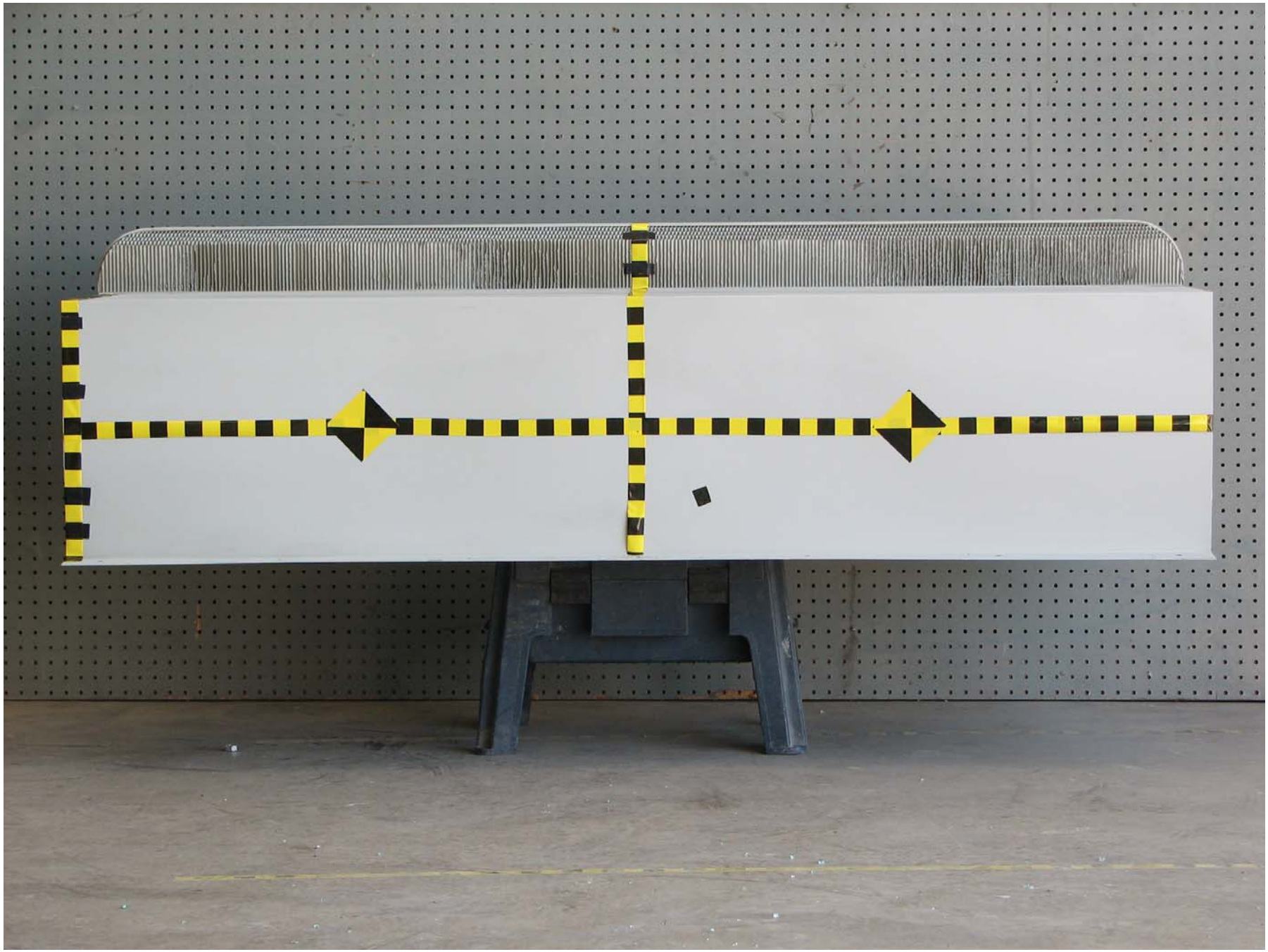


Figure A-55: Pre-Test Top View of Deformable Barrier

Figure A-56: Post-Test Top View of Deformable Barrier

Figure A-57: Pre-Test Right Side View of Deformable Barrier

Figure A-58: Post-Test Right Side View of Deformable Barrier

Figure A-59: Pre-Test Left Side View of Deformable Barrier

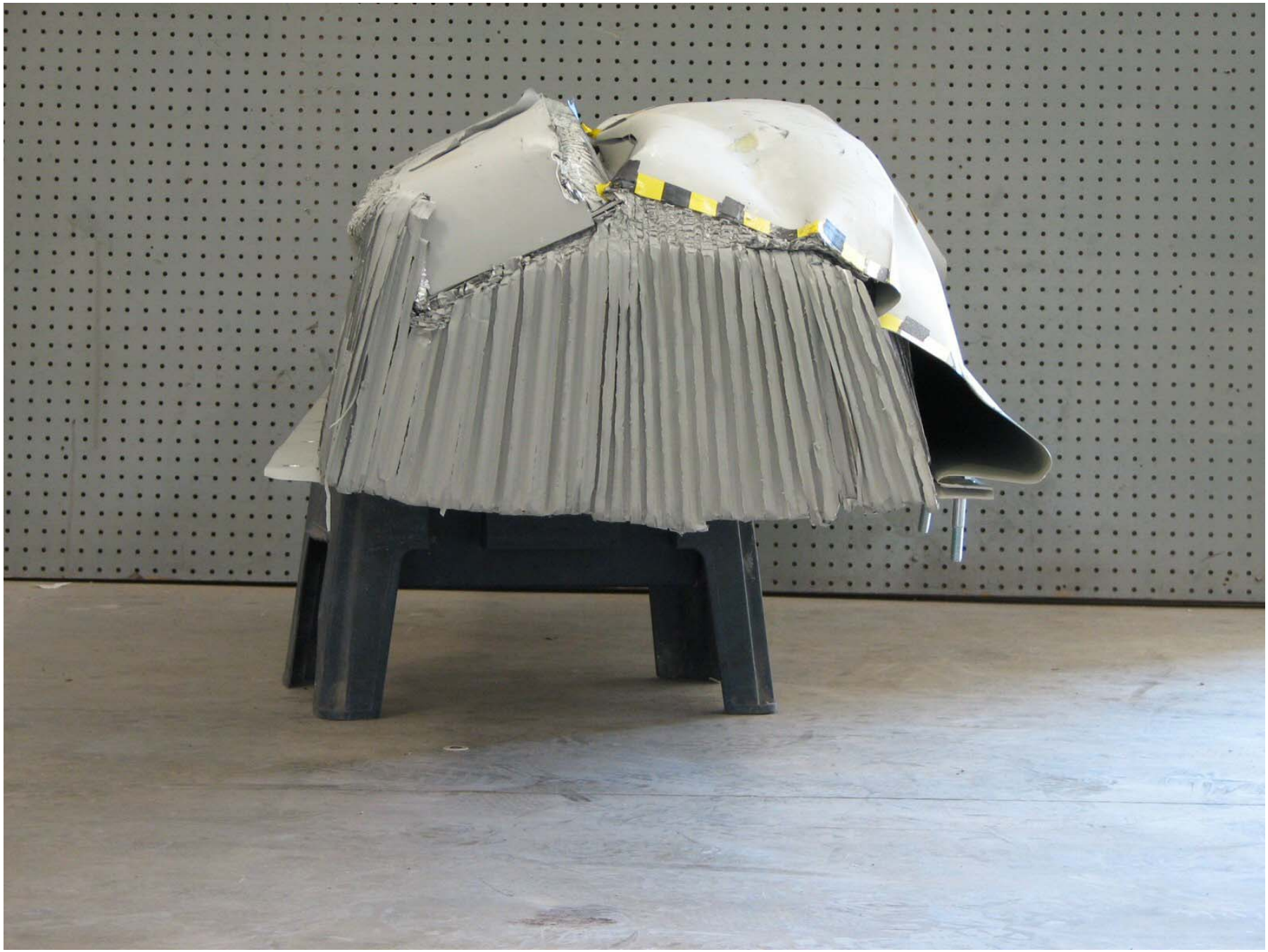


Figure A-60: Post-Test Left Side View of Deformable Barrier

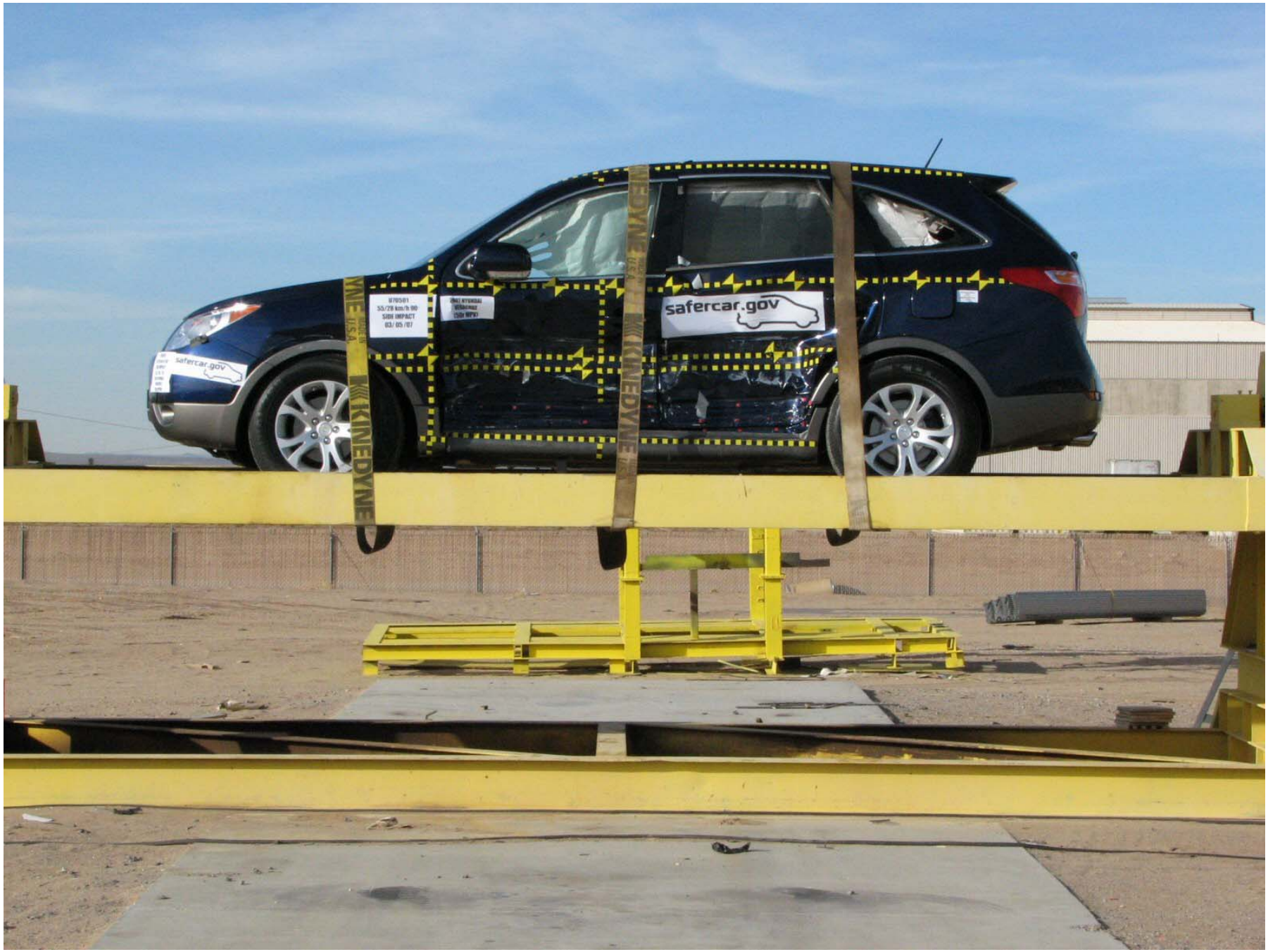


Figure A-61: Vehicle on Rollover Device (0°)

Figure A-62: Vehicle on Rollover Device (90°)

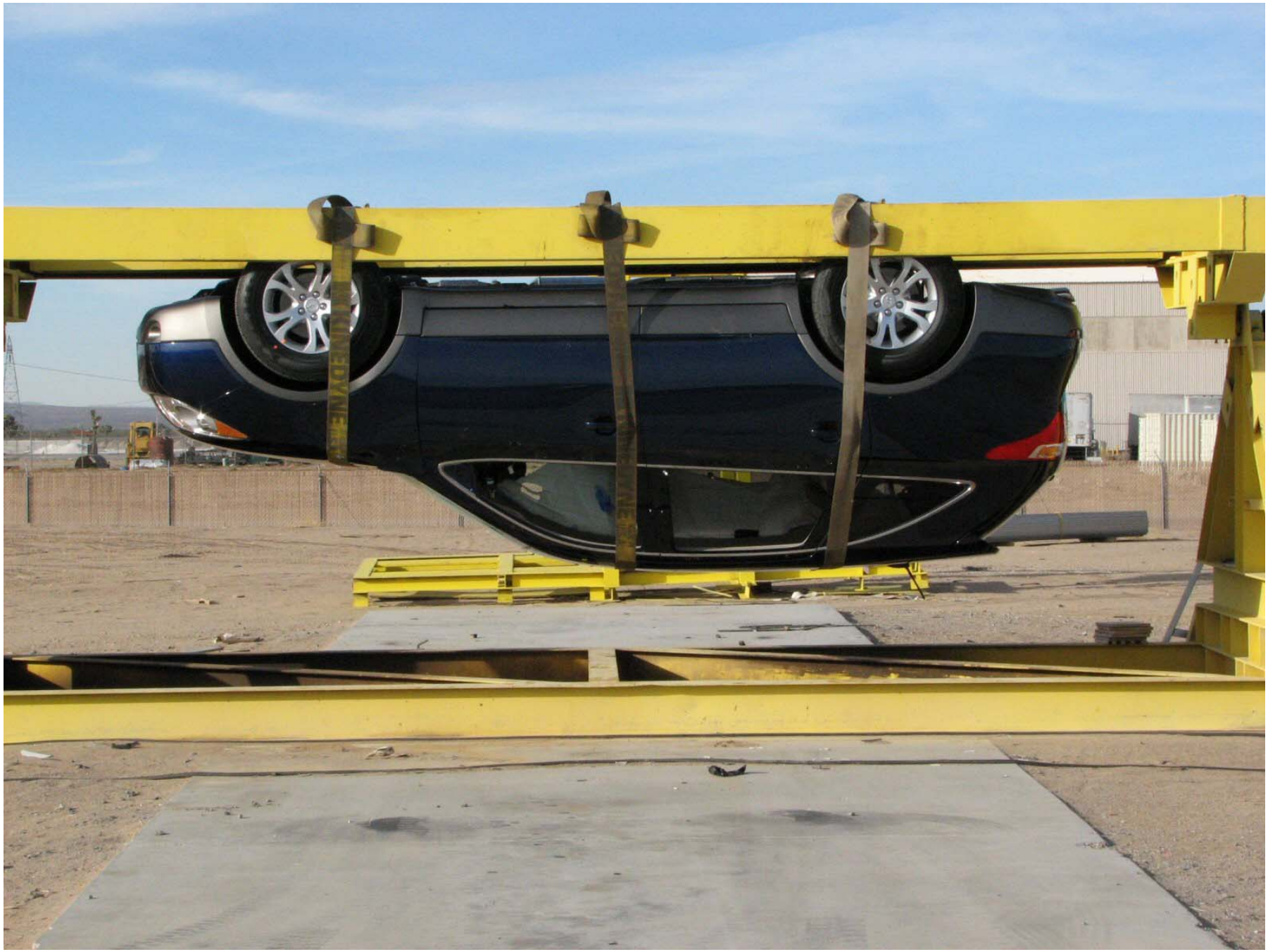


Figure A-63: Vehicle on Rollover Device (180°)

Figure A-64: Vehicle on Rollover Device (270°)


SIDE IMPACT
03 / 05 / 07

APPENDIX B

SID/HIII, VEHICLE AND MDB RESPONSE DATA

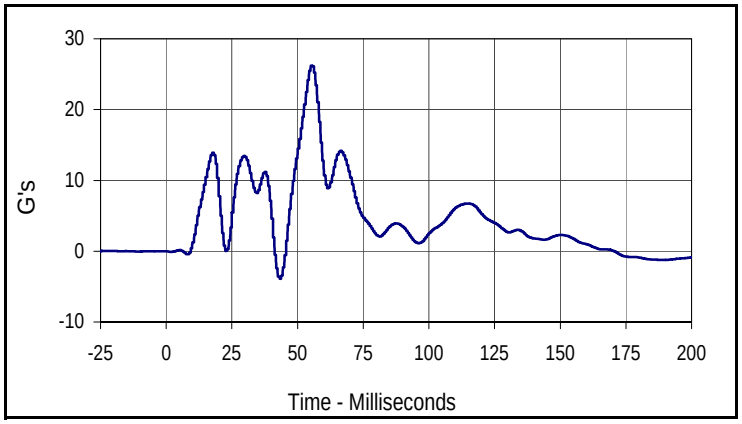
LIST OF DATA PLOTS

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

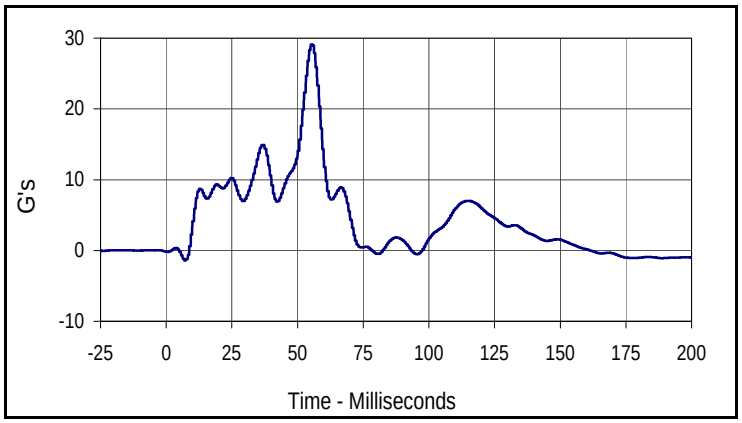
LIST OF DATA PLOTS…(CONTINUED)

Driver Head X Primary
Driver Head Y Primary
Driver Head Z Primary
Driver Head Resultant Primary
Driver Head Primary X Velocity
Driver Head Primary Y Velocity
Driver Head Primary Z Velocity
Driver Head X Redundant
Driver Head Y Redundant
Driver Head Z Redundant
Driver Head Resultant Redundant
Driver Head Redundant X Velocity
Driver Head Redundant Y Velocity
Driver Head Redundant Z Velocity
Driver Upper Neck Force X
Driver Upper Neck Force Y
Driver Upper Neck Force Z
Driver Upper Neck Force Resultant
Driver Upper Neck Moment X
Driver Upper Neck Moment Y
Driver Upper Neck Moment Z
Driver Upper Neck Moment Resultant
Driver Upper Rib Primary Y Velocity
Driver Lower Rib Primary Y Velocity
Driver Lower Spine Primary Y Velocity
Driver Pelvis Primary Y Velocity
Driver Upper Rib Redundant Y
Driver Lower Rib Redundant Y
Driver Lower Spine Redundant Y
Driver Pelvis Redundant Y

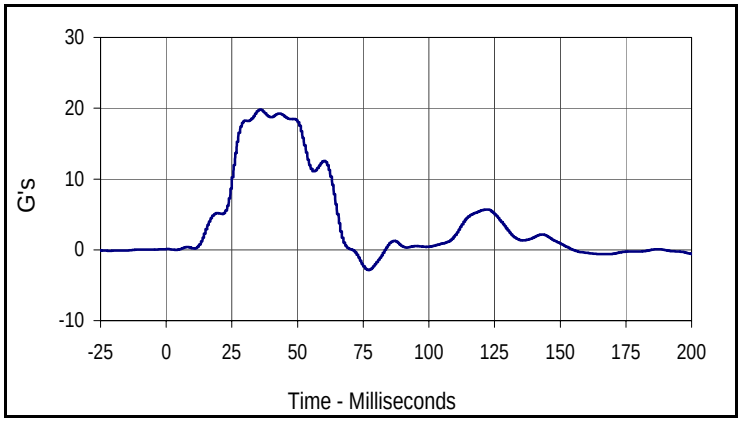
Test Vehicle:	2007 Hyundai Veracruz 5-Door MPV	Test Date:	3/5/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	U70501



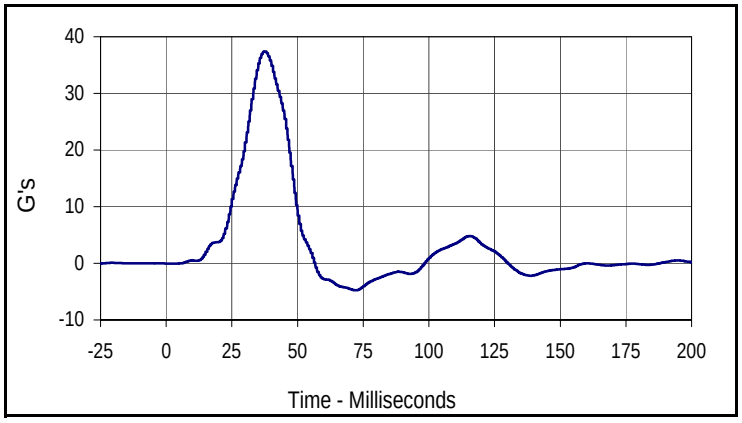
Curve Description			
Driver Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIR	FIR100	G's
Max	Time	Min	Time
26.2	55.0	-3.9	43.2



Curve Description			
Driver Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIR	FIR100	G's
Max	Time	Min	Time
29.1	55.0	-3.6	266.3

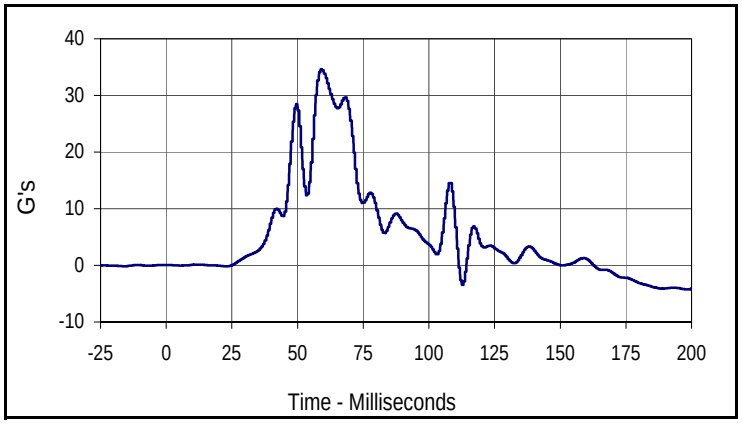


Curve Description			
Driver Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIR	FIR100	G's
Max	Time	Min	Time
19.8	35.7	-2.9	76.9

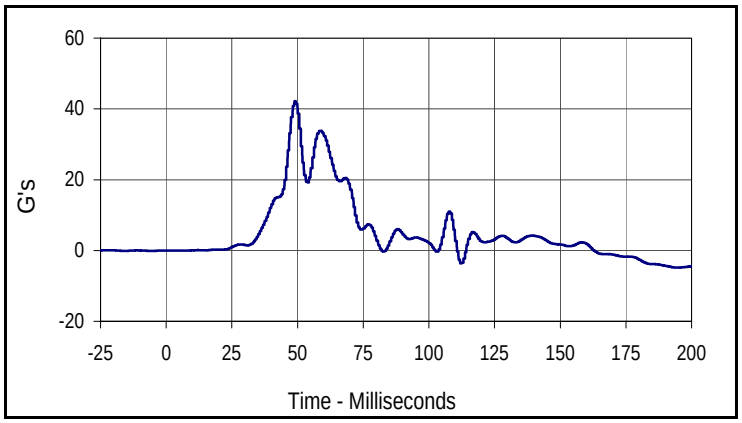


Curve Description			
Driver Pelvis Y Primary			
CURNO	Type	SAE Class	Units
004	FIR	FIR100	G's
Max	Time	Min	Time
37.4	37.5	-4.8	71.9

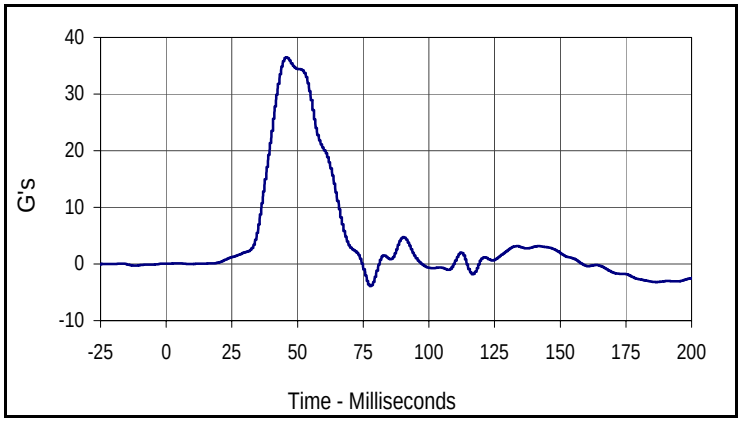
Test Vehicle:	2007 Hyundai Veracruz 5-Door MPV	Test Date:	3/5/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	U70501



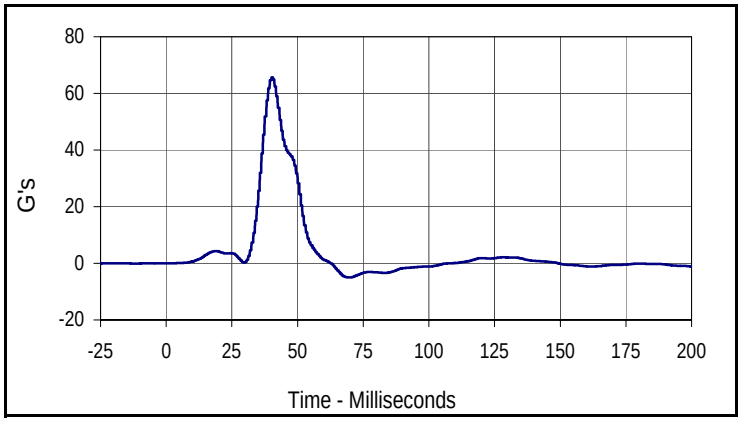
Curve Description			
Passenger Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
005	FIR	FIR100	G's
Max	Time	Min	Time
34.7	58.8	-4.2	198.2



Curve Description			
Passenger Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
006	FIR	FIR100	G's
Max	Time	Min	Time
42.2	48.8	-4.8	194.4



Curve Description			
Passenger Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
007	FIR	FIR100	G's
Max	Time	Min	Time
36.5	45.7	-3.9	77.5



Curve Description			
Passenger Pelvis Primary Y			
CURNO	Type	SAE Class	Units
008	FIR	FIR100	G's
Max	Time	Min	Time
65.6	40.0	-5.0	69.4

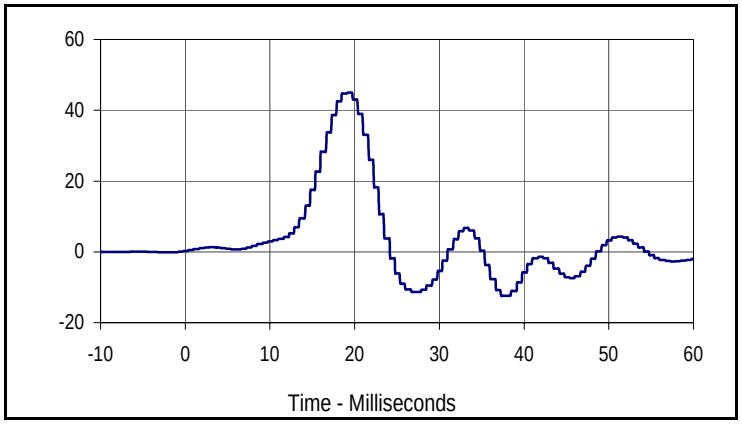
APPENDIX C
SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	SID / HIII External Measurements	Test Date:	3/2/07
ATD Serial No.:	274	Test I.D.:	N/A

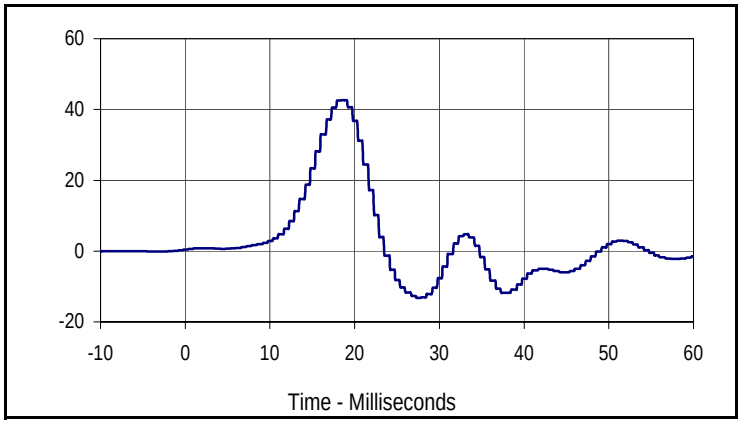
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	890	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	502	Pass
HW- Hip Width	mm	356 to 391	375	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	3/2/07
ATD Serial No.:	274	Test I.D.:	TH03B

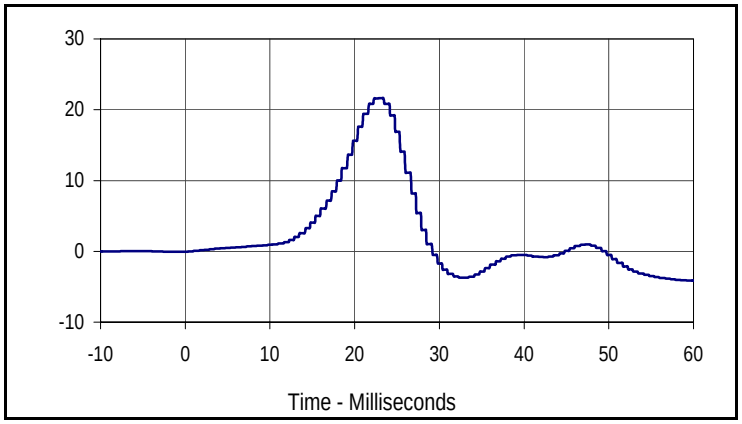
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.24	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	45.0	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	42.6	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	21.6	Pass
		Overall Test Results		Pass



Curve Description			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	
Max	Time	Min	Time
45.0	20.2	-0.1	-1.0



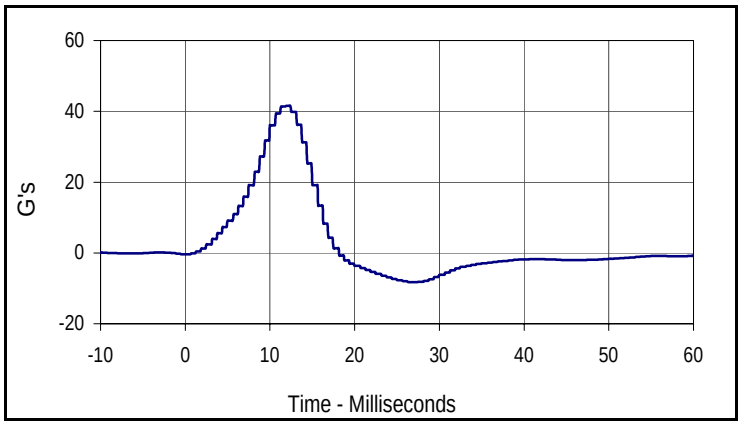
Curve Description			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	
Max	Time	Min	Time
42.6	19.5	-0.1	-2.2



Curve Description			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	
Max	Time	Min	Time
21.6	23.9	-0.1	-0.4

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	3/2/07
ATD Serial No.:	274	Test I.D.:	PL03A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.25	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	41.5	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	6.70	Pass
		Overall Test Results		Pass

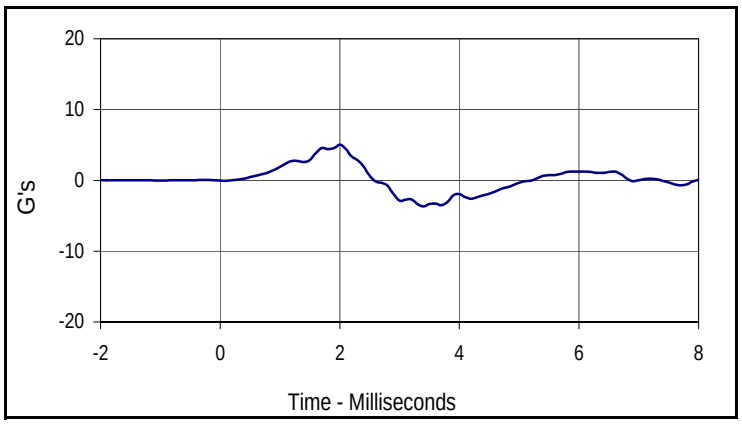


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
41.5	11.9	-8.3	26.9

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	3/2/07
ATD Serial No.:	274	Test I.D.:	HD03C

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	120.0 to 150.0	144.7	Pass
Peak Longitudinal Acceleration	G's	≤15.0	5.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	1.8	Pass
		Overall Test Results		Pass

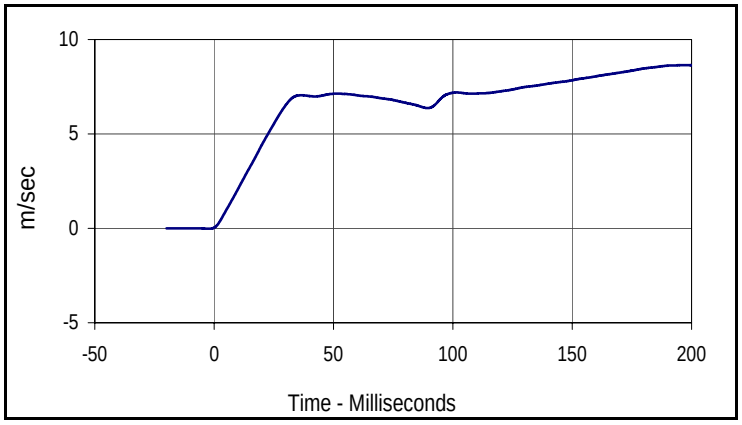
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
144.7	2.1	0.0	-1.6



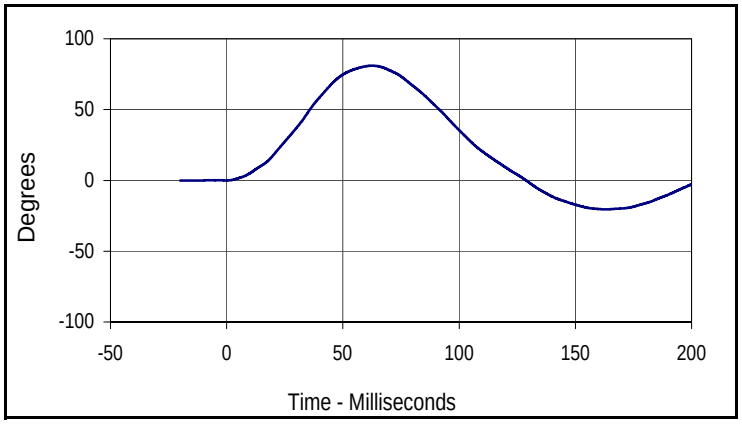
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.0	2.0	-3.7	3.4

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	3/2/07
ATD Serial No.:	274	Test I.D.:	NB03A

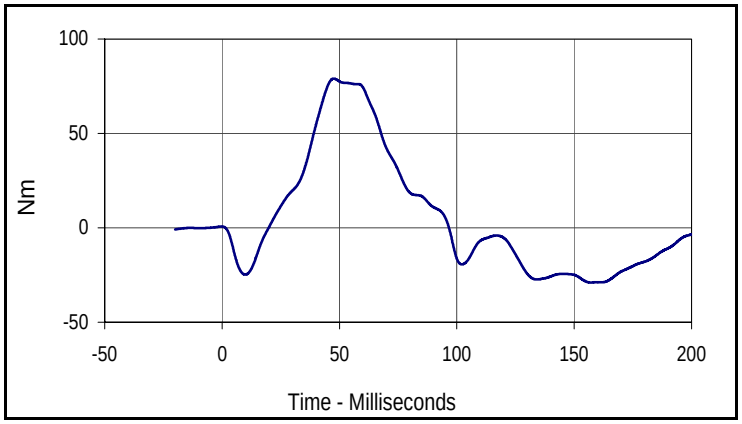
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.09	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.09	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.42	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.53	Pass
	40 to 70	m/sec	6.27 to 7.64	7.13	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	81.0	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	14.8	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	66.4	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	79.0	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	49.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	60	m/sec
Max	Time	Min	Time
8.6	197.9	0.0	-2.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
81.0	62.4	-20.5	163.3



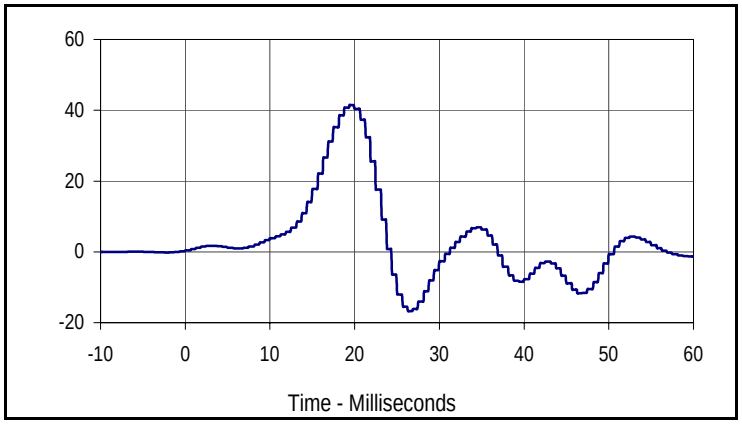
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
79.0	47.6	-29.0	157.1

Test Program:	SID / HIII External Measurements	Test Date:	3/2/07
ATD Serial No.:	275	Test I.D.:	N/A

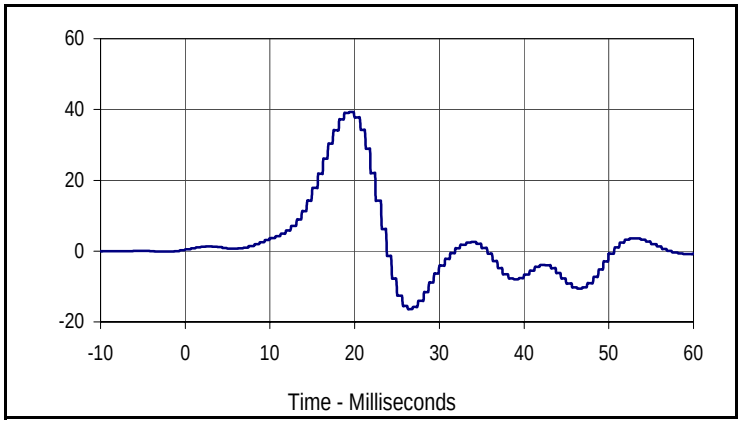
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	891	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	512	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	499	Pass
HW- Hip Width	mm	356 to 391	374	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	3/2/07
ATD Serial No.:	275	Test I.D.:	TH03D

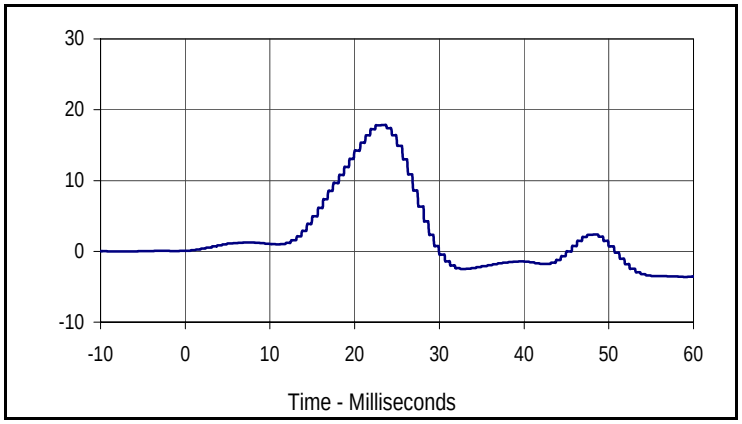
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.25	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	41.5	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	39.3	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	17.8	Pass
		Overall Test Results		Pass



Curve Description			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	
Max	Time	Min	Time
41.5	20.4	-0.2	-1.4



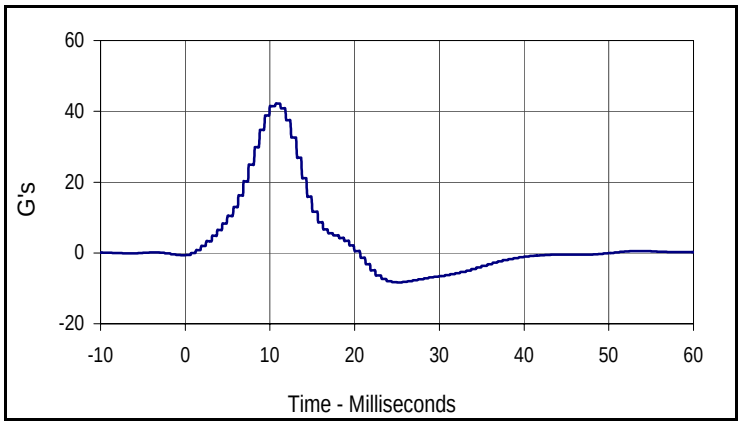
Curve Description			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	
Max	Time	Min	Time
39.3	20.4	-0.1	-1.4



Curve Description			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	
Max	Time	Min	Time
17.8	24.2	0.0	-6.4

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	3/2/07
ATD Serial No.:	274	Test I.D.:	PL03A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.25	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	42.2	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	5.80	Pass
		Overall Test Results		Pass

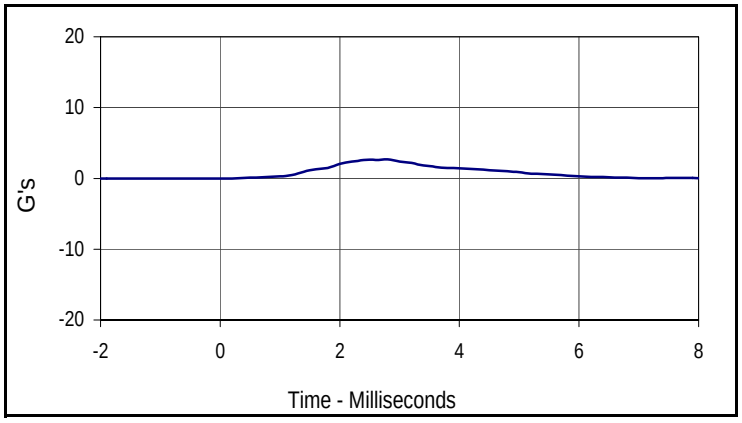


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
42.2	10.7	-8.3	25.0

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	3/2/07
ATD Serial No.:	275	Test I.D.:	HD03E

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	120.0 to 150.0	148.1	Pass
Peak Longitudinal Acceleration	G's	≤15.0	2.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	1.7	Pass
		Overall Test Results		Pass

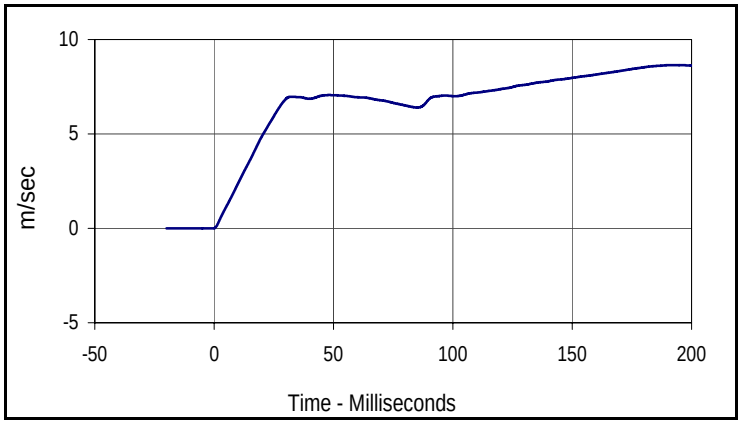
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
148.1	2.3	0.6	-2.0



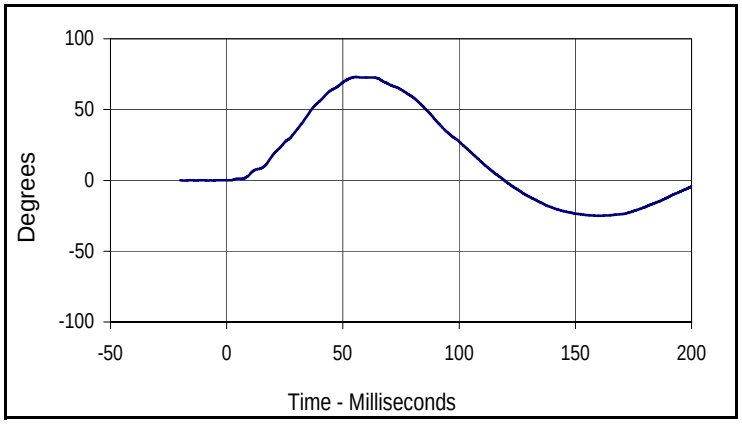
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.7	2.8	0.0	-0.8

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	3/2/07
ATD Serial No.:	275	Test I.D.:	NB03B

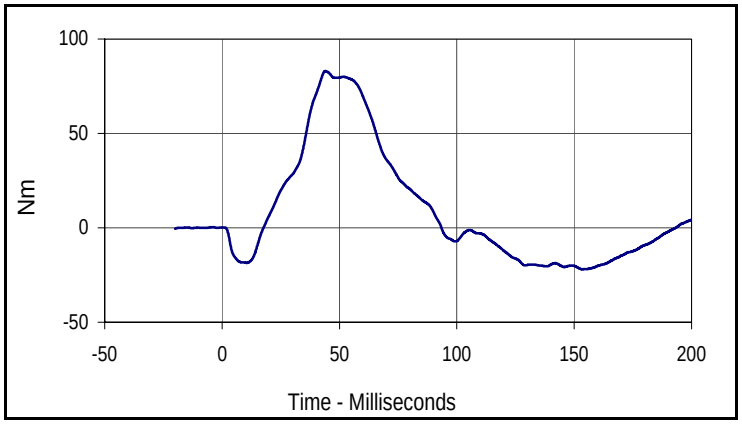
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.38	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.87	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.85	Pass
	40 to 70	m/sec	6.27 to 7.64	7.06	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	73.0	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	11.6	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	63.9	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	83.0	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	49.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
8.6	191.6	0.0	-0.5



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
73.0	55.6	-25.0	159.9



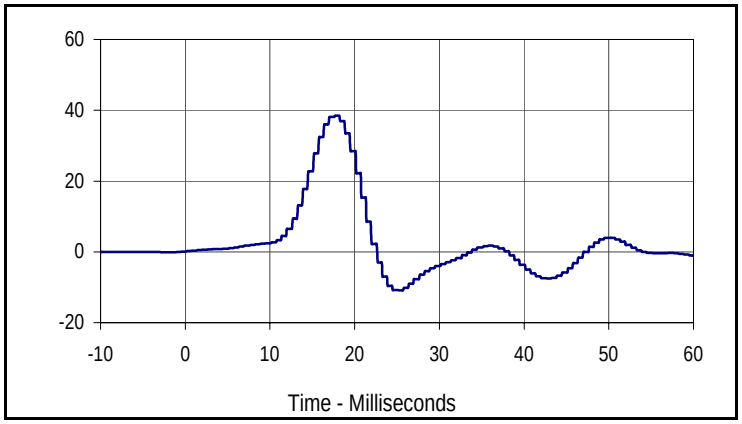
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	180	Nm
Max	Time	Min	Time
83.0	44.0	-22.0	153.4

Test Program:	SID / HIII External Measurements	Test Date:	3/8/07
ATD Serial No.:	274	Test I.D.:	N/A

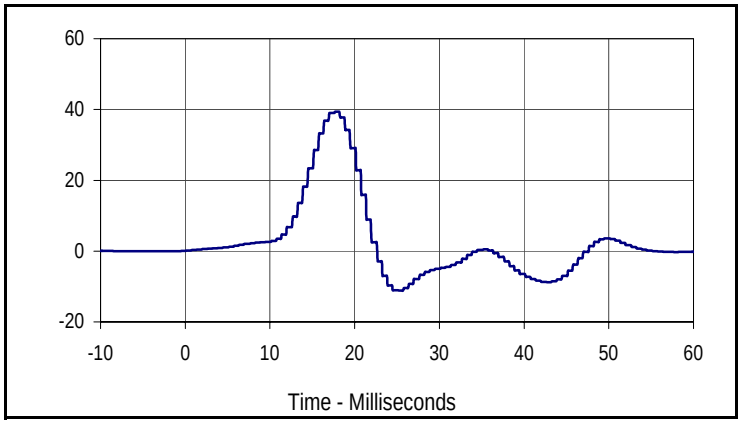
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	892	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	518	Pass
KV- Knee Pivot From Floor	mm	490 to 505	500	Pass
HW- Hip Width	mm	356 to 391	374	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	3/7/07
ATD Serial No.:	274	Test I.D.:	TH03E

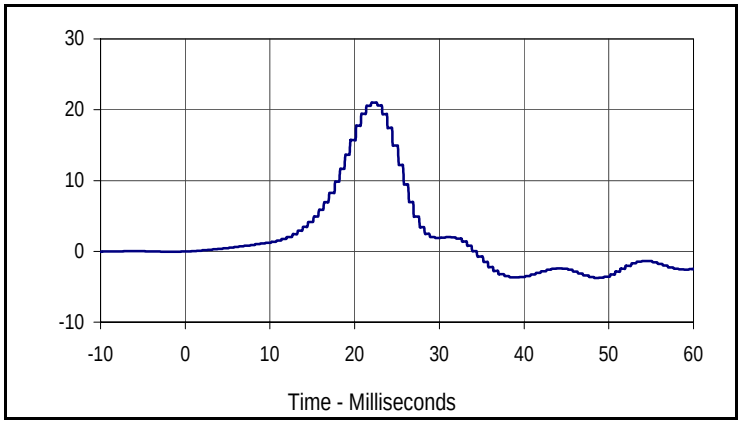
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.31	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	38.5	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	39.4	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	21.0	Pass
		Overall Test Results		Pass



Curve Description			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	
Max	Time	Min	Time
38.5	18.2	-0.1	-1.7



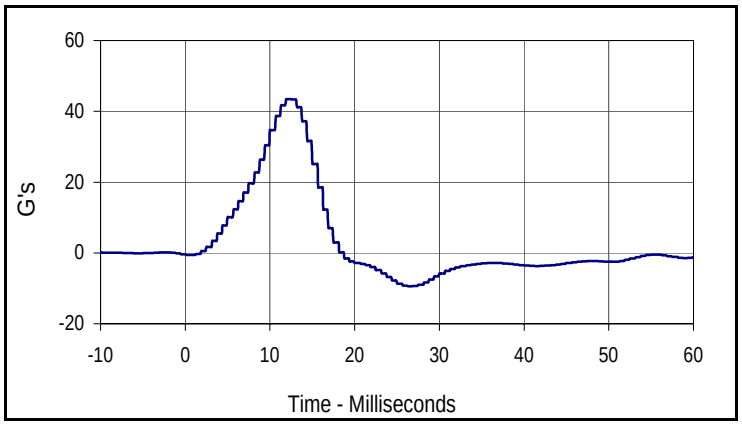
Curve Description			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	
Max	Time	Min	Time
39.4	18.2	0.0	-1.1



Curve Description			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	
Max	Time	Min	Time
21.0	22.5	-0.1	-1.1

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	3/7/07
ATD Serial No.:	274	Test I.D.:	PL03D

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.25	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	43.5	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	6.70	Pass
		Overall Test Results		Pass

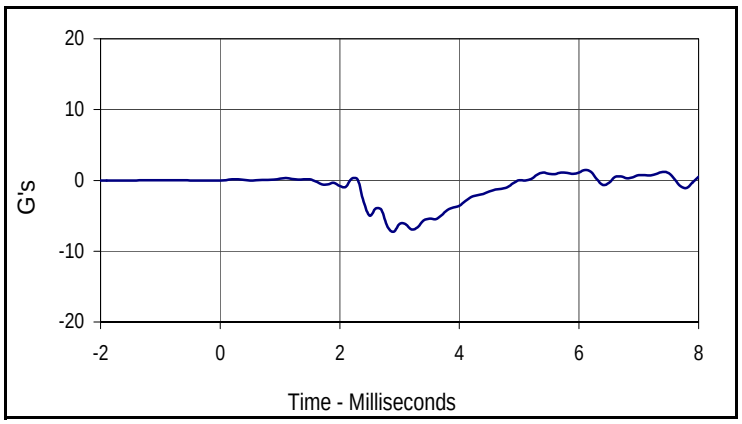


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
43.5	11.9	-9.5	26.3

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	3/8/07
ATD Serial No.:	274	Test I.D.:	HD03G

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	120.0 to 150.0	145.2	Pass
Peak Longitudinal Acceleration	G's	≤15.0	7.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	4.4	Pass
		Overall Test Results		Pass

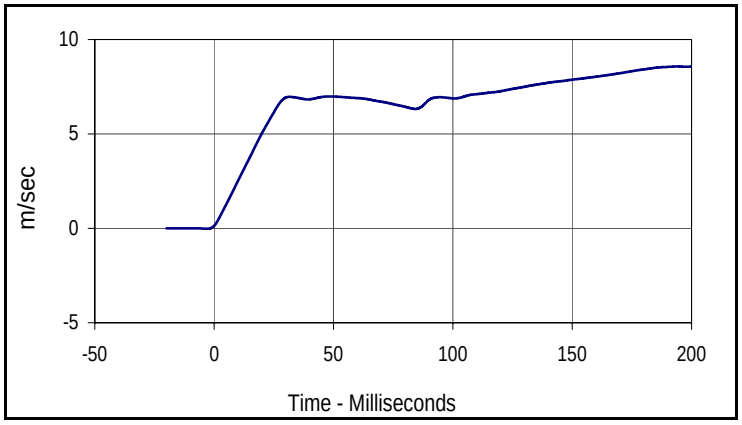
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
145.2	2.2	0.0	-0.5



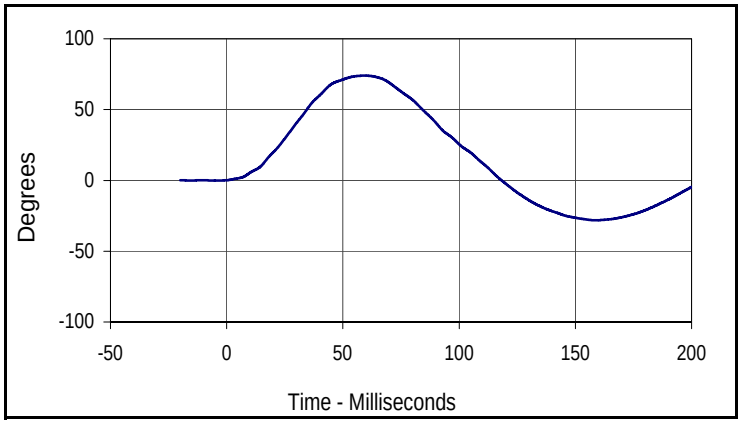
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.1	6.0	-7.3	2.9

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	3/8/07
ATD Serial No.:	274	Test I.D.:	NB03D

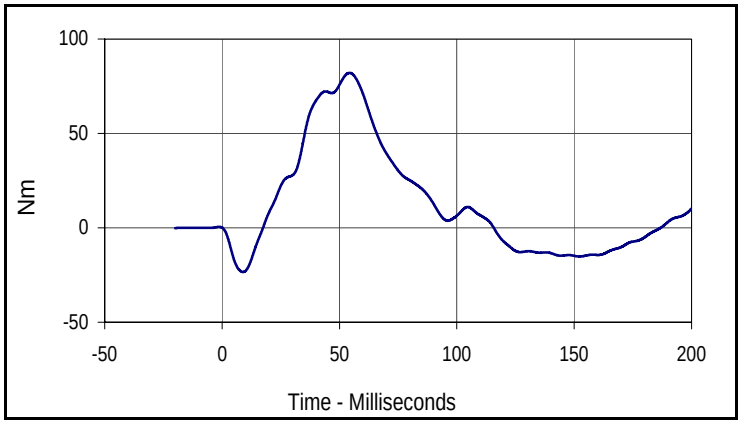
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	6.92	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.52	Pass
	20 Msec.	m/sec	4.12 to 5.10	5.03	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.93	Pass
	40 to 70	m/sec	6.27 to 7.64	6.99	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	74.0	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	5.2	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	58.8	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	82.1	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	61.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	60	m/sec
Max	Time	Min	Time
8.6	194.1	0.0	-2.9



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
74.0	59.5	-28.2	158.6



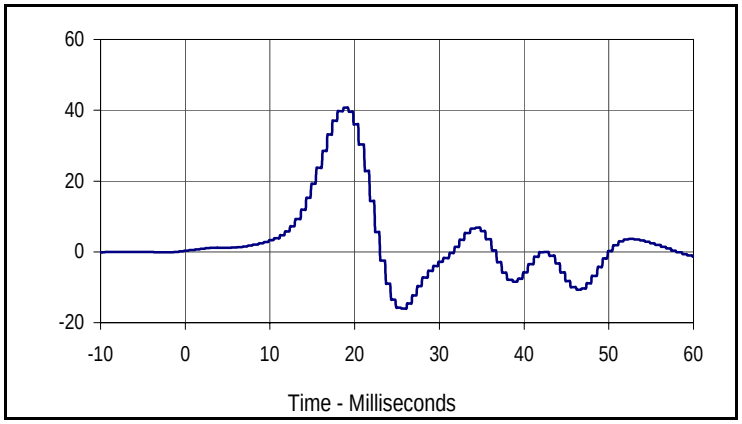
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
82.1	54.3	-23.4	8.9

Test Program:	SID / HIII External Measurements	Test Date:	3/7/07
ATD Serial No.:	275	Test I.D.:	N/A

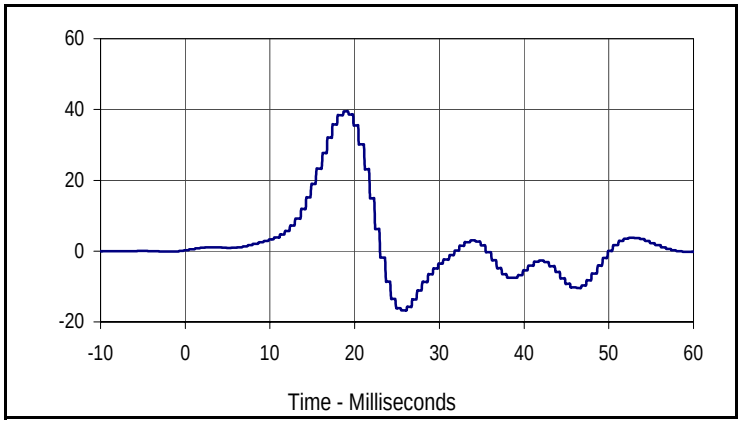
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	892	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	509	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	498	Pass
HW- Hip Width	mm	356 to 391	376	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	3/7/07
ATD Serial No.:	275	Test I.D.:	TH03G

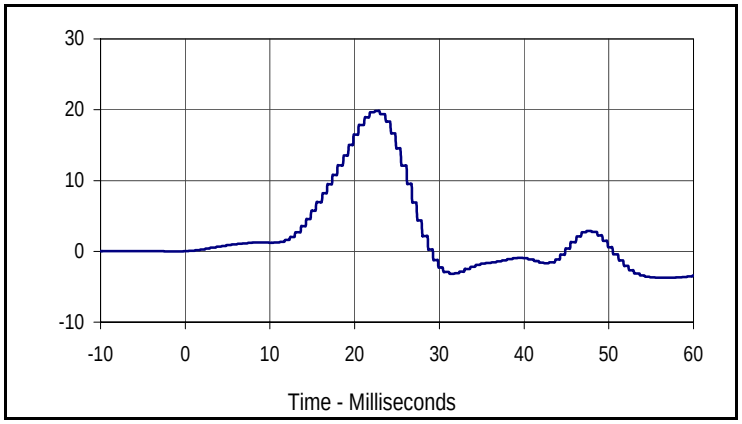
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.31	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	40.7	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	39.5	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.8	Pass
		Overall Test Results		Pass



Curve Description			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	
Max	Time	Min	Time
40.7	19.2	-0.1	-2.0



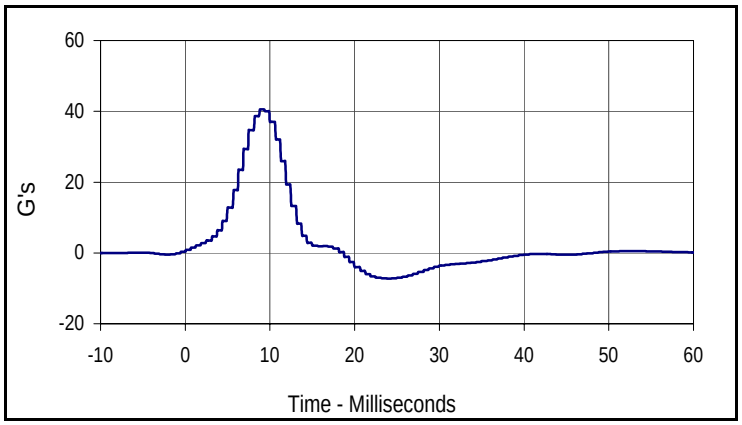
Curve Description			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	
Max	Time	Min	Time
39.5	19.2	-0.1	-2.0



Curve Description			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	
Max	Time	Min	Time
19.8	22.9	0.0	-0.8

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	3/7/07
ATD Serial No.:	275	Test I.D.:	PL03F

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.26	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	40.6	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
		Overall Test Results		Pass

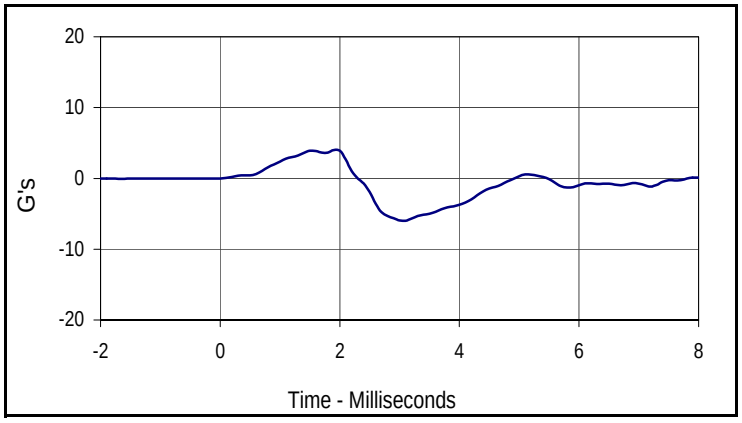


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
40.6	8.8	-7.2	23.8

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	3/8/07
ATD Serial No.:	275	Test I.D.:	HD03H

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	120.0 to 150.0	145.7	Pass
Peak Longitudinal Acceleration	G's	≤15.0	6.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	2.5	Pass
		Overall Test Results		Pass

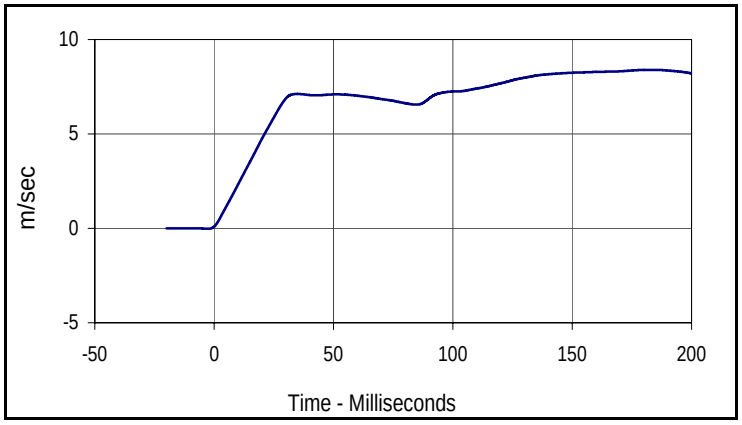
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
145.7	2.1	0.3	0.0



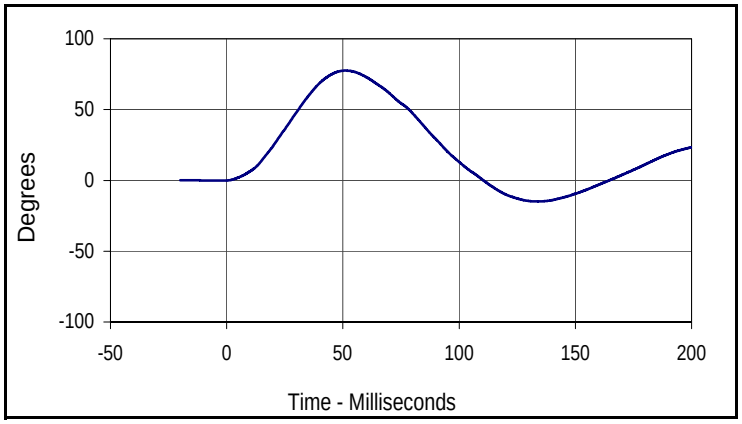
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.0	1.9	-6.0	3.1

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	3/8/07
ATD Serial No.:	275	Test I.D.:	NB08D

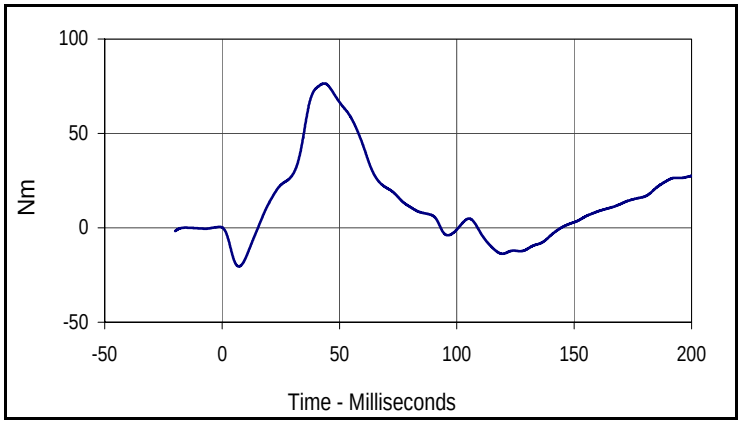
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.11	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.32	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.74	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.88	Pass
	40 to 70	m/sec	6.27 to 7.64	7.10	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	77.6	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	7.5	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	59.5	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	76.5	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	49.7	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	60	m/sec
Max	Time	Min	Time
8.4	184.7	0.0	-2.6



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
77.6	51.0	-14.9	133.5



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
76.5	43.5	-20.5	7.2

APPENDIX D

CHILD RESTRAINT SYSTEM

REPORT NUMBER TR-P27012-01-NC

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

HYUNDAI MOTOR COMPANY
2007 HYUNDAI VERACRUZ
5-DOOR MPV

NHTSA NUMBER: U70501

PREPARED BY:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301

MARCH 05, 2007

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590

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Prepared by:  Date: March 05, 2007

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Mr. Michael L. Dunlap, Quality Assurance Manager
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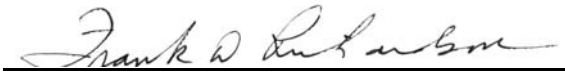
Approved by:  Date: March 05, 2007

Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

FINAL REPORT ACCEPTED BY:

_____
Manager, New Car Assessment Program

_____
Date of Acceptance

_____
COTR, NCAP Frontal Impact Program

_____
Date of Acceptance

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipients Catalog No.
TR-P27012-01-NC		

4. Title and Subtitle	5. Report Date
Final Report of a Britax Companion CRS NHTSA NO. U70501	March 5, 2007 **6. Performing Organization Code** KAR

7. Authors	8. Performing Organization Report No.
Mr. Johnny H. Dutto, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco	TR-P27012-01-NC

9. Performing Organization Name and Address	10. Work Unit No.
Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301	**11. Contract or Grant No.** DTNH22-03-D-32005

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NPS-111 400 Seventh Street, SW, Room 5311 Washington, D.C 20590	Final Test Report Base Year **14. Sponsoring Agency Code** DOT/NHTSA/NRM/OCS

15. Supplementary Notes

16. Abstract

A side impact test was conducted on the subject CRS Britax Companion in conjunction with side impact NCAP testing on a 2007 Hyundai Veracruz 5-Door MPV and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at Karco Engineering, LLC on March 05, 2007.

Measurement Description	Units	Threshold	Right Rear
Head Injury Criteria (HIC15)		390	65.2
3 msec. Chest Clip	G's	50	25.2

17. Key Words	18. Distribution of Statement
New Car Assesment Program (Side Impact NCAP) Side Impact Moving Deformable Barrier (MDB) Final Report of a Britax Companion CRS	Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, D.C. 20590

19. Security Classification (this report)	20. Security Classification (this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	45	

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

SECTION D-1

PURPOSE AND SUMMARY OF TEST U70501

The purpose of this test is to obtain CRS performance data during a 55/28 km/h 90 deg. Moving Deformable Barrier Side Impact NCAP Test

The Side Impact NCAP test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

One 12-month old CRABI (P3) was instrumented with head, chest, and six-axis upper neck load cells. A tri-axial accelerometer was installed on the CRS and the CRS base. Seat belt load cells were placed on the inboard and outboard lower anchors.

The right rear (Serial No. 022) CRABI was calibrated prior to this test. CRABI calibration information is found in Section D-4.

CHILD DUMMY VALUES		
Location	HIC15 Values	3 Msec. Chest Clip
CRABI (P3)	65.2	25.2

DATA SHEET NO.1

CRASH TEST SUMMARY

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

CHILD RESTRAINT SYSTEM INFORMATION

Description	Position #3 CRS
Manufacturer	Britax
Model Name	Companion
Serial No.	E9L80L9007406
Type	Infant
Forward/Rearward	Rearward

VISIBLE DUMMY CONTACT POINTS

Description	Position #3 CRS
Head Contact	None
Chest Contact	None
Abdomen Contact	None
Left Knee Contact	None
Right Knee Contact	None
Left Toe Contact	None
Right Toe Contact	None

POST-TEST DOOR OPENINGS

Description	Position #3 CRS
Right Rear Door	Opened, Remained Closed

CAMERA COVERAGE

Description	Standard
High Speed	1
Real Time	0
Total	1

DATA CHANNELS

CRABI (P3) Sensors	13
Belt Sensors	2
CRS Sensors	6
Total	21

DATA SHEET NO.2

CRS PARAMETER DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	553	417	970	620	483	1103
Right	kg	568	411	979	607	444	1051
Ratio	%	57.5	42.5	100	57.0	43.0	100
Totals	kg	1121	828	1949	1227	927	2154

TARGET TEST WEIGHT CALCULATION

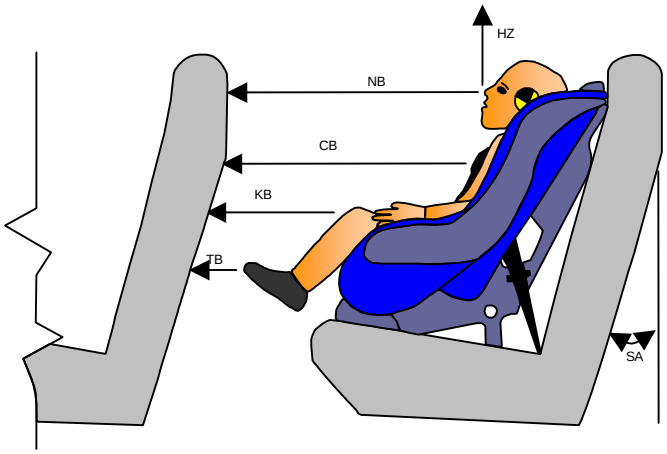
Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1949
Weight of 2 P572 ATD's	kg	161
Rated Cargo/Luggage Wt. (RCLW)	kg	50
Calculated Vehicle Target Wt. (TVTW)	kg	2160

DATA SHEET NO.3

CRABI POSITIONING IN VEHICLE

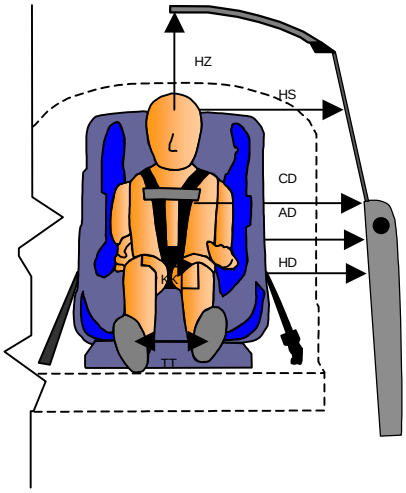
Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

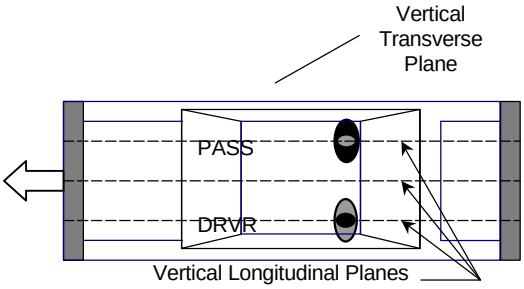
Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07



AD	Arm to Door
CD	Chest to Door
HD	H-Point to Door
HS	Head to Side Window
KK	Knee to Knee
TT	Toe to Toe

CB	Chest to Seat Back
HZ	Head to Roof
KB	Knee to Seat Back
NB	Nose to Seat Back
SA	Seat Back Angle
TB	Toe to Seat Back





DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

DATA SHEET NO.3

CRABI POSITIONING IN VEHICLE…(CONTINUED)

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

CRABI POSITION MEASUREMENTS

Code	Measurement	Units	CRABI (P3) Serial No. 022
			Length
SA	Seat Back Angle	deg.	22.5
HZ	Head to Roof (Z)	mm	480
CD	Chest to Door	mm	430
KK	Knee to Knee (Y)	mm	160
HS	Head to Side Window	mm	420
HD	H-Point to Door (Y)	mm	310
AD	Arm to Door	mm	280
NB	Nose to Seat Back	mm	525
CB	Chest to Seat Back	mm	450
FF	Foot to Foot	mm	120
KB-Left	Knee to Seat Back	mm	180
KB-Right	Knee to Seat Back	mm	200
TB-Left	Toe to Seat Back	mm	75
TB-Right	Toe to Seat Back	mm	75

DATA SHEET NO.4

CRS PERFORMANCE DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

CRS PERFORMANCE DATA

Location	CRS (P3)	
	Damage	Post-Test
Upper Tether Strap		
Upper Tether Buckle		
Upper Tether Hook		
Veh. Upper Tether Anchor		
Lower Anchor Strap		
Lower Anchor Buckle		
Lower Anchor Hooks		
Veh. Lower CRS Anchors		
5-Point Harness Connections		
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None

DATA SHEET NO. 12…(CONTINUED)
CRS ACCELEROMETER LOCATIONS

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 3/5/07

CRS ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	CRS	1830	563	920
2	CRS Base	1830	563	880

Reference Planes: X=From Rear Surface of Vehicle, Y=Vehicle Centerline, Z=Ground Plane

DATA SHEET NO.6

CRS CAMERA LOCATIONS AND DATA

Test Vehicle: 2007 Hyundai Veracruz 5-Door MPV NHTSA No.: U70501

Test Program: 55/28 km/h Side Impact NCAP Test Date: 03/05/07

CAMERA LOCATIONS

No.	Camera View	Location(mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Right Rear Dummy Onboard	1651	1351	-1499	-2	n/a	12	1000

X = Barrier Face Y = Monorail Centerline Z = Ground DNR = Did Not Run NTM = No Time Marks

SECTION D-2

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

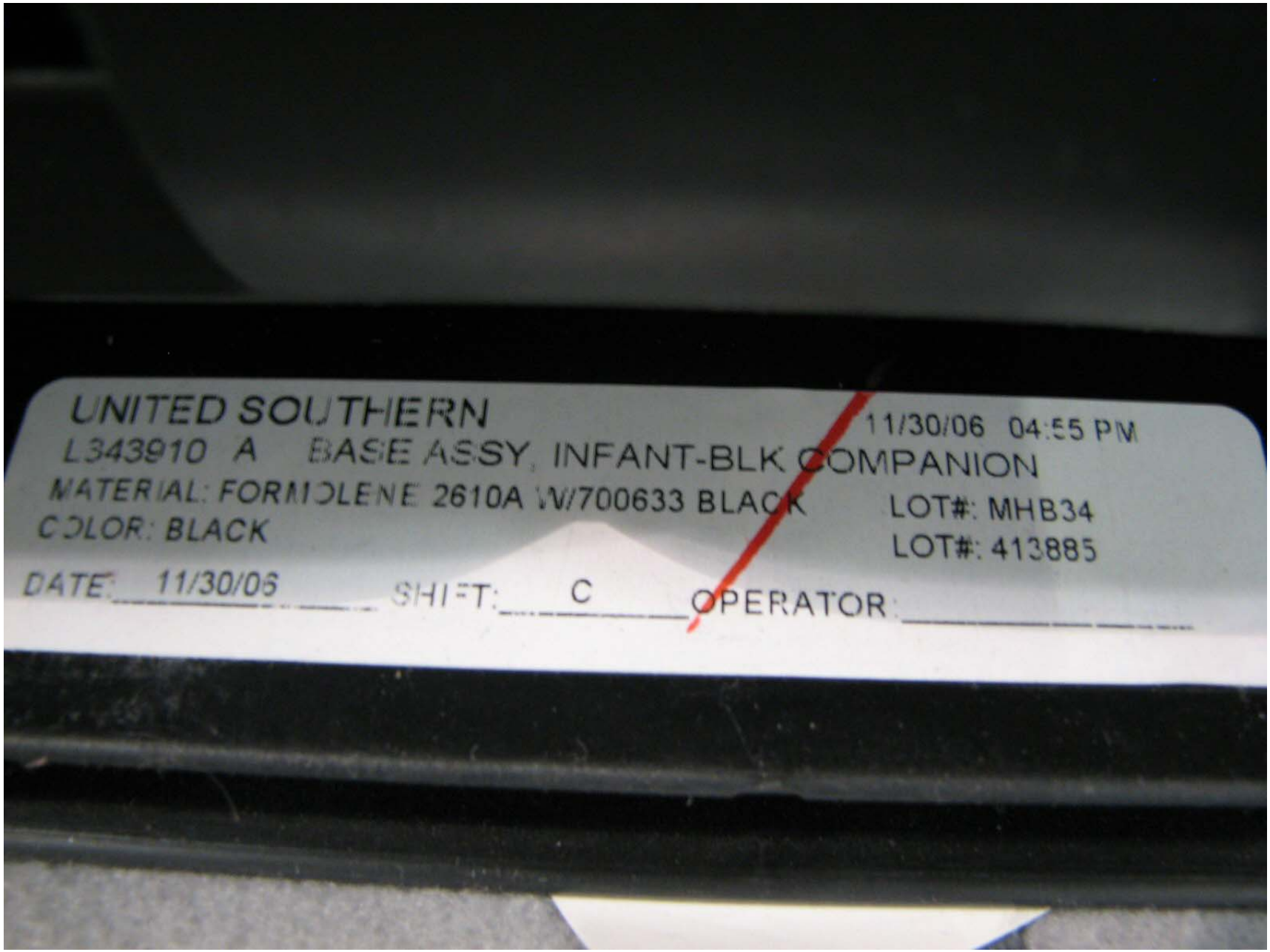


Figure D2-1: Close-up, Position 3 CRS Label

Figure D2-2: Pre-Test Frontal View of Position 3 CRS

Figure D2-3: Post-Test Frontal View of Position 3 CRS

Figure D2-4: Pre-Test Rear View of Position 3 CRS

Figure D2-5: Post-Test Rear View of Position 3 CRS

Figure D2-6: Pre-Test Left Side View of Position 3 CRS

Figure D2-7: Post-Test Left Side View of Position 3 CRS

Figure D2-8: Pre-Test Right Side View of Position 3 CRS

Figure D2-9: Post-Test Right Side View of Position 3 CRS

Figure D2-10: Pre-Test Position 3 Front View (Head and Seatbelt Position)

Figure D2-11: Post-Test Position 3 Front View (Head and Seatbelt Position)

Figure D2-12: Pre-Test Position 3 Front View (Seatbelt Position)

Figure D2-13: Post-Test Position 3 Front View (Seatbelt Position)

Figure D2-14: Pre-Test Position 3 Right Side View

Figure D2-15: Post-Test Position 3 Right Side View

Figure D2-16: Pre-Test Position 3 Right Side View (Through Window)

Figure D2-17: Post-Test Position 3 Right Side View (Through Window)

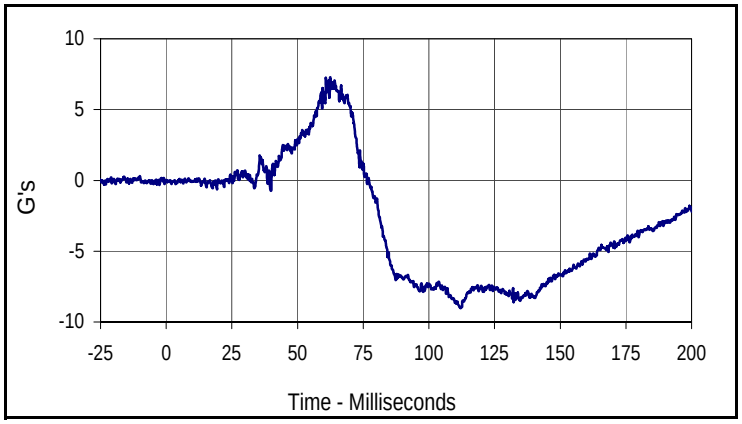
Figure D2-18: Post-Test Position 3 Dummy Legs

SECTION D-3

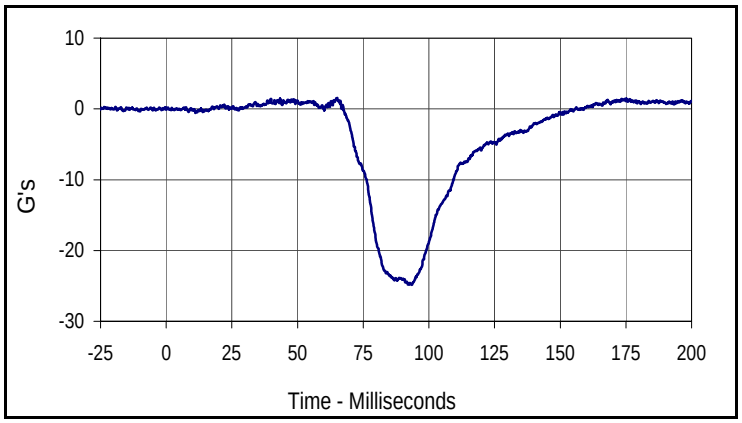
CRABI RESPONSE AND CRS DATA TRACES

LIST OF DATA PLOTS

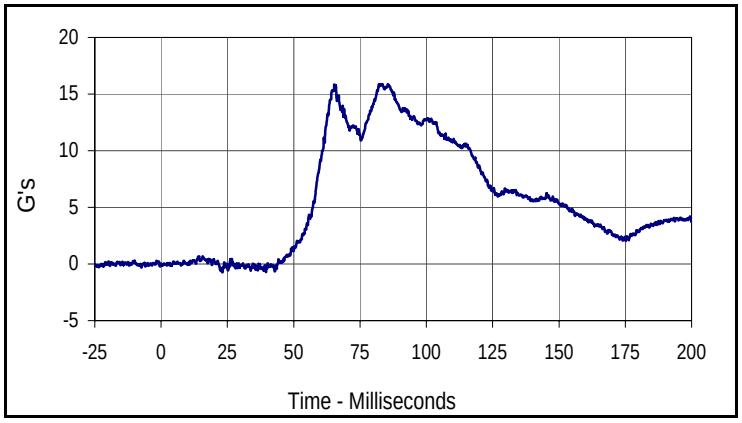
Test Vehicle:	2007 Hyundai Veracruz 5-Door MPV	Test Date:	3/5/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	U70501



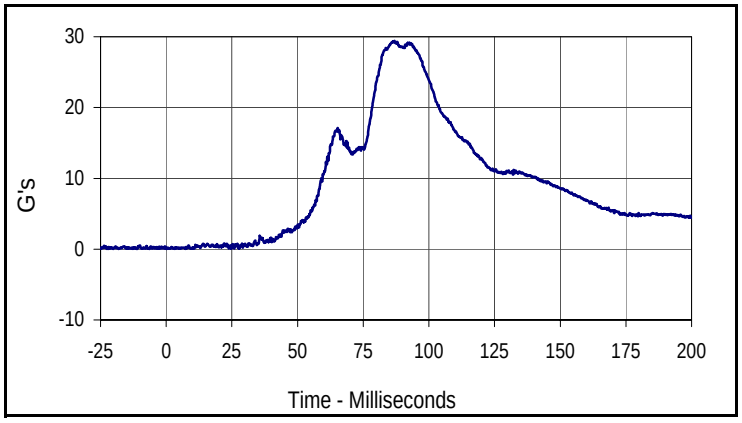
Curve Description			
CRABI Head X (P3)			
CURNO	Type	SAE Class	Units
072	FIL	1000	G's
Max	Time	Min	Time
7.3	62.5	-9.0	112.1



Curve Description			
CRABI Head Y (P3)			
CURNO	Type	SAE Class	Units
073	FIL	1000	G's
Max	Time	Min	Time
1.6	65.1	-24.8	93.5

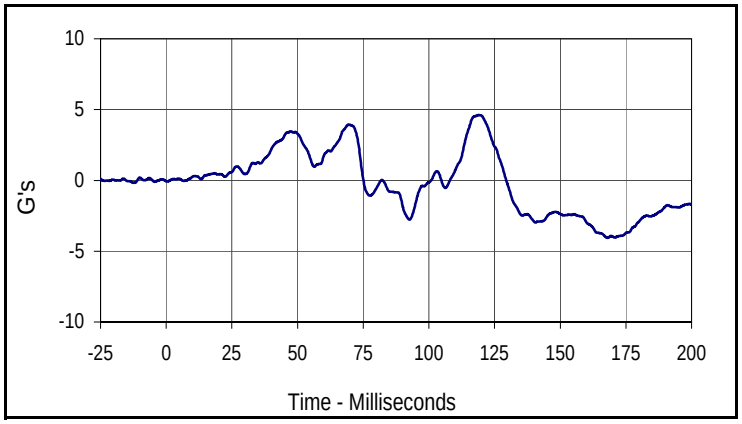


Curve Description			
CRABI Head Z (P3)			
CURNO	Type	SAE Class	Units
074	FIL	1000	G's
Max	Time	Min	Time
15.9	85.5	-0.7	23.1

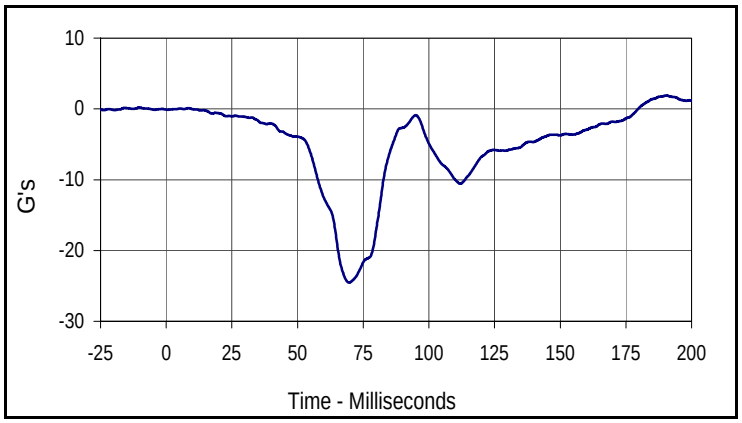


Curve Description			
CRABI Head Resultant (P3)			
CURNO	Type	SAE Class	Units
072	RES	1000	G's
Max	Time	Min	Time
29.4	86.8	0.0	0.2

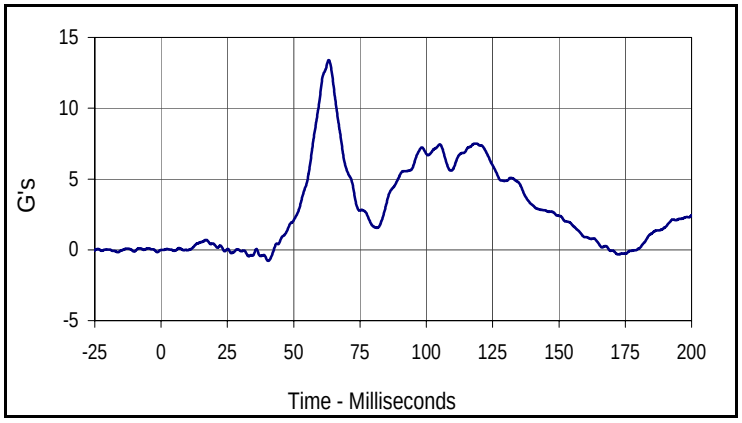
Test Vehicle:	2007 Hyundai Veracruz 5-Door MPV	Test Date:	3/5/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	U70501



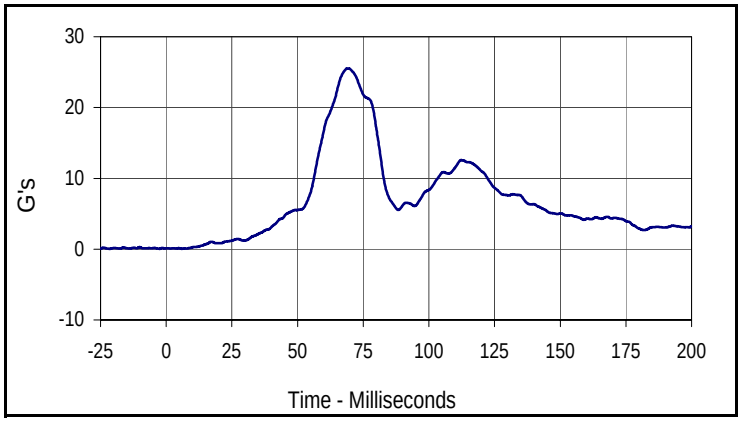
Curve Description			
CRABI Chest X (P3)			
CURNO	Type	SAE Class	Units
082	FIL	180	G's
Max	Time	Min	Time
4.6	118.9	-4.1	168.0



Curve Description			
CRABI Chest Y (P3)			
CURNO	Type	SAE Class	Units
083	FIL	180	G's
Max	Time	Min	Time
1.9	190.4	-24.5	69.6



Curve Description			
CRABI Chest Z (P3)			
CURNO	Type	SAE Class	Units
084	FIL	180	G's
Max	Time	Min	Time
13.4	63.2	-0.8	40.3



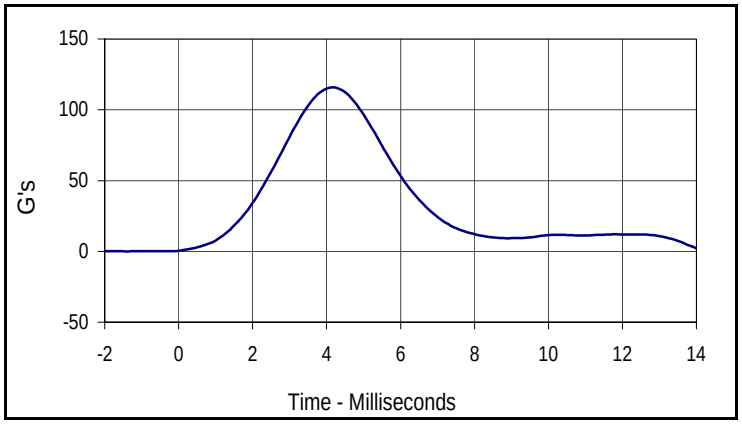
Curve Description			
CRABI Chest Resultant (P3)			
CURNO	Type	SAE Class	Units
082	RES	180	G's
Max	Time	Min	Time
25.5	69.2	0.0	6.0

SECTION D-4

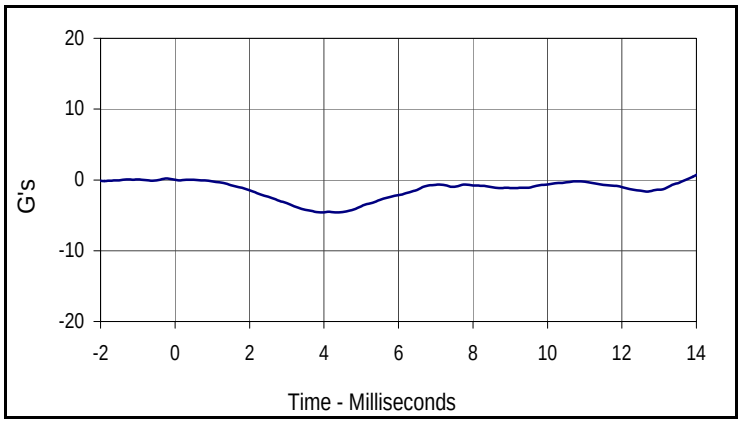
CRABI CALIBRATION INFORMATION

Test Program:	CRABI 12 Month Old Frontal Head Drop Test	Test Date:	2/26/07
ATD Serial No.:	022	Test I.D.:	HD022H

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	100.0 to 120.0	115.8	Pass
Peak Lateral Acceleration	G's	≤15.0	4.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
115.8	4.2	0.0	-1.4

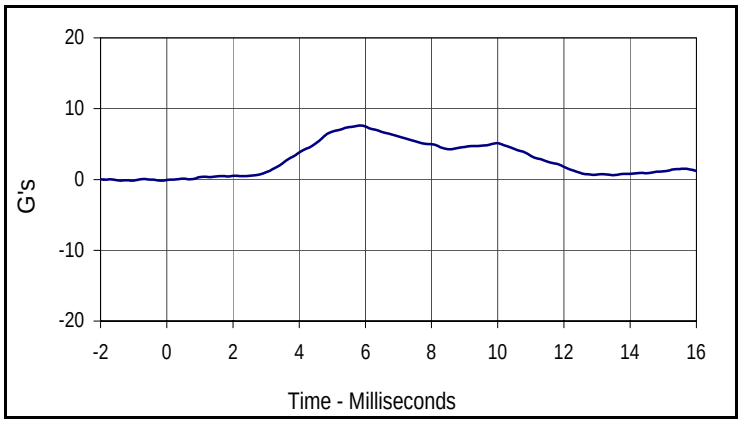


Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.2	-0.2	-4.6	3.9

Test Program:	CRABI 12 Month Old Rear Head Drop Test	Test Date:	2/26/07
ATD Serial No.:	022	Test I.D.:	HDR22S

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	55.0 to 71.0	61.1	Pass
Peak Lateral Acceleration	G's	≤15.0	7.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

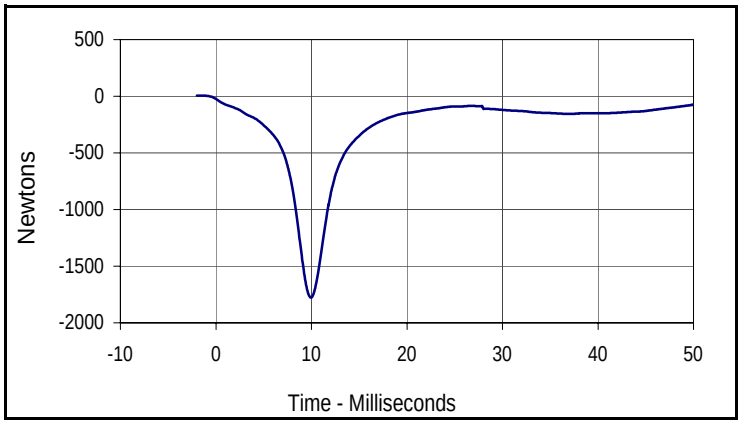
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
61.1	6.0	0.1	-0.9



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.6	5.8	-0.2	-1.4

Test Program:	12 Month Old CRABI Thorax Impact Test	Test Date:	2/27/07
ATD Serial No.:	022	Test I.D.:	TH02X

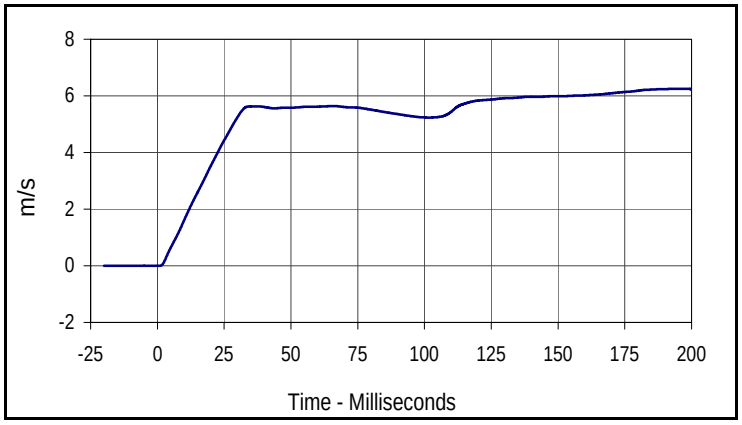
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	4.90 to 5.10	4.90	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1776	Pass
		Overall Test Results		Pass



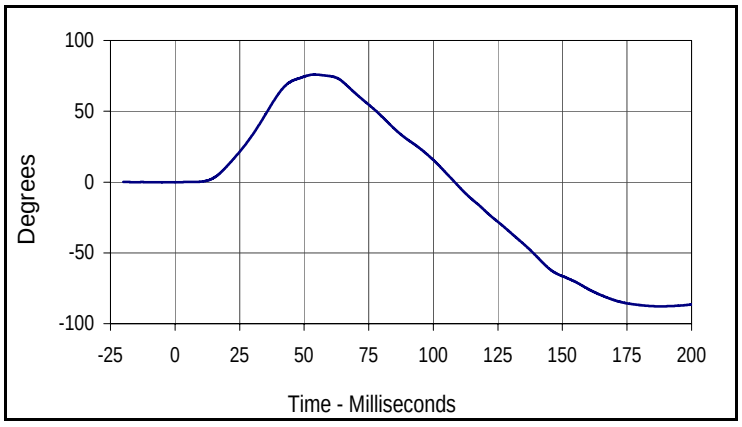
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
6.1	-1.6	-1776.2	10.0

Test Program:	CRABI 12-Month Old Neck Flexion Test	Test Date:	2/28/07
ATD Serial No.:	022	Test I.D.:	NF02P

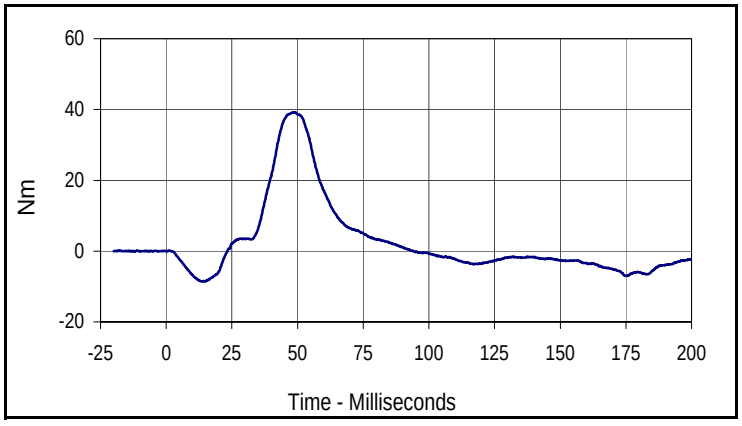
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.29	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	1.6	Pass
	20 Msec.	m/s	3.4 to 4.2	3.5	Pass
	25 Msec.	m/s	4.3 to 5.2	4.4	Pass
"D" Plane Rotation	Max	Degrees	75.0 to 86.0	75.9	Pass
Peak Moment in Rotation	Max	Nm	36.0 to 45.0	38.4	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	75.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.2	197.7	0.0	0.6



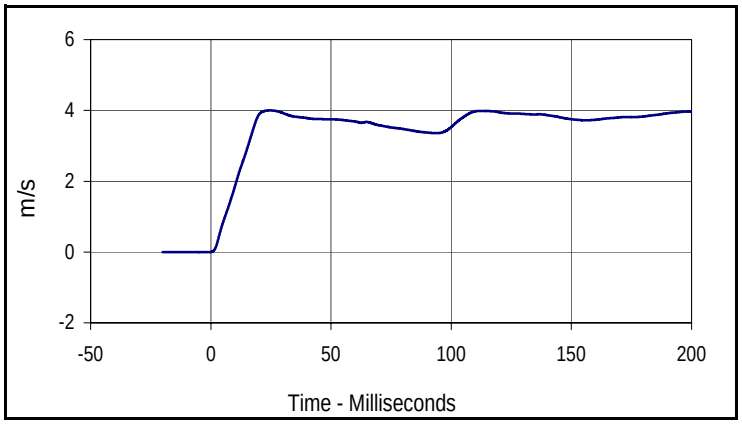
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
75.9	54.0	-87.8	188.0



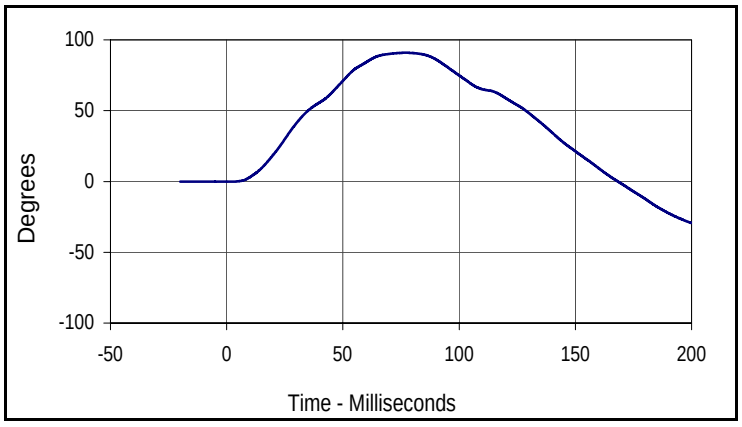
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
39.2	48.7	-8.6	13.7

Test Program:	CRABI 12-Month Old Neck Extension Test	Test Date:	2/28/07
ATD Serial No.:	022	Test I.D.:	NE02G

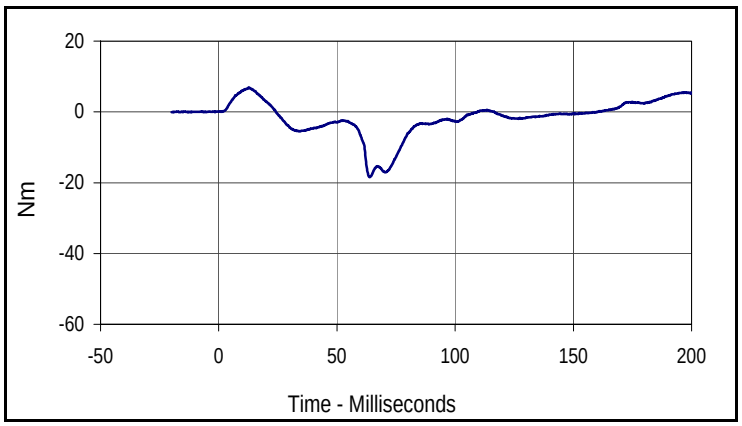
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.43	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	1.0	Pass
	10 Msec.	m/s	1.5 to 2.1	1.8	Pass
	14 Msec.	m/s	2.2 to 2.9	2.7	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	90.9	Pass
Peak Moment in Rotation	Max	Nm	-12 to -23	-18.4	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	80.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.0	24.6	0.0	-0.7



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
90.9	77.0	-29.3	200.0



Curve Description			
Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
6.8	12.8	-18.4	63.8