REPORT NUMBER TR-P29001-07-NC

NEW CAR ASSESMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

FORD MOTOR CO.
2010 FORD FUSION HYBRID
4-DOOR SEDAN

NHTSA NUMBER: MA0200

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

MAY 15, 2009

FINAL REPORT

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

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

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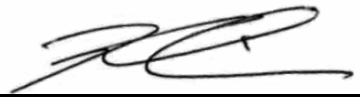
Prepared by:  Date: May 15, 2009

Mr. Kelsey Chiu, Project Engineer
KARCO Engineering, LLC

Reviewed by:  Date: May 15, 2009

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

Approved by:  Date: May 15, 2009

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

FINAL REPORT ACCEPTED BY:

_____

Manager, New Car Assessment Program

_____

Date of Acceptance

_____

COTR, NCAP Frontal Impact Program

_____

Date of Acceptance

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipients Catalog No.
TR-P29001-07-NC		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Testing of a 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No. MA0200	May 15, 2009
	6. Performing Organization Code KAR
7. Authors Mr. Kelsey Chiu, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO	**8. Performing Organization Report No.** TR-P29001-07-NC
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301	**10. Work Unit No.**
	11. Contract or Grant No. DTNH22-06-D-00027
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NVS-111 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C 20590	**13. Type of Report and Period Covered** Final Test Report
	14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS

15. Supplementary Notes

16. Abstract

A 35 mph (56.3 km/h) frontal barrier impact test was conducted on the subject 2010 Ford Fusion Hybrid 4-Door Sedan at KARCO Engineering, LLC, in Adelanto, CA, on May 15, 2009. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity was 56.35 km/h. The ambient temperature at the barrier at the time of the crash was 31.1 degrees Celsius. The vehicle's maximum post static crush was 496 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	413.8	510.6
Max. Chest Accel. (3 msec. Chest Clip)	G's	60	42.6	36.0
Left Femur Force	Newtons	10008	-3393.3	-4749.6
Right Femur Force	Newtons	10008	-5460.6	-2319.2

17. Key Words	18. Distribution Statement
56.3 km/h NCAP Frontal Impact Test New Car Assesment Program (NCAP) 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No. MA0200	Copies of this report are available from: National Highway Traffic Safety Admin. NHTSA Technical Reference Division 1200 New Jersey Ave., SE, Room W43-410 Washington, DC 20590

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	131	

Form DOT F1700.7 (8-72)

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SECTION 1
PURPOSE AND SUMMARY OF TEST MA0200

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 Ford Fusion Hybrid 4-Door Sedan at a velocity of 56.35 km/h. The test was performed at KARCO Engineering, LLC on May 15, 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.035) and the right-front passenger (position 2) ATD (Serial No. 034) 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 71.3% 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 496 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 airbag. The left knee also contacted the steering column.

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	413.8	42.6	-32.7	-3393.3	-5460.6
Passenger	510.6	36.0	-23.7	-4749.6	-2319.2

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 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

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 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.35
Test Weight	kg	1889
Impact Angle	degrees	0
Average Rebound	mm	837
Maximum Static Crush	mm	496

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	Remained closed and latched, opened without tools	Remained closed and latched, opened without tools
Seat Track Shift (mm)	25 mm	41 mm
Seatback 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, Headrest	Airbag, Headrest
Chest Contact	Airbag	Airbag
Abdomen Contact	None	None
Left Knee Contact	Knee Airbag, Steering Column	Glovebox
Right Knee Contact	Knee Airbag	Glovebox

MOVIE COVERAGE

Cameras	Standard	Additional
High Speed	16	0
Real Time	1	2
Total	15	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 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MA0200
Make	Ford
Model	Fusion Hybrid
Body Style	4-Door Sedan
VIN No.	3FADP0L35AR116546
Color	Silver
Delivery Date	05/09/09
Odometer (Miles)	153.3
Dealer	Sunrise Ford
Transmission	ECVT
Final Drive	Front
Type/No. of Cylinders	Inline 4
Engine Displ. (L)	2.5
Engine Placement	Transverse
Roof Rack	No
Sunroof/T-top	No
Tinted Glass	Yes
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

Anti-Lock Brakes	Yes
All Wheel Drive	No
Power Steering	Yes
Driver Front Airbag	Yes
Driver Side Torso Airbag	Yes
Driver Side Head Airbag	No
Driver Curtain Airbag	Yes
Pass. Front Airbag	Yes
Pass. Side Torso Airbag	Yes
Pass. Head Airbag	No
Pass. Curtain Airbag	Yes
Pre-Tensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes
Air Conditioning	Yes
AM/FM CD	Yes
Tilt Steering	Yes
Automatic Door Locks	Yes
Power Windows	Yes
Power Seats	Yes
Other	n/a

Does the Owner's Manual provide instructions to turn off automatic door locks? Yes

DATA FROM MANUFACTURER'S LABEL

Manufactured By	Ford Motor Co.
Date of Manufacture	Mar-09

GVWR (kg)	2132
GAWR Front (kg)	1130
GAWR Rear (kg)	1002

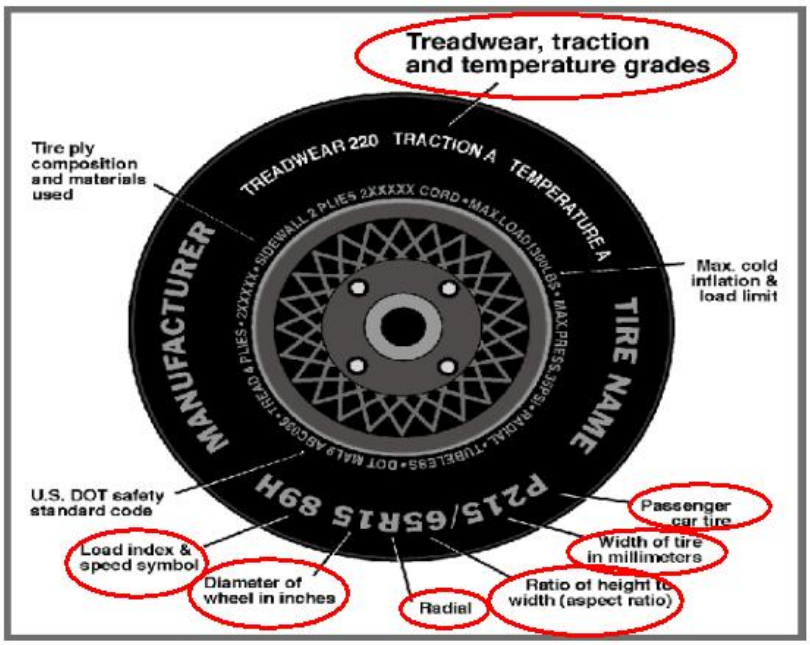
VEHICLE SEATING CAPACITY AND WEIGHT INFORMATION

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 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

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)	230	230
Recommended Tire Size	P225/50R17	P225/50R17
Tire Size on Vehicle	P225/50R17	P225/50R17
Tire Manufacturer	Michelin	Michelin
Treadwear	440	440
Traction	A	A
Temperature Grades	A	A
Tire Plies - Sidewall	2 Polyester	2 Polyester
Tire Plies - Body	2 Polyester, 1 Polyamide, 2 Steel	2 Polyester, 1 Polyamide, 2 Steel
Load Index/Speed Symbol	93V	93V
Tire Material	Polyester, Polyamide, Steel	Polyester, Polyamide, Steel
DOT Safety Code Right	B90A NNHX 0109	B90A NNHX 0109
DOT Safety Code Left	B90A NNHX 0109	B90A NNHX 0109

DATA SHEET NO. 2…(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	497	348	844	535	421	956
Right	kg	507	330	837	534	400	933
Ratio	%	59.7	40.3	100.0	56.6	43.4	100.0
Totals	kg	1004	678	1681	1069	821	1889

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1681
Weight of 2 P572 ATD's	kg	170
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Target Vehicle Test Weight (TVTW)	kg	1896

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	722	736	717	722	1101
As Tested	mm	706	715	686	696	1186

Vehicle Wheel Base (mm): 2732

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

Weight of Items Removed (kg): 43

Vehicle Components Removed: Spare tire, tire tools, rear window, outboard mirrors, trunk lid, tail lights.

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

FUEL SYSTEM DATA

Fuel System Capacity from Owner's Manual (L): 66.24

Actual Test Volume with Entire Fuel System Filled (L): 61.60

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 operates for 2 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 2 seconds the fuel pump will be shut off. The fuel pump operates continuously while the engine is running. If the engine stalls, the fuel pump is deactivated. Also, a fuel pump shut-off switch is provided, designed to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.

DATA SHEET NO. 3

POST-TEST IMPACT DATA

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

SPEED TRAP DATA

Measured Paramater	Units	Requirement	Value
Trap No. 1 Velocity	km/h	55.1 to 57.12	56.35
Trap No. 2 Velocity	km/h	55.1 to 57.12	56.43

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4072	3905	167
Center	mm	4850	4410	440
Right Side	mm	4077	3731	346

VEHICLE REBOUND FROM BARRIER

Measured Paramater	Units	Value
Left Side	mm	875
Center	mm	785
Right Side	mm	850
Average	mm	837

DATA SHEET NO. 4

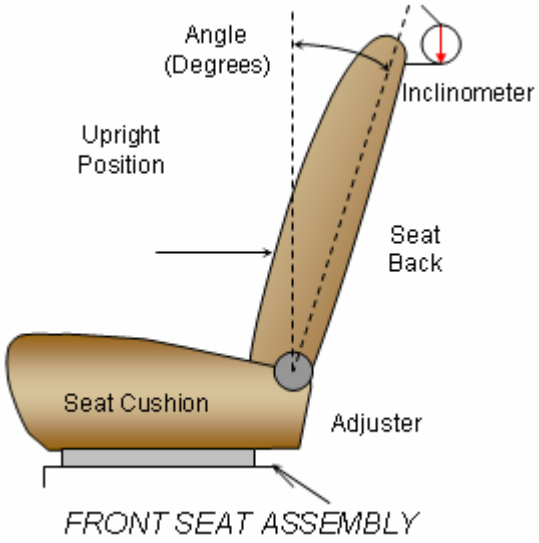
TEST VEHICLE INFORMATION

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

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 headrest, using a digital inclinometer.



SEAT BACK ANGLES

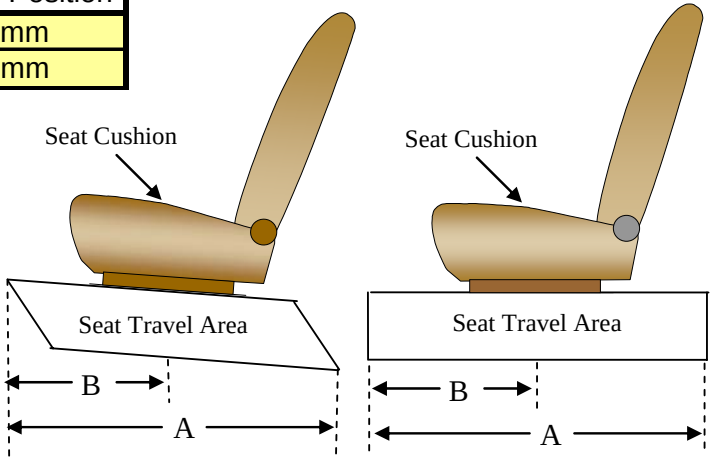
Position	Degrees
Driver w/ Seated Dummy	10.8 @ headrest
Passenger w/ Seated Dummy	11.0 @ headrest

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	278 mm	139 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

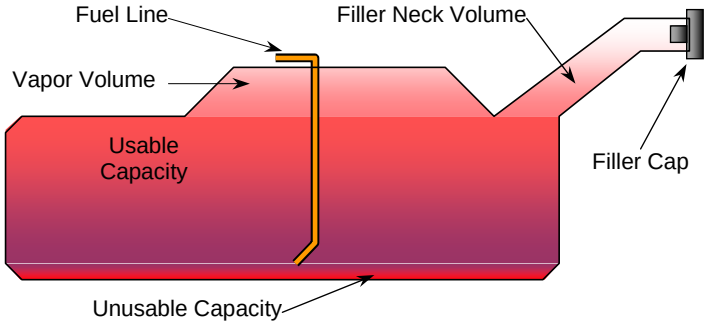
Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

FUEL TANK CAPACITY

	Liters
Usable Capacity of Standard Tank	66.24
Usable Capacity of Optional Tank	
Usable Capacity Used for FMVSS 301	60.94 to 62.27
Actual Amount of Solvent Used	61.60

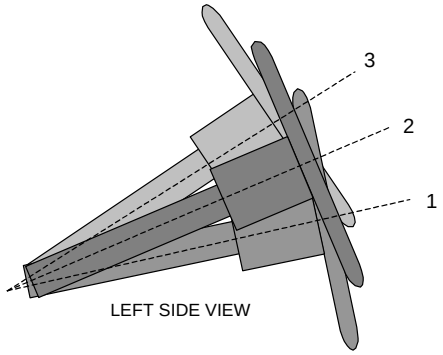
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately two (2) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the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



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering 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
Lowermost - Position No. 1	25.0	300
Geometric Center - Position No. 2	22.1	285
Uppermost - Position No. 3	19.2	270

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

TEST DUMMY POSITION MEASUREMENTS

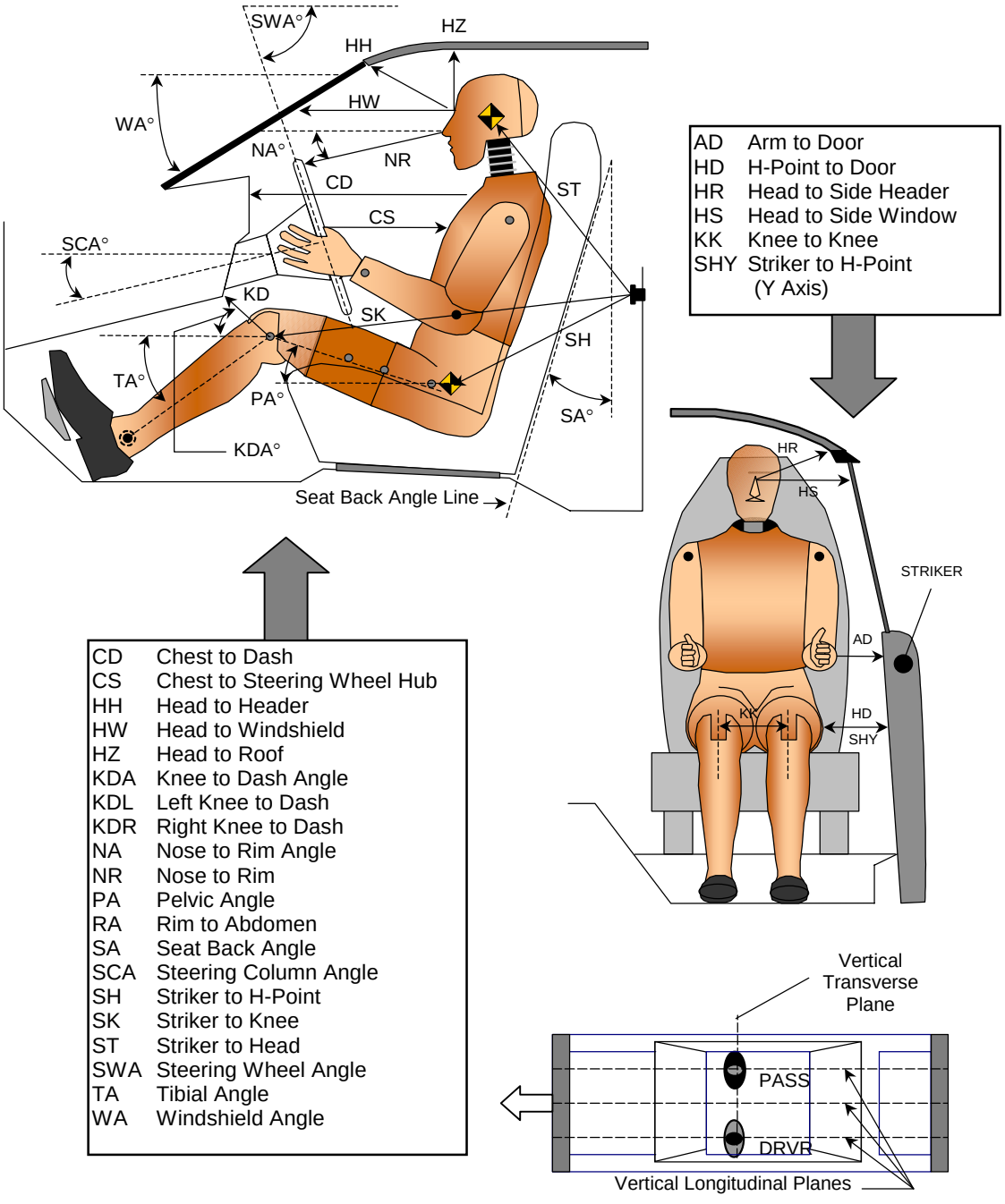
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield angle		24.5		
SWA	Steering wheel angle		22.4		
SCA	Steering column angle		67.6		
SA	Seat Back angle		11.8		0.0
HZ	Head to roof (Z)	194	90.0	190	90.0
HH	Head to header	322		355	
HW	Head to windshield	611		675	
HR	Head to side header (Y)	225		270	
NR	Nost to rim	357	7.3		
CD	Chest to dash	532		558	
CS	Chest to steering hub	289			
RA	Rim to abdomen	171			
KDL	Left knee to dash	151	29.4	155	
KDR	Right knee to dash	140		175	26.3
PA	Pelvic angle		24.8		22.5
TA	Tibia Angle		46.2		39.8
KK	Knee to knee	303		270	
SK	Striker to outboard knee	593	2.5	592	2.2
ST	Striker to head	507	83.3	489	87.5
SH	Striker to H-Point	194	0.0	168	0.0
SHY	Striker to H-Point (Y)	242		233	
HS	Head to side window	345		335	
HD	H-Point to door	137		158	
AD	Arm to door	25		77	

DATA SHEET NO. 5…(CONTINUED)

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

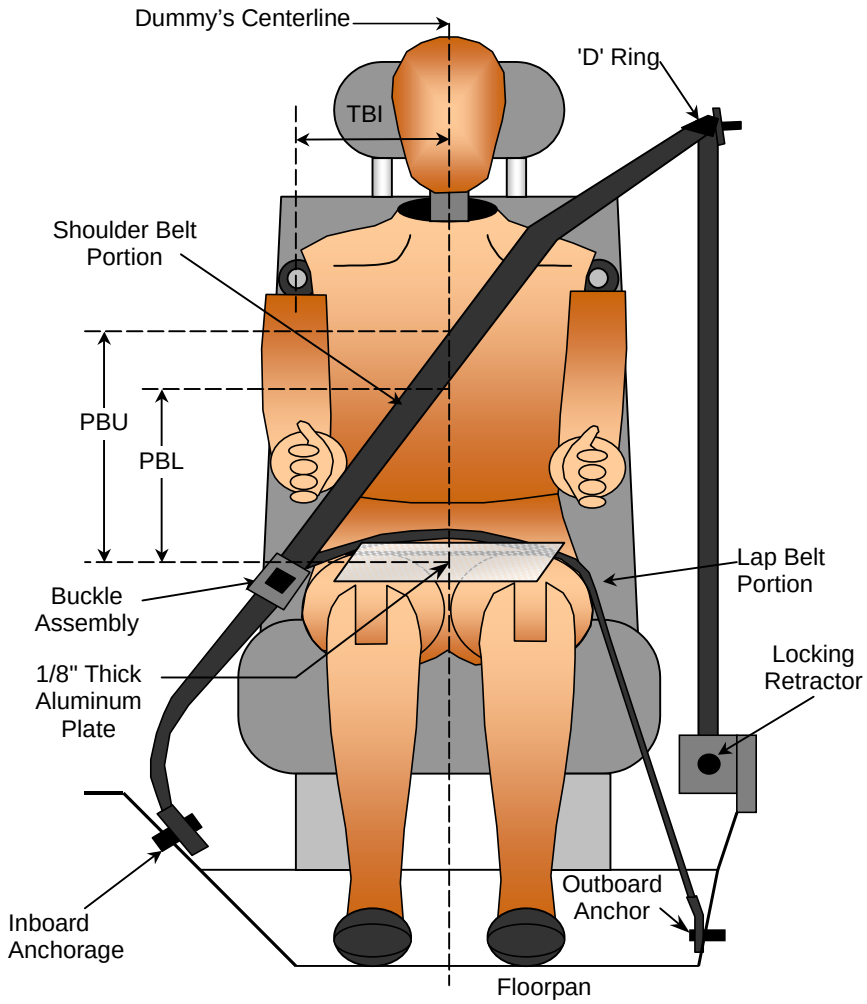


DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	205	215
PBU - Top Surface of Reference to Belt Upper Edge	mm	340	325
PBL - Top Surface of Reference to Belt Lower Edge	mm	272	250
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurement (mm)		
		X	Y	Z
1	Left Rear X-Member	1970	-700	-345
2	Right Rear X-Member	1965	710	-350
3	Engine Top	4010	180	-880
4	Engine Bottom	4230	335	-180
5	Left Brake Caliper	3965	-790	-290
6	Right Brake Caliper	3965	730	-290
7	Instrument Panel			[1]
8	Left Rear X-Member (Z-Axis)	1970	-700	-345
9	Right Rear X-Member (Z-Axis)	1965	710	-350

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: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
Retractor Reel to D-Ring	mm	610	610
Shoulder Belt Length as Measured on ATD	mm	900	862
Lap Belt Length as Measured on ATD	mm	844	616
Remainder of Belt on Reel	mm	819	865
Total Belt Length for Continuous Webbing Systems	mm	3173	2953

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	61	92
As determined electronically	mm	9.8	3.6

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 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

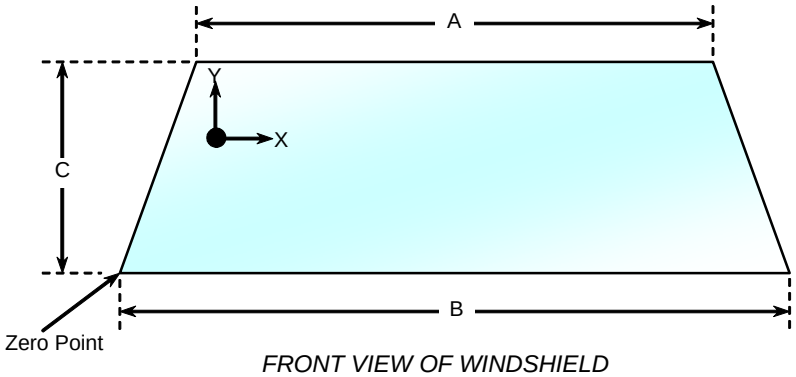
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with rubber cement type adhesive. Rubber molding covers the windshield periphery.

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: 31.1 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2153	1653	76.7
Right Side	2153	1418	65.9
Total	4306	3071	71.3



FRONT VIEW OF WINDSHIELD

WINDSHIELD DIMENSIONS

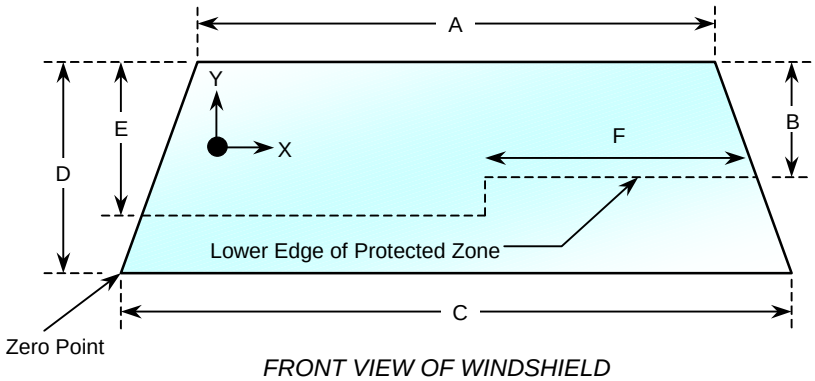
Item	Units	Segment Length	Molding Width
A	mm	1150	0
B	mm	1355	25
C-Left	mm	900	5
C-Right	mm	900	5

DATA SHEET NO. 10

WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09



FRONT VIEW OF WINDSHIELD

WINDSHIELD AND PROTECTED ZONE

Item	Units	Value
A	mm	1150
B	mm	495
C	mm	1355
D	mm	900
E	mm	550
F	mm	515

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 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

Test Time: 1:12 PM Temperature: 31.1 ° C

STODDARD SOLVENT SPILLAGE MEASUREMENTS

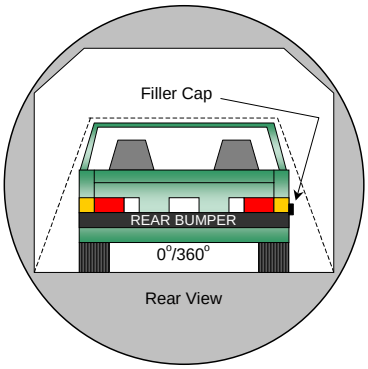
A.	From impact until vehicle motion ceases: (Maximum allowable = 1 ounce)	0
B.	For the 5 minute period after motion ceases: (Maximum allowable = 5 ounces)	0
C.	For the following 25 minutes: (Maximum allowable = 1 oz/minute)	0
D.	Spillage Details:	No leakage occurred

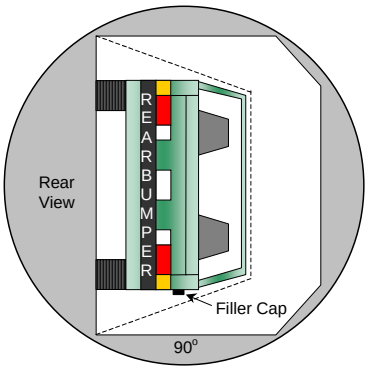
DATA SHEET NO. 12

FMVSS 301 STATIC ROLLOVER DATA

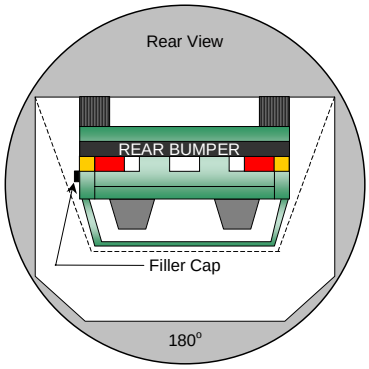
Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

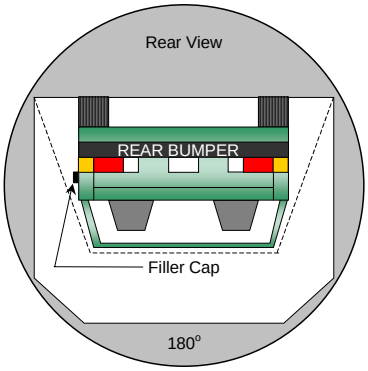




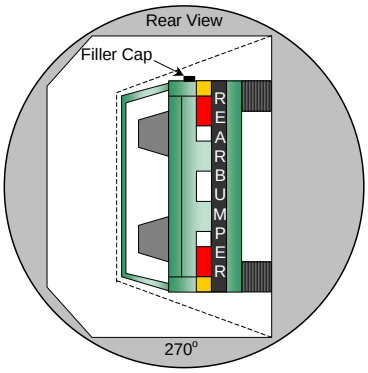
0° to 90°

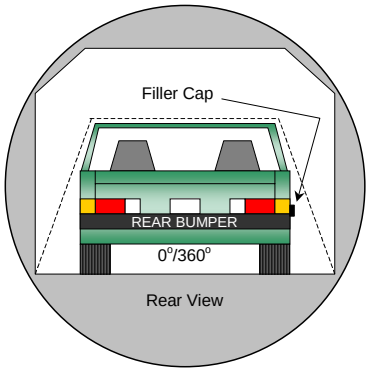


90° to 180°



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 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	83	310	393
90° to 180°	81	305	386
180° to 270°	78	303	381
270° to 360°	81	300	381

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	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: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Length of test vehicle at centerline	mm	4850	4410	-440
2	RSOV to front of engine	mm	4308	4010	-298
3	RSOV to firewall centerline	mm	3695	3550	-145
4	RSOV to upper leading edge of right door	mm	3363	3358	-5
5	RSOV to upper leading edge of left door	mm	3357	3383	26
6	RSOV to lower leading edge of right door	mm	3345	3318	-27
7	RSOV to lower leading edge of left door	mm	3338	3340	2
8	RSOV to upper trailing edge of right door	mm	2242	2245	3
9	RSOV to upper trailing edge of left door	mm	2239	2272	33
10	RSOV to lower trailing edge of right door	mm	2274	2240	-34
11	RSOV to lower trailing edge of left door	mm	2274	2274	0
12	RSOV to bottom of right A-pillar	mm	3286	3298	12
13	RSOV to bottom of left A-pillar	mm	3301	3318	17
14	RSOV to firewall on right side	mm	3688	3555	-133
15	RSOV to firewall on left side	mm	3728	3605	-123
16	RSOV to steering column hub	mm	2850	2945	95
17	Center of steering column to left A-pillar, Y	mm	424	410	-14
18	Center of steering column to headlining, Z	mm	426	420	-6
19	RSOV to right side of front bumper	mm	4077	3731	-346
20	RSOV to left side of front bumper	mm	4072	3905	-167
21	Length of engine block	mm	500	500	0
RD	RSOV to right side of dash panel	mm	3080	3080	0
CD	RSOV to center of dash panel	mm	3033	2995	-38
LD	RSOV to left side of dash panel	mm	3060	3100	40

DATA SHEET NO. 13…(CONTINUED)

VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

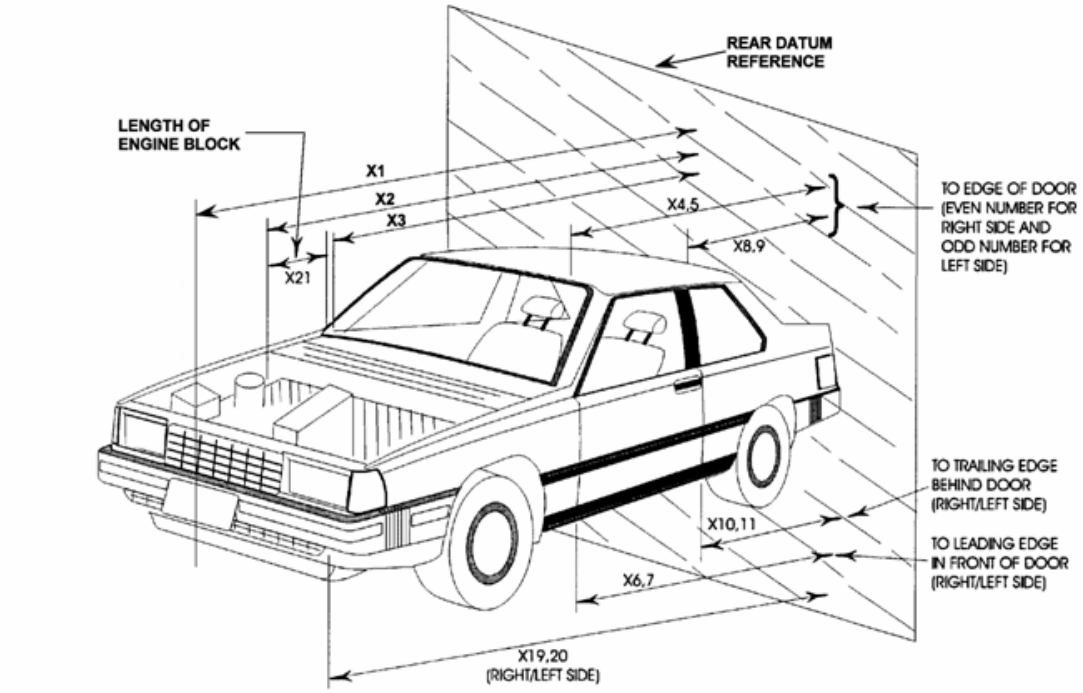
VEHICLE STRUCTURAL MEASUREMENT TABLE

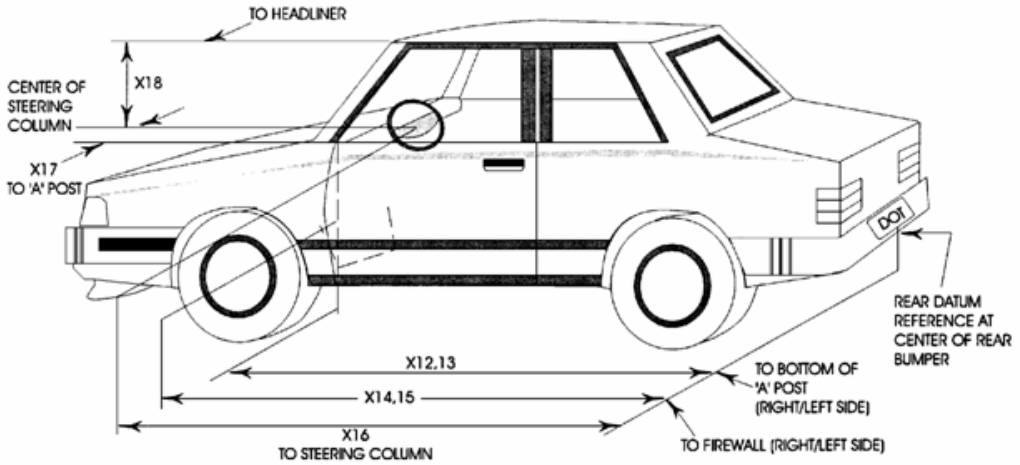
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length	mm	4850	4410	-440
2	Total width	mm	1820	1815	-5
3	Front bumper top height	mm	527	385	-142
4	Front bumper bottom height	mm	218	120	-98
5	Longitudinal member top height	mm	553	570	17
6	Longtidunal member bottom height	mm	425	475	50
7	Distance between longitudinal members	mm	925	910	-15
8	Longitudinal member width	mm	100	100	0
9	Engine top height	mm	833	795	-38
10	Engine bottom height	mm	190	168	-22
11	Engine and gearbox width	mm	825	825	0
12	Front bumper-engine distance	mm	542	480	-62
13	Front shock absorber height	mm	897	900	3
14	Front hood leading edge height	mm	764	805	41
15	Distance between front shock absorbers	mm	1005	940	-65
16	Front bumper-front axle distance	mm	1007	600	-407
17	Front axle to A-pillar distance	mm	444	400	-44
18	A Pillar to B Pillar distance	mm	987	973	-14
19	B Pillar to rear axle distance	mm	1172	1170	-2
20	B Pillar to C Pillar distance	mm	939	941	2
21	Roof sill bottom height	mm	1245	1265	20
22	Roof sill top height	mm	1401	1375	-26
23	Floor sill bottom height	mm	198	160	-38
24	Floor sill top height	mm	384	345	-39

VEHICLE MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09





DATA SHEET NO. 14

CAMERA LOCATIONS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

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	-1981	-8026	-1193	0	8105	20	1000
3	Closeup Left Side	-1701	-8051	-1498	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	-2260	8204	-1168	0	7409	20	1000
8	Closeup Right Side	-1625	8027	-1422	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	Driver Side Dummy On-Board	3265	-220	-155	-5	927	12	1000
17	Passenger Side Dummy On-Board	3265	220	-1350	-5	939	12	1000
18	Real Time Driver	-1926	-8089	-1704	-1	-1704	-1	30
19	Real Time Passenger	-1433	8047	-1704	-1	-1704	-1	30

All measurements are made relative to the point of impact.

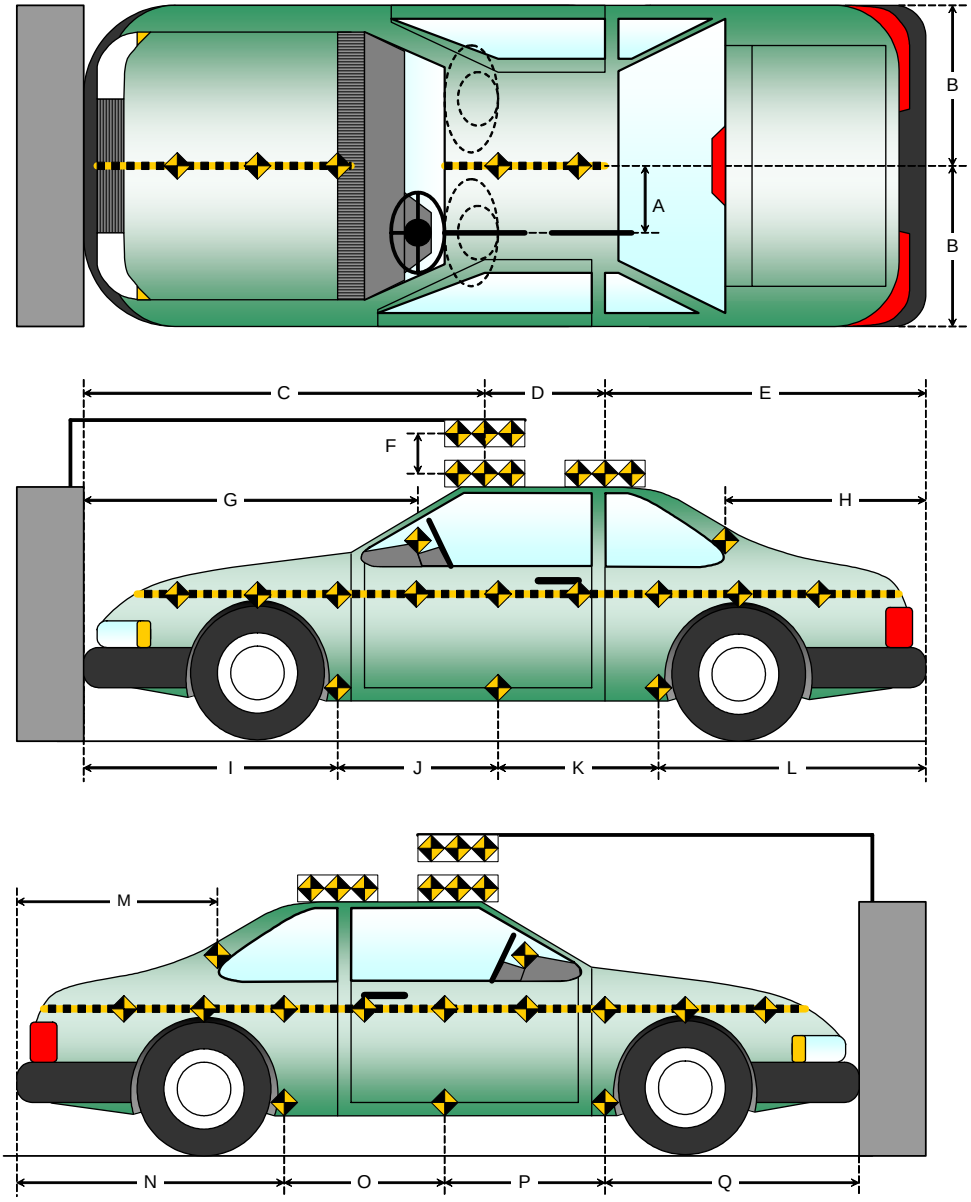
DATA SHEET NO. 15

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

All Dimensions in Millimeters (mm)	
Item	Value
A	350
B	265
C	2330
D	611
E	1920
F	295
G	1820
H	1110
I	1460
J	902
K	902
L	1565
M	1130
N	1570
O	905
P	905
Q	1465



DATA SHEET NO. 16

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

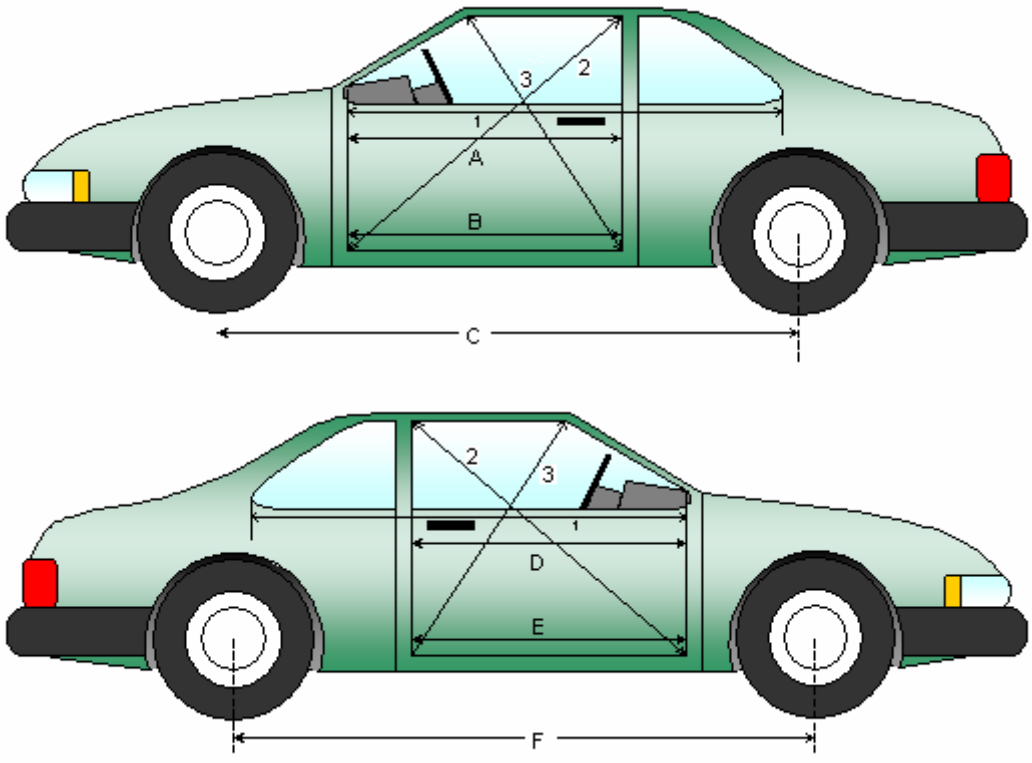
Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Difference
1L	Left Side	mm	987	978	9
2L	Left Side (Diagonally)	mm	1454	1458	-4
3L	Left Side (Diagonally)	mm	927	936	-9
1R	Right Side	mm	1001	996	5
2R	Right Side (Diagonally)	mm	1456	1461	-5
3R	Right Side (Diagonally)	mm	908	903	5

WHEELBASE MEASURMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2732	2675	57
F	Right Side Wheelbase	mm	2732	2693	39



DATA SHEET NO. 16…(CONTINUED)

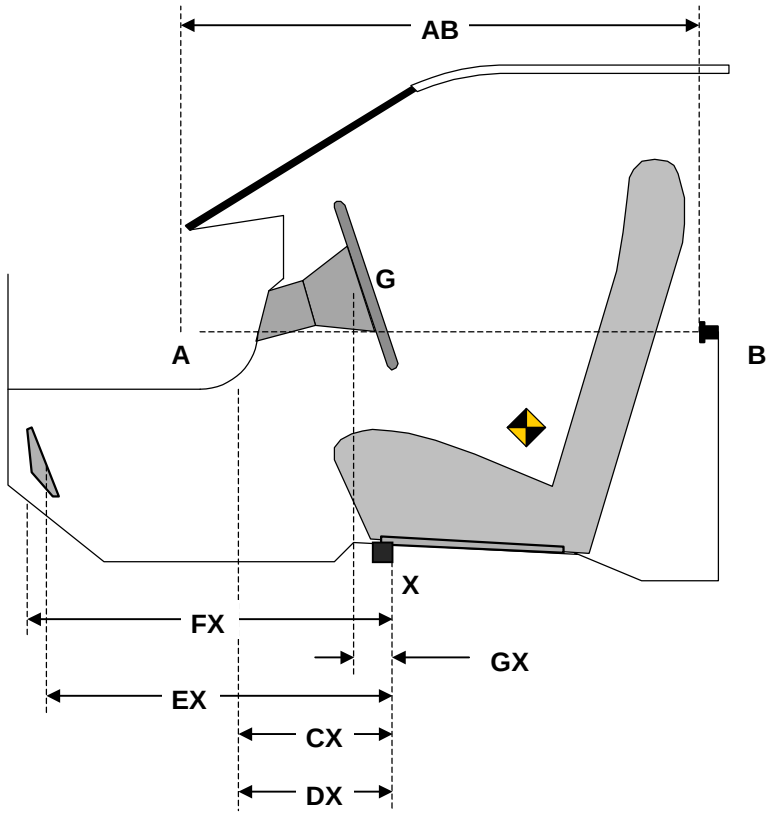
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Windown Jam)	mm	987	978	9
CX	Left Knee Bolster to X	mm	268	275	-7
DX	Right Knee Bolster to X	mm	267	255	12
EX	Brake Pedal to X	mm	550	420	130
FX	Foot Rest to X	mm	565	520	45
GX	Center of Steering Wheel Hub to X	mm	50	50	0

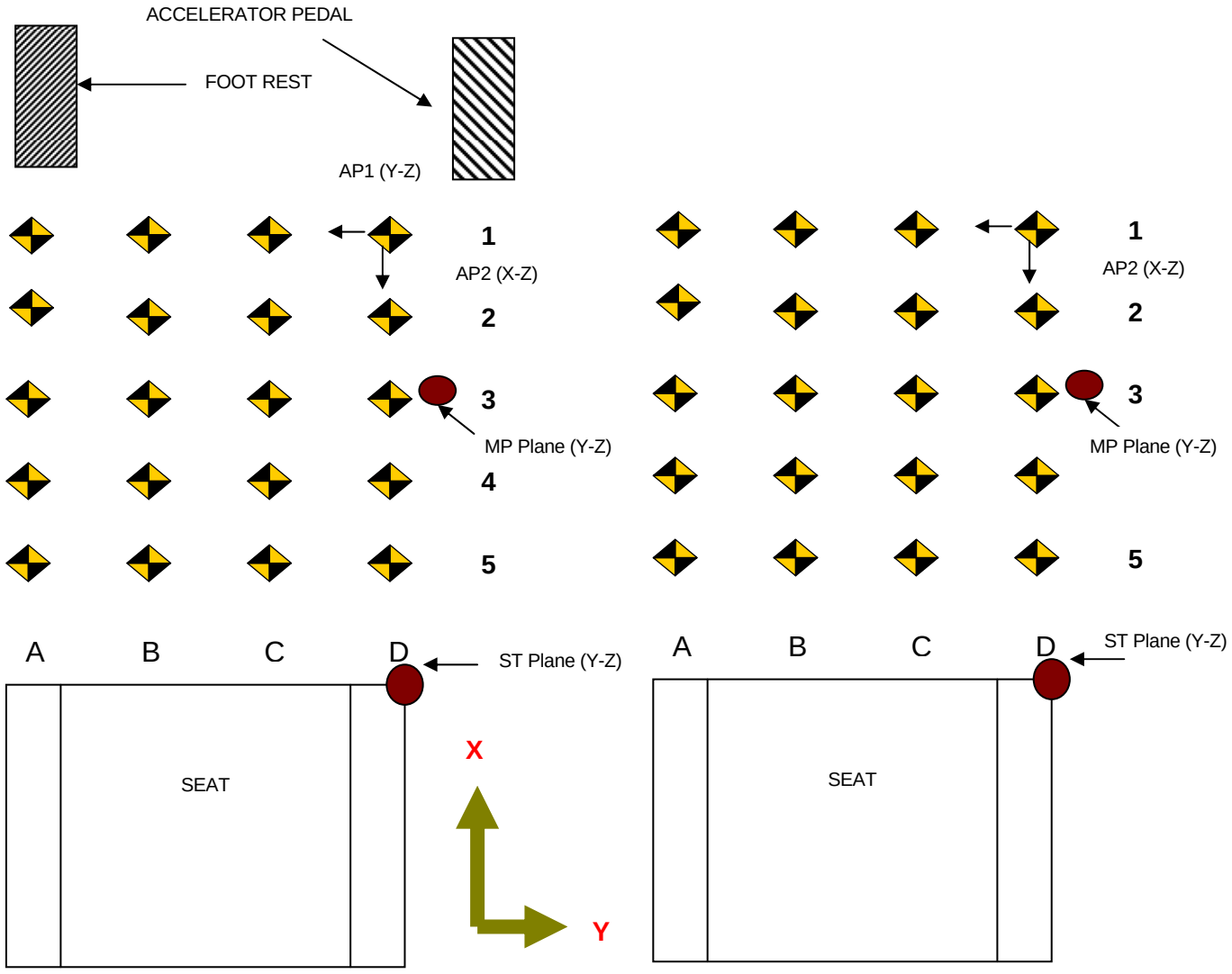


DATA SHEET NO. 16…(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09



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 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

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	-622	-668	-666	-656	-555	-572	-563	-564	-67	-96	-103	-92
2	-553	-572	-562	-530	-492	-493	-479	-445	-61	-79	-83	-85
3	-482	-477	-469	-453	-446	-411	-395	-369	-36	-66	-74	-84
4	-411	-402	-396	-383	-361	-345	-331	-303	-50	-57	-65	-80
5	-337	-328	-320	-307	-288	-276	-264	-231	-49	-52	-56	-76

DRIVER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	40	164	273	443	51	179	285	455	-11	-15	-12	-12
2	-41	153	267	438	-41	153	263	443	0	0	4	-5
3	35	147	260	430	31	136	248	421	4	11	12	9
4	29	141	255	430	32	140	254	419	-3	1	1	11
5	26	136	250	427	30	132	249	412	-4	4	1	15

DRIVER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-72	-34	-26	-20	-88	-64	-47	-44	16	30	21	24
2	-9	37	45	29	1	21	40	20	-10	16	5	9
3	70	72	71	73	82	80	87	59	-12	-8	-16	14
4	73	73	71	74	96	103	94	56	-23	-30	-23	18
5	85	75	73	78	110	124	120	67	-25	-49	-47	11

DATA SHEET NO. 16…(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

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	680	677	677	658	604	609	615	608	76	68	62	50
2	571	577	574	473	500	522	533	550	71	55	41	26
3	400	473	472	396	401	422	434	445	71	51	38	28
4	323	397	396	322	333	349	359	372	67	48	37	24
5	323	323	321	322	258	275	286	302	65	48	35	20

PASSENGER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	403	236	114	27	402	236	115	25	1	0	-1	2
2	412	237	115	19	405	231	111	17	7	6	4	2
3	413	239	114	18	390	224	101	10	23	15	13	8
4	413	239	116	15	381	217	96	-2	32	22	20	17
5	413	238	113	18	372	209	87	1	41	29	26	17

PASSENGER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	30	25	25	31	24	19	17	17	6	6	8	14
2	-50	-48	-46	-41	-59	-69	-73	-72	9	21	27	31
3	-61	-65	-65	-67	-66	-104	-105	-89	5	39	40	22
4	-63	-67	-67	-69	-57	-113	-120	-108	-6	46	53	39
5	-68	-67	-72	-80	-57	-126	-125	-116	-11	59	53	36

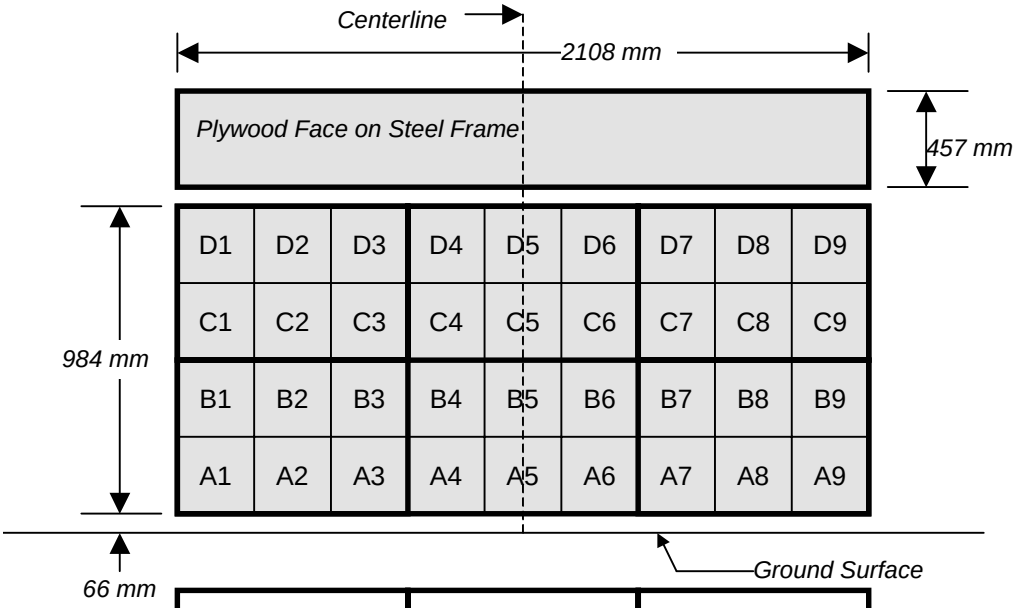
DATA SHEET NO. 17

FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

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 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09

VEHICLE INFORMATION

VIN: 3FADP0L35AR116546 Wheelbase (mm): 2732

Vehicle Size Category: 4-Door Sedan Test Weight (kg): 1889

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): 56.35

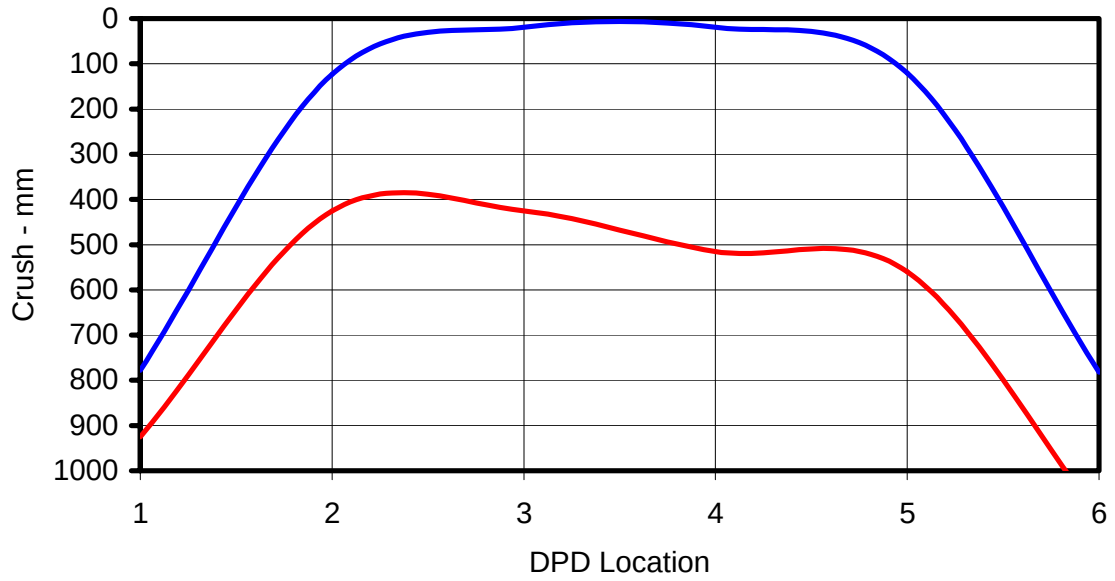
Velocity Change (km/h): 65.8 Time of Separation (msec): 78.6

CRUSH PROFILE

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

Damage Region Length: 1820 Impact Mode: Full frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side of vehicle	mm	778	925	-147
C2	Crush zone 2 on left side of vehicle	mm	123	425	-302
C3	Crush zone 3 on left side of vehicle	mm	19	425	-406
C4	Crush zone 4 on right side of vehicle	mm	19	515	-496
C5	Crush zone 5 on right side of vehicle	mm	120	560	-440
C6	Crush zone 6 at right side of vehicle	mm	782	1100	-318

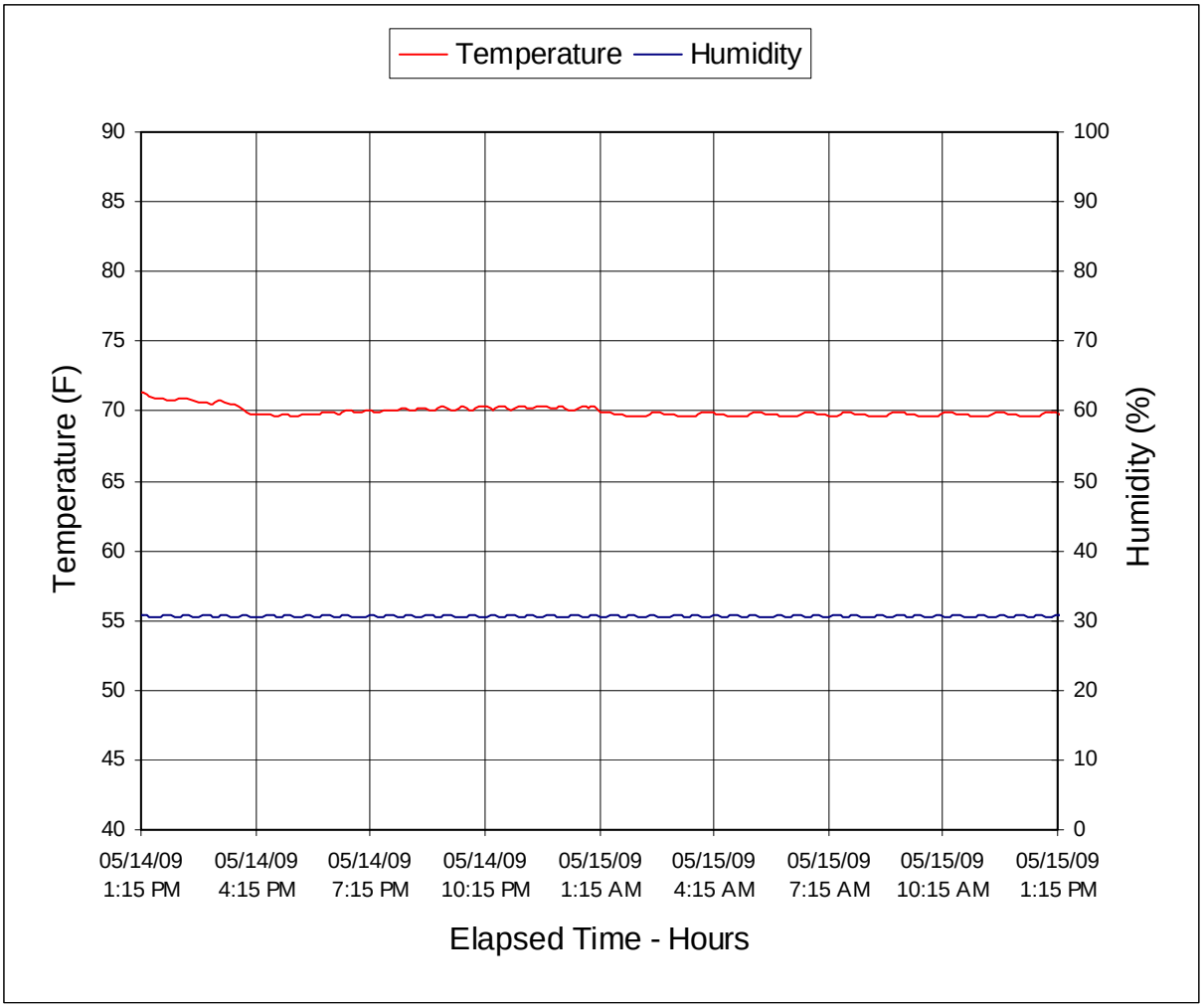


DATA SHEET NO. 19

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2010 Ford Fusion Hybrid 4-Door Sedan NHTSA No.: MA0200

Test Program: NHTSA 35mph NCAP Test Date: 5/15/09



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

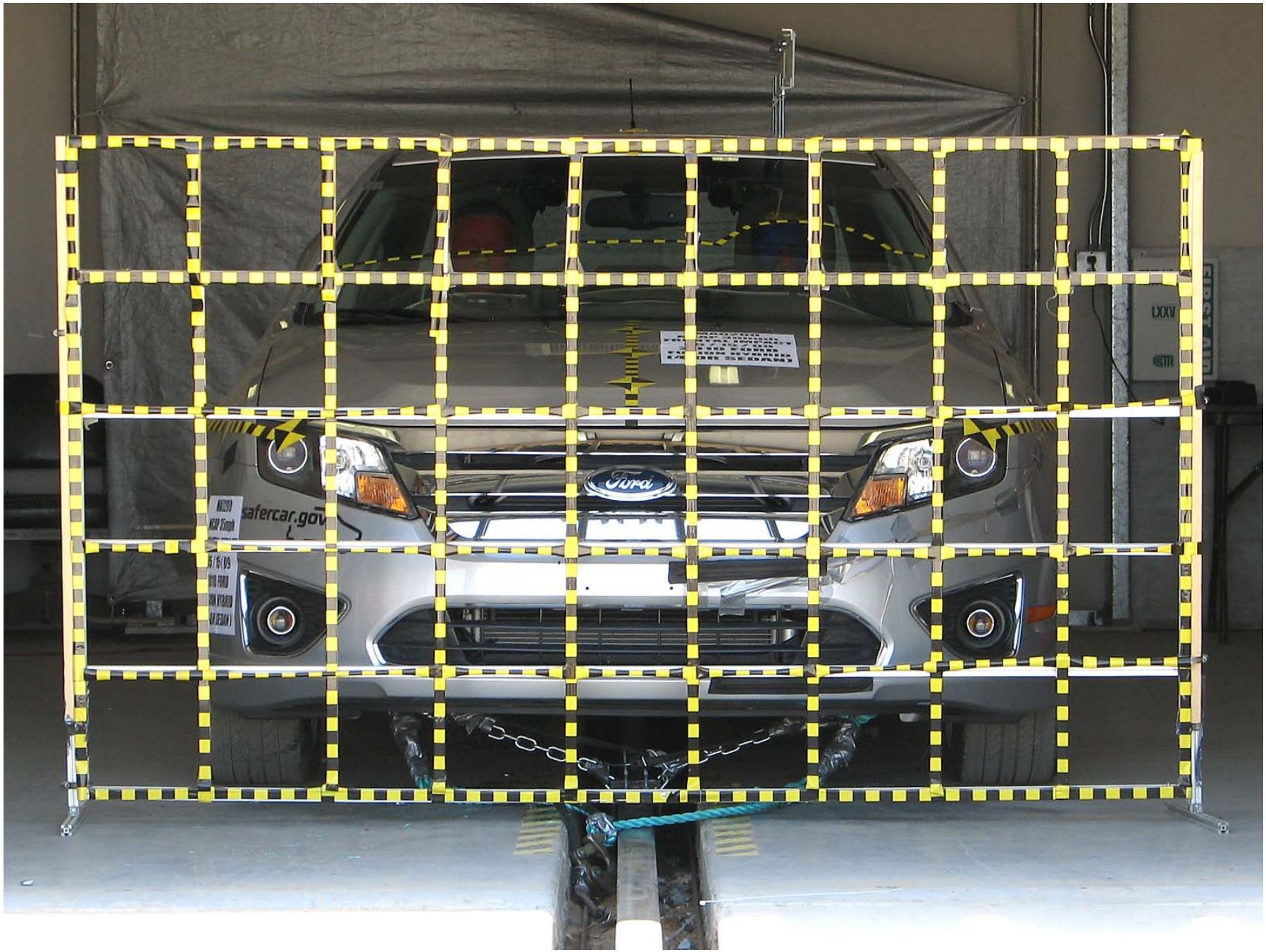


Figure A-1: Load Cell Location

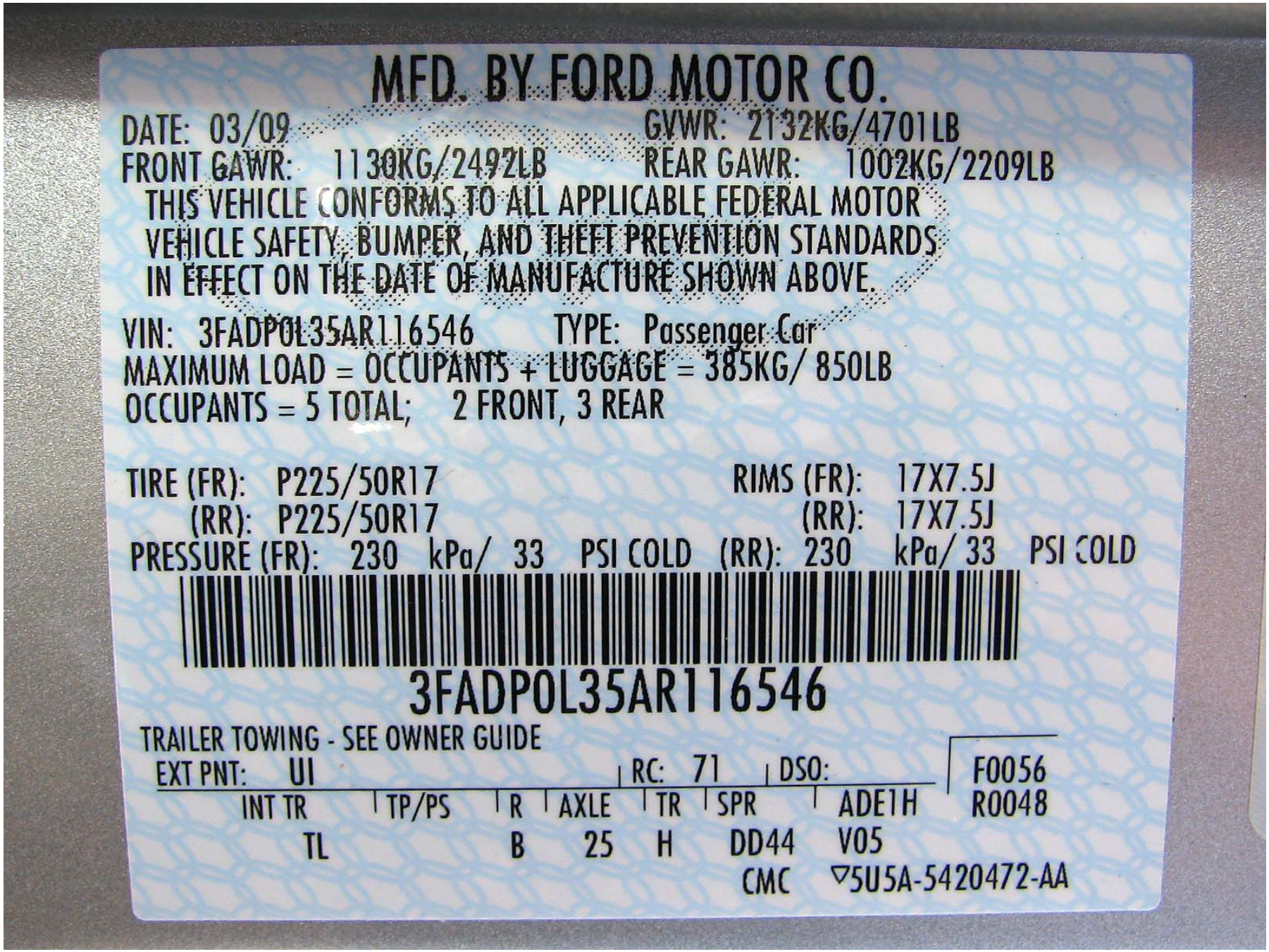


Figure A-2: Manufacturer's Label

Figure A-3: Tire Placard

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

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

Figure A-6: Pre-Test Front View

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

Figure A-8: Pre-Test Left Side View

Figure A-9: Post-Test Left Side View

Figure A-10: Pre-Test Right Side View

Figure A-11: Post-Test Right Side View

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

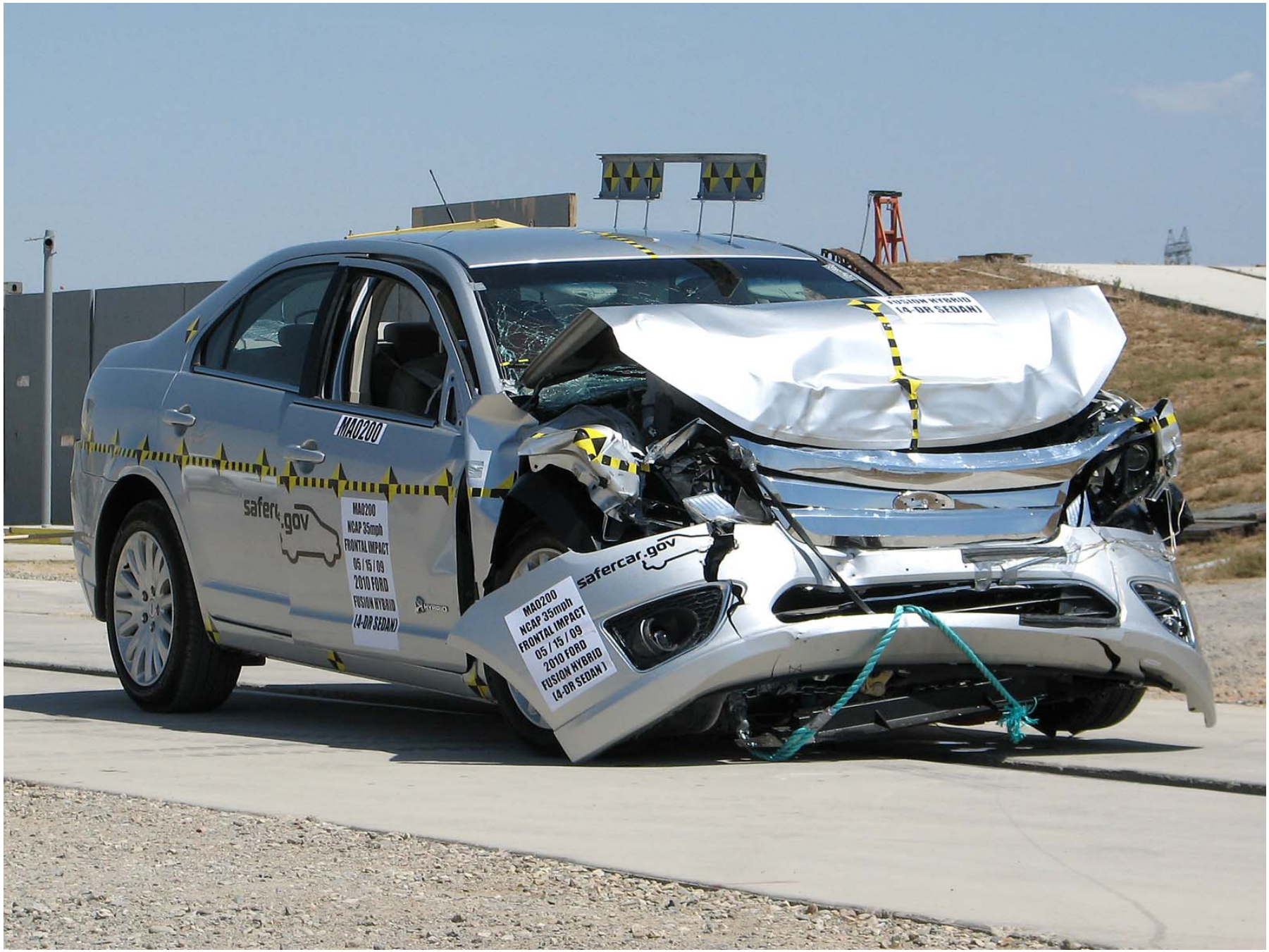


Figure A-13: Post-Test Right Front ¾ View (Vehicle Moved)

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

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

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

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

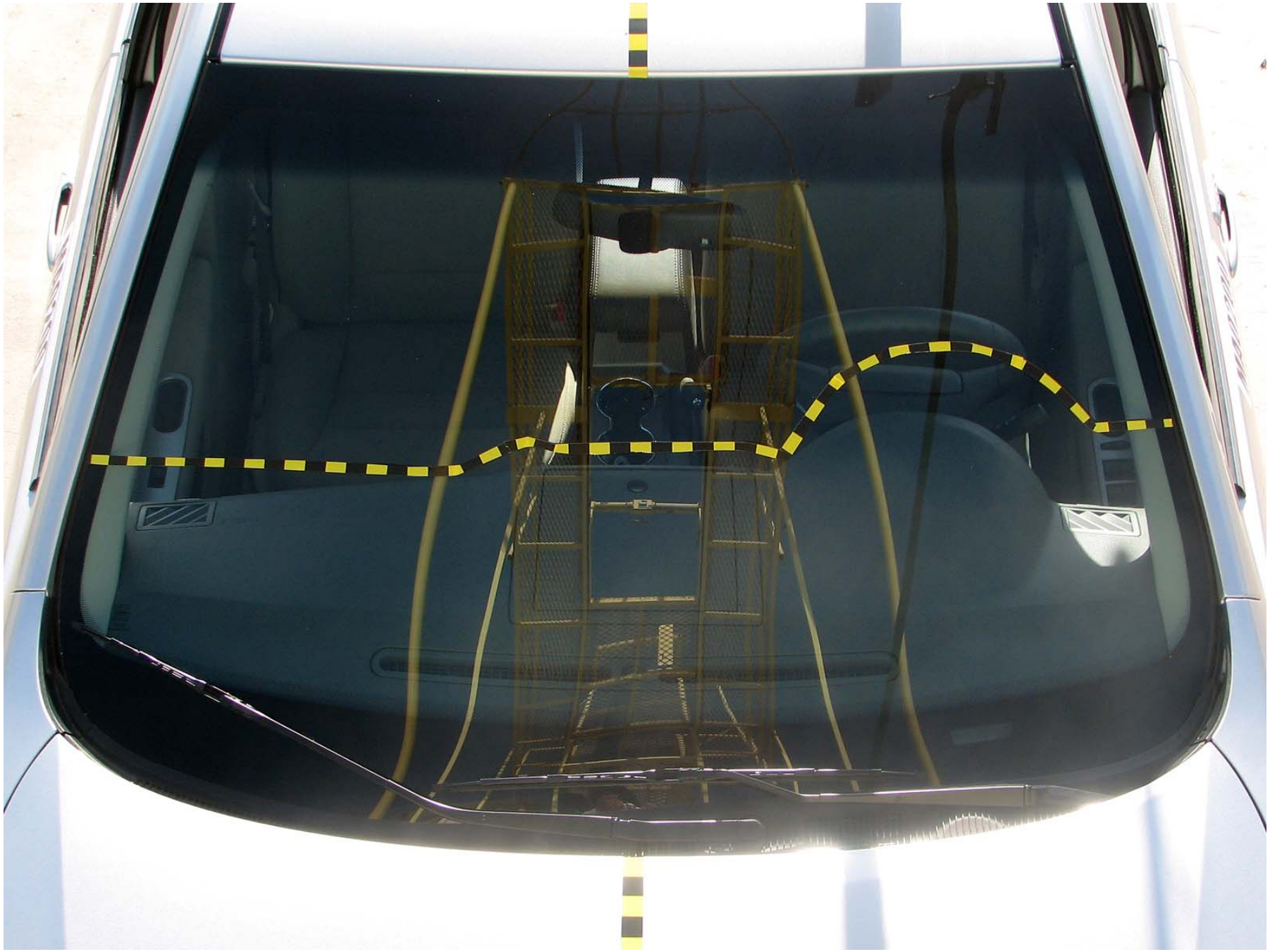


Figure A-18: Pre-Test Windshield

Figure A-19: Post-Test Windshield

Figure A-20: Pre-Test Engine Compartment

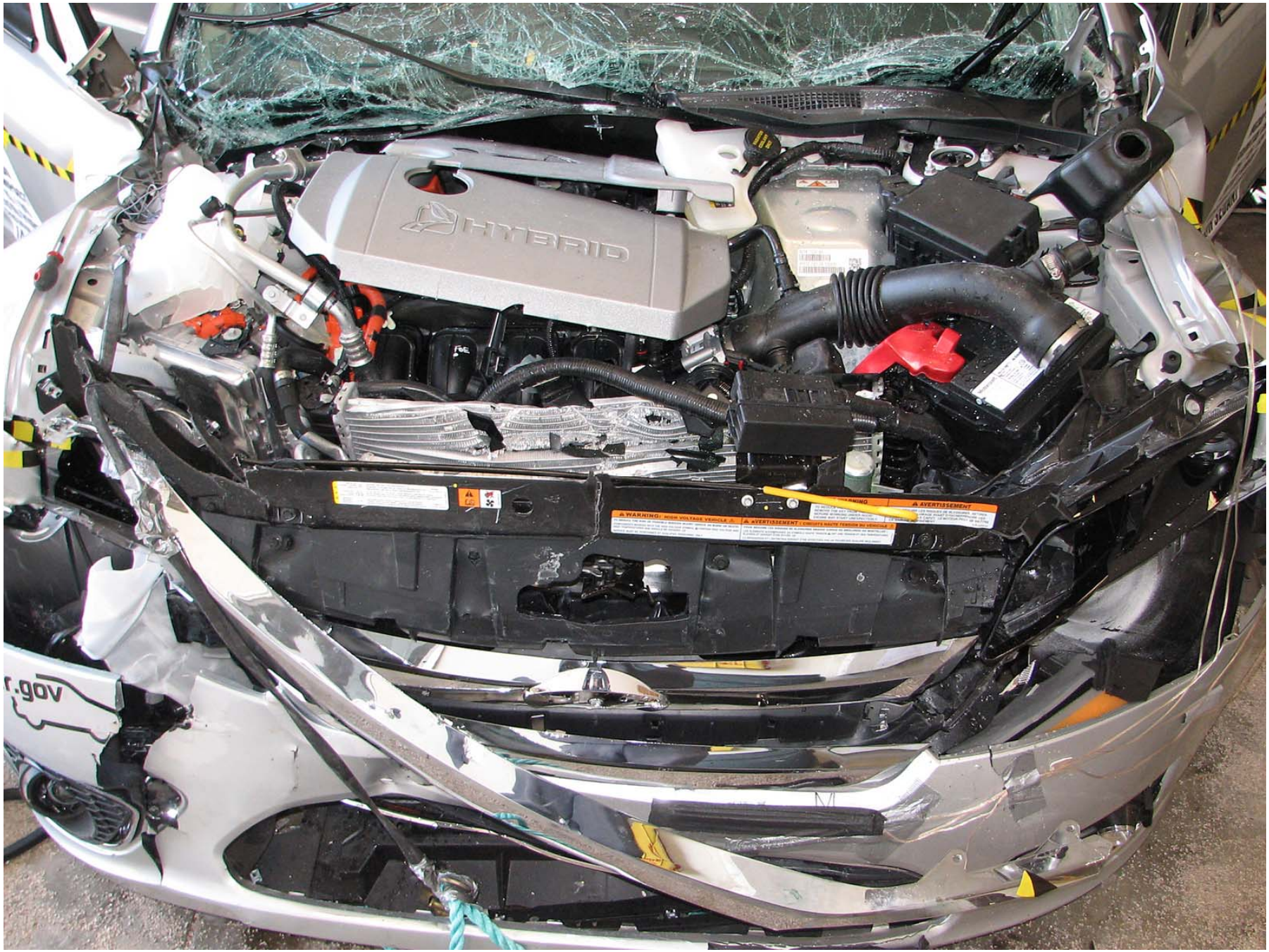


Figure A-21: Post-Test Engine Compartment (Vehicle Moved)

Figure A-22: Pre-Test Fuel Cap

Figure A-23: Post-Test Fuel Cap

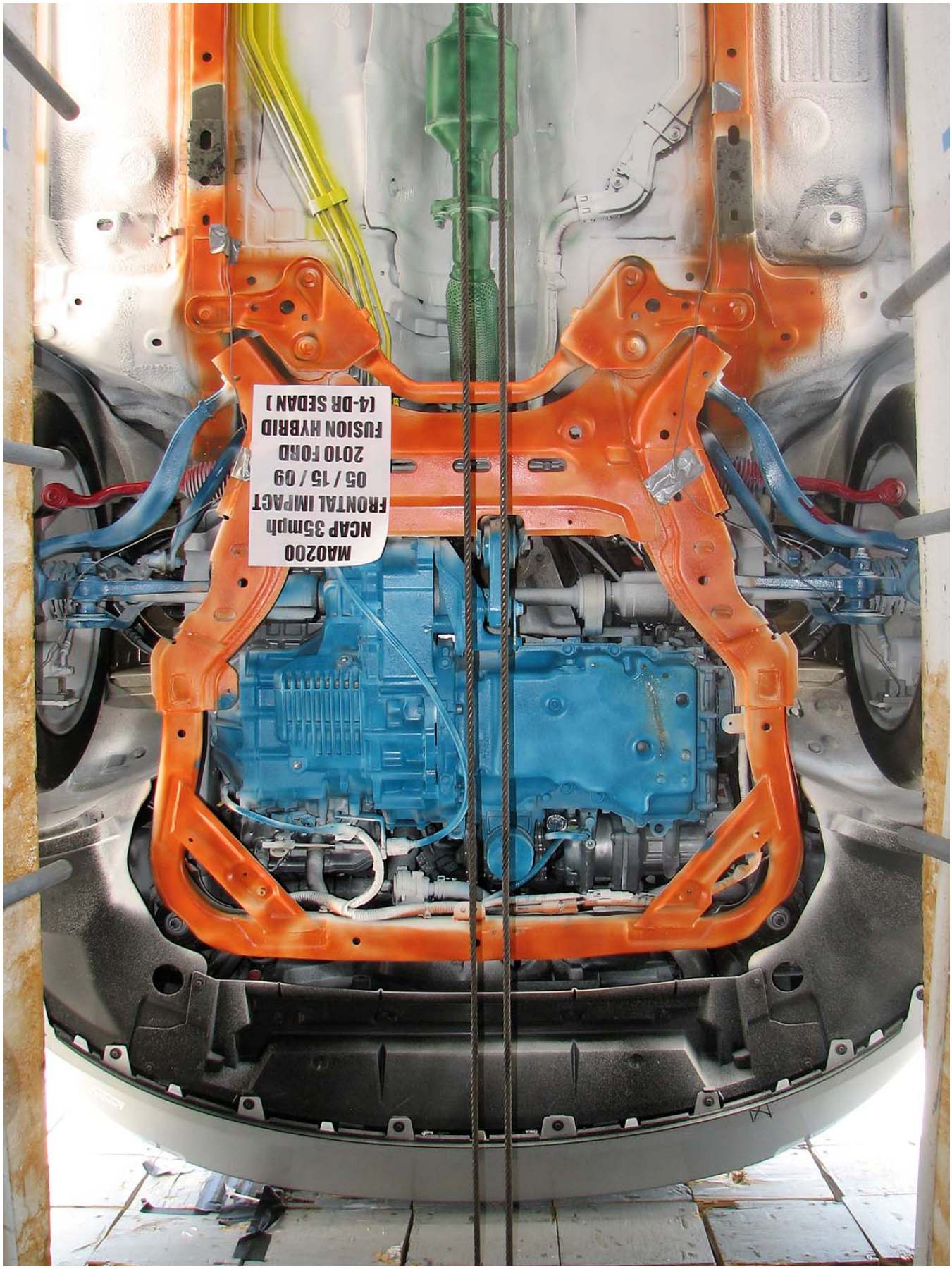


Figure A-24: Pre-Test Front Underbody

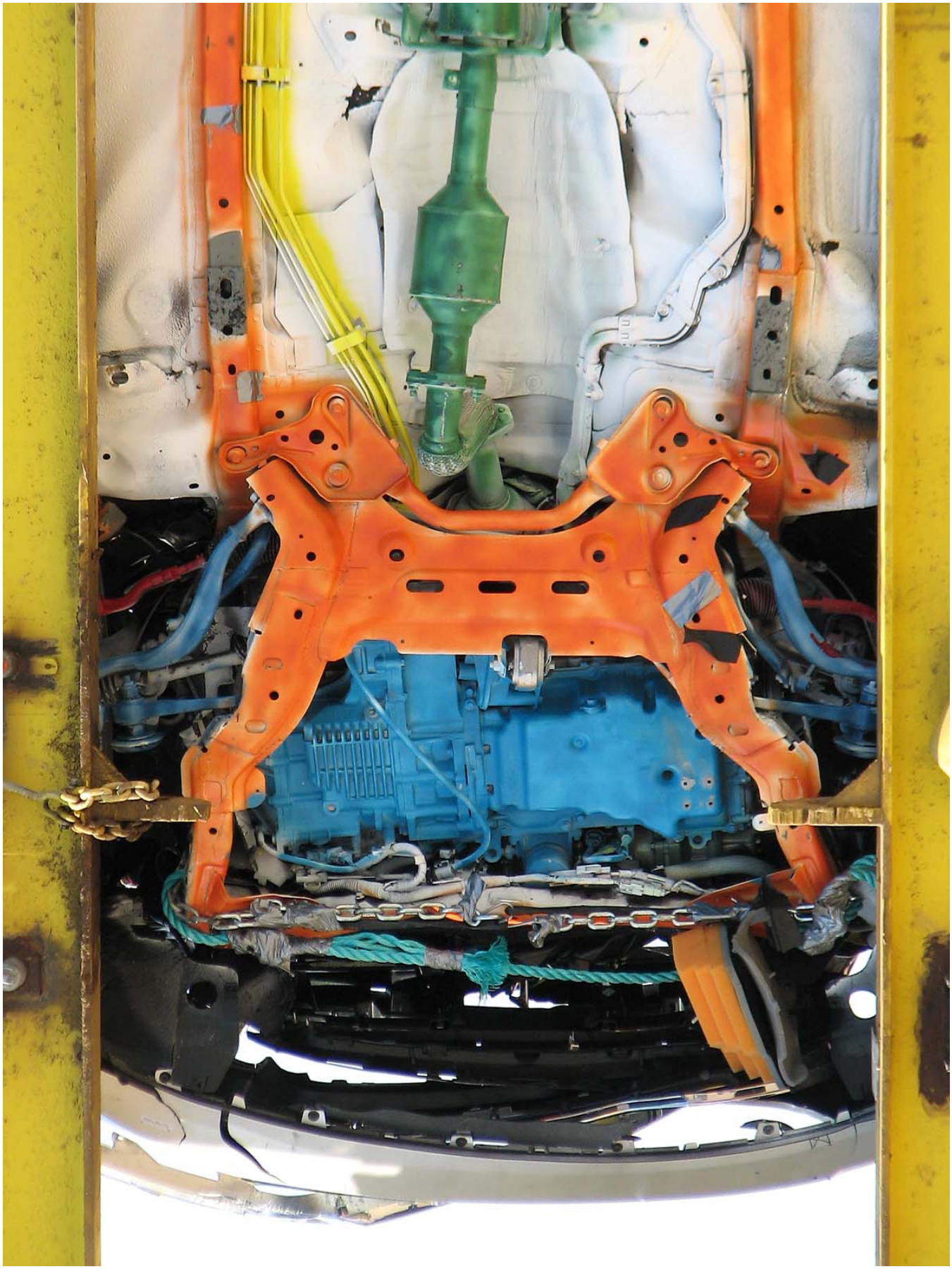


Figure A-25: Post-Test Front Underbody

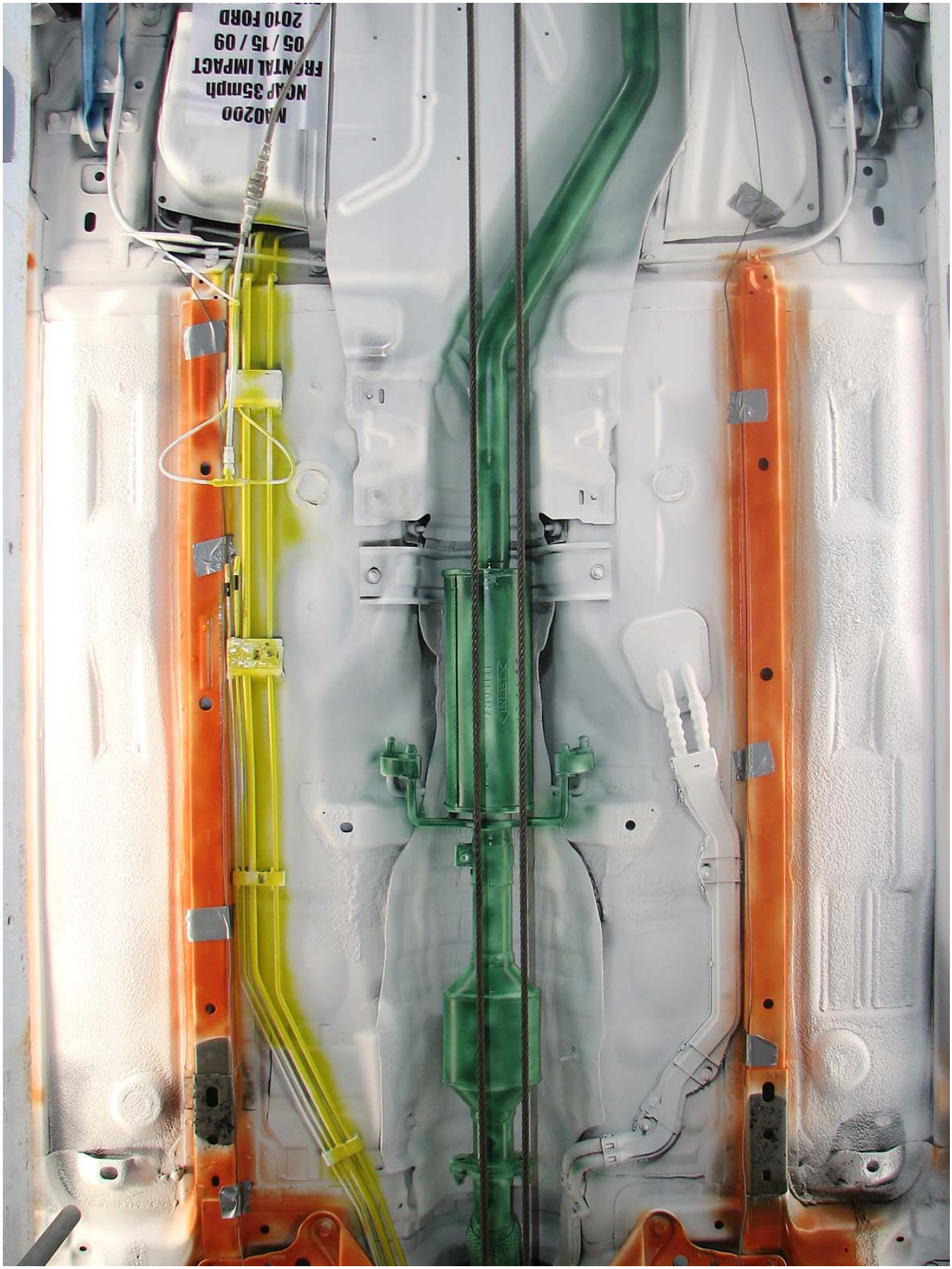


Figure A-26: Pre-Test Mid Underbody

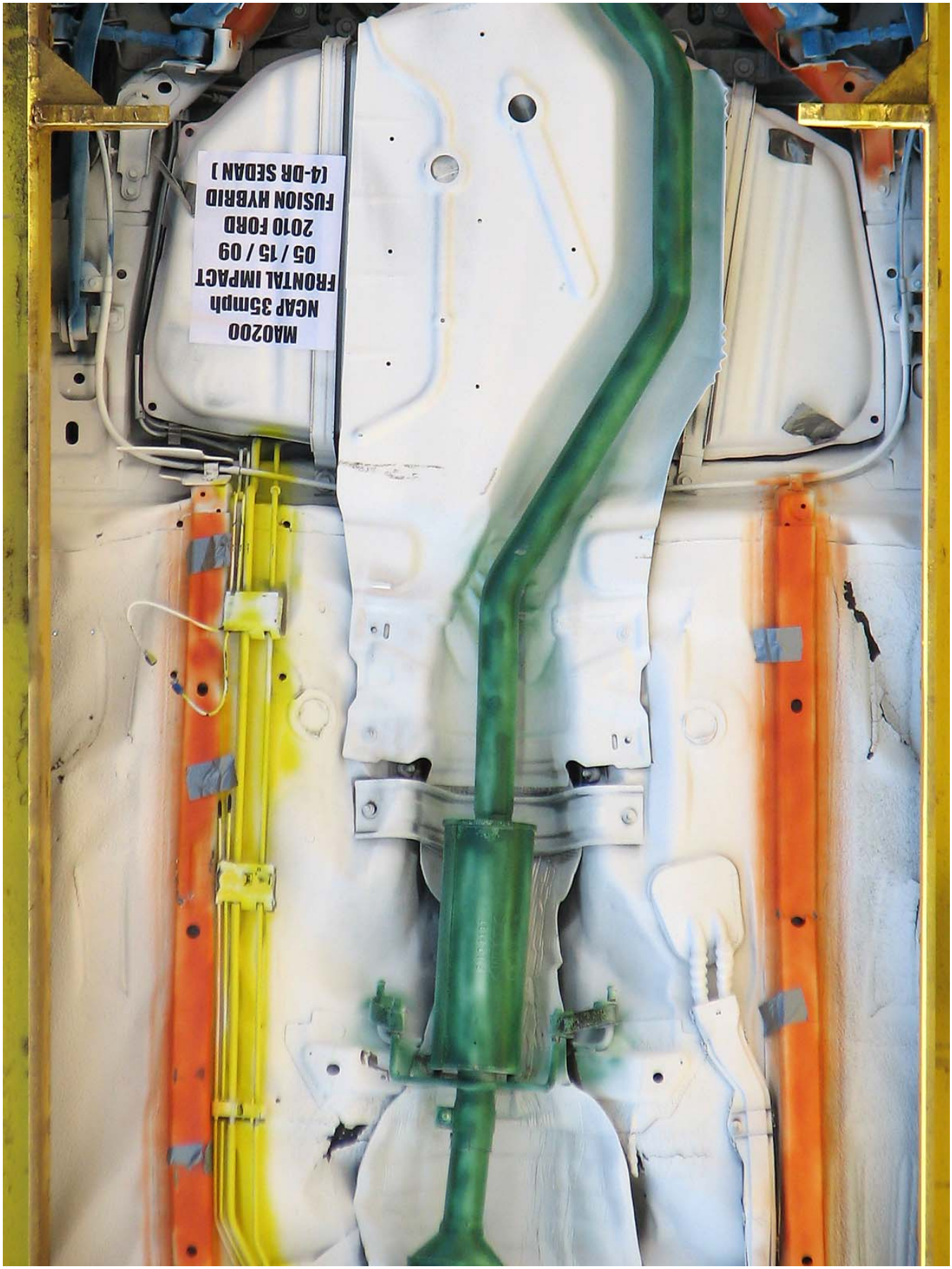


Figure A-27: Post-Test Mid Underbody

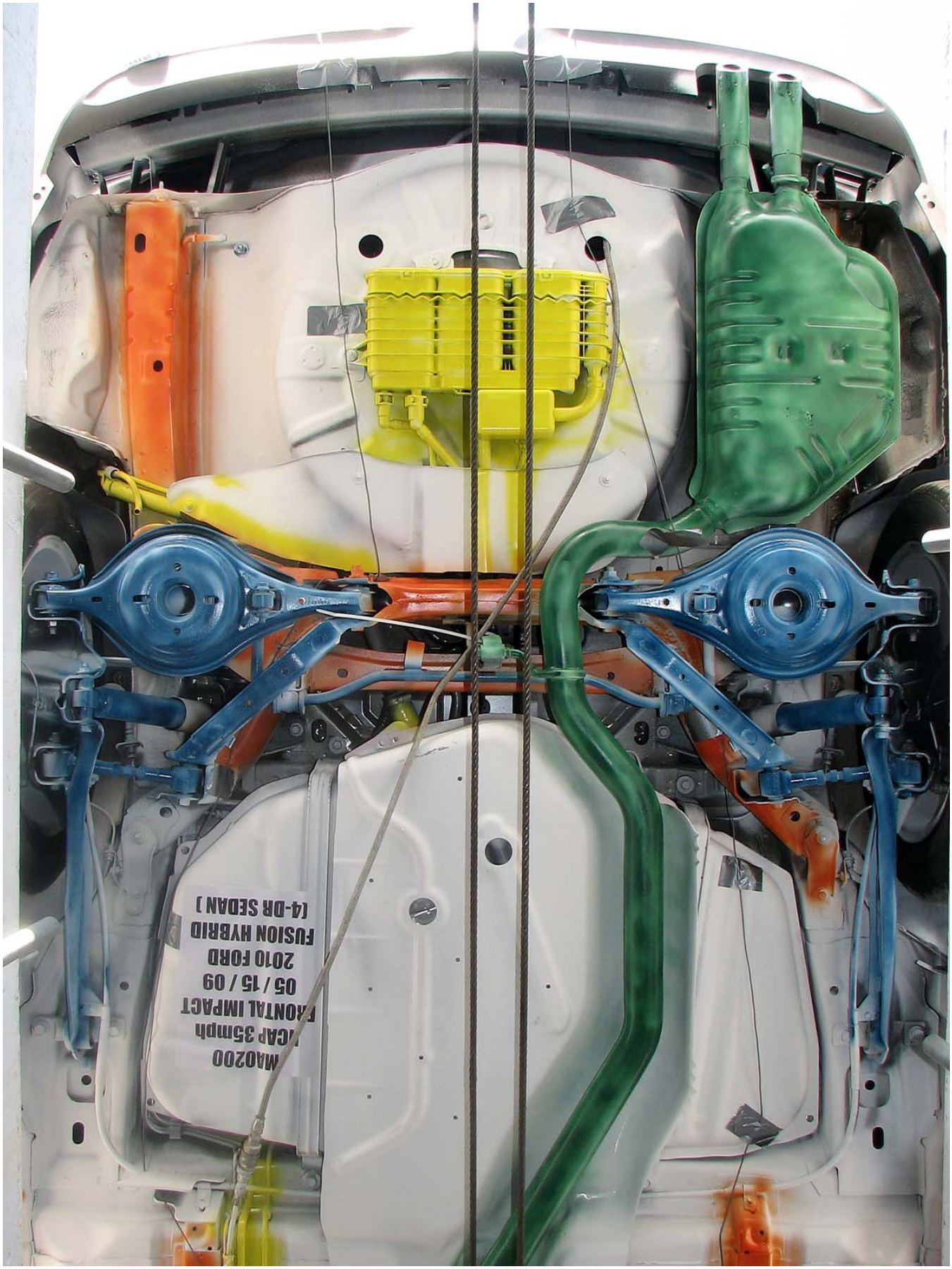


Figure A-28: Pre-Test Rear Underbody

Figure A-29: Post-Test Rear Underbody

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

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

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

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

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

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

Figure A-36: Pre-Test Driver Dummy Feet

Figure A-37: Post-Test Driver Dummy Feet

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

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

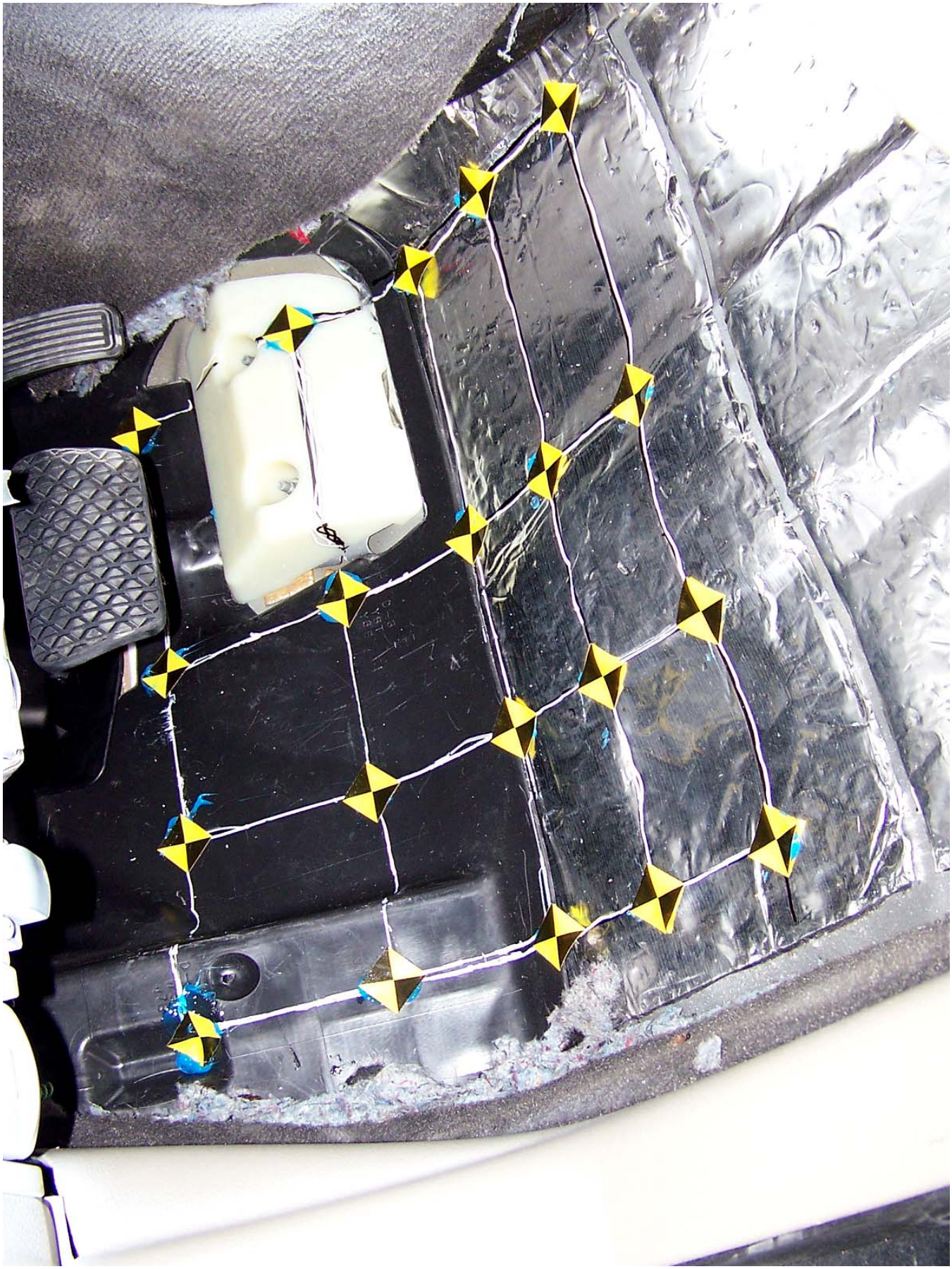


Figure A-40: Pre-Test Driver Side Floor Pan

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

Figure A-42: Post-Test Driver Dummy Head

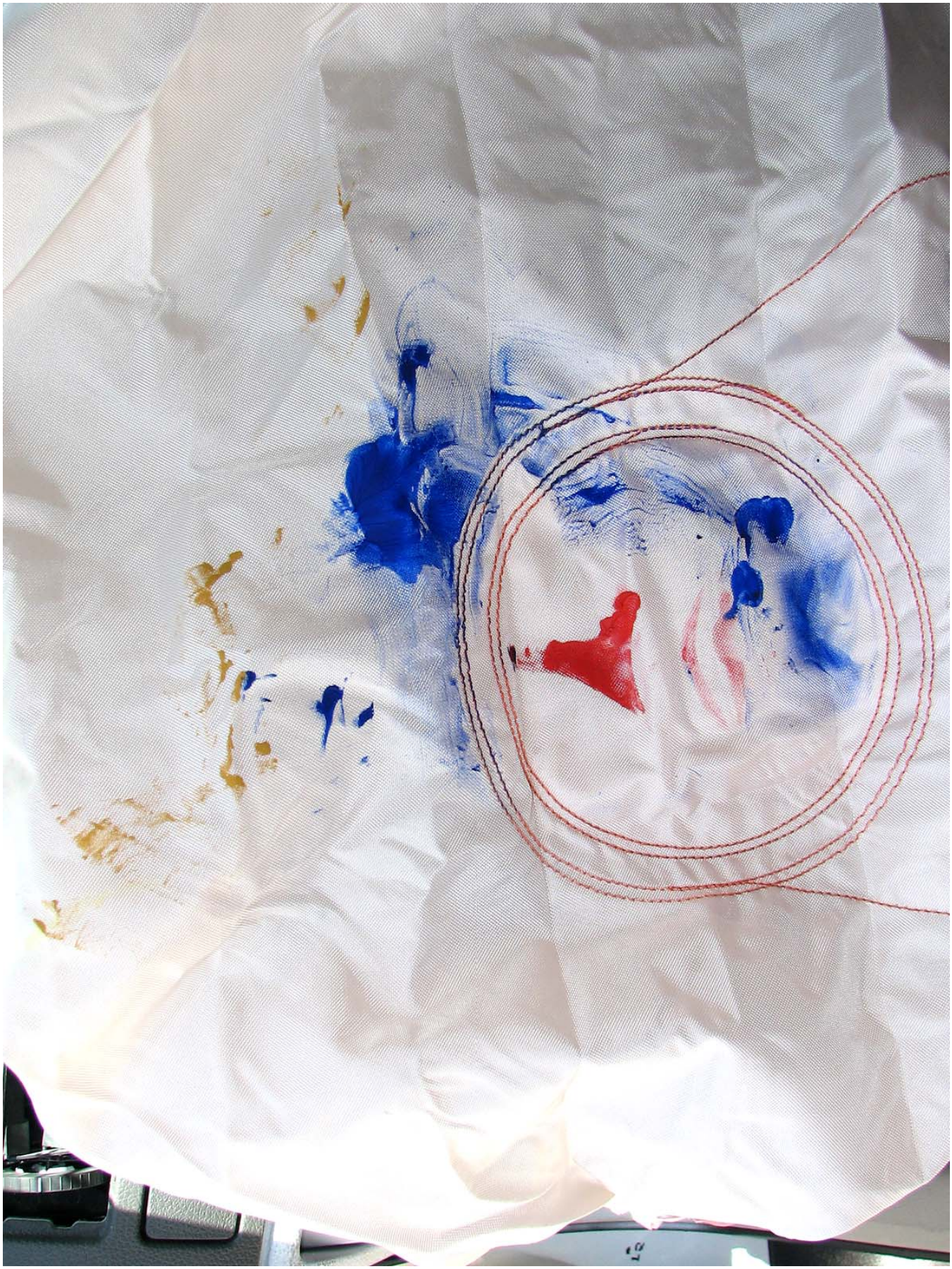


Figure A-43: Post-Test Driver Dummy Airbag Contact

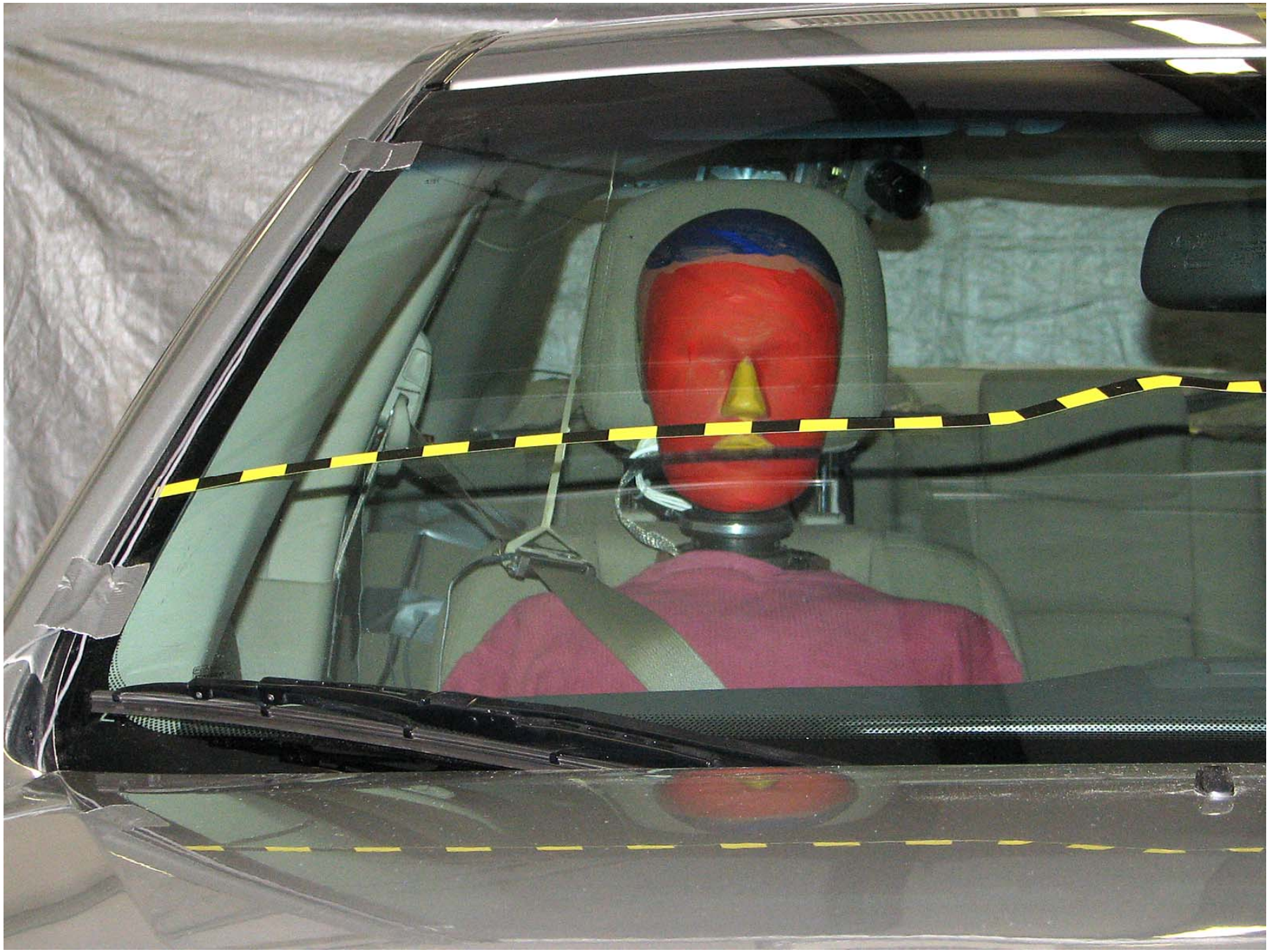


Figure A-44: Pre-Test Passenger Dummy Front View (Head Position)

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

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

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

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

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

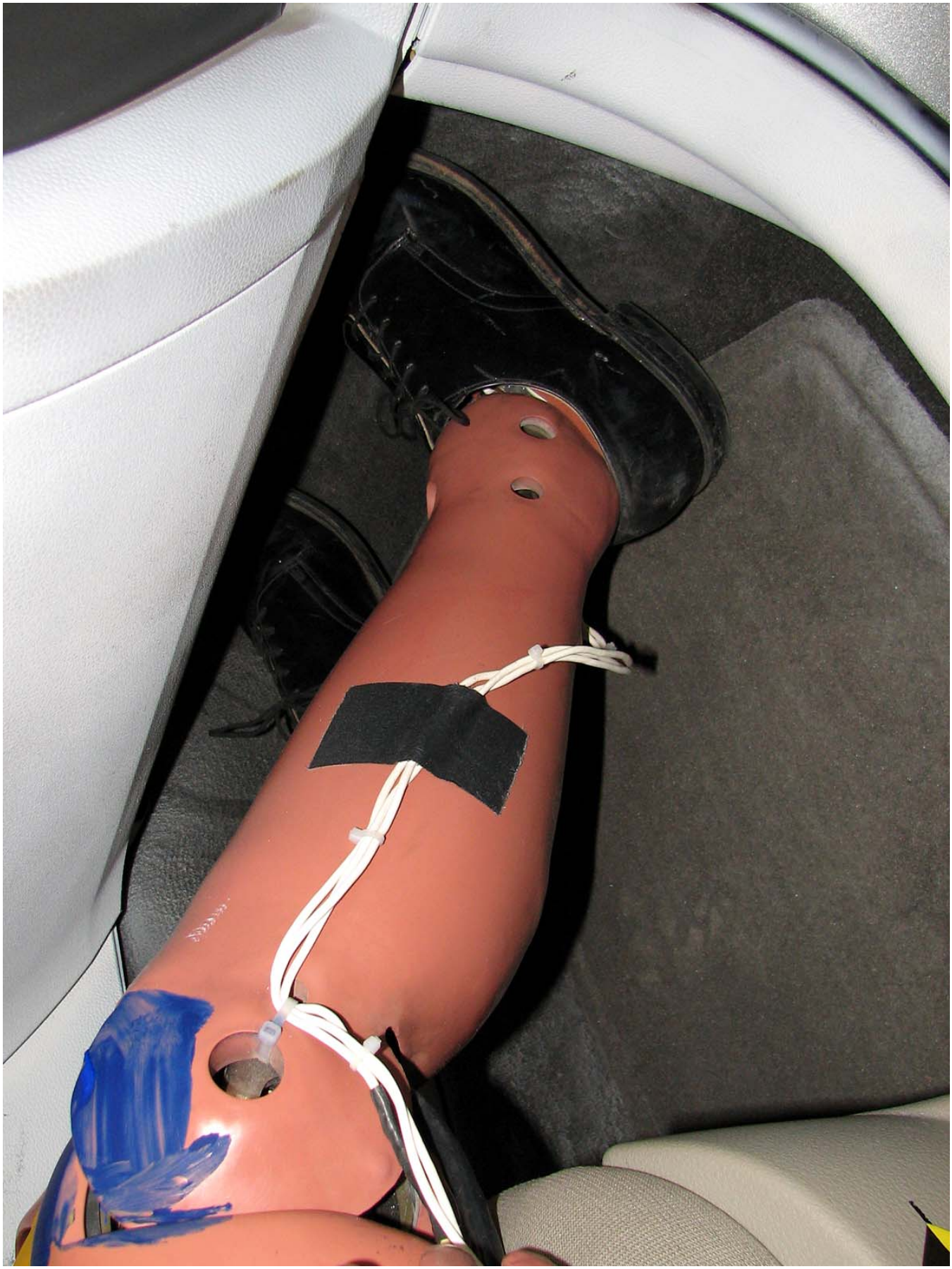


Figure A-50: Pre-Test Passenger Dummy Feet

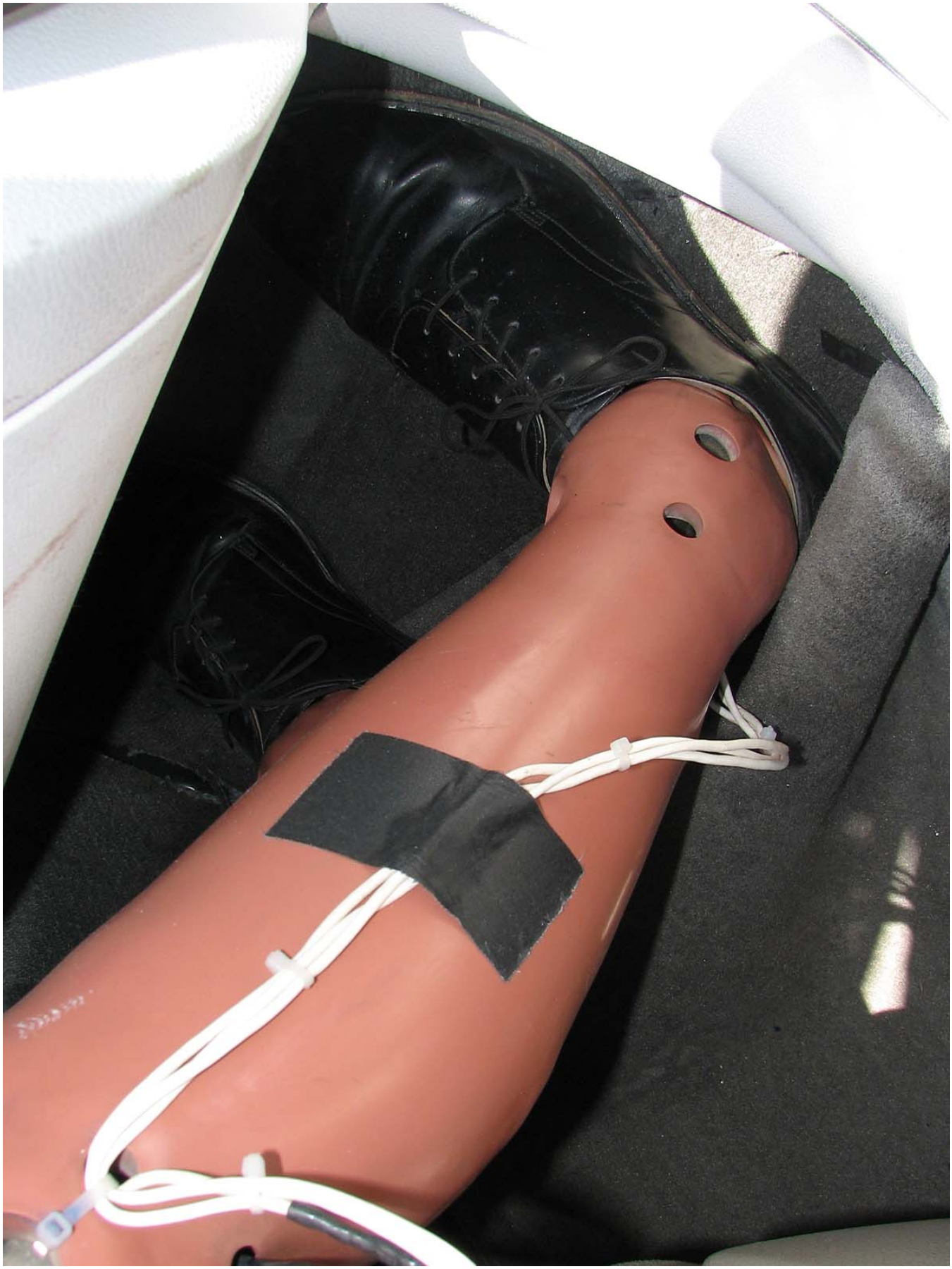


Figure A-51: Post-Test Passenger Dummy Feet

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

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

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

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

Figure A-56: Post-Test Passenger Dummy Head

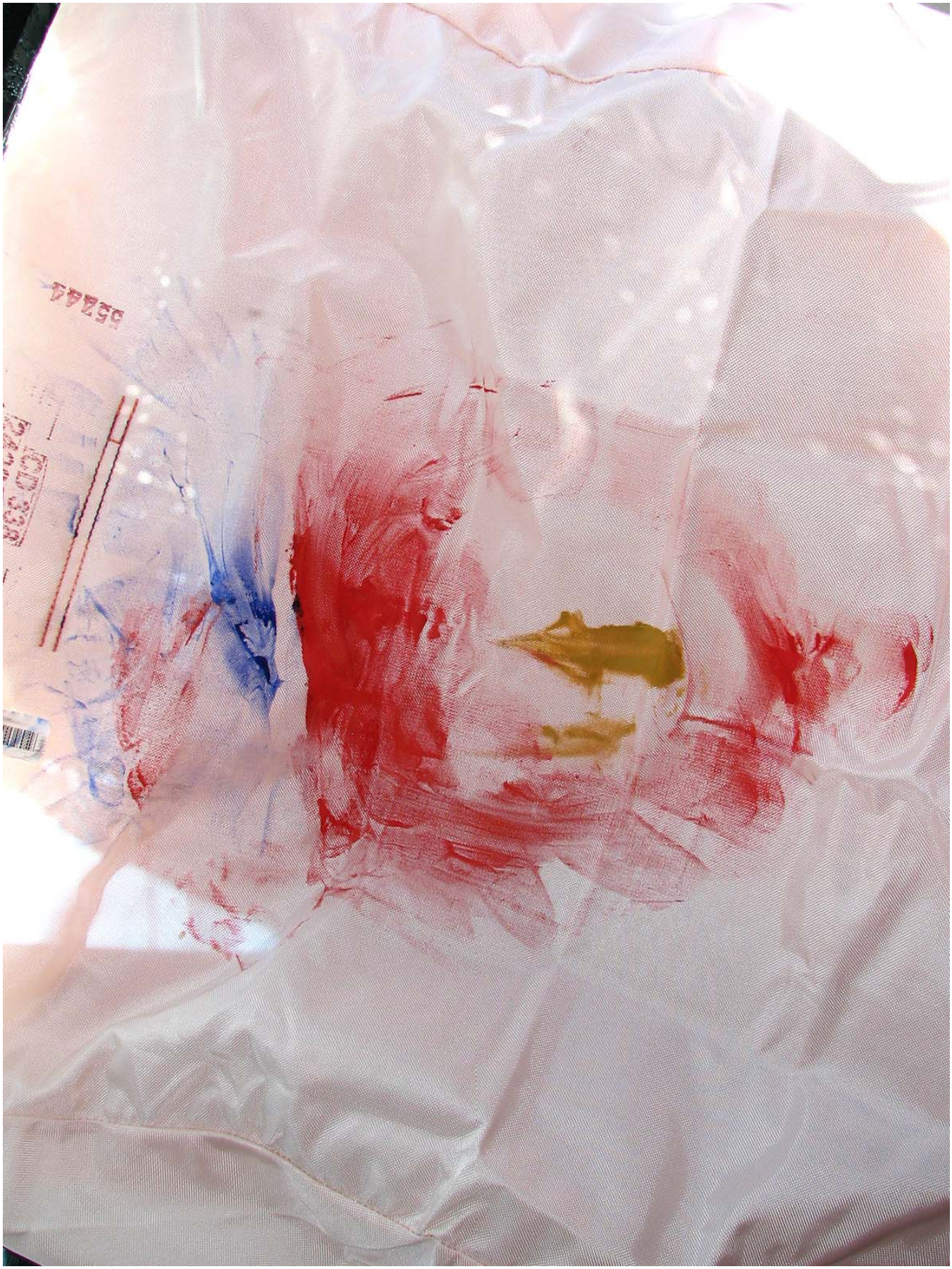


Figure A-57: Post-Test Passenger Dummy Airbag Contact

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

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

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

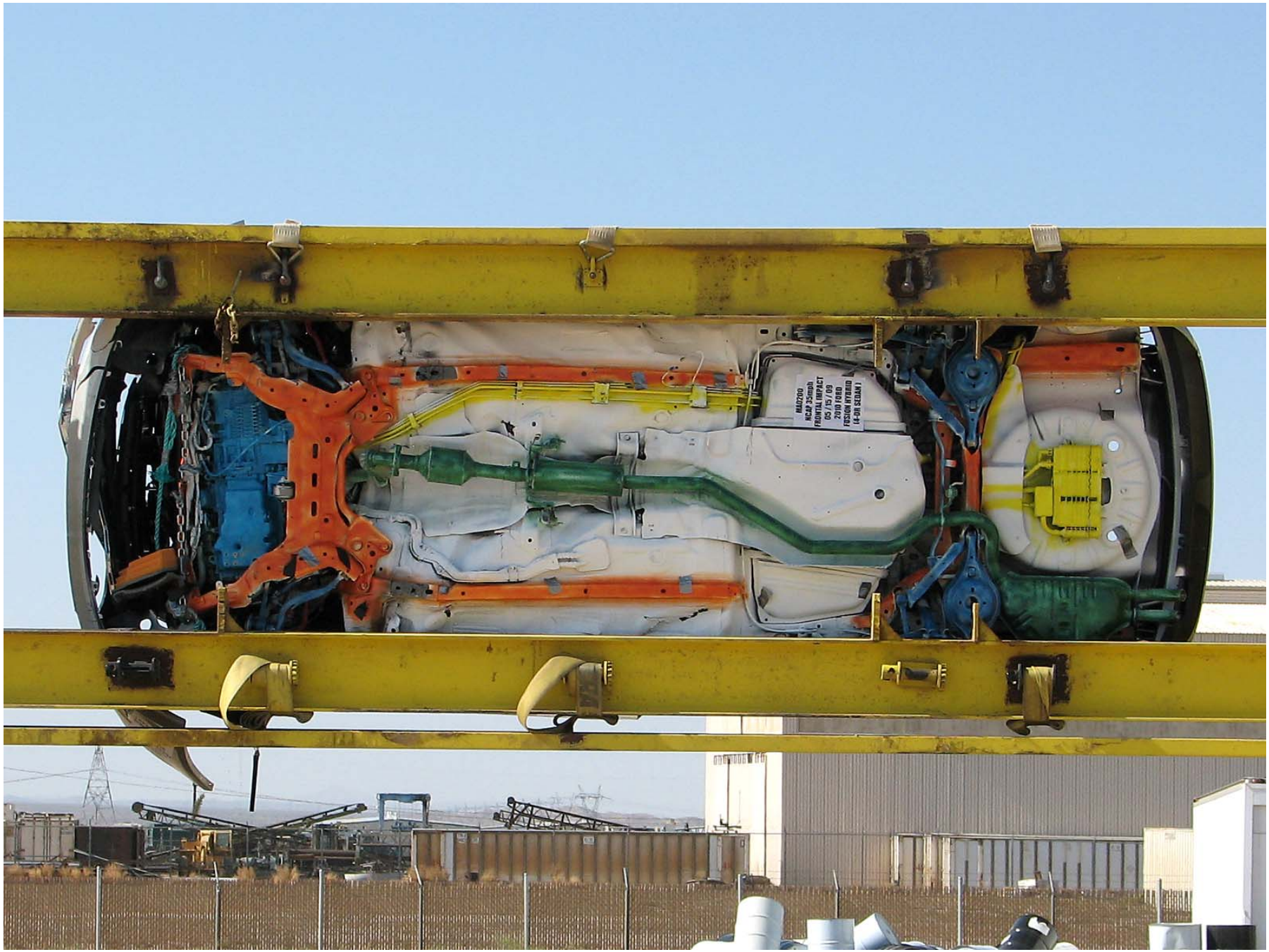


Figure A-61: Vehicle on Rollover Device (270°)

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

Figure A-63: Timers

Figure A-64: Vehicle Impact

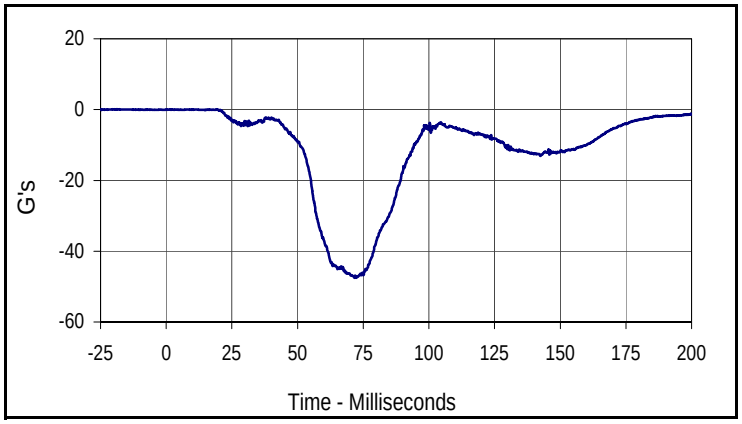
APPENDIX B
DATA PLOTS

LIST OF DATA PLOTS

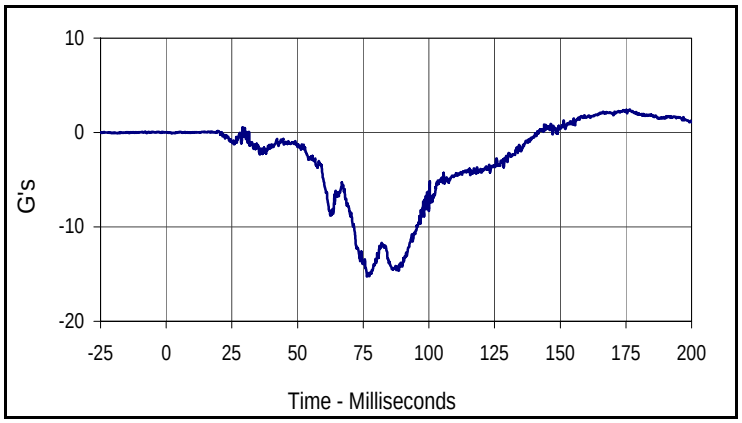
The following additional data plots for this test can be obtained from the research and development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov.

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

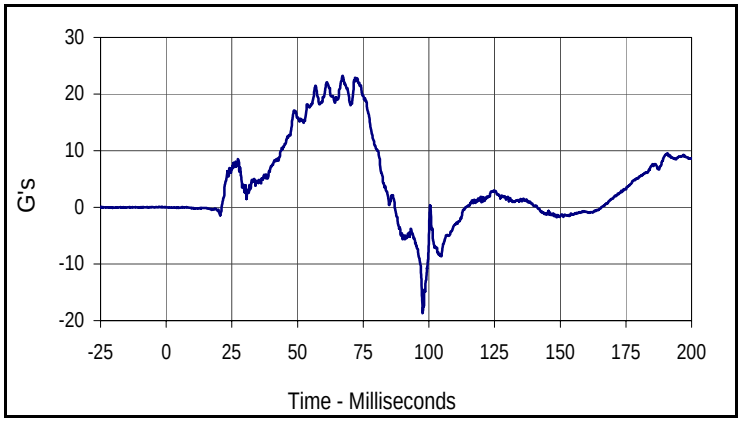
Test Vehicle:	2010 Ford Fusion Hybrid 4-Door Sedan	Test Date:	5/15/09
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	MA0200



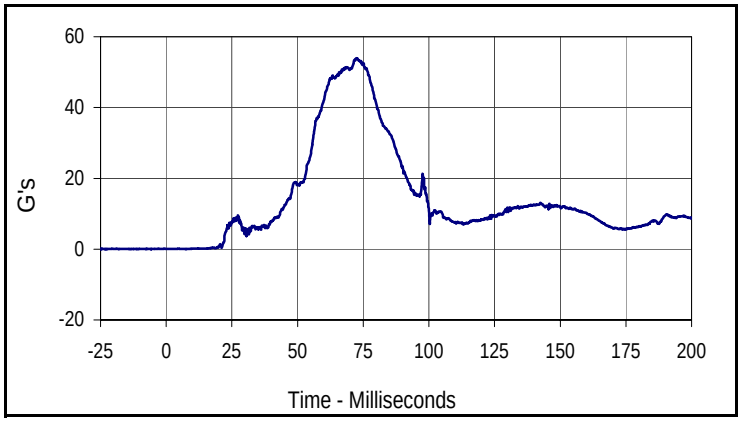
Curve Description			
Driver Head X Primary			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
0.1	19.6	-47.6	72.3



Curve Description			
Driver Head Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.4	176.5	-15.2	76.5



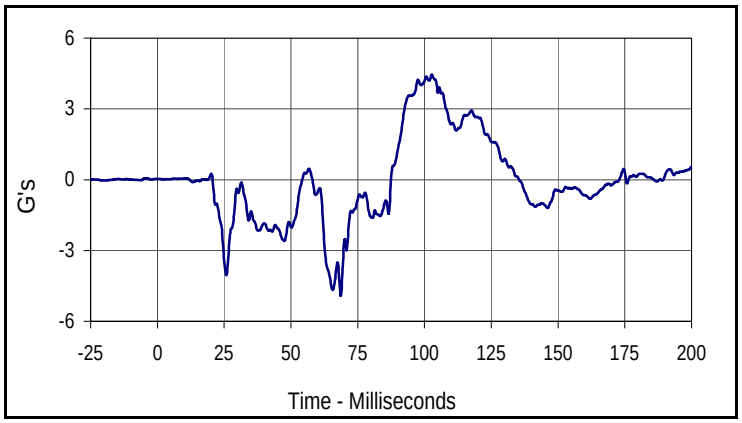
Curve Description			
Driver Head Z Primary			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
23.2	67.2	-18.7	97.6



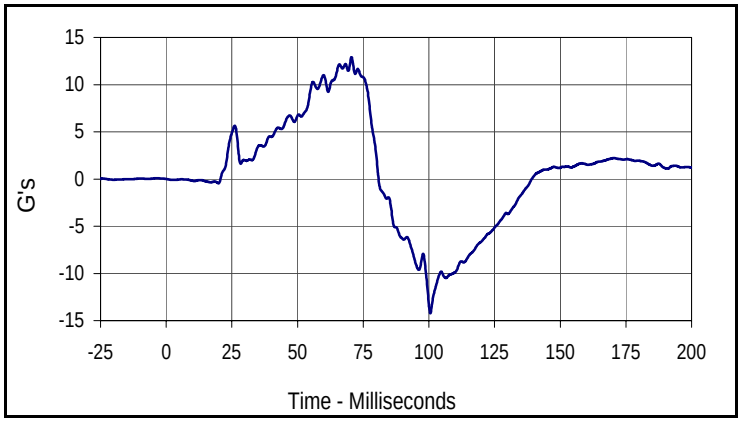
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
54.0	72.3	0.0	7.5

Test Vehicle:	2010 Ford Fusion Hybrid 4-Door Sedan	Test Date:	5/15/09
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	MA0200

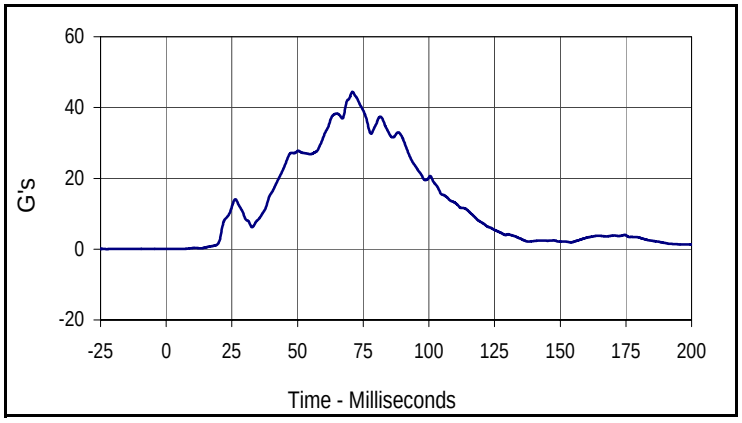
Curve Description			
Driver Chest X Primary			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
3.4	174.6	-42.5	71.1



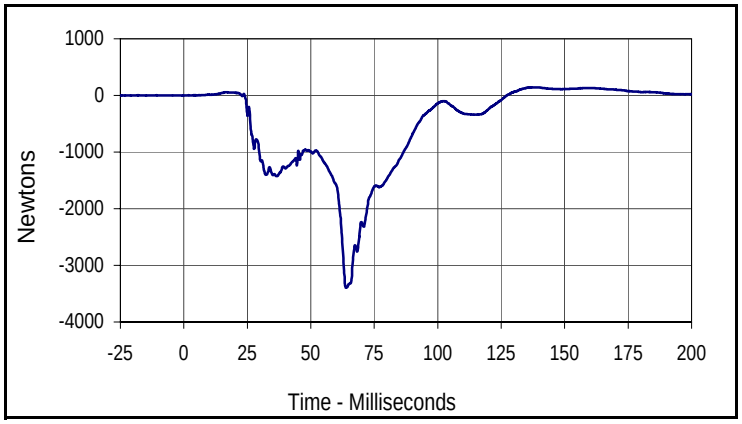
Curve Description			
Driver Chest Y Primary			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
4.5	102.7	-4.9	68.6



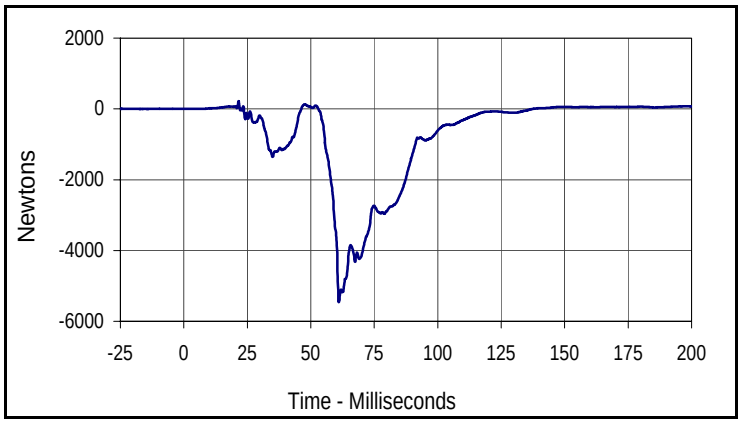
Curve Description			
Driver Chest Z Primary			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
12.9	70.6	-14.2	100.5



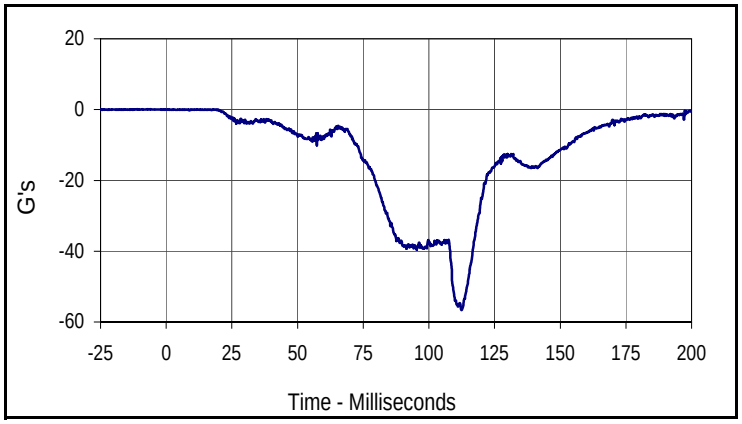
Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
44.4	70.9	0.0	5.4



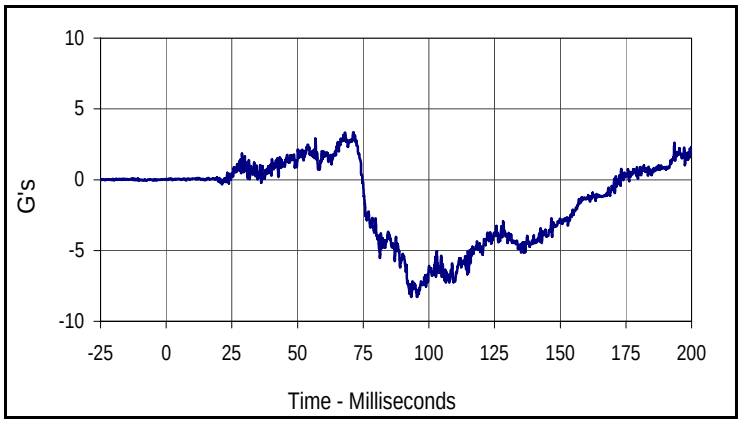
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
007	FIL	600	Newtons
Max	Time	Min	Time
144.0	138.5	-3393.3	63.8



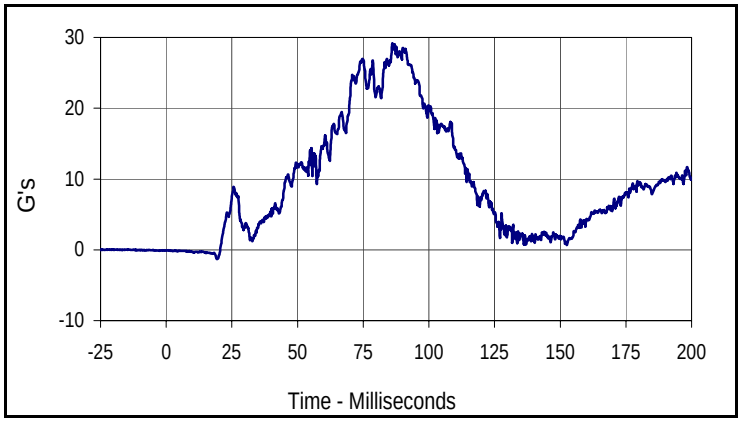
Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
219.7	21.6	-5460.6	61.1



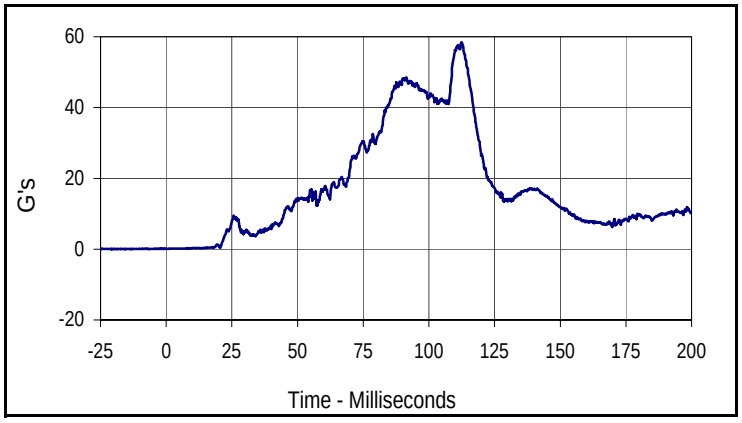
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
009	FIL	1000	G's
Max	Time	Min	Time
0.1	17.8	-56.6	112.4



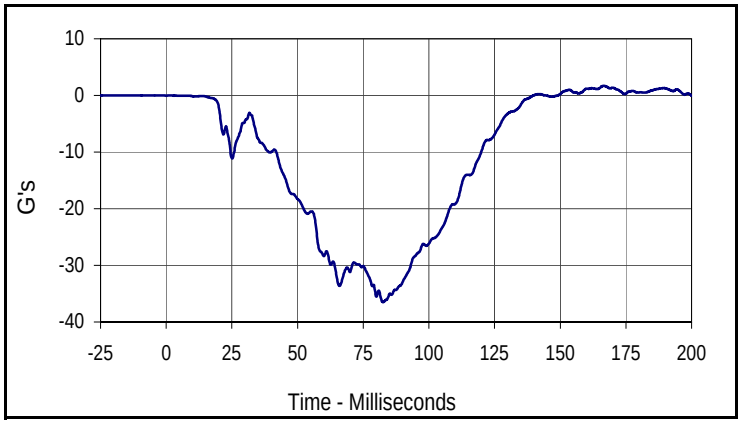
Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
3.3	71.2	-8.3	93.3



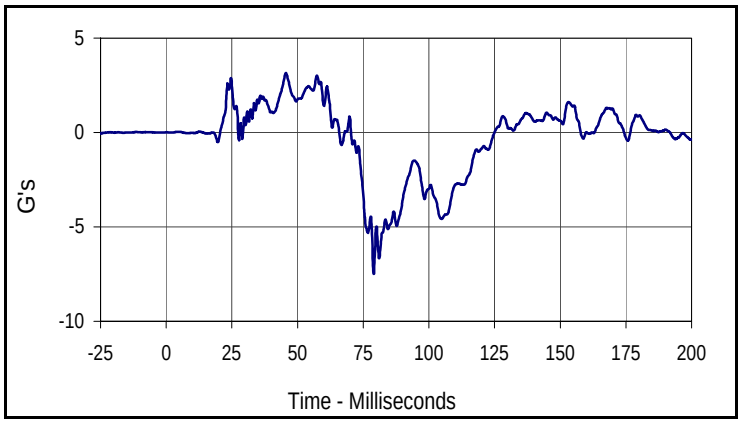
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
011	FIL	1000	G's
Max	Time	Min	Time
29.1	86.1	-1.3	19.3



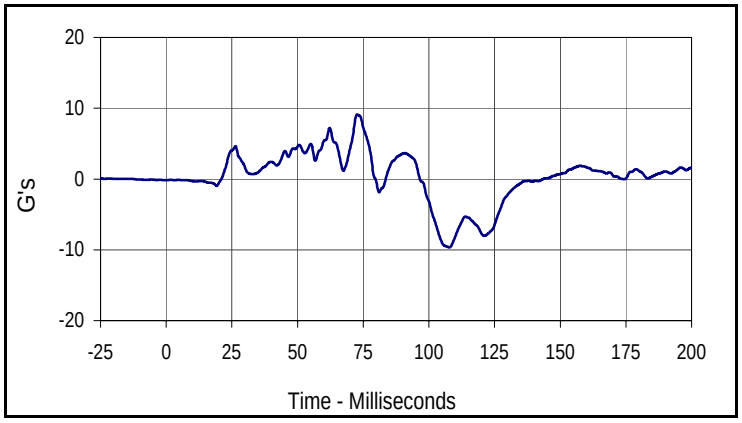
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
58.5	112.4	0.1	0.9



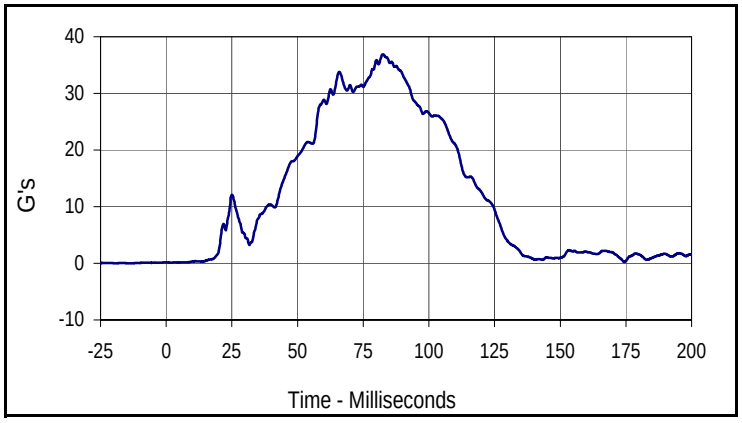
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
1.7	166.6	-36.5	82.6



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
3.1	45.6	-7.5	79.0

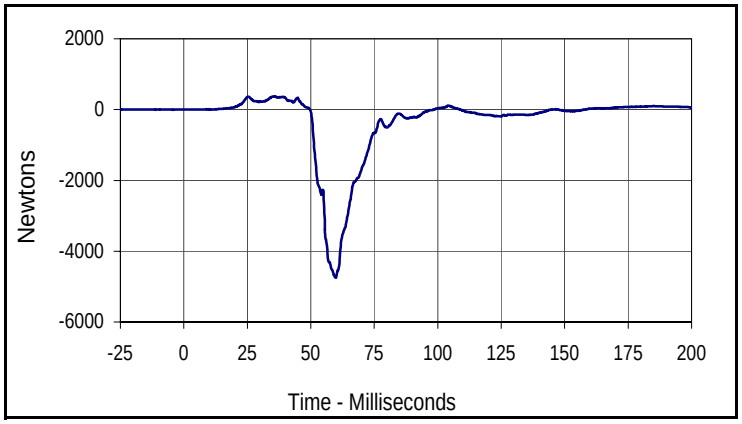


Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
9.1	72.6	-9.7	107.8

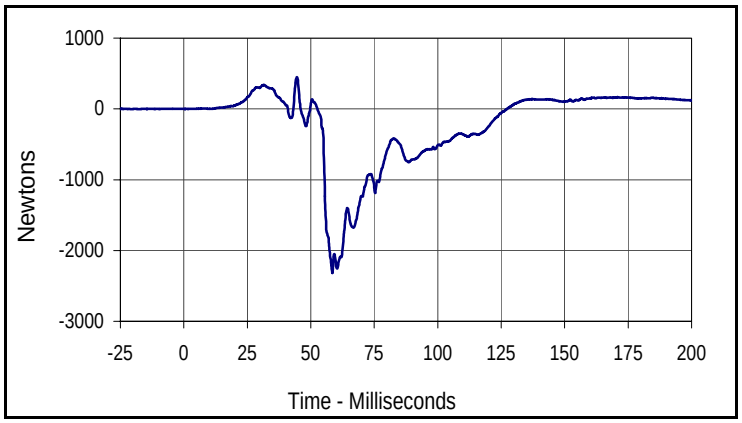


Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
36.9	82.4	0.1	1.7

Test Vehicle:	2010 Ford Fusion Hybrid 4-Door Sedan	Test Date:	5/15/09
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	MA0200



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
372.8	35.4	-4749.6	59.9



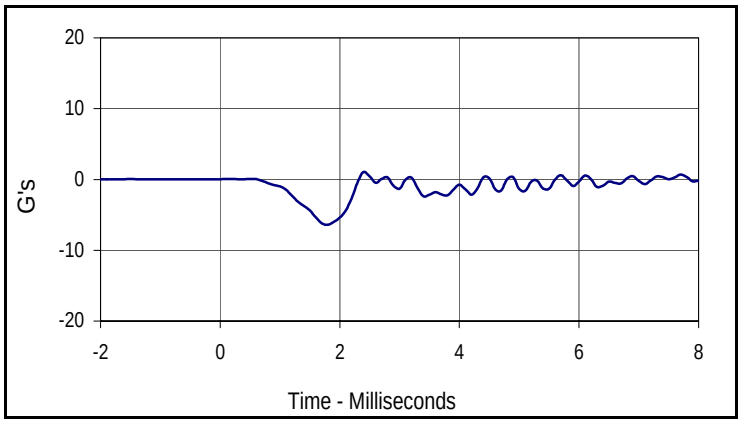
Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
449.2	44.5	-2319.2	58.5

APPENDIX C
DUMMY CALIBRATION DATA

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	5/10/09
ATD Serial No.:	035	Test I.D.:	H035L

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	268.2	Pass
Peak Lateral Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

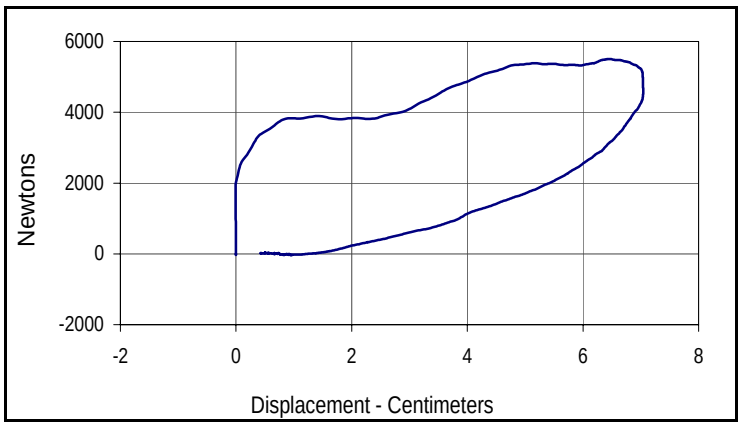
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
268.2	1.9	0.4	0.4



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.1	2.4	-6.4	1.8

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	5/10/09
ATD Serial No.:	035	Test I.D.:	CH035F

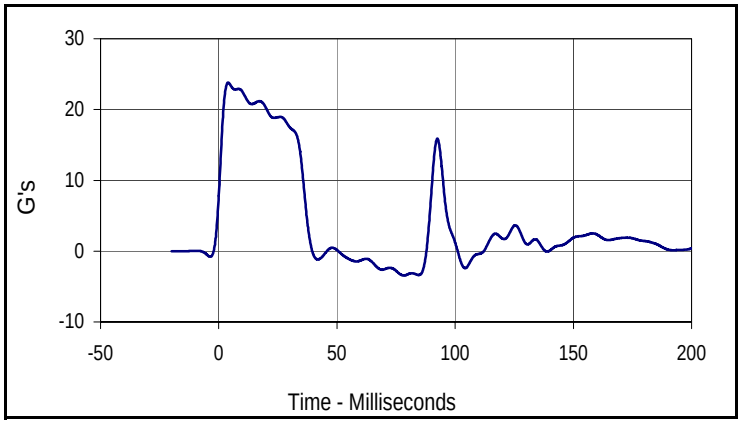
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.81	Pass
Peak Probe Force	Newtons	5159 to 5893	5506	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	7.04	Pass
Internal Hysterysis	%	69 to 85	73.8	Pass
		Overall Test Results		Pass



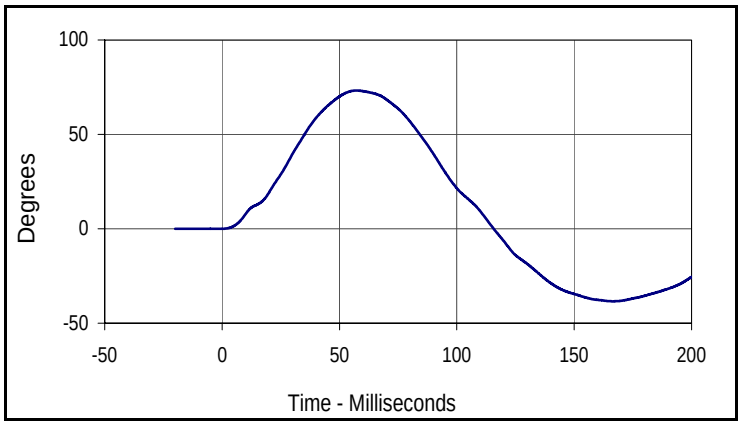
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	180	73.8
Peak Probe Force		Peak Chest Deflection	
5506		7.04	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	5/10/09
ATD Serial No.:	035	Test I.D.:	F035G

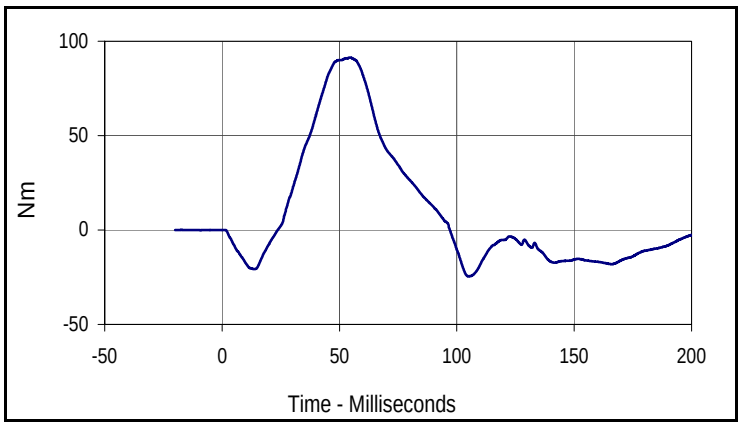
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.90	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.5	Pass
	20 Msec.	G's	17.6 to 22.6	20.2	Pass
	30 Msec.	G's	12.5 to 18.5	17.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.5	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	73.2	Pass
	Time	Msec.	57.0 to 64.0	57.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	115.7	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	91.3	Pass
	Time	Msec.	47.0 to 58.0	54.7	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.8	4.0	-3.4	78.3



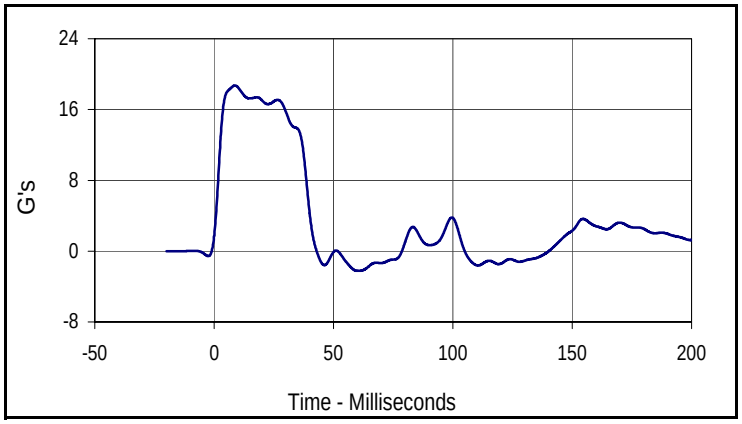
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
73.2	57.2	-38.4	166.6



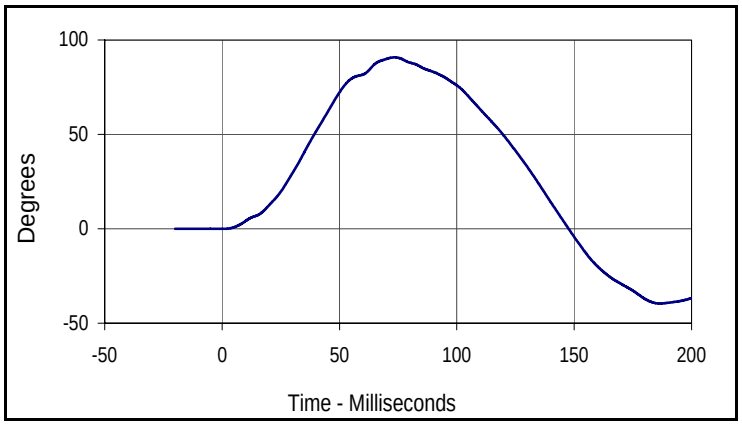
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
91.3	54.7	-24.5	105.1

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	5/10/09
ATD Serial No.:	035	Test I.D.:	E035A

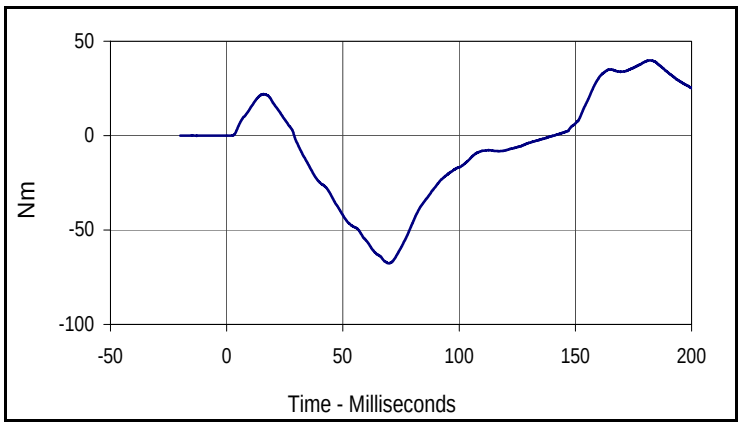
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.02	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.5	Pass
	20 Msec.	G's	14.0 to 19.0	17.1	Pass
	30 Msec.	G's	11.0 to 16.0	15.8	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.8	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	39.8	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	90.8	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
18.7	8.7	-2.2	60.2



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
90.8	73.5	-39.6	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:	5/10/09
ATD Serial No.:	035	Test I.D.:	L035A , R035A

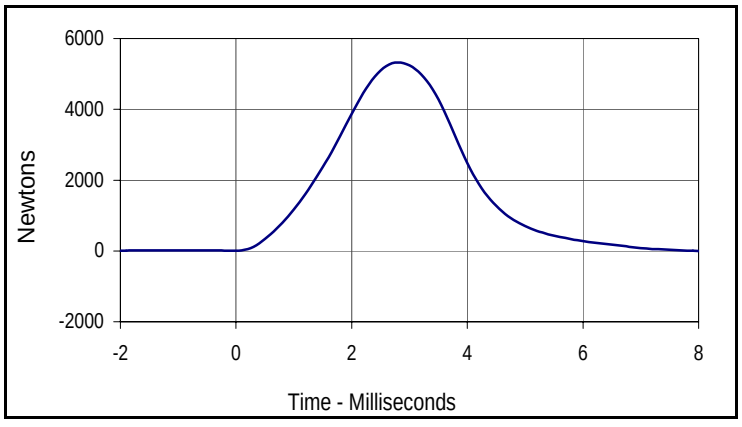
Left Knee

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	4950	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	5326	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4950.1	2.7	-45.7	9.0



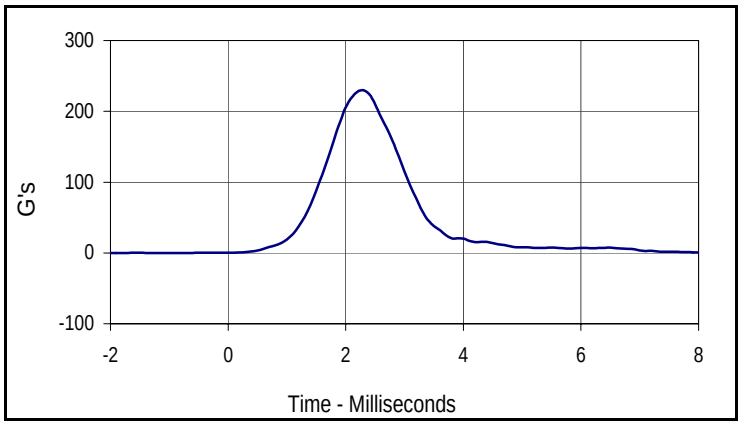
Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5326.2	2.8	-13.9	8.7

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	5/10/09
ATD Serial No.:	035	Test I.D.:	N/A

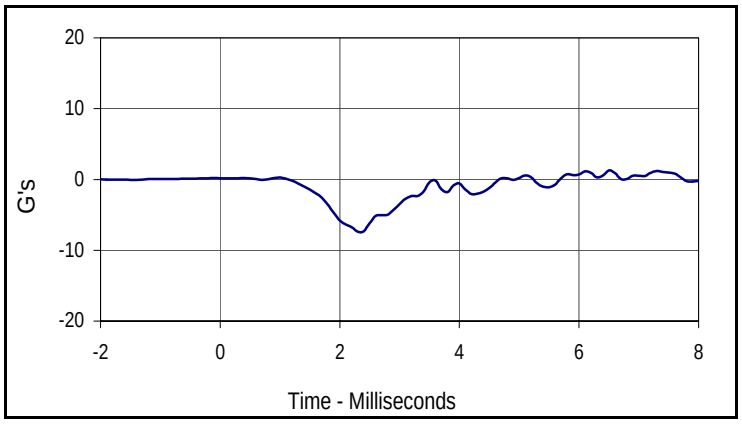
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	886	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	87	Pass
F - Thigh clearance	mm	140 to 155	152	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	339	Pass
J - Elbow rest height	mm	190 to 211	209	Pass
K - Buttock to knee length	mm	579 to 604	594	Pass
L - Poplipteal length	mm	429 to 455	447	Pass
M - Knee pivot height	mm	485 to 500	486	Pass
N - Buttock poplipteal length	mm	452 to 477	468	Pass
O - Chest depth	mm	213 to 229	214	Pass
P - Foot length	mm	251 to 267	253	Pass
V - Shoulder breadth	mm	422 to 437	428	Pass
W - Foot breadth	mm	91 to 107	103	Pass
Y - Chest circumference	mm	970 to 1001	990	Pass
Z - Waist circumference	mm	836 to 866	854	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	227	Pass
		Overall Test Results		Pass

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	5/11/09
ATD Serial No.:	034	Test I.D.:	H035H

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	229.8	Pass
Peak Lateral Acceleration	G's	≤15.0	7.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



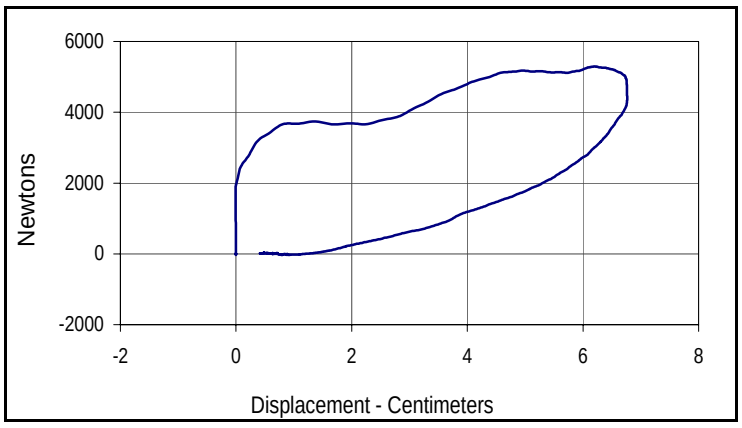
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
229.8	2.3	0.0	-2.0



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.7	5.8	-7.4	2.3

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	5/11/09
ATD Serial No.:	034	Test I.D.:	CH034H

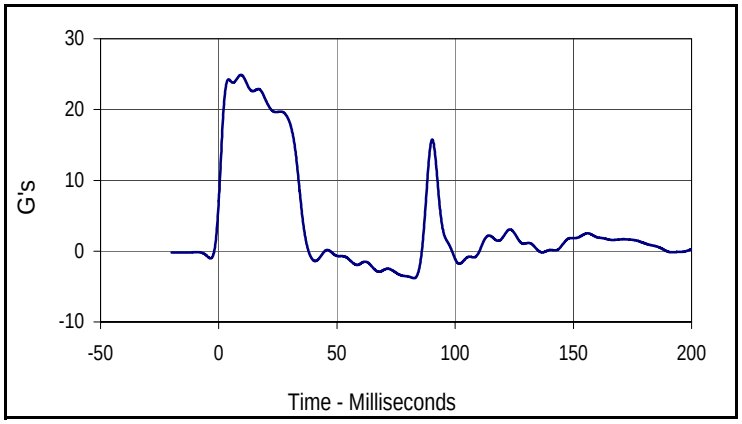
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.79	Pass
Peak Probe Force	Newtons	5159 to 5893	5292	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.76	Pass
Internal Hysterysis	%	69 to 85	74.0	Pass
		Overall Test Results		Pass



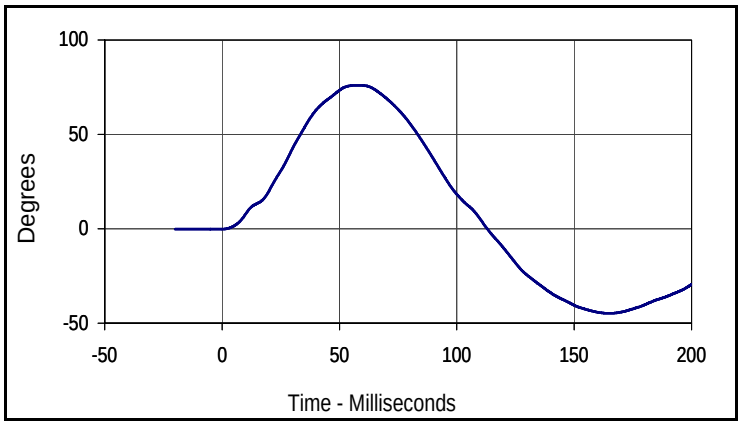
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	180	74.0
Peak Probe Force		Peak Chest Deflection	
5292		6.76	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	5/10/09
ATD Serial No.:	035	Test I.D.:	F034H

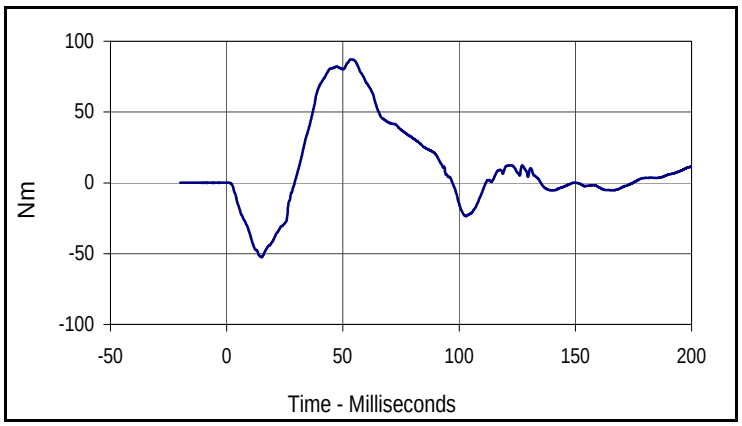
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.90	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.8	Pass
	20 Msec.	G's	17.6 to 22.6	21.2	Pass
	30 Msec.	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	87.2	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



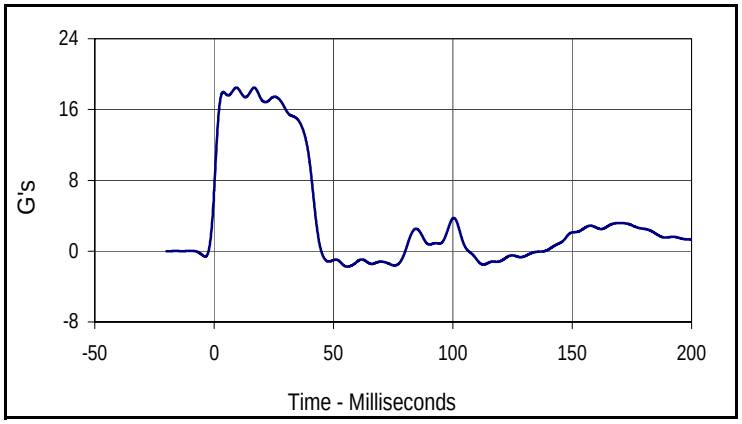
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
75.9	57.3	-44.8	164.8



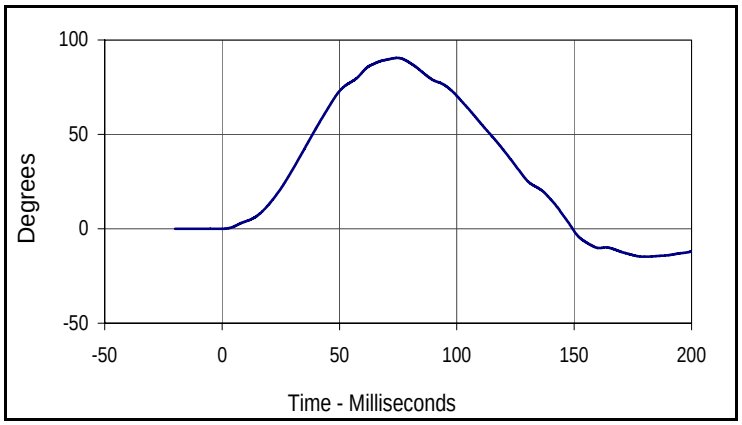
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
87.2	54.0	-52.6	15.0

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	5/11/09
ATD Serial No.:	034	Test I.D.:	E034G

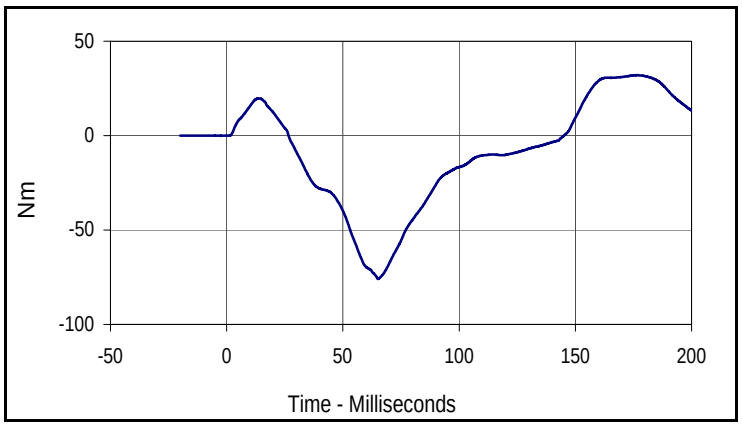
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	5.99	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.4	Pass
	20 Msec.	G's	14.0 to 19.0	17.1	Pass
	30 Msec.	G's	11.0 to 16.0	16.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	16.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	42.1	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	90.5	Pass
	Time	Msec.	72.0 to 82.0	74.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	149.4	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-75.9	Pass
	Time	Msec.	65.0 to 79.0	65.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	145.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.5	9.3	-1.7	55.8



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
90.5	74.7	-14.8	180.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
32.0	176.6	-75.9	65.0

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	5/11/09
ATD Serial No.:	034	Test I.D.:	L034H , R034H

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	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5187	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
5186.9	2.6	-20.2	10.0

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	5/11/09
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	886	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	91	Pass
F - Thigh clearance	mm	140 to 155	153	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	211	Pass
K - Buttock to knee length	mm	579 to 604	595	Pass
L - Poplipteal length	mm	429 to 455	445	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock poplipteal length	mm	452 to 477	467	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	426	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	991	Pass
Z - Waist circumference	mm	836 to 866	855	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	229	Pass
		Overall Test Results		Pass

Test Program:	Dummy Damage Checklist	Test Date:	5/10/09
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:

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	5/11/09
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	886	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	91	Pass
F - Thigh clearance	mm	140 to 155	153	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	211	Pass
K - Buttock to knee length	mm	579 to 604	595	Pass
L - Poplipteal length	mm	429 to 455	445	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock poplipteal length	mm	452 to 477	467	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	426	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	991	Pass
Z - Waist circumference	mm	836 to 866	855	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