

REPORT NUMBER TR-P28001-02-NC

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

**DAIMLERCHRYSLER CORPORATION
2008 DODGE AVENGER
4-DOOR SEDAN**

NHTSA NUMBER: M80303

**PREPARED BY:
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SEPTEMBER 18, 2007

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
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Date of Acceptance

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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2008 Dodge Avenger 4-Door Sedan at Karco Engineering, LLC on September 18, 2007. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 56.54 km/h. The ambient temperature at the barrier face at the time of impact is 27.8 degrees Celcius. The vehicle's maximum post-test static crush is 508 at DPD4 to the right of 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	469.9	595.1
Max. Chest Accel. (3 msec Clip)		Gs	60	36.1	39.1
Left Femur Force		Newtons	10008	-3044.7	-2472.5
Right Femur Force		Newtons	10008	-2191.9	-3119.7
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SECTION 1

PURPOSE AND SUMMARY OF TEST M80303

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 36 load cells was impacted by a 2008 Dodge Avenger 4-Door Sedan at a velocity of 56.54 km/h. The test was performed at Karco Engineering, LLC on September 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. 035) and the right-front passenger (position 2) ATD (Serial No. 034) were calibrated one test prior to this test.

One hundred and thirty-two (132) 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 508 mm at DPD 4. 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, chest and abdomen contacted the airbag. Both knees contacted the knee bolster.

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

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY					
ATD Position	HIC	3 msec Clip (g)	Chest Defl. (mm)	Left Femur (N)	Right Femur (N)
Driver	469.9	36.1	-27.3	-3044.7	-2191.9
Passenger	595.1	39.1	-21.7	-2472.5	-3119.7

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

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

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: 2008 Dodge Avenger 4-Door Sedan
Test Program: 2007 NHTSA 35mph NCAP

NHTSA No.: M80303
Test Date: 9/18/07

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.54
Test Weight	kg	1683
Impact Angle	degrees	0
Average Rebound	mm	560
Maximum Static Crush	mm	508

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 with tools	Remained closed and latched, opened with tools
Seat Track Shift (mm)	None	None
Seat Back Failure	No	No

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type/ Serial No.	50% Male Hybrid III No. 035	50% Male Hybrid III No. 034
Head Contact	Airbag	Airbag
Chest Contact	Airbag	Airbag
Abdomen Contact	Airbag	Airbag
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	36
Total	132

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M80303	Anti-Lock Brakes	Yes
Make	Dodge	All Wheel Drive	No
Model	Avenger	Power Steering	Yes
Body Style	4-Door Sedan	Driver Front Airbag	Yes
Vin No.	1B3LC46K18N571937	Driver Side Airbag	Yes
Color	White	Driver Head Airbag	No
Delivery Date	8/24/2007	Driver Curtain Airbag	Yes
Odometer (Miles)	71.0	Pass. Airbag	Yes
Dealer	Victorville Motors	Pass. Side Airbag	Yes
Transmission	4-Speed Automatic	Pass. Head Airbag	No
Final Drive	Front	Pass. Curtain Airbag	Yes
Type/No. Cyl.	Inline 4	Pre-Tensioners	Yes
Engine Disp. (L)	2.4	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	No	Tilt Steering	Yes
Traction Control	No	Automatic Door Locks	Yes
Power Brakes	Yes	Power Windows	Yes
Front Disc	Yes	Power Seats	No
Rear Disc	No	Other	n/a

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

No

DATA FROM MANUFACTURER

Manufactured By	DiamlerChrysler Corporation	GVWR (kg)	2019
Date of Manufacture	Mar-07	GAWR Front (kg)	1180
		GAWR Rear (kg)	1007

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				392
Cargo Weight (RCLW) (kg)				52

DATA SHEET NO. 2...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

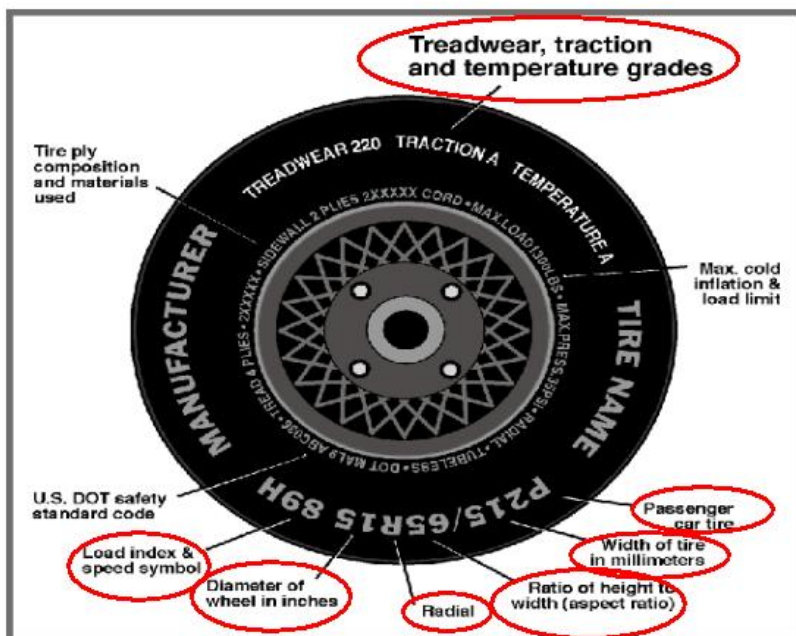
Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

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)	220	220
Recommended Tire Size	P215/65R16	P215/65R16
Tire Size on Vehicle	P215/65R16	P215/65R16
Tire Manufacturer	Firestone	Firestone
Treadwear	440	440
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel	1 Polyester, 2 Steel
Load Index/Speed Symbol	96T	96T
Tire Material	Polyester, Steel	Polyester, Steel
DOT Safety Code Right	8X2H F9H 0707	8X2H F9H 0707
DOT Safety Code Left	8X2H F9H 0707	8X2H F9H 0707

DATA SHEET NO. 2...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UWV)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	461	297	758	498	375	873
Right	kg	435	292	727	456	354	810
Ratio	%	60.3	39.7	100.0	56.7	43.3	100.0
Totals	kg	896	589	1485	954	729	1683

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UWV)	kg	1485
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	52
Calculated Vehicle Target Wt. (TVTW)	kg	1689

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	745	753	738	743	1098
As Tested	mm	730	737	707	715	1199

Vehicle Wheel Base (mm) 2768

Weight of Ballast Secured in cargo area (kg) 0

Weight of Items Removed (kg) 80

Vehicle Components Removed Rear bumper, rear glass, rear door panels, rear door windows, taillights, muffler, hub caps, spare tire, trunk lid, rear speakers, **3 gallons of stoddard solvent

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

** With approval from NHTSA

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 63.97

Actual Test Volume with entire fuel System Filled (L) 48.26

Test Fluid Type: Stoddard Solvent

Kinematic Viscosity: as per ASTM Standard D484-71 Red

Is Vehicle Fuel Pump Electric or Mechanical? Electric

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

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

DATA SHEET NO. 3**POST-TEST IMPACT DATA**Test Vehicle: 2008 Dodge Avenger 4-Door SedanNHTSA No.: M80303Test Program: 2007 NHTSA 35mph NCAPTest Date: 9/18/07**SPEED TRAP DATA**

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	56.54
Trap No.2 Velocity (Redun.)	km/h	55.51 to 57.12	56.52

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4642	4350	292
Center	mm	4835	4340	495
Right Side	mm	4642	4289	353

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	530
Center	mm	555
Right Side	mm	595
Average	mm	560

DATA SHEET NO. 4

TEST VEHICLE INFORMATION

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

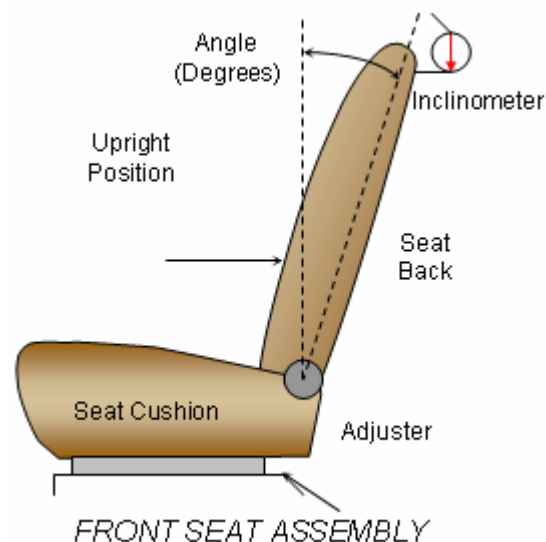
Test Date: 9/18/07

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	12.7 @ Headrest
Passenger w/seated Dummy	12.7 @ Headrest

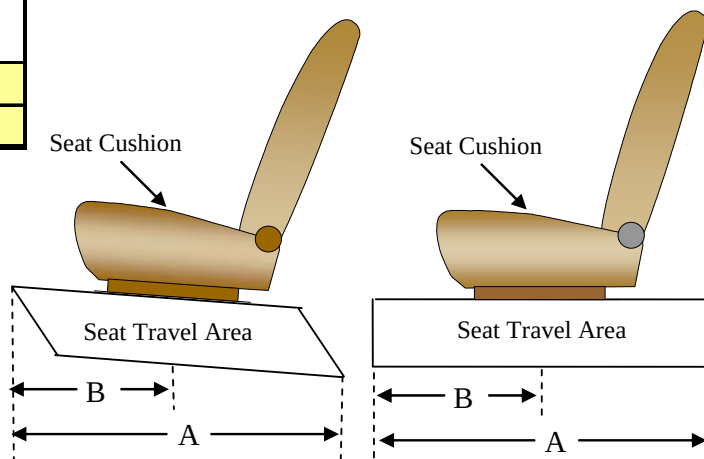


SEAT FORE/AFT POSITIONS

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 vertical adjustments on the seats that were equipped with the vehicle. They were placed at the lowermost position.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position
Driver Seat	28 Detents	14th Detent
Passenger Seat	28 Detents	14th Detent



SEAT BELT UPPER ANCHORAGE

Position number two (2) from the uppermost position.

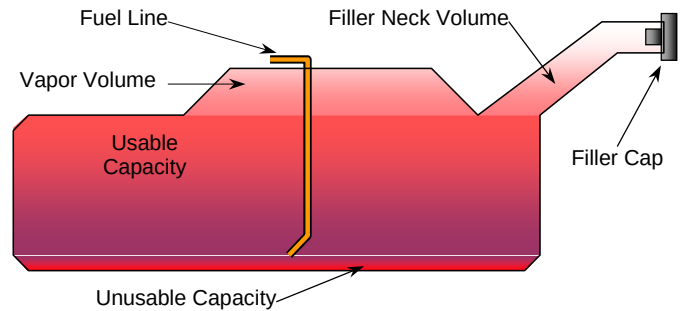
SEAT BELT UPPER ANCHORAGE

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

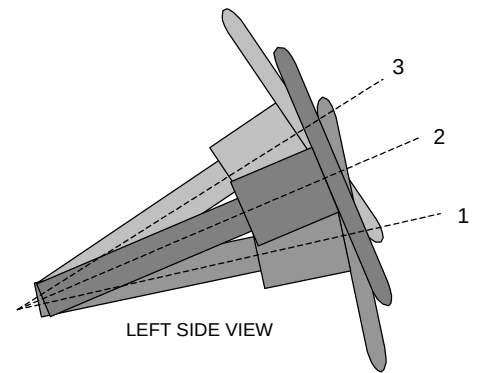
DATA SHEET NO. 4...(CONTINUED)**TEST VEHICLE INFORMATION**Test Vehicle: 2008 Dodge Avenger 4-Door SedanNHTSA No.: M80303Test Program: 2007 NHTSA 35mph NCAPTest Date: 9/18/07**FUEL TANK CAPACITY**

	Liters
Usable Capacity of "Standard Tank"	63.97
Usable Capacity of "Optional" Tank	
Usable Capacity used for FMVSS 301	58.86 to 60.14
Actual Amount of Solvent used	48.26

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	16.7	0.0
Geometric center position No. 2	19.6	26.0
Uppermost position No. 3	22.3	52.0

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		27.9		
SWA	Steering Wheel Angle		70.4		
SCA	Steering Column Angle		19.6		
SA	Seat Back Angle		12.7 @ Headrest		12.7 @ Headrest
HZ	Head to Roof (Z)	238	90.0	240	90.0
HH	Head to Header	465		435	
HW	Head to Windshield	748		705	
HR	Head to Side Header (Y)	255		266	
NR	Nose to Rim	414	10.6		
CD	Chest to Dash	566		527	
CS	Chest to Steering Hub	354			
RA	Rim to Abdomen	215			
KDL	Left Knee to Dash	133	23.3	121	
KDR	Right Knee to Dash	130		115	22.0
PA	Pelvic Angle		23.4		22.0
TA	Tibia Angle		43.5		44.5
KK	Knee to Knee (Y)	278		275	
SK	Striker to Knee	630	2.8	640	4.7
ST	Striker to Head	475	87.0	476	86.0
SH	Striker to H-Point	211	0.0	217	0.0
SHY	Striker to H-Point (Y)	232		231	
HS	Head to Side Window	380		348	
HD	H-Point to Door (Y)	120		112	
AD	Arm to Door (Y)	105		109	

DATA SHEET NO. 5...(CONTINUED)

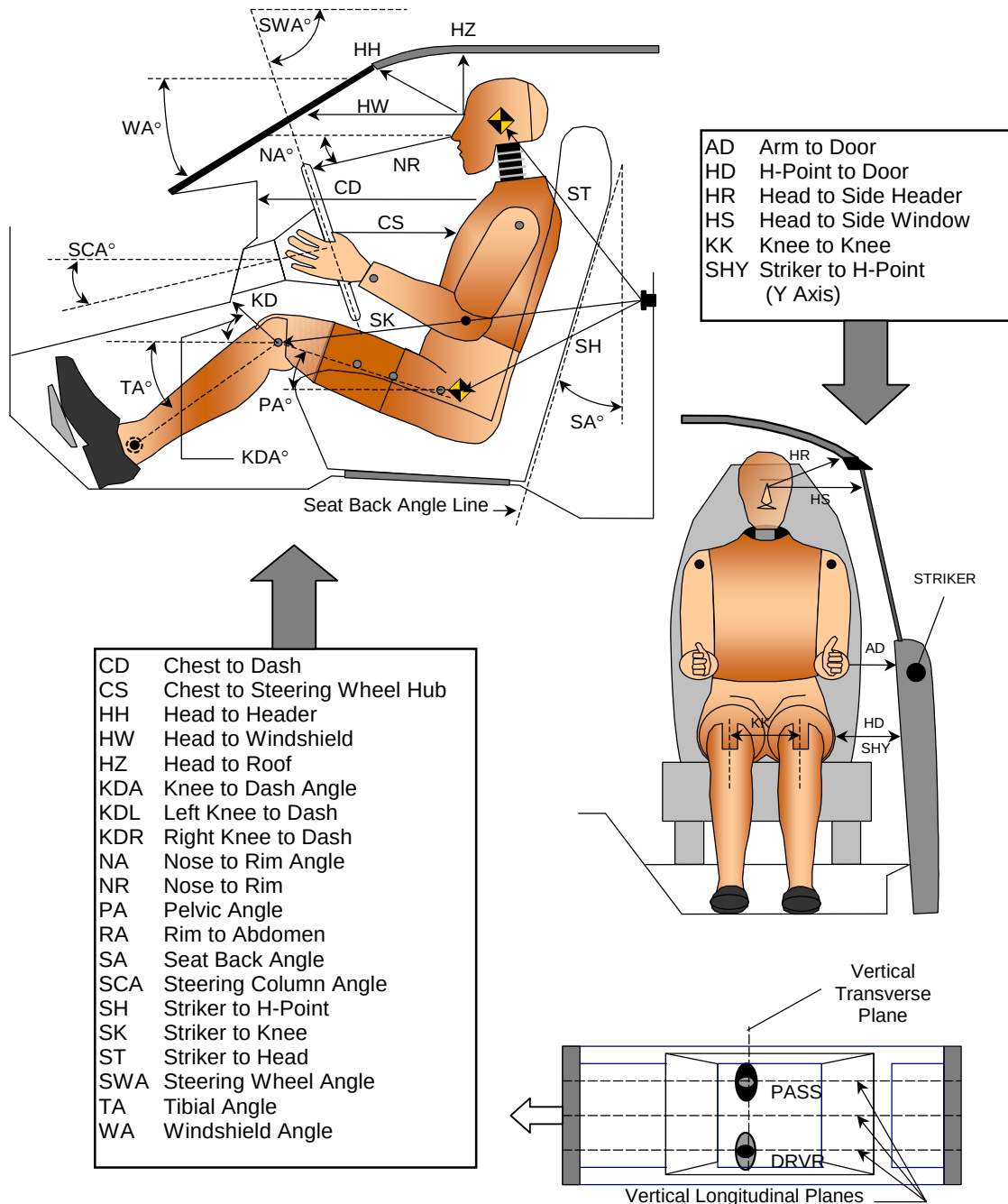
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6

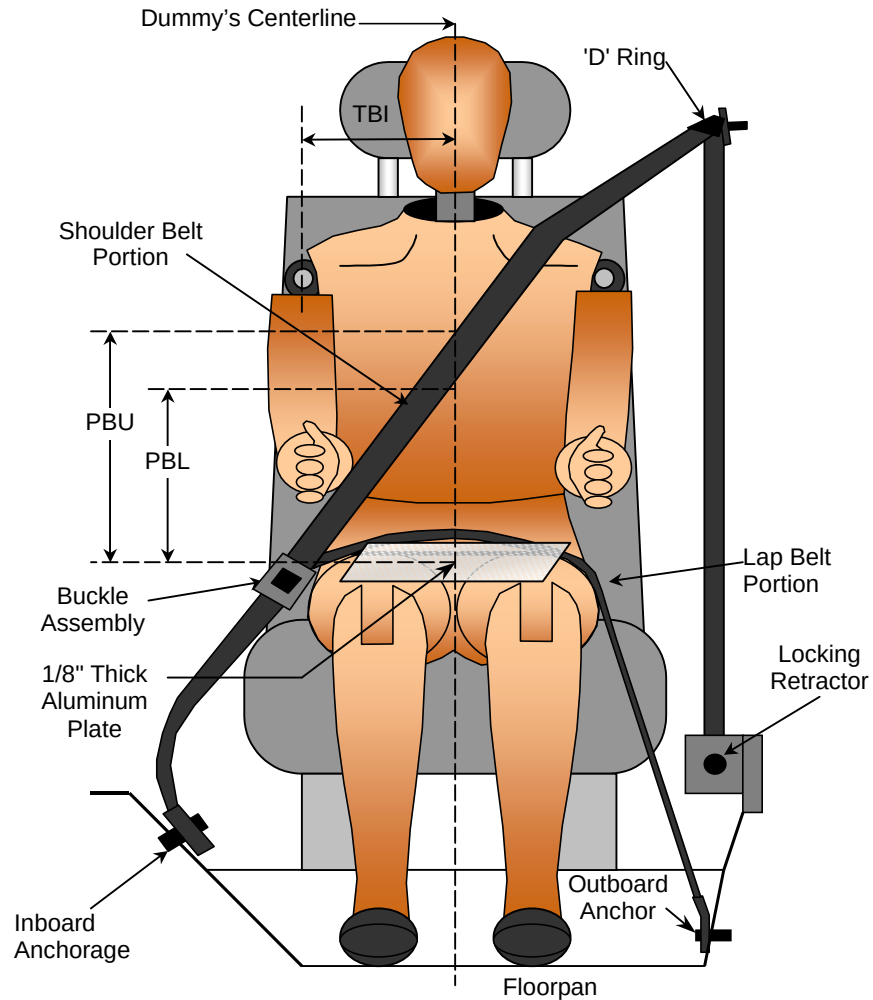
SEAT BELT POSITIONING DATA

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	230	250
PBU - Top Surface of reference to belt upper edge	mm	305	295
PBL - Top Surface of reference to belt lower edge	mm	245	235
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATION

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

Test Date: 9/18/07

Test Program: 2007 NHTSA 35mph NCAP

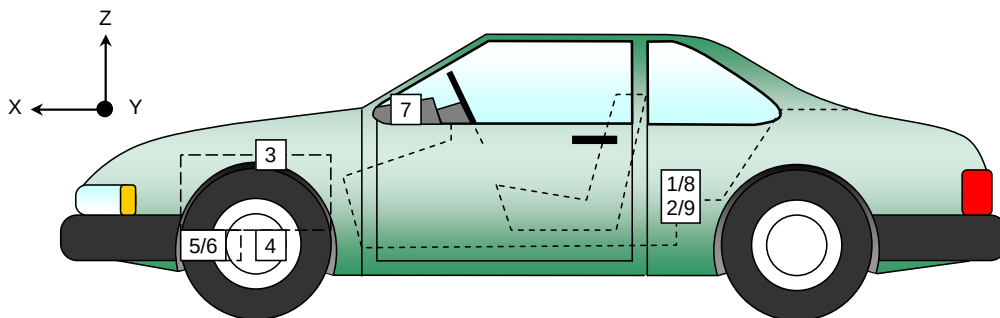
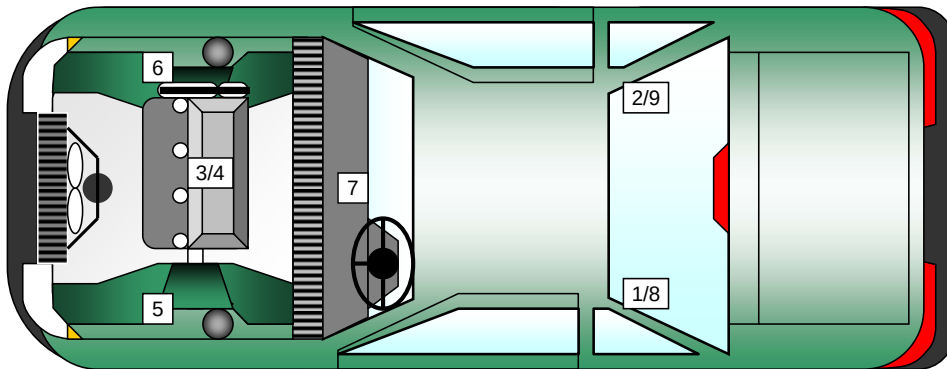
NHTSA No.: M80303

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member	1800	-710	375
2	Right Rear X-Member	1795	710	375
3	Engine Top	4025	40	890
4	Engine Bottom	4160	180	170
5	Left Brake Caliper	3965	-780	320
6	Right Brake Caliper	3965	780	320
7	Instrument Panel			
8	Left Rear X-Member (Z-Axis)	1800	-710	375
9	Right Rear X-Member (Z-Axis)	1795	710	375

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

1.) Instrument Panel no longer used by NHTSA



DATA SHEET NO. 8**SEAT BELT ASSESSMENT TEST DATA**Test Vehicle: 2008 Dodge Avenger 4-Door SedanNHTSA No.: M80303Test Program: 2007 NHTSA 35mph NCAPTest Date: 9/18/07**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
Retractor Reel to "D" ring	mm	700	710
Shoulder Belt length as measured on ATD	mm	860	885
Lap Belt length as measured on ATD	mm	600	600
Remainder of belt on reel	mm	900	820
Total belt length for continuous webbing systems	mm	3060	3015

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	185	210
As determined electronically	mm	210	303

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: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

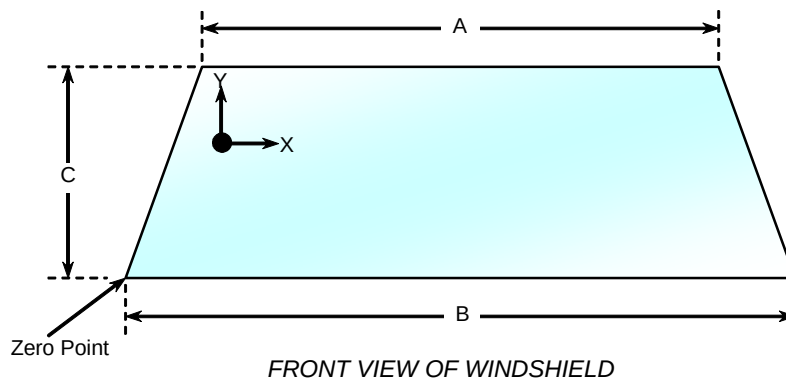
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive, and rubber and plastic molding.

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: 27.8 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test(mm)	Post-Test(mm)	% of Retention
Left Side	2121	2121	100
Right Side	2121	2121	100
Total	4242	4242	100



WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1255	n/a
B	mm	1533	129
C-Left	mm	727	25
C-Right	mm	727	25

DATA SHEET NO. 10

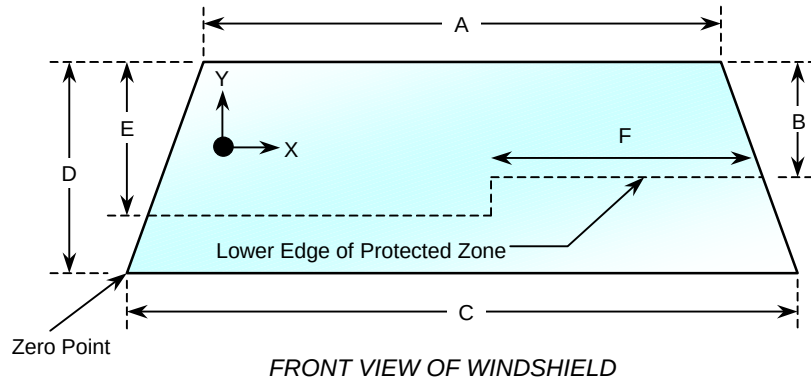
WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07



WINDSHIELD AND PROTECTED ZONE

Item	Units	Value
A	mm	1255
B	mm	478
C	mm	1533
D	mm	727
E	mm	457
F	mm	930

AREA OF PROTECTED ZONE FAILURES

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

X	Y

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

X	Y

DATA SHEET NO. 11

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan NHTSA No.: M80303
Test Program: 2007 NHTSA 35mph NCAP Test Date: 9/18/07

Test Time: 11:57 AM

Temperature: 27.8° 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

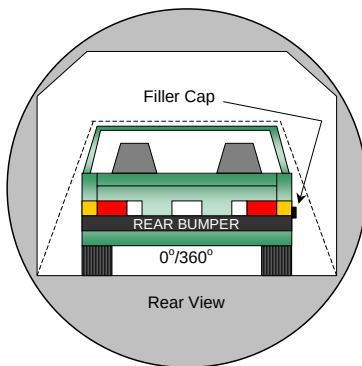
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

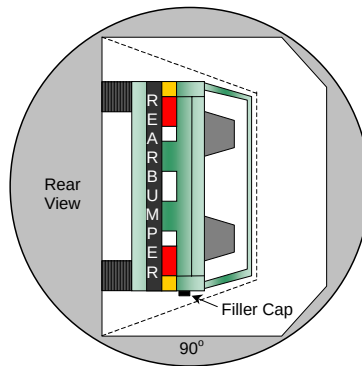
NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

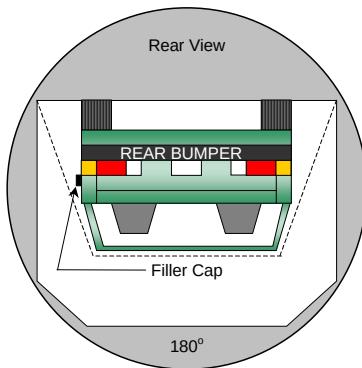
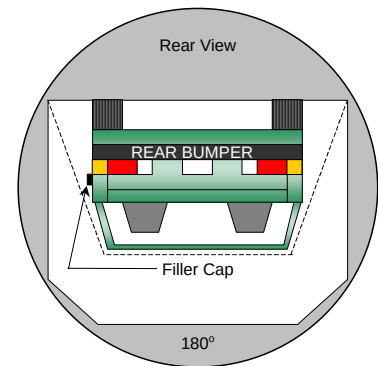
Test Date: 9/18/07



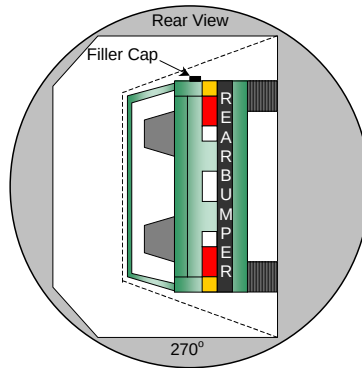
0° to 90°



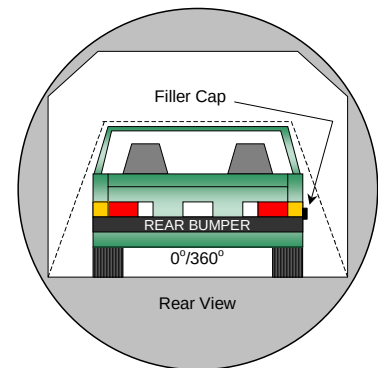
90° to 180°



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: 2008 Dodge Avenger 4-Door SedanNHTSA No.: M80303Test Program: 2007 NHTSA 35mph NCAPTest Date: 9/18/07**SOLVENT COLLECTION TIME TABLE IN SECONDS**

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	81	303	384
90° to 180°	81	305	386
180° to 270°	80	306	386
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: 2008 Dodge Avenger 4-Door SedanNHTSA No.: M80303Test Program: 2007 NHTSA 35mph NCAPTest Date: 9/18/07**VEHICLE MEASUREMENT TABLE**

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	4835	4340	-495
2	RSOV to front of engine	mm	4052	3879	-173
3	RSOV to firewall centerline	mm	3740	3739	-1
4	RSOV to leading edge of right door	mm	3333	3339	6
5	RSOV to leading edge of left door	mm	3328	3332	4
6	RSOV to lower leading edge of right door	mm	3304	3297	-7
7	RSOV to lower leading edge of left door	mm	3290	3290	0
8	RSOV to upper trailing edge of right door	mm	2215	2219	4
9	RSOV to upper trailing edge of left door	mm	2207	2212	5
10	RSOV to lower trailing edge of right door	mm	2237	2235	-2
11	RSOV to lower trailing edge of left door	mm	2224	2223	-1
12	RSOV to bottom of right 'A' pillar	mm	3253	3252	-1
13	RSOV to bottom of left 'A' pillar	mm	3248	3246	-2
14	RSOV to firewall on right side	mm	3745	3728	-17
15	RSOV to firewall on left side	mm	3745	3735	-10
16	RSOV to steering column	mm	2823	2807	-16
17	Center of steering column to left 'A' pillar	mm	440	465	25
18	Center of steering column to headlining	mm	430	446	16
19	RSOV to right side of front bumper	mm	4642	4289	-353
20	RSOV to left side of front bumper	mm	4642	4350	-292
21	Length of engine block	mm	475	475	0
RD	RSOV to right side of dash panel	mm	3052	3028	-24
CD	RSOV to center of dash panel	mm	3042	3056	14
LD	RSOV to left side of dash panel	mm	3028	3028	0

DATA SHEET NO. 13...(CONTINUED)

VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

VEHICLE STRUCTURAL MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	4835	4340	-495
2	Total width	mm	1805	1808	3
3	Bumper top height	mm	580	612	32
4	Bumper bottom height	mm	236	243	7
5	Longitudinal member top height	mm	585	590	5
6	Longitudinal member bottom height	mm	460	470	10
7	Distance between longitudinal members	mm	906	915	9
8	Longitudinal member width	mm	70	68	-2
9	Engine top height	mm	824	590	-234
10	Engine bottom height	mm	205	250	45
11	Engine and gear box width	mm	830	830	0
12	Front bumper to engine distance	mm	793	474	-319
13	Front shock absorber fixing width	mm	908	954	46
14	Bonnet leading edge height	mm	790	820	30
15	Front shock absorber fixing width	mm	1132	1098	-34
16	Front bumper to front axle distance	mm	1013	680	-333
17	Front axle to 'A' pillar distance	mm	470	410	-60
18	'A' pillar to 'B' pillar distance	mm	1006	1006	0
19	'B' pillar to rear axle distance	mm	1177	1166	-11
20	'B' pillar to 'C' pillar distance	mm	830	836	6
21	Roof sill bottom height	mm	1290	1292	2
22	Roof sill top height	mm	1403	1410	7
23	Floor sill bottom height	mm	216	226	10
24	Floor sill top height	mm	417	380	-37

DATA SHEET NO. 13...(CONTINUED)

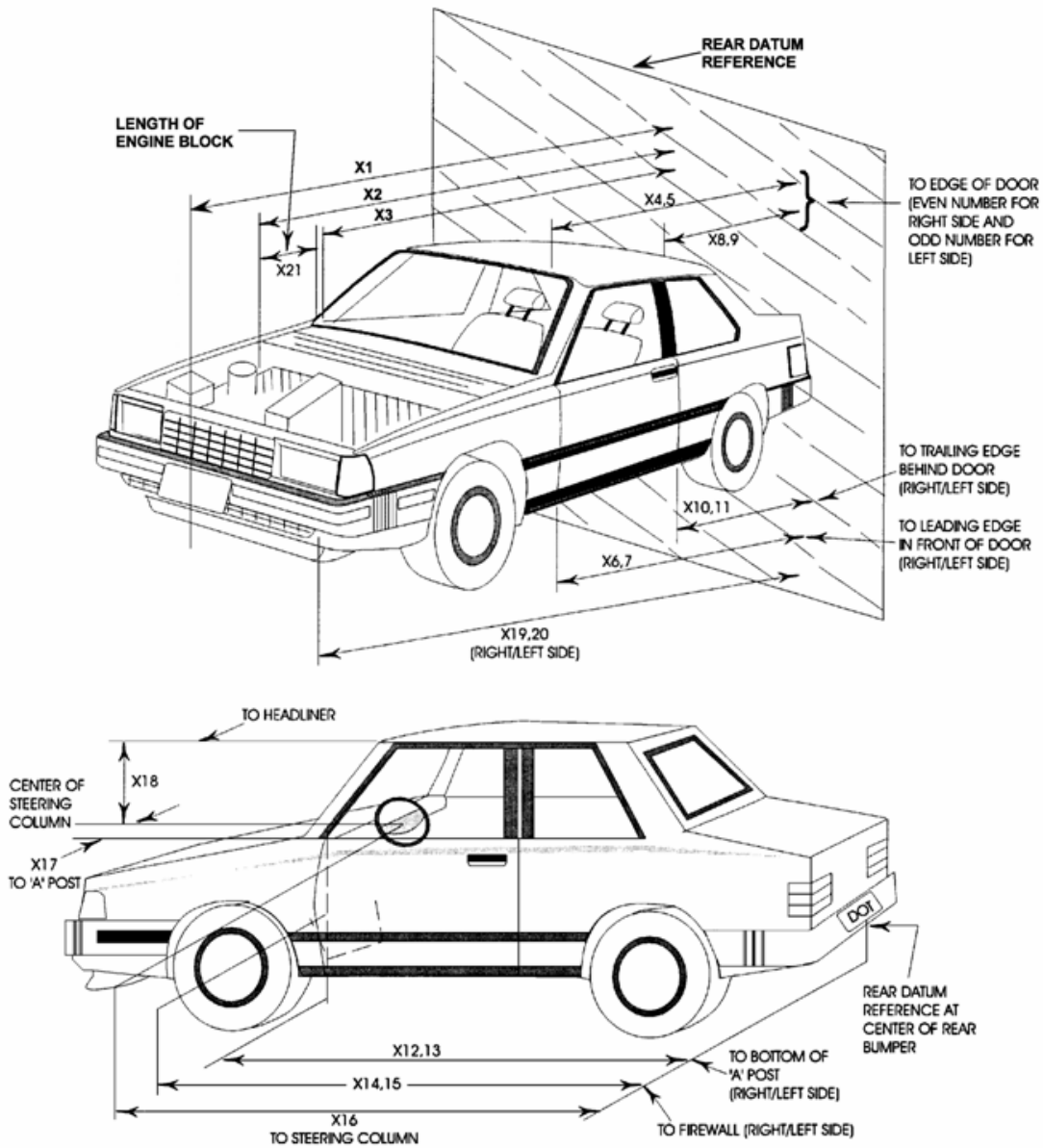
VEHICLE MEASUREMENTS

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07



DATA SHEET NO. 14

CAMERA LOCATIONS

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

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

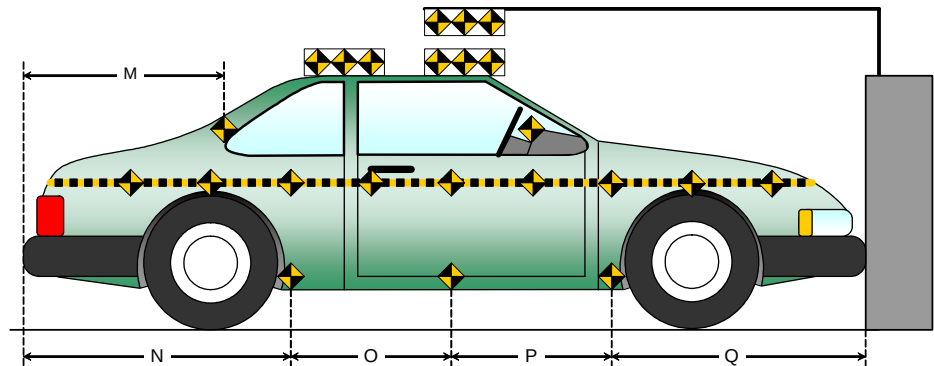
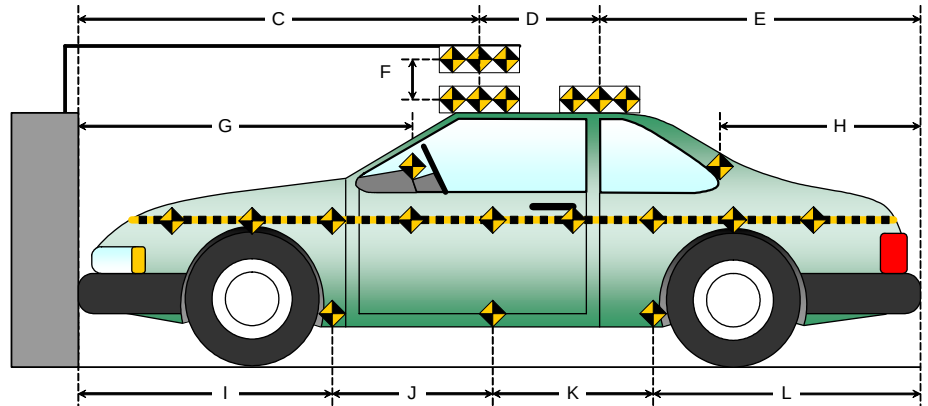
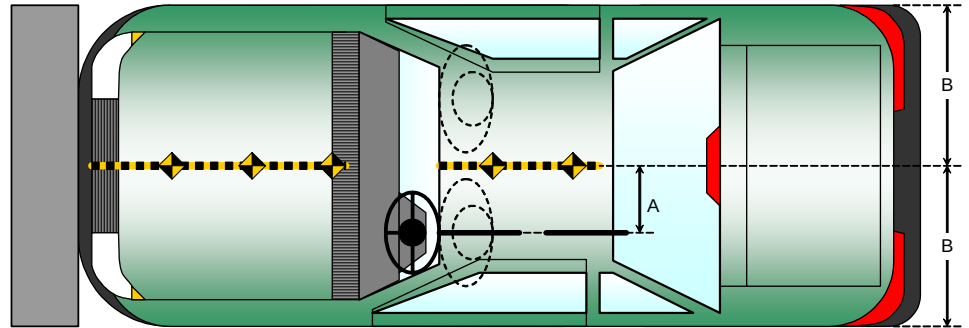
Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

All Dimensions in (mm)	
Item	Value
A	375
B	902.5
C	1975
D	615
E	1930
F	
G	2965
H	1157
I	1473
J	920
K	920
L	1535
M	1157
N	1535
O	920
P	920
Q	1473



DATA SHEET NO. 16

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

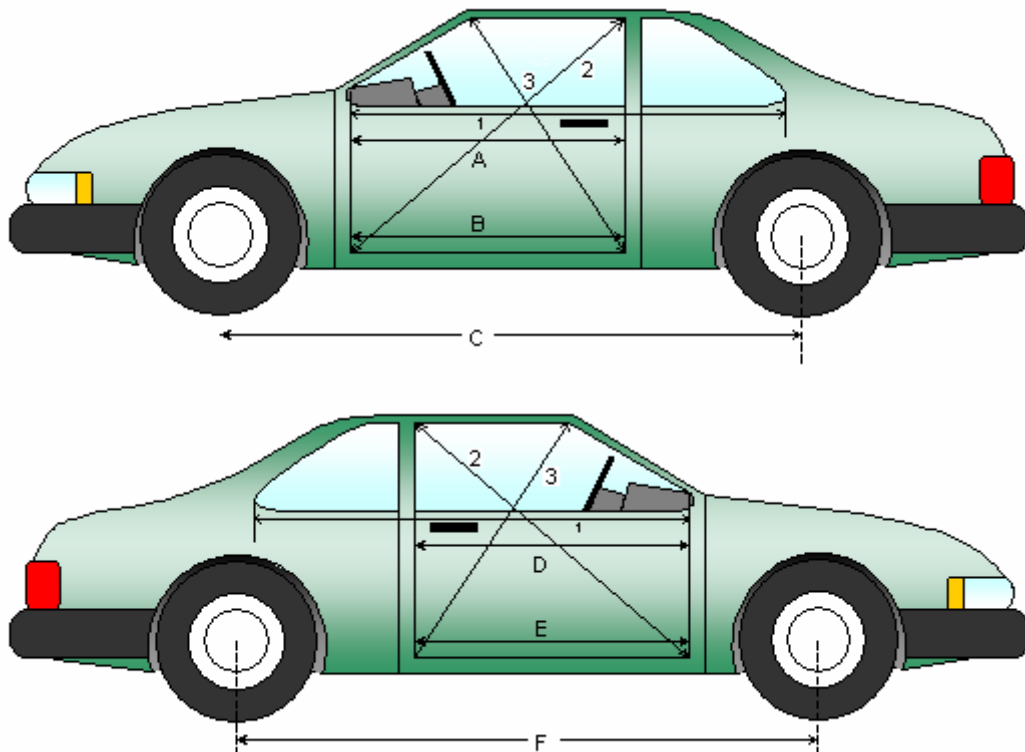
Test Date: 9/18/07

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
1L	Left Side	mm	1006	1006	0
2L	Left Side (Diagonally)	mm	1395	1395	0
3L	Left Side (Diagonally)	mm	1028	1028	0
1R	Right Side	mm	1006	1006	0
2R	Right Side (Diagonally)	mm	1395	1395	0
3R	Right Side (Diagonally)	mm	1028	1028	0

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2768	2678	-90
F	Right Side Wheel Base	mm	2768	2750	-18



DATA SHEET NO. 16...(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

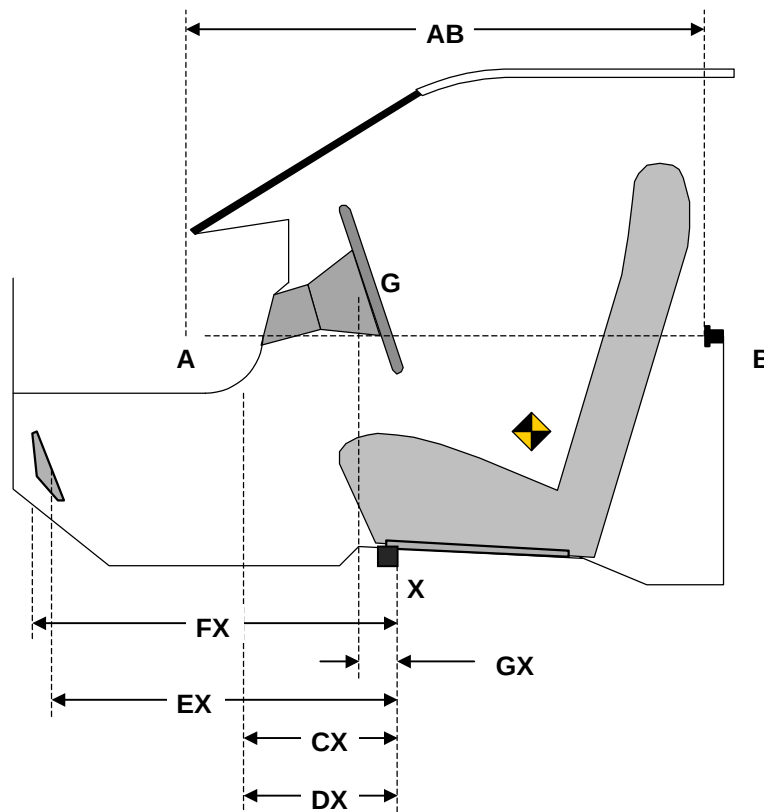
NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	1006	1006	0
CX	Left Knee Bolster to X	mm	205	198	-7
DX	Right Knee Bolster to X	mm	210	200	-10
EX	Brake Pedal to X	mm	485	405	-80
FX	Foot Rest to X	mm	515	523	8
GX	Center of Steering Wheel Hub to X	mm	50	15	-35



DATA SHEET NO. 16...(CONTINUED)

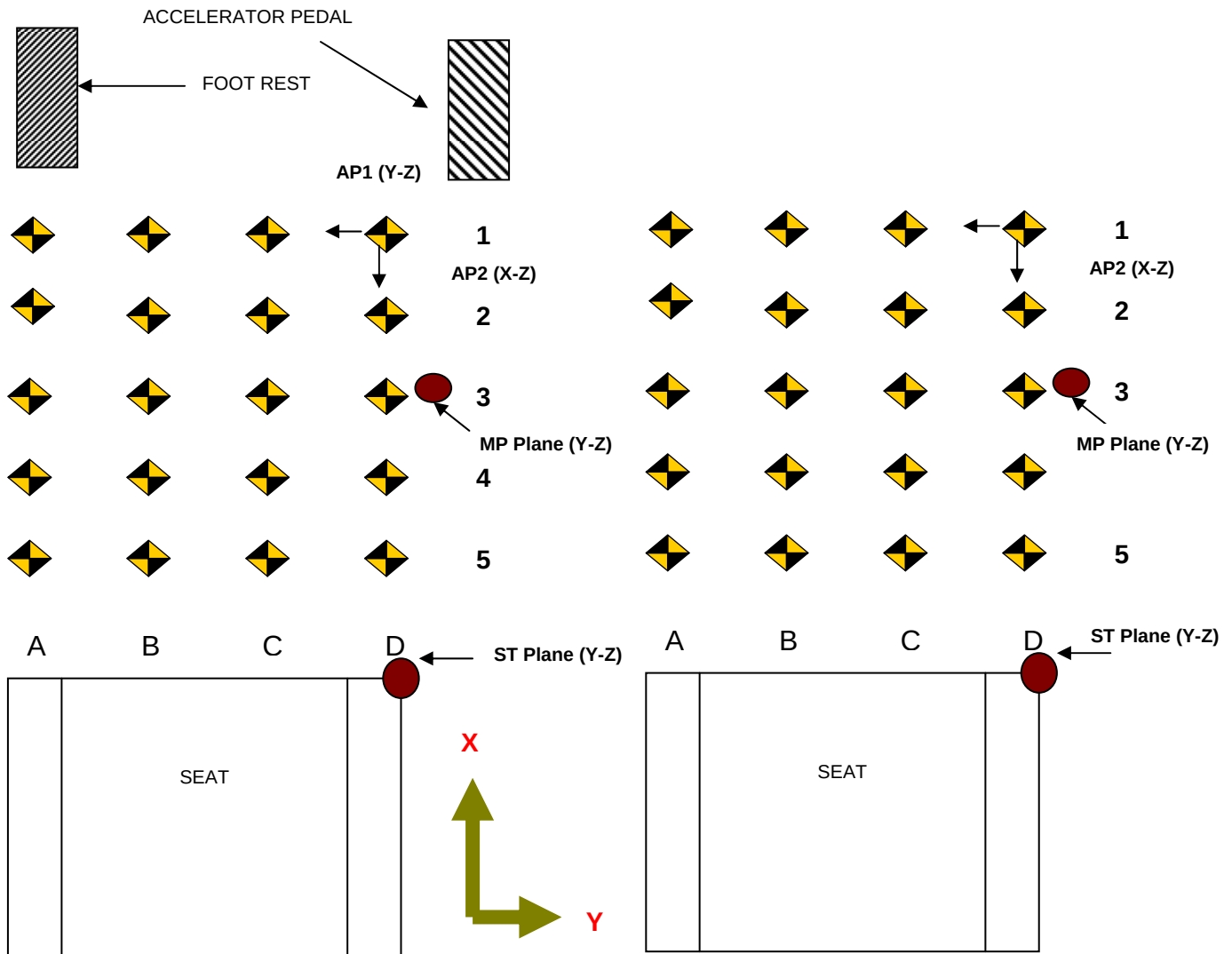
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07



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: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

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	648	680	685	683	593	607	632	648	-55	-73	-53	-35
2	576	570	577	573	573	564	557	561	-3	-6	-20	-12
3	450	447	451	447	447	438	437	434	-3	-9	-14	-13
4	344	341	336	338	338	332	325	321	-6	-9	-11	-17
5	235	233	230	229	232	227	221	209	-3	-6	-9	-20

DRIVER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	1	117	211	361	20	137	234	366	19	20	23	5
2	-10	113	214	366	6	129	225	382	16	16	11	16
3	-10	107	213	362	2	118	227	378	12	11	14	16
4	-13	104	215	372	-4	112	223	385	9	8	8	13
5	-15	101	219	378	-10	107	222	387	5	6	3	9

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-51	-40	-40	-54	-57	-49	-40	-60	-6	-9	0	-6
2	40	35	36	11	51	50	38	37	11	15	2	26
3	86	85	86	84	92	93	89	88	6	8	3	4
4	94	83	83	86	83	92	94	89	-11	9	11	3
5	99	82	84	87	98	91	91	89	-1	9	7	2

DATA SHEET NO. 16...(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

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	682	674	680	628	680	643	633	602	-2	-31	-47	-26
2	562	567	569	575	561	562	571	571	-1	-5	2	-4
3	439	438	441	455	436	435	439	455	-3	-3	-2	0
4	328	325	324	330	325	323	322	327	-3	-2	-2	-3
5	219	223	228	230	216	221	226	227	-3	-2	-2	-3

PASSENGER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-313	-187	-76	31	-313	-191	-82	35	0	-4	-6	4
2	-311	-188	-73	76	-313	-188	-74	85	-2	0	-1	9
3	-307	-185	-71	75	-310	-188	-73	75	-3	-3	-2	0
4	-305	-182	-66	91	-308	-185	-69	85	-3	-3	-3	-6
5	-302	-181	-62	94	-305	-182	-65	88	-3	-1	-3	-6

PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-32	-33	-41	-73	-29	-38	-59	-79	3	-5	-18	-6
2	35	39	37	43	39	45	38	42	4	6	1	-1
3	84	85	84	87	85	86	87	91	1	1	3	4
4	84	85	83	93	85	86	84	98	1	1	1	5
5	84	85	83	97	84	84	85	100	0	-1	2	3

DATA SHEET NO. 17

FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

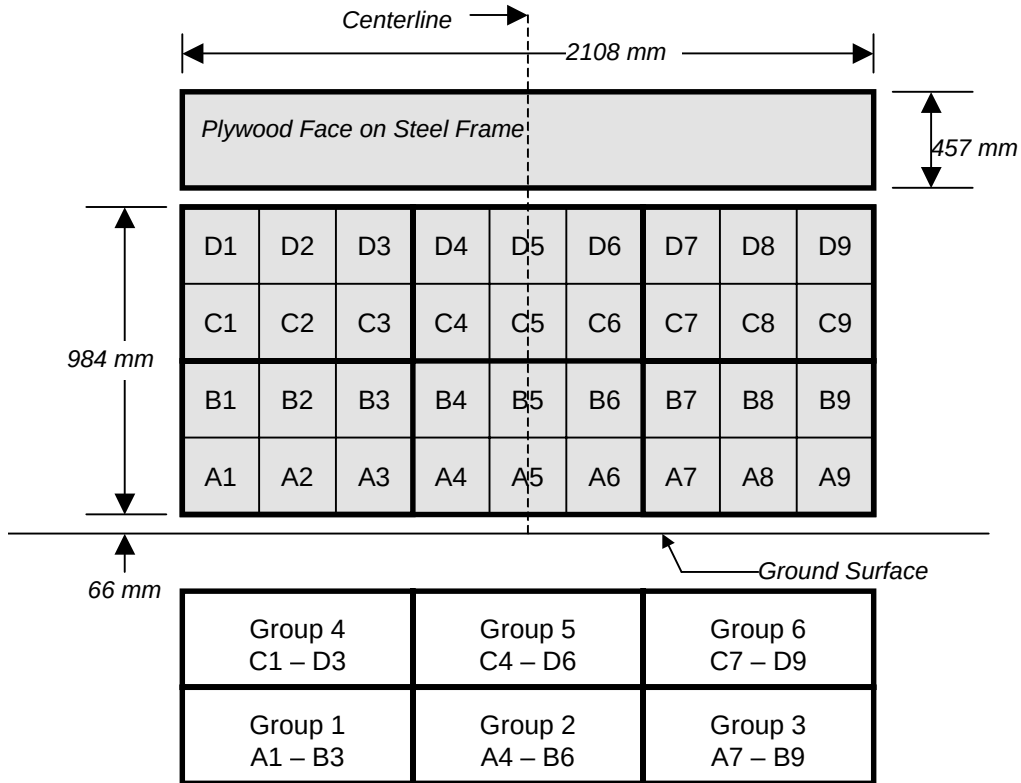
NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

36 Load Cell Rigid Barrier (NHTSA Standard)

Load Cell Locations on Fixed Barrier



6 Groups of 6 Load Cells Each

DATA SHEET NO. 18

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

VEHICLE INFORMATION

VIN: 1B3LC46K18N571937

Wheel base (mm): 2768

Vehicle Size Category: 4-Door Sedan

Test Weight (kg): 1683

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): 56.52

Velocity Change (km/h): 63.8

Time of Separation (msec): 71.2

CRUSH PROFILE

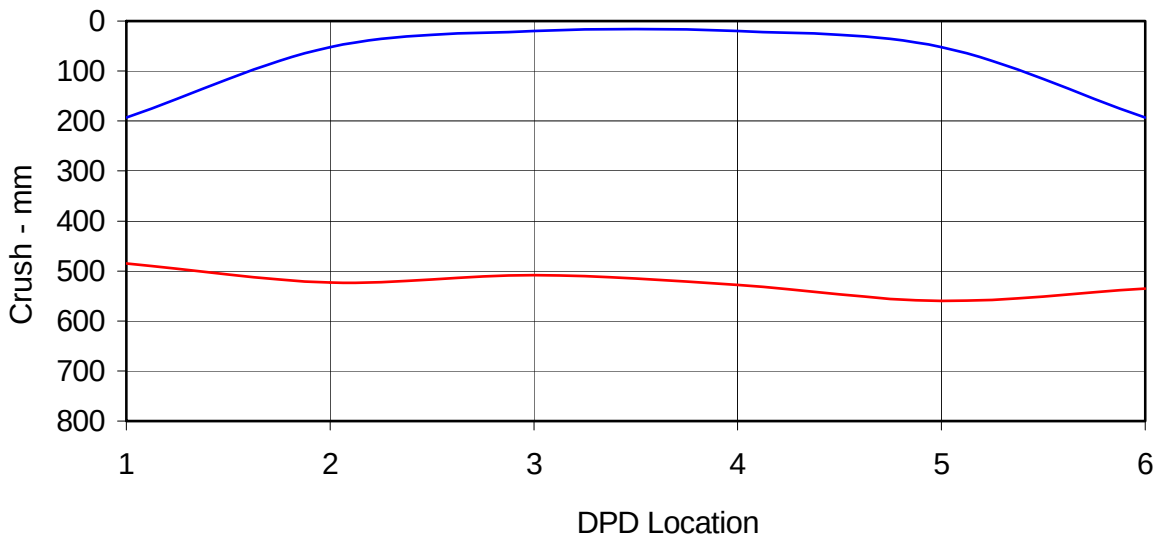
Collision Deformation Classification: 12FDEW6

Midpoint of Damage: Vehicle Centerline

Damage Region Length (mm): 1435

Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	193	485	-292
C2	Crush zone 2 on left side	mm	52	523	-471
C3	Crush zone 3 on left side	mm	20	508	-488
C4	Crush zone 4 on right side	mm	20	528	-508
C5	Crush zone 5 on right side	mm	52	560	-508
C6	Crush zone 6 at right side	mm	193	535	-342



DATA SHEET NO. 19

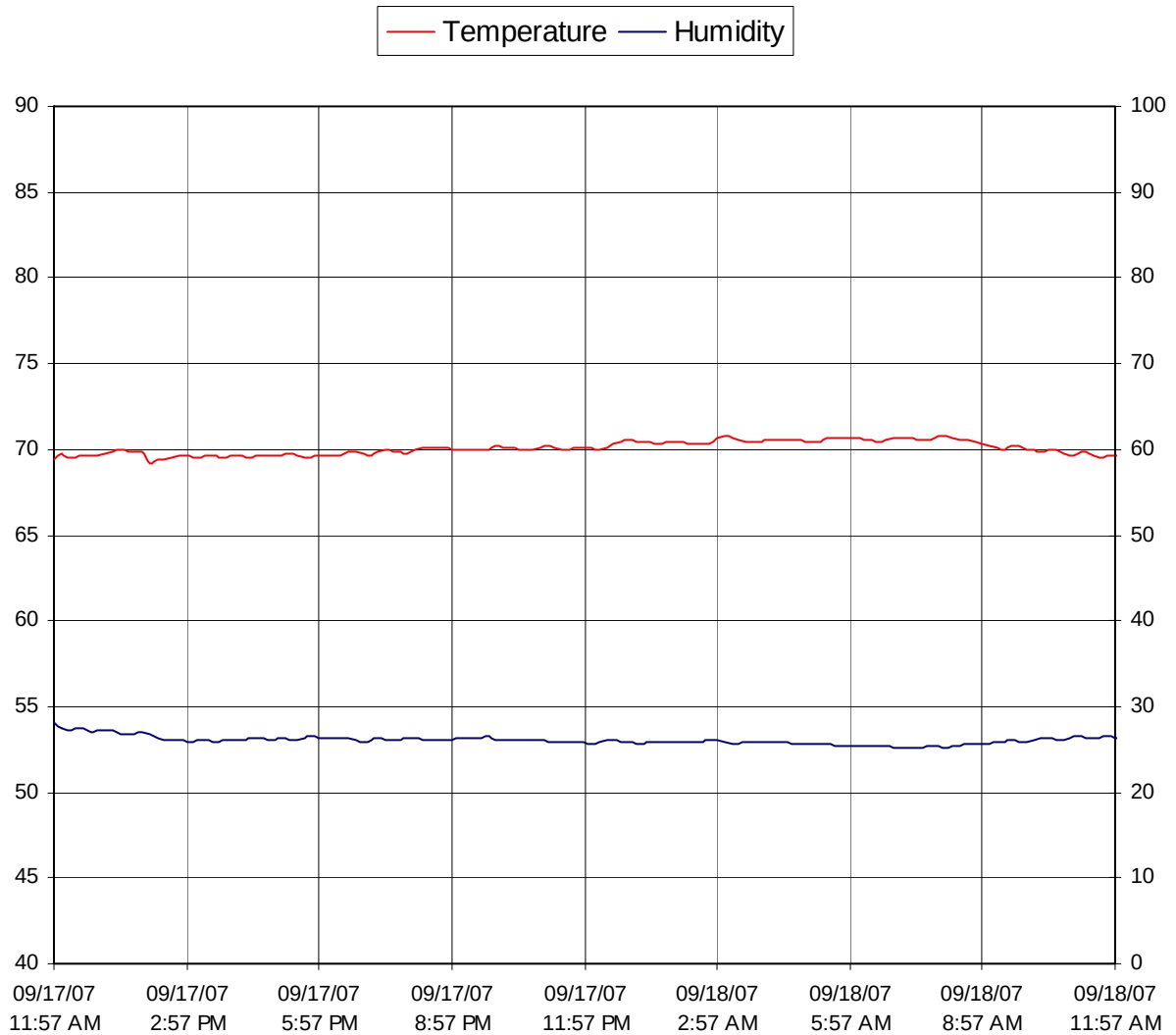
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

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A-14	Pre-Test Left Rear $\frac{3}{4}$ View	A-14
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A-20	Pre-Test Engine Compartment	A-20
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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
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A-29	Post-Test Rear Underbody	A-29
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A-33	Post-Test Driver Dummy (Through Window)	A-33
A-34	Pre-Test Driver Dummy (Door Open)	A-34
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A-41	Post-Test Driver Side Floor Pan	A-41
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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
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A-53	Post-Test Passenger Side Glove Box	A-53
A-54	Pre-Test Passenger Side Floor Pan	A-54
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A-56	Post-Test Passenger Dummy Head	A-56
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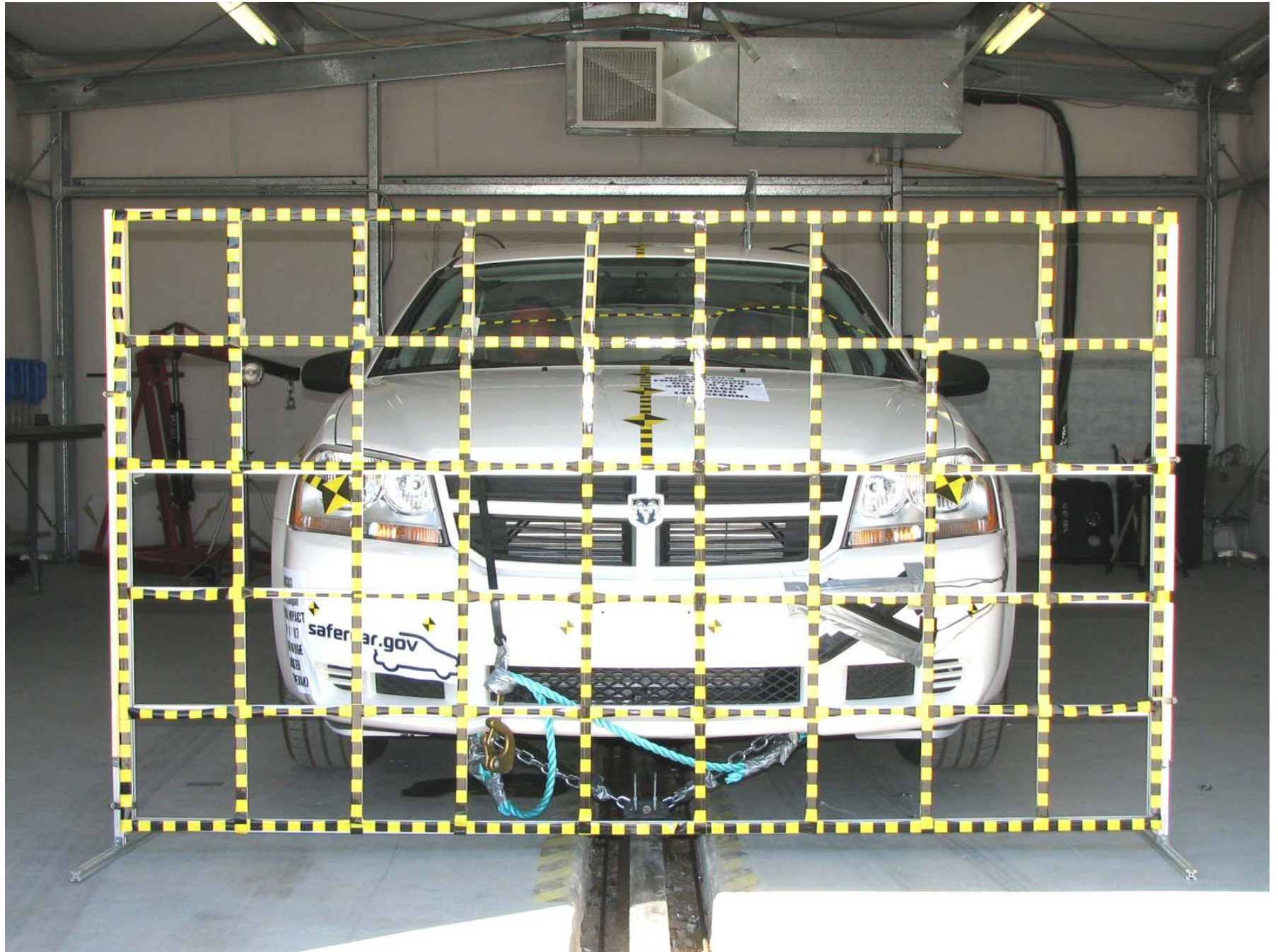


Figure A-1: Load Cell Location

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MFD BY DAIMLERCHRYSLER CORPORATION

DATE OF MFR: 3-07

GVWR: 2019 KG

GAWR: 1180 KG

GAWR: 1007 KG

04450 LB

FRONT: 2600 LB

REAR: 2220 LB



VIN: 1B3LC46K18N571937

TYPE: PASSENGER CAR

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

MDH: 030618 475AA
VEHICLE MADE IN U.S.A.

PAINT: PW1

TRIM: N8J1

4658843

Figure A-2: Manufacturer's Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY – TOTAL 5 FRONT 2 REAR 3

THE COMBINED WEIGHT OF OCCUPANTS AND CARGO SHOULD NEVER EXCEED
392 KG OR 865 LB

TIRE	FRONT	REAR	SPARE
ORIGINAL TIRE SIZE	P215/65R16	P215/65R16	T155/90D16
COLD TIRE INFLATION PRESSURE	220 kPa, 32 PSI	220 kPa, 32 PSI	420 kPa, 60 PSI

SEE OWNERS MANUAL FOR ADDITIONAL INFORMATION



8N571937

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

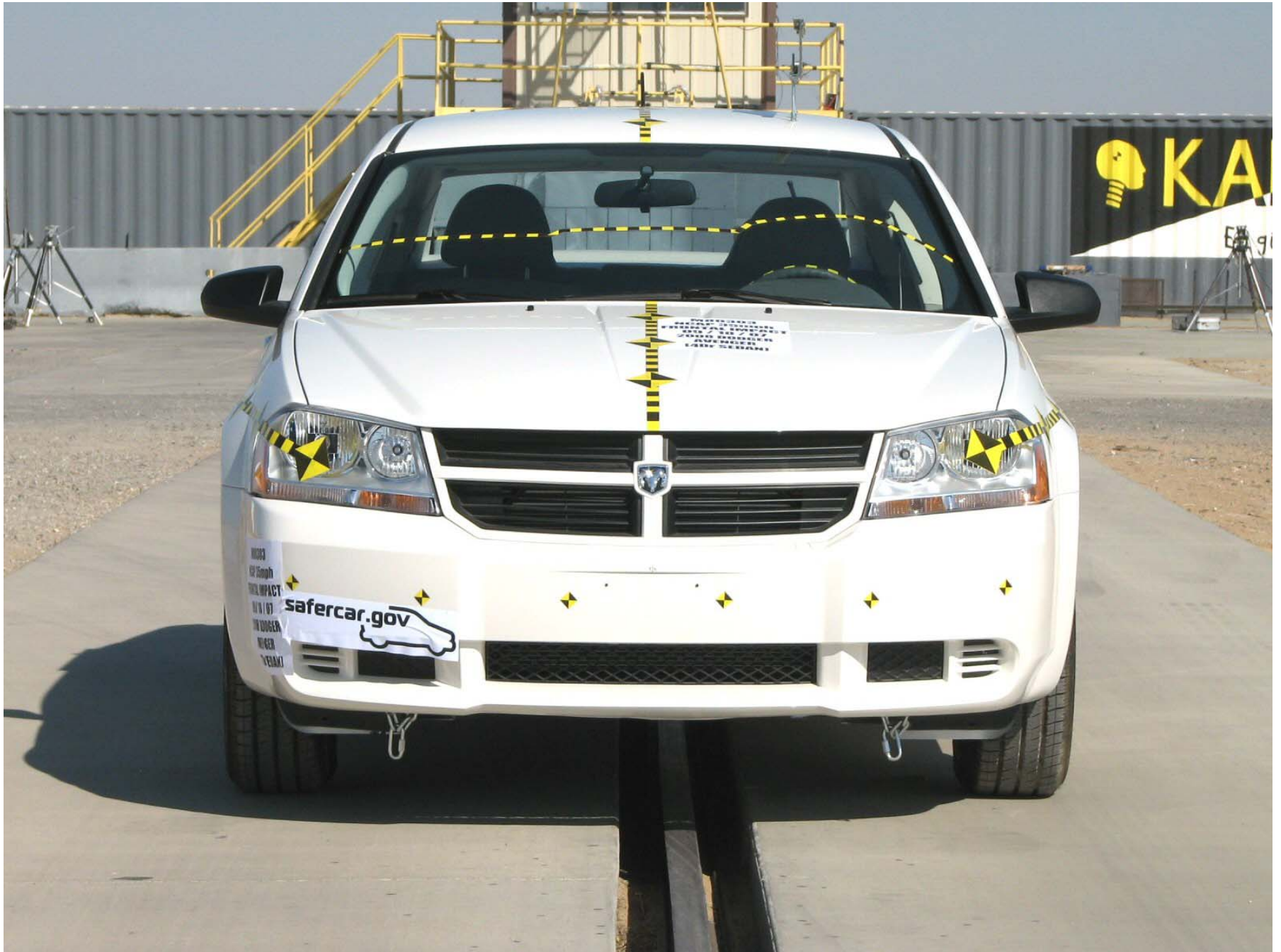


Figure A-6: Pre-Test Front View



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 ¾ View



Figure A-13: Post-Test Right Front 3/4 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

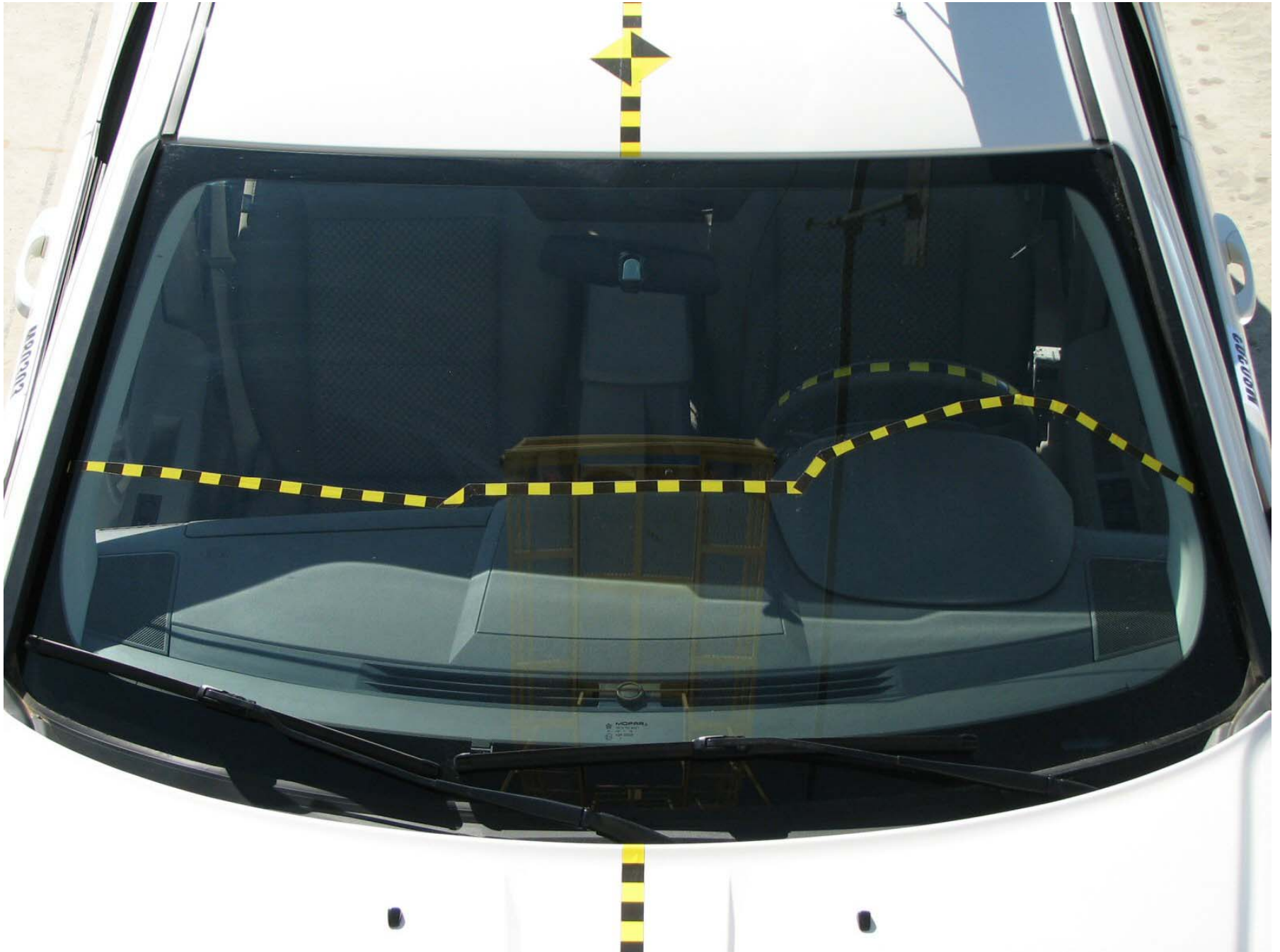


Figure A-18: Pre-Test Windshield



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

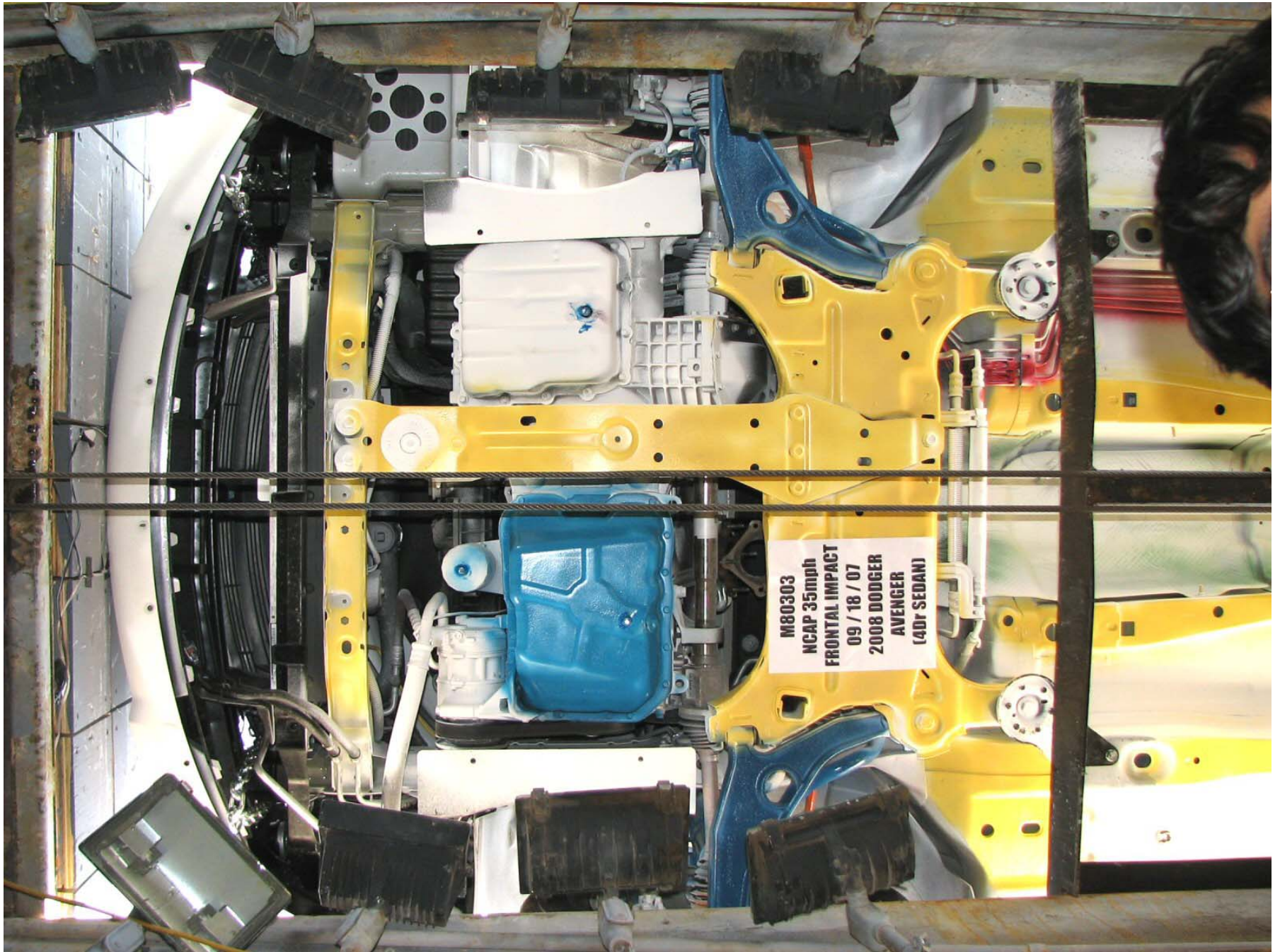


Figure A-24: Pre-Test Front Underbody

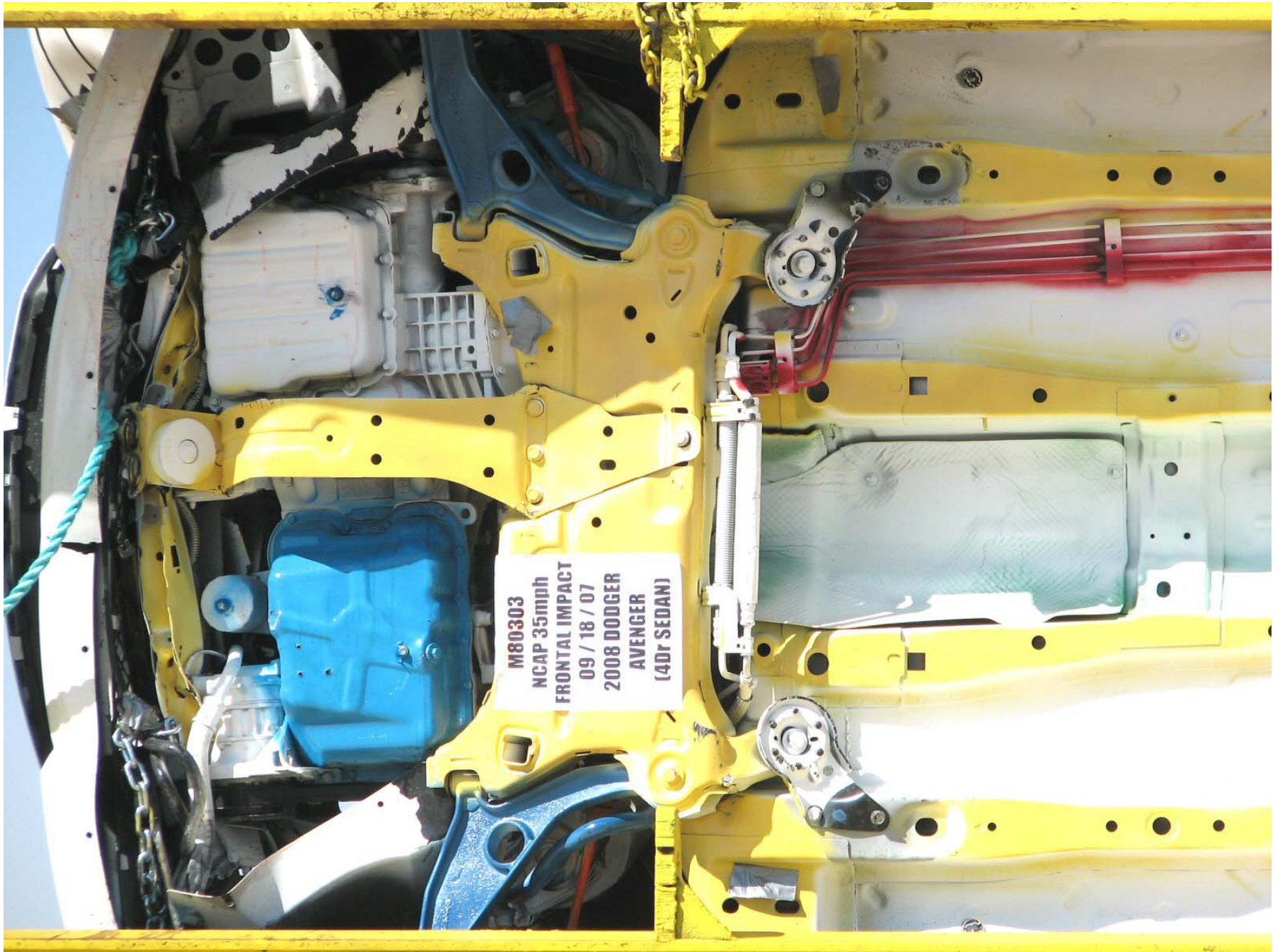


Figure A-25: Post-Test Front Underbody

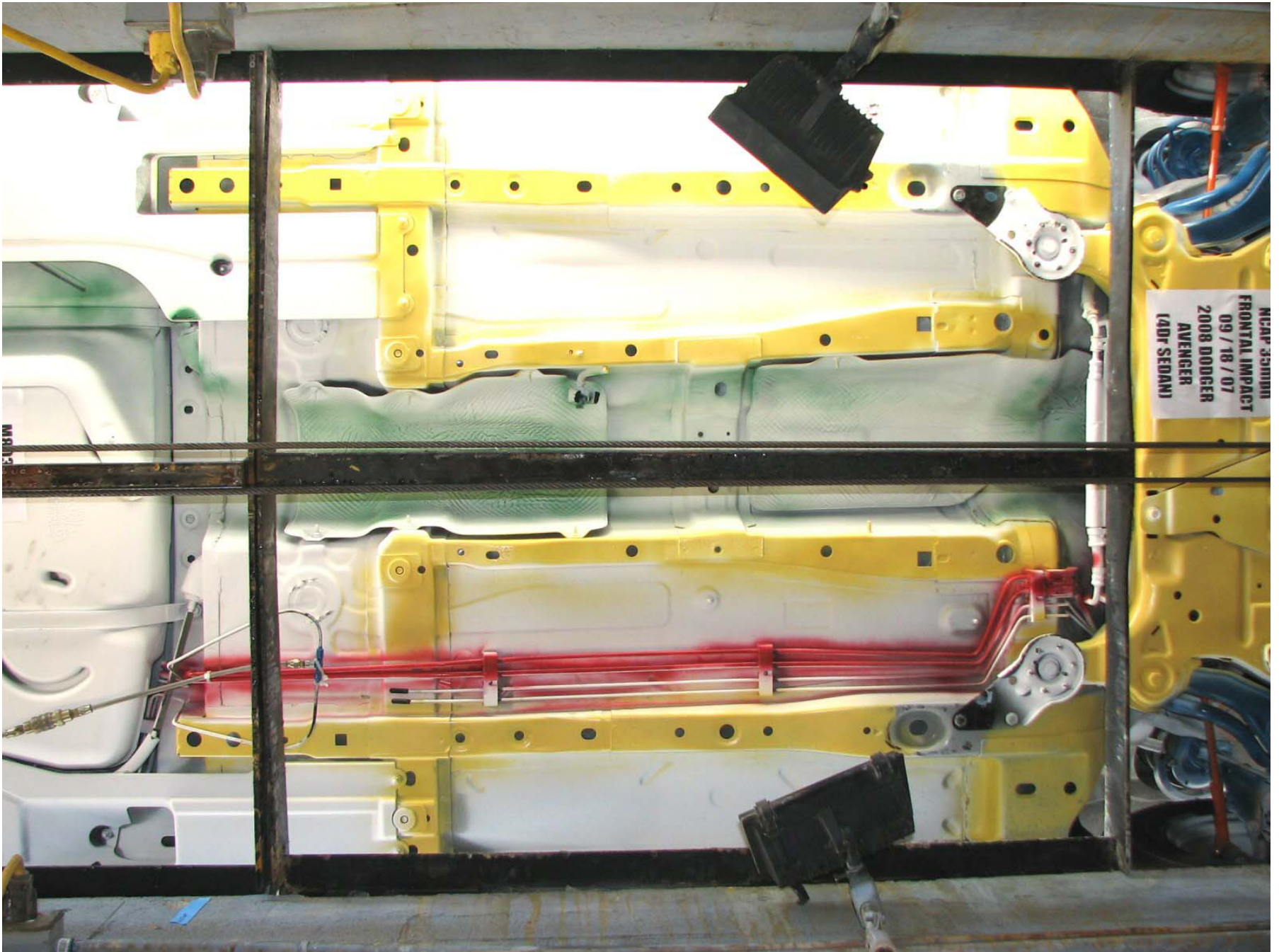


Figure A-26: Pre-Test Mid Underbody

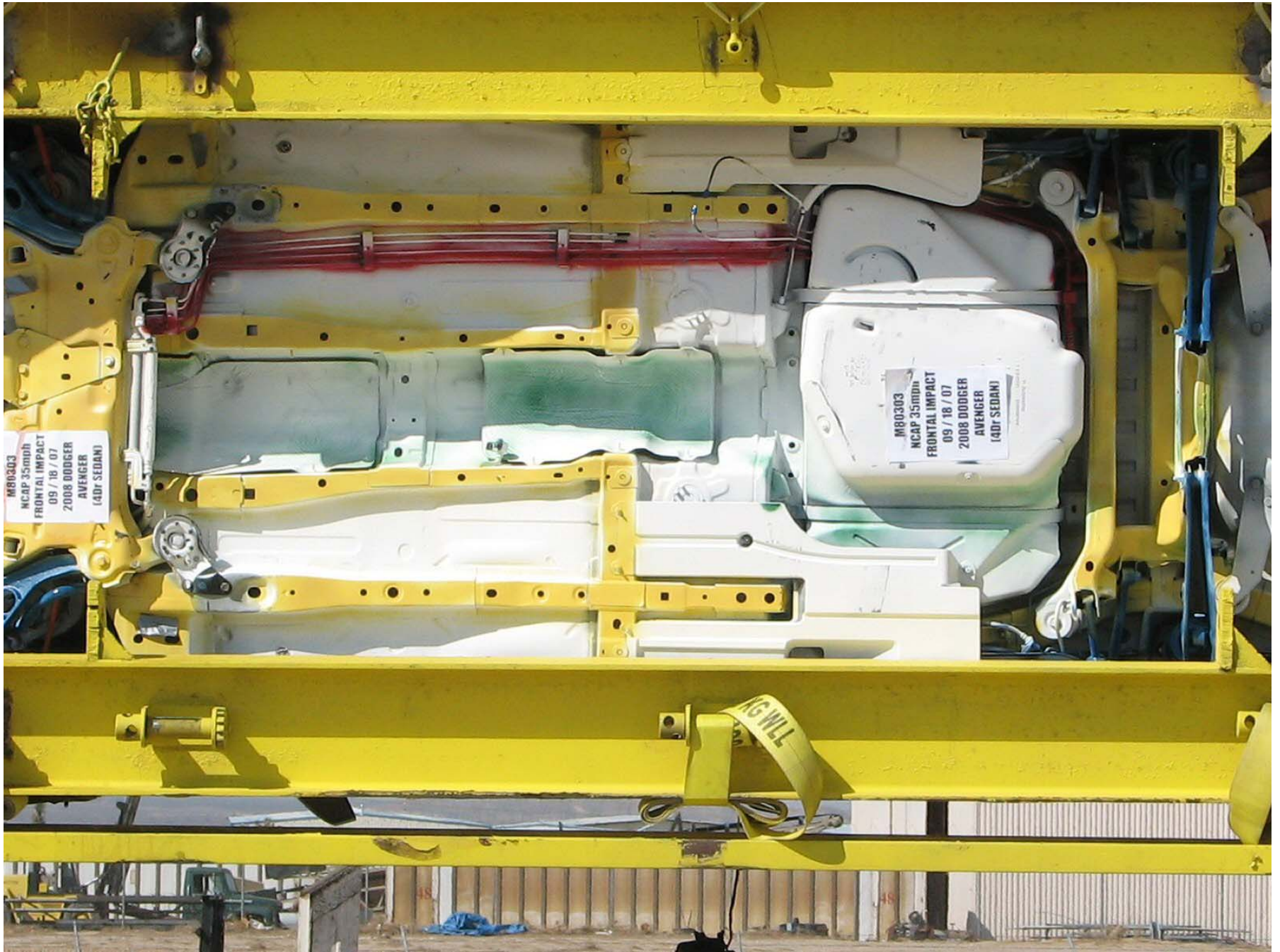


Figure A-27: Post-Test Mid Underbody



Figure A-28: Pre-Test Rear Underbody

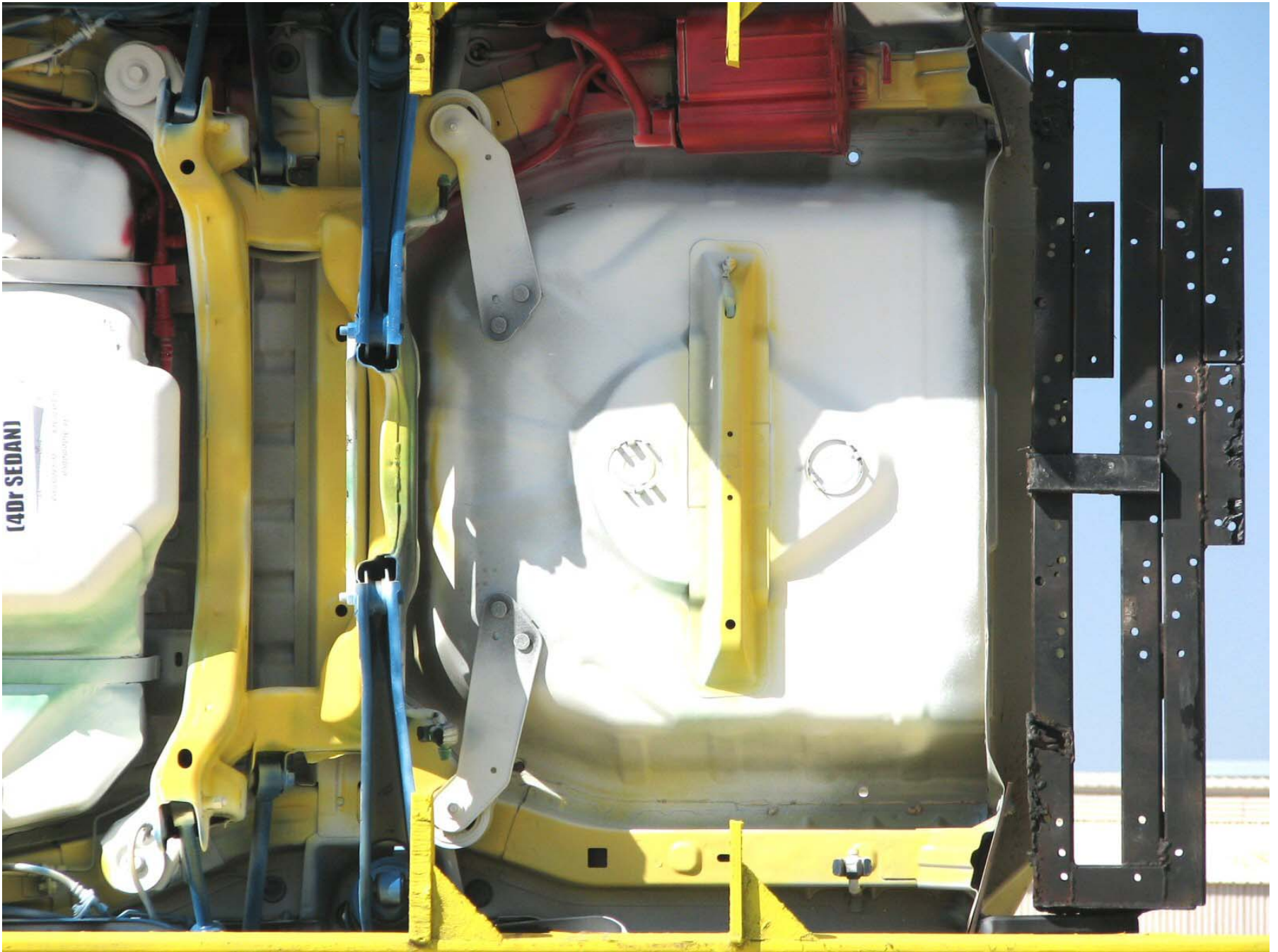


Figure A-29: Post-Test Rear Underbody



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

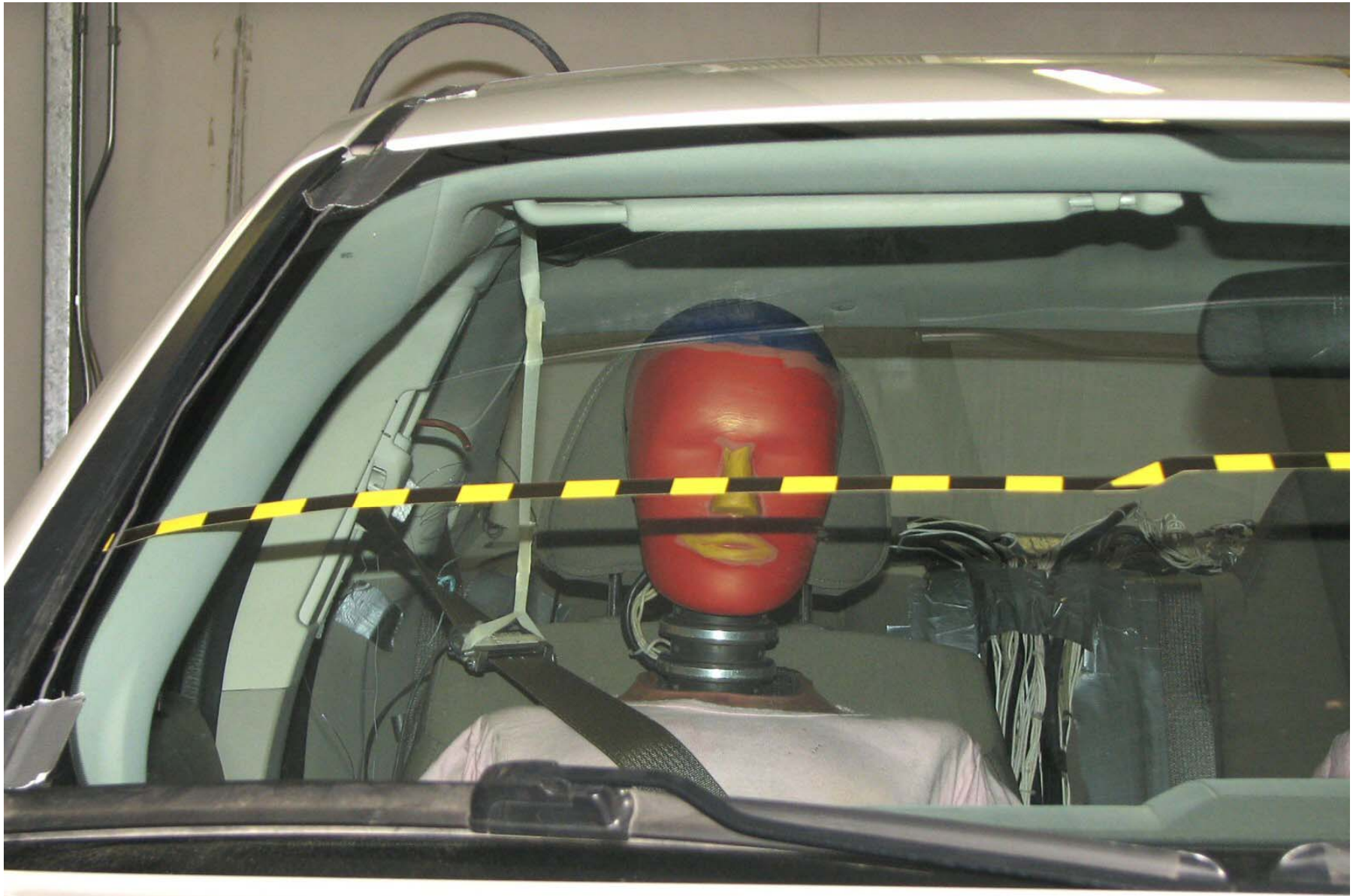


Figure A-44: Pre-Test Passenger Dummy Front View (Head Position)



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

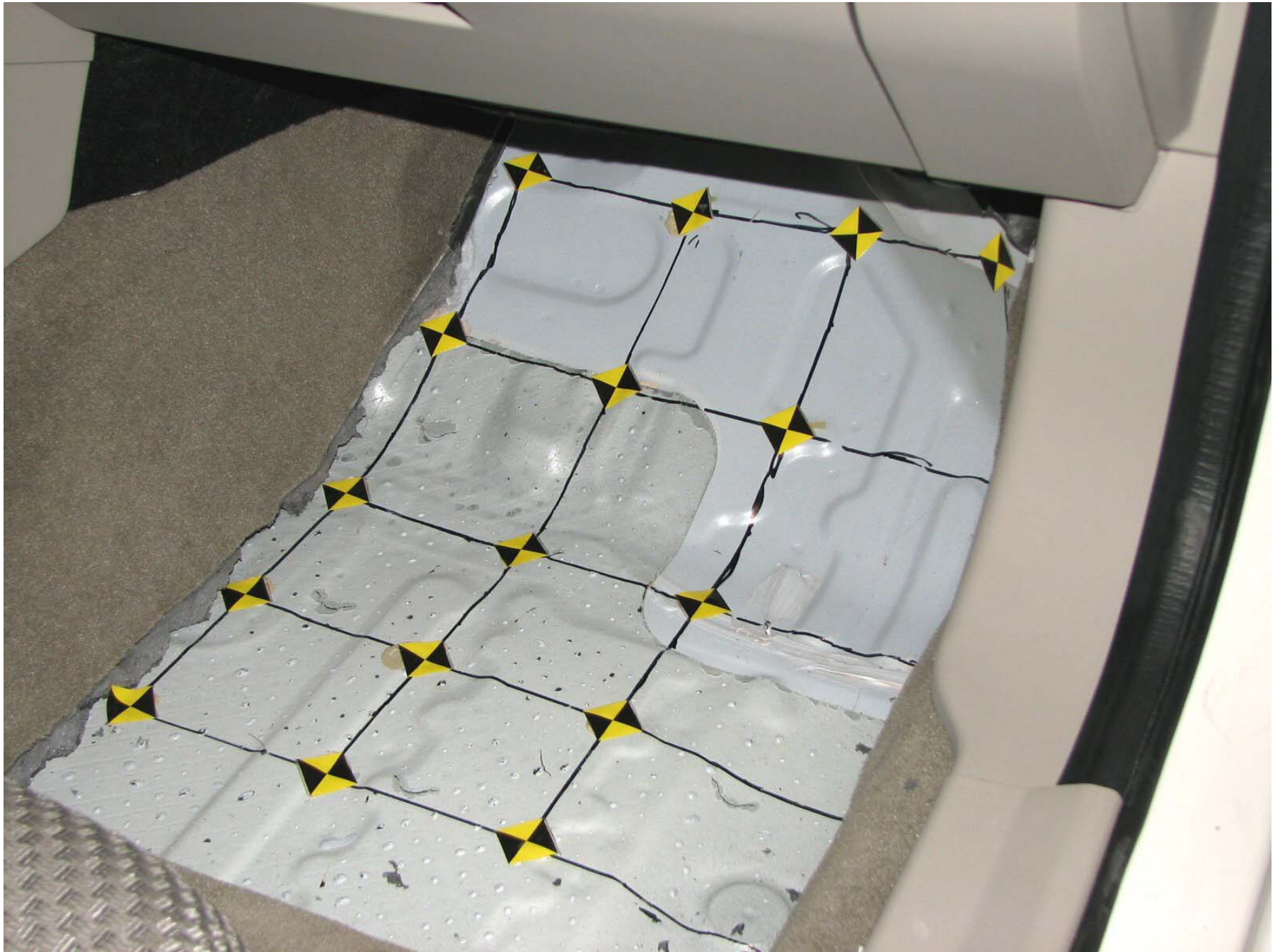


Figure A-54: Pre-Test Passenger Side Floor Pan



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

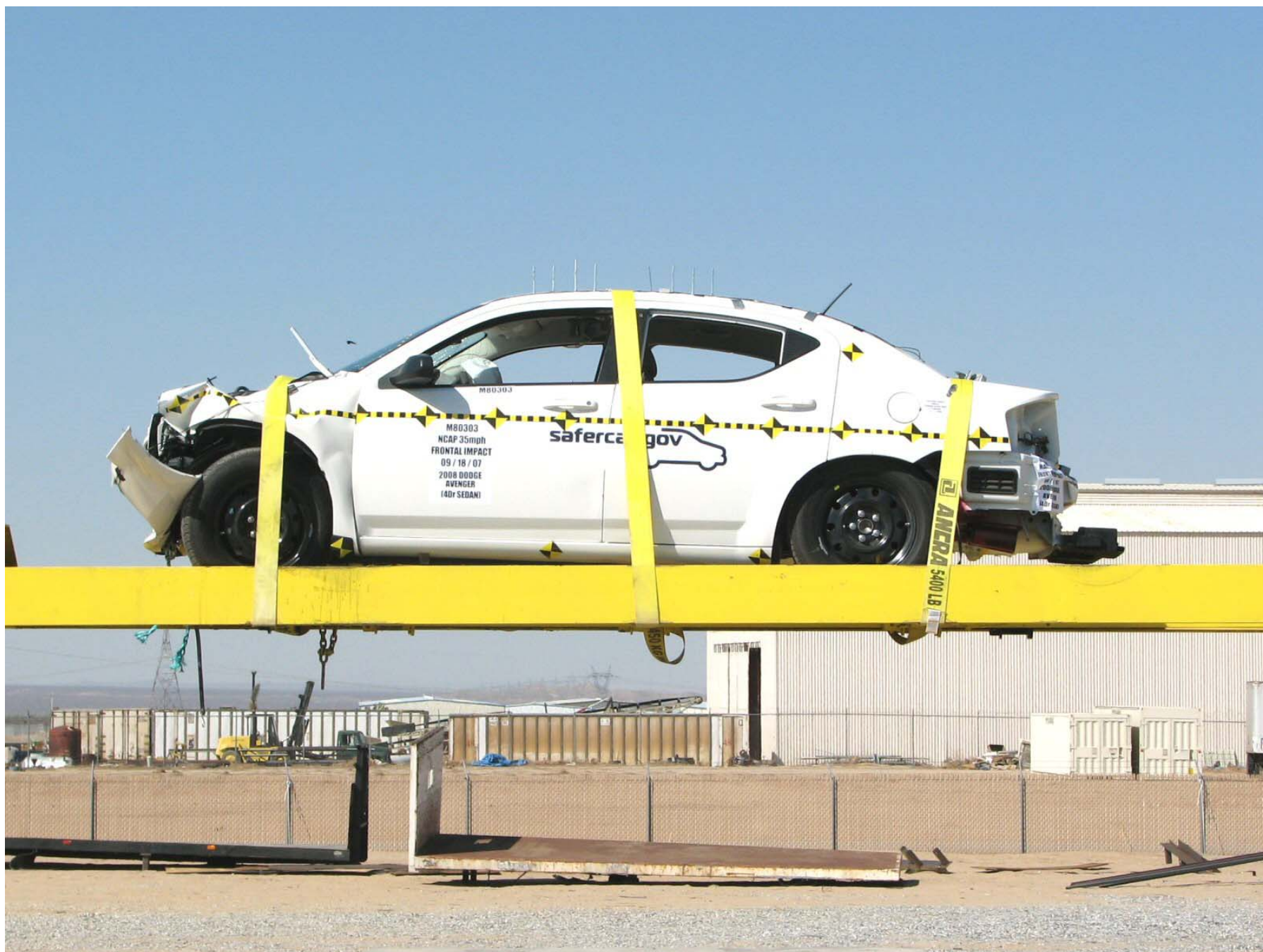


Figure A-58: Vehicle on Rollover Device (0°)



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



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

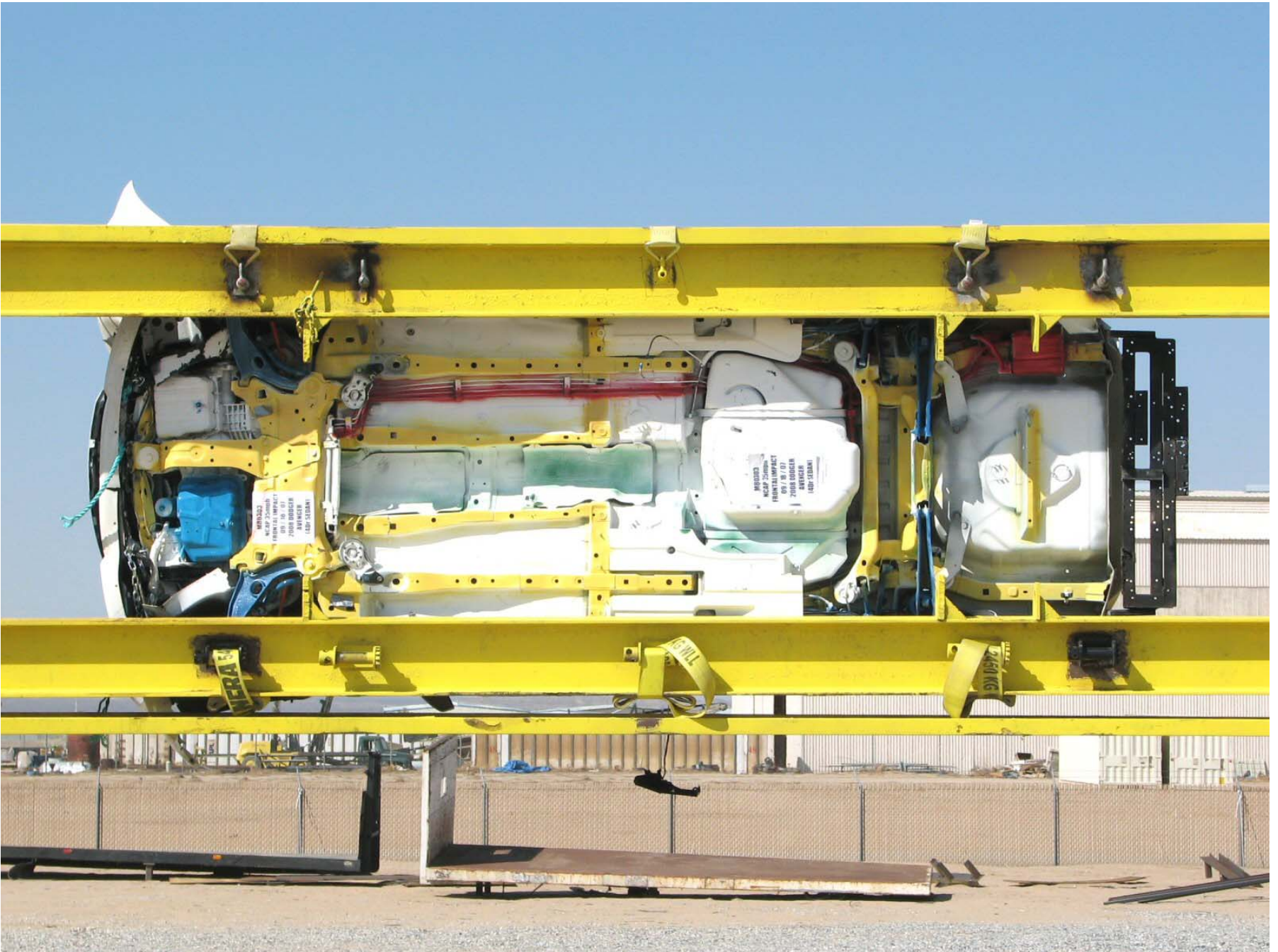


Figure A-61: Vehicle on Rollover Device (270°)



Figure A-62: Vehicle Impact

APPENDIX B
DATA PLOTS

LIST OF DATA PLOTS

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

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)

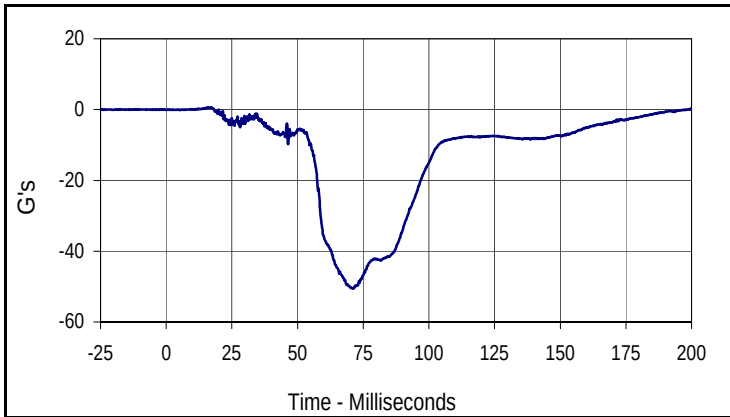
Passenger Chest Redundant Y
Passenger Chest Redundant Z
Passenger Chest Resultant Redundant
Passenger Chest Redundant X Velocity
Passenger Chest Redundant X Displacement
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Pelvis Resultant
Passenger Pelvis X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

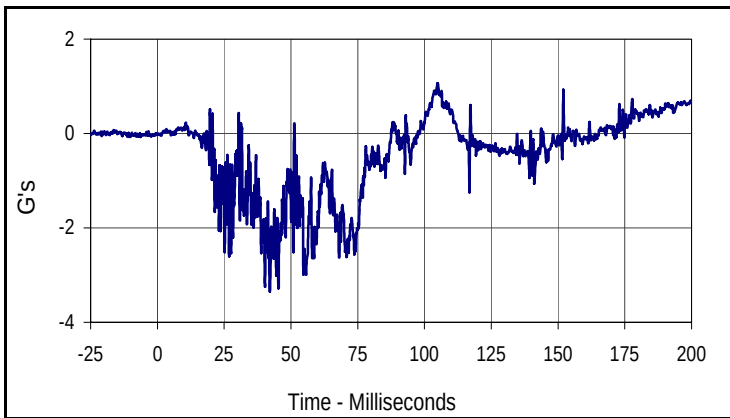
Vehicle Left Rear X Displacement
Vehicle Right Rear X
Vehicle Right Rear X Velocity
Vehicle Right Rear X Displacement
Vehicle Engine Top
Vehicle Engine Top Velocity
Vehicle Engine Top Displacement
Vehicle Engine Bottom
Vehicle Engine Bottom Velocity
Vehicle Engine Bottom Displacement
Vehicle Left Brake 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: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

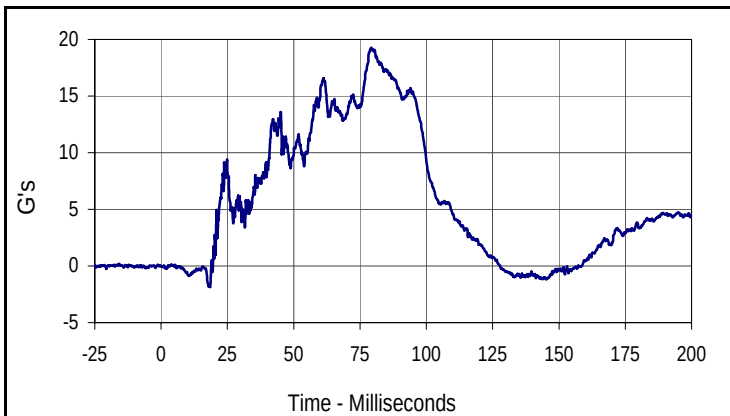
Test Date: 9/18/07
 NHTSA No.: M80303



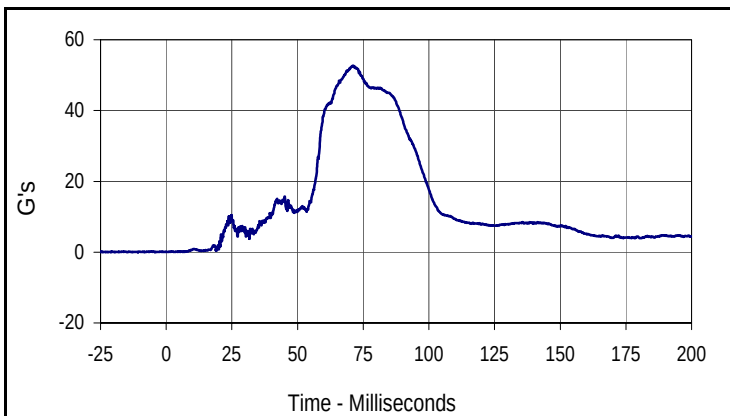
Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
0.6	16.2	-50.6	71.1



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.1	105.0	-3.4	42.1



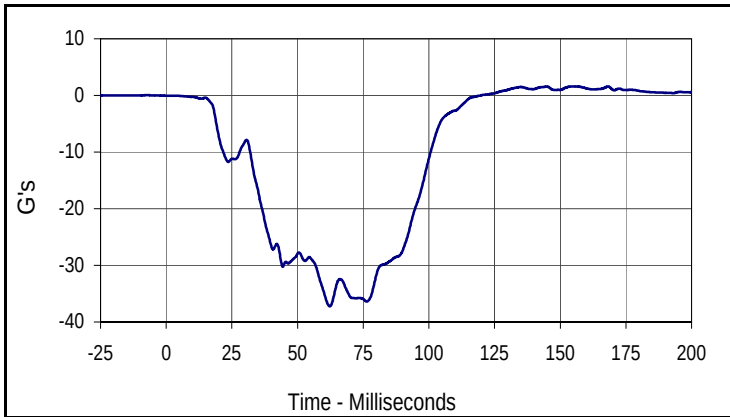
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Driver Head Primary Z			
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003	FIL	1000	G's
Max	Time	Min	Time
19.3	79.2	-1.9	18.4



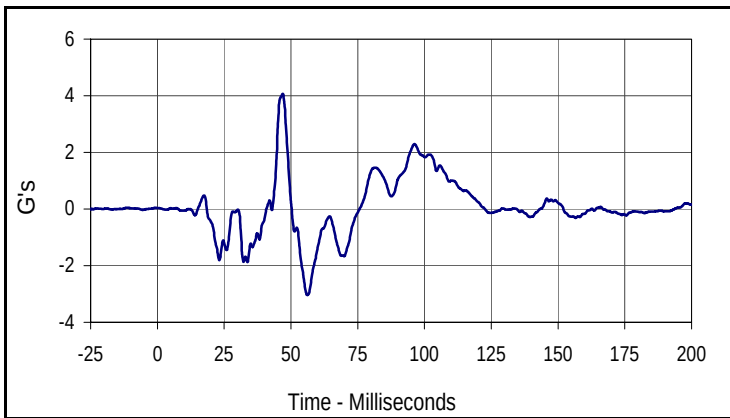
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
52.7	71.1	0.0	0.9

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

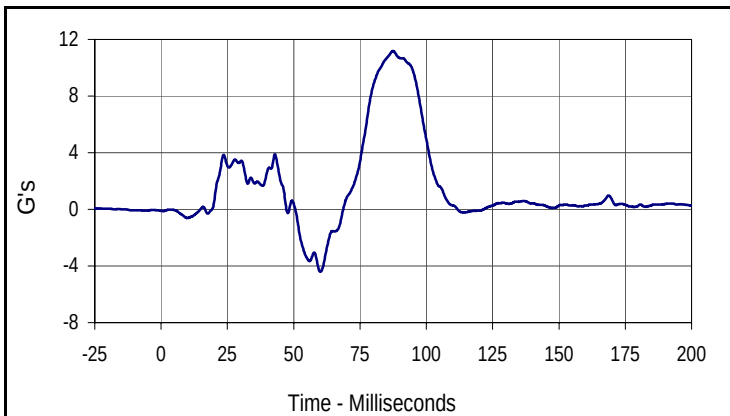
Test Date: 9/18/07
 NHTSA No.: M80303



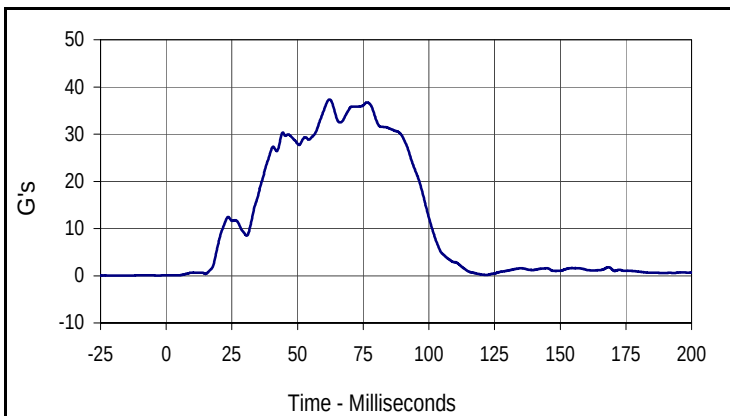
Curve Description			
Driver Chest Primary X			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
1.6	154.5	-37.2	62.2



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
4.1	46.9	-3.0	56.1



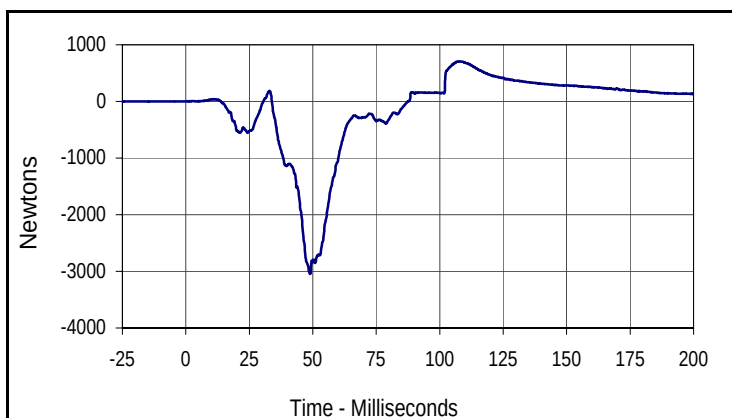
Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
11.2	87.4	-4.4	60.0



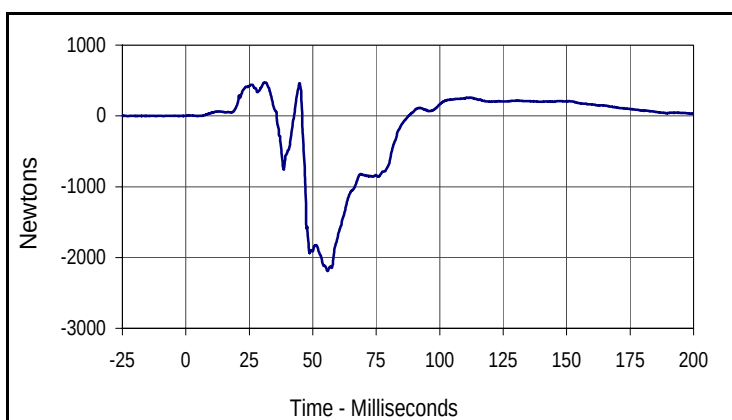
Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
37.3	62.2	0.1	3.0

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07
 NHTSA No.: M80303



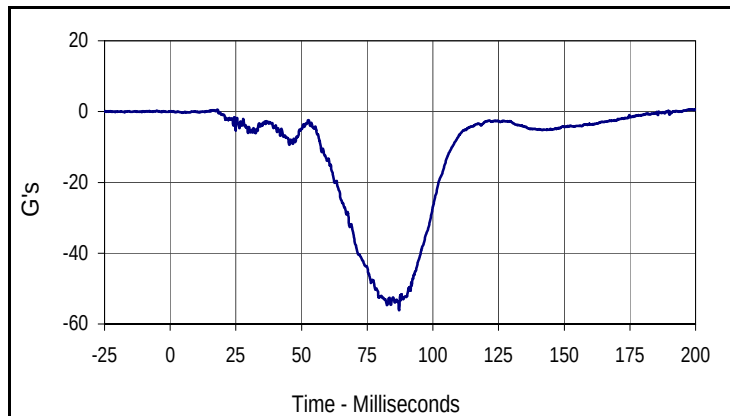
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
007	FIL	600	Newtons
Max	Time	Min	Time
706.5	107.6	-3044.7	49.0



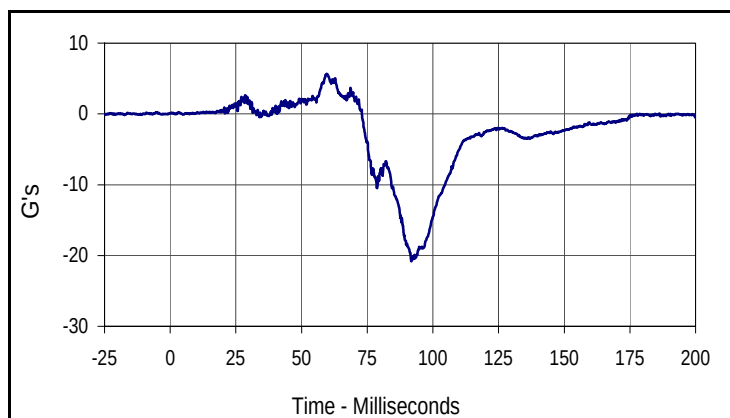
Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
470.8	31.4	-2191.9	55.9

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

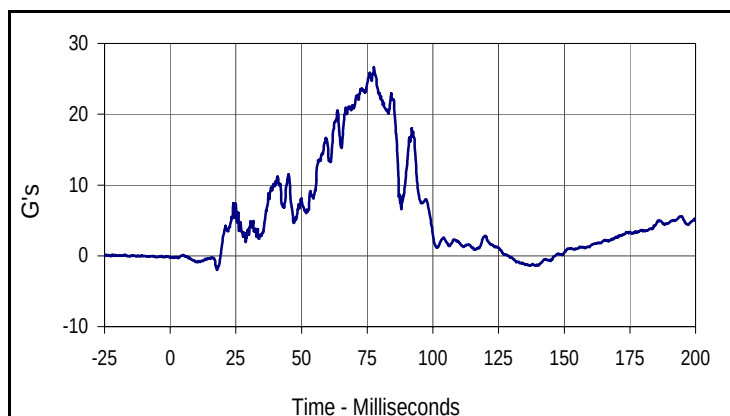
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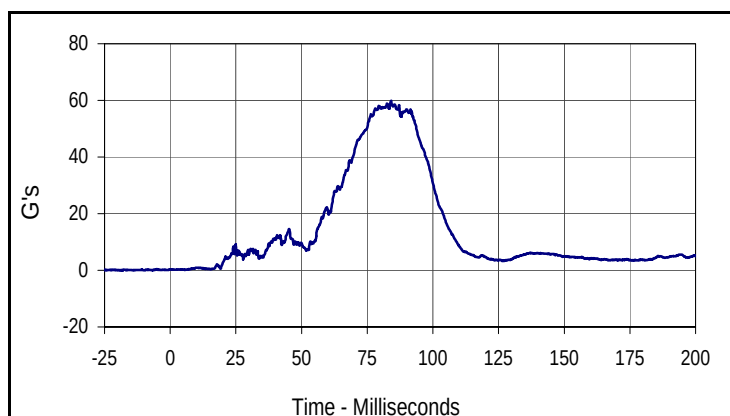
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Passenger Head Primary X			
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009	FIL	1000	G's
Max	Time	Min	Time
0.7	197.4	-56.1	87.2



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
5.7	59.5	-20.8	91.8



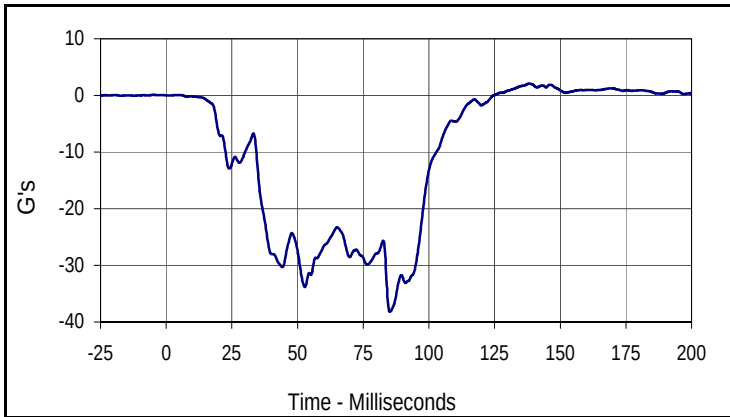
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
011	FIL	1000	G's
Max	Time	Min	Time
26.6	77.6	-2.0	17.8



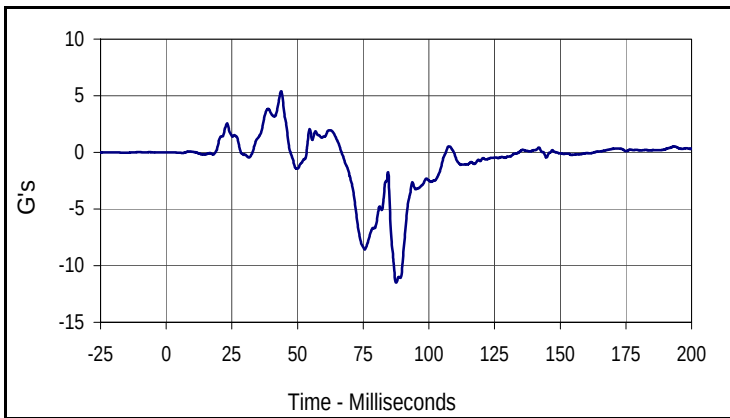
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
59.8	84.1	0.1	5.5

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

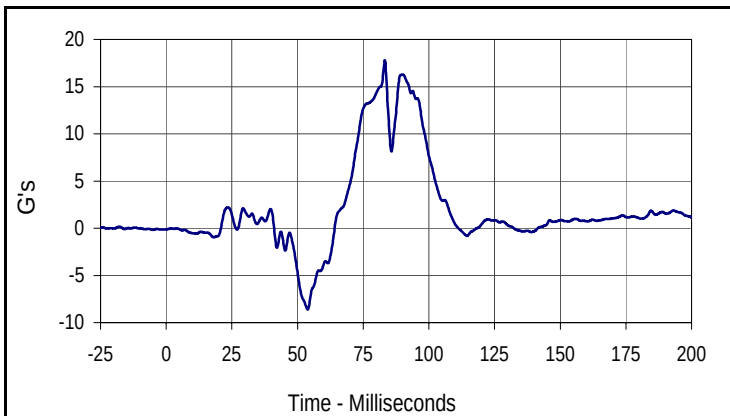
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 NHTSA No.: M80303



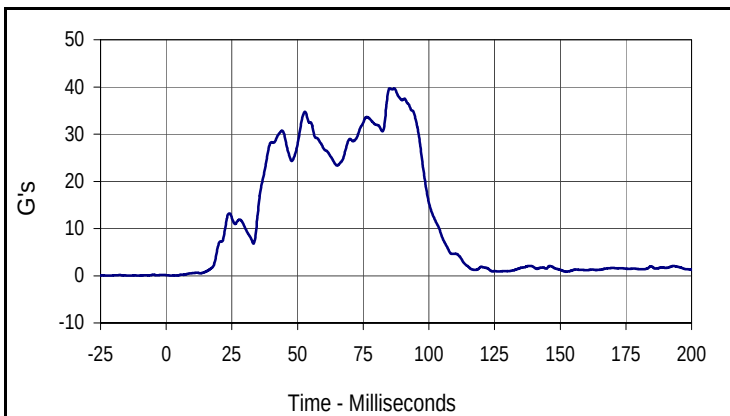
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
2.1	138.3	-38.2	85.1



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
5.4	43.8	-11.5	87.5



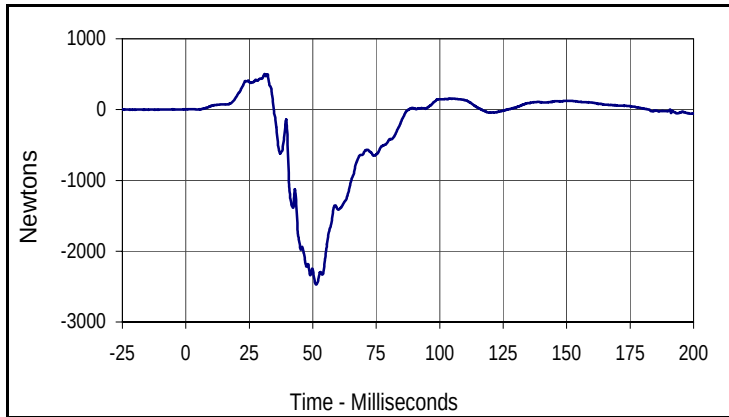
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
17.8	83.2	-8.6	53.9



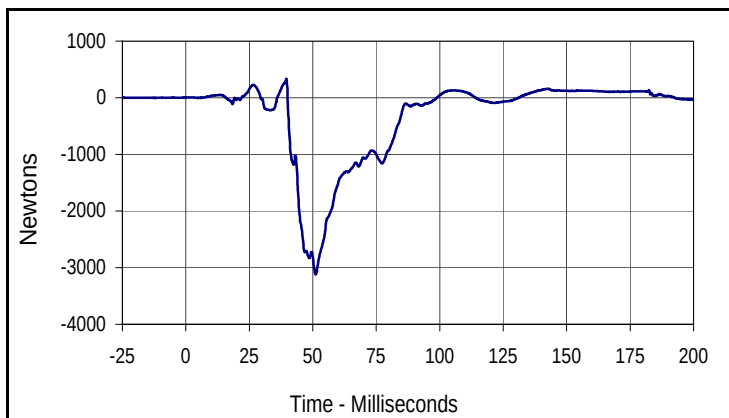
Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
39.7	85.0	0.0	2.0

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07
 NHTSA No.: M80303



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
503.4	31.1	-2472.5	51.3



Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
335.7	39.6	-3119.7	51.1

APPENDIX C
DUMMY CALIBRATION DATA

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

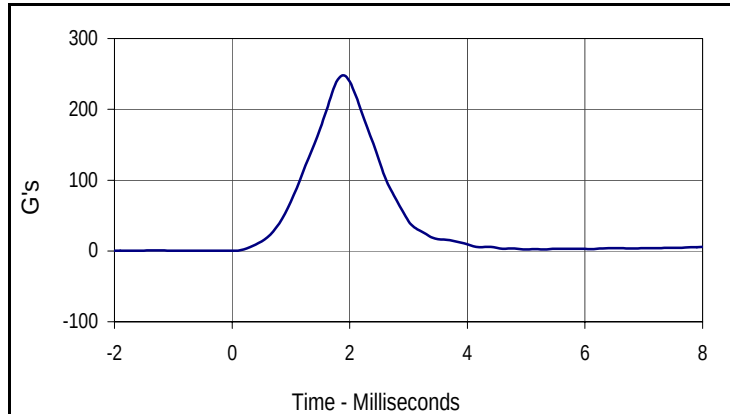
Test Date: 9/17/07

ATD Serial No.: 035

Test I.D.: HD09C



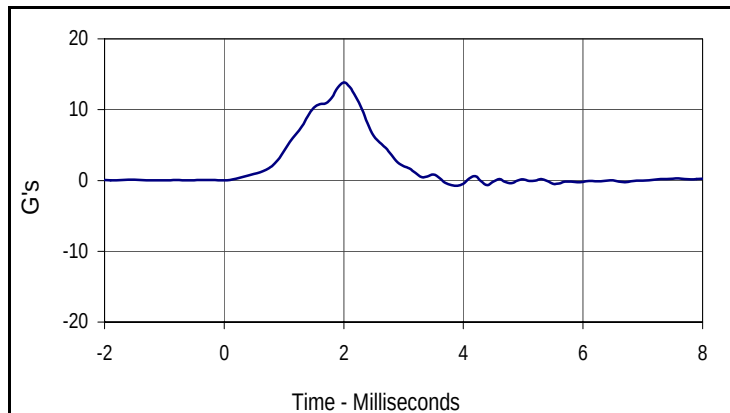
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	248.2	Pass
Peak Lateral Acceleration	G's	≤15.0	13.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description

Head Resultant

CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
248.2	1.9	0.5	-1.0



Curve Description

Head Y

CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
13.9	2.0	-0.7	3.9

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

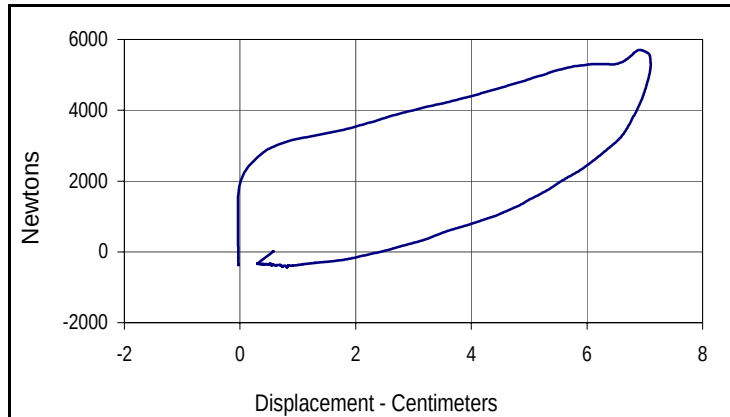
Test Date: 9/17/07

ATD Serial No.: 035

Test I.D.: CH09C



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	6.66	Pass
Peak Probe Force	Newtons	5159 to 5893	5704	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	7.10	Pass
Internal Hysteresis	%	69 to 85	75.7	Pass
Overall Test Results				Pass



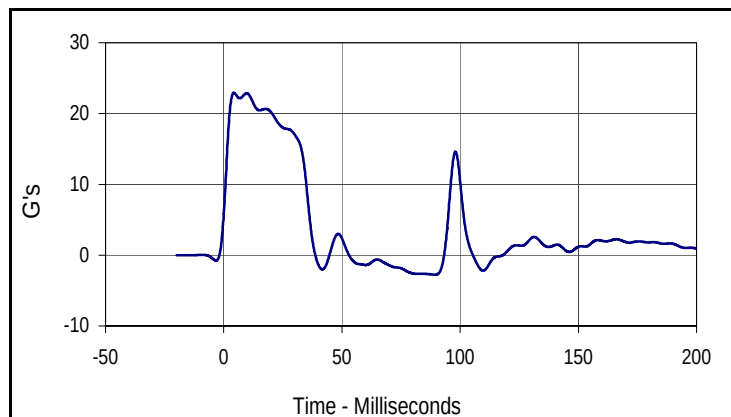
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	75.7
Peak Probe Force		Peak Chest Deflection	
5704		7.10	

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

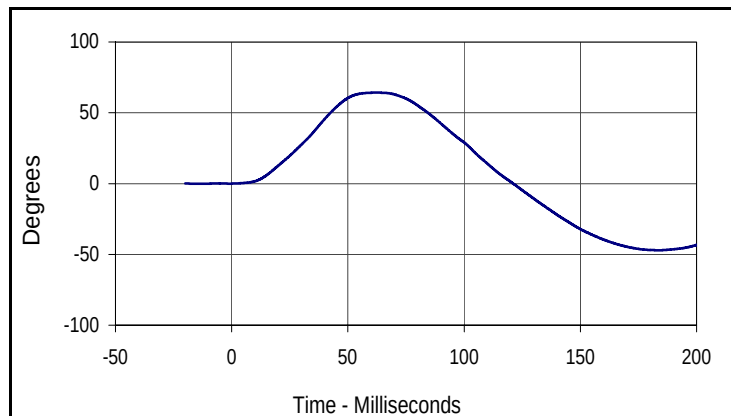
Test Date: 9/17/07
 Test I.D.: NF09C



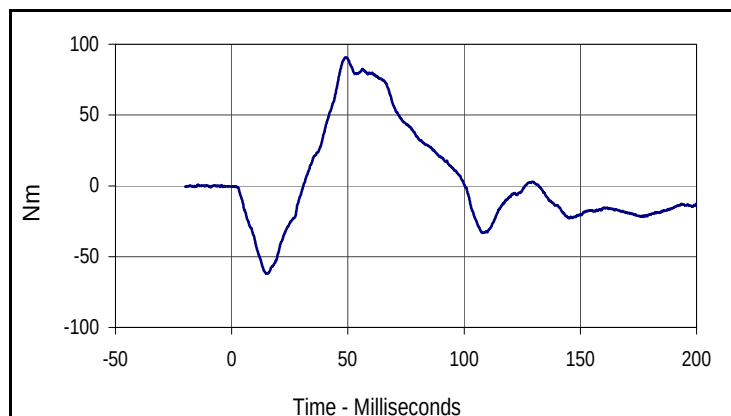
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.99	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.8	Pass
	20 Msec.	G's	17.6 to 22.6	20.2	Pass
	30 Msec.	G's	12.5 to 18.5	17.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	36.5	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	64.2	Pass
	Time	Msec.	57.0 to 64.0	62.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	121.1	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	90.8	Pass
	Time	Msec.	47.0 to 58.0	48.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	100.3	Pass
Overall Test Results					Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
22.9	4.2	-2.8	89.4



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
64.2	62.0	-47.1	183.7



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
90.8	48.9	-61.9	15.0

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

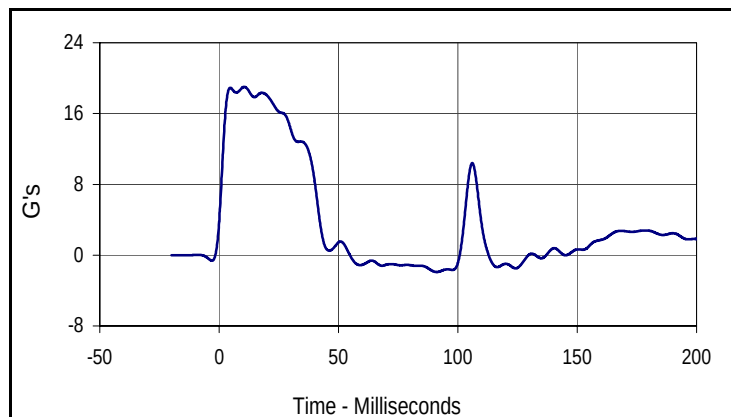
Test Date: 9/17/07

ATD Serial No.: 035

Test I.D.: NE09C



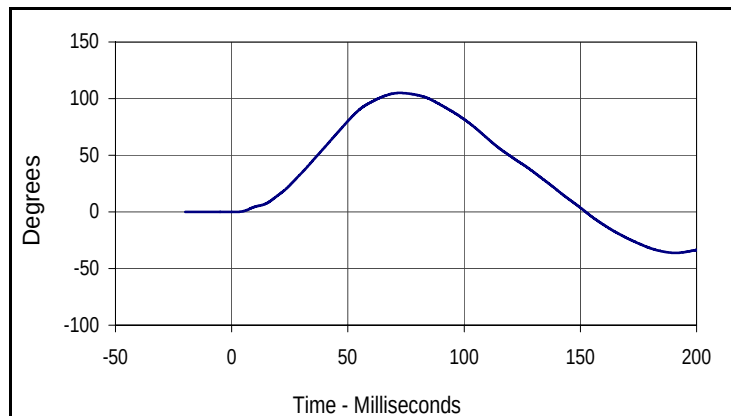
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.16	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.0	Pass
	20 Msec.	G's	14.0 to 19.0	18.1	Pass
	30 Msec.	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

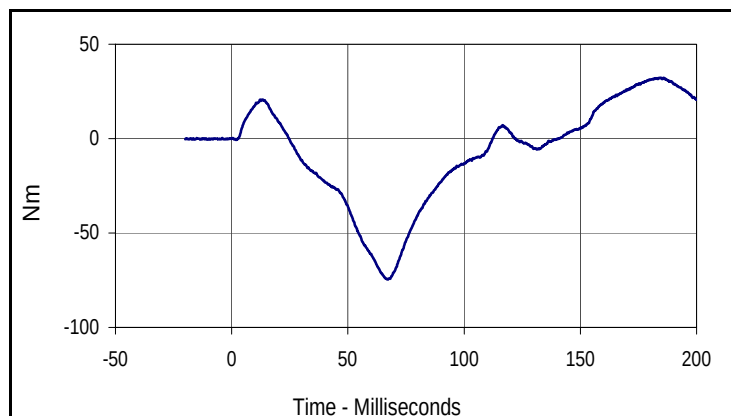
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.0	10.5	-1.9	91.2



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: 9/17/07

ATD Serial No.: 035

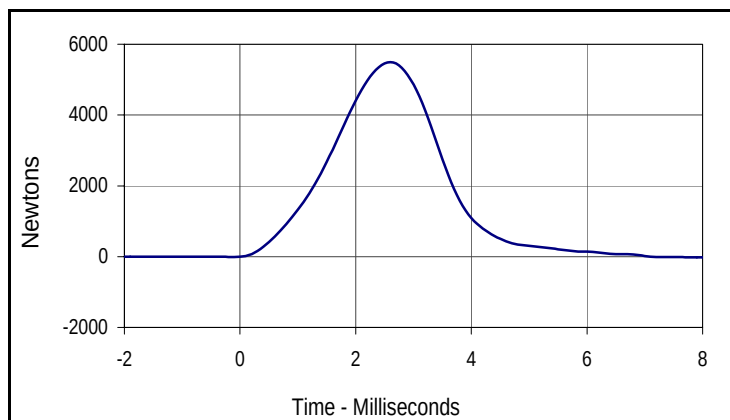
Test I.D.: LK09C , RK09C

**Left Knee**

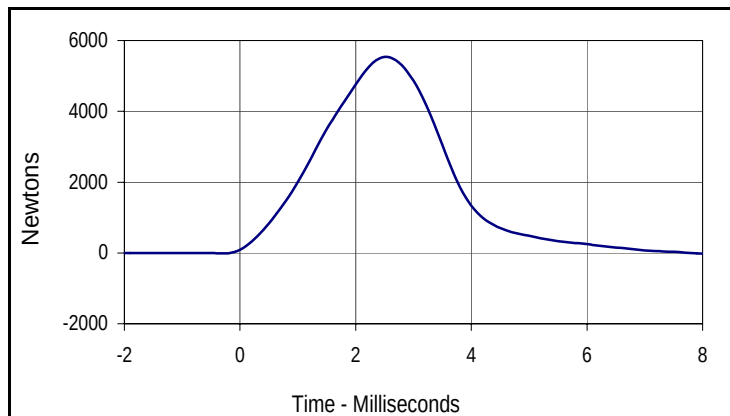
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5498	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5536	Pass
Overall Test Results				Pass

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

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5497.9	2.6	-28.9	9.6

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

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5536.4	2.5	-32.5	8.7

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 9/17/07

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	884	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	137	Pass
E - Shoulder pivot from back	mm	84 to 94	89	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	341	Pass
J - Elbow rest height	mm	190 to 211	202	Pass
K - Buttock to knee length	mm	579 to 604	580	Pass
L - Popliteal length	mm	429 to 455	441	Pass
M - Knee pivot height	mm	485 to 500	498	Pass
N - Buttock popliteal length	mm	452 to 477	465	Pass
O - Chest depth	mm	213 to 229	214	Pass
P - Foot length	mm	251 to 267	259	Pass
V - Shoulder breadth	mm	422 to 437	432	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	983	Pass
Z - Waist circumference	mm	836 to 866	840	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: Hybrid III 50th Percentile Male Head Drop Test

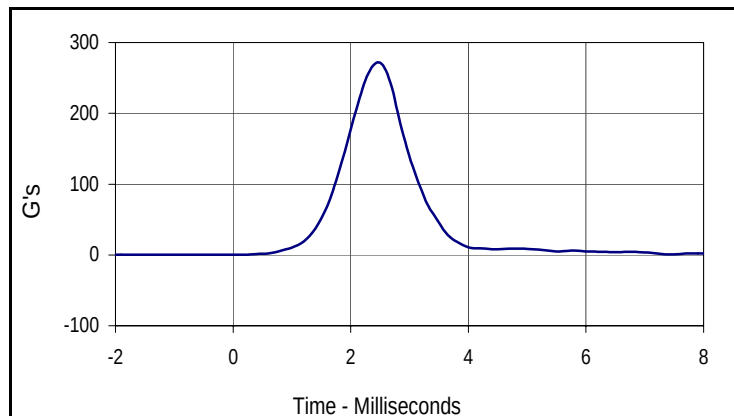
Test Date: 9/17/07

ATD Serial No.: 034

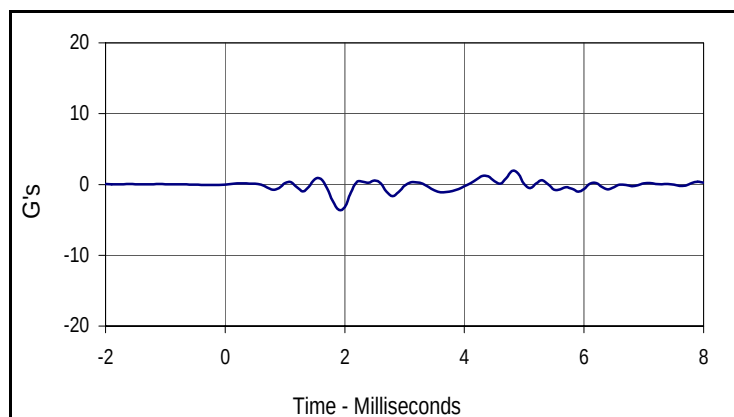
Test I.D.: HD09D



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	271.6	Pass
Peak Lateral Acceleration	G's	≤15.0	3.6	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
271.6	2.5	0.4	0.2



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.9	4.8	-3.6	1.9

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

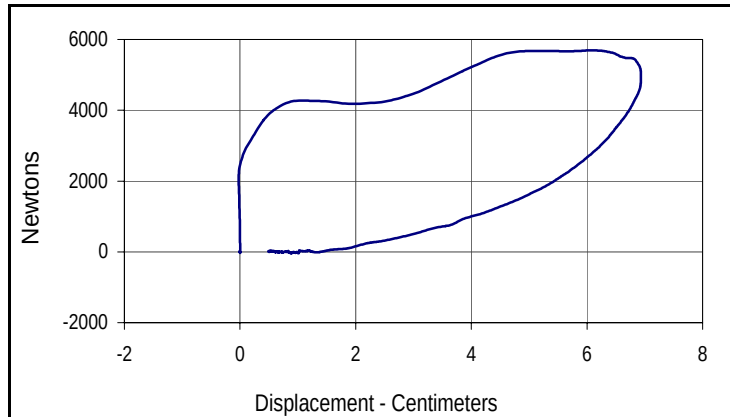
Test Date: 9/17/07

ATD Serial No.: 034

Test I.D.: CH09D



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	5694	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.93	Pass
Internal Hysteresis	%	69 to 85	76.8	Pass
Overall Test Results				Pass



Curve Description

Probe Force vs. Chest Deflection

CURNO	Type	SAE Class	Hysteresis
001	FIL	180	76.8
Peak Probe Force		Peak Chest Deflection	
5694		6.93	

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

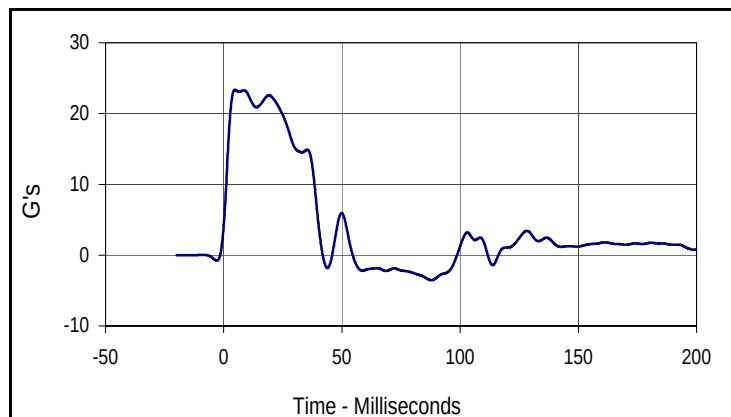
Test Date: 9/17/07

ATD Serial No.: 034

Test I.D.: NF09D



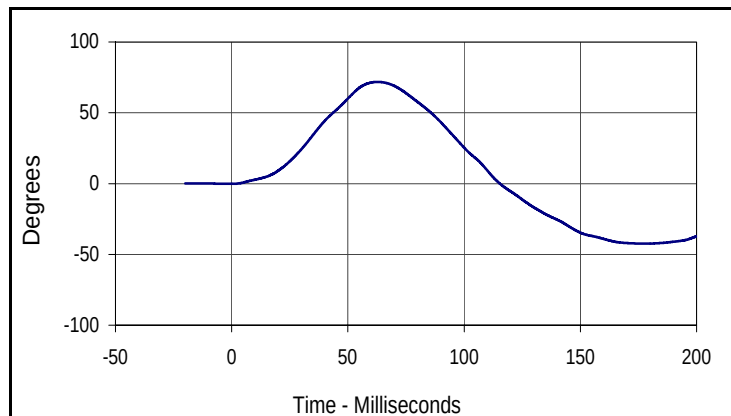
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.10	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.9	Pass
	20 Msec.	G's	17.6 to 22.6	22.5	Pass
	30 Msec.	G's	12.5 to 18.5	15.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	15.2	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	71.9	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	97.0	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

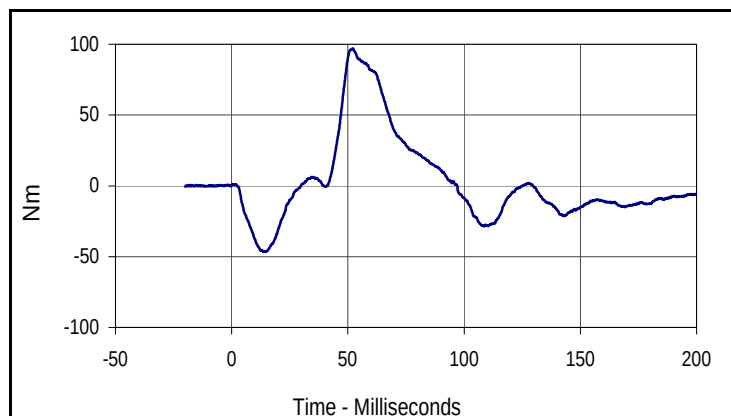
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.3	4.7	-3.5	87.8



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
71.9	62.7	-42.4	178.6



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
97.0	52.1	-46.6	14.7

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

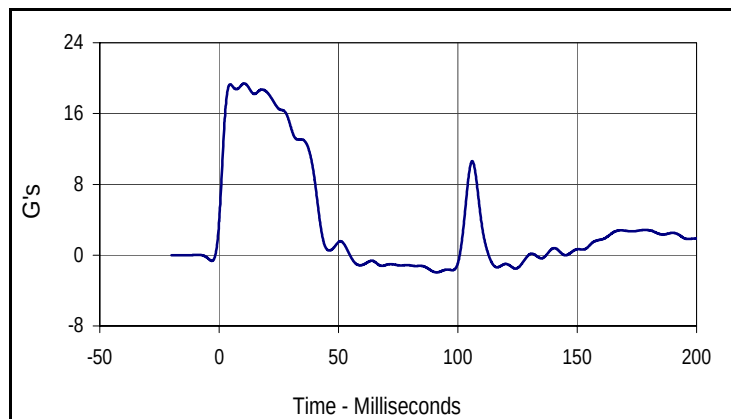
Test Date: 9/17/07

ATD Serial No.: 034

Test I.D.: NE09D



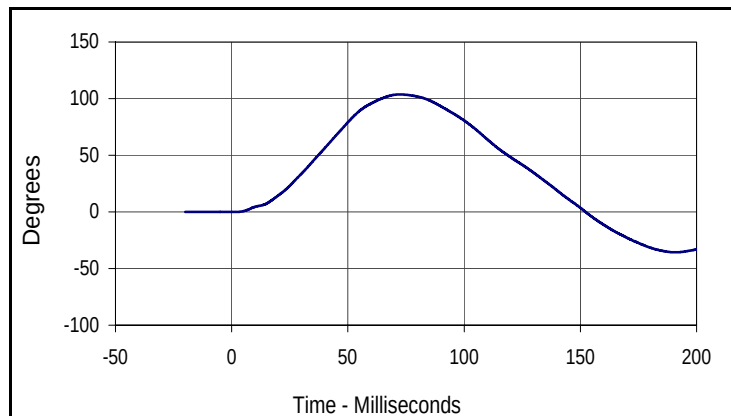
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.04	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.4	Pass
	20 Msec.	G's	14.0 to 19.0	18.4	Pass
	30 Msec.	G's	11.0 to 16.0	14.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.5	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	103.7	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	-72.0	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

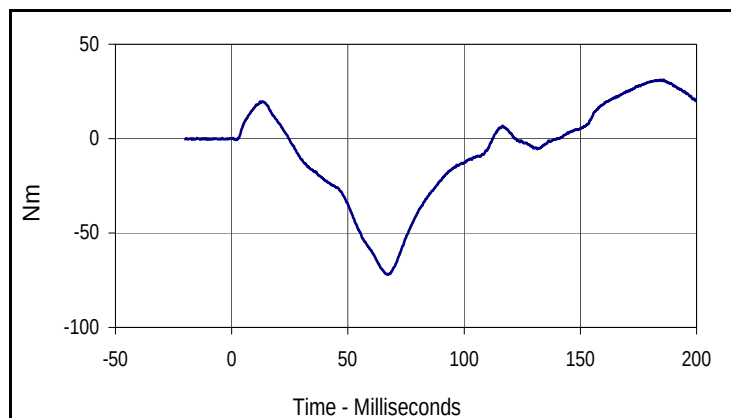
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.4	10.5	-1.9	91.2



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
103.7	72.3	-35.7	190.8



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
31.1	184.8	-72.0	67.0

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

Test Date: 9/17/07

ATD Serial No.: 034

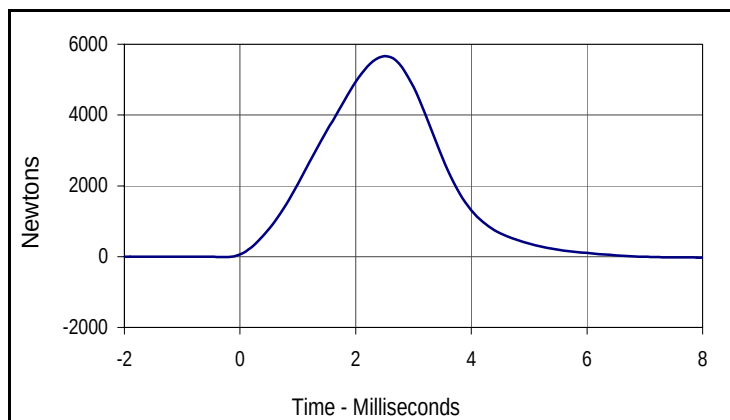
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**Left Knee**

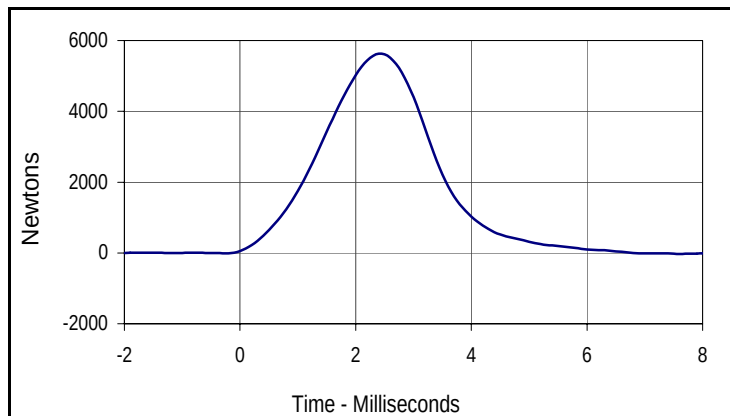
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5668	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5625	Pass
Overall Test Results				Pass

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

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5668.1	2.5	-25.4	8.0

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

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5625.1	2.4	-25.4	7.6

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 9/17/07

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	881	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	137	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	294	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	333	Pass
J - Elbow rest height	mm	190 to 211	197	Pass
K - Buttock to knee length	mm	579 to 604	593	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	486	Pass
N - Buttock popliteal length	mm	452 to 477	459	Pass
O - Chest depth	mm	213 to 229	217	Pass
P - Foot length	mm	251 to 267	258	Pass
V - Shoulder breadth	mm	422 to 437	424	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	986	Pass
Z - Waist circumference	mm	836 to 866	841	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	229	Pass
Overall Test Results				Pass

Test Program: Dummy Damage Checklist
 ATD Serial No.: 035

Test Date: 9/17/07
 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.: 034

Test Date: 9/17/07
 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-P28001-02-NC

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

**DAIMLERCHRYSLER CORPORATION
2008 DODGE AVENGER
4-DOOR SEDAN**

NHTSA NUMBER: M80303

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



SEPTEMBER 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**

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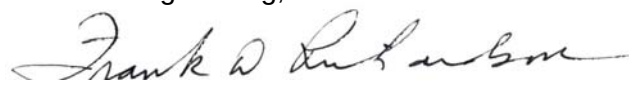
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Prepared by: 
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Date: September 18, 2007

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Date: September 18, 2007

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Date: September 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-P28001-02-NC		2. Government Accession No.		3. Recipients Catalog No.	
4. Title and Subtitle Final Report of two (2) Graco Snugride CRS's NHTSA NO. M80303				5. Report Date September 18, 2007	
				6. Performing Organization Code KAR	
7. Authors Mr. Kelsey A. Chiu, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco				8. Performing Organization Report No. TR-P28001-02-NC	
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301				10. Work Unit No.	
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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 two (2) Graco Snugride CRSs in conjunction with frontal barrier impact NCAP testing on a 2008 Dodge Avenger 4-Door Sedan and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at Karco Engineering, LLC on September 18, 2007.					
Measurement Description		Units	Threshold	Left Rear (P4)	Right Rear (P3)
Head Injury Criteria (HIC15)		N/A	390	329.5	454.5
3 msec. Chest Clip		Gs	50	57.5	47.6
17. Key Words New Car Assessment Program (Frontal NCAP) Frontal Barrier Impact Test Final Report of a Graco Snugride 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

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SECTION D1

PURPOSE AND SUMMARY OF TEST M80303

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) were instrumented with head, chest, and six-axis upper neck load cells. Tri-axial accelerometers were installed on both CRS's and the CRS bases.

The left rear (Serial No. 017) and right rear (Serial No. 022) 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)	454.5	47.6
CRABI (P4)	329.5	57.5

DATA SHEET NO.1
CRASH TEST SUMMARY

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

CHILD RESTRAINT SYSTEM INFORMATION

Description	Position #3 CRS	Position #4 CRS
Manufacturer	Graco	Graco
Model Name	Snugride	Snugride
Serial No.	8645GLN3	8F19C5E3
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	Seatback	None
Right Toe Contact	None	Seatback

POST-TEST DOOR OPENINGS

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

CAMERA COVERAGE

Description	Standard
High Speed	4
Real Time	0
Total	4

DATA CHANNELS

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

DATA SHEET NO.2**VEHICLE PARAMETER DATA**Test Vehicle: 2008 Dodge Avenger 4-Door SedanNHTSA No.: M80303Test Program: 2007 NHTSA 35mph NCAPTest Date: 9/18/07**TEST VEHICLE WEIGHTS**

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	461	297	758	498	375	873
Right	kg	435	292	727	456	354	810
Ratio	%	60.3	39.7	100.0	56.7	43.3	100.0
Totals	kg	896	589	1485	954	729	1683

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1485
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	52
Calculated Vehicle Target Wt. (TVTW)	kg	1689

DATA SHEET NO.3

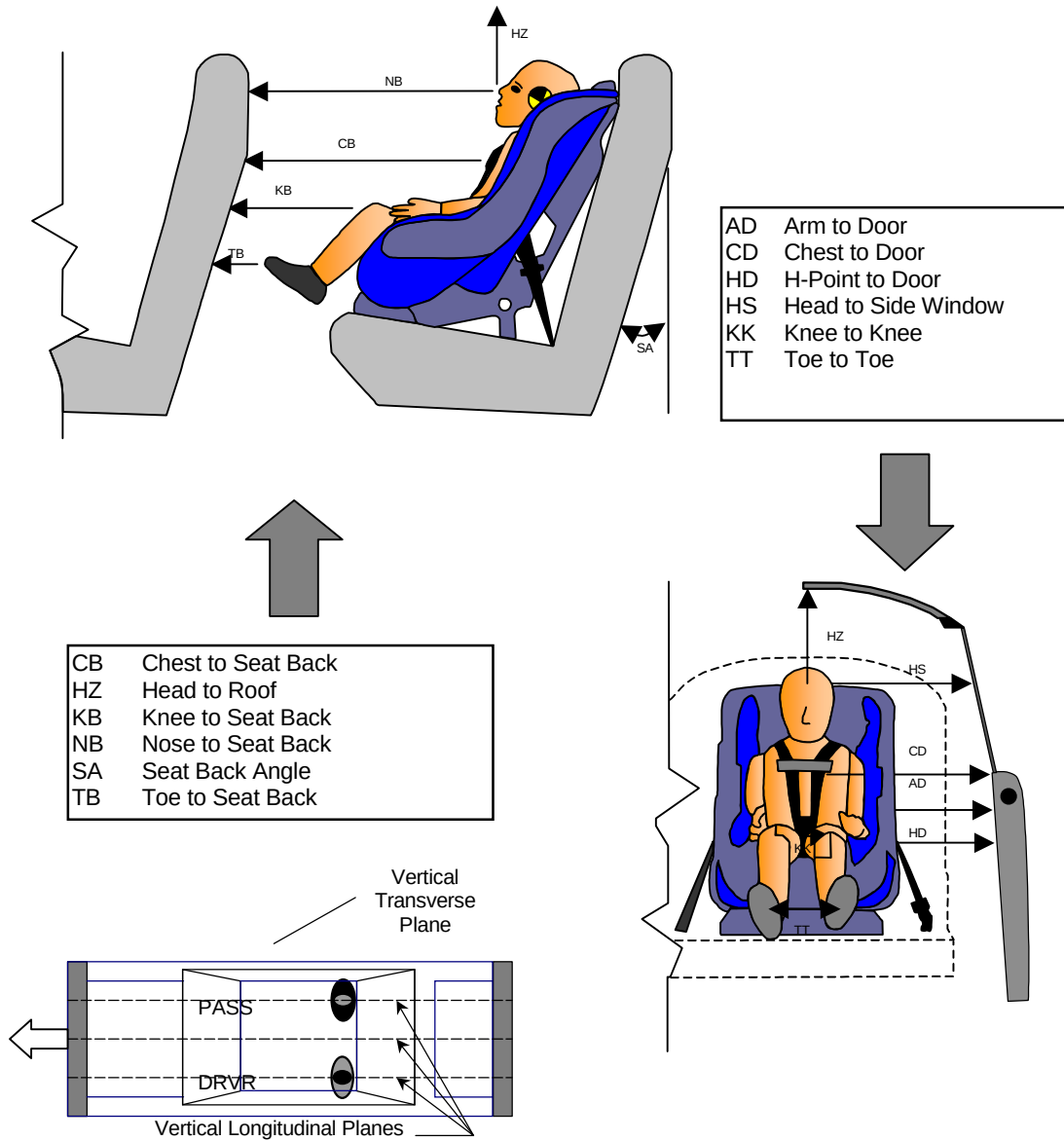
CRABI POSITIONING IN VEHICLE

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

DATA SHEET NO.3**CRABI POSITIONING IN VEHICLE...(CONTINUED)**Test Vehicle: 2008 Dodge Avenger 4-Door SedanNHTSA No.: M80303Test Program: 2007 NHTSA 35mph NCAPTest Date: 9/18/07**CRABI POSITION MEASUREMENTS**

Code	Measurement	P3 (Passenger's Side)		P4 (Driver's Side)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
SA	Seat Back Angle		22.3		22.3
HZ	Head to Roof (Z)	465		462	
CD	Chest to Door	415		427	
KK	Knee to Knee (Y)	120		130	
HS	Head to Side Window	444		454	
HD	H-Point to Door (Y)	375		342	
AD	Arm to Door	320		317	
NB	Nose to Seat Back	575		594	
CB	Chest to Seat Back	475		515	
FF	Foot to Foot	70		95	
KB-Left	Knee to Seat Back	235		260	
KB-Right	Knee to Seat Back	247		258	
TB-Left	Toe to Seat Back	25		120	
TB-Right	Toe to Seat Back	45		121	

DATA SHEET NO.4**CRS PERFORMANCE DATA**Test Vehicle: 2008 Dodge Avenger 4-Door SedanNHTSA No.: M80303Test Program: 2007 NHTSA 35mph NCAPTest Date: 9/18/07**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: 2008 Dodge Avenger 4-Door Sedan

NHTSA No.: M80303

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 9/18/07

CRS ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	CRS (P4)	1535	-475	810
2	CRS Base (P4)	1640	-420	585
3	CRS (P3)	1890	495	785
4	CRS Base (P3)	1855	530	650

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

DATA SHEET NO.6**CRS CAMERA LOCATIONS AND DATA**Test Vehicle: 2008 Dodge Avenger 4-Door SedanNHTSA No.: M80303Test Program: 2007 NHTSA 35mph NCAPTest Date: 9/18/07**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	-3490	706	1412	-2		12	1000
2	Passenger Side Upper CRS View	-3490	-706	1412	2		12	1000
3	Driver Side Lower CRS View	-2951	611	543	-2		10	1000
4	Passenger Side Lower CRS View	-2951	-611	543	2		12	1000

SECTION D2

PHOTOGRAPHS

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36	Post-Test Position 4 Dummy Legs	D2-18

MODEL **8645GLN3**

NAME **SNUGRIDE**

Manufactured in 051007 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

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



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



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



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



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



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



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



Figure D2-9: Post-Test Left 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)

**Photograph Not
Available**

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



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

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MODEL 8F19CSE3 **NAME SNUGRIDE**
Manufactured in 071107 10
GRACO CHILDREN'S PRODUCTS, INC.
EXTON, PA 19341 1-800-345-4109
Made in U.S.A.

PB-25777

Figure D2-19: Position 4 CRS Label

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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 Right Side View of Position 4 CRS



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



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



Figure D2-27: Post-Test Left 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 Left Side View



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



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

SECTION D3

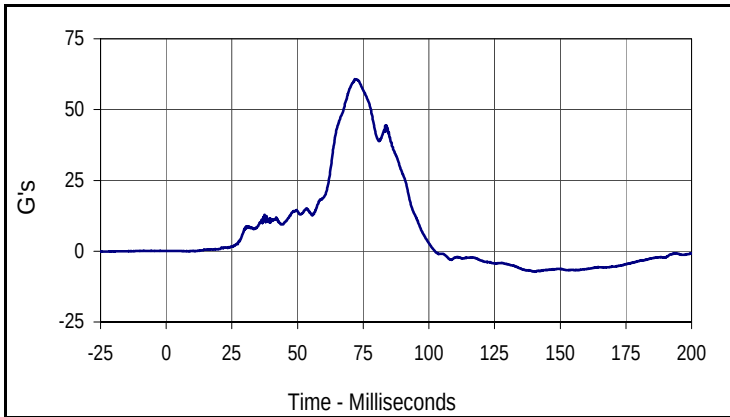
CRABI RESPONSE AND CRS DATA TRACES

LIST OF DATA PLOTS

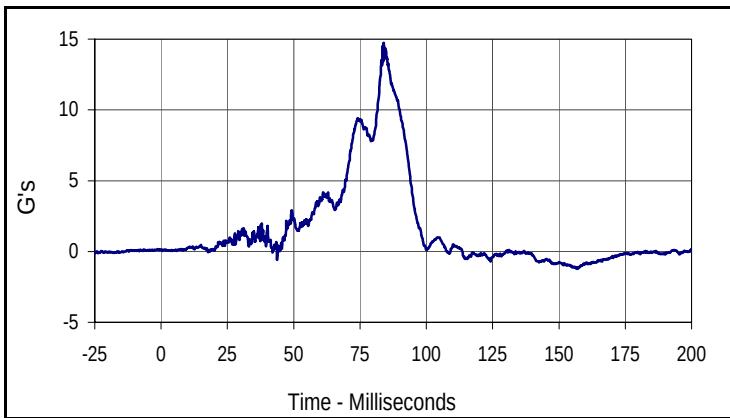
<u>Data Plot</u>		<u>Page</u>
D3-1	Right Rear CRABI (P4) Head X	D3-1
	Right Rear CRABI (P4) Head Y	D3-1
	Right Rear CRABI (P4) Head Z	D3-1
	Right Rear CRABI (P4) Head Resultant	D3-1
D3-2	Right Rear CRABI (P4) Chest X	D3-2
	Right Rear CRABI (P4) Chest Y	D3-2
	Right Rear CRABI (P4) Chest Z	D3-2
	Right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

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

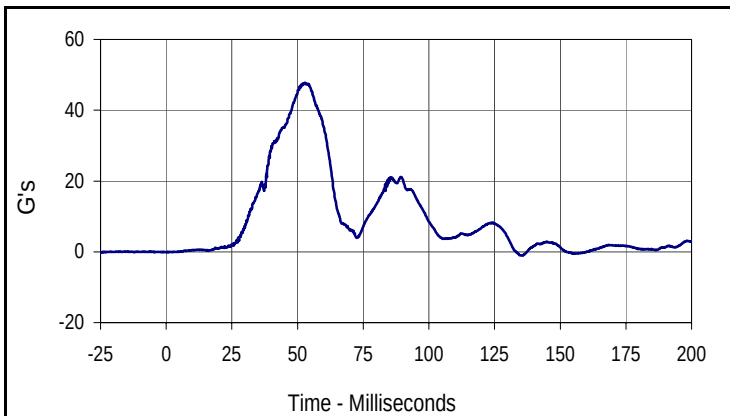
Test Date: 9/18/07
 NHTSA No.: M80303



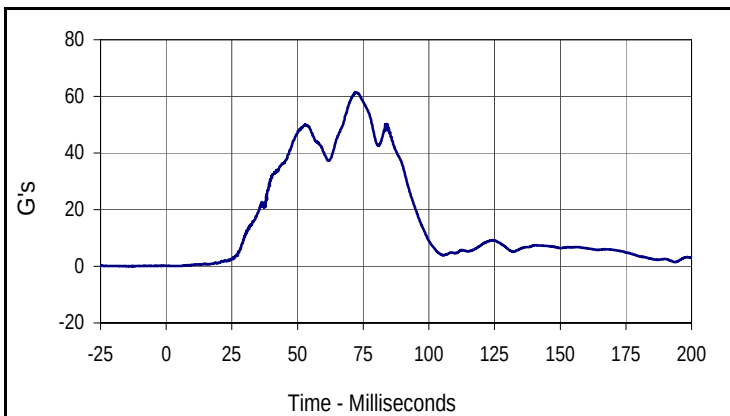
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CRABI CRABI Head X (P4)			
CURNO	Type	SAE Class	Units
142	FIL	1000	G's
Max	Time	Min	Time
60.7	71.8	-7.3	140.3



Curve Description			
CRABI CRABI Head Y (P4)			
CURNO	Type	SAE Class	Units
143	FIL	1000	G's
Max	Time	Min	Time
14.7	84.0	-1.2	157.1



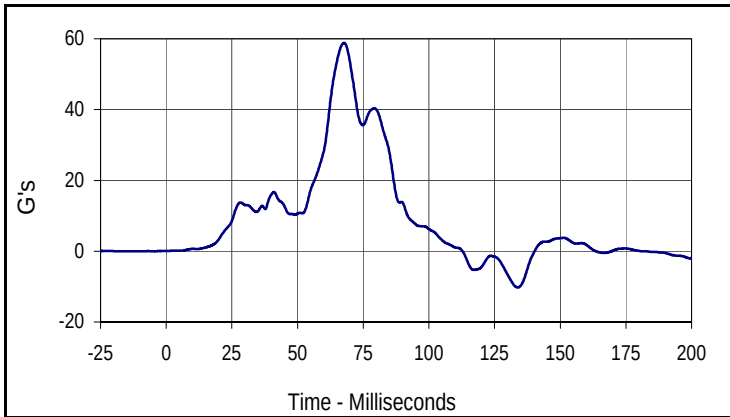
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Max	Time	Min	Time
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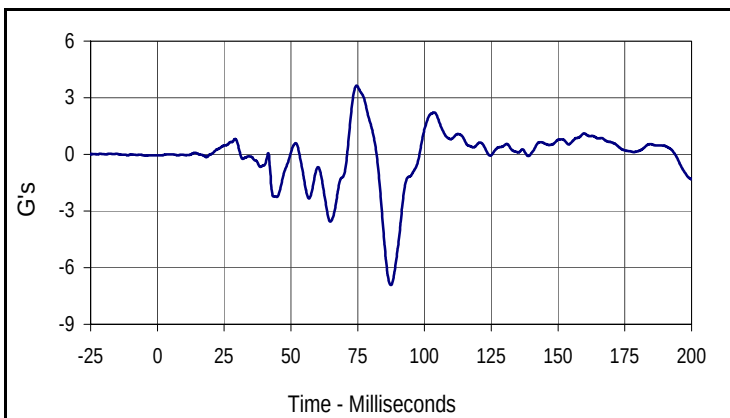
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142	RES	1000	G's
Max	Time	Min	Time
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Test Vehicle: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

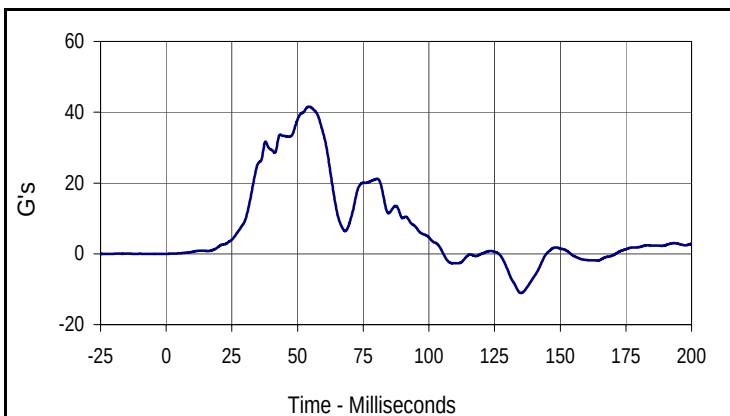
Test Date: 9/18/07
 NHTSA No.: M80303



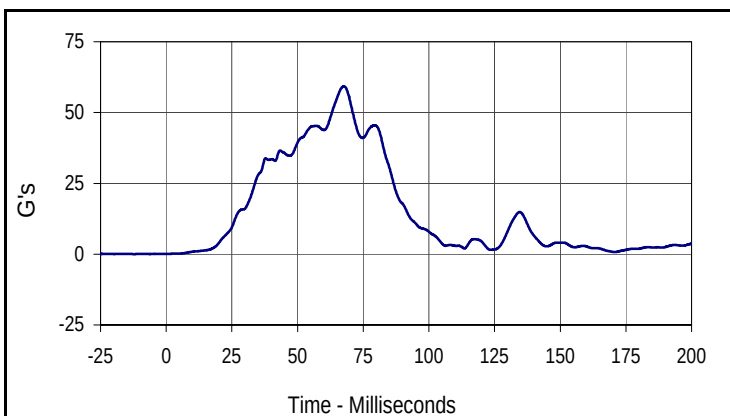
Curve Description			
CRABI CRABI Chest X (P4)			
CURNO	Type	SAE Class	Units
145	FIL	180	G's
Max	Time	Min	Time
58.9	67.7	-10.2	133.8



Curve Description			
CRABI CRABI Chest Y (P4)			
CURNO	Type	SAE Class	Units
146	FIL	180	G's
Max	Time	Min	Time
3.6	74.6	-6.9	87.4



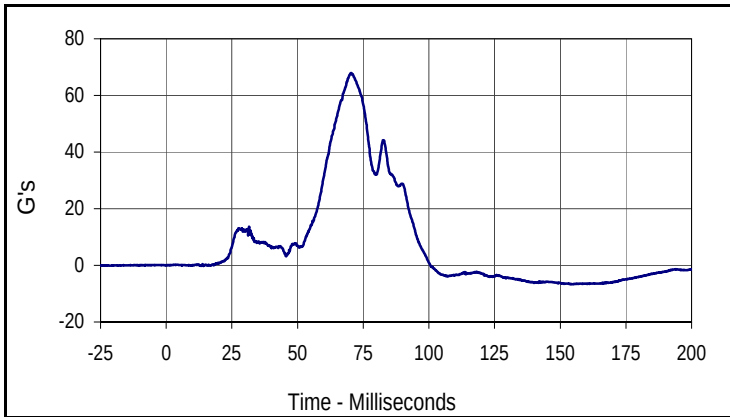
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CRABI CRABI Chest Z (P4)			
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147	FIL	180	G's
Max	Time	Min	Time
41.5	54.3	-11.1	135.0



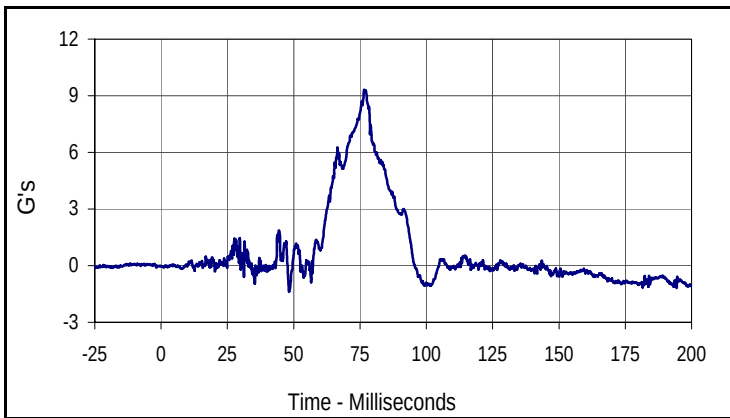
Curve Description			
CRABI CRABI Chest Resultant (P4)			
CURNO	Type	SAE Class	Units
145	RES	180	G's
Max	Time	Min	Time
59.3	67.6	0.1	0.0

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

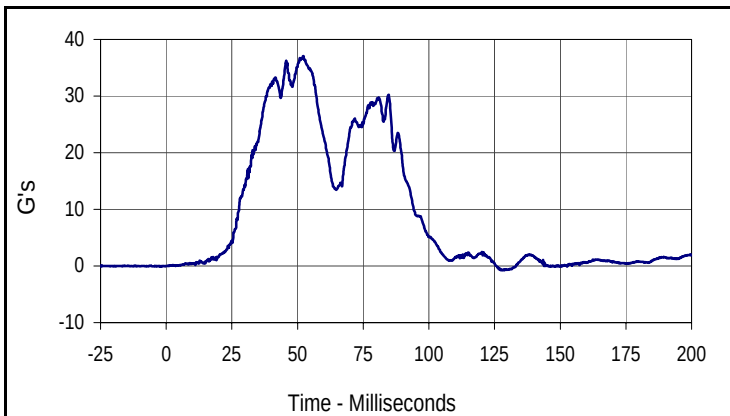
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 NHTSA No.: M80303



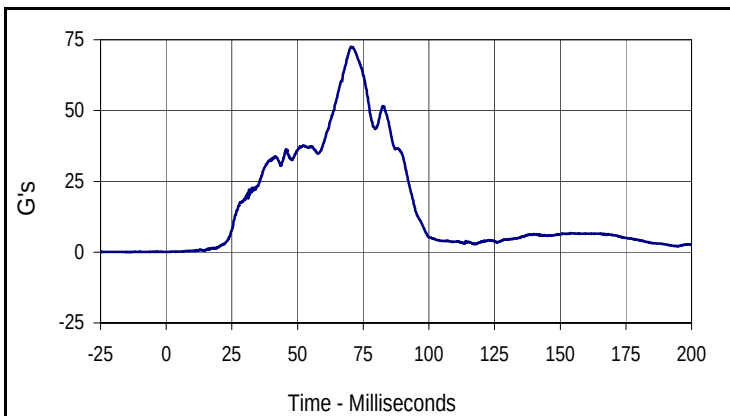
Curve Description			
CRABI CRABI Head X (P3)			
CURNO	Type	SAE Class	Units
163	FIL	1000	G's
Max	Time	Min	Time
68.0	70.4	-6.7	153.8



Curve Description			
CRABI CRABI Head Y (P3)			
CURNO	Type	SAE Class	Units
164	FIL	1000	G's
Max	Time	Min	Time
9.3	76.6	-1.4	48.2



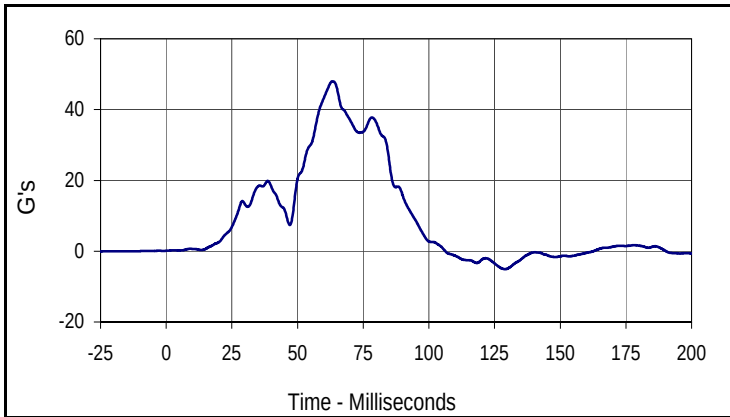
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CRABI CRABI Head Z (P3)			
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165	FIL	1000	G's
Max	Time	Min	Time
37.1	52.1	-0.7	128.4



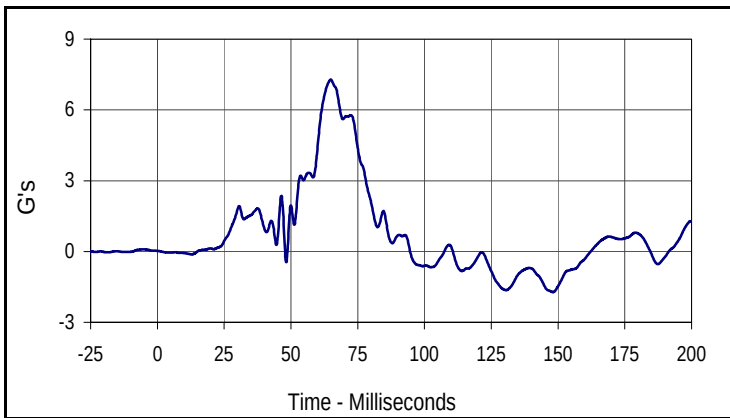
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CRABI CRABI Head Resultant (P3)			
CURNO	Type	SAE Class	Units
163	RES	1000	G's
Max	Time	Min	Time
72.5	70.5	0.1	0.1

Test Vehicle: 2008 Dodge Avenger 4-Door Sedan
 Test Program: 2007 NHTSA 35mph NCAP

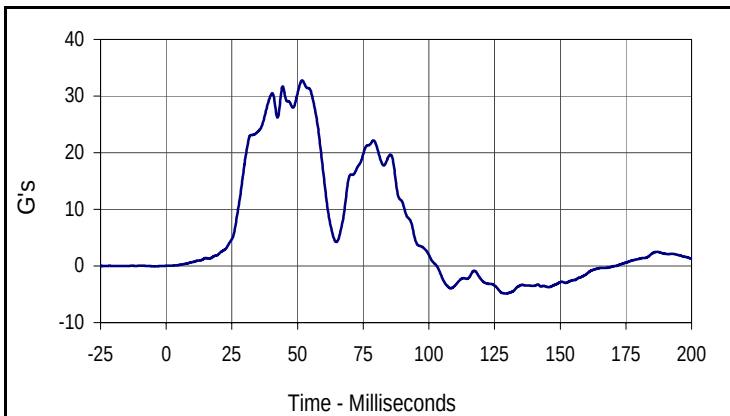
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 NHTSA No.: M80303



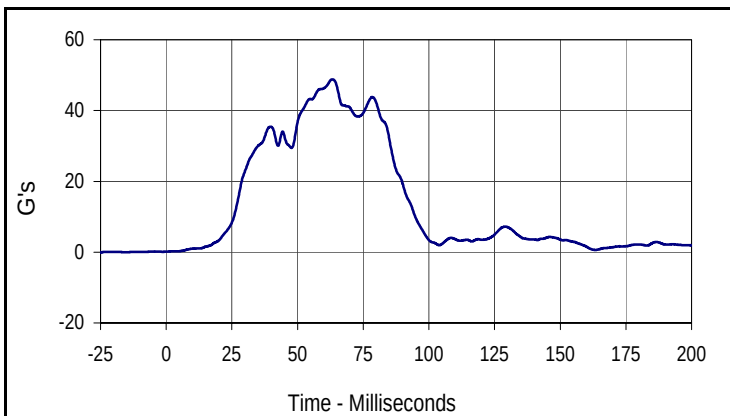
Curve Description			
CRABI CRABI Chest X (P3)			
CURNO	Type	SAE Class	Units
166	FIL	180	G's
Max	Time	Min	Time
48.0	63.4	-5.1	129.0



Curve Description			
CRABI CRABI Chest Y (P3)			
CURNO	Type	SAE Class	Units
167	FIL	180	G's
Max	Time	Min	Time
7.3	64.9	-1.7	148.1



Curve Description			
CRABI CRABI Chest Z (P3)			
CURNO	Type	SAE Class	Units
168	FIL	180	G's
Max	Time	Min	Time
32.8	51.7	-4.9	129.3



Curve Description			
CRABI CRABI Chest Resultant (P3)			
CURNO	Type	SAE Class	Units
166	RES	180	G's
Max	Time	Min	Time
48.8	63.2	0.1	0.0

SECTION D4

CRABI CALIBRATION INFORMATION

Test Program: CRABI 12 Month Old Frontal Head Drop Test

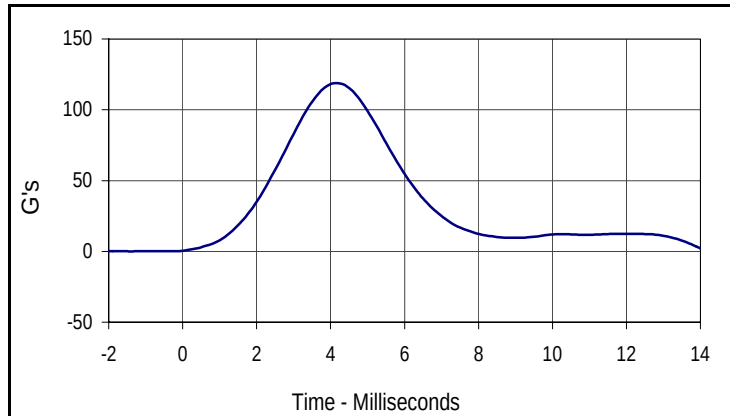
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ATD Serial No.: 022

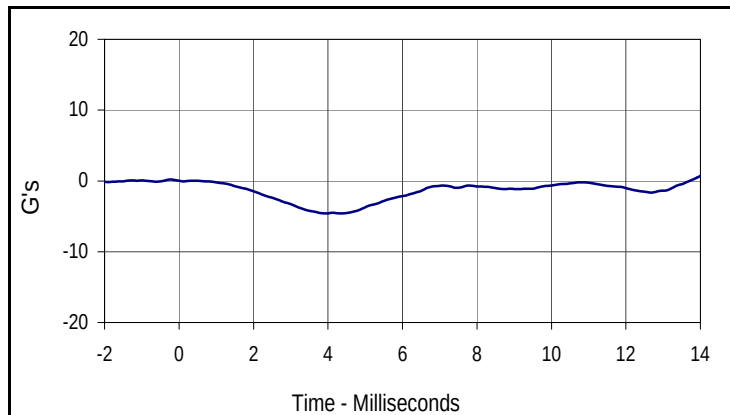
Test I.D.: FHD09E



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



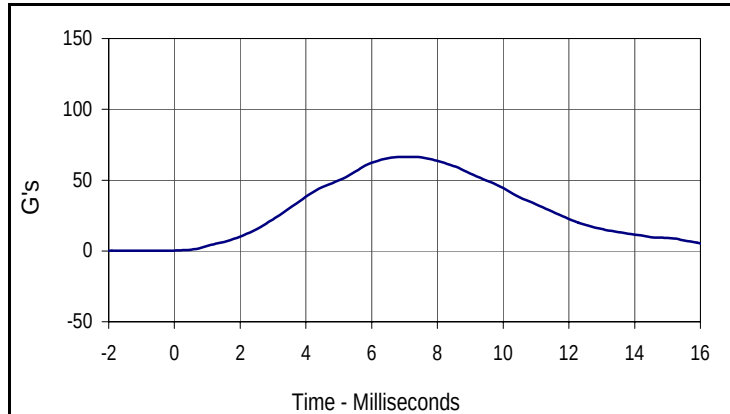
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.2	-0.2	-4.6	3.9

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

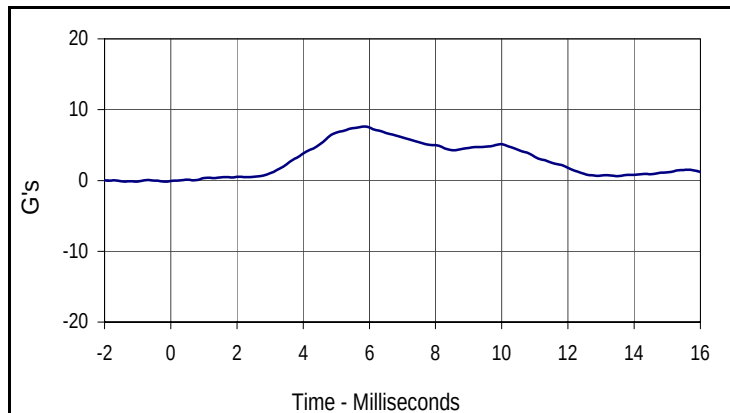
Test Date: 9/17/07
 Test I.D.: RHD09E



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	62.2	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
62.2	6.0	0.1	-0.9



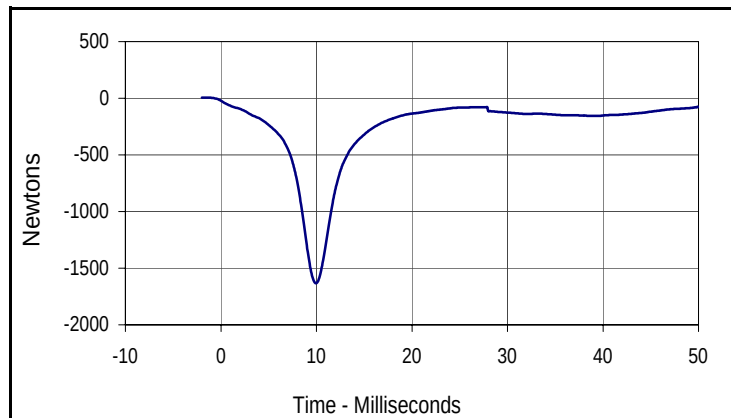
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.6	5.8	-0.2	-1.4

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

Test Date: 9/17/07
 Test I.D.: CH09E



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	-1633	Pass
Overall Test Results				Pass



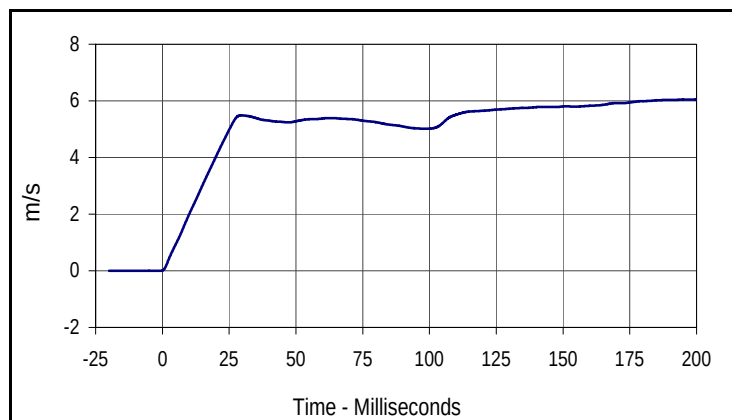
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
6.1	-1.7	-1633.2	10.0

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

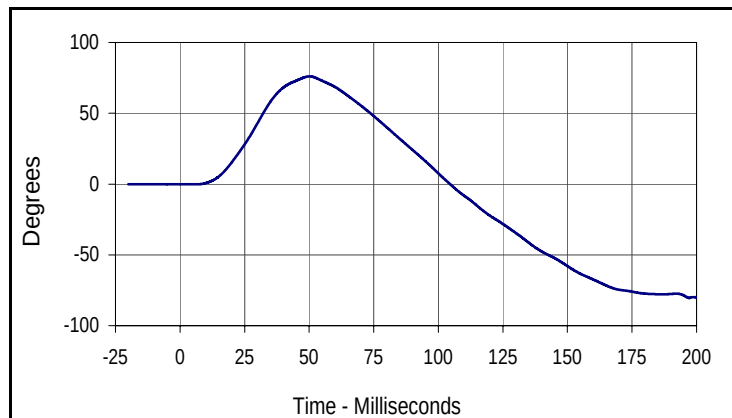
Test Date: 9/17/07
 Test I.D.: NF09E



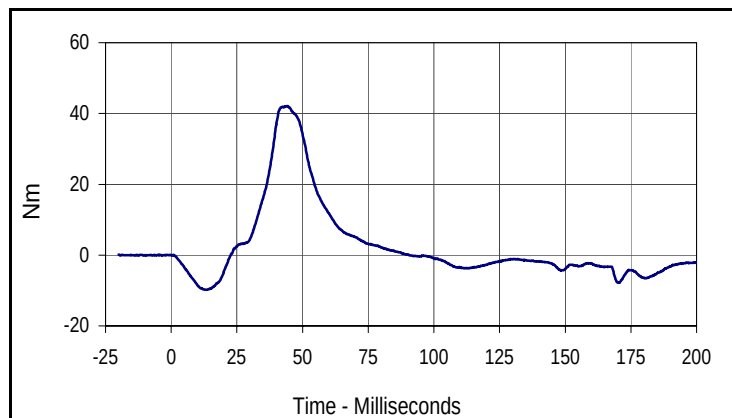
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.15	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	2.0	Pass
	20 Msec.	m/s	3.4 to 4.2	4.0	Pass
	25 Msec.	m/s	4.3 to 5.2	5.0	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	39.4	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	70.6	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.0	199.3	0.0	-0.7



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



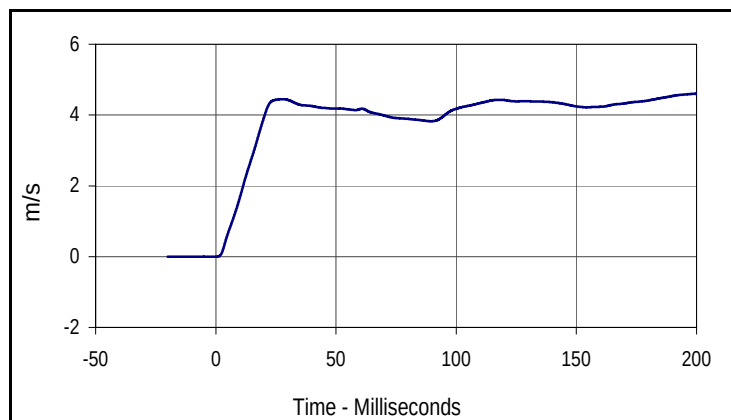
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
42.1	44.3	-9.8	13.5

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

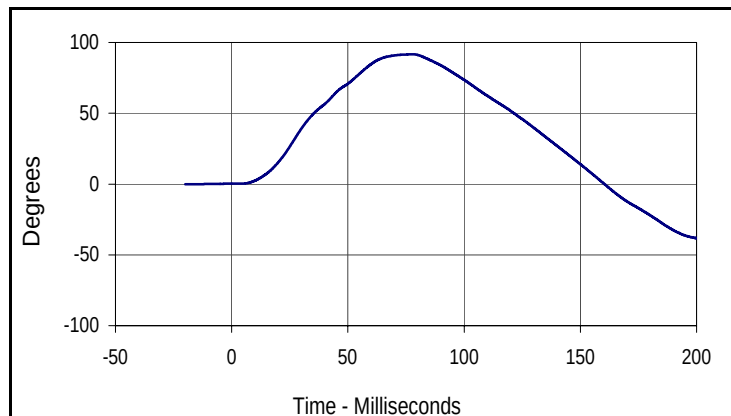
Test Date: 9/17/07
 Test I.D.: NE09E



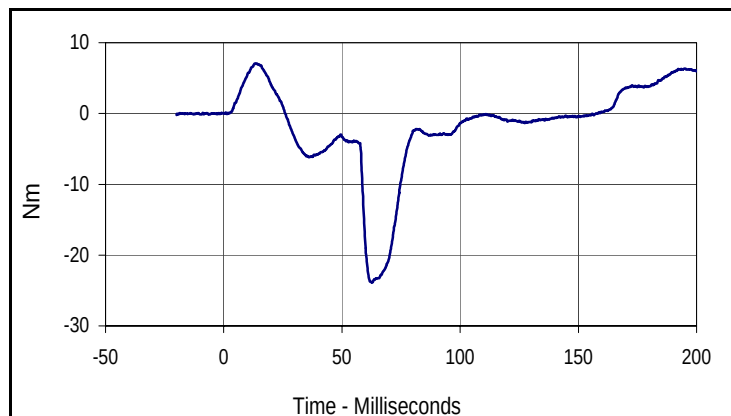
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.44	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.8	Pass
	10 Msec.	m/s	1.5 to 2.1	1.7	Pass
	14 Msec.	m/s	2.2 to 2.9	2.6	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	91.7	Pass
Peak Moment in Rotation	Max	Nm	-12 to -23	-19.1	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	77.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.6	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
7.1	13.2	-23.9	62.8

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

Test Date: 9/17/07
 Test I.D.: N/A



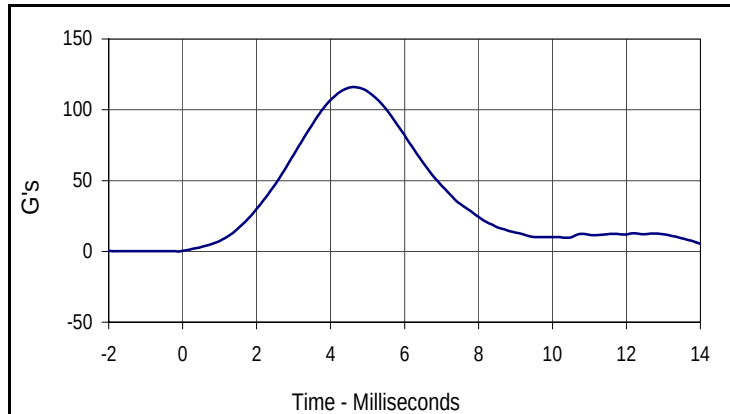
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	456.0 to 471.2	462	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	279	Pass
C - "H" point height	mm	27.9 to 38.1	34	Pass
D - "H" point from backline	mm	40.1 to 50.3	47	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	56	Pass
F - Thigh clearance	mm	63.0 to 73.2	70	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	188	Pass
I - Shoulder pivot to elbow pivot	mm	99.1 to 114.3	104	Pass
J - Elbow rest height	mm	150.1 to 165.3	155	Pass
K - Buttock to knee length	mm	202.7 to 217.9	203	Pass
L - Popliteal length	mm	138.7 to 153.9	139	Pass
M - Knee pivot height	mm	165.1 to 180.3	167	Pass
N - Buttock popliteal length	mm	144.8 to 160.0	150	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	184	Pass
S - Head Breadth	mm	124.4 to 134.6	130	Pass
T - Head Depth	mm	149.9 to 165.1	150	Pass
U - Hip breadth	mm	158.5 to 173.7	163	Pass
V - Shoulder breadth	mm	200.7 to 215.9	205	Pass
W - Foot breadth	mm	39.1 to 49.3	40	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	462	Pass
Z - Waist circumference	mm	447.0 to 472.4	458	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	110	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.: 017

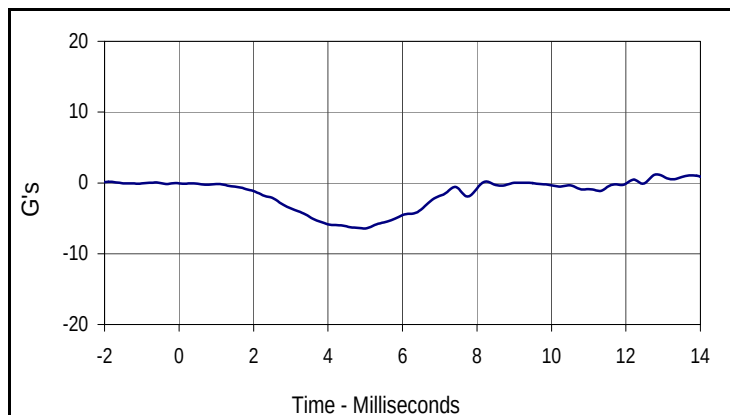
Test Date: 9/17/07
 Test I.D.: FHD09F



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



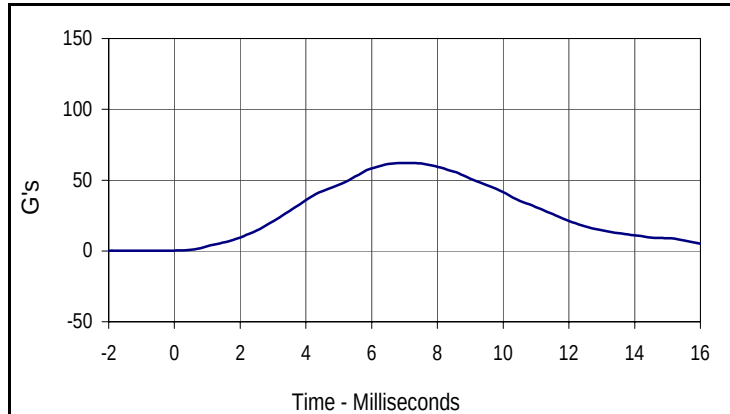
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.1	-1.9	-6.4	5.0

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

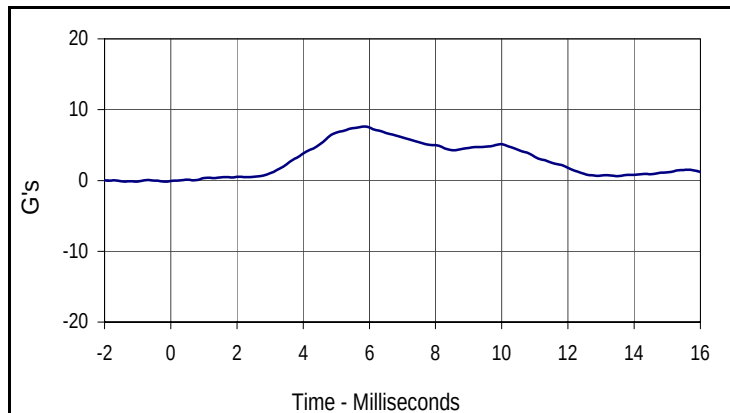
Test Date: 9/17/07
 Test I.D.: RHD09F



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	55.0 to 71.0	58.3	Pass
Peak Lateral Acceleration	G's	≤15.0	7.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
58.3	6.0	0.1	-0.9



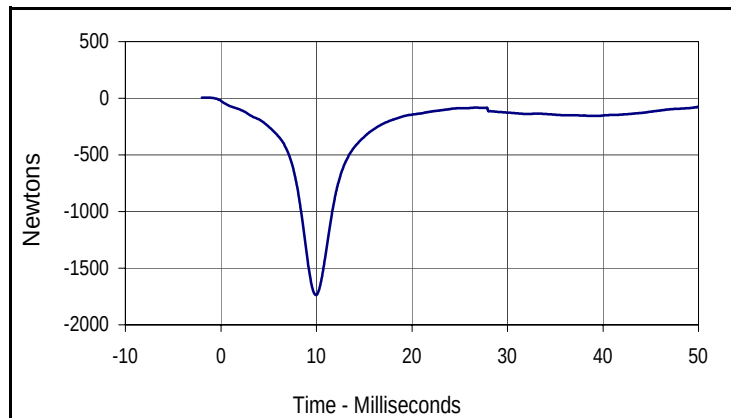
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.6	5.8	-0.2	-1.4

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

Test Date: 9/17/07
 Test I.D.: CH09F



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	5.07	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1736	Pass
Overall Test Results				Pass



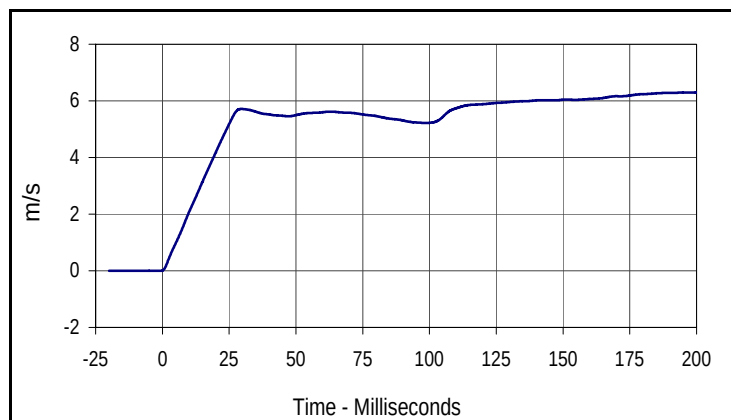
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
6.2	-1.6	-1736.1	10.0

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

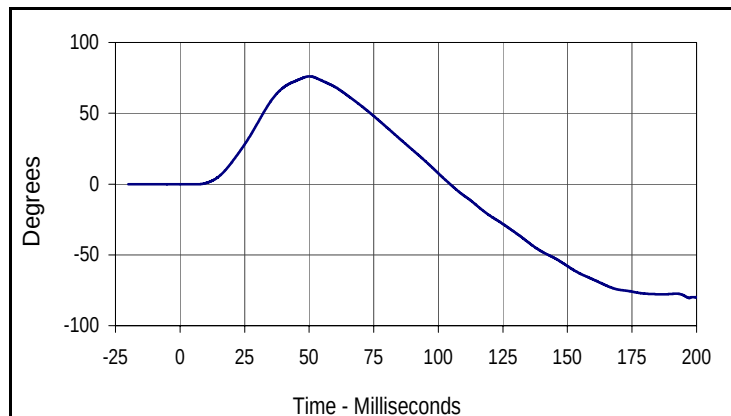
Test Date: 9/17/07
 Test I.D.: NF09F



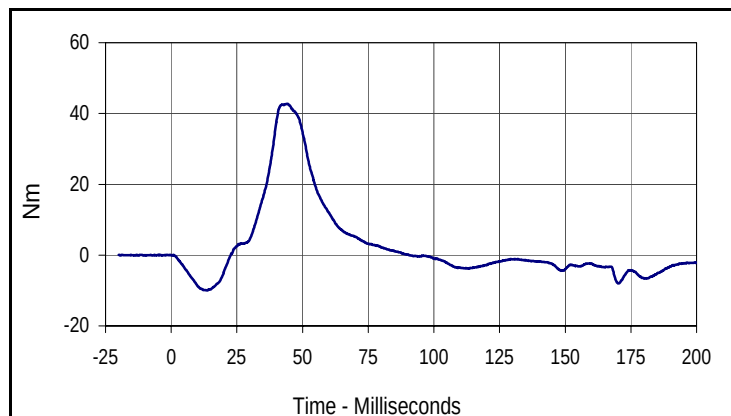
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.22	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	2.1	Pass
	20 Msec.	m/s	3.4 to 4.2	4.2	Pass
	25 Msec.	m/s	4.3 to 5.2	5.2	Pass
"D" Plane Rotation	Max	Degrees	75.0 to 86.0	76.1	Pass
Peak Moment in Rotation	Max	Nm	36.0 to 45.0	40.0	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	70.7	Pass
			Overall Test Results		Pass



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



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



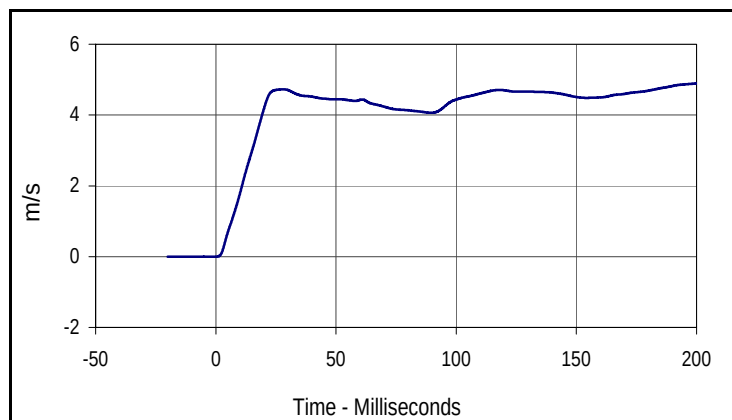
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
42.8	44.3	-9.9	13.5

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

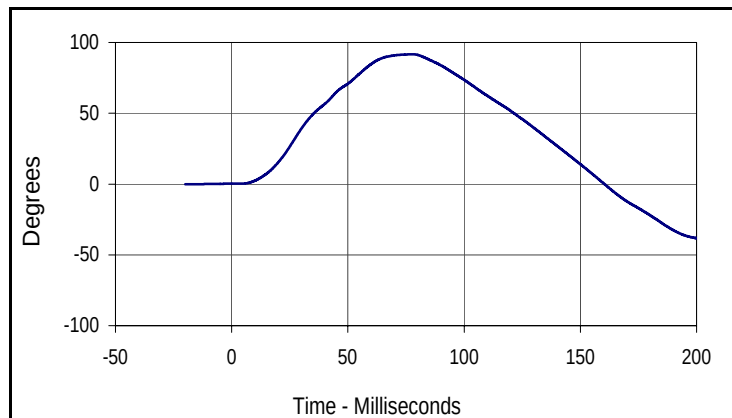
Test Date: 9/17/07
 Test I.D.: NE09F



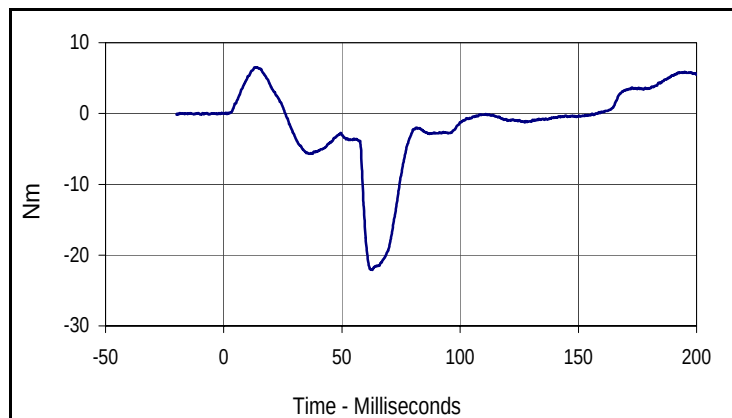
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.45	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.9	Pass
	10 Msec.	m/s	1.5 to 2.1	1.8	Pass
	14 Msec.	m/s	2.2 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	-17.8	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	77.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.9	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
6.5	13.2	-22.1	62.8

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

Test Date: 9/17/07
 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	277	Pass
C - "H" point height	mm	27.9 to 38.1	36	Pass
D - "H" point from backline	mm	40.1 to 50.3	44	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	59	Pass
F - Thigh clearance	mm	63.0 to 73.2	67	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	181	Pass
I - Shoulder pivot to elbow pivot	mm	99.1 to 114.3	100	Pass
J - Elbow rest height	mm	150.1 to 165.3	159	Pass
K - Buttock to knee length	mm	202.7 to 217.9	210	Pass
L - Popliteal length	mm	138.7 to 153.9	140	Pass
M - Knee pivot height	mm	165.1 to 180.3	175	Pass
N - Buttock popliteal length	mm	144.8 to 160.0	155	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	109	Pass
P - Foot length	mm	92.4 to 102.6	98	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	182	Pass
S - Head Breadth	mm	124.4 to 134.6	127	Pass
T - Head Depth	mm	149.9 to 165.1	159	Pass
U - Hip breadth	mm	158.5 to 173.7	164	Pass
V - Shoulder breadth	mm	200.7 to 215.9	202	Pass
W - Foot breadth	mm	39.1 to 49.3	44	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	259	Pass
BB - Reference Location For dimension Z	mm	106.7 to 116.9	112	Pass
CC - Shoulder Height	mm	299.7 to 314.9	305	Pass
DD - Chin Height	mm	289.6 to 304.8	290	Pass
Overall Test Results				Pass