REPORT NUMBER TR-P27209-01-NC

NEW CAR ASSESMENT PROGRAM
SIDE IMPACT TEST

GENERAL MOTORS CORP.
2008 CADILLAC CTS
4-DOOR SEDAN

NHTSA NUMBER: G80101

Prepared By:
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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 2008 Cadillac CTS 4-Door Sedan in accordance with the specifications of the Office of Crashworthiness Standards Test Procedures for the generation of consumer information on vehicle side crash protection. The test was conducted at KARCO Engineering on November 2, 2007. The impact velocity of the Moving Deformable Barrier was 62.25 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 21.7 deg. C. The target vehicle's maximum post-test static crush was 291, 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	36.3	38.4
Left Lower Rib (LLR) G's	35.9	41.9
Lower Spine (T_{12}) G's	40.3	42.3
Thoracic Trauma Index (TTI) G's	38.0	42.0
Pelvis (PEV) G's	42.3	46.7

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New Car Assessment Program (NCAP)
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SECTION 1
PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This Side Impact NCAP test is conducted as part of the FY' 2008 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 2008 Cadillac CTS 4-Door Sedan manufactured by General Motors Corp.

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 2008 Cadillac CTS 4-Door Sedan 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 62.25 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 1965 kg and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering, LLC in Adelanto, California, on November 2, 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 291 mm at level 3, 1650 mm rearward of the left vertical impact point. The driver SID/Hybrid III, Serial No. 275, and the passenger SID/Hybrid III, Serial No. 274, were calibrated prior to this test. The SID/Hybrid III injury criteria are summarized as follows:

Measurement	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	Gs	38.0	42.0
Peak Pelvis Gs	Gs	42.3	46.7

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. Appendix D contains the Child Restraint System data.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION SHEETS

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

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: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	G80101	Anti-Lock Brakes	Yes
Make	Cadillac	All Wheel Drive	No
Model	CTS	Power Steering	Yes
Body Style	4-Door Sedan	Driver Front Airbag	Yes
VIN No.	1G6DM577180127067	Driver Side Torso Airbag	Yes
Color	Sunset Blue	Driver Side Head Airbag	No
Delivery Date	10/19/2007	Driver Curtain Airbag	Yes
Odometer (Miles)	91.0	Rear Pass. Airbag	No
Dealer	Rydell Cadillac	Rear Pass. Side Airbag	No
Transmission	6-Speed Automatic	Rear Pass. Head Airbag	No
Final Drive	Rear	Rear Pass. Curtain Airbag	Yes
Type/No. of Cylinders	V6	Pre-Tensioners	Yes
Engine Displ. (L)	3.6	Load Limiters	Yes
Engine Placement	Longitudinal	Bucket Seats	Yes
Roof Rack	No	Air Conditioning	Yes
Sunroof/T-top	No	AM/FM CD	Yes
Tinted Glass	No	Tilt Steering	Yes
Traction Control	Yes	Automatic Door Locks	Yes
Power Brakes	Yes	Power Windows	Yes
Front Disc	Yes	Power Seats	Yes
Rear Disc	Yes	Other	n/a

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

DATA FROM CERTIFICATION TABLE

Manufactured By	General Motors Corp.	GVWR (kg)	2164
Date of Manufacture	Sep-07	GAWR Front (kg)	1013
		GAWR Rear (kg)	1151

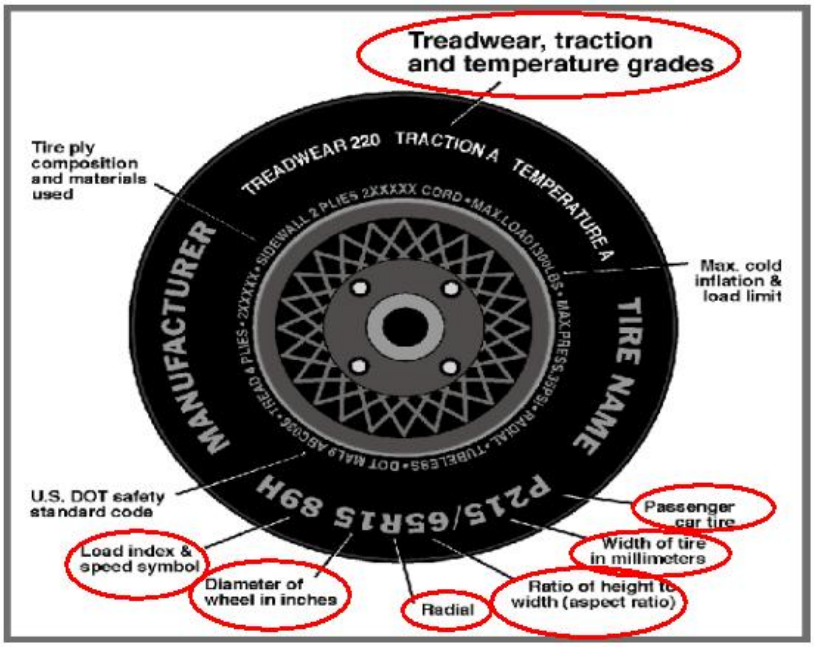
VEHICLE SEATING CAPACITY AND WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				404
Cargo Weight (RCLW) (kg)				64

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

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 Tire Pressure (kPa)	240	240
Recommended Tire Size	P235/55R17	P235/55R17
Tire Size on Vehicle	P235/55R17	P235/55R17
Tire Manufacturer	Michelin	Michelin
Treadwear	300	300
Traction	A	A
Temperature Grades	A	A
Tire Plies - Sidewall	2 Polyester	2 Polyester
Tire Plies - Body	2 Polyester, 1 Polyamide, 2 Steel	2 Polyester, 1 Polyamide, 2 Steel
Load Index/Speed Symbol	98H	98H
DOT Safety Code Left	B9JJ PNEX 3407	B9JJ PNEX 3407
DOT Safety Code Right	B9JJ PNEX 3407	B9JJ PNEX 3407

DATA SHEET NO. 1…(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	469	415	884	513	513	1026
Right	kg	449	413	862	458	481	939
Ratio	%	52.6	47.4	100.0	49.4	50.6	100.0
Total	kg	918	828	1746	971	994	1965

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1746
Weight of 2 P572 ATDs	kg	162
Rated Cargo/Luggage Wt (RCLW)	kg	64
Calculated Vehicle Target Wt (TVTW)	kg	1972

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	734	733	744	747	1367
As Tested	mm	724	729	711	724	1459
Fully Loaded	mm	723	728	710	722	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2883
Total Vehicle Length at Left Side	mm	3503
Total Vehicle Length at Centerline	mm	4844
Total Vehicle Length at Right Side	mm	3503
Weight of Ballast in Cargo Area	kg	16.0
Amount of Stoddard Solvent Added	L	63.44

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2883
Target Impact Point Aft of Front Axle	mm	502
Actual Impact Point Aft of Front Axle	mm	499

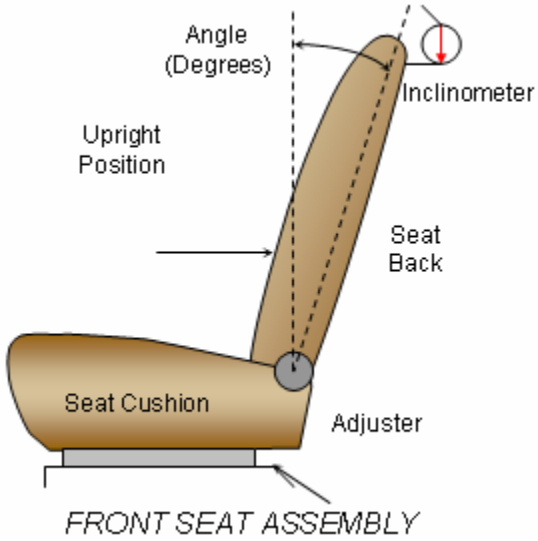
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

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

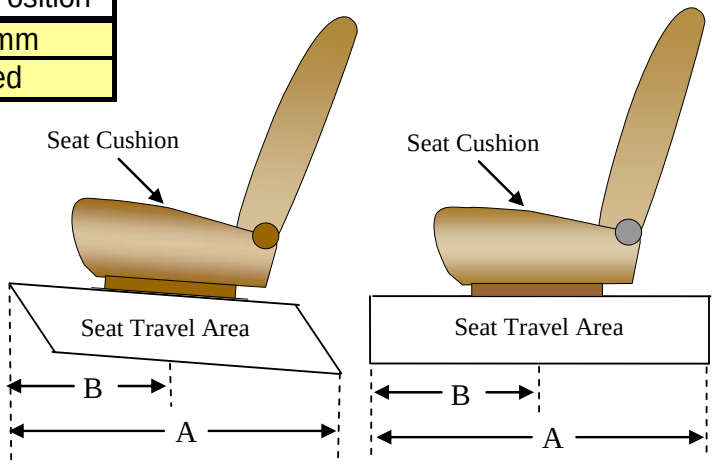
Position	Degrees
Driver w/Seated Dummy	8.2° @ Headrest
Passenger w/Seated Dummy	Fixed

SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position. The seat was set at the longitudinal mid position. There were vertical adjustments on the driver seat that was equipped with the vehicle. There were no adjustments on the passenger seat. The driver seat was placed in the lowermost position.

SEAT FORE/AFT POSITIONING

Position	Total Fore/Aft Travel	Placed in Position
Driver Seat	270 mm	135 mm
Passenger Seat	Fixed	Fixed



SEAT BELT ANCHORAGE

Position number one (1) is the uppermost position.

SEAT BELT ANCHORAGE POSITIONING

	Total Number of Positions	Placed in Position
Driver Seat	5	3
Passenger Seat	Fixed	Fixed

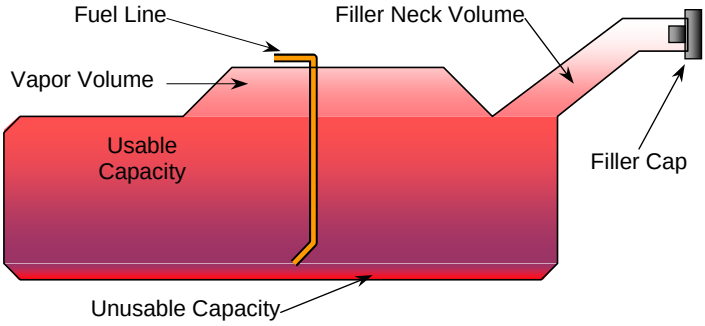
Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

FUEL TANK CAPACITY

	Liters
Usable Capacity of Standard Tank	68.13
Usable Capacity of Optional Tank	
Usable Capacity Used for FMVSS 301	62.76 to 64.12
Actual Amount of Solvent Used	63.44

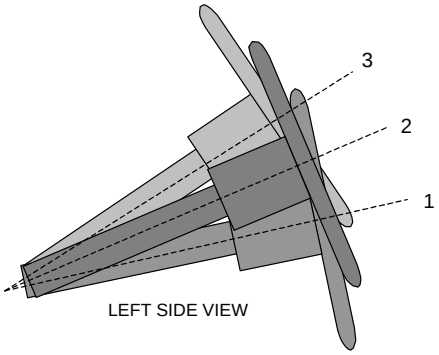
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately two (2) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the right rear fender. The standard fuel tank is a saddle tanks and occupies the area under the rear passenger seat.



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
Lowermost - Position No. 1	17.0	0
Geometric Center - Position No. 2	20.0	26
Uppermost - Position No. 3	23.0	52

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

MAXIMUM EXTERIOR CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
1	Sill Top	mm	61	236
2	Occupant H-Point	mm	271	550
3	Mid Door	mm	291	638
4	Window Sill	mm	194	923
5	Window Top	mm	30	1391
n/a	Maximum Penetration	mm	291	

INSTRUMENTATION

Driver SID/Hybrid III Accelerometers	20
Passenger SID/Hybrid III Accelerometers	20
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total Number 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: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

MDB SPECIFICATIONS

Measurement Description	Length
Overall Width of Frame Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheelbase of Frame Carriage	2590
CG 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	100.0
Total	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	62.25
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.24
MDB to Target CL	deg	88.5 to 91.5	89.5

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		
Row	Description	Height	Distance	Direction	Max Crush
A	Center of Bumper	432	800	Left	230
B	Top of Bumper	533	800	Left	243
C	Mid Level	686	800	Left	271
D	Top of Stack	813	800	Right	292

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	1
High Speed Cameras	2

DATA SHEET NO. 4

POST-TEST OBSERVATIONS

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Remained closed and latched, jammed	Remained closed and latched, jammed
Right Side Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Seat Movement	None	None
Seatback Failure	No	No

POST-TEST STRUCUTURAL OBSERVATIONS

Critical Areas of Performan	Observations and Conclusions
Pillar Performance	No separation occurred
Sill Seperation	Left rear sill separated
Windshield Damage	None
Window Damage	Both driver and left rear passenger side windows broken
Other Notable Effects	None

.

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 2	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	No	
Side Airbag	Yes	Yes	No	
Head Airbag	No		No	
Curtain Airbag	Yes	Yes	Yes	Yes
Pre-Tensioners	Yes		No	
Load Limiters	Yes		No	

MDB LEFT EDGE IMPACT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	-3 (Left)
Vertical Offset	mm	+/-20	+8 (Above)

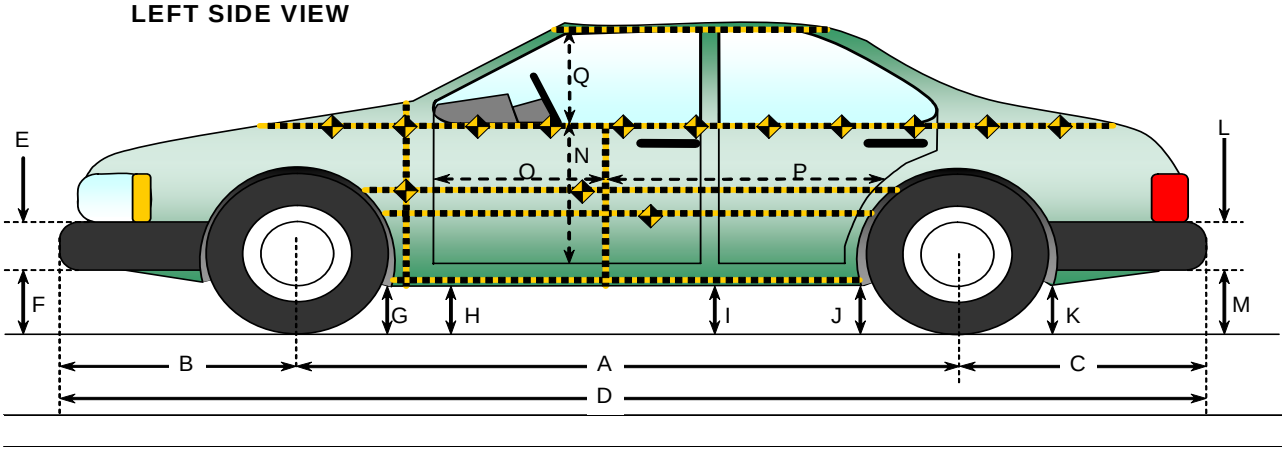
DATA SHEET NO. 5

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

LEFT SIDE VIEW



VEHICLE PRE AND POST-TEST MEASUREMENT INFORMATION

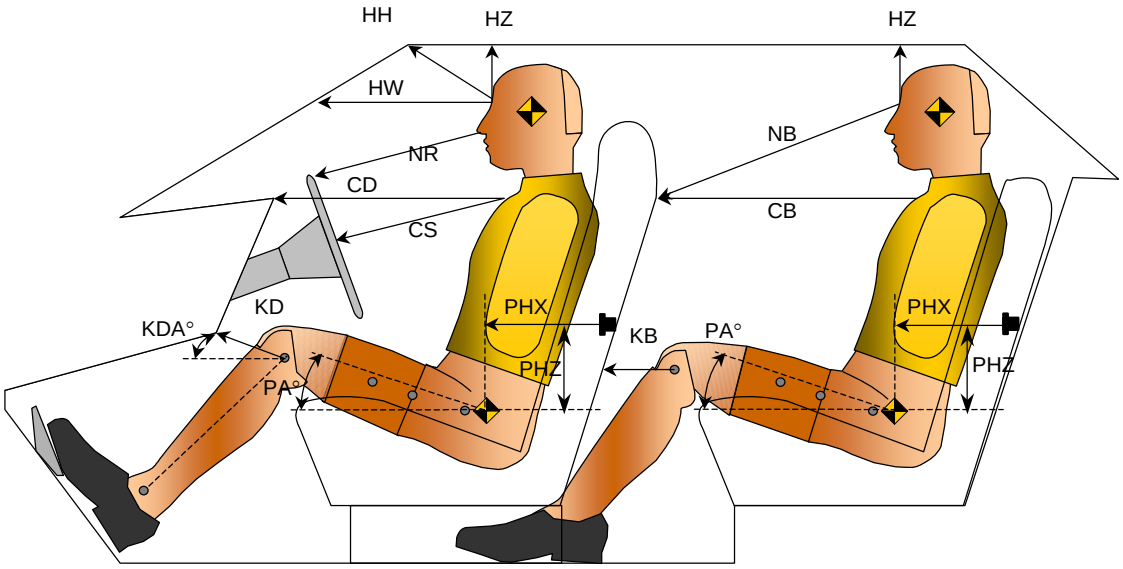
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheel base	2883	2877	-6
B	Front Surface of Vehicle To Front Axle	877	880	3
C	Rear Surface of Vehicle to Rear Axle	1085	1080	-5
D	Length of Vehicle at Centerline	4844	4838	-6
E	Front Bumper Vertical Dimension	380	380	0
F	Ground Surface to Front Bumper Bottom	179	198	19
G	Ground Surface to Sill aft of Front Wheel	174	186	12
H	Ground Surface to Sill at Front Door Leading Edge	178	198	20
I	Ground Surface to Sill at Front Door Trailing Edge	189	230	41
J1	Ground Surface to Pinch Weld	181	220	39
J2	Ground Surface to Sill	181	240	59
K	Ground Surface to Sill aft of Rear Wheel	209	263	54
L	Rear Bumper Vertical Dimension	410	412	2
M	Ground Surface to Below Rear Bumper	270	334	64
N	Inside Rocker to Window Bottom (Door Height)	725	688	-37
O	Front Door Leading Edge to Impact Centerline	727	740	13
P	Rear Door Trailing Edge to Impact Centerline	1444	1395	-49
Q	Window Vertical Height	390	340	-50
R	Right Side Length	3503	3505	2
S	Left Side Length	3503	3473	-30
T	Vehicle Width at "B" Post	1770	1605	-165

DATA SHEET NO. 6

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07



LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Passenger Code	Measurement	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	410	19.5		
HW		Head to Windshield	670	0		
HZ	HZ	Head to Roof	190	90.0	150	9.0
NR	NB	Nose to Rim (Seatback)	479	11.0	555	20.9
CD	CB	Chest to Dash (Seatback)	552	6.2	502	0
CS		Chest to Steering Hub	379	11.6		
KDL	KBL	Left Knee to Dash (Seatback)	223	34.1	172	23.0
KDR	KBR	Right Knee to Dash (Seatback)	161		174	
PA	PA	Pelvic Angle		23.0		24.4
PHX	PHX	Striker to H-Point (X)	135	0	148	0
PHZ	PHZ	Striker to H-Point (Z))	114	0	230	0

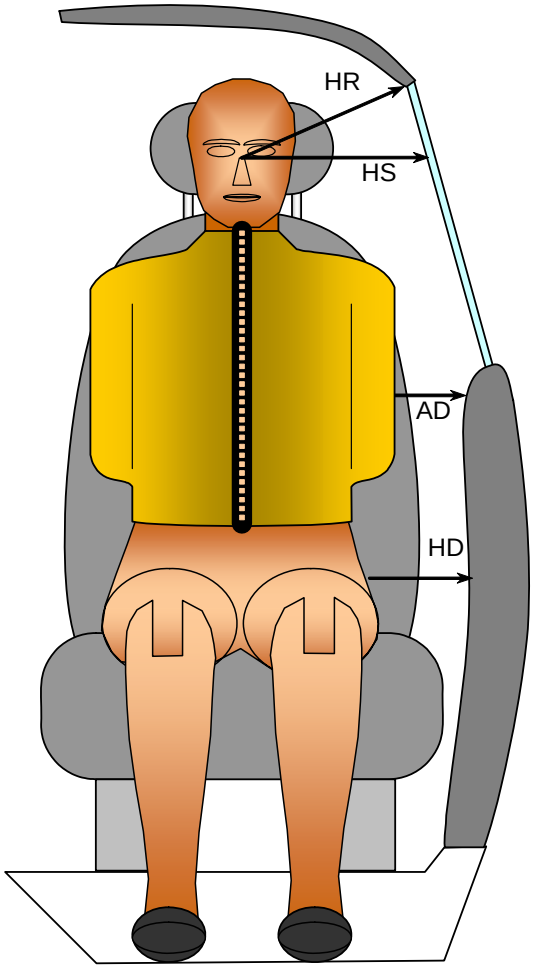
All dimensions shown in millimeters (mm).

DATA SHEET NO. 7

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07



FRONT VIEW OF DUMMY

LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement	Units	Driver	Passenger
HR	Head to Side Header (Y)	mm	215	270
HS	Head to Side Window	mm	333	340
AD	Arm to Door (Y)	mm	101	76
HD	H-Point to Door (Y)	mm	178	127

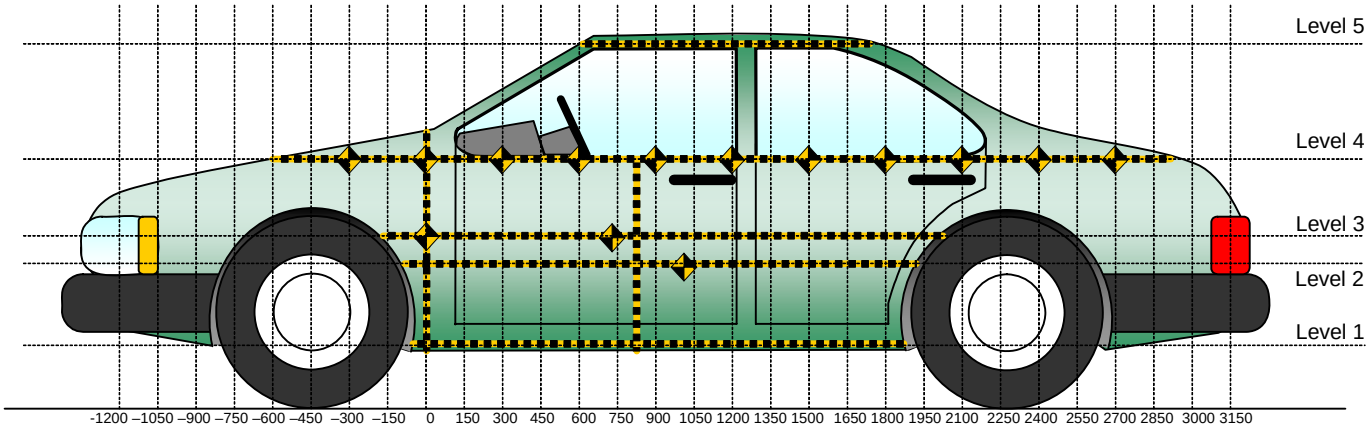
All dimensions shown in millimeters (mm)

DATA SHEET NO. 8

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.

Measurements taken 900 mm right of impact reference.

All measurements below in mm

.

Level	Measurement Description	Units	Height Above Ground
1	Sill Top	mm	236
2	Occupant H-Point	mm	550
3	Mid-Door	mm	638
4	Window Sill	mm	923
5	Window Top	mm	1391

All dimensions shown in millimeters (mm).

DATA SHEET NO. 9

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

	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				710					741					31	
-150		586	586	692			607	619	716			21	33	24	
0	640	611	611	692		652	660	645	700		12	49	34	8	
150	643	610	610	689		682	761	727	691		39	151	117	2	
300	643	607	607	684		682	783	772	706		39	176	165	22	
450	643	606	605	676		683	783	796	736		40	177	191	60	
600	643	605	604	667		688	793	806	756		45	188	202	89	
750	644	605	604	661		691	816	826	796		47	211	222	135	
900	647	605	604	658	913	696	829	829	813	940	49	224	225	155	27
1050	650	605	605	656	913	697	820	827	813	929	47	215	222	157	16
1200	650	609	605	658	913	701	807	822	794	933	51	198	217	136	20
1350	653	613	612	658	920	700	854	854	810	943	47	241	242	152	23
1500	657	617	616	663	920	701	863	886	857	946	44	246	270	194	26
1650	660	621	621	663	916	701	892	912	851	946	41	271	291	188	30
1800	655	614	626	669	930	698	877	910	836	946	43	263	284	167	16
1950	619	587	603	671	936	680	692	729	746	946	61	105	126	75	10
2100			590	674	952			625	671	951			35	-3	-1
2250				689					624					-65	
2400				696					693					-3	
2550															
2700															
2850															
3000															

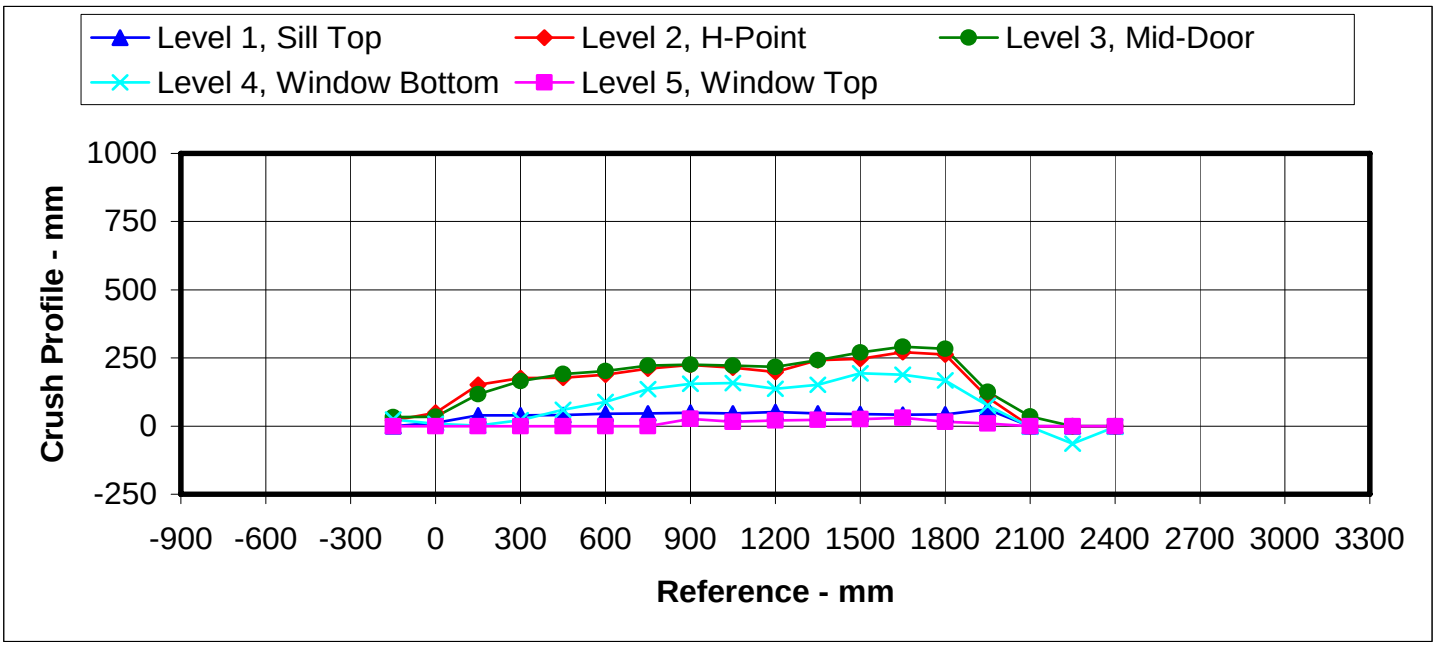
All dimensions in millimeters (mm)

DATA SHEET NO. 9…(CONTINUED)

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07



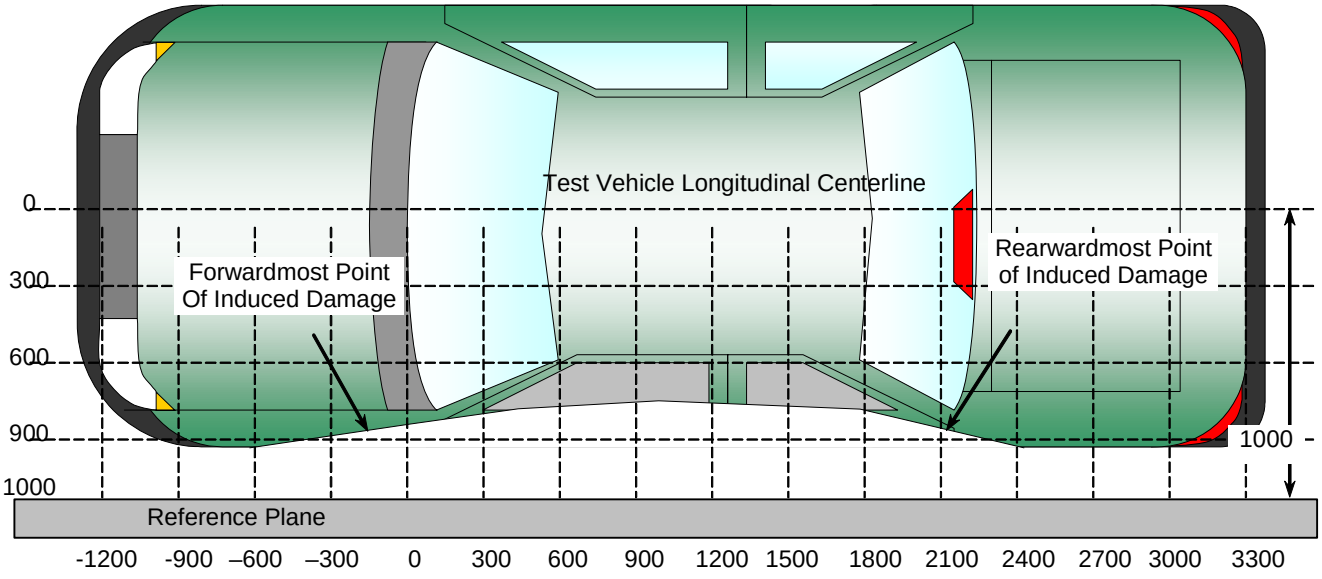
	Units	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush	mm	61	271	291	194	30
Distance From Impact Point	mm	1950	1650	1650	1500	1650

DATA SHEET NO. 10

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07



All Dimensions Shown in millimeters

TOP VIEW

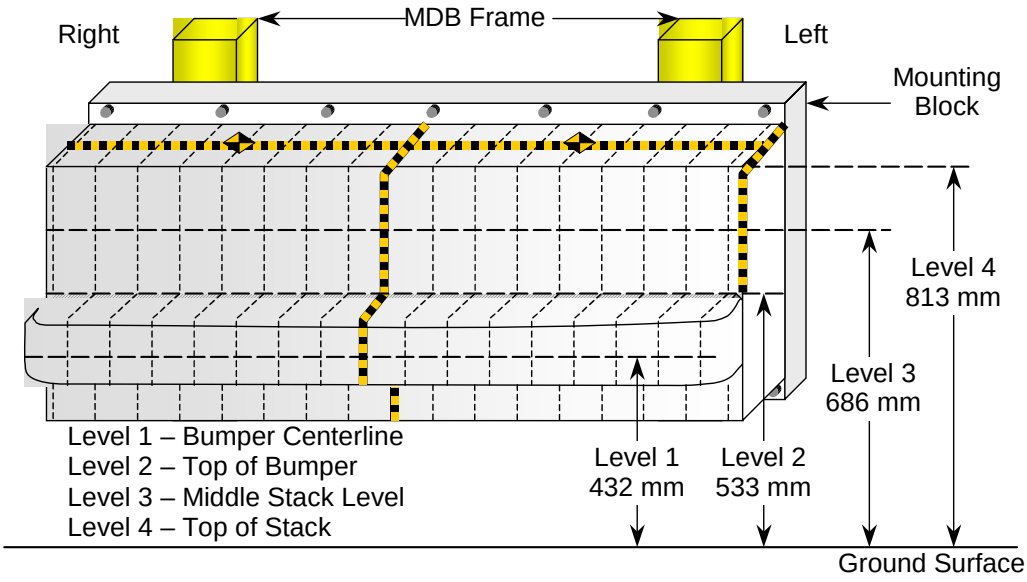
DPD	Distance From Impact Point	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2250	4	689	624	-65
2	1800	3	626	910	284
3	1350	3	612	854	242
4	900	3	604	829	225
5	450	3	605	796	191
6	0	2	611	660	49

DATA SHEET NO. 11

DEFORMABLE BARRIER HONEYCOMBE FACE STATIC CRUSH

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07



Stack Level	Right of Center								CL	Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	748	733	735	732	740	726	722	720	726	715	714	716	712	714	714	735	744
2	733	726	723	717	713	708	713	717	726	728	728	727	726	726	735	752	761
3	666	650	646	599	658	669	668	650	641	642	638	651	660	679	704	735	789
4	683	659	645	660	689	714	682	676	656	656	658	668	686	705	736	740	810

All dimensions in millimeters (mm)

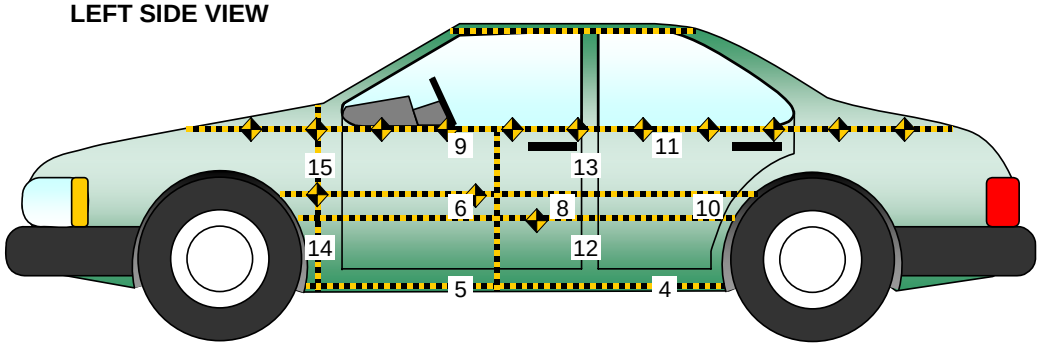
DATA SHEET NO. 12

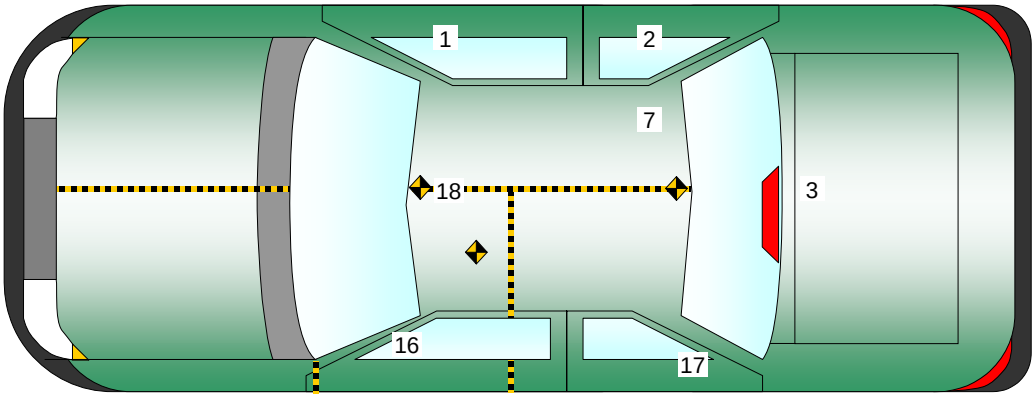
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

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 LOCATION AND DATA SUMMARY

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No	Accelerometer Location	Measurements (mm)			
		X	Y	Z	
1	Right Sill at Front Seat	2825	700	375	
2	Right Sill at Rear Seat	2015	710	380	
3	Rear Floorpan Above Axle	765	-165	320	
4	Left Sill at Rear Door	1820	-700	190	
5	Left Sill at Front Door	2550	-700	190	
6	Front Door Centerline				1
7	Rt. Rear Occ. Compartment	2080	175	205	
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	2200	-705	625	
13	B-Post Middle	2200	-705	820	
14	A-Post Lower	3352	-730	480	
15	A-Post Middle	3352	-730	575	
16	Front Seat Track	2725	-550	345	
17	Rear Seat Structure				1
18	Vehicle CG	3020	210	200	

Reference Planes: X = From rear surface of vehicle, Y = Vehicle Centerline, Z = Ground Plane

1.) Not Installed

DATA SHEET NO. 13

MDB ACCELEROMETER LOCATIONS

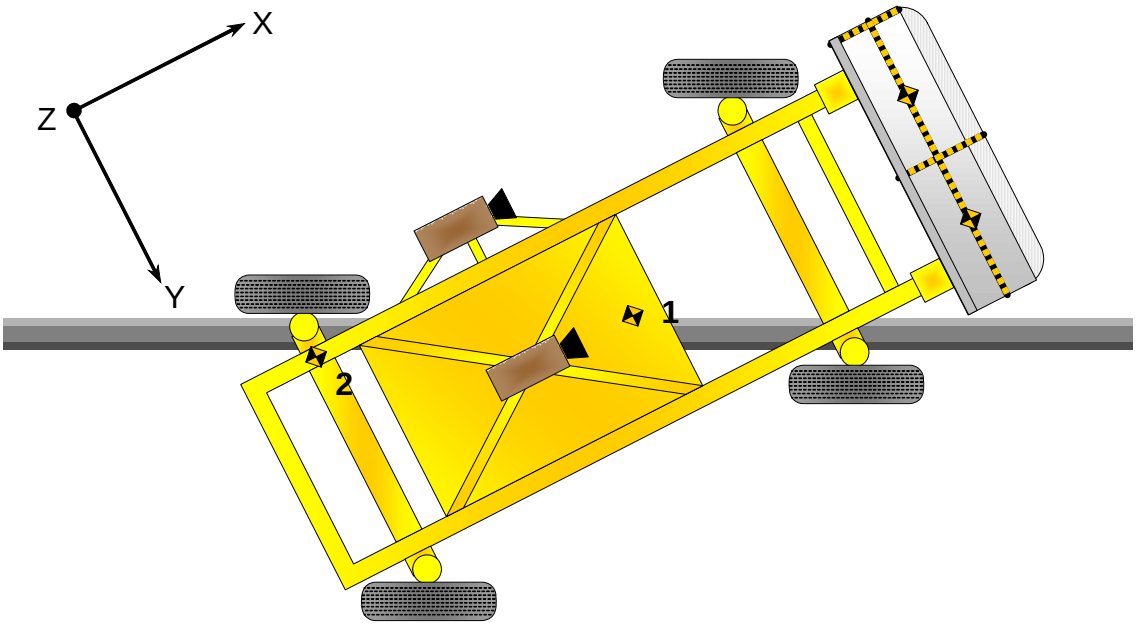
Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

MDB ACCELEROMETER LOCATIONS

Loc. No	Accelerometer Locations	Measurements		
		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

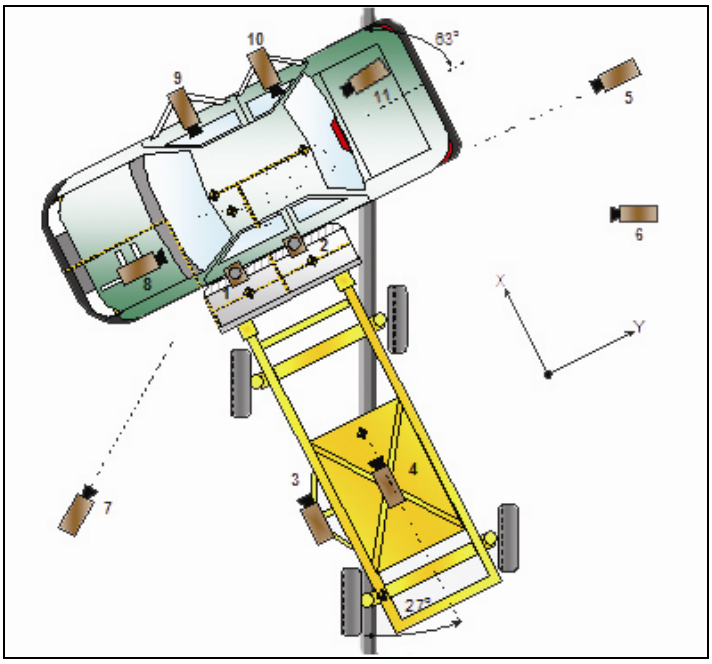


DATA SHEET NO. 14

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07



No.	Camera View	Location (mm)			Angle (°)	Lens (mm)	Film Speed
		X	Y	Z			
Doc	Real Time Inrun	-2484	-3958	-1506	0		30
Doc	Real Time Left Front	-2266	3549	-1475	-2		30
1	Overhead Overall	1220	2287	-5486	-90	14	1000
2	Overhead Close Up	609	2287	-5102	-90	Zoom	1000
3	Left Impact Point (MDB)	-2134	0	-1143	-2	12	1000
4	Side Overall (MDB)	-3912	838	-1829	-4	12	1000
5	Rear	-64	20485	-1348	0	105	1000
6	Left Rear (MDB)	-2137	-1302	-339	-4	85	1000
7	Left Front	-2266	-3564	-1475	-2	24	1000
8	Driver Front (O.B.)	593	-573	-1375	-6	35mm	1000
9	Driver Side (O.B.)	1783	966	-1108	-2	20mm	1000
10	Passenger Side (O.B.)	1791	1843	-1112	-2	20mm	1000
11	Passenger CRS (O.B.)	875	2391	-1227	-2	10mm	1000

DNR = Did Not Run

All measurements are made relative to the point of impact.

DATA SHEET NO. 15

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

Test Time: 12:40 PM Temperature: 21.7 deg. C

STODDARD SOLVENT SPILLAGE MEASUREMENTS

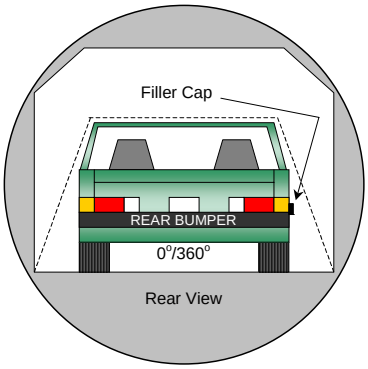
A.	From impact until vehicle motion ceases:	0
	(Maximum allowable = 1 ounce)	
B.	For the 5 minute period after motion ceases:	0
	(Maximum allowable = 5 ounces)	
C.	For the following 25 minutes:	0
	(Maximum allowable = 1 oz/minute)	
D.	Spillage Details:	No leakage occurred

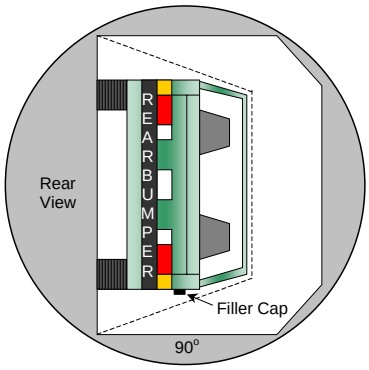
DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER DATA

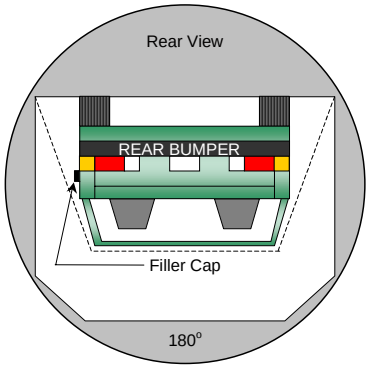
Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

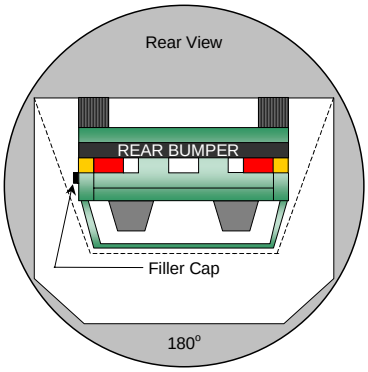


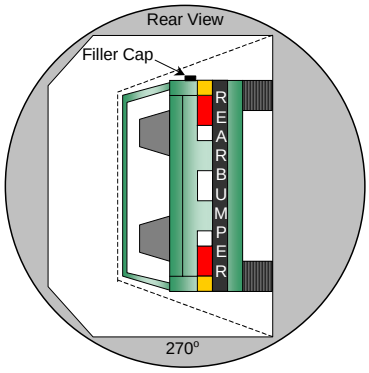


0° to 90°

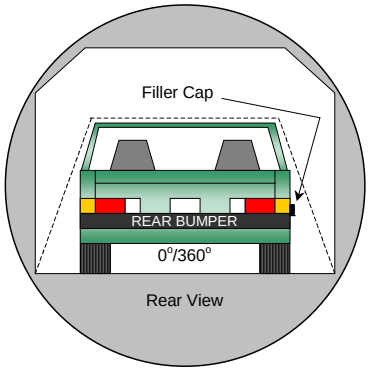


90° to 180°





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

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

SOLVENT COLLECTION TIME TABLE (SECONDS)

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	84	307	391
90° to 180°	81	318	399
180° to 270°	78	315	393
270° to 360°	83	311	394

FMVSS 301 SPILLAGE REQUIREMENT TABLE (OZ)

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

FMVSS 301 SPILLAGE INFORMATION

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
270° to 360°	0	0	0	0

SOLVENT SPILLAGE LOCATION TABLE

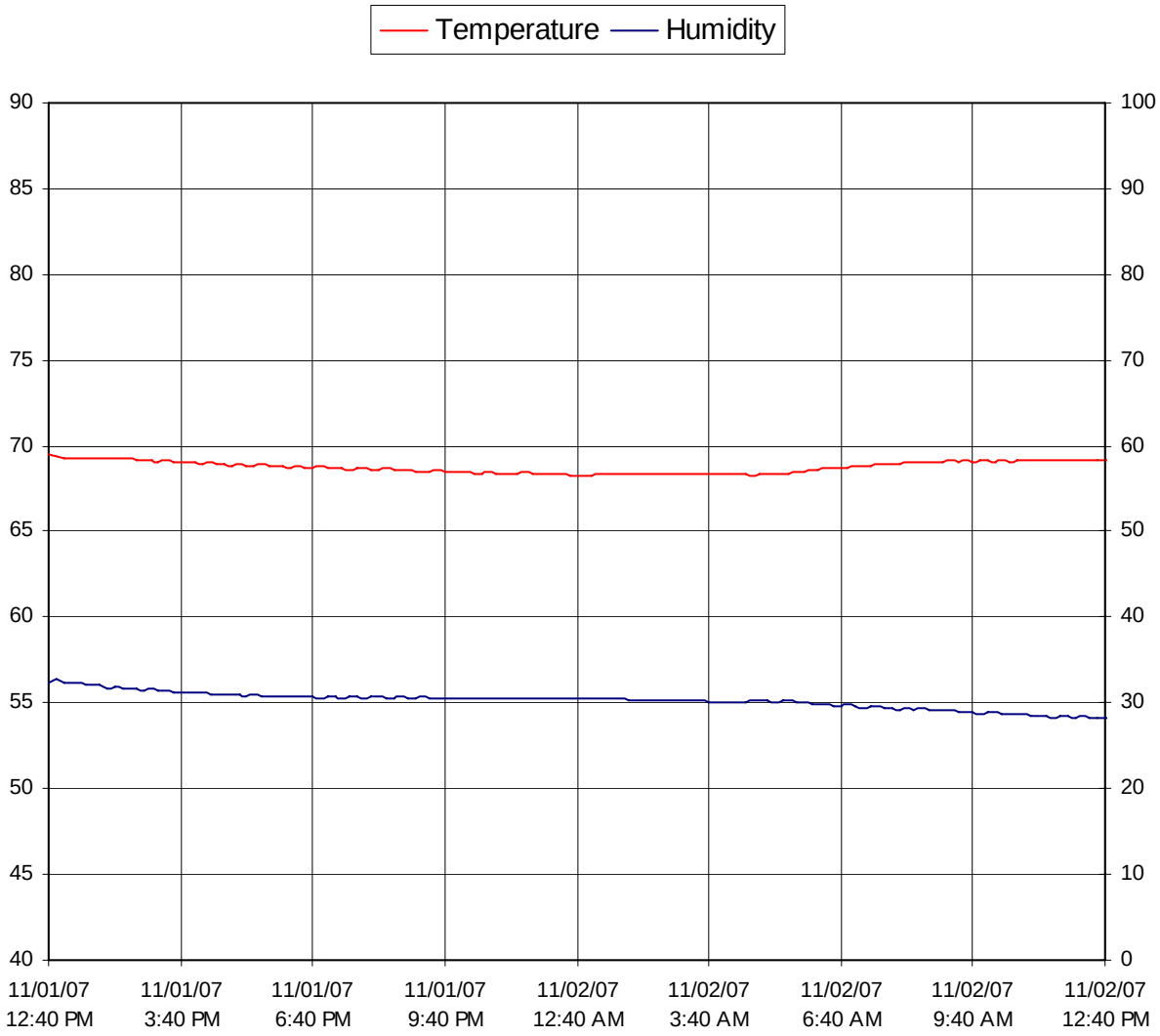
Test Phase	Spillage Location
0° to 90°	n/a
90° to 180°	n/a
180° to 270°	n/a
270° to 360°	n/a

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07



APPENDIX A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

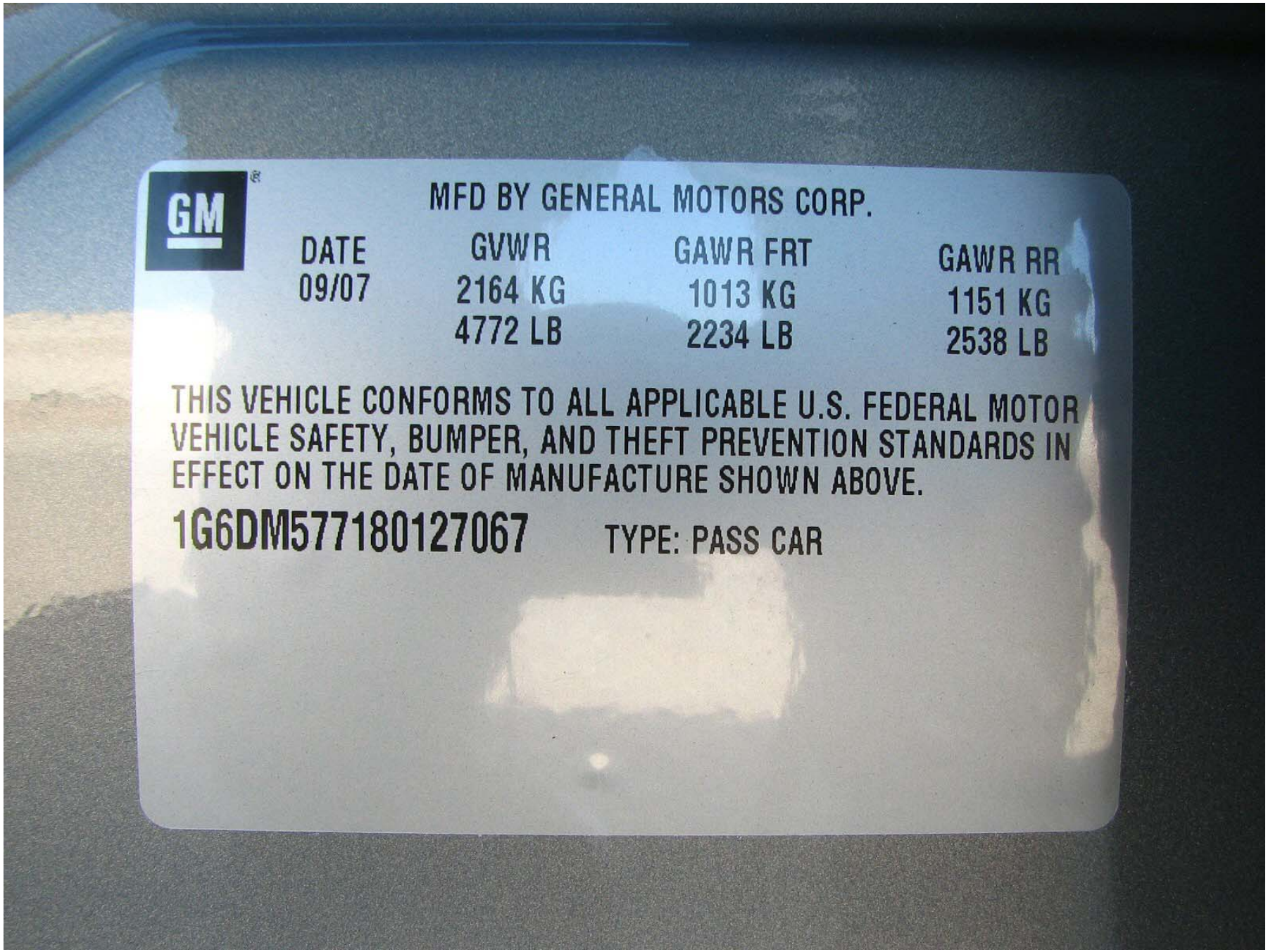


Figure A-1: Right Front ¾ View, as Received

Figure A-2: Left 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

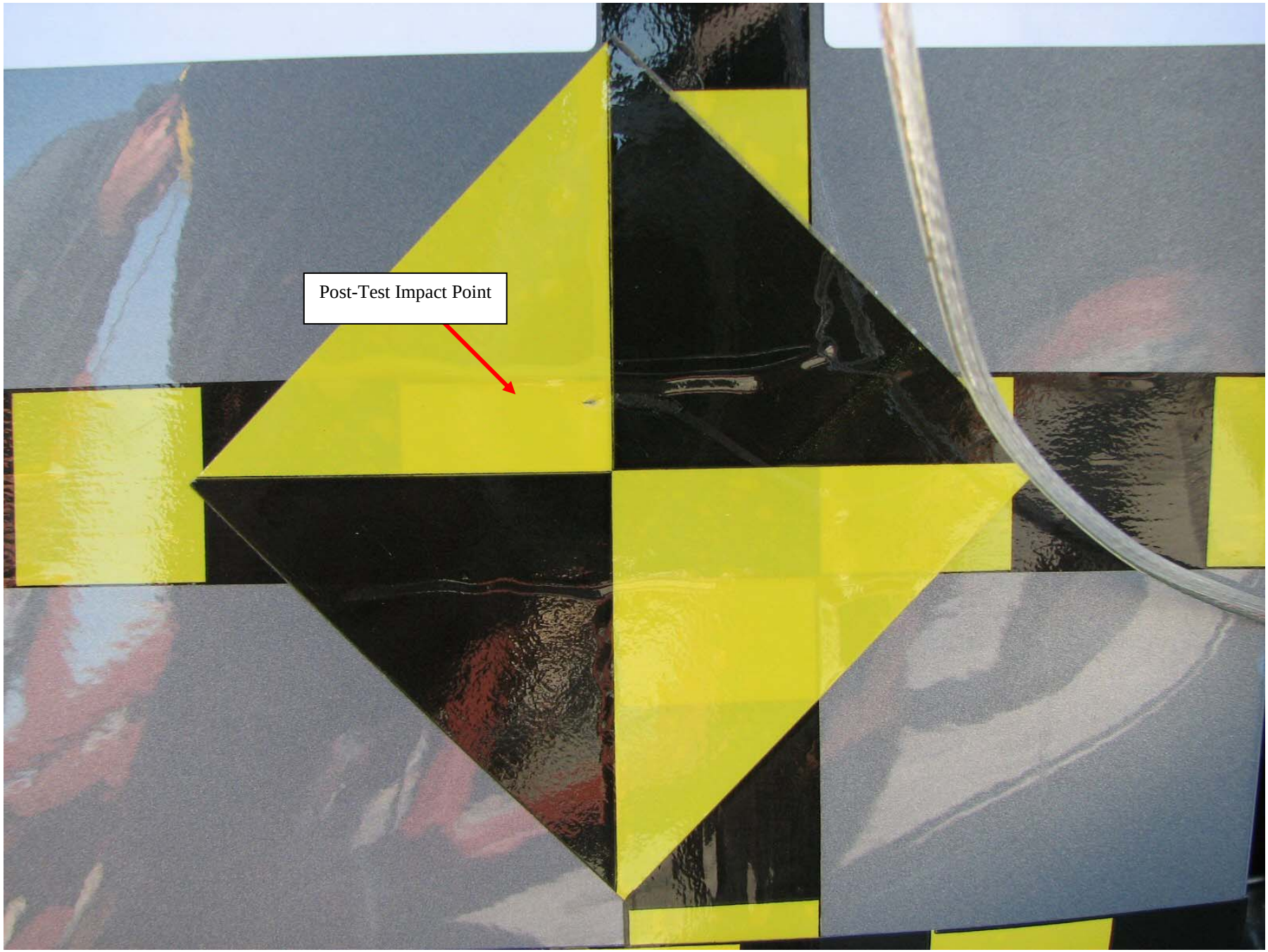


Figure A-26: Post-Test Left Impact Point

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

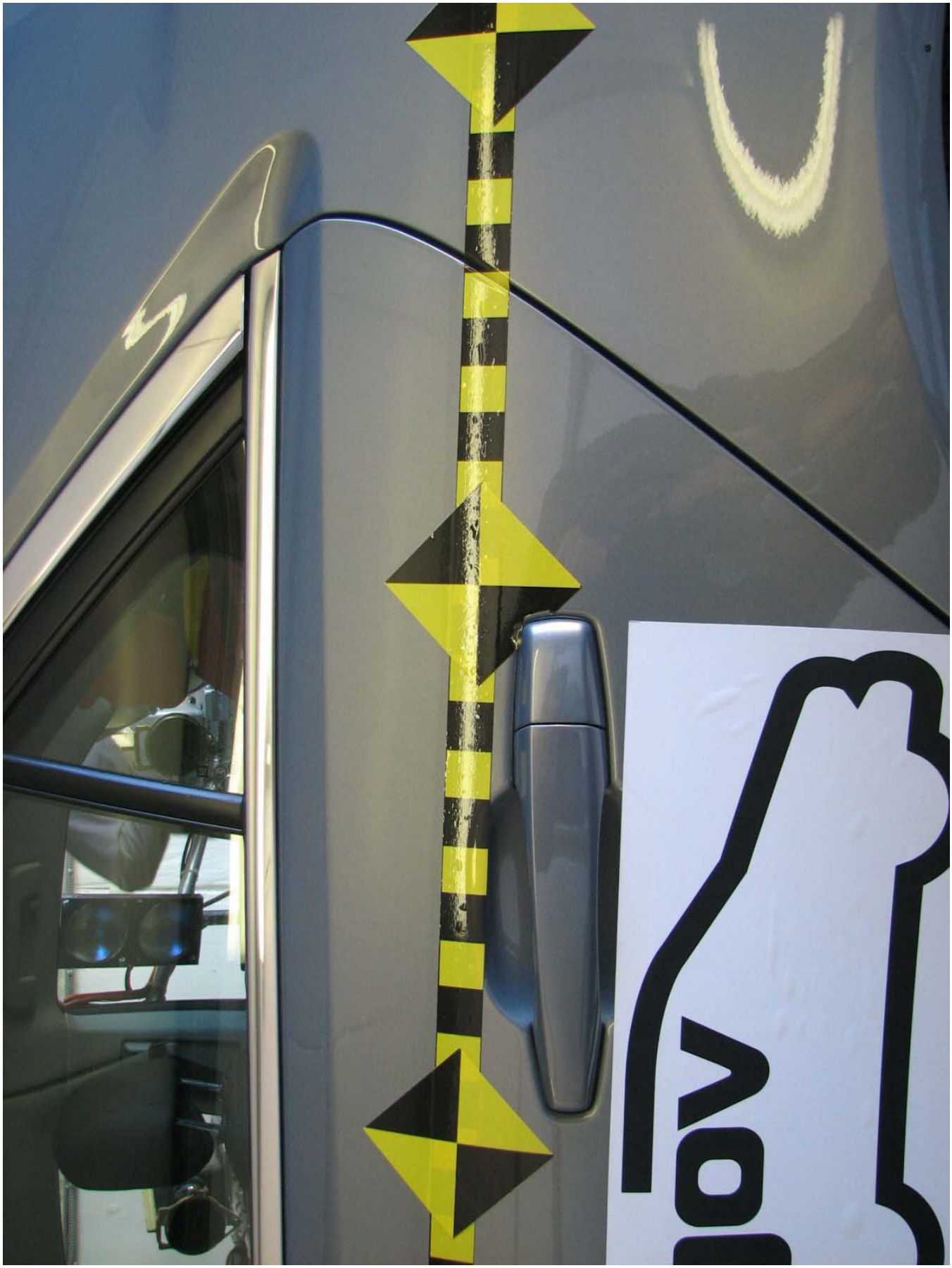


Figure A-33: Pre-Test Left Rear Door

Figure A-34: Post-Test Left Rear Door

Figure A-35: Pre-Test Driver Dummy (Door Open)

This Space Intentionally Left Blank

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)

This Space Intentionally Left Blank

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

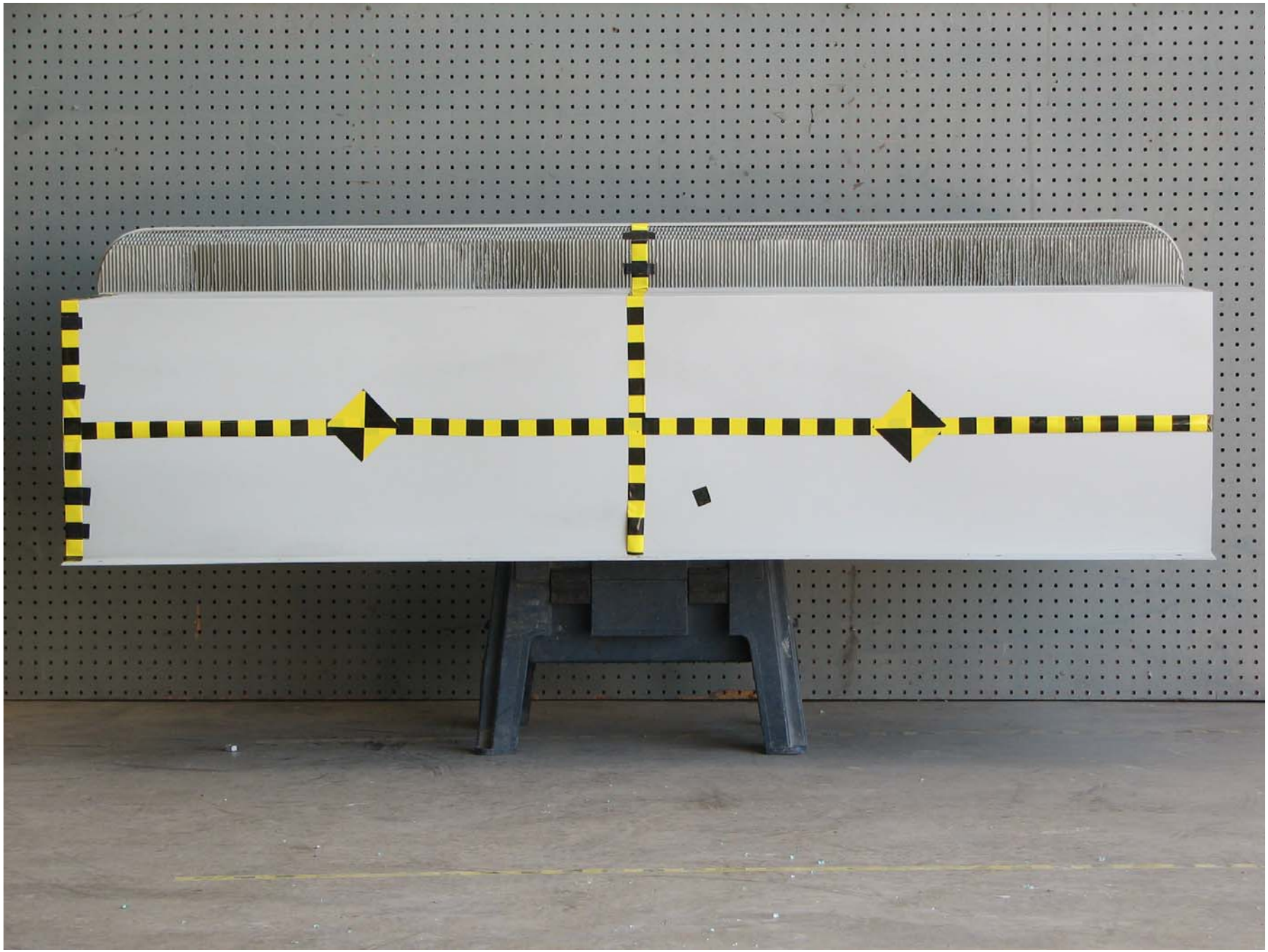


Figure A-55: Pre-Test Top View of Deformable Barrier

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

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

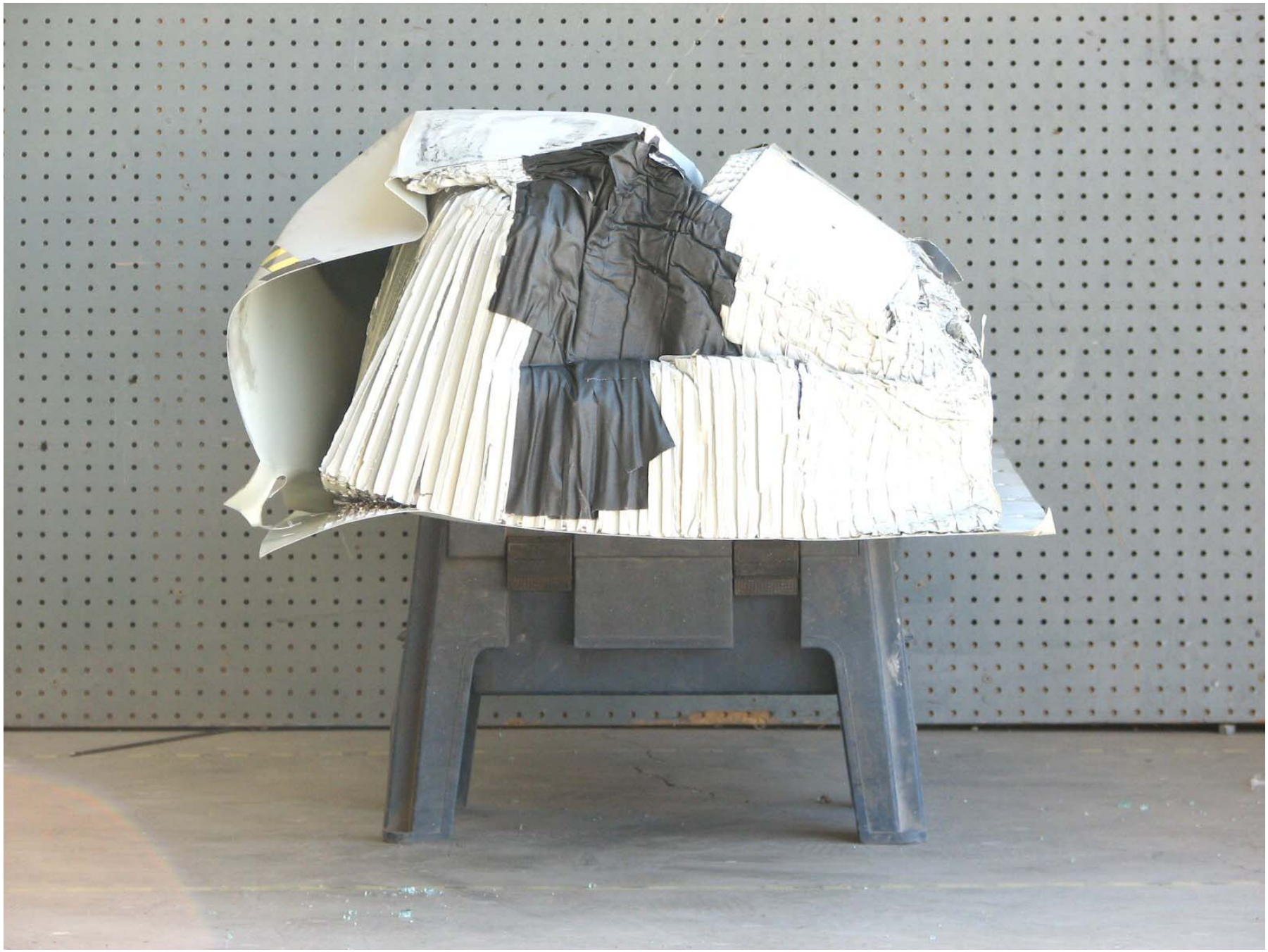


Figure A-58: Post-Test Right Side View of Deformable Barrier

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°)

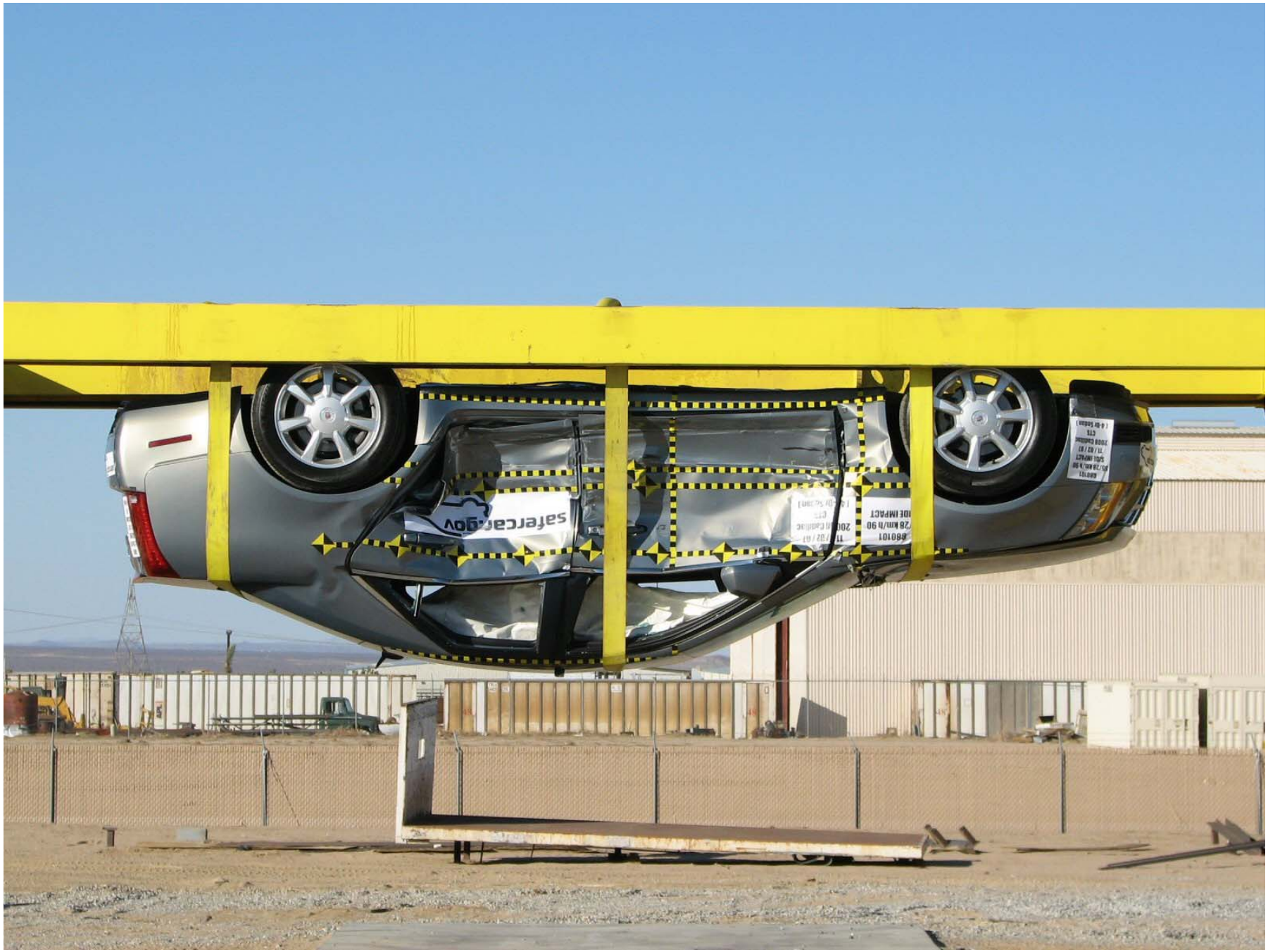


Figure A-63: Vehicle on Rollover Device (180°)

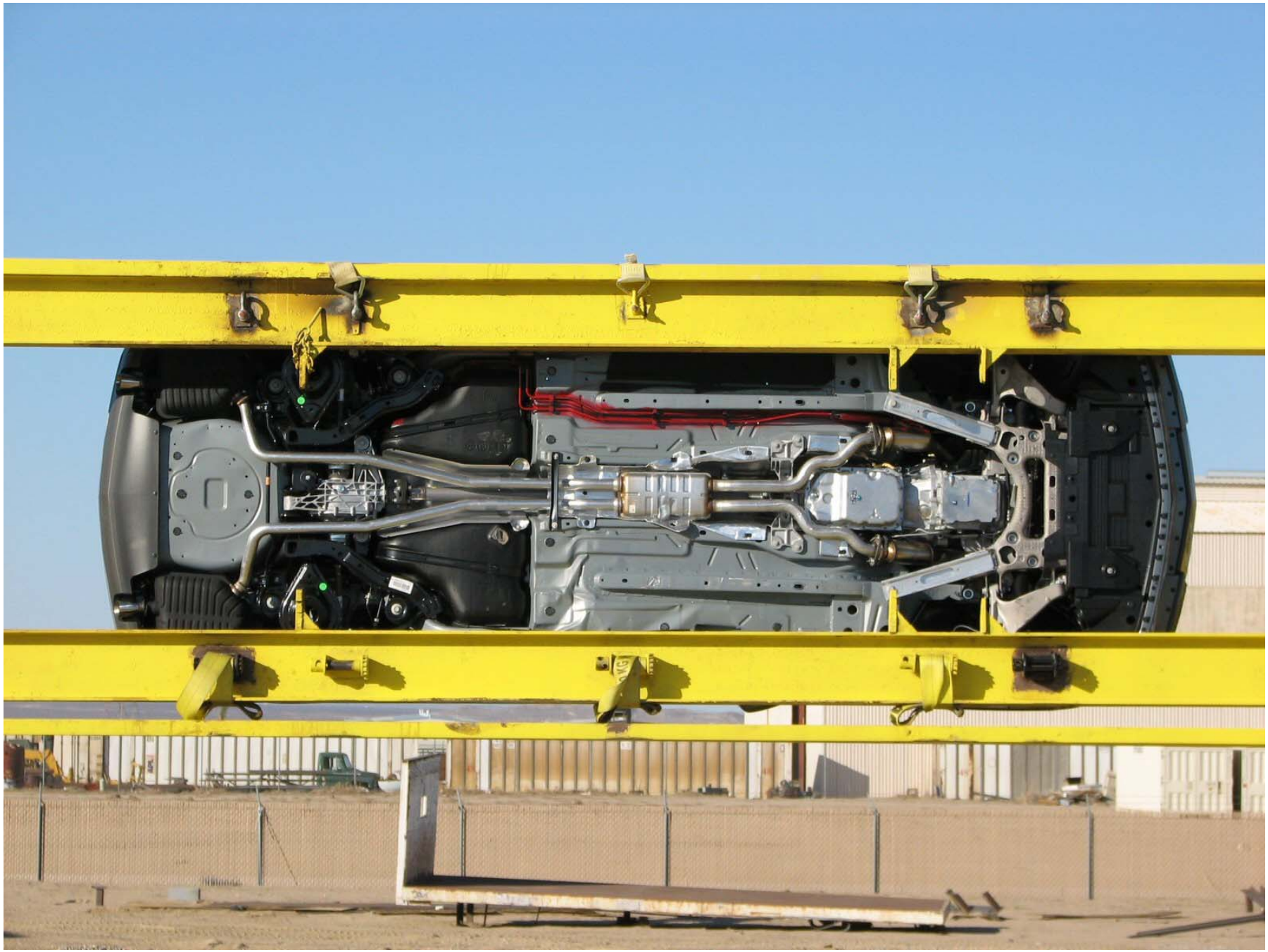


Figure A-64: Vehicle on Rollover Device (270°)

Figure A-65: Vehicle Impact

APPENDIX B

SID/HIII, VEHICLE AND MDB RESPONSE DATA

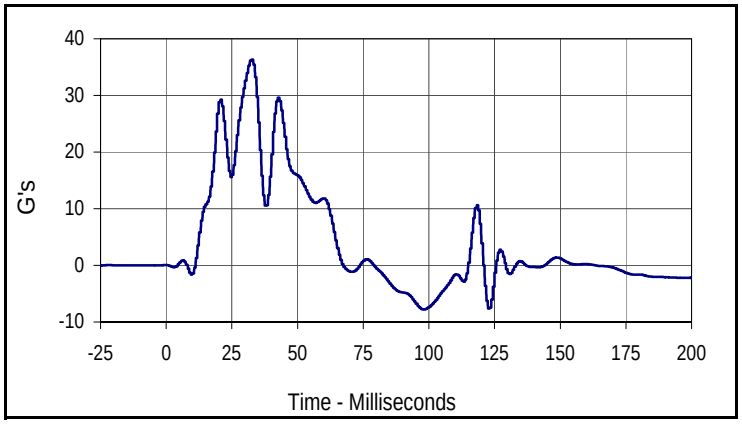
LIST OF DATA PLOTS

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

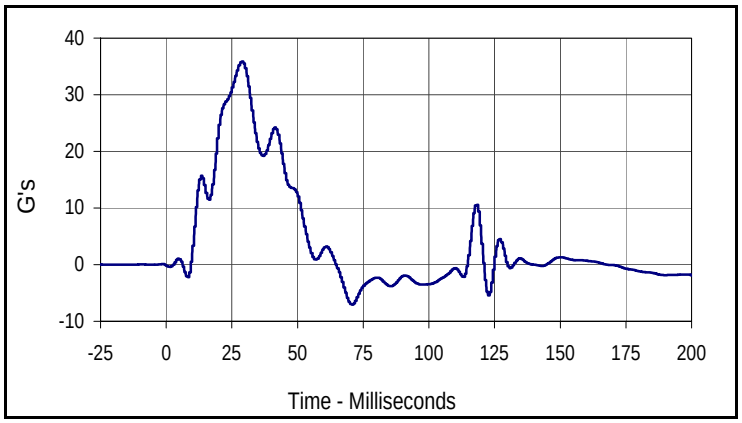
LIST OF DATA PLOTS…(CONTINUED)

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

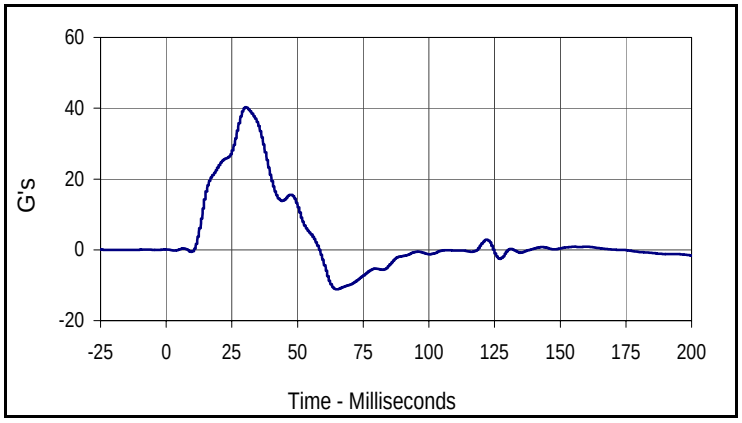
Test Vehicle:	2008 Cadillac CTS 4-Door Sedan	Test Date:	11/2/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	G80101



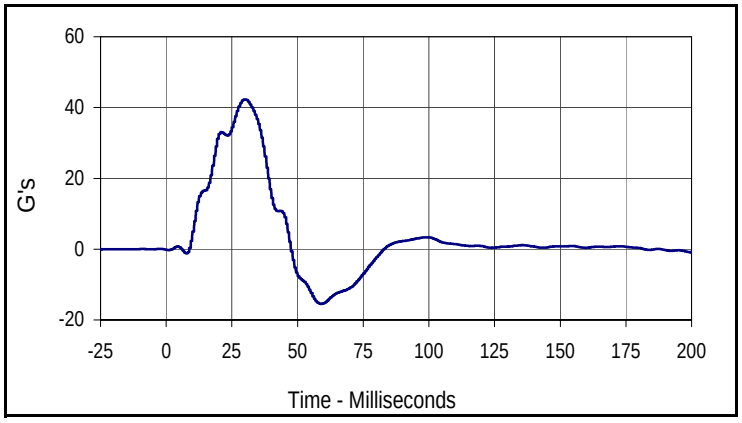
Curve Description			
Driver Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIR	FIR100	G's
Max	Time	Min	Time
36.3	32.5	-7.8	97.5



Curve Description			
Driver Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIR	FIR100	G's
Max	Time	Min	Time
35.9	28.8	-7.0	70.7

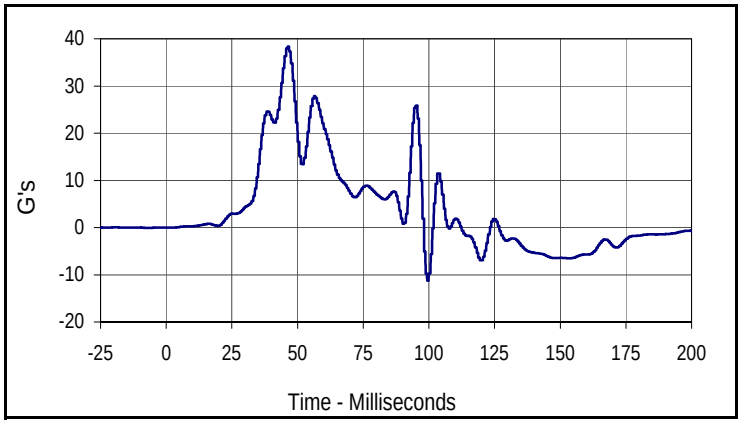


Curve Description			
Driver Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIR	FIR100	G's
Max	Time	Min	Time
40.3	30.0	-11.1	64.4

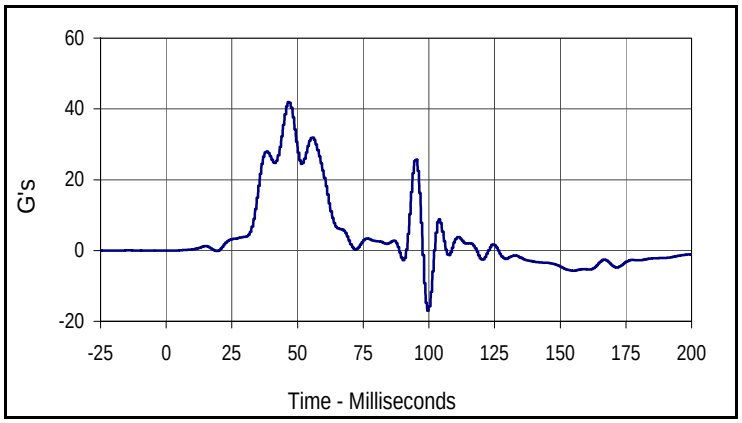


Curve Description			
Driver Pelvis Primary Y			
CURNO	Type	SAE Class	Units
004	FIR	FIR100	G's
Max	Time	Min	Time
42.3	30.0	-15.5	58.8

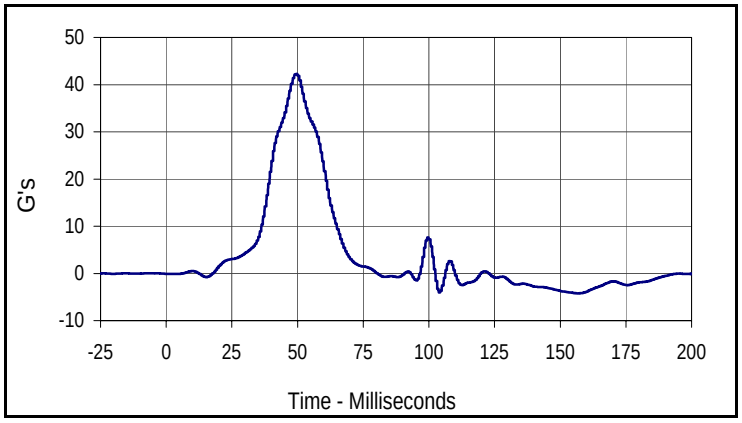
Test Vehicle:	2008 Cadillac CTS 4-Door Sedan	Test Date:	11/2/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	G80101



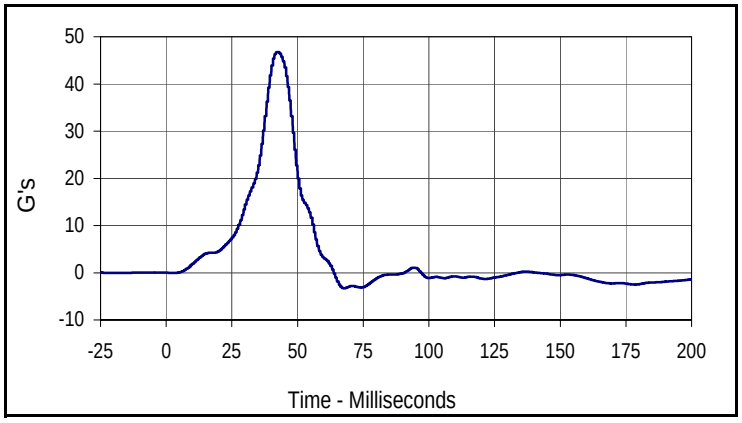
Curve Description			
Passenger Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
005	FIR	FIR100	G's
Max	Time	Min	Time
38.4	46.3	-11.3	99.4



Curve Description			
Passenger Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
006	FIR	FIR100	G's
Max	Time	Min	Time
41.9	46.3	-17.0	99.4



Curve Description			
Passenger Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
007	FIR	FIR100	G's
Max	Time	Min	Time
42.3	49.4	-4.2	156.9



Curve Description			
Passenger Pelvis Y Primary			
CURNO	Type	SAE Class	Units
008	FIR	FIR100	G's
Max	Time	Min	Time
46.7	41.9	-3.3	67.5

APPENDIX C

SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

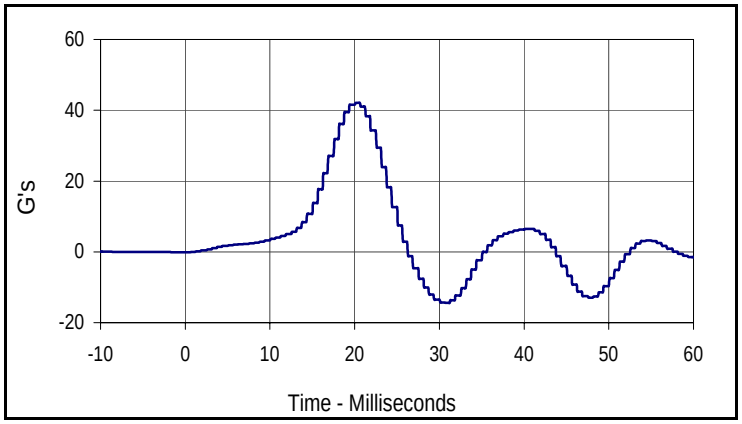
APPENDIX C
PRE-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	SID / HIII External Measurements	Test Date:	10/26/07
ATD Serial No.:	275	Test I.D.:	N/A

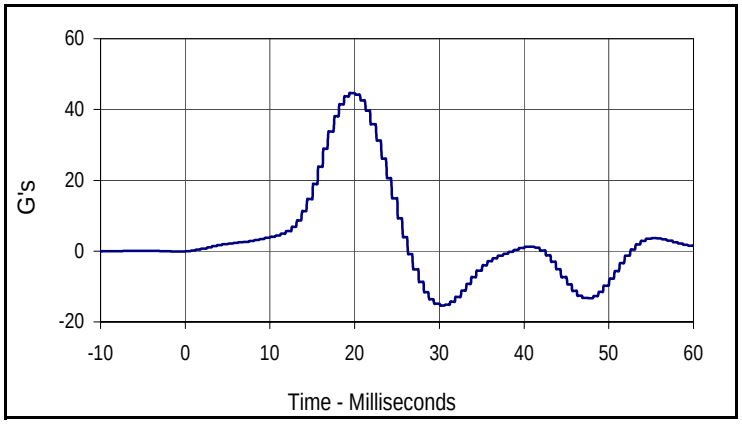
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	900	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	516	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	496	Pass
HW- Hip Width	mm	356 to 391	370	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	10/26/07
ATD Serial No.:	275	Test I.D.:	TH10Z

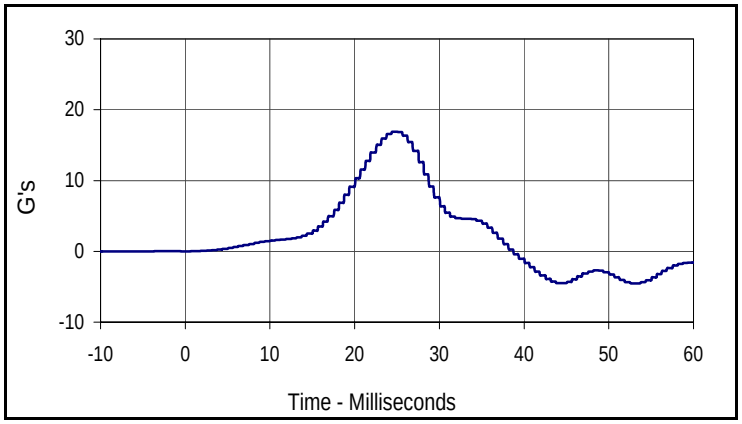
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.32	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	42.1	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	44.6	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	16.9	Pass
		Overall Test Results		Pass



Curve Description			
Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
42.1	20.1	-14.4	30.7



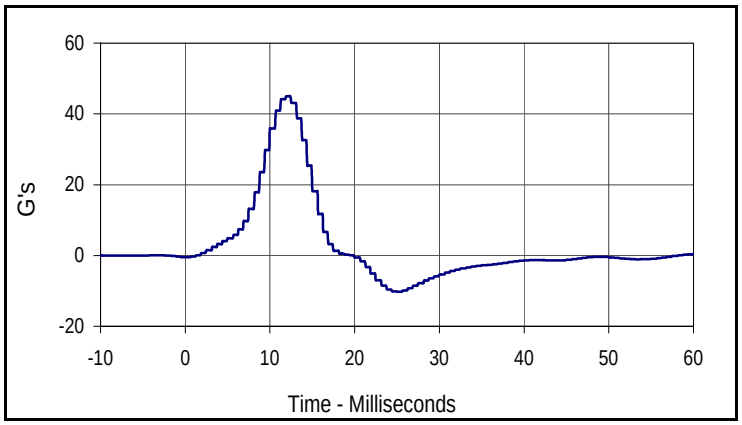
Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
44.6	19.4	-15.4	30.1



Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
16.9	24.4	-4.5	53.2

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	10/26/07
ATD Serial No.:	275	Test I.D.:	PL10Z

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	4.32	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	45.0	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	6.10	Pass
		Overall Test Results		Pass

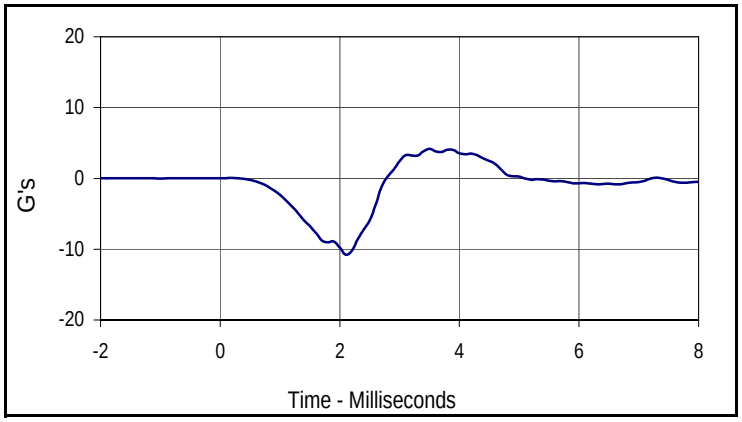


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
45.0	11.9	-10.2	25.0

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	10/26/07
ATD Serial No.:	275	Test I.D.:	HD10Z

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	140.4	Pass
Peak Longitudinal Acceleration	G's	≤15.0	10.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	2.7	Pass
		Overall Test Results		Pass

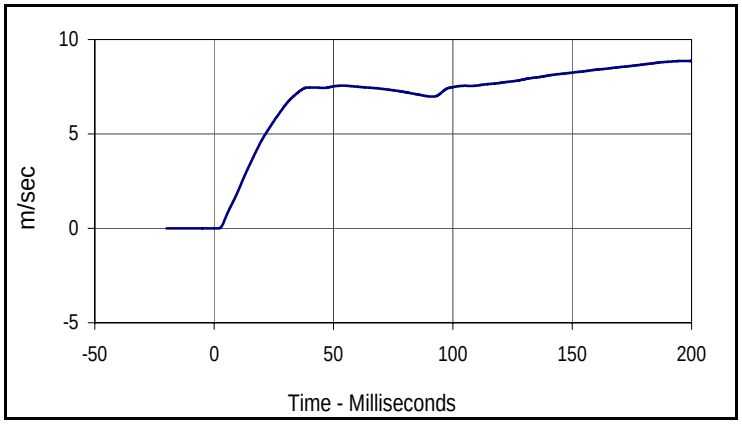
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
140.4	2.2	0.4	-2.0



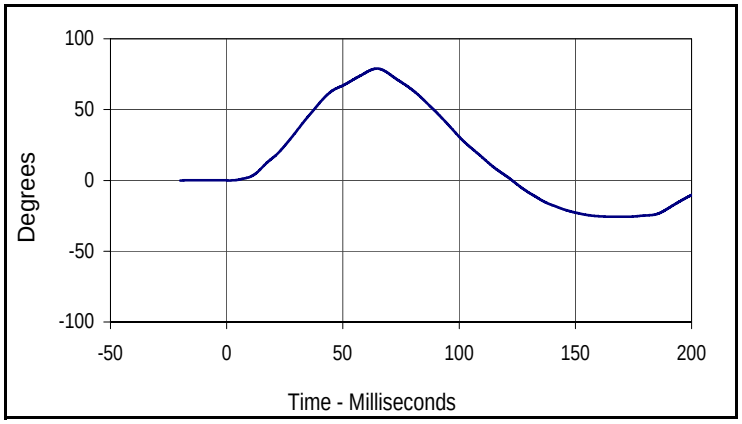
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.2	3.5	-10.8	2.1

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	10/26/07
ATD Serial No.:	275	Test I.D.:	NB10Z

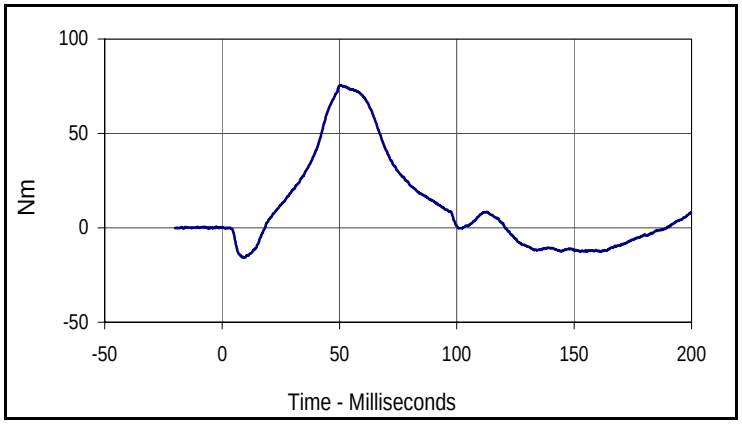
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.09	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	1.97	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.68	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.56	Pass
	40 to 70	m/sec	6.27 to 7.64	7.56	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	79.0	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	13.8	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	58.2	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	75.6	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	49.8	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
8.9	200.0	0.0	1.7



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
79.0	64.6	-25.6	165.7



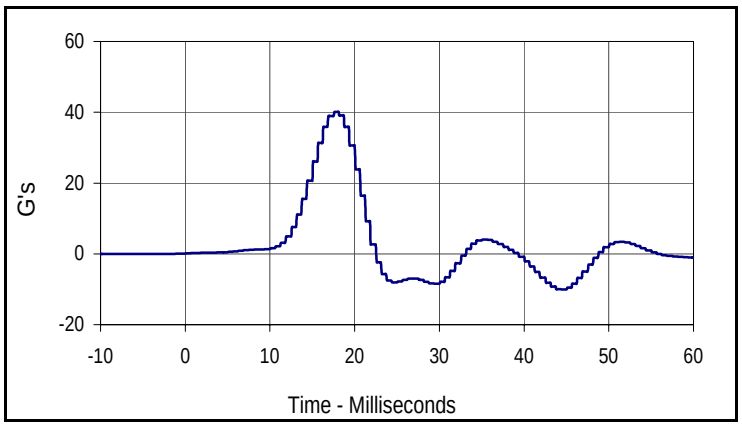
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
75.6	50.8	-15.8	9.7

Test Program:	SID / HIII External Measurements	Test Date:	10/26/07
ATD Serial No.:	274	Test I.D.:	N/A

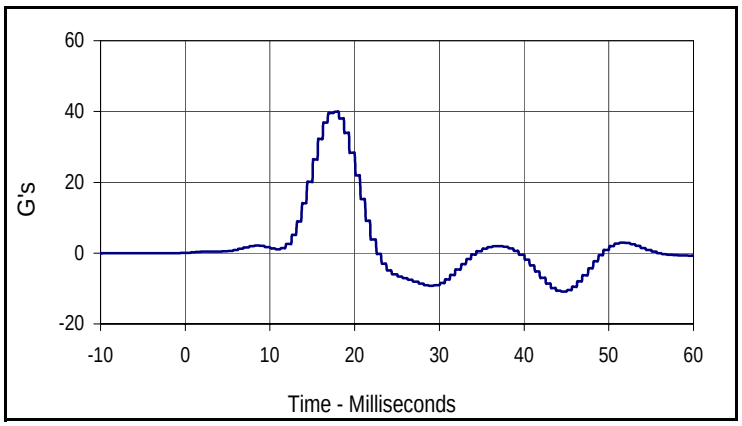
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	894	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	516	Pass
KH- Knee Pivot From Back 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	367	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	10/26/07
ATD Serial No.:	274	Test I.D.:	TH10V

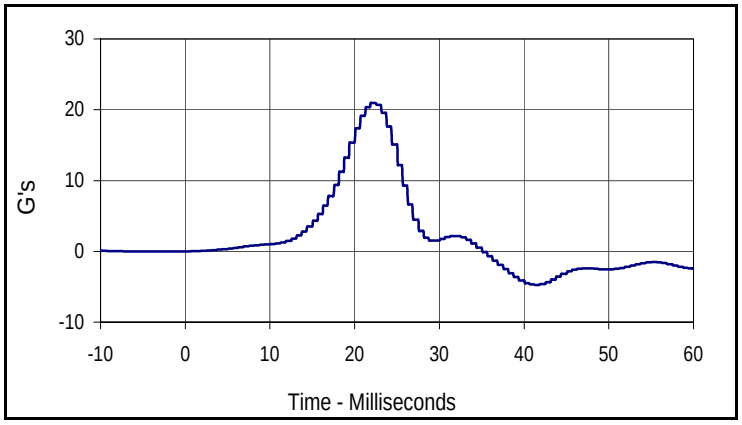
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.33	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	40.1	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	40.0	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	21.0	Pass
		Overall Test Results		Pass



Curve Description			
Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
40.1	17.6	-10.0	44.4



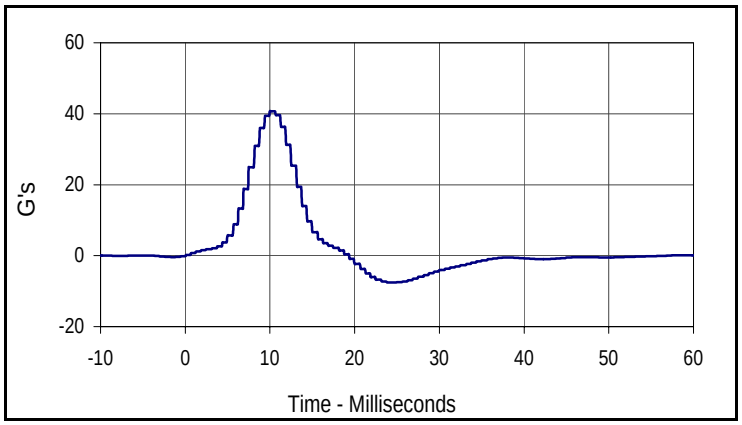
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
40.0	17.6	-10.8	44.4



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
21.0	21.9	-4.7	41.3

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	10/26/07
ATD Serial No.:	274	Test I.D.:	PL10V

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	4.32	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	40.7	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
		Overall Test Results		Pass

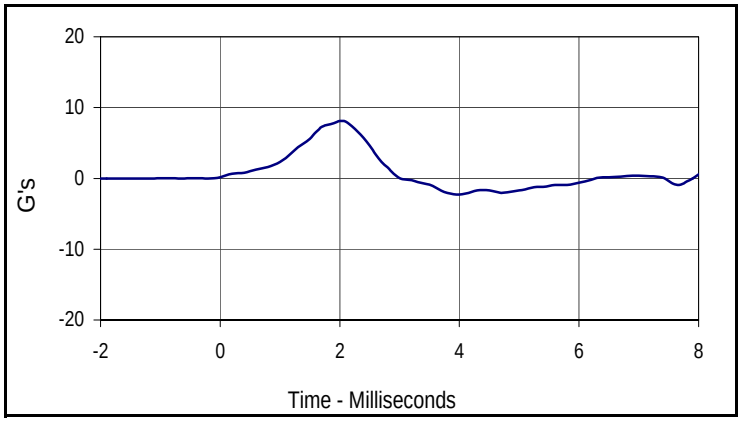


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
40.7	10.0	-7.6	24.4

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	10/26/07
ATD Serial No.:	274	Test I.D.:	HD10V

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	143.5	Pass
Peak Longitudinal Acceleration	G's	≤15.0	8.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	1.5	Pass
		Overall Test Results		Pass

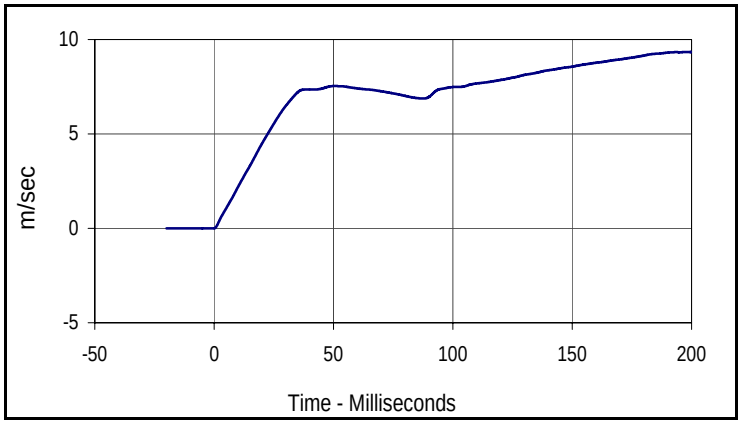
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
143.5	2.1	0.0	-0.8



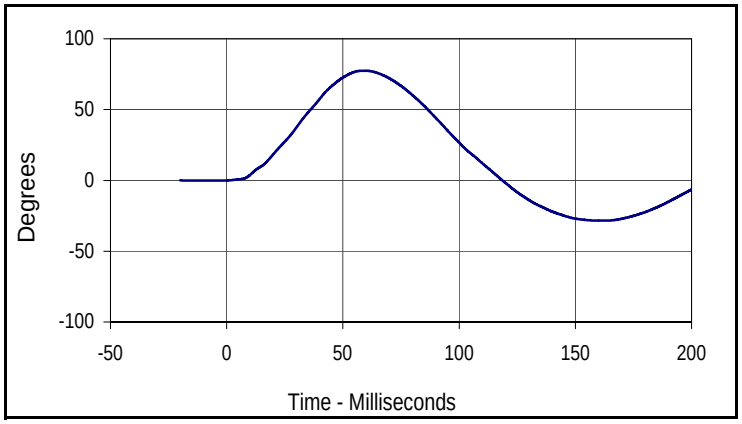
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
8.1	2.0	-2.3	4.0

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	10/26/07
ATD Serial No.:	274	Test I.D.:	NB10V

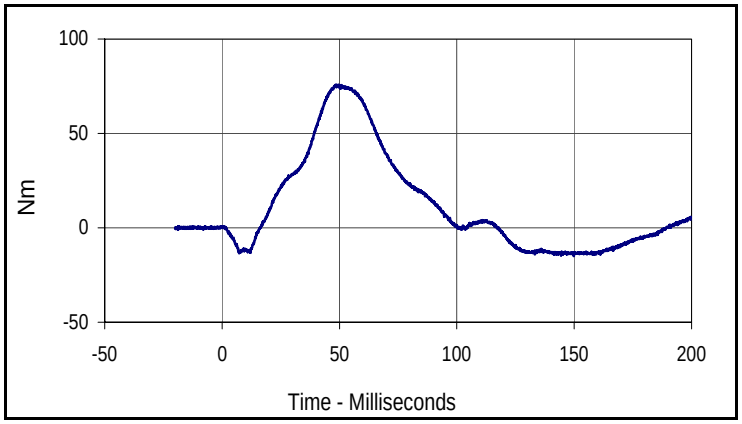
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.20	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.48	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.49	Pass
	40 to 70	m/sec	6.27 to 7.64	7.54	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	77.5	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	9.4	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	59.4	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	75.8	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	50.4	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
9.3	198.8	0.0	-0.5



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
77.5	59.2	-28.4	161.2



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
75.8	49.8	-14.9	149.8

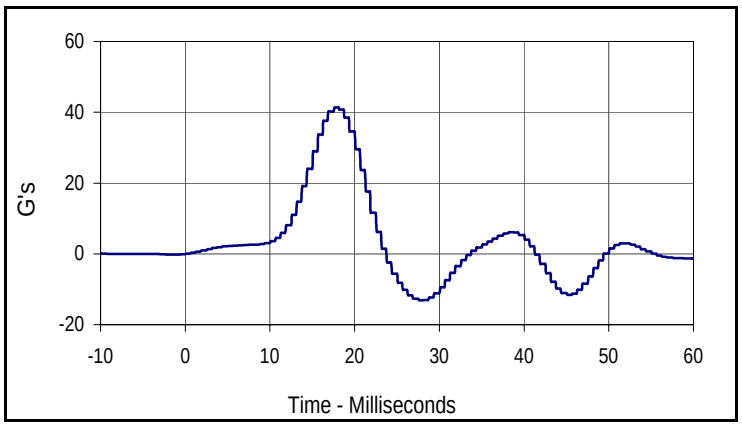
APPENDIX C
POST-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	SID / HIII External Measurements	Test Date:	11/5/07
ATD Serial No.:	275	Test I.D.:	N/A

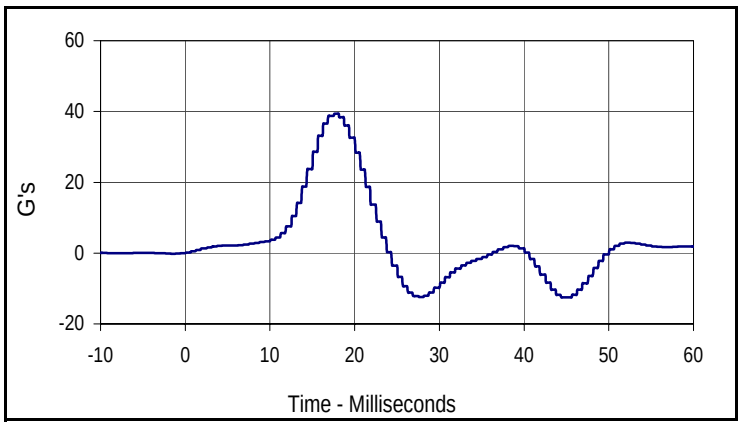
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	900	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	519	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	500	Pass
HW- Hip Width	mm	356 to 391	370	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	11/5/07
ATD Serial No.:	275	Test I.D.:	TH11A

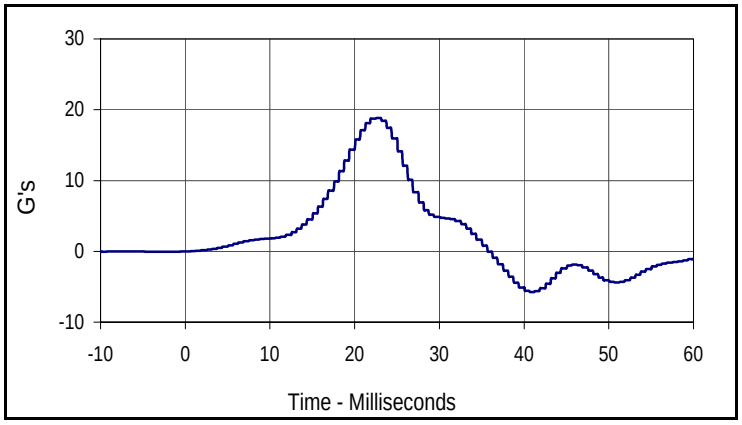
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.31	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	41.4	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	39.3	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	18.9	Pass
		Overall Test Results		Pass



Curve Description			
Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
41.4	17.6	-13.1	27.6



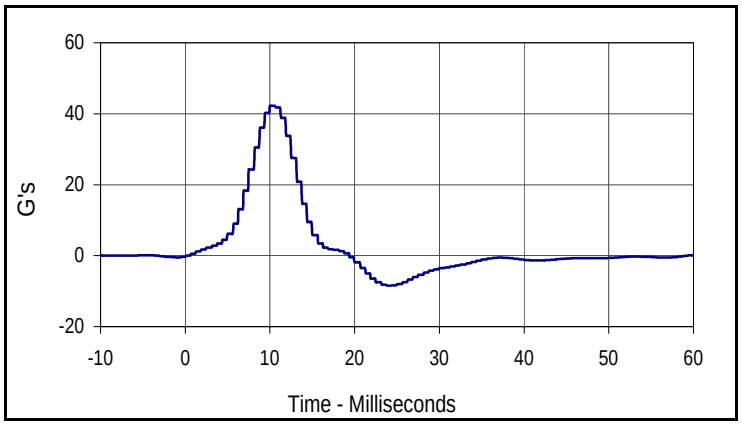
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
39.3	17.6	-12.5	44.4



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
18.9	22.6	-5.8	40.7

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	11/5/07
ATD Serial No.:	275	Test I.D.:	PL11A

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	4.30	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	4.90	Pass
		Overall Test Results		Pass

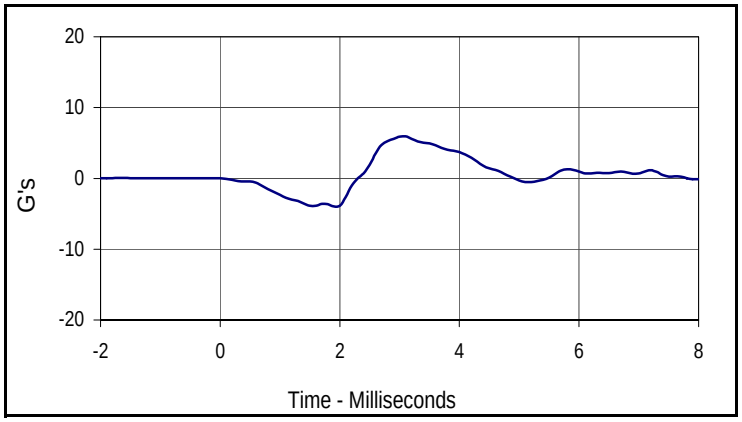


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
42.2	10.0	-8.4	23.8

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	11/5/07
ATD Serial No.:	275	Test I.D.:	HD11A

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	144.2	Pass
Peak Longitudinal Acceleration	G's	≤15.0	5.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	2.5	Pass
		Overall Test Results		Pass

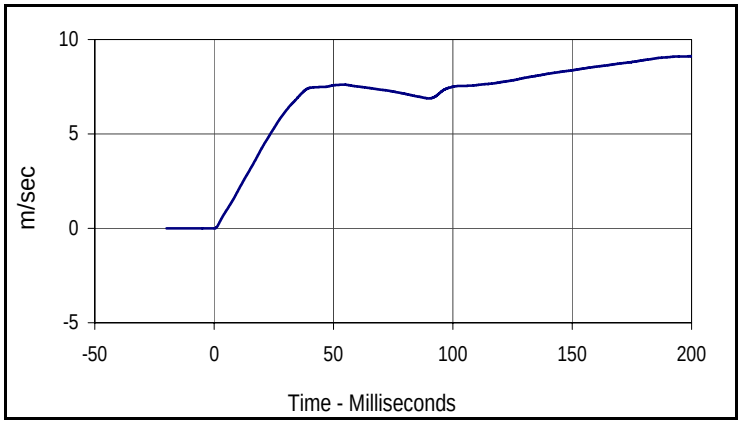
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
144.2	2.1	0.3	0.0



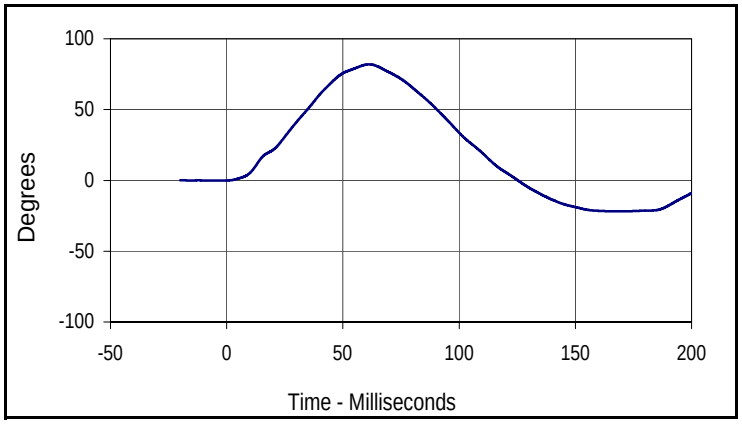
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.9	3.1	-4.0	1.9

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	11/5/07
ATD Serial No.:	275	Test I.D.:	NB11A

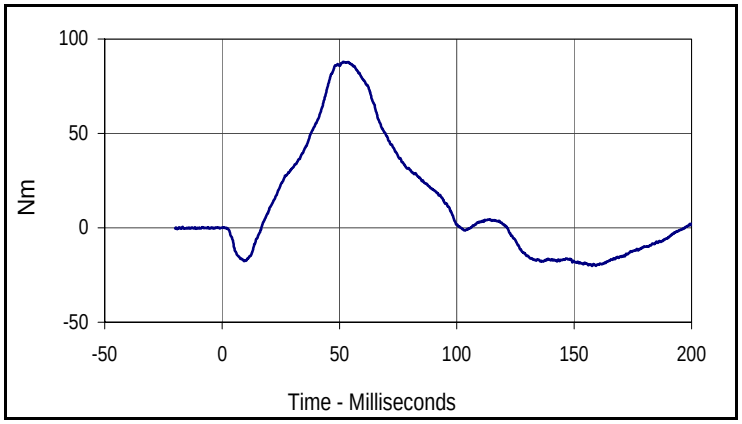
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.08	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.00	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.25	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.21	Pass
	40 to 70	m/sec	6.27 to 7.64	7.61	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	81.9	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	9.7	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	64.0	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	87.9	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	50.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
9.1	200.0	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
81.9	61.3	-21.8	167.2



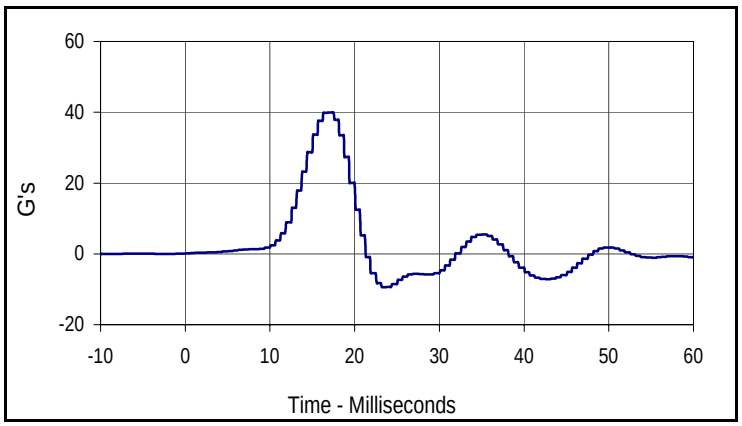
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
87.9	51.6	-20.1	157.6

Test Program:	SID / HIII External Measurements	Test Date:	11/5/07
ATD Serial No.:	274	Test I.D.:	N/A

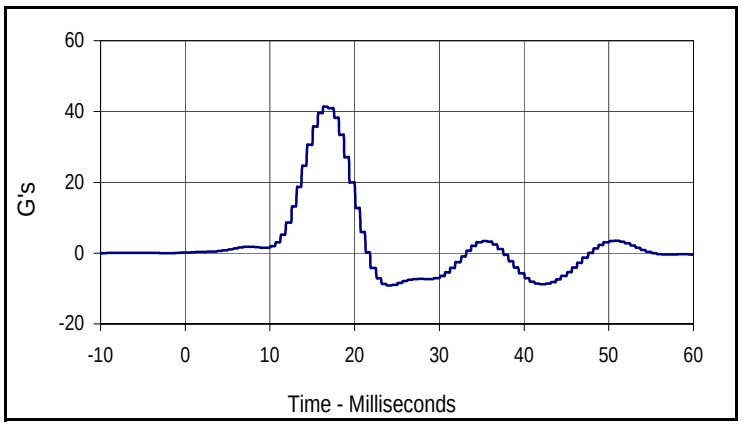
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	895	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	514	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	518	Pass
KV- Knee Pivot From Floor	mm	490 to 505	499	Pass
HW- Hip Width	mm	356 to 391	370	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	11/5/07
ATD Serial No.:	274	Test I.D.:	TH11B

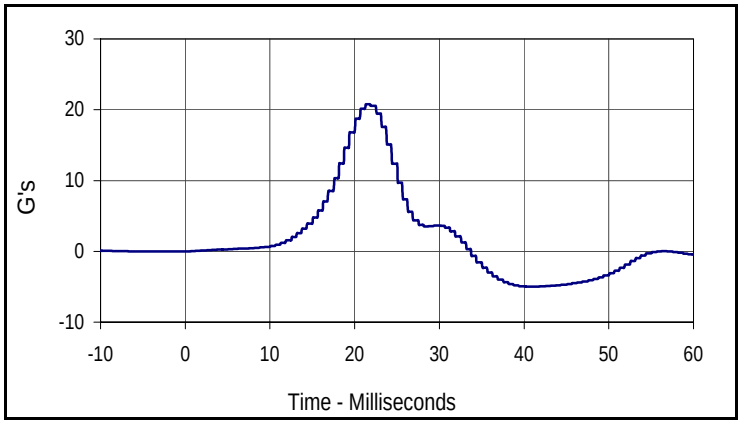
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.30	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	40.0	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	41.3	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.8	Pass
		Overall Test Results		Pass



Curve Description			
Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
40.0	16.9	-9.4	23.2



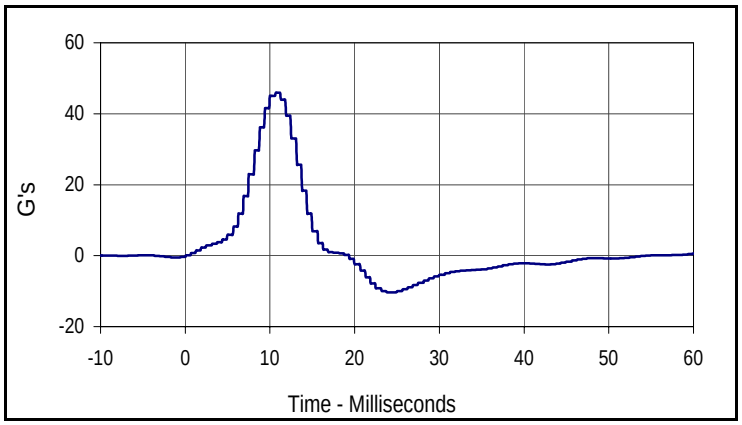
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
41.3	16.3	-9.2	23.8



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
20.8	21.3	-5.0	40.7

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	11/5/07
ATD Serial No.:	274	Test I.D.:	PL11B

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	4.32	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	45.9	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
		Overall Test Results		Pass

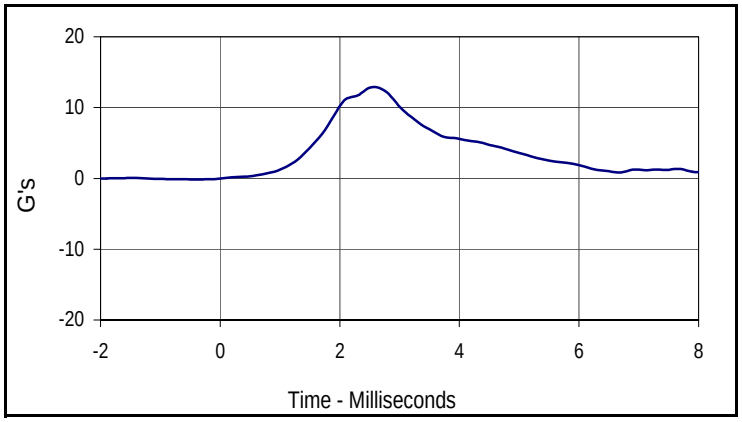


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
45.9	10.7	-10.4	23.8

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	11/5/07
ATD Serial No.:	274	Test I.D.:	HD11B

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	140.3	Pass
Peak Longitudinal Acceleration	G's	≤15.0	12.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	4.3	Pass
		Overall Test Results		Pass

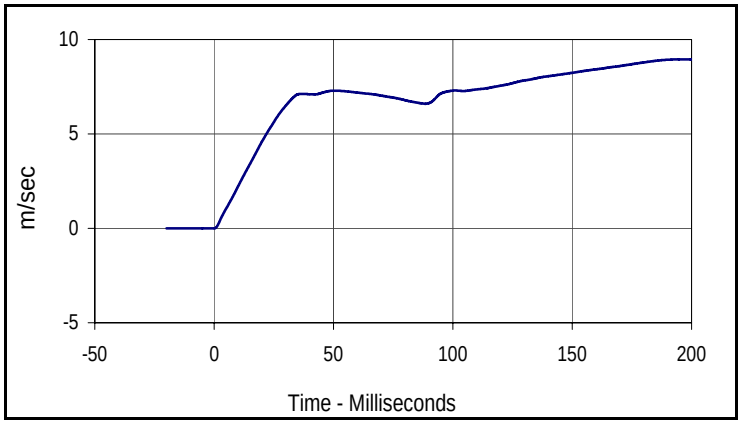
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
140.3	2.4	0.1	-1.3



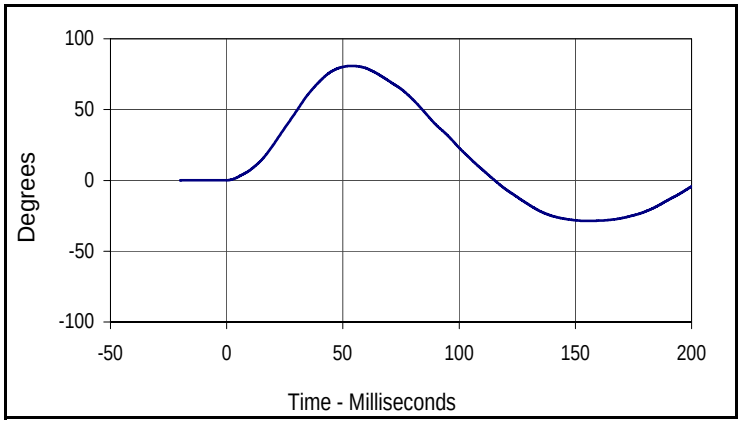
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
12.9	2.6	-0.2	-0.4

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	11/5/07
ATD Serial No.:	274	Test I.D.:	NB11B

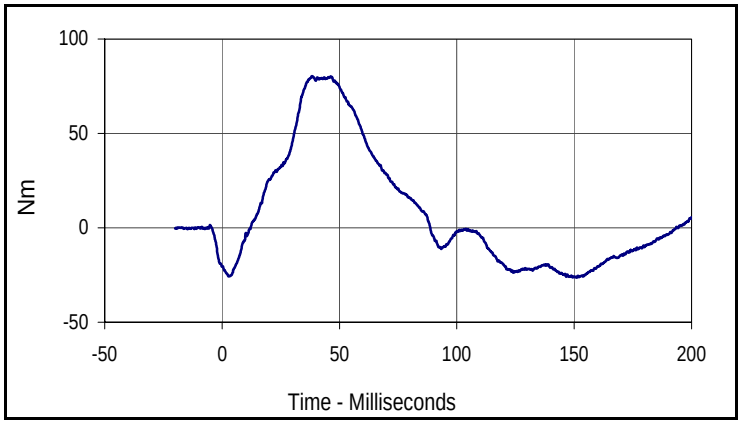
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.22	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.59	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.50	Pass
	40 to 70	m/sec	6.27 to 7.64	7.29	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	80.9	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.5	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	61.6	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	80.4	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	50.4	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
9.0	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
80.9	53.8	-28.7	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
80.4	38.3	-26.4	151.0

APPENDIX D

CHILD RESTRAINT SYSTEM

REPORT NUMBER TR-P27209-01-NC

NEW CAR ASSESMENT PROGRAM
SIDE IMPACT TEST

GENERAL MOTORS CORP.
2008 CADILLAC CTS
4-DOOR SEDAN

NHTSA NUMBER: G80101

Prepared By:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301

NOVEMBER 2, 2007

FINAL REPORT

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

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Prepared by:  Date: November 2, 2007

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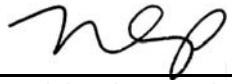
Reviewed by:  Date: November 2, 2007

Mr. Michael L. Dunlap, Director of Operations
KARCO Engineering, LLC

Approved by:  Date: November 2, 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-P27209-01		

4. Title and Subtitle	5. Report Date
Final report of a Graco Snugride CRS. NHTSA No. G80101	November 2, 2007
	6. Performing Organization Code KAR

7. Authors	8. Performing Organization Report No.
Mr. Kelsey A. Chiu, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO	TR-P27209-01

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 NVS-111 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C 20590	Final Test Report
	14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS

15. Supplementary Notes

16. Abstract

A side impact test was conducted on the subject CRS Graco Snugride in conjunction with side impact NCAP testing on a 2008 Cadillac CTS 4-Door Sedan, and in accordance with the specifications of the Office of Crahsworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at KARCO Engineering, LLC, on November 2, 2007.

Measurement Description	Units	Threshold	Right Rear (P3)
Head Injury Criteria (HIC 15)	N/A	390	30.9
3 msec. Chest Clip	G's	50	18.2

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) Final report of a Graco Snugride CRS	Copies of this report are available from: National Highway Traffic Safety Admin. NHTSA Technical Reference Division 1200 New Jersey Ave., SE, Room W43-410 Washington, DC 20590

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	43	

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

SECTION D-1

PURPOSE AND SUMMARY OF TEST G80101

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 tethers.

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	HIC 15 Value	3 msec. Chest Clip
CRABI (P3)	30.9	18.2

DATA SHEET NO. 1

CRASH TEST SUMMARY

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

CHILD RESTRAINT INFORMATION

Description	Position #3 CRS
Manufacturer	Graco
Model Name	Snugride
Model No.	8645THR3
Type	Infant
Forward/Rearward	Rearward

VISIBLE DUMMY CONTACT POINTS

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

POST-TEST DOOR OPENINGS

Description	Position #3 CRS
Right Rear Door	Remained closed and latched, operational

CAMERAS

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

VEHICLE PARAMETER DATA

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	469	415	884	513	513	1026
Right	kg	449	413	862	458	481	939
Ratio	%	52.6	47.4	100.0	49.4	50.6	100.0
Total	kg	918	828	1746	971	994	1965

TARGET TEST WEIGHT CALCULATION

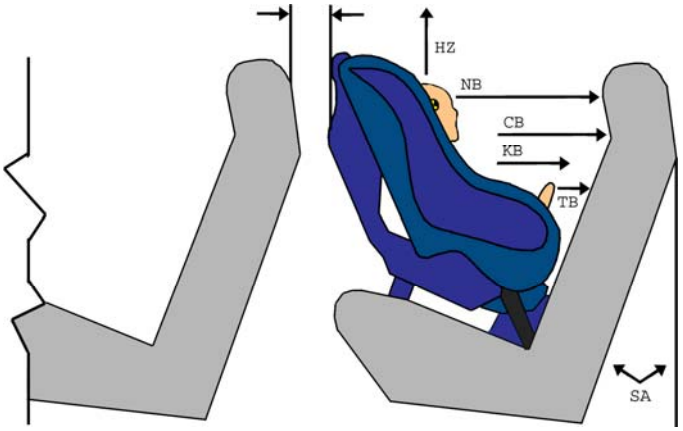
Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1746
Weight of 2 P572 ATDs	kg	162
Rated Cargo/Luggage Wt (RCLW)	kg	64
Calculated Vehicle Target Wt (TVTW)	kg	1972

DATA SHEET NO. 3

CRABI POSITIONING IN VEHICLE

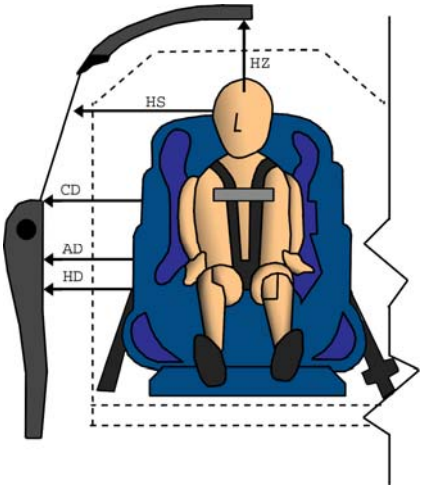
Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

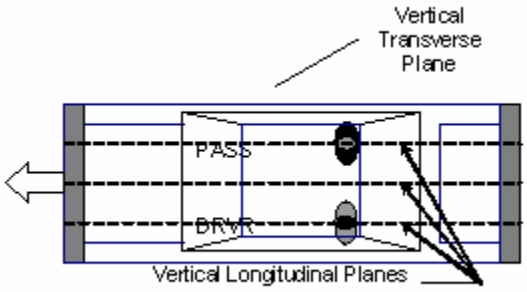
Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07



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…(CONTINUED)

CRABI POSITIONING IN VEHICLE

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

CRABI POSITION MEASUREMENTS

Code	Measurement	P3 (Passenger's Side)	
		Length (mm)	Angle (°)
SA	Seatback Angle		21.0
HZ	Head to Roof (Z)	421	
CD	Chest to Door	372	
KK	Knee to Knee (Y)	120	
HS	Head to Side Window	380	
HD	H-Point to Door (Y)	310	
AD	Arm to Door	269	
NB	Nose to Seatback	588	
CB	Chest to Seatback	479	
FF	Foot to Foot	118	
KB-Left	Knee to Seatback	228	
KB-Right	Knee to Seatback	230	
TB-Left	Toe to Seatback	83	
TB-Right	Toe to Seatback	86	

DATA SHEET NO. 4

CRS PERFORMANCE DATA

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

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	No	None
Lower Anchor Buckle	No	None
Lower Anchor Hooks	No	None
Veh. Lower CRS Anchors	No	None
5-Point Harness Connections	No	None
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. 5

CRS ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

CRS ACCELEROMETER PRE-TEST LOCATIONS

Loc No.	Accelerometer Location	Measurements		
		X	Y	Z
1	CRS	1910	520	840
2	CRS Base	1885	585	685

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: 2008 Cadillac CTS 4-Door Sedan NHTSA No.: G80101

Test Program: 55/28 km/h Side Impact NCAP Test Date: 11/02/07

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Angle (°)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Passenger CRS (O.B.)	875	2391	-1227	-2	n/a	10	1000

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

SECTION D2

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

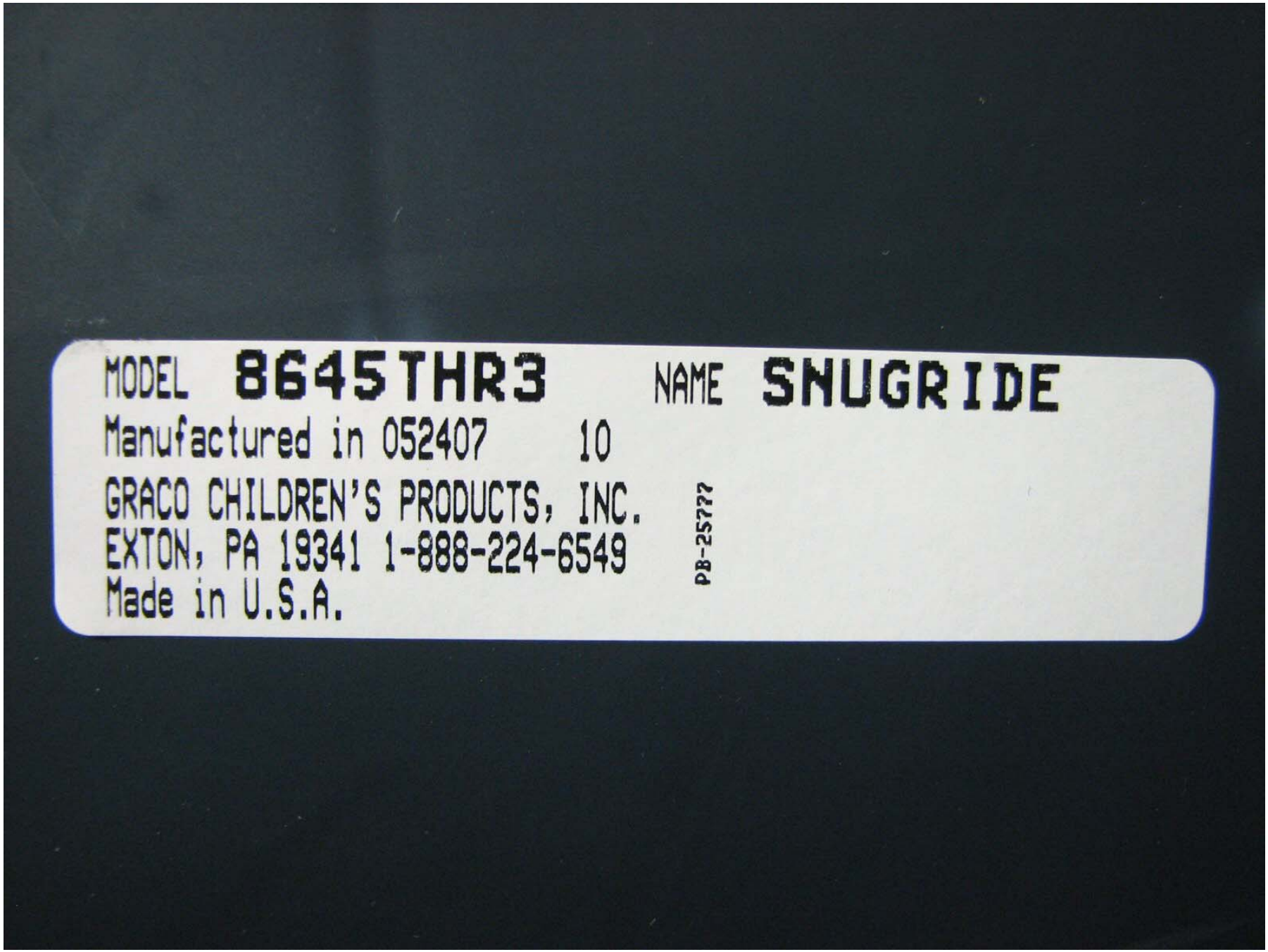


Figure D2-1: Position 3 CRS Label

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 Seat Belt Position)

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

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

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

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

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

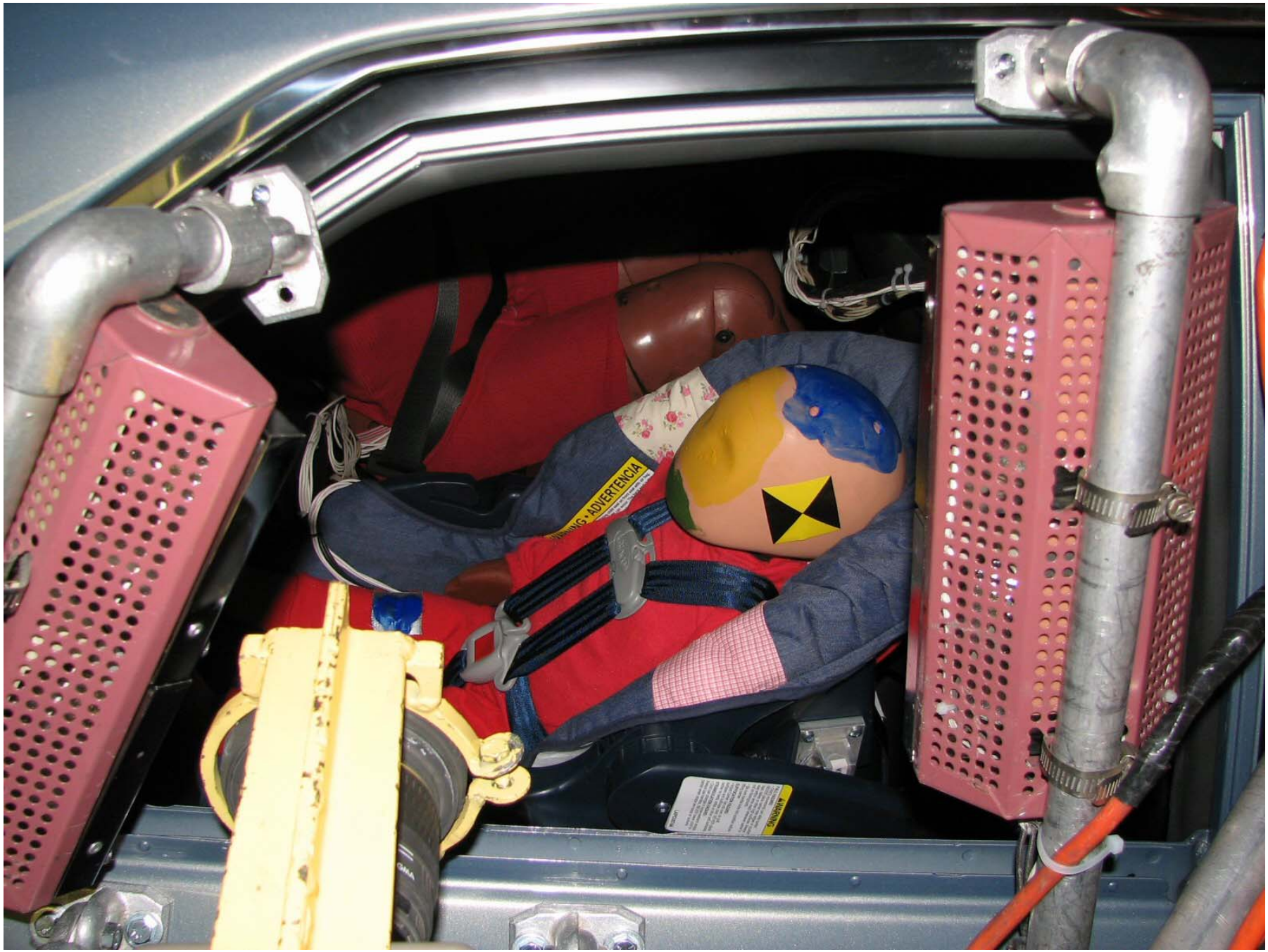


Figure D2-16: Pre-Test Position 3 Right Side View (Through Window)

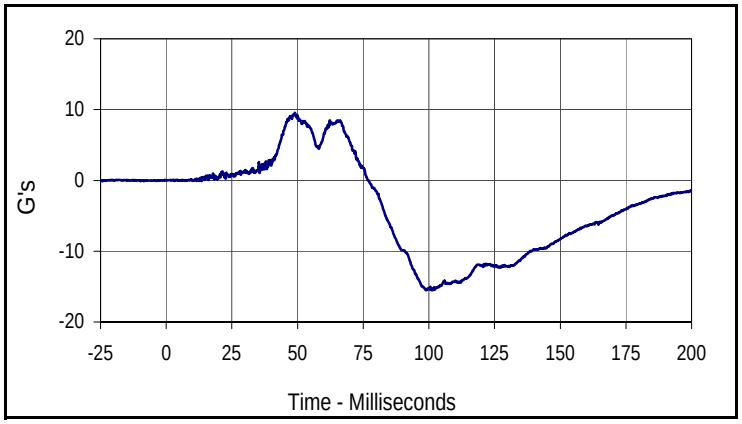
Figure D2-17: Post-Test Position 3 Right Side View (Through Window)

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

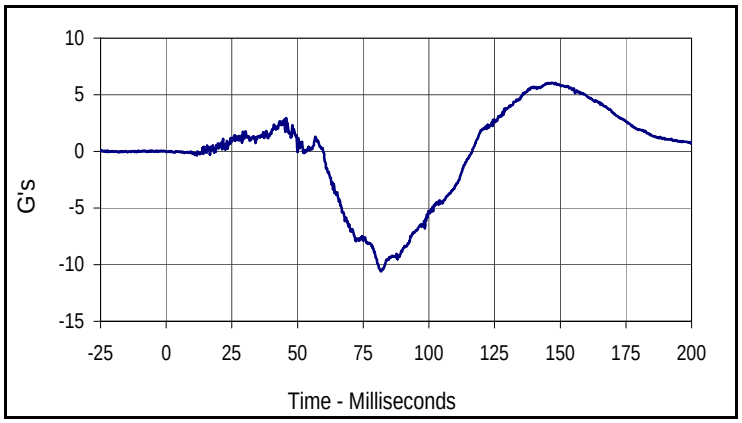
SECTION D3

CRABI RESPONSE AND CRS DATA TRACES

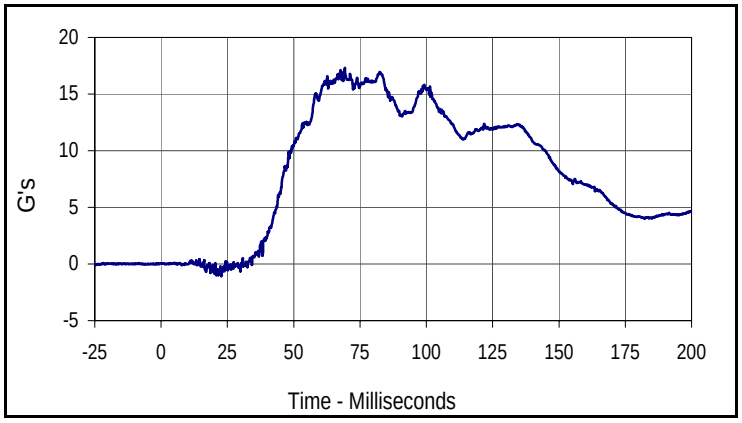
Test Vehicle:	2008 Cadillac CTS 4-Door Sedan	Test Date:	11/2/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	G80101



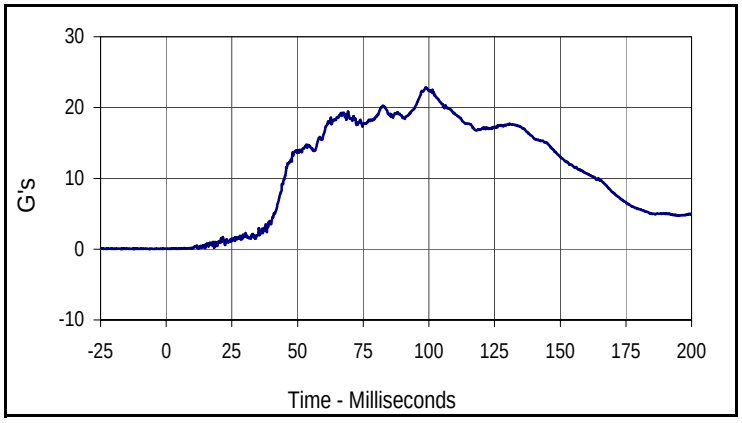
Curve Description			
CRABI Head X (P3)			
CURNO	Type	SAE Class	Units
072	FIL	1000	G's
Max	Time	Min	Time
9.6	49.0	-15.5	101.2



Curve Description			
CRABI Head Y (P3)			
CURNO	Type	SAE Class	Units
073	FIL	1000	G's
Max	Time	Min	Time
6.1	148.1	-10.6	81.8

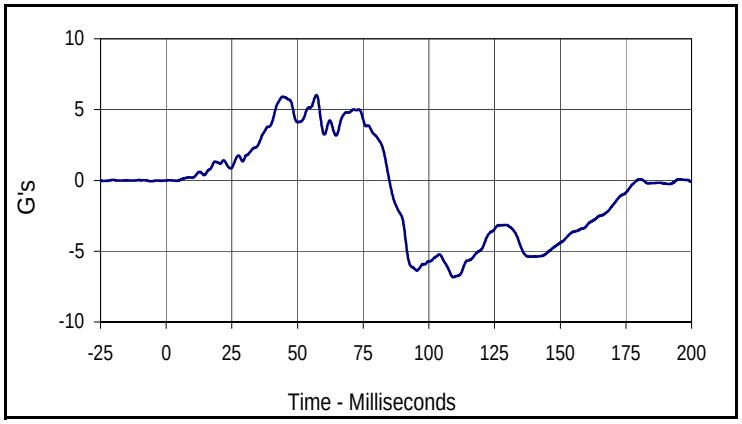


Curve Description			
CRABI Head Z (P3)			
CURNO	Type	SAE Class	Units
074	FIL	1000	G's
Max	Time	Min	Time
17.3	69.3	-1.1	22.7

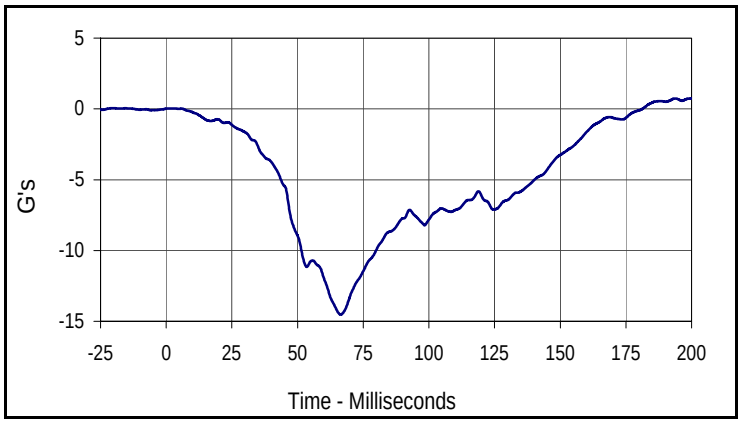


Curve Description			
CRABI Head Resultant (P3)			
CURNO	Type	SAE Class	Units
072	RES	1000	G's
Max	Time	Min	Time
22.9	98.9	0.0	1.2

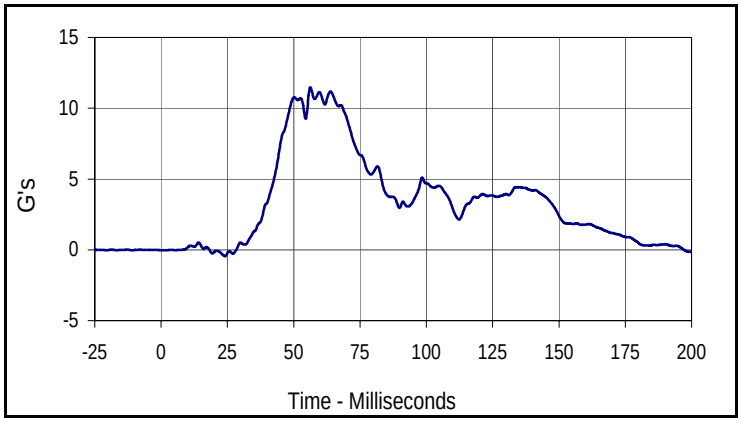
Test Vehicle:	2008 Cadillac CTS 4-Door Sedan	Test Date:	11/2/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	G80101



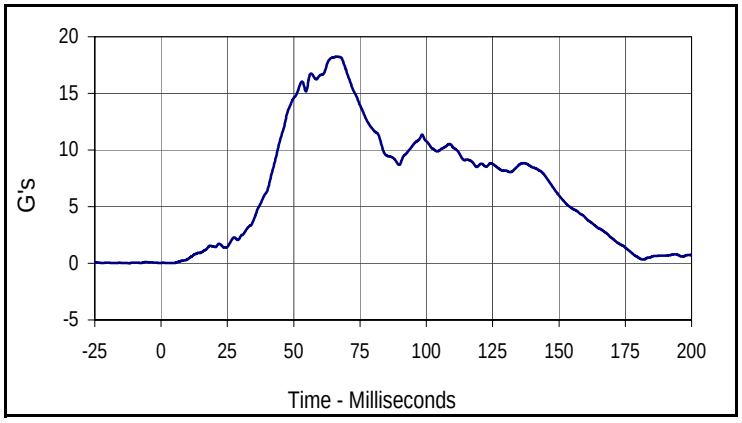
Curve Description			
CRABI Chest X (P3)			
CURNO	Type	SAE Class	Units
082	FIL	180	G's
Max	Time	Min	Time
6.0	57.2	-6.8	109.3



Curve Description			
CRABI Chest Y (P3)			
CURNO	Type	SAE Class	Units
083	FIL	180	G's
Max	Time	Min	Time
0.7	193.7	-14.5	66.4



Curve Description			
CRABI Chest Z (P3)			
CURNO	Type	SAE Class	Units
084	FIL	180	G's
Max	Time	Min	Time
11.5	56.2	-0.5	24.1



Curve Description			
CRABI Chest Resultant (P3)			
CURNO	Type	SAE Class	Units
082	RES	180	G's
Max	Time	Min	Time
18.2	66.3	0.0	4.9

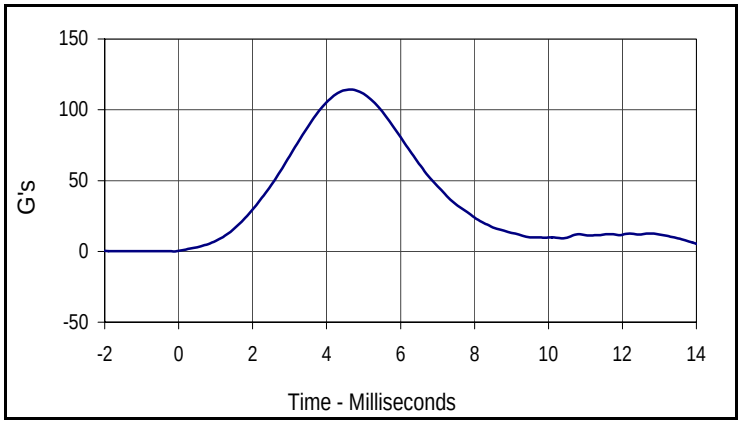
LIST OF DATA PLOTS

SECTION D4

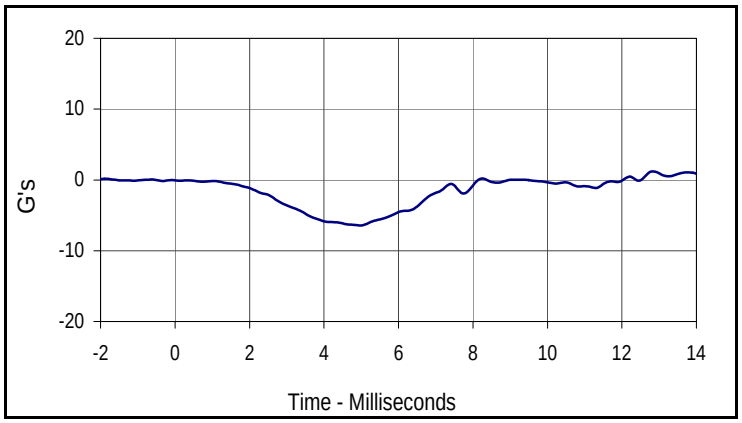
CRABI CALIBRATION INFORMATION

Test Program:	CRABI 12 Month Old Frontal Head Drop Test	Test Date:	10/22/07
ATD Serial No.:	022	Test I.D.:	FHD10R

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	114.3	Pass
Peak Lateral Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



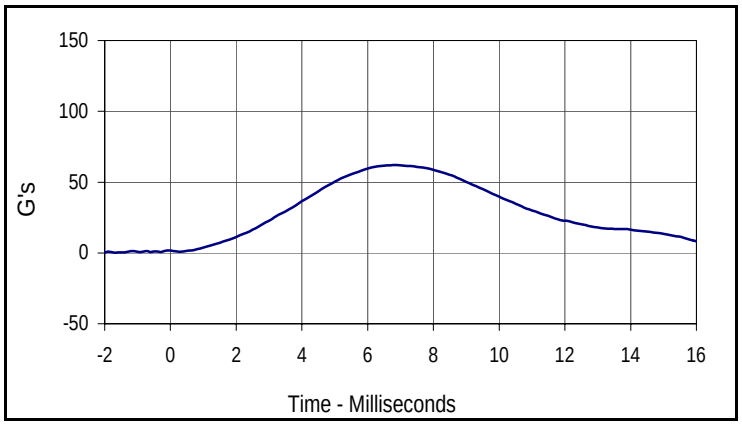
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
114.3	4.6	0.0	-0.1



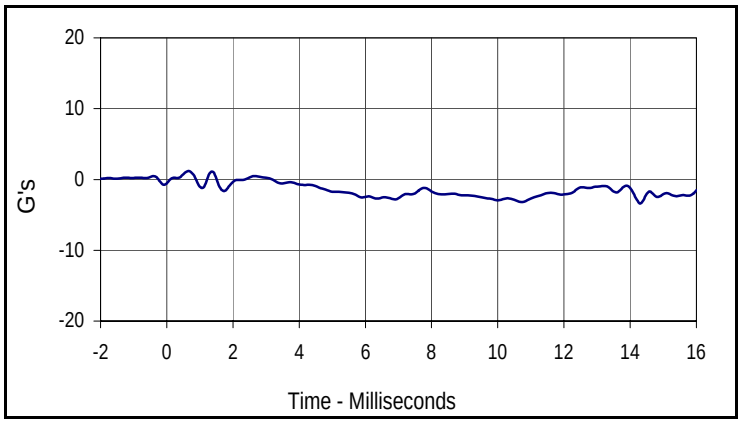
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.1	-1.9	-6.4	5.0

Test Program:	CRABI 12 Month Old Rear Head Drop Test	Test Date:	10/22/07
ATD Serial No.:	022	Test I.D.:	RHD10R

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	59.6	Pass
Peak Lateral Acceleration	G's	≤15.0	2.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



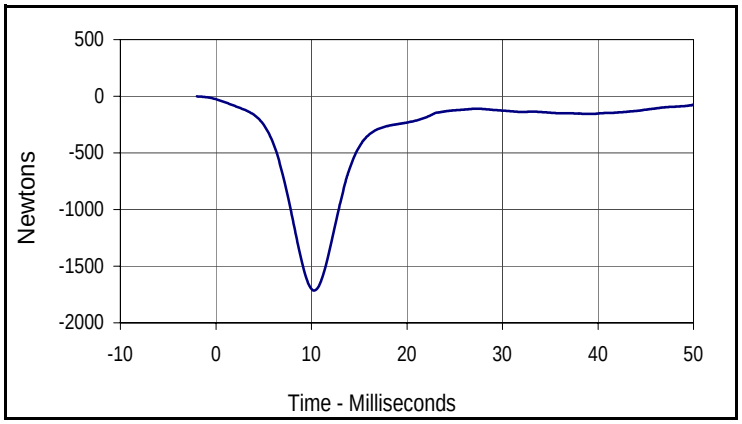
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
59.6	6.0	0.3	-1.7



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.1	0.7	-2.6	5.9

Test Program:	CRABI 12 Month Old Thorax Impact Test	Test Date:	10/22/07
ATD Serial No.:	022	Test I.D.:	CH10R

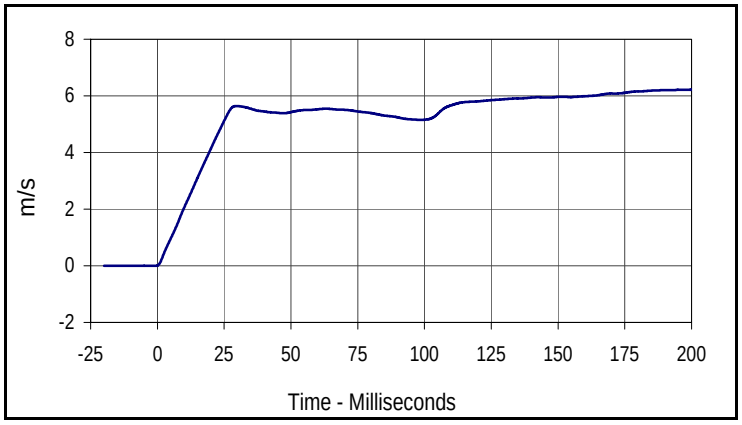
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	4.90 to 5.10	4.96	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1701	Pass
		Overall Test Results		Pass



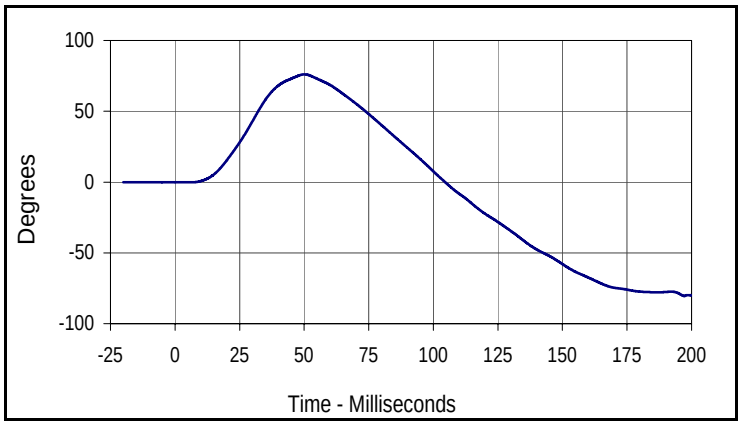
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	60	Newtons
Max	Time	Min	Time
-1.2	-2.0	-1700.9	10.0

Test Program:	CRABI 12 Month Old Neck Flexion Test	Test Date:	10/22/07
ATD Serial No.:	022	Test I.D.:	NF10R

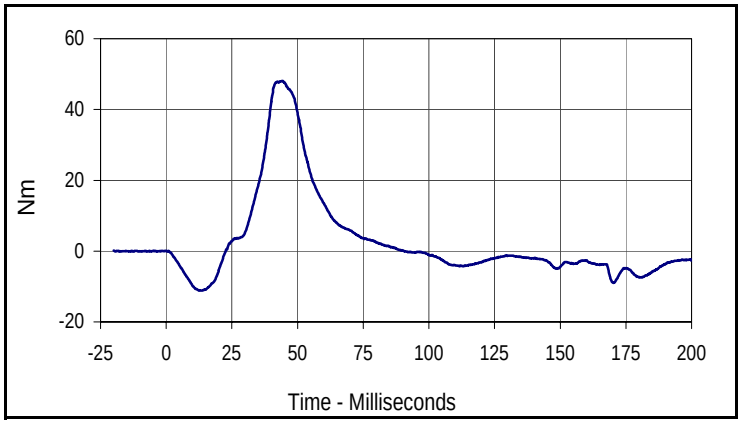
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.16	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	2.0	Pass
	20 Msec.	m/s	3.4 to 4.2	4.1	Pass
	25 Msec.	m/s	4.3 to 5.2	5.1	Pass
"D" Plane Rotation	Max	Degrees	75.0 to 86.0	76.1	Pass
Peak Moment in Rotation	Max	Nm	36.0 to 45.0	45.0	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	71.8	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	199.3	0.0	-0.7



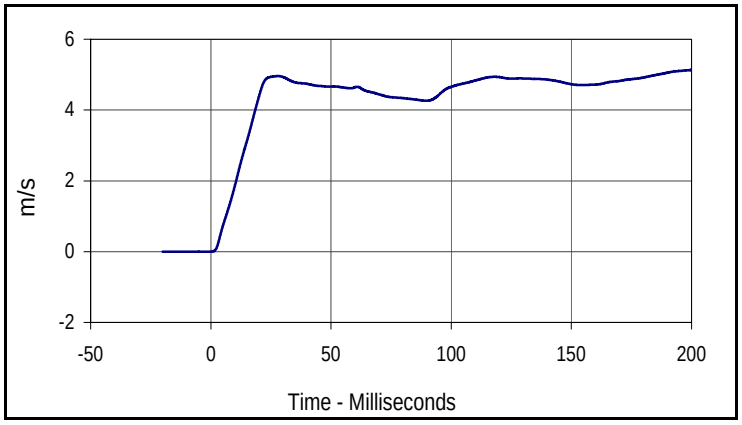
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.1	50.1	-80.5	197.1



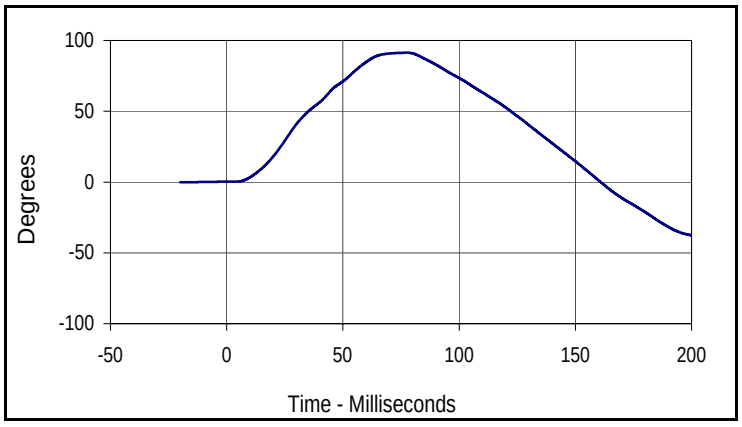
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
48.1	44.3	-11.2	13.5

Test Program:	CRABI 12 Month Old Neck Extension Test	Test Date:	10/22/07
ATD Serial No.:	022	Test I.D.:	NE10R

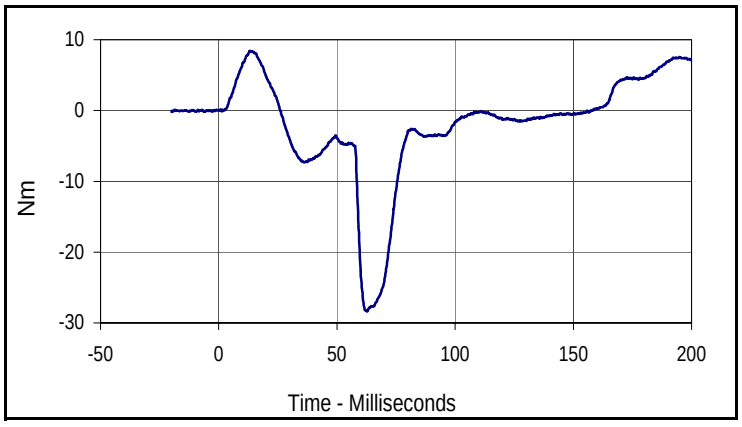
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.41	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.9	Pass
	10 Msec.	m/s	1.5 to 2.1	1.9	Pass
	14 Msec.	m/s	2.2 to 2.9	2.9	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	91.4	Pass
Peak Moment in Rotation	Max	Nm	-12 to -23	-20.4	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	78.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.1	200.0	0.0	0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
91.4	77.5	-37.6	200.0



Curve Description			
Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
8.4	13.2	-28.4	62.8

Test Program:	CRABI 12 Month Old External Dimensions	Test Date:	10/22/07
ATD Serial No.:	022	Test I.D.:	N/A

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
A - Total sitting height	mm	456.0 to 471.2	463	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	284	Pass
C - "H" point height	mm	27.9 to 38.1	33	Pass
D - "H" point from backline	mm	40.1 to 50.3	47	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	56	Pass
F - Thigh clearance	mm	63.0 to 73.2	70	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	185	Pass
I - Shoulder pivot to elbow pivot	mm	99.1 to 114.3	110	Pass
J - Elbow rest height	mm	150.1 to 165.3	160	Pass
K - Buttock to knee length	mm	202.7 to 217.9	210	Pass
L - Poplipteal length	mm	138.7 to 153.9	147	Pass
M - Knee pivot height	mm	165.1 to 180.3	169	Pass
N - Buttock poplipteal length	mm	144.8 to 160.0	150	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	112	Pass
P - Foot length	mm	92.4 to 102.6	100	Pass
Q- Stature	mm	727.7 to 753.1	N/A	N/A
R - Buttock to knee pivot length	mm	178.5 to 188.7	182	Pass
S - Head Breadth	mm	124.4 to 134.6	129	Pass
T - Head Depth	mm	149.9 to 165.1	150	Pass
U - Hip breadth	mm	158.5 to 173.7	164	Pass
V - Shoulder breadth	mm	200.7 to 215.9	213	Pass
W - Foot breadth	mm	39.1 to 49.3	47	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	463	Pass
Z - Waist circumference	mm	447.0 to 472.4	470	Pass
AA - Refrence location for dimension Y & O	mm	256.5 to 266.7	263	Pass
BB - Reference Location For dimension Z	mm	106.7 to 116.9	112	Pass
CC - Shoulder Height	mm	299.7 to 314.9	303	Pass
DD - Chin Height	mm	289.6 to 304.8	297	Pass
		Overall Test Results		Pass