REPORT NUMBER TR-P30001-01-NC

NEW CAR ASSESMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

HYUNDAI MOTOR COMPANY
2010 HYUNDAI ACCENT
3-DOOR HATCHBACK

NHTSA NUMBER: MA0517

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DECEMBER 4, 2009

FINAL REPORT

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16. Abstract

A 35 mph (56.3 km/h) frontal barrier impact test was conducted on the subject 2010 Hyundai Accent 3-Door Hatchback at KARCO Engineering, LLC, in Adelanto, CA, on December 4, 2009. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, 305, and footwell intrusion performance. The impact velocity was 56.19 km/h. The ambient temperature at the barrier at the time of the crash was 15.6 degrees Celsius. The vehicle's maximum post static crush was 382 mm at DPD 4, to the right of the vehicle's centerline. The test vehicle was equipped with a 3-point continuous belt system and a second generation airbag at both front outboard 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	574.9	269.7
Max. Chest Accel. (3 msec. Chest Clip)	G's	60	37.7	39.2
Left Femur Force	Newtons	10008	-1682.3	-3249.6
Right Femur Force	Newtons	10008	-4938.6	-706.5

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56.3 km/h NCAP Frontal Impact Test New Car Assesment Program (NCAP) M2010 Hyundai Accent 3-Door Hatchback NHTSA No. MA0517	Copies of this report are available from: National Highway Traffic Safety Admin. NHTSA Technical Reference Division 1200 New Jersey Ave., SE, Room W43-410 Washington, DC 20590

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SECTION 1
PURPOSE AND SUMMARY OF TEST MA0517

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 2010 Hyundai Accent 3-Door Hatchback at a velocity of 56.19 km/h. The test was performed at KARCO Engineering, LLC on December 4, 2009

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

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

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

One hundred and 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, and Appendix C contains the Dummy Calibration data.

There was 100% windshield retention and no intrusion into the protected zone of the windshield during impact. 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 382 mm at DPD 4, to the right of the vehicle's centerline. Both the driver and passenger side doors remained closed and latched during the impact event, and were operable after the impact.

The driver’s visible contact points were as follows: The driver ATD's head and chest contacted the airbag. The head also contacted the headrest. Both knees contacted the Knee bolster.

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

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY

ATD Position	HIC 36	3 msec Chest Clip	Chest Defl. (mm)	Left Femur (N)	Right Femur (N)
Driver	574.9	37.7	-23.6	-1682.3	-4938.6
Passenger	269.7	39.2	-13.5	-3249.6	-706.5

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

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

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	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressures	lbf/in^2	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	^oF	^oC	=(tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

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

DATA SHEET NO. 1

CRASH TEST SUMMARY

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.19
Test Weight	kg	1320
Impact Angle	degrees	0
Average Rebound	mm	500
Maximum Static Crush	mm	382

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door Opening	Remained closed and latched, opened without tools	Remained closed and latched, opened without tools
Rear Door Opening		
Seat Track Shift (mm)	5 mm	4 mm
Seatback Failure	No	No

TEST DUMMY INFORMATION

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

MOVIE COVERAGE

Cameras	Standard	Additional
High Speed	16	0
Real Time	1	2
Total	17	2

DATA CHANNELS

Driver ATD Sensors	40
Passenger ATD Sensors	40
Belt Assessment Sensors	8
Vehicle Structure Acclerometers	8
Rigid Barrier Load Cells	36
Total	132

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MA0517
Make	Hyundai
Model	Accent
Body Style	3-Door Hatchback
VIN No.	KMHCM3AC1AU150751
Color	Nordic White
Delivery Date	11/06/09
Odometer (Miles)	5.0
Dealer	Northtown Hyundai
Transmission	5-Speed Manual
Final Drive	Front
Type/No. of Cylinders	Inline 4
Engine Displ. (L)	1.6
Engine Placement	Transverse
Roof Rack	No
Sunroof/T-top	No
Tinted Glass	No
Traction Control	No
Power Brakes	Yes
Front Disc	Yes
Rear Disc	No
Anti-Lock Brakes	No
All Wheel Drive	No

Power Steering	Yes
Driver Front Airbag	Yes
Driver Knee Airbag	No
Driver Side Torso Airbag	Yes
Driver Side Head Airbag	No
Driver Curtain Airbag	Yes
Pass. Front Airbag	Yes
Pass. Knee Airbag	No
Pass. Side Torso Airbag	Yes
Pass. Head Airbag	No
Pass. Curtain Airbag	Yes
Pre-Tensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes
Air Conditioning	No
AM/FM CD	No
Tilt Steering	No
Automatic Door Locks	No
Power Windows	No
Power Seats	No
Other	Tire Pressure Monitoring System

Does the Owner's Manual provide instructions to turn off automatic door locks? n/a

DATA FROM MANUFACTURER'S LABEL

Manufactured By	Hyundai Motor Company
Date of Manufacture	Jun-09

GVWR (kg)	1650
GAWR Front (kg)	870
GAWR Rear (kg)	850

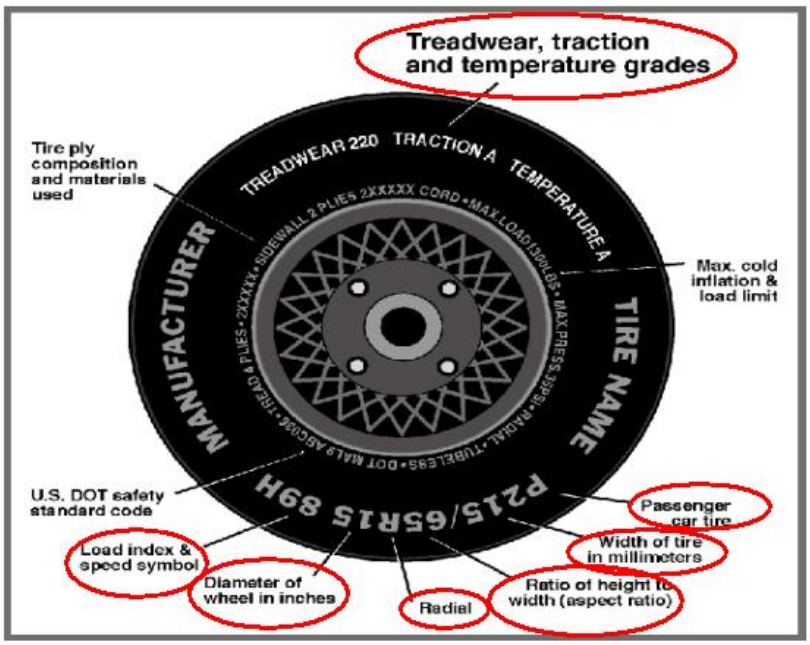
VEHICLE SEATING CAPACITY AND WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				385
Cargo Weight (RCLW) (kg)				45

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

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



TIRE INFORMATION

Measured Paramater	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Tire Pressure (kPa)	220	220
Recommended Tire Size	P175/70R14	P175/70R14
Tire Size on Vehicle	P175/70R14	P175/70R14
Tire Manufacturer	Kumho	Kumho
Treadwear	440	440
Traction	AA	AA
Temperature Grades	A	A
Tire Plies - Sidewall	1 Polyester	1 Polyester
Tire Plies - Body	1 Polyester, 2 Steel	1 Polyester, 2 Steel
Load Index/Speed Symbol	84T	84T
Tire Material	Polyester, Steel	Polyester, Steel
DOT Safety Code Right	C0F9 YP5M 2109	C0F9 YP5M 2109
DOT Safety Code Left	C0F9 YP5M 2109	C0F9 YP5M 2109

DATA SHEET NO. 2…(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	353.5	219.0	572.5	393.0	287.5	680.5
Right	kg	333.5	205.0	538.5	366.0	273.0	639.0
Ratio	%	61.8	38.2	100.0	57.5	42.5	100.0
Totals	kg	687.0	424.0	1111.0	759.0	560.5	1319.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1111
Weight of 2 P572 ATD's	kg	170
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Target Vehicle Test Weight (TVTW)	kg	1326

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	643	643	645	644	953
As Tested	mm	623	623	614	615	1060

Vehicle Wheel Base (mm): 2495

Weight of Ballast Secured in Cargo Area (kg): 0

Weight of Items Removed (kg): 32

Vehicle Components Removed: Spare tire and tools, trunk cover, hatch cover, outboard mirrors, tail lights, rear bumper and cover

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

FUEL SYSTEM DATA

Fuel System Capacity from Owner's Manual (L): 45.04

Actual Test Volume with Entire Fuel System Filled (L): 41.85

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 the ignition switch "ON" & engine "OFF"? yes

Fuel System Particulars: The fuel pump will operate when the ignition is turned to "ON"

DATA SHEET NO. 3

POST-TEST IMPACT DATA

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

SPEED TRAP DATA

Measured Paramater	Units	Requirement	Value
Trap No. 1 Velocity	km/h	55.1 to 57.12	56.19
Trap No. 2 Velocity	km/h	55.1 to 57.12	56.15

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	3320	3282	38
Center	mm	4045	3698	347
Right Side	mm	3325	3260	65

VEHICLE REBOUND FROM BARRIER

Measured Paramater	Units	Value
Left Side	mm	510
Center	mm	500
Right Side	mm	490
Average	mm	500

DATA SHEET NO. 4

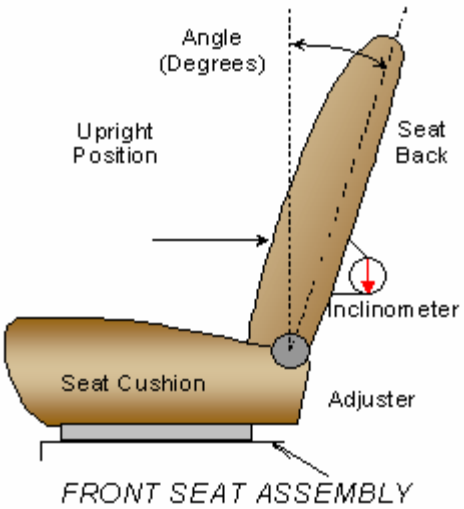
TEST VEHICLE INFORMATION

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

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 seat back, using a digital inclinometer.



SEAT BACK ANGLES

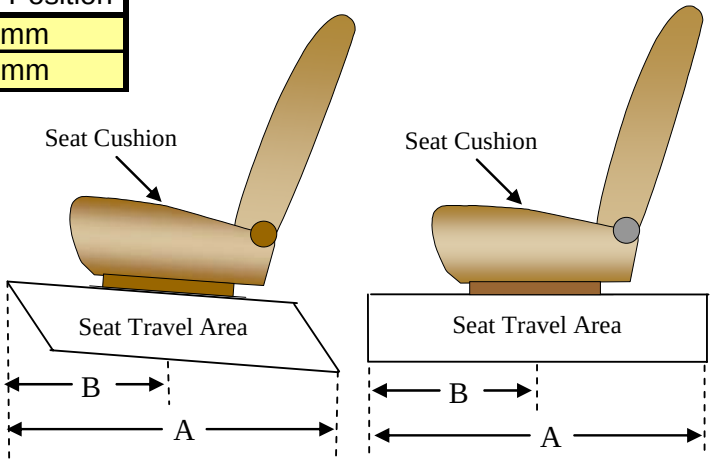
Position	Degrees
Driver w/ Seated Dummy	24.8 @ Seat back
Passenger w/ Seated Dummy	25.0 @ Seat back

SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position. The seat was set at the longitudinal mid position. There were vertical adjustments on the driver seat that was equipped with the vehicle. There were no adjustments on the passenger seat. The driver seat was placed in the lowermost position.

SEAT FORE/AFT POSITIONING

Position	Total Fore/Aft Travel	Placed in Position
Driver Seat	215 mm	108 mm
Passenger Seat	222 mm	111 mm



SEAT BELT ANCHORAGE

Position number one (1) is the uppermost position.

SEAT BELT ANCHORAGE POSITIONING

	Total Number of Positions	Placed in Position
Driver Seat	4	1
Passenger Seat	4	1

TEST VEHICLE INFORMATION

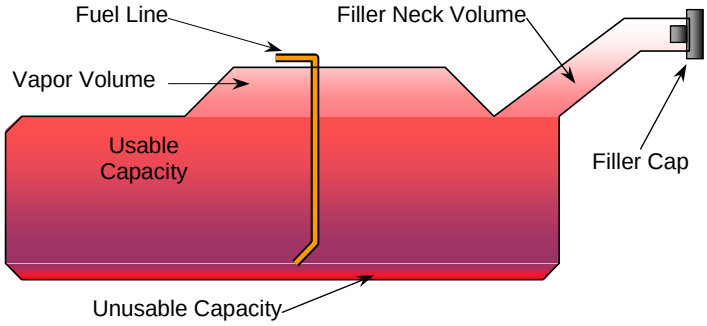
Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

FUEL TANK CAPACITY

	Liters
Usable Capacity of Standard Tank	45.04
Usable Capacity of Optional Tank	
Usable Capacity Used for FMVSS 301	41.44 to 42.34
Actual Amount of Solvent Used	41.85

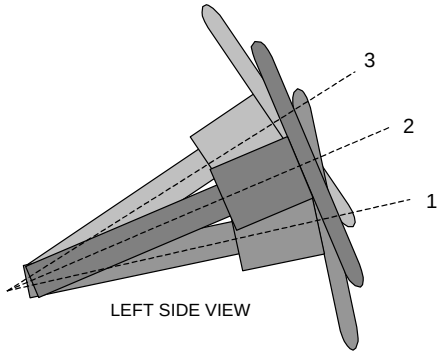
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately two (2) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the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



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering column was fixed.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position
Lowermost - Position No. 1		
Geometric Center - Position No. 2		
Uppermost - Position No. 3		

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

TEST DUMMY POSITION MEASUREMENTS

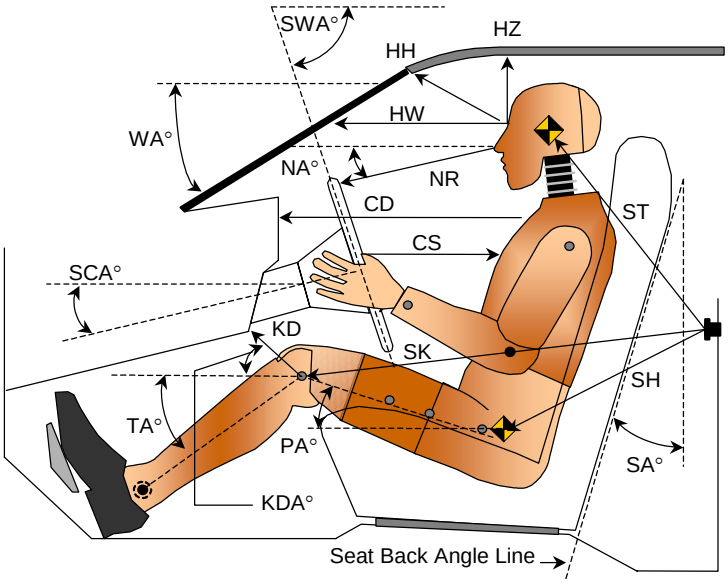
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield angle		28.7		
SWA	Steering wheel angle		65.7		
SCA	Steering column angle		24.3		
SA	Seat Back angle		24.8		25.0
HZ	Head to roof (Z)	212	90.0	204	90.0
HH	Head to header	345	21.8	358	23.9
HW	Head to windshield	570	0.0	574	0.0
HR	Head to side header (Y)	261		249	
NR	Nose to rim	451	19.5		
CD	Chest to dash	519	8.3	576	12.8
CS	Chest to steering hub	335	9.7		
RA	Rim to abdomen	201			
KDL	Left knee to dash	177	22.3	176	
KDR	Right knee to dash	121		189	22.0
PA	Pelvic angle		23.4		23.5
TA	Tibia Angle		45.8		39.5
KK	Knee to knee	340		276	
SK	Striker to outboard knee	807	3.6	810	3.0
ST	Striker to head	575	60.0	580	60.8
SH	Striker to H-Point	455	14.1	470	15.9
SHY	Striker to H-Point (Y)	215		213	
HS	Head to side window	326		325	
HD	H-Point to door	175		181	
AD	Arm to door	111		14	

DATA SHEET NO. 5…(CONTINUED)

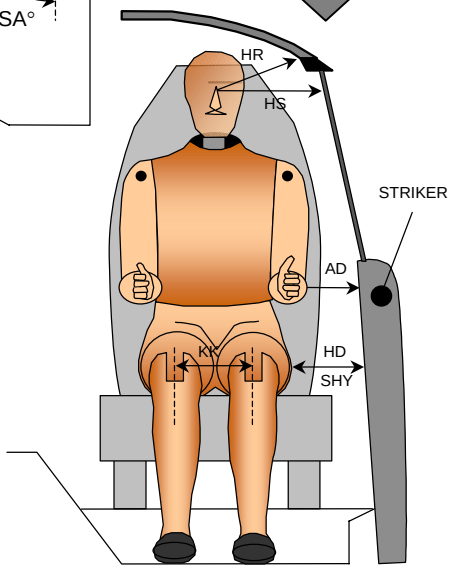
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

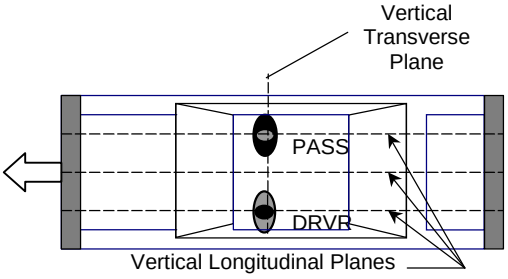
Test Program: NHTSA 35mph NCAP Test Date: 12/4/09



AD	Arm to Door
HD	H-Point to Door
HR	Head to Side Header
HS	Head to Side Window
KK	Knee to Knee
SHY	Striker to H-Point (Y Axis)



CD	Chest to Dash
CS	Chest to Steering Wheel Hub
HH	Head to Header
HW	Head to Windshield
HZ	Head to Roof
KDA	Knee to Dash Angle
KDL	Left Knee to Dash
KDR	Right Knee to Dash
NA	Nose to Rim Angle
NR	Nose to Rim
PA	Pelvic Angle
RA	Rim to Abdomen
SA	Seat Back Angle
SCA	Steering Column Angle
SH	Striker to H-Point
SK	Striker to Knee
ST	Striker to Head
SWA	Steering Wheel Angle
TA	Tibial Angle
WA	Windshield Angle

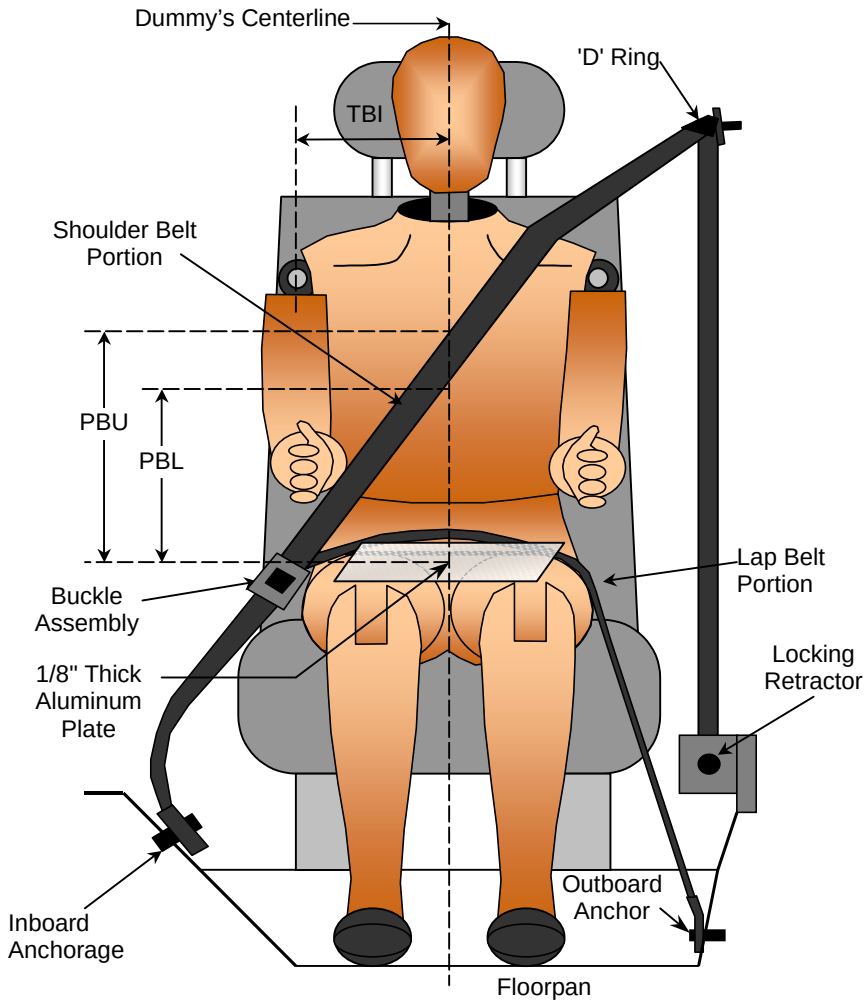


DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	189	181
PBU - Top Surface of Reference to Belt Upper Edge	mm	354	323
PBL - Top Surface of Reference to Belt Lower Edge	mm	273	267
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurement (mm)		
		X	Y	Z
1	Left Rear X-Member	1390	675	320
2	Right Rear X-Member	1390	-675	320
3	Engine Top	220	-120	760
4	Engine Bottom	200	-260	160
5	Left Brake Caliper	110	720	275
6	Right Brake Caliper	110	-720	275
7	Instrument Panel			[1]
8	Left Rear X-Member (Z-Axis)	1390	675	320
9	Right Rear X-Member (Z-Axis)	1390	-675	320

Reference Planes: X=From front axle centerline, Y=Vehicle Centerline, Z=Ground Plane

1.) Instrument Panel no longer used by NHTSA.

2.) Not installed

DATA SHEET NO. 8

SEAT BELT ASSESSMENT TEST DATA

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
Retractor Reel to D-Ring	mm	645	645
Shoulder Belt Length as Measured on ATD	mm	987	984
Lap Belt Length as Measured on ATD	mm	934	955
Remainder of Belt on Reel	mm	735	715
Total Belt Length for Continuous Webbing Systems	mm	3301	3299

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	271	320
As determined electronically	mm	243.5	358.9

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: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

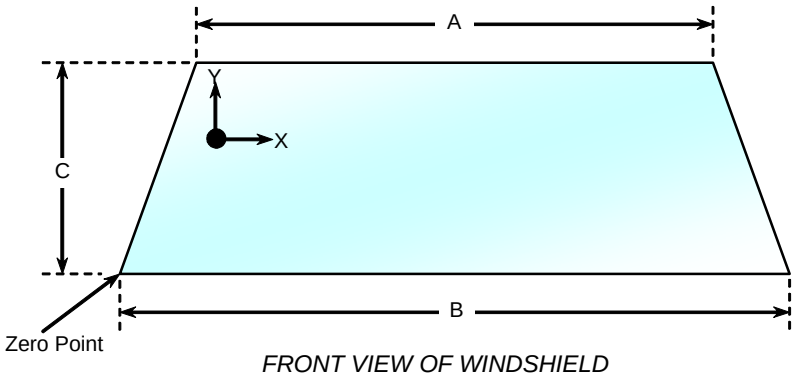
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with rubber cement type adhesive. plastic and rubber molding molding covers the windshield periphery.

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: 15.6 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2080	2080	100.0
Right Side	2080	2080	100.0
Total	4160	4160	100.0



FRONT VIEW OF WINDSHIELD

WINDSHIELD DIMENSIONS

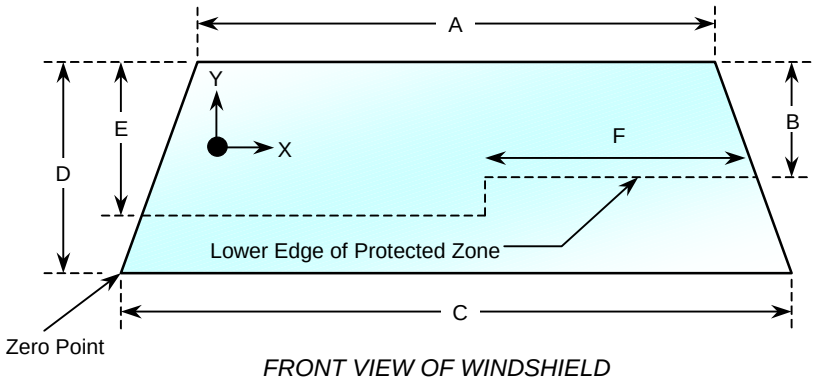
Item	Units	Segment Length	Molding Width
A	mm	1100	5
B	mm	1380	37
C-Left	mm	840	20
C-Right	mm	840	20

DATA SHEET NO. 10

WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09



FRONT VIEW OF WINDSHIELD

WINDSHIELD AND PROTECTED ZONE

Item	Units	Value
A	mm	1100
B	mm	388
C	mm	1380
D	mm	840
E	mm	520
F	mm	480

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: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

Test Time: 12:10 PM Temperature: 15.6 ° C

STODDARD SOLVENT SPILLAGE MEASUREMENTS

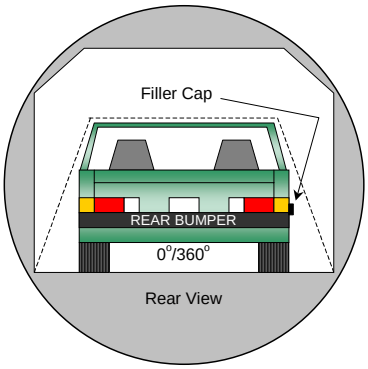
A.	From impact until vehicle motion ceases:	0
	(Maximum allowable = 1 ounce)	
B.	For the 5 minute period after motion ceases:	0
	(Maximum allowable = 5 ounces)	
C.	For the following 25 minutes:	0
	(Maximum allowable = 1 oz/minute)	
D.	Spillage Details:	No leakage occurred.

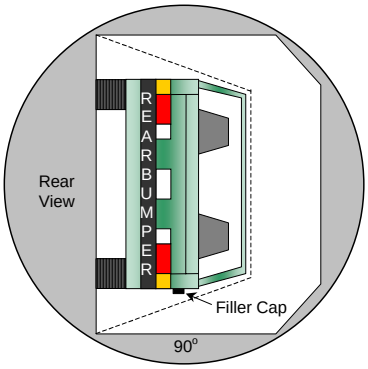
DATA SHEET NO. 12

FMVSS 301 STATIC ROLLOVER DATA

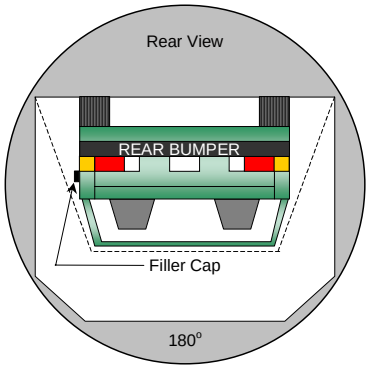
Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

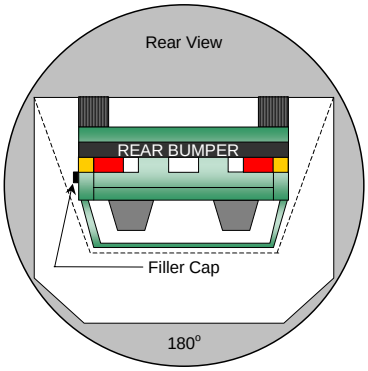




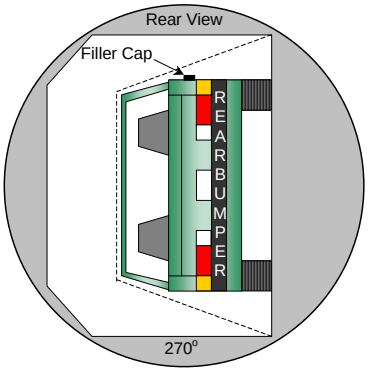
0° to 90°

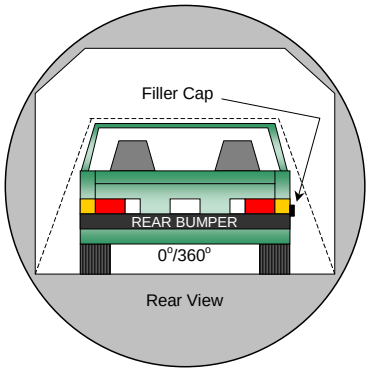


90° to 180°



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: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	85	300	385
90° to 180°	81	300	381
180° to 270°	79	300	379
270° to 360°	86	300	386

FMVSS 301 SPILLAGE TABLE REQUIREMENT

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			
90° to 180°	0			
180° to 270°	0			
270° to 360°	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: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Length of test vehicle at centerline	mm	4045	3698	-347
2	RSOV to front of engine	mm	3495	3325	-170
3	RSOV to firewall centerline	mm	3100	2945	-155
4	RSOV to upper leading edge of right door	mm	2735	2752	17
5	RSOV to upper leading edge of left door	mm	2735	2750	15
6	RSOV to lower leading edge of right door	mm	2707	2710	3
7	RSOV to lower leading edge of left door	mm	2700	2711	11
8	RSOV to upper trailing edge of right door	mm	1425	1440	15
9	RSOV to upper trailing edge of left door	mm	1422	1440	18
10	RSOV to lower trailing edge of right door	mm	1517	1525	8
11	RSOV to lower trailing edge of left door	mm	1512	1522	10
12	RSOV to bottom of right A-pillar	mm	2670	2612	-58
13	RSOV to bottom of left A-pillar	mm	2677	2697	20
14	RSOV to firewall on right side	mm	3100	3025	-75
15	RSOV to firewall on left side	mm	3100	3045	-55
16	RSOV to steering column hub	mm	2240	2280	40
17	Center of steering column to left A-pillar, Y	mm	400	360	-40
18	Center of steering column to headlining, Z	mm	430	420	-10
19	RSOV to right side of front bumper	mm	3325	3260	-65
20	RSOV to left side of front bumper	mm	3320	3282	-38
21	Length of engine block	mm	520	520	0
RD	RSOV to right side of dash panel	mm	2490	2505	15
CD	RSOV to center of dash panel	mm	2405	2385	-20
LD	RSOV to left side of dash panel	mm	2490	2490	0

DATA SHEET NO. 13…(CONTINUED)

VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

VEHICLE STRUCTURAL MEASUREMENT TABLE

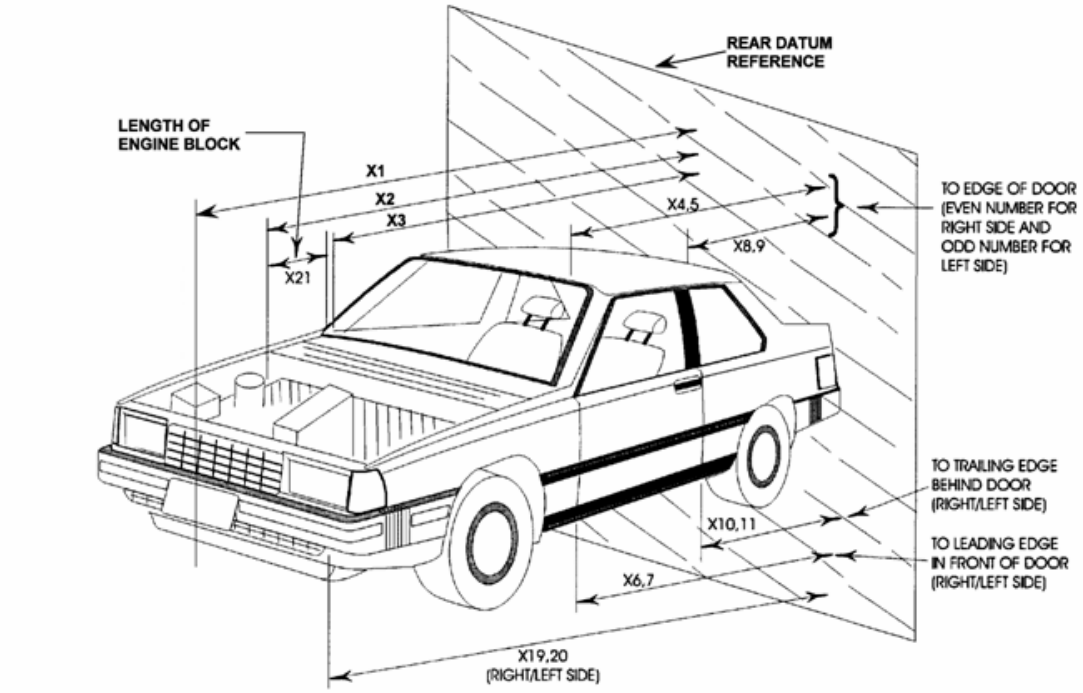
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length	mm	4045	3698	-347
2	Total width	mm	1690	1690	0
3	Front bumper top height	mm	564	570	6
4	Front bumper bottom height	mm	198	220	22
5	Longitudinal member top height	mm	505	530	25
6	Longtidunal member bottom height	mm	389	450	61
7	Distance between longitudinal members	mm	855	920	65
8	Longitudinal member width	mm	105	110	5
9	Engine top height	mm	855	865	10
10	Engine bottom height	mm	138	148	10
11	Engine and gearbox width	mm	740	740	0
12	Front bumper-engine distance	mm	558	300	-258
13	Front shock absorber height	mm	817	835	18
14	Front hood leading edge height	mm	693	760	67
15	Distance between front shock absorbers	mm	1097	1005	-92
16	Front bumper-front axle distance	mm	834	540	-294
17	Front axle to A-pillar distance	mm	490	400	-90
18	A Pillar to B Pillar distance	mm	1143	1123	-20
19	B Pillar to rear axle distance	mm	793	798	5
20	B Pillar to C Pillar distance	mm	800	800	0
21	Roof sill bottom height	mm	1331	1350	19
22	Roof sill top height	mm	1421	1455	34
23	Floor sill bottom height	mm	210	238	28
24	Floor sill top height	mm	340	420	80

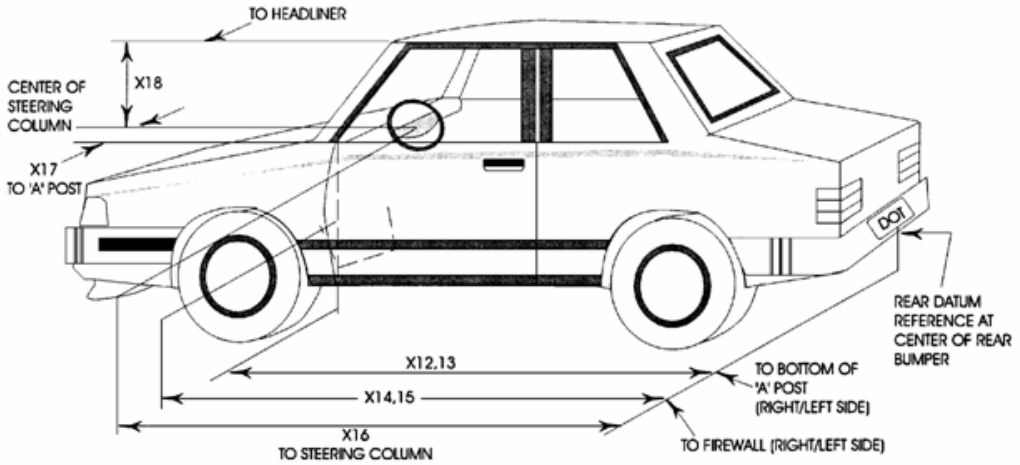
DATA SHEET NO. 13…(CONTINUED)

VEHICLE MEASUREMENTS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09





DATA SHEET NO. 14

CAMERA LOCATIONS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

VEHICLE CAMERA MEASUREMENT TABLE

No.	Camera View	Location			Angle (deg)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Real Time Camera (Panning)	-11412	-8150	-1484	0			30
2	Overall Left Side	-2590	-7950	-1371	0	8105	20	1000
3	Closeup Left Side	-1701	-6197	-1701	0	7844	50	1000
4	Driver and Interior View	-6696	-5987	-1071	-17	15570	ZOOM	1000
5	Steering Column (Bottom)	-1972	-8184	-2879	-13	9453	35	1000
6	Steering Column (Top)	-1966	-8141	-3258	-13	9549	35	1000
7	Overall Right Side	-2336	7569	-1168	0	7409	20	1000
8	Closeup Right Side	-1600	6121	-1651	0	7079	50	1000
9	Passenger and Interior View	-5136	9516	-2460	-10	10211	ZOOM	1000
10	Right Side View	-1582	7995	-1713	-6	7134	ZOOM	1000
11	Windshield View	-354	0	-5749	-90		24	1000
12	Driver Front View	363	-543	-2548	-34		25	1000
13	Passenger Front View	381	445	-2548	-34		25	1000
14	Pit View of Engine	-756	0	1495	90		12	1000
15	Pit View of Fuel Tank	-3398	0	1495	90		8	1000
16	Real Time Driver	-1926	-8089	-1704	-1	8488	0	30
17	Real Time Passenger	-1433	8047	-1704	-1	8349	0	30

All measurements are made relative to the point of impact.

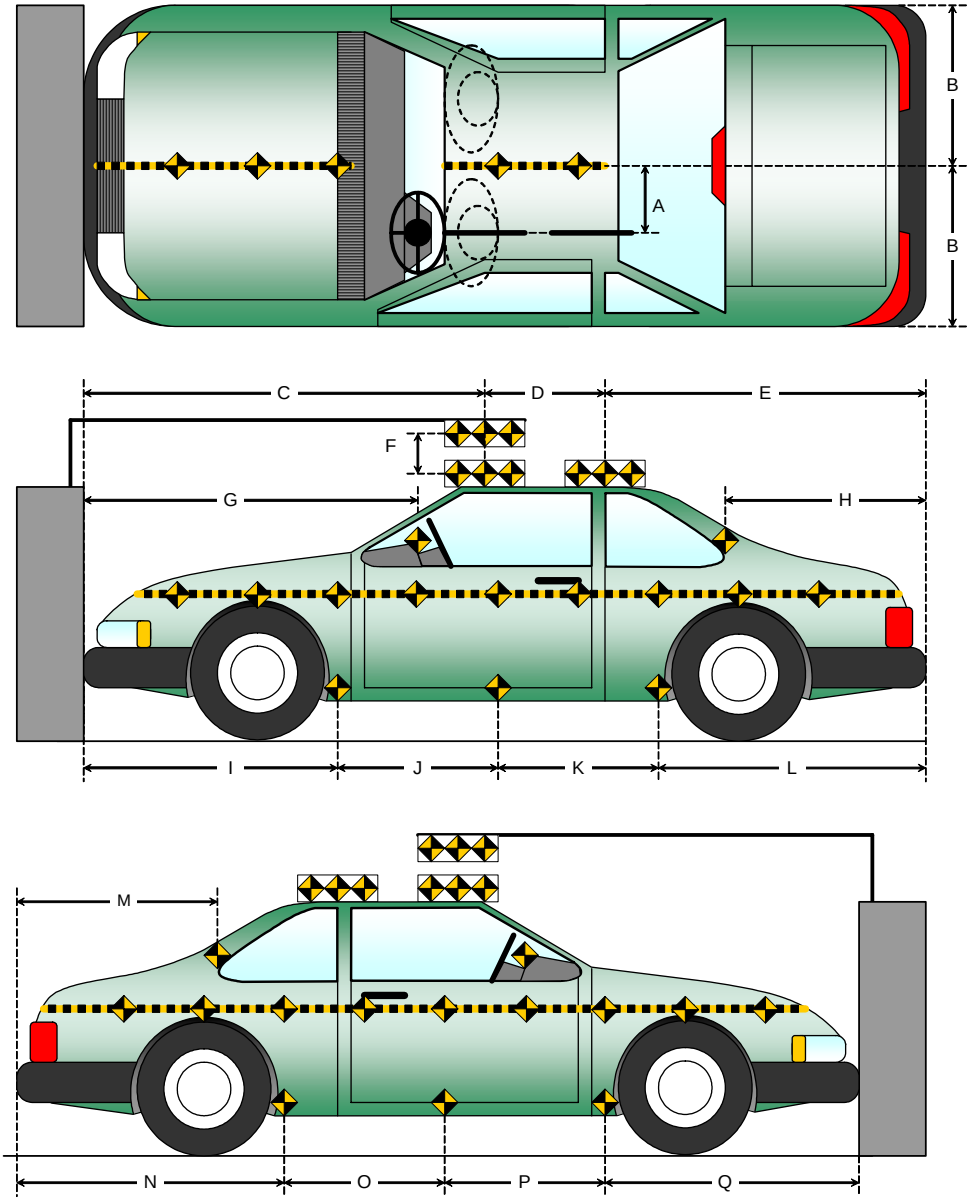
DATA SHEET NO. 15

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

All Dimensions in Millimeters (mm)	
Item	Value
A	335
B	845
C	2115
D	610
E	1325
F	266
G	1605
H	633
I	1253
J	842
K	842
L	1093
M	628
N	1096
O	844
P	844
Q	1243



DATA SHEET NO. 16

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

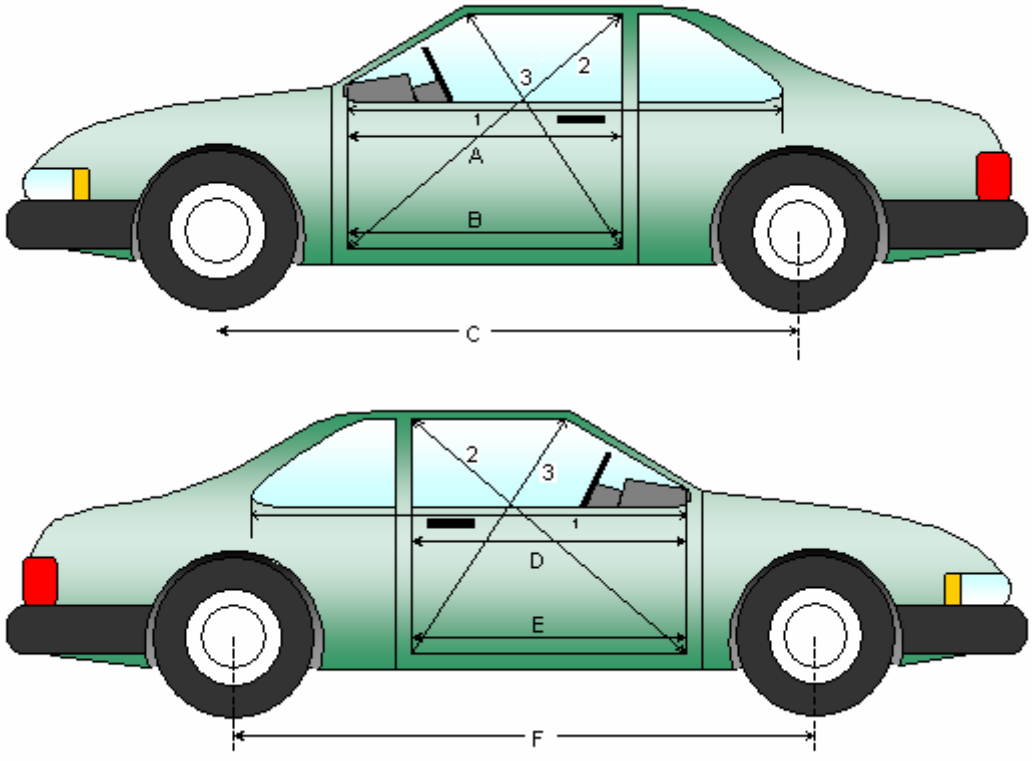
Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Difference
1L	Left Side	mm	1143	1135	8
2L	Left Side (Diagonally)	mm	1563	1553	10
3L	Left Side (Diagonally)	mm	1122	1119	3
1R	Right Side	mm	1148	1150	-2
2R	Right Side (Diagonally)	mm	1553	1553	0
3R	Right Side (Diagonally)	mm	1133	1138	-5

WHEELBASE MEASURMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2495	2427	68
F	Right Side Wheelbase	mm	2495	2405	90



DATA SHEET NO. 16…(CONTINUED)

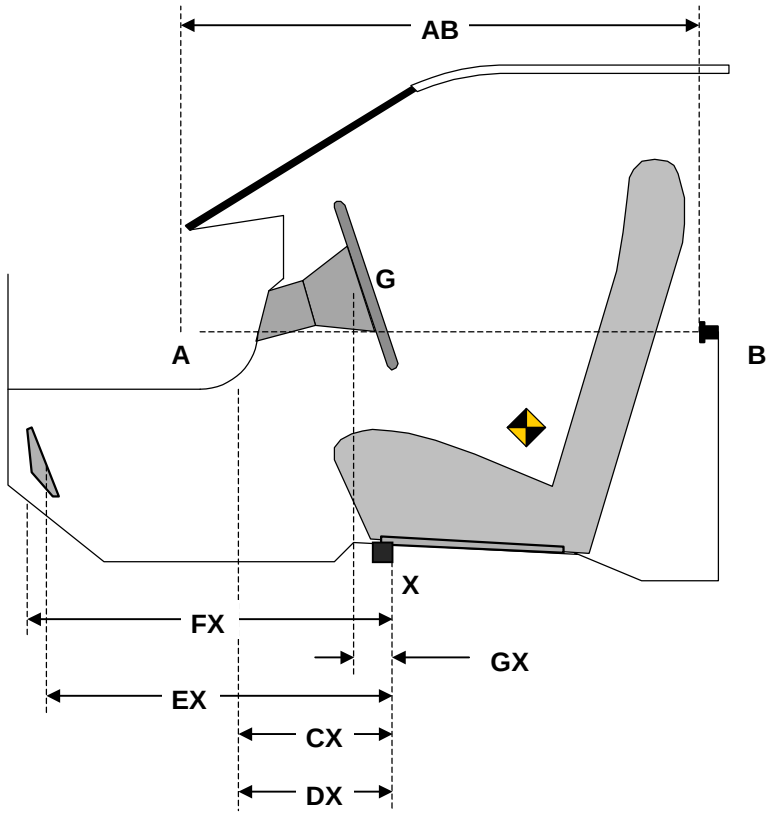
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

DRIVER COMPARTMENT INTRUSION TABLE

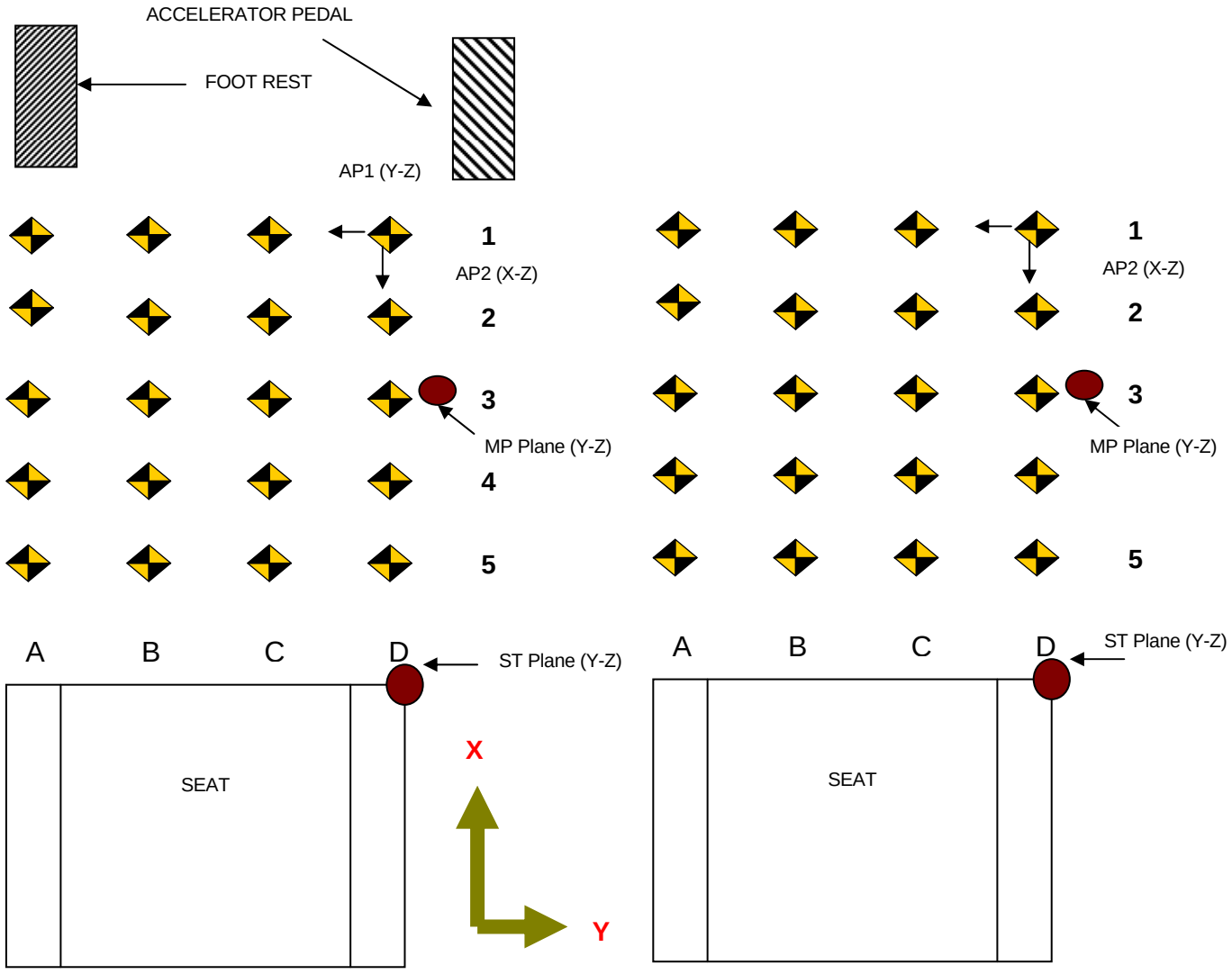
Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Windown Jam)	mm	1143	1135	8
CX	Left Knee Bolster to X	mm	290	305	-15
DX	Right Knee Bolster to X	mm	230	300	-70
EX	Brake Pedal to X	mm	535	525	10
FX	Foot Rest to X	mm	550	553	-3
GX	Center of Steering Wheel Hub to X	mm	45	35	10



VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09



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: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

All measurements in mm

DRIVER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-620	-703	-706	-719	-599	-654	-625	-596	-21	-49	-81	-123
2	-619	-629	-636	-642	-603	-588	-575	-565	-16	-41	-61	-77
3	-541	-547	-557	-565	-502	-522	-504	-486	-39	-25	-53	-79
4	-418	-425	-431	-436	-401	-400	-399	-394	-17	-25	-32	-42
5	-293	-302	-306	-312	-281	-276	-274	-278	-12	-26	-32	-34

DRIVER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-4	116	248	383	23	146	265	399	-27	-30	-17	-16
2	10	123	250	387	-13	141	263	398	23	-18	-13	-11
3	-2	129	257	392	9	140	254	385	-11	-11	3	7
4	3	135	263	396	7	139	263	384	-4	-4	0	12
5	10	141	271	401	9	138	265	388	1	3	6	13

DRIVER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-63	10	10	3	-78	-18	-32	-33	15	28	42	36
2	-51	53	52	48	-34	31	32	24	-17	22	20	24
3	99	93	94	90	64	92	72	58	35	1	22	32
4	112	101	99	102	98	106	103	82	14	-5	-4	20
5	122	102	100	112	121	113	103	128	1	-11	-3	-16

DATA SHEET NO. 16…(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

All measurements in mm

PASSENGER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	715	719	723	657	680	692	695	635	35	27	28	22
2	643	643	645	625	613	623	629	612	30	20	16	13
3	569	571	572	571	542	550	558	566	27	21	14	5
4	443	444	446	448	420	426	432	442	23	18	14	6
5	322	321	319	315	306	304	306	308	16	17	13	7

PASSENGER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	370	248	123	7	379	259	133	13	-9	-11	-10	-6
2	378	253	129	4	381	259	133	9	-3	-6	-4	-5
3	387	255	130	3	383	253	133	7	4	2	-3	-4
4	395	267	138	8	383	264	136	5	12	3	2	3
5	402	275	147	13	384	267	141	5	18	8	6	8

PASSENGER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	8	6	7	59	21	22	28	71	-13	-16	-21	-12
2	-36	-38	-39	-20	-34	-34	-28	-9	-2	-4	-11	-11
3	-78	-81	-80	-86	-77	-68	-72	-79	-1	-13	-8	-7
4	-91	-96	-98	-105	-110	-92	-97	-99	19	-4	-1	-6
5	-107	-100	-99	-119	-151	-108	-106	-120	44	8	7	1

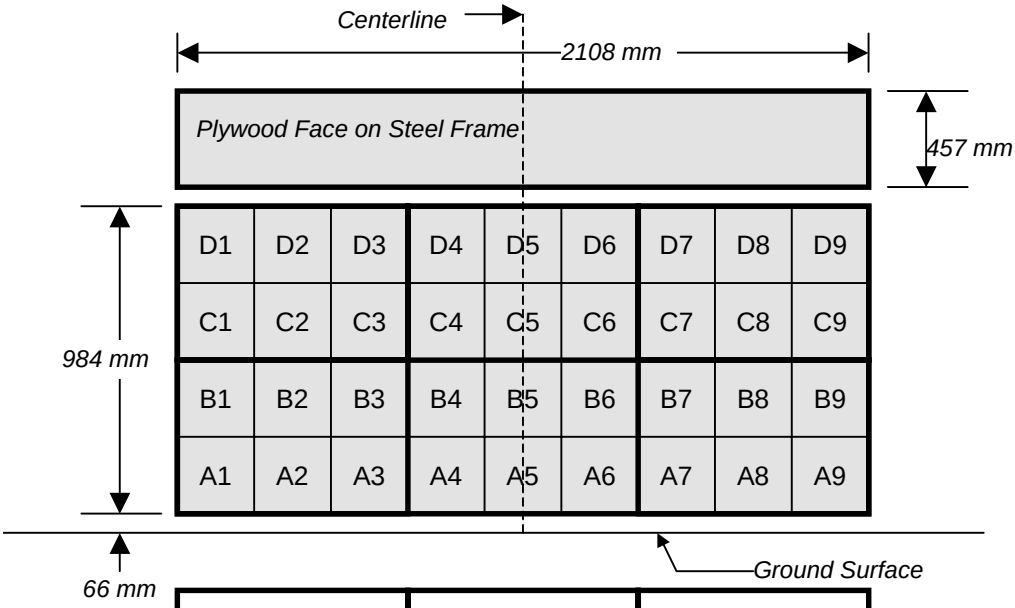
DATA SHEET NO. 17

FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

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



D1	D2	D3	D4	D5	D6	D7	D8	D9
C1	C2	C3	C4	C5	C6	C7	C8	C9
B1	B2	B3	B4	B5	B6	B7	B8	B9
A1	A2	A3	A4	A5	A6	A7	A8	A9

Group 4 C1 – D3	Group 5 C4 – D6	Group 6 C7 – D9
Group 1 A1 – B3	Group 2 A4 – B6	Group 3 A7 – B9

6 Groups of 6 Load Cells Each

DATA SHEET NO. 18

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09

VEHICLE INFORMATION

VIN: KMHCM3AC1AU150751 Wheelbase (mm): 2495

Vehicle Size Category: 3-Door Hatchback Test Weight (kg): 1320

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): 56.19

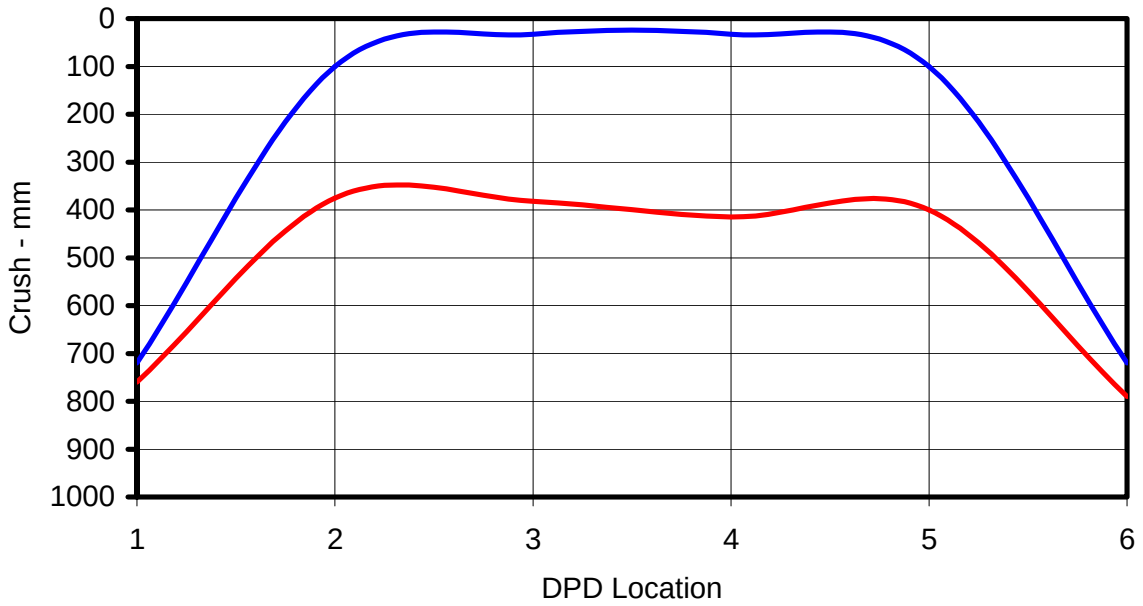
Velocity Change (km/h): 67.0 Time of Separation (msec): 63.2

CRUSH PROFILE

Collision Deformation Classification: 12FCEW2 Midpoint of Damage: Vehicle Centerline

Damage Region Length: 1680 Impact Mode: Full frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side of vehicle	mm	720	760	-40
C2	Crush zone 2 on left side of vehicle	mm	100	375	-275
C3	Crush zone 3 on left side of vehicle	mm	33	382	-349
C4	Crush zone 4 on right side of vehicle	mm	33	415	-382
C5	Crush zone 5 on right side of vehicle	mm	100	400	-300
C6	Crush zone 6 at right side of vehicle	mm	720	790	-70

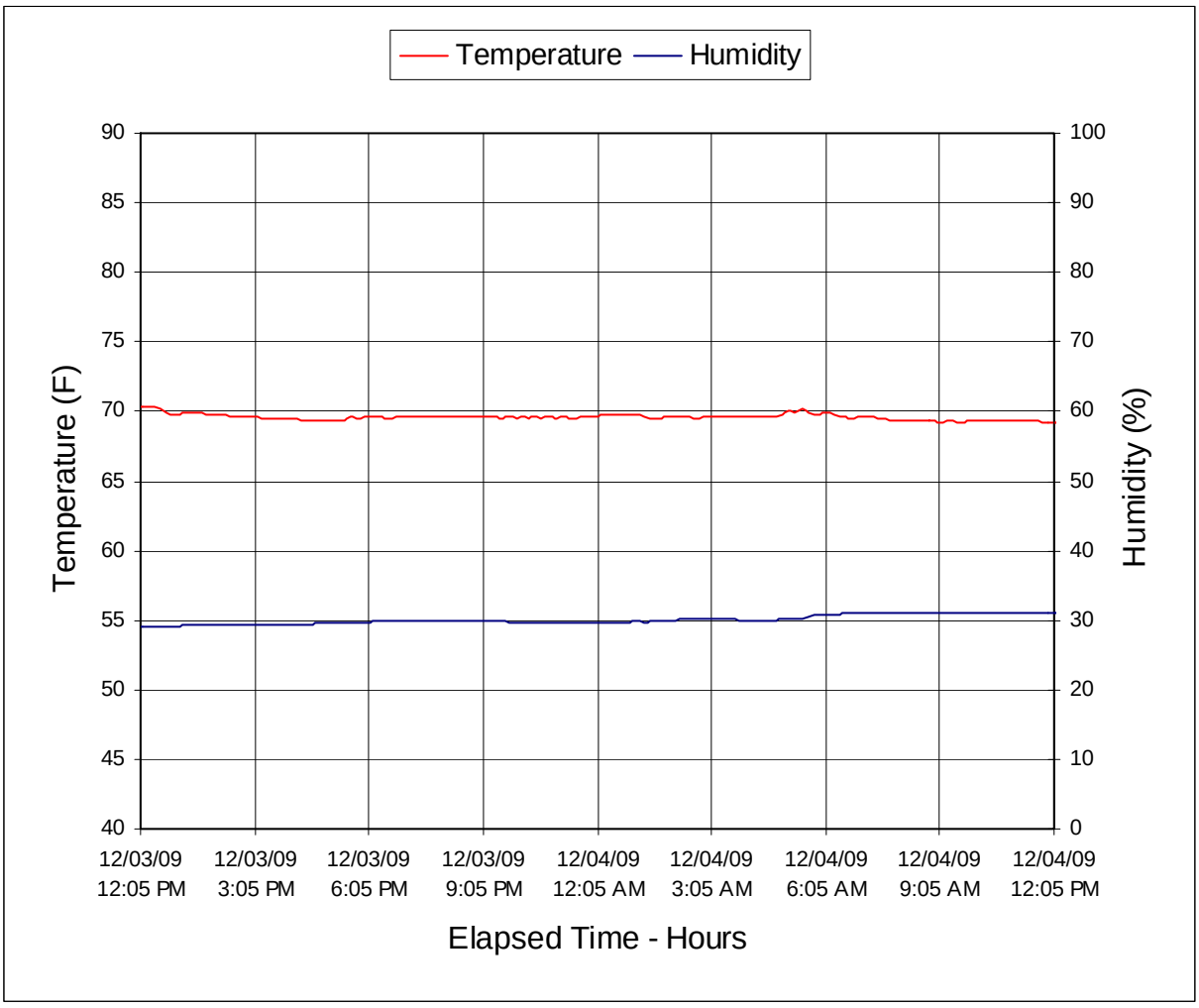


DATA SHEET NO. 19

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2010 Hyundai Accent 3-Door Hatchback NHTSA No.: MA0517

Test Program: NHTSA 35mph NCAP Test Date: 12/4/09



APPENDIX A
PHOTOGRAPHS

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A-9	Post-Test Left Side View	A-9
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A-11	Post-Test Right Side View	A-11
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A-38	Pre-Test Driver Side Knee Bolster	A-38
A-39	Post-Test Driver Side Knee Bolster	A-39
A-40	Pre-Test Driver Side Floor Pan	A-40
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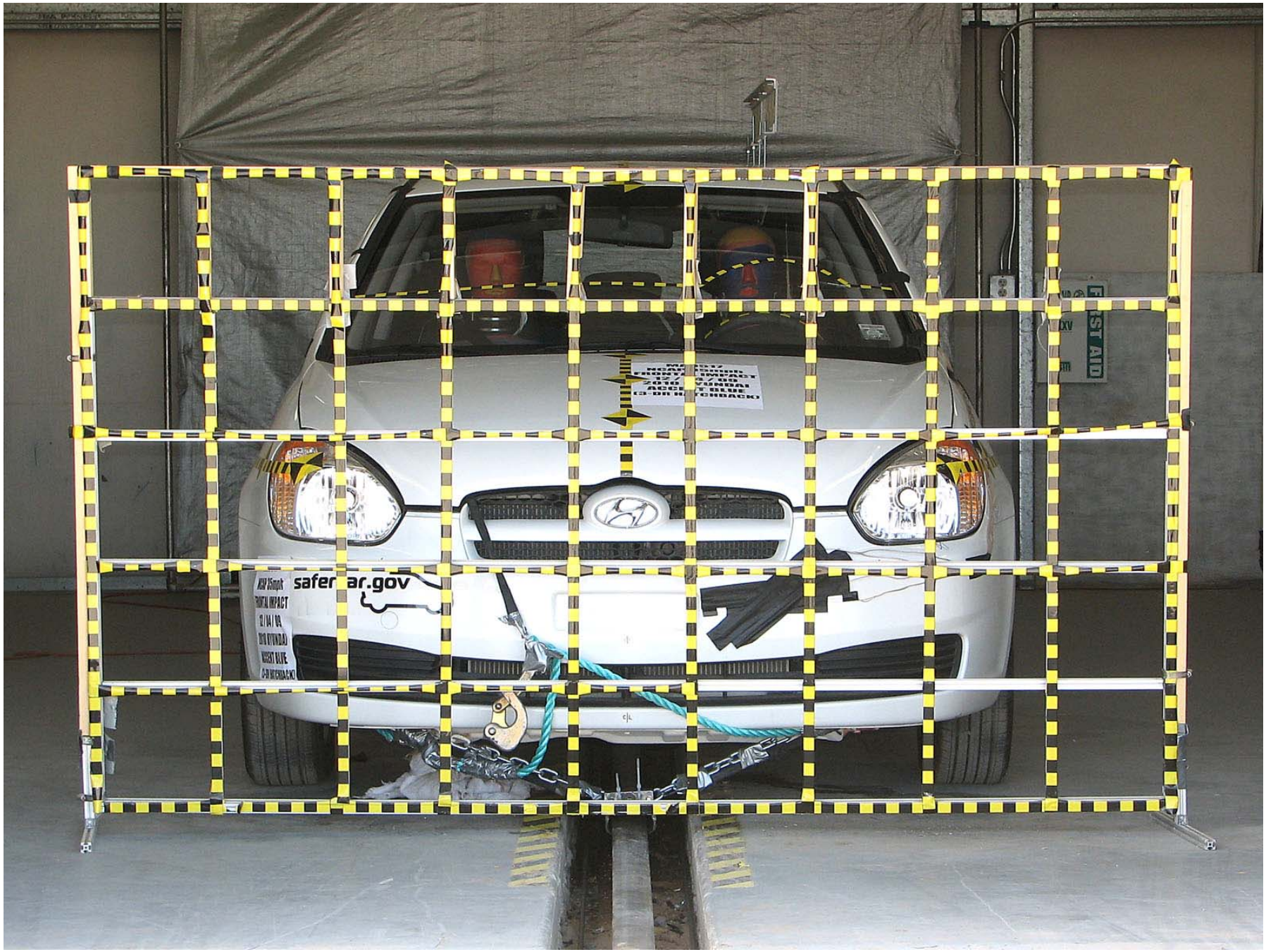


Figure A-1: Load Cell Location

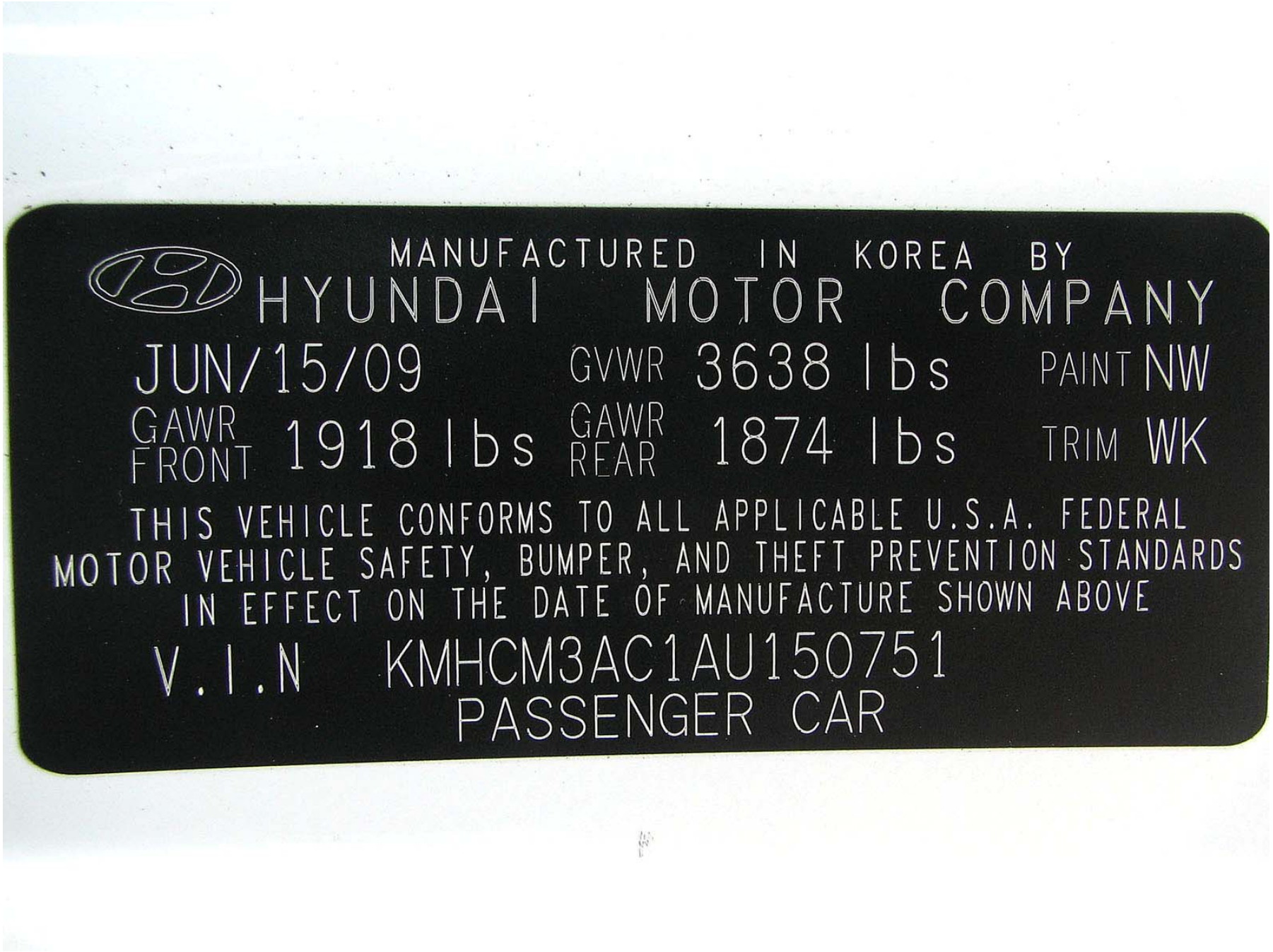


Figure A-2: Manufacturer's Label

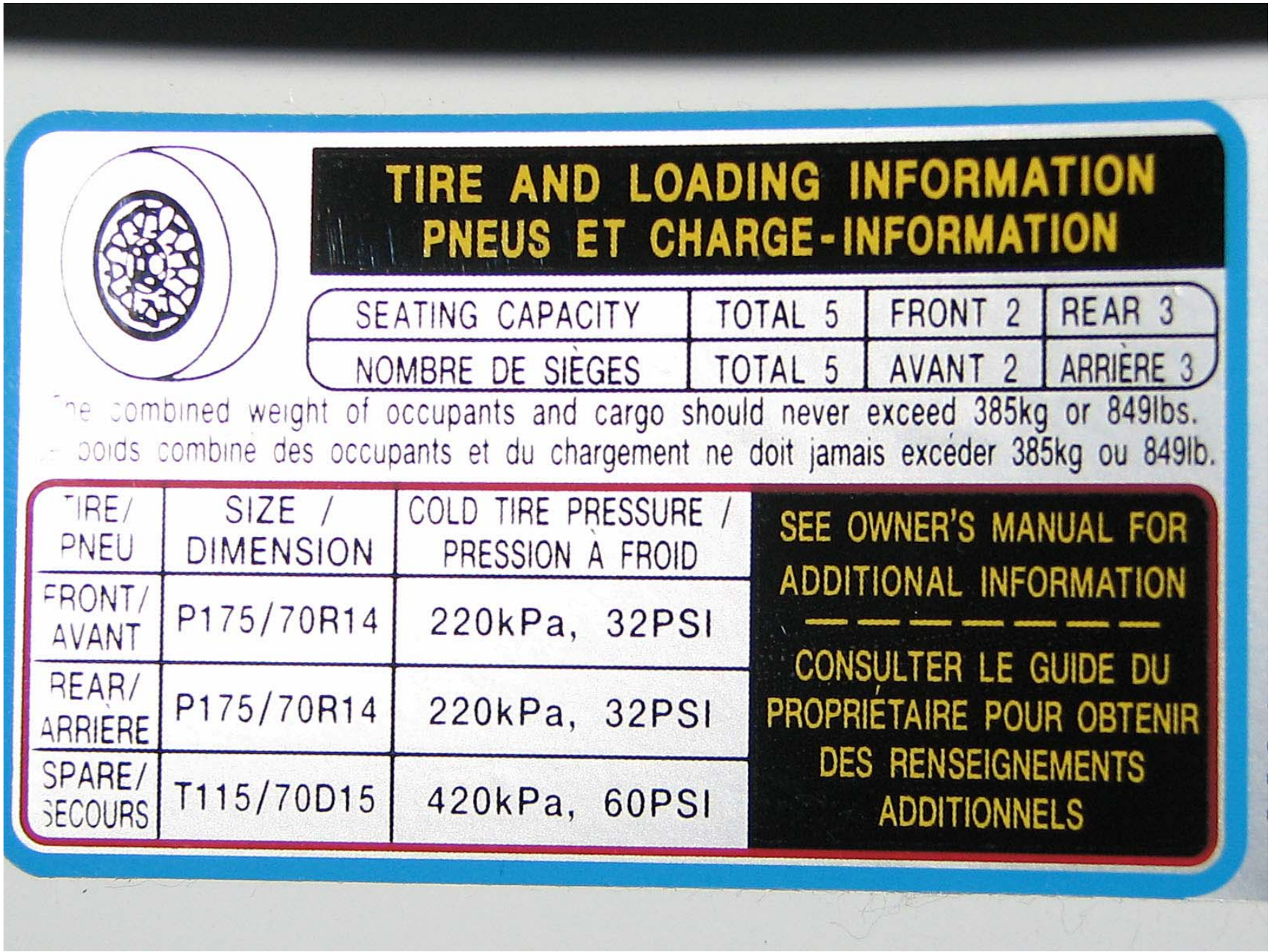


Figure A-3: Tire Placard

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

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

Figure A-6: Pre-Test Front View

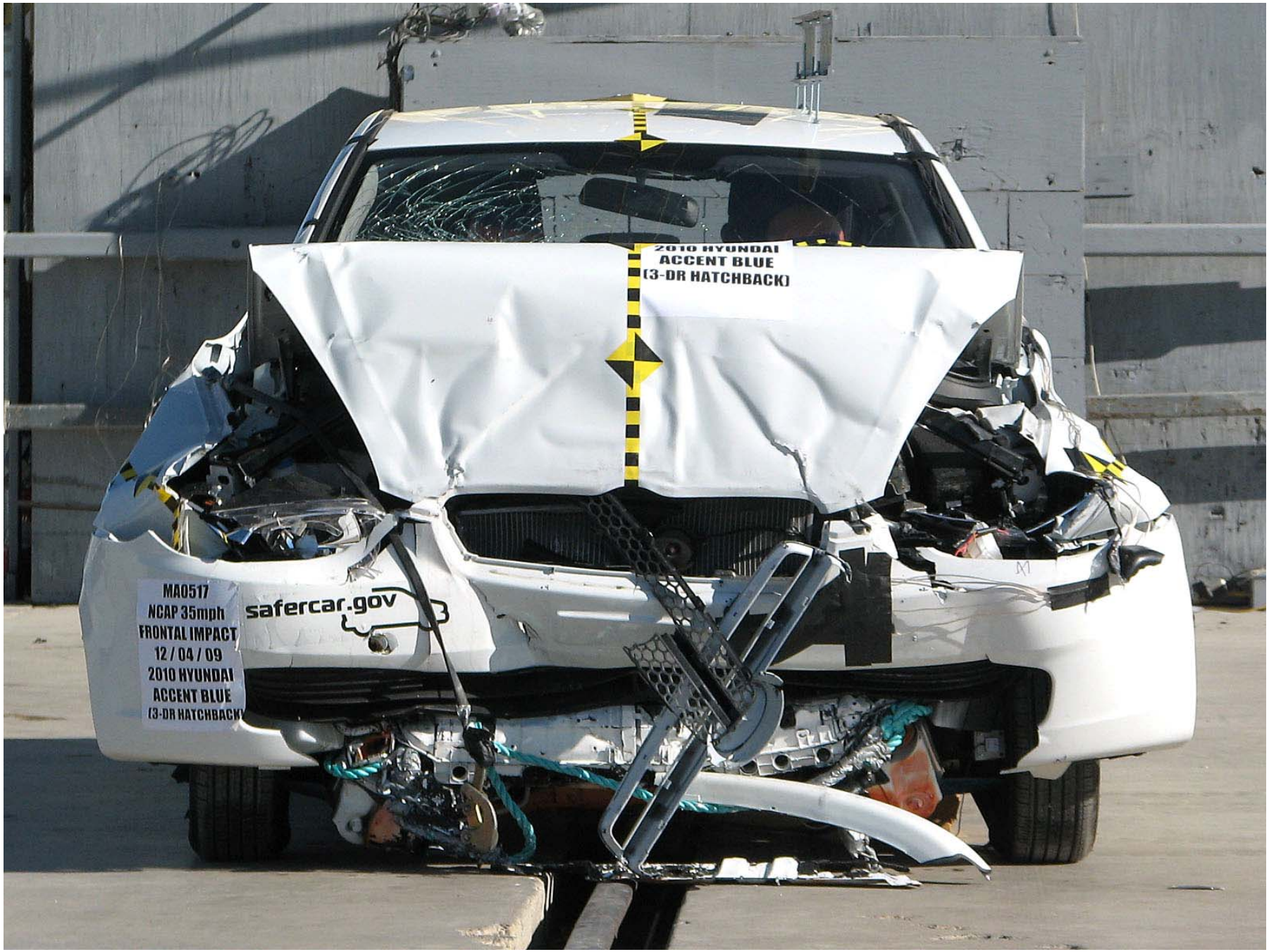


Figure A-7: Post-Test Front View (Vehicle Moved)

Figure A-8: Pre-Test Left Side View

Figure A-9: Post-Test Left Side View

Figure A-10: Pre-Test Right Side View

Figure A-11: Post-Test Right Side View

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

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

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

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

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

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

Figure A-18: Pre-Test Windshield

Figure A-19: Post-Test Windshield

Figure A-20: Pre-Test Engine Compartment

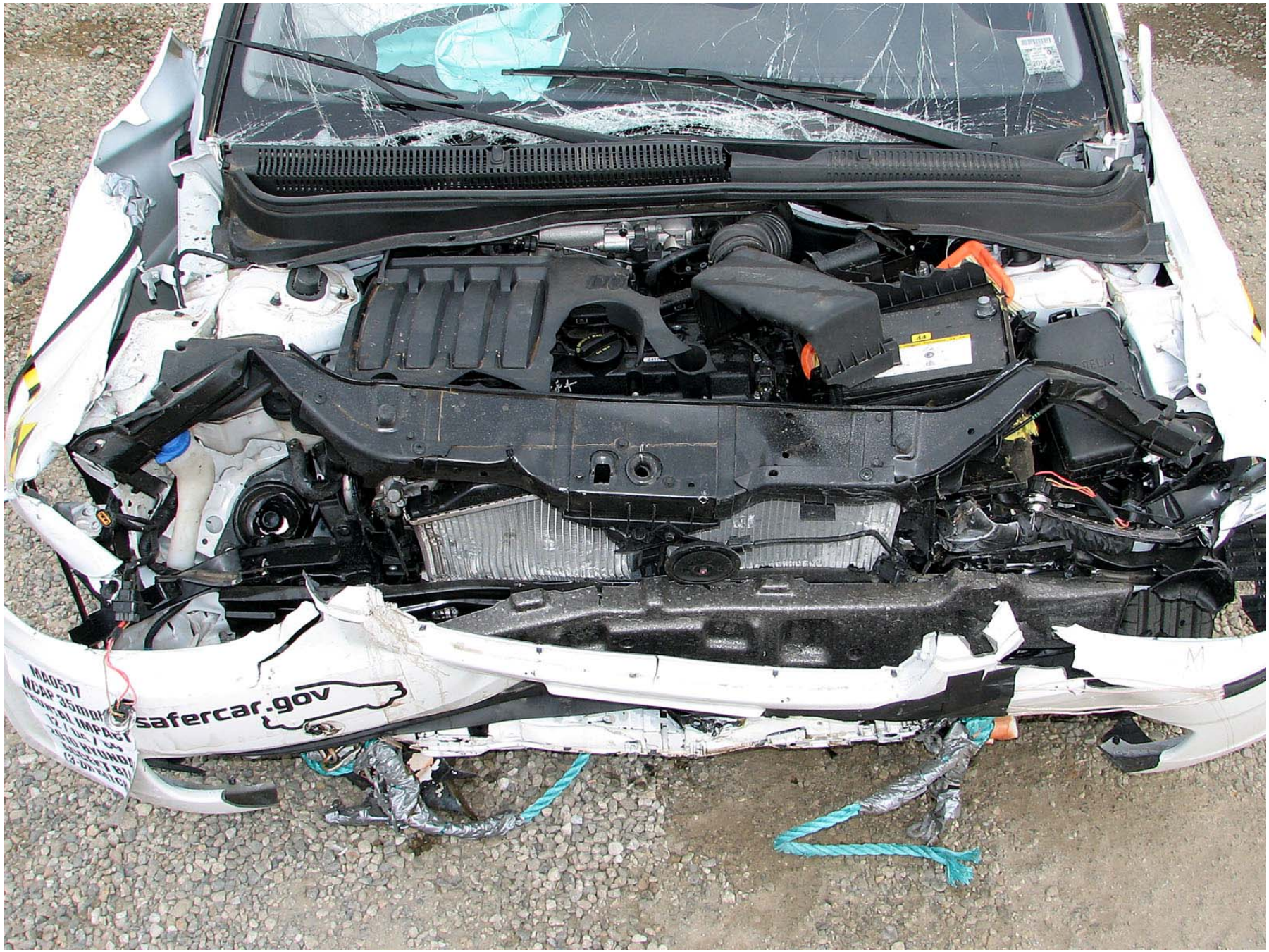


Figure A-21: Post-Test Engine Compartment (Vehicle Moved)

Figure A-22: Pre-Test Fuel Cap

Figure A-23: Post-Test Fuel Cap

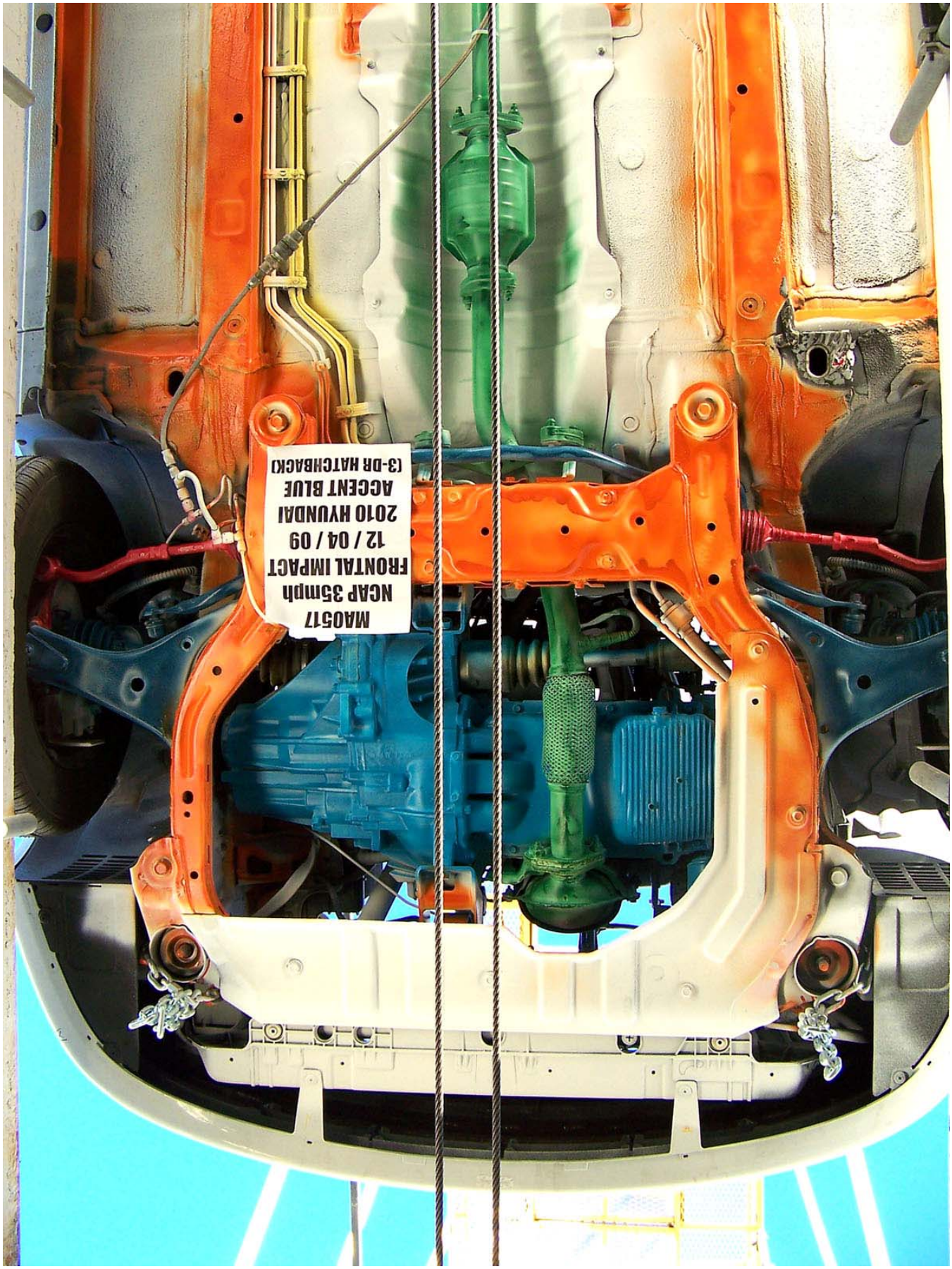


Figure A-24: Pre-Test Front Underbody

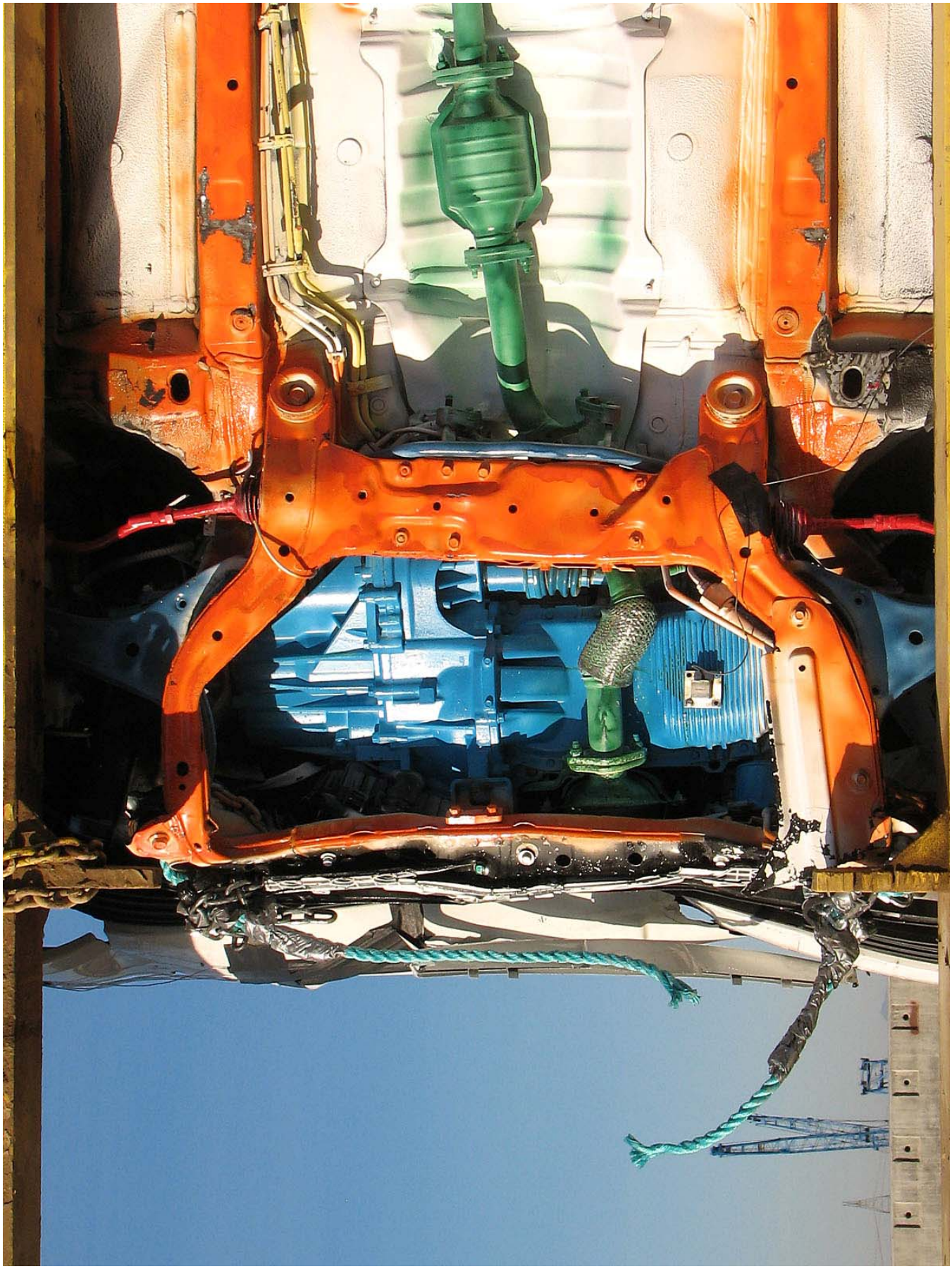


Figure A-25: Post-Test Front Underbody

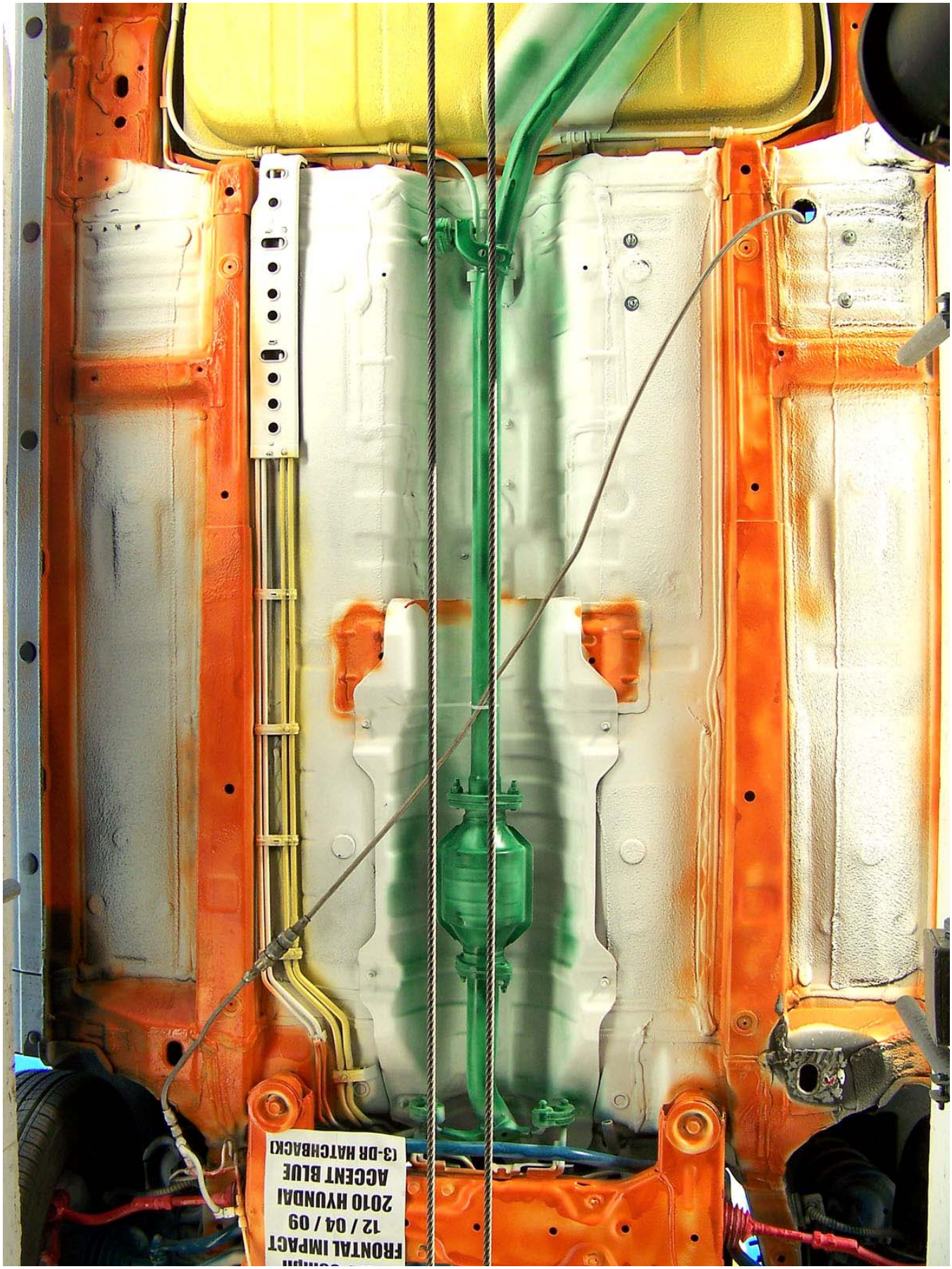


Figure A-26: Pre-Test Mid Underbody

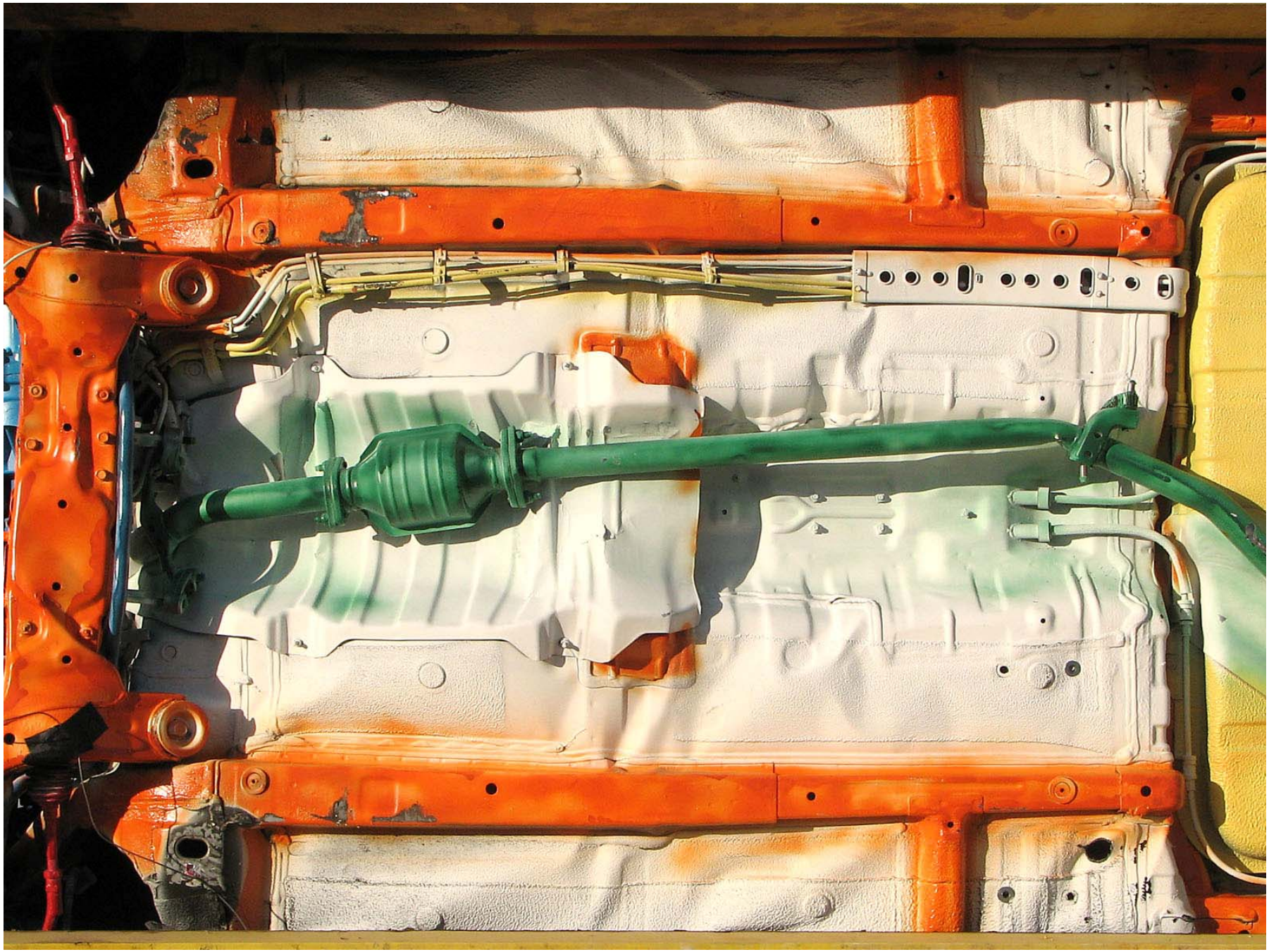


Figure A-27: Post-Test Mid Underbody

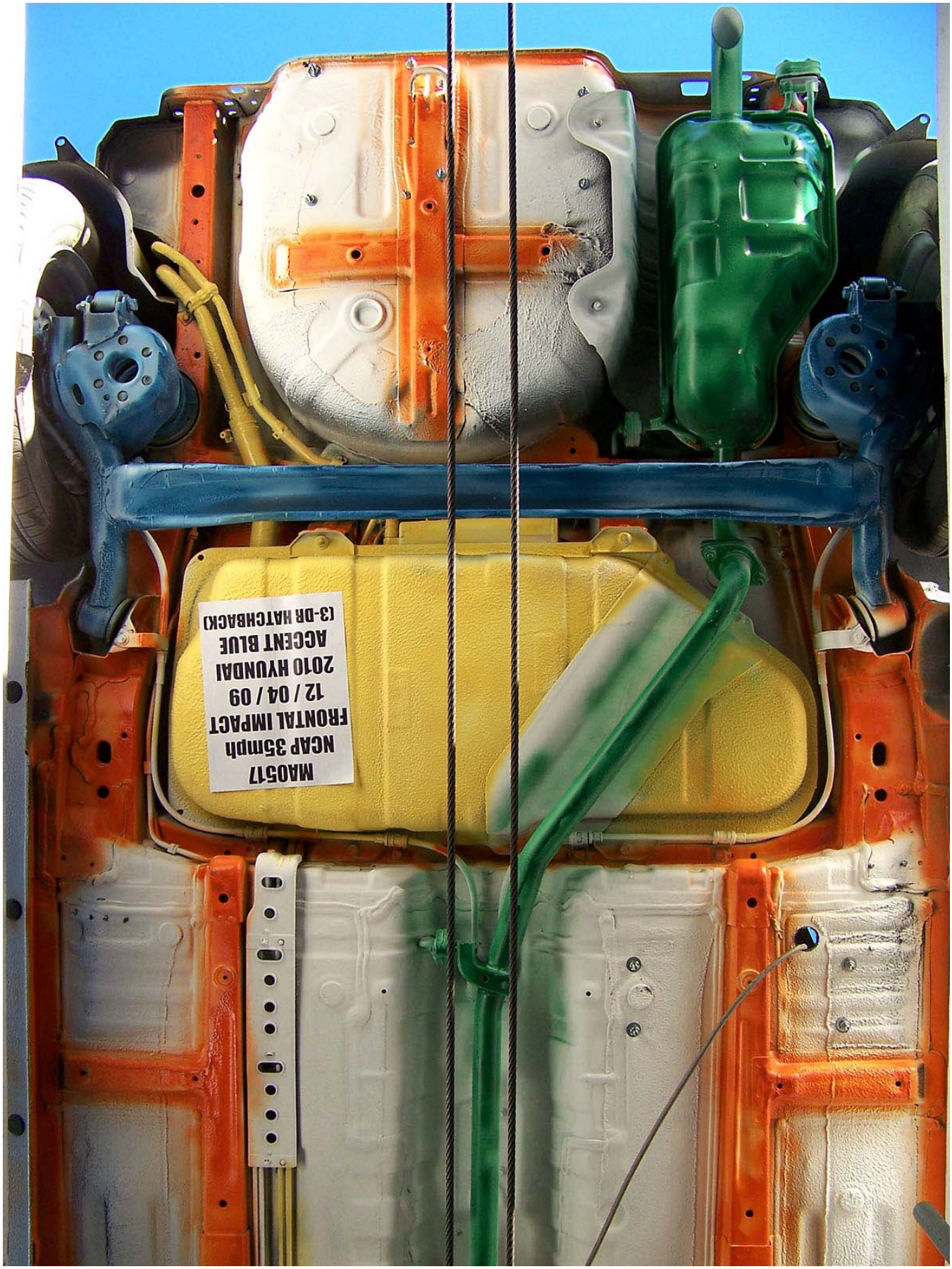


Figure A-28: Pre-Test Rear Underbody

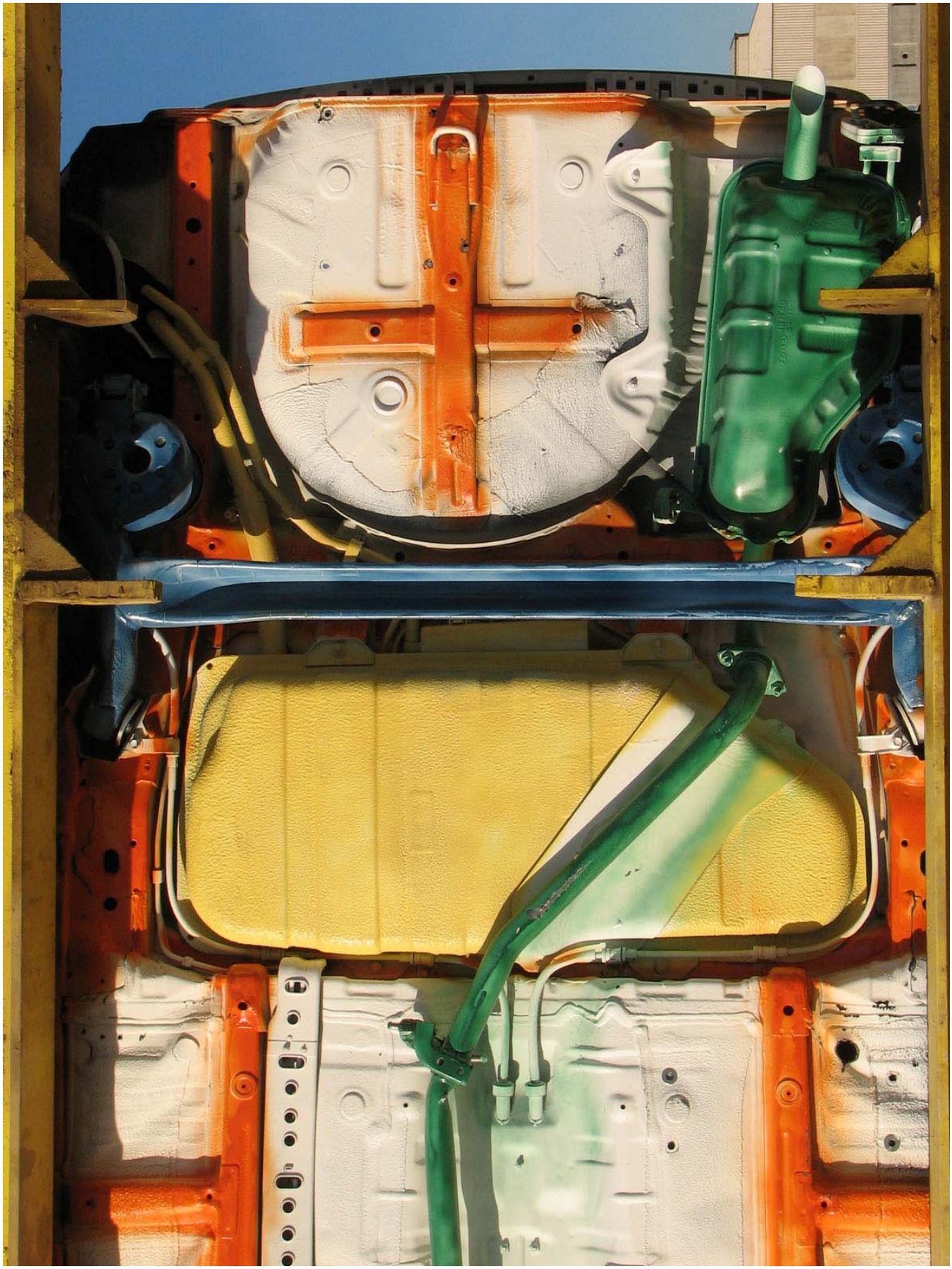


Figure A-29: Post-Test Rear Underbody

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

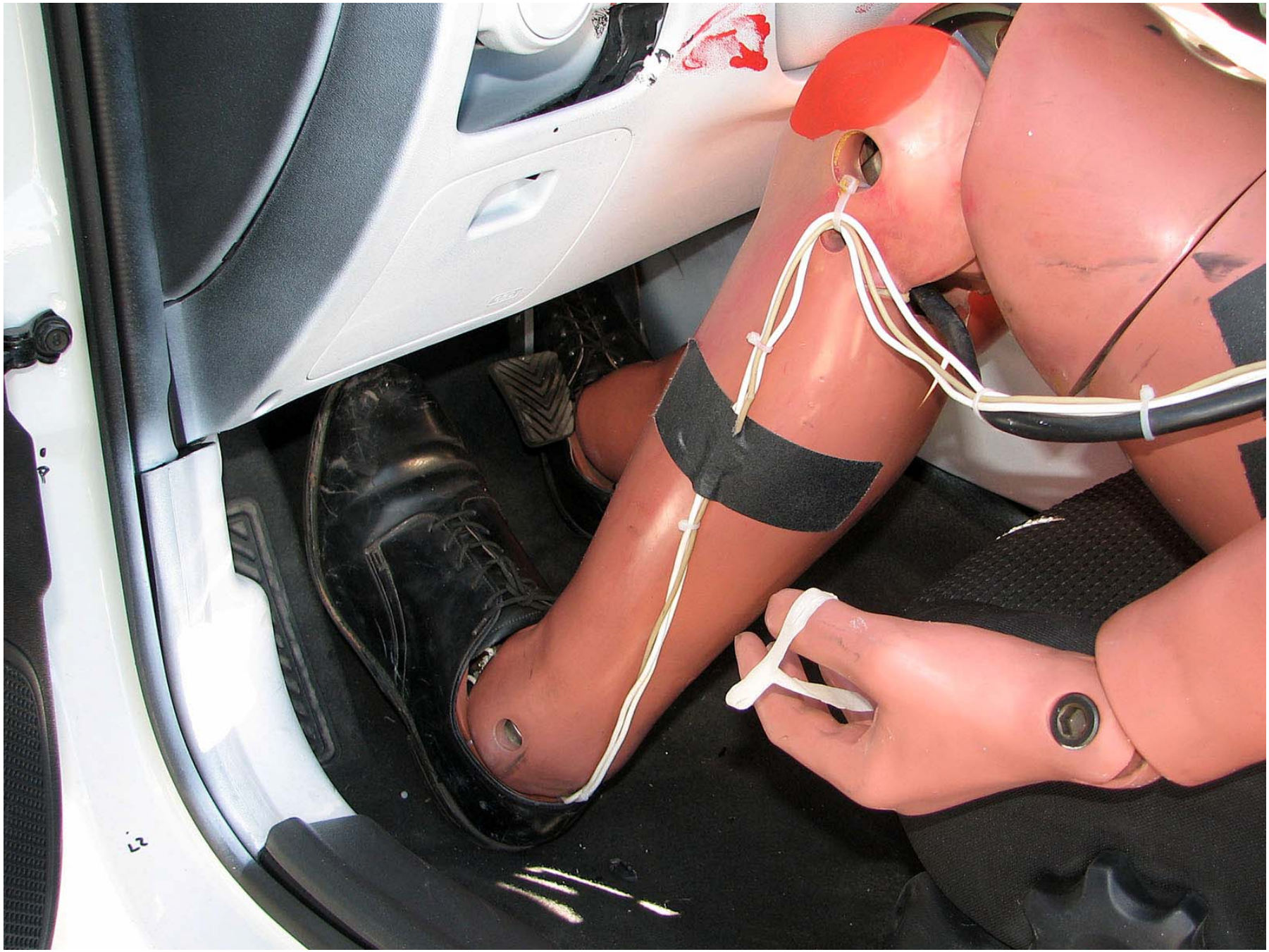


Figure A-37: Post-Test Driver Dummy Feet

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

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

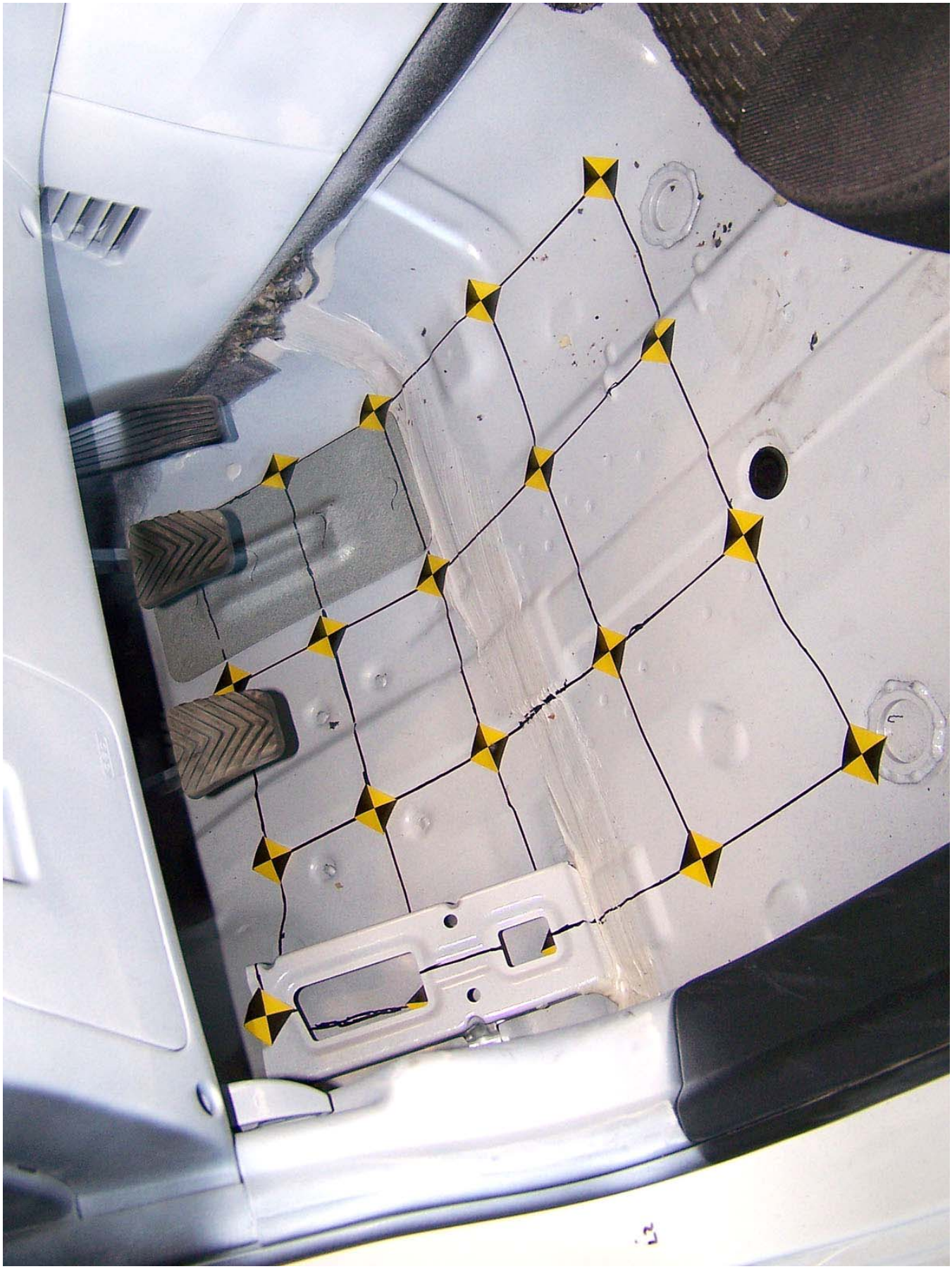


Figure A-40: Pre-Test Driver Side Floor Pan

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

Figure A-42: Post-Test Driver Dummy Head

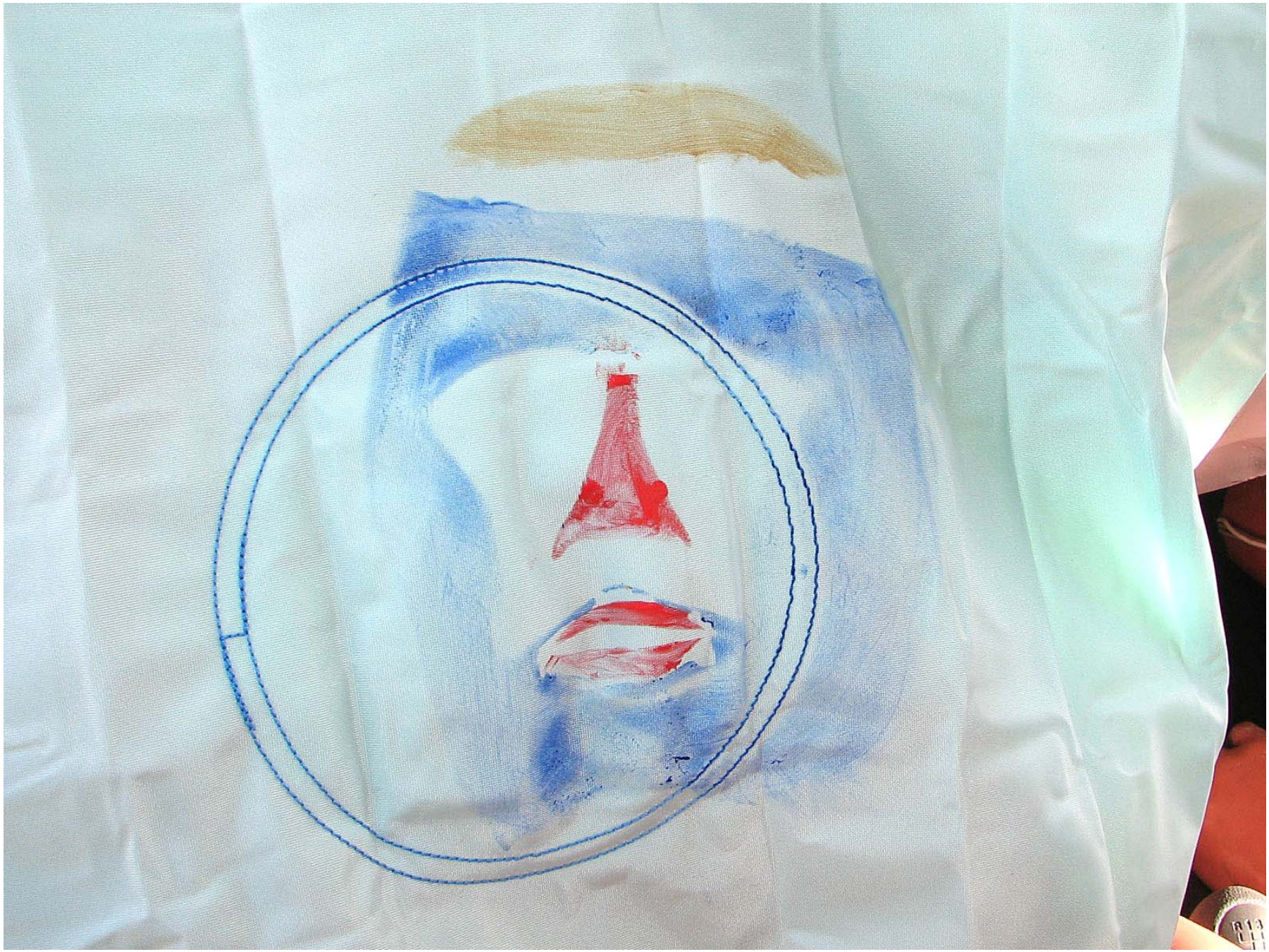


Figure A-43: Post-Test Driver Dummy Airbag Contact

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

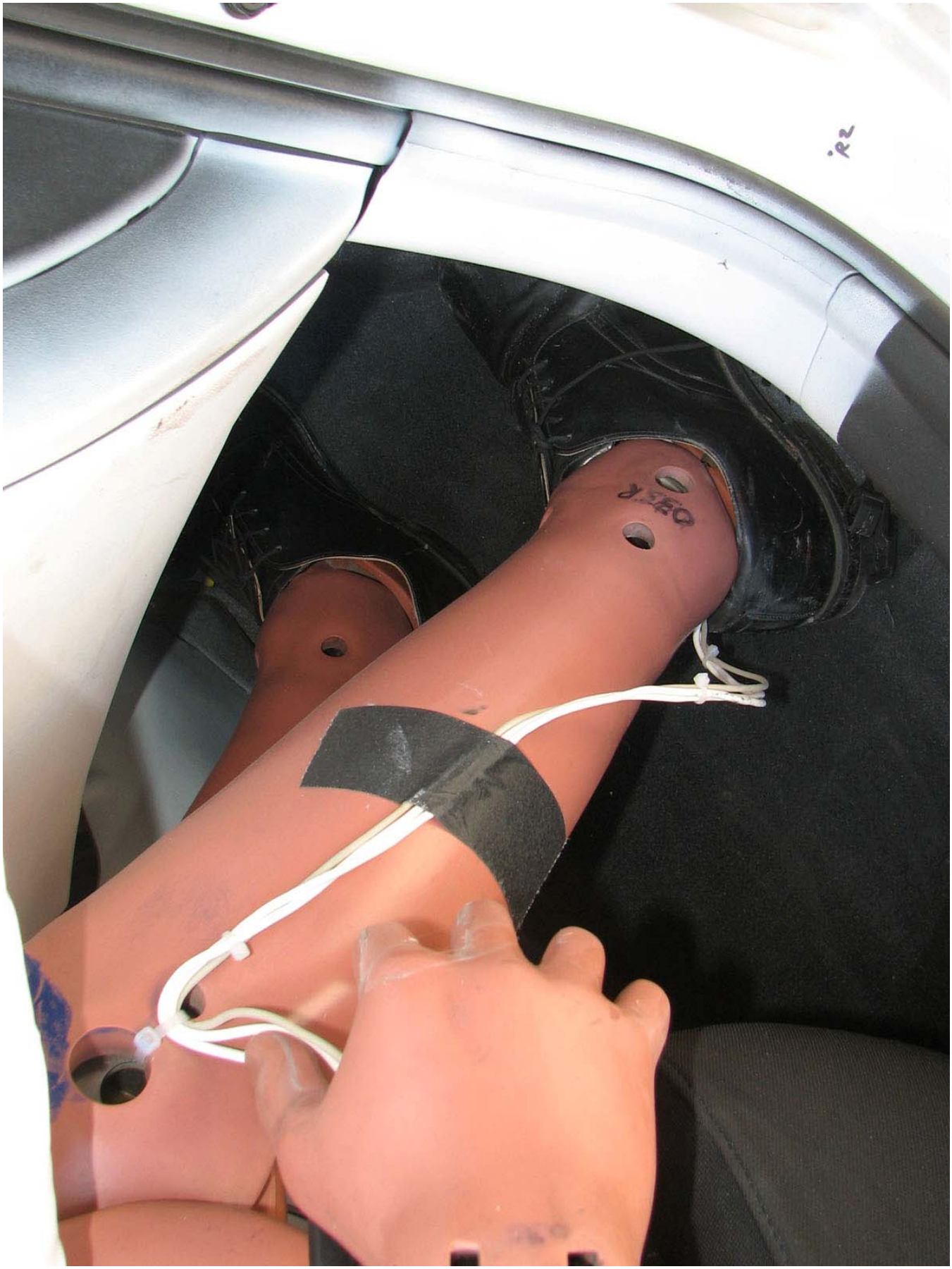


Figure A-51: Post-Test Passenger Dummy Feet

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

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

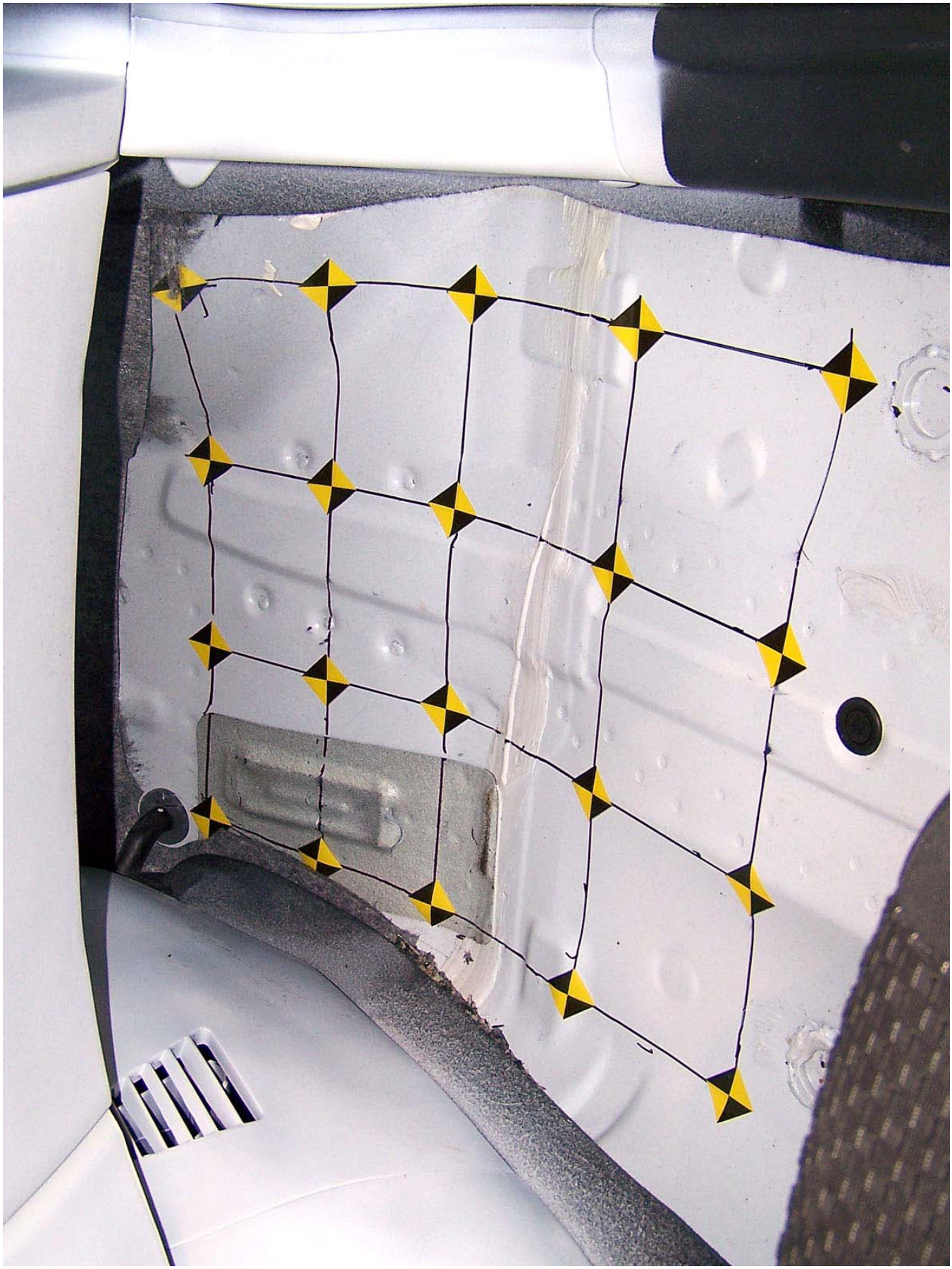


Figure A-54: Pre-Test Passenger Side Floor Pan

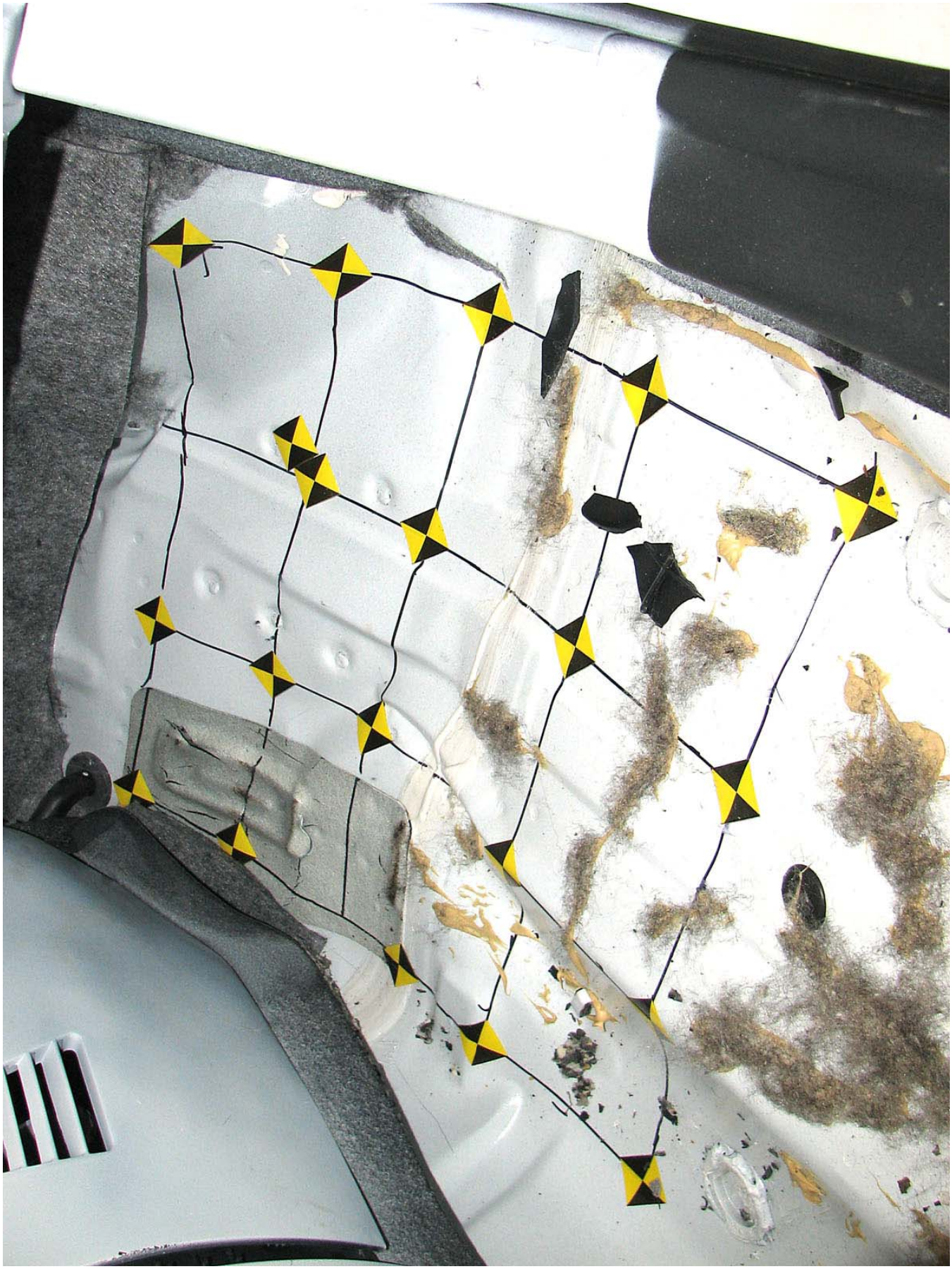


Figure A-55: Post-Test Passenger Side Floor Pan

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°)

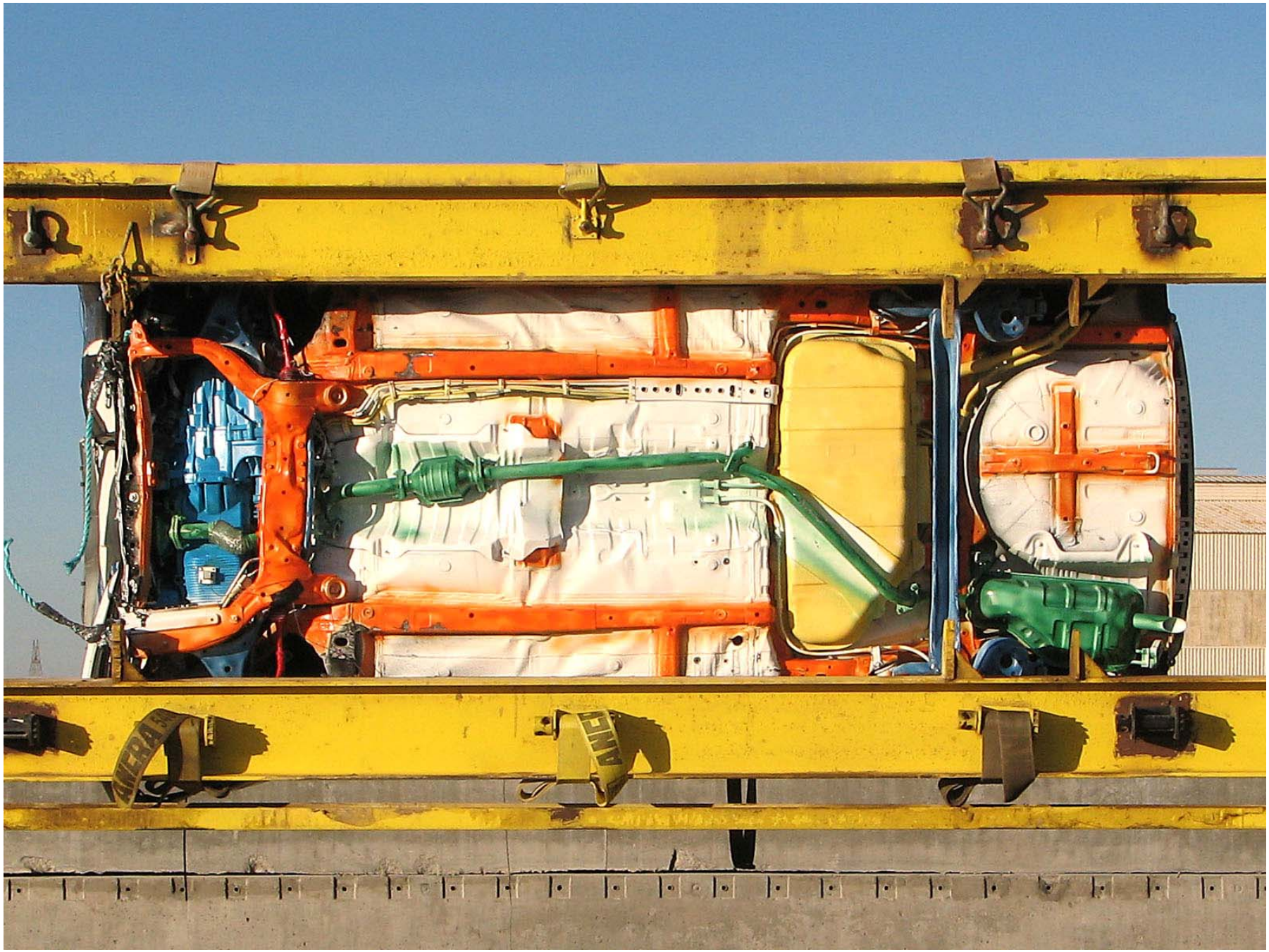


Figure A-61: Vehicle on Rollover Device (270°)

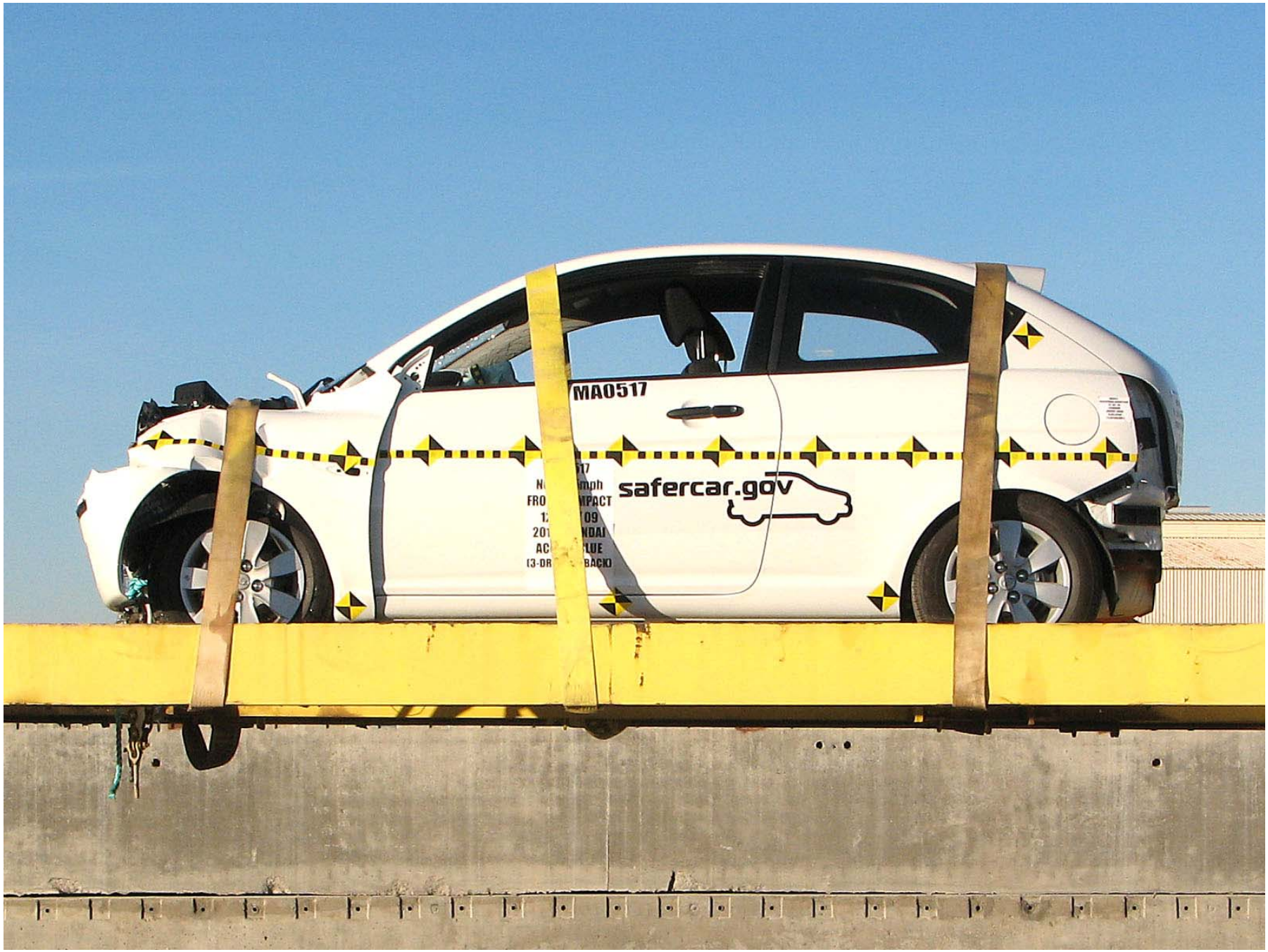


Figure A-62: Vehicle on Rollover Device (360°)

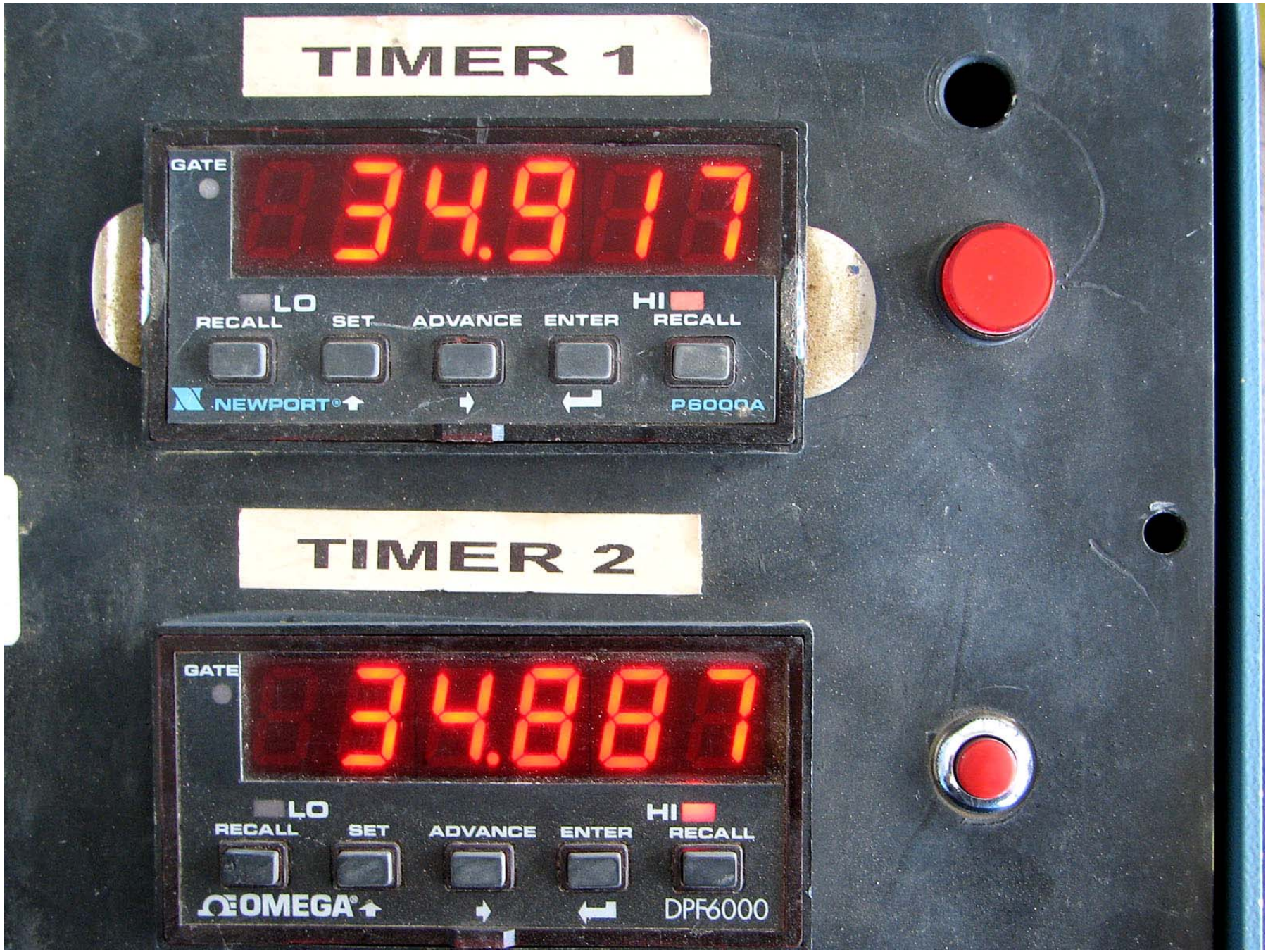


Figure A-63: Timers

Figure A-64: Vehicle Impact

APPENDIX B
DATA PLOTS

LIST OF DATA PLOTS

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

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

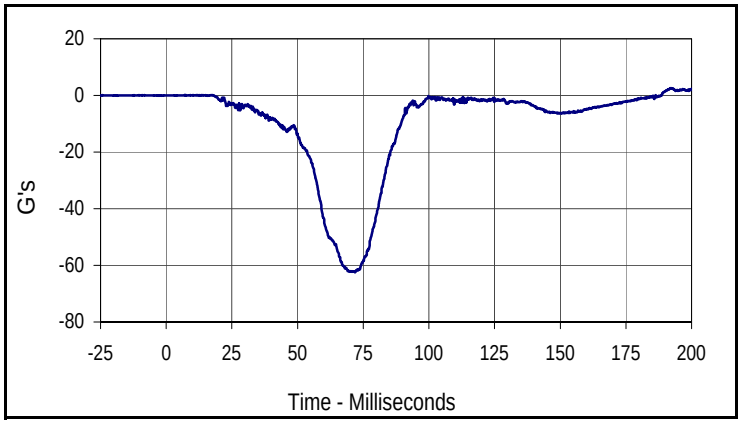
Driver Head Primary X Velocity
Driver Head Primary X Displacement
Driver Head Redundant X
Driver Head Redundant Y
Driver Head Redundant Z
Driver Head Resultant Redundant
Driver Head Redundant X Velocity
Driver Head Redundant X Displacement
Driver Upper Neck Force X
Driver Upper Neck Force Y
Driver Upper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

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

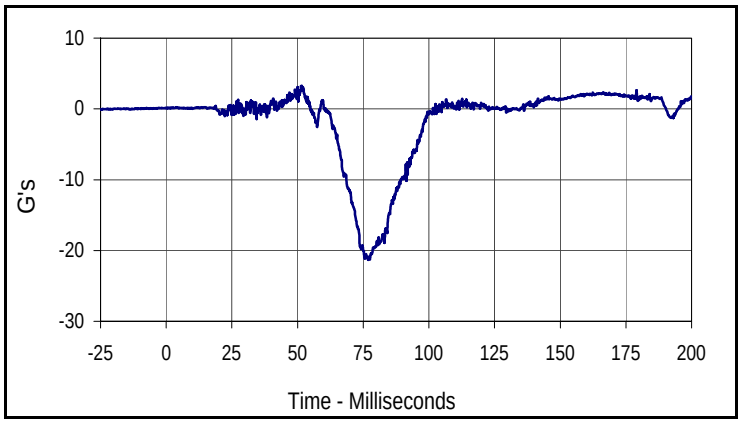
Passenger Chest Redundant Y
Passenger Chest Redundant Z
Passenger Chest Resultant Redundant
Passenger Chest Redundant X Velocity
Passenger Chest Redundant X Displacement
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Pelvis Resultant
Passenger Pelvis X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

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

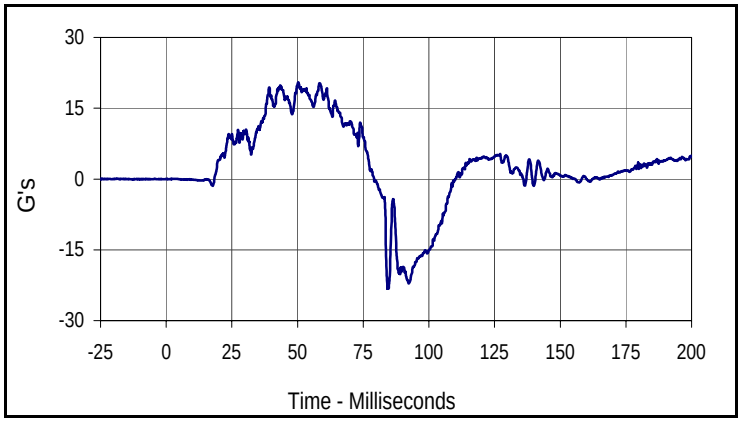
Test Vehicle:	2010 Hyundai Accent 3-Door Hatchback	Test Date:	12/4/09
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	MA0517



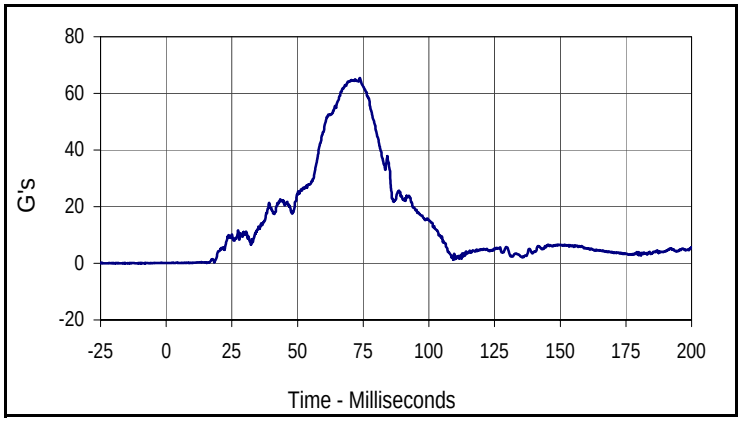
Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
2.6	192.2	-62.5	71.9



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.3	51.6	-21.3	76.9

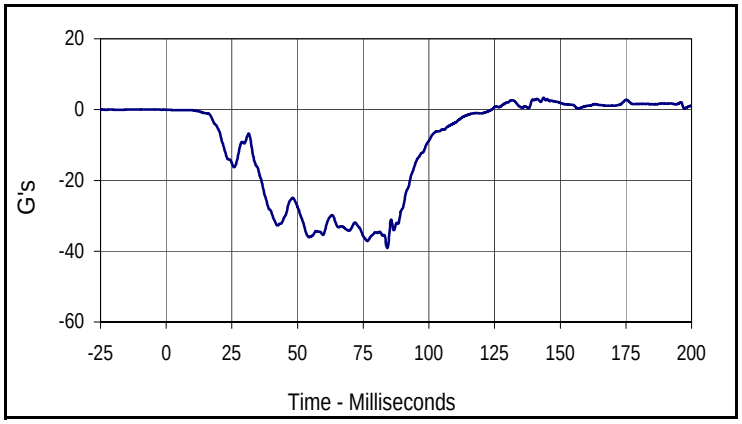


Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
20.5	50.3	-23.3	84.6

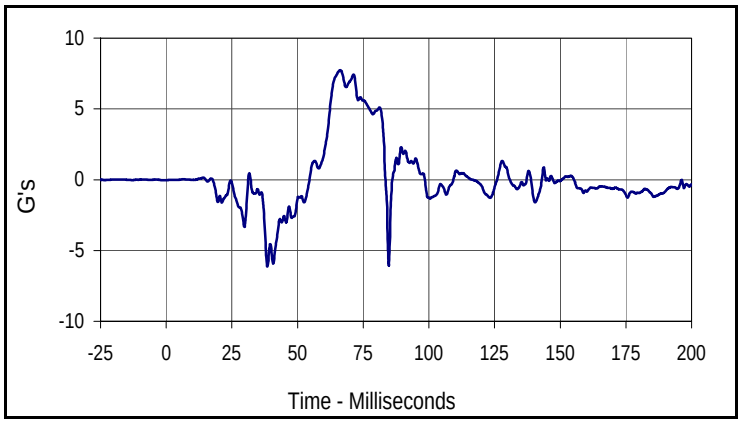


Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
65.5	73.8	0.1	9.0

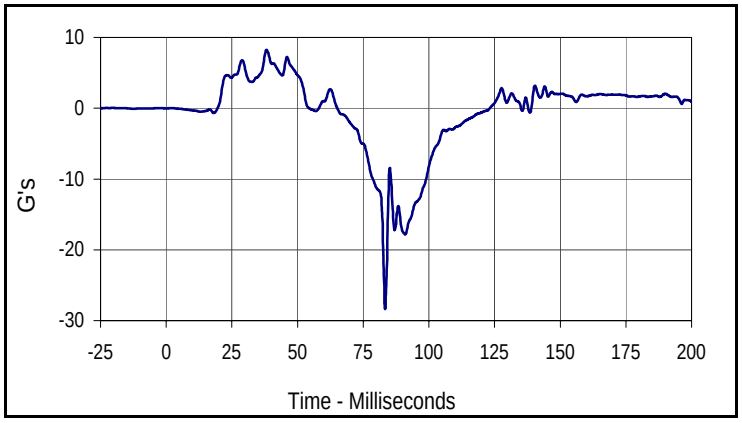
Test Vehicle:	2010 Hyundai Accent 3-Door Hatchback	Test Date:	12/4/09
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	MA0517



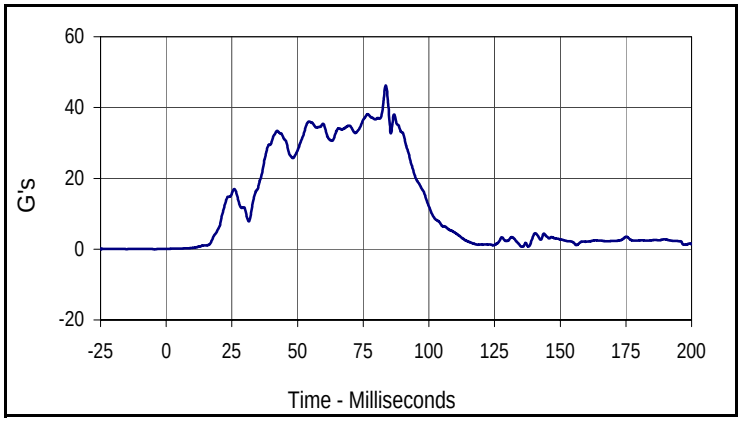
Curve Description			
Driver Chest Primary X			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
3.3	143.6	-39.1	84.2



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
7.7	66.3	-6.1	38.5

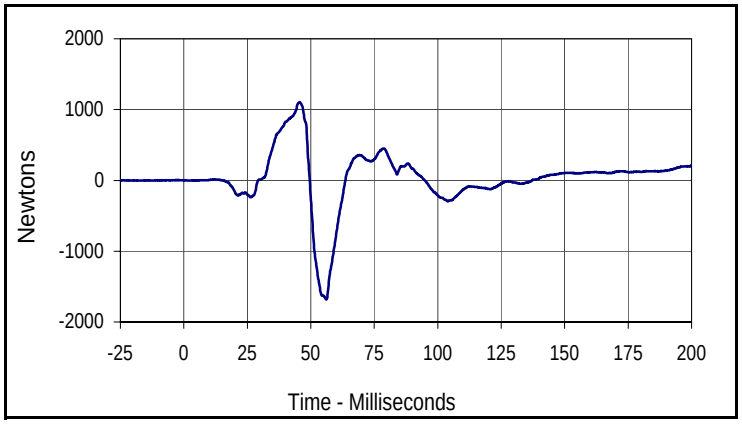


Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
8.2	38.2	-28.4	83.3

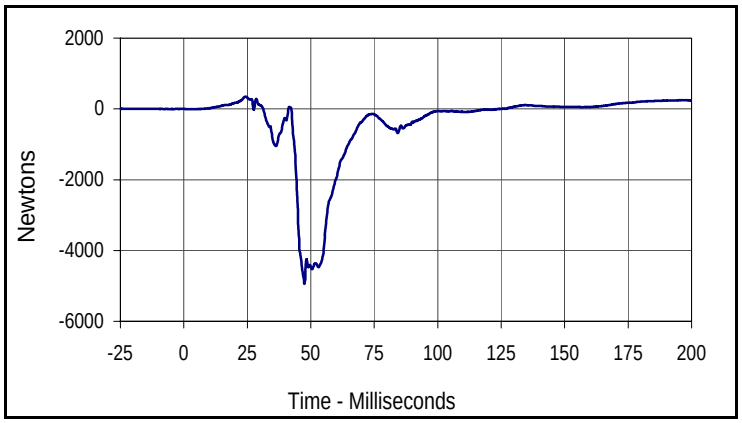


Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
46.2	83.6	0.1	0.0

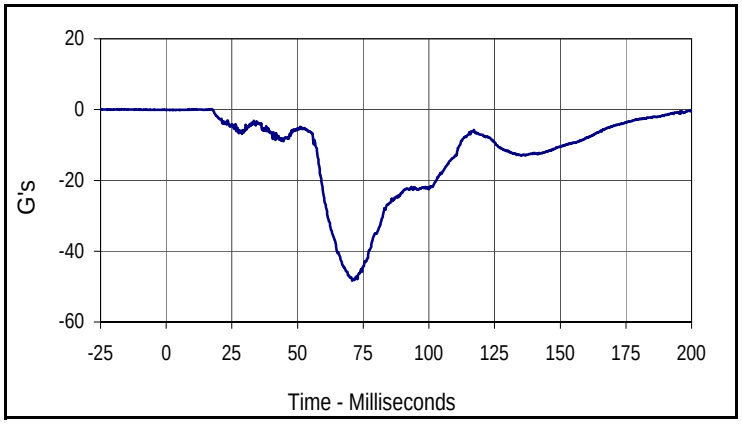
Test Vehicle:	2010 Hyundai Accent 3-Door Hatchback	Test Date:	12/4/09
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	MA0517



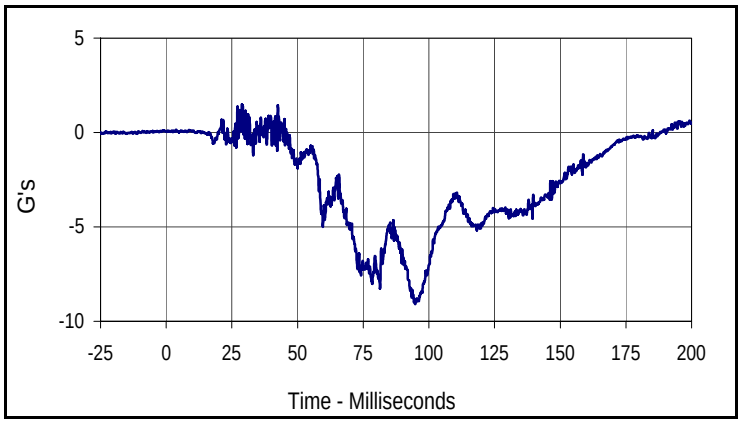
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
007	FIL	600	Newtons
Max	Time	Min	Time
1105.2	45.5	-1682.3	56.1



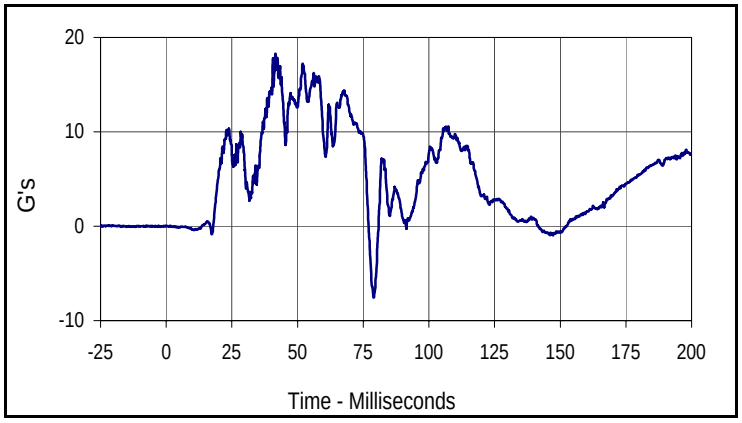
Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
348.1	24.4	-4938.6	47.5



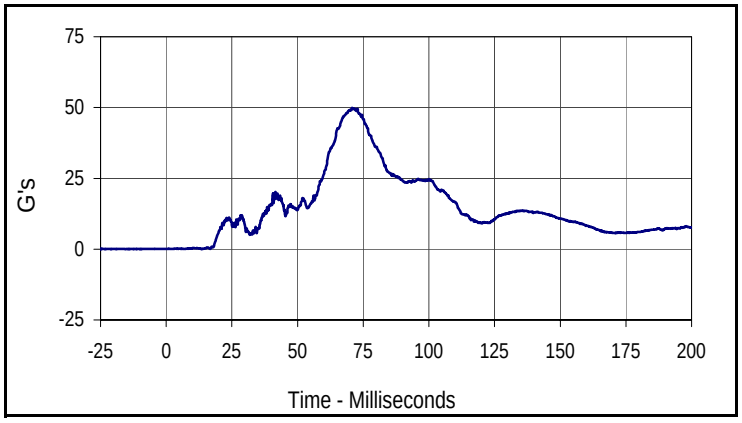
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
009	FIL	1000	G's
Max	Time	Min	Time
0.1	17.2	-48.3	70.8



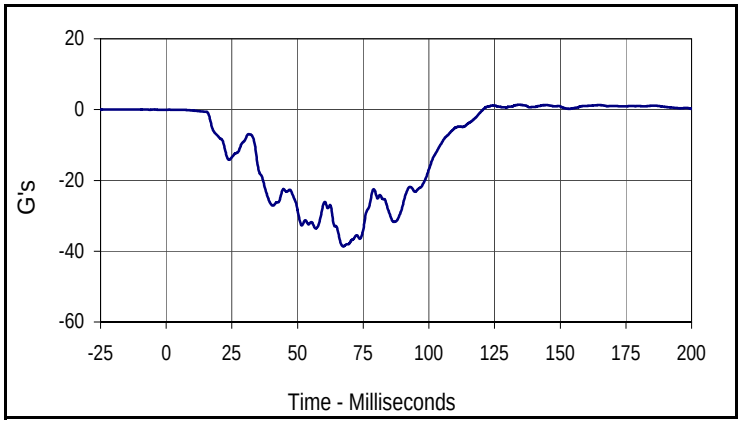
Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
1.5	28.8	-9.1	94.8



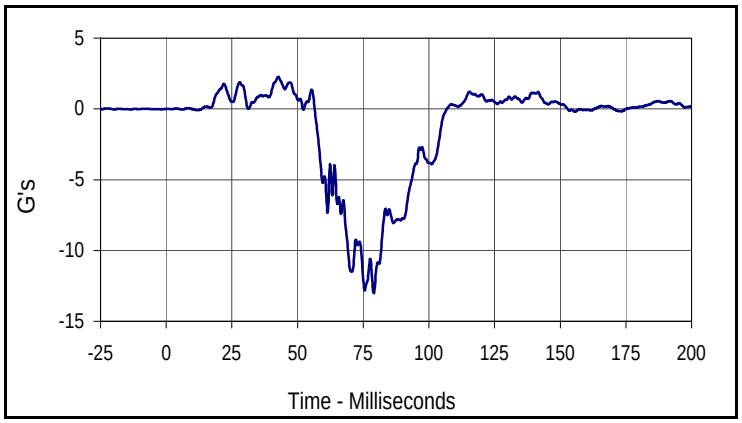
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
011	FIL	1000	G's
Max	Time	Min	Time
18.3	41.6	-7.6	79.0



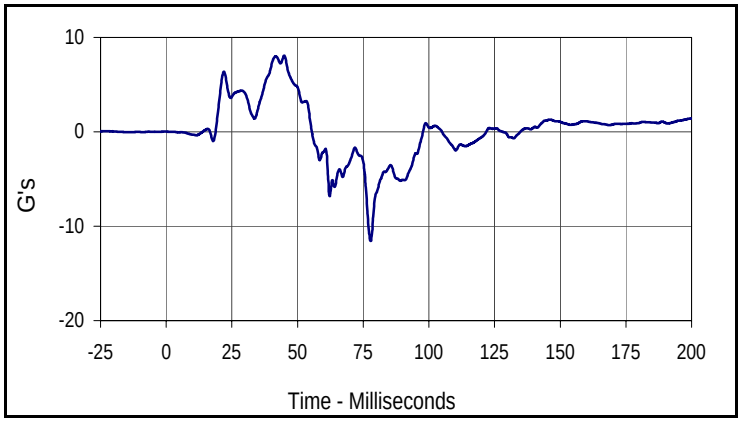
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
49.9	70.8	0.0	13.5



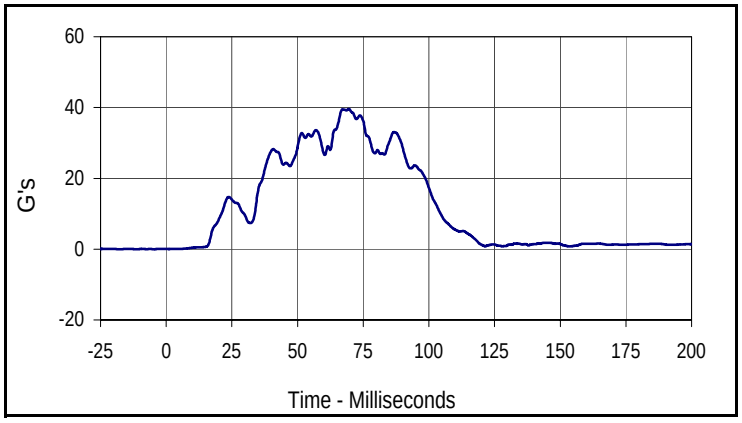
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
1.4	134.3	-38.6	67.4



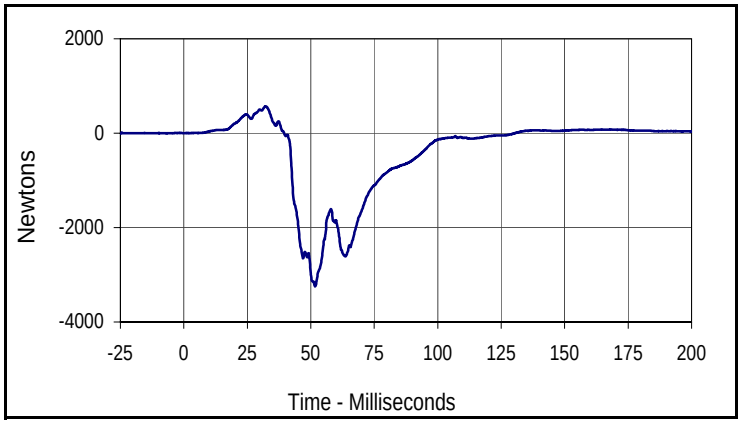
Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
2.3	42.7	-13.0	79.0



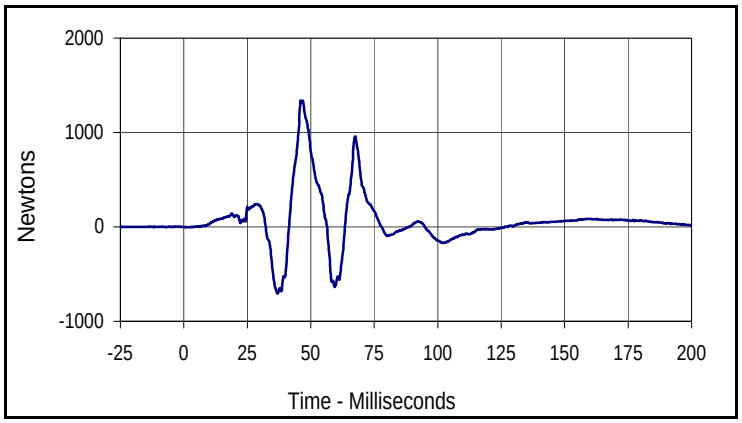
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
8.1	44.9	-11.6	77.8



Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
39.6	69.5	0.0	1.1



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
567.7	32.3	-3249.6	51.7



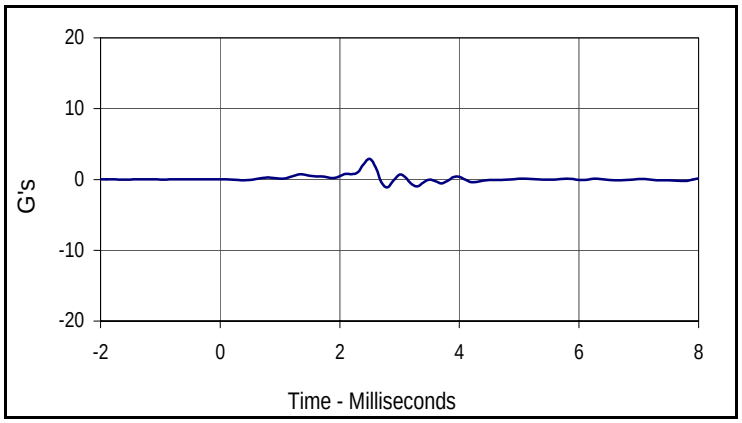
Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
1339.8	46.8	-706.5	36.9

APPENDIX C
DUMMY CALIBRATION DATA

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	11/25/09
ATD Serial No.:	034	Test I.D.:	HD11D

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	240.7	Pass
Peak Lateral Acceleration	G's	≤15.0	2.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

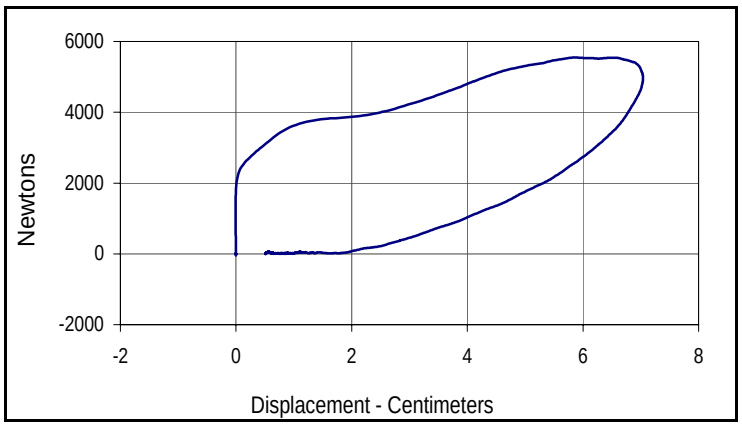
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
240.7	2.2	0.2	-0.1



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.9	2.5	-1.1	2.8

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	11/25/09
ATD Serial No.:	034	Test I.D.:	CH11D

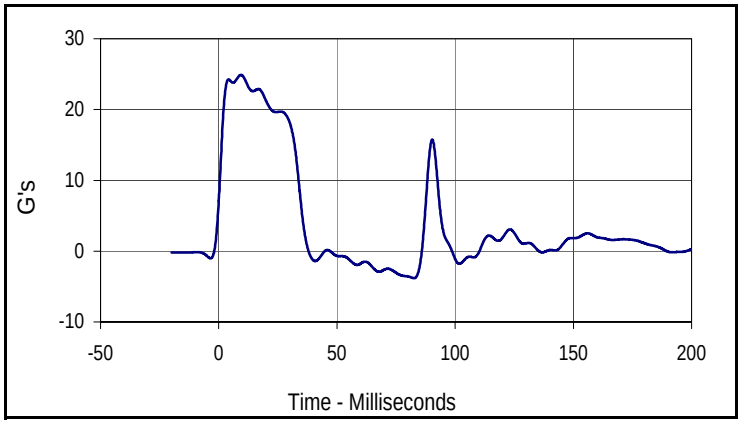
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.61	Pass
Peak Probe Force	Newtons	5159 to 5893	5546	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	7.04	Pass
Internal Hysterysis	%	69 to 85	73.7	Pass
		Overall Test Results		Pass



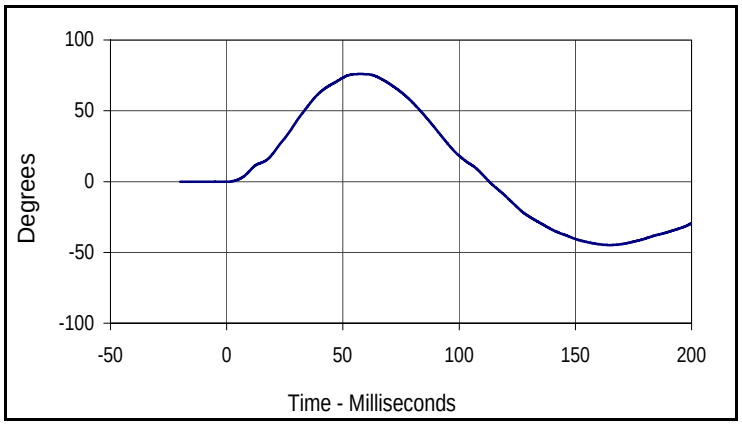
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	180	73.7
Peak Probe Force		Peak Chest Deflection	
5546		7.04	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	11/25/09
ATD Serial No.:	034	Test I.D.:	NF11D

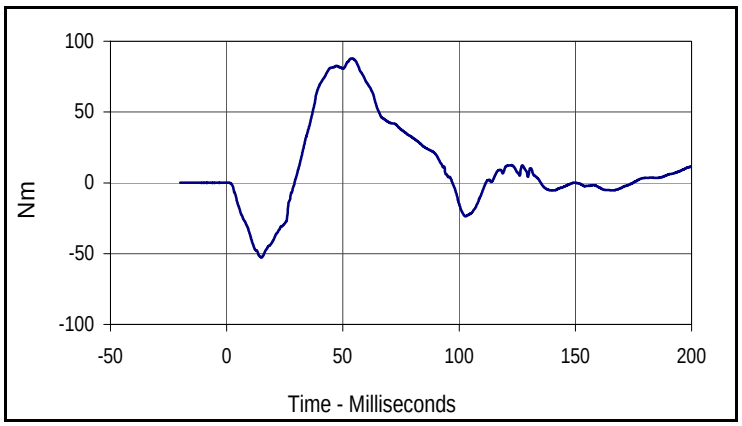
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.90	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.8	Pass
	20 Msec.	G's	17.6 to 22.6	21.2	Pass
	30 Msec.	G's	12.5 to 18.5	18.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.4	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	75.9	Pass
	Time	Msec.	57.0 to 64.0	57.3	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	113	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	87.7	Pass
	Time	Msec.	47.0 to 58.0	54.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.9	9.4	-3.8	82.6



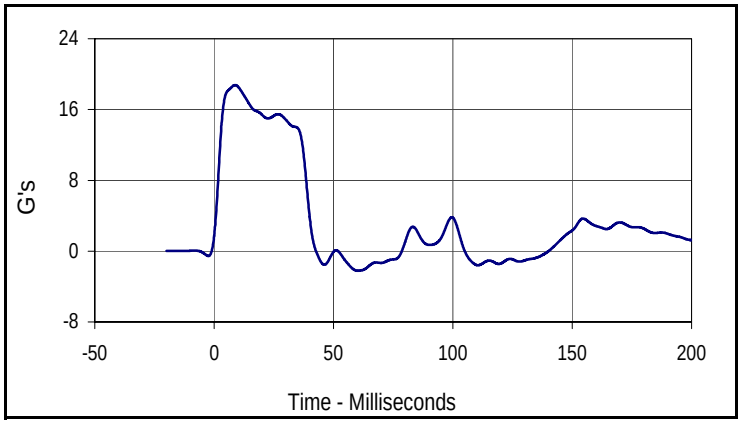
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
75.9	57.3	-44.8	164.8



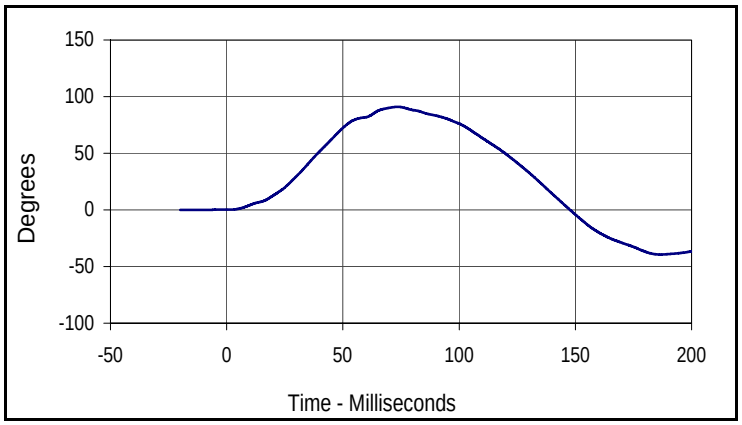
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
87.7	54.0	-52.8	15.0

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	11/25/09
ATD Serial No.:	034	Test I.D.:	NE11A

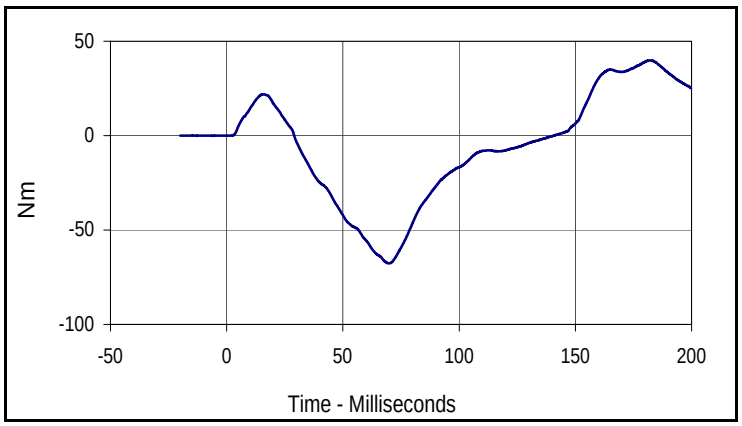
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.10	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.6	Pass
	20 Msec.	G's	14.0 to 19.0	15.4	Pass
	30 Msec.	G's	11.0 to 16.0	14.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	39.6	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	91.0	Pass
	Time	Msec.	72.0 to 82.0	73.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	147.8	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-67.6	Pass
	Time	Msec.	65.0 to 79.0	69.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	140.8	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.8	8.8	-2.2	60.2



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
91.0	73.5	-39.4	186.5



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
39.8	181.7	-67.6	69.9

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	11/25/09
ATD Serial No.:	034	Test I.D.:	LK11D , RK11D

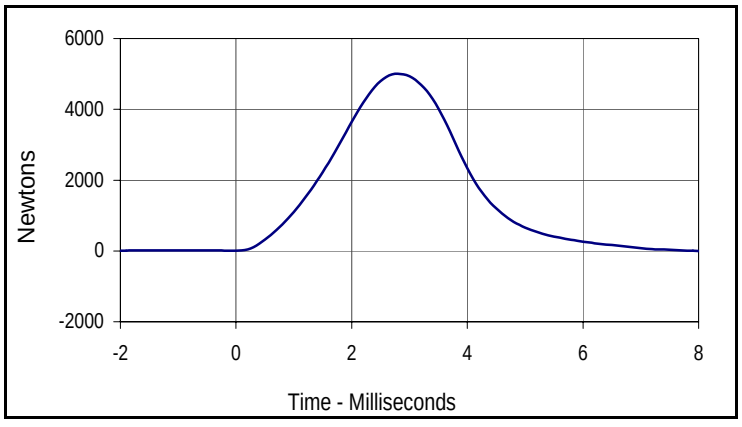
Left Knee

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5326	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	5009	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5326.2	2.8	-13.9	8.7



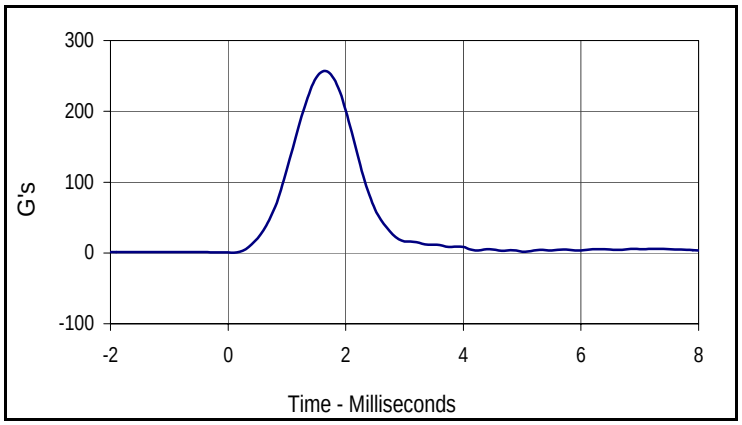
Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5009.2	2.8	-13.2	8.7

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	11/25/09
ATD Serial No.:	034	Test I.D.:	N/A

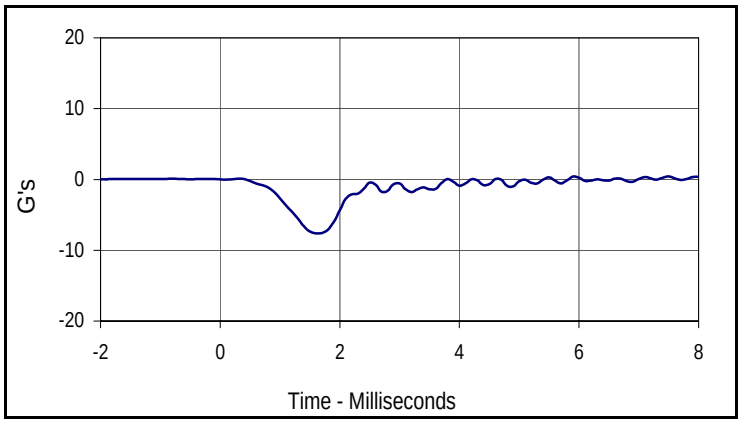
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	509	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	136	Pass
E - Shoulder pivot from back	mm	84 to 94	89	Pass
F - Thigh clearance	mm	140 to 155	145	Pass
G - Elbow back to wrist pivot	mm	290 to 305	301	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	332	Pass
J - Elbow rest height	mm	190 to 211	209	Pass
K - Buttock to knee length	mm	579 to 604	592	Pass
L - Poplipteal length	mm	429 to 455	441	Pass
M - Knee pivot height	mm	485 to 500	492	Pass
N - Buttock poplipteal length	mm	452 to 477	474	Pass
O - Chest depth	mm	213 to 229	215	Pass
P - Foot length	mm	251 to 267	256	Pass
V - Shoulder breadth	mm	422 to 437	425	Pass
W - Foot breadth	mm	91 to 107	106	Pass
Y - Chest circumference	mm	970 to 1001	990	Pass
Z - Waist circumference	mm	836 to 866	855	Pass
AA - Location for chest circumference	mm	429 to 434	429	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
		Overall Test Results		Pass

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	11/25/09
ATD Serial No.:	035	Test I.D.:	HD11E

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



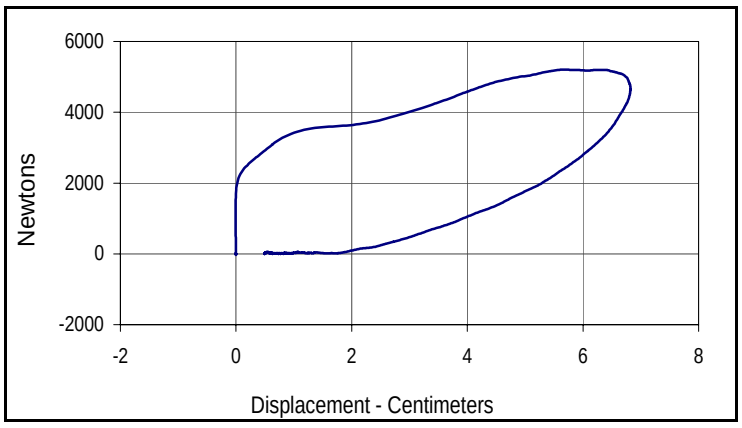
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
256.2	1.6	0.2	0.1



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.4	5.9	-7.6	1.6

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	11/25/09
ATD Serial No.:	035	Test I.D.:	CH11E

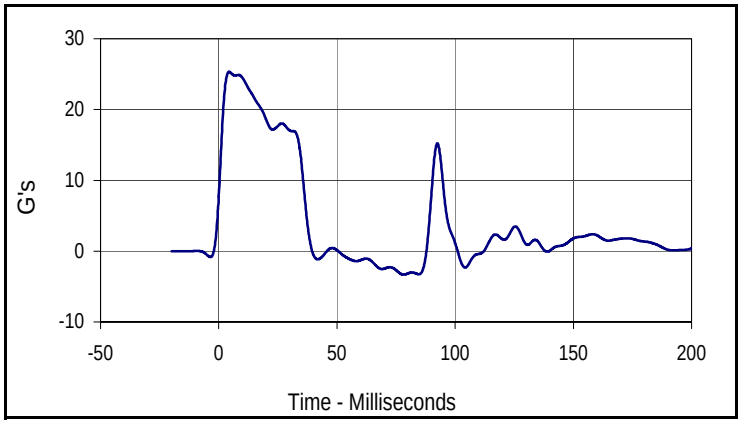
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.61	Pass
Peak Probe Force	Newtons	5159 to 5893	5206	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.82	Pass
Internal Hysterysis	%	69 to 85	73.7	Pass
		Overall Test Results		Pass



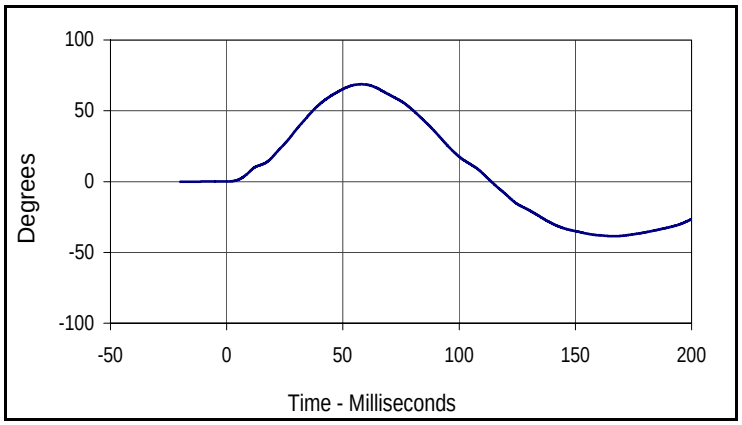
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	180	73.7
Peak Probe Force		Peak Chest Deflection	
5206		6.82	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	11/25/09
ATD Serial No.:	035	Test I.D.:	NF11E

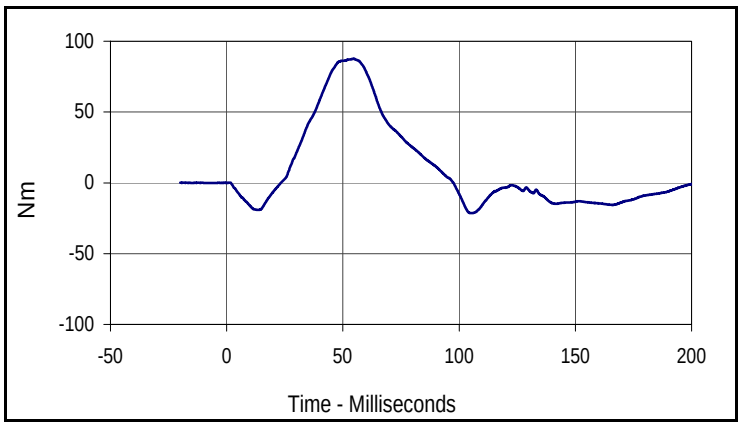
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.92	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.5	Pass
	20 Msec.	G's	17.6 to 22.6	18.6	Pass
	30 Msec.	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	37.2	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	68.7	Pass
	Time	Msec.	57.0 to 64.0	57.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	113.9	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	87.5	Pass
	Time	Msec.	47.0 to 58.0	54.3	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.6	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
25.3	4.4	-3.3	78.3



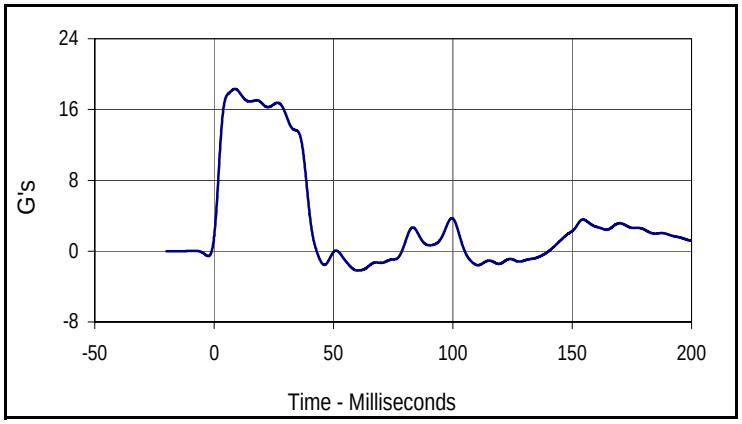
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
68.7	57.9	-38.6	166.5



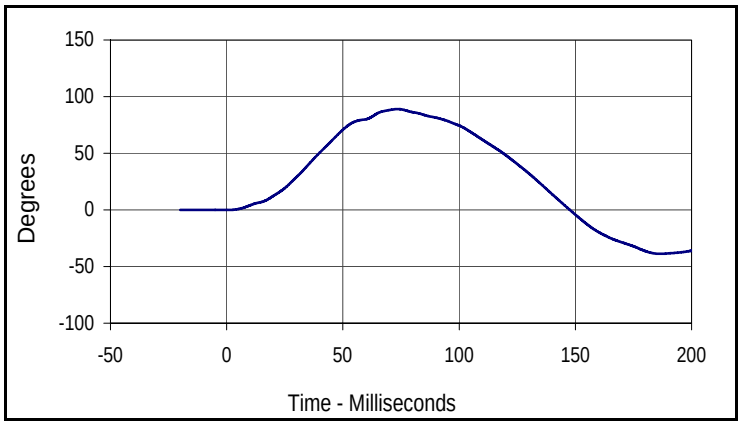
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
87.5	54.3	-21.4	105.1

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	11/25/09
ATD Serial No.:	035	Test I.D.:	NE11E

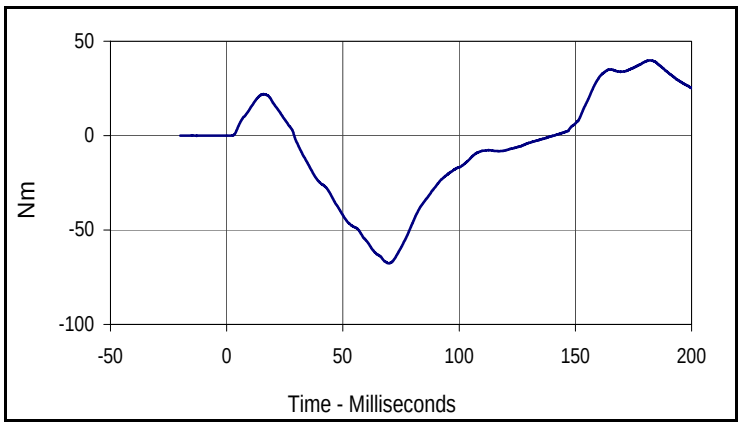
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	5.96	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.1	Pass
	20 Msec.	G's	14.0 to 19.0	16.7	Pass
	30 Msec.	G's	11.0 to 16.0	15.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	39.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	89.0	Pass
	Time	Msec.	72.0 to 82.0	73.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	147.7	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-67.6	Pass
	Time	Msec.	65.0 to 79.0	69.9	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
18.3	8.7	-2.2	60.2



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
89.0	73.5	-38.8	186.5



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
39.9	181.7	-67.6	69.9

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	11/25/09
ATD Serial No.:	035	Test I.D.:	LK11E , RK11E

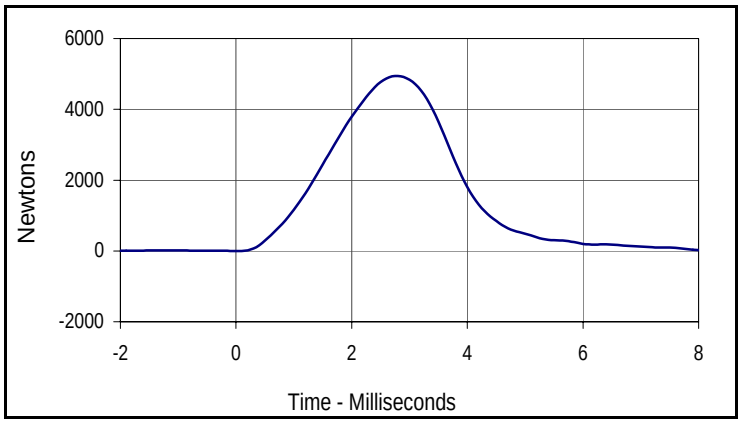
Left Knee

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	4807	Pass
		Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	4944	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4806.7	2.8	-12.5	8.7



Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
4944.1	2.8	-43.5	10.0

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	11/25/09
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	883	Pass
B - Shoulder pivot height	mm	505 to 521	505	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	85	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	305	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	205	Pass
K - Buttock to knee length	mm	579 to 604	595	Pass
L - Poplipteal length	mm	429 to 455	443	Pass
M - Knee pivot height	mm	485 to 500	492	Pass
N - Buttock poplipteal length	mm	452 to 477	472	Pass
O - Chest depth	mm	213 to 229	215	Pass
P - Foot length	mm	251 to 267	254	Pass
V - Shoulder breadth	mm	422 to 437	429	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	999	Pass
Z - Waist circumference	mm	836 to 866	855	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
		Overall Test Results		Pass

Test Program:	Dummy Damage Checklist	Test Date:	11/25/09
ATD Serial No.:	034	Test I.D.:	N/A

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

Comments on repair or replacement parts:

Test Program:	Dummy Damage Checklist	Test Date:	11/25/09
ATD Serial No.:	035	Test I.D.:	N/A

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

Comments on repair or replacement parts: