

REPORT NUMBER TR-P27183-01-NC

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**GENERAL MOTORS OF CANADA LTD.
2007 CHEVROLET SILVERADO
4-DOOR TRUCK**

NHTSA NUMBER: G70118

**Prepared By:
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AUGUST 27, 2007

FINAL REPORT

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Technical Report Documentation Page

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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 Chevrolet Silverado 4-Door Truck 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 August 27, 2007. The impact velocity of the Moving Deformable Barrier was 61.90 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 35.0 deg. C. The target vehicle's maximum post-test static crush was 406 mm located at level 1. The test vehicle's occupant performance data is as follows:			
Measurement Description	Driver SID/HIII	Pass. SID/HIII	
Left Upper Rib (LUR) G's	25.7	21.8	
Left Lower Rib (LLR) G's	24.3	26.7	
Lower Spine (T ₁₂) G's	28.6	24.6	
Thoracic Trauma Index (TTI) G's	27.0	26.0	
Pelvis (PEV) G's	29.8	35.5	
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TABLE OF CONTENTS

Section		Page
1	Purpose and Test Procedure	1
2	Summary of Side Impact Test	2
3	Occupant and Vehicle Information Sheets	4

Data Sheet No.		Page
1	General Test and Vehicle Parameter Data	5
2	Test Vehicle Summary of Results	10
3	Moving Deformable Barrier (MDB) Summary of Results	11
4	Post-Test Observations	12
5	Vehicle Pre-Test and Post-Test Measurements	13
6	SID/HIII Longitudinal Clearance Dimensions	14
7	SID/HIII Lateral Clearance Dimensions	15
8	Vehicle Side Measurements	16
9	Vehicle Exterior Crush Profiles	17
10	Vehicle Damage Profile Distances	19
11	Deformable Barrier Honeycomb Face Static Crush	20
12	Vehicle Accelerometer Locations	21
13	MDB Accelerometer Locations	23
14	High Speed Camera Locations and Data	24
15	FMVSS 301 Fuel System Integrity Post-Impact Data	25
16	FMVSS 301 Static Rollover Data Sheet	26
17	Dummy / Vehicle Temperature Stabilization	28

Appendix		
A	Photographs	A
B	SID/HIII, Vehicle and MDB Response Data	B
C	SID/HIII Configuration and Performance Verification Data	C
D	Child Restraint System	D

SECTION 1

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 Chevrolet Silverado 4-Door Truck manufactured by General Motors of Canada Ltd.

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 Chevrolet Silverado 4-Door Truck 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 61.90 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 2597 kg and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering, LLC in Adelanto, California, on August 27, 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	No		No	
Head Airbag	No		No	
Curtain Airbag	No		No	

SECTION 2...(CONTINUED)

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 406 mm at level 1, 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)	G's	27	26
Peak Pelvic G's (PEV)	G's	30	35

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 contains the Child Restraint System data.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION SHEETS

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

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	°F	°C	$=(t_f - 32)/1.8$
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 Chevrolet Silverado 4-Door Truck NHTSA No.: G70118
 Test Program: 55/28 km/h Side Impact NCAP Test Date: 8/27/07

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	G70118	Anti-Lock Brakes	Yes
Make	Chevrolet	All Wheel Drive	No
Model	Silverado	Power Steering	Yes
Body Style	4-Door Truck	Driver Front Airbag	Yes
Vin No.	2GCEC13C271505318	Driver Side Torso Airbag	No
Color	Black	Driver Side Head Airbag	No
Delivery Date	8/2/2007	Driver Curtain/Airbag	No
Odometer (Miles)	80.0	Rear Pass. Airbag	No
Dealer	Crest Chevrolet	Rear Pass. Side Airbag	No
Transmission	4-Speed Automatic	Rear Pass. Head Airbag	No
Final Drive	Rear	Rear Pass. Curtain/Airbag	No
Type/No. Cyl.	V8	Pre-Tensioners	Yes
Engine Disp. (L)	4.8	Load Limiters	Yes
Engine Placement	Longitudinal	Bucket Seats	Yes
Roof Rack	No	Air Cond.	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	No
Front Disc	Yes	Power Seats	No
Rear Disc	No	Other	None

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors of Canada Ltd.	GVWR (kg)	3085
Date of Manufacture	Oct-06	GAWR Front (kg)	1656
		GAWR Rear (kg)	1792

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	3	3		6
Capacity Weight (VCW) (kg)				740
Cargo Weight (RCLW) (kg)				136

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

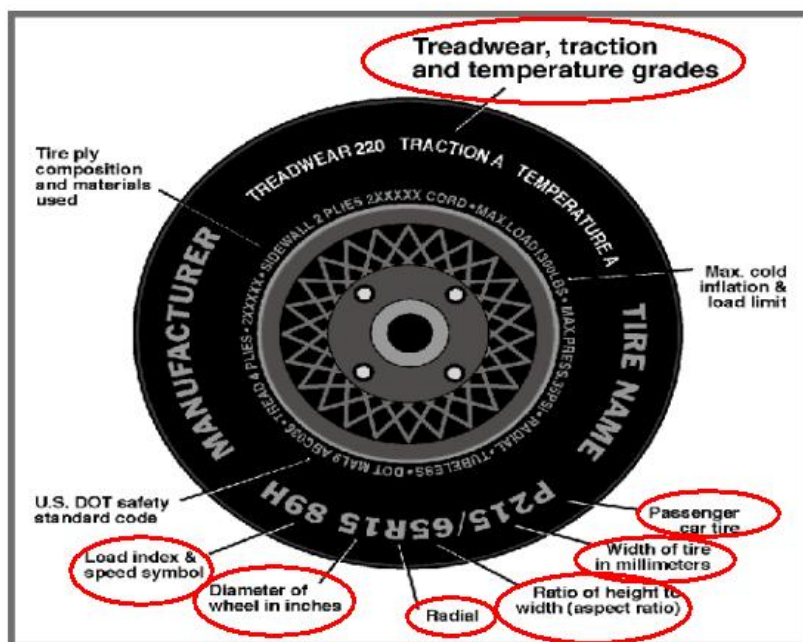
Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

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)	240	240
Recommended Tire Size	P245/70/R17	P245/70/R17
Tire Size on Vehicle	P245/70/R17	P245/70/R17
Tire Manufacturer	General	General
Treadwear	420	420
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel	2 Polyester, 2 Steel
Load Index/Speed Symbol	108S	108S
Tire Material	Polyester, Steel	Polyester, Steel
DOT Safety Code Right	A383 BLP	A383 BLP
DOT Safety Code Left	A383 BLP	A383 BLP

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	693	476	1169	740	609	1349
Right	kg	660	478	1138	655	593	1248
Ratio	%	58.6	41.4	100.0	53.7	46.3	100
Totals	kg	1353	954	2307	1395	1202	2597

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2307
Weight of 2 P572 ATD's	kg	162
Rated Cargo/Luggage Wt. (RCLW)	kg	136
Calculated Vehicle Target Wt. (TVTW)	kg	2605

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	929	933	992	1000	1513
As Tested	mm	909	918	954	964	1694
Fully Loaded	mm	908	913	950	960	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	3660
Total Vehicle Length at Left Side	mm	4505
Total Vehicle Length at Centerline	mm	5830
Total Vehicle Length at Right Side	mm	4505
Weight of Ballast In Cargo Area	kg	89
Amount of Stoddard Solvent in Fuel Tank	liters	90.62

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	3660
Target Impact Point Aft of Front Axle	mm	508
Actual Impact Point Aft of Front Axle	mm	513

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

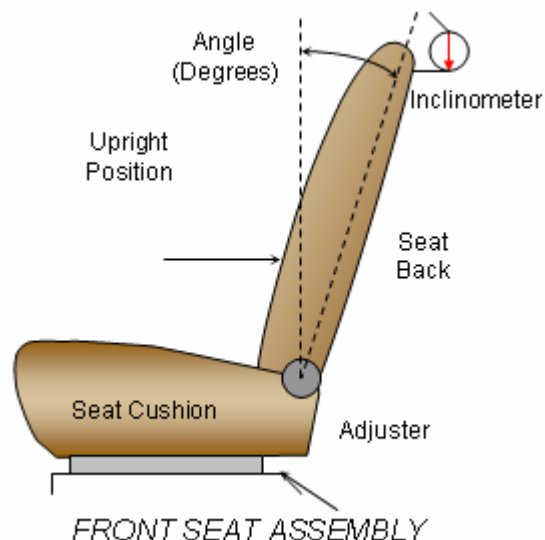
NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

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

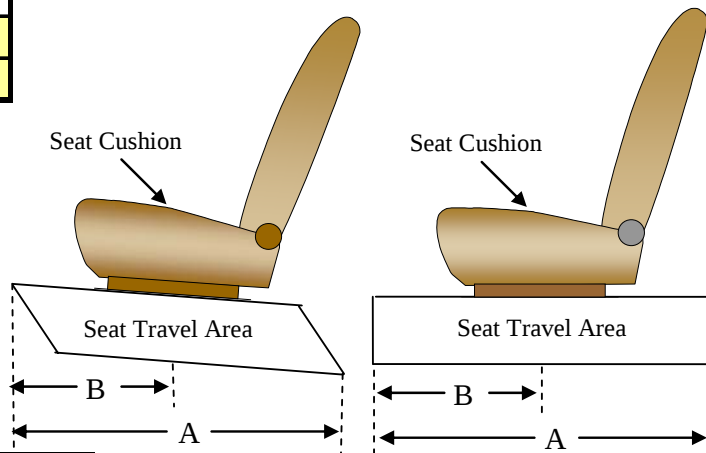
	Deg.
Driver w/seated Dummy	6.4 @ Headrest
Passenger w/seated Dummy	3.8 @ Headrest

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. 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 at the lowermost position.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	25 Detents	13th Detent
Rear Seat	N/A	N/A



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	3
Rear Seat	Fixed	Fixed

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

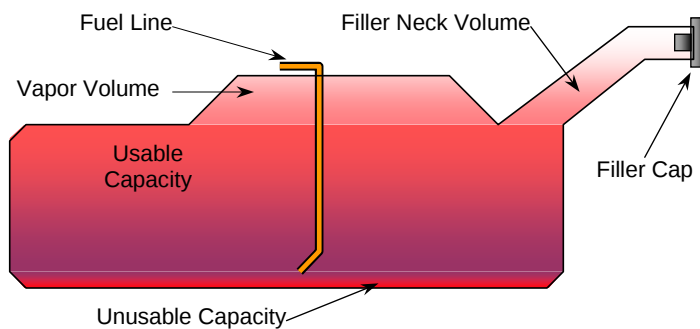
Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	97.46
Usable Capacity of "Optional" Tank	
Usable Capacity used for FMVSS 301	89.67 to 91.6
Actual Amount of Solvent used	90.62

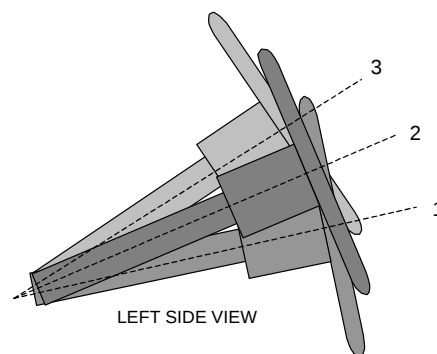
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately two (2) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the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



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 position No. 1	10.8	
Geometric center position No. 2	20.6	
Uppermost position No. 3	31.2	

DATA SHEET NO. 2**TEST VEHICLE SUMMARY OF RESULTS**Test Vehicle: 2007 Chevrolet Silverado 4-Door TruckNHTSA No.: G70118Test Program: 55/28 km/h Side Impact NCAPTest Date: 8/27/07**MAXIMUM EXTERIOR STATIC CRUSH**

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	406	414
Level 2	Occupant H-Point	mm	370	809
Level 3	Mid Door	mm	358	814
Level 4	Window Sill	mm	220	1169
Level 5	Window top	mm	22	1763
N/A	Maximum Penetration	mm	406	

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 Chevrolet Silverado 4-Door TruckNHTSA No.: G70118Test Program: 55/28 km/h Side Impact NCAPTest Date: 8/27/07**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	61.90
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.84
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	148
B	Top of Bumper	533	700	Right	98
C	Mid Level	686	800	Right	99
D	Top of Stack	813	800	Right	143

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	1
High Speed Cameras	2

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

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	Window	Window / Outside C-Pillar
Upper Torso Contact	Door Panel	Door Panel
Lower Torso Contact	Door Panel	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	None	None

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	Cracked
Window Damage	None
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	No		No	
Head Airbag	No		No	
Curtain Airbag	No		No	
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	+5 (right)
Vertical Offset	mm	+/- 20	+12 (above)

DATA SHEET NO. 5

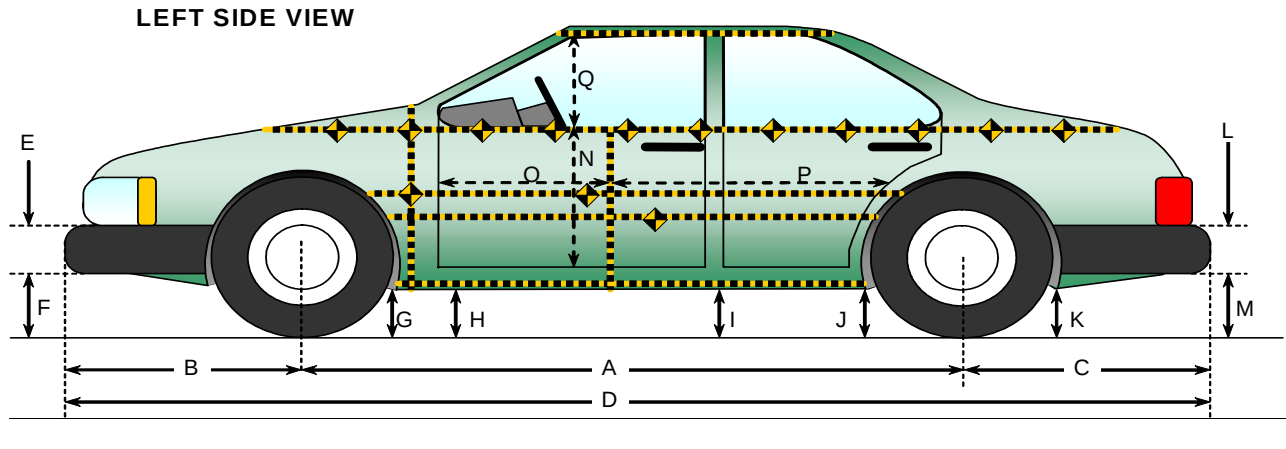
VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



VEHICLE PRE AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3660	3634	-26
B	Front Axle to FSOV	1010	998	-12
C	Rear Axle to RSOV	1160	1132	-28
D	Total Length at Centerline	5830	5818	-12
E	Front Bumper Thickness	400	400	0
F	Front Bumper Bottom to Ground	227	223	-4
G	Sill Height at Front Wheel Well	372	367	-5
H	Sill Height at Front Door Leading Edge	384	400	16
I	Sill Height at "B" Pillar	397	380	-17
J1	Sill Height at Rear Wheel Well	276	286	10
J2	Pinch Weld Height at Rear Wheel Well	413	404	-9
K	Sill Height aft of Rear Wheel Well	409	481	72
L	Rear Bumper Thickness	230	230	0
M	Rear Bumper Bottom to Ground	450	564	114
N	Sill Height to Window Bottom Sill	815	786	-29
O	Front Door Leading Edge to Impact CL	795	805	10
P	Rear Door Trailing Edge to Impact CL	1347	1298	-49
Q	Front Window Opening	483	505	22
R	Right Side Length	4505	4505	0
S	Left Side Length	4505	4380	-125
T	Vehicle Width at "B" Post	1960	1795	-165

DATA SHEET NO. 6

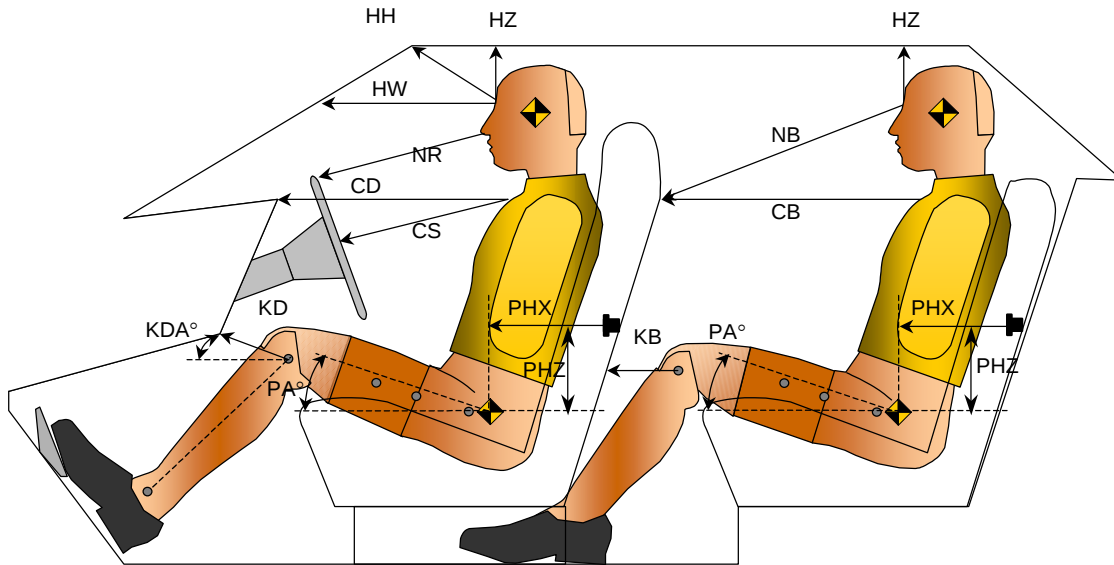
SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length(mm)	Angle	Length(mm)	Angle
HH		Head to Header	495	13.2		
HW		Head to Windshield	664	0.0		
HZ	HZ	Head to Roof	228	90.0	250	90.0
NR	NB	Nose to Rim/Nose to Seat Back	421	13.0	607	13.0
CD	CB	Chest to Dash or Seat Back	541	4.0	575	3.0
CS		Chest to Steering Wheel	350	13.0		
KDL	KBL	Left Knee to Dash or Seat Back	156	20.8	255	0.0
KDR	KBR	Right Knee to Dash or Seat Back	150		271	
PA	PA	Pelvic Angle		23.0		23.5
PHX	PHX	H-Point to Striker (X-Axis)	318		309	
PHZ	PHZ	H-Point to Striker (Z-Axis)	9		10	

DATA SHEET NO. 7

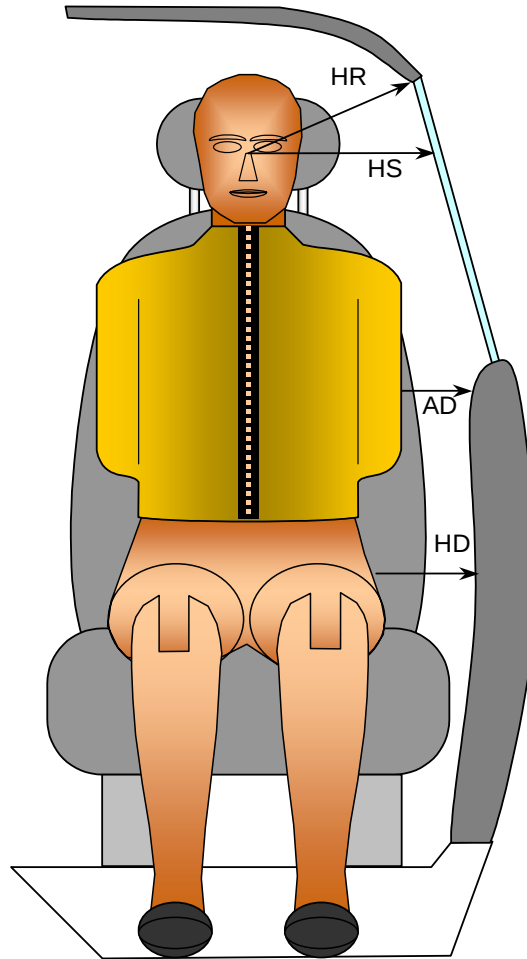
SID/HII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



FRONT VIEW OF DUMMY

LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	250	245
HS	Head to Side Window	mm	320	345
AD	Arm to Door	mm	122	124
HD	H-Point to Door	mm	180	217

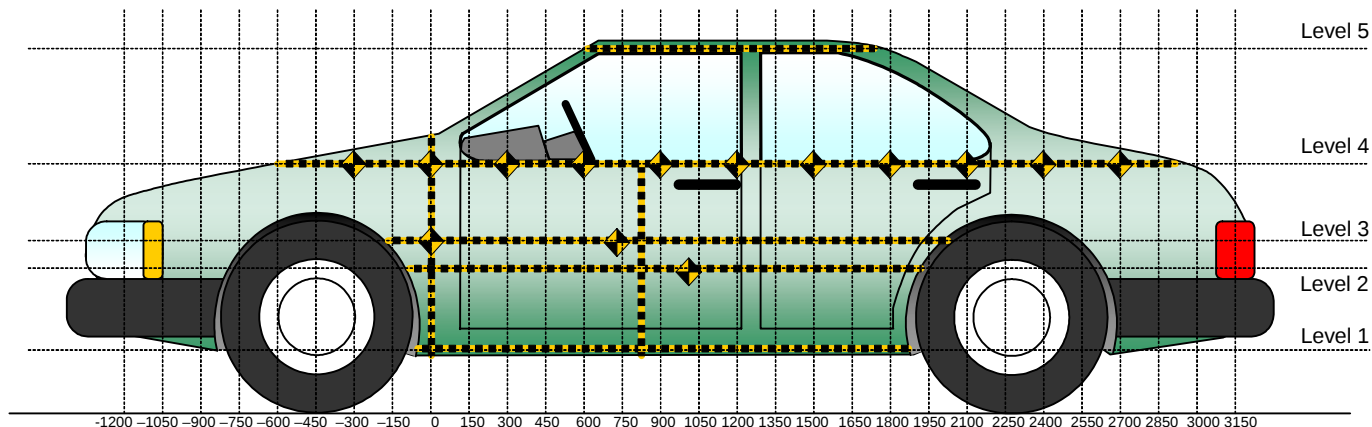
DATA SHEET NO. 8 **VEHICLE SIDE MEASUREMENTS**

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



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	Height Above Ground
1	Sill Top	414
2	Occupant H-Point	809
3	Mid Door	814
4	Window Sill	1169
5	Window Top	1763

All Dimensions shown in millimeters

DATA SHEET NO. 9

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

	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			496	570				567	630				71	60	
0	566	512	511	566		693	615	611	633		127	103	100	67	
150	581	518	518	562		776	697	699	611		195	179	181	49	
300	583	517	516	561		836	752	722	632		253	235	206	71	
450	581	515	515	557		860	774	748	653		279	259	233	96	
600	581	513	513	555	796	864	807	776	672	675	283	294	263	117	-121
750	586	512	511	554	785	871	836	796	694	686	285	324	285	140	-99
900	583	512	511	552	793	881	861	825	716	701	298	349	314	164	-92
1050	583	512	512	551	789	885	873	841	741	716	302	361	329	190	-73
1200	584	512	514	549	789	894	871	860	763	734	310	359	346	214	-55
1350	586	514	513	551	789	948	884	871	771	811	362	370	358	220	22
1500	584	515	515	550	789	967	876	856	746	776	383	361	341	196	-13
1650	586	516	516	550	793	992	846	816	703	746	406	330	300	153	-47
1800	586	518	518	550	790	964	819	776	675	706	378	301	258	125	-84
1950	591	520	519	551	794	829	764	741	635	699	238	244	222	84	-95
2100	592	521	520	551		732	705	706	602		140	184	186	51	
2250	581	526	525	572		730	631	631	660		149	105	106	88	
2400	591	508	507	556		602	553	538	593		11	45	31	37	
2550		501	506	554			541	541	591			40	35	37	
2700															
2850															

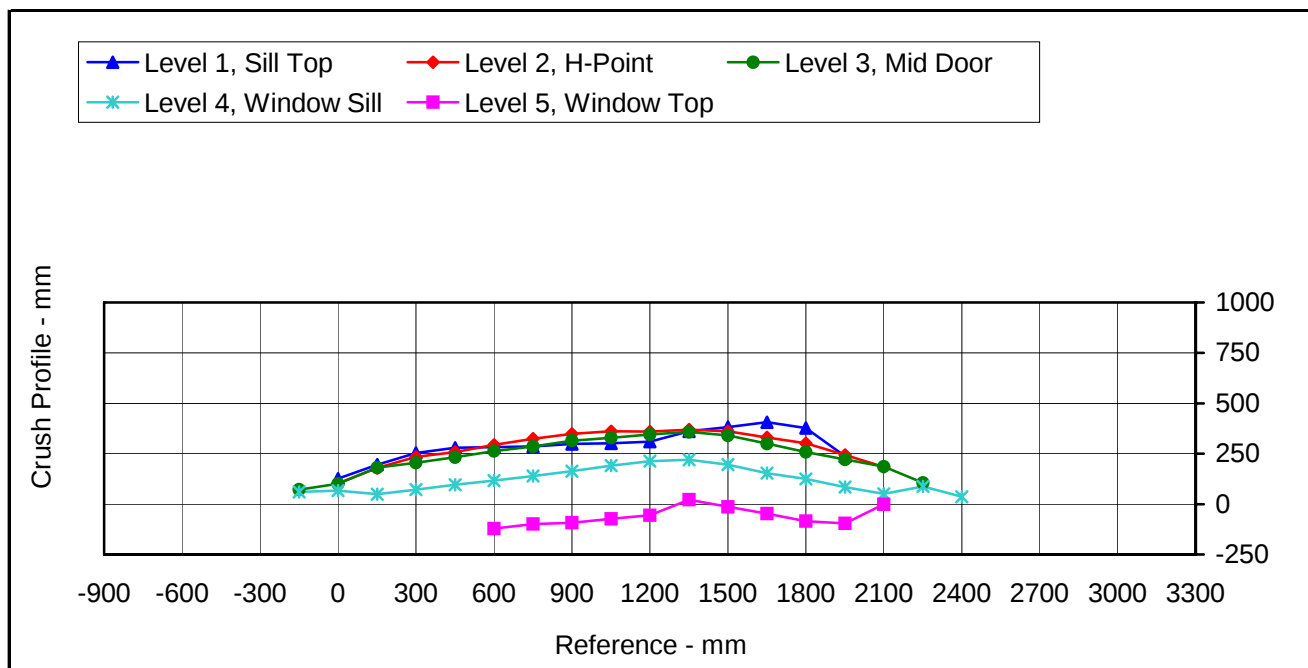
DATA SHEET NO. 9...(CONTINUED)
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



	Units	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush	mm	406	370	358	220	22
Distance from Impact	mm	1650	1350	1350	1350	1350

DATA SHEET NO. 10

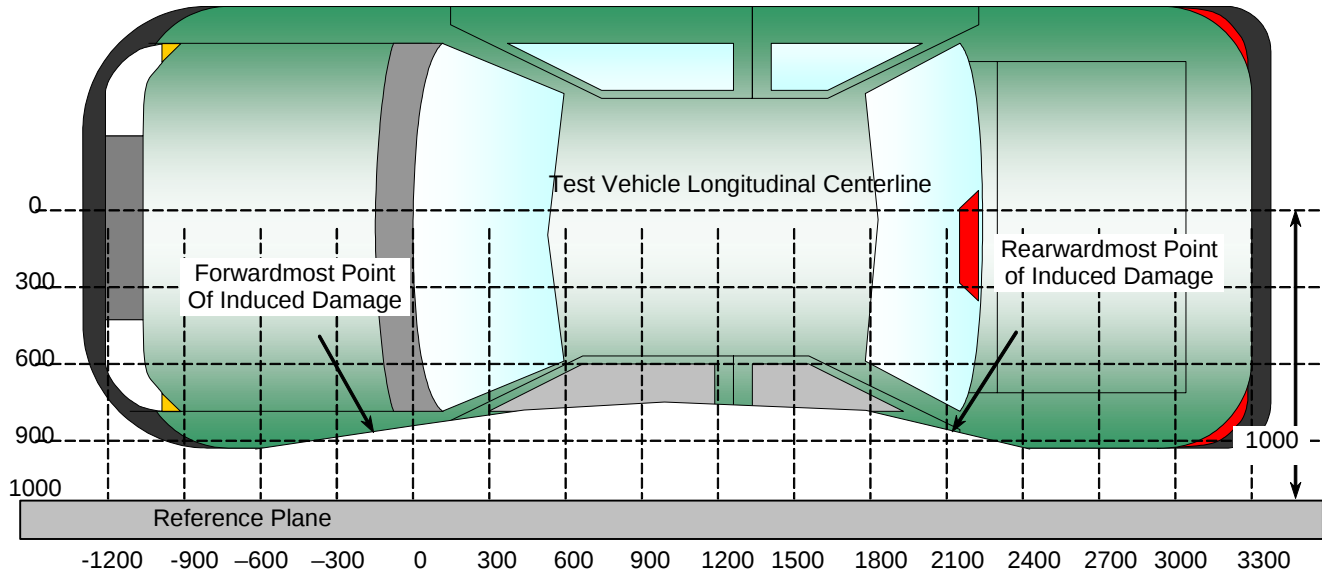
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



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	520	706	186
2	1650	1	586	992	406
3	1200	2	512	871	359
4	750	2	512	836	324
5	300	1	583	836	253
6	-150	3	496	567	71

DATA SHEET NO. 11

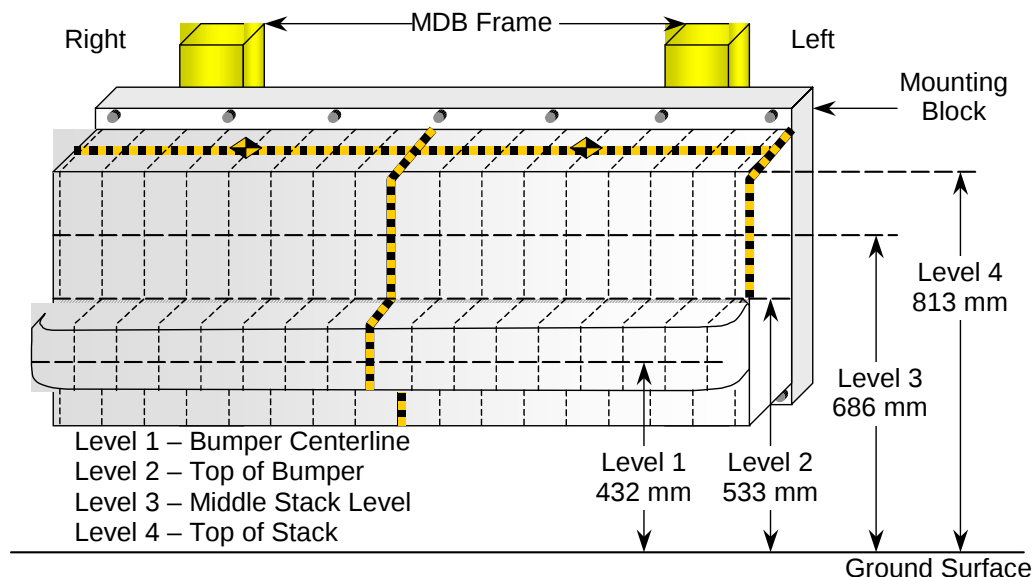
DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	666	643	636	629	624	619	615	611	612	616	611	604	593	582	579	577	593
2	696	718	716	711	708	701	689	685	682	688	697	684	684	685	681	676	677
3	719	675	655	645	636	631	629	628	629	629	651	665	648	639	638	651	686
4	763	734	713	694	676	666	653	643	632	649	663	694	675	675	690	716	741

All Dimensions in mm

DATA SHEET NO. 12

VEHICLE ACCELEROMETER LOCATIONS

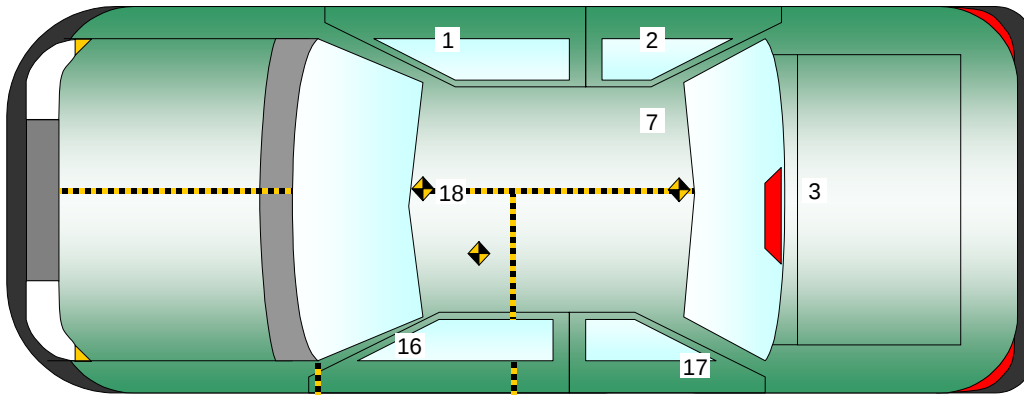
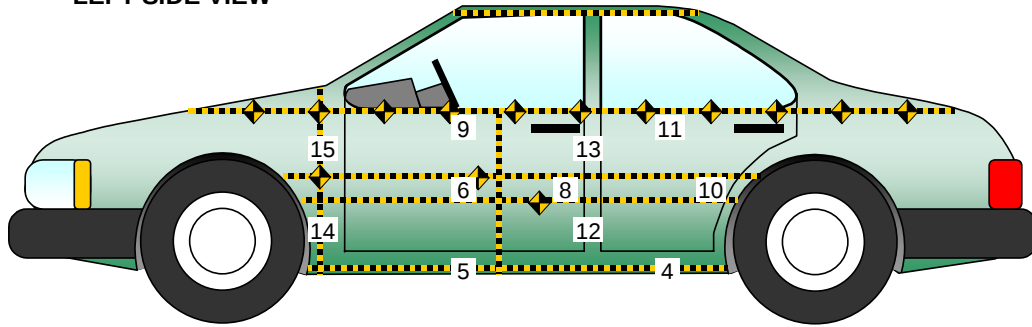
Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

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 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3470	805	535
2	Right Sill at Rear Seat	2485	800	530
3	Rear Floorpan Above Axle	1190	60	830
4	Left Sill at Rear Door	2560	-605	255
5	Left Sill at Front Door	33370	-605	255
6	Front Door Centerline			
7	Rt. Rear Occ. Compartment	3120	430	560
8	Front Door Mid-Rear			
9	Front Door Upper Centerline			
10	Rear Door Mid-Rear			
11	Rear Door Upper Centerline			
12	B-Post Lower	3025	-810	1005
13	B-Post Middle	3025	-810	1150
14	A-Post Lower	4160	-875	740
15	A-Post Middle	4160	-875	930
16	Front Seat Track	3695	-670	735
17	Rear Seat Structure	2250	700	595
18	Vehicle CG	3850	325	540

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 Chevrolet Silverado 4-Door Truck

Test Program: 55/28 km/h Side Impact NCAP

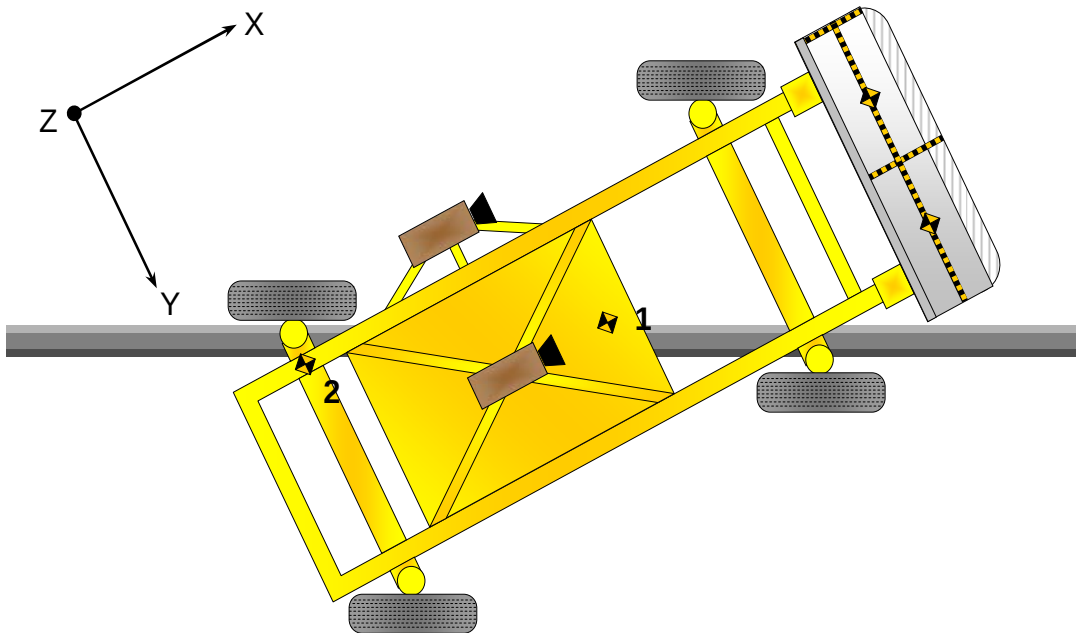
NHTSA No.: G70118

Test Date: 8/27/07

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

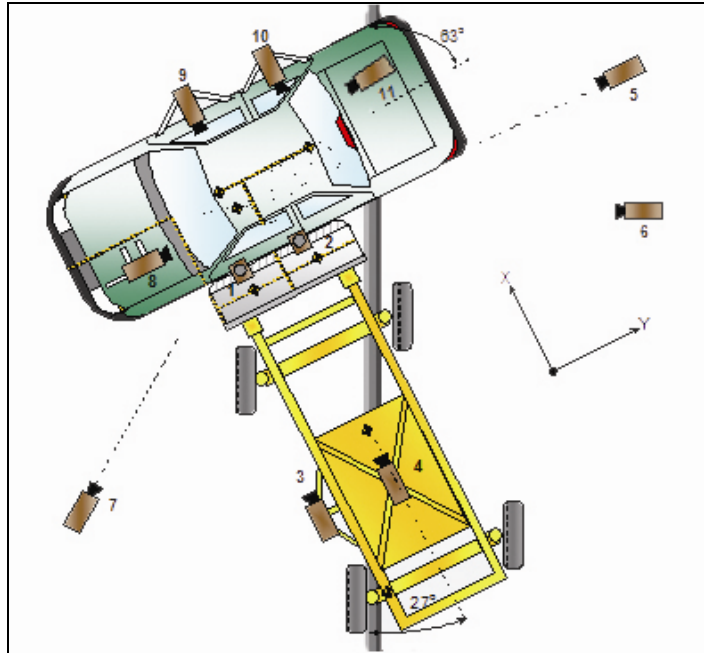
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



No.	Camera View	Location (mm)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X	Y	Z			
Doc	Real Time Inrun	-2484	-3958	-1506			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	-64	20485	-1348	0	105mm	1000
6	Left Rear (MDB)	-2137	-1302	-339	-4	85mm	1000
7	Left Front	-2266	-3564	-1475	-2	24mm	1000
8	Driver Front (O.B.)	545	-855	-1631	-3	35mm	1000
9	Driver Side (O.B.)	1398	853	-1324	0	20mm	1000
10	Passenger Side (O.B.)	1411	1733	1378	0	20mm	1000

All measurements are made relative to the point of impact.

DATA SHEET NO. 15

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP Test Date: 8/27/07

Test Time: 1:05 PM Temperature: 35.0 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

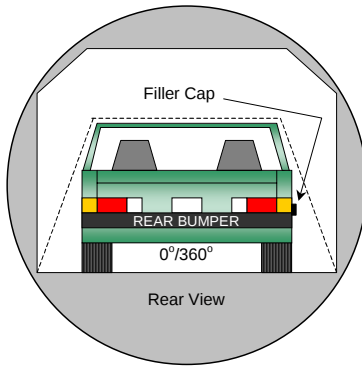
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

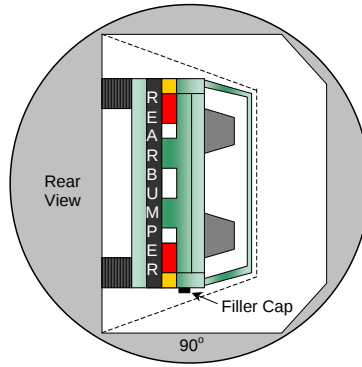
NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

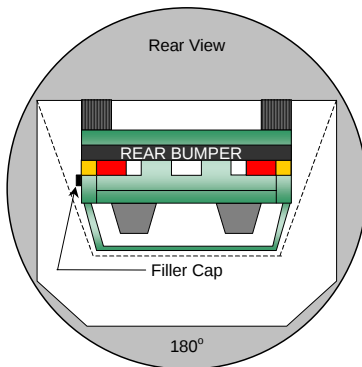
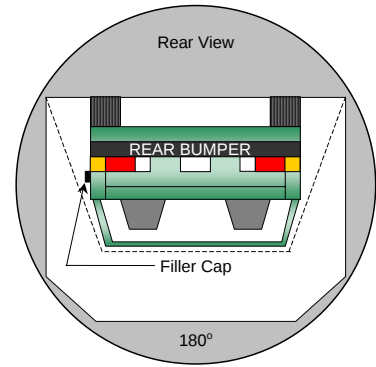
Test Date: 8/27/07



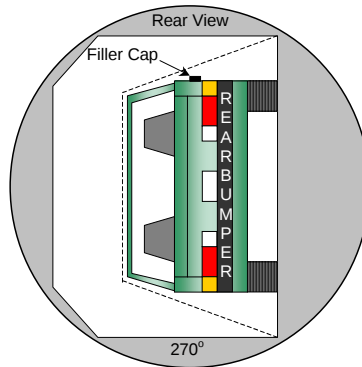
0° to 90°



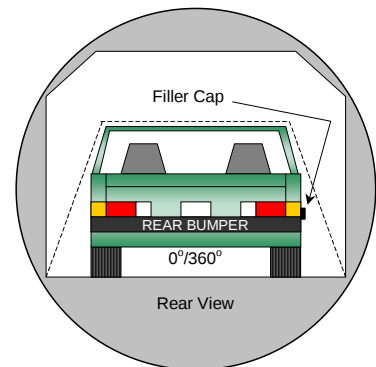
90° to 180°



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 Chevrolet Silverado 4-Door TruckNHTSA No.: G70118Test Program: 55/28 km/h Side Impact NCAPTest Date: 8/27/07**SOLVENT COLLECTION TIME TABLE IN SECONDS**

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	82	300	382
90° to 180°	85	300	385
180° to 270°	82	300	382
270° to 360°	83	300	383

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

DATA SHEET NO. 17

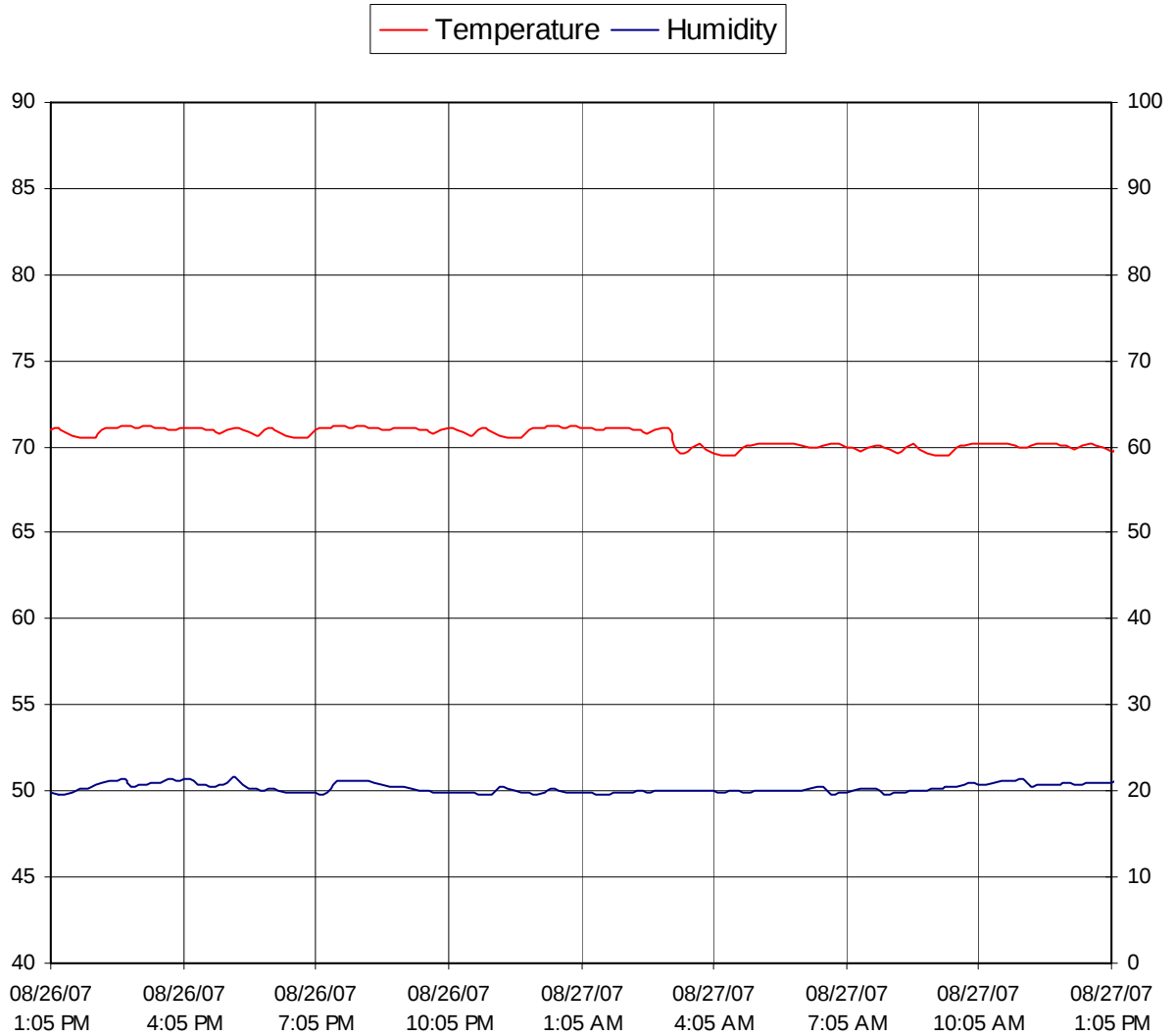
DUMMY / VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure		Page
A-1	Left Front $\frac{3}{4}$ View, as Received	A-1
A-2	Right Rear $\frac{3}{4}$ View, as Received	A-2
A-3	Manufacturer's Label	A-3
A-4	Tire Placard	A-4
A-5	Pre-Test Front View	A-5
A-6	Post-Test Front View	A-6
A-7	Pre-Test Left Front $\frac{3}{4}$ View	A-7
A-8	Post-Test Left Front $\frac{3}{4}$ View	A-8
A-9	Pre-Test Left Side View	A-9
A-10	Post-Test Left Side View	A-10
A-11	Pre-Test Left Rear $\frac{3}{4}$ View	A-11
A-12	Post-Test Left Rear $\frac{3}{4}$ View	A-12
A-13	Pre-Test Rear View	A-13
A-14	Post-Test Rear View	A-14
A-15	Pre-Test Right Rear $\frac{3}{4}$ View	A-15
A-16	Post-Test Right Rear $\frac{3}{4}$ View	A-16
A-17	Pre-Test Right Side View	A-17
A-18	Post-Test Right Side View	A-18
A-19	Pre-Test Right Front $\frac{3}{4}$ View	A-19
A-20	Post-Test Right Front $\frac{3}{4}$ View	A-20
A-21	Pre-Test Overhead View	A-21
A-22	Post-Test Overhead View	A-22
A-23	Pre-Test Overhead Close-up View	A-23
A-24	Post-Test Overhead Close-up View	A-24
A-25	Pre-Test Left Impact Point	A-25
A-26	Post-Test Left Impact Point	A-26
A-27	Pre-Test Front $\frac{3}{4}$ View of Left Side Doors	A-27
A-28	Post-Test Front $\frac{3}{4}$ View of Left Side Doors	A-28
A-29	Pre-Test Rear $\frac{3}{4}$ View of Left Side Doors	A-29
A-30	Post-Test Rear $\frac{3}{4}$ View of Left Side Doors	A-30
A-31	Pre-Test Left Front Door	A-31
A-32	Post-Test Left Front Door	A-32
A-33	Pre-Test Left Rear Door	A-33
A-34	Post-Test Left Rear Door	A-34

LIST OF PHOTOGRAPHS...(CONTINUED)

Figure		Page
A-35	Pre-Test Driver Dummy (Door Open)	A-35
A-36	Pre-Test Driver Dummy (Through Window)	A-36
A-37	Post-Test Driver Dummy (Through Window)	A-37
A-38	Pre-Test Driver Dummy Clearance from Door	A-38
A-39	Post-Test Driver Dummy Clearance from Door	A-39
A-40	Pre-Test Driver Dummy Right Side View	A-40
A-41	Post-Test Driver Dummy Right Side View	A-41
A-42	Pre-Test Front Door Panel (Interior)	A-42
A-43	Post-Test Front Door Panel (Interior)	A-43
A-44	Pre-Test Passenger Dummy Left Side (Door Open)	A-44
A-45	Pre-Test Passenger Dummy Left Side (Through Window)	A-45
A-46	Post-Test Passenger Dummy Left Side (Through Window)	A-46
A-47	Pre-Test Passenger Dummy Clearance from Door	A-47
A-48	Post-Test Passenger Dummy Clearance from Door	A-48
A-49	Pre-Test Passenger Dummy Right Side View	A-49
A-50	Post-Test Passenger Dummy Right Side View	A-50
A-51	Pre-Test Rear Door Panel (Interior)	A-51
A-52	Post-Test Rear Door Panel (Interior)	A-52
A-53	Pre-Test Front View of Deformable Barrier	A-53
A-54	Post-Test Front View of Deformable Barrier	A-54
A-55	Pre-Test Top View of Deformable Barrier	A-55
A-56	Post-Test Top View of Deformable Barrier	A-56
A-57	Pre-Test Right Side View of Deformable Barrier	A-57
A-58	Post-Test Right Side View of Deformable Barrier	A-58
A-59	Pre-Test Left Side View of Deformable Barrier	A-59
A-60	Post-Test Left Side View of Deformable Barrier	A-60
A-61	Vehicle on Rollover Device (0°)	A-61
A-62	Vehicle on Rollover Device (90°)	A-62
A-63	Vehicle on Rollover Device (180°)	A-63
A-64	Vehicle on Rollover Device (270°)	A-64
A-65	Vehicle Impact	A-65



Figure A-1: Left Front $\frac{3}{4}$ View, as Received



Figure A-2: Right Rear $\frac{3}{4}$ View, as Received



MFD BY GENERAL MOTORS OF CANADA LTD.

10/06

GVWR	GAWR FRT	GAWR RR
3085KG(6800LB)	1656KG(3650LB)	1792KG(3950LB)

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR
VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF
MANUFACTURE SHOWN ABOVE.

2GCEC13C271505318 TYPE: TRUCK

MODEL: C10543

CQR8	TIRE SIZE	SPEED RTG	RIM	COLD TIRE PRESSURE
FRT	P245/70R17	S	17X7.5J	240KPA(35PSI)
RR	P245/70R17	S	17X7.5J	240KPA(35PSI)
SPA	P245/70R17	S	17X7.5J	240KPA(35PSI)

SEE OWNER'S MANUAL  FOR MORE INFORMATION.

F 229
T 732

Figure A-3: Manufacturer's Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY

TOTAL 6

FRONT 3

REAR 3

The combined weight of occupants and cargo should never exceed 740 kg or 1632 lbs.

TIRE	ORIGINAL SIZE		COLD TIRE PRESSURE
FRONT	P245/70R17	S	240 kPa, 35 PSI
REAR	P245/70R17	S	240 kPa, 35 PSI
SPARE	P245/70R17	S	240 kPa, 35 PSI

**SEE OWNER'S
MANUAL FOR
ADDITIONAL
INFORMATION**

2GCEC13C271505318

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 $\frac{3}{4}$ View



Figure A-8: Post-Test Left Front $\frac{3}{4}$ View



Figure A-9: Pre-Test Left Side View



Figure A-10: Post-Test Left Side View



Figure A-11: Pre-Test Left Rear $\frac{3}{4}$ View



Figure A-12: Post-Test Left Rear $\frac{3}{4}$ View



Figure A-13: Pre-Test Rear View



Figure A-14: Post-Test Rear View



Figure A-15: Pre-Test Right Rear $\frac{3}{4}$ 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 3/4 View



Figure A-20: Post-Test Right Front $\frac{3}{4}$ View



Figure A-21: Pre-Test Overhead View



Figure A-22: Post-Test Overhead View

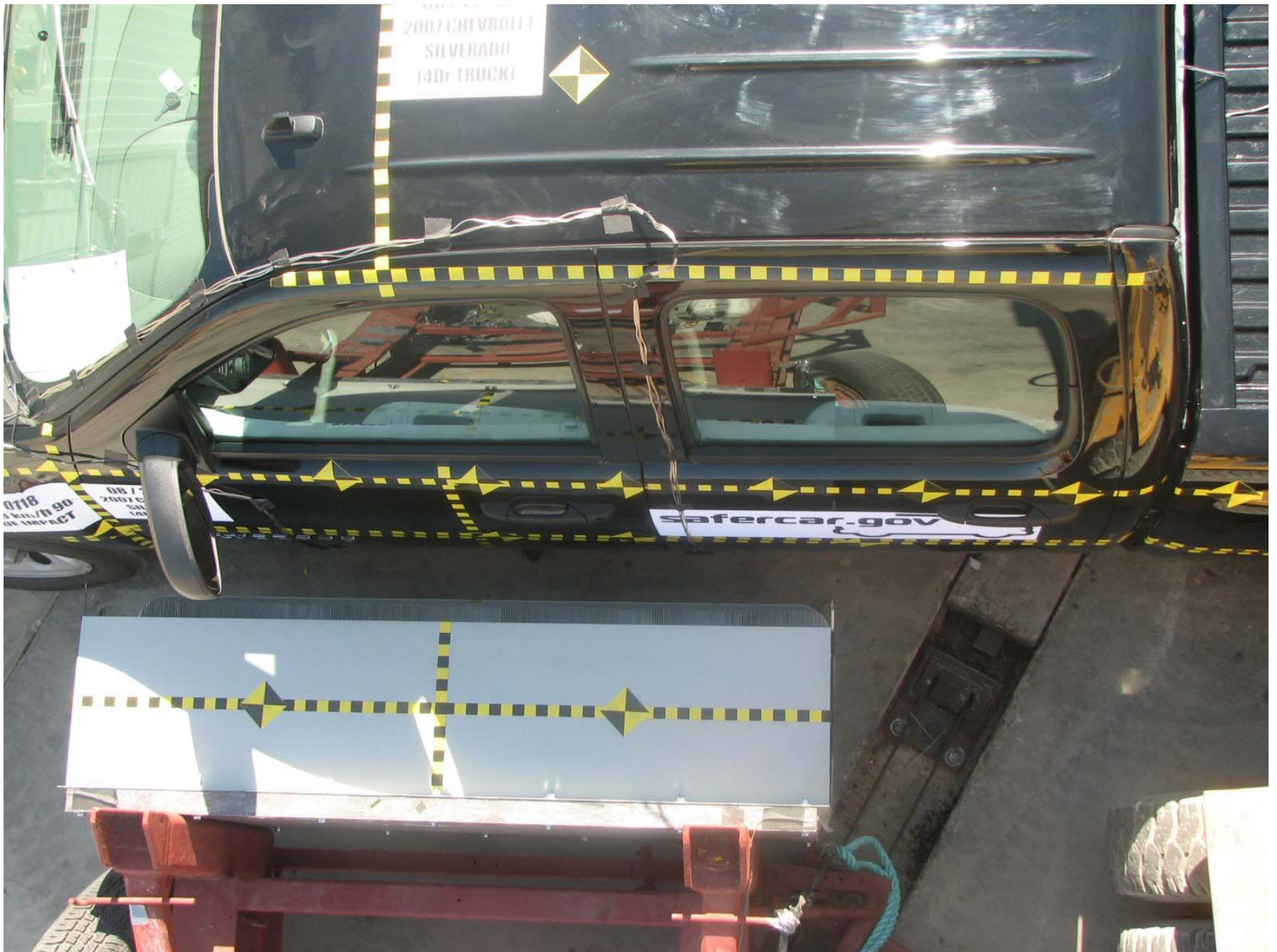


Figure A-23: Pre-Test Overhead Close-up View



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 $\frac{3}{4}$ View of Left Side Door



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



Figure A-29: Pre-Test Rear $\frac{3}{4}$ 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

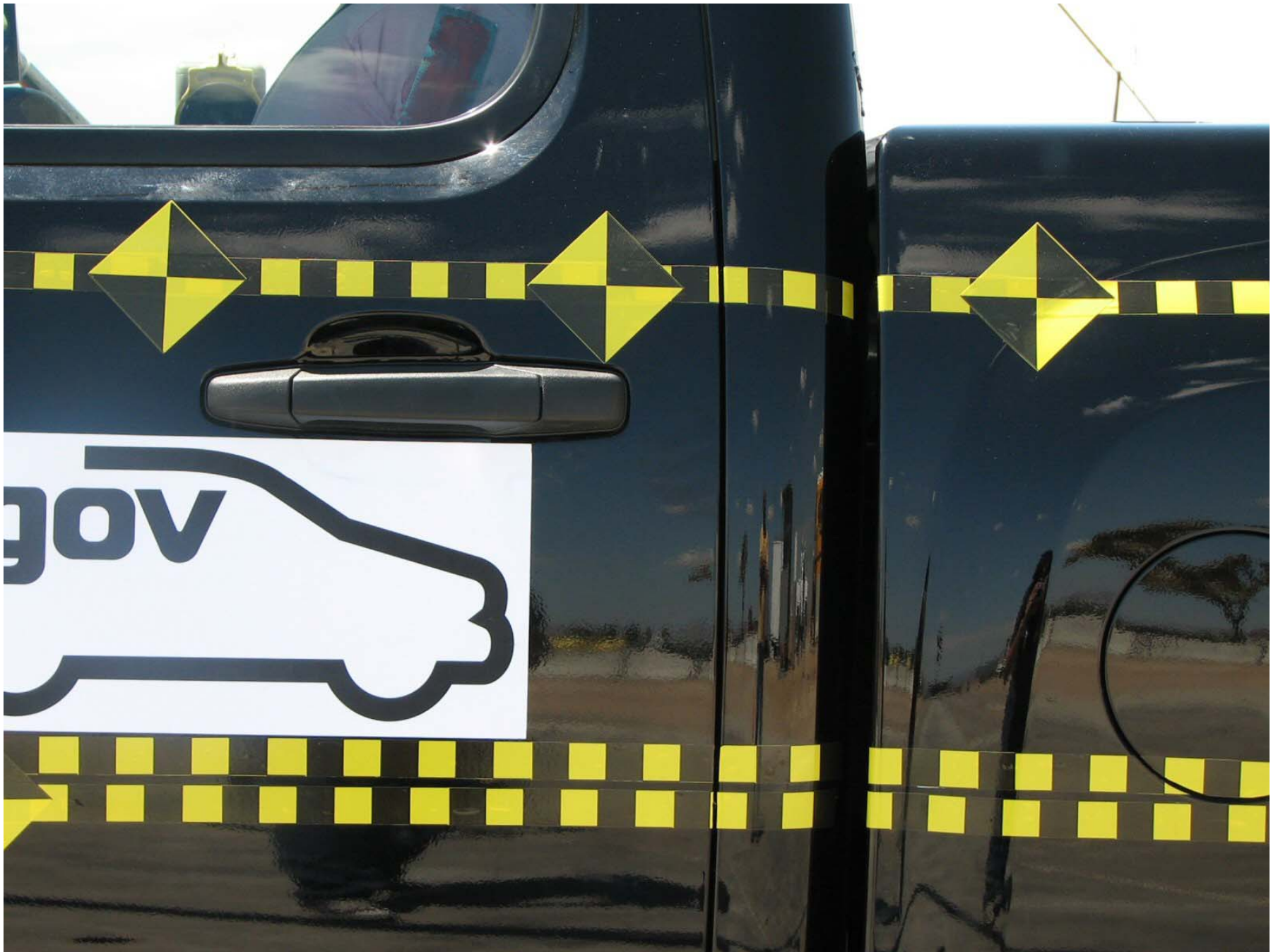


Figure A-33: Pre-Test Left Rear Door



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

**Photograph Not
Available**

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

**Photograph Not
Available**

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°)

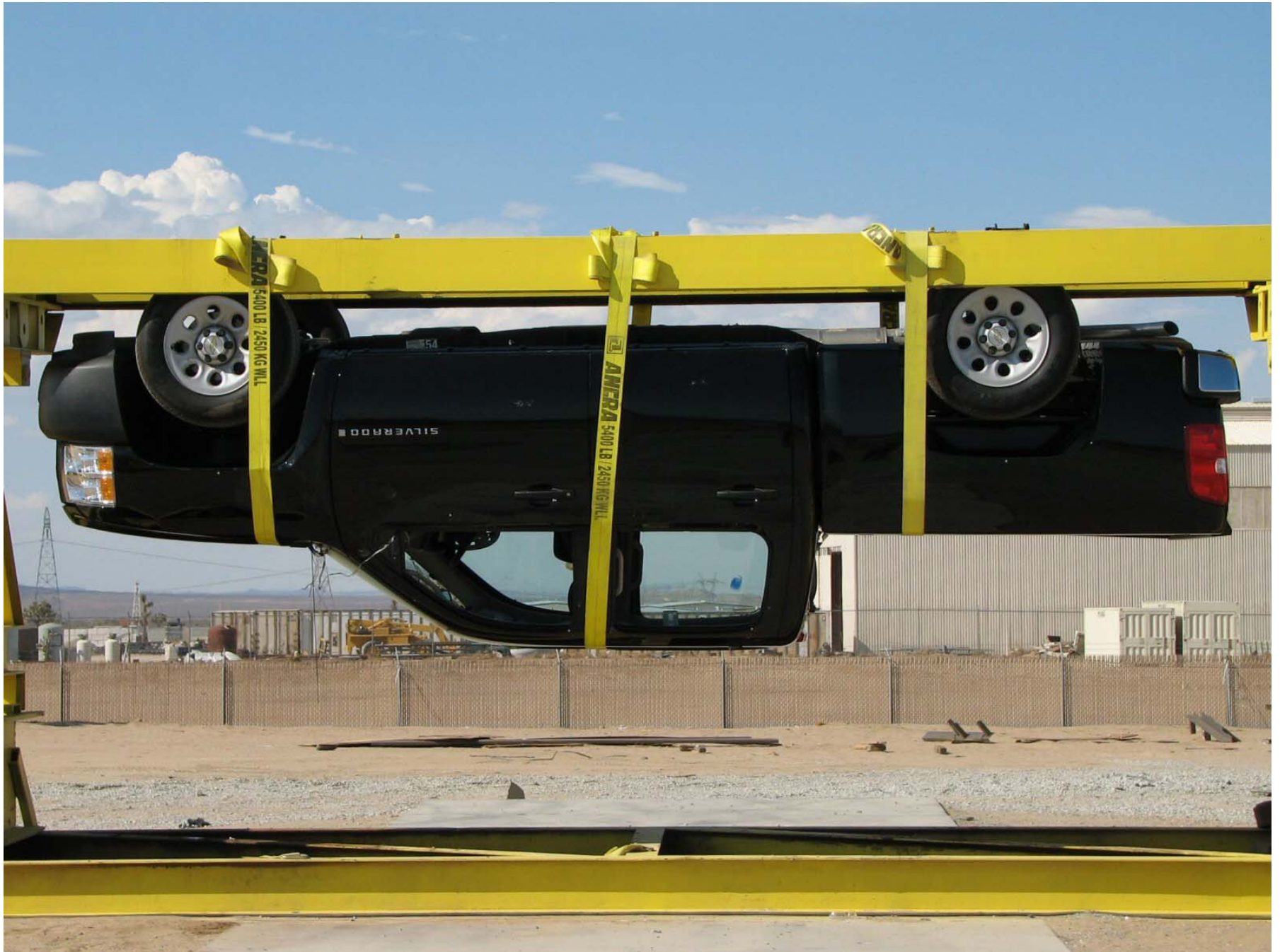


Figure A-63: Vehicle on Rollover Device (180°)

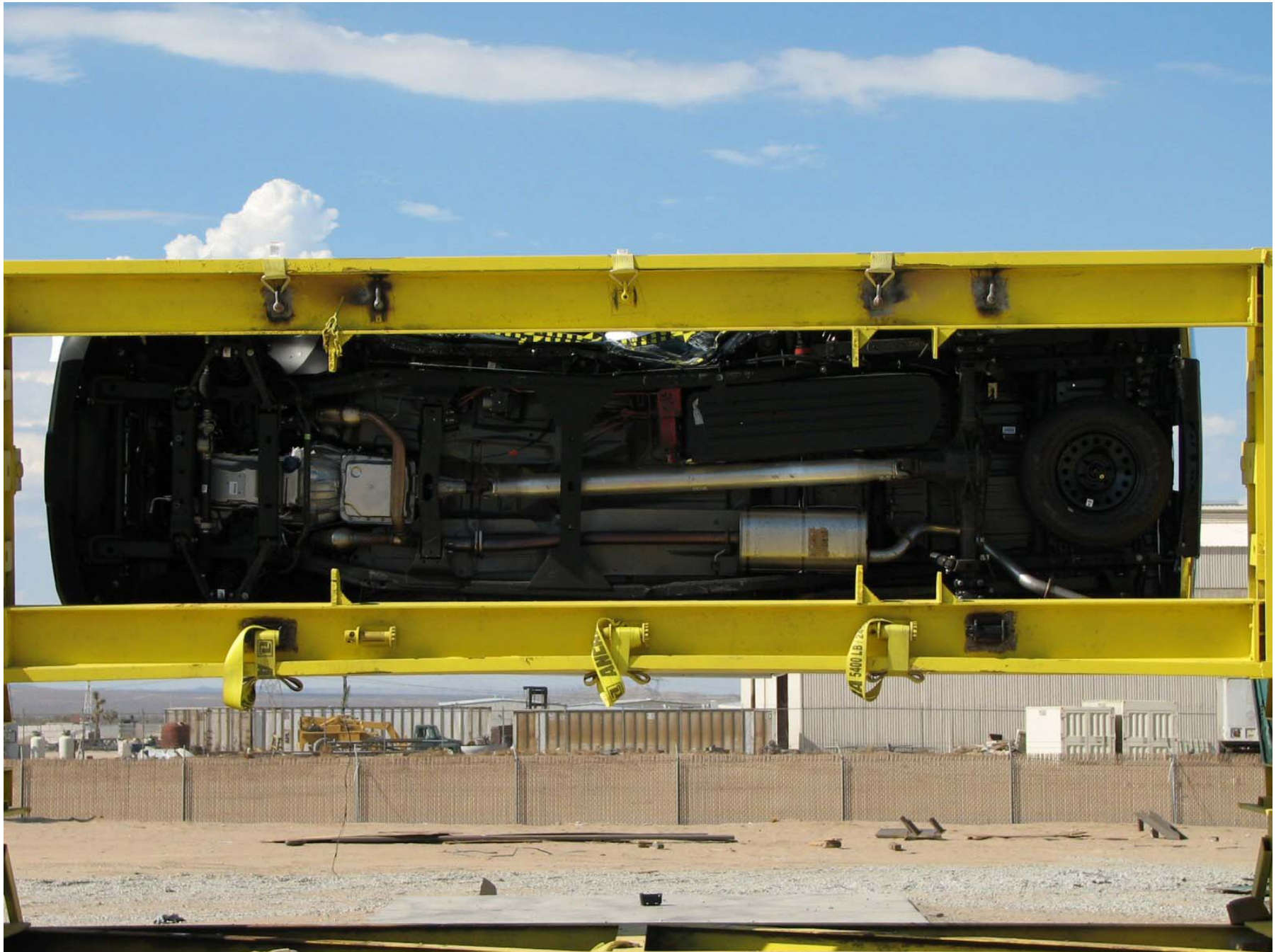


Figure A-64: Vehicle on Rollover Device (270°)



Figure A-65: Vehicle Impact

APPENDIX B
SID/HIII, VEHICLE AND MDB RESPONSE DATA

LIST OF DATA PLOTS

<u>Data Plot</u>	<u>Page</u>
B-1	Driver Upper Rib Primary Y
	Driver Lower Rib Primary Y
	Driver Lower Spine Primary Y
	Driver Pelvis Primary Y
B-2	Passenger Upper Rib Primary Y
	Passenger Lower Rib Primary Y
	Passenger Lower Spine Primary Y
	Passenger Pelvis Primary Y

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

LIST OF DATA PLOTS...(CONTINUED)

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

LIST OF DATA PLOTS...(CONTINUED)

Passenger Upper Rib Primary Y Velocity
Passenger Lower Rib Primary Y Velocity
Passenger Lower Spine Primary Y Velocity
Passenger Pelvis Primary Y Velocity
Passenger Upper Rib Redundant Y
Passenger Lower Rib Redundant Y
Passenger Lower Spine Redundant Y
Passenger Pelvis Redundant Y
Passenger Upper Rib Redundant Y Velocity
Passenger Lower Rib Redundant Y Velocity
Passenger Lower Spine Redundant Y Velocity
Passenger Pelvis Redundant Y Velocity
Passenger Thorax Contact
Passenger Pelvis Contact
Vehicle Right Sill at Front Seat X
Vehicle Right Sill at Front Seat Y
Vehicle Right Sill at Front Seat Z
Vehicle Right Sill Front Seat Resultant
Vehicle Right Sill at Front Seat X Velocity
Vehicle Right Sill at Front Seat Y Velocity
Vehicle Right Sill at Front Seat Z Velocity
Vehicle Right Sill at Rear Seat X
Vehicle Right Sill at Rear Seat Y
Vehicle Right Sill at Rear Seat Z
Vehicle Right Sill Rear Seat Resultant
Vehicle Right Sill at Rear Seat X Velocity
Vehicle Right Sill at Rear Seat Y Velocity
Vehicle Right Sill at Rear Seat Z Velocity
Vehicle Rear Floor Above Axle X
Vehicle Rear Floor Above Axle Y
Vehicle Rear Floor Above Axle Z
Vehicle Rear Floor Above Axle Resultant
Vehicle Rear Floor Above Axle X Velocity
Vehicle Rear Floor Above Axle Y Velocity
Vehicle Rear Floor Above Axle Z Velocity

LIST OF DATA PLOTS...(CONTINUED)

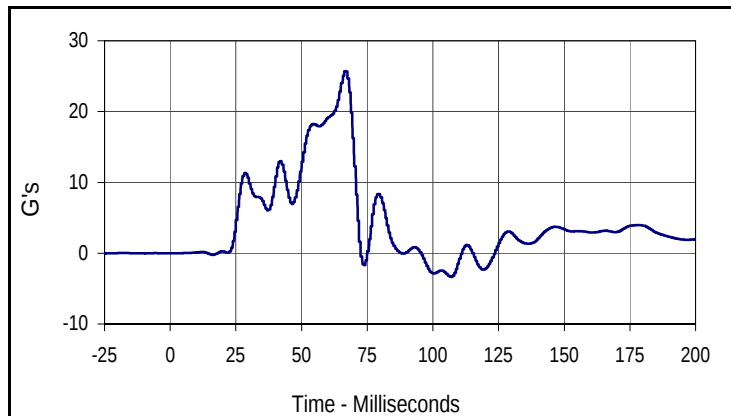
Vehicle Left Sill at Rear Door Y
Vehicle Left Sill at Front Door Y
Vehicle Left Sill at Rear Door Y Velocity
Vehicle Left Sill at Front Door Y Velocity
Vehicle Left Front Door C/L Y
Vehicle Right Rear Occupant Compartment
Vehicle Left Front Door Mid Rear Y
Vehicle Left Front Door Upper CL Y
Vehicle Left Front Door CL Y Velocity
Vehicle Right Rear Occupant Compartment Y Velocity
Vehicle Left Front Door Mid Rear Y Velocity
Vehicle Left Rear Door Upper CL Y Velocity
Vehicle Left Rear Door Mid Rear Y
Vehicle Left Rear Door Upper C/L Y
Vehicle Left Rear Door Mid Rear Y Velocity
Vehicle Left Rear Door Upper CL Y Velocity
Vehicle B-Post Lower Y
Vehicle B-Post Middle Y
Vehicle B-Post Lower Y Velocity
Vehicle B-Post Middle Y Velocity
Vehicle A-Post Lower Y
Vehicle A-Post Middle Y
Vehicle A-Post Lower Y Velocity
Vehicle A-Post Middle Y Velocity
Vehicle Left Front Seat Track
Vehicle Rear Seat Structure
Vehicle Left Front Seat Track Y Velocity
Vehicle Rear Seat Structure Y Velocity
Vehicle CG X
Vehicle CG Y
Vehicle CG Z
Vehicle CG Resultant
Vehicle CG X Velocity
Vehicle CG Y Velocity
Vehicle CG Z Velocity

LIST OF DATA PLOTS...(CONTINUED)

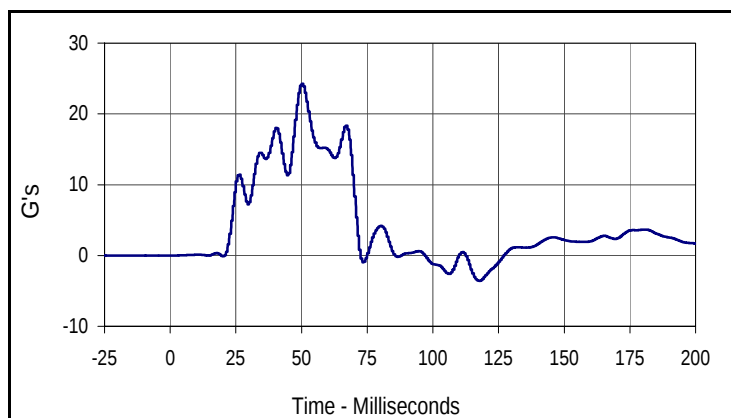
Driver Upper Rib Primary Y
Driver Lower Rib Primary Y
Driver Lower Spine Primary Y
Driver Pelvis Primary Y
Driver Upper Rib Redundant Y
Driver Lower Rib Redundant Y
Driver Lower Spine Redundant Y
Driver Pelvis Redundant Y
Passenger Upper Rib Primary Y
Passenger Lower Rib Primary Y
Passenger Lower Spine Primary Y
Passenger Pelvis Primary Y
Passenger Upper Rib Redundant Y
Passenger Lower Rib Redundant Y
Passenger Lower Spine Redundant Y
Passenger Pelvis Redundant Y
MDB CG X
MDB CG Y
MDB CG Z
MDB CG Resultant
MDB CG X Velocity
MDB CG Y Velocity
MDB CG Z Velocity
MDB Rear X
MDB Rear Y
MDB Rear X Velocity
MDB Rear Y Velocity
MDB Right Bumper Contact

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck
 Test Program: 55/28 km/h Side Impact NCAP

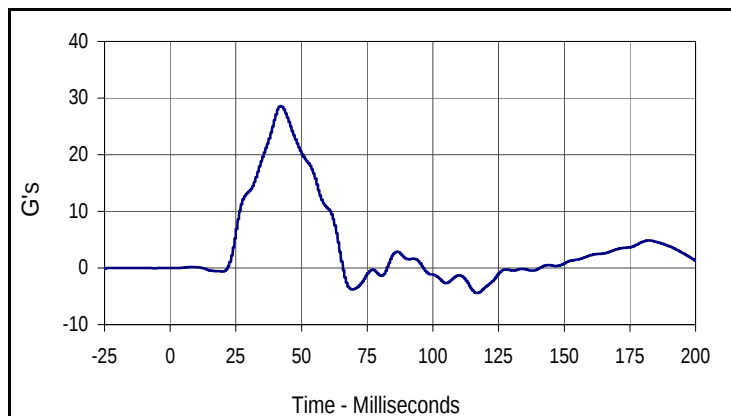
Test Date: 8/27/07
 NHTSA No.: G70118



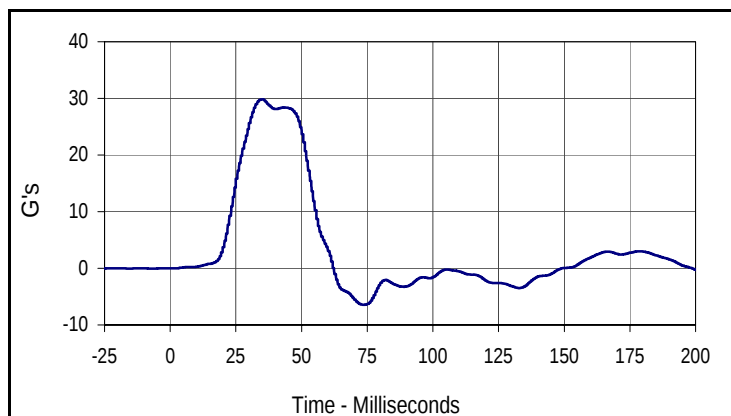
Curve Description			
Driver Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIR	FIR100	G's
Max	Time	Min	Time
25.7	66.3	-3.3	106.9



Curve Description			
Driver Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIR	FIR100	G's
Max	Time	Min	Time
24.3	50.0	-3.6	117.5



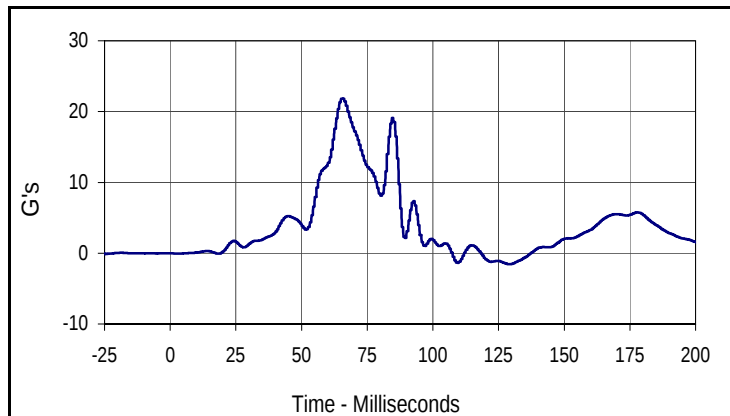
Curve Description			
Driver Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIR	FIR100	G's
Max	Time	Min	Time
28.6	41.9	-4.4	116.3



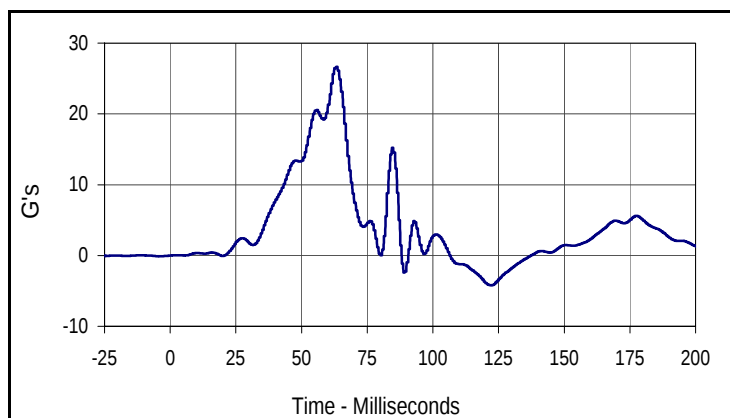
Curve Description			
Driver Pelvis Primary Y			
CURNO	Type	SAE Class	Units
004	FIR	FIR100	G's
Max	Time	Min	Time
29.8	34.4	-6.4	73.8

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck
 Test Program: 55/28 km/h Side Impact NCAP

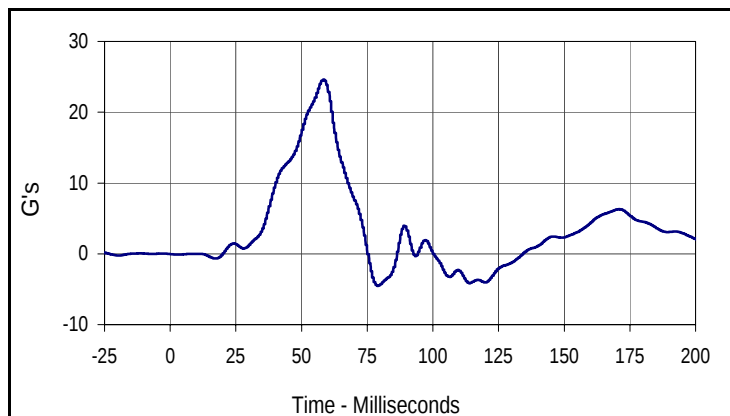
Test Date: 8/27/07
 NHTSA No.: G70118



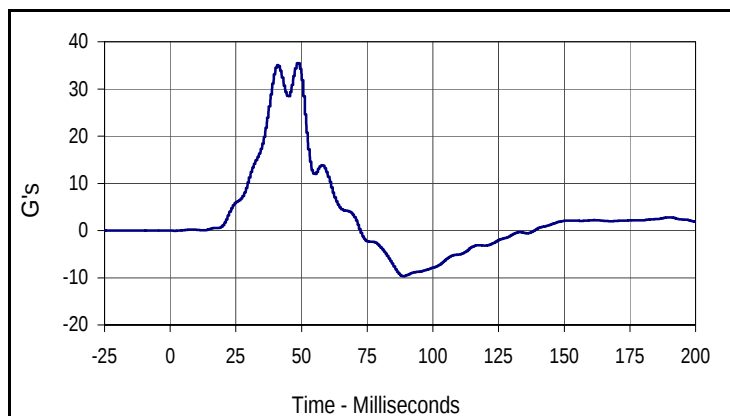
Curve Description			
Passenger Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
005	FIR	FIR100	G's
Max	Time	Min	Time
21.8	65.7	-1.6	128.8



Curve Description			
Passenger Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
006	FIR	FIR100	G's
Max	Time	Min	Time
26.7	63.2	-4.2	121.9



Curve Description			
Passenger Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
007	FIR	FIR100	G's
Max	Time	Min	Time
24.6	58.2	-4.5	78.8



Curve Description			
Passenger Pelvis Y Primary			
CURNO	Type	SAE Class	Units
008	FIR	FIR100	G's
Max	Time	Min	Time
35.5	48.8	-9.7	88.8

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
ATD Serial No.: 275

Test Date: 8/24/07
Test I.D.: N/A



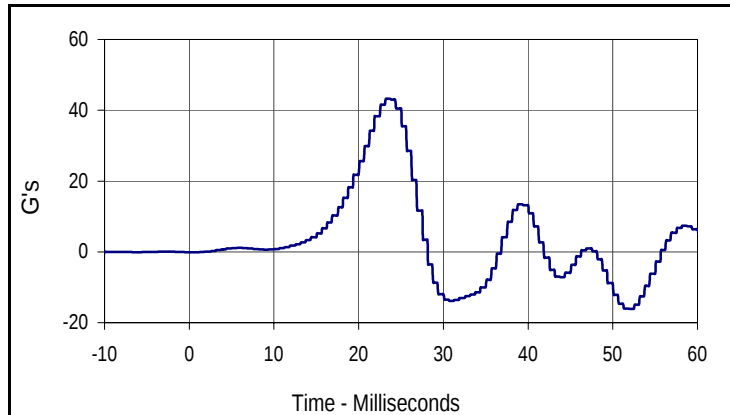
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	896	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	514	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	493	Pass
HW- Hip Width	mm	356 to 391	359	Pass
Overall Test Results				Pass

Test Program: SID / HIII Thorax Lateral Impact
 ATD Serial No.: 275

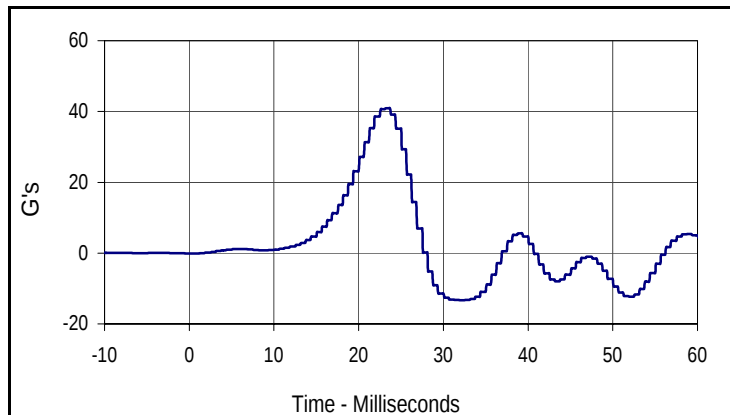
Test Date: 8/24/07
 Test I.D.: TH08B1



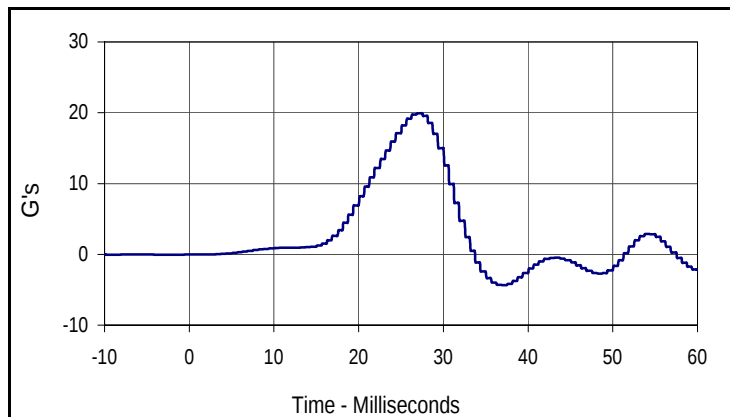
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.32	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	43.3	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	40.9	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.9	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
43.3	23.2	-16.1	51.9



Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
40.9	23.2	-13.3	31.9



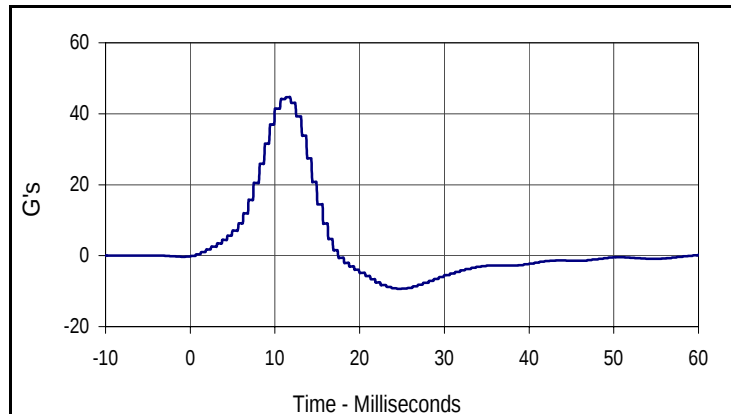
Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.9	26.9	-4.3	36.9

Test Program: SID / HIII Pelvis Lateral Impact
 ATD Serial No.: 275

Test Date: 8/24/07
 Test I.D.: PL08B1



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	4.28	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	44.7	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
Overall Test Results				Pass



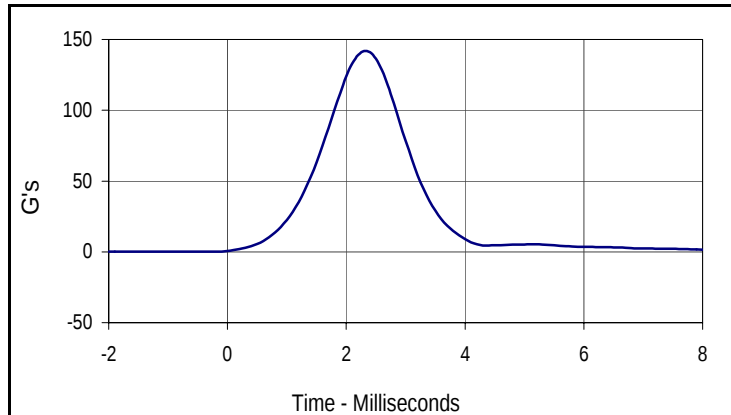
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
44.7	11.3	-9.4	24.4

Test Program: SID / HIII Head Drop Lateral Impact Test
 ATD Serial No.: 275

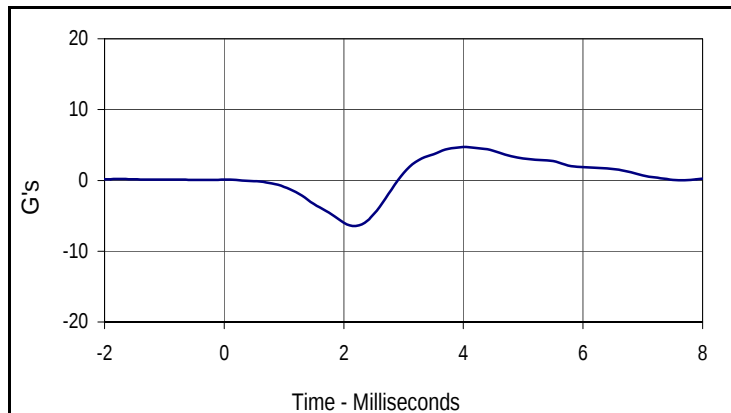
Test Date: 8/24/07
 Test I.D.: HD08B1



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	141.9	Pass
Peak Longitudinal Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.8	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
141.9	2.3	0.1	-1.0



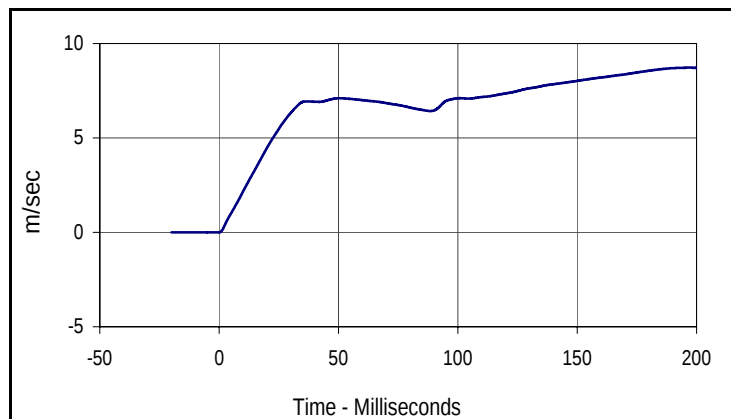
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.7	4.0	-6.4	2.2

Test Program: SID / HIII Neck Pendulum Lateral Test
 ATD Serial No.: 275

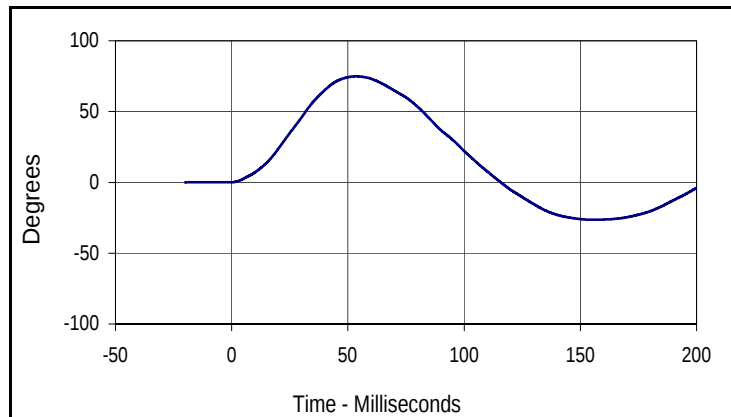
Test Date: 8/24/07
 Test I.D.: NB08B1



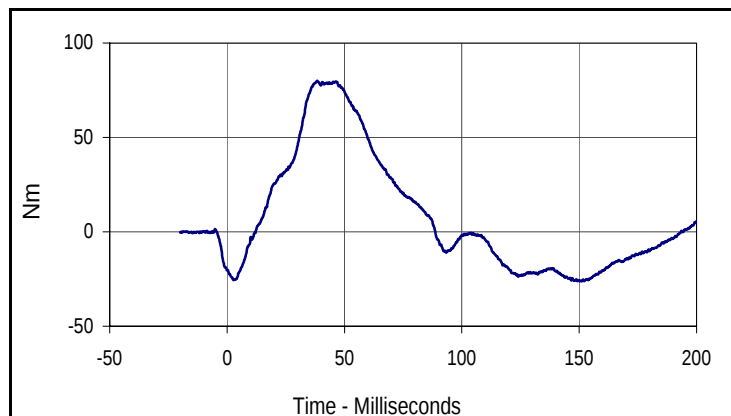
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	6.99	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.16	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.46	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.33	Pass
	40 to 70	m/sec	6.27 to 7.64	7.10	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	74.9	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.3	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	62.2	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	80.0	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
8.7	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
74.9	53.6	-26.4	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
80.0	38.3	-26.2	151.0

Test Program: SID / HIII External Measurements
 ATD Serial No.: 274

Test Date: 8/24/07
 Test I.D.: N/A



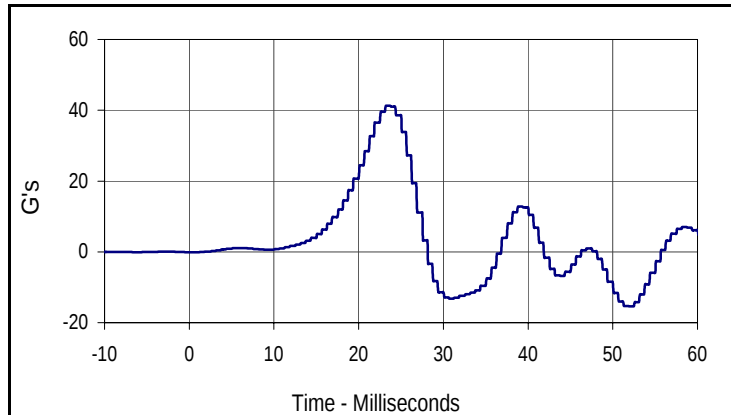
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	897	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	508	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	515	Pass
KV- Knee Pivot From Floor	mm	490 to 505	492	Pass
HW- Hip Width	mm	356 to 391	361	Pass
Overall Test Results				Pass

Test Program: SID / HIII Thorax Lateral Impact
 ATD Serial No.: 274

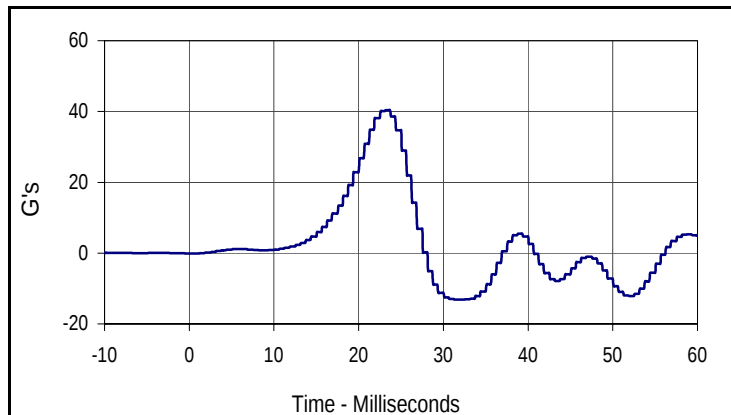
Test Date: 8/24/07
 Test I.D.: TH08A1



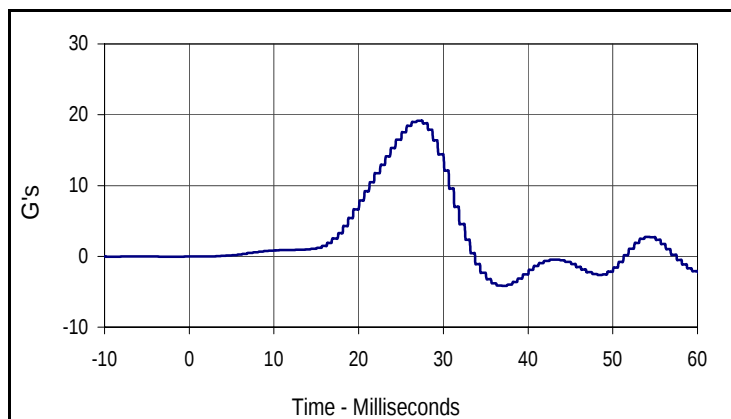
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.26	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	41.3	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	40.4	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.2	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
41.3	23.2	-15.4	51.9



Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
40.4	23.2	-13.1	31.9



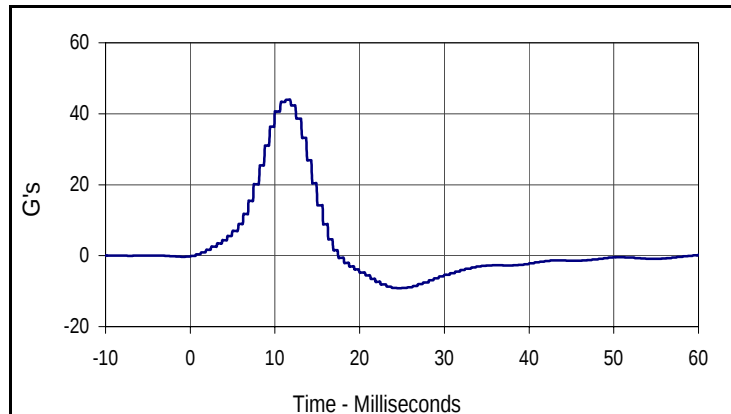
Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.2	26.9	-4.2	36.9

Test Program: SID / HIII Pelvis Lateral Impact
 ATD Serial No.: 274

Test Date: 8/24/07
 Test I.D.: PL08A1



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	4.28	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	43.9	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
Overall Test Results				Pass



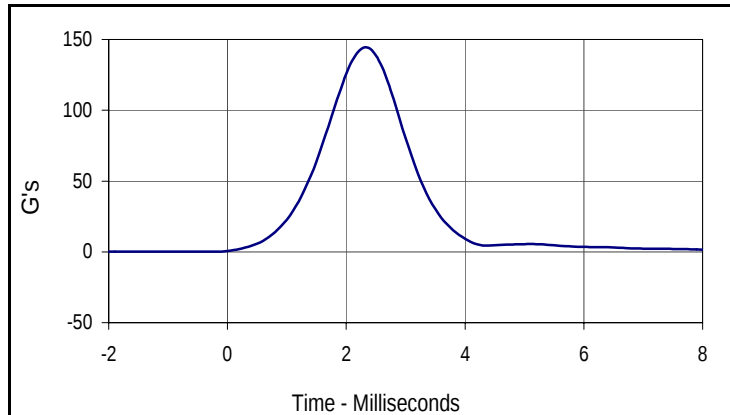
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
43.9	11.3	-9.2	24.4

Test Program: SID / HIII Head Drop Lateral Impact Test
 ATD Serial No.: 274

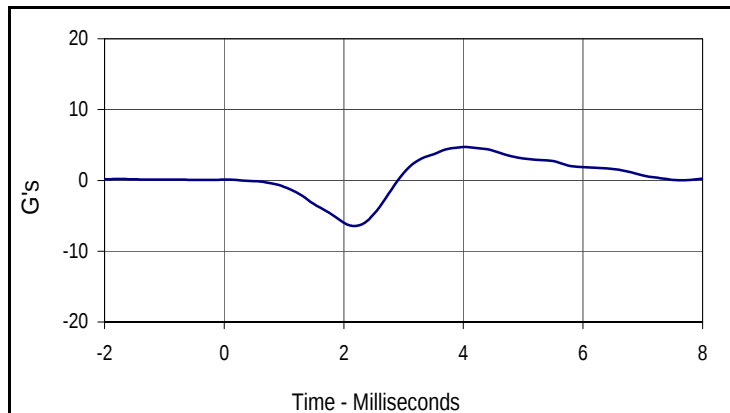
Test Date: 8/24/07
 Test I.D.: HD08A1



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	144.3	Pass
Peak Longitudinal Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.8	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
144.3	2.3	0.1	-1.0



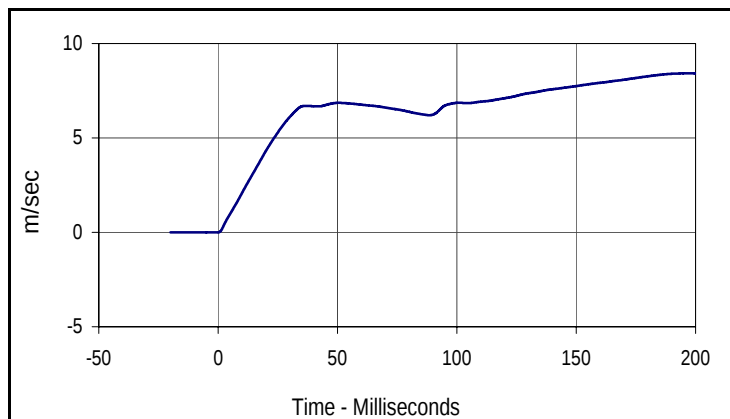
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.7	4.0	-6.4	2.2

Test Program: SID / HIII Neck Pendulum Lateral Test
 ATD Serial No.: 274

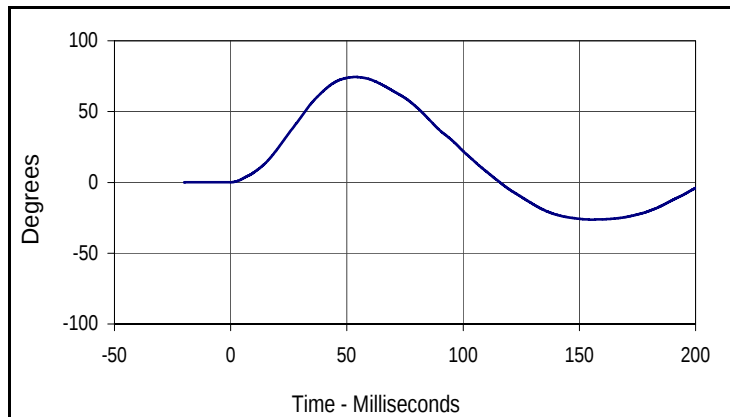
Test Date: 8/24/07
 Test I.D.: NB08A1



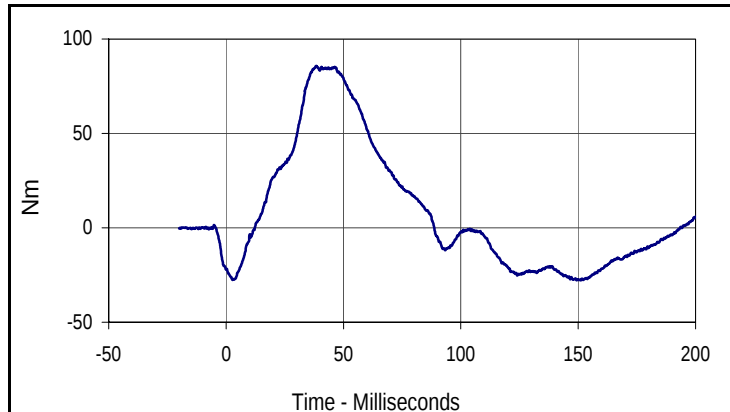
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.09	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.09	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.31	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.11	Pass
	40 to 70	m/sec	6.27 to 7.64	6.86	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	74.4	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.3	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	62.3	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	85.8	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
8.4	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
74.4	53.6	-26.3	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
85.8	38.3	-27.8	151.0

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

Test Program: SID / HIII External Measurements
ATD Serial No.: 275

Test Date: 8/27/07
Test I.D.: N/A



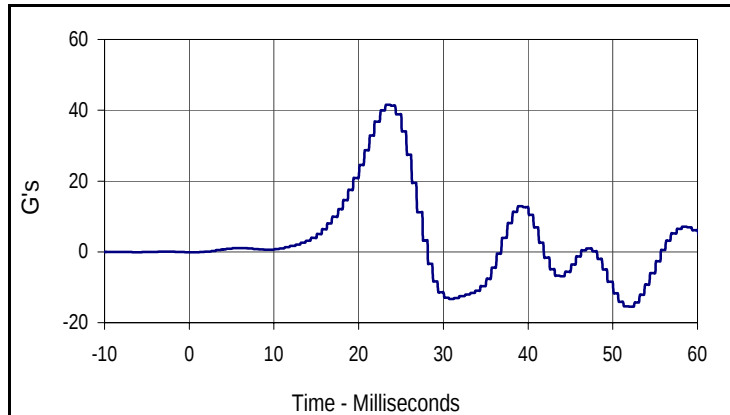
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	892	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	517	Pass
KV- Knee Pivot From Floor	mm	490 to 505	500	Pass
HW- Hip Width	mm	356 to 391	363	Pass
Overall Test Results				Pass

Test Program: SID / HIII Thorax Lateral Impact
 ATD Serial No.: 275

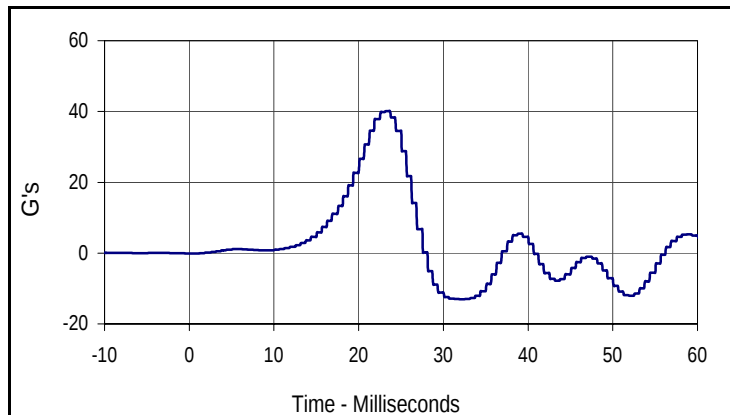
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 Test I.D.: TH08D1



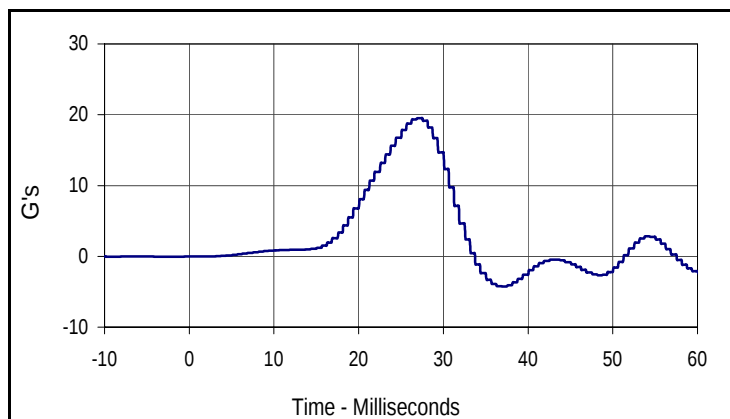
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.25	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	41.6	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	40.1	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.5	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
41.6	23.2	-15.5	51.9



Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
40.1	23.2	-13.0	31.9



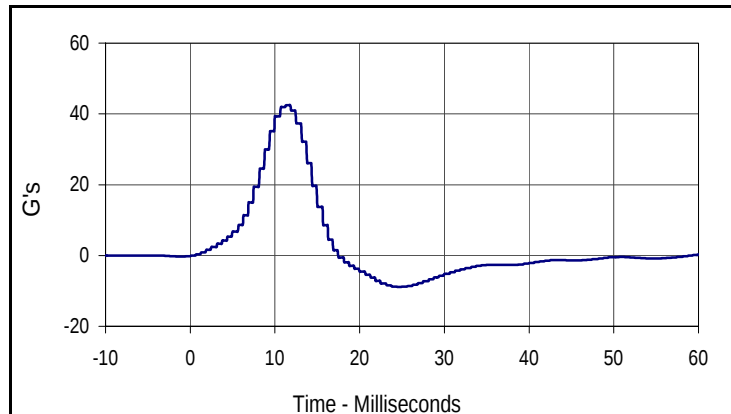
Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.5	26.9	-4.3	36.9

Test Program: SID / HIII Pelvis Lateral Impact
 ATD Serial No.: 275

Test Date: 8/27/07
 Test I.D.: PL08D1



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	4.23	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	42.5	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	6.70	Pass
Overall Test Results				Pass



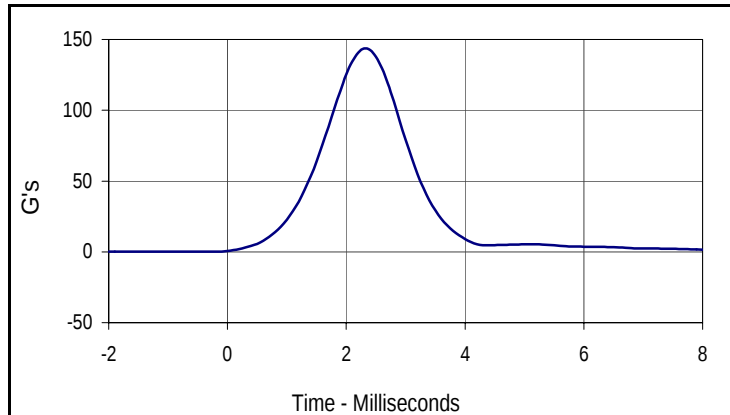
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
42.5	11.3	-8.9	24.4

Test Program: SID / HIII Head Drop Lateral Impact Test
 ATD Serial No.: 275

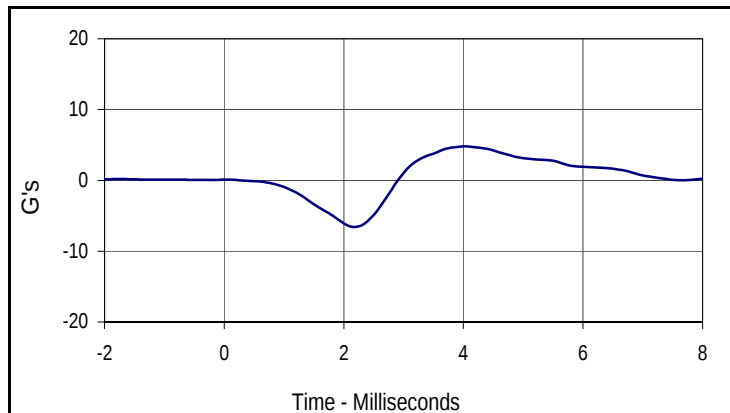
Test Date: 8/27/07
 Test I.D.: HD08D1



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	143.6	Pass
Peak Longitudinal Acceleration	G's	≤15.0	6.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.8	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
143.6	2.3	0.1	-1.0



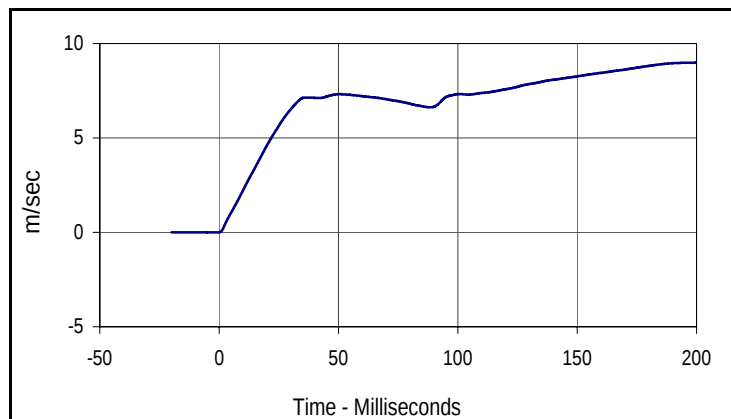
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.8	4.0	-6.6	2.2

Test Program: SID / HIII Neck Pendulum Lateral Test
 ATD Serial No.: 275

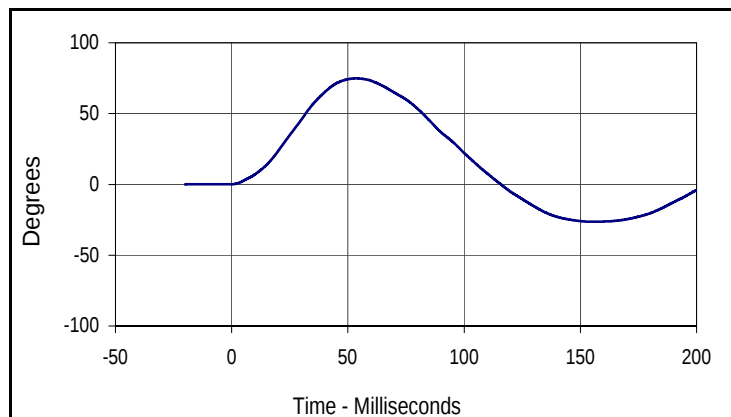
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 Test I.D.: NB08D1



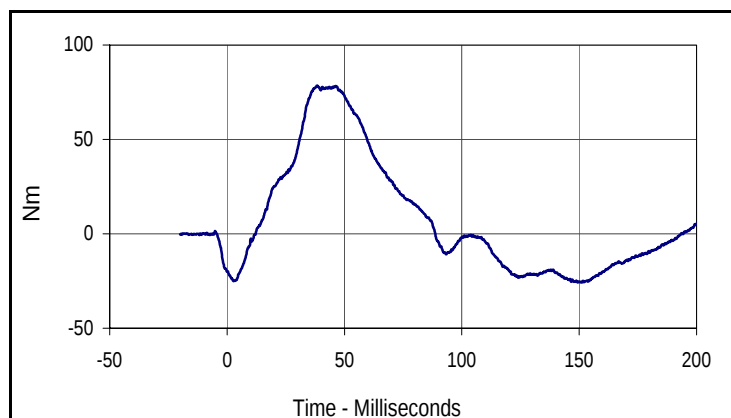
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.09	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.23	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.60	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.52	Pass
	40 to 70	m/sec	6.27 to 7.64	7.32	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	74.9	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.3	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	62.2	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	78.5	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
74.9	53.6	-26.4	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
78.5	38.3	-25.8	151.0

Test Program: SID / HIII External Measurements
 ATD Serial No.: 274

Test Date: 8/27/07
 Test I.D.: N/A



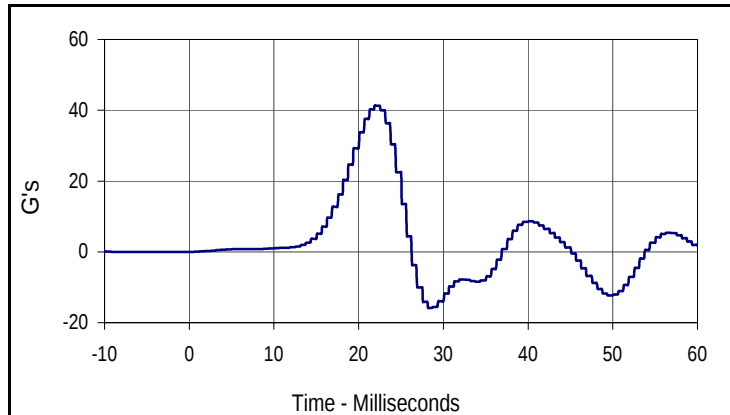
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	894	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	508	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	513	Pass
KV- Knee Pivot From Floor	mm	490 to 505	499	Pass
HW- Hip Width	mm	356 to 391	359	Pass
Overall Test Results				Pass

Test Program: SID / HIII Thorax Lateral Impact
 ATD Serial No.: 274

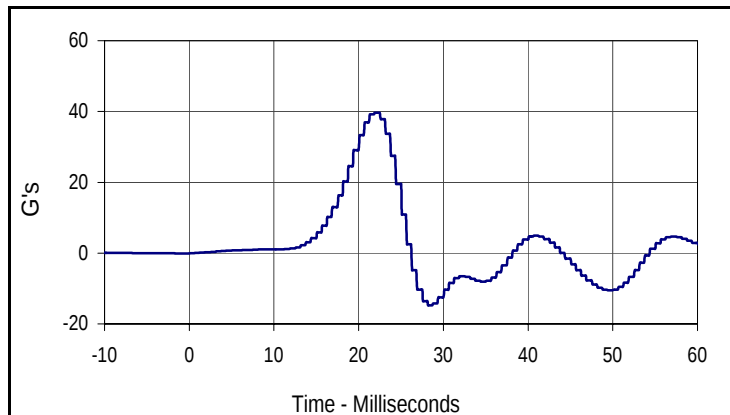
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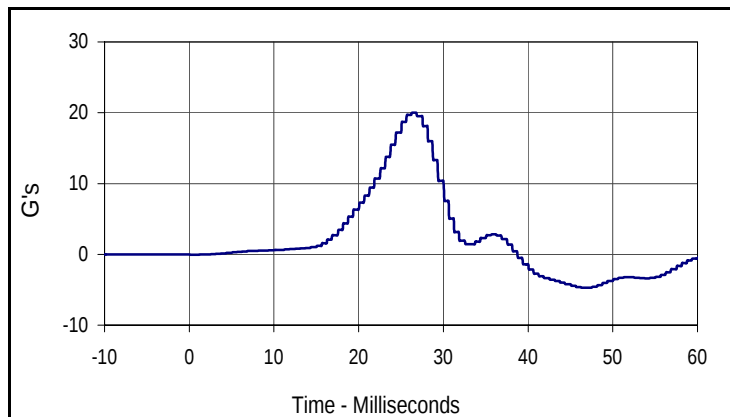
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.30	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	41.2	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	39.7	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.0	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
41.2	21.9	-15.9	28.2



Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
39.7	21.9	-14.8	28.2



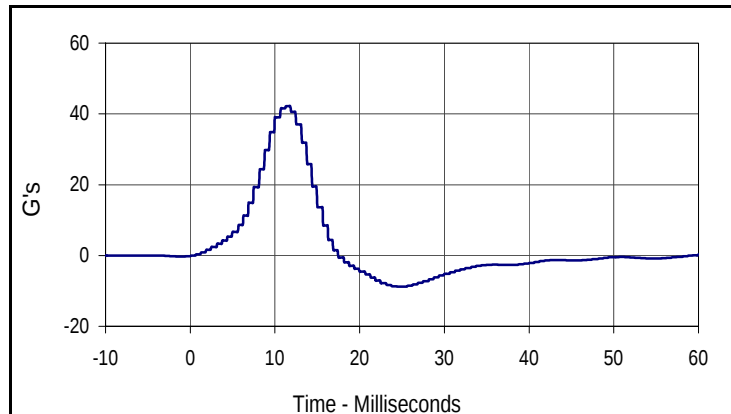
Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
20.0	26.3	-4.7	46.3

Test Program: SID / HIII Pelvis Lateral Impact
 ATD Serial No.: 274

Test Date: 8/27/07
 Test I.D.: PL08E1



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	4.28	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	6.70	Pass
Overall Test Results				Pass



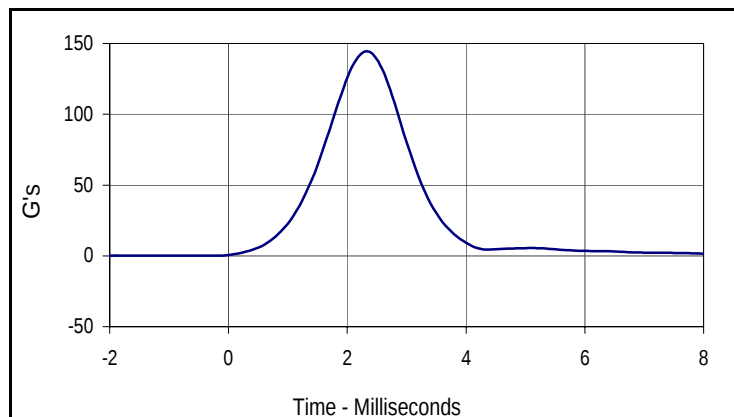
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
42.2	11.3	-8.8	24.4

Test Program: SID / HIII Head Drop Lateral Impact Test
 ATD Serial No.: 274

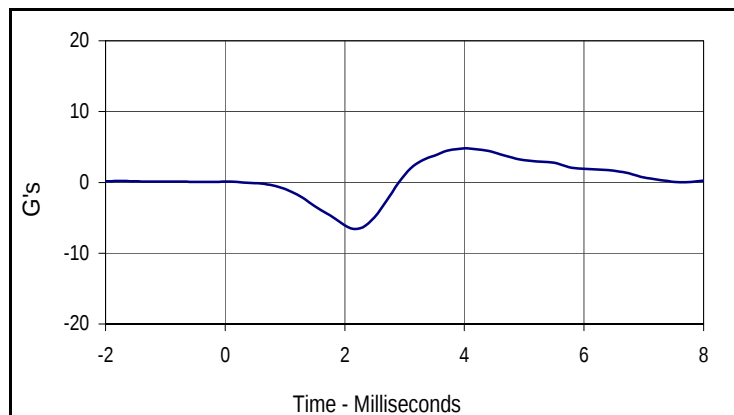
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 Test I.D.: HD08E1



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	144.3	Pass
Peak Longitudinal Acceleration	G's	≤15.0	6.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.8	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
144.3	2.3	0.1	-1.0



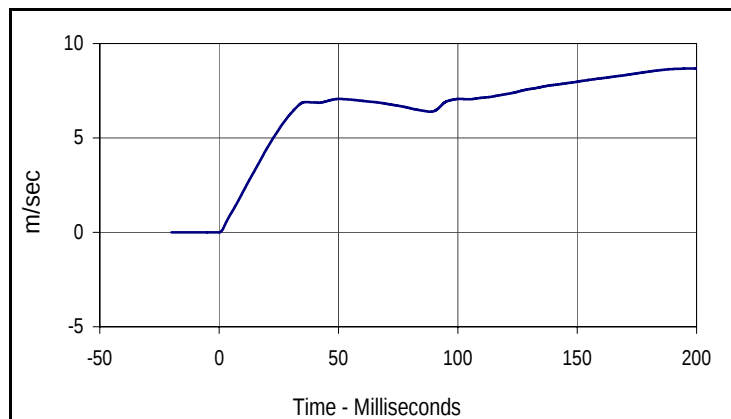
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.8	4.0	-6.6	2.2

Test Program: SID / HIII Neck Pendulum Lateral Test
 ATD Serial No.: 274

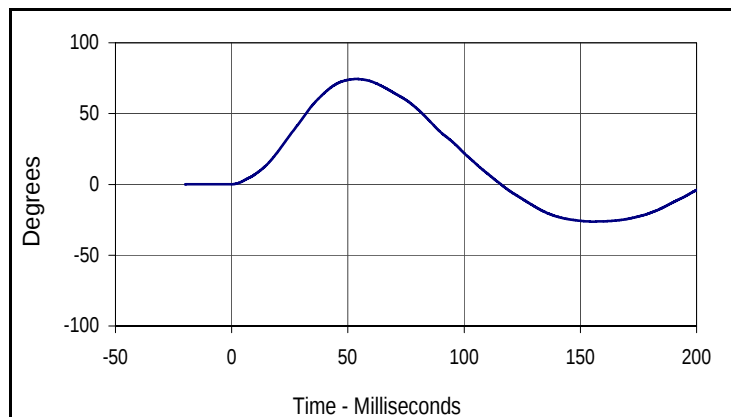
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 Test I.D.: NB08E1



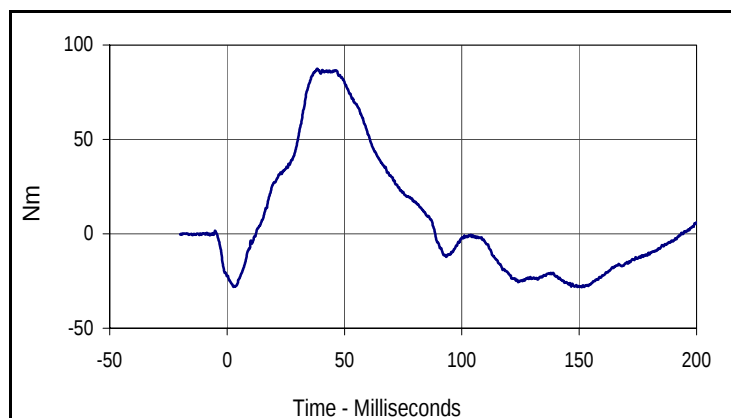
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.11	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.15	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.44	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.30	Pass
	40 to 70	m/sec	6.27 to 7.64	7.07	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	74.4	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.3	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	62.3	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	87.4	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
8.7	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
74.4	53.6	-26.3	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
87.4	38.3	-28.3	151.0

APPENDIX D
CHILD RESTRAINT SYSTEM

REPORT NUMBER TR-P27183-01-NC

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**GENERAL MOTORS OF CANADA LTD.
2007 CHEVROLET SILVERADO
4-DOOR TRUCK**

NHTSA NUMBER: G70118

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



AUGUST 27, 2007

FINAL REPORT

**PREPARED FOR:
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**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-03-D-32005.

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Date: August 27, 2007

Approved by: 
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

Date: August 27, 2007

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. TR-P27183-01-NC		2. Government Accession No.		3. Recipients Catalog No.	
4. Title and Subtitle Final Report of a Britax Companion NHTSA No. G70118				5. Report Date August 27, 2007	
				6. Performing Organization Code KAR	
7. Authors Mr. Johnny H. Dutto, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco				8. Performing Organization Report No. TR-P27183-01-NC	
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-03-D-32005	
12. Sponsoring Agency Name and Address 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				13. Type of Report and Period Covered 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 Britax Companion in conjunction with side impact NCAP testing on a 2007 Chevrolet Silverado 4-Door Truck, 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 August 27, 2007.					
Measurement Description		Units	Threshold	Right Rear (P3)	
Head Injury Criteria (HIC15)		N/A	390	85.9	
3 msec. Chest Clip		G's	50	34.8	
17. Key Words New Car Assesment Program (Side Impact NCAP) Side Impact Moving Deformable Barrier (MDB) Final Report of a Britax Companion				18. Distribution of Statement Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 1200 New Jersey Ave SE, W43-410 Washington, D.C. 20590	
19. Security Classification (this report) Unclassified		20. Security Classification (this page) Unclassified		21. No. of Pages 44	22. Price

TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Page</u>
D-1	Purpose and Summary of Test G70118	D1-1 to D1-8
D-2	Photographs	D2-1 to D2-18
D-3	CRABI Response and CRS Data Traces	D3-1 to D3-2
D-4	CRABI Calibration Information	D4-1 to D4-6

<u>Data Sheet</u>	<u>Description</u>	<u>Page</u>
1	Crash Test Summary	D1-2
2	Vehicle Parameter Data	D1-3
3	CRABI Positioning in Vehicle	D1-4
4	CRS Performance Data	D1-6
5	CRS Accelerometer Locations	D1-7
6	CRS Camera Locations and Data	D1-8

SECTION D-1

PURPOSE AND SUMMARY OF TEST G70118

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. 017) CRABI was calibrated prior to this test. CRABI calibration information is found in Section D-4.

CHILD DUMMY VALUES		
Location	HIC15 Value	3 Msec. Chest Clip
CRABI (P3)	85.9	34.8

DATA SHEET NO.1
CRASH TEST SUMMARY

Test Vehicle: 2007 Chevrolet Silverado 4-door truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

CHILD RESTRAINT SYSTEM INFORMATION

Description	Position #3 CRS
Manufacturer	Britax
Model Name	Companion
Model No.	E9L8069
Type	Infant
Forward/Rearward	Rearward

VISIBLE DUMMY CONTACT POINTS

Description	Position #3 CRS
Head Contact	Right Side of CRS, right shoulder harness
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 without tools, Remained closed during test

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: 2007 Chevrolet Silverado 4-door truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	693	476	1169	740	609	1349
Right	kg	660	478	1138	655	593	1248
Ratio	%	58.6	41.4	100.0	53.7	46.3	100.0
Totals	kg	1353	954	2307	1395	1202	2597

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2307
Weight of 2 P572 ATD's	kg	162
Rated Cargo/Luggage Wt. (RCLW)	kg	136
Calculated Vehicle Target Wt. (TVTW)	kg	2605

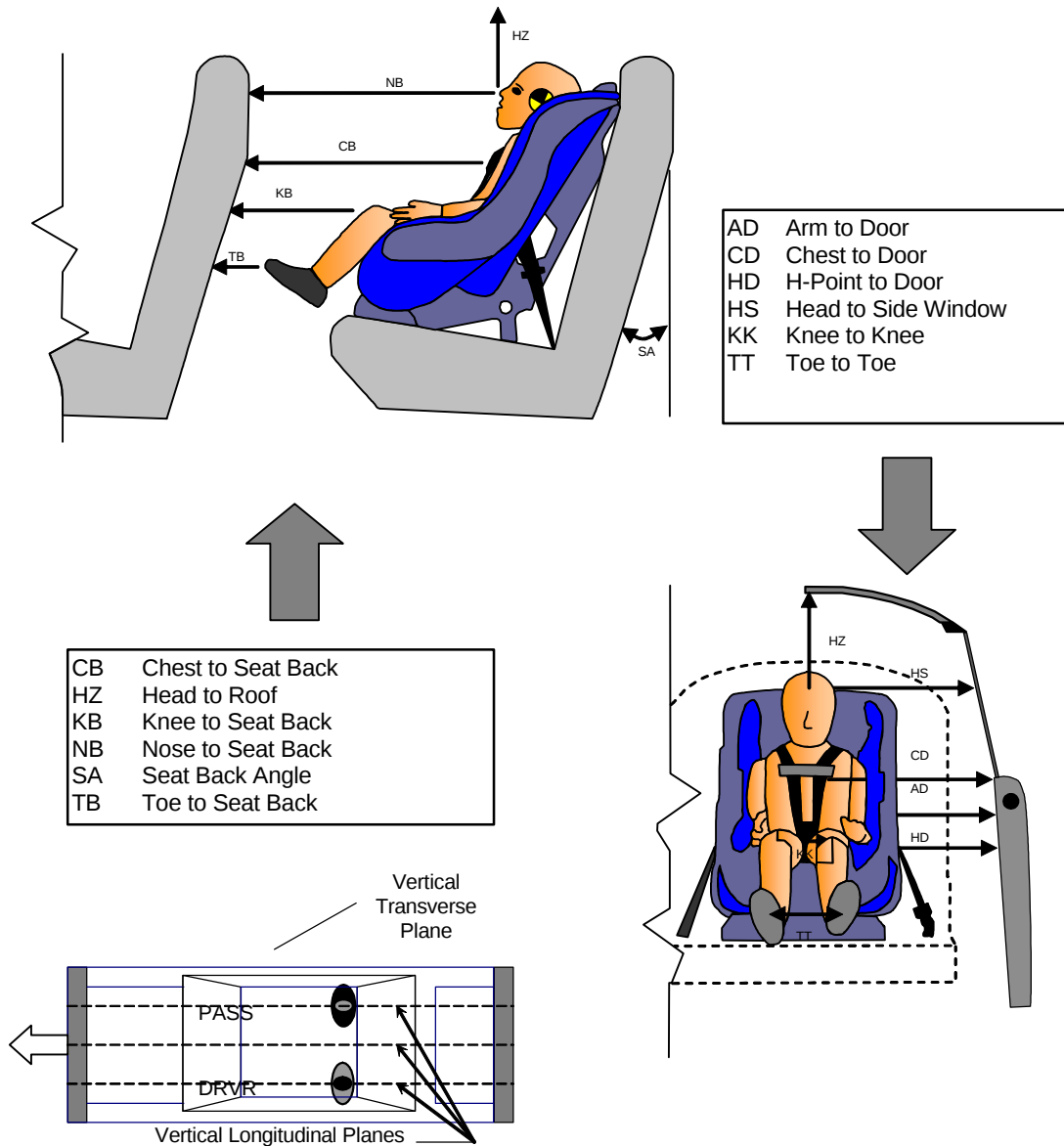
DATA SHEET NO.3 **CRABI POSITIONING IN VEHICLE**

Test Vehicle: 2007 Chevrolet Silverado 4-door truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

DATA SHEET NO.3
CRABI POSITIONING IN VEHICLE...(CONTINUED)

Test Vehicle: 2007 Chevrolet Silverado 4-door truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

CRABI POSITION MEASUREMENTS

Code	Measurement	P3 (Passenger's Side)	
		Length (mm)	Angle (°)
SA	Seat Back Angle		20.0
HZ	Head to Roof (Z)	430	
CD	Chest to Door	385	
KK	Knee to Knee (Y)	130	
HS	Head to Side Window	400	
HD	H-Point to Door (Y)	285	
AD	Arm to Door	275	
NB	Nose to Seat Back	486	
CB	Chest to Seat Back	396	
FF	Foot to Foot	120	
KB-Left	Knee to Seat Back	160	
KB-Right	Knee to Seat Back	158	
TB-Left	Toe to Seat Back	50	
TB-Right	Toe to Seat Back	62	

DATA SHEET NO.4
CRS PERFORMANCE DATA

Test Vehicle: 2007 Chevrolet Silverado 4-door truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

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: 2007 Chevrolet Silverado 4-Door Truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

CRS ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	CRS	2495	660	1045
2	CRS Base	2505	690	940

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 Chevrolet Silverado 4-door truck

NHTSA No.: G70118

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 8/27/07

CAMERA LOCATIONS

No.	Camera View	Location(mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Passenger CRS (O.B.)	1058	2182	-1608	-2	n/a	10	1000

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

SECTION D2

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure		Page
1	Close-up, Position 3 CRS Label	D-1
2	Pre-Test Frontal View of Position 3 CRS	D-2
3	Post-Test Frontal View of Position 3 CRS	D-3
4	Pre-Test Rear View of Position 3 CRS	D-4
5	Post-Test Rear View of Position 3 CRS	D-5
6	Pre-Test Left Side View of Position 3 CRS	D-6
7	Post-Test Left Side View of Position 3 CRS	D-7
8	Pre-Test Right Side View of Position 3 CRS	D-8
9	Post-Test Right Side View of Position 3 CRS	D-9
10	Pre-Test Position 3 Front View (Head and Seat Belt Position)	D-10
11	Post-Test Position 3 Front View (Head and Seat Belt Position)	D-11
12	Pre-Test Position 3 Front View (Seat Belt Position)	D-12
13	Post-Test Position 3 Front View (Seat Belt Position)	D-13
14	Pre-Test Position 3 Right Side View	D-14
15	Post-Test Position 3 Right Side View	D-15
16	Pre-Test Position 3 Left Side View	D-16
17	Post-Test Position 3 Left Side View	D-17
18	Post-Test Position 3 Dummy Legs	D-18

Serial #: E9L8069009652

Model #: E9L8069

Batch #: J000010377

Manufactured In: 07/17/07

Manufactured in Charlotte, NC, USA



Figure D2-1: Position 3 CRS Label

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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)



SECTION D3

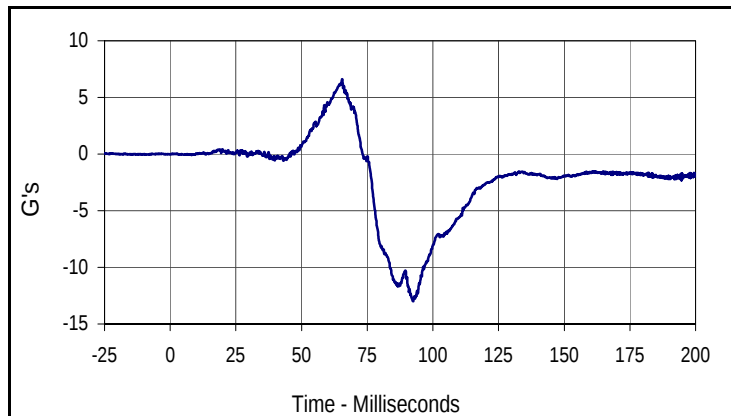
CRABI RESPONSE AND CRS DATA TRACES

LIST OF DATA PLOTS

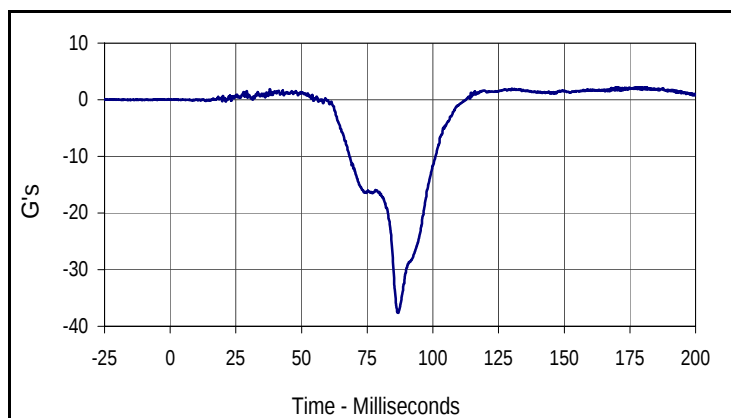
<u>Data Plot</u>	<u>Page</u>
D3-1	Right Rear CRABI Head X
	Right Rear CRABI Head Y
	Right Rear CRABI Head Z
	Right Rear CRABI Head Resultant
D3-2	Right Rear CRABI Chest X
	Right Rear CRABI Chest Y
	Right Rear CRABI Chest Z
	Right Rear CRABI Chest Resultant

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck
 Test Program: 55/28 km/h Side Impact NCAP

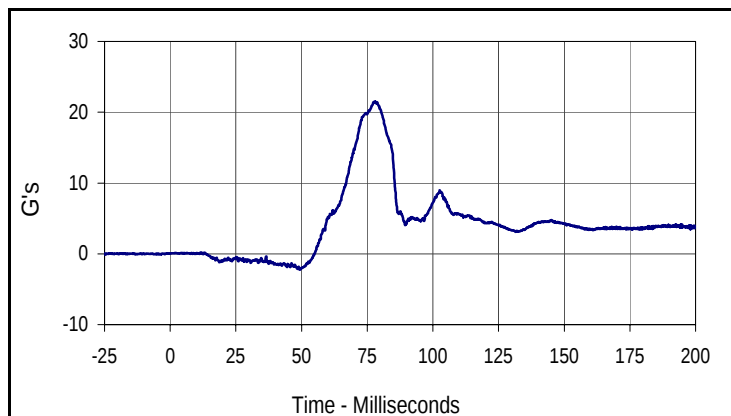
Test Date: 8/27/07
 NHTSA No.: G70118



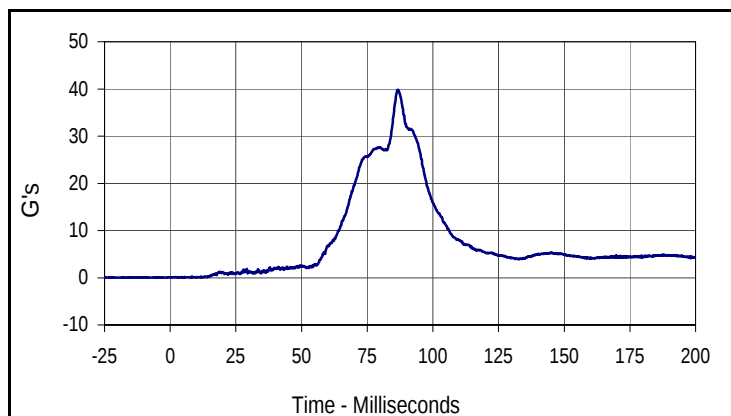
Curve Description			
CRABI Head X (P3)			
CURNO	Type	SAE Class	Units
072	FIL	1000	G's
Max	Time	Min	Time
6.6	65.5	-13.0	92.4



Curve Description			
CRABI Head Y (P3)			
CURNO	Type	SAE Class	Units
073	FIL	1000	G's
Max	Time	Min	Time
2.2	169.8	-37.6	86.8



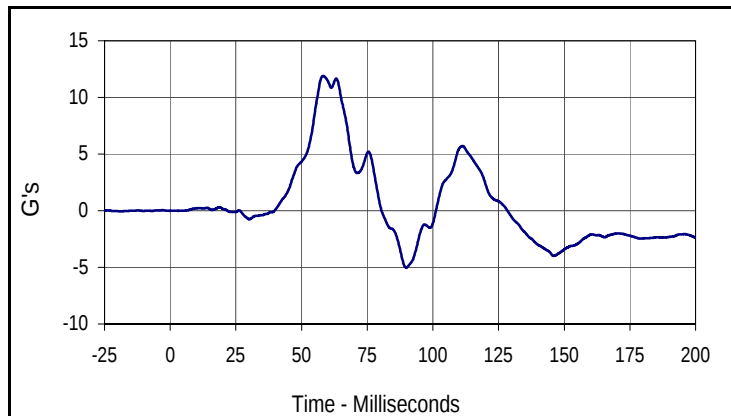
Curve Description			
CRABI Head Z (P3)			
CURNO	Type	SAE Class	Units
074	FIL	1000	G's
Max	Time	Min	Time
21.5	78.0	-2.2	49.2



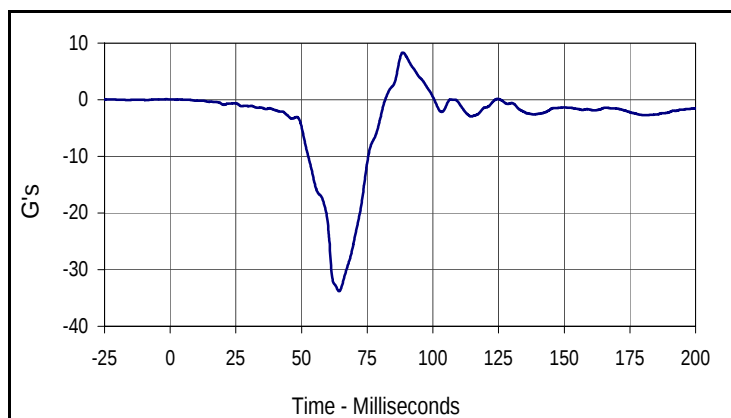
Curve Description			
CRABI Head Resultant (P3)			
CURNO	Type	SAE Class	Units
072	RES	1000	G's
Max	Time	Min	Time
39.8	86.7	0.0	9.8

Test Vehicle: 2007 Chevrolet Silverado 4-Door Truck
 Test Program: 55/28 km/h Side Impact NCAP

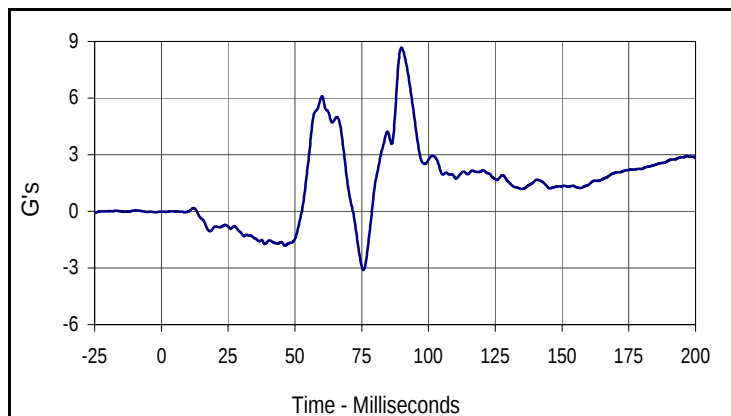
Test Date: 8/27/07
 NHTSA No.: G70118



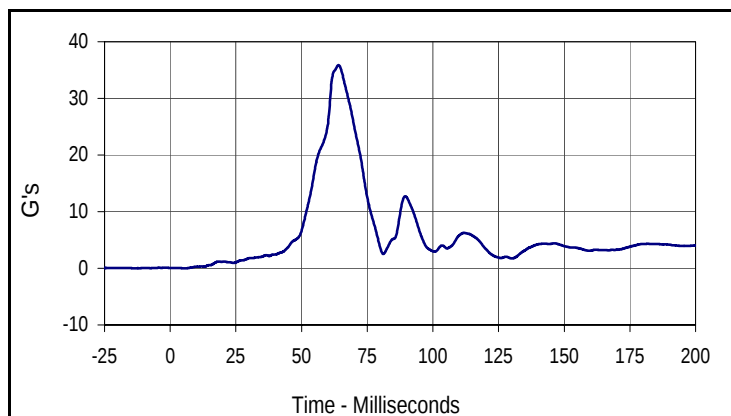
Curve Description			
CRABI Chest X (P3)			
CURNO	Type	SAE Class	Units
082	FIL	180	G's
Max	Time	Min	Time
11.9	58.1	-5.0	89.8



Curve Description			
CRABI Chest Y (P3)			
CURNO	Type	SAE Class	Units
083	FIL	180	G's
Max	Time	Min	Time
8.3	88.6	-33.8	64.3



Curve Description			
CRABI Chest Z (P3)			
CURNO	Type	SAE Class	Units
084	FIL	180	G's
Max	Time	Min	Time
8.7	89.9	-3.1	75.6



Curve Description			
CRABI Chest Resultant (P3)			
CURNO	Type	SAE Class	Units
082	RES	180	G's
Max	Time	Min	Time
35.9	64.1	0.0	4.9

SECTION D4

CRABI CALIBRATION INFORMATION

Test Program: CRABI 12 Month Old Frontal Head Drop Test

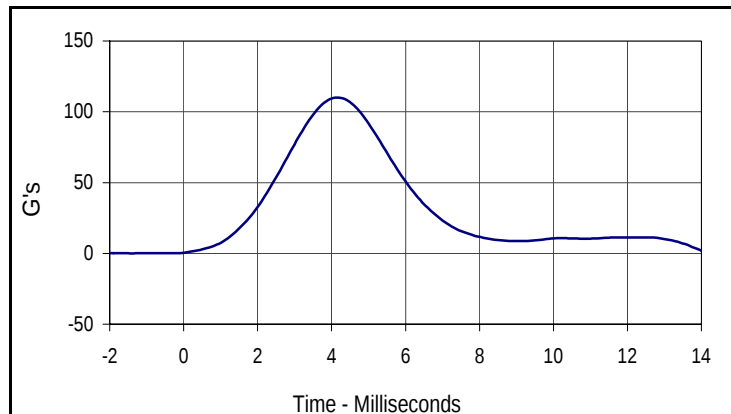
Test Date: 8/23/07

ATD Serial No.: 017

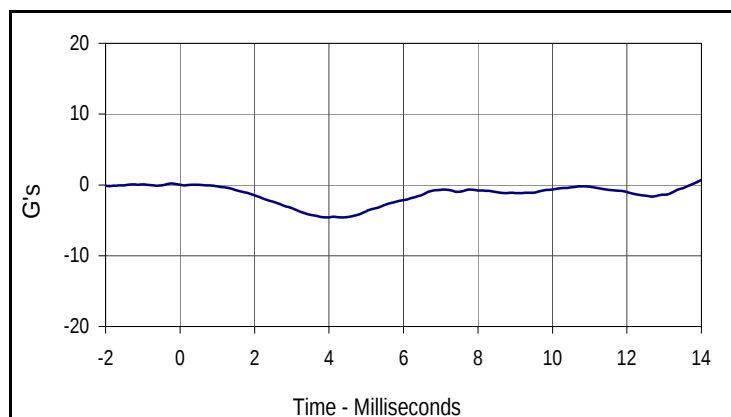
Test I.D.: FHD08C1



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	110.1	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
110.1	4.2	0.0	-1.4



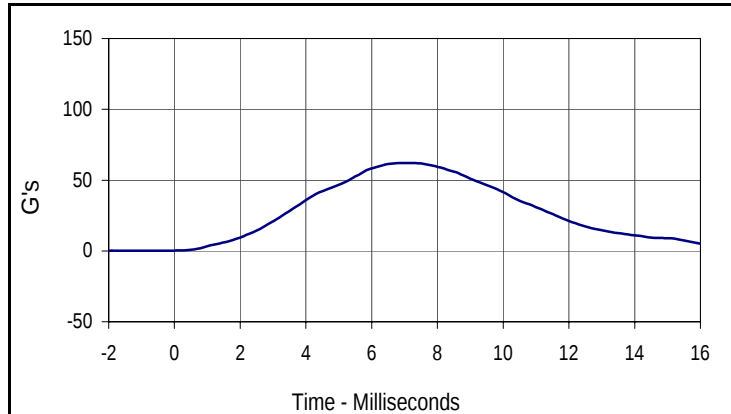
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.2	-0.2	-4.6	3.9

Test Program: CRABI 12 Month Old Rear Head Drop Test
 ATD Serial No.: 017

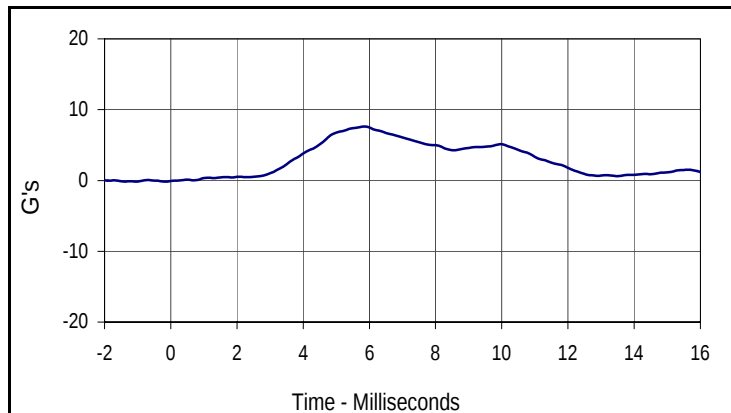
Test Date: 8/23/07
 Test I.D.: RHD08C1



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	58.3	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
58.3	6.0	0.1	-0.9



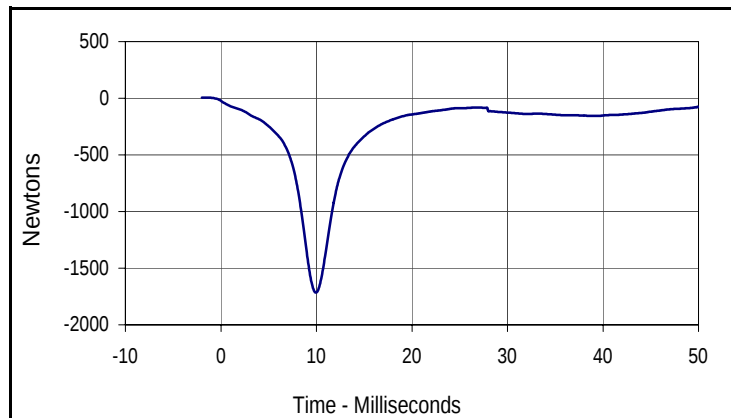
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.6	5.8	-0.2	-1.4

Test Program: CRABI 12 Month Old Thorax Impact Test
 ATD Serial No.: 017

Test Date: 8/23/07
 Test I.D.: CH08C1



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	5.06	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1716	Pass
Overall Test Results				Pass



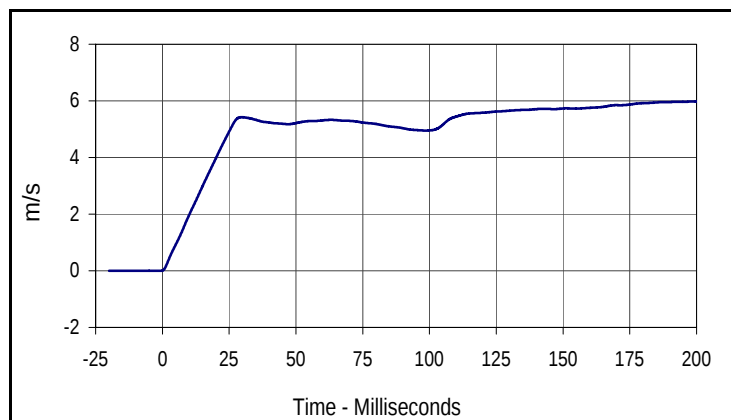
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
6.1	-1.6	-1715.6	10.0

Test Program: CRABI 12 Month Old Neck Flexion Test
 ATD Serial No.: 017

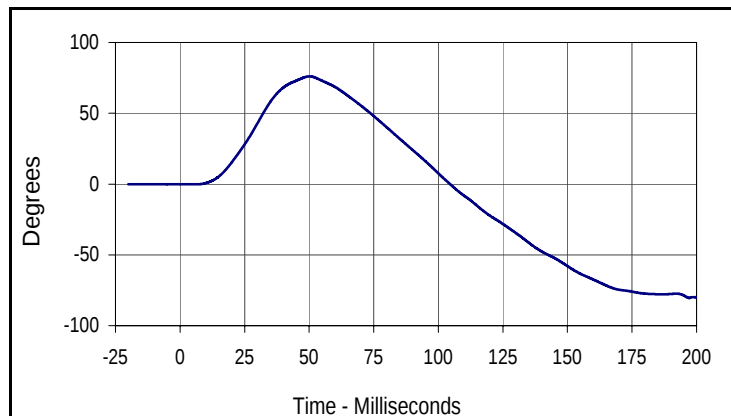
Test Date: 8/23/07
 Test I.D.: NF08C1



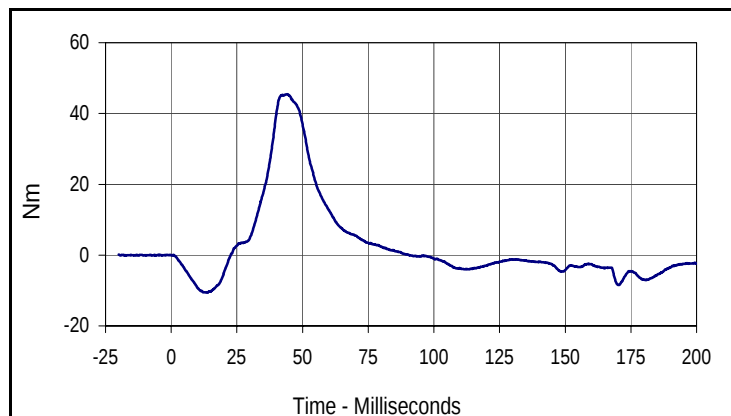
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.12	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	2.0	Pass
	20 Msec.	m/s	3.4 to 4.2	4.0	Pass
	25 Msec.	m/s	4.3 to 5.2	4.9	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	42.5	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	71.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.0	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



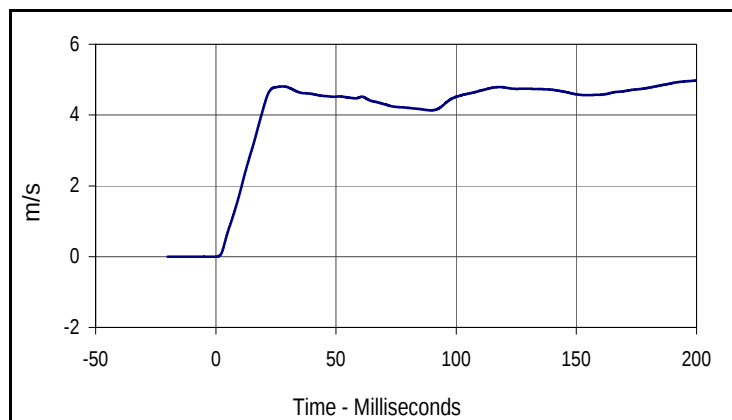
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
45.5	44.3	-10.6	13.5

Test Program: CRABI 12 Month Old Neck Extension Test
 ATD Serial No.: 017

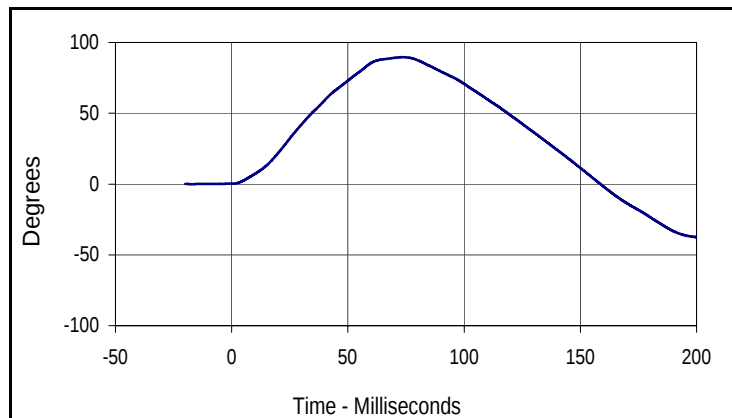
Test Date: 8/23/07
 Test I.D.: NE08C1



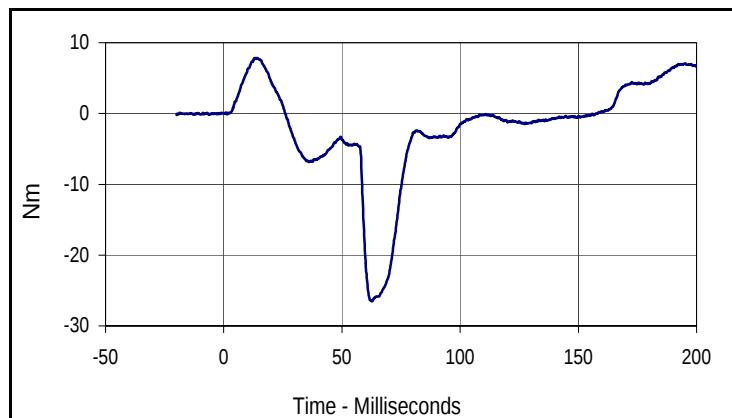
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.40	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.9	Pass
	10 Msec.	m/s	1.5 to 2.1	1.8	Pass
	14 Msec.	m/s	2.2 to 2.9	2.8	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	89.6	Pass
Peak Moment in Rotation	Max	Nm	-12 to -23	-13.8	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	78.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.0	200.0	0.0	0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
89.6	73.6	-37.5	200.0



Curve Description			
Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
7.8	13.2	-26.5	62.8

Test Program: CRABI 12 Month Old External Dimensions
 ATD Serial No.: 017

Test Date: 8/23/07
 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	465	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	282	Pass
C - "H" point height	mm	27.9 to 38.1	30	Pass
D - "H" point from backline	mm	40.1 to 50.3	44	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	57	Pass
F - Thigh clearance	mm	63.0 to 73.2	66	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	188	Pass
I - Shoulder pivot to elbow pivot	mm	99.1 to 114.3	107	Pass
J - Elbow rest height	mm	150.1 to 165.3	154	Pass
K - Buttock to knee length	mm	202.7 to 217.9	210	Pass
L - Popliteal length	mm	138.7 to 153.9	147	Pass
M - Knee pivot height	mm	165.1 to 180.3	170	Pass
N - Buttock popliteal length	mm	144.8 to 160.0	150	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	117	Pass
P - Foot length	mm	92.4 to 102.6	99	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	180	Pass
S - Head Breadth	mm	124.4 to 134.6	129	Pass
T - Head Depth	mm	149.9 to 165.1	153	Pass
U - Hip breadth	mm	158.5 to 173.7	161	Pass
V - Shoulder breadth	mm	200.7 to 215.9	206	Pass
W - Foot breadth	mm	39.1 to 49.3	42	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	467	Pass
Z - Waist circumference	mm	447.0 to 472.4	454	Pass
AA - Reference location for dimension Y & O	mm	256.5 to 266.7	259	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	293	Pass
Overall Test Results				Pass