

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

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

NHTSA NUMBER: Z75400

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



JULY 18, 2007

FINAL REPORT

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

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-06-D-00027

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

Prepared by:  Date: July 18, 2007
Mr. Johnny H. Dutto, Project Engineer
KARCO Engineering, LLC

Reviewed by:  Date: July 18, 2007
Mr. Michael Dunlap, Director of Operations
KARCO Engineering, LLC

Approved by:  Date: July 18, 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. TR-P27137-01-NC		2. Government Accession No.		3. Recipients Catalog No.	
4. Title and Subtitle Final Report of New Car Assessment Program Testing of a 2007 Mazda CX-9 5-Door MPV NHTSA No. Z75400				5. Report Date 7/18/2007	
				6. Performing Organization Code KAR	
7. Authors Mr. Johnny H. Dutto, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco				8. Performing Organization Report No. TR-P27137-01-NC	
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-06-D-00027	
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NVS-111 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C 20590				13. Type of Report and Period Covered Final Test Report Base Year	
				14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS	
15. Supplementary Notes					
16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2007 Mazda CX-9 5-Door MPV at Karco Engineering, LLC on 7/18/07. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 56.32 km/h. The ambient temperature at the barrier face at the time of impact is 34.8 degrees Celcius. The vehicle's maximum post-test static crush is 510 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	314.0	379.5
Max. Chest Accel. (3 msec Clip)		G's	60	39.5	37.6
Left Femur Force		Newtons	10008	-5265.1	-3333.7
Right Femur Force		Newtons	10008	-2110.4	-2399.0
17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2007 Mazda CX-9 5-Door MPV NHTSA No. Z75400				18. Distribution of Statement Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590	
19. Security Classification (this report) Unclassified		20. Security Classification (this page) Unclassified		21. No. of Pages 203	22. Price

TABLE OF CONTENTS

Section	Description	Page
1	Purpose and Summary of Test Z75400	1
2	Occupant and Vehicle Information/Data Sheets	3

Data Sheet	Description	Page
1	Crash Test Summary	4
2	General Test and Vehicle Parameter Data	5
3	Post-Test Impact Data	8
4	Test Vehicle Information	9
5	Dummy Positioning in Vehicle	11
6	Seat Belt Positioning Data	13
7	Vehicle Accelerometer Location	14
8	Seat Belt Assessment Test Data	15
9	Summary of FMVSS 212 Data	16
10	Windshield Zone Intrusion FMVSS 219 Data (Partial)	17
11	FMVSS 301 Fuel System Integrity Post-Impact Data	18
12	FMVSS 301 Static Rollover Data	19
13	Vehicle Measurements	21
14	Camera Locations	24
15	Photographic Reference Target Locations	25
16	Vehicle Intrusion Measurements	26
17	Fixed Barrier Load Cell Locations	31
18	Accident Investigation Division Data	32
19	Dummy/Vehicle Temperature Stabilization	33

Appendix	Description	Appendix
A	Photographs	A
B	Data Plots	B
C	Dummy Calibration Data	C
D	Child Restraint System	D

SECTION 1

PURPOSE AND SUMMARY OF TEST Z75400

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 2007 Mazda CX-9 5-Door MPV at a velocity of 56.32 km/h. The test was performed at Karco Engineering, LLC on July 18, 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. 034) and the right-front passenger (position 2) ATD (Serial No. 035) 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 510 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 bolster.

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

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY					
ATD Position	HIC 36	3 msec Clip (g)	Chest Defl. (mm)	Left Femur (N)	Right Femur (N)
Driver	314.0	39.5	-19.6	-5265.1	-2110.4
Passenger	379.5	37.6	-19.9	-3333.7	-2399.0

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

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

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	°F	°C	$=(tf - 32)/1.8$
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: 2007 Mazda CX-9 5-Door MPV
Test Program: 2007 NHTSA 35mph NCAP

NHTSA No.: Z75400
Test Date: 7/18/07

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.32
Test Weight	kg	2230
Impact Angle	degrees	0
Average Rebound	mm	1516
Maximum Static Crush	mm	510

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. 034	50% Male Hybrid III No. 035
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: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	Z75400	Anti-Lock Brakes	Yes
Make	Mazda	All Wheel Drive	Yes
Model	CX-9	Power Steering	Yes
Body Style	5-Door MPV	Driver Front Airbag	Yes
Vin No.	JM3TB38C770103683	Driver Side Airbag	Yes
Color	Blue	Driver Head Airbag	No
Delivery Date	6/27/2007	Driver Curtain Airbag	Yes
Odometer (Miles)	209.0	Pass. Airbag	Yes
Dealer	Perry Mazda	Pass. Side Airbag	No
Transmission	6-Speed Automatic	Pass. Head Airbag	No
Final Drive	4WD	Pass. Curtain Airbag	Yes
Type/No. Cyl.	V6	Pre-Tensioners	Yes
Engine Disp. (L)	3.5	Load Limiters	Yes
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air. Cond.	Yes
Sunroof/T-Top	No	AM/FM CD	Yes
Tinted Glass	Yes	Tilt Steering	Yes
Traction Control	Yes	Automatic Door Locks	No
Power Brakes	No	Power Windows	Yes
Front Disc	Yes	Power Seats	Yes
Rear Disc	Yes	Other	None

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

N/A

DATA FROM MANUFACTURER

Manufactured By	Mazda Motor Corporation	GVWR (kg)	2733
Date of Manufacture	Dec-06	GAWR Front (kg)	1307
		GAWR Rear (kg)	1456

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

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

DATA SHEET NO. 2...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

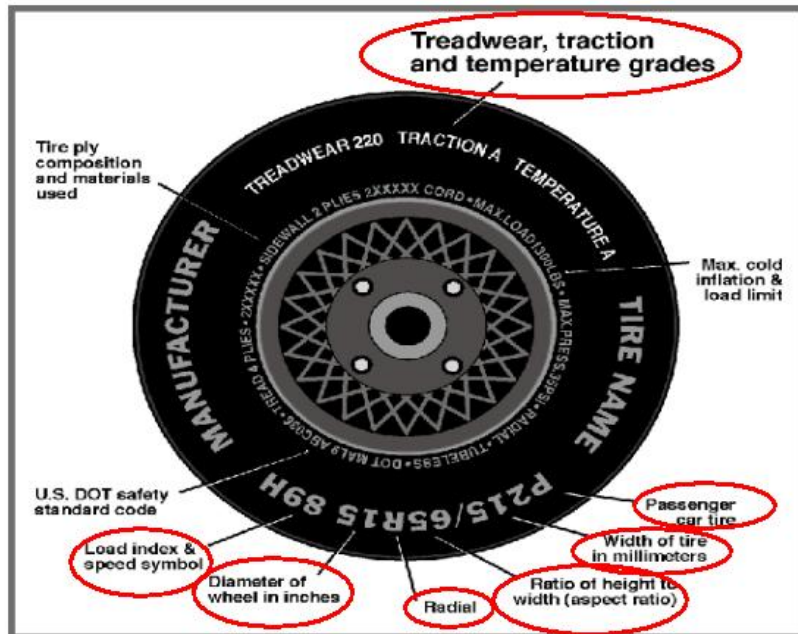
Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

Collect year, make, model, VIN, items circled in red, and tire manufacturer and tire name.



TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	308	308
Cold Pressure (kpa)	250	250
Recommended Tire Size	P245/60R18	P245/60R18
Tire Size on Vehicle	P245/60R18	P245/60R18
Tire Manufacturer	Bridgestone	Bridgestone
Treadwear	300	300
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	
Tire Plies Body	Tread, 2 Polyester + 2 Steel + 1 Nylon	Tread, 2 Polyester + 2 Steel + 1 Nylon
Load Index/Speed Symbol	104H	104H
Tire Material	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
DOT Safety Code Right	H4L2 CAL 4906	H4L2 CAL 4906
DOT Safety Code Left	H4L2 CAL 4906	H4L2 CAL 4906

DATA SHEET NO. 2...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	573	445	1018	604	522	1126
Right	kg	568	435	1003	587	517	1104
Ratio	%	56	44	100	53	47	100
Totals	kg	1141	880	2021	1191	1039	2230

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2021
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	64
Calculated Vehicle Target Wt. (TVTW)	kg	2237

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	847	850	866	863	1254
As Tested	mm	835	845	838	845	1342

Vehicle Wheel Base (mm) 2880

Weight of Ballast Secured in cargo area (kg) 15

Weight of Items Removed (kg) 114

Vehicle Components Removed Rear Hatch, Rear Passenger Door Panels and Windows, 3rd Seat
Rear Carpeting, Rear Tailights, Rear Bumper

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

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 75.74

Actual Test Volume with entire fuel System Filled (L) 70.45

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: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**SPEED TRAP DATA**

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	56.32
Trap No.2 Velocity (Redun.)	km/h	55.51 to 57.12	56.30

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4752	4435	-317
Center	mm	5060	4550	-510
Right Side	mm	4752	4448	-304

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1592
Center	mm	1430
Right Side	mm	1525
Average	mm	1516

DATA SHEET NO. 4

TEST VEHICLE INFORMATION

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

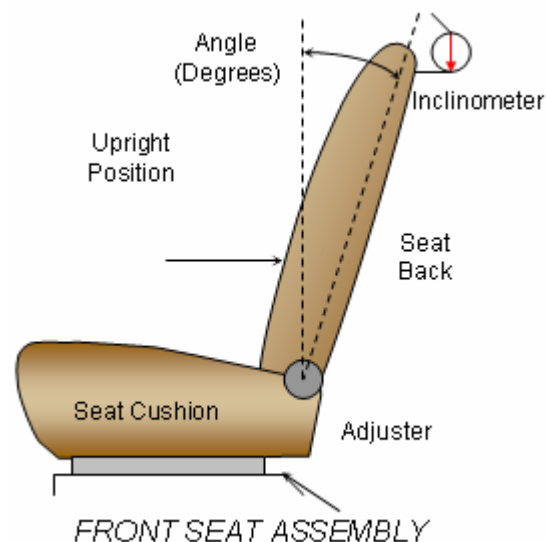
NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

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

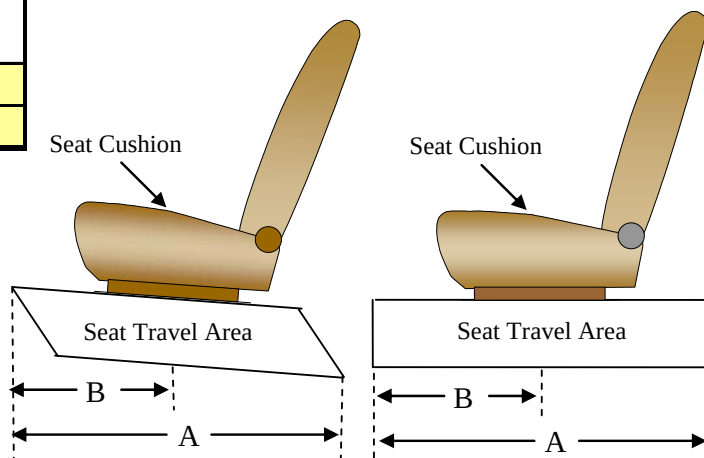
	Deg.
Driver w/seated Dummy	15.5 @ Headrest
Passenger w/seated Dummy	15.5 @ Headrest

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	280 mm	140 mm
Passenger Seat	27 detents	14th detent



SEAT BELT UPPER ANCHORAGE

Position number two (2) from the uppermost position.

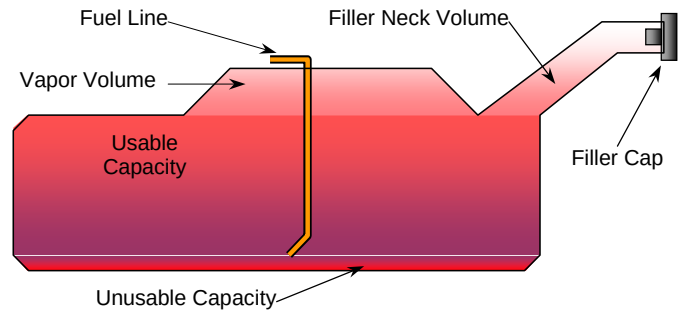
SEAT BELT UPPER ANCHORAGE

	Total # of Positions	Placed in Position #
Driver Seat	4	2
Passenger Seat	4	2

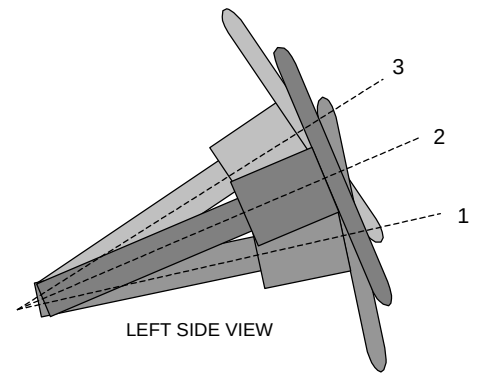
DATA SHEET NO. 4...(CONTINUED)**TEST VEHICLE INFORMATION**Test Vehicle: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**FUEL TANK CAPACITY**

	Liters
Usable Capacity of "Standard Tank"	75.74
Usable Capacity of "Optional" Tank	
Usable Capacity used for FMVSS 301	69.64 to 71.16
Actual Amount of Solvent used	70.45

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 position No. 1	26.5	0.0
Geometric center position No. 2	29.0	27.5
Uppermost position No. 3	32.0	55.0

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		22.2		
SWA	Steering Wheel Angle		61.0		
SCA	Steering Column Angle		29.0		
SA	Seat Back Angle		15.5 @ Headrest		15.5 @ Headrest
HZ	Head to Roof (Z)	225	90.0	170	90.0
HH	Head to Header	395		368	
HW	Head to Windshield	684		620	
HR	Head to Side Header (Y)	305		295	
NR	Nose to Rim	425	10.7		
CD	Chest to Dash	555		618	
CS	Chest to Steering Hub	310			
RA	Rim to Abdomen	190			
KDL	Left Knee to Dash	160	9.0	120	
KDR	Right Knee to Dash	140		140	18.8
PA	Pelvic Angle		21.5		24.8
TA	Tibia Angle		47.3		45.7
KK	Knee to Knee (Y)	315		278	
SK	Striker to Knee	689	8.3	715	6.1
ST	Striker to Head	528	71.4	590	70.0
SH	Striker to H-Point	307	21.6	320	16.8
SHY	Striker to H-Point (Y)	260		280	
HS	Head to Side Window	353		342	
HD	H-Point to Door (Y)	182		162	
AD	Arm to Door (Y)	153		65	

DATA SHEET NO. 5...(CONTINUED)

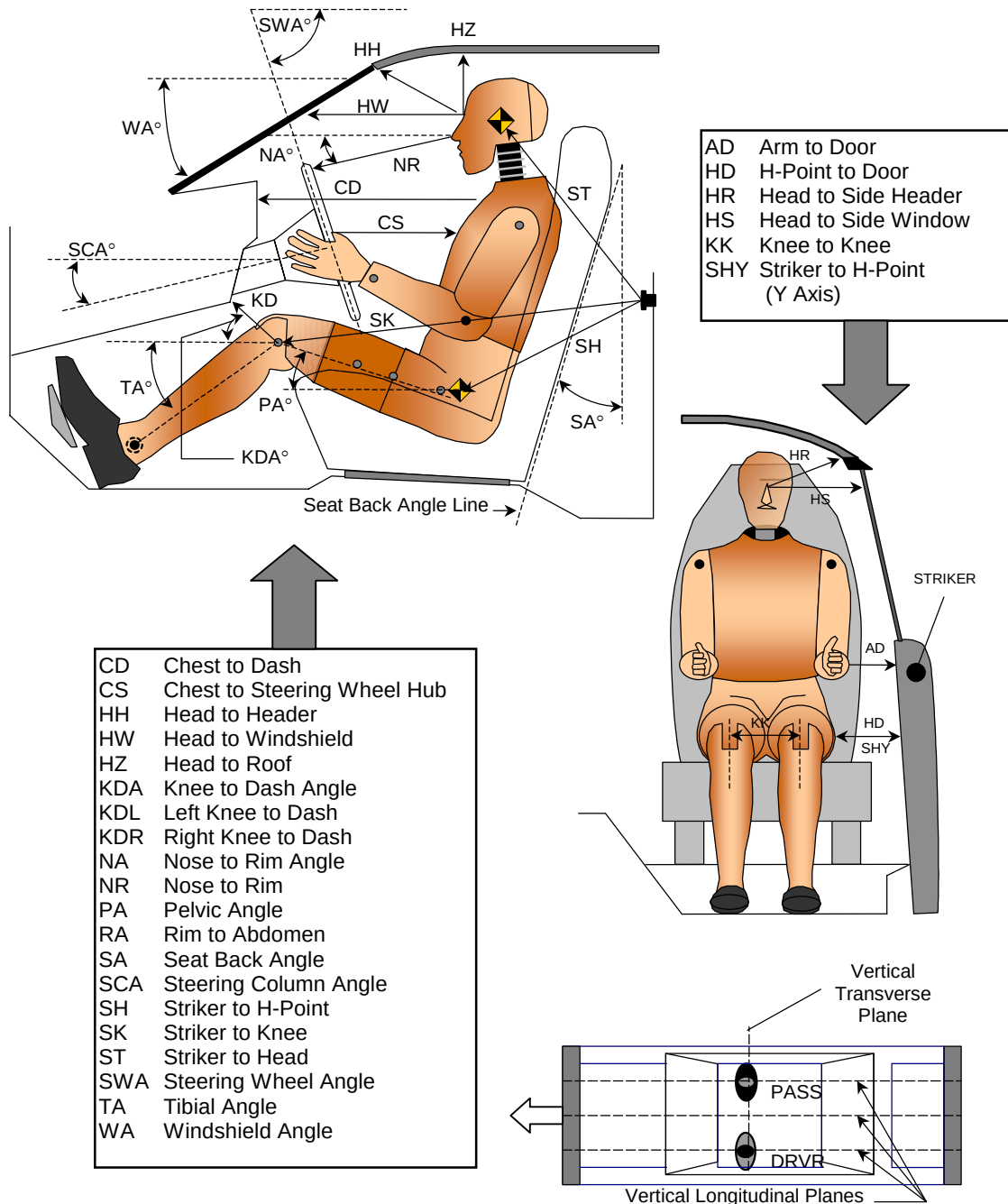
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6

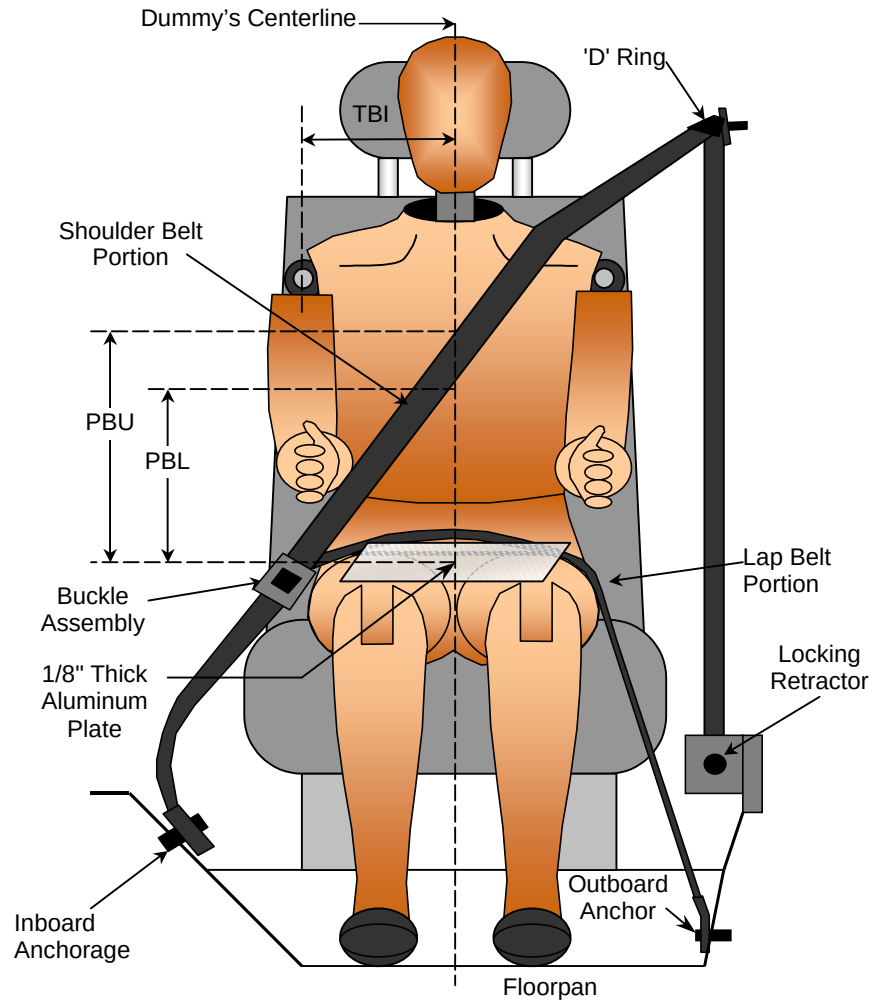
SEAT BELT POSITIONING DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	220	220
PBU - Top Surface of reference to belt upper edge	mm	350	360
PBL - Top Surface of reference to belt lower edge	mm	275	280
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATION

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

Test Date: 7/18/07

Test Program: 2007 NHTSA 35mph NCAP

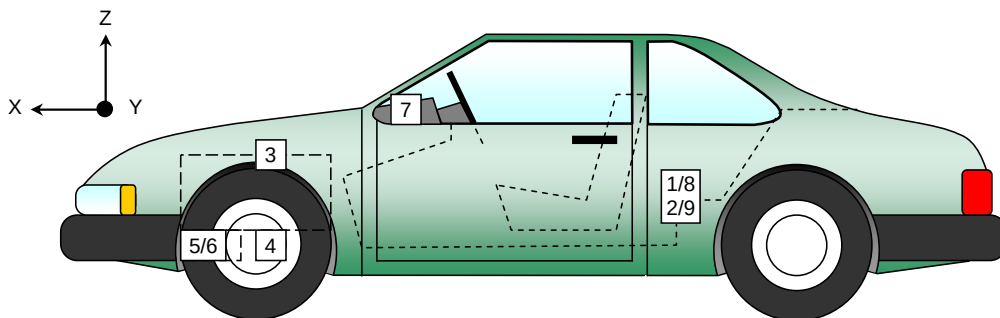
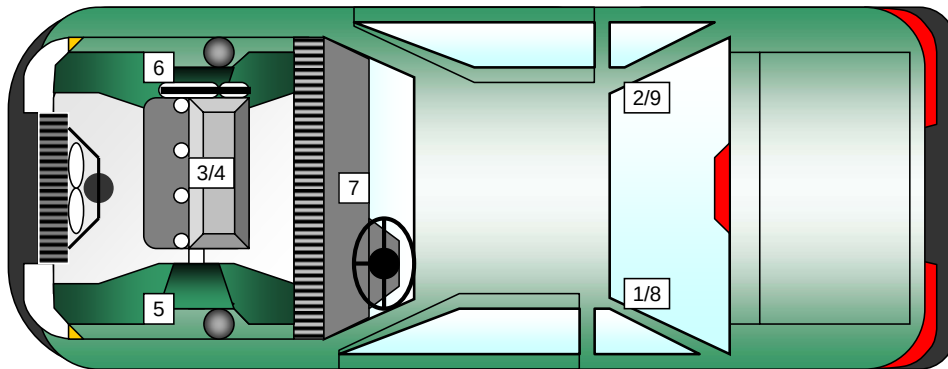
NHTSA No.: Z75400

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member	1856	-745	466
2	Right Rear X-Member	1856	745	466
3	Engine Top	4412	320	820
4	Engine Bottom	4270	230	190
5	Left Brake Caliper	4134	-735	430
6	Right Brake Caliper	4134	745	430
7	Instrument Panel			
8	Left Rear X-Member (Z-Axis)	1856	-745	466
9	Right Rear X-Member (Z-Axis)	1856	745	466

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: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
Retractor Reel to "D" ring	mm	800	800
Shoulder Belt length as measured on ATD	mm	935	955
Lap Belt length as measured on ATD	mm	785	605
Remainder of belt on reel	mm	905	905
Total belt length for continuous webbing systems	mm	3425	3265

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	160	155
As determined electronically	mm	224	149

BELT STRETCH DATA

Measurement 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

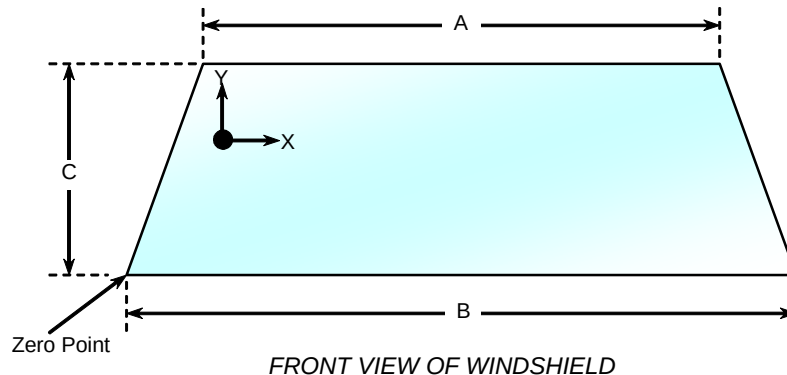
DATA SHEET NO. 9**SUMMARY OF FMVSS 212 DATA**Test Vehicle: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07

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	2422	2422	100
Right Side	2422	2422	100
Total	4843	5148	100

**WINDSHIELD DIMENSIONS**

Item	Units	Segment Length	Molding Width
A	mm	1298	14
B	mm	1505	74
C-Left	mm	1020	14
C-Right	mm	1020	14

DATA SHEET NO. 10

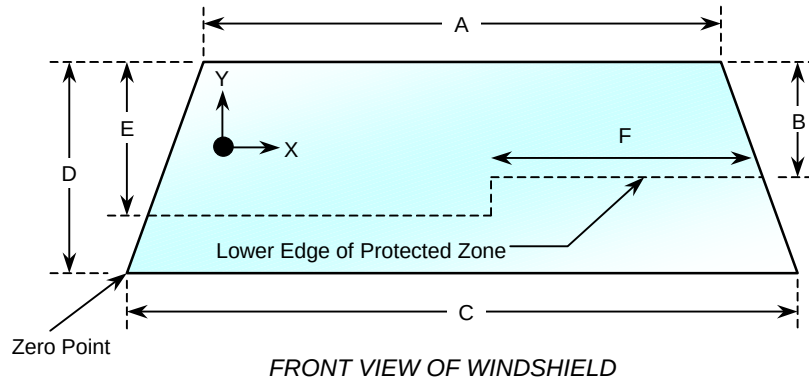
WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07



WINDSHIELD AND PROTECTED ZONE

Item	Units	Value
A	mm	1298
B	mm	610
C	mm	1505
D	mm	1020
E	mm	595
F	mm	545

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: 2007 Mazda CX-9 5-Door MPV NHTSA No.: Z75400
Test Program: 2007 NHTSA 35mph NCAP Test Date: 7/18/07

Test Time: 12:37 PM

Temperature: 34.8 ° 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

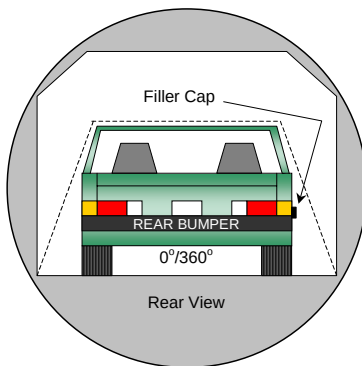
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

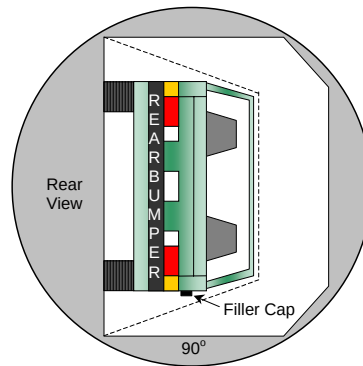
NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

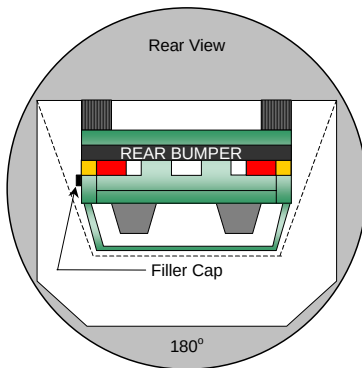
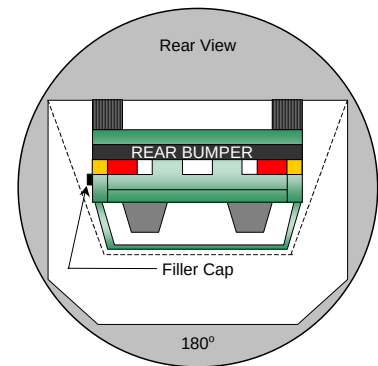
Test Date: 7/18/07



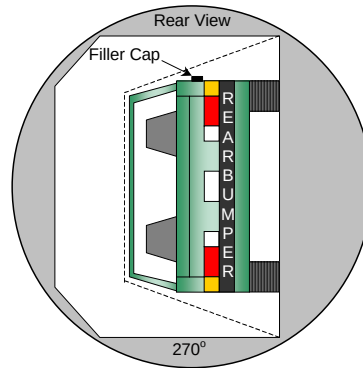
0° to 90°



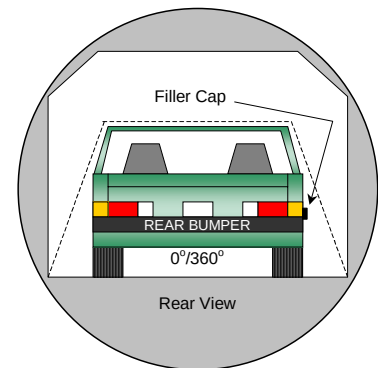
90° to 180°



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: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**SOLVENT COLLECTION TIME TABLE IN SECONDS**

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	84	303	387
90° to 180°	85	305	390
180° to 270°	89	306	395
270° to 360°	82	309	391

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: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**VEHICLE MEASUREMENT TABLE**

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	5060	4550	-510
2	RSOV to front of engine	mm	4488	4292	-196
3	RSOV to firewall centerline	mm	4026	3985	-41
4	RSOV to leading edge of right door	mm	3483	3475	-8
5	RSOV to leading edge of left door	mm	3471	3473	2
6	RSOV to lower leading edge of right door	mm	3446	3446	0
7	RSOV to lower leading edge of left door	mm	3455	3455	0
8	RSOV to upper trailing edge of right door	mm	2342	2340	-2
9	RSOV to upper trailing edge of left door	mm	2345	2348	3
10	RSOV to lower trailing edge of right door	mm	2396	2396	0
11	RSOV to lower trailing edge of left door	mm	2405	2404	-1
12	RSOV to bottom of right 'A' pillar	mm	3429	3416	-13
13	RSOV to bottom of left 'A' pillar	mm	3419	3421	2
14	RSOV to firewall on right side	mm	3985	3960	-25
15	RSOV to firewall on left side	mm	3985	3965	-20
16	RSOV to steering column	mm	3062	3059	-3
17	Center of steering column to left 'A' pillar	mm	430	397	-33
18	Center of steering column to headlining	mm	400	435	35
19	RSOV to right side of front bumper	mm	4752	4448	-304
20	RSOV to left side of front bumper	mm	4752	4435	-317
21	Length of engine block	mm	520	520	0
RD	RSOV to right side of dash panel	mm	3264	3264	0
CD	RSOV to center of dash panel	mm	3240	3240	0
LD	RSOV to left side of dash panel	mm	3296	3296	0

DATA SHEET NO. 13...(CONTINUED)

VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

VEHICLE STRUCTURAL MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	5060	4550	-510
2	Total width	mm	1925	1920	-5
3	Bumper top height	mm	778	879	101
4	Bumper bottom height	mm	286	270	-16
5	Longitudinal member top height	mm	686	676	-10
6	Longitudinal member bottom height	mm	488	487	-1
7	Distance between longitudinal members	mm	1000	950	-50
8	Longitudinal member width	mm	64	64	0
9	Engine top height	mm	777	905	128
10	Engine bottom height	mm	219	296	77
11	Engine and gear box width	mm	850	850	0
12	Front bumper to engine distance	mm	572	350	-222
13	Front shock absorber fixing width	mm	1050	1035	-15
14	Bonnet leading edge height	mm	940	1065	125
15	Front shock absorber fixing width	mm	1255	1245	-10
16	Front bumper to front axle distance	mm	1070	820	-250
17	Front axle to 'A' pillar distance	mm	489	489	0
18	'A' pillar to 'B' pillar distance	mm	1020	1018	-2
19	'B' pillar to rear axle distance	mm	1242	1242	0
20	'B' pillar to 'C' pillar distance	mm	996	996	0
21	Roof sill bottom height	mm	1550	1483	-67
22	Roof sill top height	mm	1608	1610	2
23	Floor sill bottom height	mm	261	278	17
24	Floor sill top height	mm	469	476	7

DATA SHEET NO. 13...(CONTINUED)

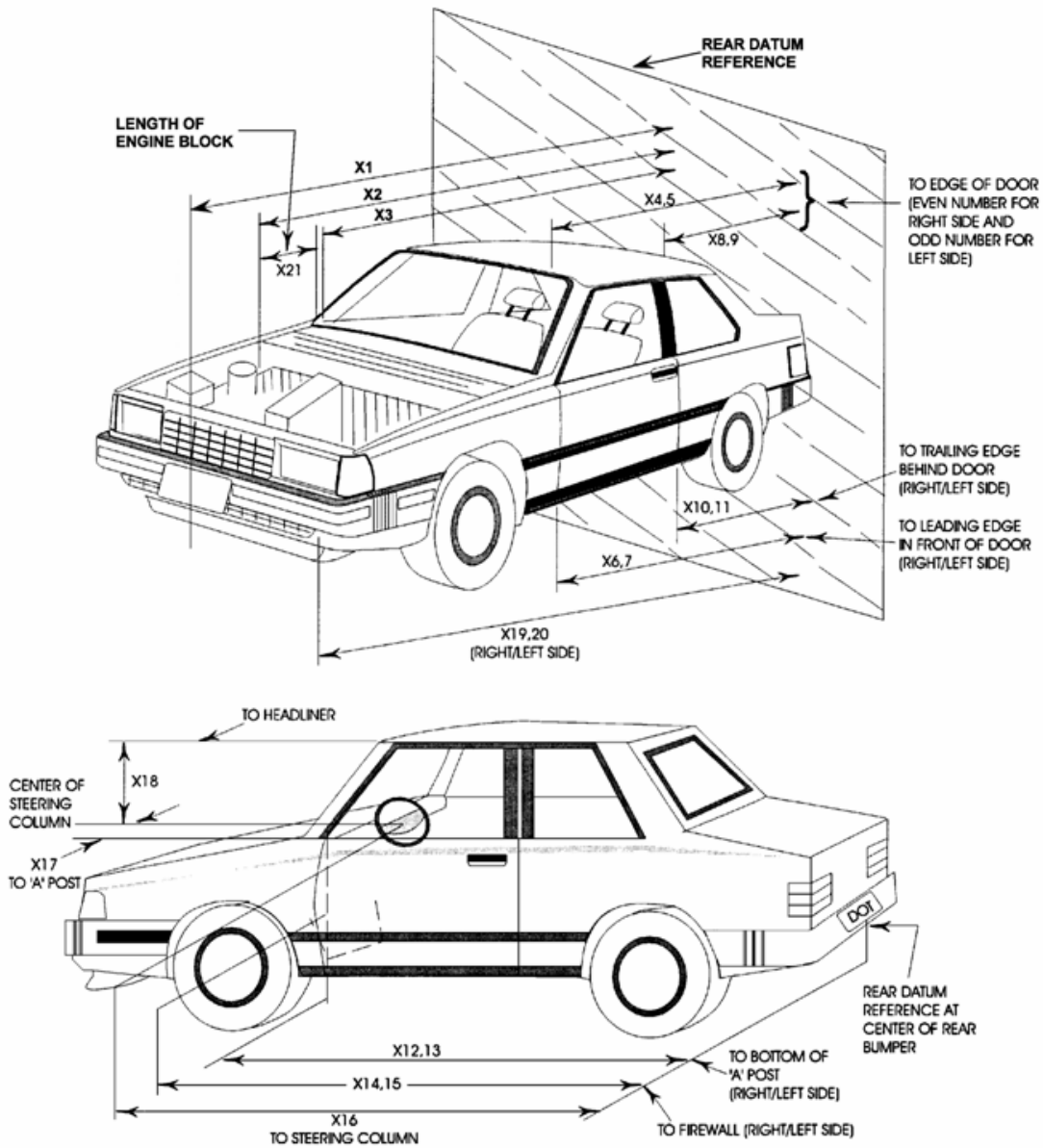
VEHICLE MEASUREMENTS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07



DATA SHEET NO. 14**CAMERA LOCATIONS**Test Vehicle: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**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)	-16589	-7485	-1475	0			30
2	Overall Left Side	-2798	-7397	-1048	0	8105	20mm	1000
3	Closeup Left Side	-2584	-7124	-1095	0	7844	50mm	1000
4	Driver and Interior View	-8696	-12562	-4511	-17	15570	ZOOM	1000
5	Steering Column (Bottom)	-1631	-8234	-2682	-13	9453	35mm	1000
6	Steering Column (Top)	-1663	-8153	-3078	-13	9549	35mm	1000
7	Overall Right Side	-2798	7384	-1048	0	7409	20mm	1000
8	Closeup Right Side	-2584	7052	-1048	0	7079	50mm	1000
9	Passenger and Interior View	-5330	9365	-2407	-10	10211	ZOOM	1000
10	Right Side View	-2006	6967	-1463	-6	7134	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	-3398	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

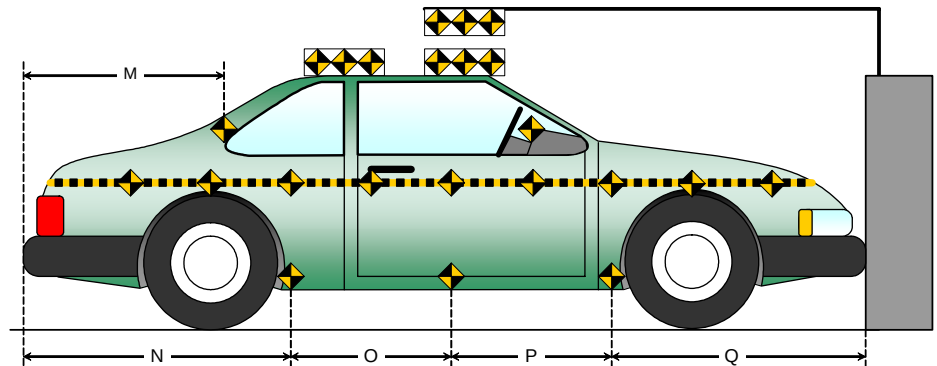
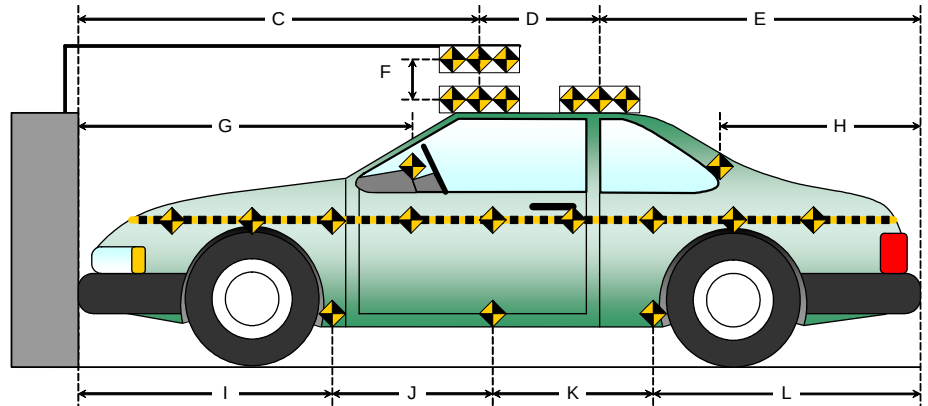
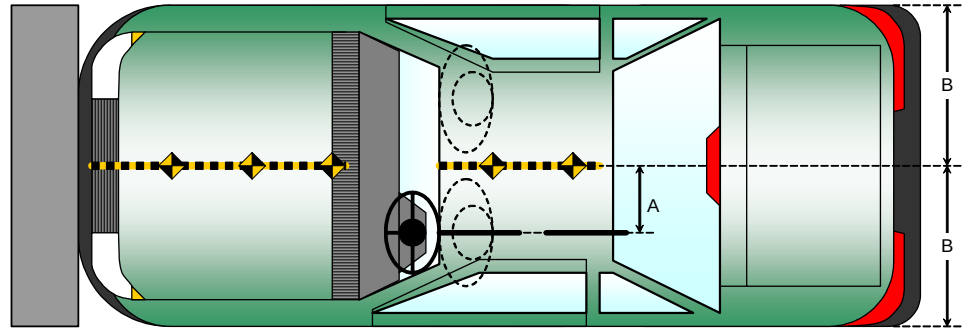
Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

All Dimensions in (mm)	
Item	Value
A	N/A
B	963
C	N/A
D	615
E	N/A
F	155
G	177
H	650
I	1530
J	942
K	942
L	1603
M	651
N	1603
O	942
P	942
Q	1530



DATA SHEET NO. 16

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

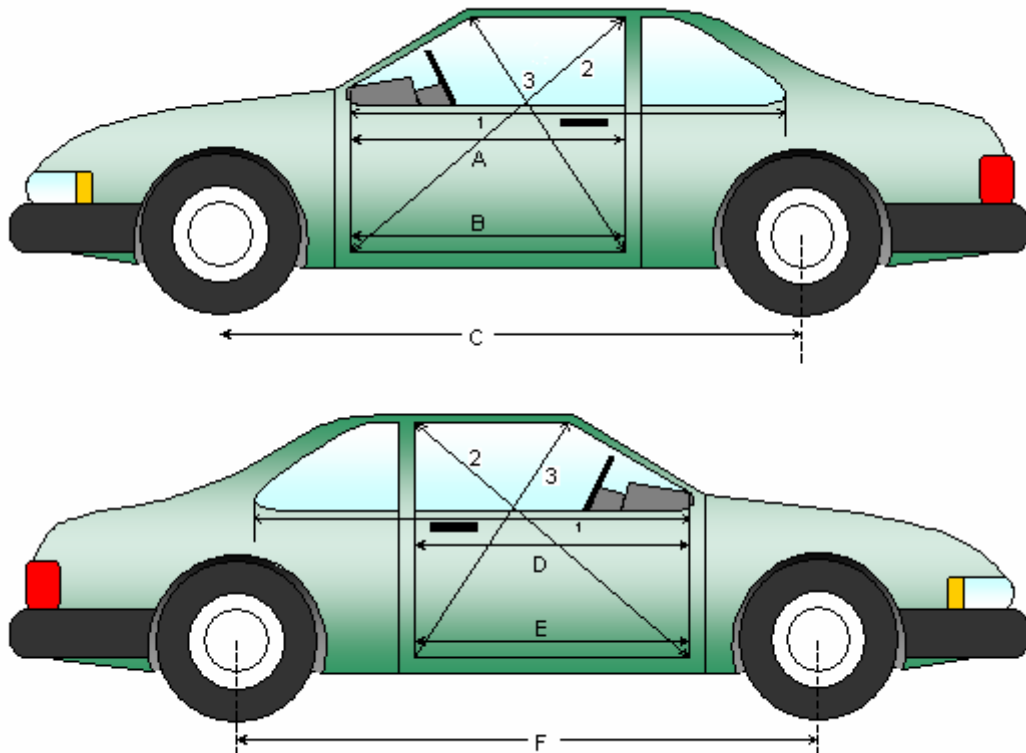
Test Date: 7/18/07

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
1L	Left Side	mm	1012	1012	0
2L	Left Side (Diagonally)	mm	1526	1526	0
3L	Left Side (Diagonally)	mm	1106	1106	0
1R	Right Side	mm	1019	1016	-3
2R	Right Side (Diagonally)	mm	1522	1522	0
3R	Right Side (Diagonally)	mm	1091	1091	0

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2880	2865	-15
F	Right Side Wheel Base	mm	2880	2865	-15



DATA SHEET NO. 16...(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

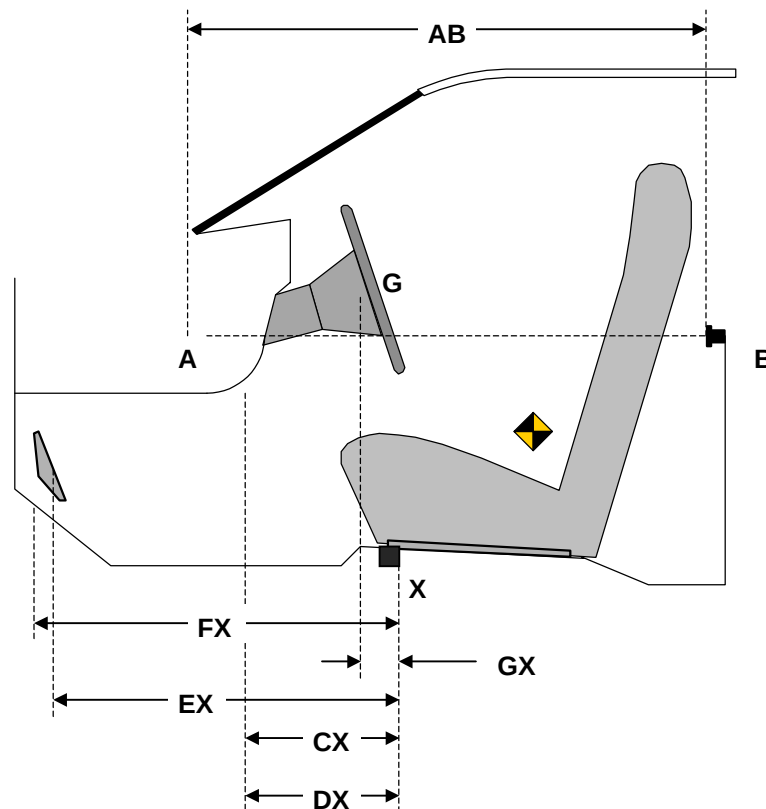
NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	1018	1019	1
CX	Left Knee Bolster to X	mm	275	280	5
DX	Right Knee Bolster to X	mm	276	280	4
EX	Brake Pedal to X	mm	520	521	1
FX	Foot Rest to X	mm	503	531	28
GX	Center of Steering Wheel Hub to X	mm	85	75	-10



DATA SHEET NO. 16...(CONTINUED)

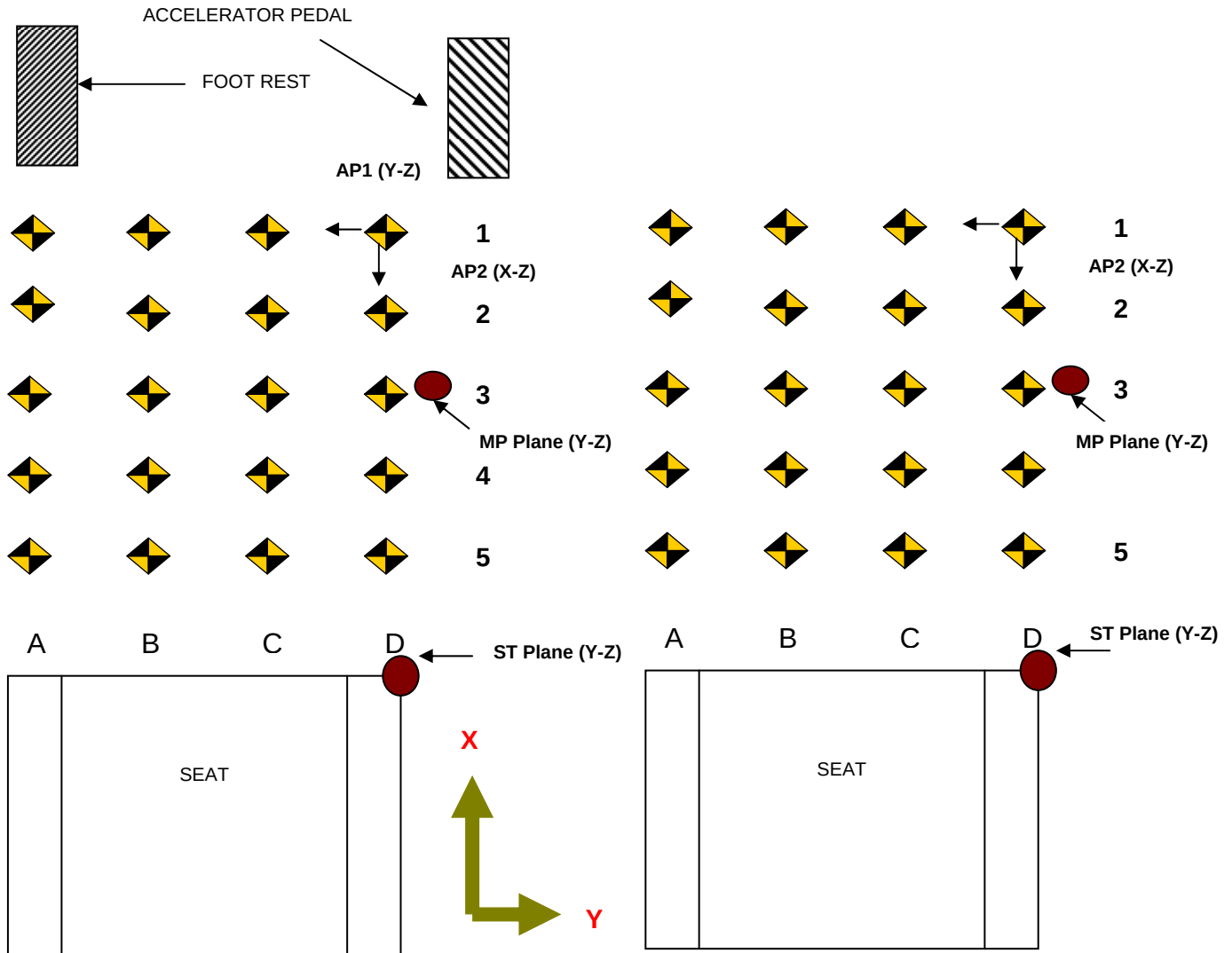
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07



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: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

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	661	727	710	677	666	726	707	692	5	-1	-3	15
2	631	650	640	621	635	652	638	649	4	2	-2	28
3	573	568	562	546	576	575	569	560	3	7	7	14
4	485	479	476	456	489	483	479	477	4	4	3	21
5	392	390	384	380	398	396	390	386	6	6	6	6

DRIVER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	45	161	295	399	40	157	288	440	-5	-4	-7	41
2	29	160	291	416	20	154	282	440	-9	-6	-9	24
3	23	159	287	445	18	152	276	435	-5	-7	-11	-10
4	24	155	282	403	15	146	272	427	-9	-9	-10	24
5	23	152	279	408	16	144	274	423	-7	-8	-5	15

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-104	-58	-65	-198	-111	-69	-68	-68	-7	-11	-3	130
2	-29	-11	-9	-103	-40	-15	-4	-9	-11	-4	5	94
3	30	36	35	14	24	31	36	42	-6	-5	1	28
4	52	52	51	-62	46	48	52	60	-6	-4	1	122
5	51	49	52	14	41	44	52	58	-10	-5	0	44

DATA SHEET NO. 16...(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

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	734	735	736	678	752	750	735	672	18	15	-1	-6
2	661	660	660	646	695	676	664	639	34	16	4	-7
3	581	585	586	590	618	607	592	583	37	22	6	-7
4	493	497	499	500	531	518	509	498	38	21	10	-2
5	404	403	405	406	444	424	416	404	40	21	11	-2

PASSENGER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-393	-261	-142	-38	-301	-173	-55	44	92	88	87	82
2	-397	-262	-143	-21	-321	-181	-66	58	76	81	77	79
3	-405	-263	-142	-16	-336	-187	-73	54	69	76	69	70
4	-414	-266	-146	-14	-349	-203	-83	46	65	63	63	60
5	-418	-270	-145	-16	-368	-214	-94	36	50	56	51	52

PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-76	-75	-78	-122	-87	-81	-85	-125	-11	-6	-7	-3
2	-32	-30	-31	-50	-25	-30	-32	-48	7	0	-1	2
3	14	14	13	10	20	15	14	11	6	1	1	1
4	36	34	33	34	43	37	35	37	7	3	2	3
5	35	34	33	34	42	38	36	32	7	4	3	-2

DATA SHEET NO. 17

FIXED BARRIER LOAD CELL LOCATIONS

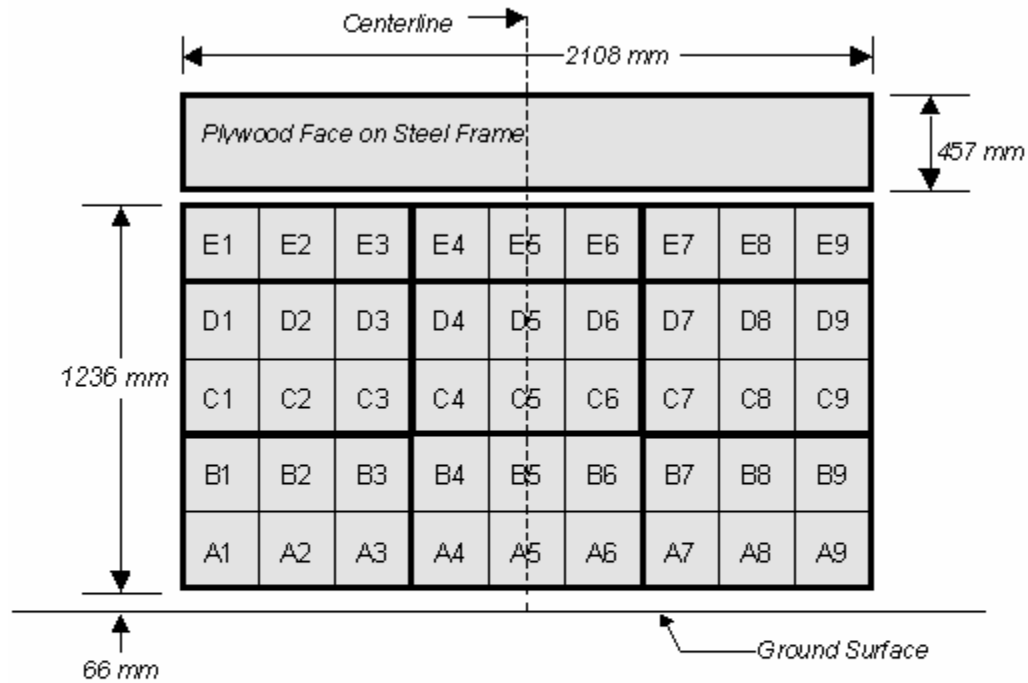
Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

45 Load Cell Rigid Barrier (NHTSA Standard) Load Cell Locations on Fixed Barrier



Group 4 C1 – D3	Group 5 C4 – D6	Group 6 C7 – D9	R&D Additional Group E1– E9
Group 1 A1 – B3	Group 2 A4 – B6	Group 3 A7 – B9	

6 Groups of 6 Load Cells Each

DATA SHEET NO. 18

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

VEHICLE INFORMATION

VIN: JM3TB38C770103683

Wheel base (mm): 2880

Vehicle Size Category: 5-Door MPV

Test Weight (kg): 2230

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): 56.32

Velocity Change (km/h): 63.7

Time of Separation (msec): 73.4

CRUSH PROFILE

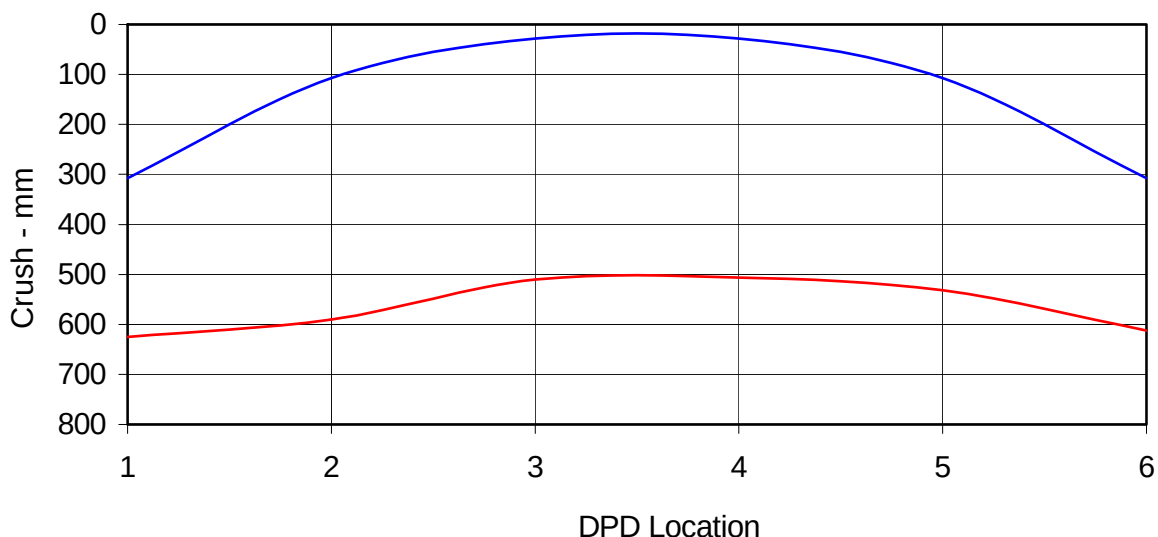
Collision Deformation Classification: 12FDEW6

Midpoint of Damage: Vehicle Centerline

Damage Region Length (mm): 1637

Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	308	625	-317
C2	Crush zone 2 on left side	mm	107	590	-483
C3	Crush zone 3 on left side	mm	28	510	-482
C4	Crush zone 4 on right side	mm	28	506	-478
C5	Crush zone 5 on right side	mm	107	532	-425
C6	Crush zone 6 at right side	mm	308	612	-304



DATA SHEET NO. 19

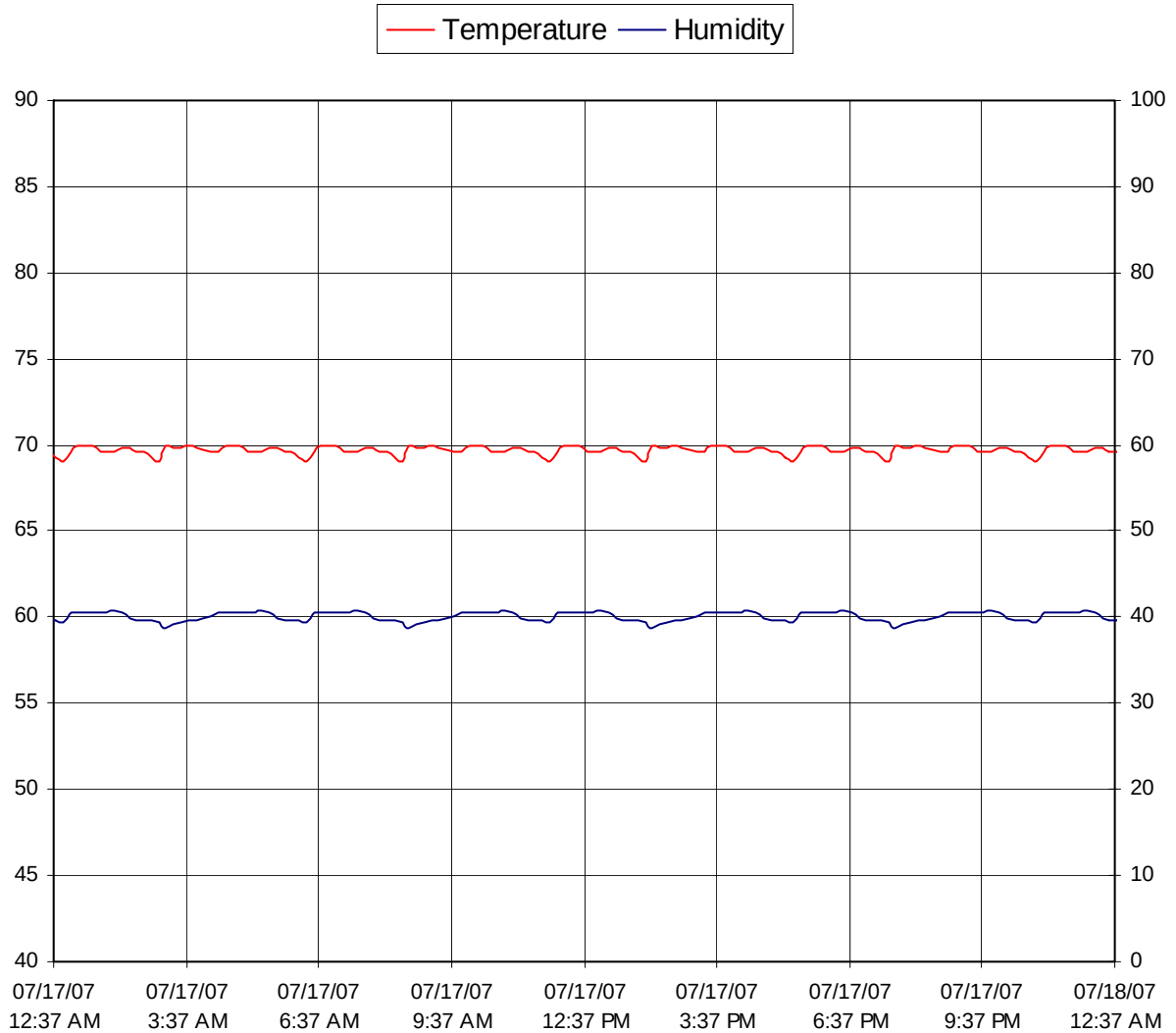
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

<u>Figure</u>		<u>Page</u>
A-1	Load Cell Location	A-1
A-2	Manufacturer's Label	A-2
A-3	Tire Placard	A-3
A-4	Right Front $\frac{3}{4}$ View, As Received	A-4
A-5	Left Rear $\frac{3}{4}$ View, As Received	A-5
A-6	Pre-Test Front View	A-6
A-7	Post-Test Front View	A-7
A-8	Pre-Test Left Side View	A-8
A-9	Post-Test Left Side View	A-9
A-10	Pre-Test Right Side View	A-10
A-11	Post-Test Right Side View	A-11
A-12	Pre-Test Right Front $\frac{3}{4}$ View	A-12
A-13	Post-Test Right Front $\frac{3}{4}$ View	A-13
A-14	Pre-Test Left Rear $\frac{3}{4}$ View	A-14
A-15	Post-Test Left Rear $\frac{3}{4}$ View	A-15
A-16	Post-Test Left Side $\frac{3}{4}$ View of Doors After Impact	A-16
A-17	Post-Test Right Side $\frac{3}{4}$ View of Doors After Impact	A-17
A-18	Pre-Test Windshield	A-18
A-19	Post-Test Windshield	A-19
A-20	Pre-Test Engine Compartment	A-20
A-21	Post-Test Engine Compartment (Vehicle Moved)	A-21
A-22	Pre-Test Fuel Cap	A-22
A-23	Post-Test Fuel Cap	A-23
A-24	Pre-Test Front Underbody	A-24
A-25	Post-Test Front Underbody	A-25
A-26	Pre-Test Mid Underbody	A-26
A-27	Post-Test Mid Underbody	A-27
A-28	Pre-Test Rear Underbody	A-28
A-29	Post-Test Rear Underbody	A-29
A-30	Pre-Test Driver Dummy Front View (Head Position)	A-30
A-31	Post-Test Driver Dummy Front View (Head Position)	A-31
A-32	Pre-Test Driver Dummy (Through Window)	A-32
A-33	Post-Test Driver Dummy (Through Window)	A-33
A-34	Pre-Test Driver Dummy (Door Open)	A-34
A-35	Post-Test Driver Dummy (Door Open)	A-35

LIST OF PHOTOGRAPHS...(CONTINUED)

Figure		Page
A-36	Pre-Test Driver Dummy Feet	A-36
A-37	Post-Test Driver Dummy Feet	A-37
A-38	Pre-Test Driver Side Knee Bolster	A-38
A-39	Post-Test Driver Side Knee Bolster	A-39
A-40	Pre-Test Driver Side Floor Pan	A-40
A-41	Post-Test Driver Side Floor Pan	A-41
A-42	Post-Test Driver Dummy Head	A-42
A-43	Post-Test Driver Dummy Airbag Contact	A-43
A-44	Pre-Test Passenger Dummy Front View (Head Position)	A-44
A-45	Post-Test Passenger Dummy Front View (Head Position)	A-45
A-46	Pre-Test Passenger Dummy Front (Through Window)	A-46
A-47	Post-Test Passenger Dummy Front (Through Window)	A-47
A-48	Pre-Test Passenger Dummy (Door Open)	A-48
A-49	Post-Test Passenger Dummy (Door Open)	A-49
A-50	Pre-Test Passenger Dummy Feet	A-50
A-51	Post-Test Passenger Dummy Feet	A-51
A-52	Pre-Test Passenger Side Glove Box	A-52
A-53	Post-Test Passenger Side Glove Box	A-53
A-54	Pre-Test Passenger Side Floor Pan	A-54
A-55	Post-Test Passenger Side Floor Pan	A-55
A-56	Post-Test Passenger Dummy Head	A-56
A-57	Post-Test Passenger Dummy Airbag Contact	A-57
A-58	Vehicle on Rollover Device (0°)	A-58
A-59	Vehicle on Rollover Device (90°)	A-59
A-60	Vehicle on Rollover Device (180°)	A-60
A-61	Vehicle on Rollover Device (270°)	A-61
A-62	Vehicle Impact	A-62

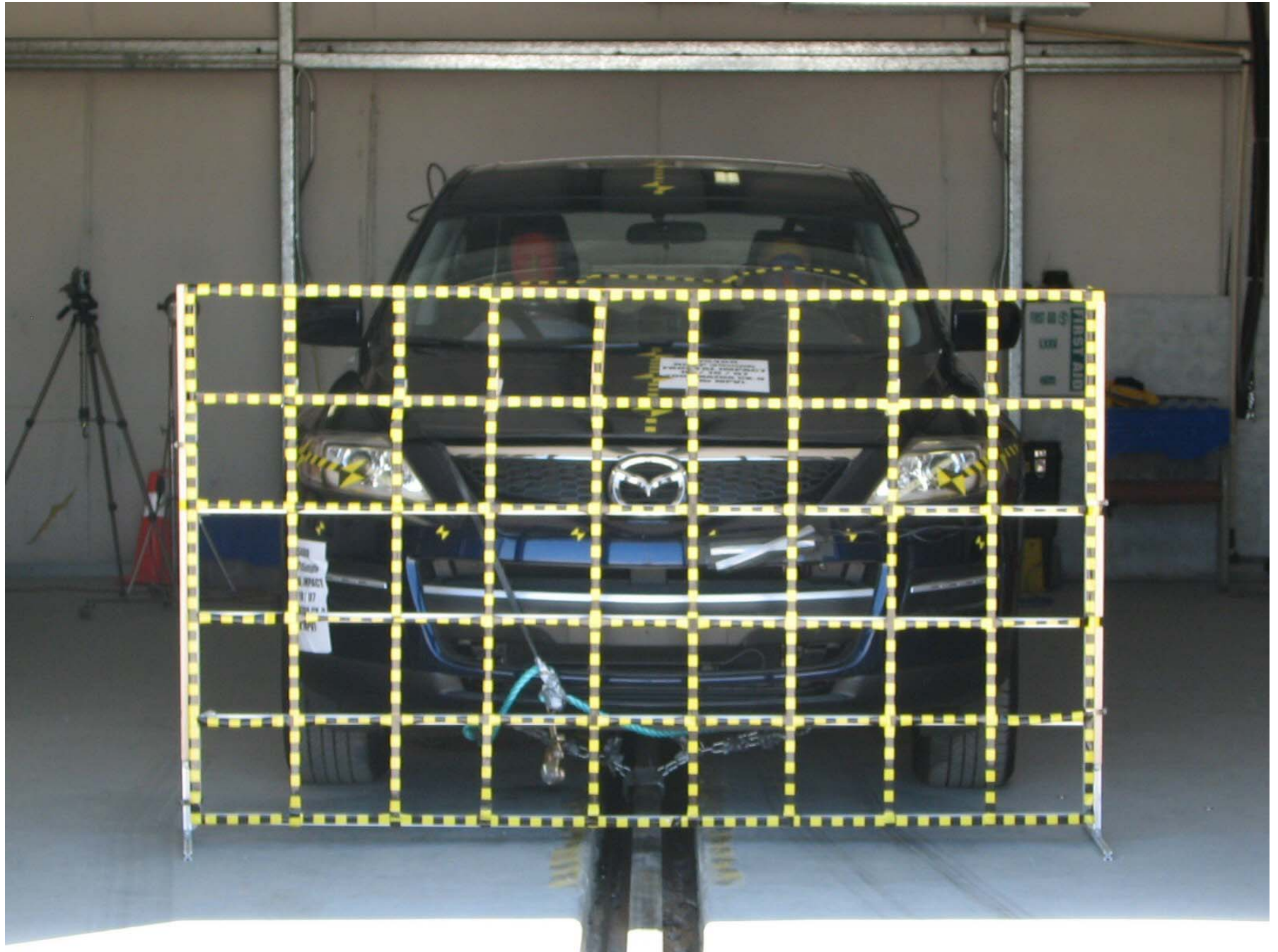


Figure A-1: Load Cell Location

This Space Intentionally Left Blank

MFD. BY MAZDA MOTOR CORPORATION

DATE 12/06

GVWR/PNBV 6025 LB 2733 KG

FRONT GAWR/PNBE AV 2881 LB 1307 KG

REAR GAWR/PNBE AR 3210 LB 1456 KG

WITH/AVEC P245/60R18 104H TIRES/PNEUS WITH/AVEC P245/60R18 104H TIRES/PNEUS

18X7 1/2J RIMS/JANTES

18X7 1/2J RIMS/JANTES

250 KPA/36 PSI COLD/A FROID

250 KPA/36 PSI COLD/A FROID

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

VIN: JM3TB38C770103683 TYPE:MPV

COLOR CODE:35J MADE IN JAPAN



Figure A-2: Manufacturer's Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY : TOTAL 7 : FRONT 2 : REAR 5

The combined weight of occupants and cargo should never exceed 539kg or 1188lbs.

TIRE	SIZE	COLD TIRE PRESSURE
FRONT	P245/60 R18	250KPA , 36PSI
REAR	P245/60 R18	250KPA , 36PSI
SPARE	T155/90 D18	420KPA , 60PSI

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

(TD11A)

Figure A-3: Tire Placard



Figure A-4: Right Front $\frac{3}{4}$ View, As Received



Figure A-5: Left Rear $\frac{3}{4}$ View, as Received



Figure A-6: Pre-Test Front View

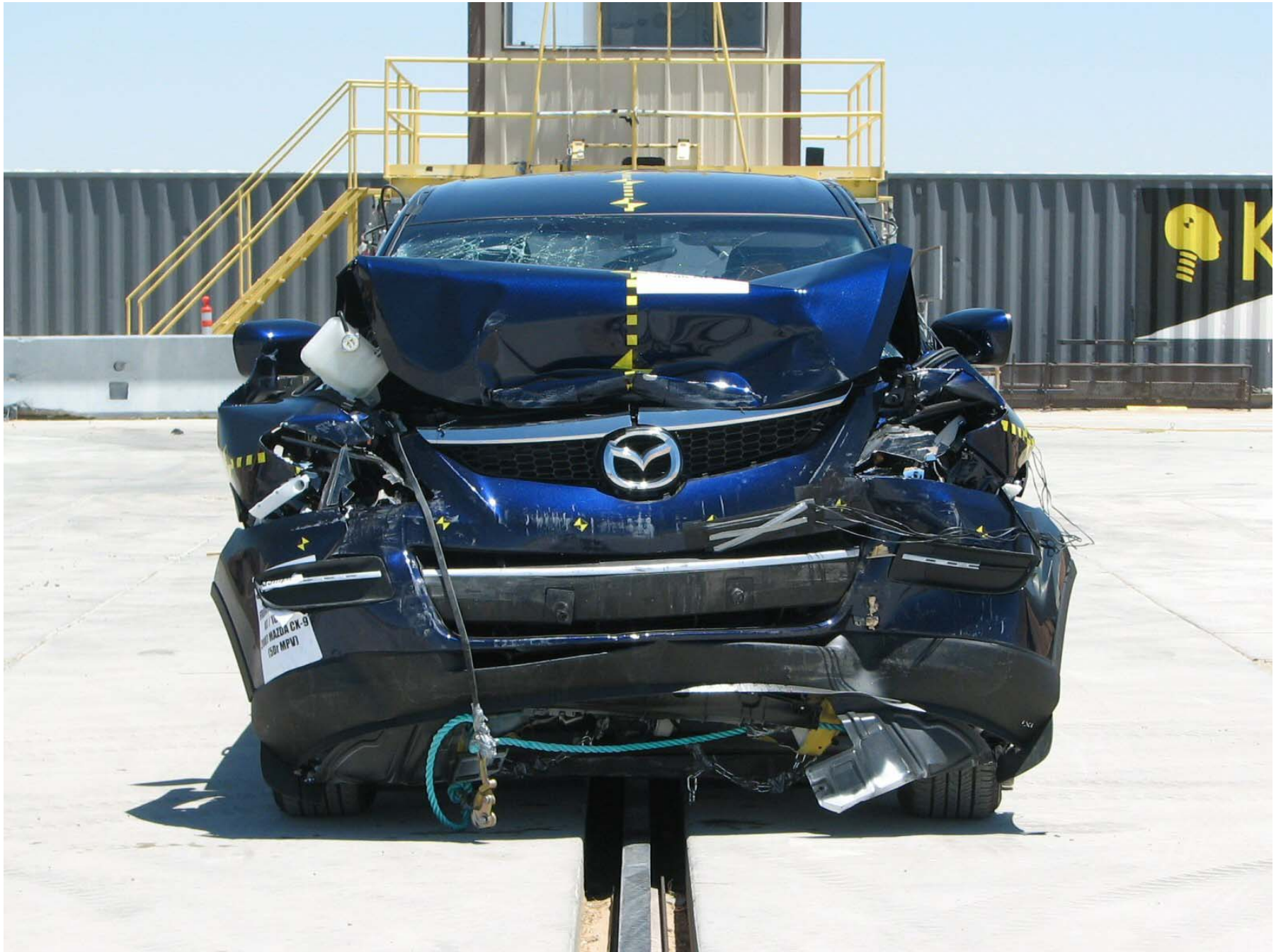


Figure A-7: Post-Test Front View (Vehicle Moved)



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 $\frac{3}{4}$ View



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



Figure A-14: Pre-Test Left Rear $\frac{3}{4}$ View



Figure A-15: Post-Test Left Rear $\frac{3}{4}$ View



Figure A-16: Post-Test Left Side $\frac{3}{4}$ View of Doors After Impact



Figure A-17: Post-Test Right Side $\frac{3}{4}$ View of Doors After Impact

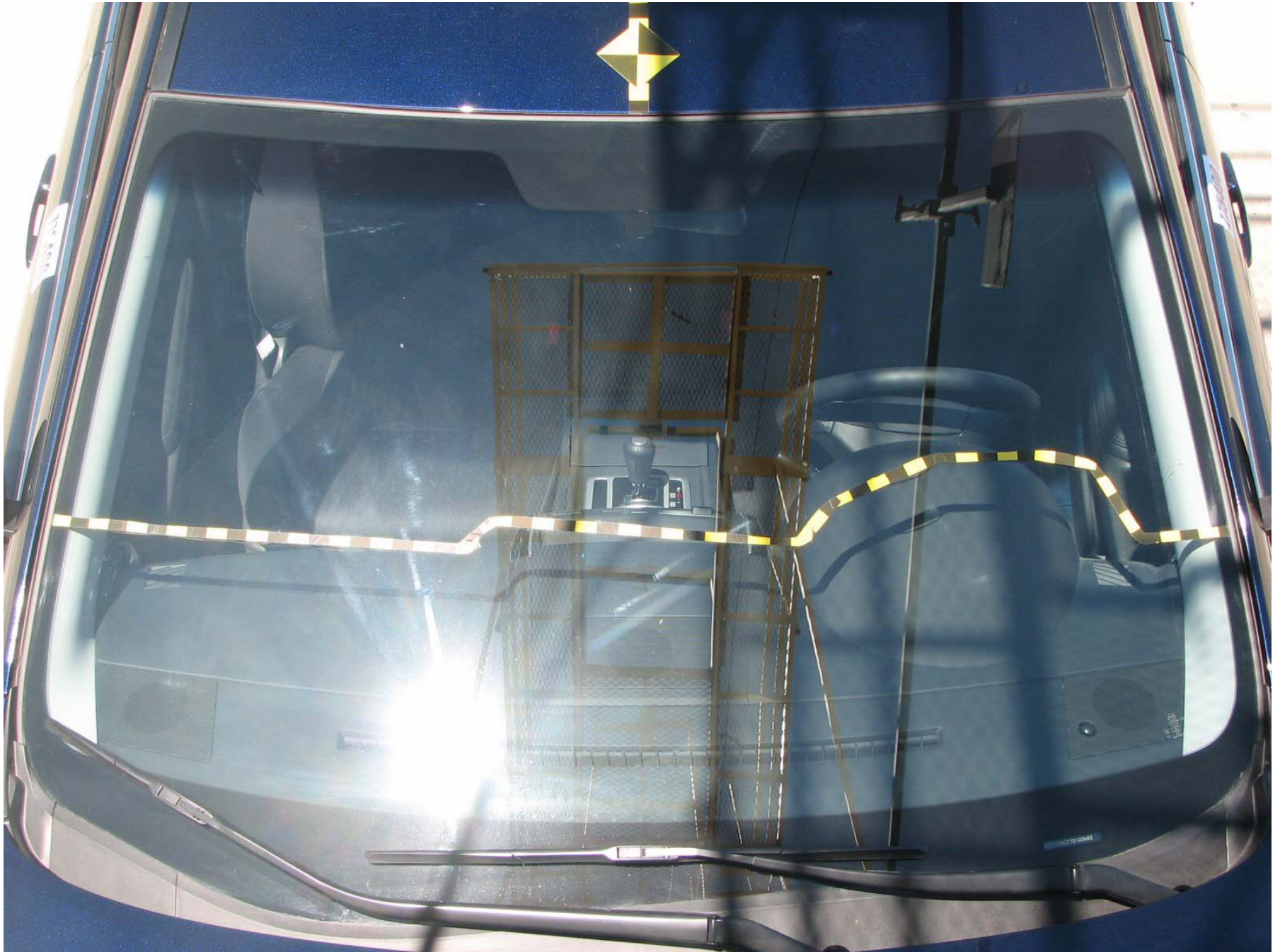


Figure A-18: Pre-Test Windshield



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

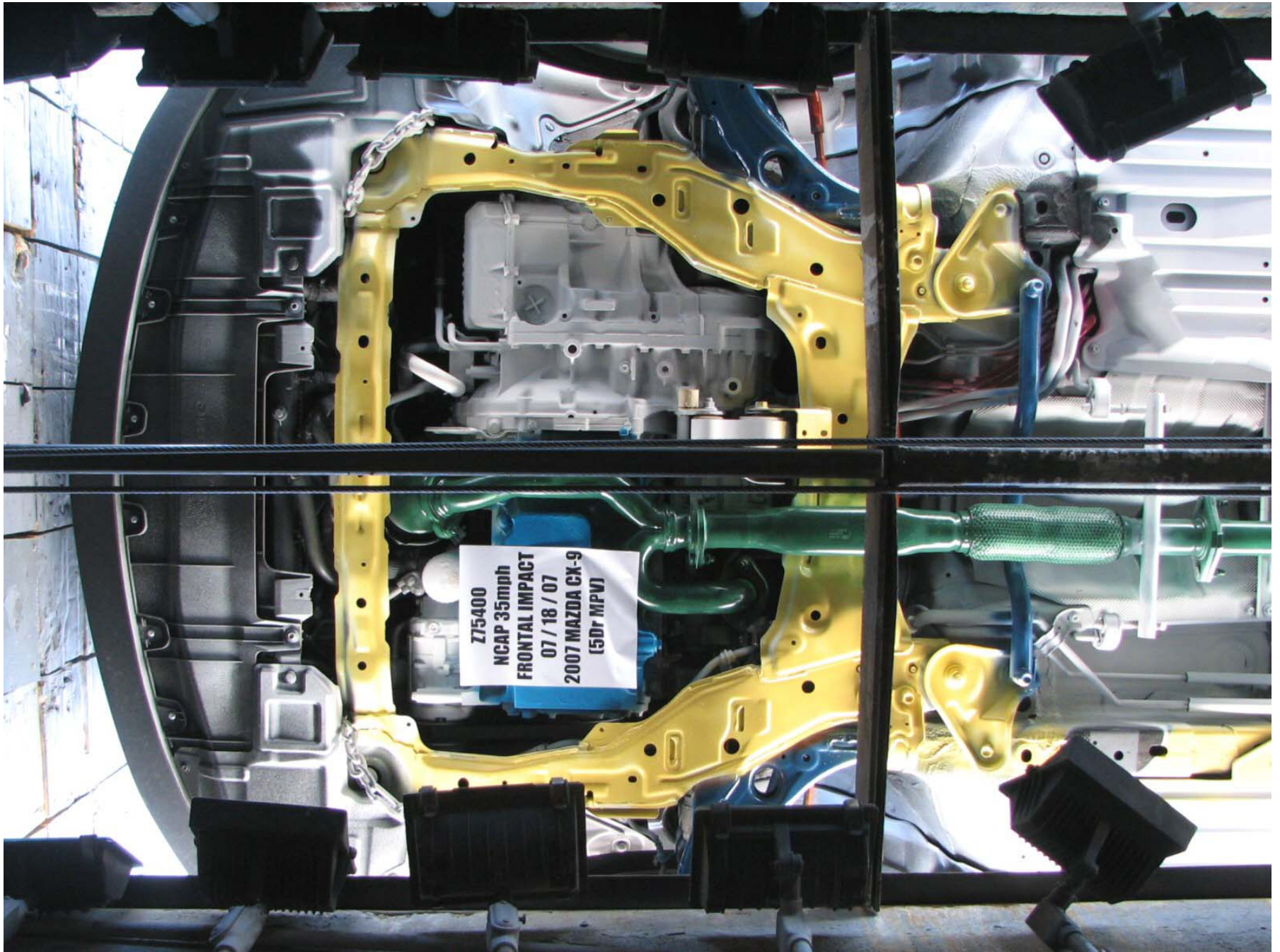


Figure A-24: Pre-Test Front Underbody

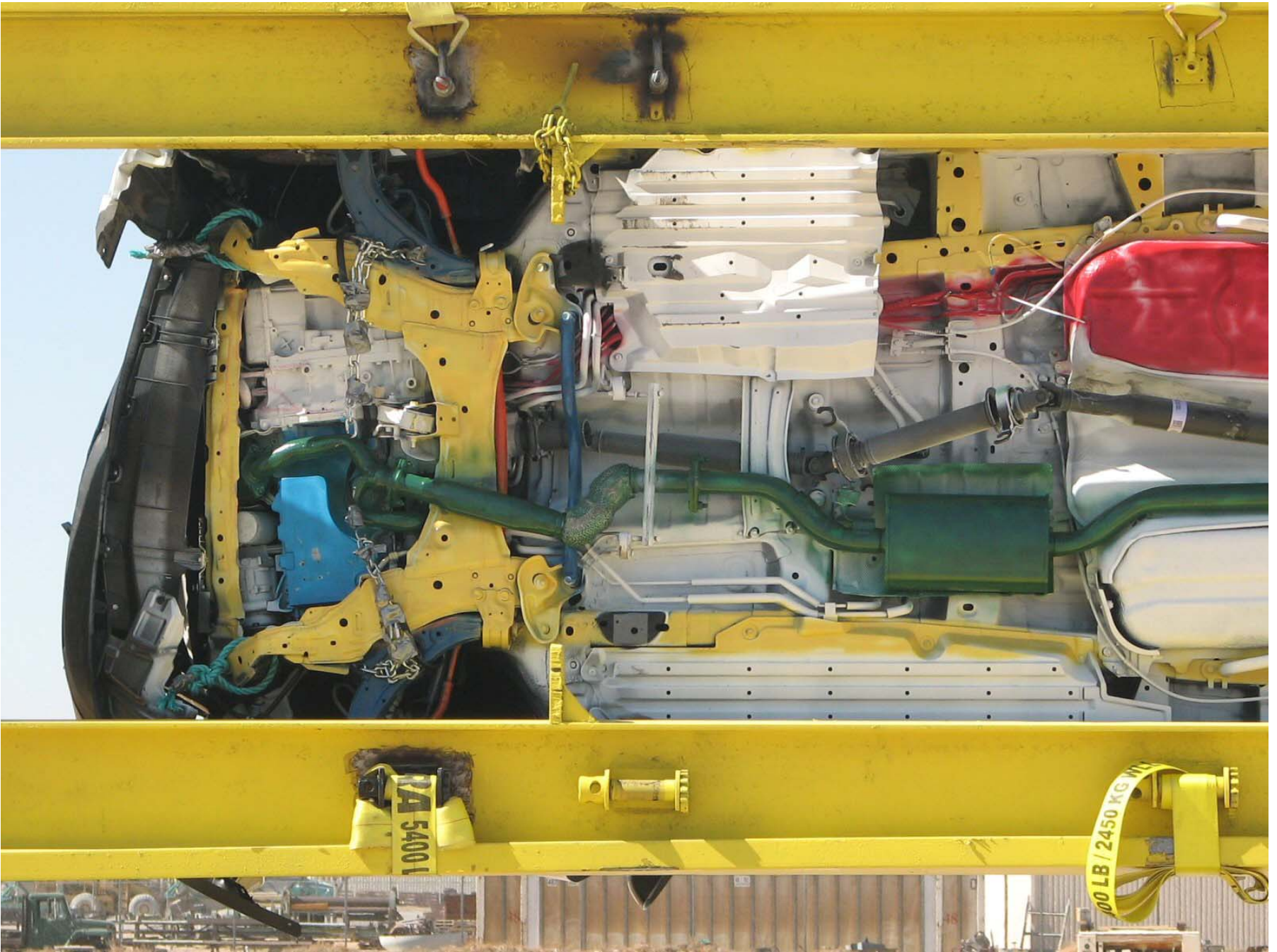


Figure A-25: Post-Test Front Underbody

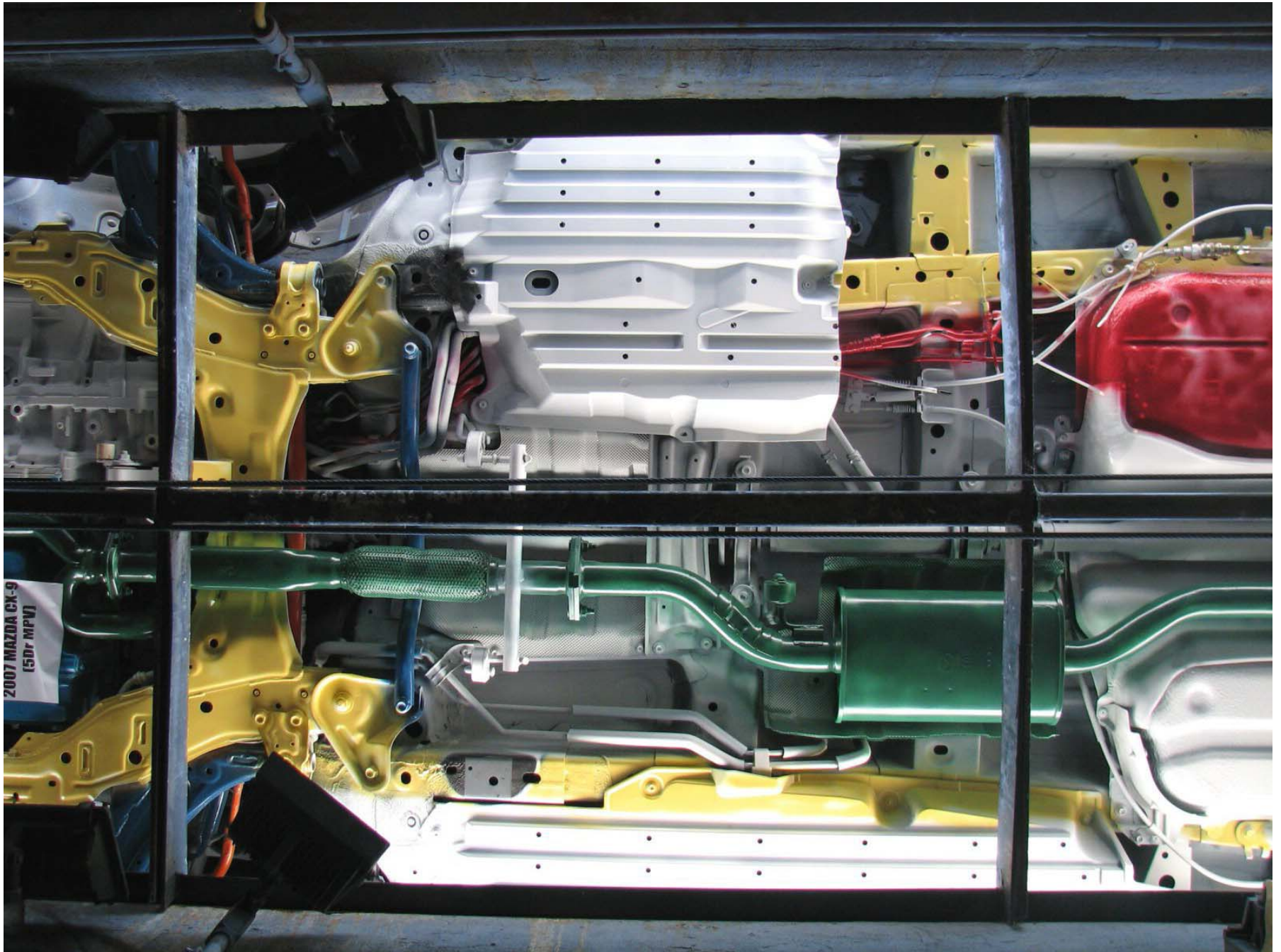


Figure A-26: Pre-Test Mid Underbody

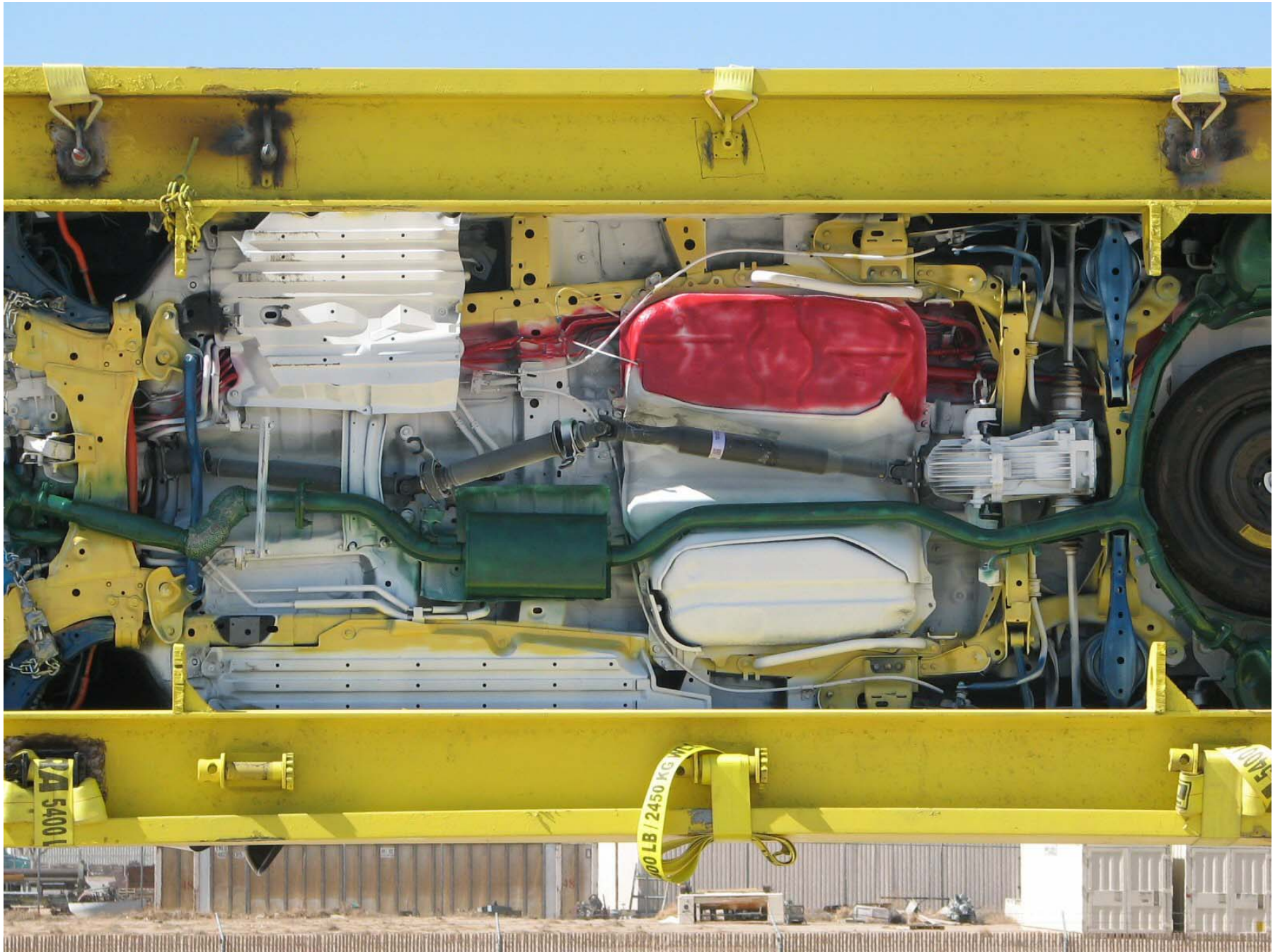


Figure A-27: Post-Test Mid Underbody

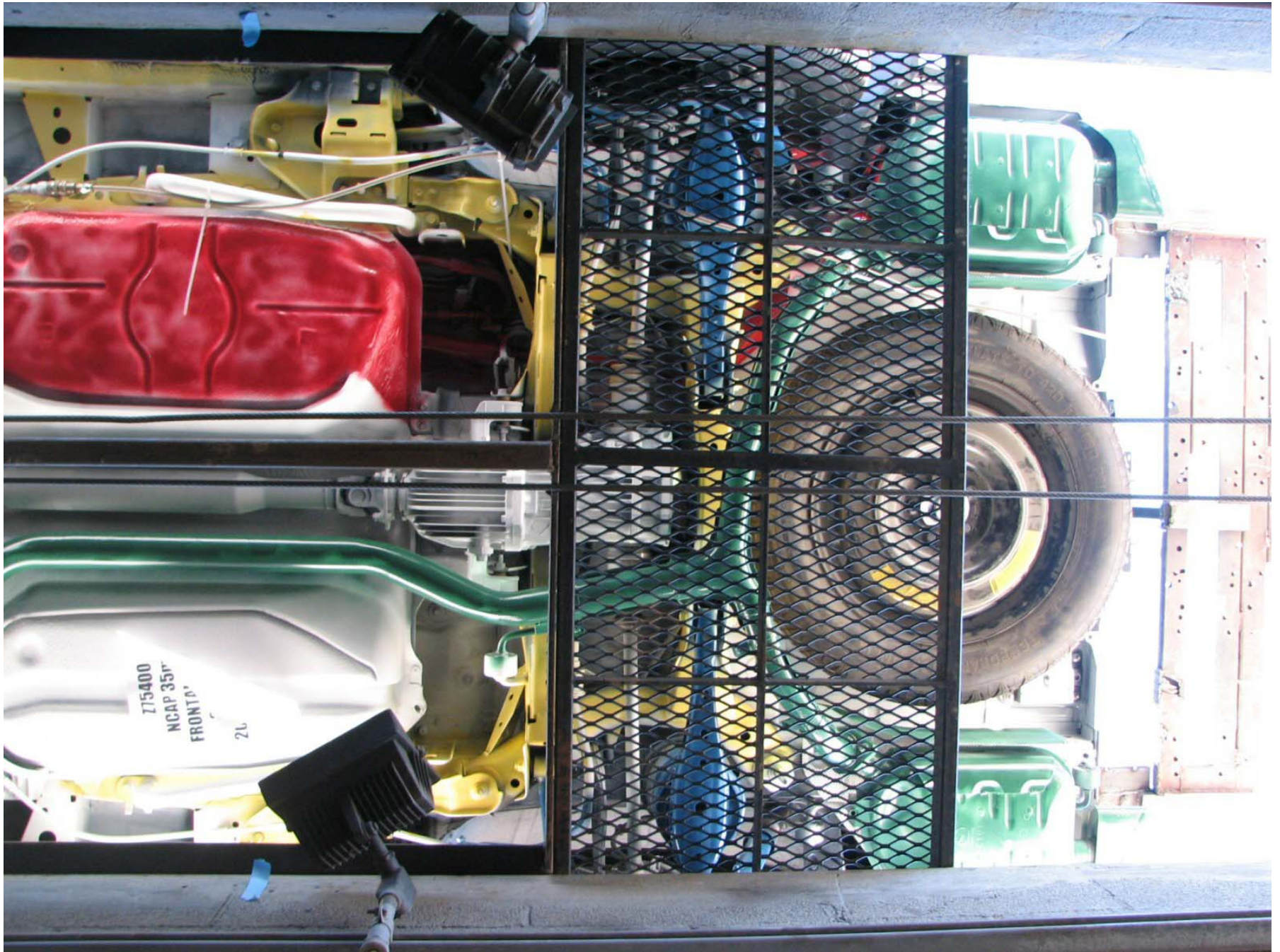


Figure A-28: Pre-Test Rear Underbody

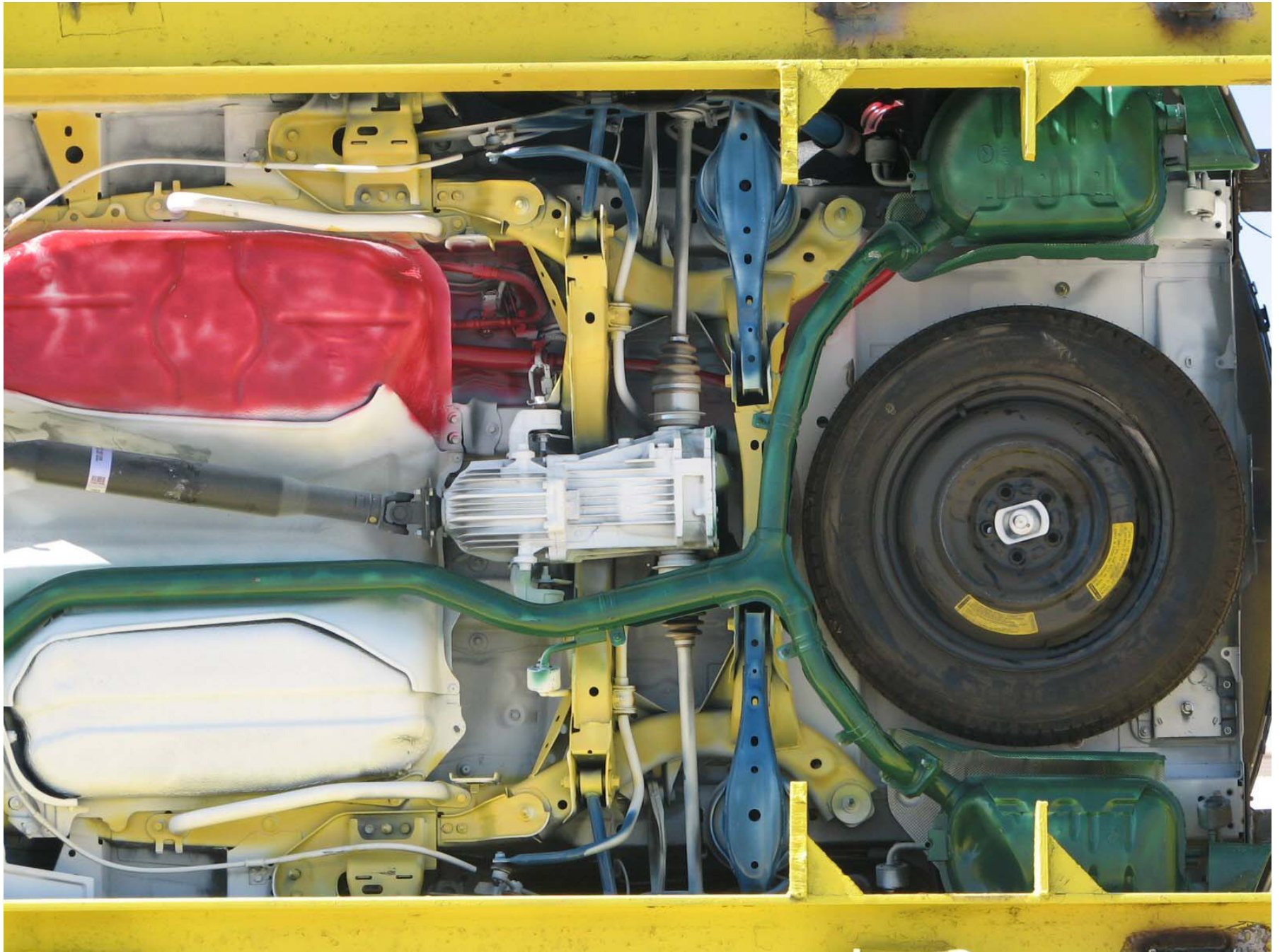


Figure A-29: Post-Test Rear Underbody



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

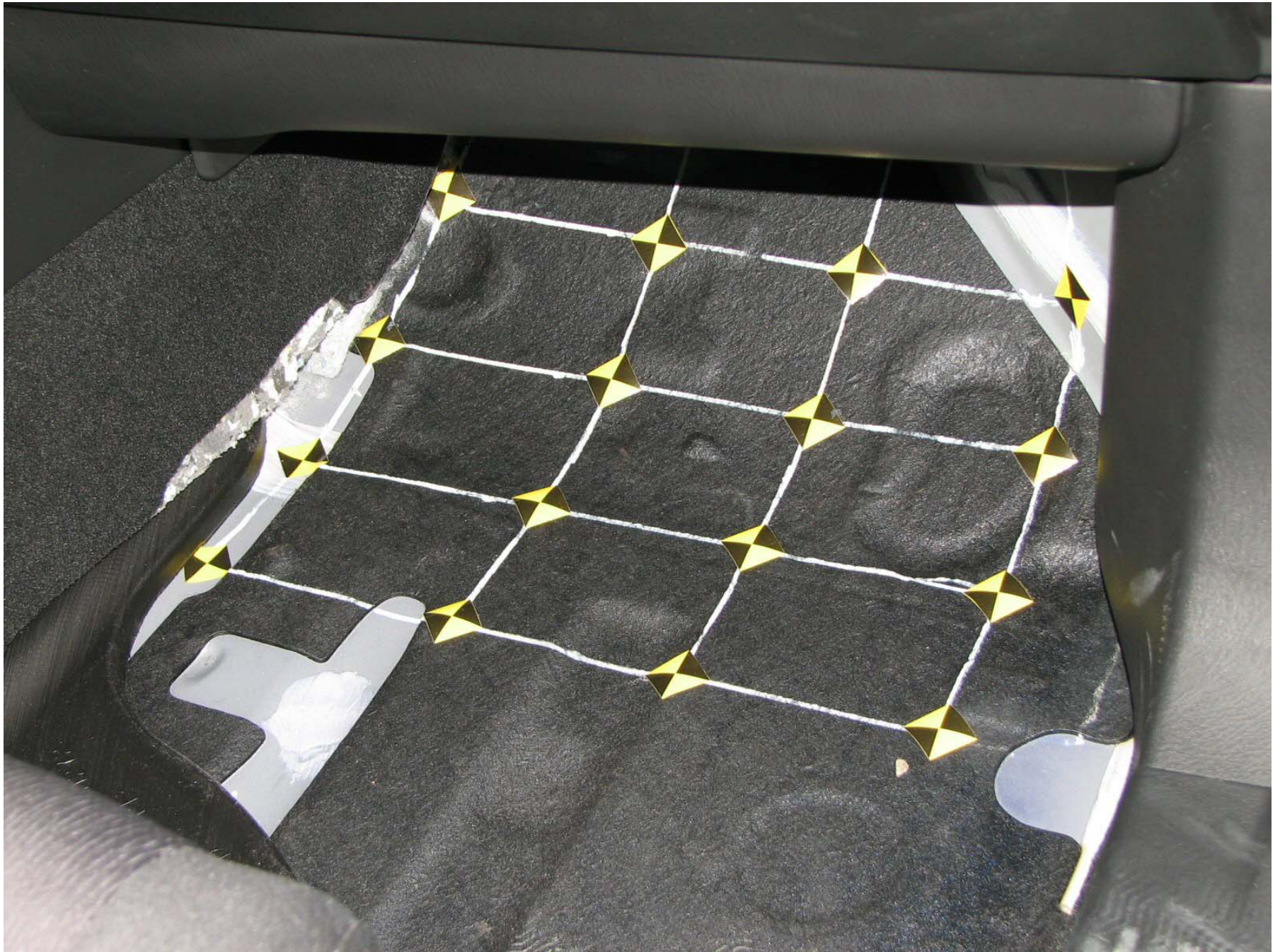


Figure A-54: Pre-Test Passenger Side Floor Pan



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°)

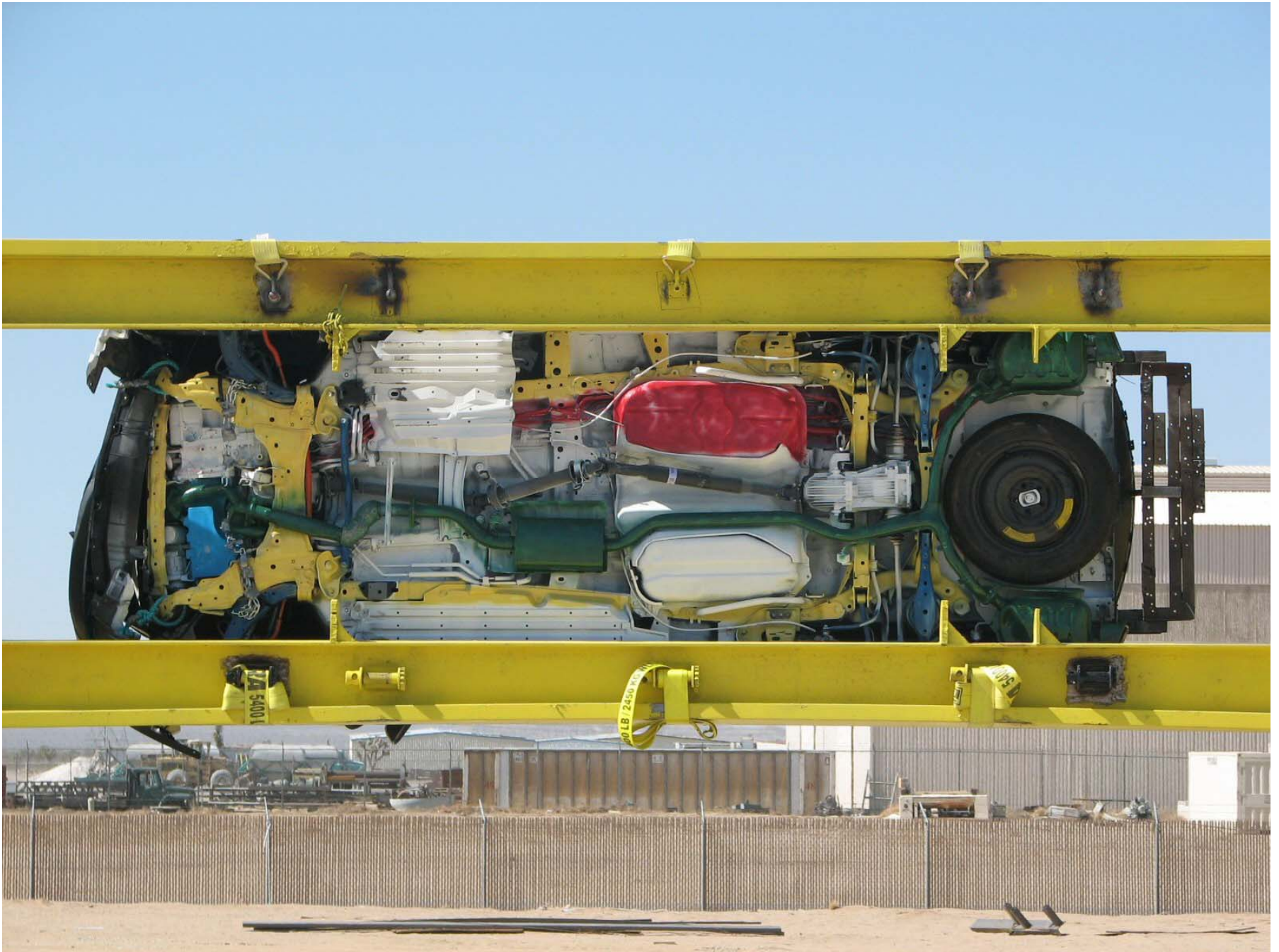


Figure A-61: Vehicle on Rollover Device (270°)



Figure A-62: Vehicle Impact

APPENDIX B
DATA PLOTS

LIST OF DATA PLOTS

Data Plot		Page
B-1	Driver Head Primary X	B-1
	Driver Head Primary Y	B-1
	Driver Head Primary Z	B-1
	Driver Head Resultant Primary	B-1
B-2	Driver Chest Primary X	B-2
	Driver Chest Primary Y	B-2
	Driver Chest Primary Z	B-2
	Driver Chest Resultant Primary	B-2
B-3	Driver Left Femur Force Z	B-3
	Driver Right Femur Force Z	B-3
B-4	Passenger Head Primary X	B-4
	Passenger Head Primary Y	B-4
	Passenger Head Primary Z	B-4
	Passenger Head Resultant Primary	B-4
B-5	Passenger Chest Primary X	B-5
	Passenger Chest Primary Y	B-5
	Passenger Chest Primary Z	B-5
	Passenger Chest Resultant Primary	B-5
B-6	Passenger Left Femur Force Z	B-6
	Passenger Right Femur Force Z	B-6

LIST OF DATA PLOTS...(CONTINUED)

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

LIST OF DATA PLOTS...(CONTINUED)

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

LIST OF DATA PLOTS...(CONTINUED)

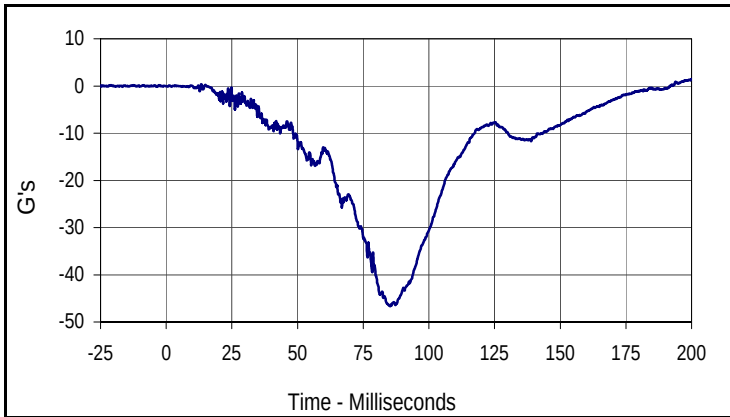
Passenger Chest Redundant Y
Passenger Chest Redundant Z
Passenger Chest Resultant Redundant
Passenger Chest Redundant X Velocity
Passenger Chest Redundant X Displacement
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Pelvis Resultant
Passenger Pelvis X 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

LIST OF DATA PLOTS...(CONTINUED)

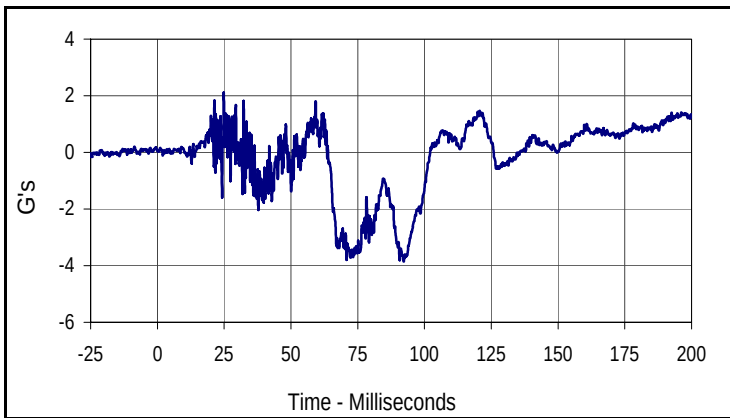
Vehicle Left Rear X Displacement
Vehicle Right Rear X
Vehicle Right Rear X Velocity
Vehicle Right Rear X Displacement
Vehicle Engine Top
Vehicle Engine Top Velocity
Vehicle Engine Top Displacement
Vehicle Engine Bottom
Vehicle Engine Bottom Velocity
Vehicle Engine Bottom Displacement
Vehicle Left Brake 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: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

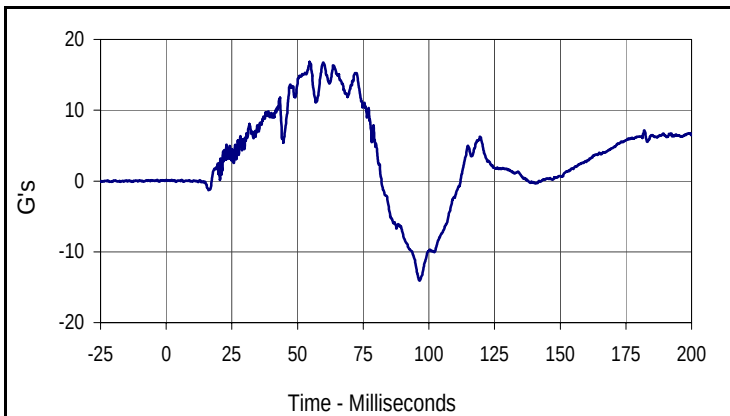
Test Date: 7/18/07
 NHTSA No.: Z75400



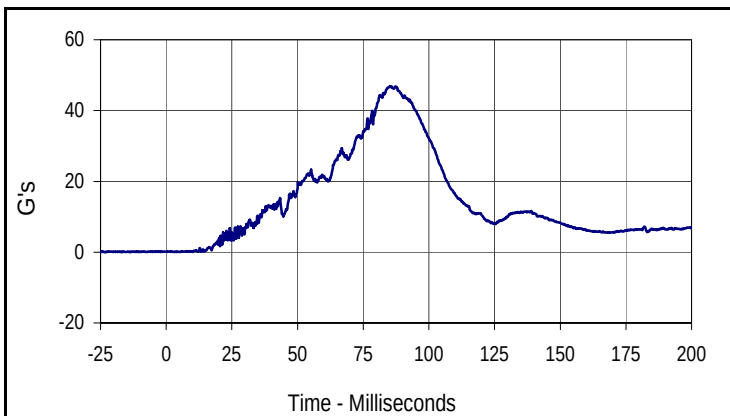
Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
1.4	199.9	-46.7	85.2



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.1	24.9	-3.9	92.3



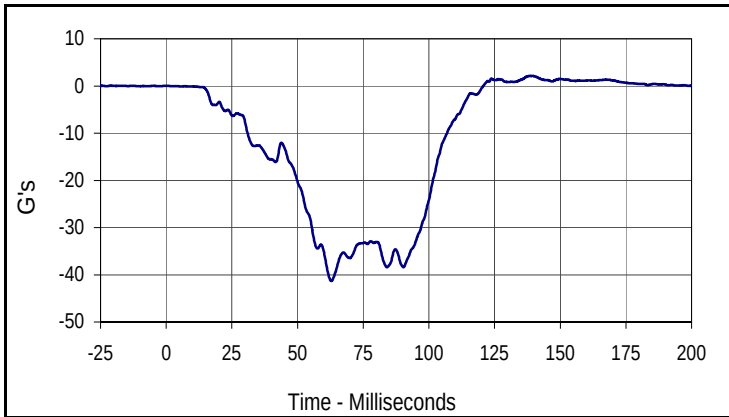
Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
16.8	54.6	-14.1	96.5



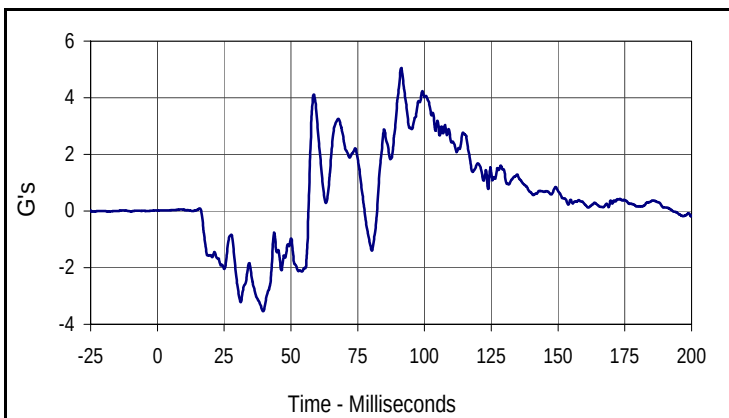
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
46.9	85.2	0.0	4.0

Test Vehicle: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

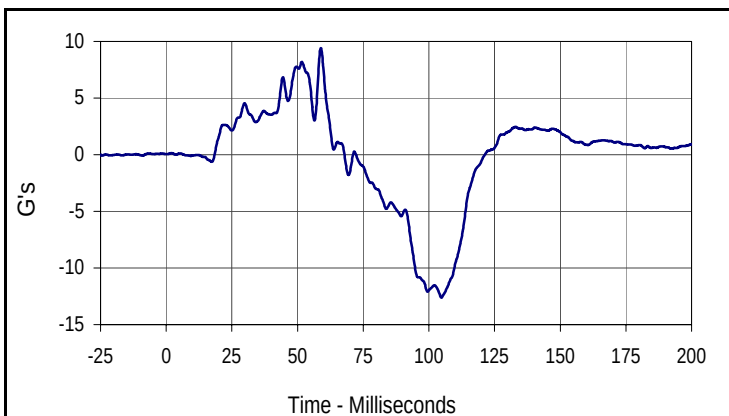
Test Date: 7/18/07
 NHTSA No.: Z75400



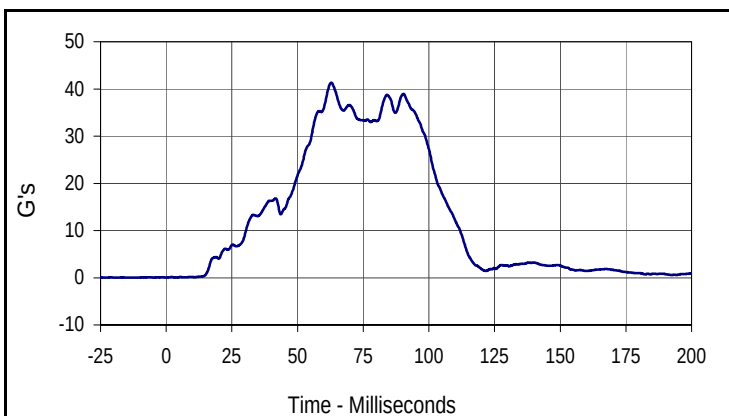
Curve Description			
Driver Chest Primary X			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
2.1	139.4	-41.3	62.9



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
5.0	91.3	-3.5	39.6



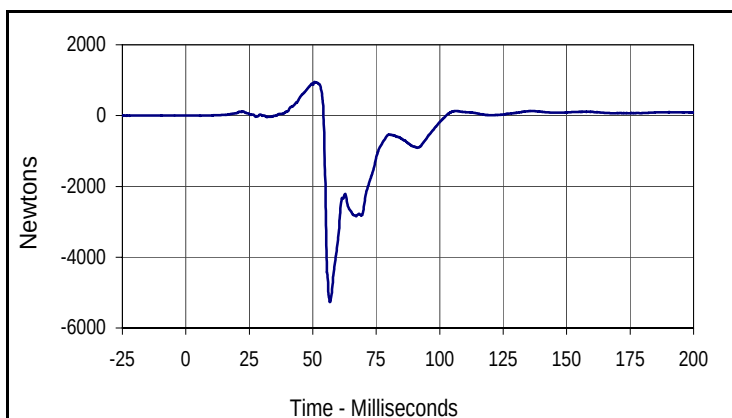
Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
9.4	58.9	-12.6	104.8



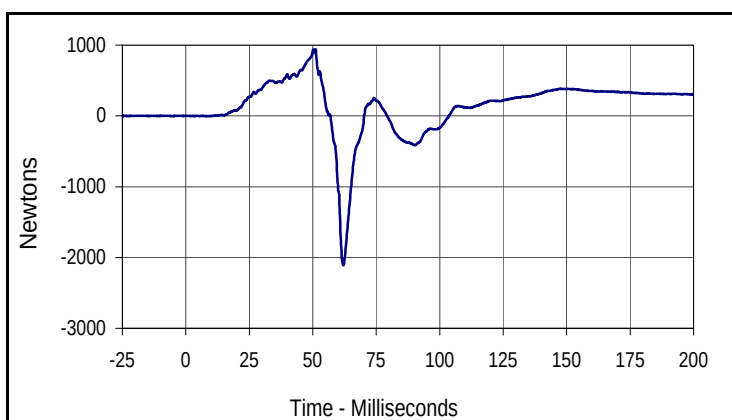
Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
41.3	62.8	0.0	3.7

Test Vehicle: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07
 NHTSA No.: Z75400



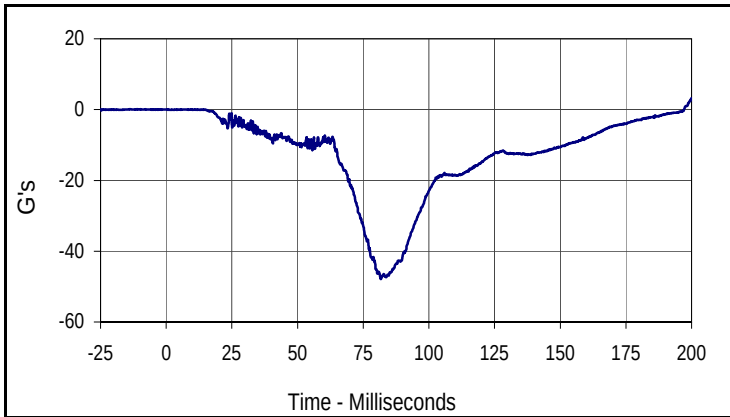
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
007	FIL	600	Newtons
Max	Time	Min	Time
952.1	50.7	-5265.1	56.8



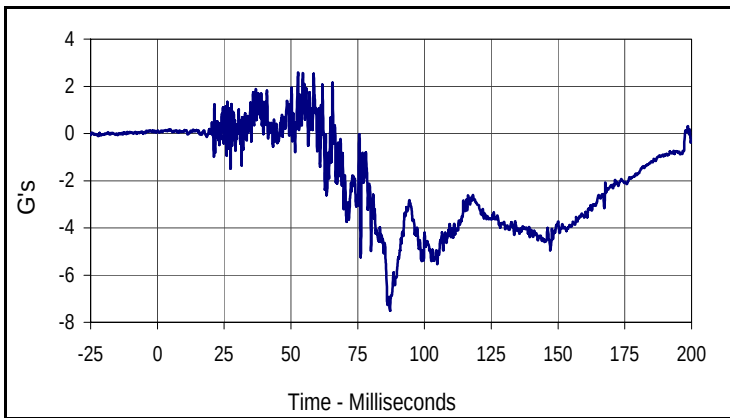
Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
942.5	51.1	-2110.4	62.0

Test Vehicle: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

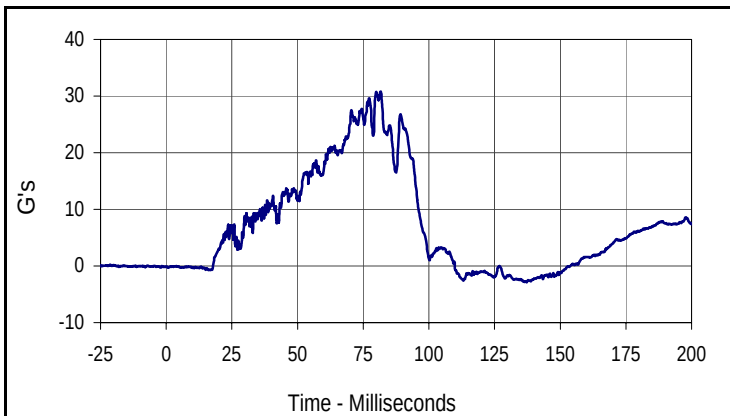
Test Date: 7/18/07
 NHTSA No.: Z75400



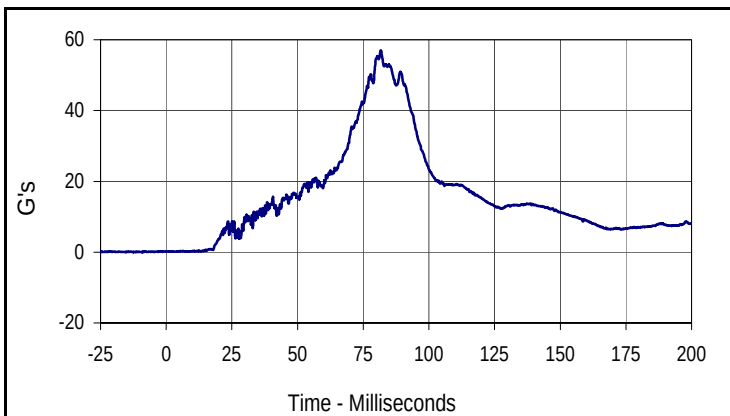
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
009	FIL	1000	G's
Max	Time	Min	Time
3.2	200.0	-47.8	81.7



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
2.6	52.6	-7.5	87.1



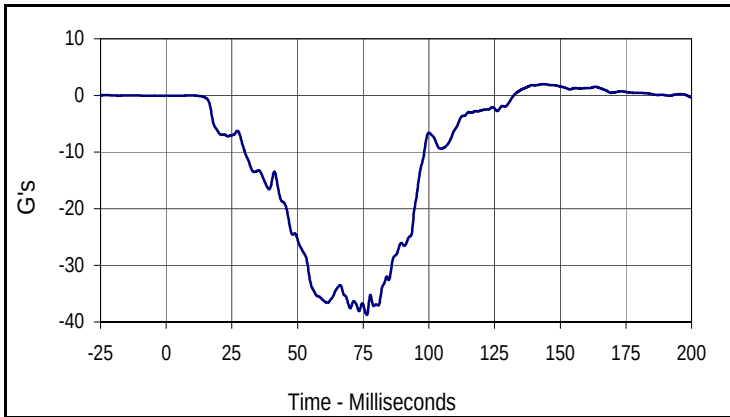
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
011	FIL	1000	G's
Max	Time	Min	Time
30.8	81.6	-2.9	137.2



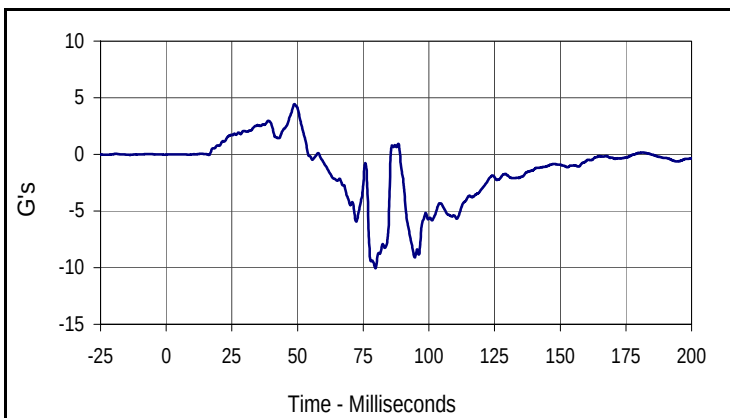
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
57.0	81.7	0.1	8.1

Test Vehicle: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

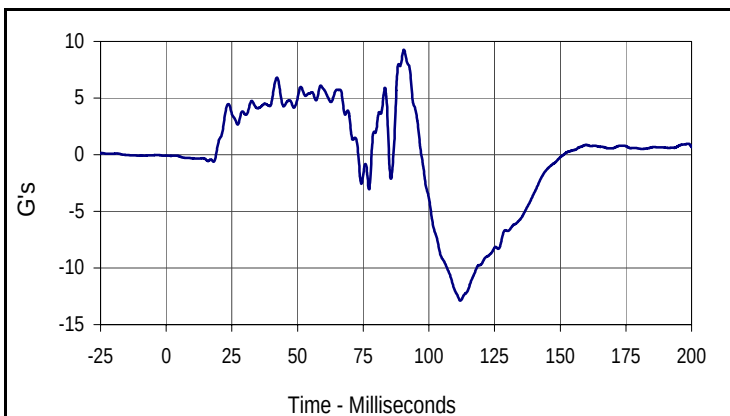
Test Date: 7/18/07
 NHTSA No.: Z75400



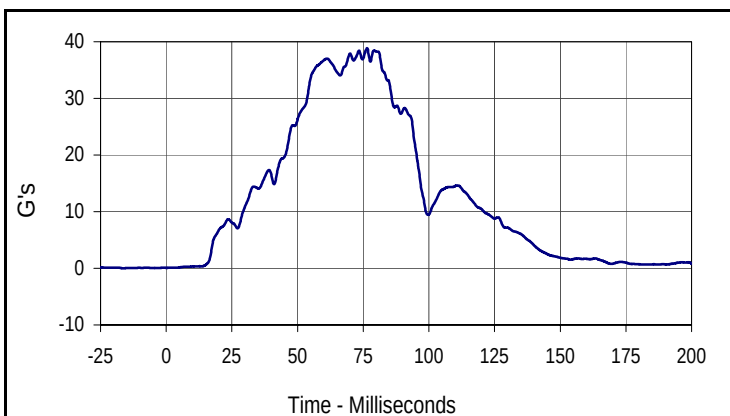
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
2.0	143.3	-38.8	76.4



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
4.4	48.8	-10.1	79.7



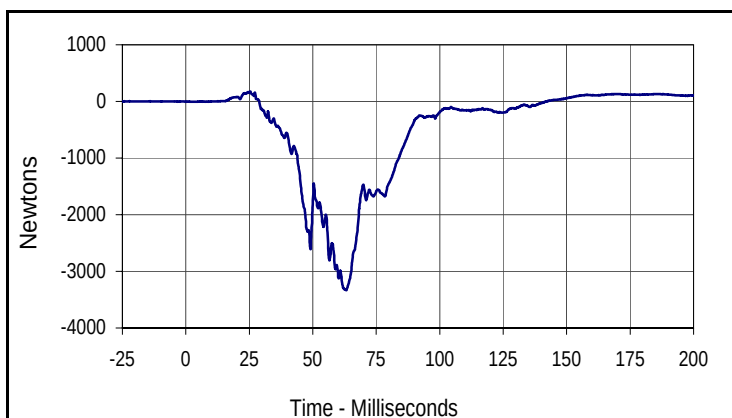
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
9.3	90.5	-12.9	112.0



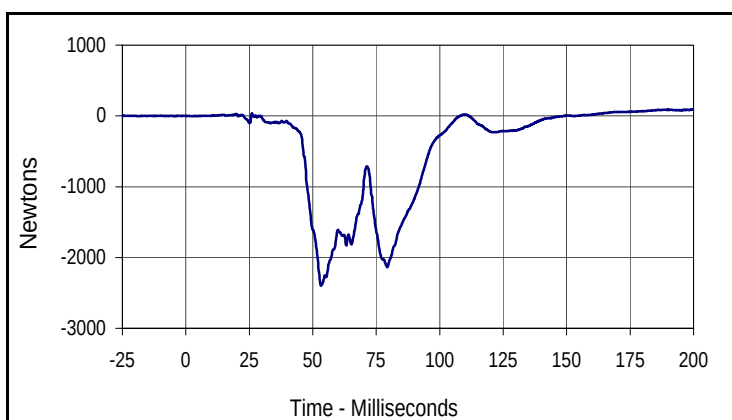
Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
38.9	76.5	0.1	0.2

Test Vehicle: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07
 NHTSA No.: Z75400



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
176.0	25.3	-3333.7	63.1



Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
93.4	200.0	-2399.0	53.2

APPENDIX C
DUMMY CALIBRATION DATA

Test Program: Hybrid III 50th Percentile Male Head Drop Test

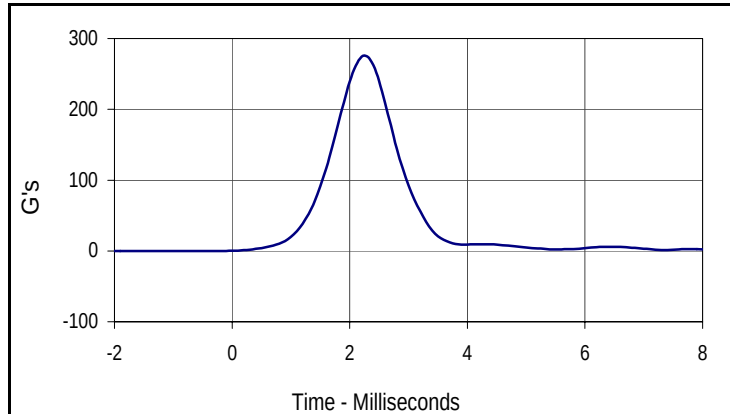
Test Date: 6/28/07

ATD Serial No.: 034

Test I.D.: HD06Q



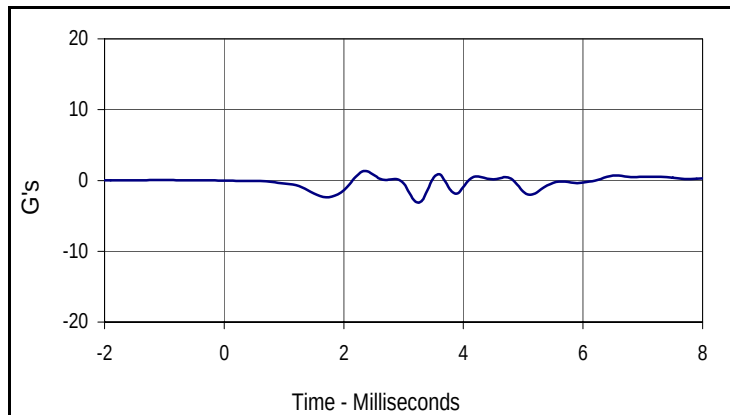
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	274.8	Pass
Peak Lateral Acceleration	G's	≤15.0	3.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description

Head Resultant

CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
274.8	2.3	0.0	-0.1



Curve Description

Head Y

CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.3	2.4	-3.0	3.2

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

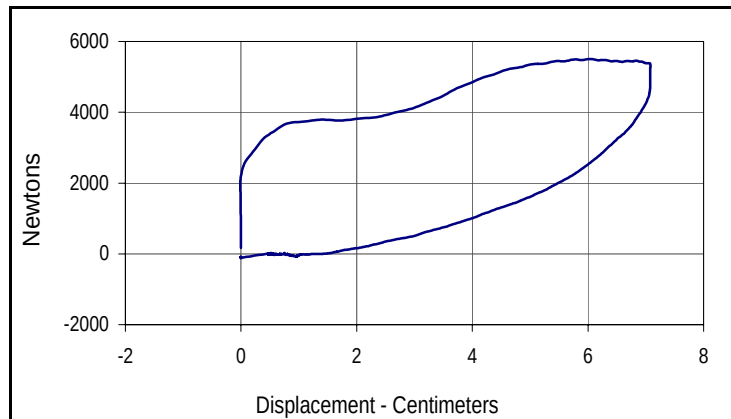
Test Date: 7/3/07

ATD Serial No.: 034

Test I.D.: CH07A



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	6.73	Pass
Peak Probe Force	Newtons	5159 to 5893	5507	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	7.08	Pass
Internal Hysteresis	%	69 to 85	74.5	Pass
Overall Test Results				Pass



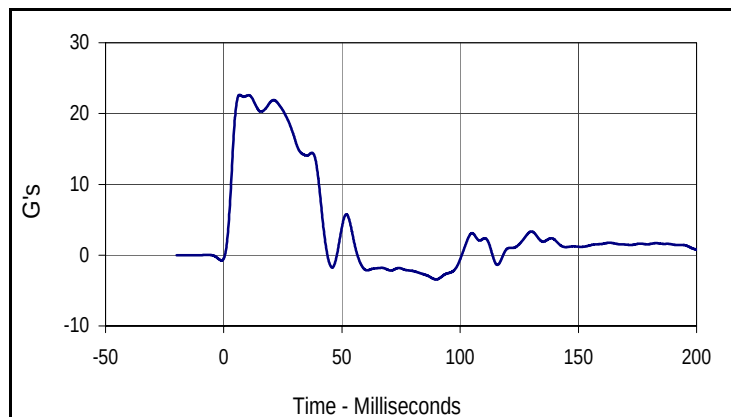
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	74.5
Peak Probe Force		Peak Chest Deflection	
5507		7.08	

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 034

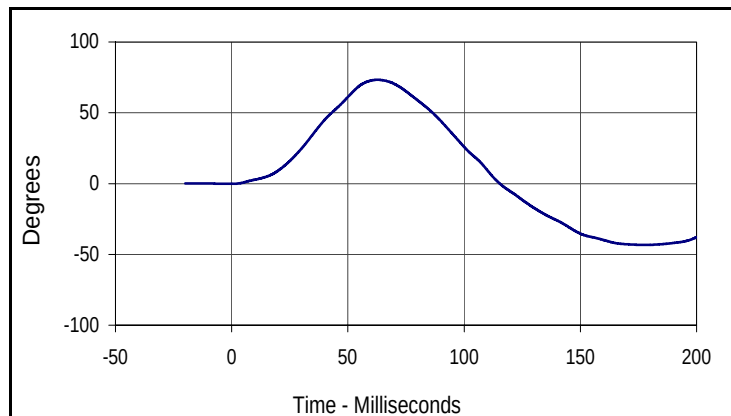
Test Date: 7/12/07
 Test I.D.: NF07A



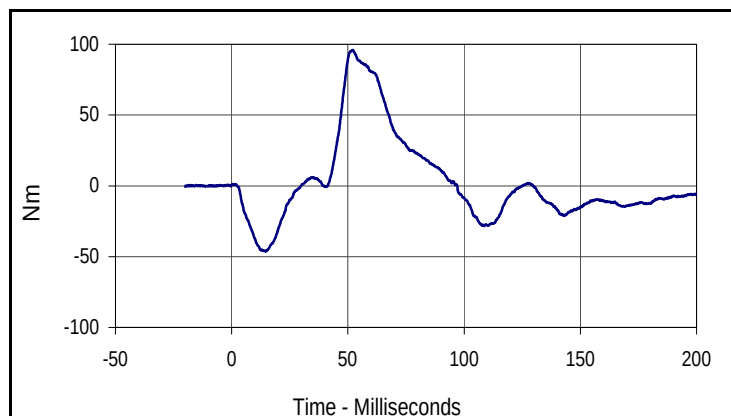
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.97	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.6	Pass
	20 Msec.	G's	17.6 to 22.6	21.7	Pass
	30 Msec.	G's	12.5 to 18.5	16.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	16.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	41.9	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	73.3	Pass
	Time	Msec.	57.0 to 64.0	62.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	115.4	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	95.9	Pass
	Time	Msec.	47.0 to 58.0	52.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.0	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	6.7	-3.4	89.8



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
73.3	62.7	-43.3	178.6



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
95.9	52.1	-46.2	14.7

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

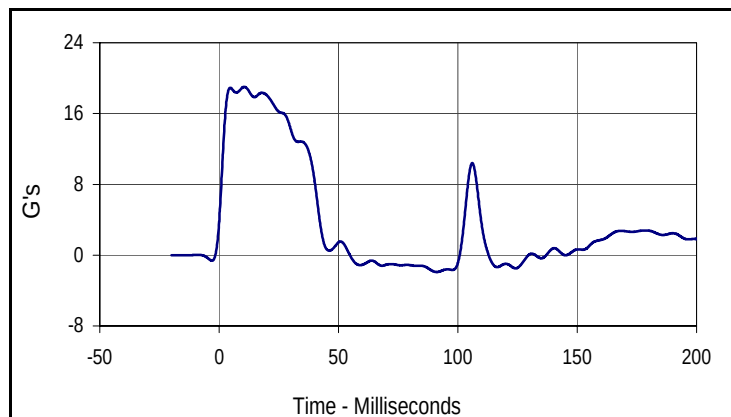
Test Date: 7/11/07

ATD Serial No.: 034

Test I.D.: NE07A



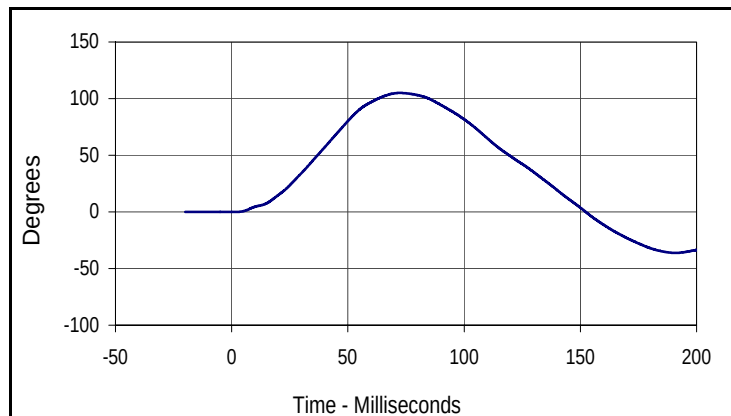
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	5.99	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.0	Pass
	20 Msec.	G's	14.0 to 19.0	18.1	Pass
	30 Msec.	G's	11.0 to 16.0	14.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	41.6	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	105.0	Pass
	Time	Msec.	72.0 to 82.0	72.3	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	152.3	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-74.6	Pass
	Time	Msec.	65.0 to 79.0	67.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	140.7	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

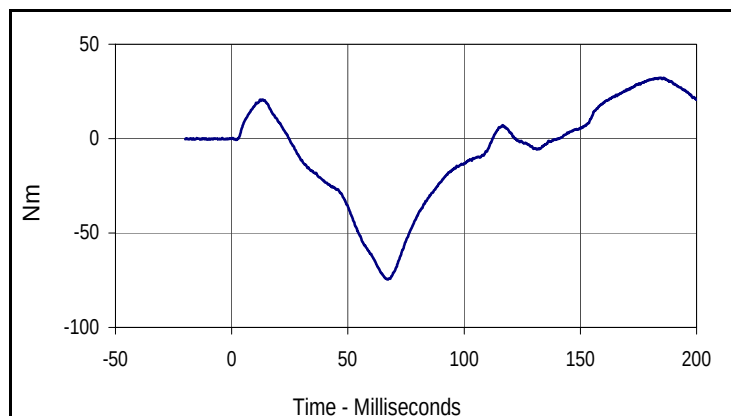
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.0	10.5	-1.9	91.2



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
105.0	72.3	-36.2	190.9



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
32.2	184.8	-74.6	67.0

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 7/4/07

ATD Serial No.: 034

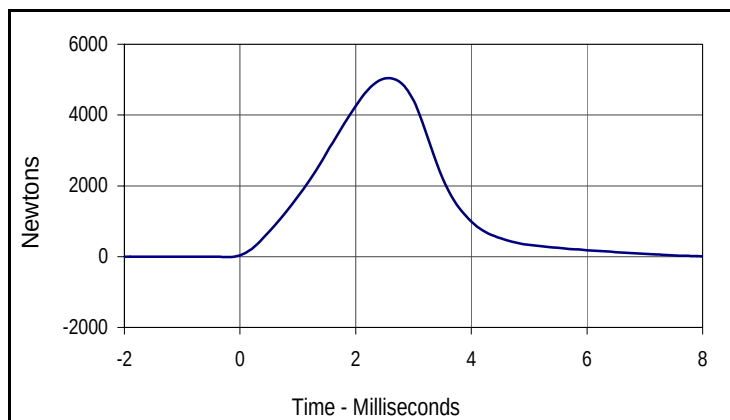
Test I.D.: LK07A , RK07A

**Left Knee**

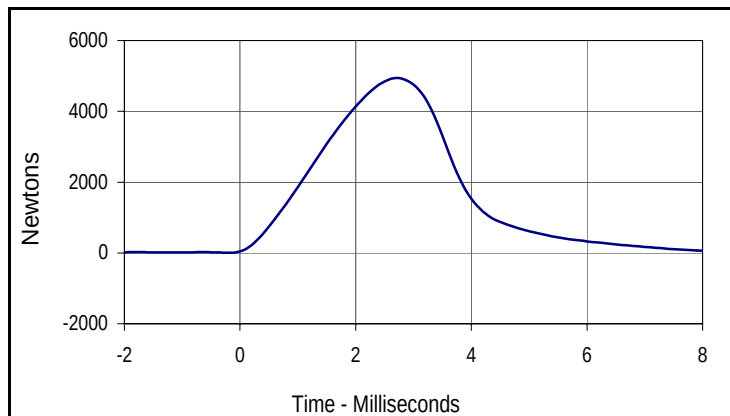
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5044	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	4939	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5043.6	2.6	-13.6	-0.2

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
4938.7	2.7	-2.4	9.7

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 7/11/07

ATD Serial No.: 034

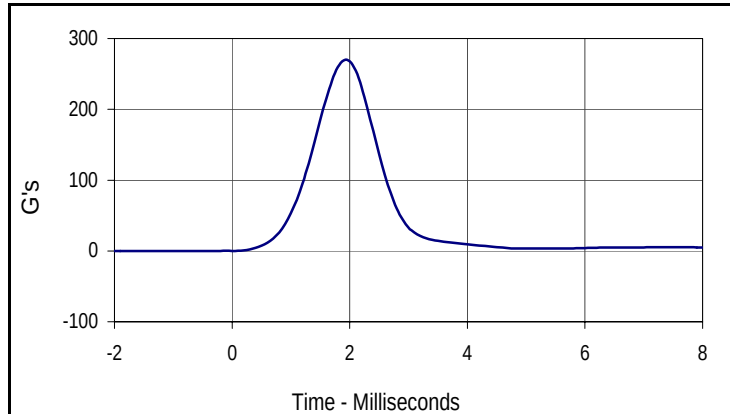
Test I.D.: N/A



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	886	Pass
B - Shoulder pivot height	mm	505 to 521	509	Pass
C - "H" point height	mm	84 to 89	87	Pass
D - "H" point from seat back	mm	135 to 140	137	Pass
E - Shoulder pivot from back	mm	84 to 94	88	Pass
F - Thigh clearance	mm	140 to 155	149	Pass
G - Elbow back to wrist pivot	mm	290 to 305	299	Pass
H - Skull cap to back line	mm	41 to 46	43	Pass
I - Shoulder to elbow length	mm	330 to 345	332	Pass
J - Elbow rest height	mm	190 to 211	207	Pass
K - Buttock to knee length	mm	579 to 604	590	Pass
L - Popliteal length	mm	429 to 455	445	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock popliteal length	mm	452 to 477	474	Pass
O - Chest depth	mm	213 to 229	215	Pass
P - Foot length	mm	251 to 267	256	Pass
V - Shoulder breadth	mm	422 to 437	426	Pass
W - Foot breadth	mm	91 to 107	101	Pass
Y - Chest circumference	mm	970 to 1001	990	Pass
Z - Waist circumference	mm	836 to 866	855	Pass
AA - Location for chest circumference	mm	429 to 434	429	Pass
BB - Location for waist circumference	mm	226 to 231	228	Pass
Overall Test Results				Pass

Test Program: Hybrid III 50th Percentile Male Head Drop TestTest Date: 6/28/07ATD Serial No.: 035Test I.D.: HD06R

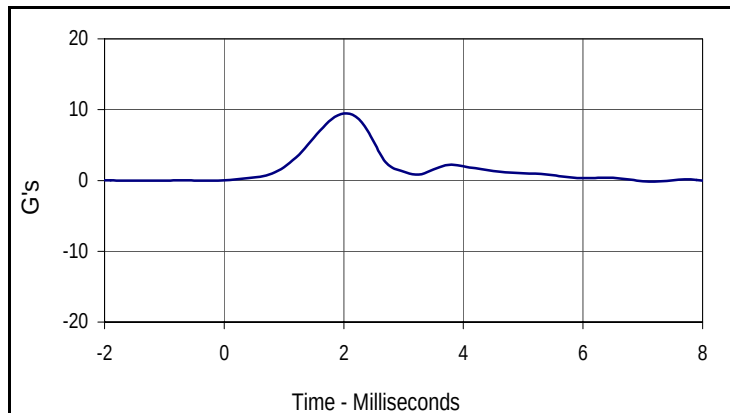
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	269.4	Pass
Peak Lateral Acceleration	G's	≤15.0	9.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results			Pass	



Curve Description

Head Resultant

CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
269.4	1.9	0.0	-1.8



Curve Description

Head Y

CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
9.5	2.0	0.0	-1.2

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

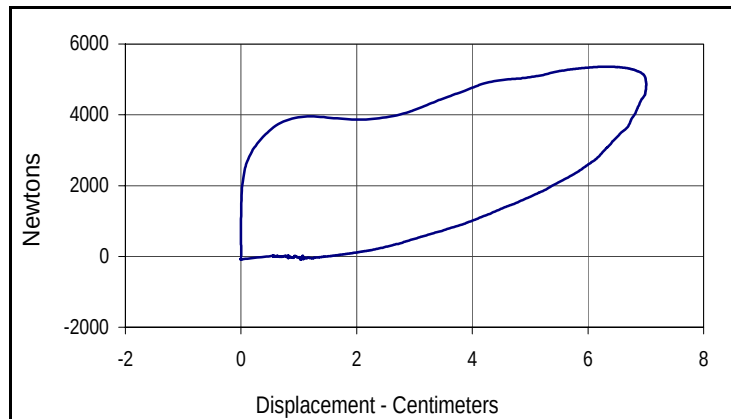
Test Date: 7/9/07

ATD Serial No.: 035

Test I.D.: CH07C



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	6.63	Pass
Peak Probe Force	Newtons	5159 to 5893	5360	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	7.01	Pass
Internal Hysteresis	%	69 to 85	74.2	Pass
Overall Test Results				Pass



Curve Description

Probe Force vs. Chest Deflection

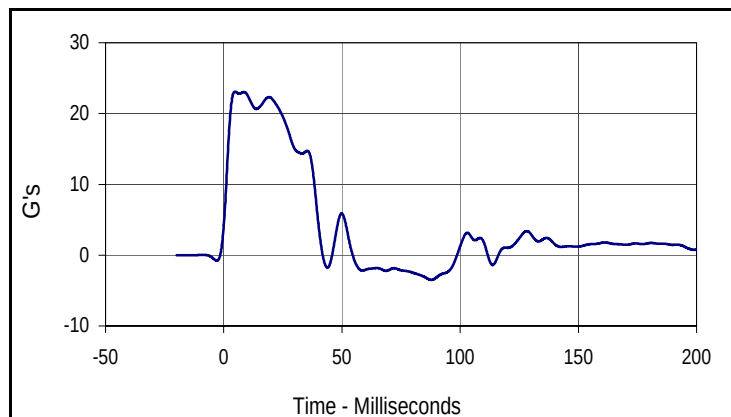
CURNO	Type	SAE Class	Hysteresis
001	FIL	600	74.2
Peak Probe Force		Peak Chest Deflection	
5360		7.01	

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 035

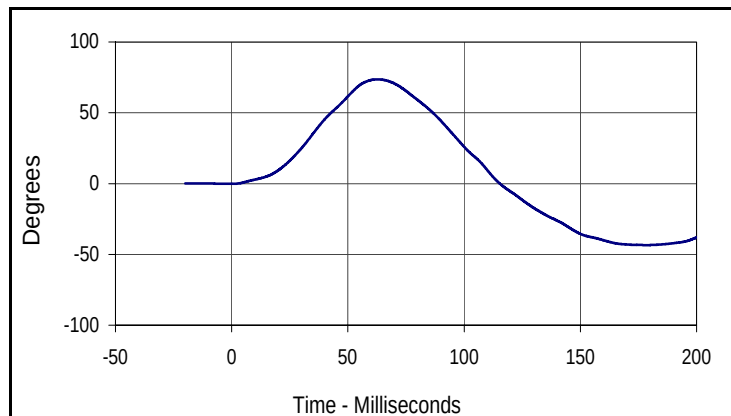
Test Date: 7/13/07
 Test I.D.: NF07C



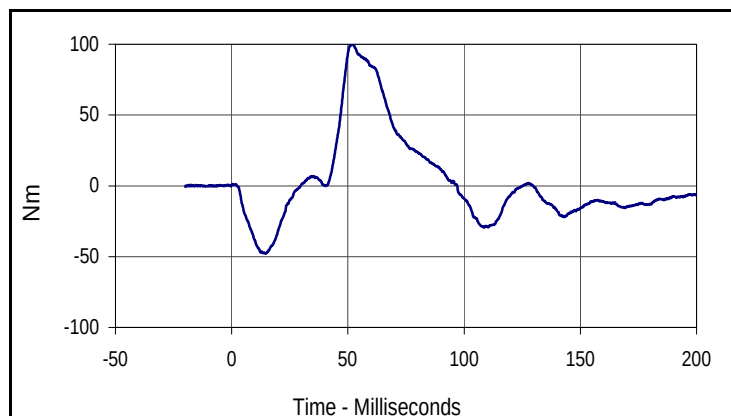
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.6	Pass
	20 Msec.	G's	17.6 to 22.6	22.2	Pass
	30 Msec.	G's	12.5 to 18.5	15.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	15.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	39.9	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	73.6	Pass
	Time	Msec.	57.0 to 64.0	62.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	115.4	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	100.4	Pass
	Time	Msec.	47.0 to 58.0	52.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.1	4.7	-3.5	87.8



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
73.6	62.7	-43.4	178.6



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
100.4	52.1	-47.8	14.7

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

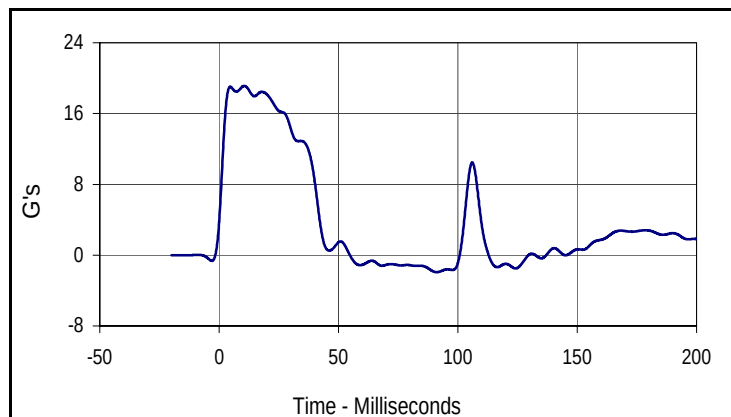
Test Date: 7/12/07

ATD Serial No.: 035

Test I.D.: NE07C



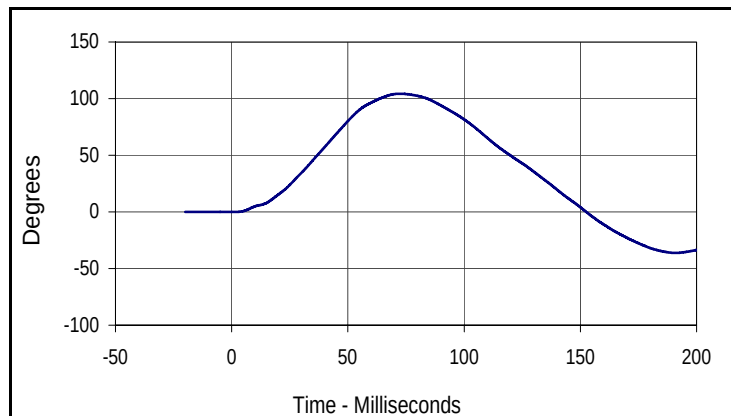
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.16	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.1	Pass
	20 Msec.	G's	14.0 to 19.0	18.2	Pass
	30 Msec.	G's	11.0 to 16.0	14.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	41.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	104.3	Pass
	Time	Msec.	72.0 to 82.0	72.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	152.6	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-79.2	Pass
	Time	Msec.	65.0 to 79.0	67.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	141.3	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

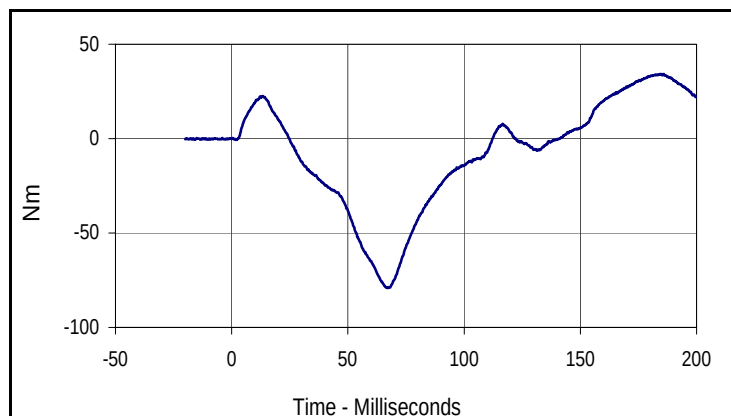
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.1	10.5	-1.9	91.2



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
104.3	72.4	-36.2	191.0



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
34.2	184.8	-79.2	67.0

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 7/12/07

ATD Serial No.: 035

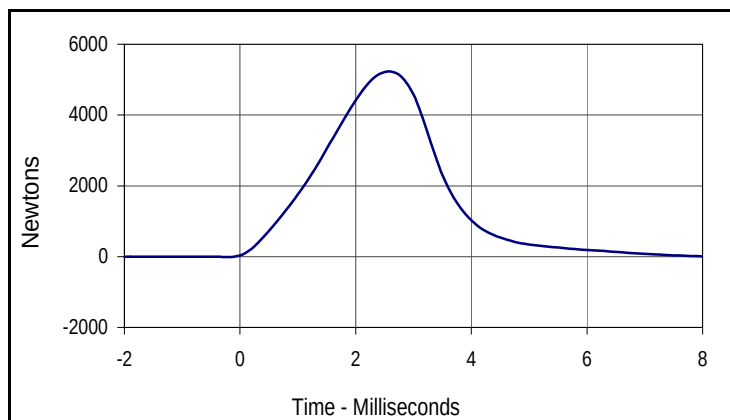
Test I.D.: LK07C , RK07C

**Left Knee**

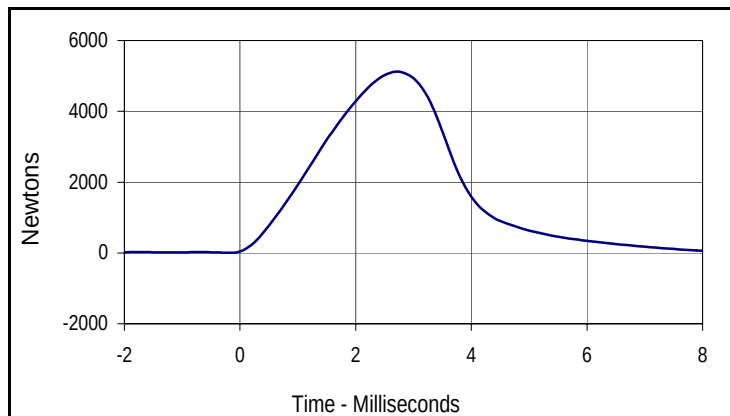
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5231	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5119	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5231.2	2.6	-14.1	-0.2

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5118.7	2.7	-2.6	9.8

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 7/11/07

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	885	Pass
B - Shoulder pivot height	mm	505 to 521	507	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	297	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	202	Pass
K - Buttock to knee length	mm	579 to 604	589	Pass
L - Popliteal length	mm	429 to 455	445	Pass
M - Knee pivot height	mm	485 to 500	492	Pass
N - Buttock popliteal length	mm	452 to 477	476	Pass
O - Chest depth	mm	213 to 229	217	Pass
P - Foot length	mm	251 to 267	254	Pass
V - Shoulder breadth	mm	422 to 437	424	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	988	Pass
Z - Waist circumference	mm	836 to 866	857	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
 ATD Serial No.: 034

Test Date: 7/11/07
 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
 ATD Serial No.: 035

Test Date: 7/11/07
 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-P27137-01-NC

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**MAZDA MOTORS CORPORATION
2007 MAZDA CX-9
5-DOOR MPV**

NHTSA NUMBER: Z75400

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



JULY 18, 2007

FINAL REPORT

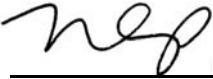
**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
1200 NEW JERSEY AVE, SE, ROOM W43-410
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-06-D-00027.

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

Prepared by: 
Mr. Johnny H. Dutto, Project Engineer
KARCO Engineering, LLC

Date: July 18, 2007

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

Date: July 18, 2007

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

Date: July 18, 2007

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

Technical Report Documentation Page

1. Report No. TR-P27137-01-NC		2. Government Accession No.		3. Recipients Catalog No.	
4. Title and Subtitle Final Report of one (1) Graco Snugride CRS Final Report of one (1) Baby Trend Flex Loc CRS NHTSA NO. Z75400				5. Report Date 7/18/2007	
				6. Performing Organization Code KAR	
7. Authors Mr. Johnny H. Dutto, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco				8. Performing Organization Report No. TR-P27137-01-NC	
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-06-D-00027	
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NVS-111 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C 20590				13. Type of Report and Period Covered Final Test Report 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 and one (1) Baby Trend Flex Loc CRS in conjunction with frontal barrier impact NCAP testing on a 2007 Mazda CX-9 5-Door MPV and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at Karco Engineering, LLC on July 18, 2007.					
Measurement Description		Units	Threshold	Left Rear (P4)	Right Rear (P3)
Head Injury Criteria (HIC15)		N/A	390	469.8	515.6
3 msec. Chest Clip		G's	50	60.7	50.4
17. Key Words New Car Assessment Program (Frontal NCAP) Frontal Barrier Impact Test Final Report of a Graco Snugride CRS Final Report of a Baby Trend Flex Loc CRS				18. Distribution of Statement Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590	
19. Security Classification (this report) Unclassified		20. Security Classification (this page) Unclassified		21. No. of Pages 72	22. Price

TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Page</u>
D1	Purpose and Summary of Test Z75400	D1-1 to D1-8
D2	Photographs	D2-1 to D2-36
D3	CRABI Response and CRS Data Traces	D3-1 to D3-4
D4	CRABI Calibration Information	D4-1 to D4-10
<u>Data Sheet</u>	<u>Description</u>	<u>Page</u>
1	Crash Test Summary	D1-2
2	Vehicle Parameter Data	D1-3
3	CRABI Positioning in Vehicle	D1-4
4	CRS Performance Data	D1-6
5	CRS Accelerometer Locations	D1-7
6	CRS Camera Locations and Data	D1-8

SECTION D1

PURPOSE AND SUMMARY OF TEST Z75400

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

Two 12-month old CRABI's (P3 & P4) 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. 022) and rear rear (Serial No. 017) CRABI's were 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)	515.6	50.4
CRABI (P4)	469.8	60.7

DATA SHEET NO.1
CRASH TEST SUMMARY

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

CHILD RESTRAINT SYSTEM INFORMATION

Description	Position #3 CRS	Position #4 CRS
Manufacturer	Graco	Baby Trend
Model Name	Snugride	Flex Loc
Serial No.	8645HEM3	6311
Type	Infant	Infant
Forward/Rearward	Rearward	Rearward

VISIBLE DUMMY CONTACT POINTS

Description	Position #3 CRS	Position #4 CRS
Head Contact	None	Driver Seatback
Chest Contact	None	None
Abdomen Contact	None	None
Left Knee Contact	None	None
Right Knee Contact	None	None
Left Toe Contact	Rear Passenger Seatback	Rear Passenger Seatback
Right Toe Contact	Rear Passenger Seatback	Rear Passenger Seatback

POST-TEST DOOR OPENINGS

Description	Position #3 CRS	Position #4 CRS
Right Rear Door	Remained closed and latched, opened w/o tools	Remained closed and latched, opened w/o tools

CAMERA COVERAGE

Description	Standard
High Speed	2
Real Time	0
Total	2

DATA CHANNELS

CRABI (P3 & P4) Sensors	26
Belt Sensors	4
CRS Sensors	12
Total	42

DATA SHEET NO.2**VEHICLE PARAMETER DATA**Test Vehicle: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**TEST VEHICLE WEIGHTS**

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	573	445	1018	604	522	1126
Right	kg	568	435	1003	587	517	1104
Ratio	%	56	44	100	53	47	100
Totals	kg	1141	880	2021	1191	1039	2230

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2021
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	64
Calculated Vehicle Target Wt. (TVTW)	kg	2237

DATA SHEET NO.3

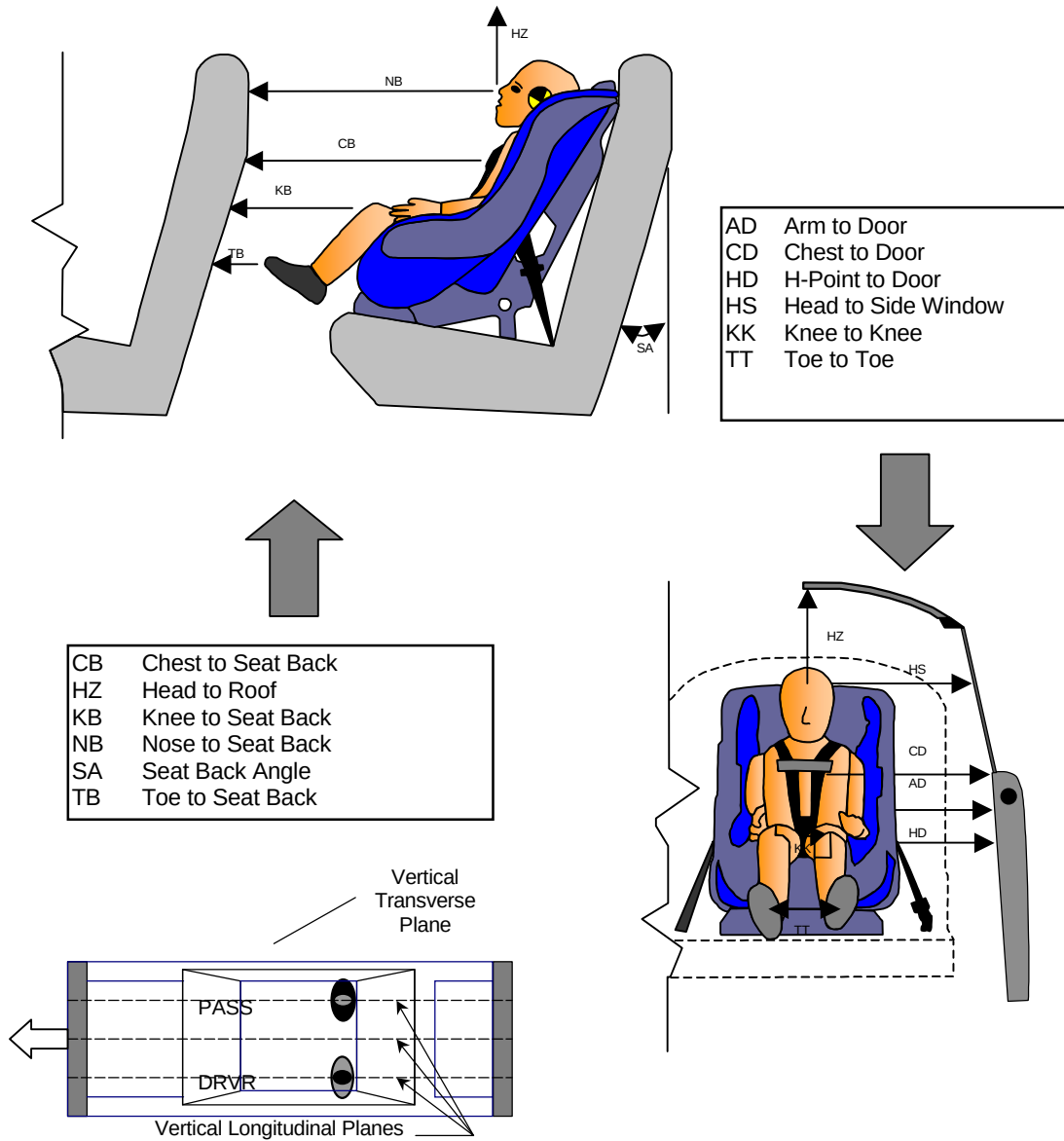
CRABI POSITIONING IN VEHICLE

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

DATA SHEET NO.3**CRABI POSITIONING IN VEHICLE...(CONTINUED)**Test Vehicle: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**CRABI POSITION MEASUREMENTS**

Code	Measurement	P3 (Passenger's Side)		P4 (Driver's Side)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
SA	Seat Back Angle		65.9		65.9
HZ	Head to Roof (Z)	456		385	
CD	Chest to Door	395		415	
KK	Knee to Knee (Y)	120		110	
HS	Head to Side Window	400		375	
HD	H-Point to Door (Y)	345		365	
AD	Arm to Door	310		315	
NB	Nose to Seat Back	510		480	
CB	Chest to Seat Back	424		423	
FF	Foot to Foot	140		95	
KB-Left	Knee to Seat Back	187		195	
KB-Right	Knee to Seat Back	187		192	
TB-Left	Toe to Seat Back	72		40	
TB-Right	Toe to Seat Back	63		25	

DATA SHEET NO.4**CRS PERFORMANCE DATA**Test Vehicle: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**CRS PERFORMANCE DATA**

Location	CRS (P4)		CRS (P3)	
	Damage	Post-Test	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	No	None
Veh. Lower CRS Anchors	No	None	No	None
5-Point Harness Connections	No	None	No	None
Cracks on CRS	No	None	No	None
Fabric Tears on CRS	No	None	No	None
Vehicle Seat Structure	No	None	No	None
Vehicle Seat Fabric Tears	No	None	No	None

DATA SHEET NO. 5
CRS ACCELEROMETER LOCATIONS

Test Vehicle: 2007 Mazda CX-9 5-Door MPV

NHTSA No.: Z75400

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 7/18/07

CRS ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	CRS (P4)	1946	-530	895
2	CRS Base (P4)	1956	-530	850
3	CRS (P3)	1786	540	920
4	CRS Base (P3)	1786	540	815

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

DATA SHEET NO.6**CRS CAMERA LOCATIONS AND DATA**Test Vehicle: 2007 Mazda CX-9 5-Door MPVNHTSA No.: Z75400Test Program: 2007 NHTSA 35mph NCAPTest Date: 7/18/07**CAMERA LOCATIONS**

No.	Camera View	Location(mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Driver Side Upper CRS View	-1880	737	-1473	-2		12	1000
2	Passenger Side Upper CRS View	-1880	-737	-1473	2		12	1000
3	Driver Side Lower CRS View	-1346	635	-535	-2		10	1000
4	Passenger Side Lower CRS View	-1346	-635	535	2		12	1000

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

SECTION D2

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure		Page
1	Position 3 CRS Label	D2-1
2	Pre-Test Frontal View of Position 3 CRS	D2-2
3	Post-Test Frontal View of Position 3 CRS	D2-3
4	Pre-Test Rear View of Position 3 CRS	D2-4
5	Post-Test Rear View of Position 3 CRS	D2-5
6	Pre-Test Left Side View of Position 3 CRS	D2-6
7	Post-Test Left Side View of Position 3 CRS	D2-7
8	Pre-Test Right Side View of Position 3 CRS	D2-8
9	Post-Test Right Side View of Position 3 CRS	D2-9
10	Pre-Test Position 3 Front View (Head and Seat Belt Position)	D2-10
11	Post-Test Position 3 Front View (Head and Seat Belt Position)	D2-11
12	Pre-Test Position 3 Front View (Seat Belt Position)	D2-12
13	Post-Test Position 3 Front View (Seat Belt Position)	D2-13
14	Pre-Test Position 3 Right Side View	D2-14
15	Post-Test Position 3 Right Side View	D2-15
16	Pre-Test Position 3 Right Side View (Through Window)	D2-16
17	Post-Test Position 3 Right Side View (Through Window)	D2-17
18	Post-Test Position 3 Dummy Legs	D2-18
19	Position 4 CRS Label	D2-1
20	Pre-Test Frontal View of Position 4 CRS	D2-2
21	Post-Test Frontal View of Position 4 CRS	D2-3
22	Pre-Test Rear View of Position 4 CRS	D2-4
23	Post-Test Rear View of Position 4 CRS	D2-5
24	Pre-Test Left Side View of Position 4 CRS	D2-6
25	Post-Test Left Side View of Position 4 CRS	D2-7
26	Pre-Test Right Side View of Position 4 CRS	D2-8
27	Post-Test Right Side View of Position 4 CRS	D2-9
28	Pre-Test Position 4 Front View (Head and Seat Belt Position)	D2-10
29	Post-Test Position 4 Front View (Head and Seat Belt Position)	D2-11
30	Pre-Test Position 4 Front View (Seat Belt Position)	D2-12
31	Post-Test Position 4 Front View (Seat Belt Position)	D2-13
32	Pre-Test Position 4 Right Side View	D2-14
33	Post-Test Position 4 Right Side View	D2-15
34	Pre-Test Position 4 Right Side View (Through Window)	D2-16
35	Post-Test Position 4 Right Side View (Through Window)	D2-17
36	Post-Test Position 4 Dummy Legs	D2-18

MODEL **8645HEM3**

NAME **SNUGRIDE**

Manufactured in 040907 10

GRACO CHILDREN'S PRODUCTS, INC.

EXTON, PA 19341 1-888-224-6549

Made in U.S.A.

PB-25777

Figure D2-1: Position 3 CRS Label

This Space Intentionally Left Blank



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

This Space Intentionally Left Blank

Manufactured in:03-17-07
Model Number:6311



B73513A070317A000996

This product is protected by one or more of
the following US patents as well as patents
pending: 6,811,216, 6,834,915

Figure D2-19: Position 4 CRS Label

This Space Intentionally Left Blank



Figure D2-20: Pre-Test Frontal View of Position 4 CRS



Figure D2-21: Post-Test Frontal View of Position 4 CRS



Figure D2-22: Pre-Test Rear View of Position 4 CRS



Figure D2-23: Post-Test Rear View of Position 4 CRS



Figure D2-24: Pre-Test Left Side View of Position 4 CRS



Figure D2-25: Post-Test Left Side View of Position 4 CRS



Figure D2-26: Pre-Test Right Side View of Position 4 CRS



Figure D2-27: Post-Test Right Side View of Position 4 CRS



Figure D2-28: Pre-Test Position 4 Front View (Head & Seat Belt Position)



Figure D2-29: Post-Test Position 4 Front View (Head & Seat Belt Position)



Figure D2-30: Pre-Test Position 4 Front View (Seat Belt Position)



Figure D2-31: Post-Test Position 4 Front View (Seat Belt Position)



Figure D2-32: Pre-Test Position 4 Left Side View



Figure D2-33: Post-Test Position 4 Left Side View



Figure D2-34: Pre-Test Position 4 Right Side View



Figure D2-35: Post-Test Position 4 Right Side View



Figure D2-36: Post-Test Position 4 Dummy Legs

SECTION D3

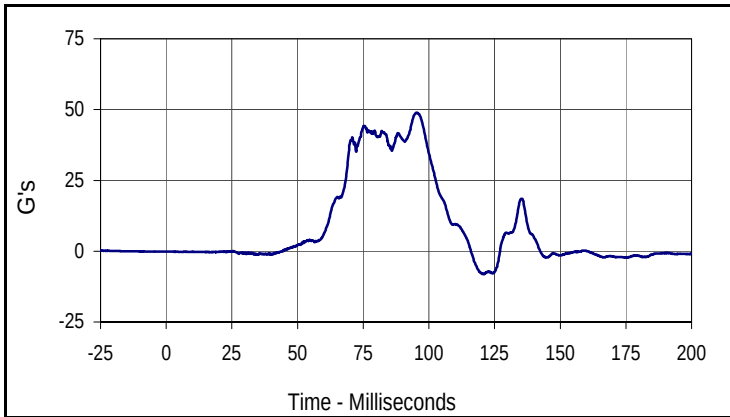
CRABI RESPONSE AND CRS DATA TRACES

LIST OF DATA PLOTS

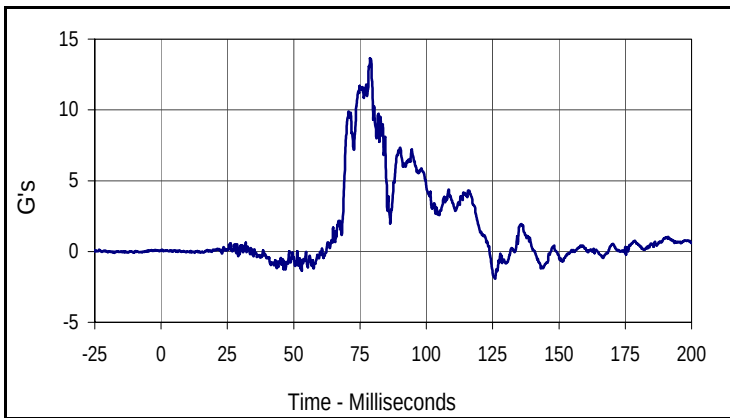
<u>Data Plot</u>		<u>Page</u>
D3-1	Right Rear CRABI (P4) Head X	D3-1
	Right Rear CRABI (P4) Head Y	D3-1
	Right Rear CRABI (P4) Head Z	D3-1
	Right Rear CRABI (P4) Head Resultant	D3-1
D3-2	Right Rear CRABI (P4) Chest X	D3-2
	Right Rear CRABI (P4) Chest Y	D3-2
	Right Rear CRABI (P4) Chest Z	D3-2
	Right Rear CRABI (P4) Chest Resultant	D3-2
D3-3	Right Rear CRABI (P3) Head X	D3-3
	Right Rear CRABI (P3) Head Y	D3-3
	Right Rear CRABI (P3) Head Z	D3-3
	Right Rear CRABI (P3) Head Resultant	D3-3
D3-4	Right Rear CRABI (P3) Chest X	D3-4
	Right Rear CRABI (P3) Chest Y	D3-4
	Right Rear CRABI (P3) Chest Z	D3-4
	Right Rear CRABI (P3) Chest Resultant	D3-4

Test Vehicle: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

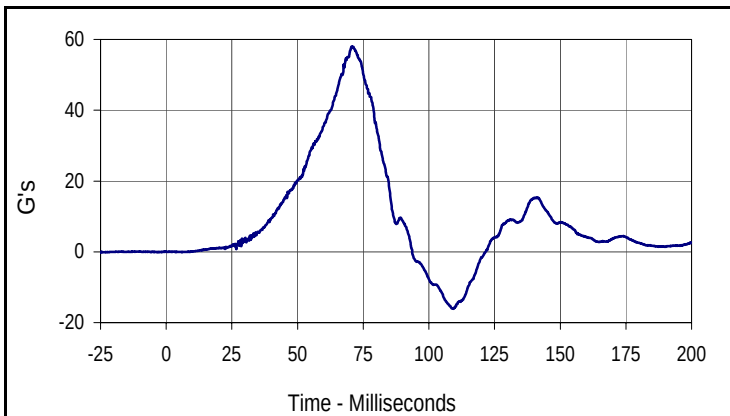
Test Date: 7/18/07
 NHTSA No.: Z75400



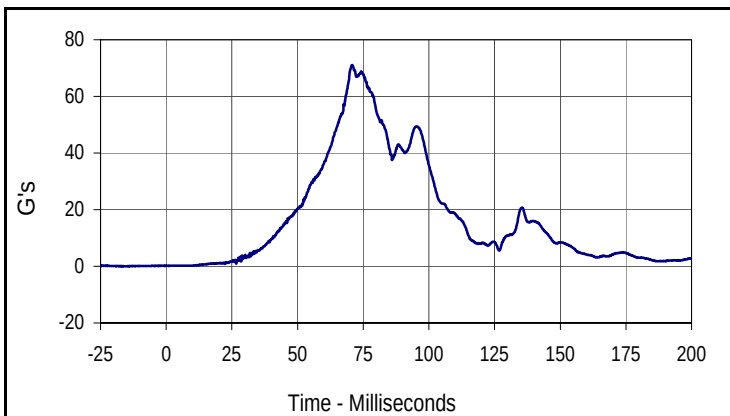
Curve Description			
CRABI CRABI Head X (P4)			
CURNO	Type	SAE Class	Units
142	FIL	1000	G's
Max	Time	Min	Time
48.9	95.3	-8.1	120.9



Curve Description			
CRABI CRABI Head Y (P4)			
CURNO	Type	SAE Class	Units
143	FIL	1000	G's
Max	Time	Min	Time
13.6	78.8	-1.9	125.9



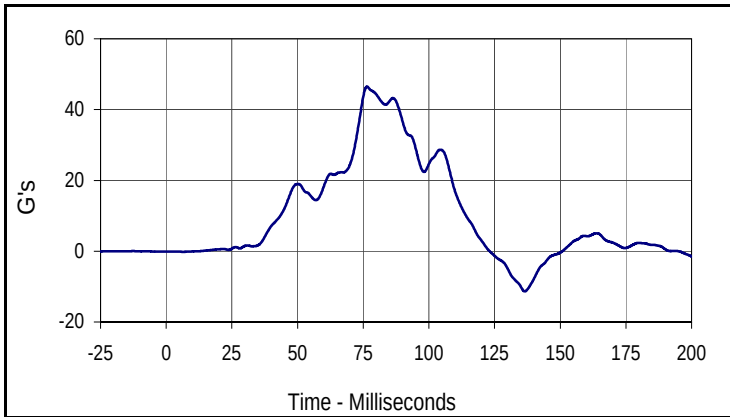
Curve Description			
CRABI CRABI Head Z (P4)			
CURNO	Type	SAE Class	Units
144	FIL	1000	G's
Max	Time	Min	Time
58.0	70.6	-16.1	109.2



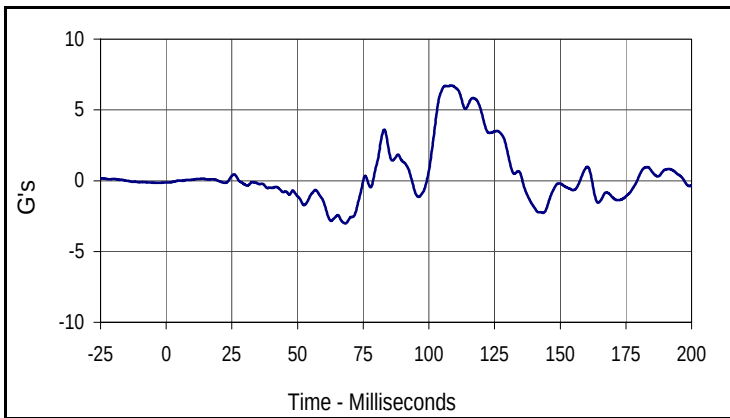
Curve Description			
CRABI CRABI Head Resultant (P4)			
CURNO	Type	SAE Class	Units
142	RES	1000	G's
Max	Time	Min	Time
71.1	70.9	0.2	0.9

Test Vehicle: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

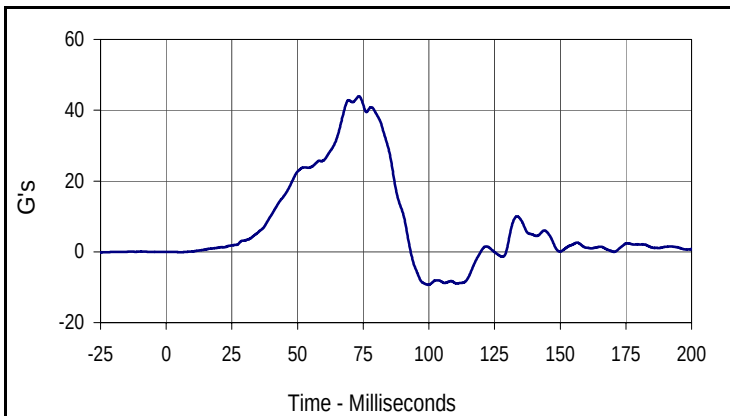
Test Date: 7/18/07
 NHTSA No.: Z75400



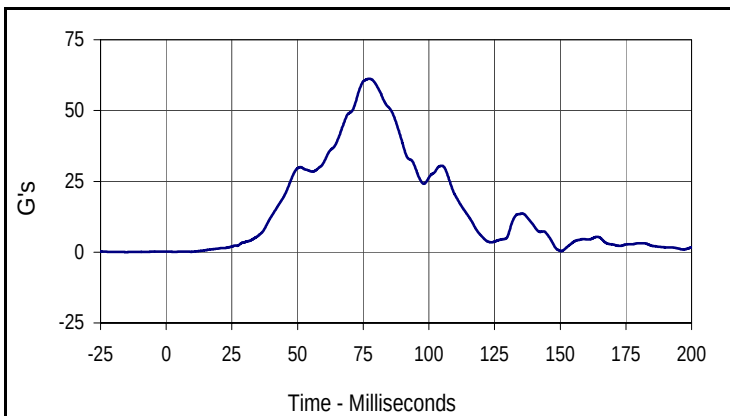
Curve Description			
CRABI CRABI Chest X (P4)			
CURNO	Type	SAE Class	Units
145	FIL	180	G's
Max	Time	Min	Time
46.5	76.4	-11.4	136.5



Curve Description			
CRABI CRABI Chest Y (P4)			
CURNO	Type	SAE Class	Units
146	FIL	180	G's
Max	Time	Min	Time
6.7	108.6	-3.0	68.3



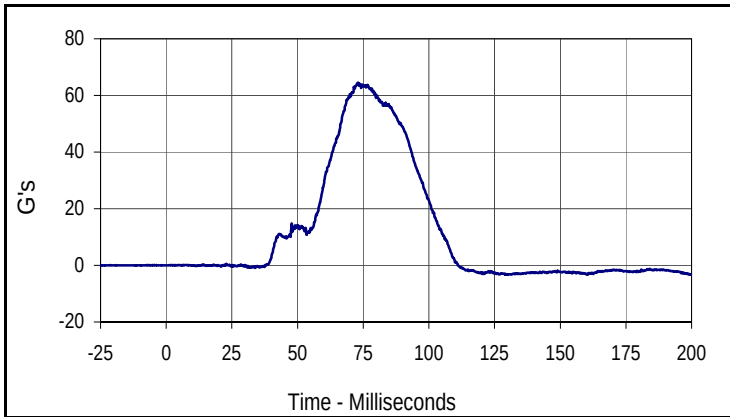
Curve Description			
CRABI CRABI Chest Z (P4)			
CURNO	Type	SAE Class	Units
147	FIL	180	G's
Max	Time	Min	Time
43.9	73.4	-9.3	99.7



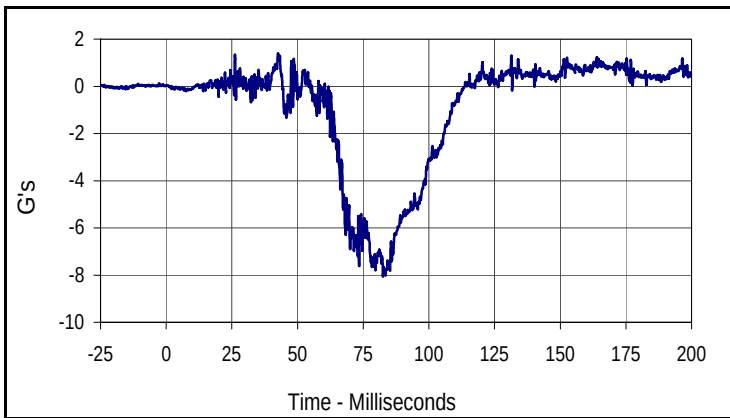
Curve Description			
CRABI CRABI Chest Resultant (P4)			
CURNO	Type	SAE Class	Units
145	RES	180	G's
Max	Time	Min	Time
61.2	77.1	0.1	3.4

Test Vehicle: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

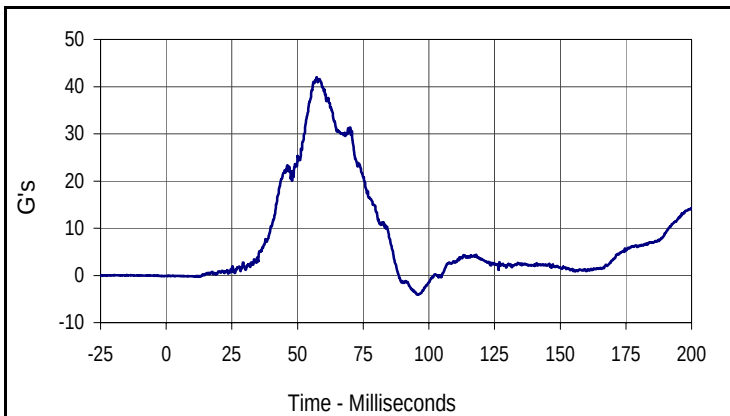
Test Date: 7/18/07
 NHTSA No.: Z75400



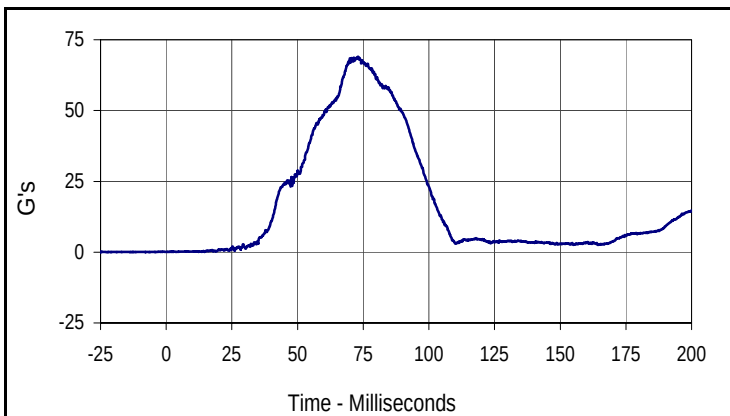
Curve Description			
CRABI CRABI Head X (P3)			
CURNO	Type	SAE Class	Units
163	FIL	1000	G's
Max	Time	Min	Time
64.6	73.1	-3.3	130.0



Curve Description			
CRABI CRABI Head Y (P3)			
CURNO	Type	SAE Class	Units
164	FIL	1000	G's
Max	Time	Min	Time
1.4	42.6	-8.1	82.6



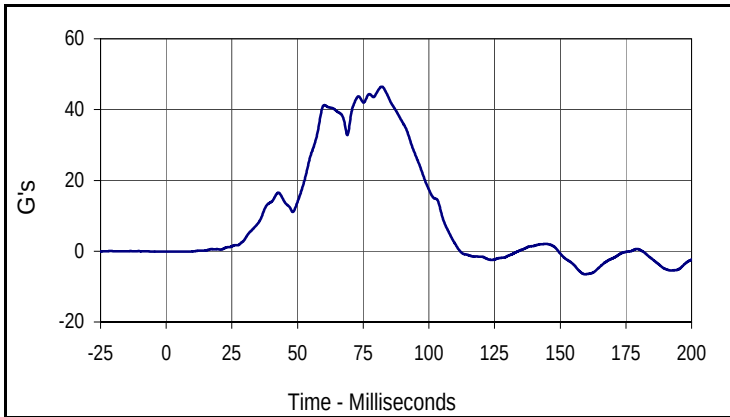
Curve Description			
CRABI CRABI Head Z (P3)			
CURNO	Type	SAE Class	Units
165	FIL	1000	G's
Max	Time	Min	Time
42.0	57.3	-4.1	96.0



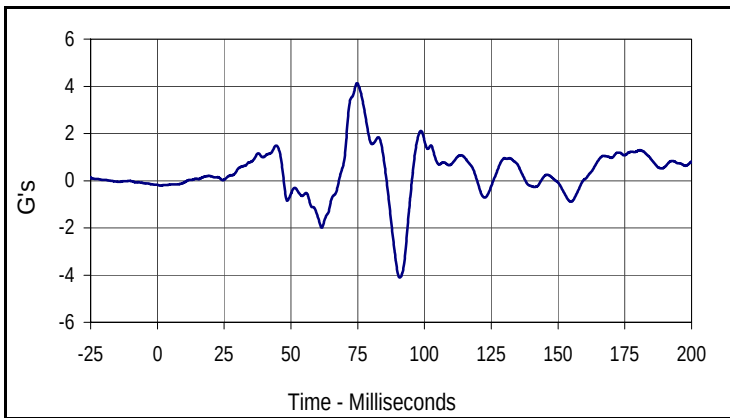
Curve Description			
CRABI CRABI Head Resultant (P3)			
CURNO	Type	SAE Class	Units
163	RES	1000	G's
Max	Time	Min	Time
69.1	73.1	0.1	14.6

Test Vehicle: 2007 Mazda CX-9 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

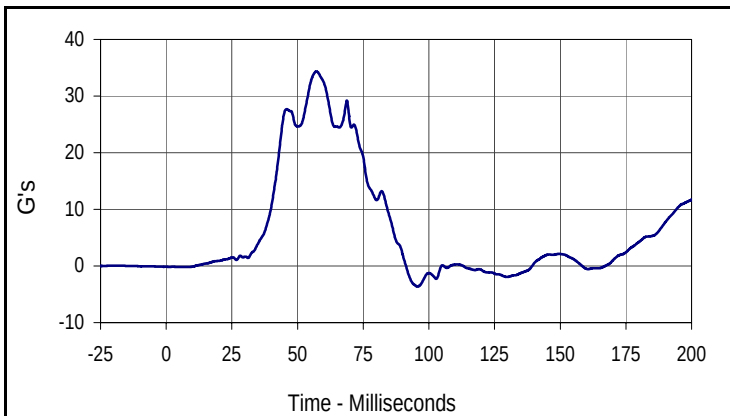
Test Date: 7/18/07
 NHTSA No.: Z75400



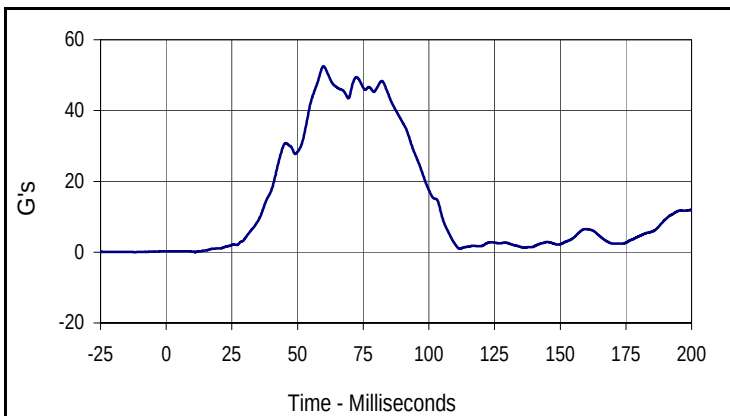
Curve Description			
CRABI CRABI Chest X (P3)			
CURNO	Type	SAE Class	Units
166	FIL	180	G's
Max	Time	Min	Time
46.5	82.1	-6.5	159.4



Curve Description			
CRABI CRABI Chest Y (P3)			
CURNO	Type	SAE Class	Units
167	FIL	180	G's
Max	Time	Min	Time
4.1	74.8	-4.1	90.8



Curve Description			
CRABI CRABI Chest Z (P3)			
CURNO	Type	SAE Class	Units
168	FIL	180	G's
Max	Time	Min	Time
34.3	57.2	-3.6	95.6



Curve Description			
CRABI CRABI Chest Resultant (P3)			
CURNO	Type	SAE Class	Units
166	RES	180	G's
Max	Time	Min	Time
52.5	59.8	0.0	11.0

SECTION D4

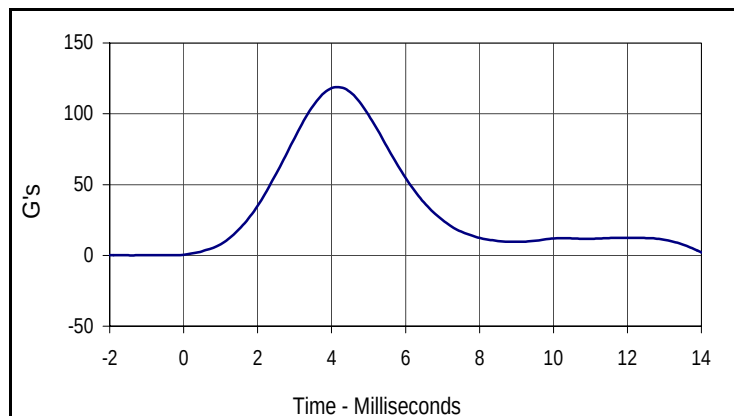
CRABI CALIBRATION INFORMATION

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

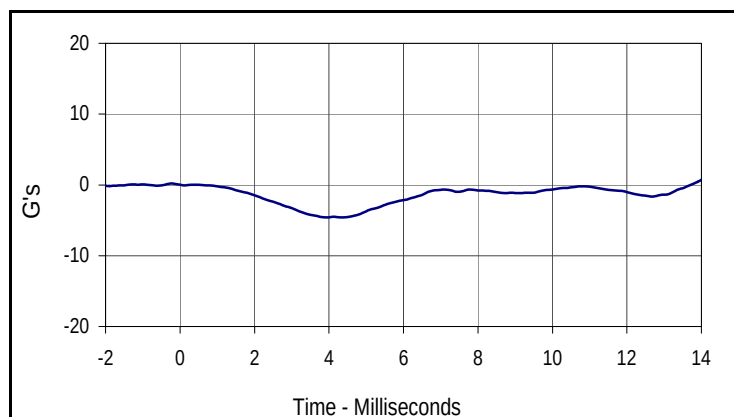
Test Date: 7/12/07
 Test I.D.: FHD07I



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	118.9	Pass
Peak Lateral Acceleration	G's	≤15.0	4.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
118.9	4.2	0.0	-1.4



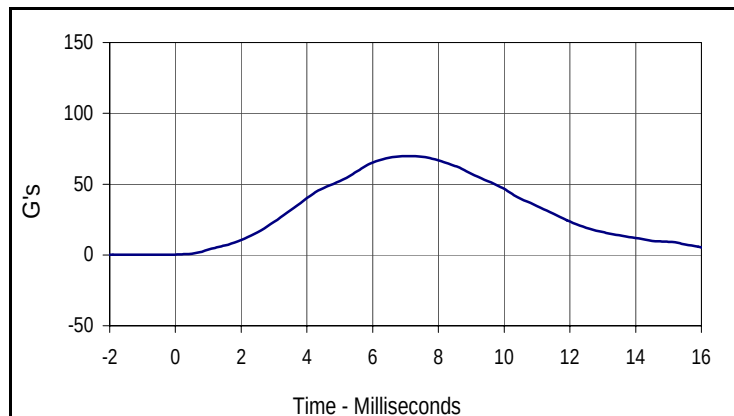
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.2	-0.2	-4.6	3.9

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

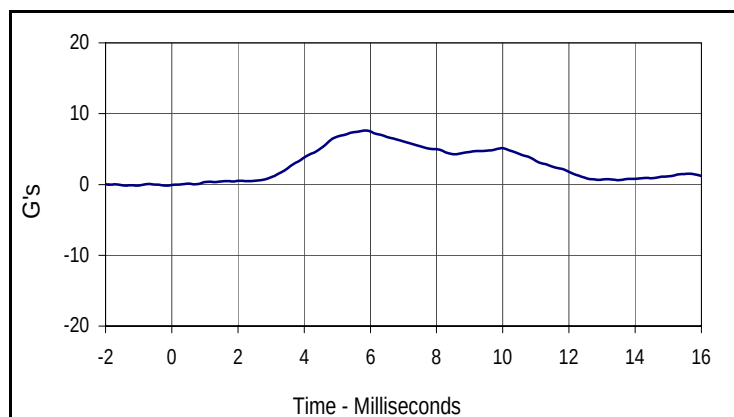
Test Date: 7/12/07
 Test I.D.: RHD07I



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	65.3	Pass
Peak Lateral Acceleration	G's	≤15.0	7.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
65.3	6.0	0.1	-0.9



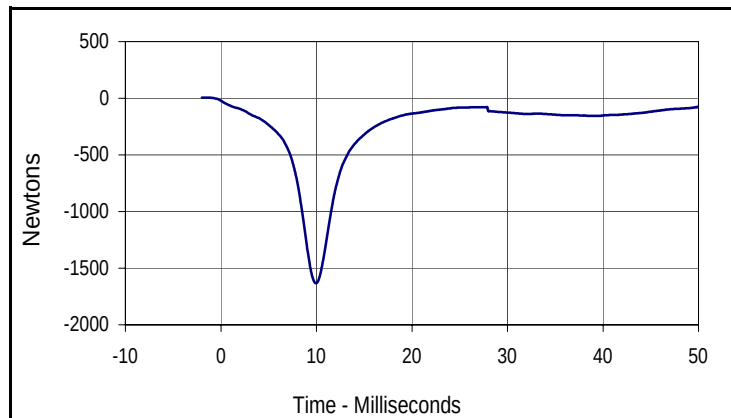
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.6	5.8	-0.2	-1.4

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

Test Date: 7/12/07
 Test I.D.: CH07I



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	4.90 to 5.10	5.08	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1633	Pass
Overall Test Results				Pass



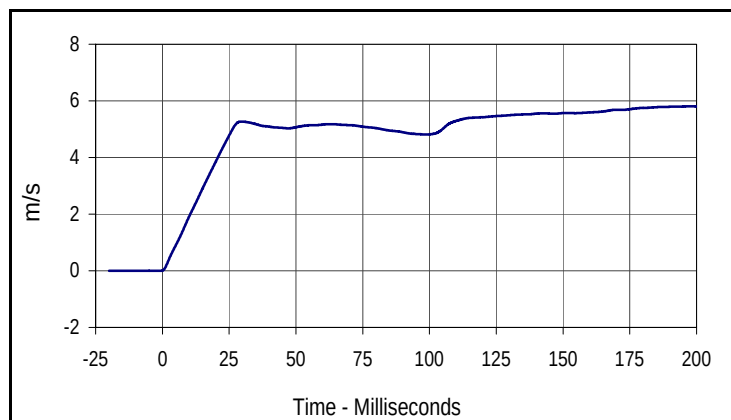
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
6.1	-1.7	-1633.2	10.0

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

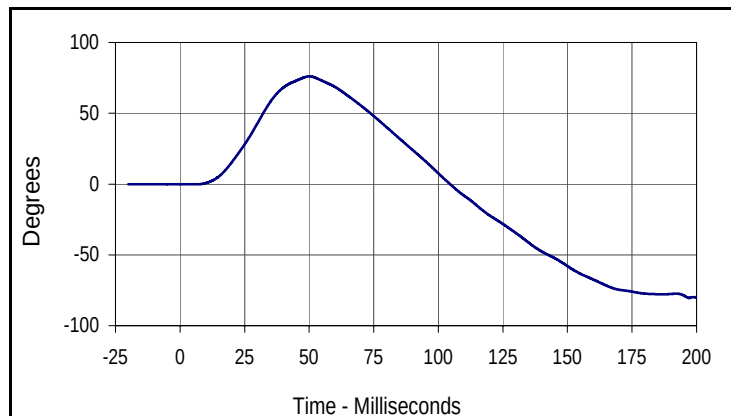
Test Date: 7/12/07
 Test I.D.: NF07I



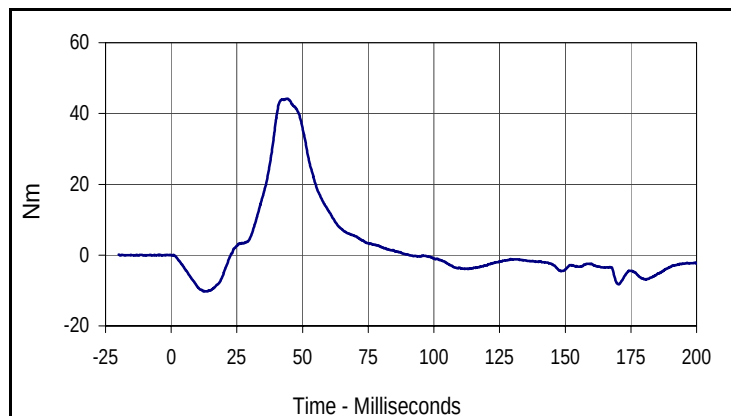
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.17	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	1.9	Pass
	20 Msec.	m/s	3.4 to 4.2	3.9	Pass
	25 Msec.	m/s	4.3 to 5.2	4.8	Pass
"D" Plane Rotation	Max	Degrees	75.0 to 86.0	76.1	Pass
Peak Moment in Rotation	Max	Nm	36.0 to 45.0	41.3	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	70.9	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.8	199.3	0.0	-0.7



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



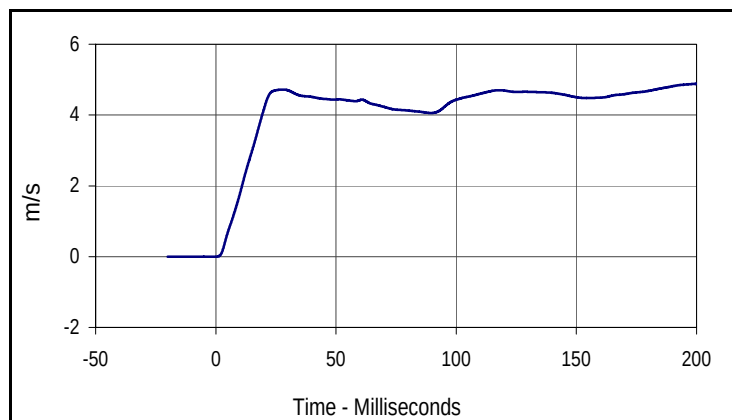
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
44.2	44.3	-10.3	13.5

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

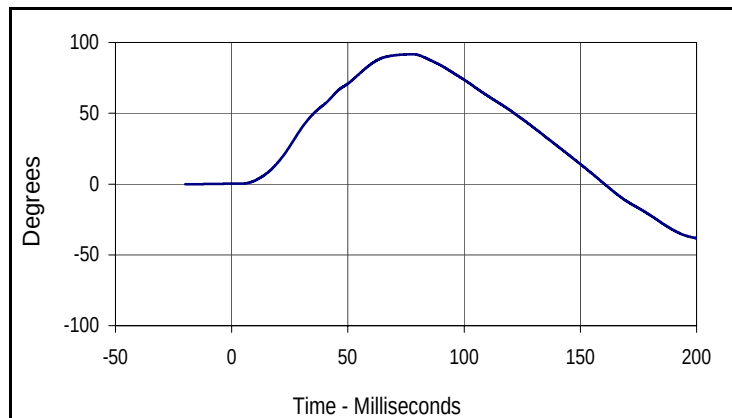
Test Date: 7/11/07
 Test I.D.: NE07I



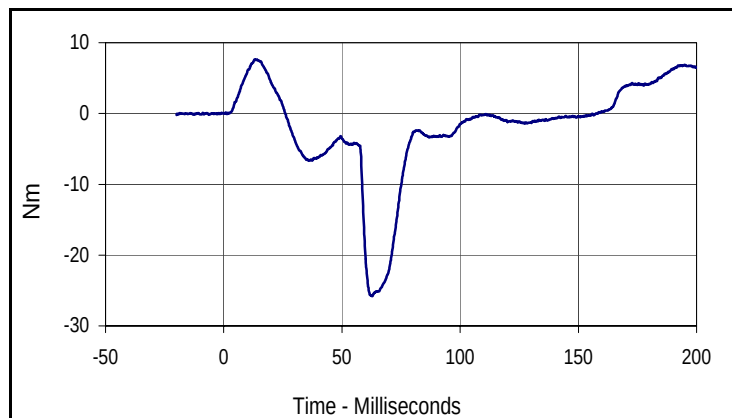
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.47	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.9	Pass
	10 Msec.	m/s	1.5 to 2.1	1.8	Pass
	14 Msec.	m/s	2.2 to 2.9	2.8	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	91.7	Pass
Peak Moment in Rotation	Max	Nm	-12 to -23	-21.1	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	77.9	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.9	200.0	0.0	0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
91.7	77.7	-38.2	200.0



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

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

Test Date: 7/11/07
 Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	456.0 to 471.2	462	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	285	Pass
C - "H" point height	mm	27.9 to 38.1	30	Pass
D - "H" point from backline	mm	40.1 to 50.3	47	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	53	Pass
F - Thigh clearance	mm	63.0 to 73.2	66	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	185	Pass
I - Shoulder pivot to elbow pivot	mm	99.1 to 114.3	102	Pass
J - Elbow rest height	mm	150.1 to 165.3	156	Pass
K - Buttock to knee length	mm	202.7 to 217.9	209	Pass
L - Popliteal length	mm	138.7 to 153.9	139	Pass
M - Knee pivot height	mm	165.1 to 180.3	173	Pass
N - Buttock popliteal length	mm	144.8 to 160.0	150	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	113	Pass
P - Foot length	mm	92.4 to 102.6	97	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	183	Pass
S - Head Breadth	mm	124.4 to 134.6	130	Pass
T - Head Depth	mm	149.9 to 165.1	155	Pass
U - Hip breadth	mm	158.5 to 173.7	161	Pass
V - Shoulder breadth	mm	200.7 to 215.9	210	Pass
W - Foot breadth	mm	39.1 to 49.3	41	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	468	Pass
Z - Waist circumference	mm	447.0 to 472.4	455	Pass
AA - Reference location for dimension Y & O	mm	256.5 to 266.7	260	Pass
BB - Reference Location For dimension Z	mm	106.7 to 116.9	112	Pass
CC - Shoulder Height	mm	299.7 to 314.9	303	Pass
DD - Chin Height	mm	289.6 to 304.8	294	Pass
Overall Test Results				Pass

Test Program: CRABI 12 Month Old Frontal Head Drop Test
 ATD Serial No.: 022

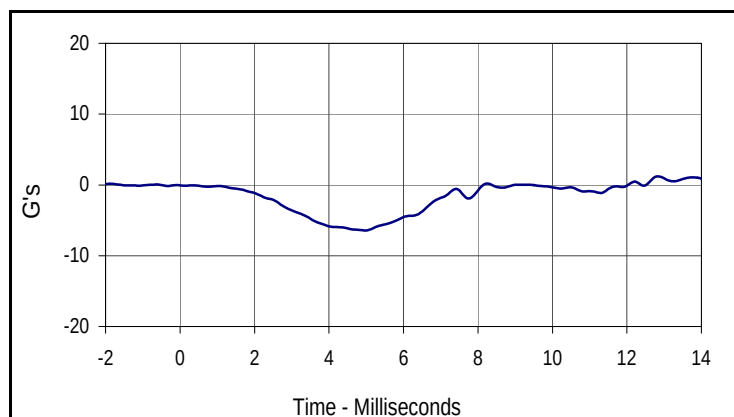
Test Date: 7/2/07
 Test I.D.: FHD06S



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	100.0 to 120.0	116.0	Pass
Peak Lateral Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



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



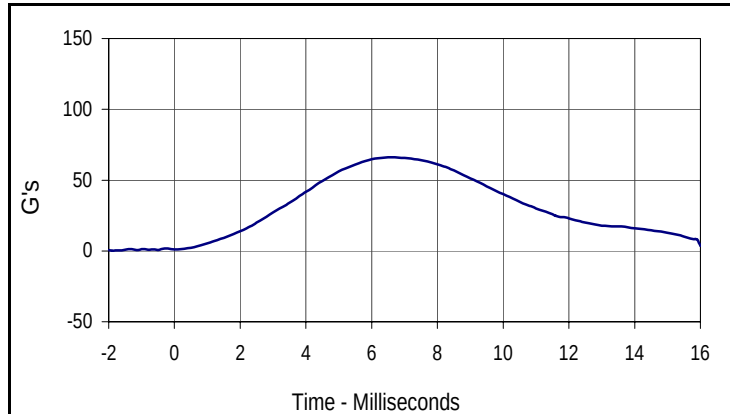
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.1	-1.9	-6.4	5.0

Test Program: CRABI 12 Month Old Rear Head Drop Test
 ATD Serial No.: 022

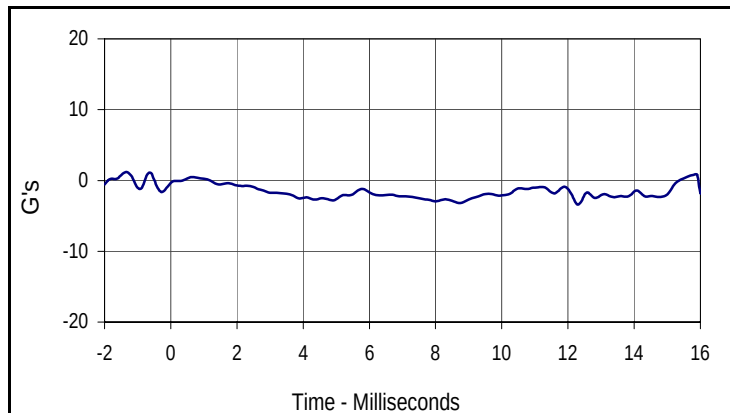
Test Date: 7/3/07
 Test I.D.: RHD06S



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	55.0 to 71.0	64.8	Pass
Peak Lateral Acceleration	G's	≤15.0	2.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



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



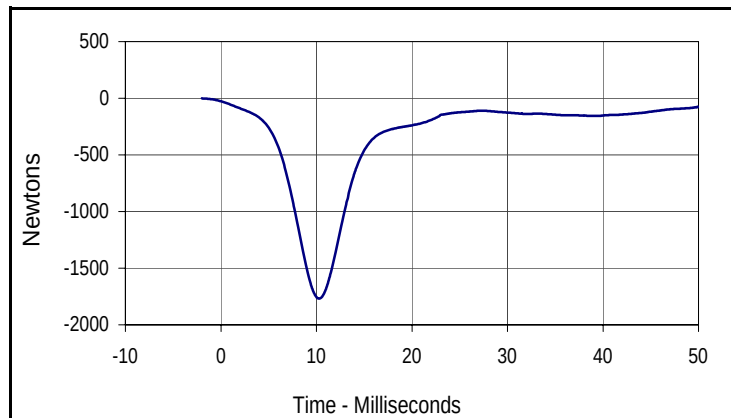
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.1	-1.3	-2.8	4.9

Test Program: CRABI 12 Month Old Thorax Impact Test
 ATD Serial No.: 022

Test Date: 7/3/07
 Test I.D.: CH07S



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



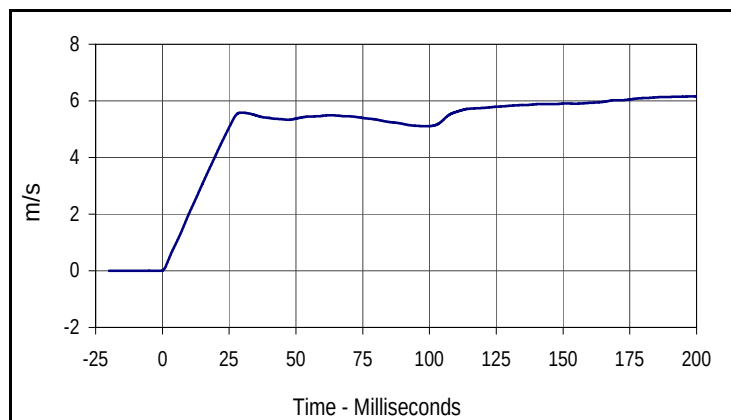
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	60	Newtons
Max	Time	Min	Time
-1.3	-2.0	-1753.5	10.0

Test Program: CRABI 12 Month Old Neck Flexion Test
 ATD Serial No.: 022

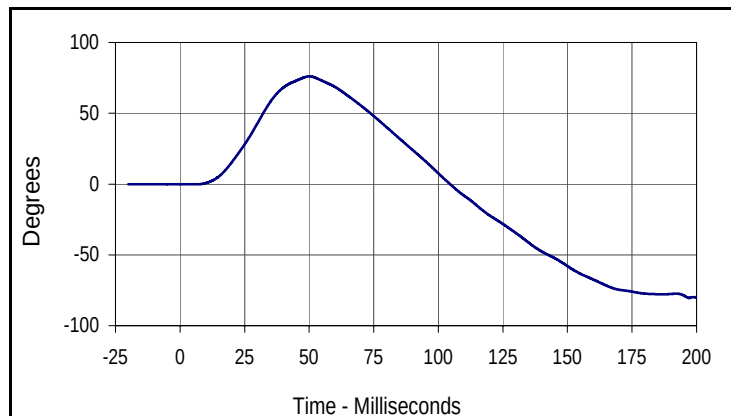
Test Date: 7/6/07
 Test I.D.: NF07S



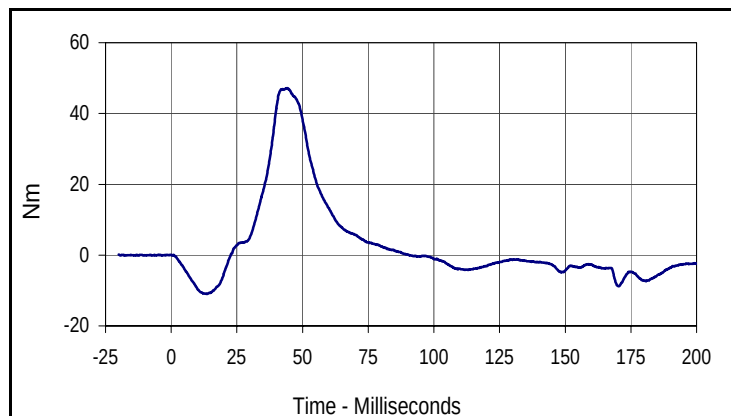
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.15	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	2.0	Pass
	20 Msec.	m/s	3.4 to 4.2	4.1	Pass
	25 Msec.	m/s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



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



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



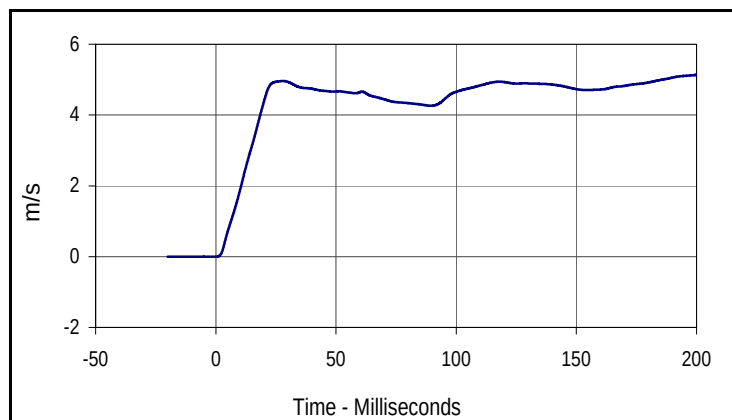
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
47.1	44.3	-10.9	13.5

Test Program: CRABI 12 Month Old Neck Extension Test
 ATD Serial No.: 022

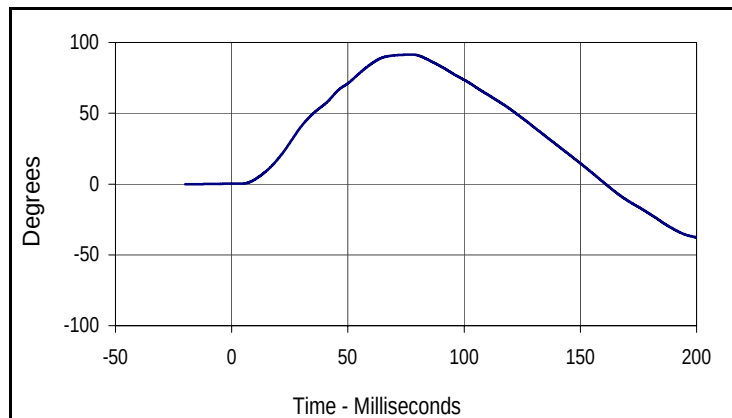
Test Date: 7/4/07
 Test I.D.: NE07S



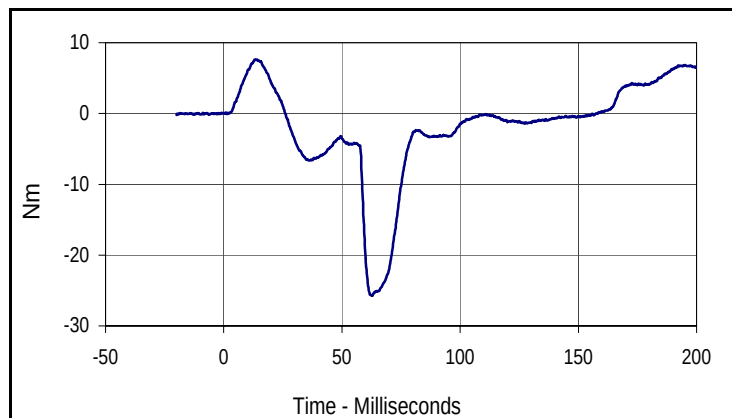
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.44	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.9	Pass
	10 Msec.	m/s	1.5 to 2.1	1.9	Pass
	14 Msec.	m/s	2.2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



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



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



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

Test Program: CRABI 12 Month Old External Dimensions
 ATD Serial No.: 022

Test Date: 7/4/07
 Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	456.0 to 471.2	460	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	283	Pass
C - "H" point height	mm	27.9 to 38.1	32	Pass
D - "H" point from backline	mm	40.1 to 50.3	45	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	55	Pass
F - Thigh clearance	mm	63.0 to 73.2	67	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	187	Pass
I - Shoulder pivot to elbow pivot	mm	99.1 to 114.3	107	Pass
J - Elbow rest height	mm	150.1 to 165.3	158	Pass
K - Buttock to knee length	mm	202.7 to 217.9	206	Pass
L - Popliteal length	mm	138.7 to 153.9	140	Pass
M - Knee pivot height	mm	165.1 to 180.3	172	Pass
N - Buttock popliteal length	mm	144.8 to 160.0	149	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	110	Pass
P - Foot length	mm	92.4 to 102.6	99	Pass
Q- Stature	mm	727.7 to 753.1	N/A	N/A
R - Buttock to knee pivot length	mm	178.5 to 188.7	181	Pass
S - Head Breadth	mm	124.4 to 134.6	128	Pass
T - Head Depth	mm	149.9 to 165.1	152	Pass
U - Hip breadth	mm	158.5 to 173.7	160	Pass
V - Shoulder breadth	mm	200.7 to 215.9	211	Pass
W - Foot breadth	mm	39.1 to 49.3	45	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	460	Pass
Z - Waist circumference	mm	447.0 to 472.4	453	Pass
AA - Reference location for dimension Y & O	mm	256.5 to 266.7	261	Pass
BB - Reference Location For dimension Z	mm	106.7 to 116.9	111	Pass
CC - Shoulder Height	mm	299.7 to 314.9	300	Pass
DD - Chin Height	mm	289.6 to 304.8	290	Pass
Overall Test Results				Pass