REPORT NUMBER TR-P27143-01-NC

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

MITSUBISHI MOTORS CORPORATION
2008 MITSUBISHI LANCER
4-DOOR SEDAN

NHTSA NUMBER: B85600

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

MAY 30, 2007

FINAL REPORT

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

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.

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by:  Date: May 30, 2007

Mr. Johnny H. Dutto Project Engineer
KARCO Engineering, LLC

Reviewed by:  Date: May 30, 2007

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

Approved by:  Date: May 30, 2007

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

FINAL REPORT ACCEPTED BY:

Manager, Side Impact NCAP

Date of Acceptance

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipients Catalog No.
TR-P27143-01-NC		

4. Title and Subtitle	5. Report Date
Final Report of Side Impact New Car Assessment Program Testing of a 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No. B85600	May 30, 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-P27143-01-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 55/28 km/h 90 deg. Moving Deformable Barrier Side Impact NCAP Test was conducted on the subject 2008 Mitsubishi Lancer 4-Door Sedan 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 May 30, 2007. The impact velocity of the Moving Deformable Barrier was 62.43 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 30.0 deg. C. The target vehicle's maximum post-test static crush was 237 mm located at level 2. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver SID/HIII	Pass. SID/HIII
Left Upper Rib (LUR) G's	37.9	62.1
Left Lower Rib (LLR) G's	30.0	65.7
Lower Spine (T_{12}) G's	31.1	72.0
Thoracic Trauma Index (TTI) G's	35.0	69.0
Pelvis (PEV) G's	44.5	91.0

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

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	134	

Form DOT F1700.7 (8-72)

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 2008 Mitsubishi Lancer 4-Door Sedan manufactured by Mitsubishi Motors 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 2008 Mitsubishi Lancer 4-Door Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.43 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 1549 kg and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering, LLC in Adelanto, California, on May 30, 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 237 mm at level 2, 750 mm rearward of the left vertical impact point. The driver SID/Hybrid III, Serial No. 274 and the passenger SID/Hybrid III, Serial No. 275 were calibrated prior to this test. The SID/Hybrid III injury criteria is summarized as follows:

Measurement	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	G's	35	69
Peak Pelvic G's (PEV)	G's	45	91

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

SECTION 3

OCCUPANT AND VEHICLE INFORMATION SHEETS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

CONVERSION FACTORS USED IN THIS REPORT*

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

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	B85600	Anti-Lock Brakes	No
Make	Mitsubishi	All Wheel Drive	No
Model	Lancer	Power Steering	Yes
Body Style	4-Door Sedan	Driver Front Airbag	Yes
Vin No.	JA3AU26U48U018938	Driver Side Torso Airbag	Yes
Color	White	Driver Side Head Airbag	No
Delivery Date	5/23/2007	Driver Curtain/Airbag	Yes
Odometer (Miles)	1	Rear Pass. Airbag	No
Dealer	Manufacturer	Rear Pass. Side Airbag	No
Transmission	5-Speed Manual	Rear Pass. Head Airbag	No
Final Drive	Front	Rear Pass. Curtain/Airbag	Yes
Type/No. Cyl.	Inline 4	Pre-Tensioners	Yes
Engine Disp. (L)	2.0	Load Limiters	Yes
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air Cond.	No
Sunroof/T-Top	No	AM/FM CD	Yes
Tinted Glass	Yes	Tilt Steering	Yes
Traction Control	No	Automatic Door Locks	No
Power Brakes	Yes	Power Windows	Yes
Front Disc	Yes	Power Seats	No
Rear Disc	Yes	Other	None

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Mitsubishi Motors Corporation	GVWR (kg)	1850
Date of Manufacture	May-07	GAWR Front (kg)	1010
		GAWR Rear (kg)	910

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				375
Cargo Weight (RCLW) (kg)				35

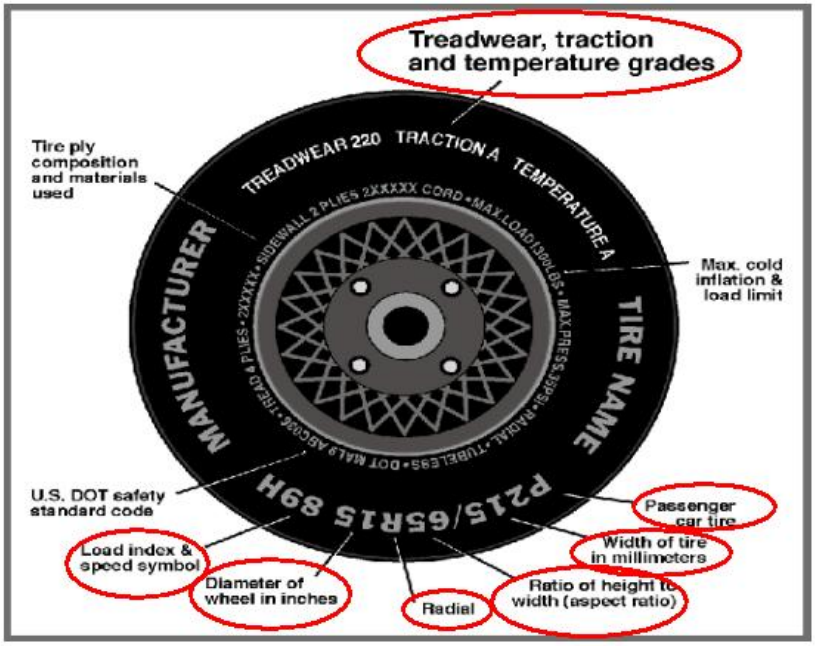
DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

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)	300	300
Cold Pressure (kpa)	220	220
Recommended Tire Size	P205/60R16	P205/60R16
Tire Size on Vehicle	P205/60R16	P205/60R16
Tire Manufacturer	Yokohama	Yokohama
Treadwear	320	320
Traction	B	B
Temperature Grades	A	A
Tire Plies Sidewall	Polyester 1 + Steel 2 + Nylon 1	Polyester 1 + Steel 2 + Nylon 1
Tire Plies Body	Radial Tubless M + S	Radial Tubless M + S
Load Index/Speed Symbol	S34	S34
Tire Material	Polyester 1 + Steel 2 + Nylon 1	Polyester 1 + Steel 2 + Nylon 1
DOT Safety Code Right	FD20 N2L1807	FD20 N2L1807
DOT Safety Code Left	FD20 N2L1807	FD20 N2L1807

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	415	278	693	470	344	814
Right	kg	405	261	666	433	302	735
Ratio	%	60.3	39.7	100	58.3	41.7	100
Totals	kg	820	539	1359	903	646	1549

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1359
Weight of 2 P572 ATD's	kg	161
Rated Cargo/Luggage Wt. (RCLW)	kg	35
Calculated Vehicle Target Wt. (TVTW)	kg	1555

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	712	718	715	707	1046
As Tested	mm	696	710	689	699	1100
Fully Loaded	mm	701	712	679	693	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2637
Total Vehicle Length at Left Side	mm	3015
Total Vehicle Length at Centerline	mm	4578
Total Vehicle Length at Right Side	mm	3015
Weight of Ballast In Cargo Area	kg	0
Amount of Stoddard Solvent in Fuel Tank	liters	54.54

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2637
Target Impact Point Aft of Front Axle	mm	379
Actual Impact Point Aft of Front Axle	mm	369

DATA SHEET NO. 1...(CONTINUED)

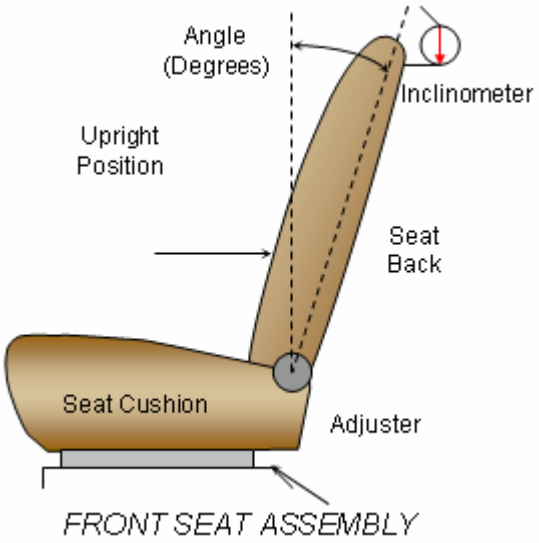
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

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

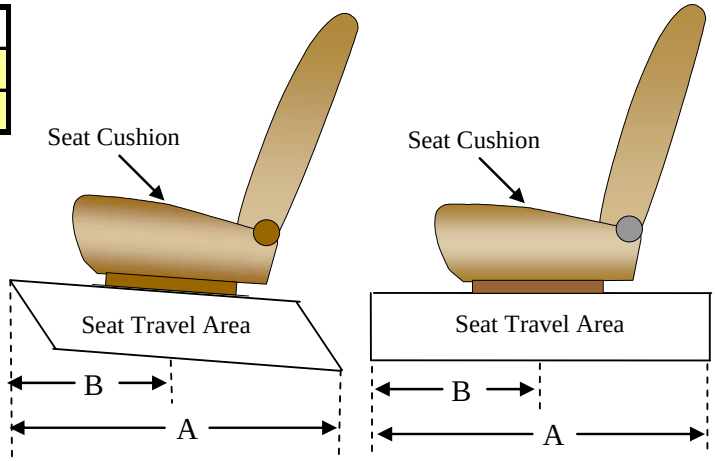
	Deg.
Driver w/seated Dummy	4.0 @ Headrest
Passenger w/seated Dummy	4.0 @ Headrest

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. T

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	22 detents	10th detent
Rear Seat	N/A	N/A



SEAT BELT UPPER ANCHORAGE

Position number zero (0) 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: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

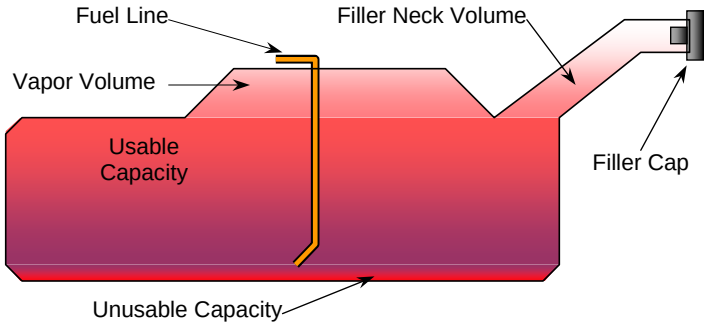
Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

.

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	58.67
Usable Capacity of "Optional" Tank	
Usable Capacity used for FMVSS 301	53.97 to 55.15
Actual Amount of Solvent used	54.54

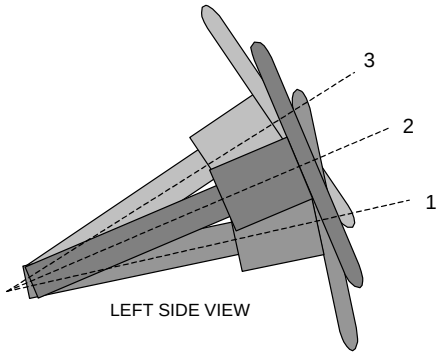
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately two (2) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the 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	18.5	
Geometric center position No. 2	20.5	
Uppermost position No. 3	22.8	

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	415	278		470	344	
Right	kg	405	261		433	302	
Ratio	%	60.3	39.7		58.3	41.7	
Totals	kg	820	539	1359	903	646	1549

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	54	258
Level 2	Occupant H-Point	mm	237	529
Level 3	Mid Door	mm	233	622
Level 4	Window Sill	mm	178	915
Level 5	Window top	mm	-38	1419
N/A	Maximum Penetration	mm	237	

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: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

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	62.43
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.40
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	Left	210
B	Top of Bumper	533	800	Left	122
C	Mid Level	686	800	Left	162
D	Top of Stack	813	800	Left	208

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	1
High Speed Cameras	2

DATA SHEET NO. 4

POST-TEST OBSERVATIONS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/Hybrid III	Rear Seat SID/Hybrid III
Dummy Type / Serial No.	P572F, SID / No. 274	P572F, SID / No. 275
Head Contact	Curtain Airbag and Side Header	Curtain Airbag and 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	Front and rear windows broken on struck side
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 01		Left Rear (Passenger) Occupant Location 04	
	Installed	Operation	Installed	Operation
Front Airbag	Yes	No	No	
Side Torso Airbag	Yes	Yes	No	
Head Airbag	No		No	
Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes		No	
Seat Belt Load Limiter	Yes		No	

MDB LEFT EDGE IMPACT POINT DATA

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

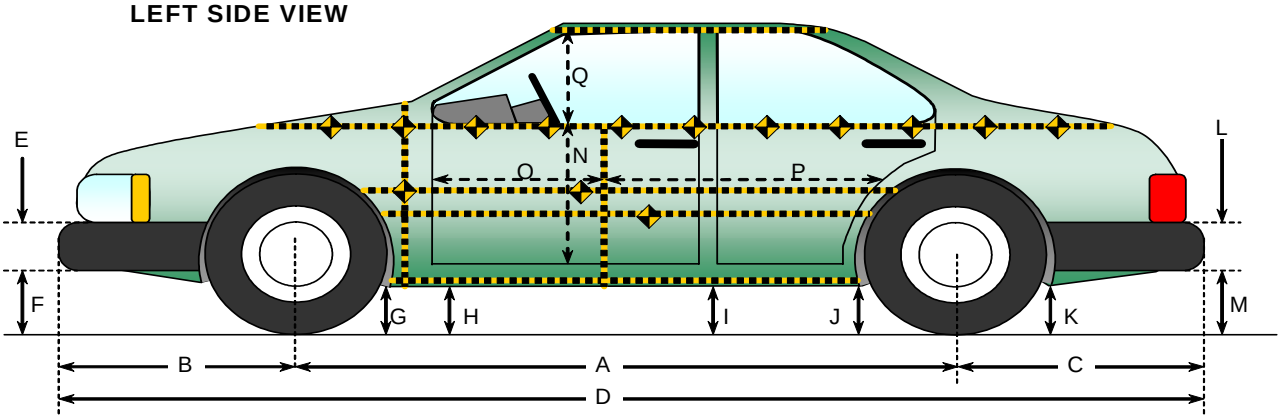
DATA SHEET NO. 5

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

LEFT SIDE VIEW



VEHICLE PRE AND POST-TEST MEASUREMENT INFORMATION

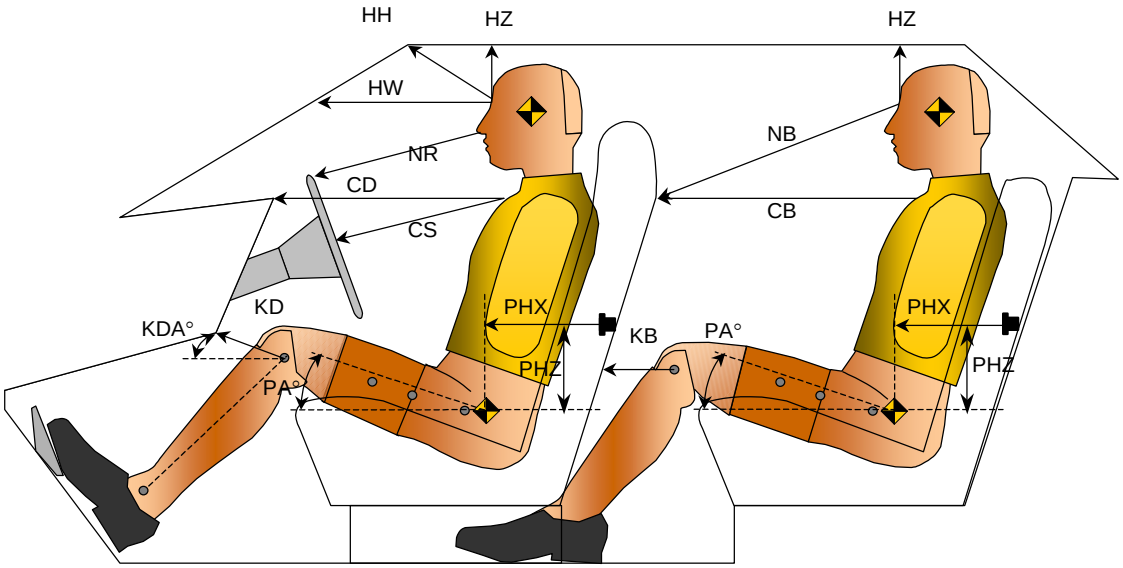
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2637	2634	-3
B	Front Axle to FSOV	961	950	-11
C	Rear Axle to RSOV	979	974	-5
D	Total Length at Centerline	4578	4558	-20
E	Front Bumper Thickness	405	405	0
F	Front Bumper Bottom to Ground	190	210	20
G	Sill Height at Front Wheel Well	206	274	68
H	Sill Height at Front Door Leading Edge	206	276	70
I	Sill Height at "B" Pillar	206	268	62
J1	Sill Height at Rear Wheel Well	196	227	31
J2	Pinch Weld Height at Rear Wheel Well	225	257	32
K	Sill Height aft of Rear Wheel Well	230	274	44
L	Rear Bumper Thickness	380	380	0
M	Rear Bumper Bottom to Ground	295	344	49
N	Sill Height to Window Bottom Sill	710	645	-65
O	Front Door Leading Edge to Impact CL	685	655	-30
P	Rear Door Trailing Edge to Impact CL	1400	1385	-15
Q	Front Window Opening	361	370	9
R	Right Side Length	3015	3018	3
S	Left Side Length	3015	3000	-15
T	Vehicle Width at "B" Post	1725	1618	-107

DATA SHEET NO. 6

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07



LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length(mm)	Angle	Length(mm)	Angle
HH		Head to Header	390	13.8		
HW		Head to Windshield	620	0.0		
HZ	HZ	Head to Roof	163	90.0	155	90.0
NR	NB	Nose to Rim/Nose to Seat Back	422	14.6	678	13.5
CD	CB	Chest to Dash or Seat Back	595	1.0	594	5.2
CS		Chest to Steering Wheel	358	11.6		
KDL	KBL	Left Knee to Dash or Seat Back	212	16.0	200	0.0
KDR	KBR	Right Knee to Dash or Seat Back	193		190	
PA	PA	Pelvic Angle		23.0		24.2
PHX	PHX	H-Point to Striker (X-Axis)	188		215	
PHZ	PHZ	H-Point to Striker (Z-Axis)	195		268	

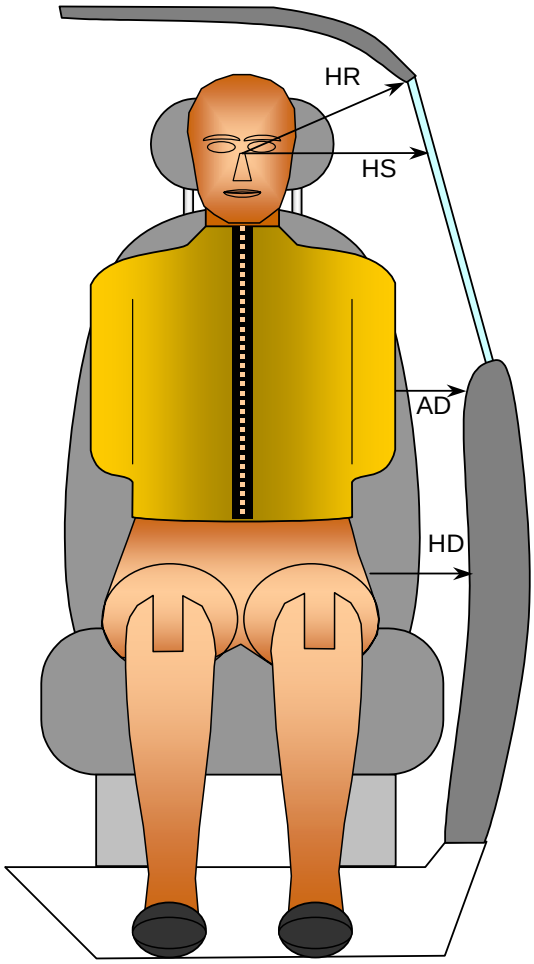
All Dimensions shown in millimeters

DATA SHEET NO. 7

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07



FRONT VIEW OF DUMMY

LATERAL CLEARANCE DIMENSION INFORMATION

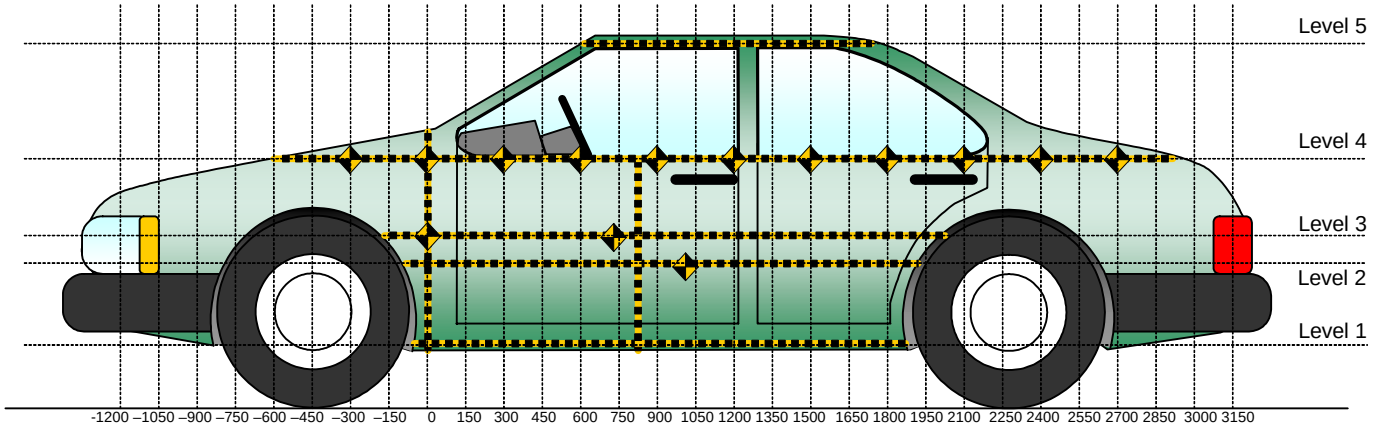
Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	238	290
HS	Head to Side Window	mm	300	385
AD	Arm to Door	mm	101	120
HD	H-Point to Door	mm	140	170

DATA SHEET NO. 8

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07



All Measurements Shown in mm

LEFT SIDE VIEW

Level	Measurement Description	Height Above Ground
1	Sill Top	258
2	Occupant H-Point	529
3	Mid Door	622
4	Window Sill	915
5	Window Top	1419

All Dimensions shown in millimeters

DATA SHEET NO. 9

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

	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			630	711				616	749				-14	38	
0	661	633	641	701		684	672	648	736		23	39	7	35	
150	692	650	644	692		722	826	789	727		30	176	145	35	
300	701	650	643	680		744	868	828	764		43	218	185	84	
450	701	650	642	671		752	874	871	819		51	224	229	148	
600	701	649	641	668		755	878	871	844		54	229	230	176	
750	700	649	641	663	1011	754	886	874	833	973	54	237	233	170	-38
900	703	648	640	661	1011	754	884	868	830	961	51	236	228	169	-50
1050	703	649	640	661	1021	752	879	858	818	956	49	230	218	157	-65
1200	706	649	641	658	1016	751	871	852	784	963	45	222	211	126	-53
1350	705	650	642	656	1016	753	844	833	819	966	48	194	191	163	-50
1500	706	651	644	656	1016	748	811	811	834	966	42	160	167	178	-50
1650	701	652	667	656	1021	742	771	783	811	964	41	119	116	155	-57
1800	666	650	648	656	1016	686	734	724	802	971	20	84	76	146	-45
1950		653	628	656	1021		648	669	726	966		-5	41	70	-55
2100				651					674					23	
2250				666					688					22	
2400				666					694					28	
2550															
2700															
2850															
3000															

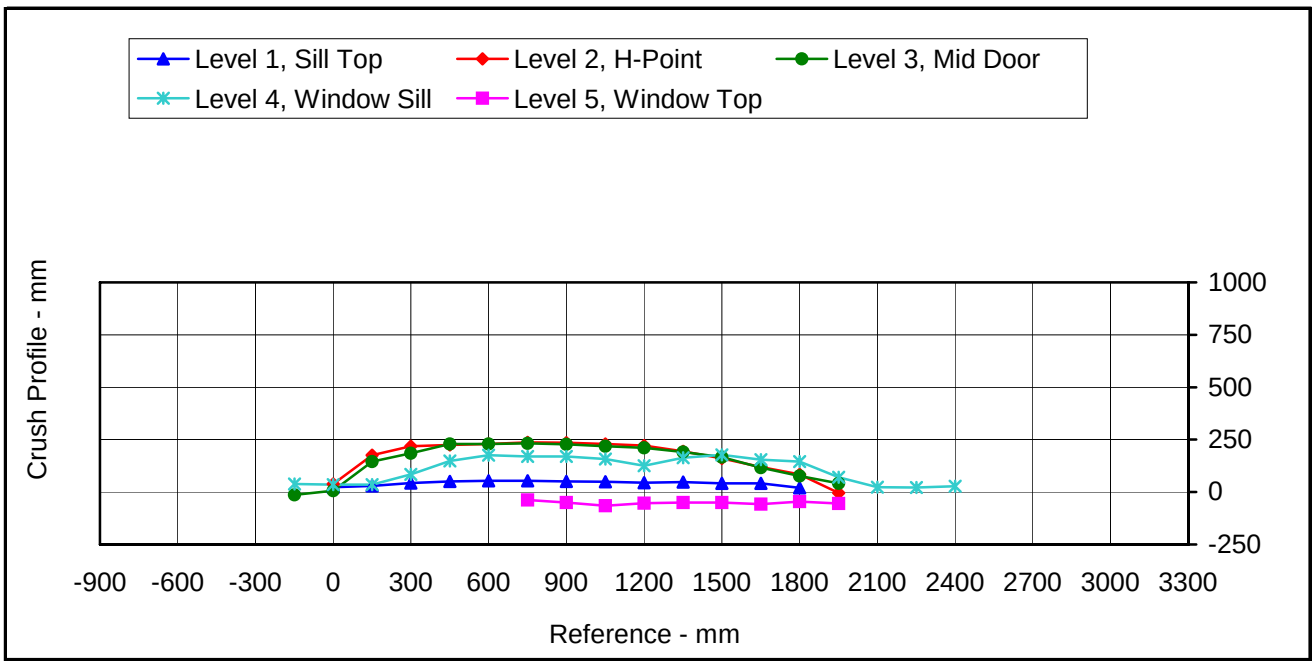
All Dimensions shown in millimeters

DATA SHEET NO. 9…(CONTINUED)

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07



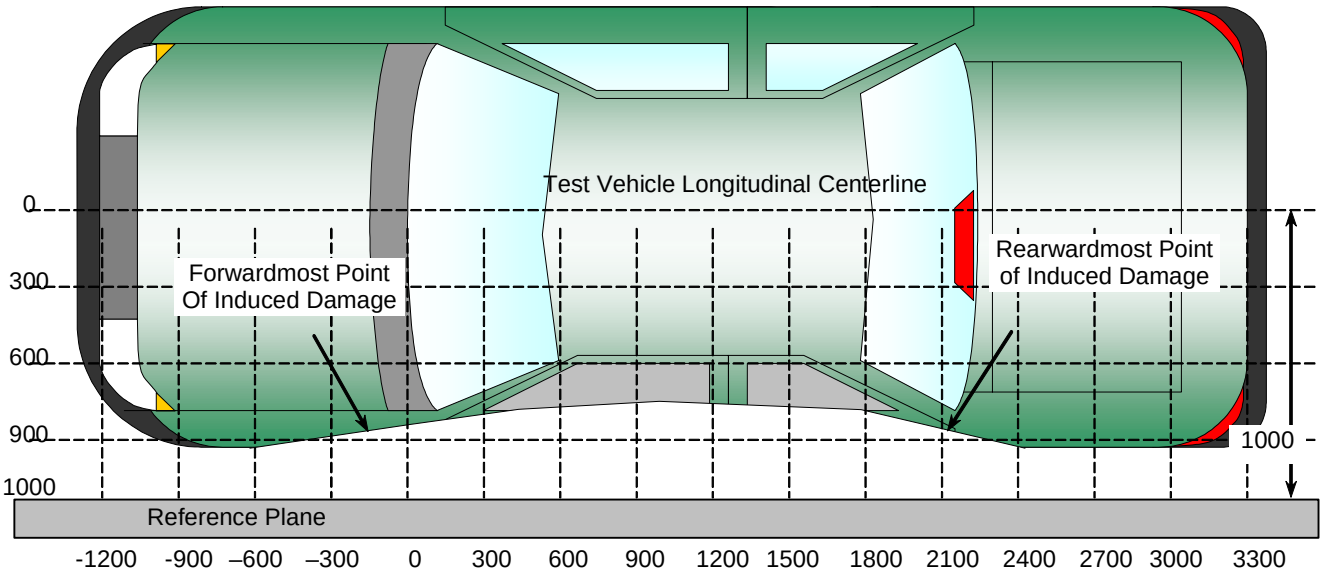
	Units	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush	mm	54	237	233	178	-38
Distance from Impact	mm	1500	1500	1350	1350	1050

DATA SHEET NO. 10

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07



All Dimensions Shown in millimeters

TOP VIEW

DAMAGE PROFILE DISTANCES

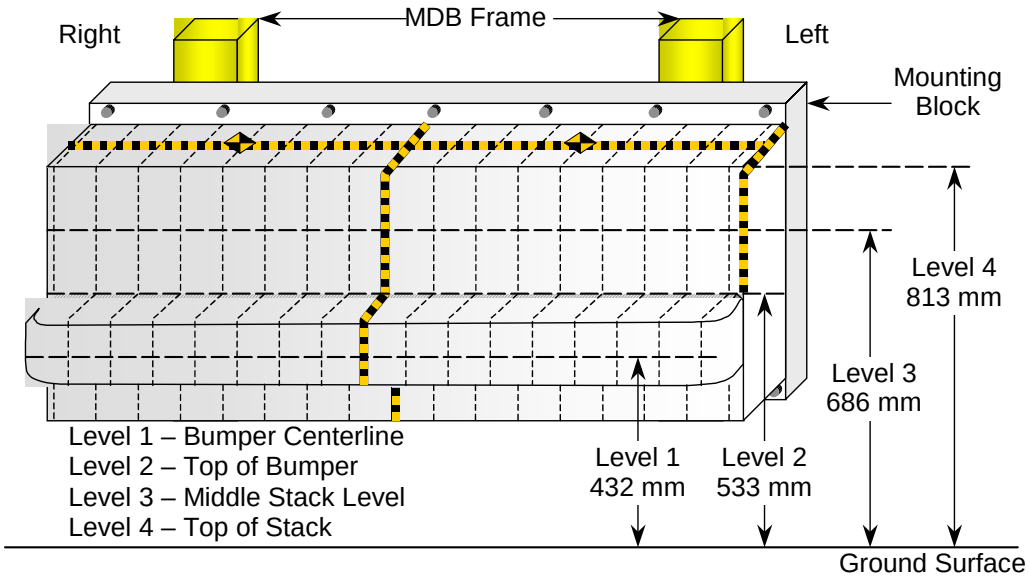
DPD	Distance From Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2100	4	651	674	23
2	1650	2	656	811	155
3	1200	2	649	871	222
4	750	2	649	886	237
5	300	2	650	868	218
6	-150	4	711	749	38

DATA SHEET NO. 11

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07



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	649	641	648	656	668	673	674	670	664	661	661	666	673	679	691	713	728
2	683	689	676	672	681	696	682	674	674	679	689	704	712	718	724	736	742
3	672	646	644	658	678	704	690	663	646	644	643	648	654	663	681	727	782
4	694	674	666	676	706	744	727	698	668	663	644	646	654	678	713	769	828

All Dimensions in mm

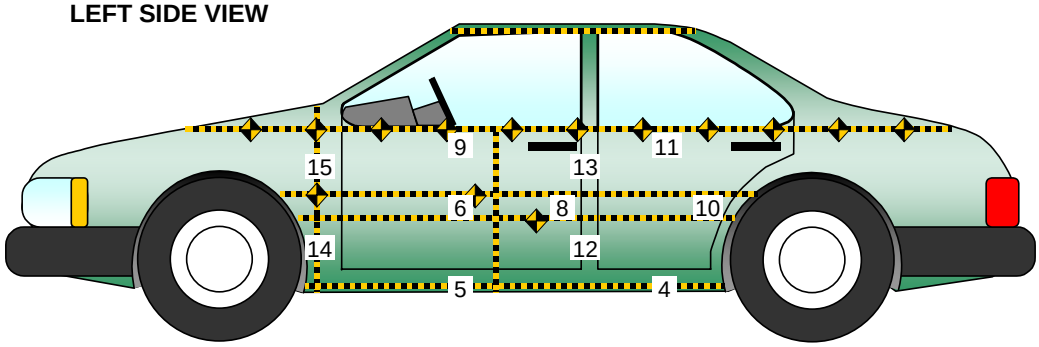
DATA SHEET NO. 12

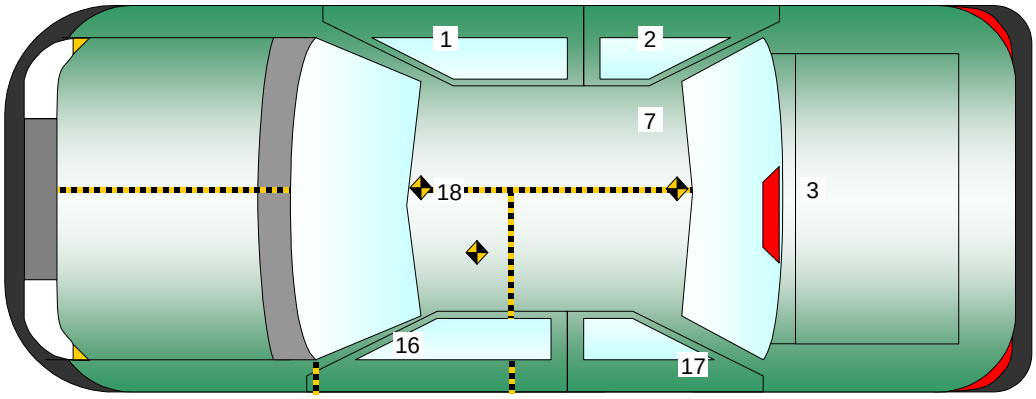
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

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: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)			
		X	Y	Z	
1	Right Sill at Front Seat	2494	672	353	
2	Right Sill at Rear Seat	1700	619	375	
3	Rear Floorpan Above Axle	960	11	535	
4	Left Sill at Rear Door	1674	-620	199	
5	Left Sill at Front Door	2235	-660	199	
6	Front Door Centerline				1
7	Rt. Rear Occ. Compartment	2023	338	347	
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	2045	-680	589	
13	B-Post Middle	2045	-680	860	
14	A-Post Lower	3103	-820	508	
15	A-Post Middle	3103	-820	77	
16	Front Seat Track	2577	-554	400	
17	Rear Seat Structure				1
18	Vehicle CG	2772	314	215	

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

1.) Not installed

DATA SHEET NO. 13
MDB ACCELEROMETER LOCATIONS

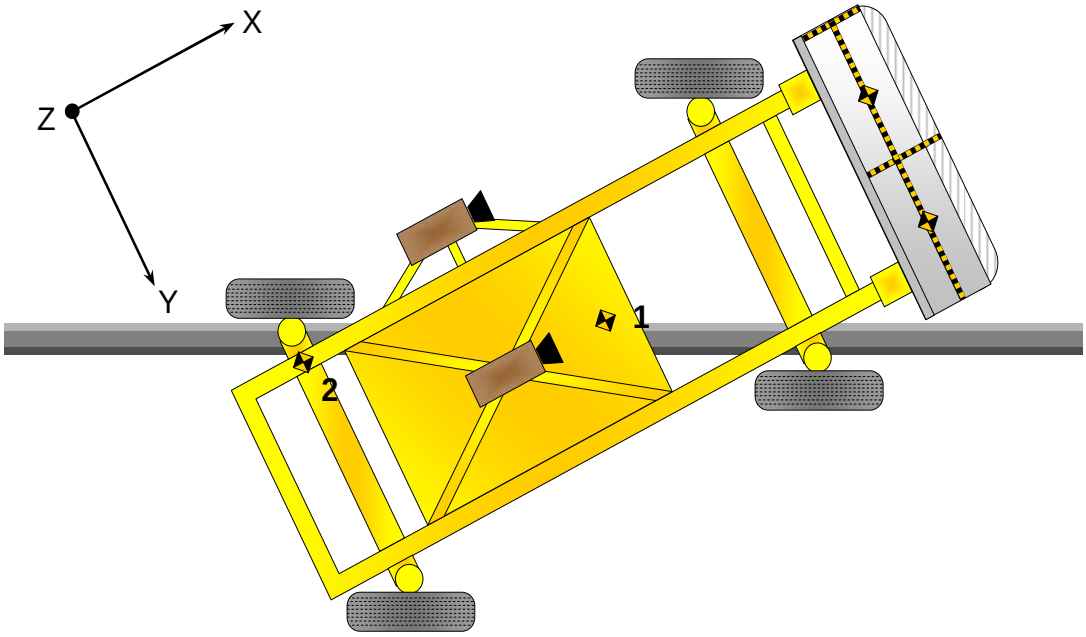
Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

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

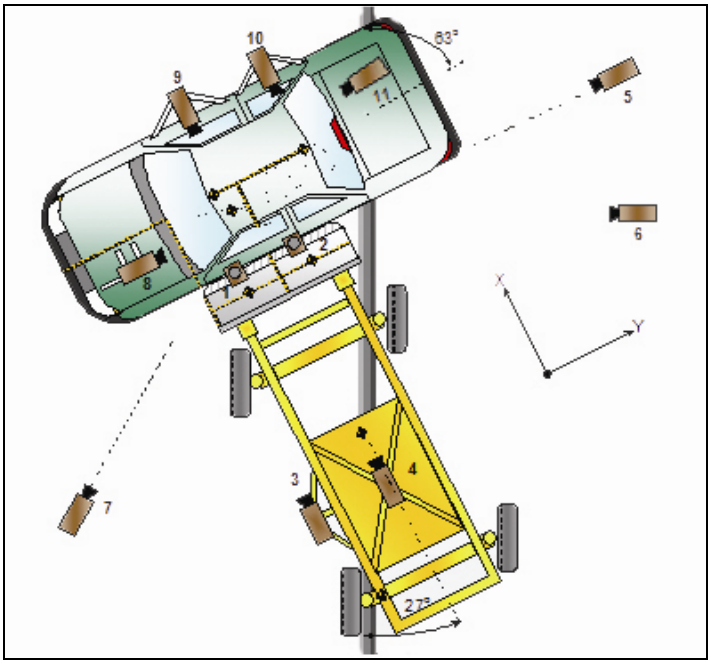


DATA SHEET NO. 14

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07



No.	Camera View	Location (mm)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X	Y	Z			
Doc	Real Time Inrun	-2484	-3958	-1506	-2		30
Doc	Real Time Left Front	-2266	3549	-1475	-2		30
1	Overhead Overall	1220	2287	-5486	-90	14mm	1000
2	Overhead Close Up	609	2287	-5102	-90	Zoom	1000
3	Left Impact Point (MDB)	-2134	0	-1143	-2	12mm	1000
4	Side Overall (MDB)	-3912	838	-1829	-4	12mm	1000
5	Rear	-64	20485	-1348	0	Zoom	1000
6	Left Rear (MDB)	-2137	-1302	-339	-4	Zoom	1000
7	Left Front	-2266	-3564	-1475	-2	24mm	1000
8	Driver Front (O.B.)	485	-218	-1348	-14	35mm	1000
9	Driver Side (O.B.)	1987	325	-1350	-2	20mm	1000
10	Passenger Side (O.B.)	1987	925	-1350	-2	20mm	1000

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

DATA SHEET NO. 15

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

Test Time: 11:15 AM Temperature: 30.0 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)

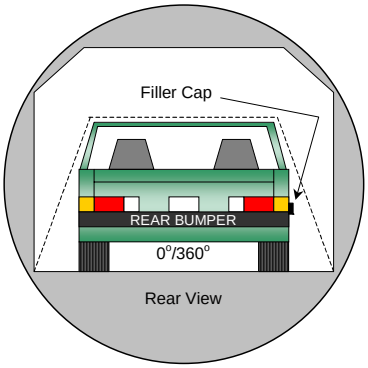
D. Spillage Details: No leakage occurred

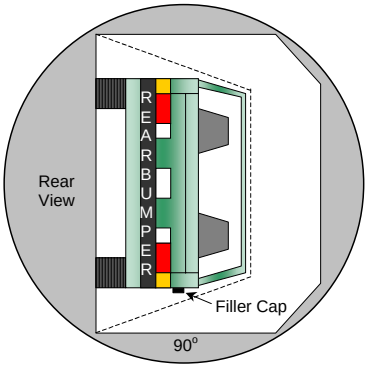
DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER DATA

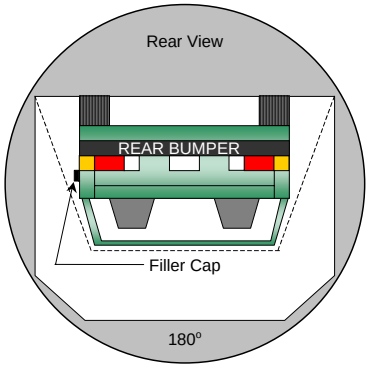
Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

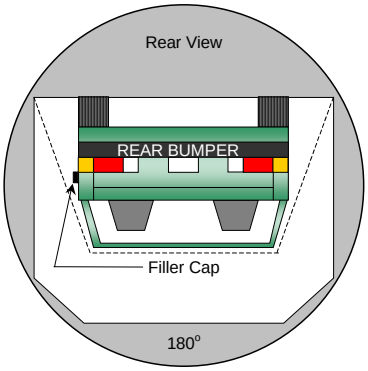




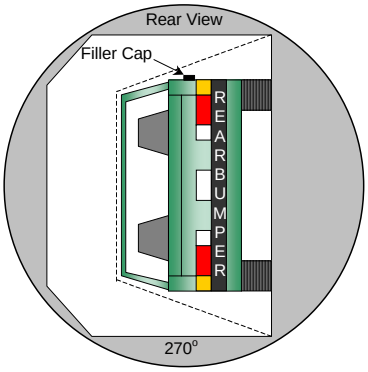
0° to 90°

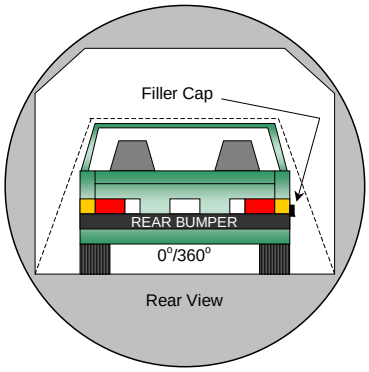


90° to 180°



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: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	79	300	379
90° to 180°	81	300	381
180° to 270°	83	300	383
270° to 360°	84	300	384

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

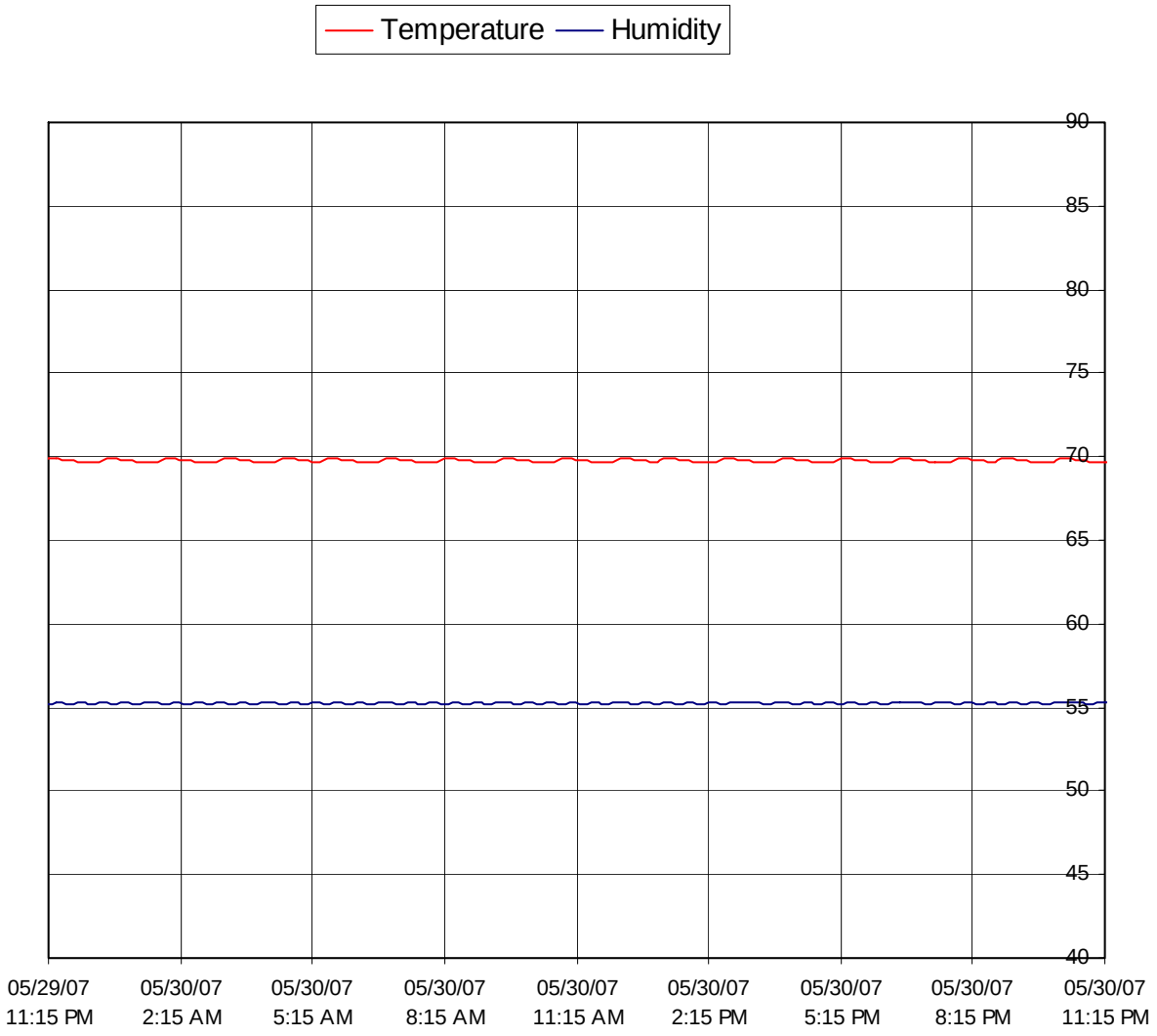
Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: B85600

Test Program: 55/28 km/h Side Impact NCAP Test Date: 5/30/07



APPENDIX A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

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

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

Figure A-3: Manufacturer's Label

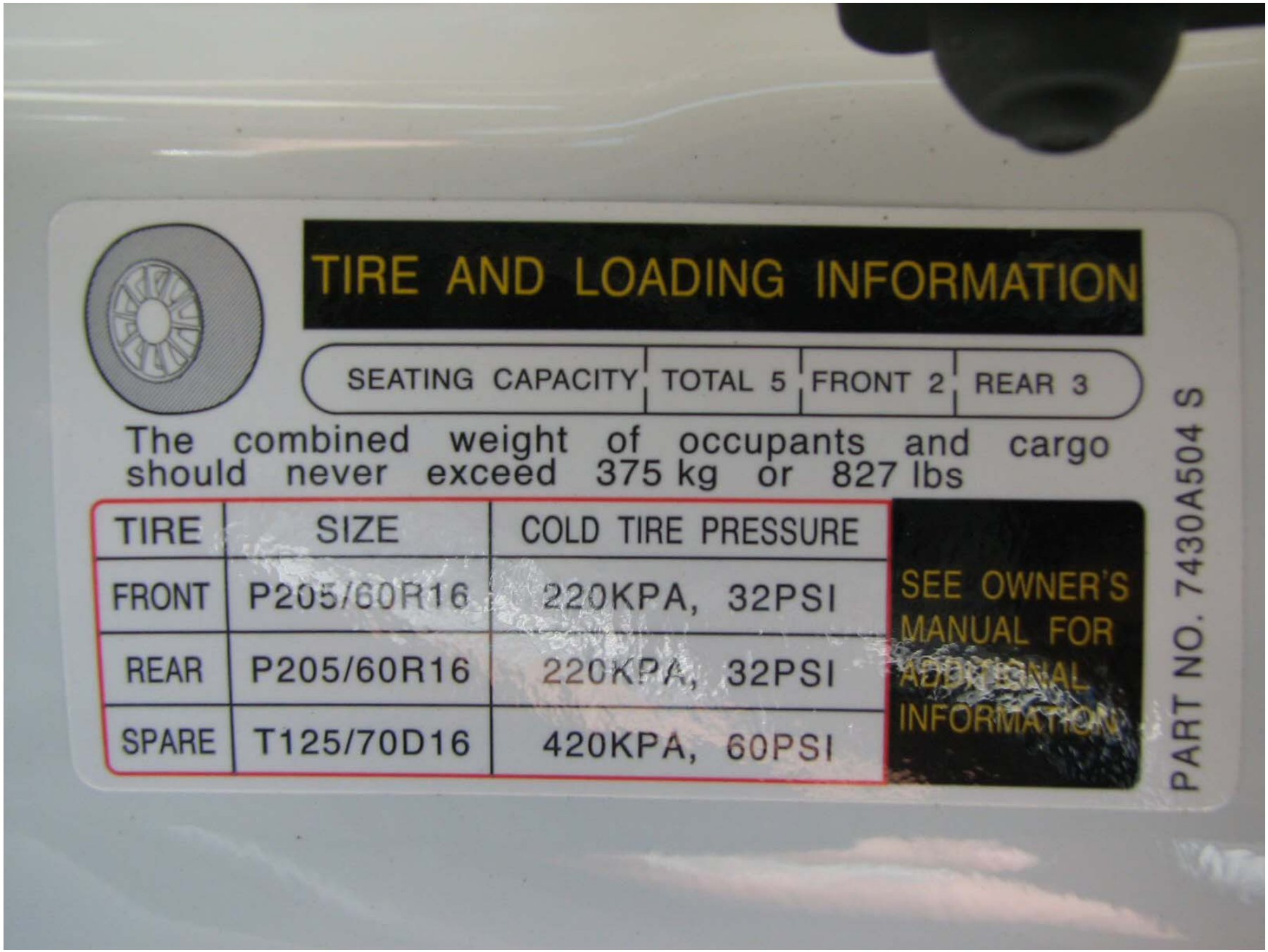


Figure A-4: Tire Placard

Figure A-5: Pre-Test Front View

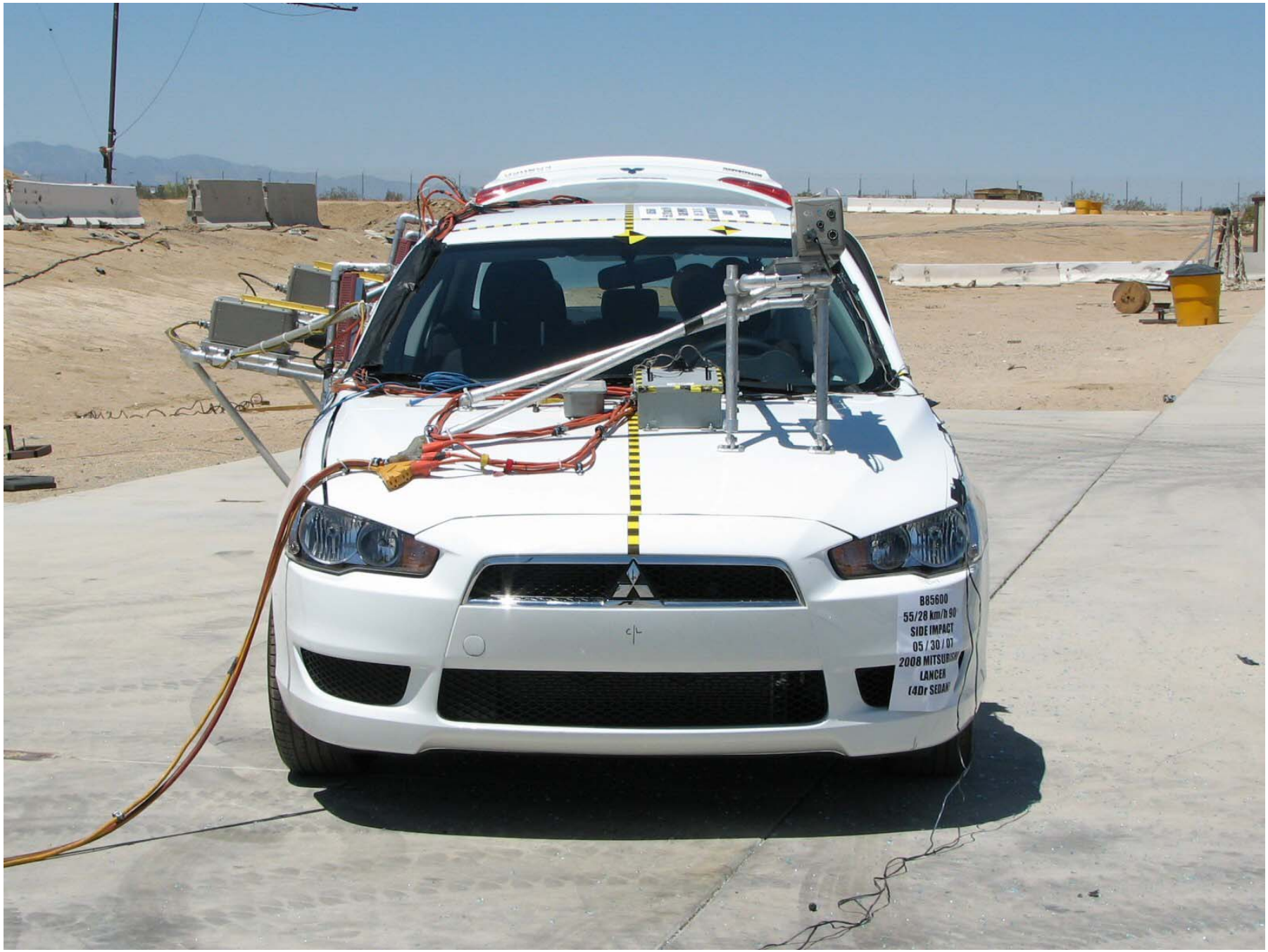


Figure A-6: Post-Test Front View

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

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

Figure A-9: Pre-Test Left Side View

Figure A-10: Post-Test Left Side View

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

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

Figure A-13: Pre-Test Rear View

Figure A-14: Post-Test Rear View

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

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

Figure A-17: Pre-Test Right Side View

Figure A-18: Post-Test Right Side View

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

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

Figure A-21: Pre-Test Overhead View

Figure A-22: Post-Test Overhead View

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

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

Figure A-25: Pre-Test Left Impact Point

Figure A-26: Post-Test Left Impact Point

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

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

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

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

Figure A-31: Pre-Test Left Front Door

Figure A-32: Post-Test Left Front Door

Figure A-33: Pre-Test Left Rear Door

Figure A-34: Post-Test Left Rear Door

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

This Space Intentionally Left Blank

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

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

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

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

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

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

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

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

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

This Space Intentionally Left Blank

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

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

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

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

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

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

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

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

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

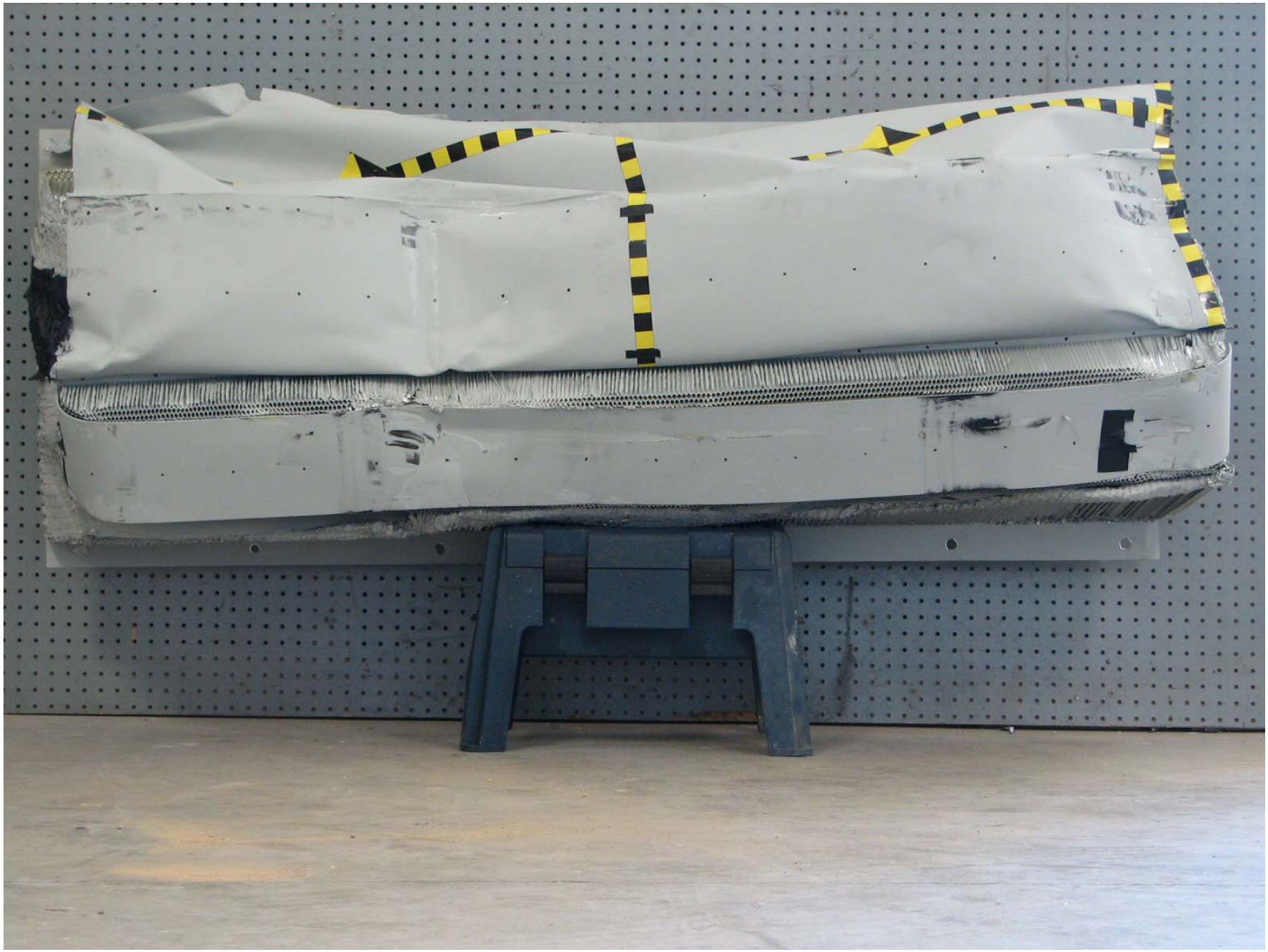


Figure A-54: Post-Test Front View of Deformable Barrier

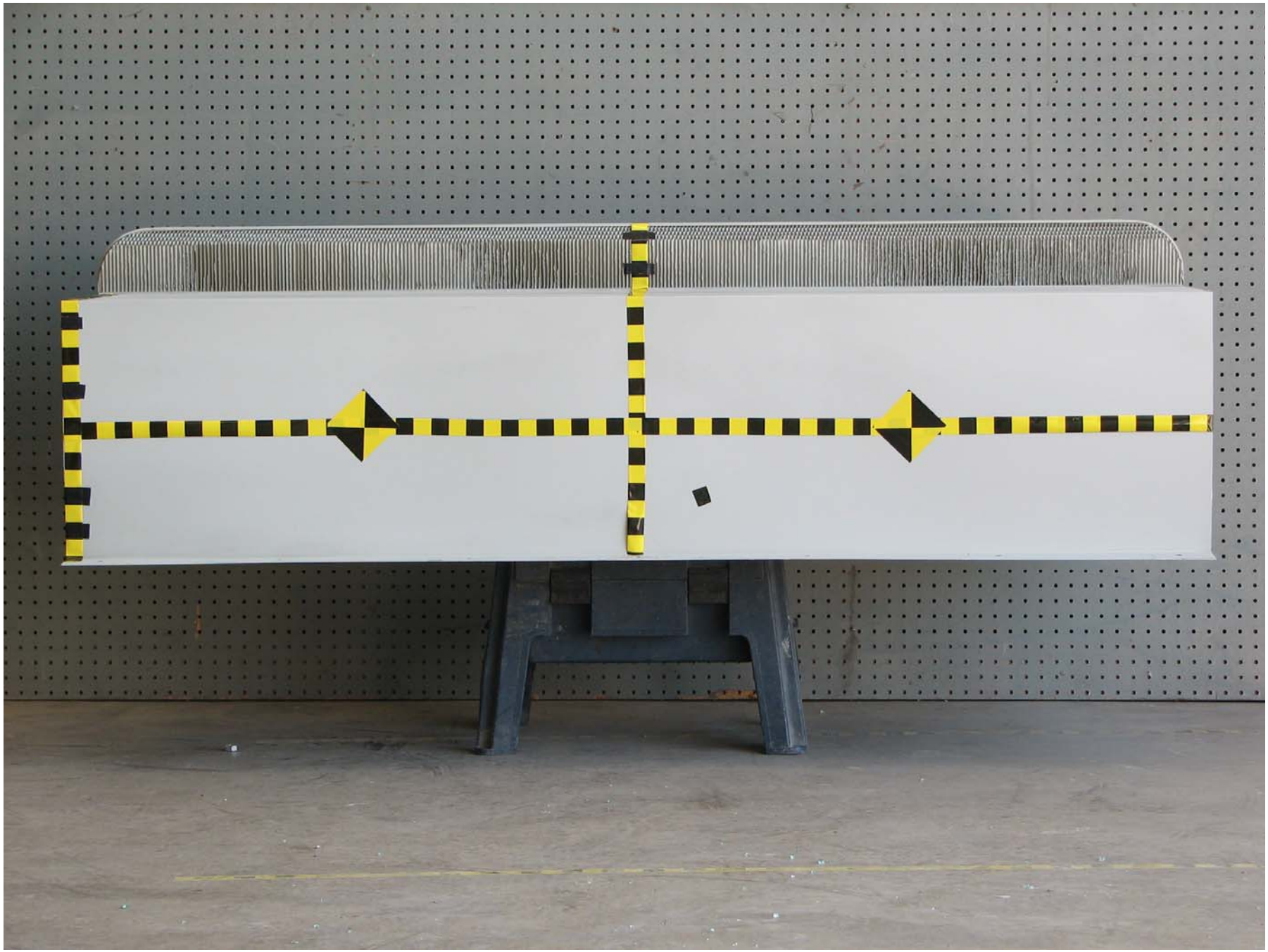


Figure A-55: Pre-Test Top View of Deformable Barrier

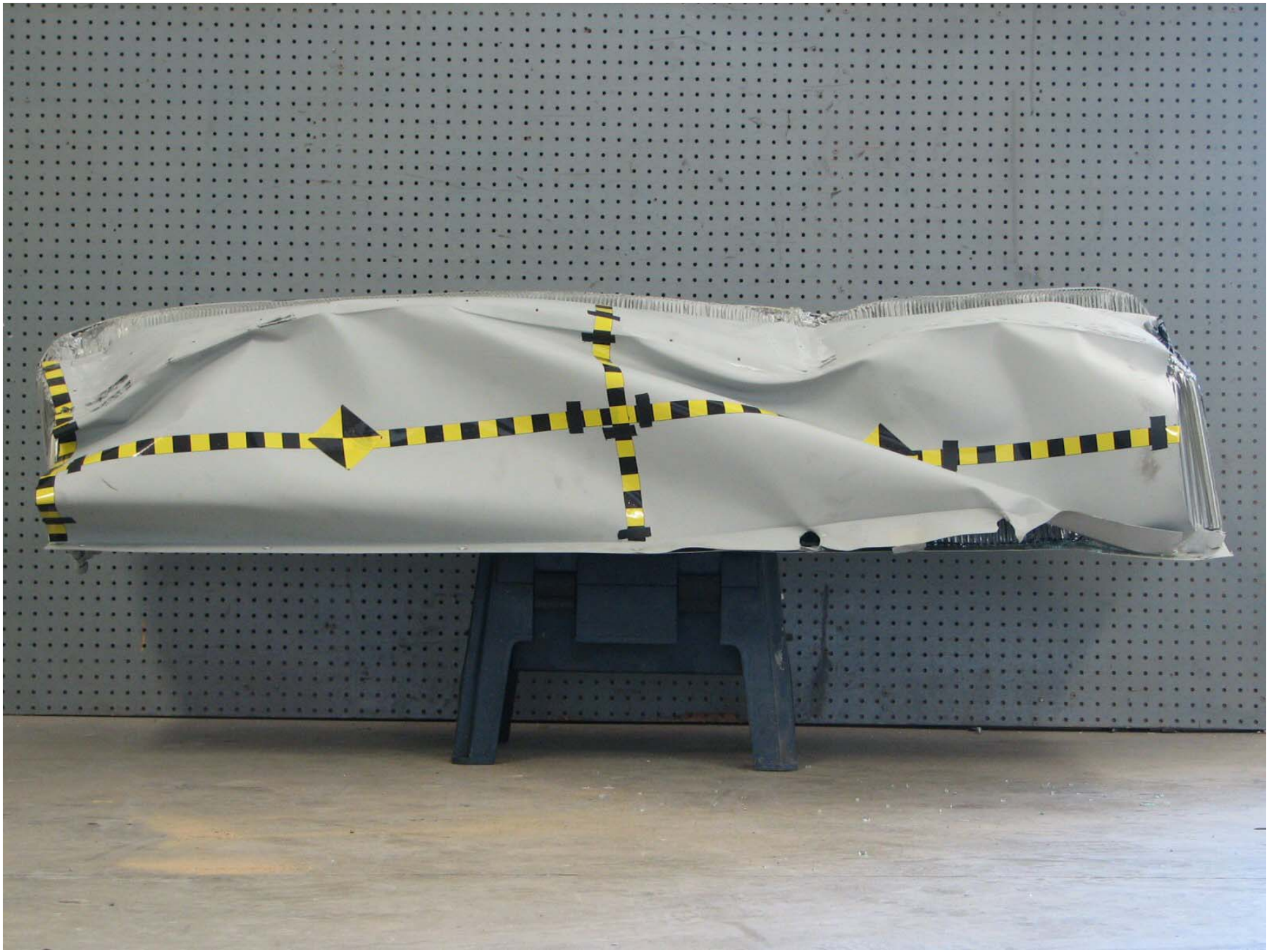


Figure A-56: Post-Test Top View of Deformable Barrier

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

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

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

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

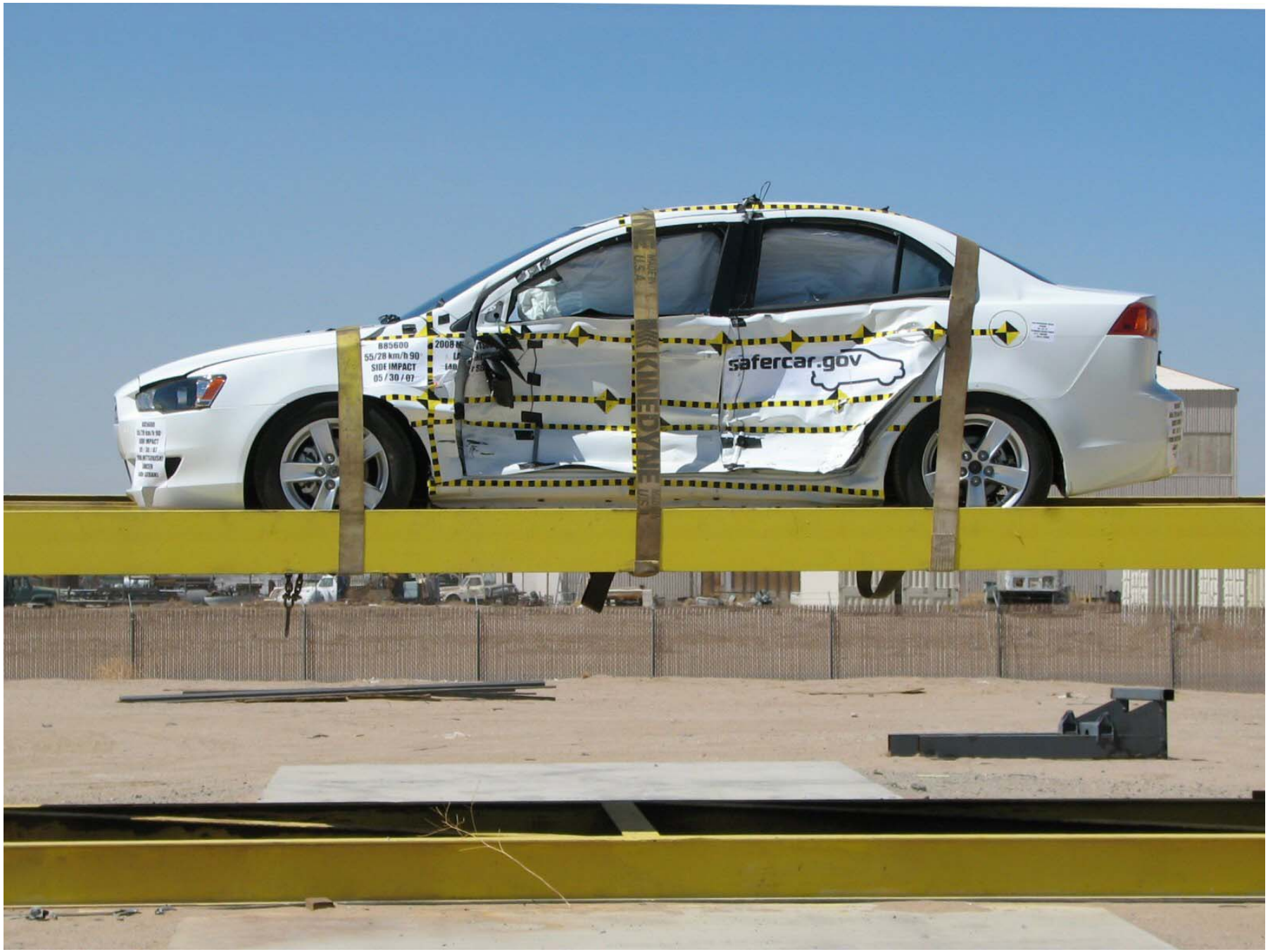


Figure A-61: Vehicle on Rollover Device (0°)

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

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

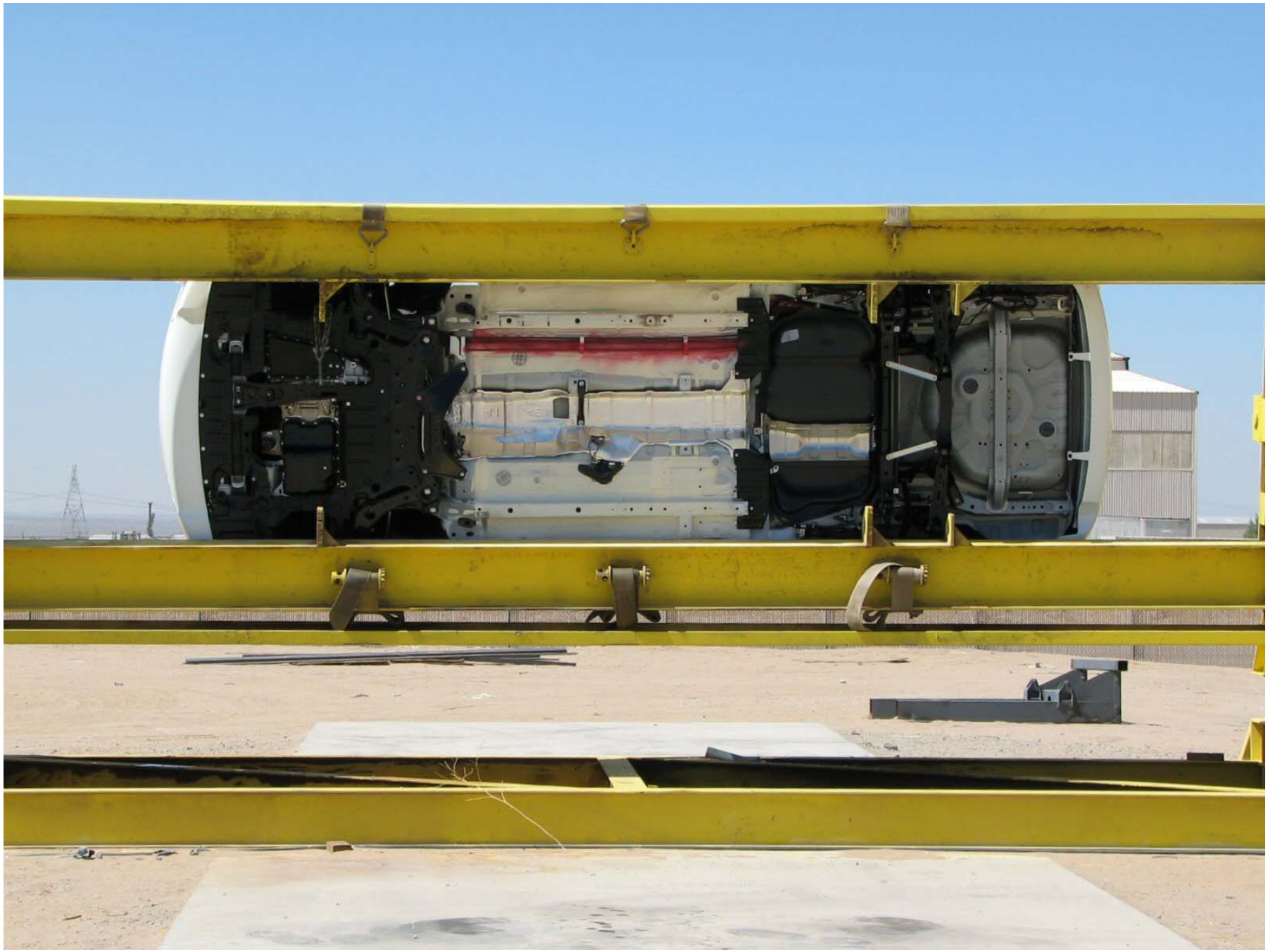


Figure A-64: Vehicle on Rollover Device (270°)

Figure A-65: Vehicle Impact

APPENDIX B

SID/HIII, VEHICLE AND MDB RESPONSE DATA

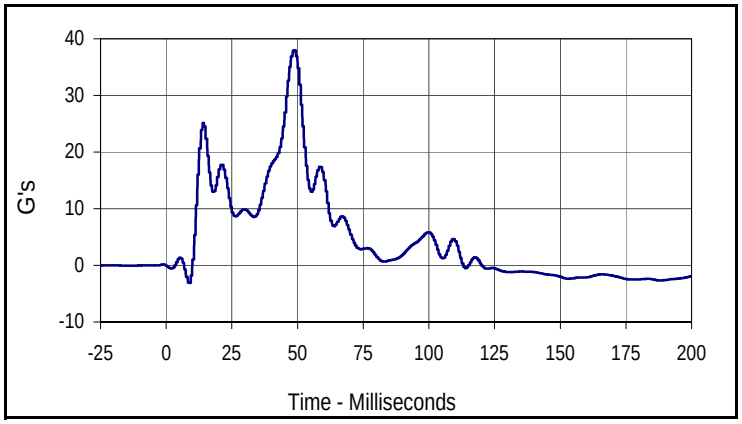
LIST OF DATA PLOTS

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

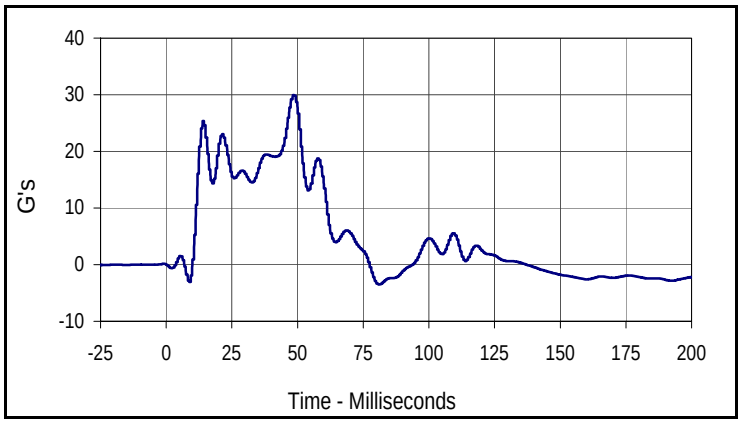
LIST OF DATA PLOTS…(CONTINUED)

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

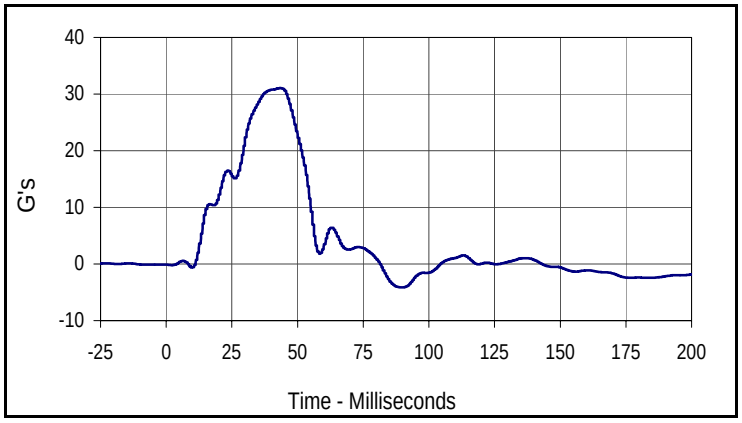
Test Vehicle:	2008 Mitsubishi Lancer 4-Door Sedan	Test Date:	5/30/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	B85600



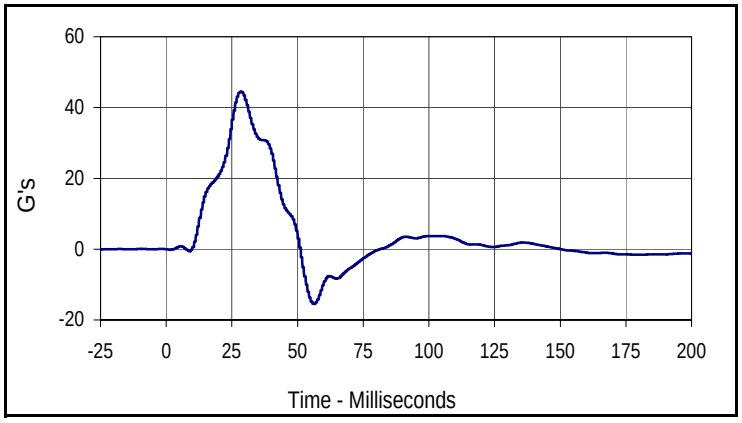
Curve Description			
Driver Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIR	FIR100	G's
Max	Time	Min	Time
37.9	48.8	-3.1	8.8



Curve Description			
Driver Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIR	FIR100	G's
Max	Time	Min	Time
30.0	48.2	-3.5	80.7

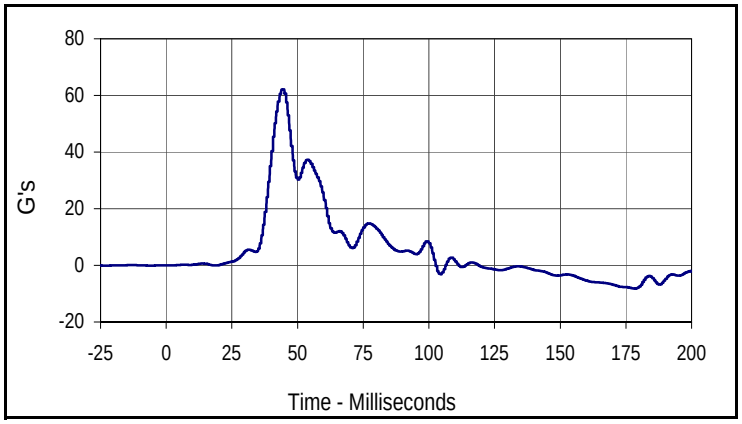


Curve Description			
Driver Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIR	FIR100	G's
Max	Time	Min	Time
31.1	43.2	-4.2	89.4

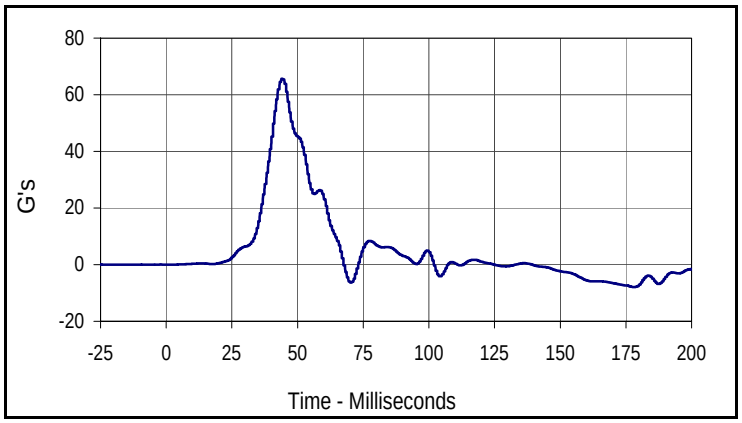


Curve Description			
Driver Pelvis Y Primary			
CURNO	Type	SAE Class	Units
004	FIR	FIR100	G's
Max	Time	Min	Time
44.5	28.2	-15.5	56.3

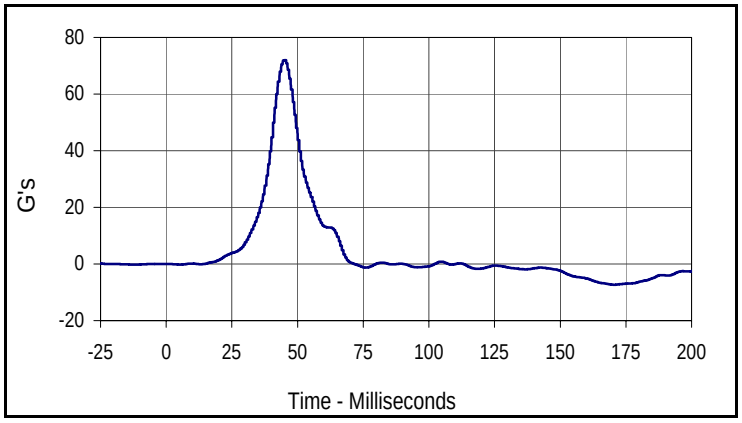
Test Vehicle:	2008 Mitsubishi Lancer 4-Door Sedan	Test Date:	5/30/07
Test Program:	55/28 km/h Side Impact NCAP	NHTSA No.:	B85600



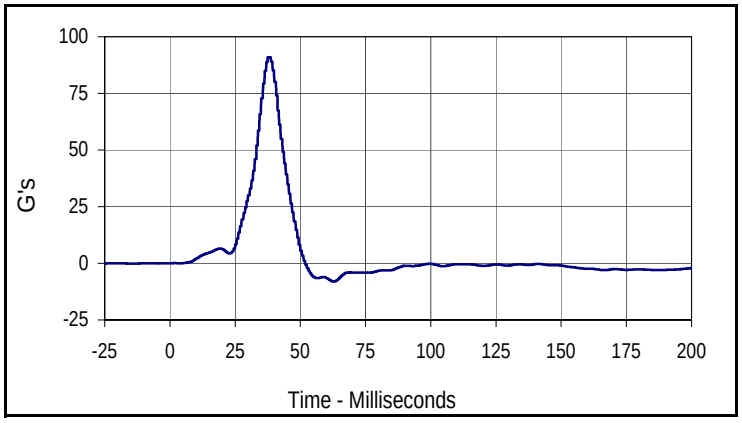
Curve Description			
Passenger Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
005	FIR	FIR100	G's
Max	Time	Min	Time
62.1	44.4	-8.2	178.2



Curve Description			
Passenger Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
006	FIR	FIR100	G's
Max	Time	Min	Time
65.7	43.8	-8.0	178.2



Curve Description			
Passenger Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
007	FIR	FIR100	G's
Max	Time	Min	Time
72.0	45.0	-7.3	170.7



Curve Description			
Passenger Pelvis Primary Y			
CURNO	Type	SAE Class	Units
008	FIR	FIR100	G's
Max	Time	Min	Time
91.0	38.2	-8.1	62.5

APPENDIX C

SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

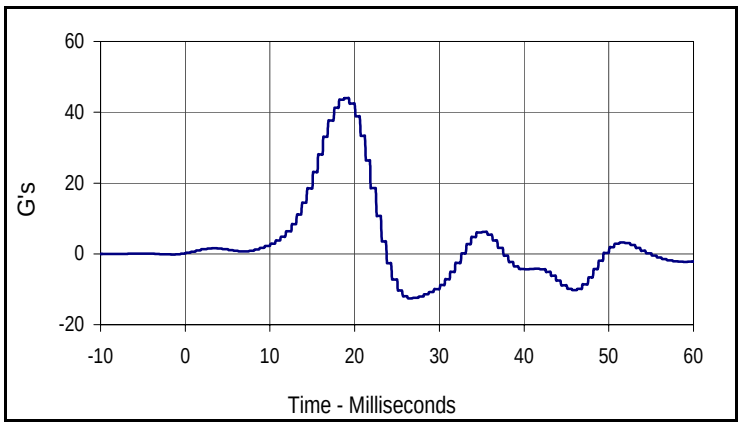
APPENDIX C
PRE-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	SID / HIII External Measurements	Test Date:	5/24/07
ATD Serial No.:	274	Test I.D.:	N/A

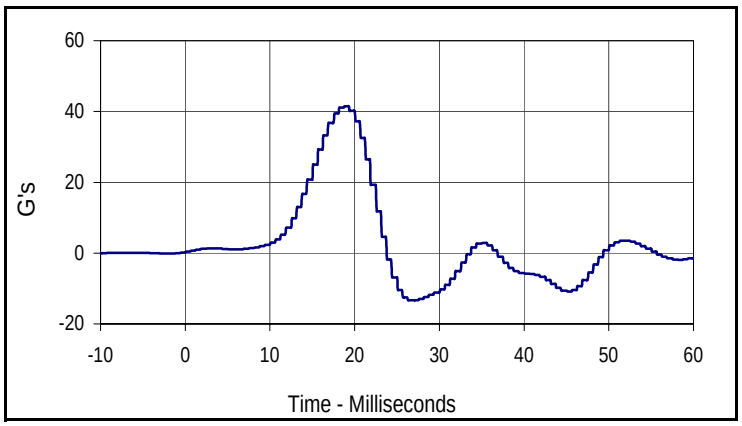
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	893	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	511	Pass
KH- Knee Pivot From Back 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	377	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	5/25/07
ATD Serial No.:	274	Test I.D.:	TH05A

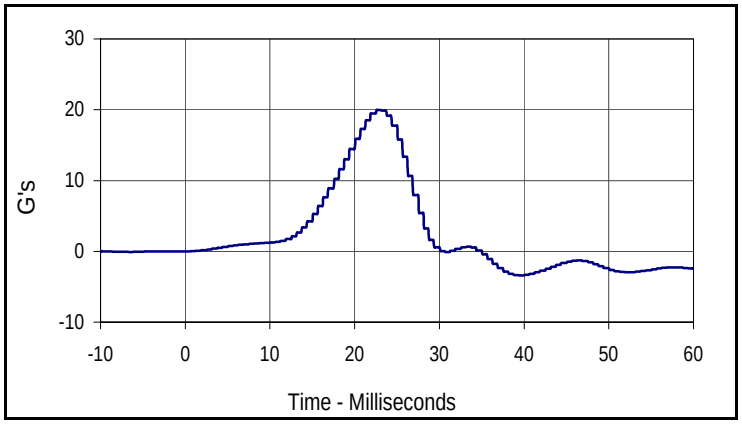
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.32	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	44.0	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	41.4	Pass
Thoracic 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
44.0	18.8	-12.5	26.3



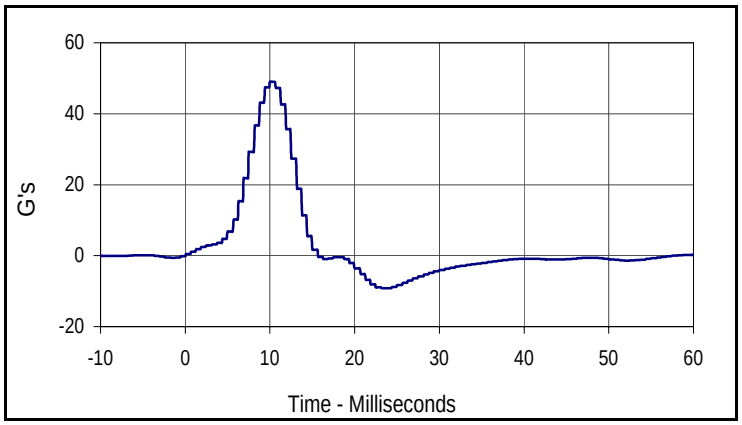
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
41.4	18.8	-13.3	26.9



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.9	22.6	-3.4	39.4

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	5/25/07
ATD Serial No.:	274	Test I.D.:	PL05A

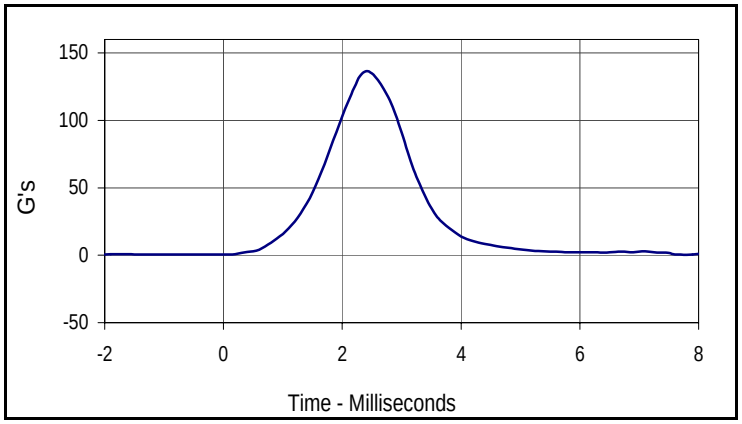
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.28	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	49.0	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
		Overall Test Results		Pass



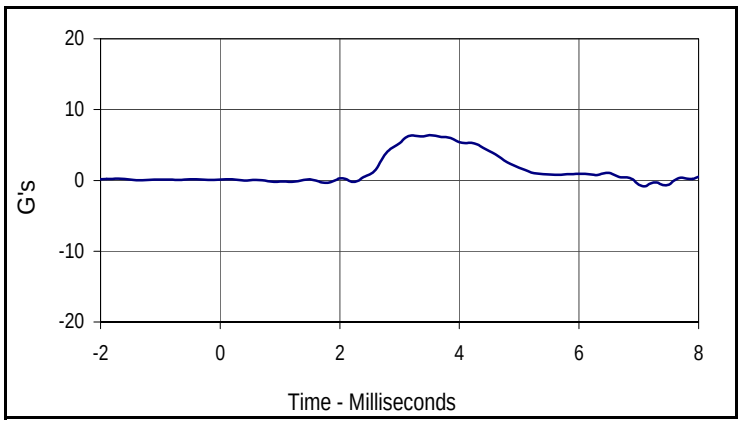
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
49.0	10.0	-9.2	23.2

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	5/24/07
ATD Serial No.:	274	Test I.D.:	HD05A

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	136.6	Pass
Peak Longitudinal Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.1	Pass
		Overall Test Results		Pass



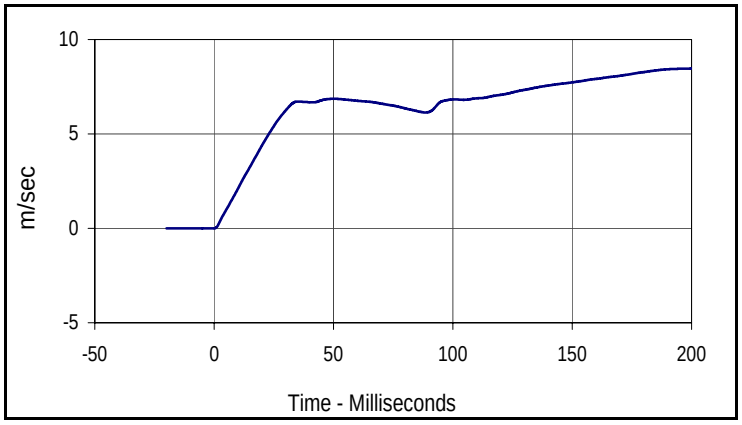
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
136.6	2.4	0.5	-0.2



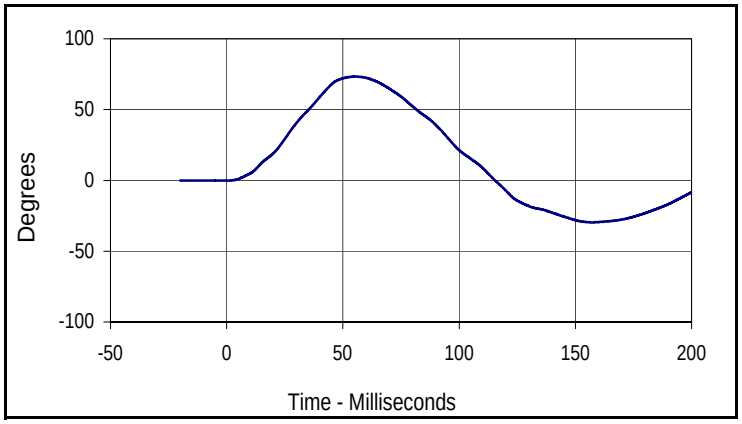
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.4	3.5	-0.3	1.8

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	5/24/07
ATD Serial No.:	274	Test I.D.:	NB05A

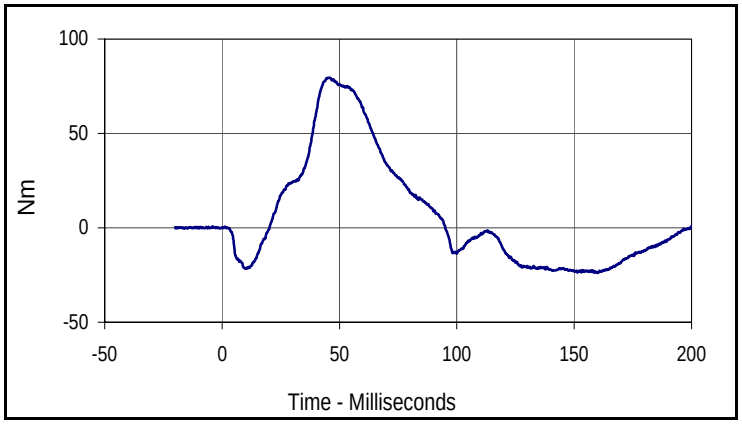
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.11	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.38	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.25	Pass
	40 to 70	m/sec	6.27 to 7.64	6.86	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	73.3	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	9.2	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	60.3	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	79.5	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	49.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
8.5	198.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
73.3	55.2	-29.6	157.1



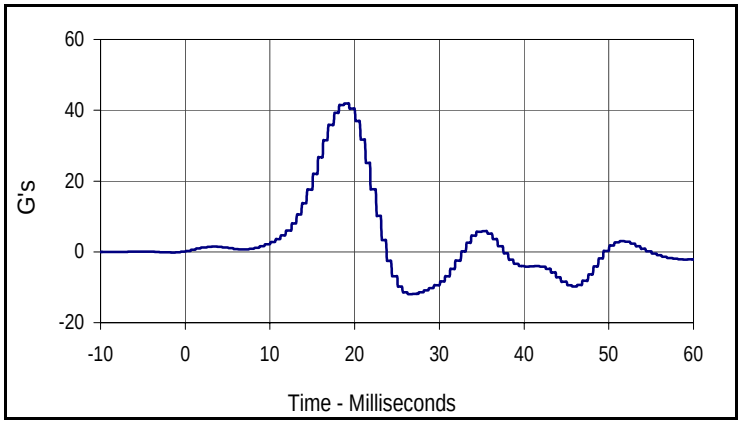
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
79.5	46.0	-23.8	160.2

Test Program:	SID / HIII External Measurements	Test Date:	5/24/07
ATD Serial No.:	275	Test I.D.:	N/A

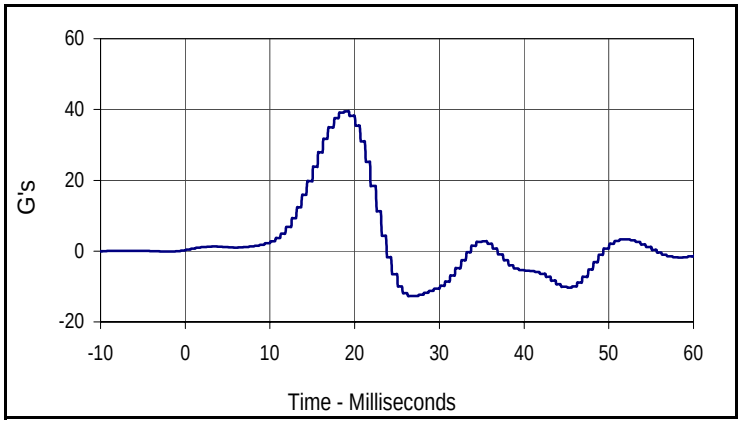
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	893	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	515	Pass
KV- Knee Pivot From Floor	mm	490 to 505	496	Pass
HW- Hip Width	mm	356 to 391	375	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	5/25/07
ATD Serial No.:	275	Test I.D.:	TH05Z

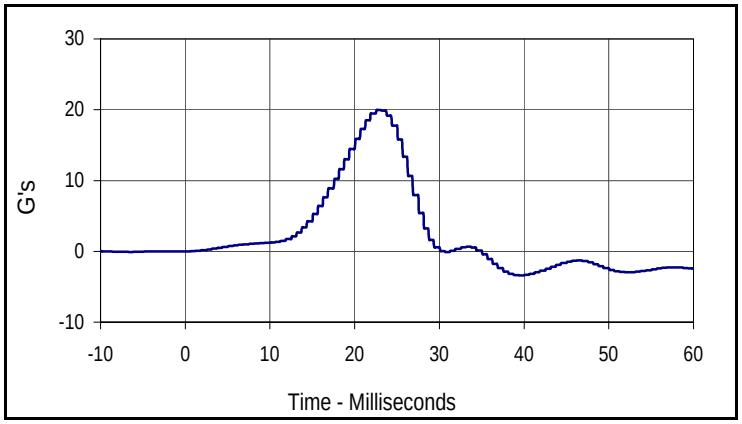
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.29	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	41.9	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	39.5	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.9	Pass
		Overall Test Results		Pass



Curve Description			
Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
41.9	18.8	-12.0	26.3



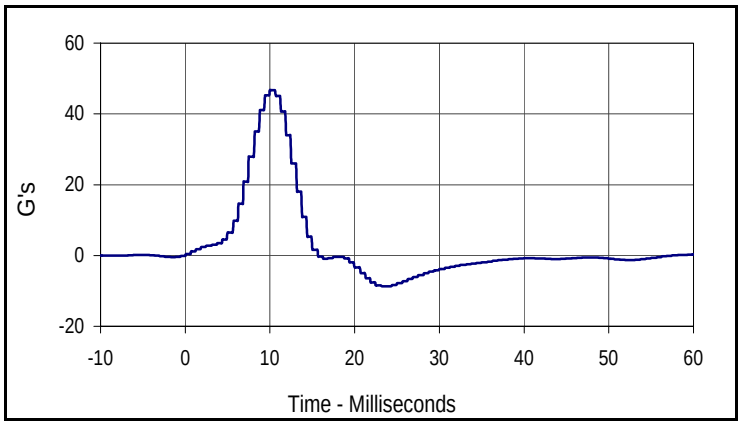
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
39.5	18.8	-12.7	26.9



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.9	22.6	-3.4	39.4

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	5/25/07
ATD Serial No.:	275	Test I.D.:	PL05Z

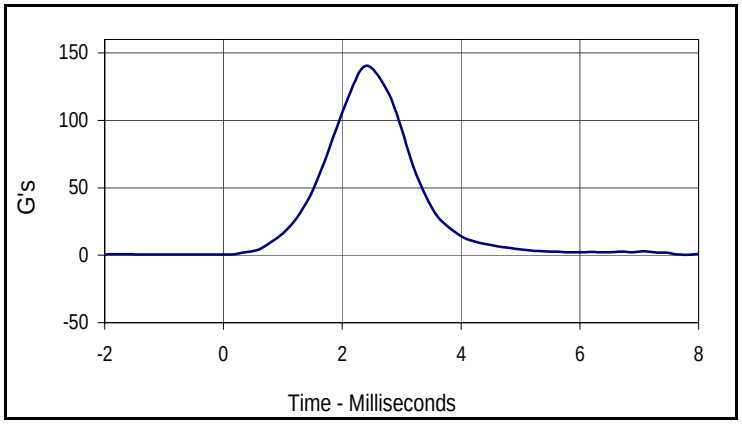
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.28	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	46.7	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
		Overall Test Results		Pass



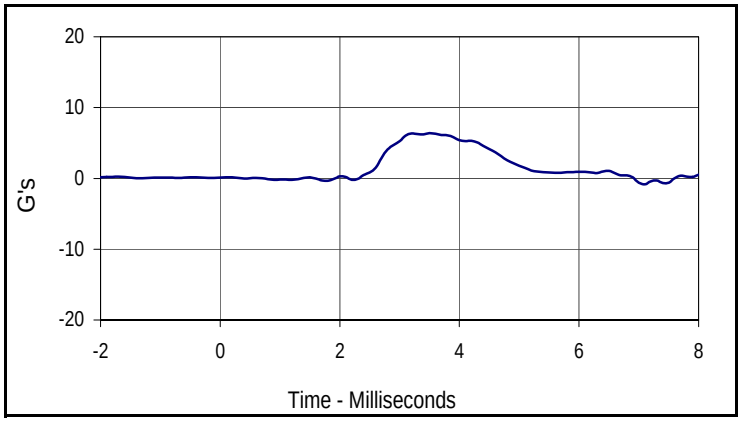
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
46.7	10.0	-8.7	23.2

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	5/24/07
ATD Serial No.:	275	Test I.D.:	HD05Z

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	120.0 to 150.0	140.5	Pass
Peak Longitudinal Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.1	Pass
		Overall Test Results		Pass



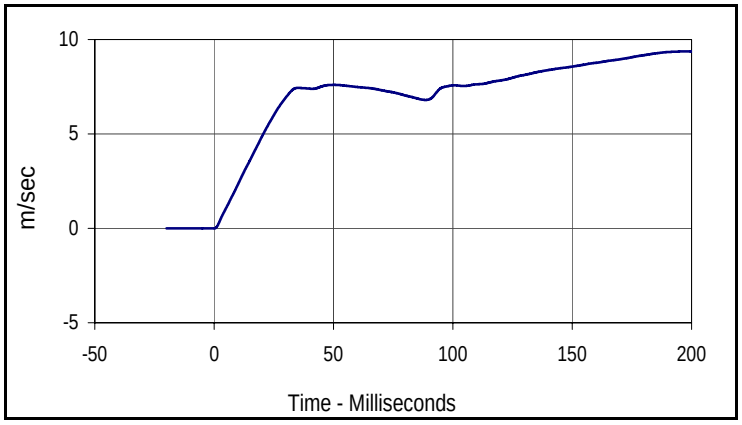
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
140.5	2.4	0.5	-0.2



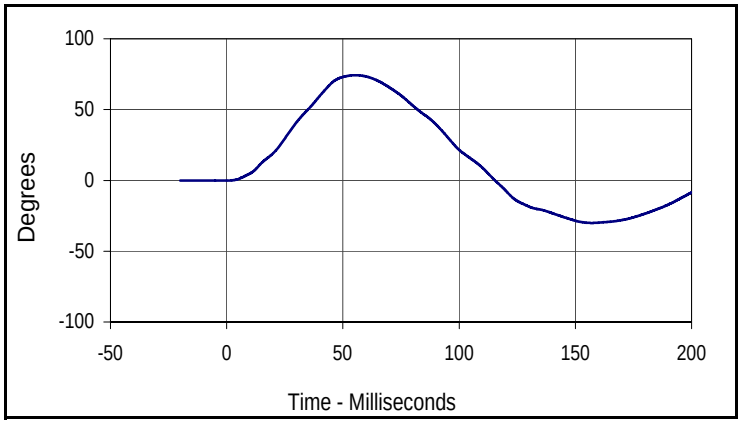
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.4	3.5	-0.3	1.8

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	5/24/07
ATD Serial No.:	275	Test I.D.:	NB05Z

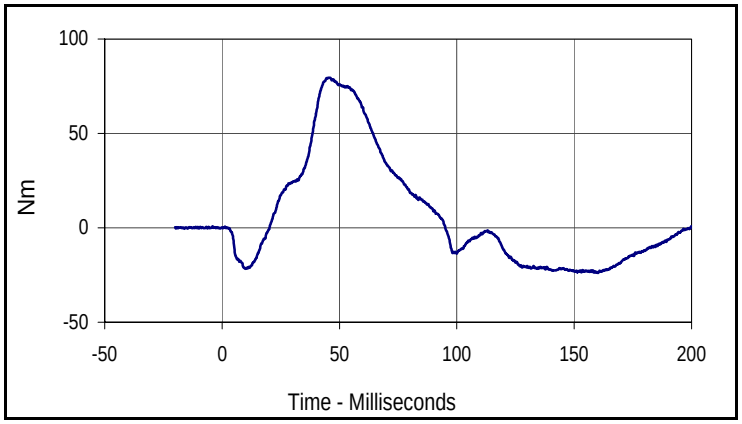
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.03	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.34	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.85	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.93	Pass
	40 to 70	m/sec	6.27 to 7.64	7.60	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	74.3	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	9.3	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	60.1	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	79.5	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	49.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
9.4	198.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
74.3	55.3	-30.1	157.1



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
79.5	46.0	-23.8	160.2

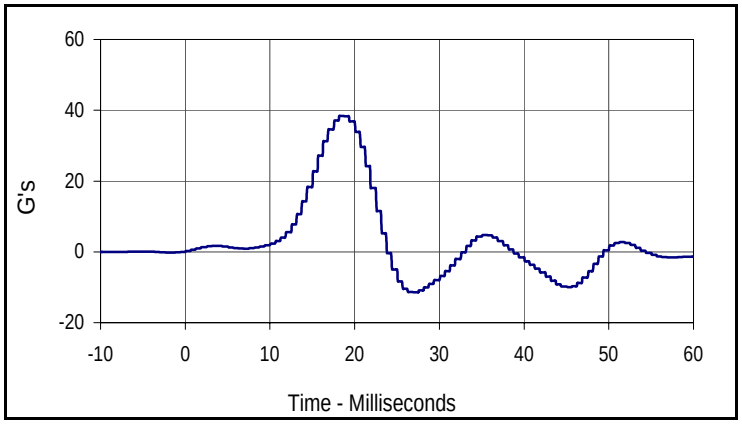
APPENDIX C
POST-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	SID / HIII External Measurements	Test Date:	5/31/07
ATD Serial No.:	274	Test I.D.:	N/A

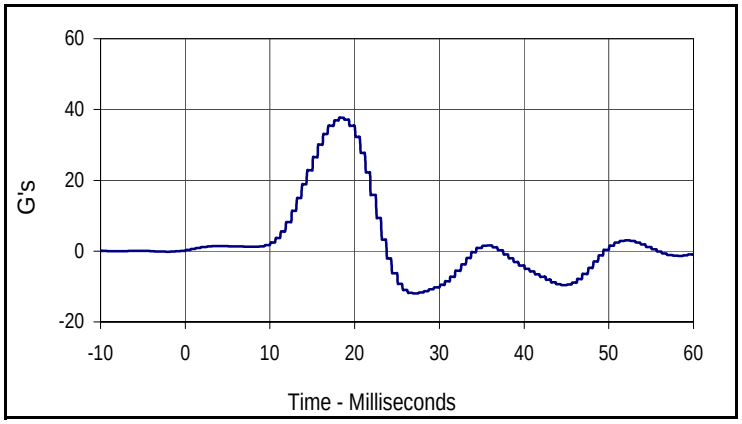
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	895	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	514	Pass
KV- Knee Pivot From Floor	mm	490 to 505	498	Pass
HW- Hip Width	mm	356 to 391	379	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	5/31/07
ATD Serial No.:	274	Test I.D.:	TH05C

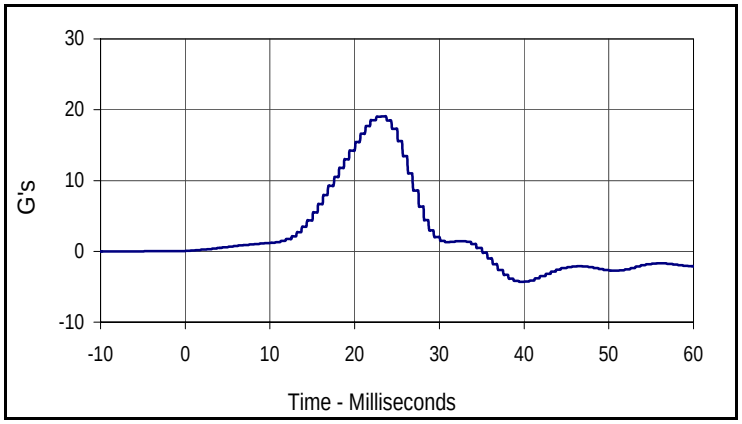
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.22	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	38.4	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	37.6	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.0	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
38.4	18.2	-11.4	26.9



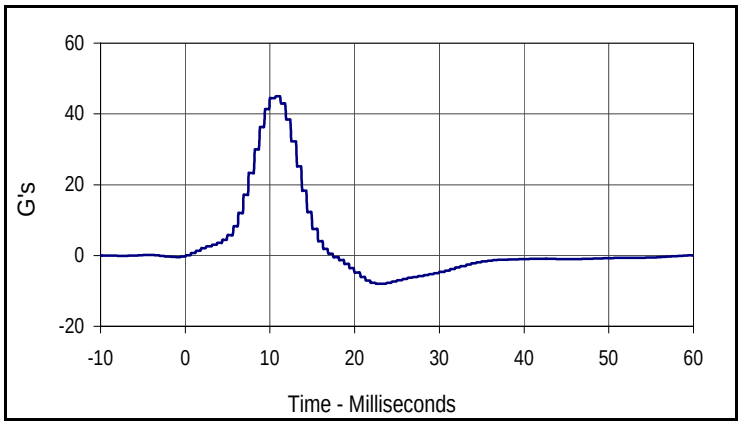
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
37.6	18.2	-11.9	26.9



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.0	23.2	-4.3	39.4

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	5/31/07
ATD Serial No.:	274	Test I.D.:	PL05C

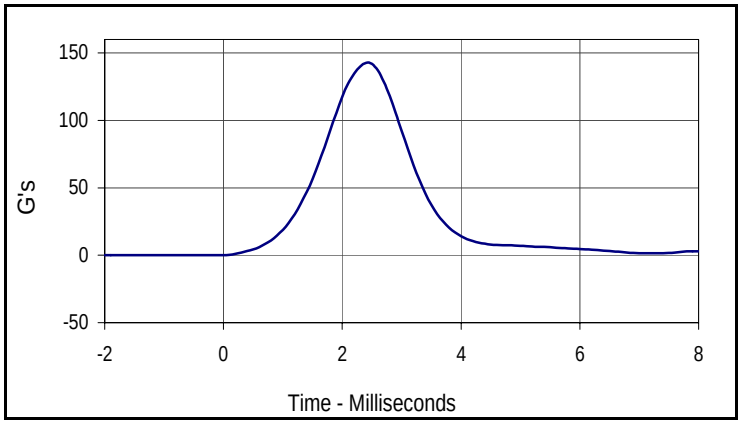
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.25	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	45.0	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
		Overall Test Results		Pass



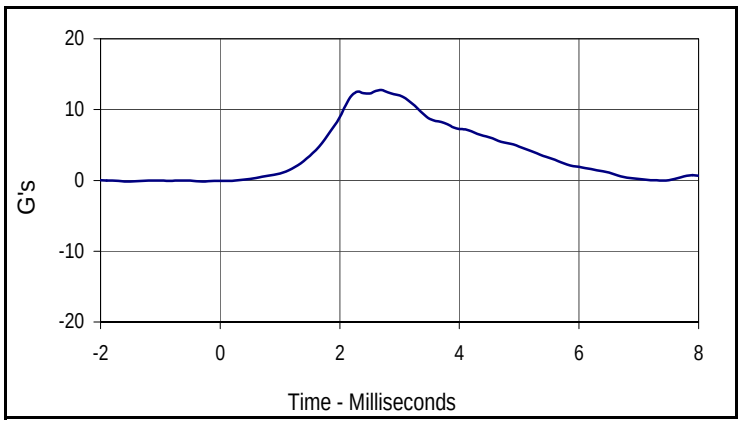
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
45.0	10.7	-8.0	22.5

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	5/31/07
ATD Serial No.:	274	Test I.D.:	HD05C

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	142.7	Pass
Peak Longitudinal Acceleration	G's	≤15.0	12.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	4.9	Pass
		Overall Test Results		Pass



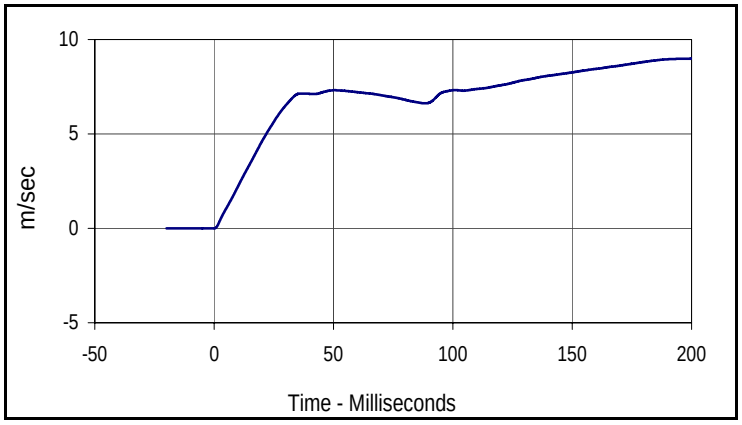
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
142.7	2.4	0.0	-0.7



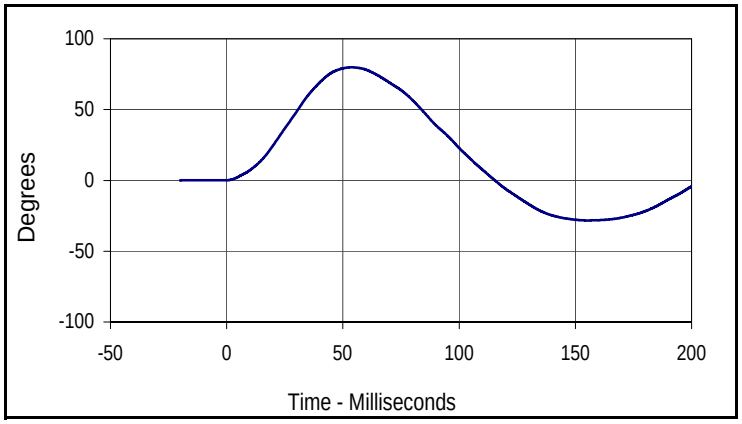
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
12.8	2.7	-0.1	-1.5

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	5/31/07
ATD Serial No.:	274	Test I.D.:	NB05C

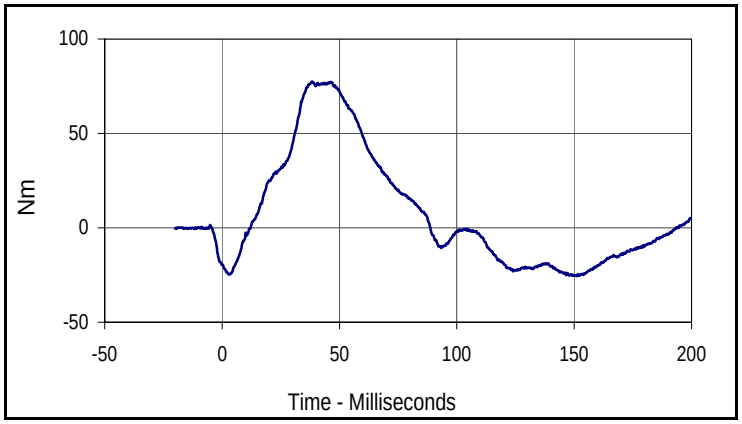
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.23	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.60	Pass
	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	79.8	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.5	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	61.6	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	77.5	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
79.8	53.8	-28.3	155.3



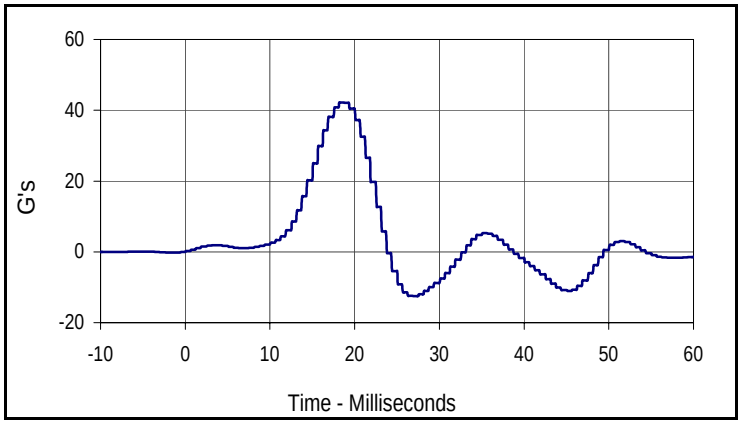
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
77.5	38.3	-25.5	151.1

Test Program:	SID / HIII External Measurements	Test Date:	5/24/07
ATD Serial No.:	275	Test I.D.:	N/A

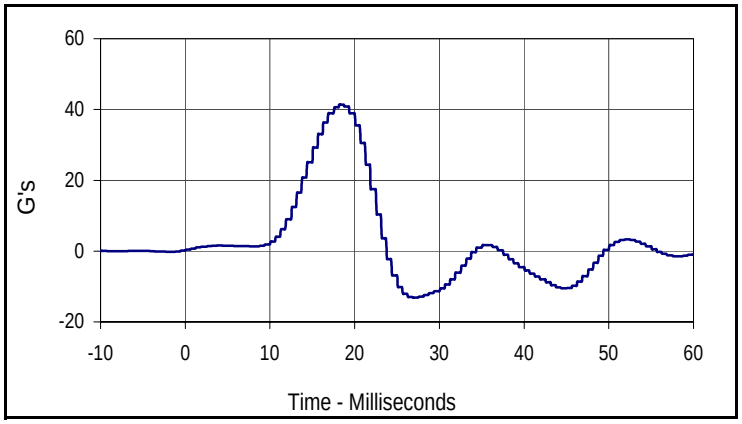
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	895	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	515	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	513	Pass
KV- Knee Pivot From Floor	mm	490 to 505	498	Pass
HW- Hip Width	mm	356 to 391	377	Pass
		Overall Test Results		Pass

Test Program:	SID / HIII Thorax Lateral Impact	Test Date:	5/31/07
ATD Serial No.:	275	Test I.D.:	TH05D

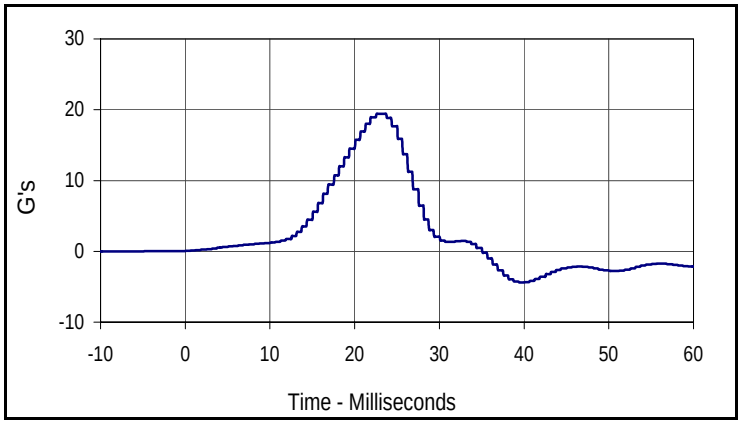
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.24	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	42.2	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	41.4	Pass
Thoracic 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
42.2	18.2	-12.5	26.9



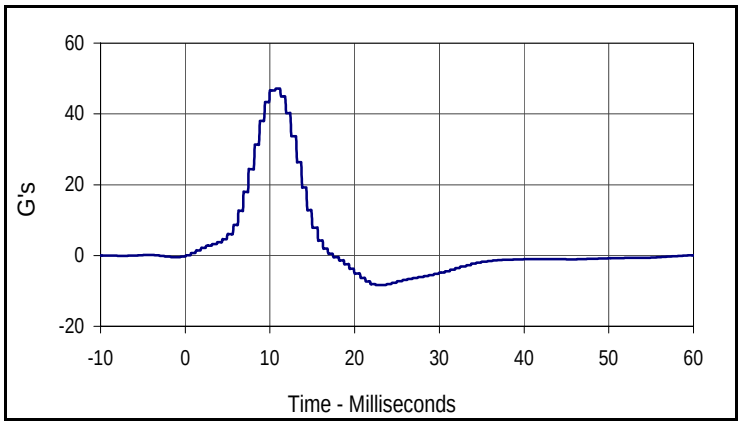
Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
41.4	18.2	-13.1	26.9



Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.4	23.2	-4.4	39.4

Test Program:	SID / HIII Pelvis Lateral Impact	Test Date:	5/31/07
ATD Serial No.:	275	Test I.D.:	PL05D

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.26	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	47.1	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
		Overall Test Results		Pass

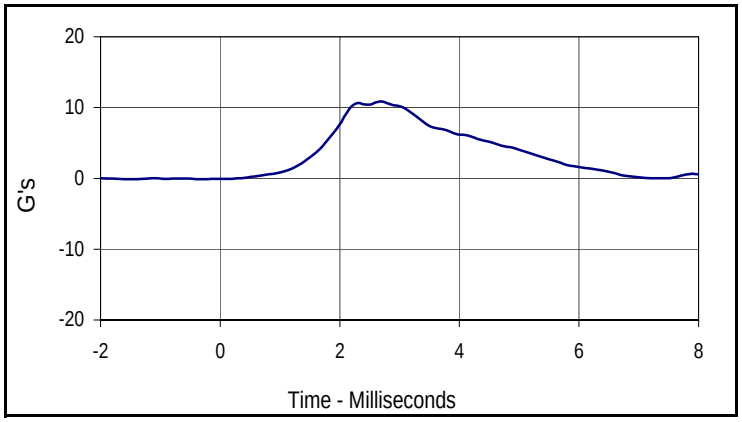


Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
47.1	10.7	-8.4	22.5

Test Program:	SID / HIII Head Drop Lateral Impact Test	Test Date:	5/31/07
ATD Serial No.:	275	Test I.D.:	HD05D

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	147.7	Pass
Peak Longitudinal Acceleration	G's	≤15.0	10.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	4.5	Pass
		Overall Test Results		Pass

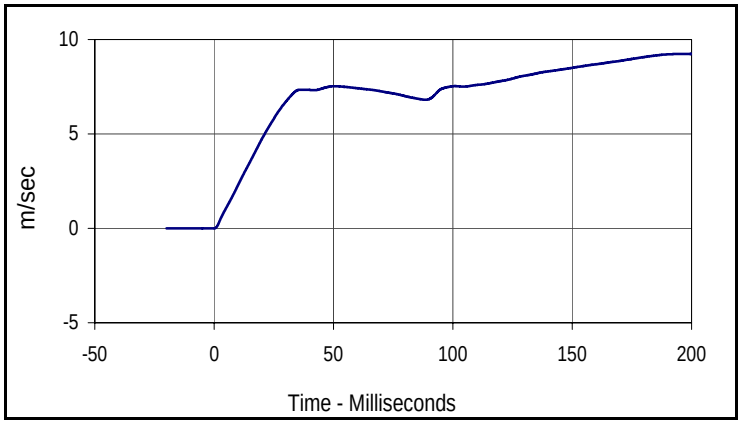
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
147.7	2.4	0.0	-0.7



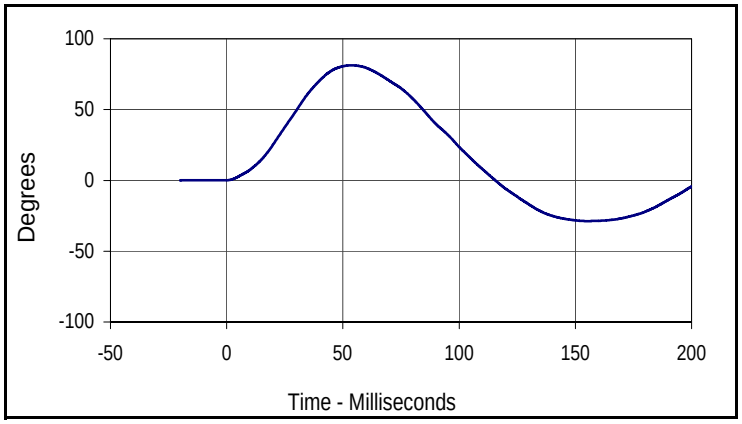
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
10.9	2.7	-0.1	-1.5

Test Program:	SID / HIII Neck Pendulum Lateral Test	Test Date:	5/31/07
ATD Serial No.:	275	Test I.D.:	NB05D

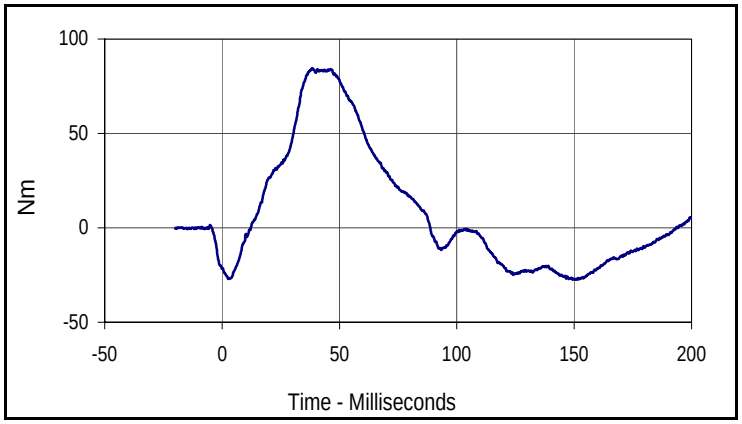
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.29	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.73	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.71	Pass
	40 to 70	m/sec	6.27 to 7.64	7.53	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	81.3	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	84.6	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
9.2	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
81.3	53.7	-28.8	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
84.6	38.3	-27.5	151.0