REPORT NUMBER TR-P27144-01-NC

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

MAZDA MOTOR CORPORATION
2007 MAZDA CX-9
5-DOOR MPV

NHTSA NUMBER: Z75401

Prepared By:
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JULY 17, 2007

FINAL REPORT

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Date of Acceptance

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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 Mazda CX-9 5-Door MPV in accordance with the specifications of the Office of Crash Worthiness Standards Test Procedures for the generation of consumer information on vehicle side crash protection. The test was conducted at KARCO Engineering, LLC in Adelanto, CA, on July 17, 2007. The impact velocity of the Moving Deformable Barrier was 62.37 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 31.7 deg. C. The target vehicle's maximum post-test static crush was 284 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver SID/HIII	Pass. SID/HIII
Left Upper Rib (LUR) G's	36.6	29.3
Left Lower Rib (LLR) G's	26.4	29.2
Lower Spine (T_{12}) G's	32.8	32.4
Thoracic Trauma Index (TTI) G's	35.0	31.0
Pelvis (PEV) G's	57.4	52.0

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TABLE OF CONTENTS

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 Mazda CX-9 5-Door MPV manufactured by Mazda Motor Corporation.

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 Mazda CX-9 5-Door MPV was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.37 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 2150 kg and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering, LLC in Adelanto, California, on July 17, 2007.

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

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

SUPPLEMENTAL RESTRAINT INFORMATION

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

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

2.2 GENERAL COMMENTS

The driver and passenger doors remained closed during impact. The test vehicle sustained a maximum static crush of 284 mm at level 3, 1350 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 is summarized as follows:

Measurement	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	G's	35	31
Peak Pelvic G's (PEV)	G's	57	52

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 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

CONVERSION FACTORS USED IN THIS REPORT*

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

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	Z75401	Anti-Lock Brakes	Yes
Make	Mazda	All Wheel Drive	No
Model	CX-9	Power Steering	Yes
Body Style	5-Door MPV	Driver Front Airbag	Yes
Vin No.	JM3TB28C570105796	Driver Side Torso Airbag	Yes
Color	White	Driver Side Head Airbag	No
Delivery Date	6/22/2007	Driver Curtain/Airbag	Yes
Odometer (Miles)	150.0	Rear Pass. Airbag	No
Dealer	Mazda of San Bernadino	Rear Pass. Side Airbag	No
Transmission	6-Speed Automatic	Rear Pass. Head Airbag	No
Final Drive	Front	Rear Pass. Curtain/Airbag	Yes
Type/No. Cyl.	6-Cylinder	Pre-Tensioners	Yes
Engine Disp. (L)	3.5	Load Limiters	Yes
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air Cond.	Yes
Sunroof/T-Top	No	AM/FM CD	Yes
Tinted Glass	Yes	Tilt Steering	Yes
Traction Control	Yes	Automatic Door Locks	No
Power Brakes	Yes	Power Windows	No
Front Disc	Yes	Power Seats	No
Rear Disc	Yes	Other	None

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Mazda Motor Corporation	GVWR (kg)	2633
Date of Manufacture	Dec-06	GAWR Front (kg)	1271
		GAWR Rear (kg)	1390

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	Bench	
Number of Occupants	2	3	2	7
Capacity Weight (VCW) (kg)				539
Cargo Weight (RCLW) (kg)				63

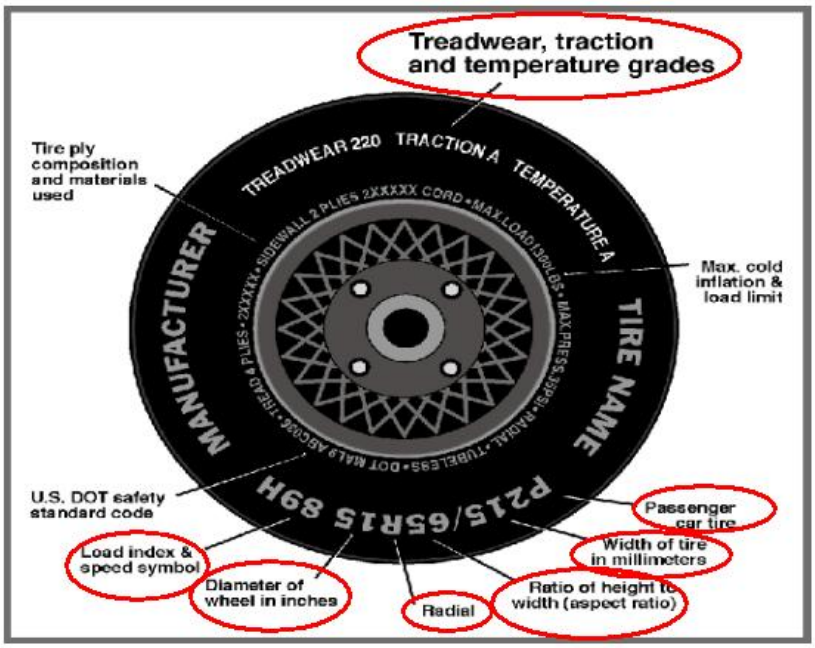
DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

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)	250	250
Recommended Tire Size	P245/60R18	P245/60R18
Tire Size on Vehicle	P245/60R18	P245/60R18
Tire Manufacturer	Bridgestone	Bridgestone
Treadwear	300	300
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	104S	104S
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Right	H4L2-CAL5006	H4L2-CAL5006
DOT Safety Code Left	H4L2-CAL5006	H4L2-CAL5006

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	562	416	978	610	506	1116
Right	kg	549	406	955	561	473	1034
Ratio	%	57.5	42.5	100	54.4	45.6	100
Totals	kg	1111	822	1933	1171	979	2150

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1933
Weight of 2 P572 ATD's	kg	161
Rated Cargo/Luggage Wt. (RCLW)	kg	63
Calculated Vehicle Target Wt. (TVTW)	kg	2156

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	694	704	704	714	1225
As Tested	mm	670	685	676	690	1312
Fully Loaded	mm	665	680	662	686	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2882
Total Vehicle Length at Left Side	mm	3394
Total Vehicle Length at Centerline	mm	5125
Total Vehicle Length at Right Side	mm	3394
Weight of Ballast In Cargo Area	kg	51
Amount of Stoddard Solvent in Fuel Tank	liters	70.45

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2882
Target Impact Point Aft of Front Axle	mm	501
Actual Impact Point Aft of Front Axle	mm	503

DATA SHEET NO. 1...(CONTINUED)

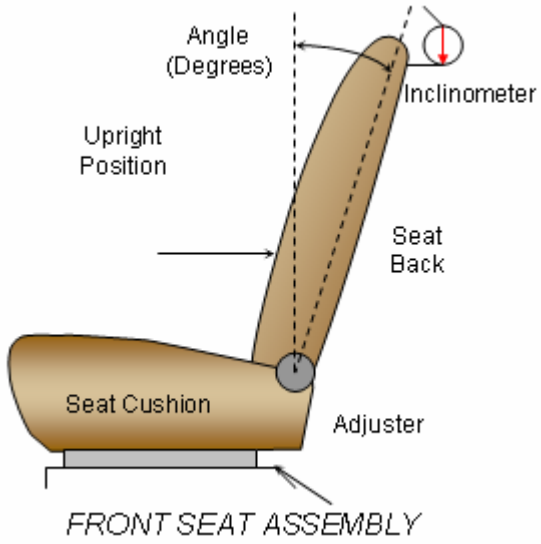
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

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

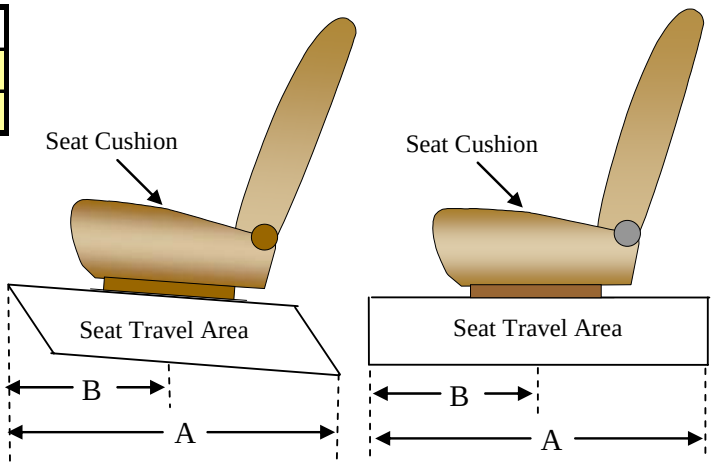
	Deg.
Driver w/seated Dummy	15.5 @ Headrest
Passenger w/seated Dummy	N/A

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	272 mm	136 mm
Rear Seat	N/A	N/A



SEAT BELT UPPER ANCHORAGE

Position number one (1) is the uppermost position

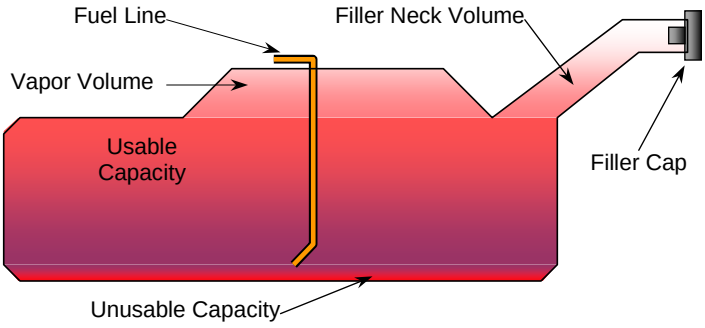
SEAT BELT UPPER ANCHORAGE

	Total # of Positions	Placed in Position #
Driver Seat	5	1
Rear Seat	Fixed	Fixed

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	75.73
Usable Capacity of "Optional" Tank	
Usable Capacity used for FMVSS 301	69.68 to 71.19
Actual Amount of Solvent used	70.45

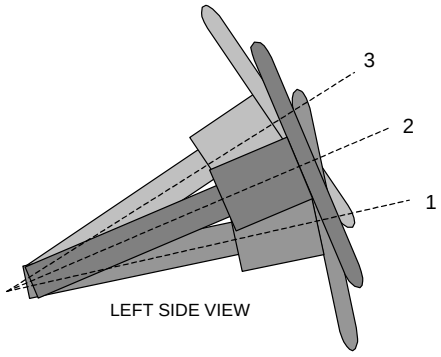
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately two (2) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the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



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost positon No. 1	27.7	236
Geometric center position No. 2	30.0	261
Uppermost position No. 3	32.5	287

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	120	336
Level 2	Occupant H-Point	mm	279	689
Level 3	Mid Door	mm	284	707
Level 4	Window Sill	mm	133	1083
Level 5	Window top	mm	22	1591
N/A	Maximum Penetration	mm	284	

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 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

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	62.37
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.37
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	263
B	Top of Bumper	533	700	Right	120
C	Mid Level	686	800	Left	103
D	Top of Stack	813	800	Right	116

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	1
High Speed Cameras	2

DATA SHEET NO. 4

POST-TEST OBSERVATIONS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

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	Curtain Airbag / Side Header	Curtain Airbag /Side Header
Upper Torso Contact	Side Airbag	Door Panel
Lower Torso Contact	Side Airbag / 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	None
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	Yes	Yes	No	
Head Airbag	No		No	
Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes		No	
Seat Belt Load Limiter	Yes		No	

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	+2 (right)
Vertical Offset	mm	+/- 20	+6 (above)

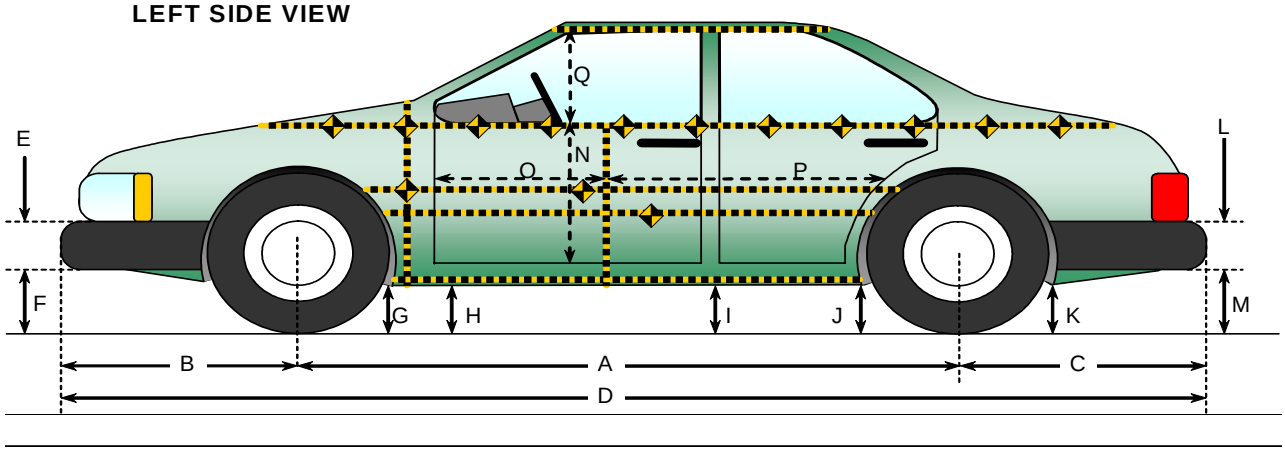
DATA SHEET NO. 5

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

LEFT SIDE VIEW



VEHICLE PRE AND POST-TEST MEASUREMENT INFORMATION

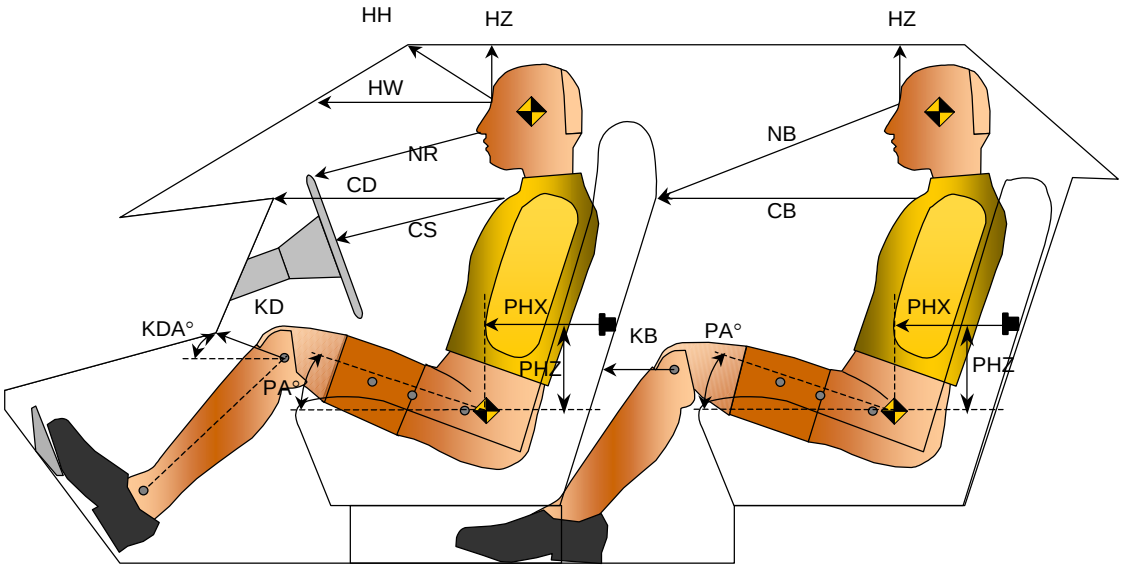
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2882	2867	-15
B	Front Axle to FSOV	1089	1032	-57
C	Rear Axle to RSOV	1161	1084	-77
D	Total Length at Centerline	5125	5068	-57
E	Front Bumper Thickness	494	480	-14
F	Front Bumper Bottom to Ground	292	306	14
G	Sill Height at Front Wheel Well	299	278	-21
H	Sill Height at Front Door Leading Edge	306	279	-27
I	Sill Height at "B" Pillar	301	326	25
J1	Sill Height at Rear Wheel Well	250	288	38
J2	Pinch Weld Height at Rear Wheel Well	269	301	32
K	Sill Height aft of Rear Wheel Well	289	312	23
L	Rear Bumper Thickness	369	369	0
M	Rear Bumper Bottom to Ground	372	410	38
N	Sill Height to Window Bottom Sill	895	830	-65
O	Front Door Leading Edge to Impact CL	806	755	-51
P	Rear Door Trailing Edge to Impact CL	1443	1425	-18
Q	Front Window Opening	400	420	20
R	Right Side Length	3394	3390	-4
S	Left Side Length	3394	3360	-34
T	Vehicle Width at "B" Post	1923	1745	-178

DATA SHEET NO. 6

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07



LONGITUDINAL CLEARANCE DIMENSION INFORMATION

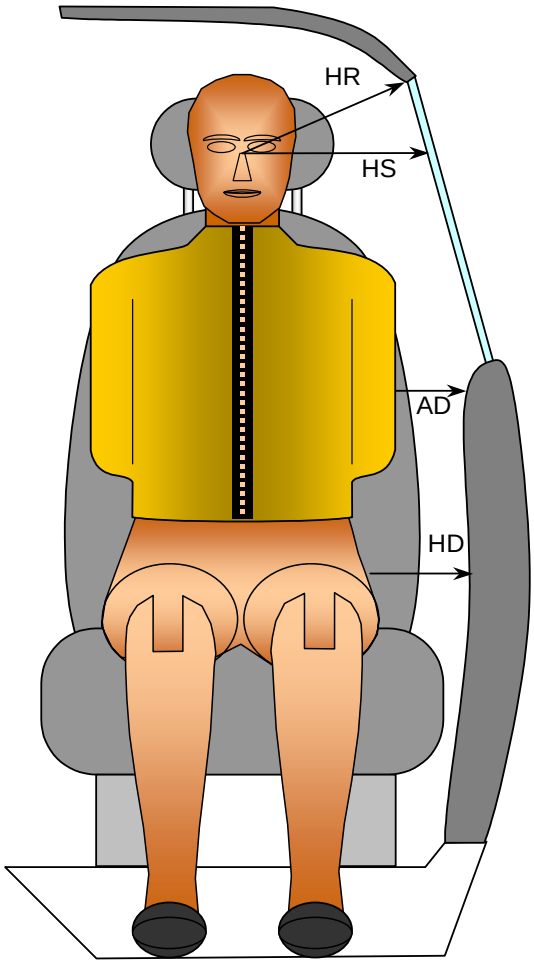
Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length(mm)	Angle	Length(mm)	Angle
HH		Head to Header	436	13.5		
HW		Head to Windshield	728	0.0		
HZ	HZ	Head to Roof	190	90.0	190	90.0
NR	NB	Nose to Rim/Nose to Seat Back	493	12.0	595	23.2
CD	CB	Chest to Dash or Seat Back	586	6.5	518	1.5
CS		Chest to Steering Wheel	320	0.6		
KDL	KBL	Left Knee to Dash or Seat Back	187	9.5	220	0.0
KDR	KBR	Right Knee to Dash or Seat Back	160		214	
PA	PA	Pelvic Angle		23.8		23.5
PHX	PHX	H-Point to Striker (X-Axis)	262		463	
PHZ	PHZ	H-Point to Striker (Z-Axis)	128		205	

DATA SHEET NO. 7

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07



FRONT VIEW OF DUMMY

LATERAL CLEARANCE DIMENSION INFORMATION

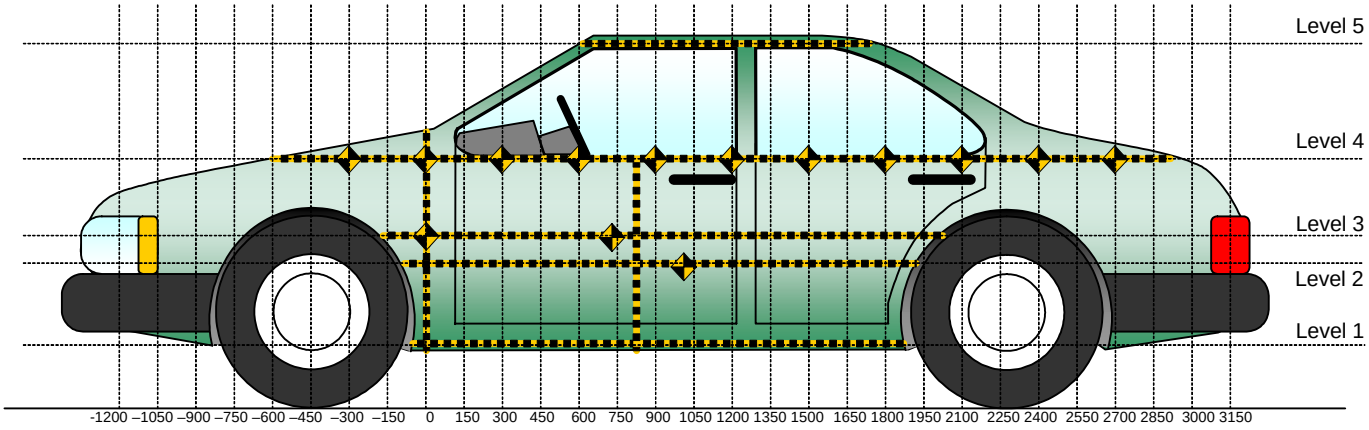
Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	290	262
HS	Head to Side Window	mm	342	310
AD	Arm to Door	mm	130	115
HD	H-Point to Door	mm	187	168

DATA SHEET NO. 8

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.
Measurments taken 900 mm right of impact reference.
All measurements below in mm.

Level	Measurement Description	Height Above Ground
1	Sill Top	336
2	Occupant H-Point	689
3	Mid Door	707
4	Window Sill	1083
5	Window Top	1591

All Dimensions shown in millimeters

DATA SHEET NO. 9

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

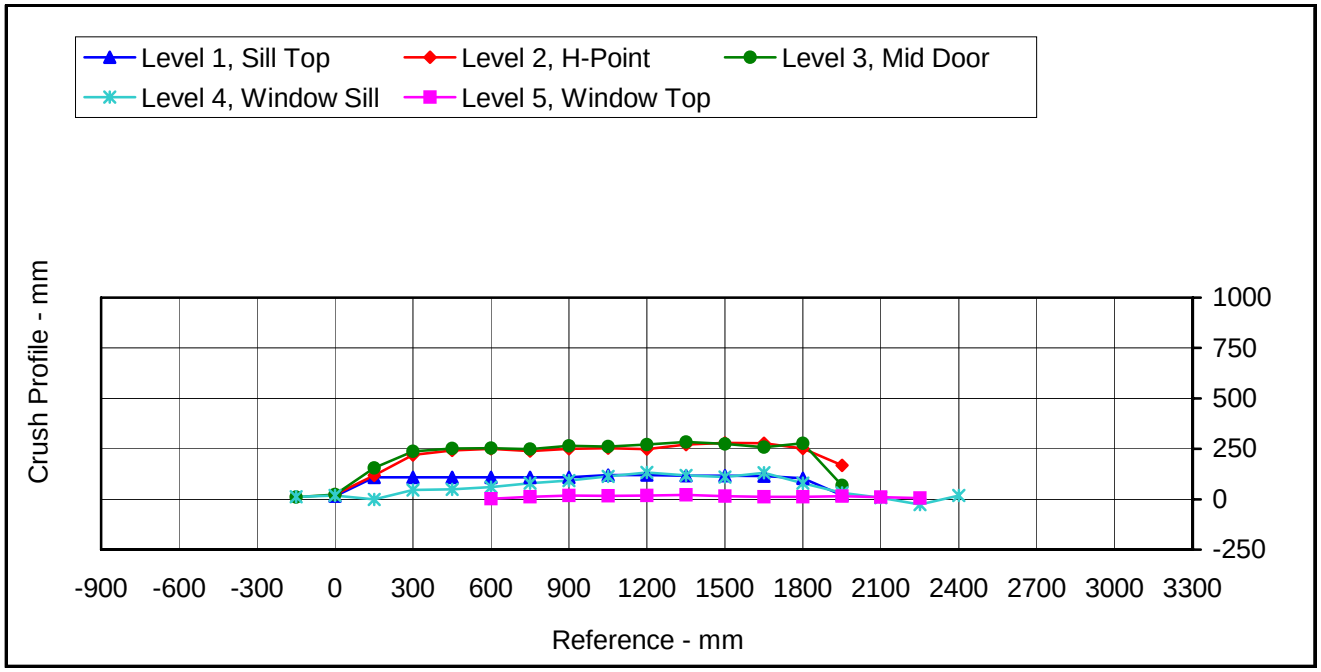
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150			539	686				550	698				11	12	
0	571	543	541	661		586	566	564	679		15	23	23	18	
150	573	550	549	650		681	668	705	650		108	118	156	0	
300	572	549	549	634		681	768	786	680		109	219	237	46	
450	569	548	547	626		677	791	799	675		108	243	252	49	
600	569	548	547	621	891	678	798	801	681	893	109	250	254	60	2
750	569	547	547	611	879	677	786	795	690	891	108	239	248	79	12
900	569	547	547	606	871	677	798	811	698	889	108	251	264	92	18
1050	569	547	547	598	866	689	800	809	711	883	120	253	262	113	17
1200	570	548	548	599	861	690	796	820	732	879	120	248	272	133	18
1350	571	549	549	596	861	687	820	833	714	883	116	271	284	118	22
1500	570	550	551	596	861	686	829	826	706	876	116	279	275	110	15
1650	571	551	553	586	863	686	828	812	717	876	115	277	259	131	13
1800	572	551	554	586	866	676	803	832	666	878	104	252	278	80	12
1950	576	548	546	586	866	596	716	614	617	881		168	68	31	15
2100				586	871				593	881				7	10
2250				586					560					-26	
2400				587					605					18	
2550				593					601					8	
2700															
2850															

DATA SHEET NO. 9…(CONTINUED)

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07



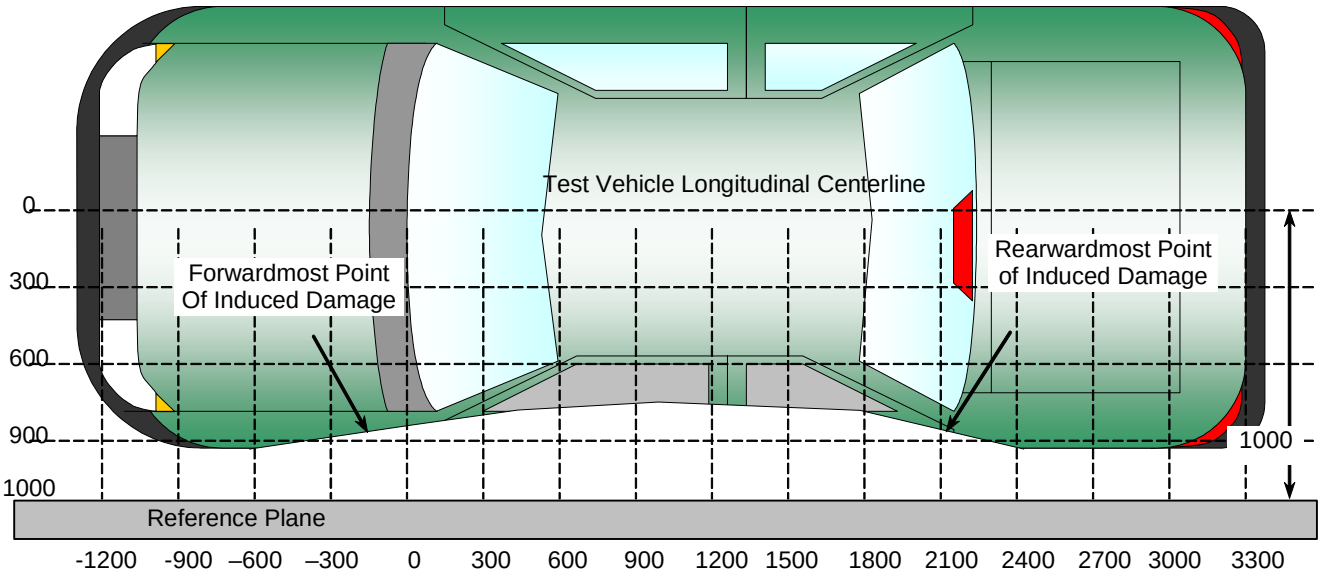
	Units	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush	mm	120	279	284	133	22
Distance from Impact	mm	1200	1500	1350	1200	1350

DATA SHEET NO. 10

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07



All Dimensions Shown in millimeters

TOP VIEW

DAMAGE PROFILE DISTANCES

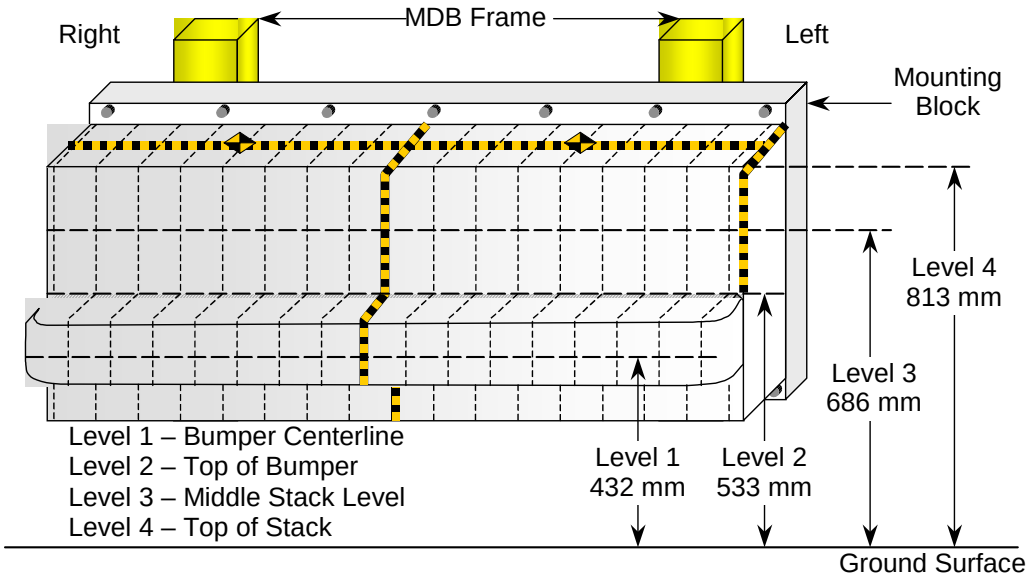
DPD	Distance From Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2100	5	871	881	10
2	1650	2	551	828	277
3	1200	3	548	820	272
4	750	3	547	795	248
5	300	3	549	786	237
6	-150	4	686	698	12

DATA SHEET NO. 11

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	736	699	676	664	659	661	666	671	646	638	638	641	644	654	666	686	726
2	719	686	674	669	671	679	679	667	658	649	647	643	643	647	657	672	723
3	739	740	731	726	720	718	726	721	709	710	713	716	716	714	708	709	716
4	781	759	752	744	741	742	730	728	728	727	713	711	706	701	697	701	725

All Dimensions in mm

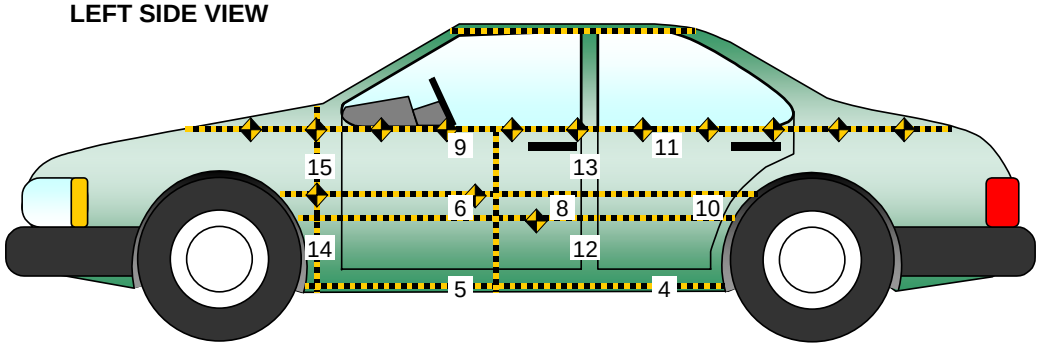
DATA SHEET NO. 12

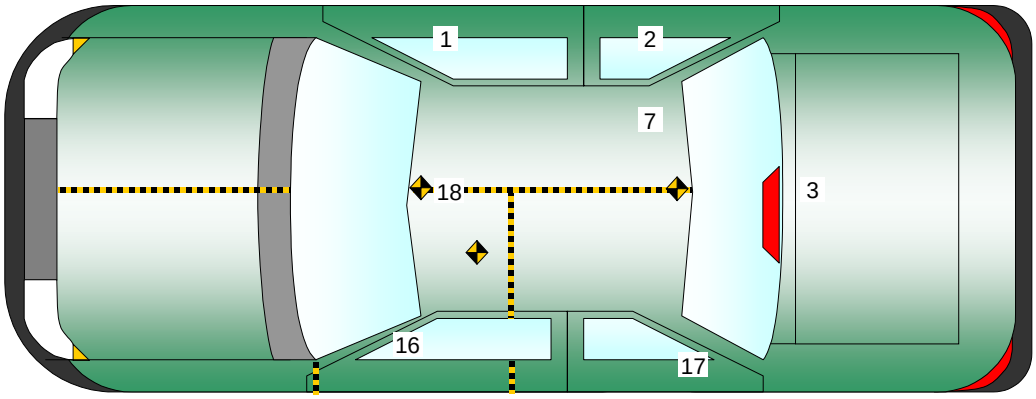
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

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 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3076	750	440
2	Right Sill at Rear Seat	1900	753	460
3	Rear Floorpan Above Axle	1140	0	595
4	Left Sill at Rear Door	1920	-785	263
5	Left Sill at Front Door	2720	-790	253
6	Front Door Centerline			[1]
7	Rt. Rear Occ. Compartment	2385	305	475
8	Front Door Mid-Rear			[1]
9	Front Door Upper Centerline			[1]
10	Rear Door Mid-Rear			[1]
11	Rear Door Upper Centerline			[1]
12	B-Post Lower	2415	-725	725
13	B-Post Middle	2410	-720	1080
14	A-Post Lower	3487	-888	685
15	A-Post Middle	3485	-888	825
16	Front Seat Track	3001	-620	530
17	Rear Seat Structure	1995	-640	542
18	Vehicle CG	3145	235	420

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

1.) Not installed

DATA SHEET NO. 13
MDB ACCELEROMETER LOCATIONS

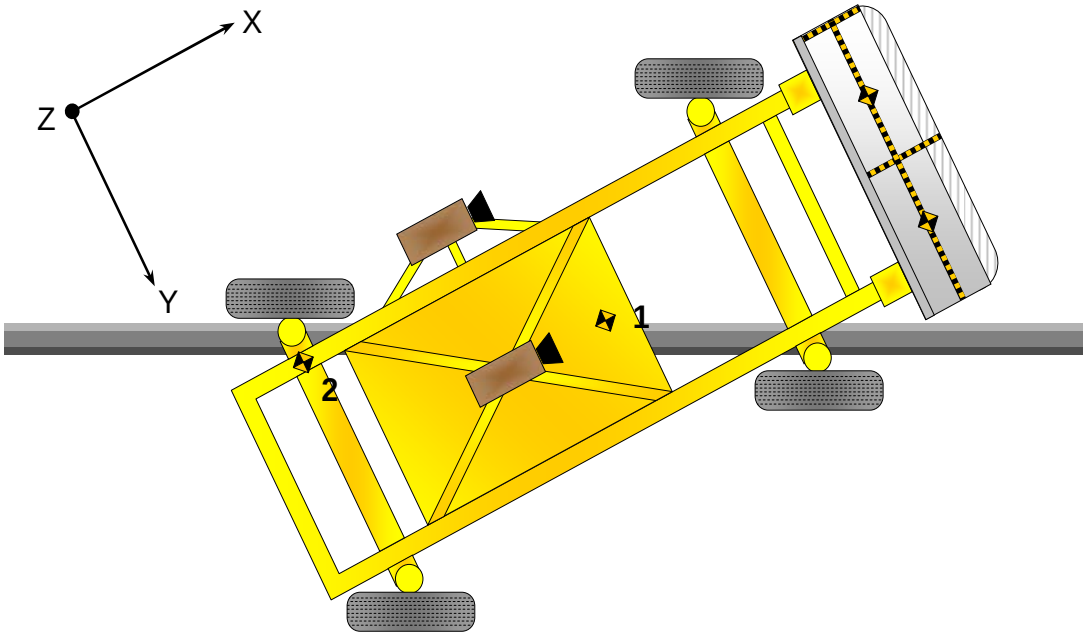
Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

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

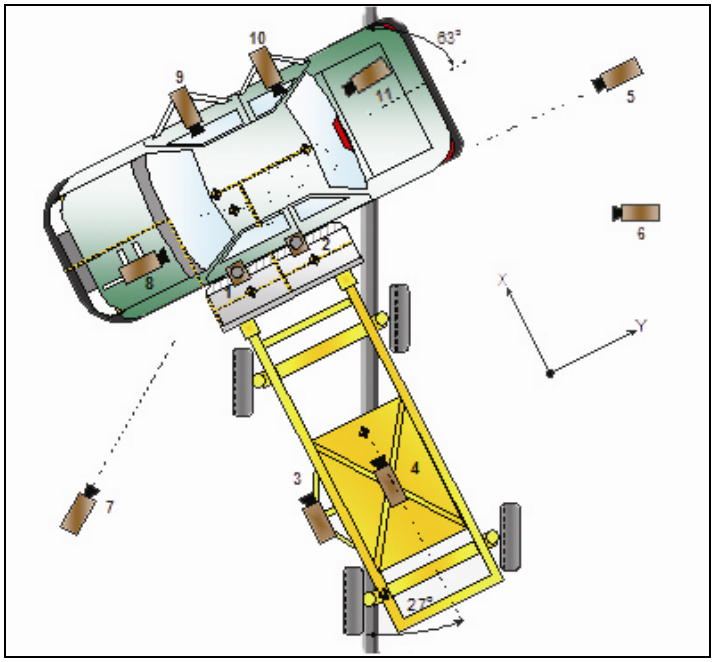


DATA SHEET NO. 14

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07



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.)	1584	-508	-737	-7	35mm	1000
9	Driver Side (O.B.)	1880	800	-1397	-2	20mm	1000
10	Passenger Side (O.B.)	1880	1740	-1397	-2	20mm	1000
11	Passenger CRS (O.B.)	1524	2184	-1448	-2	10mm	1000

All measurments are relative to the point of impact.

DATA SHEET NO. 15

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

Test Time: 10:48 AM Temperature: 31.6 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)

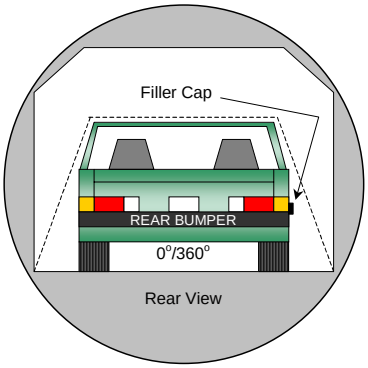
D. Spillage Details: No leakage occurred

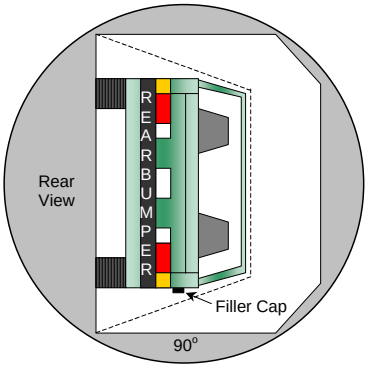
DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER DATA

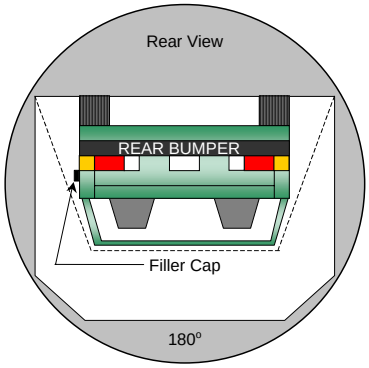
Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

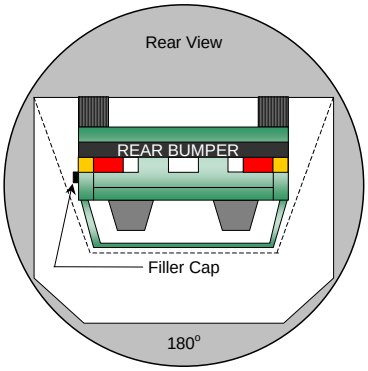




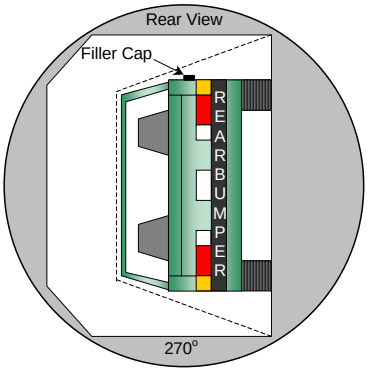
0° to 90°

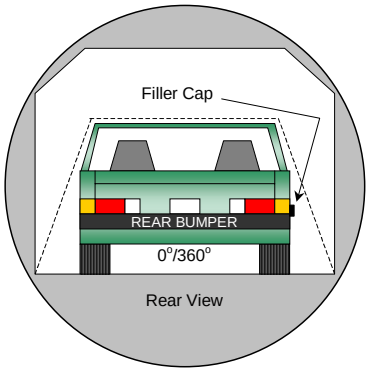


90° to 180°



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 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	82	300	382
90° to 180°	84	300	384
180° to 270°	81	300	381
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

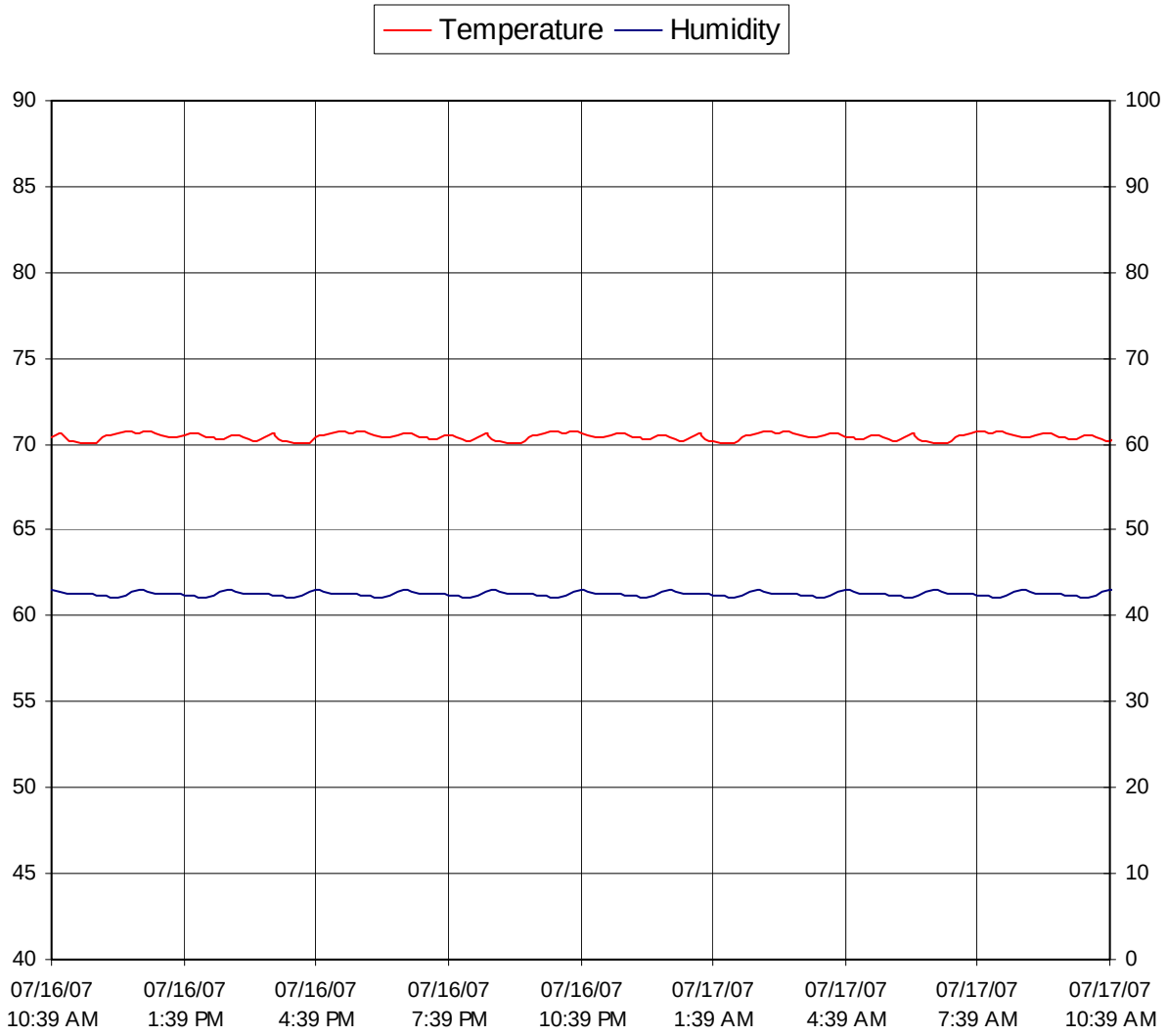
Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 17

DUMMY / VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

LIST OF PHOTOGRAPHS…(CONTINUED)

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

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

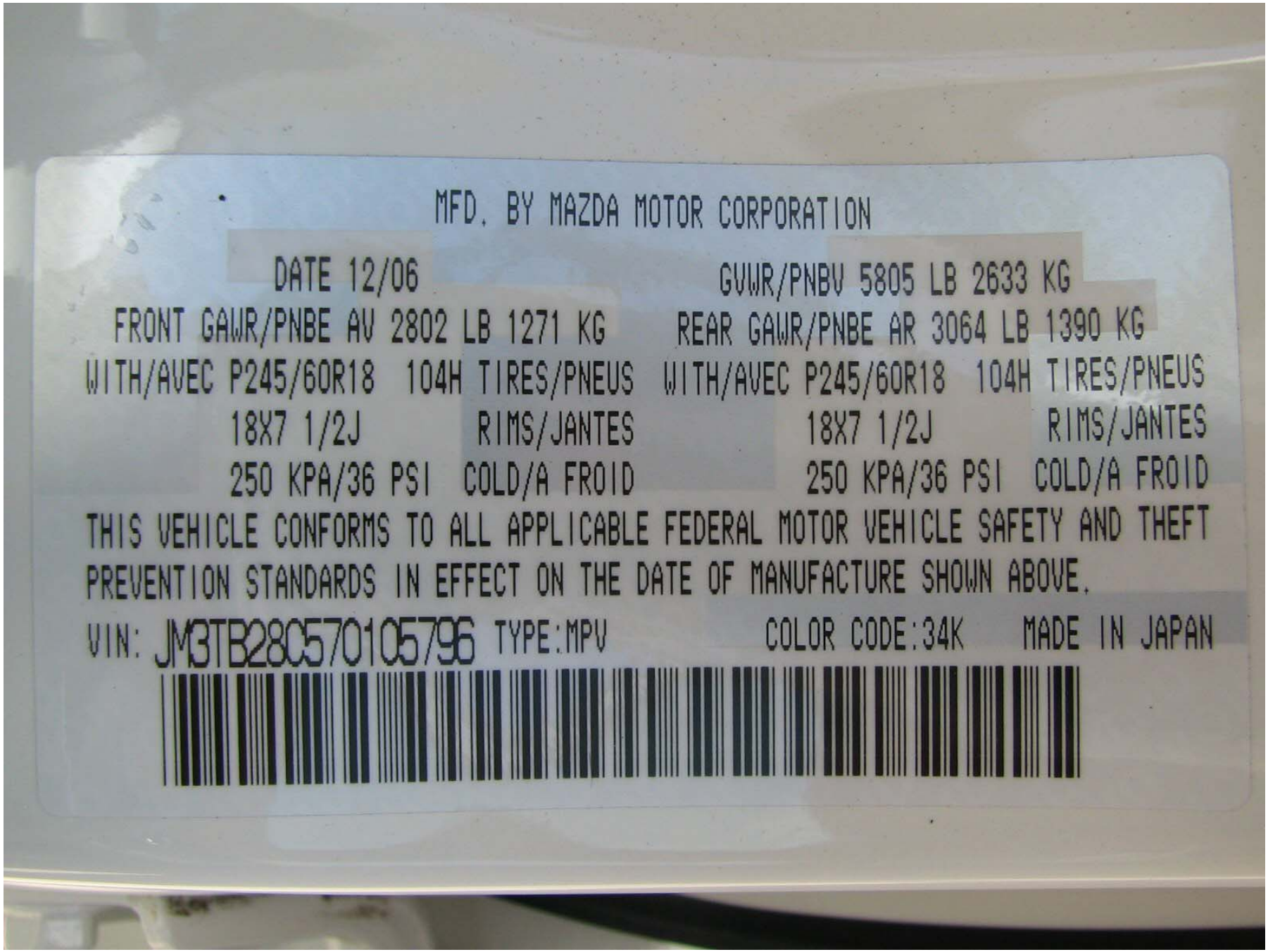


Figure A-3: Manufacturer's Label

Figure A-4: Tire Placard

Figure A-5: Pre-Test Front View

Figure A-6: Post-Test Front View

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

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

Figure A-9: Pre-Test Left Side View

Figure A-10: Post-Test Left Side View

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

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

Figure A-13: Pre-Test Rear View

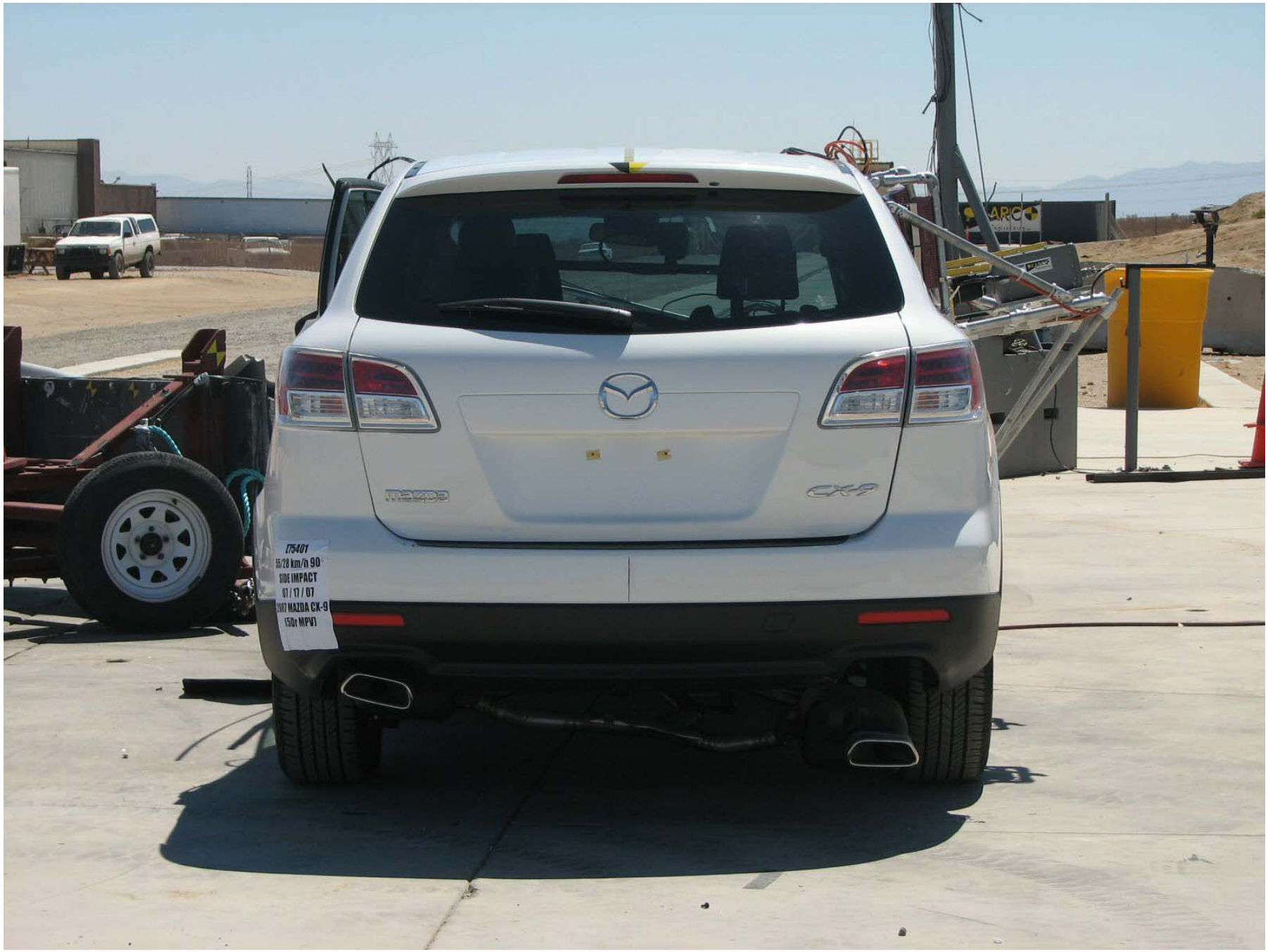


Figure A-14: Post-Test Rear View

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

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

Figure A-17: Pre-Test Right Side View

Figure A-18: Post-Test Right Side View

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

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

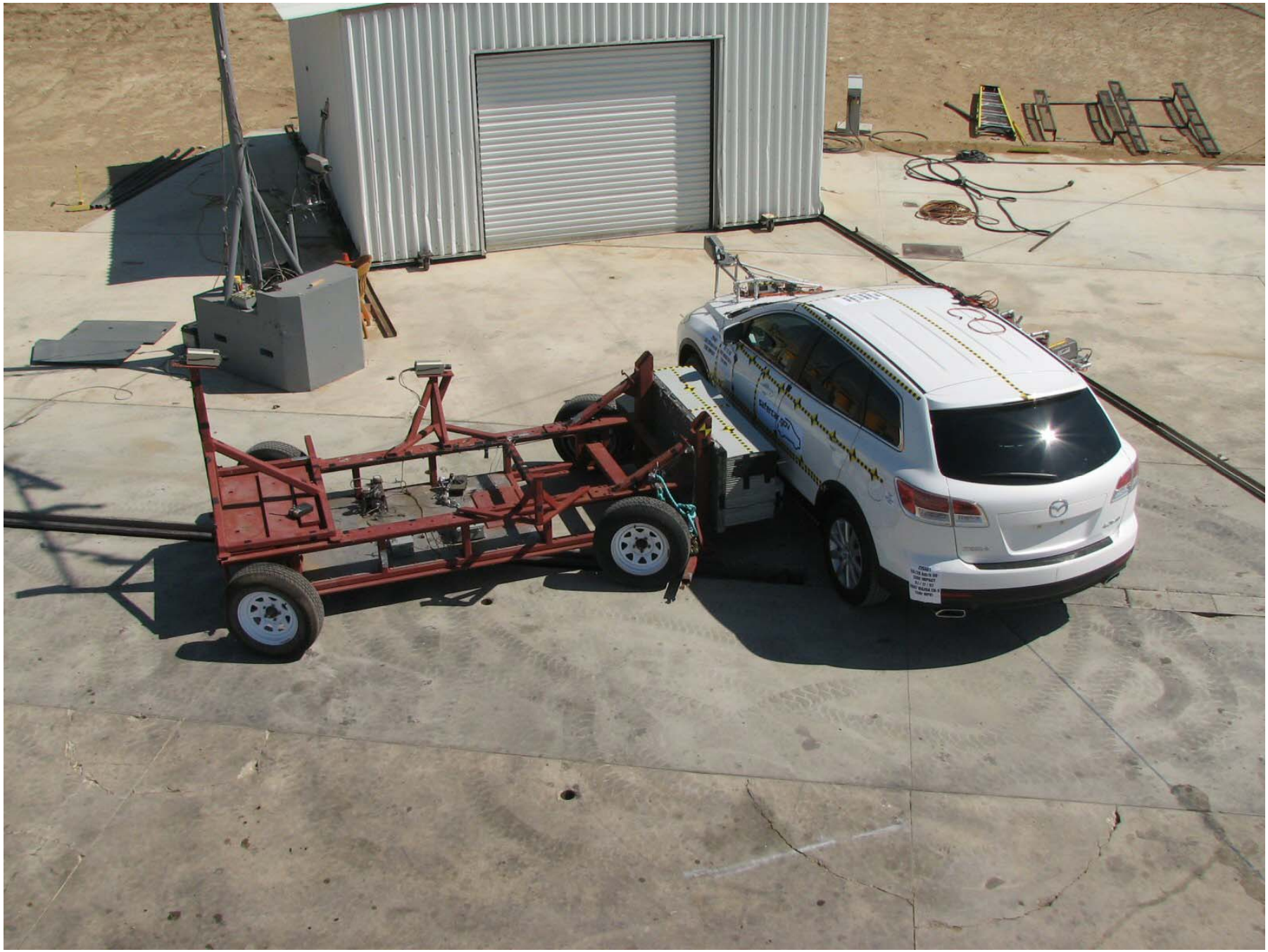


Figure A-21: Pre-Test Overhead View

Figure A-22: Post-Test Overhead View

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

Figure A-24: Post-Test Overhead Close-up View

Figure A-25: Pre-Test Left Impact Point

Figure A-26: Post-Test Left Impact Point

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

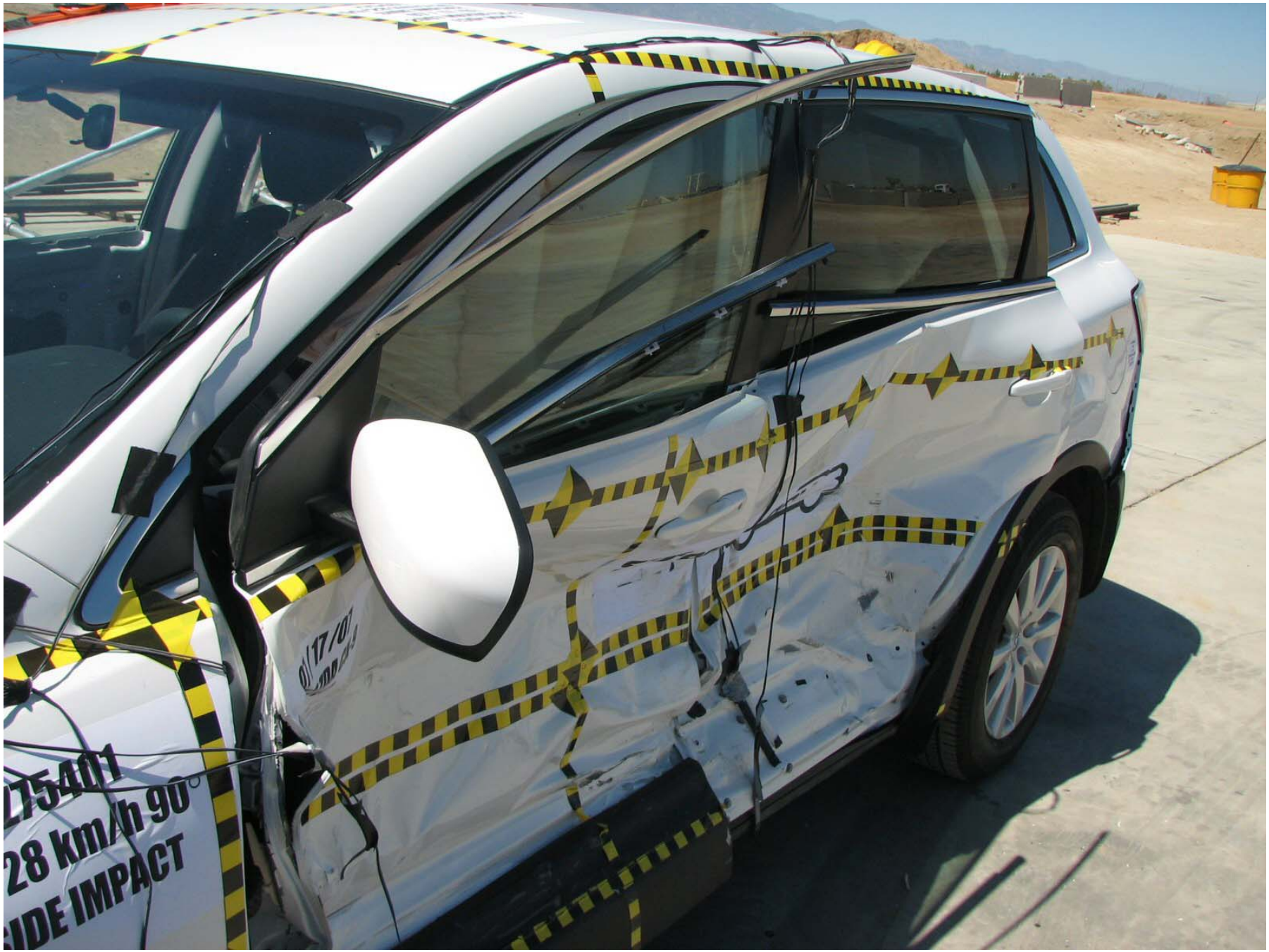


Figure A-28: Post-Test Front ¾ View of Left Side Door

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

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

Figure A-31: Pre-Test Left Front Door

Figure A-32: Post-Test Left Front Door

Figure A-33: Pre-Test Left Rear Door

Figure A-34: Post-Test Left Rear Door

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

This Space Intentionally Left Blank

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

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

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

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

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

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

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

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

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

This Space Intentionally Left Blank

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

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

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

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

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

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

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

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

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

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

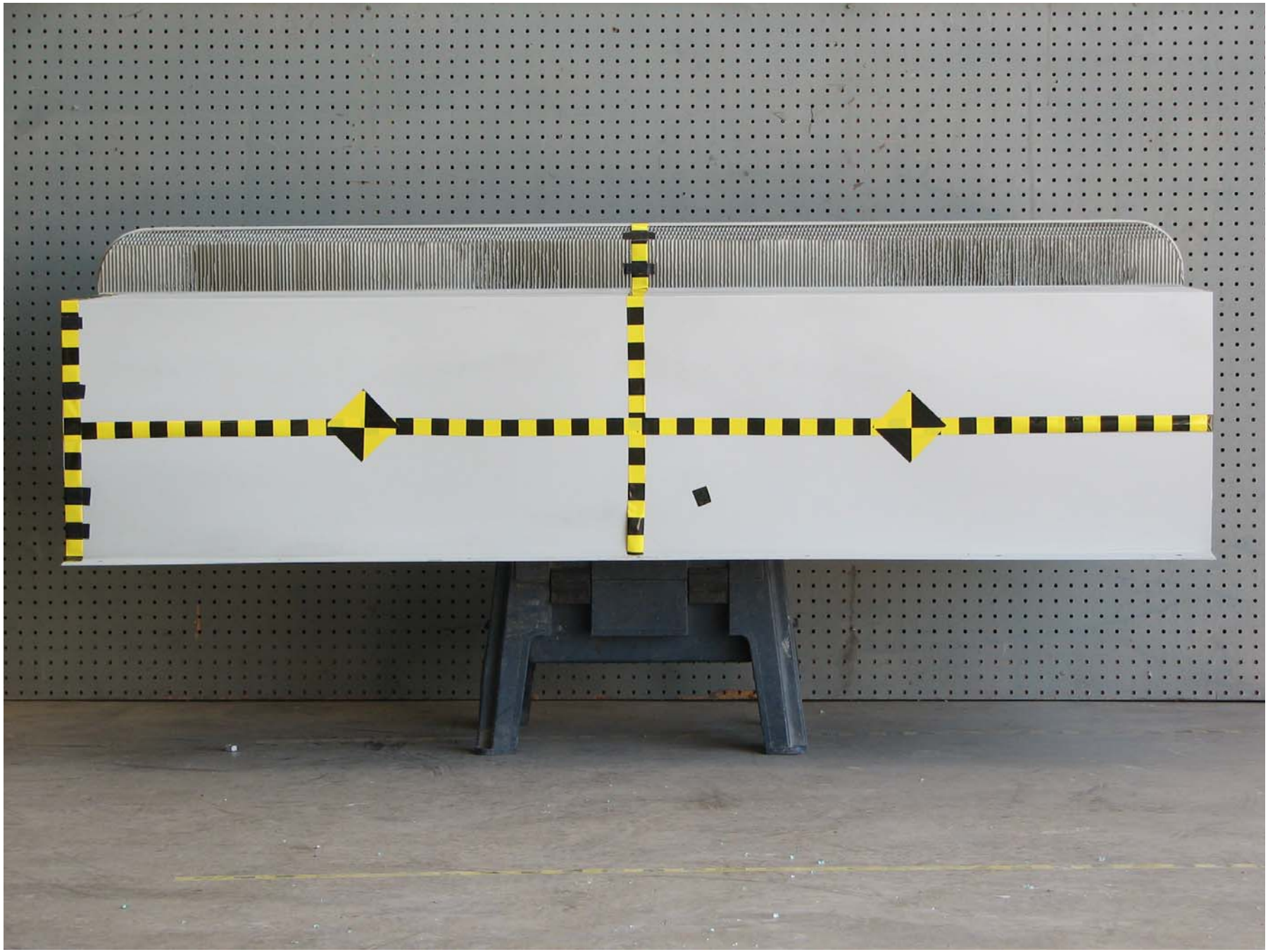


Figure A-55: Pre-Test Top View of Deformable Barrier

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

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

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

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

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

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

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

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

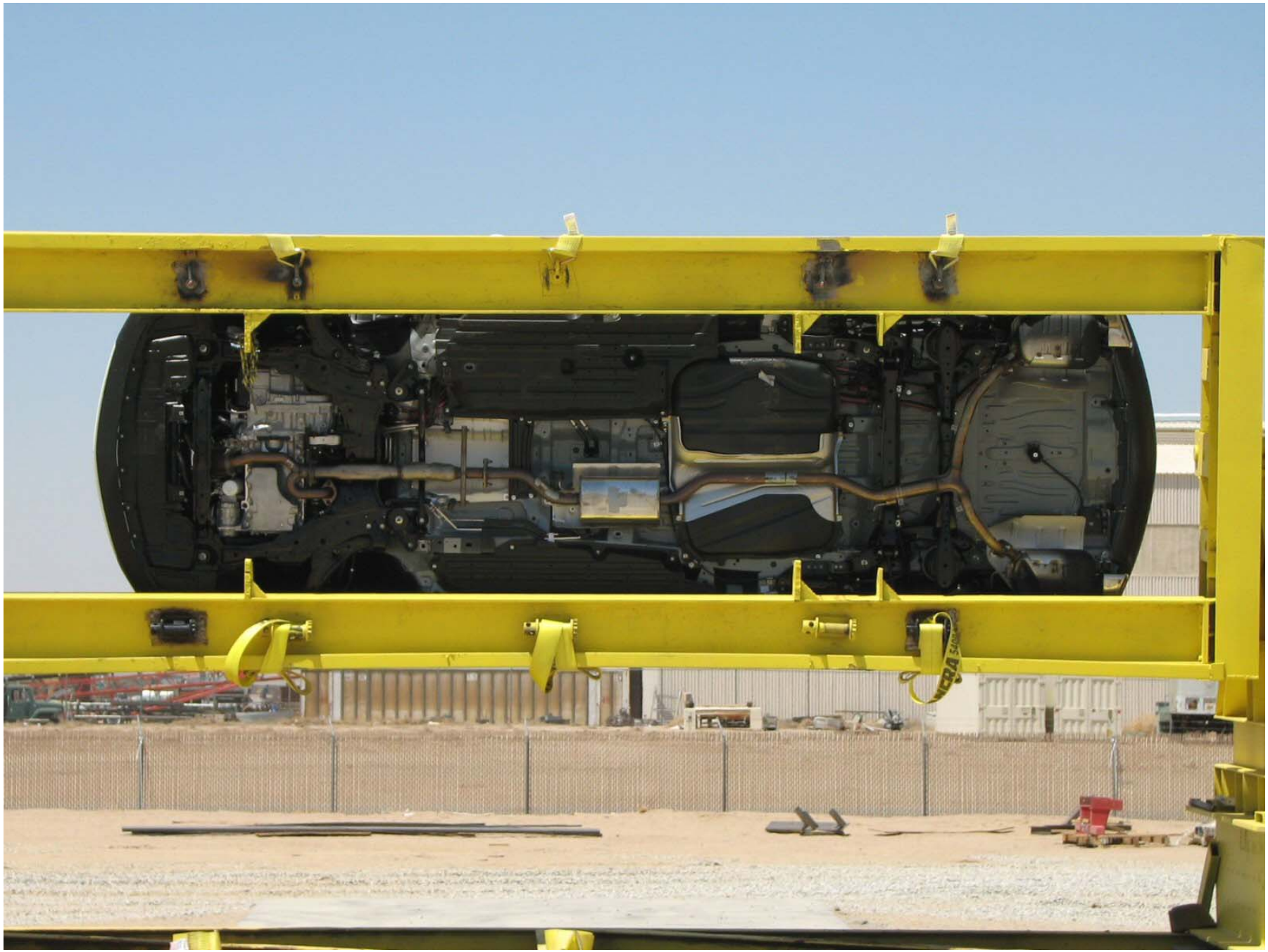


Figure A-64: Vehicle on Rollover Device (270°)

Figure A-65: Vehicle Impact

APPENDIX B

SID/HIII, VEHICLE AND MDB RESPONSE DATA

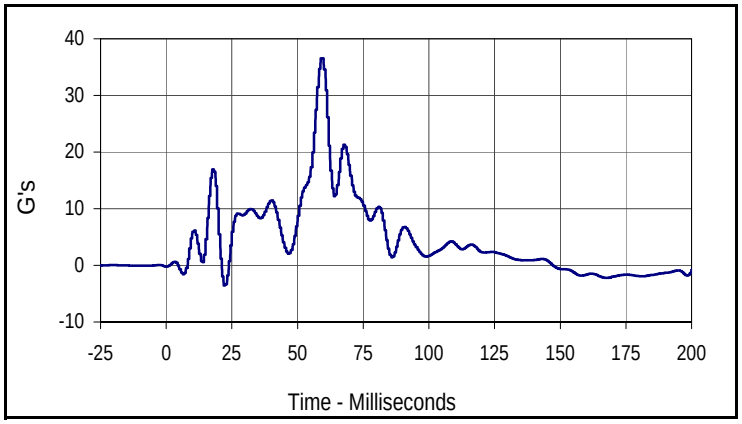
LIST OF DATA PLOTS

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

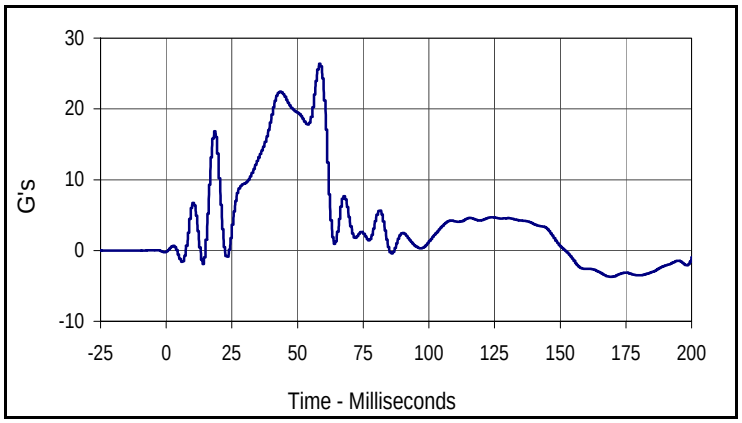
LIST OF DATA PLOTS…(CONTINUED)

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

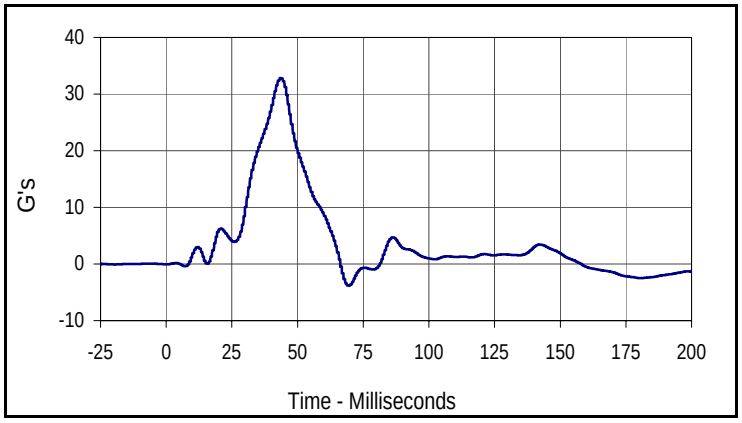
Test Vehicle:	2007 Mazda CX-9 5-Door MPV	Test Date:	7/17/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	Z75401



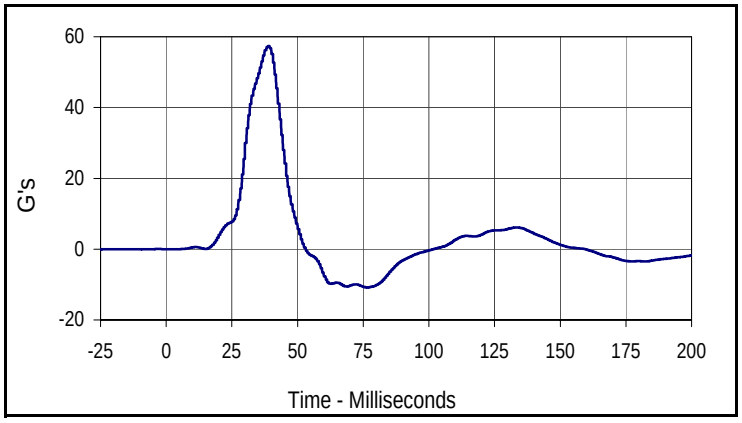
Curve Description			
Driver Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIR	FIR100	G's
Max	Time	Min	Time
36.6	59.4	-3.9	207.5



Curve Description			
Driver Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIR	FIR100	G's
Max	Time	Min	Time
26.4	58.2	-3.9	206.9

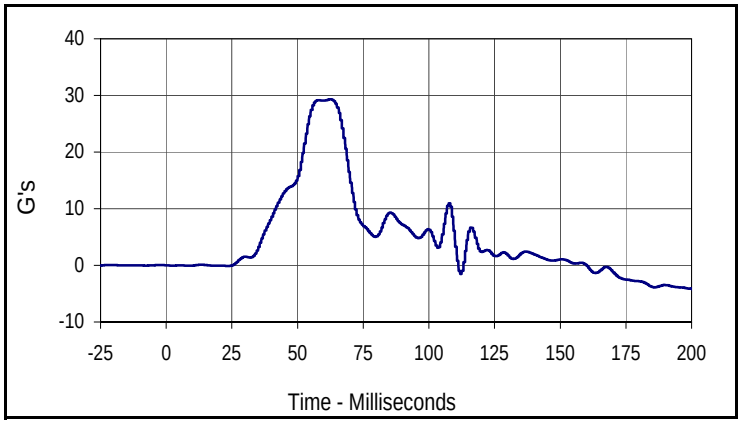


Curve Description			
Driver Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIR	FIR100	G's
Max	Time	Min	Time
32.8	43.2	-3.9	69.4

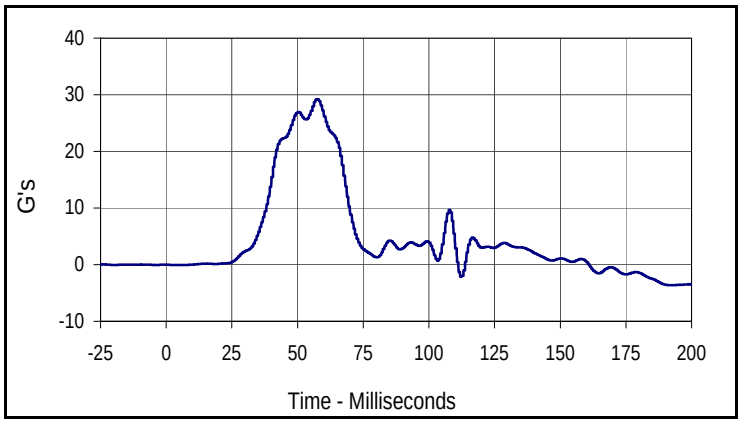


Curve Description			
Driver Pelvis Primary Y			
CURNO	Type	SAE Class	Units
004	FIR	FIR100	G's
Max	Time	Min	Time
57.4	38.8	-10.8	76.3

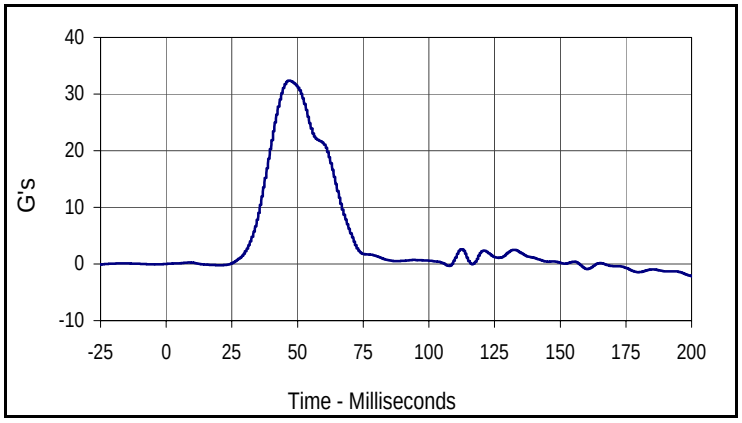
Test Vehicle:	2007 Mazda CX-9 5-Door MPV	Test Date:	7/17/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	Z75401



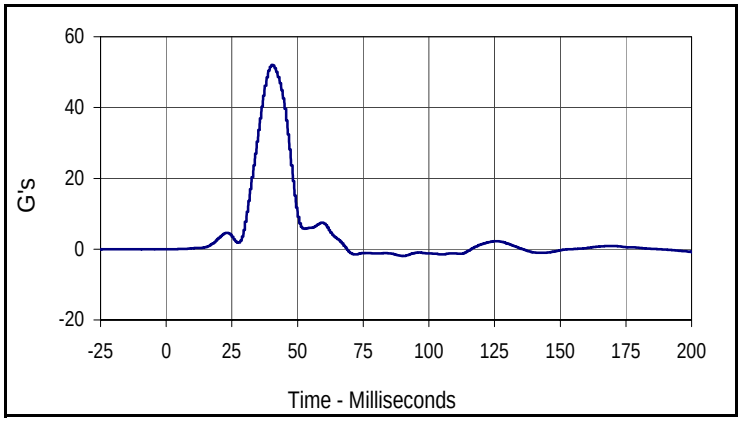
Curve Description			
Passenger Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
005	FIR	FIR100	G's
Max	Time	Min	Time
29.3	62.5	-4.4	205.0



Curve Description			
Passenger Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
006	FIR	FIR100	G's
Max	Time	Min	Time
29.2	57.5	-4.7	242.5



Curve Description			
Passenger Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
007	FIR	FIR100	G's
Max	Time	Min	Time
32.4	46.9	-2.2	201.3



Curve Description			
Passenger Pelvis Y Primary			
CURNO	Type	SAE Class	Units
008	FIR	FIR100	G's
Max	Time	Min	Time
52.0	40.0	-1.9	90.0

APPENDIX C
SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

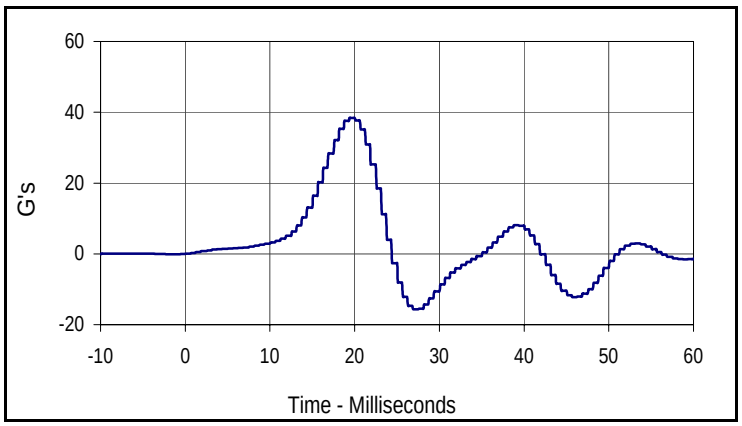
APPENDIX C
PRE-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	SID / HIII External Measurements	Test Date:	7/11/07
ATD Serial No.:	275	Test I.D.:	N/A

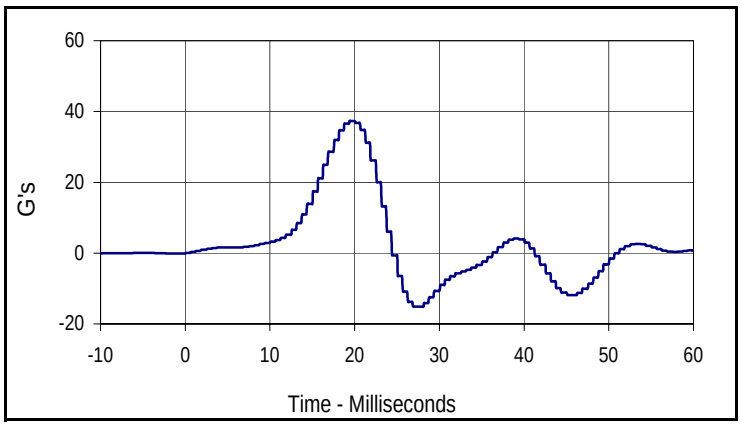
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	891	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	517	Pass
KV- Knee Pivot From Floor	mm	490 to 505	492	Pass
HW- Hip Width	mm	356 to 391	367	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	7/13/07
ATD Serial No.:	275	Test I.D.:	TH07E

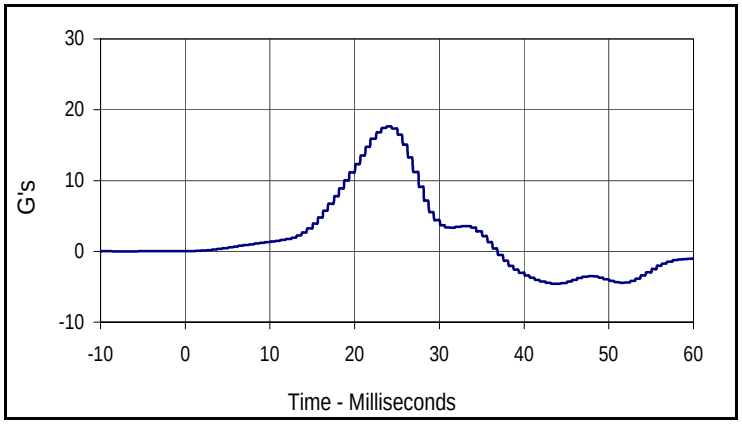
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.30	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	38.4	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	37.3	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	17.7	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
38.4	19.4	-15.7	26.9



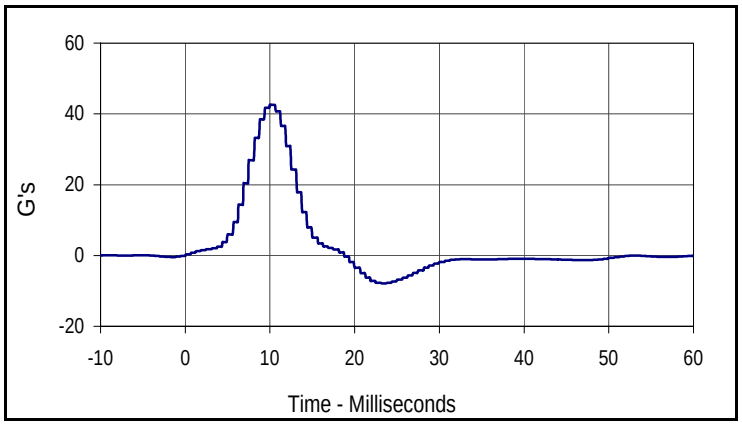
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
37.3	19.4	-15.1	27.6



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
17.7	23.8	-4.6	43.8

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	7/12/07
ATD Serial No.:	275	Test I.D.:	PL07E

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.31	Pass
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	4.90	Pass
		Overall Test Results		Pass

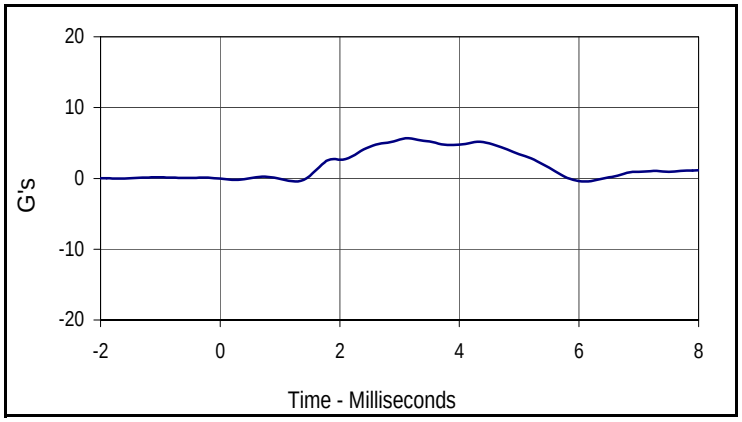


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
42.5	10.0	-7.9	23.2

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	7/12/07
ATD Serial No.:	275	Test I.D.:	HD07E

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	147.1	Pass
Peak Longitudinal Acceleration	G's	≤15.0	5.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	4.0	Pass
		Overall Test Results		Pass

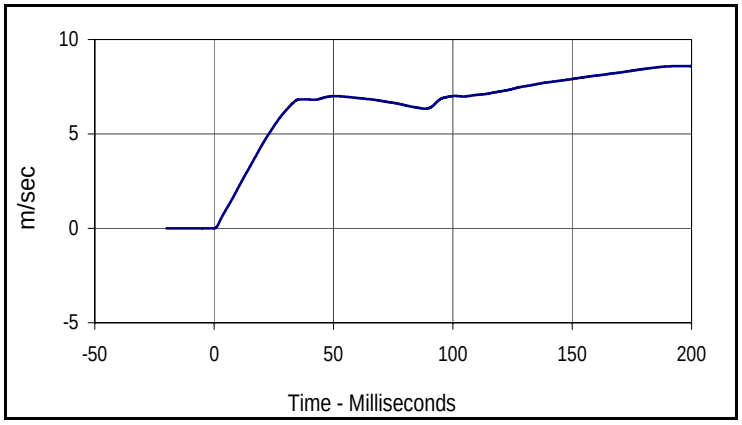
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
147.1	2.1	0.0	-1.6



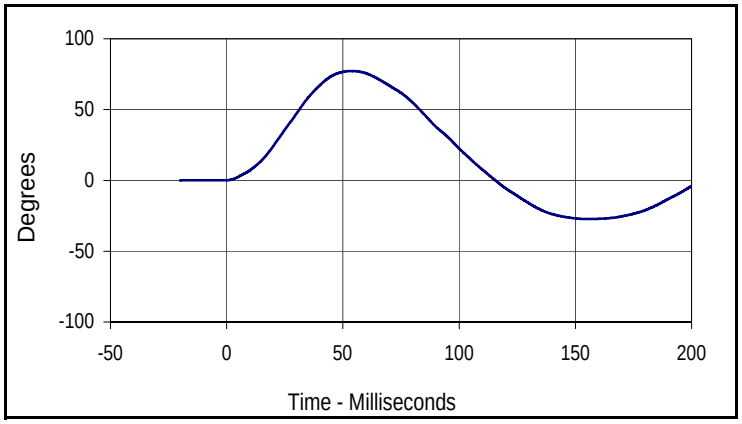
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.7	3.1	-0.4	1.3

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	7/13/07
ATD Serial No.:	275	Test I.D.:	NB07E

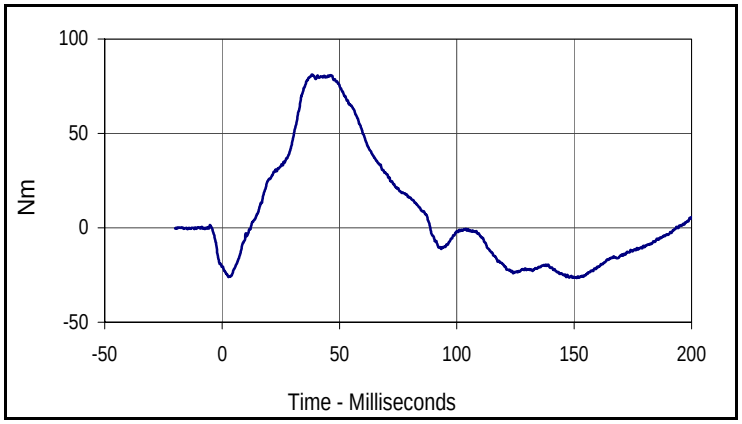
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.09	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.13	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.40	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.24	Pass
	40 to 70	m/sec	6.27 to 7.64	7.01	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	77.3	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.4	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	61.9	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	81.3	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
8.6	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
77.3	53.7	-27.3	155.3



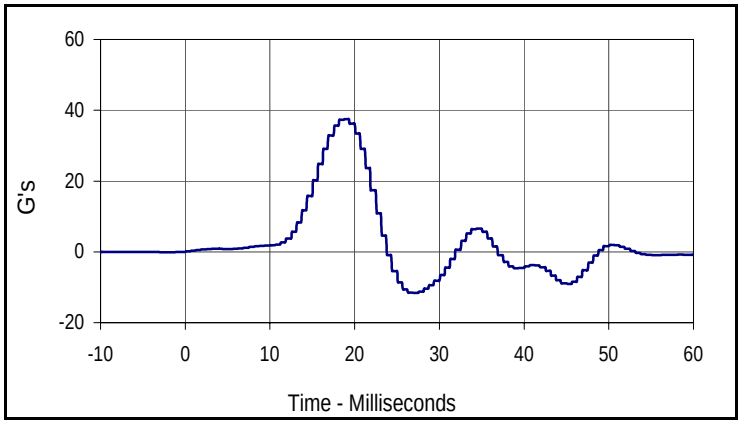
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
81.3	38.3	-26.6	151.0

Test Program:	SID / HIII External Measurements	Test Date:	7/11/07
ATD Serial No.:	274	Test I.D.:	N/A

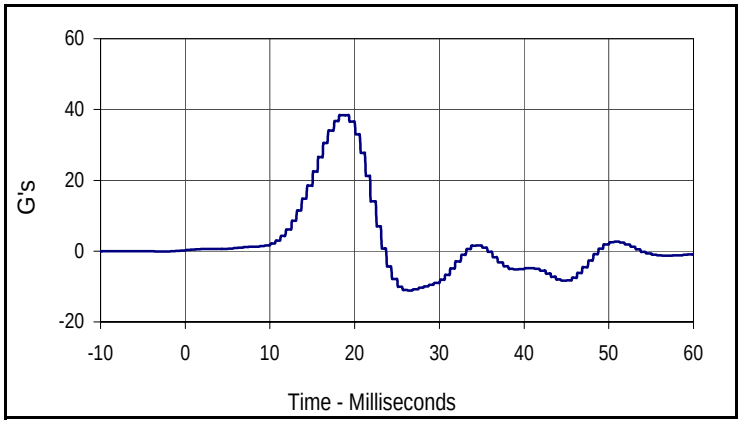
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	890	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	506	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	514	Pass
KV- Knee Pivot From Floor	mm	490 to 505	495	Pass
HW- Hip Width	mm	356 to 391	360	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	7/13/07
ATD Serial No.:	274	Test I.D.:	TH07F

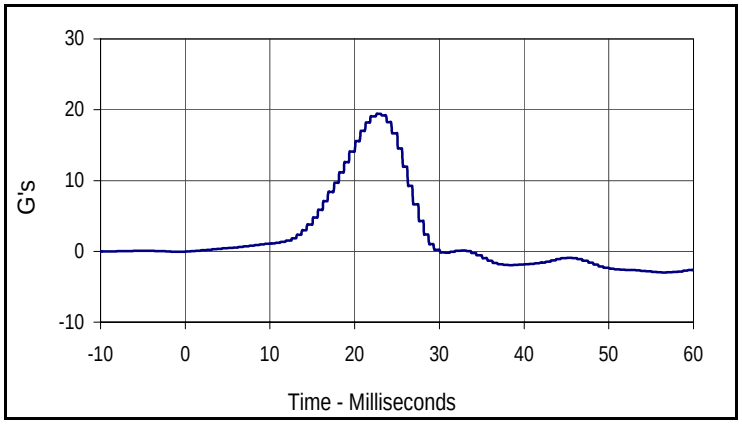
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.30	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	37.5	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	38.4	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.4	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
37.5	18.8	-11.6	26.9



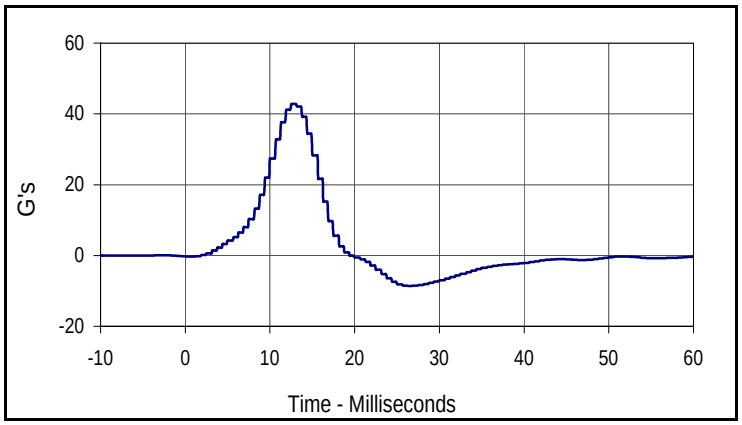
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
38.4	18.8	-11.1	26.3



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.4	22.6	-3.0	56.3

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	7/13/07
ATD Serial No.:	274	Test I.D.:	PL07F

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	42.8	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	5.50	Pass
		Overall Test Results		Pass

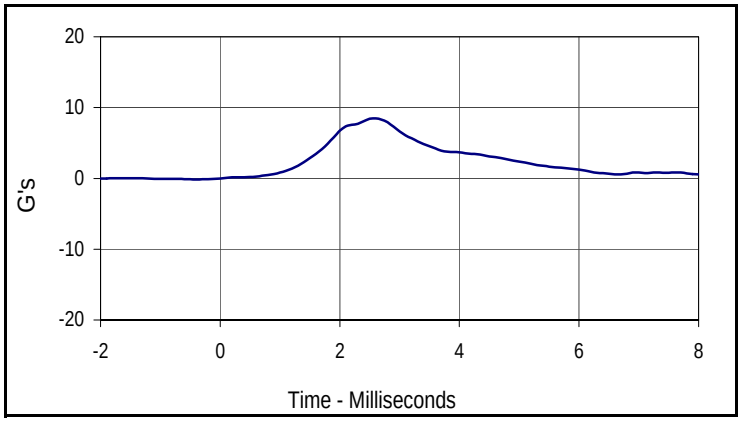


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
42.8	12.5	-8.6	26.3

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	7/12/07
ATD Serial No.:	274	Test I.D.:	HD07F

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	146.3	Pass
Peak Longitudinal Acceleration	G's	≤15.0	8.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.7	Pass
		Overall Test Results		Pass

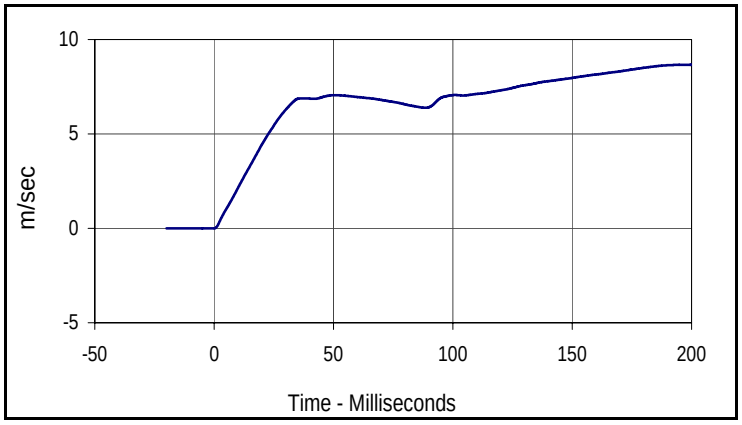
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
146.3	2.4	0.1	-1.0



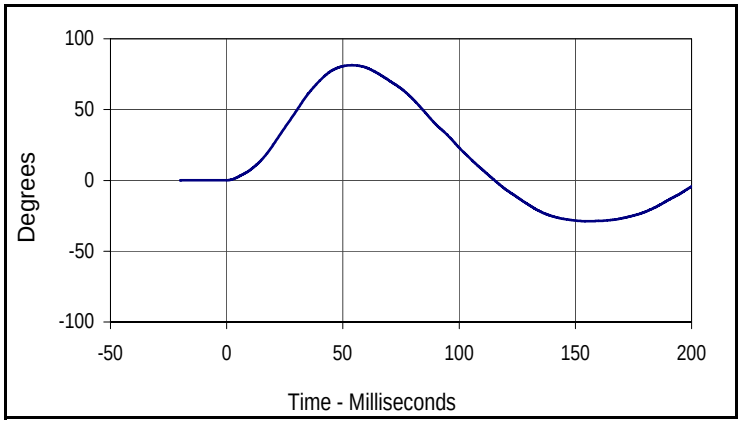
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
8.5	2.6	-0.1	-0.4

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	7/12/07
ATD Serial No.:	274	Test I.D.:	NB07F

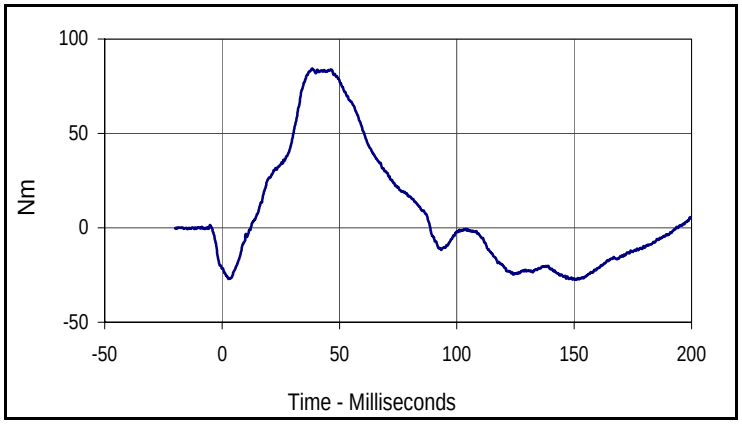
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.15	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.44	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.29	Pass
	40 to 70	m/sec	6.27 to 7.64	7.06	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	81.4	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.5	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	61.5	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	84.4	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
81.4	53.8	-28.9	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
84.4	38.3	-27.5	151.0

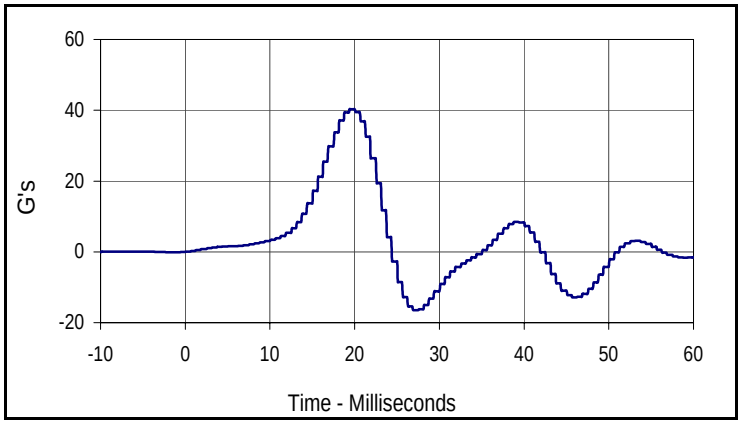
APPENDIX C
POST-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	SID / HIII External Measurements	Test Date:	7/19/07
ATD Serial No.:	275	Test I.D.:	N/A

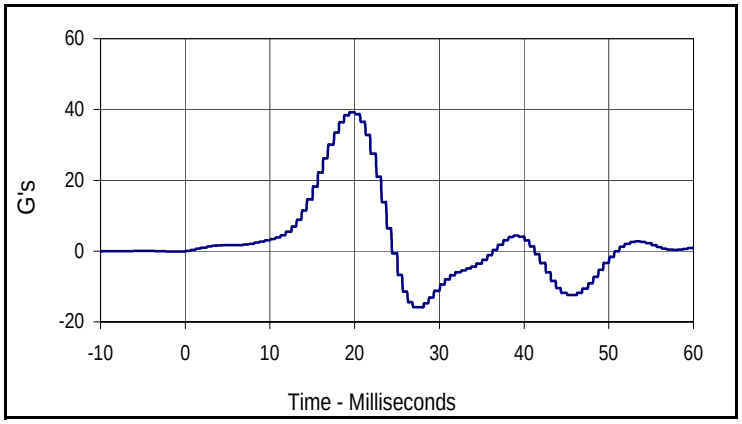
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	891	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	504	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	514	Pass
KV- Knee Pivot From Floor	mm	490 to 505	496	Pass
HW- Hip Width	mm	356 to 391	362	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	7/20/07
ATD Serial No.:	275	Test I.D.:	TH07J

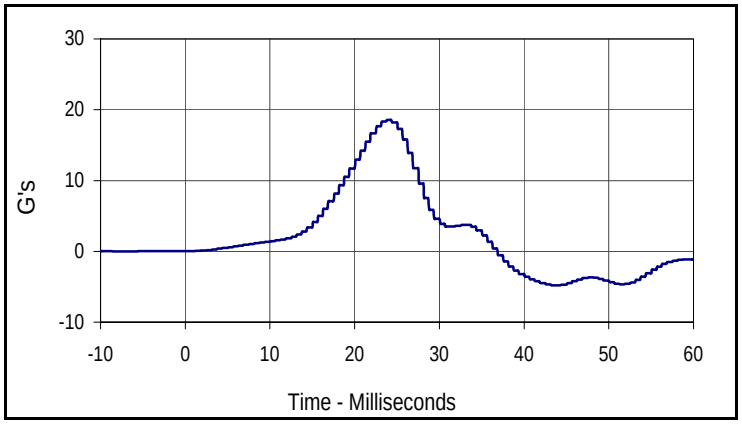
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.32	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	40.3	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	39.2	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	18.5	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
40.3	19.4	-16.4	26.9



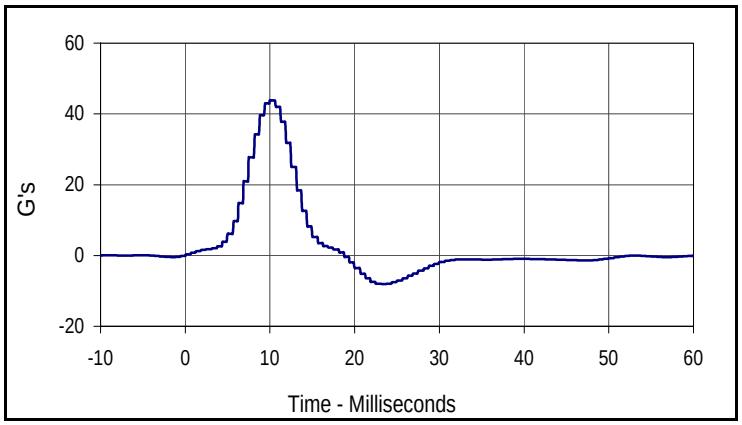
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
39.2	19.4	-15.8	27.6



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
18.5	23.8	-4.8	43.8

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	7/20/07
ATD Serial No.:	275	Test I.D.:	PL07J

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	43.8	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
		Overall Test Results		Pass

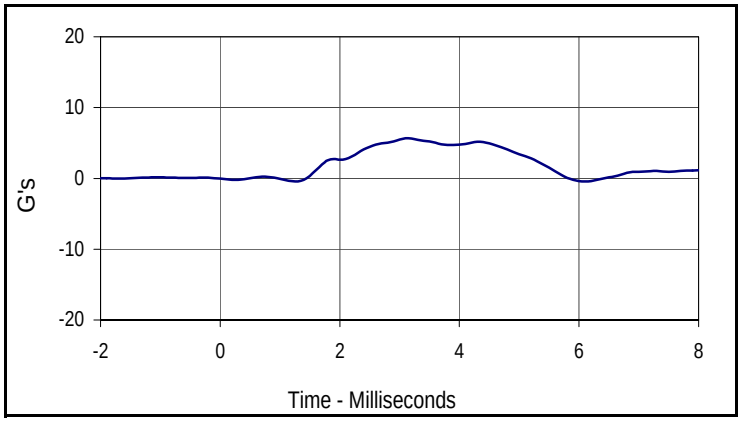


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
43.8	10.0	-8.1	23.2

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	7/19/07
ATD Serial No.:	275	Test I.D.:	HD07J

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	146.9	Pass
Peak Longitudinal Acceleration	G's	≤15.0	5.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	4.0	Pass
		Overall Test Results		Pass

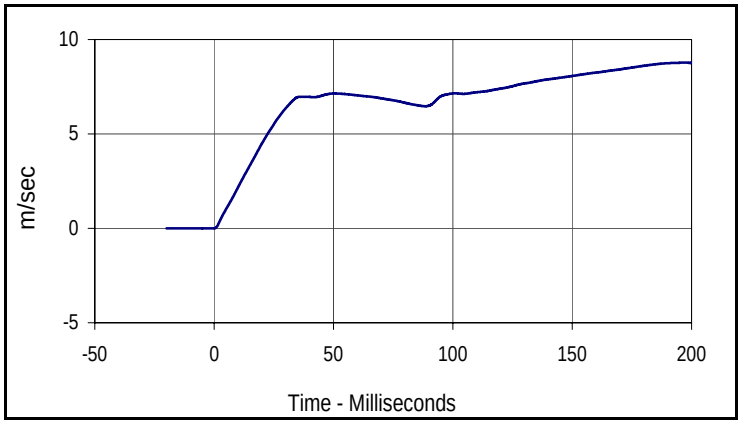
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
146.9	2.1	0.0	-1.6



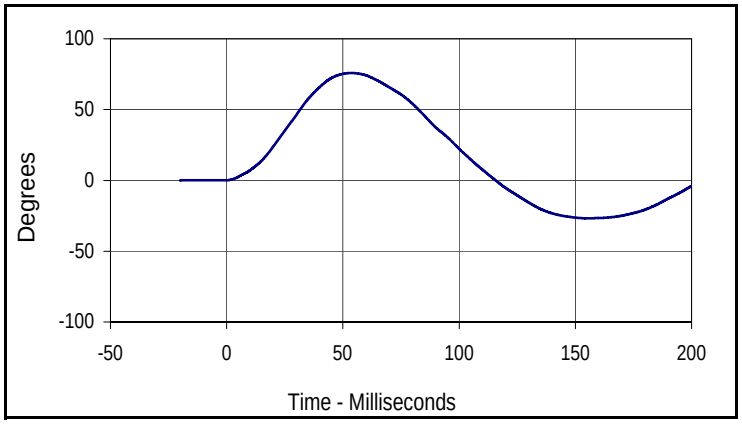
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.7	3.1	-0.4	1.3

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	7/20/07
ATD Serial No.:	275	Test I.D.:	NB07J

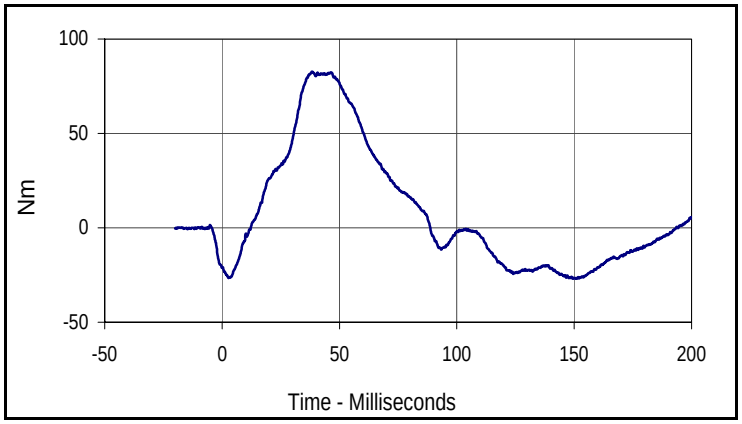
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.18	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.49	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.37	Pass
	40 to 70	m/sec	6.27 to 7.64	7.15	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	75.8	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	62.1	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	82.8	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
8.8	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
75.8	53.6	-26.8	155.3



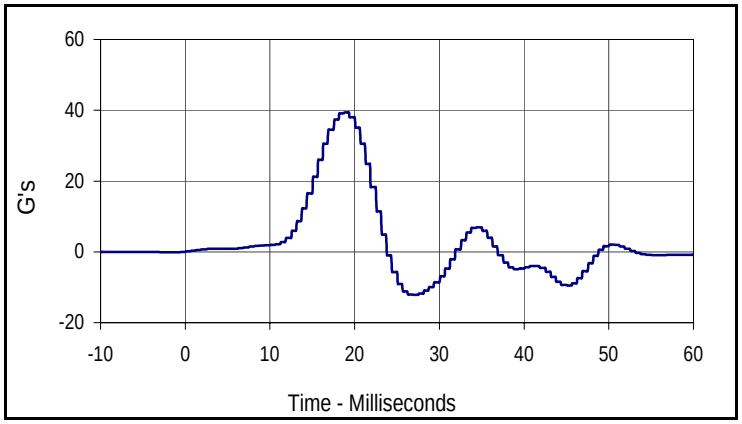
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
82.8	38.3	-27.0	151.0

Test Program:	SID / HIII External Measurements	Test Date:	7/19/07
ATD Serial No.:	274	Test I.D.:	N/A

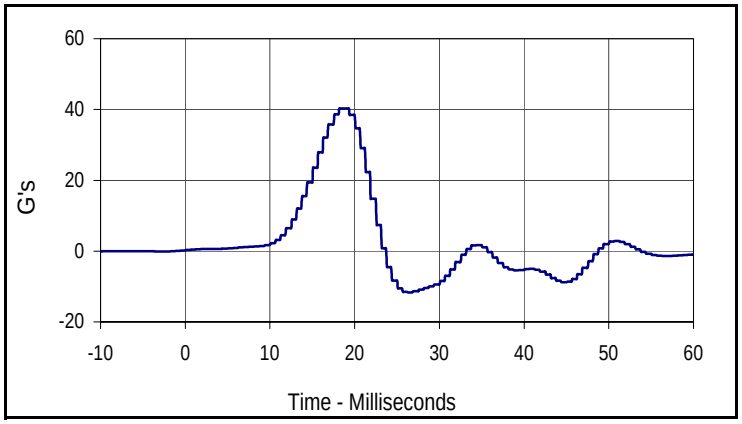
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	896	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	515	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	516	Pass
KV- Knee Pivot From Floor	mm	490 to 505	494	Pass
HW- Hip Width	mm	356 to 391	367	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	7/20/07
ATD Serial No.:	274	Test I.D.:	TH07K

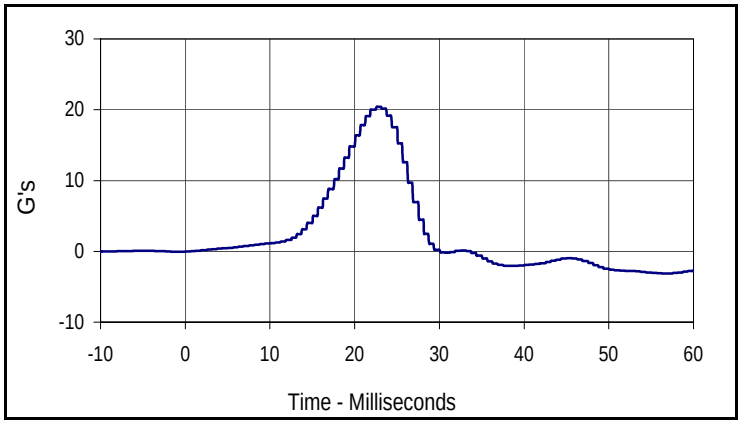
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.31	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	39.4	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	40.3	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.4	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
39.4	18.8	-12.2	26.9



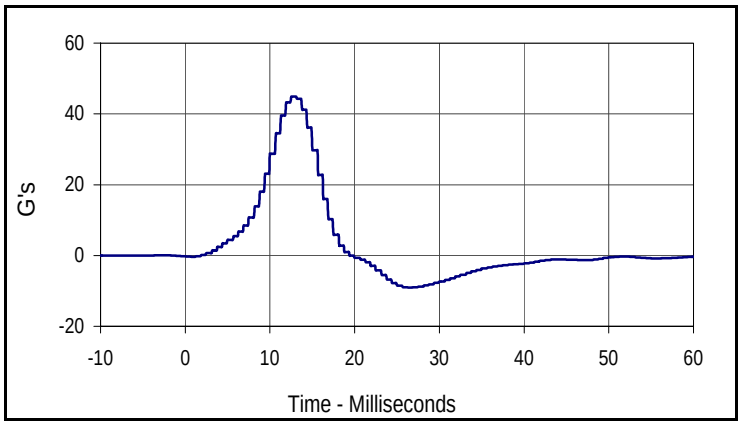
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
40.3	18.8	-11.7	26.3



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
20.4	22.6	-3.1	56.3

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	7/20/07
ATD Serial No.:	274	Test I.D.:	PL07K

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.32	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	44.9	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	5.50	Pass
		Overall Test Results		Pass

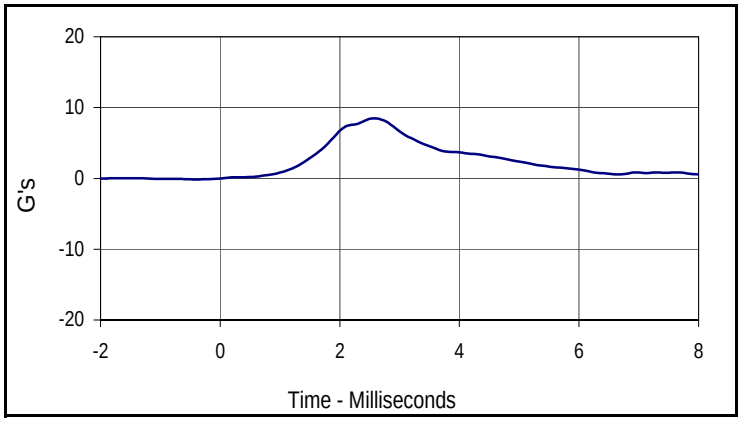


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
44.9	12.5	-9.1	26.3

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	7/19/07
ATD Serial No.:	274	Test I.D.:	HD07K

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	137.7	Pass
Peak Longitudinal Acceleration	G's	≤15.0	8.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.9	Pass
		Overall Test Results		Pass

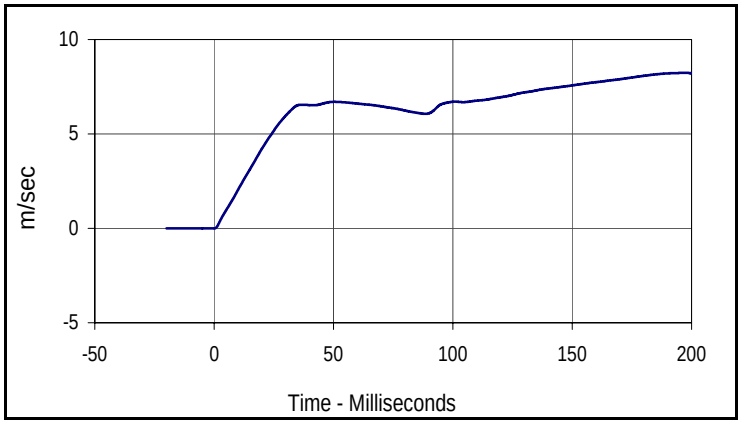
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
137.7	2.4	0.1	-1.0



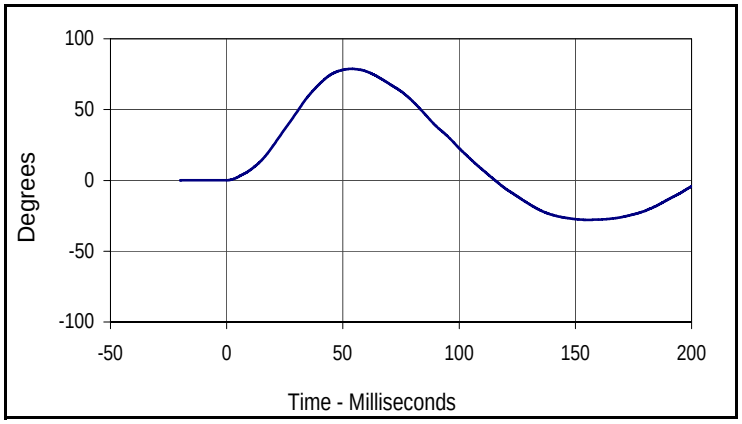
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
8.5	2.6	-0.1	-0.4

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	7/20/07
ATD Serial No.:	274	Test I.D.:	NB07K

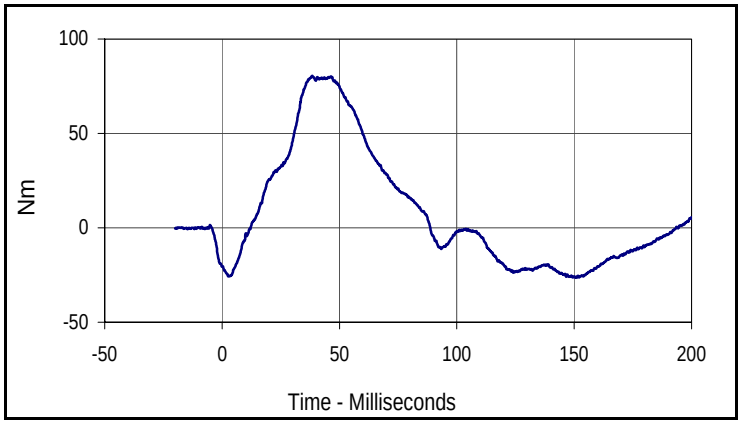
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.09	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.04	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.21	Pass
	30 Msec.	m/sec	5.73 to 7.01	5.97	Pass
	40 to 70	m/sec	6.27 to 7.64	6.70	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	78.7	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.4	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	61.8	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	80.5	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
8.2	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
78.7	53.7	-27.9	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
80.5	38.3	-26.4	151.0

APPENDIX D

CHILD RESTRAINT SYSTEM

REPORT NUMBER TR-P27144-01-NC

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

MAZDA MOTOR CORPORATION
2007 MAZDA CX-9
5-DOOR MPV

NHTSA NUMBER: Z75401

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

JULY 17, 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, R00M W43-410
WASHINGTON, D.C. 20590

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Prepared by: _____ Date: July 17, 2007
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Approved by: _____ Date: July 17, 2007
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

FINAL REPORT ACCEPTED BY:

_____
Manager, New Car Assessment Program

_____
Date of Acceptance

_____
COTR, NCAP Frontal Impact Program

_____
Date of Acceptance

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipients Catalog No.
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4. Title and Subtitle	5. Report Date
Final Report of a Combi Centre DX CRS NHTSA No. Z75401	July 17, 2007
	6. Performing Organization Code KAR

7. Authors	8. Performing Organization Report No.
Mr. Johnny H. Dutto, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco	TR-P27144-01-NC

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

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NVS-111 1200 New Jersey Ave SE, Room W43-410 Washington, D.C 20590	Final Test Report
	14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS

15. Supplementary Notes

16. Abstract

A side impact test was conducted on the subject CRS Combi Centre DX in conjunction with side impact NCAP testing on a 2007 Mazda CX-9 5-Door MPV and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at Karco Engineering, LLC on July 17, 2007.

Measurement Description	Units	Threshold	Right Rear (P3)
Head Injury Criteria (HIC15)	N/A	390	72.1
3 msec. Chest Clip	G's	50	19.0

17. Key Words	18. Distribution of Statement
New Car Assesment Program (Side Impact NCAP) Side Impact Moving Deformable Barrier (MDB) Final Report of a Combi Centre DX CRS	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)	20. Security Classification (this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	44	

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

SECTION D-1

PURPOSE AND SUMMARY OF TEST Z75401

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

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

SUMMARY

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

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

CHILD DUMMY VALUES		
Location	HIC15 Value	3 Msec. Chest Clip
CRABI (P3)	72.1	19.0

DATA SHEET NO.1

CRASH TEST SUMMARY

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

CHILD RESTRAINT SYSTEM INFORMATION

Description	Position #3 CRS
Manufacturer	Combi
Model Name	Centre DX
Model No.	927500
Type	Infant
Forward/Rearward	Rearward

VISIBLE DUMMY CONTACT POINTS

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

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 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	562	416	978	610	506	1116
Right	kg	549	406	955	561	473	1034
Ratio	%	57.5	42.5	100	54.4	45.6	100
Totals	kg	1111	822	1933	1171	979	2150

TARGET TEST WEIGHT CALCULATION

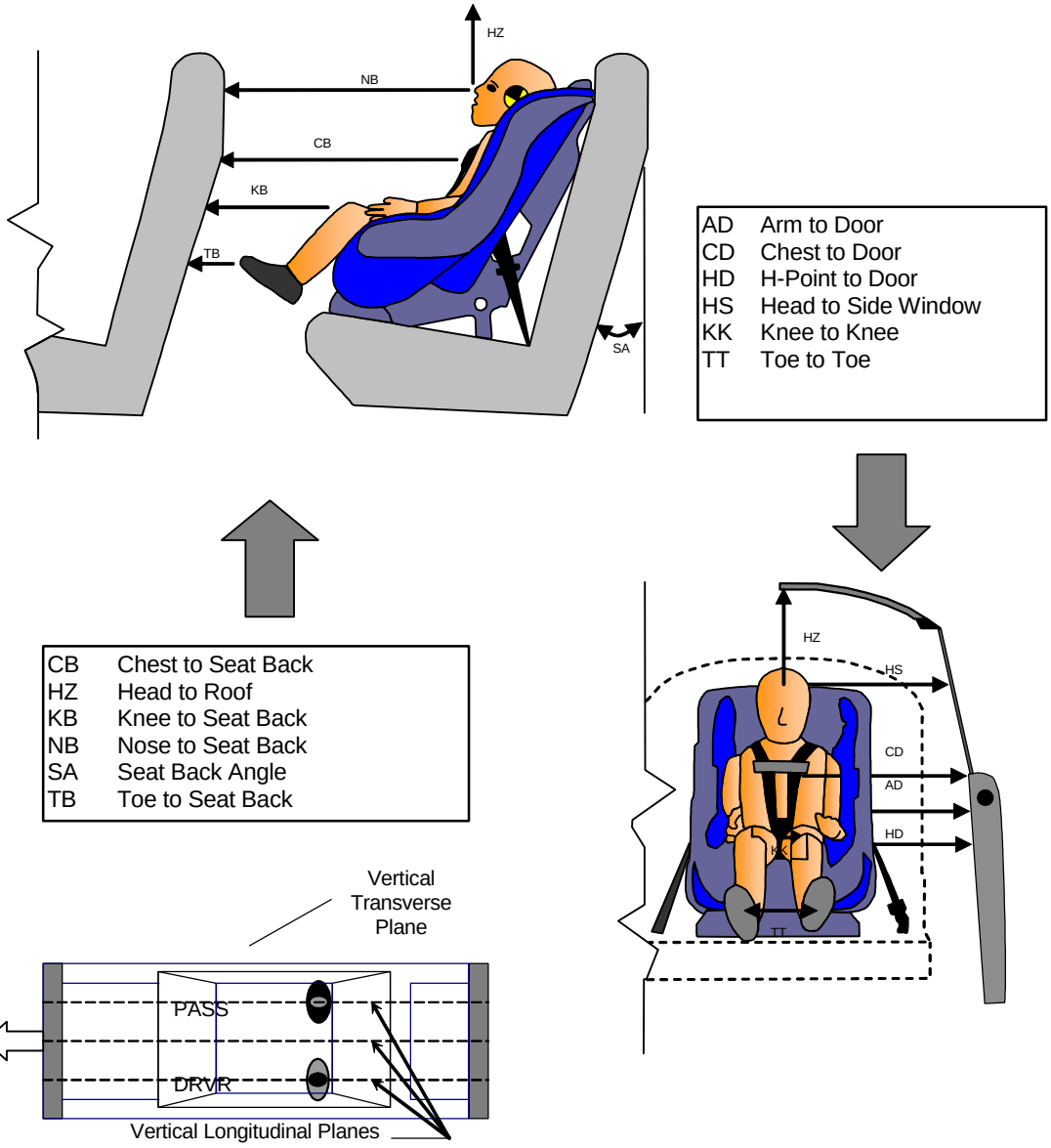
Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1933
Weight of 2 P572 ATD's	kg	161
Rated Cargo/Luggage Wt. (RCLW)	kg	63
Calculated Vehicle Target Wt. (TVTW)	kg	2156

DATA SHEET NO.3

CRABI POSITIONING IN VEHICLE

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

DATA SHEET NO.3

CRABI POSITIONING IN VEHICLE…(CONTINUED)

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

CRABI POSITION MEASUREMENTS

Code	Measurement	P3 (Passenger's Side)	
		Length (mm)	Angle (°)
SA	Seat Back Angle		20.2
HZ	Head to Roof (Z)	464	
CD	Chest to Door	400	
KK	Knee to Knee (Y)	115	
HS	Head to Side Window	407	
HD	H-Point to Door (Y)	325	
AD	Arm to Door	244	
NB	Nose to Seat Back	518	
CB	Chest to Seat Back	448	
FF	Foot to Foot	90	
KB-Left	Knee to Seat Back	225	
KB-Right	Knee to Seat Back	220	
TB-Left	Toe to Seat Back	60	
TB-Right	Toe to Seat Back	70	

DATA SHEET NO.4

CRS PERFORMANCE DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

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 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

CRS ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	CRS	1960	615	890
2	CRS Base	1970	673	825

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 Mazda CX-9 5-Door MPV NHTSA No.: Z75401

Test Program: 55/28 km/h Side Impact NCAP Test Date: 7/17/07

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.)	1000	2290	-1499	-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 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)

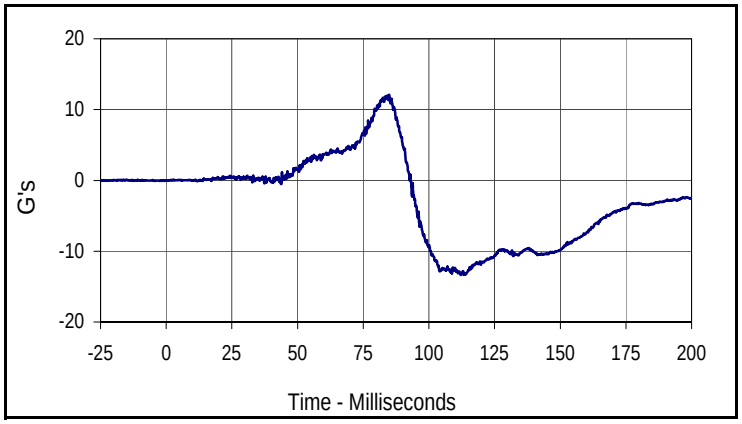
Figure D2-17: Post-Test Position 3 Right Side View (Through Window)

SECTION D3

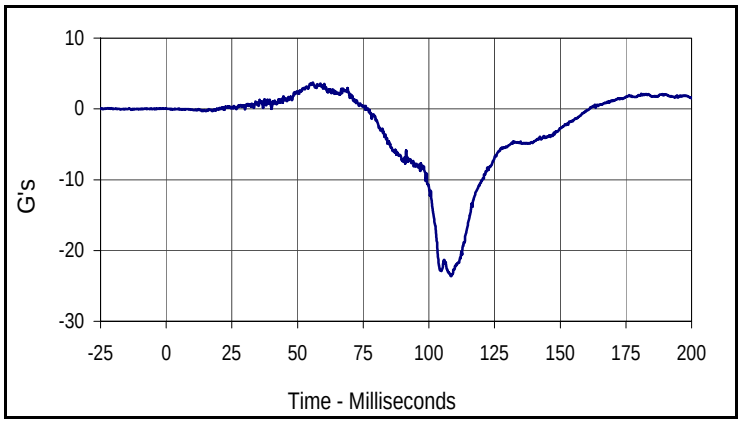
CRABI RESPONSE AND CRS DATA TRACES

LIST OF DATA PLOTS

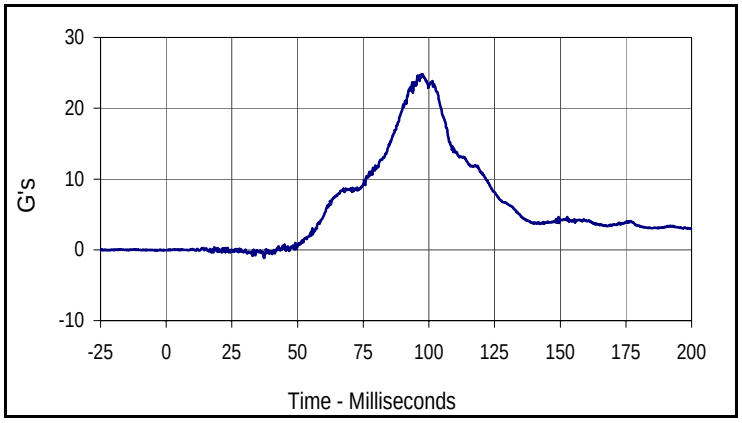
Test Vehicle:	2007 Mazda CX-9 5-Door MPV	Test Date:	7/17/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	Z75401



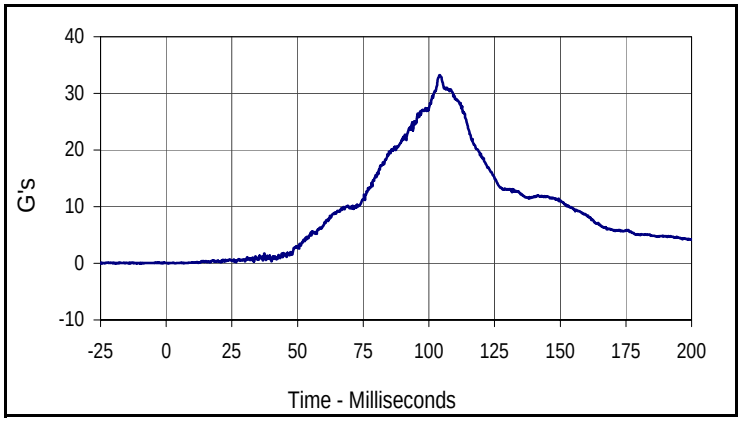
Curve Description			
CRABI Head X			
CURNO	Type	SAE Class	Units
072	FIL	1000	G's
Max	Time	Min	Time
12.1	84.9	-13.4	113.3



Curve Description			
CRABI Head Y			
CURNO	Type	SAE Class	Units
073	FIL	1000	G's
Max	Time	Min	Time
3.7	55.8	-23.6	108.5

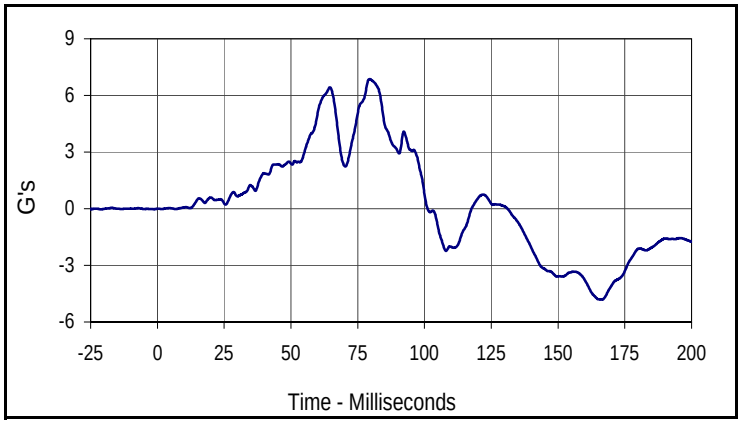


Curve Description			
CRABI Head Z			
CURNO	Type	SAE Class	Units
074	FIL	1000	G's
Max	Time	Min	Time
24.8	97.7	-1.2	37.3

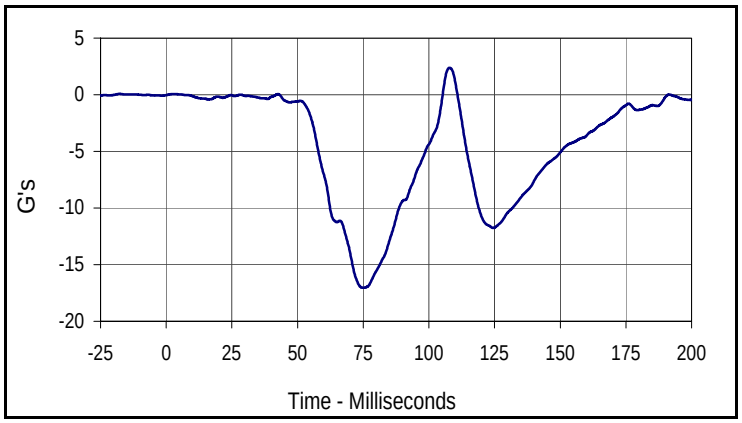


Curve Description			
CRABI CRABI Head Resultant			
CURNO	Type	SAE Class	Units
072	RES	1000	G's
Max	Time	Min	Time
33.2	104.1	0.0	0.7

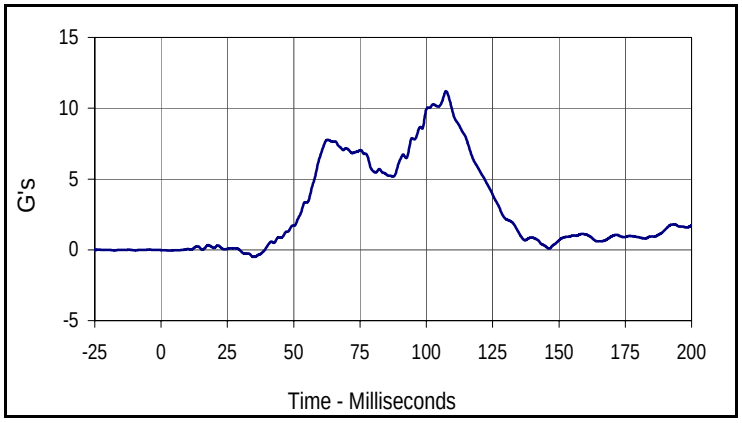
Test Vehicle:	2007 Mazda CX-9 5-Door MPV	Test Date:	7/17/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	Z75401



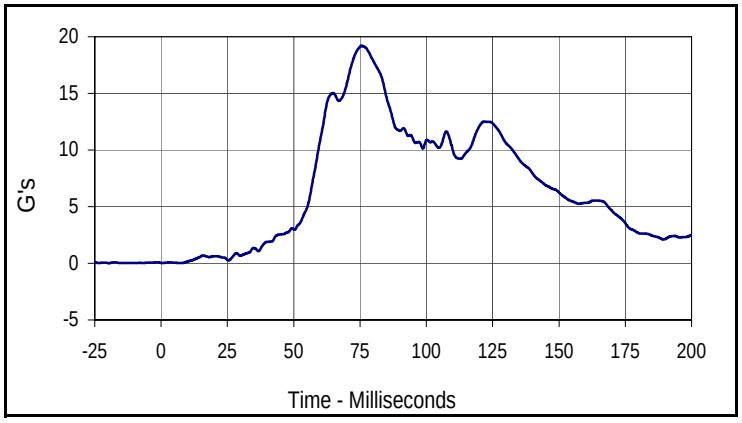
Curve Description			
CRABI Chest X			
CURNO	Type	SAE Class	Units
082	FIL	180	G's
Max	Time	Min	Time
6.9	79.5	-4.8	166.3



Curve Description			
CRABI Chest Y			
CURNO	Type	SAE Class	Units
083	FIL	180	G's
Max	Time	Min	Time
2.4	107.9	-17.0	74.9



Curve Description			
CRABI Chest Z			
CURNO	Type	SAE Class	Units
084	FIL	180	G's
Max	Time	Min	Time
11.2	107.4	-0.5	35.4



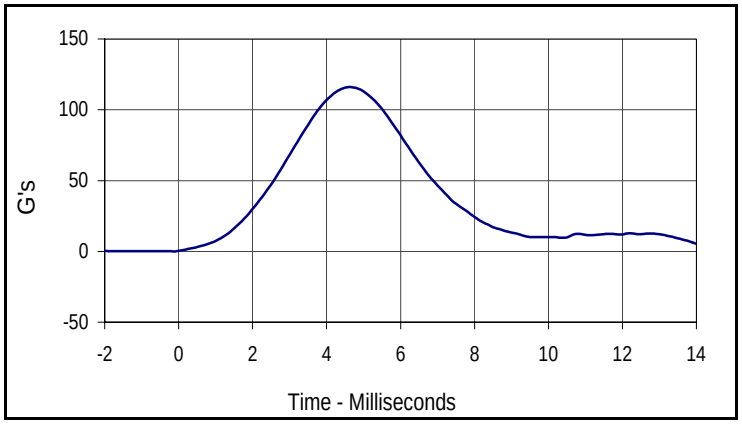
Curve Description			
CRABI CRABI Chest Resultant			
CURNO	Type	SAE Class	Units
082	RES	180	G's
Max	Time	Min	Time
19.2	75.6	0.0	0.7

SECTION D4

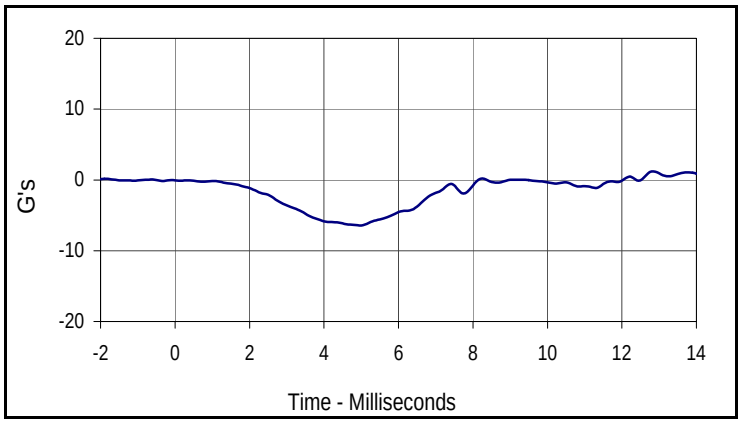
CRABI CALIBRATION INFORMATION

Test Program:	CRABI 12 Month Old Frontal Head Drop Test	Test Date:	7/2/07
ATD Serial No.:	022	Test I.D.:	FHD06S

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



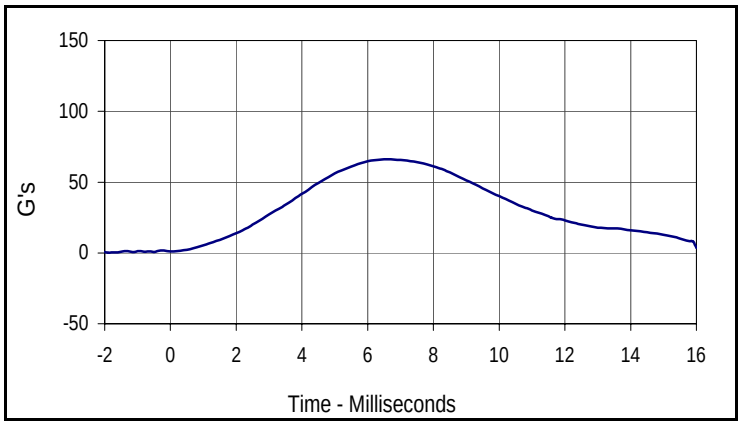
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
116.0	4.6	0.0	-0.1



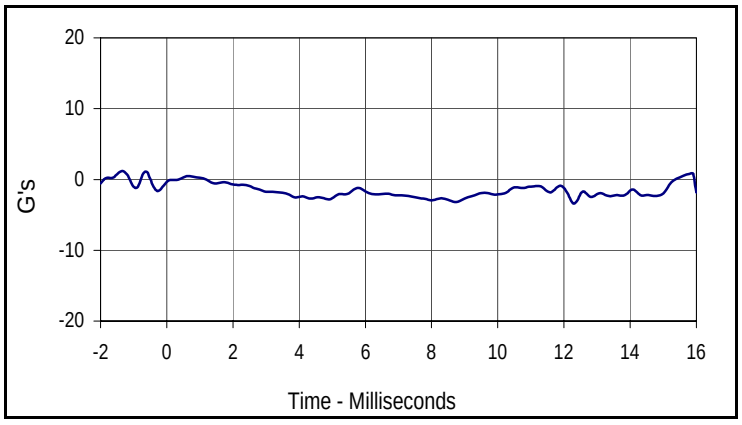
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.1	-1.9	-6.4	5.0

Test Program:	CRABI 12 Month Old Rear Head Drop Test	Test Date:	7/3/07
ATD Serial No.:	022	Test I.D.:	RHD06S

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	64.8	Pass
Peak Lateral Acceleration	G's	≤15.0	2.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



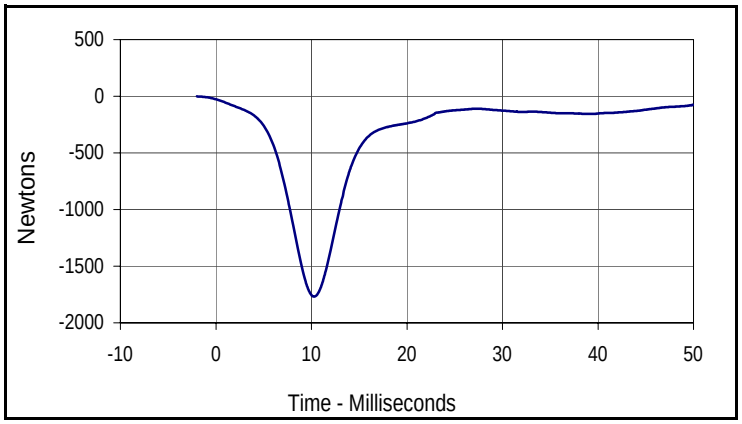
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
64.8	6.0	0.3	-1.9



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.1	-1.3	-2.8	4.9

Test Program:	CRABI 12 Month Old Thorax Impact Test	Test Date:	7/3/07
ATD Serial No.:	022	Test I.D.:	CH07S

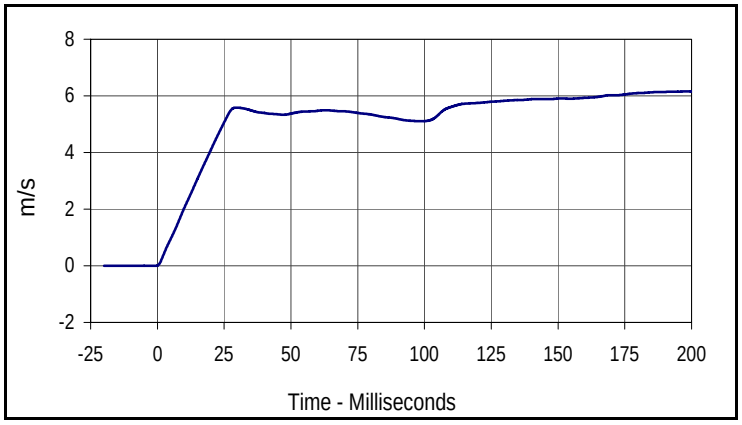
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	4.90 to 5.10	5.03	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1754	Pass
		Overall Test Results		Pass



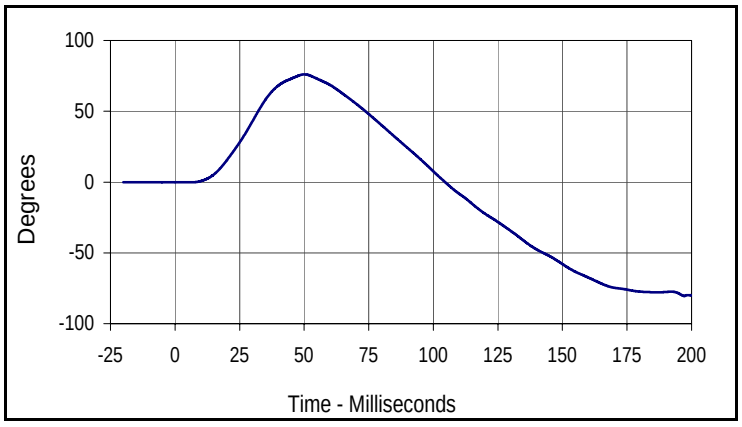
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	60	Newtons
Max	Time	Min	Time
-1.3	-2.0	-1753.5	10.0

Test Program:	CRABI 12 Month Old Neck Flexion Test	Test Date:	7/6/07
ATD Serial No.:	022	Test I.D.:	NF07S

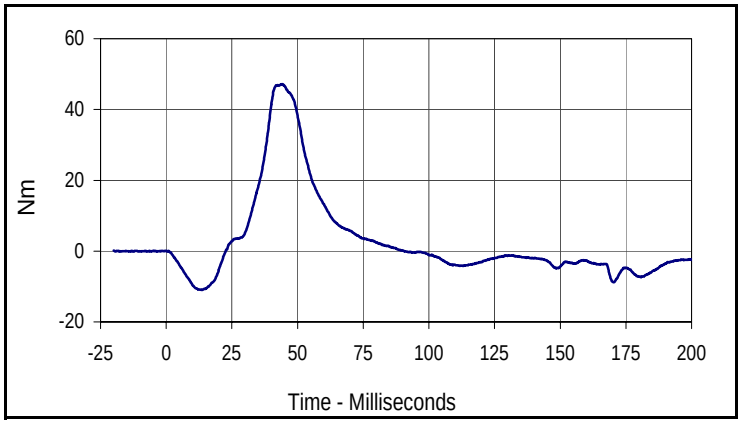
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.15	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	2.0	Pass
	20 Msec.	m/s	3.4 to 4.2	4.1	Pass
	25 Msec.	m/s	4.3 to 5.2	5.1	Pass
"D" Plane Rotation	Max	Degrees	75.0 to 86.0	76.1	Pass
Peak Moment in Rotation	Max	Nm	36.0 to 45.0	44.1	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	71.6	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.2	199.3	0.0	-0.7



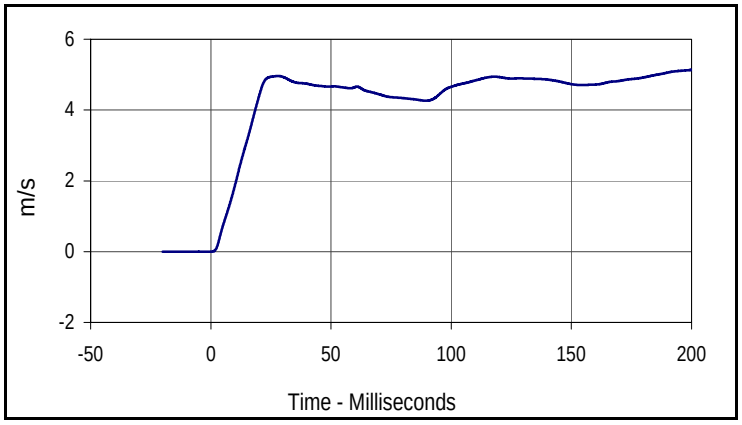
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.1	50.1	-80.5	197.1



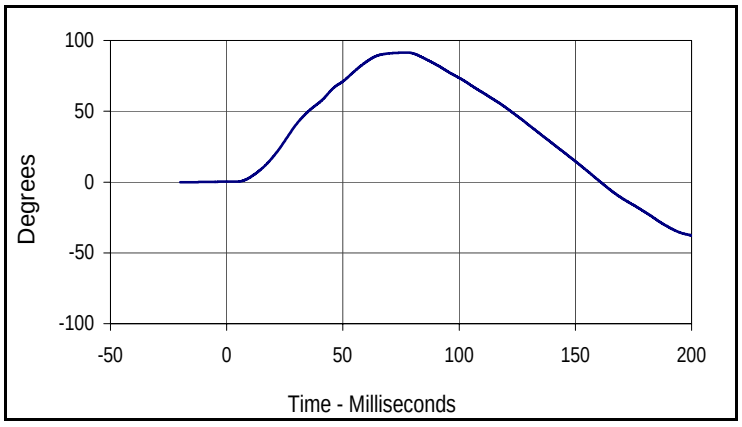
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
47.1	44.3	-10.9	13.5

Test Program:	CRABI 12 Month Old Neck Extension Test	Test Date:	7/4/07
ATD Serial No.:	022	Test I.D.:	NE07S

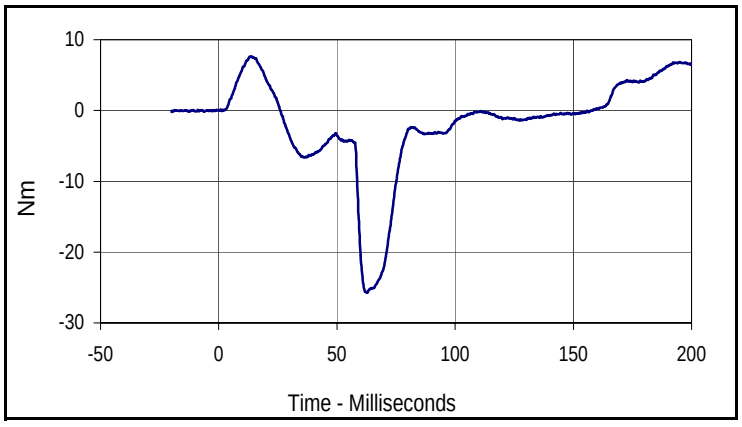
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.44	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.9	Pass
	10 Msec.	m/s	1.5 to 2.1	1.9	Pass
	14 Msec.	m/s	2.2 to 2.9	2.9	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	91.5	Pass
Peak Moment in Rotation	Max	Nm	-12 to -23	-20.4	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	77.9	Pass
			Overall Test Results		Pass



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



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
91.5	77.5	-37.7	200.0



Curve Description			
Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
7.6	13.2	-25.8	62.8

Test Program:	CRABI 12 Month Old External Dimensions	Test Date:	7/4/07
ATD Serial No.:	022	Test I.D.:	N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	456.0 to 471.2	460	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	283	Pass
C - "H" point height	mm	27.9 to 38.1	32	Pass
D - "H" point from backline	mm	40.1 to 50.3	45	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	55	Pass
F - Thigh clearance	mm	63.0 to 73.2	67	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	187	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	158	Pass
K - Buttock to knee length	mm	202.7 to 217.9	206	Pass
L - Poplipteal length	mm	138.7 to 153.9	140	Pass
M - Knee pivot height	mm	165.1 to 180.3	172	Pass
N - Buttock poplipteal length	mm	144.8 to 160.0	149	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	110	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	181	Pass
S - Head Breadth	mm	124.4 to 134.6	128	Pass
T - Head Depth	mm	149.9 to 165.1	152	Pass
U - Hip breadth	mm	158.5 to 173.7	160	Pass
V - Shoulder breadth	mm	200.7 to 215.9	211	Pass
W - Foot breadth	mm	39.1 to 49.3	45	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	460	Pass
Z - Waist circumference	mm	447.0 to 472.4	453	Pass
AA - Refrence location for dimension Y & O	mm	256.5 to 266.7	261	Pass
BB - Reference Location For dimension Z	mm	106.7 to 116.9	111	Pass
CC - Shoulder Height	mm	299.7 to 314.9	300	Pass
DD - Chin Height	mm	289.6 to 304.8	290	Pass
		Overall Test Results		Pass