REPORT NUMBER TR-P27001-08-NC

NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

MITSUBISHI MOTORS CORPORATION
2008 MITSUBISHI LANCER
4-DOOR SEDAN

NHTSA NUMBER: M85600

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

APRIL 4, 2007

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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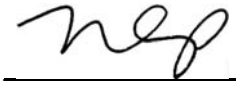
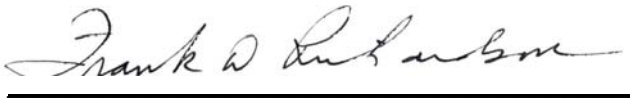
Prepared by:  Date: April 4, 2007

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

Reviewed by:  Date: April 4, 2007

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

Approved by:  Date: April 4, 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

_____
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7. Authors
Mr. Johnny H. Dutto, Project Engineer, Karco
Mr. Frank Richardson, Program Manager, Karco

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9270 Holly Rd.
Adelanto, CA, 92301

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16. Abstract

A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2008 Mitsubishi Lancer 4-Door Sedan at Karco Engineering, LLC on 04/04/07. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 55.75 km/h. The ambient temperature at the barrier face at the time of impact is 28.0 degrees Celcius. The vehicle's maximum post-test static crush is 573 mm at the vehicle's centerline. The test vehicle is equipped with a 3-point continuous belt system and second generation supplemental airbags in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:

Measurement Description	Units	Threshold	Driver ATD	Passenger ATD
Head Injury Criteria (HIC)	N/A	1000	274.8	414.3
Max. Chest Accel. (3 msec Clip)	G's	60	36.8	46.5
Left Femur Force	Newtons	10008	-1462.6	-2632.8
Right Femur Force	Newtons	10008	-1985.4	-845.7

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NHTSA No. M85600

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SECTION 1

PURPOSE AND SUMMARY OF TEST M85600

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of the New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-D-00027. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph (48.3 km/h) requirements.

The 35 mph (56.3 km/h) frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated July 2005. Data was obtained indicant of FMVSS 208 “Occupant Crash Protection”, FMVSS 212, “Windshield Retention”, FMVSS 219, “Windshield Zone Intrusion (Partial)”, and FMVSS 301 “Fuel System Integrity”, performance. Procedures for receiving, inspection, testing and reporting of test results are described in the test procedures and are not repeated in this report.

1.2 SUMMARY

A load cell barrier consisting of 45 load cells was impacted by a 2008 Mitsubishi Lancer 4-Door Sedan at a velocity of 55.75 km/h. The test was performed at Karco Engineering, LLC on April 4, 2007.

Three (3) real-time and fourteen (14) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet number 14 (page number 24) of this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with head (primary and redundant), chest (primary and redundant) and pelvis triaxial accelerometers, chest displacement potentiometers, six-axis upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were placed on the driver’s and passenger’s lap and shoulder belts to measure dummy torso and pelvic section loading. Shoulder belt spool-off was measured for the driver and passenger dummies. The driver (position 1) ATD (Serial No. 035) and the right-front passenger (position 2) ATD (Serial No. 034) were calibrated prior to this test.

One hundred and forty one (141) channels of data were recorded using a TDAS data acquisition system. Appendix A contains Pre and Post-Test Photographs, Appendix B contains the Dummy

Response data traces, Appendix C contains the Dummy Calibration data, and Appendix D contains the Child Restraint System Report.

There was 100 percent windshield retention and there was no intrusion into the protected zone of the windshield during the impact event. There was no stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 573 mm at the vehicle's centerline and both the driver and the passenger side doors remained closed and latched during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver ATD's head and chest contacted the airbag and the abdomen had no contact. Both knees contacted the knee airbag.

The passenger's visible contact points were as follows: The passenger ATD's head and chest contacted the airbag. Both knees contacted the glove box.

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY

ATD Position	HIC 36	Clip (g)	Chest Defl. (mm)	Left Femur (N)	Right Femur (N)
Driver	274.8	36.8	-24.7	-1462.6	-1985.4
Passenger	414.3	46.5	-24.2	-2632.8	-845.7

Additional data plots for this test are available in the research and development section of the NHTSA website. The website can be found at: www.NHTSA.Dot.Gov

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

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	miles/hr	km/hr	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

CRASH TEST SUMMARY

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	55.75
Test Weight	kg	1507
Impact Angle	degrees	0
Average Rebound	mm	2587
Maximum Static Crush	mm	573

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door opening	Remained closed and latched, opened w/o tools	Remained closed and latched, opened w/o tools
Rear Door Opening	Remained closed and latched, opened w/o tools	Remained closed and latched, opened w/o tools
Seat Track Shift (mm)	None	None
Seat Back Failure	No	No

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type/ Serial No.	50% Male Hybrid III No. 035	50% Male Hybrid III No. 034
Head Contact	Airbag	Airbag
Chest Contact	Airbag	Airbag
Abdomen Contact	None	None
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

MOVIE COVERAGE

Cameras	Standard	Additional
High Speed	14	0
Real Time	1	2
Total	15	2

DATA CHANNELS

Driver ATD Sensors	40
Passenger ATD Sensors	40
Belt Assessment Sensors	8
Vehicle Structure Accelerometers	8
Rigid Barrier Load Cells	45
Total	141

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M85600	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.	JA3AU16UX8U001846	Driver Side Airbag	No
Color	Charcoal Grey	Driver Head Airbag	No
Delivery Date	3/23/2007	Driver Curtain Airbag	Yes
Odometer (Miles)	35.0	Pass. Airbag	Yes
Dealer	Southcoast Mitsubishi	Pass. Side Airbag	No
Transmission	5-Speed Manual	Pass. Head Airbag	No
Final Drive	Front	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 Cassette	Yes
Tinted Glass	No	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 MANUFACTURER

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

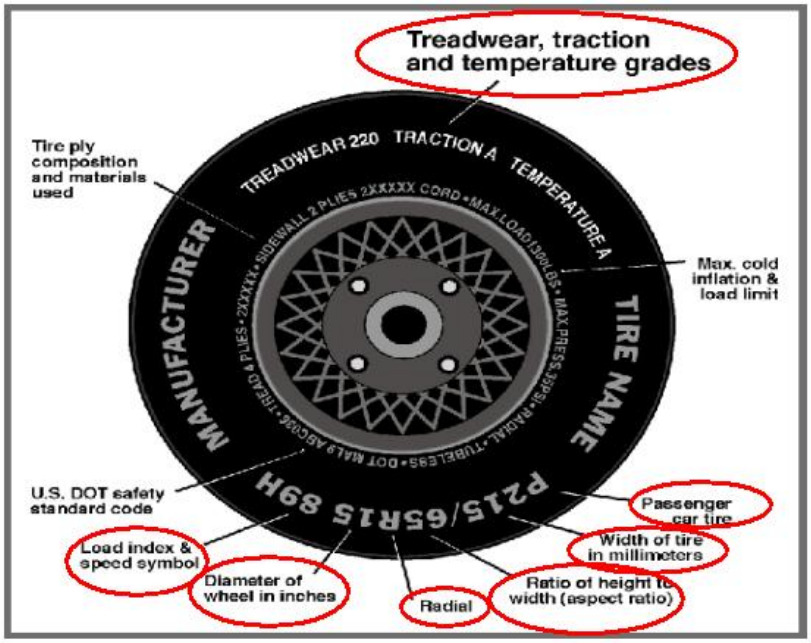
VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

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

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

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	534B	534B
Tire Material	Polyester 1 + Steel 2 + Nylon 1	Polyester 1 + Steel 2 + Nylon 1
DOT Safety Code Right	FD20 N2L0707	FD20 N2L0707
DOT Safety Code Left	FD20 N2L0707	FD20 N2L0707

DATA SHEET NO. 2…(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	400	260	660	428	322	750
Right	kg	383	271	654	425	332	757
Ratio	%	60	40	100	57	43	100
Totals	kg	783	531	1314	853	654	1507

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1314
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	35
Calculated Vehicle Target Wt. (TVTW)	kg	1501

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	713	710	706	710	1065
As Tested	mm	687	686	664	660	1144

Vehicle Wheel Base (mm): 2635

Weight of Ballast Secured in cargo area (kg): 0

Weight of Items Removed (kg): 65

Vehicle Components Removed: Spare Tire, Car Jack / Tools, Rear Lights, Trunk Lid, Hub Caps Rear Bumper, Rear Glass, Exhaust, Rear Door Panels / Rear Glass

* Ballast weight does not include cameras, instrumentation and brake abort system.

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L): 58.67

Actual Test Volume with entire fuel System Filled (L): 54.55

Test Fluid Type: Stoddard Solvent

Kinematic Viscosity: as per ASTM Standard D484-71 Red

Is Vehicle Fuel Pump Electric or Mechanical? Electric

If electric, does pump operate with ignition switch "On" & engine "OFF" Yes

Fuel System Particulars: Electric fuel pump. Activated when electrical system is activated. Fuel pump will run during the operation of the engine.

DATA SHEET NO. 3

POST-TEST IMPACT DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

SPEED TRAP DATA

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	55.75
Trap No.2 Velocity (Redun.)	km/h	55.51 to 57.12	55.77

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4336	4025	-311
Center	mm	4555	3982	-573
Right Side	mm	4336	4060	-276

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	2560
Center	mm	2640
Right Side	mm	2560
Average	mm	2587

DATA SHEET NO. 4

TEST VEHICLE INFORMATION

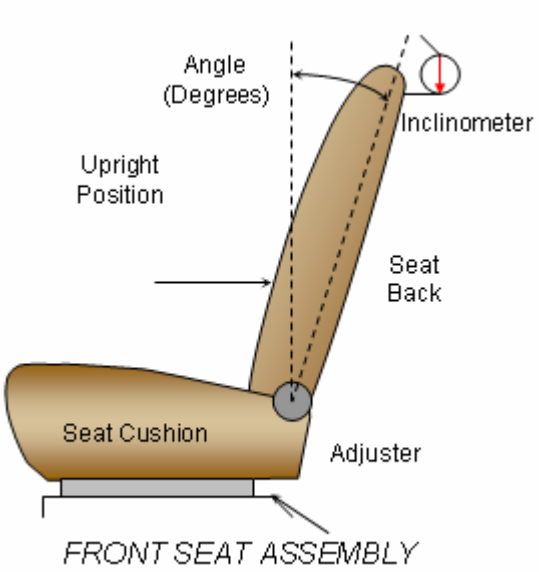
Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

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 of the seat using a digital inclinometer.



SEAT BACK ANGLES

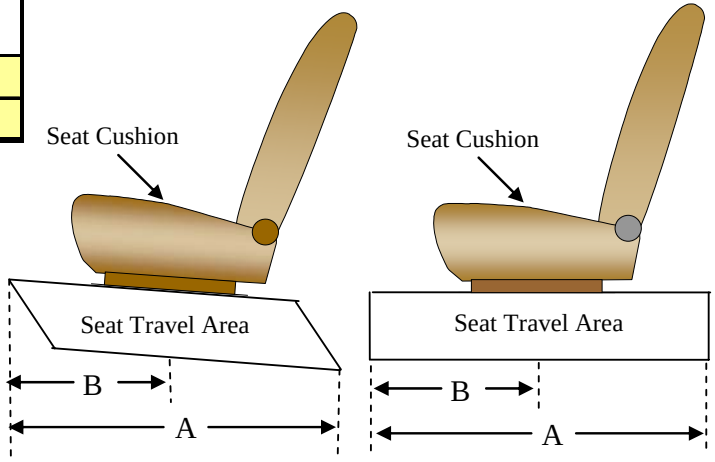
	Deg.
Driver w/seated Dummy	4.0 @ Headrest
Passenger w/seated Dummy	4.0 @ Headrest

SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position. There were no vertical adjustments on the seats that were equipped with the vehicle.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position
Driver Seat	22 Detents	10th Detent
Passenger Seat	22 Detents	11th Detent



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	0
Passenger Seat	5	0

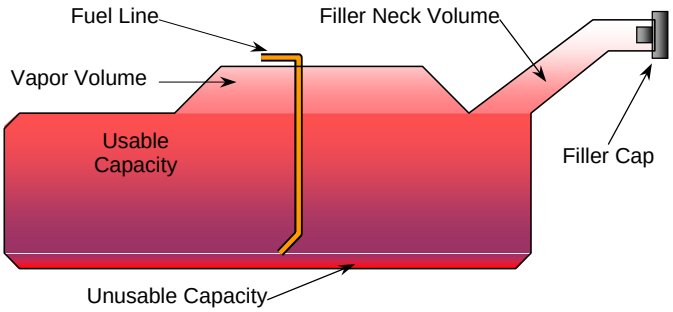
Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

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	54.55

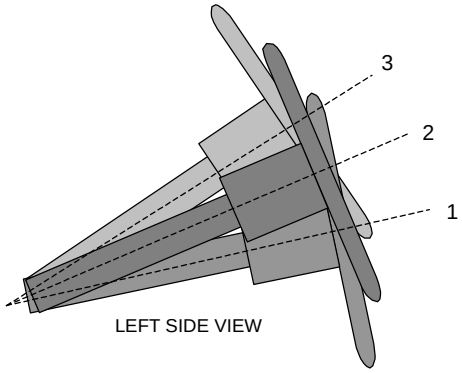
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies 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. 5

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

TEST DUMMY POSITION MEASUREMENTS

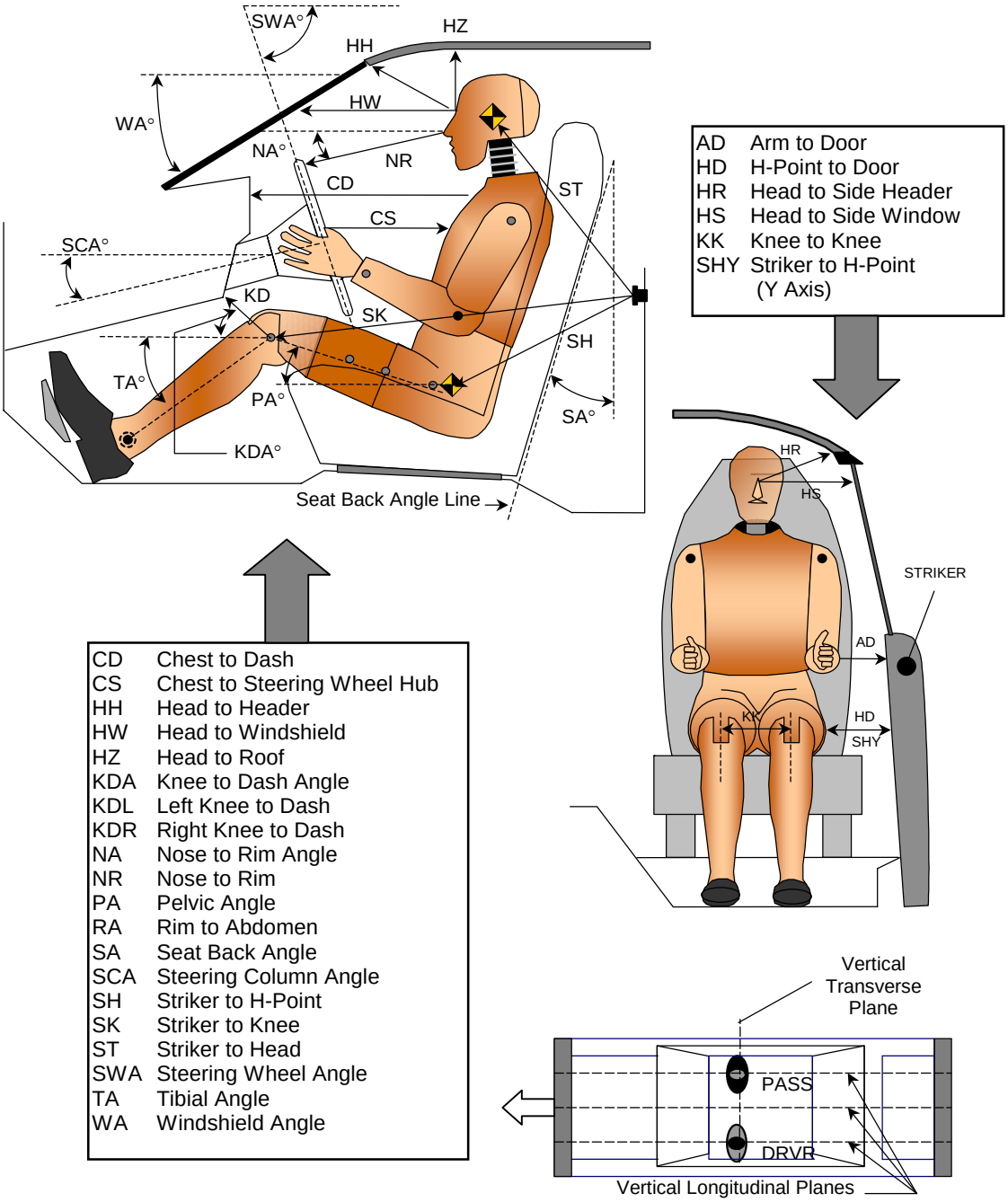
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		24.0		
SWA	Steering Wheel Angle		69.5		
SCA	Steering Column Angle		20.5		
SA	Seat Back Angle		4.0 @ Headrest		4.0 @ Headrest
HZ	Head to Roof (Z)	185	90.0	175	90.0
HH	Head to Header	360		355	
HW	Head to Windshield	640		650	
HR	Head to Side Header (Y)	260		260	
NR	Nose to Rim	405	11.0		
CD	Chest to Dash	590		540	
CS	Chest to Steering Hub	330			
RA	Rim to Abdomen	230			
KDL	Left Knee to Dash	180	21.0	140	
KDR	Right Knee to Dash	170		140	20.0
PA	Pelvic Angle		23.3		23.4
TA	Tibia Angle		43.0		41.0
KK	Knee to Knee (Y)	280		270	
SK	Striker to Knee	590	8.6	600	7.6
ST	Striker to Head	465	82.0	450	79.0
SH	Striker to H-Point	260	43.0	270	48.0
SHY	Striker to H-Point (Y)	220		230	
HS	Head to Side Window	330		330	
HD	H-Point to Door (Y)	130		125	
AD	Arm to Door (Y)	130		65	

DATA SHEET NO. 5…(CONTINUED)

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07



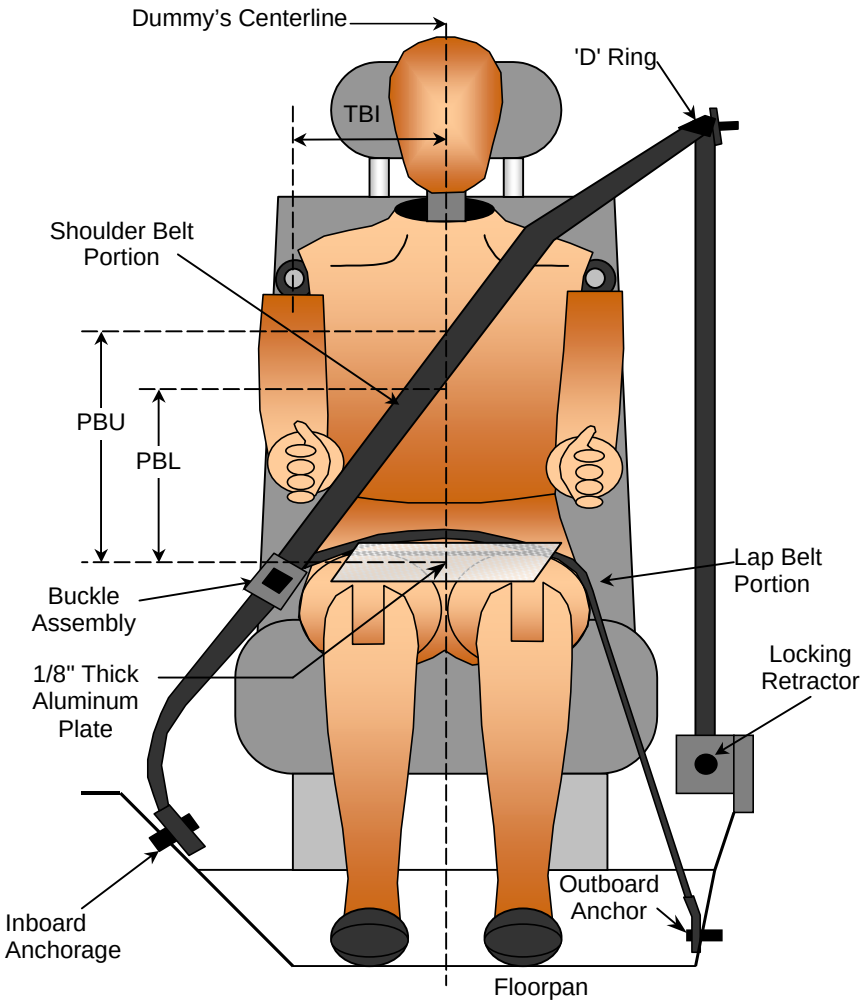
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	200	210
PBU - Top Surface of reference to belt upper edge	mm	305	340
PBL - Top Surface of reference to belt lower edge	mm	230	250
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATION

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan Test Date: 4/4/07

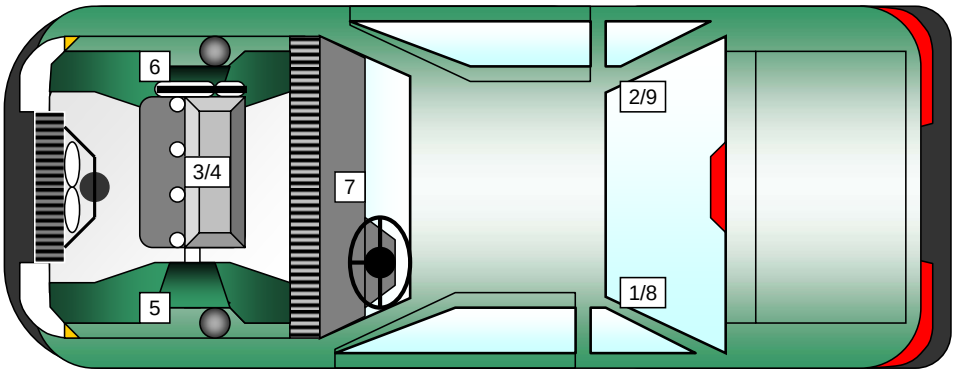
Test Program: 2007 NHTSA 35mph NCAP NHTSA No.: M85600

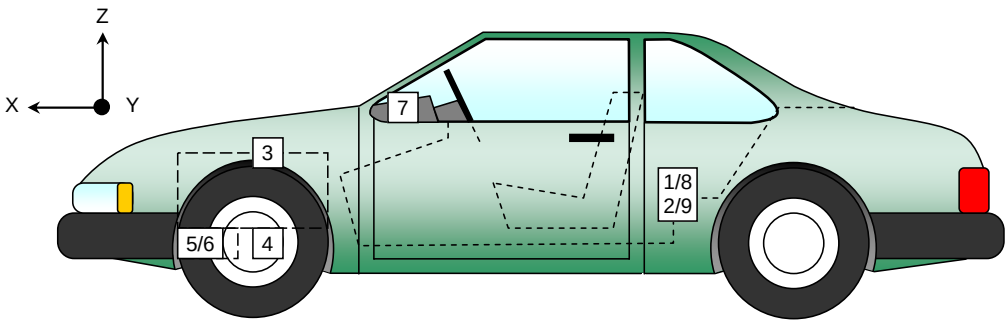
VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member	1690	-720	385
2	Right Rear X-Member	1690	720	385
3	Engine Top	3953	105	1120
4	Engine Bottom	3913	262	265
5	Left Brake Caliper	3752	-683	360
6	Right Brake Caliper	3752	683	360
7	Instrument Panel			[1]
8	Left Rear X-Member (Z-Axis)	1690	-720	385
9	Right Rear X-Member (Z-Axis)	1690	720	385

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

1.) Instrument Panel no longer used by NHTSA





DATA SHEET NO. 8

SEAT BELT ASSESSMENT TEST DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
Retractor Reel to "D" ring	mm	680	680
Shoulder Belt length as measured on ATD	mm	890	900
Lap Belt length as measured on ATD	mm	780	820
Remainder of belt on reel	mm	710	890
Total belt length for continuous webbing systems	mm	3060	3290

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	320	150
As determined electronically	mm	646**	161

** Data was questionable due to the driver side curtain airbag deployment

BELT STRETCH DATA

Measuerment Description	Units	Driver	Passenger
Electronically between belt load cell and "D" ring	mm/cm	*	*
Mechanically	mm/cm		

* Not used with shoulder belt pre-tensioner systems

DATA SHEET NO. 9

SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

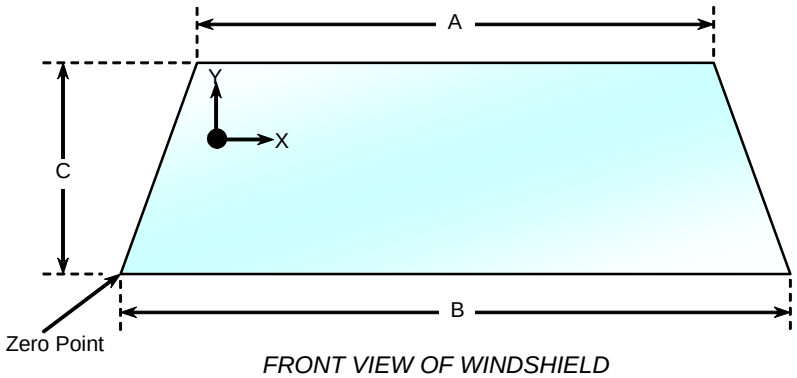
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles that are equipped with occupant passive restraints.

Temperature of windshield molding during test: 28.0 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test(mm)	Post-Test(mm)	% of Retention
Left Side	2132	2132	100
Right Side	2132	2132	100
Total	4264	4264	100



FRONT VIEW OF WINDSHIELD

WINDSHIELD DIMENSIONS

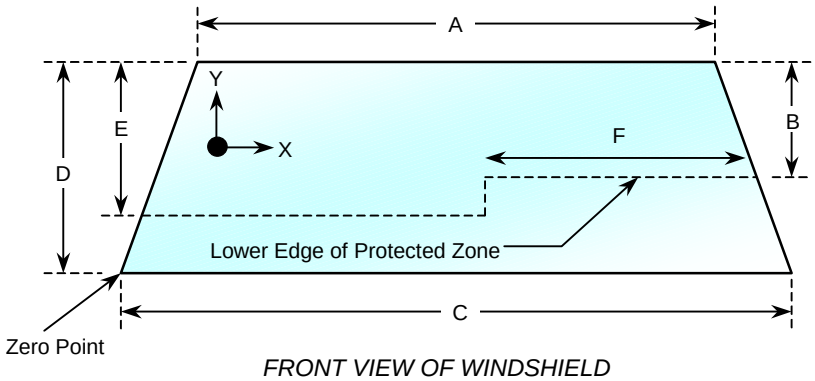
Item	Units	Segment Length	Molding Width
A	mm	1180	15
B	mm	1440	30
C-Left	mm	822	15
C-Right	mm	822	15

DATA SHEET NO. 10

WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07



FRONT VIEW OF WINDSHIELD

WINDSHIELD AND PROTECTED ZONE

Item	Units	Value
A	mm	1180
B	mm	513
C	mm	1440
D	mm	822
E	mm	515
F	mm	495

AREA OF PROTECTED ZONE FAILURES

A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 in. by a vehicle component other than one that is normally in contact with the windshield.

X	Y

B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y

DATA SHEET NO. 11

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

Test Time: 3:15 PM Temperature: 28.0 ° 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)

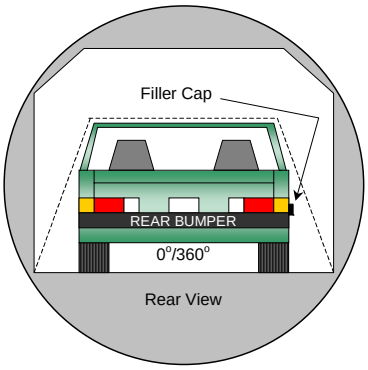
D. Spillage Location Details: No leakage occurred

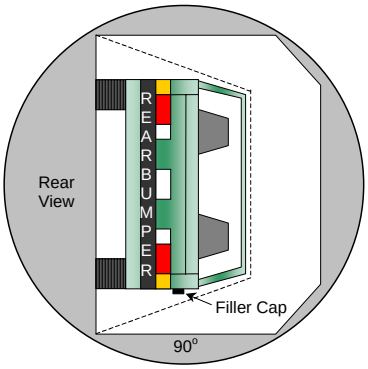
DATA SHEET NO. 12

FMVSS 301 STATIC ROLLOVER DATA

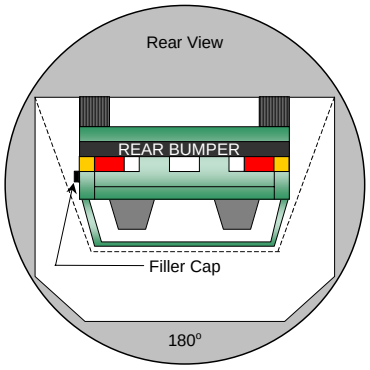
Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

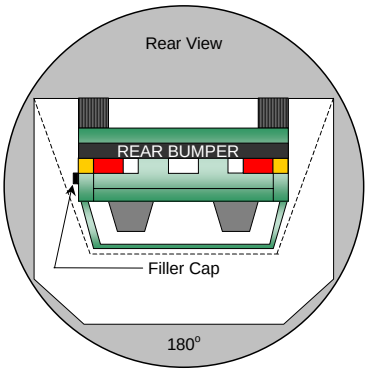




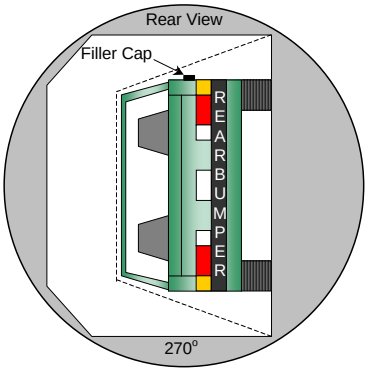
0° to 90°

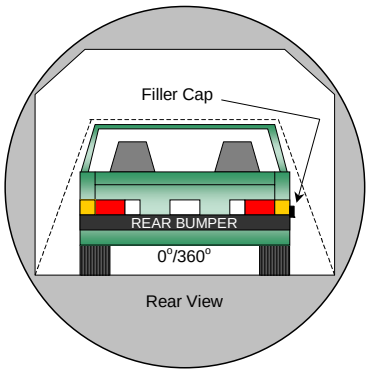


90° to 180°



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. No solvent leakage occurred during rollover.

DATA SHEET NO. 12…(CONTINUED)

FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	83	301	384
90° to 180°	85	302	387
180° to 270°	88	301	389
270° to 360°	85	303	388

FMVSS 301 SPILLAGE TABLE REQUIREMENT (oz.)

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

ACTUAL TEST VEHICLE SOLVENT SPILLAGE TABLE (oz.)

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. 13

VEHICLE MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	4555	3982	-573
2	RSOV to front of engine	mm	3835	3605	-230
3	RSOV to firewall centerline	mm	3545	3540	-5
4	RSOV to leading edge of right door	mm	3078	3075	-3
5	RSOV to leading edge of left door	mm	3070	3080	10
6	RSOV to lower leading edge of right door	mm	3086	3070	-16
7	RSOV to lower leading edge of left door	mm	3076	3064	-12
8	RSOV to upper trailing edge of right door	mm	2013	2012	-1
9	RSOV to upper trailing edge of left door	mm	2010	2020	10
10	RSOV to lower trailing edge of right door	mm	2034	2013	-21
11	RSOV to lower trailing edge of left door	mm	2020	2005	-15
12	RSOV to bottom of right 'A' pillar	mm	3068	3042	-26
13	RSOV to bottom of left 'A' pillar	mm	3058	3051	-7
14	RSOV to firewall on right side	mm	3490	3480	-10
15	RSOV to firewall on left side	mm	3483	3440	-43
16	RSOV to steering column	mm	2642	2665	23
17	Center of steering column to left 'A' pillar	mm	421	418	-3
18	Center of steering column to headlining	mm	434	475	41
19	RSOV to right side of front bumper	mm	4336	4060	-276
20	RSOV to left side of front bumper	mm	4336	4025	-311
21	Length of engine block	mm	483	482	-1
RD	RSOV to right side of dash panel	mm	2905	2900	-5
CD	RSOV to center of dash panel	mm	2812	2677	-135
LD	RSOV to left side of dash panel	mm	2905	2905	0

DATA SHEET NO. 13…(CONTINUED)

VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

VEHICLE STRUCTURAL MEASUREMENT TABLE

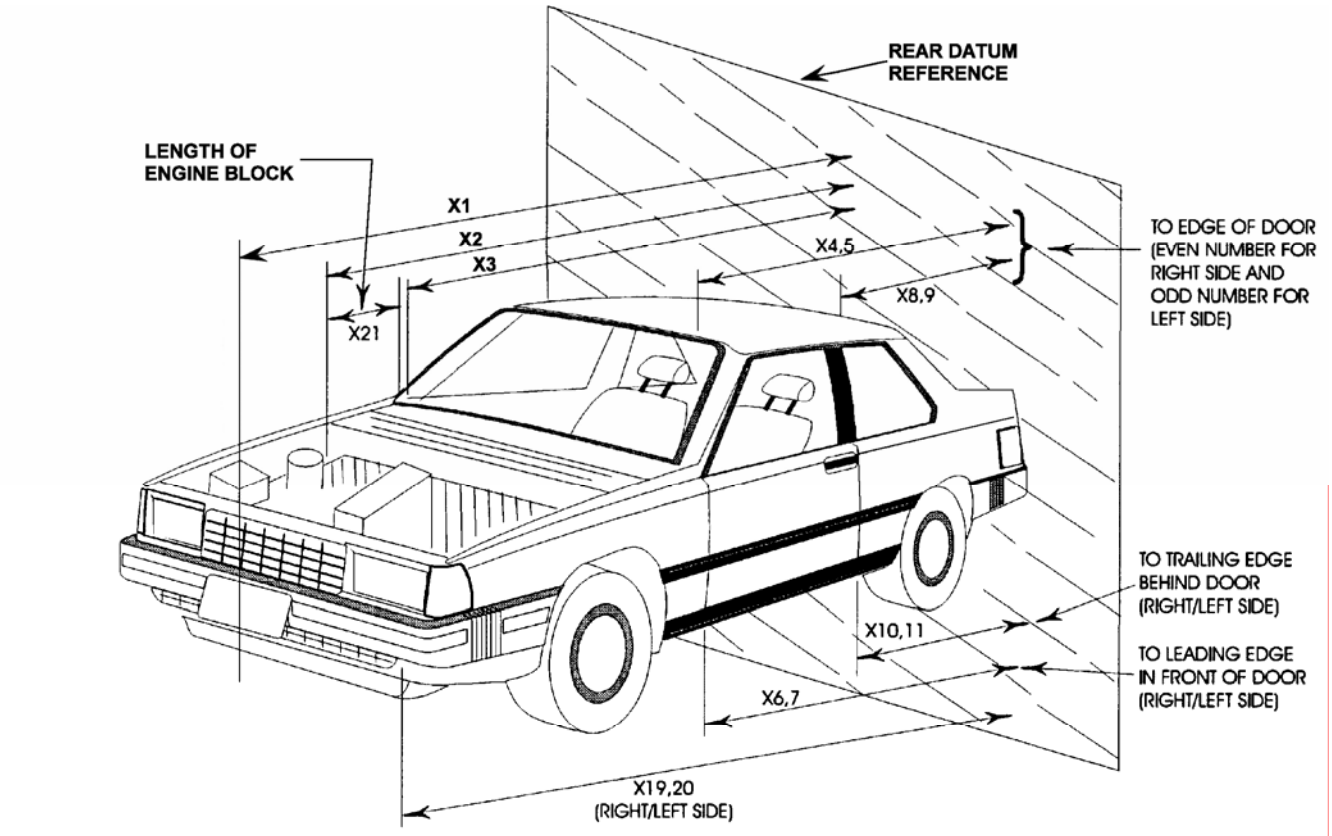
No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	4555	3982	-573
2	Total width	mm	1730	1740	10
3	Bumper top height	mm	600	551	-49
4	Bumper bottom height	mm	145	25	-120
5	Longitudinal member top height	mm	545	555	10
6	Longitudinal member bottom height	mm	415	435	20
7	Distance between longitudinal members	mm	875	995	120
8	Longitudunal member width	mm	55	50	-5
9	Engine top height	mm	800	800	0
10	Engine bottom height	mm	179	165	-14
11	Engine and gear box width	mm	825	855	30
12	Front bumper to engine distance	mm	720	175	-545
13	Front shock absorber fixing width	mm	875	832	-43
14	Bonnet leading edge height	mm	755	750	-5
15	Front shock absorber fixing width	mm	1135	1113	-22
16	Front bumper to front axle distance	mm	963	445	-518
17	Front axle to 'A' pillar distance	mm	484	465	-19
18	'A' pillar to 'B' pillar distance	mm	1080	957	-123
19	'B' pillar to rear axle distance	mm	1067	1074	7
20	'B' pillar to 'C' pillar distance	mm	955	955	0
21	Roof sill bottom height	mm	1340	1343	3
22	Roof sill top height	mm	1445	1431	-14
23	Floor sill bottom height	mm	216	203	-13
24	Floor sill top height	mm	404	360	-44

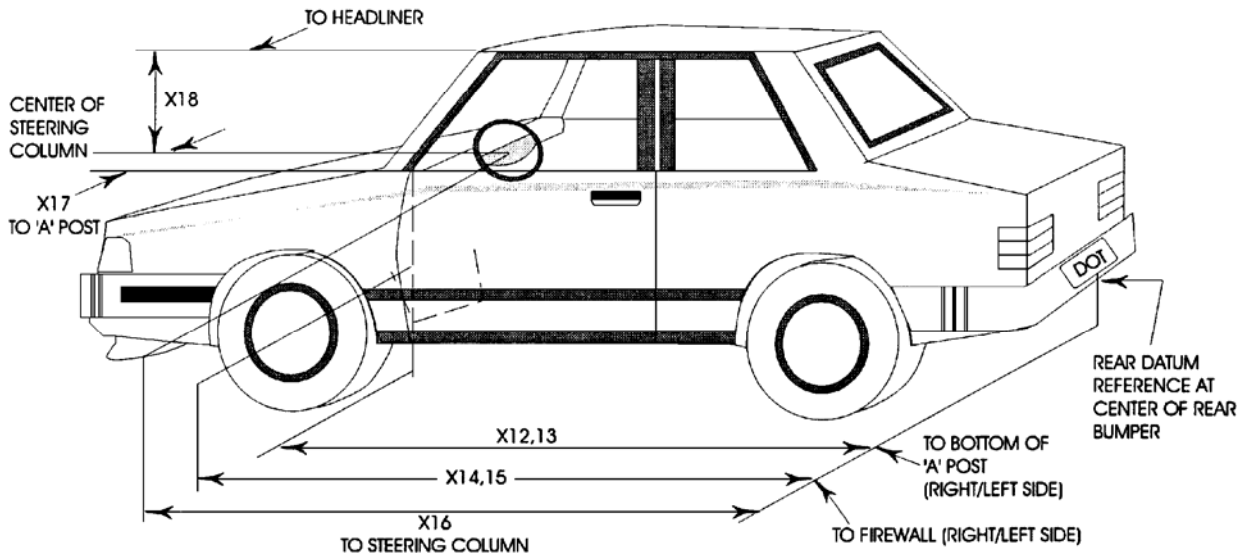
DATA SHEET NO. 13…(CONTINUED)

VEHICLE MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07





DATA SHEET NO. 14

CAMERA LOCATIONS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

VEHICLE CAMERA MEASUREMENT TABLE

No.	Camera View	Location (mm)			Angle (deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Real Time Camera (Panning)	-15316	-7910	-1584	0			30
2	Overall Left Side	-1795	-7189	-1128	0	7495	20mm	1000
3	Closeup Left Side	-1533	-7126	-1188	0	7385	50mm	1000
4	Driver and Interior View	-8696	-12562	-4511	-17	15930	ZOOM	1000
5	Steering Column (Bottom)	-1631	-8234	-2682	-13	8812	35mm	1000
6	Steering Column (Top)	-1663	-8153	-3078	-13	8872	35mm	1000
7	Overall Right Side	-2536	6867	-1066	0	7398	20mm	1000
8	Closeup Right Side	-2005	6967	-1250	0	7357	50mm	1000
9	Passenger and Interior View	-5330	9365	-2407	-10	11041	ZOOM	1000
10	Right Side View	-2006	6967	-1463	-6	7396	ZOOM	1000
11	Windshield View	-589	0	-5556	-90		24mm	1000
12	Driver Front View	378	-286	-2438	-34		25mm	1000
13	Passenger Front View	375	413	-2439	-34		25mm	1000
14	Pit View of Engine	-756	0	1495	90		12mm	1000
15	Pit View of Fuel Tank	-3211	0	1495	90		8mm	1000
16	Real Time Driver	-2458	-7598	1301	-1			30
17	Real Time Passenger	-2985	3981	-1284	-1			30

All measurements are made relative to the point of impact.

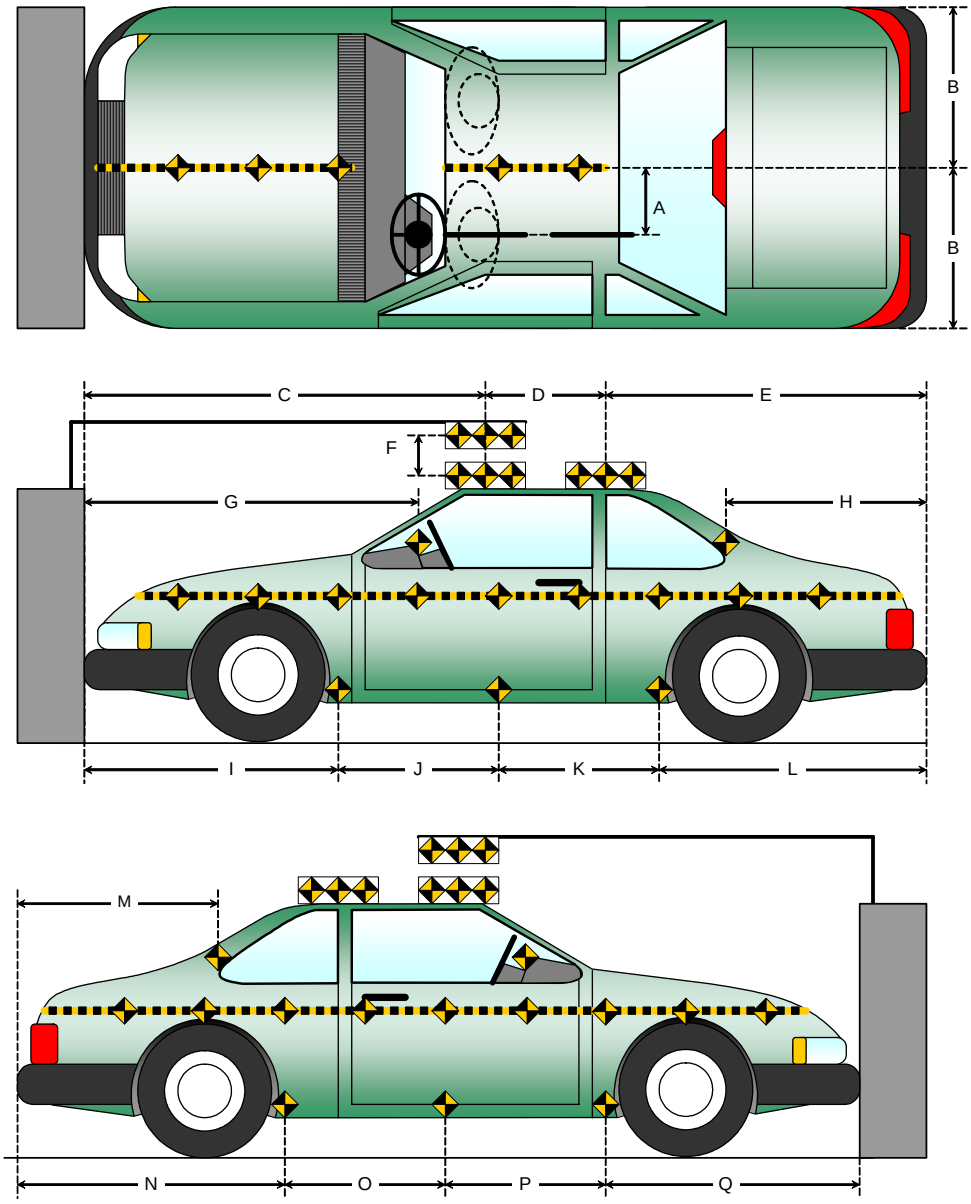
DATA SHEET NO. 15

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

All Dimensions in (mm)	
Item	Value
A	382
B	865
C	2350
D	615
E	1717
F	155
G	1733
H	935
I	1410
J	890
K	890
L	1399
M	935
N	1399
O	890
P	890
Q	1410



DATA SHEET NO. 16

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

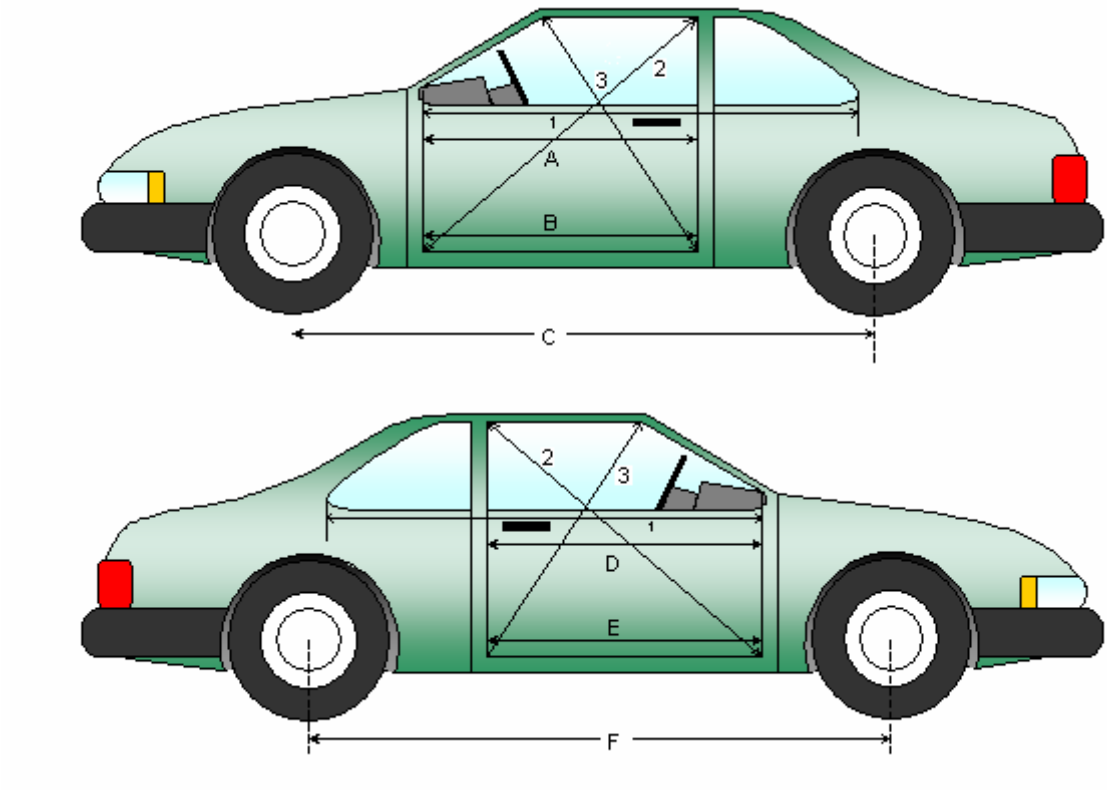
Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
1L	Left Side	mm	972	961	-11
2L	Left Side (Diagonally)	mm	1400	1393	-7
3L	Left Side (Diagonally)	mm	945	945	0
1R	Right Side	mm	973	966	-7
2R	Right Side (Diagonally)	mm	1400	1400	0
3R	Right Side (Diagonally)	mm	945	945	0

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2635	2635	0
F	Right Side Wheel Base	mm	2565	2635	70



DATA SHEET NO. 16…(CONTINUED)

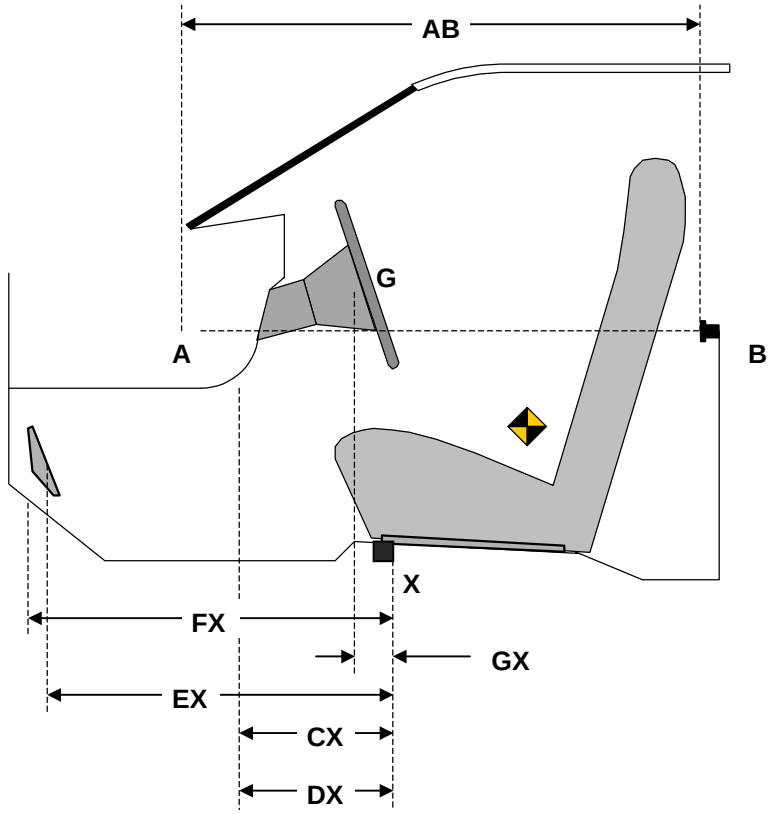
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	970	973	3
CX	Left Knee Bolster to X	mm	300	325	25
DX	Right Knee Bolster to X	mm	296	270	-26
EX	Brake Pedal to X	mm	573	446	-127
FX	Foot Rest to X	mm	570	496	-74
GX	Center of Steering Wheel Hub to X	mm	80	125	45

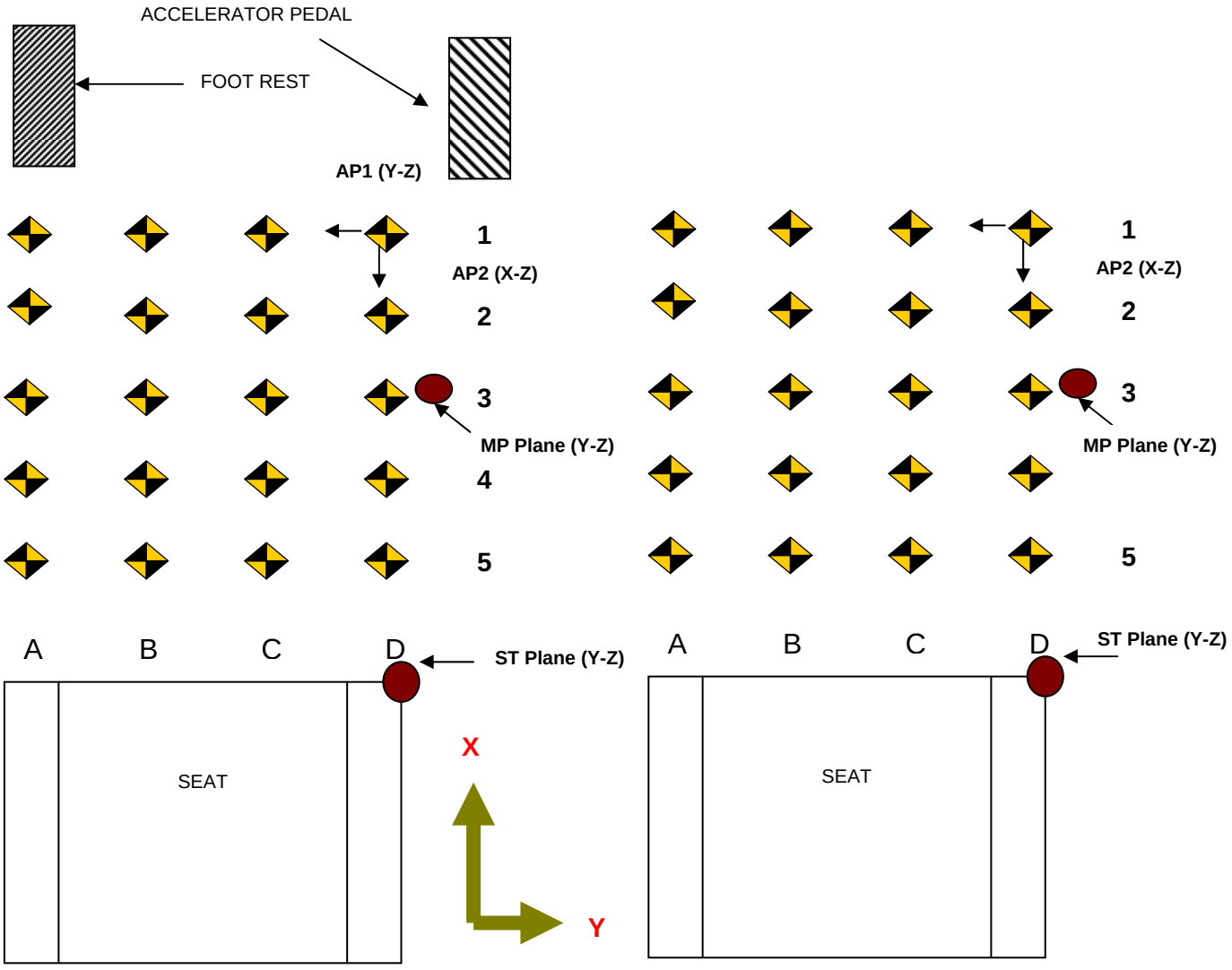


DATA SHEET NO. 16…(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07



AP1: Y-Z Plane passing through D1
AP2: X-Z Plane passing through D1
AP3: X-Y plane passing through D1
MP: Y-Z plane, halfway between the ST plane and AP1 plane
CF Plane: X-Z plane passes through center of footrest.
BP Plane: X-Z plane passes through center of brake pedal
TP Plane: Y-Z plane, intersection of BP Plane and the intersection of the toe pan and floorboard
Column A: intersection of vehicle and CF plane
Column D: Intersection of vehicle and AP2 plane
Row 1: intersection of the vehicle and the AP3 Plane
Row 3: intersection of the vehicle and TP plane
Row 5: intersection of the vehicle and MP plane
Row 2: evenly spaced between row 1 and 3
Row 4: evenly spaced between row 3 and 5

DATA SHEET NO. 16…(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

All measurements in mm

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	628	696	709	689	618	678	658	600	-10	-18	-51	-89
2	567	612	622	636	562	594	592	545	-5	-18	-30	-91
3	505	508	509	527	505	497	487	453	0	-11	-22	-74
4	407	407	409	414	401	394	389	358	-6	-13	-20	-56
5	309	304	311	321	304	295	288	275	-5	-9	-23	-46

DRIVER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-5	103	220	340	30	152	268	353	35	49	48	13
2	-10	104	221	343	19	142	263	364	29	38	42	21
3	-15	101	231	349	7	133	259	366	22	32	28	17
4	-12	107	237	355	6	130	256	368	18	23	19	13
5	-12	112	242	365	-2	126	253	376	10	14	11	11

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-71	7	10	-67	-60	24	0	-174	11	17	-10	-107
2	2	60	65	65	17	83	86	-95	15	23	21	-160
3	84	103	107	108	107	133	133	-12	23	30	26	-120
4	112	104	119	117	120	124	147	63	8	20	28	-54
5	123	102	125	116	130	122	148	94	7	20	23	-22

DATA SHEET NO. 16…(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

All measurements in mm

PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	635	690	700	658	672	692	699	642	37	2	-1	-16
2	566	608	613	624	583	601	602	612	17	-7	-11	-12
3	520	525	527	532	513	526	528	533	-7	1	1	1
4	409	414	421	425	414	420	420	425	5	6	-1	0
5	309	313	317	329	315	311	319	325	6	-2	2	-4

PASSENGER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-323	-208	-98	23	-255	-208	-90	40	68	0	8	17
2	-324	-213	-92	47	-261	-202	-87	52	63	11	5	5
3	-341	-209	-91	45	-315	-201	-88	49	26	8	3	4
4	-340	-207	-89	47	-332	-218	-89	44	8	-11	0	-3
5	-342	-210	-89	48	-336	-205	-90	50	6	5	-1	2

PASSENGER FLOOR PAN Z-AXIS

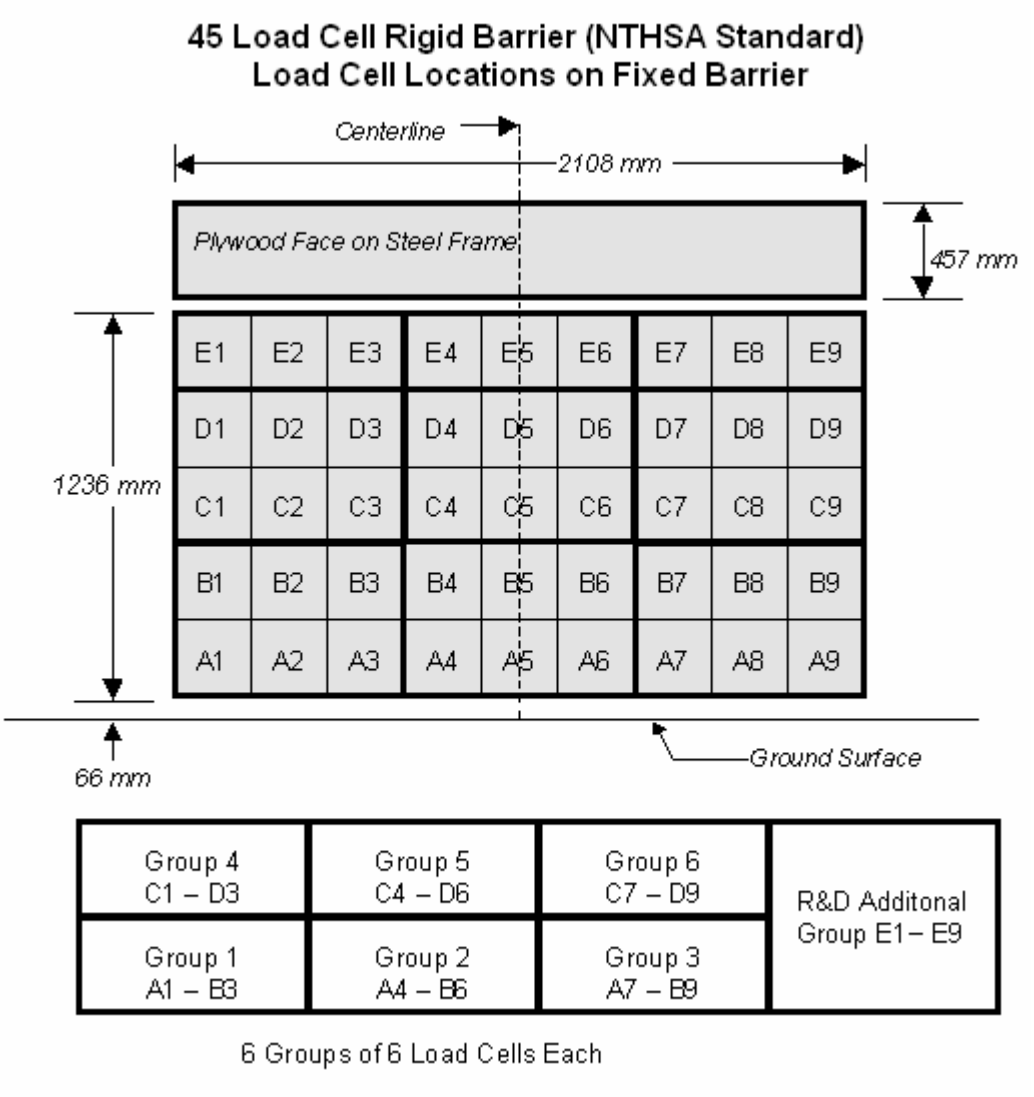
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-185	-35	0	-35	-209	4	9	-20	-24	39	9	15
2	-98	64	52	49	-169	66	62	65	-71	2	10	16
3	96	102	102	95	9	119	115	112	-87	17	13	17
4	92	104	101	105	94	102	110	120	2	-2	9	15
5	90	104	99	116	72	105	105	130	-18	1	6	14

DATA SHEET NO. 17

FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07



DATA SHEET NO. 18

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 004/04/07

VEHICLE INFORMATION

VIN: JA3AU16UX8U001846 Wheel base (mm): 2635

Vehicle Size Category: 4-Door Sedan Test Weight (kg): 1507

ACCELEROMETER DATA

Accelerometer Location: Left rear cross member

Cal. Procedure/Interval: 6 months / drop test

Integration Algorithm: NHTSA Standard Linearity: Good

Impact Velocity (km/h): 55.75

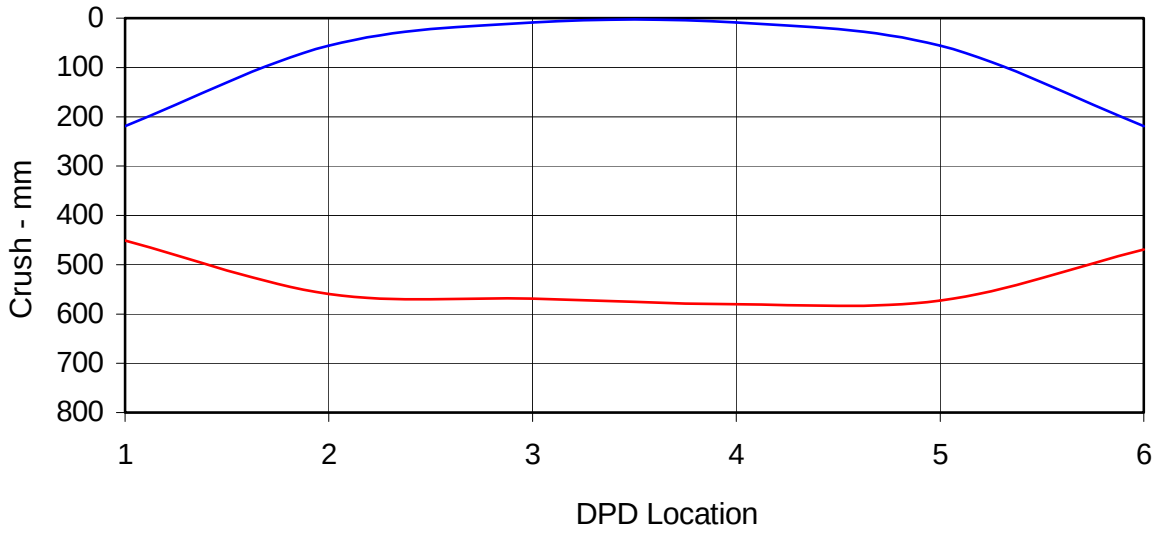
Velocity Change (km/h): 63.4 Time of Separation (msec): 68.7

CRUSH PROFILE

Collision Deformation Classification: 12FDEW6 Midpoint of Damage: Vehicle Centerline

Damage Region Length (mm): 1452 Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	219	451	-232
C2	Crush zone 2 on left side	mm	56	559	-503
C3	Crush zone 3 on left side	mm	9	569	-560
C4	Crush zone 4 on right side	mm	9	580	-571
C5	Crush zone 5 on right side	mm	56	573	-517
C6	Crush zone 6 at right side	mm	219	469	-250

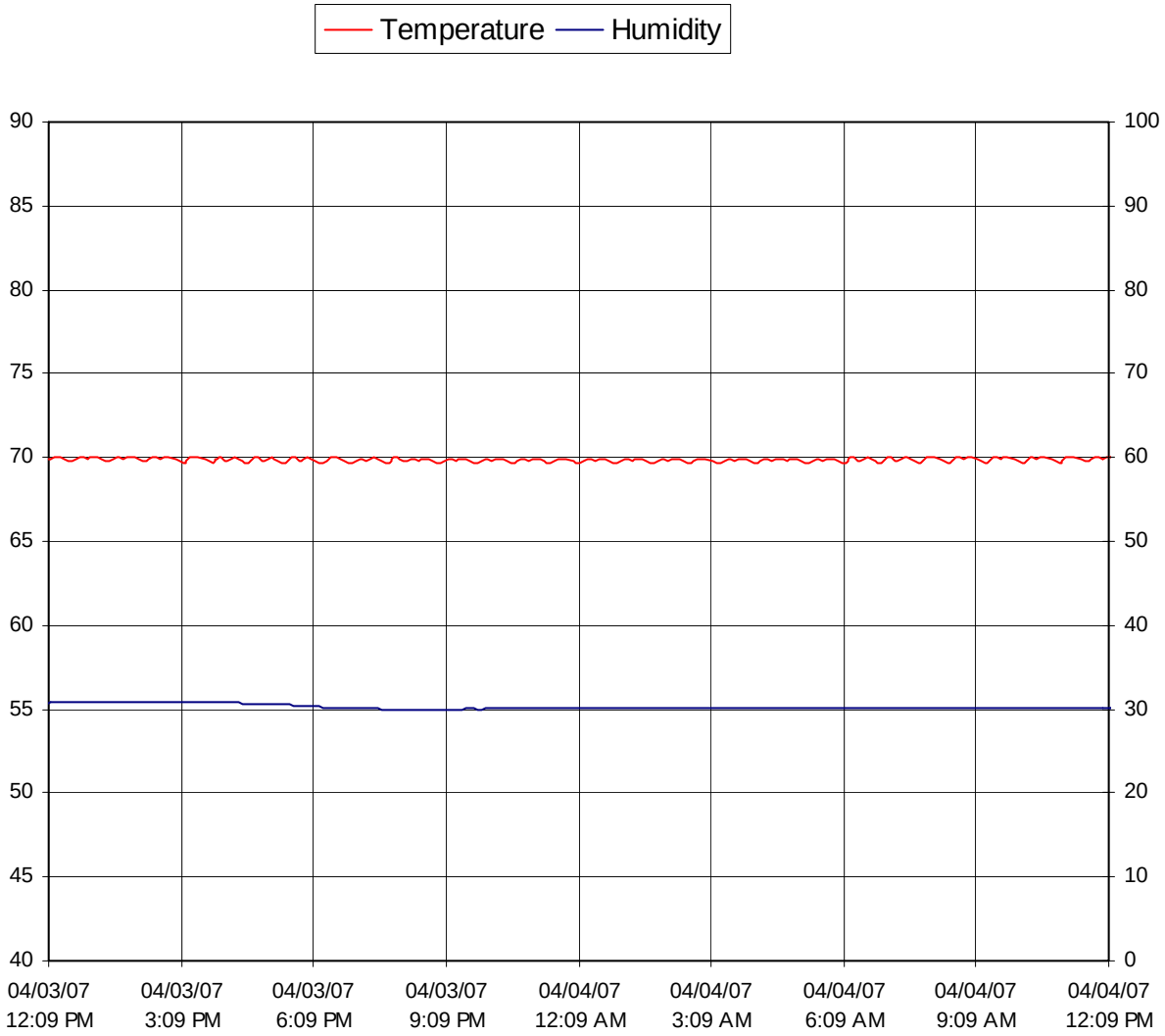


DATA SHEET NO. 19

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07



APPENDIX A
PHOTOGRAPHS

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Figure A-1: Load Cell Location

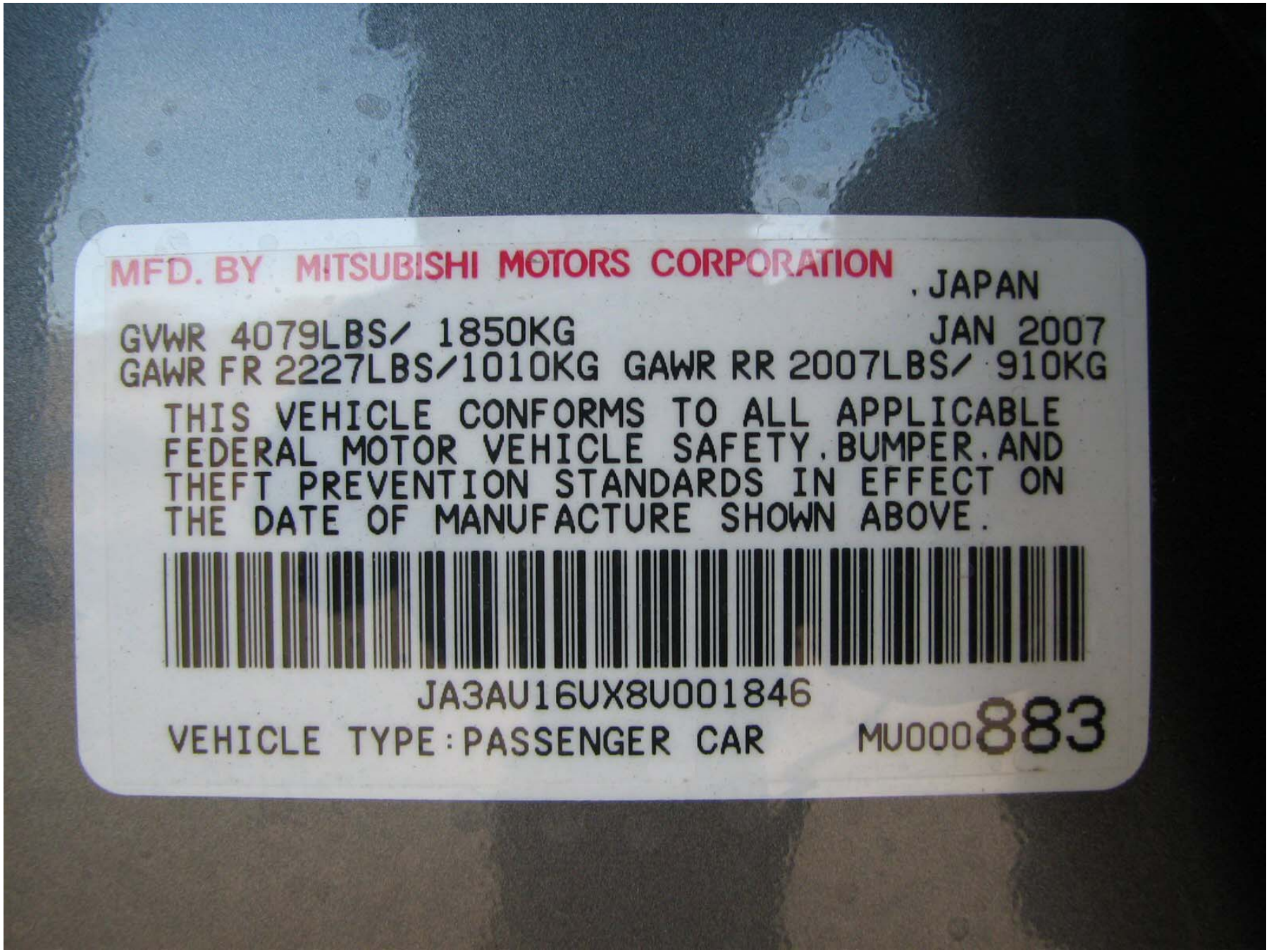

Figure A-2: Manufacturer's Label

Figure A-3: Tire Placard

Figure A-4: Right Front ¾ View, As Received

Figure A-5: Left Rear ¾ View, as Received

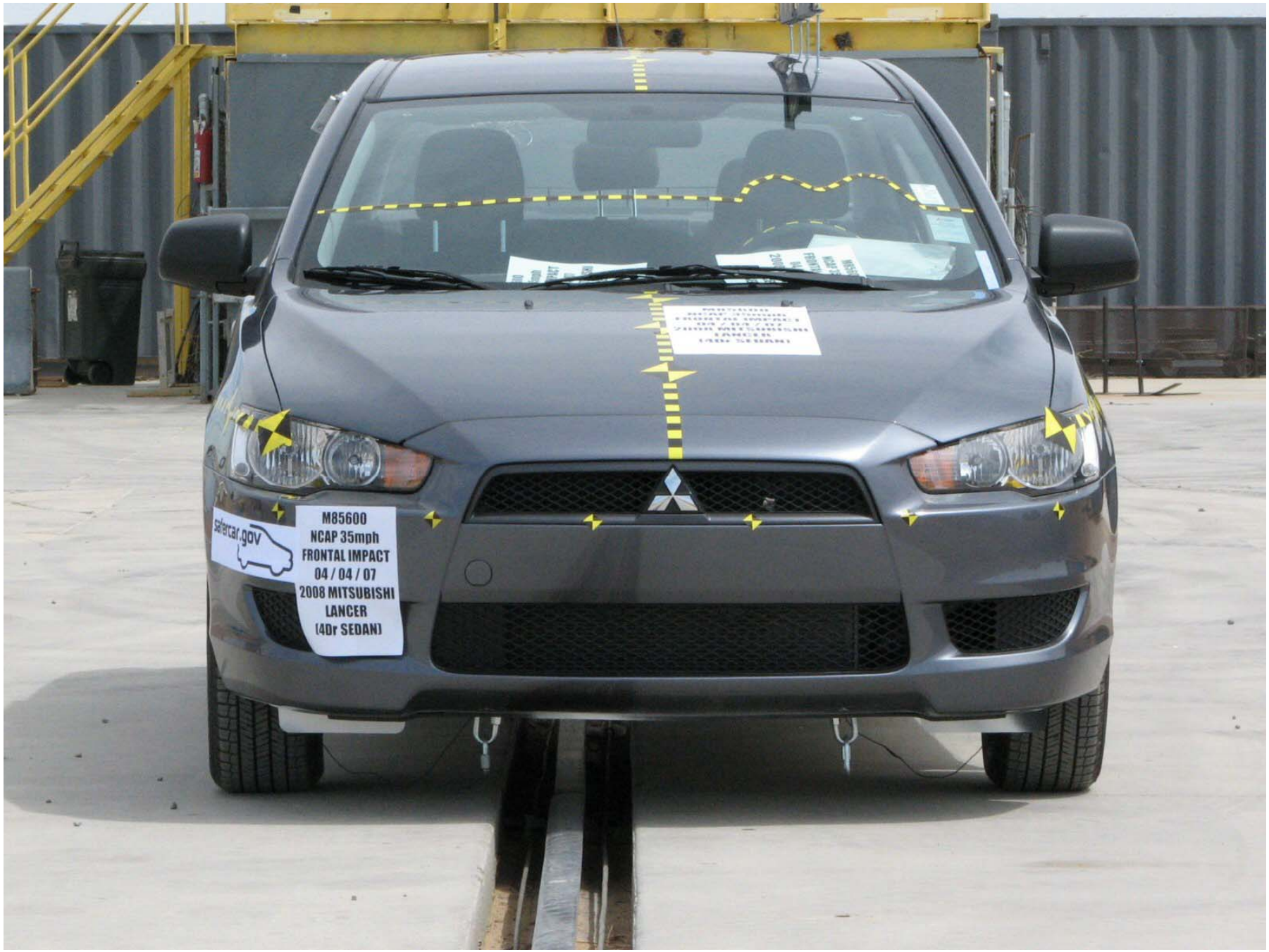

Figure A-6: Pre-Test Front View

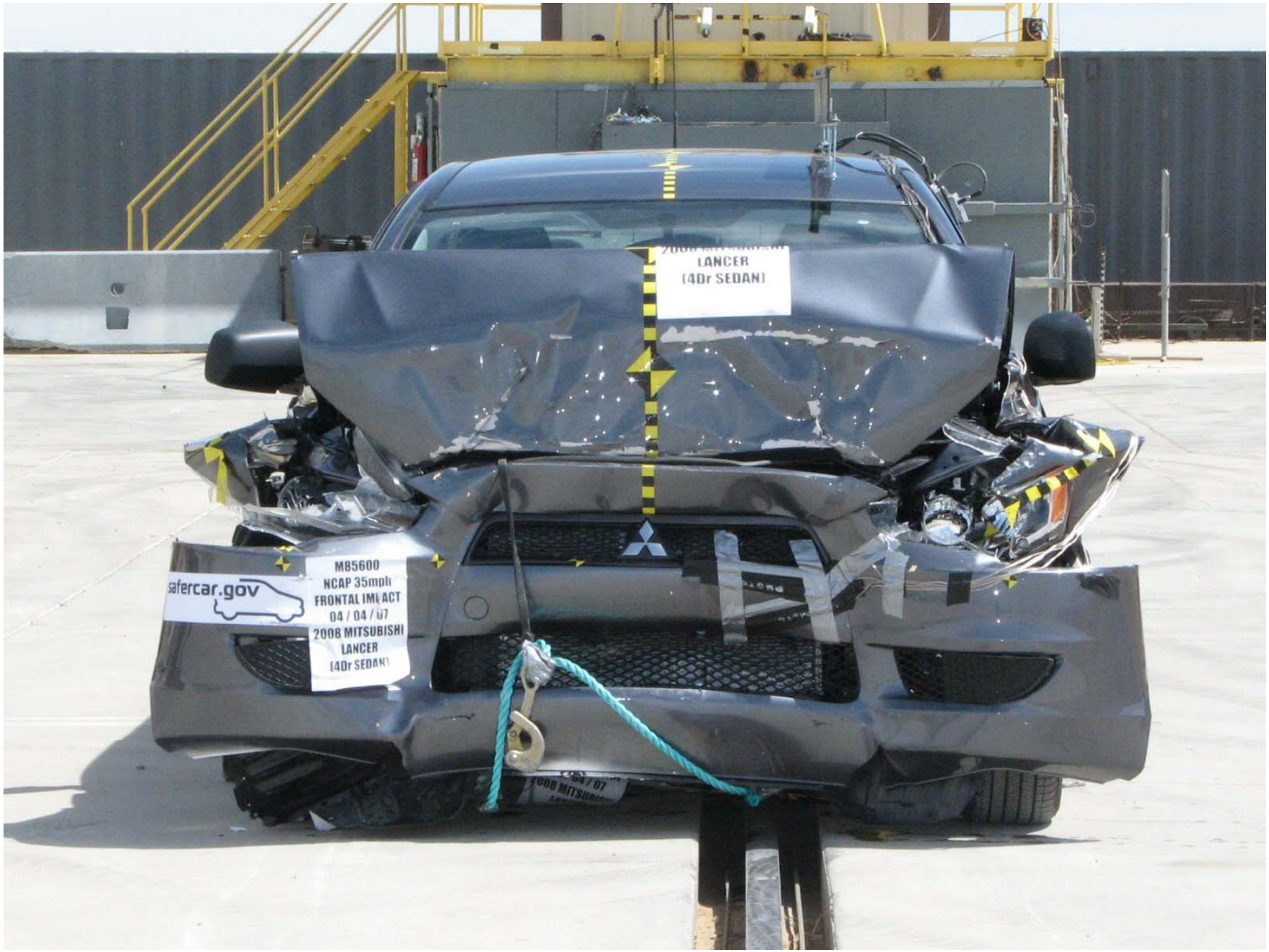

Figure A-7: Post-Test Front View (Vehicle Moved)

Figure A-8: Pre-Test Left Side View

Figure A-9: Post-Test Left Side View

Figure A-10: Pre-Test Right Side View

Figure A-11: Post-Test Right Side View

Figure A-12: Pre-Test Right Front ¾ View

Figure A-13: Post-Test Right Front ¾ View (Vehicle Moved)

Figure A-14: Pre-Test Left Rear ¾ View

Figure A-15: Post-Test Left Rear ¾ View

Figure A-16: Post-Test Left Side ¾ View of Doors After Impact

Figure A-17: Post-Test Right Side ¾ View of Doors After Impact

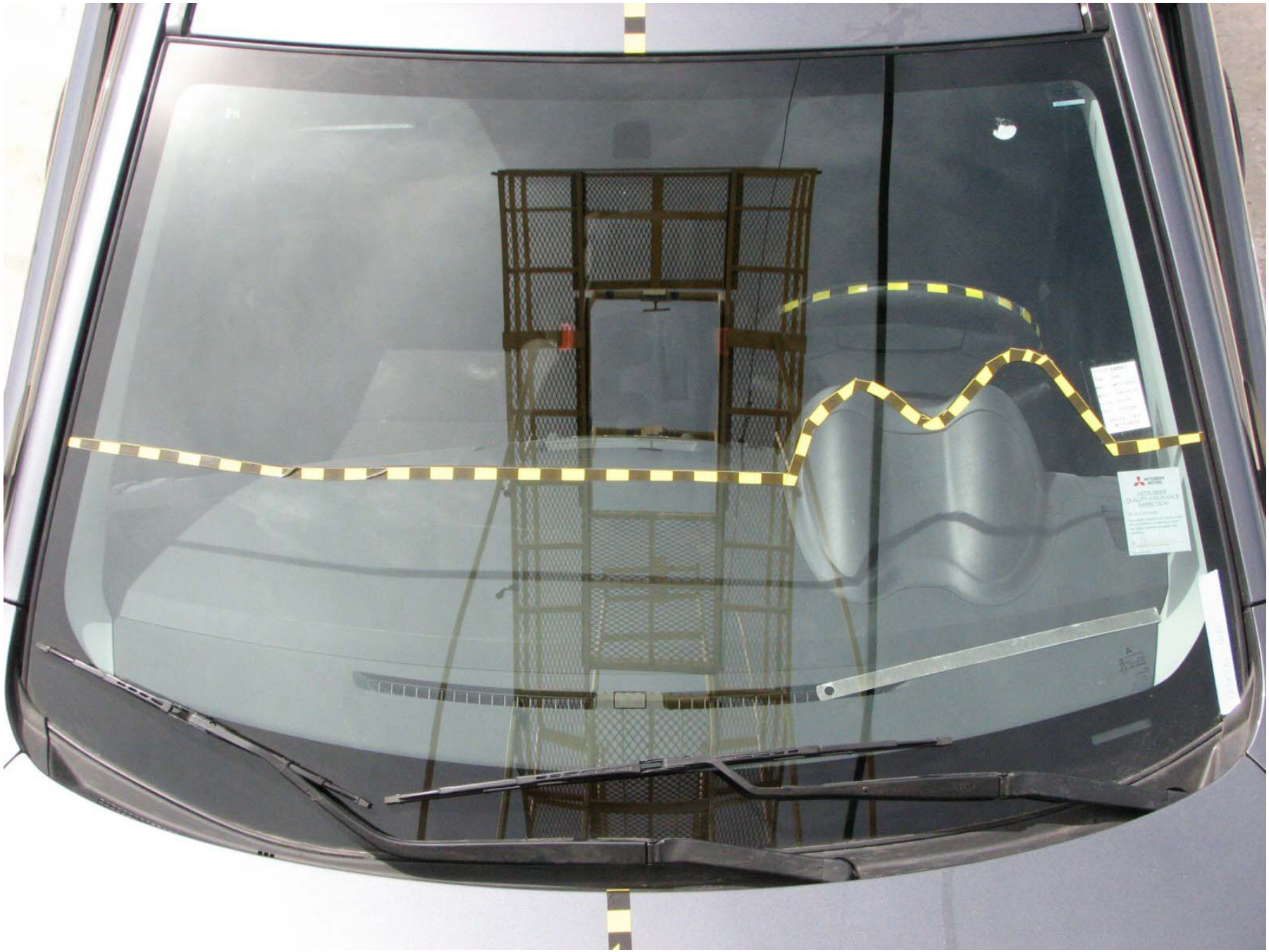

Figure A-18: Pre-Test Windshield

Figure A-19: Post-Test Windshield

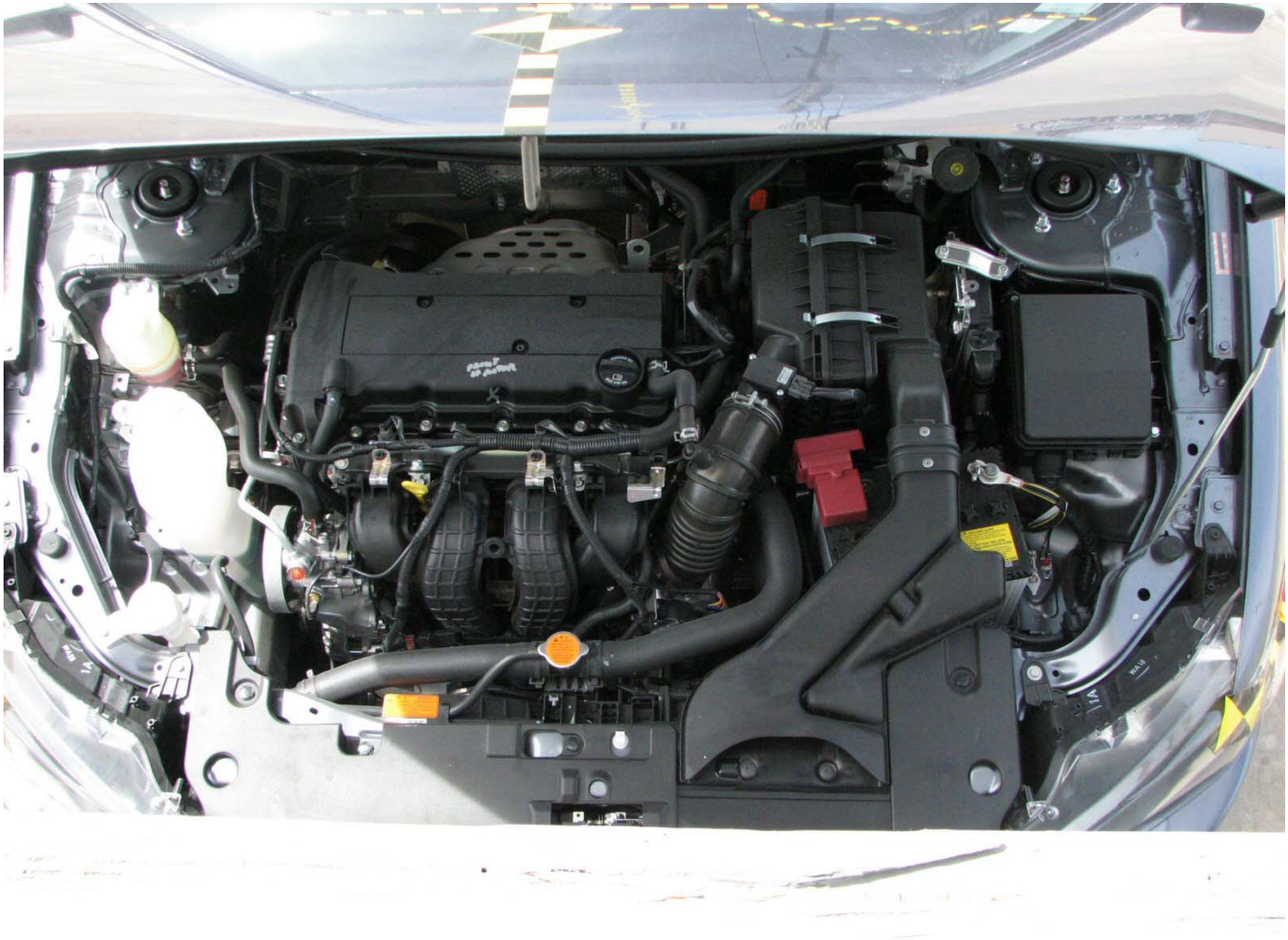

Figure A-20: Pre-Test Engine Compartment

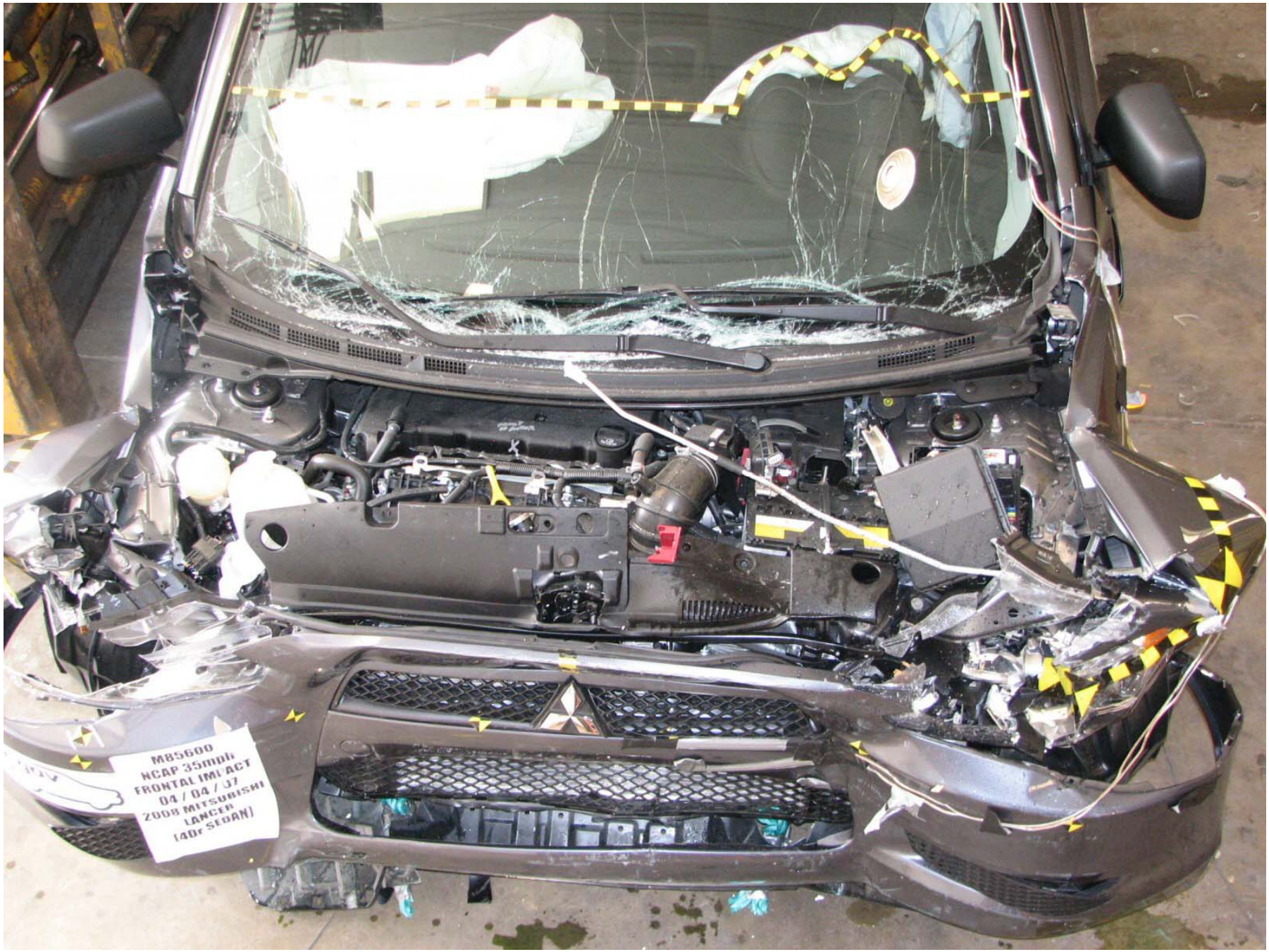

Figure A-21: Post-Test Engine Compartment (Vehicle Moved)

Figure A-22: Pre-Test Fuel Cap

Figure A-23: Post-Test Fuel Cap

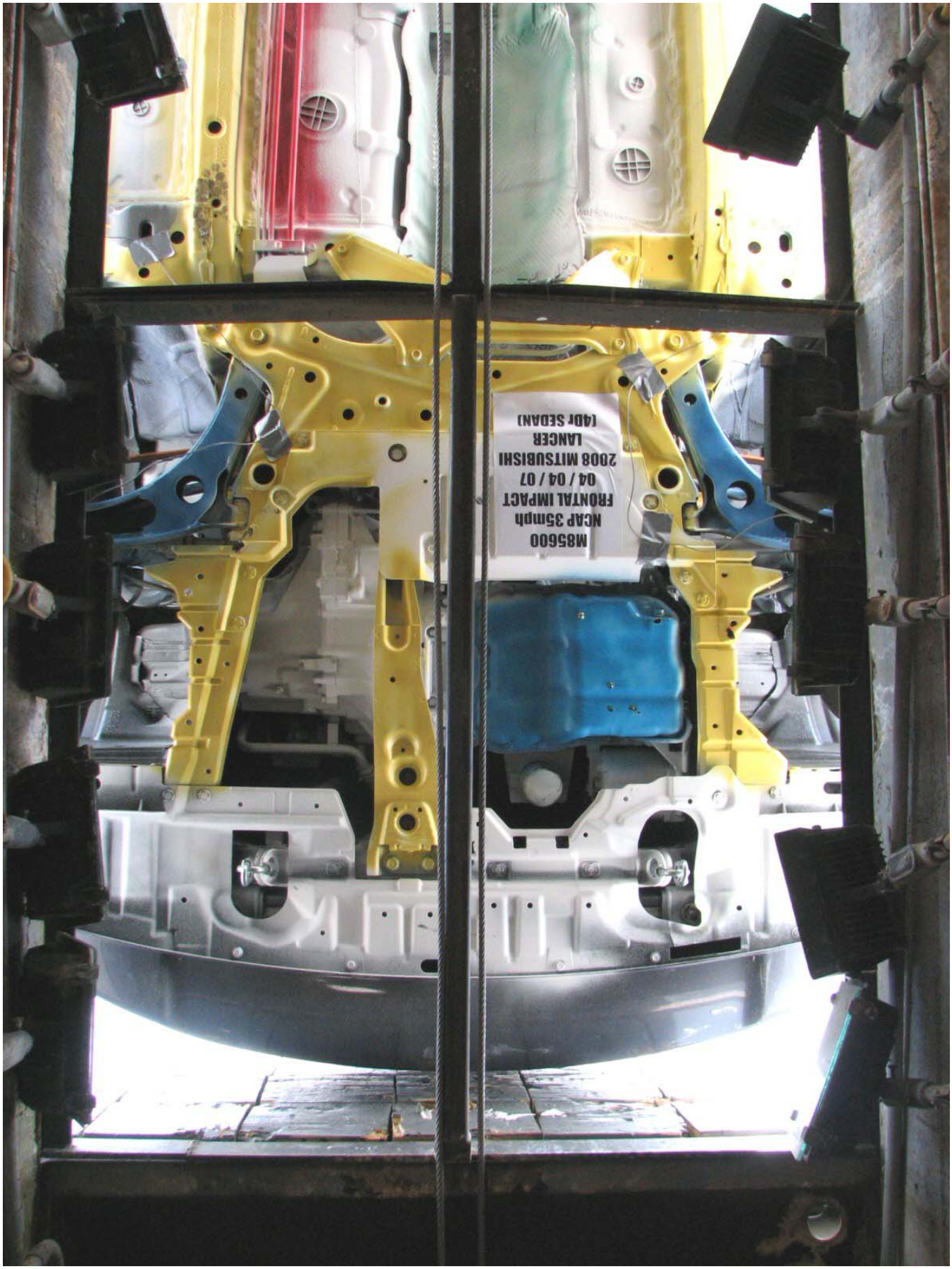

Figure A-24: Pre-Test Front Underbody

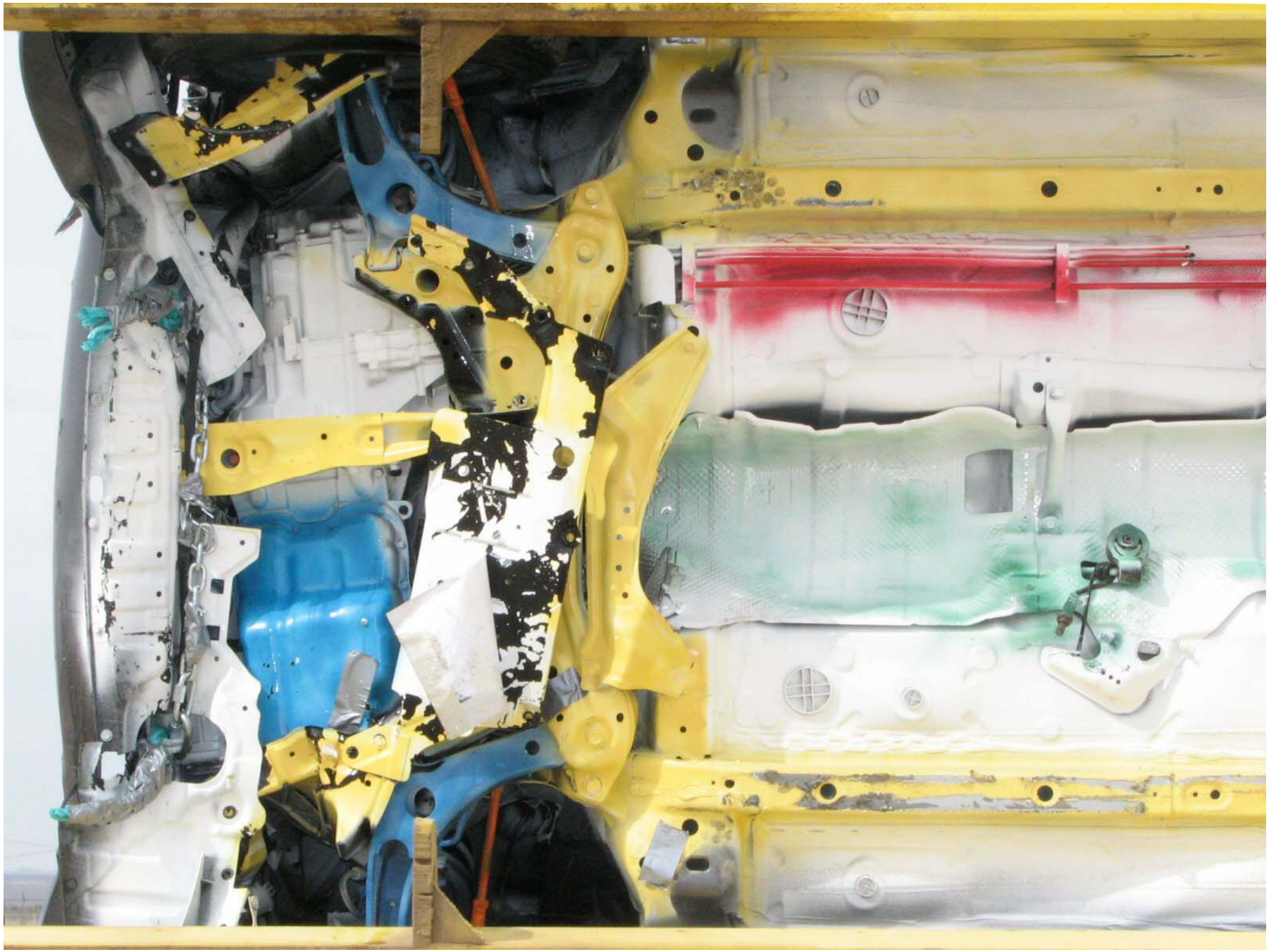

Figure A-25: Post-Test Front Underbody

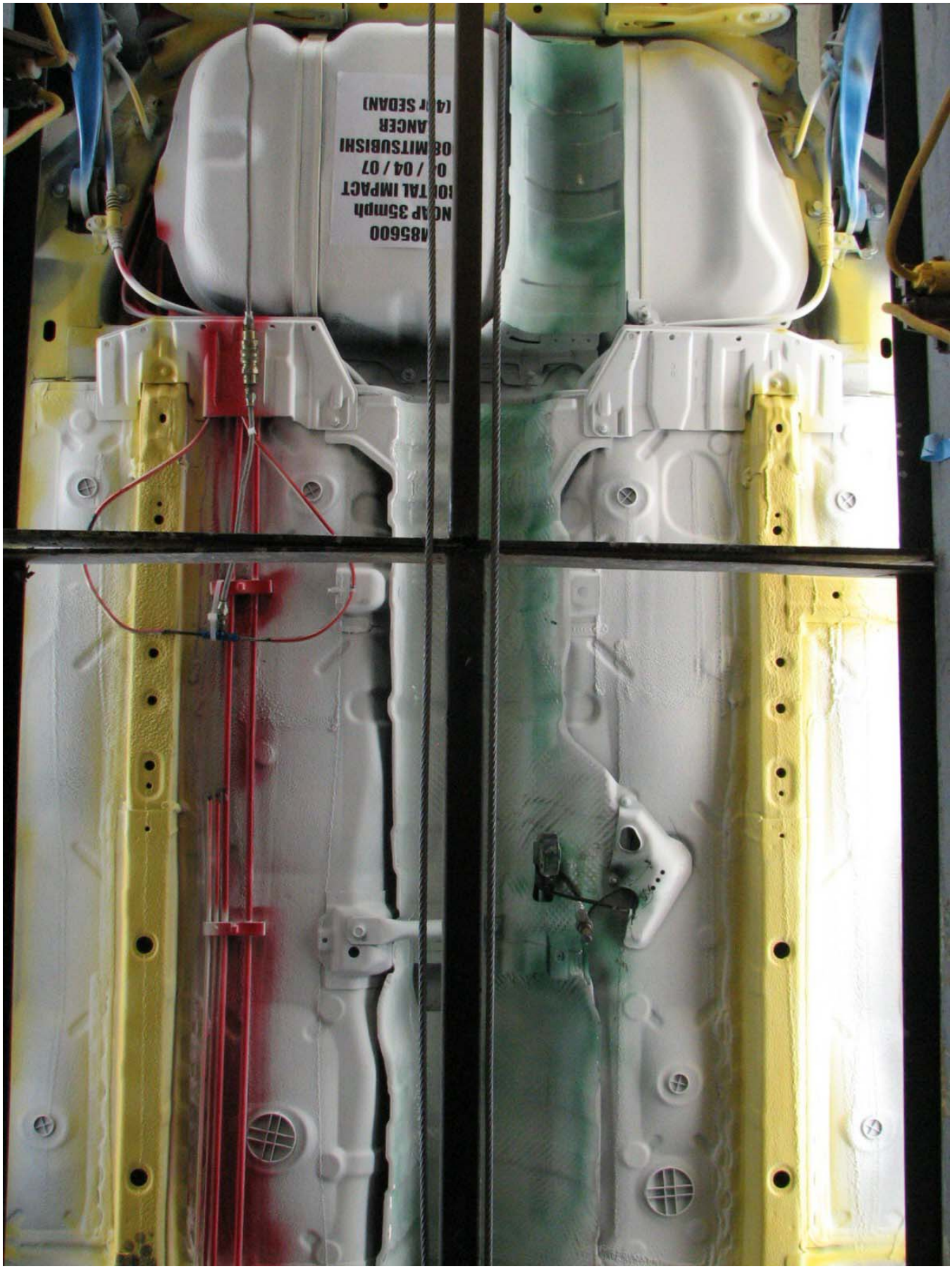

Figure A-26: Pre-Test Mid Underbody

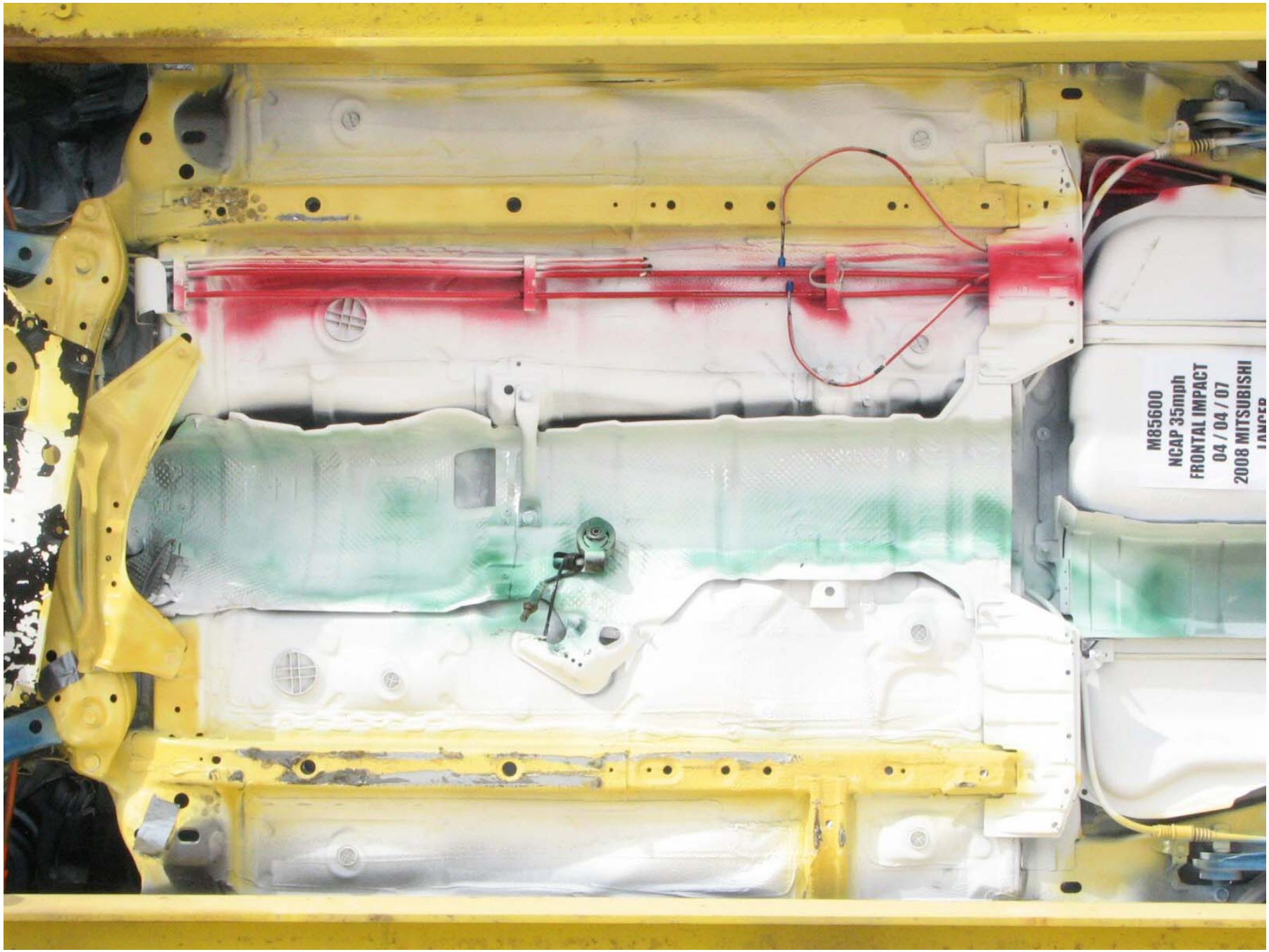

Figure A-27: Post-Test Mid Underbody

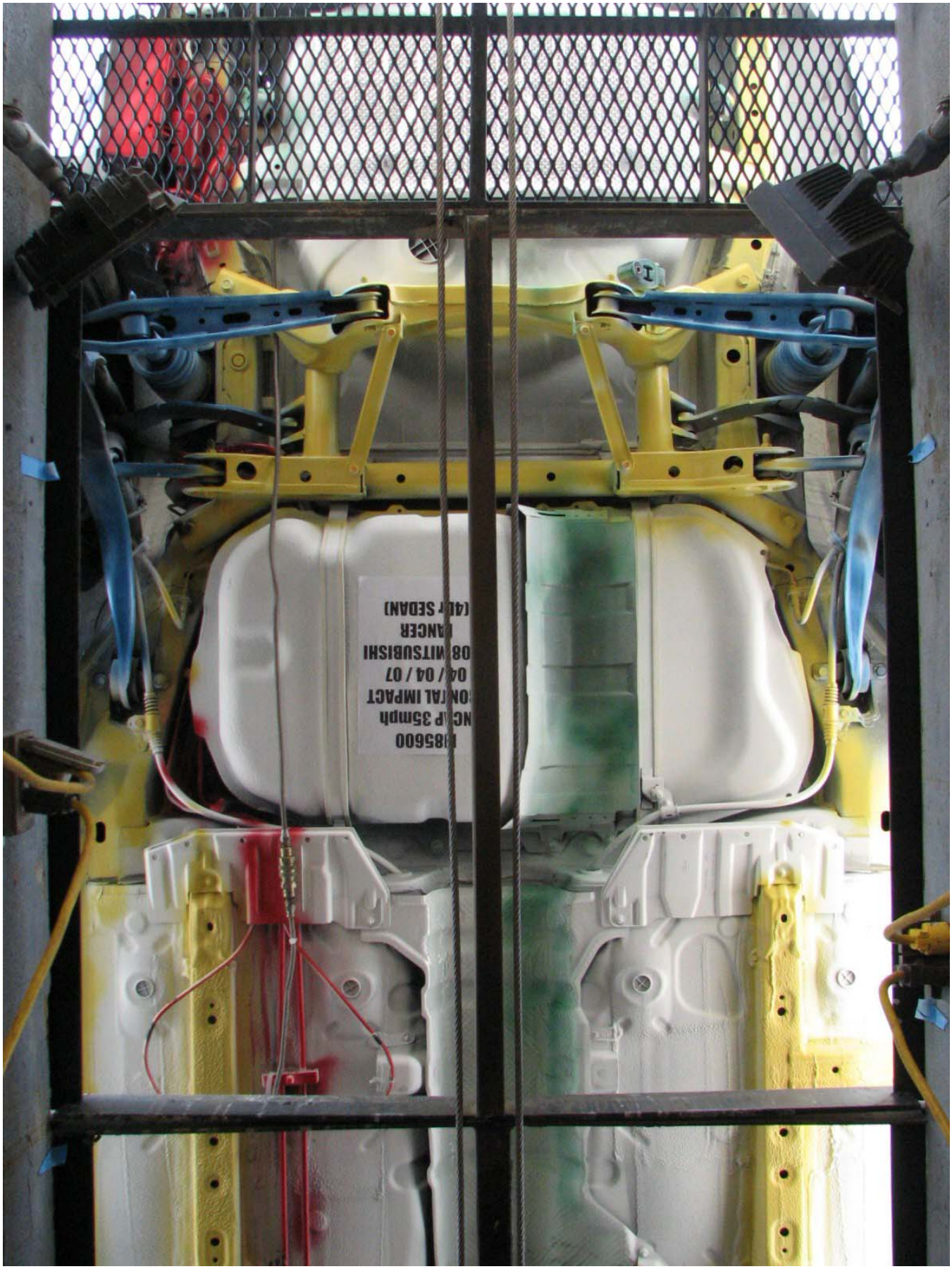

Figure A-28: Pre-Test Rear Underbody

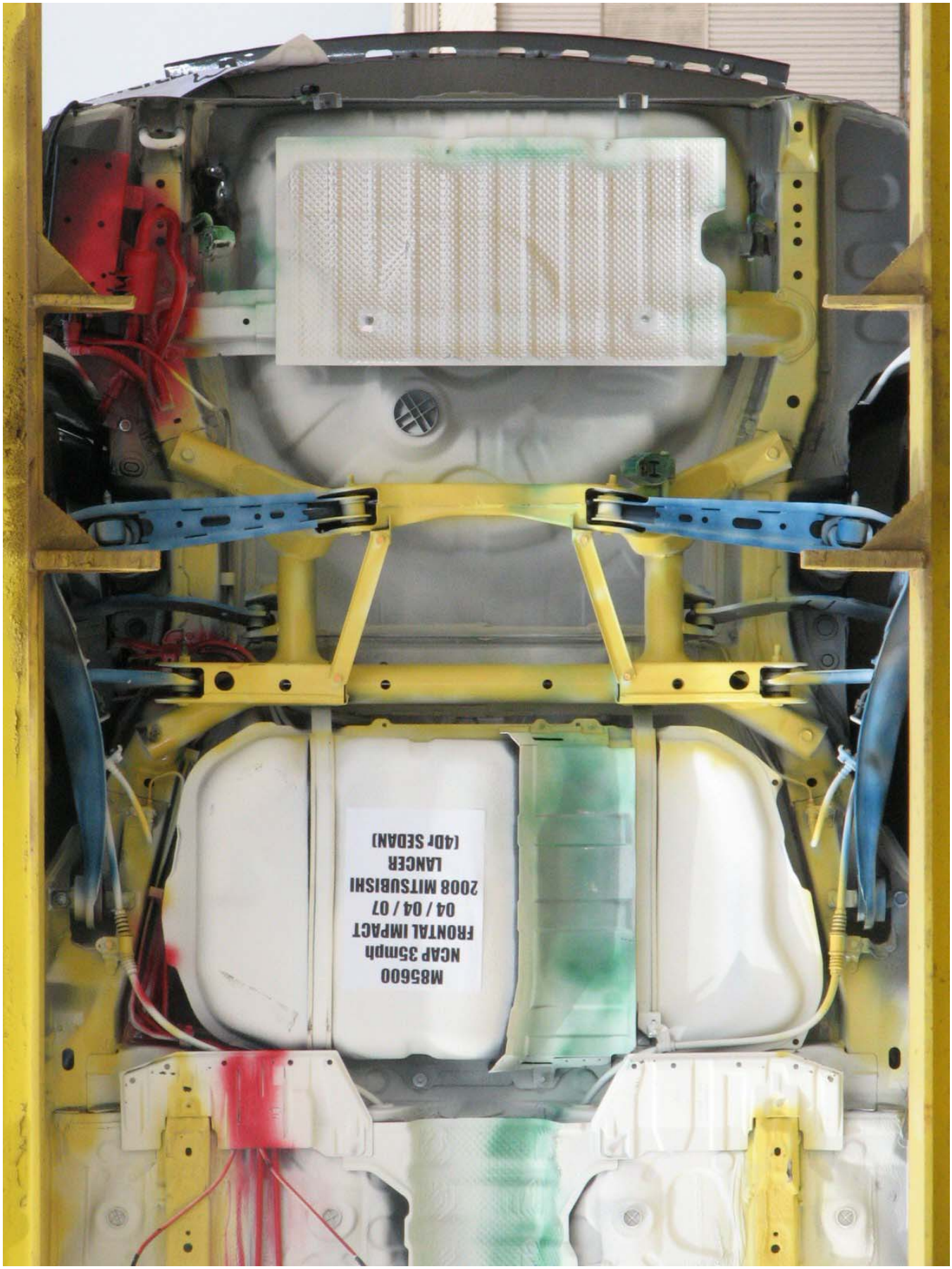

Figure A-29: Post-Test Rear Underbody

Figure A-30: Pre-Test Driver Dummy Front View (Head Position)

Figure A-31: Post-Test Driver Dummy Front View (Head Position)

Figure A-32: Pre-Test Driver Dummy (Through Window)

Figure A-33: Post-Test Driver Dummy (Through Window)

Figure A-34: Pre-Test Driver Dummy (Door Open)

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

Figure A-36: Pre-Test Driver Dummy Feet

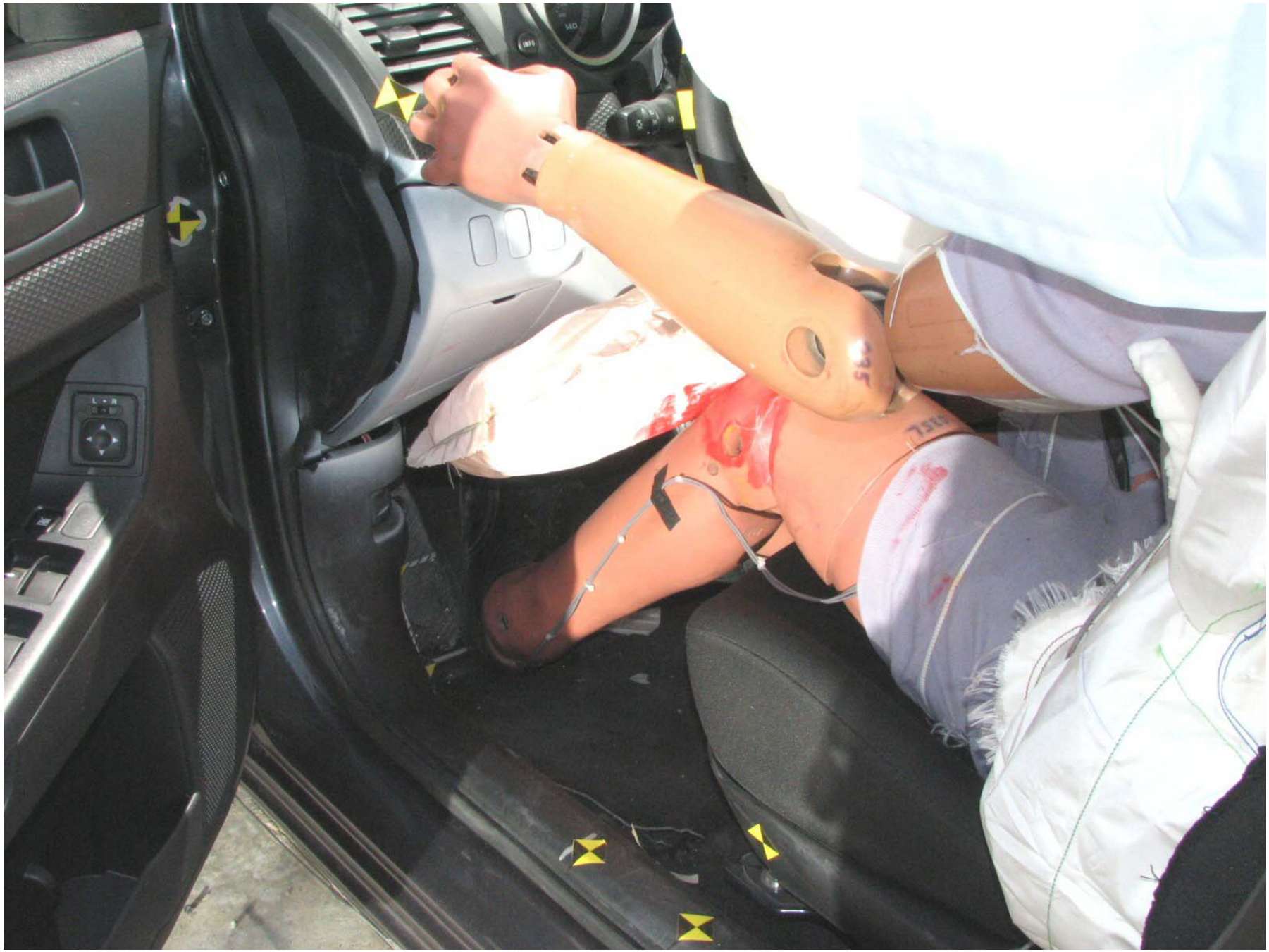

Figure A-37: Post-Test Driver Dummy Feet

Figure A-38: Pre-Test Driver Side Knee Bolster

Figure A-39: Post-Test Driver Side Knee Bolster

Figure A-40: Pre-Test Driver Side Floor Pan

Figure A-41: Post-Test Driver Side Floor Pan

Figure A-42: Post-Test Driver Dummy Head

Figure A-43: Post-Test Driver Dummy Airbag Contact

Figure A-44: Pre-Test Passenger Dummy Front View (Head Position)

Figure A-45: Post-Test Passenger Dummy Front View (Head Position)

Figure A-46: Pre-Test Passenger Dummy (Through Window)

Figure A-47: Post-Test Passenger Dummy (Through Window)

Figure A-48: Pre-Test Passenger Dummy (Door Open)

Figure A-49: Post-Test Passenger Dummy (Door Open)

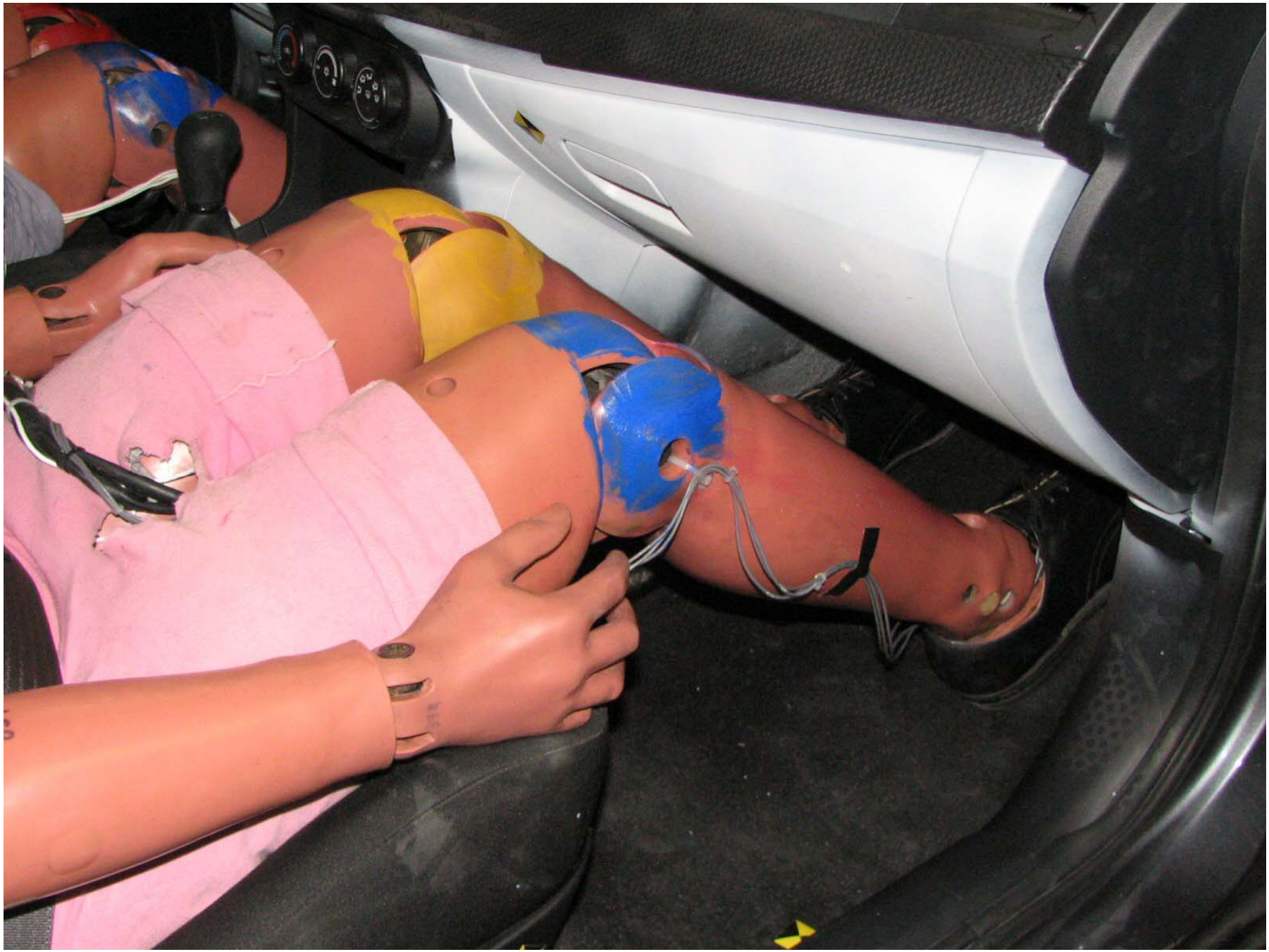

Figure A-50: Pre-Test Passenger Dummy Feet

Figure A-51: Post-Test Passenger Dummy Feet

Figure A-52: Pre-Test Passenger Side Glove Box

Figure A-53: Post-Test Passenger Side Glove Box

Figure A-54: Pre-Test Passenger Side Floor Pan

Figure A-55: Post-Test Passenger Side Floor Pan

Figure A-56: Post-Test Passenger Dummy Head

Figure A-57: Post-Test Passenger Dummy Airbag Contact

Figure A-58: Vehicle on Rollover Device (0°)

Figure A-59: Vehicle on Rollover Device (90°)

Figure A-60: Vehicle on Rollover Device (180°)

Figure A-61: Vehicle on Rollover Device (270°)

Figure A-62: Vehicle Impact

APPENDIX B

DATA PLOTS

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	Driver Right Femur Force Z	B-3
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	Passenger Head Primary Y	B-4
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B-6	Passenger Left Femur Force Z	B-6
	Passenger Right Femur Force Z	B-6

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.

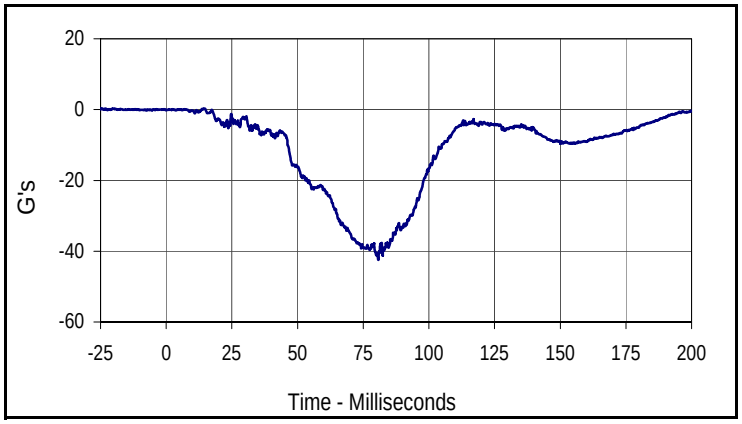
Driver Head Primary X Velocity
Driver Head Primary X Displacement
Driver Head Redundant X
Driver Head Redundant Y
Driver Head Redundant Z
Driver Head Resultant Redundant
Driver Head Redundant X Velocity
Driver Head Redundant X Displacement
Driver Upper Neck Force X
Driver Upper Neck Force Y
Driver Upper 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 Chest Primary X Velocity
Driver Chest Primary X Displacement
Driver Chest Redundant X
Driver Chest Redundant Y
Driver Chest Redundant Z
Driver Chest Resultant Redundant
Driver Chest Redundant X Velocity
Driver Chest Redundant X Displacement
Driver Chest Displacement
Driver Pelvis X
Driver Pelvis Y
Driver Pelvis Z
Driver Pelvis Resultant
Driver Pelvis X Velocity
Driver Pelvis X Displacement
Driver Left Upper Tibia Moment X
Driver Left Upper Tibia Moment Y
Driver Right Upper Tibia Moment X

Driver Right Upper Tibia Moment Y
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Left Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver Right Foot Fore Z
Driver Lap Belt Force
Driver Shoulder Belt Force
Driver Shoulder Belt Pullout
Driver Shoulder Belt Elongation
Passenger Head Primary X Velocity
Passenger Head Primary X Displacement
Passenger Head Redundant X
Passenger Head Redundant Y
Passenger Head Redundant Z
Passenger Head Resultant Redundant
Passenger Head Redundant X Velocity
Passenger Head Redundant X Displacement
Passenger Upper Neck Force X
Passenger Upper Neck Force Y
Passenger Upper Neck Force Z
Passenger Upper Neck Force Resultant
Passenger Upper Neck Moment X
Passenger Upper Neck Moment Y
Passenger Upper Neck Moment Z
Passenger Upper Neck Moment Resultant
Passenger Chest Primary X Velocity
Passenger Chest Primary X Displacement
Passenger Chest Redundant X

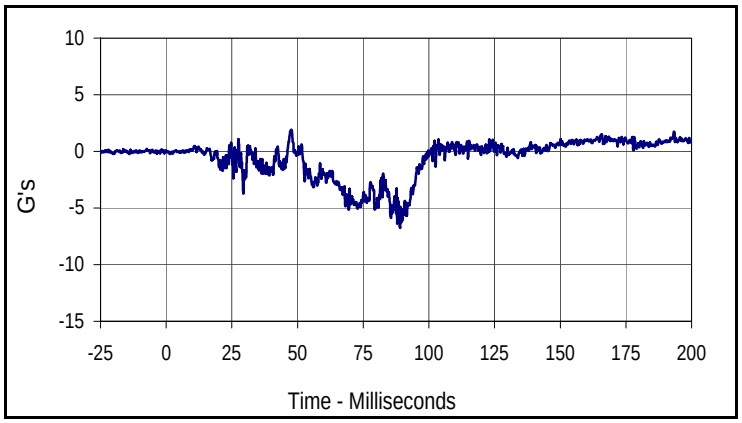
Passenger Chest Redundant Y
Passenger Chest Redundant Z
Passenger Chest Resultant Redundant
Passenger Chest Redundant X Velocity
Passenger Chest Redundant X Displacement
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Pelvis Resultant
Passenger Pelvis X Velocity
Passenger Pelvis X Displacement
Passenger Left Femur Force
Passenger Right Femur Force
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Left Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Right Foot Fore Z
Passenger Lap Belt Force
Passenger Shoulder Belt Force
Passenger Shoulder Belt Pullout
Passenger Shoulder Belt Elongation
Vehicle Left Rear X
Vehicle Left Rear X Velocity

Vehicle Left Rear X Displacement
Vehicle Right Rear X
Vehicle Right Rear X Velocity
Vehicle Right Rear X Displacement
Vehicle Engine Top
Vehicle Engine Top Velocity
Vehicle Engine Top Displacement
Vehicle Engine Bottom
Vehicle Engine Bottom Velocity
Vehicle Engine Bottom Displacement
Vehicle Left Brake Caliper
Vehicle Left Brake Caliper Velocity
Vehicle Left Brake Caliper Displacement
Vehicle Right Brake Caliper
Vehicle Right Brake Caliper Velocity
Vehicle Right Brake Caliper Displacement
Vehicle Instrument Panel
Vehicle Instrument Panel Velocity
Vehicle Instrument Panel Displacement
Vehicle Left Rear Z
Vehicle Left Rear Z Velocity
Vehicle Left Rear Z Displacement
Vehicle Right Rear Z
Vehicle Right Rear Z Velocity
Vehicle Right Rear Z Displacement

Test Vehicle:	2008 Mitsubishi Lancer 4-Door Sedan	Test Date:	4/4/07
Test Program:	2007 NHTSA 35mph NCAP	NHTSA No.:	M85600

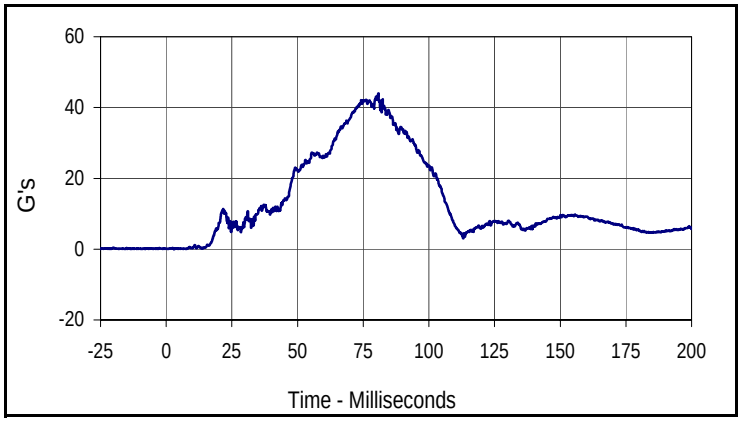


Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
0.3	14.6	-42.4	80.7

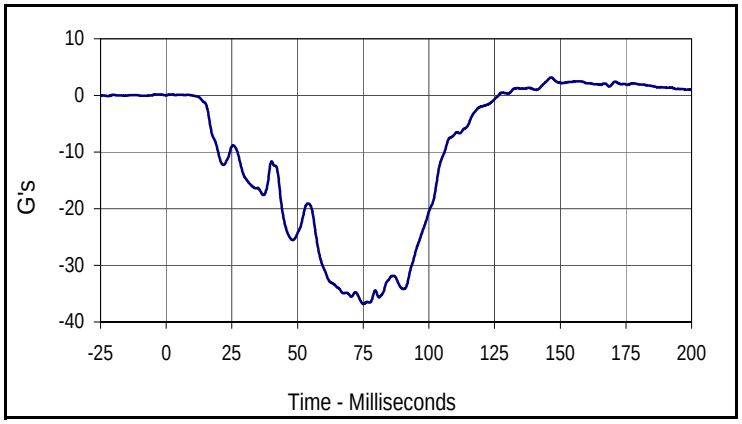


Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.9	47.6	-6.7	89.0

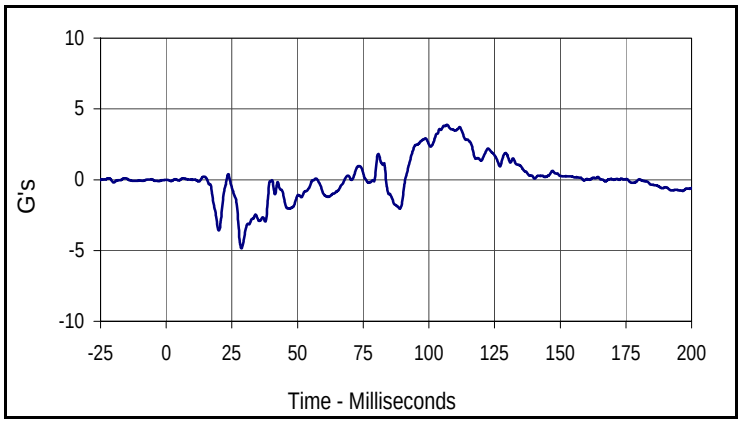
Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
16.5	49.1	-17.0	101.1



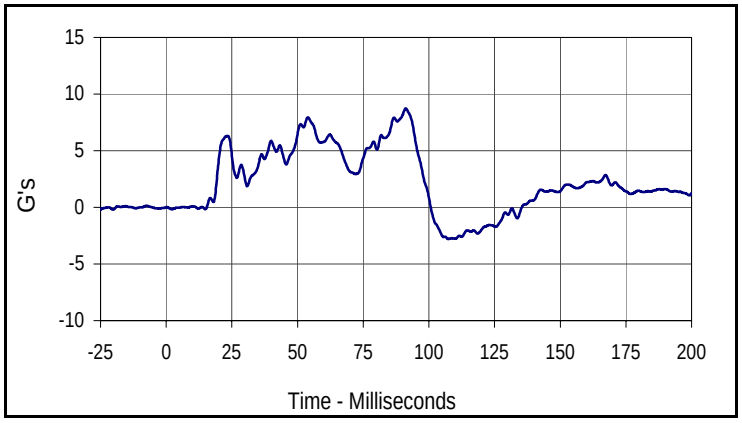
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
44.0	80.7	0.0	3.0



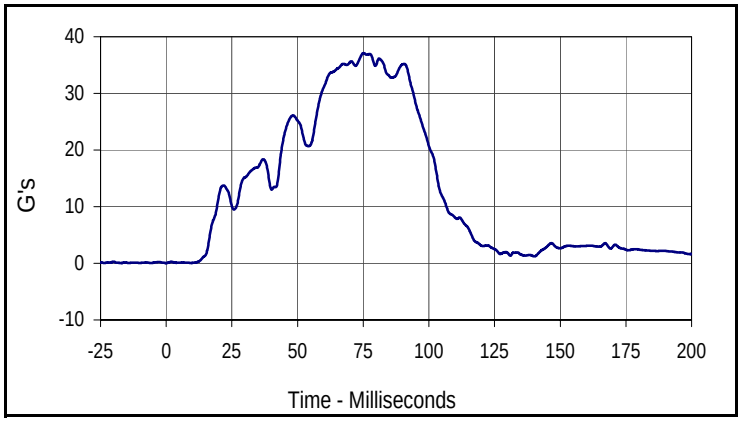
Curve Description			
Driver Chest Primary X			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
3.2	146.6	-36.8	75.1



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
3.9	106.9	-4.8	28.6

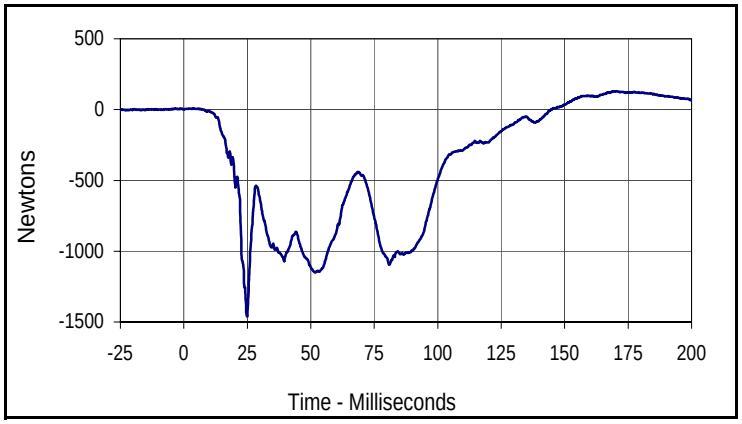


Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
8.7	91.2	-2.8	107.4

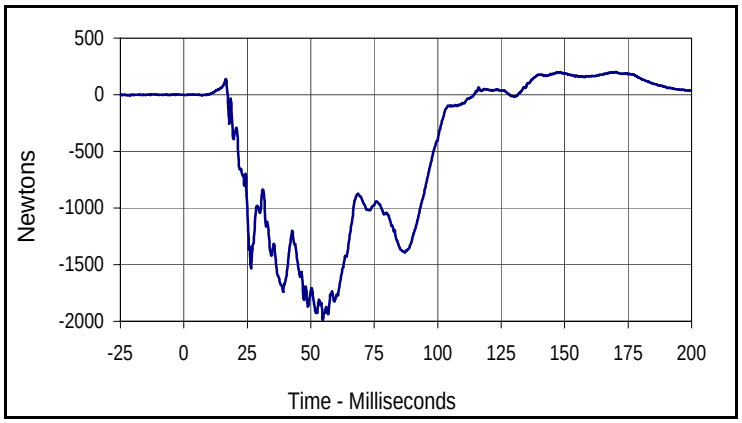


Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
37.1	75.1	0.0	0.0

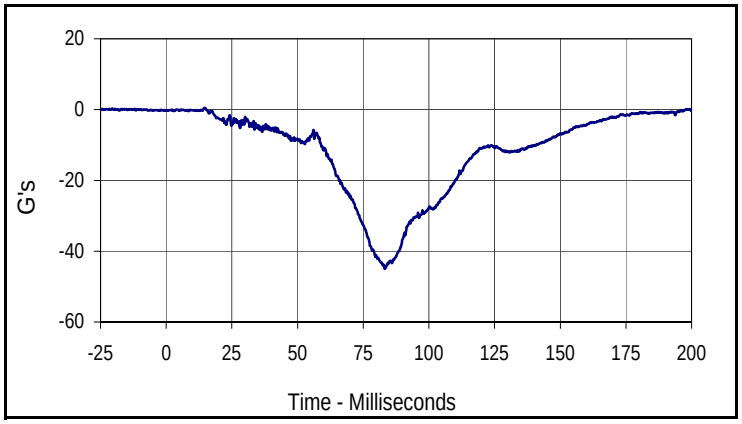
Test Vehicle:	2008 Mitsubishi Lancer 4-Door Sedan	Test Date:	4/4/07
Test Program:	2007 NHTSA 35mph NCAP	NHTSA No.:	M85600



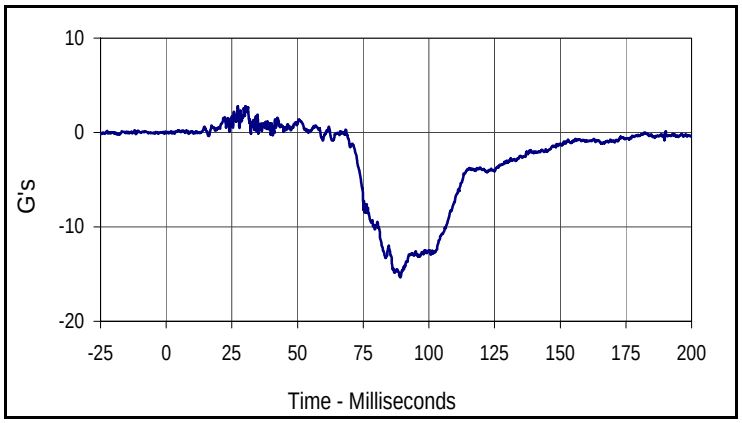
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
007	FIL	600	Newtons
Max	Time	Min	Time
130.0	170.3	-1462.6	24.9



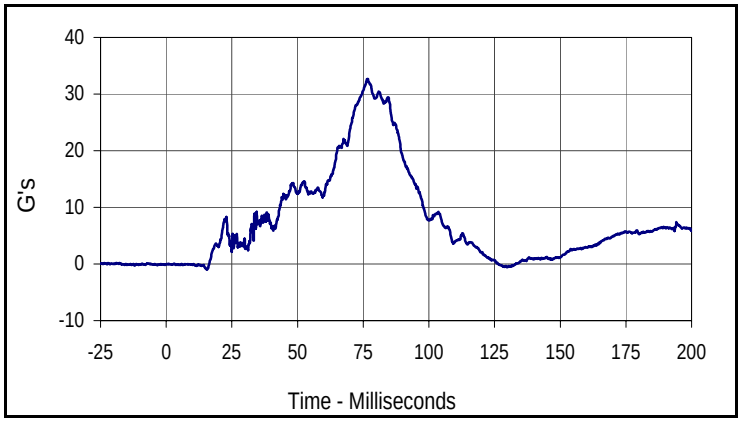
Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
201.6	170.1	-1985.4	54.8



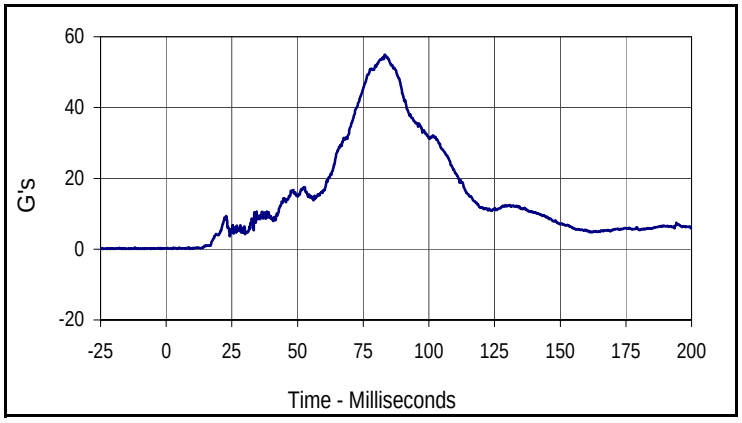
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
009	FIL	1000	G's
Max	Time	Min	Time
0.4	14.6	-45.0	83.3



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
2.8	27.2	-15.4	89.1

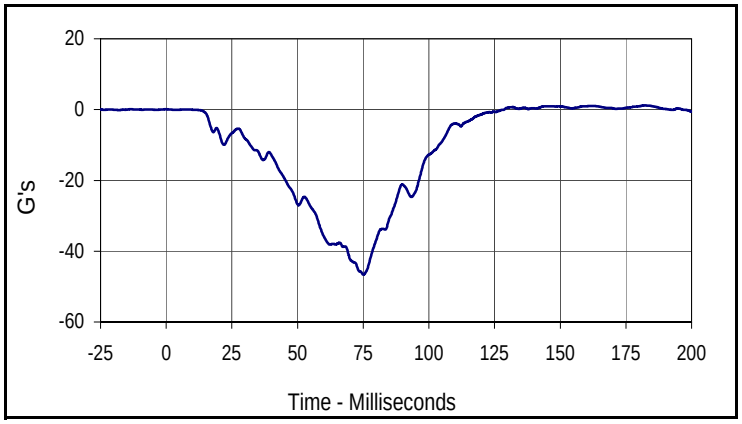


Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
011	FIL	1000	G's
Max	Time	Min	Time
32.6	76.7	-1.0	15.5

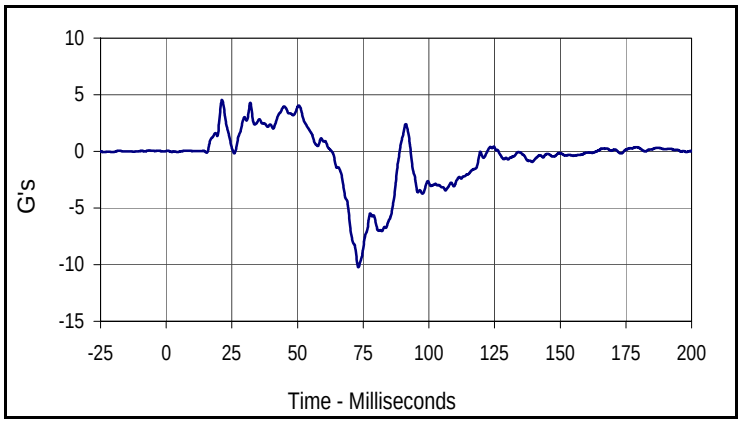


Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
54.9	83.3	0.1	4.1

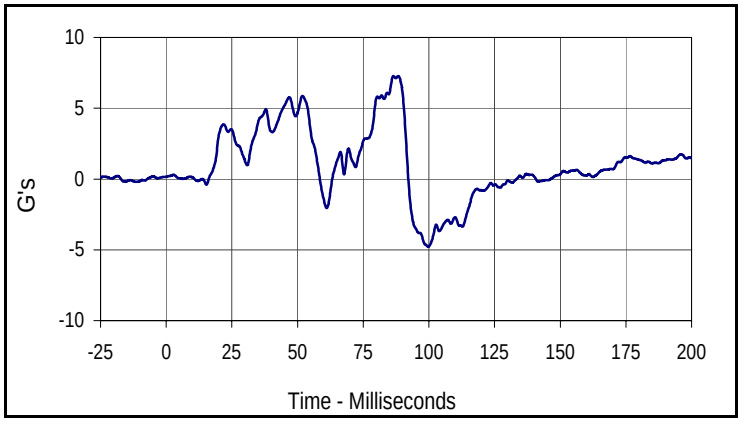
Test Vehicle:	2008 Mitsubishi Lancer 4-Door Sedan	Test Date:	4/4/07
Test Program:	2007 NHTSA 35mph NCAP	NHTSA No.:	M85600



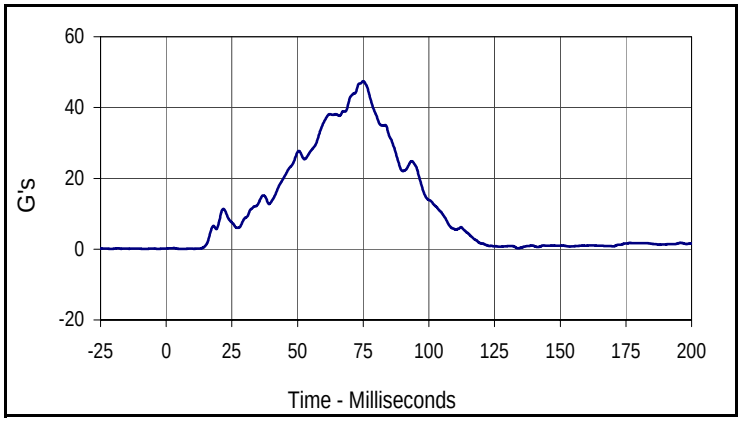
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
1.2	182.2	-46.6	75.1



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
4.5	21.2	-10.2	73.1

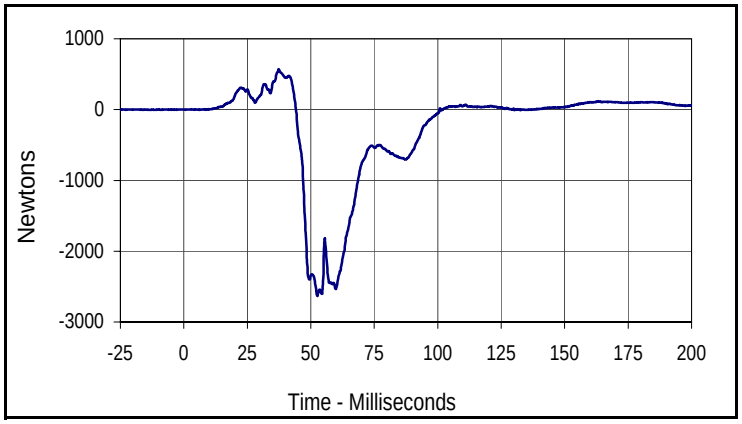


Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
7.3	86.4	-4.8	99.7

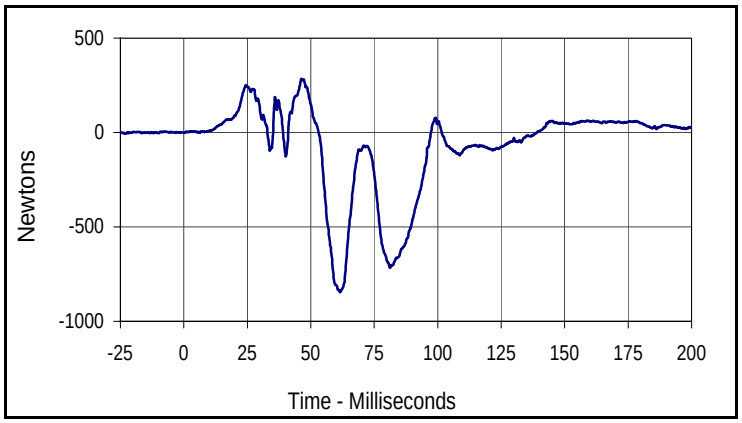


Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
47.5	75.0	0.0	5.9

Test Vehicle:	2008 Mitsubishi Lancer 4-Door Sedan	Test Date:	4/4/07
Test Program:	2007 NHTSA 35mph NCAP	NHTSA No.:	M85600



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
569.0	37.4	-2632.8	52.6

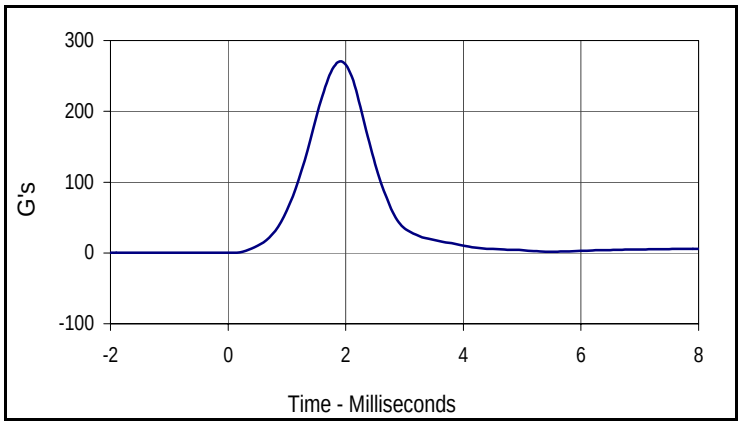


Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
285.3	46.3	-845.7	61.6

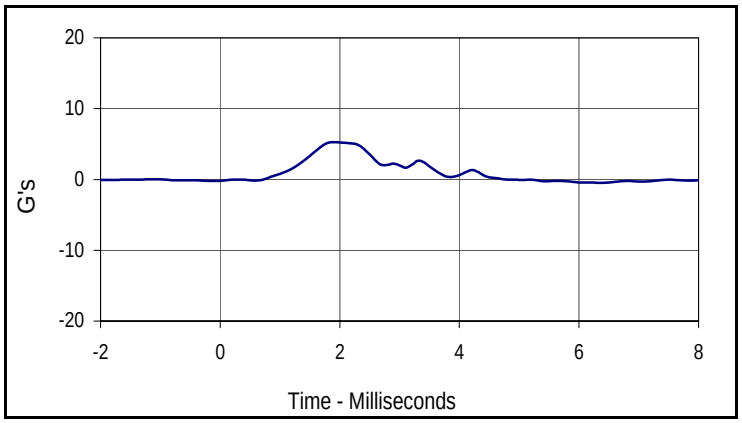
APPENDIX C
DUMMY CALIBRATION DATA

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	3/30/07
ATD Serial No.:	035	Test I.D.:	HD03D

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	225.0 to 275.0	270.5	Pass
Peak Lateral Acceleration	G's	≤15.0	5.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



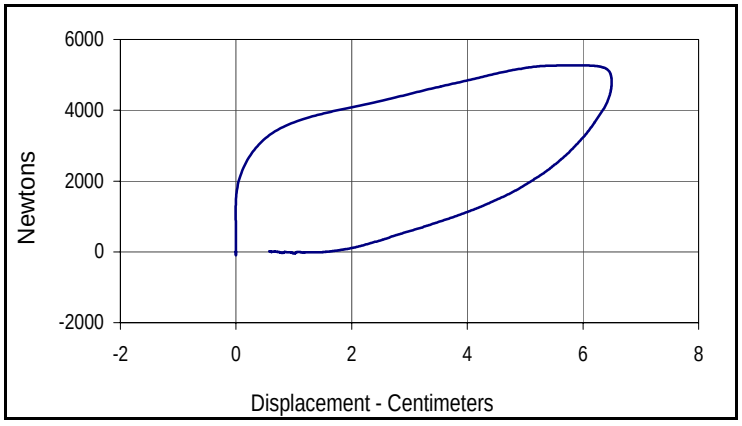
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
270.5	1.9	0.1	-1.4



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.3	1.9	-0.4	6.0

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	4/2/07
ATD Serial No.:	035	Test I.D.:	CH04B

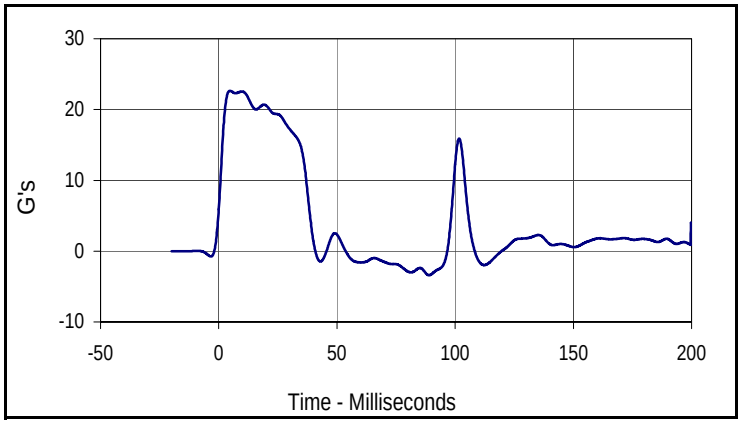
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.71	Pass
Peak Probe Force	Newtons	5159 to 5893	5266	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.50	Pass
Internal Hysterysis	%	69 to 85	75.4	Pass
		Overall Test Results		Pass



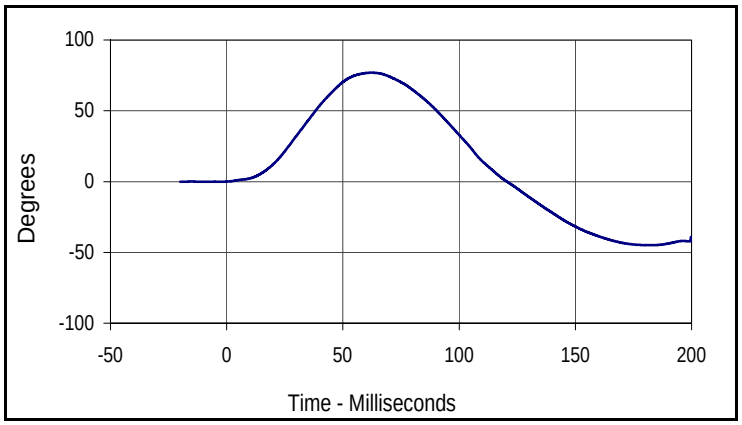
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	180	75.4
Peak Probe Force		Peak Chest Deflection	
5266		6.50	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	3/29/07
ATD Serial No.:	035	Test I.D.:	NF03D

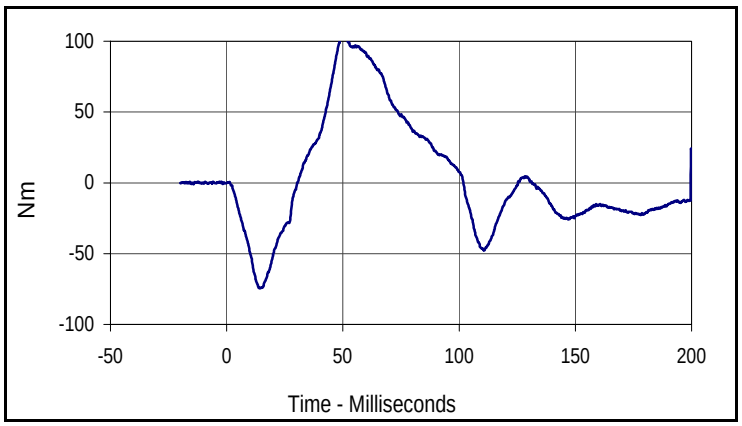
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.5	Pass
	20 Msec.	G's	17.6 to 22.6	20.6	Pass
	30 Msec.	G's	12.5 to 18.5	17.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	38.6	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	76.9	Pass
	Time	Msec.	57.0 to 64.0	62.3	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	120.6	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	105.6	Pass
	Time	Msec.	47.0 to 58.0	49.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	101.9	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
22.6	4.7	-3.4	88.9



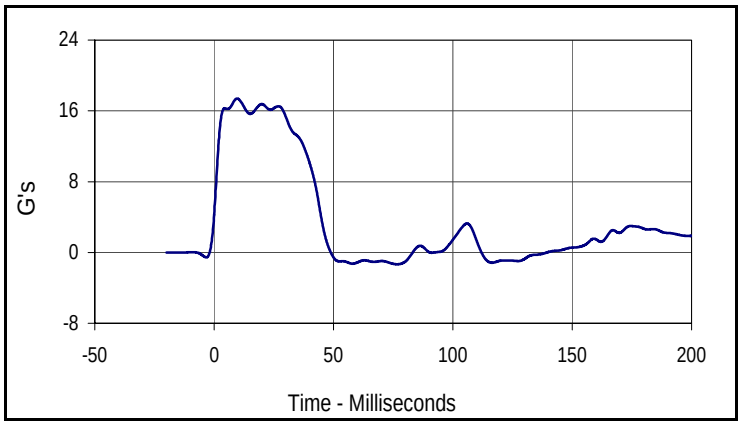
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.9	62.3	-44.9	182.3



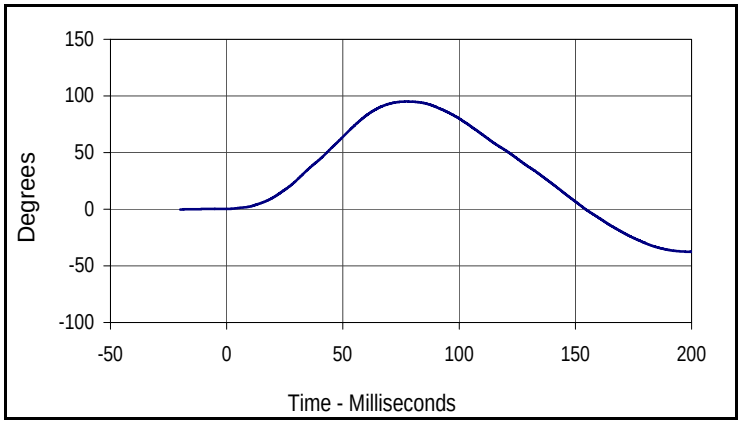
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
105.6	49.9	-74.6	14.5

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	3/30/07
ATD Serial No.:	035	Test I.D.:	NE03E

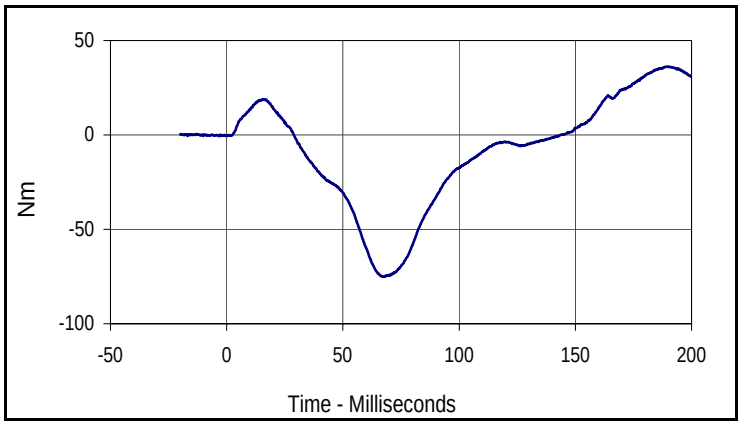
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.05	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.4	Pass
	20 Msec.	G's	14.0 to 19.0	16.8	Pass
	30 Msec.	G's	11.0 to 16.0	15.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	44.2	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	95.1	Pass
	Time	Msec.	72.0 to 82.0	77.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	154.4	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-75.1	Pass
	Time	Msec.	65.0 to 79.0	67.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	143.7	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.4	9.6	-1.3	76.6



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
95.1	77.4	-37.6	200.0



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
36.2	189.5	-75.1	67.9

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	4/2/07
ATD Serial No.:	035	Test I.D.:	LK04C , RK04D

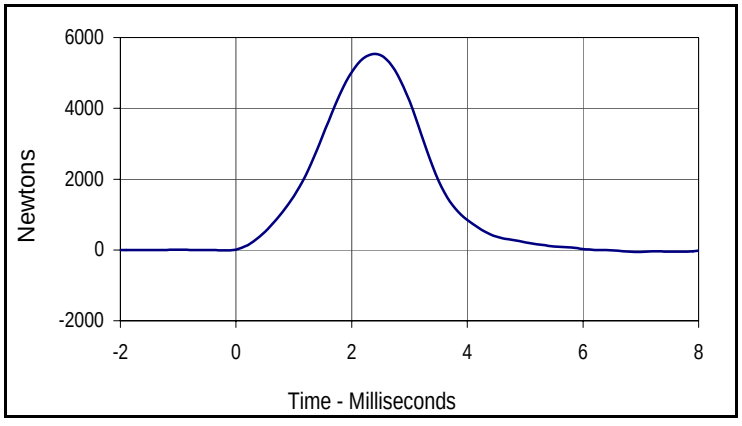
Left Knee

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
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5425	Pass
		Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	5538	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5425.0	2.5	-29.6	8.6



Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5538.5	2.4	-58.0	6.9

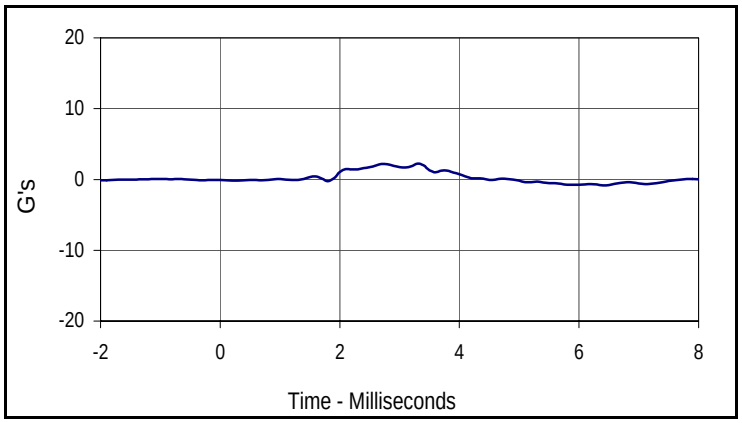
Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	3/29/07
ATD Serial No.:	035	Test I.D.:	N/A

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	879 to 889	886	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	140	Pass
E - Shoulder pivot from back	mm	84 to 94	85	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	206	Pass
K - Buttock to knee length	mm	579 to 604	580	Pass
L - Poplipteal length	mm	429 to 455	449	Pass
M - Knee pivot height	mm	485 to 500	489	Pass
N - Buttock poplipteal length	mm	452 to 477	474	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	253	Pass
V - Shoulder breadth	mm	422 to 437	435	Pass
W - Foot breadth	mm	91 to 107	102	Pass
Y - Chest circumference	mm	970 to 1001	985	Pass
Z - Waist circumference	mm	836 to 866	850	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
		Overall Test Results		Pass

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	3/30/07
ATD Serial No.:	034	Test I.D.:	HD03C

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	225.0 to 275.0	257.7	Pass
Peak Lateral Acceleration	G's	≤15.0	2.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

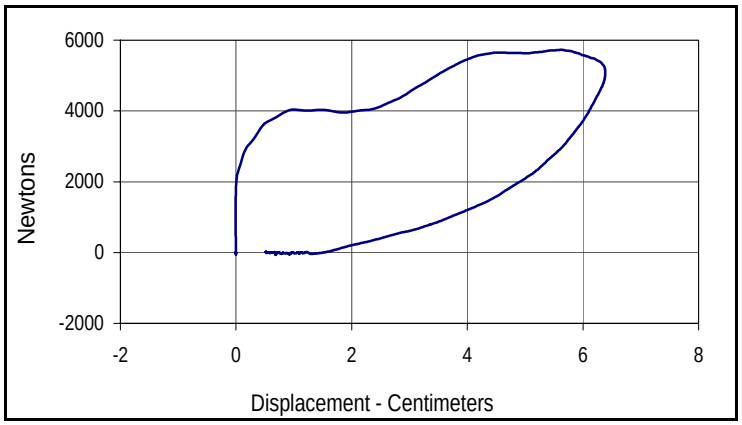
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
257.7	2.4	0.1	-1.1



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.3	3.3	-0.7	5.9

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	4/2/07
ATD Serial No.:	034	Test I.D.:	CH04A

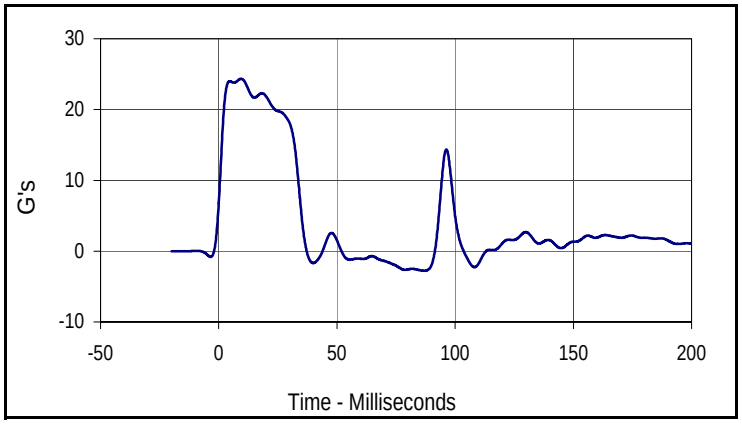
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.79	Pass
Peak Probe Force	Newtons	5159 to 5893	5725	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.39	Pass
Internal Hysterysis	%	69 to 85	75.4	Pass
		Overall Test Results		Pass



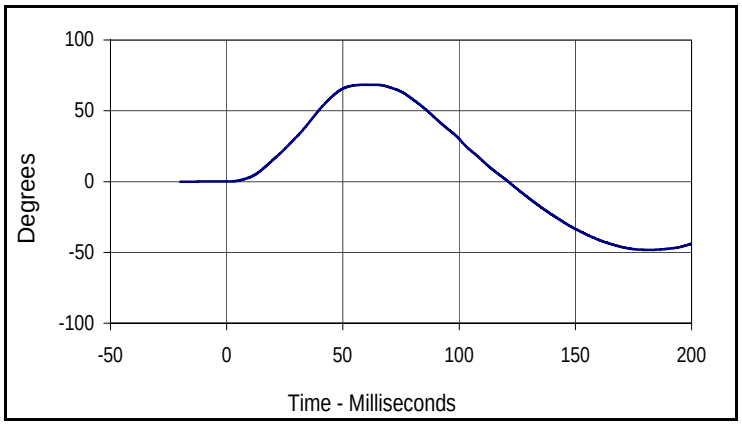
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	180	75.4
Peak Probe Force		Peak Chest Deflection	
5725		6.39	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	3/29/07
ATD Serial No.:	034	Test I.D.:	NF03G

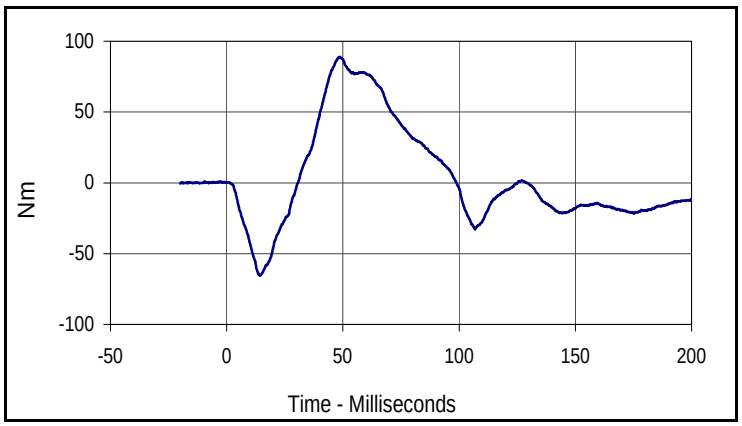
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.08	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.3	Pass
	20 Msec.	G's	17.6 to 22.6	21.9	Pass
	30 Msec.	G's	12.5 to 18.5	18.1	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.1	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.1	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	68.4	Pass
	Time	Msec.	57.0 to 64.0	62.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	121.1	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	88.9	Pass
	Time	Msec.	47.0 to 58.0	48.6	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	99.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.3	9.5	-2.8	87.1



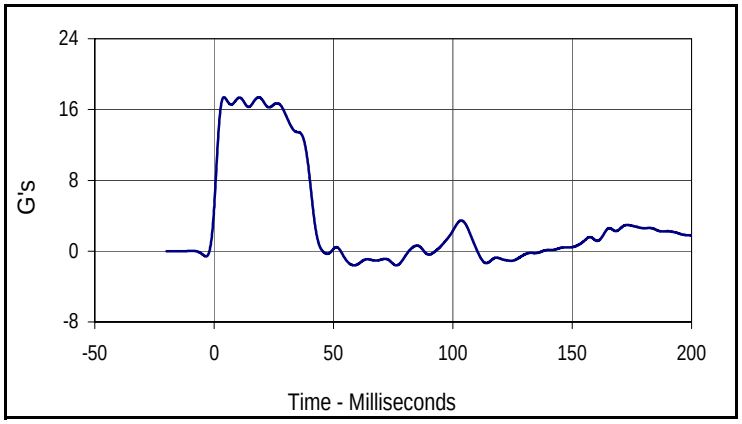
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
68.4	62.4	-48.2	181.9



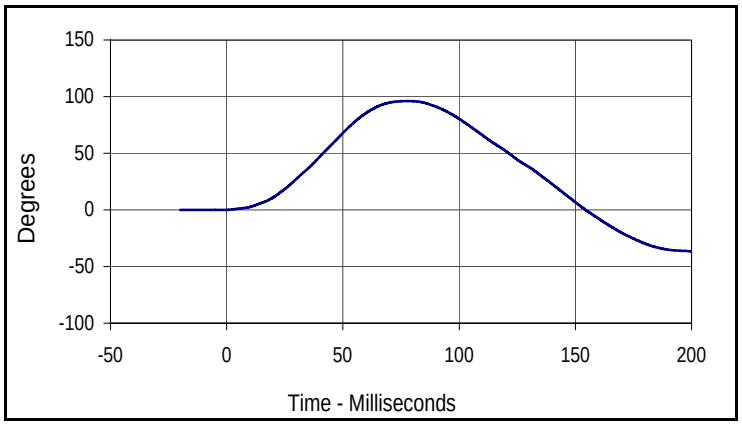
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
88.9	48.6	-65.5	14.5

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	3/29/07
ATD Serial No.:	034	Test I.D.:	NE03H

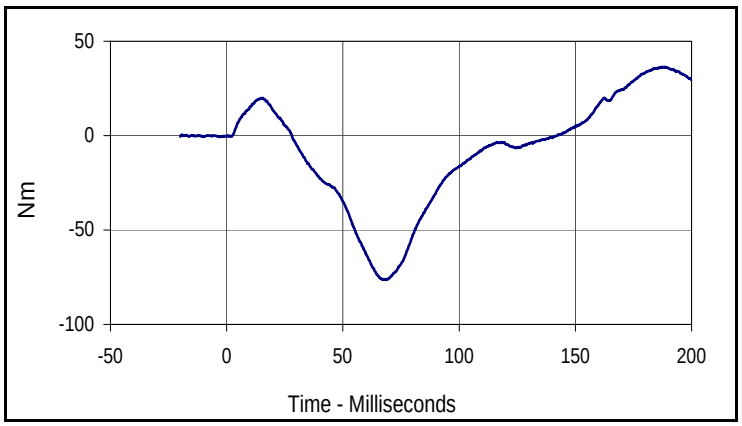
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.14	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.3	Pass
	20 Msec.	G's	14.0 to 19.0	17.2	Pass
	30 Msec.	G's	11.0 to 16.0	15.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	41.4	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	96.0	Pass
	Time	Msec.	72.0 to 82.0	77.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	154.4	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-76.4	Pass
	Time	Msec.	65.0 to 79.0	68.3	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	142.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.4	4.1	-1.6	58.6



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
96.0	77.6	-36.4	200.0



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
36.4	187.5	-76.4	68.3

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	4/2/07
ATD Serial No.:	034	Test I.D.:	LK04A , RK04B

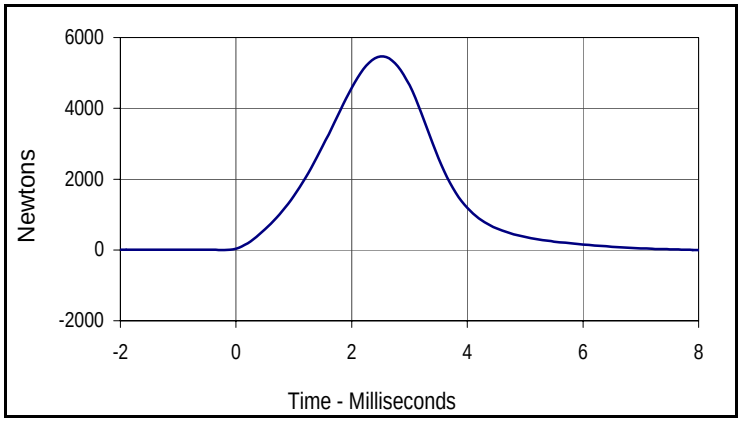
Left Knee

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
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5691	Pass
		Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5465	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5691.0	2.5	-25.0	8.8



Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5465.2	2.5	-195.5	9.7

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	3/29/07
ATD Serial No.:	034	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	879 to 889	880	Pass
B - Shoulder pivot height	mm	505 to 521	513	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	138	Pass
E - Shoulder pivot from back	mm	84 to 94	85	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	42	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	207	Pass
K - Buttock to knee length	mm	579 to 604	598	Pass
L - Poplipteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	489	Pass
N - Buttock poplipteal length	mm	452 to 477	475	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	255	Pass
V - Shoulder breadth	mm	422 to 437	434	Pass
W - Foot breadth	mm	91 to 107	102	Pass
Y - Chest circumference	mm	970 to 1001	986	Pass
Z - Waist circumference	mm	836 to 866	850	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	229	Pass
		Overall Test Results		Pass

Test Program:	Dummy Damage Checklist	Test Date:	4/2/07
ATD Serial No.:	035	Test I.D.:	N/A

GENERAL	DAMAGED	OK
Outer skin on entire dummy		X
Head ballast secure		X
Gashes, rips, general appearance, etc.		X
Neck-Broken or cracks in rubber		X
Check that upper neck bracket is firmly attached to lwr neck bracket		X
Three rubber bumpers in place		X
Spine- Broken or cracks in rubber		X
Check for looseness at the condyle joint		X
Nodding blocks- cracked or out of position		X
Ribs- Check all ribs and rib supports for damage (bent or broken)		X
Check damping material or separation or cracks		X
OTHER		
CHEST DISPLACEMENT ASSEMBLY		
Bent shaft		X
Slider arm riding correctly, in track		X
TRANSDUCER LEADS		
Torn cables		X
ACCELEROMETER MOUNTINGS		
Check for secure mounting		X
KNEES		
Check outer skin, insert and casting (without removing insert)		X
Knee sliders - Wires intact		X
Knee sliders- Rubber returned to "at rest position"		X
LIMBS		
Check for normal movement and adjustment		X
PELVIS		
Inspect for breakage, especially at iliac crest		X

Comments on repair or replacement parts:

Test Program:	Dummy Damage Checklist	Test Date:	4/2/07
ATD Serial No.:	034	Test I.D.:	N/A

GENERAL	DAMAGED	OK
Outer skin on entire dummy		X
Head ballast secure		X
Gashes, rips, general appearance, etc.		X
Neck-Broken or cracks in rubber		X
Check that upper neck bracket is firmly attached to lwr neck bracket		X
Three rubber bumpers in place		X
Spine- Broken or cracks in rubber		X
Check for looseness at the condyle joint		X
Nodding blocks- cracked or out of position		X
Ribs- Check all ribs and rib supports for damage (bent or broken)		X
Check damping material or separation or cracks		X
OTHER		
CHEST DISPLACEMENT ASSEMBLY		
Bent shaft		X
Slider arm riding correctly, in track		X
TRANSDUCER LEADS		
Torn cables		X
ACCELEROMETER MOUNTINGS		
Check for secure mounting		X
KNEES		
Check outer skin, insert and casting (without removing insert)		X
Knee sliders - Wires intact		X
Knee sliders- Rubber returned to "at rest position"		X
LIMBS		
Check for normal movement and adjustment		X
PELVIS		
Inspect for breakage, especially at iliac crest		X

Comments on repair or replacement parts:

APPENDIX D
CHILD RESTRAINT SYSTEM

REPORT NUMBER TR-P27001-08-NC

NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

MITSUBISHI MOTORS CORPORATION
2008 MITSUBISHI LANCER
4-DOOR SEDAN

NHTSA NUMBER: M85600

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

APRIL 4, 2007

FINAL REPORT

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

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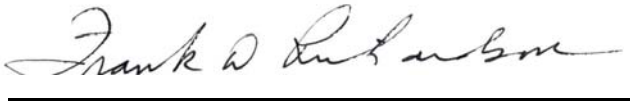
Prepared by:  Date: April 4, 2007

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

Reviewed by:  Date: April 4, 2007

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

Approved by:  Date: April 4, 2007

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

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipients Catalog No.
TR-P27001-08-NC		

4. Title and Subtitle	5. Report Date
Final Report of one (1) Graco Snugride CRS NHTSA NO. M85600	4/4/2007
	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-P27001-08-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.** DTNH22-06-D-00027

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

15. Supplementary Notes

16. Abstract

A frontal impact test was conducted on one (1) Graco Snugride CRS in conjunction with frontal barrier impact NCAP testing on a 2008 Mitsubishi Lancer 4-Door Sedan 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 April 4, 2007.

Measurement Description	Units	Threshold	Left Rear (P4)	Right Rear (P3)
Head Injury Criteria (HIC15)	N/A	390		383.1
3 msec. Chest Clip	G's	50		55.0

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

19. Security Classification (this report)	20. Security Classification (this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	43	

Form DOT F1700.7 (8-72)

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SECTION D1

PURPOSE AND SUMMARY OF TEST M85600

The purpose of this test is to obtain CRS performance data during 35 mph (56.3 km/h) frontal barrier impact NCAP test.

The frontal barrier 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.

The left rear (Serial No. 017) CRABI was calibrated prior to this test. CRABI calibration information is found in Section D-4.

CHILD DUMMY VALUES		
Location	HIC15 Values	3 Msec. Chest Clip
CRABI (P3)	383.1	55.0

DATA SHEET NO.1

CRASH TEST SUMMARY

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

CHILD RESTRAINT SYSTEM INFORMATION

Description	Position #3 CRS
Manufacturer	Graco
Model Name	Snugride
Serial No.	8649MTR3
Type	Infant
Forward/Rearward	Rearward

VISIBLE DUMMY CONTACT POINTS

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

POST-TEST DOOR OPENINGS

Description	Position #3 CRS
Right Rear Door	Remained closed and latched, opened w/o tools

CAMERA COVERAGE

Description	Standard
High Speed	2
Real Time	0
Total	2

DATA CHANNELS

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

DATA SHEET NO.2

VEHICLE PARAMETER DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	400	260	660	428	322	750
Right	kg	383	271	654	425	332	757
Ratio	%	60	40	100	57	43	100
Totals	kg	783	531	1314	853	654	1507

TARGET TEST WEIGHT CALCULATION

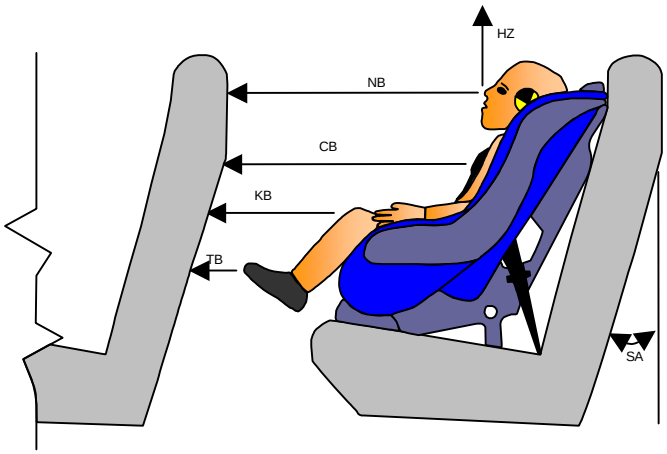
Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1314
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	35
Calculated Vehicle Target Wt. (TVTW)	kg	1501

DATA SHEET NO.3

CRABI POSITIONING IN VEHICLE

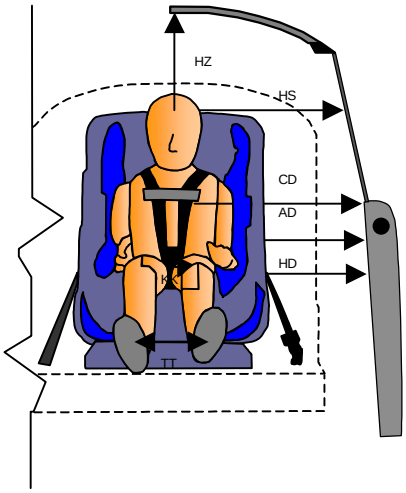
Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

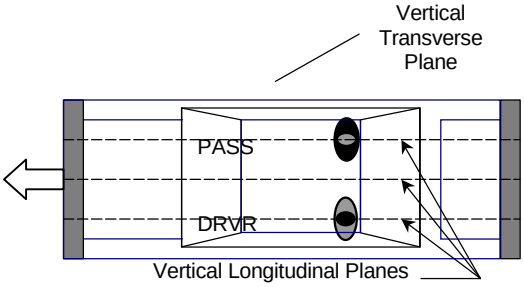
Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07



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

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





DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

DATA SHEET NO.3

CRABI POSITIONING IN VEHICLE…(CONTINUED)

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

CRABI MEASUREMENTS

Code	Measurement	Units	CRABI (P3) Serial No. 017
SA	Seat Back Angle	deg.	23.0
HZ	Head to Roof (Z)	mm	407
CD	Chest to Door	mm	410
KK	Knee to Knee (Y)	mm	130
HS	Head to Side Window	mm	465
HD	H-Point to Door (Y)	mm	340
AD	Arm to Door	mm	300
NB	Nose to Seat Back	mm	530
CB	Chest to Seat Back	mm	465
FF	Foot to Foot	mm	138
KB-Left	Knee to Seat Back	mm	200
KB-Right	Knee to Seat Back	mm	198
TB-Left	Toe to Seat Back	mm	10
TB-Right	Toe to Seat Back	mm	12
CCA	Car Cushion Angle	deg.	18
BA	Back Angle	deg.	55.1
SCA	Seat Cushion Angle	deg.	10.5

DATA SHEET NO.4

CRS PERFORMANCE DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

CRS PERFORMANCE DATA

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

DATA SHEET NO. 5

CRS ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 4/4/2007

CRS ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	CRS (P3)	1530	500	830
2	CRS Base (P3)	1530	500	780

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

DATA SHEET NO.6

CRS CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Mitsubishi Lancer 4-Door Sedan NHTSA No.: M85600

Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/04/07

CAMERA LOCATIONS

No.	Camera View	Location(mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Passenger Side Upper CRS View	-2518	952	-1602	-2	160	12	1000
2	Passenger Side Lower CRS View	-25188	952	-685	2	N/A	12	1000

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

SECTION D2

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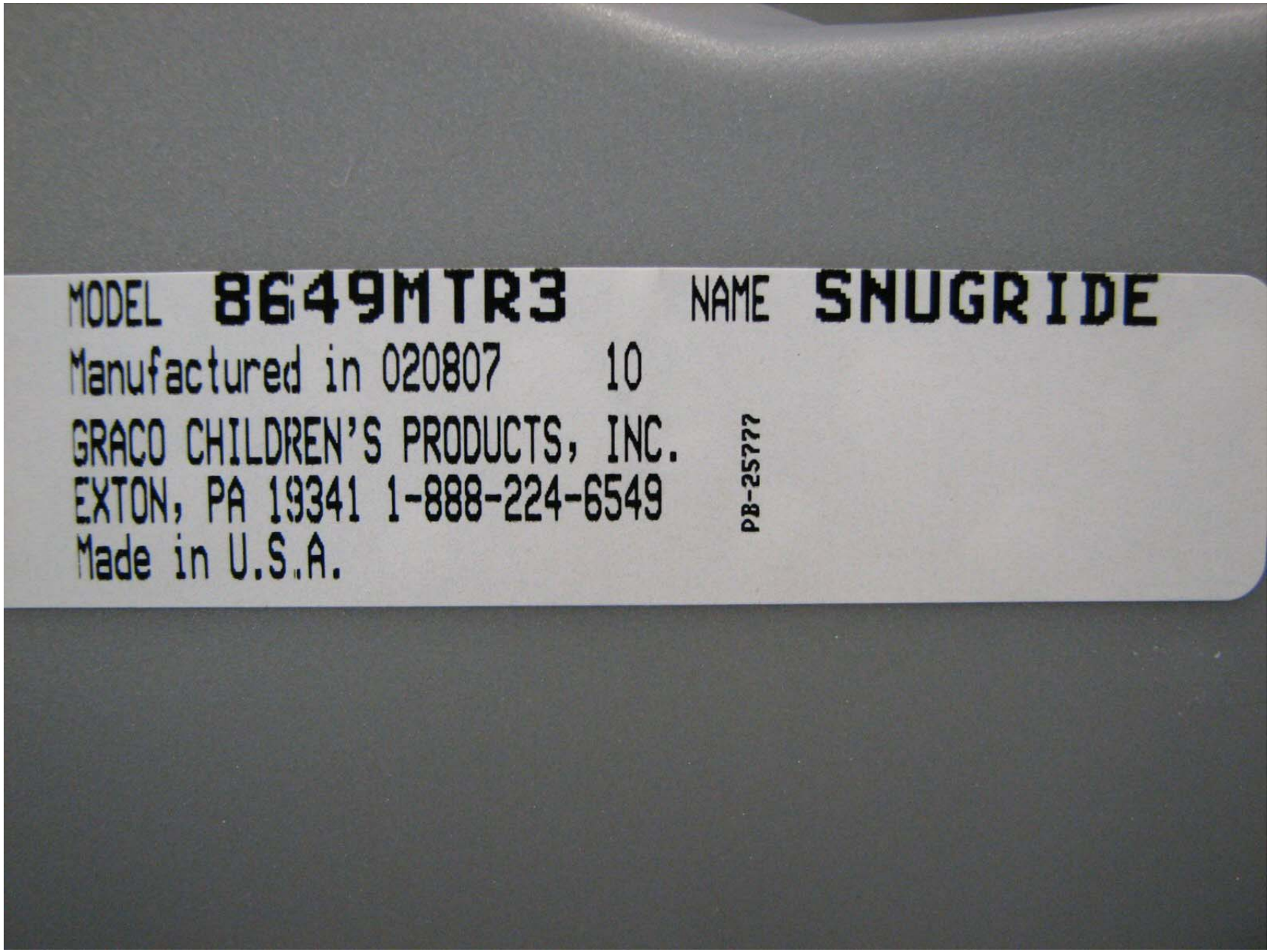

Figure D2-1: Position 3 CRS Label

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

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

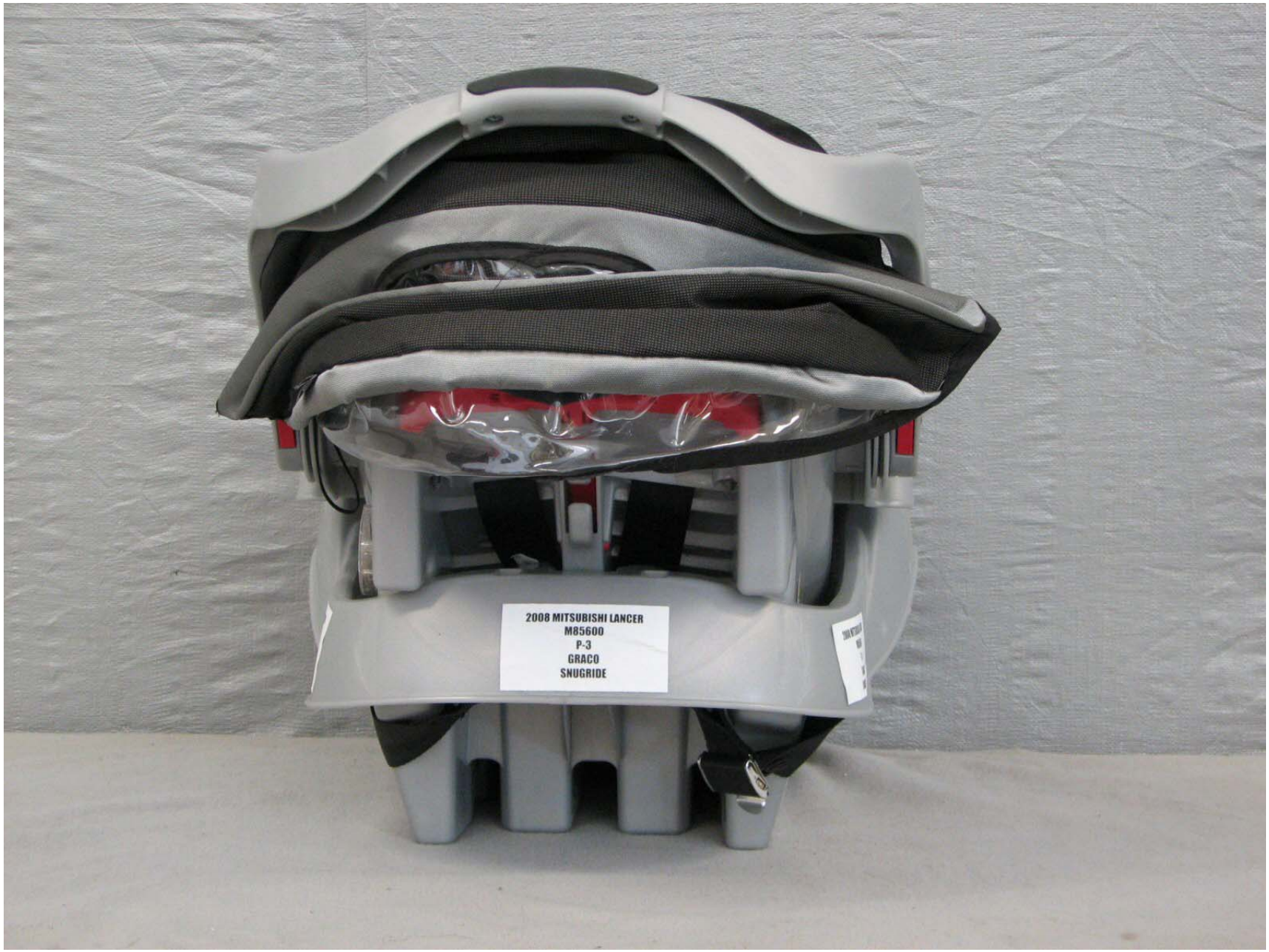

Figure D2-4: Pre-Test Rear View of Position 3 CRS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SECTION D3

CRABI RESPONSE AND CRS DATA TRACES

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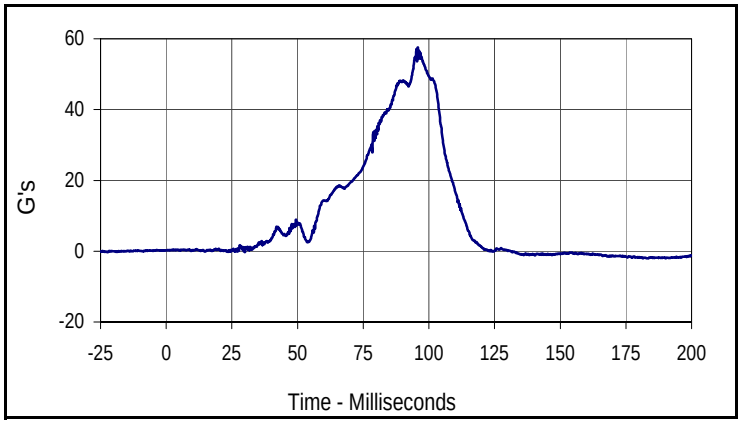
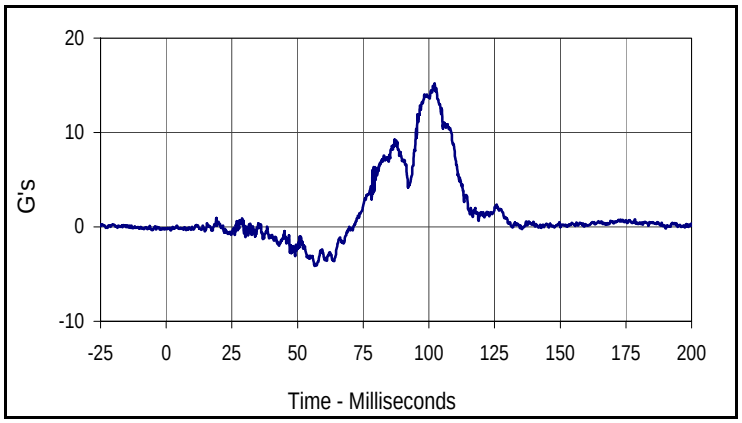
	Right Rear CRABI (P3) Chest Z	D3-2
	Right Rear CRABI (P3) Chest Resultant	D3-2

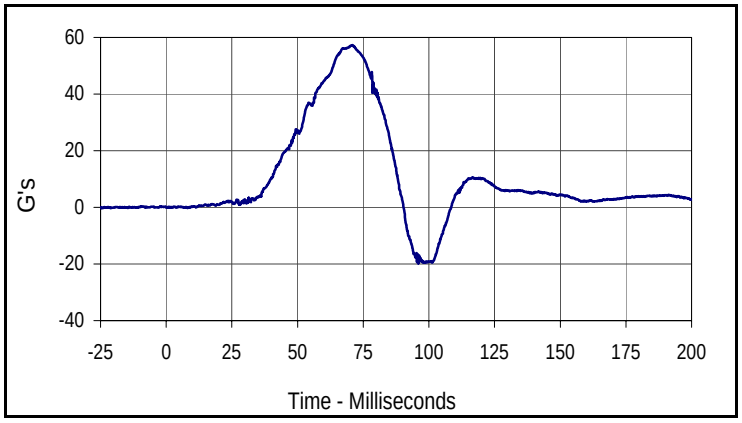
Test Vehicle:	2008 Mitsubishi Lancer 4-Door Sedan	Test Date:	4/4/07
Test Program:	2007 NHTSA 35mph NCAP	NHTSA No.:	M85600



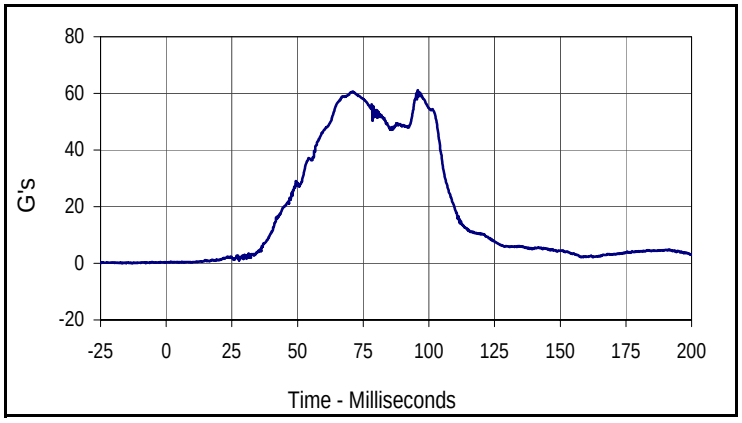
Curve Description			
CRABI Head X (P3)			
CURNO	Type	SAE Class	Units
133	FIL	1000	G's
Max	Time	Min	Time
57.5	95.7	-2.1	181.5



Curve Description			
CRABI Head Y (P3)			
CURNO	Type	SAE Class	Units
134	FIL	1000	G's
Max	Time	Min	Time
15.2	102.2	-4.2	56.6

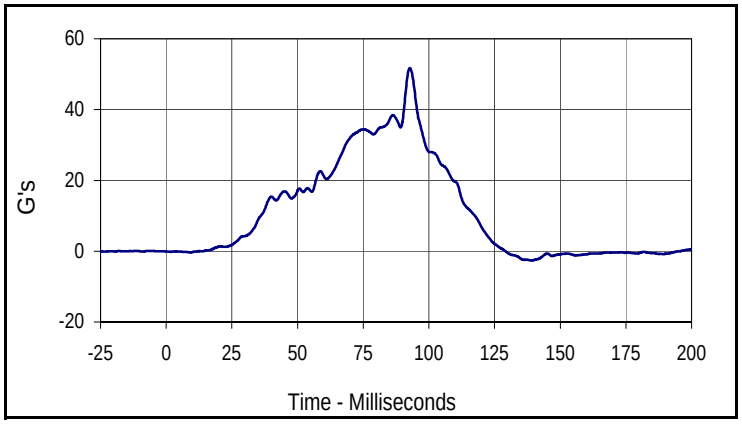


Curve Description			
CRABI Head Z (P3)			
CURNO	Type	SAE Class	Units
135	FIL	1000	G's
Max	Time	Min	Time
57.3	71.0	-19.7	96.0

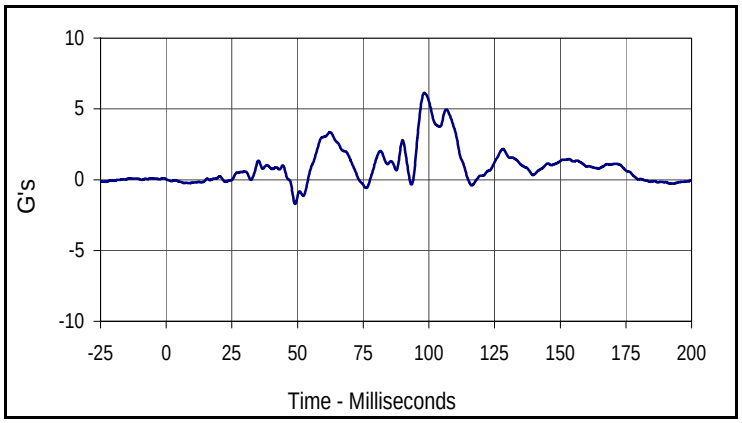


Curve Description			
CRABI Head Resultant (P3)			
CURNO	Type	SAE Class	Units
133	RES	1000	G's
Max	Time	Min	Time
61.1	95.7	0.2	9.7

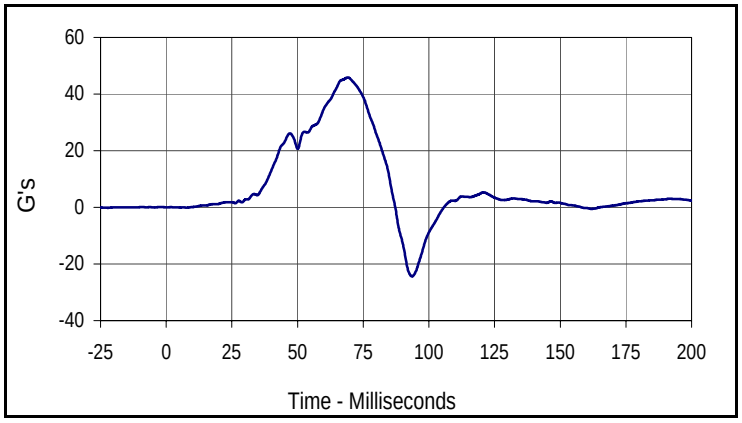
Test Vehicle:	2008 Mitsubishi Lancer 4-Door Sedan	Test Date:	4/4/07
Test Program:	2007 NHTSA 35mph NCAP	NHTSA No.:	M85600



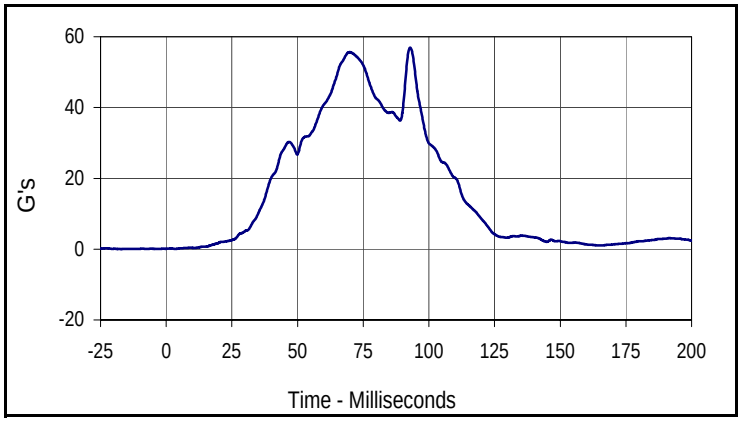
Curve Description			
CRABI Chest X (P3)			
CURNO	Type	SAE Class	Units
136	FIL	180	G's
Max	Time	Min	Time
51.7	92.7	-2.6	139.1



Curve Description			
CRABI Chest Y (P3)			
CURNO	Type	SAE Class	Units
137	FIL	180	G's
Max	Time	Min	Time
6.1	98.2	-1.7	49.1



Curve Description			
CRABI Chest Z (P3)			
CURNO	Type	SAE Class	Units
138	FIL	180	G's
Max	Time	Min	Time
45.9	69.2	-24.4	93.6



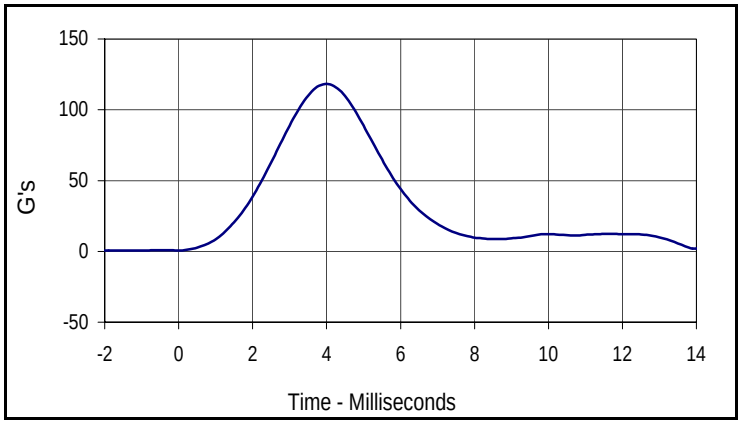
Curve Description			
CRABI Chest Resultant (P3)			
CURNO	Type	SAE Class	Units
136	RES	180	G's
Max	Time	Min	Time
56.9	92.9	0.1	3.5

SECTION D4

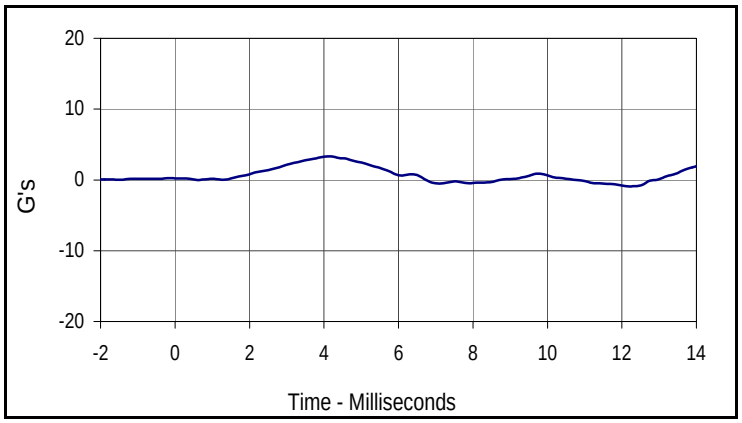
CRABI CALIBRATION INFORMATION

Test Program:	CRABI 12 Month Old Frontal Head Drop Test	Test Date:	3/30/07
ATD Serial No.:	017	Test I.D.:	HD017A

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	118.3	Pass
Peak Lateral Acceleration	G's	≤15.0	3.3	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
118.3	4.0	0.5	0.0

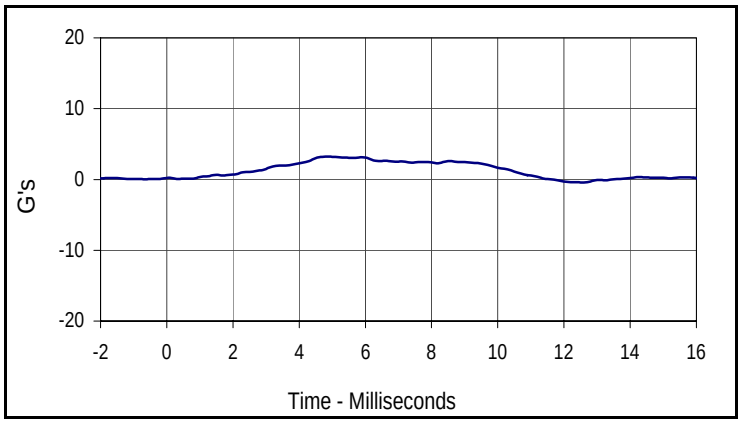


Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.3	4.1	0.0	0.6

Test Program:	CRABI 12 Month Old Rear Head Drop Test	Test Date:	3/28/07
ATD Serial No.:	017	Test I.D.:	HDR17A

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	67.8	Pass
Peak Lateral Acceleration	G's	≤15.0	3.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

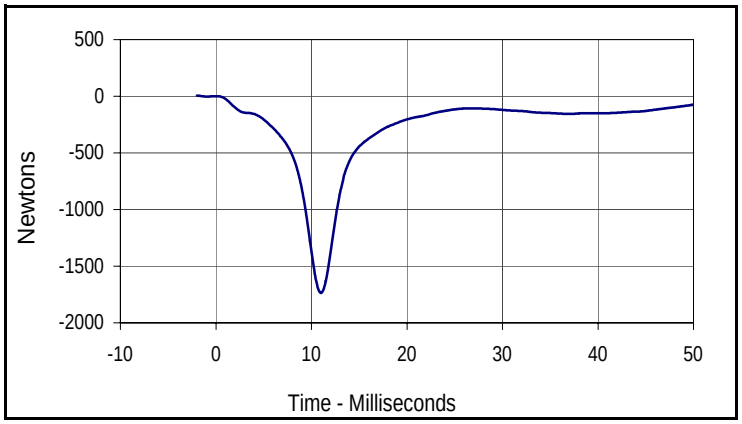
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
67.8	6.0	0.1	-1.1



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.2	4.8	0.0	-0.6

Test Program:	12 Month Old CRABI Thorax Impact Test	Test Date:	3/28/07
ATD Serial No.:	017	Test I.D.:	TH02K

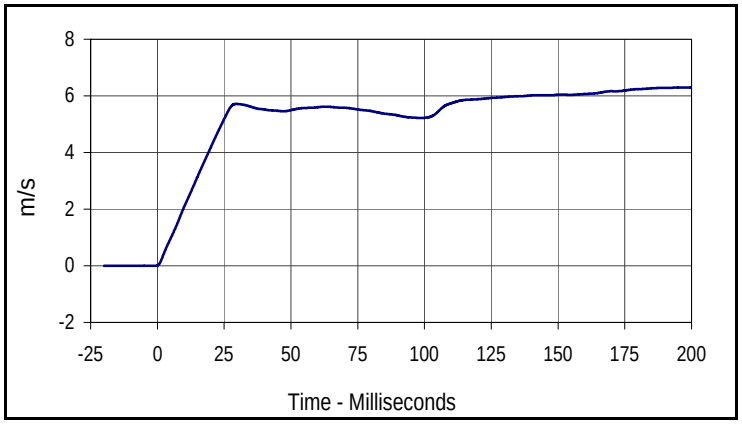
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	4.90 to 5.10	4.90	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1736	Pass
		Overall Test Results		Pass



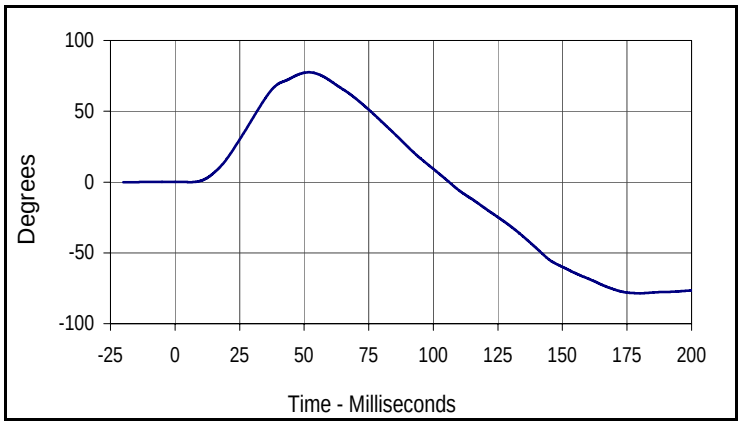
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
7.0	-2.0	-1736.1	11.0

Test Program:	CRABI 12-Month Old Neck Flexion Test	Test Date:	3/28/07
ATD Serial No.:	017	Test I.D.:	NF08A

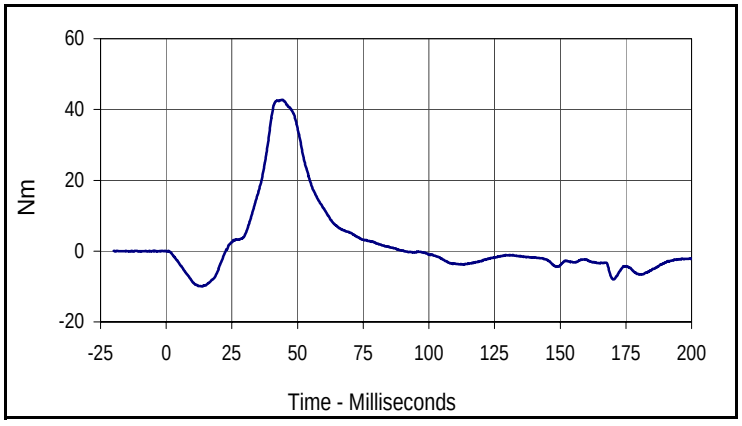
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.18	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	2.1	Pass
	20 Msec.	m/s	3.4 to 4.2	4.2	Pass
	25 Msec.	m/s	4.3 to 5.2	5.2	Pass
"D" Plane Rotation	Max	Degrees	75.0 to 86.0	77.5	Pass
Peak Moment in Rotation	Max	Nm	36.0 to 45.0	40.7	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	70.7	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.3	199.3	0.0	-0.7



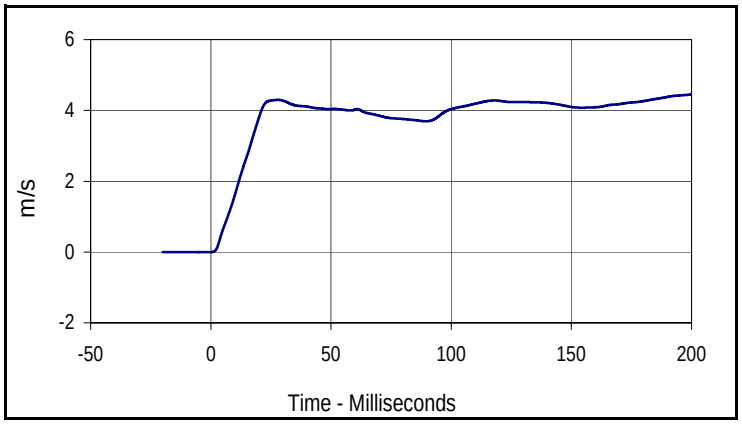
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
77.5	51.8	-78.5	179.8



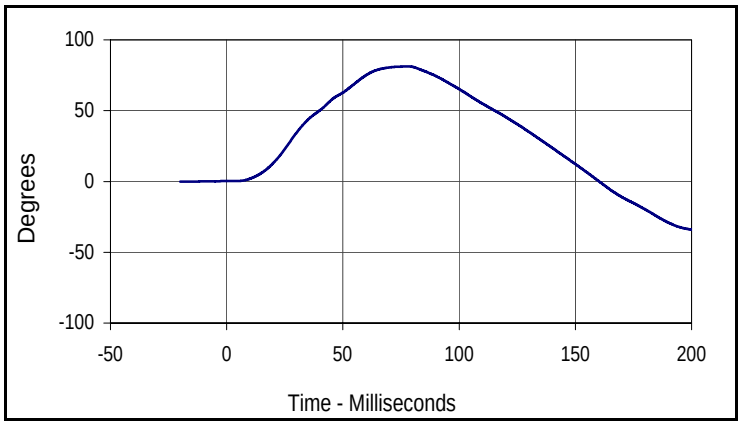
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
42.8	44.3	-9.9	13.5

Test Program:	CRABI 12-Month Old Neck Extension Test	Test Date:	3/29/07
ATD Serial No.:	017	Test I.D.:	NE02C

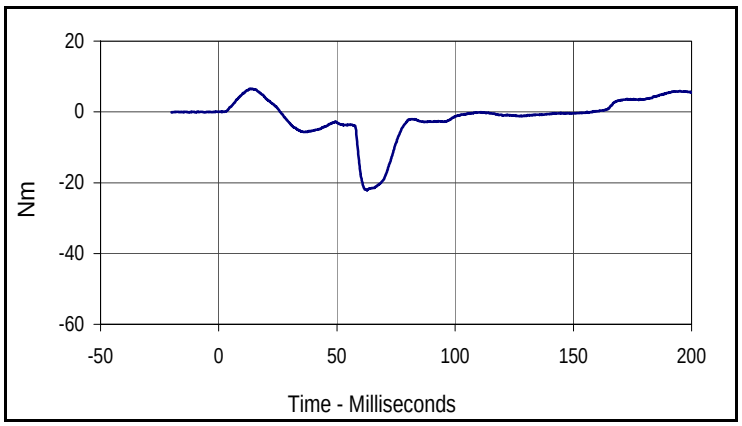
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.45	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.8	Pass
	10 Msec.	m/s	1.5 to 2.1	1.6	Pass
	14 Msec.	m/s	2.2 to 2.9	2.5	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	81.3	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	77.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.4	200.0	0.0	0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
81.3	77.8	-34.0	200.0



Curve Description			
Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
6.5	13.2	-22.1	62.8

Test Program:	CRABI 12 Month Old External Dimensions	Test Date:	3/30/07
ATD Serial No.:	017	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	458	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	282	Pass
C - "H" point height	mm	27.9 to 38.1	37	Pass
D - "H" point from backline	mm	40.1 to 50.3	49	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	54	Pass
F - Thigh clearance	mm	63.0 to 73.2	70	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	103	Pass
J - Elbow rest height	mm	150.1 to 165.3	155	Pass
K - Buttock to knee length	mm	202.7 to 217.9	205	Pass
L - Poplipteal length	mm	138.7 to 153.9	140	Pass
M - Knee pivot height	mm	165.1 to 180.3	170	Pass
N - Buttock poplipteal length	mm	144.8 to 160.0	150	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	112	Pass
P - Foot length	mm	92.4 to 102.6	102	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	129	Pass
T - Head Depth	mm	149.9 to 165.1	154	Pass
U - Hip breadth	mm	158.5 to 173.7	165	Pass
V - Shoulder breadth	mm	200.7 to 215.9	213	Pass
W - Foot breadth	mm	39.1 to 49.3	47	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	463	Pass
Z - Waist circumference	mm	447.0 to 472.4	454	Pass
AA - Refrence location for dimension Y & O	mm	256.5 to 266.7	265	Pass
BB - Reference Location For dimension Z	mm	106.7 to 116.9	110	Pass
CC - Shoulder Height	mm	299.7 to 314.9	305	Pass
DD - Chin Height	mm	289.6 to 304.8	302	Pass
		Overall Test Results		Pass