mga research corporation

30 MPH FRONTAL IMPACT

C/FMVSS 204/212/219/301

2011 Chrysler Town and Country
Amerivan Side Entry

MGA Reference Number: C11C3-003.8

Test Date: March 16, 2011

Report Date: March 23, 2011

PREPARED FOR:
ElDorado National
1655 Wall Street
Salina, KS 67401

PREPARED BY:
MGA Research Corporation
5000 Warren Road
Burlington, WI 53105

SIGNATURE APPROVAL PAGE

Procedure Number: MGA Frontal/Rear/Side Impact
Dated June 15, 2010

MGA Reference #: C11C3-003.8

Prepared By: Jordan Haynes, Project Engineer

Reviewed By: David Winkelbauer, Project Engineer

Technicians: Tim Bratz
Tim Novak
Ben Storey
Chris Roach

Photographic: Chris Young

Secretary: Cyndy Kline

The results presented in this report relate only to the specified test items.

TABLE OF CONTENTS

MGA REFERENCE #C11C3-003.8

	Page No
Test Summary	1
Vehicle Information / Data Sheets	2
Photographs	12

TEST SUMMARY

MGA REFERENCE #C11C3-003.8

A rigid barrier was impacted by a 2011 Chrysler Town and Country Amerivan Side Entry at a velocity of 48.4 km/h. The test was performed at MGA Research Corporation on March 16, 2011. Pre-and post-test photographs of the vehicle can be found beginning on page 12.

One real-time camera and five high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

Two ballast dummies were placed in the driver and right-front passenger seating positions.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. The steering column rearward displacement was less than 125 mm.

There was no Stoddard Solvent leakage after the event or during any phase of the static rollover.

VEHICLE INFORMATION / DATA SHEETS

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	English Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Pressure	Tire Pressure	lbf/in^2	kPa	7.0
Temperature	General Use	°F	°C	=(tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

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

DATA SHEET NO. 1

CRASH TEST SUMMARY

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal

TEST SPEED

Measured Parameter	Units	Value
Trap No. 1 Velocity (Primary)	km/h	48.4
Trap No. 2 Velocity (Redundant)	km/h	48.4

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Rear Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None

TEST VEHICLE ATTITUDES

	Units	LF	RF	LR	RR
As Tested	mm	895	892	898	894
Post Test	mm	851	842	888	864

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal

TEST VEHICLE INFORMATION

Manufacturer	Chrysler/ElDorado
Model	Chrysler Town & Country
VIN	2A4PS6DG5BR500094
Transmission	Automatic
Final Drive	Front
Number of Cylinders	6
Engine (L)	3.6
Engine Placement	Lateral

TEST VEHICLE OPTIONS

Driver Airbag	Yes
Passenger Airbag	Yes
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes

TIRE DATA

Measured Parameter	Front	Rear
Cold Pressure (kPa)	248	248
Tire Size on Vehicle	225/65R16	225/65R16
Tire Manufacturer	Yokohama	Yokohama

TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Unloaded Vehicle Weight as supplied by manufacturer	kg	2234
Weight of 2 P572E ATDs	kg	156
Cargo Weight	kg	136
Calculated Test Vehicle Weight	kg	2526

TEST VEHICLE WEIGHT

	Units	As Tested (Axle)		
		Front	Rear	Total
Left	kg	644.1	624.2	
Right	kg	640.9	616.4	
Ratio	%	50.9	49.1	
Totals	kg	1285.0	1240.6	2526.6

Vehicle Wheelbase (mm): 3100

DATA SHEET NO. 3

TEST VEHICLE INFORMATION

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal

NORMAL DESIGN RIDING POSITION

Driver seat back angle: 4.3° head rest post

Passenger seat back angle: 3.9° head rest post

SEAT FORE/AFT POSITIONS

Driver seat fore/aft total travel: 265mm

Passenger seat fore/aft total travel: 220 mm

Driver seat fore/aft position: 132 mm

Passenger seat fore/aft position: 110 mm

SEAT BELT UPPER ANCHORAGE

The front outboard D-rings were placed in the uppermost position.

STEERING COLUMN ADJUSTMENT

The steering column was placed in the mid position.

DATA SHEET NO. 4

SUMMARY OF C/FMVSS 212 DATA

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal

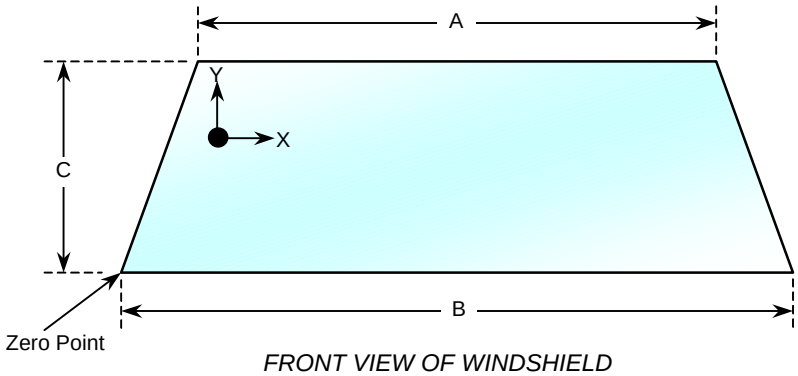
Windshield Mounting Details:
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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, which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2458	2458	100
Right Side	2458	2458	100
Total	4916	4916	100



FRONT VIEW OF WINDSHIELD

WINDSHIELD DIMENSIONS

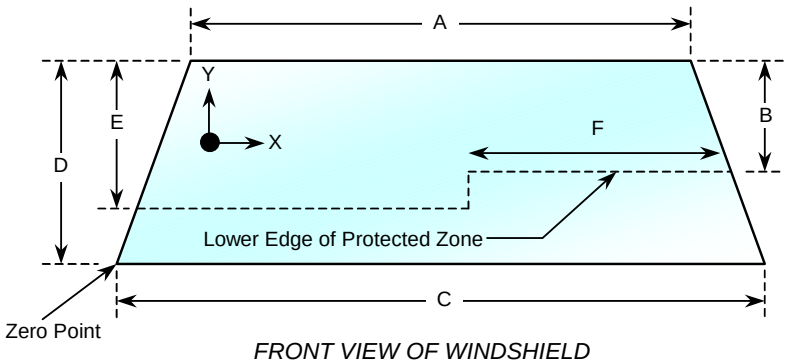
Item	Units	Segment Length
A	mm	1424
B	mm	1700
C	mm	896

DATA SHEET NO. 5

WINDSHIELD ZONE INTRUSION C/FMVSS 219 (Partial) DATA

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1424
B	mm	590
C	mm	1700
D	mm	896
E	mm	572
F	mm	484

AREA OF PROTECTED ZONE FAILURES - NONE

A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 inches by a vehicle component other than one that is normally in contact with the windshield. **None**

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. **None**

X	Y

DATA SHEET NO. 6

C/FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal

FUEL TANK CAPACITY DATA

The "Usable Capacity" of the standard equipment fuel tank is: 75.7 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 70.4 liters

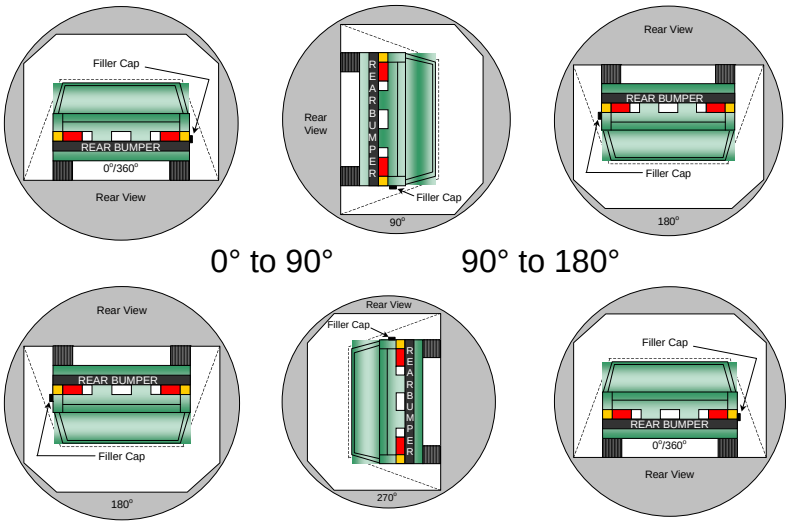
Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)

B. For the 5 minute period after motion ceases: 0 oz.
(Maximum Allowable = 5 ounces)

C. For the following 25 minutes: 0 oz.
(Maximum Allowable = 1 oz. /minute)

C/FMVSS 301 STATIC ROLLOVER DATA



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 180 seconds.

2. The position hold time at each position is 300 seconds (minimum).

3. Details of Stoddard Solvent spillage locations:
None

DATA SHEET NO. 6…continued

SUMMARY OF C/FMVSS 301 DATA

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal

0° TO 90° Rotation

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
First 5 minutes form onset of rotation	118	300	0
Sixth Minute from onset of rotation			0
Seventh minute from onset of rotation			0
Eight minute if required			0

90° TO 180° Rotation

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
First 5 minutes form onset of rotation	112	300	0
Sixth Minute from onset of rotation			0
Seventh minute from onset of rotation			0
Eight minute if required			0

180° TO 270° Rotation

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
First 5 minutes form onset of rotation	113	300	0
Sixth Minute from onset of rotation			0
Seventh minute from onset of rotation			0
Eight minute if required			0

270° TO 360° Rotation

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
First 5 minutes form onset of rotation	115	300	0
Sixth Minute from onset of rotation			0
Seventh minute from onset of rotation			0
Eight minute if required			0

DATA SHEET NO. 7

VEHICLE MEASUREMENTS

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal

VEHICLE MEASUREMENTS

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	5011	4581	430
C2	Crush zone 2 at left side	mm	5083	4610	473
C3	Crush zone 3 at left side	mm	5120	4641	479
C4	Crush zone 4 at right side	mm	5120	4639	481
C5	Crush zone 5 at right side	mm	5083	4605	478
C6	Crush zone 6 at right side	mm	5011	4560	451
L	C1 TO C6	mm	1320	1326	-6

DATA SHEET NO. 8

CAMERA LOCATIONS

MGA REFERENCE #C11C3-003.8

Test Vehicle: 2011 Chrysler Town & Country Amerivan Side Entry Test Date: 3/16/2011
Test Program: 30 mph Frontal

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Left Front Half	1340	-5190	1190	24	1000
2	Right Overall	2100	6340	1220	20	1000
3	Right Front Half	1370	5220	1180	24	1000
4	Pit Front	1210	0	-3150	24	1000
5	Pit Rear	3370	0	-3150	24	1000
6	Real-Time				13	30

*COORDINATES:

+X = film plane rearward of barrier

+Y = film plane to right of monorail centerline

+Z = film plane above ground level

TABLE OF PHOTOGRAPHS

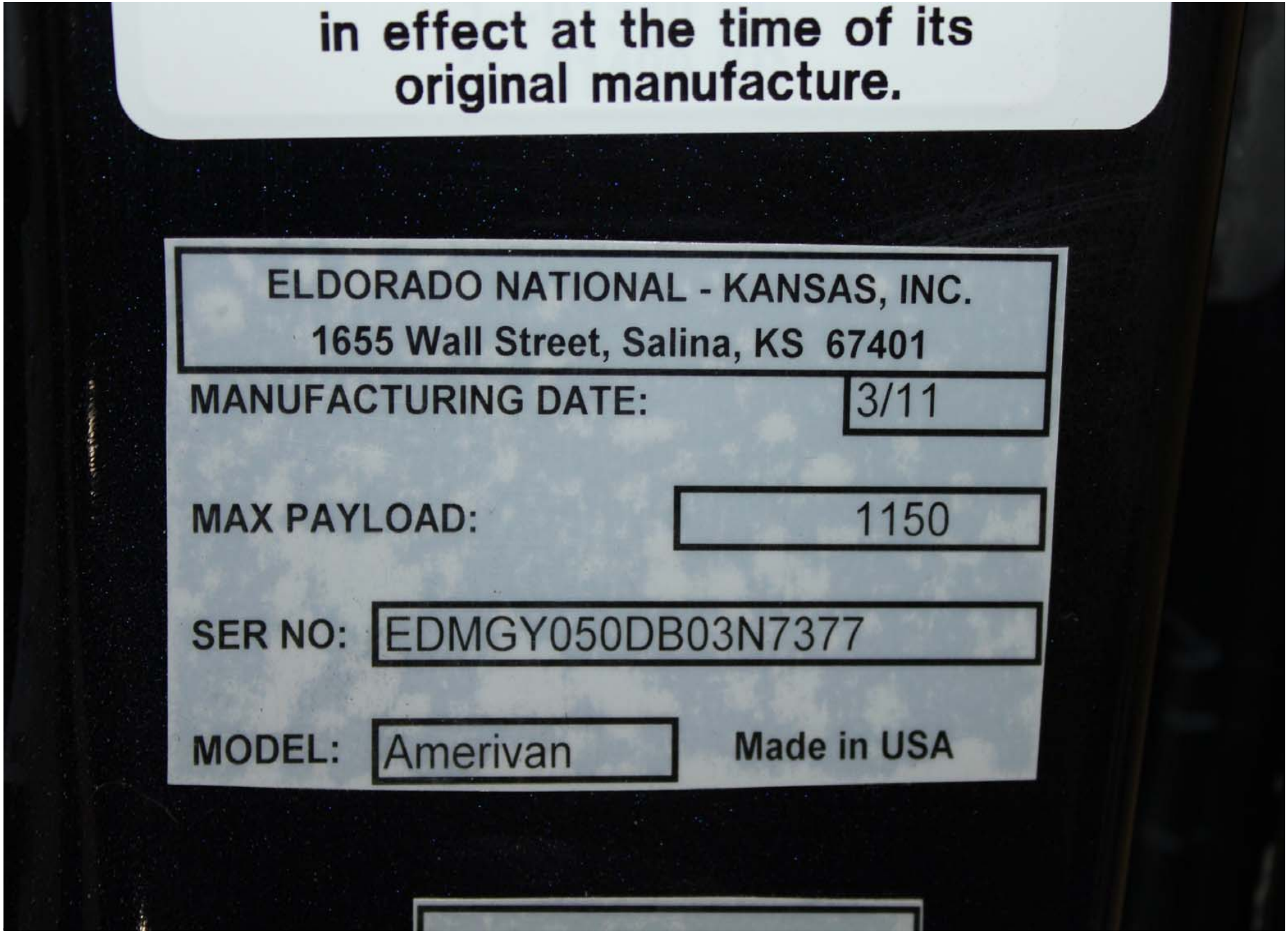
MGA REFERENCE #C11C3-003.8

	Page No.
Eldorado Manufacturing Label	14
Vehicle Vin Label	15
Tire Placard	16
Pre-Test Front View of Test Vehicle	17
Post-Test Front View of Test Vehicle	18
Pre-Test Rear View of Test Vehicle	19
Post-Test Rear View of Test Vehicle	20
Pre-Test Left Side View of Test Vehicle	21
Post-Test Left Side View of Test Vehicle	22
Pre-Test Left Front Three-Quarter View of Test Vehicle	23
Post-Test Left Front Three-Quarter View of Test Vehicle	24
Pre-Test Left Rear Three-Quarter View of Test Vehicle	25
Post-Test Left Rear Three-Quarter View of Test Vehicle	26
Pre-Test Right Side View of Test Vehicle	27
Post-Test Right Side View of Test Vehicle	28
Pre-Test Right Front Three-Quarter View of Test Vehicle	29
Post-Test Right Front Three-Quarter View of Test Vehicle	30
Pre-Test Right Rear Three-Quarter View of Test Vehicle	31
Post-Test Right Rear Three-Quarter View of Test Vehicle	32
Pre-Test Fuel Filler Cap View	33
Post-Test Fuel Filler Cap View	34
Pre-Test Front Underbody View	35
Post-Test Front Underbody View	36
Pre-Test Mid Underbody View	37
Post-Test Mid Underbody View	38
Pre-Test Rear Underbody View	39

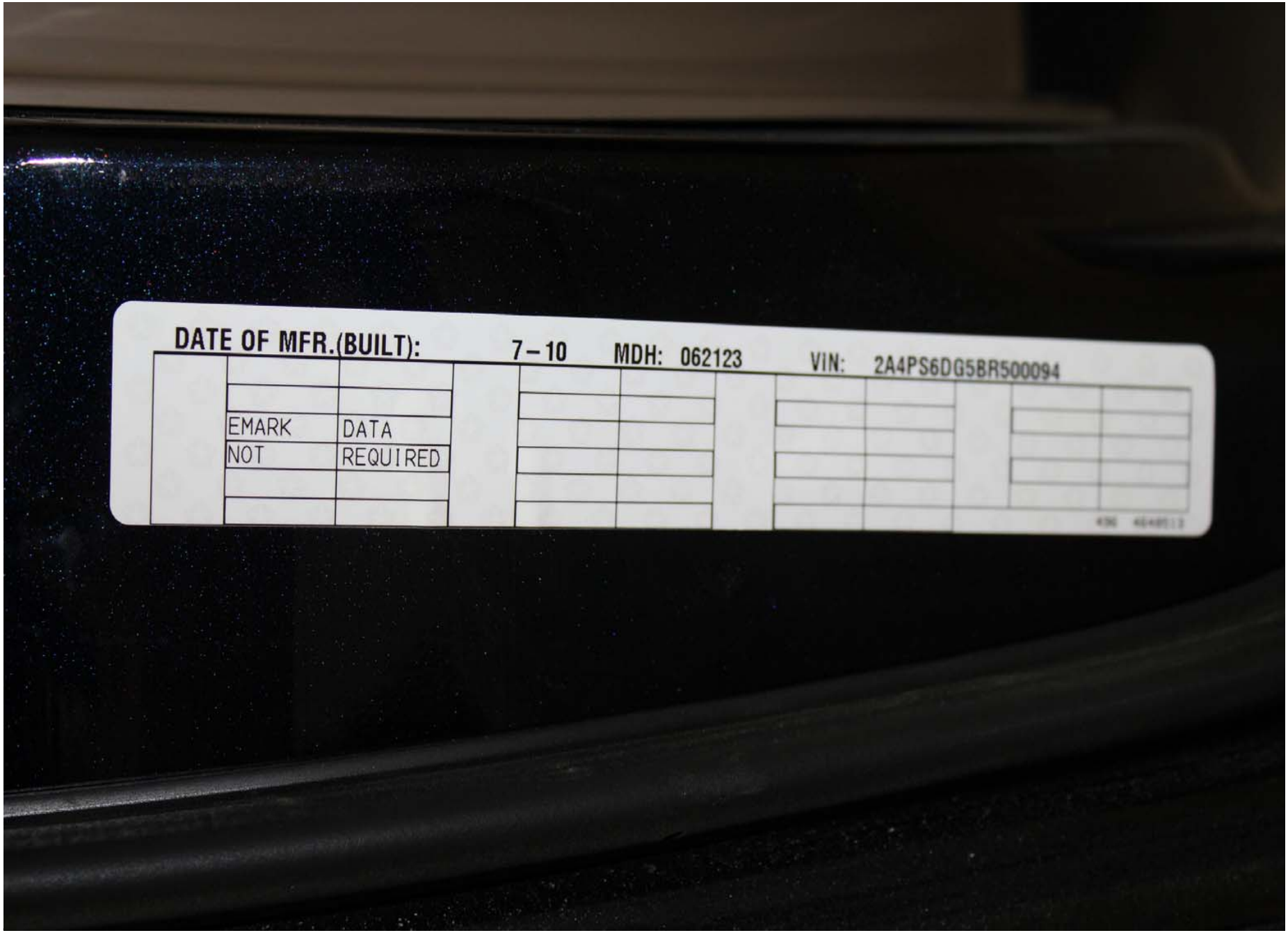
TABLE OF PHOTOGRAPHS

MGA REFERENCE #C11C3-003.8

Post-Test Rear Underbody View	40
Pre-Test Driver Dummy Position Left Side View	41
Post-Test Driver Dummy Position Left Side View	42
Pre-Test Driver Dummy Position Left Side View (Door Open)	43
Post-Test Driver Dummy Position Left Side View (Door Open)	44
Pre-Test Driver Dummy Seat Position	45
Post-Test Driver Dummy Seat Position	46
Pre-Test Passenger Dummy Position Right Side View	47
Post-Test Passenger Dummy Position Right Side View	48
Pre-Test Passenger Dummy Position Right Side View (Door Open)	49
Post-Test Passenger Dummy Position Right Side View (Door Open)	50
Pre-Test Passenger Dummy Seat Position	51
Post-Test Passenger Dummy Seat Position	52
Rollover 90 Degrees	53
Rollover 180 Degrees	54
Rollover 270 Degrees	55
Rollover 360 Degrees	56
Vehicle Impact	57

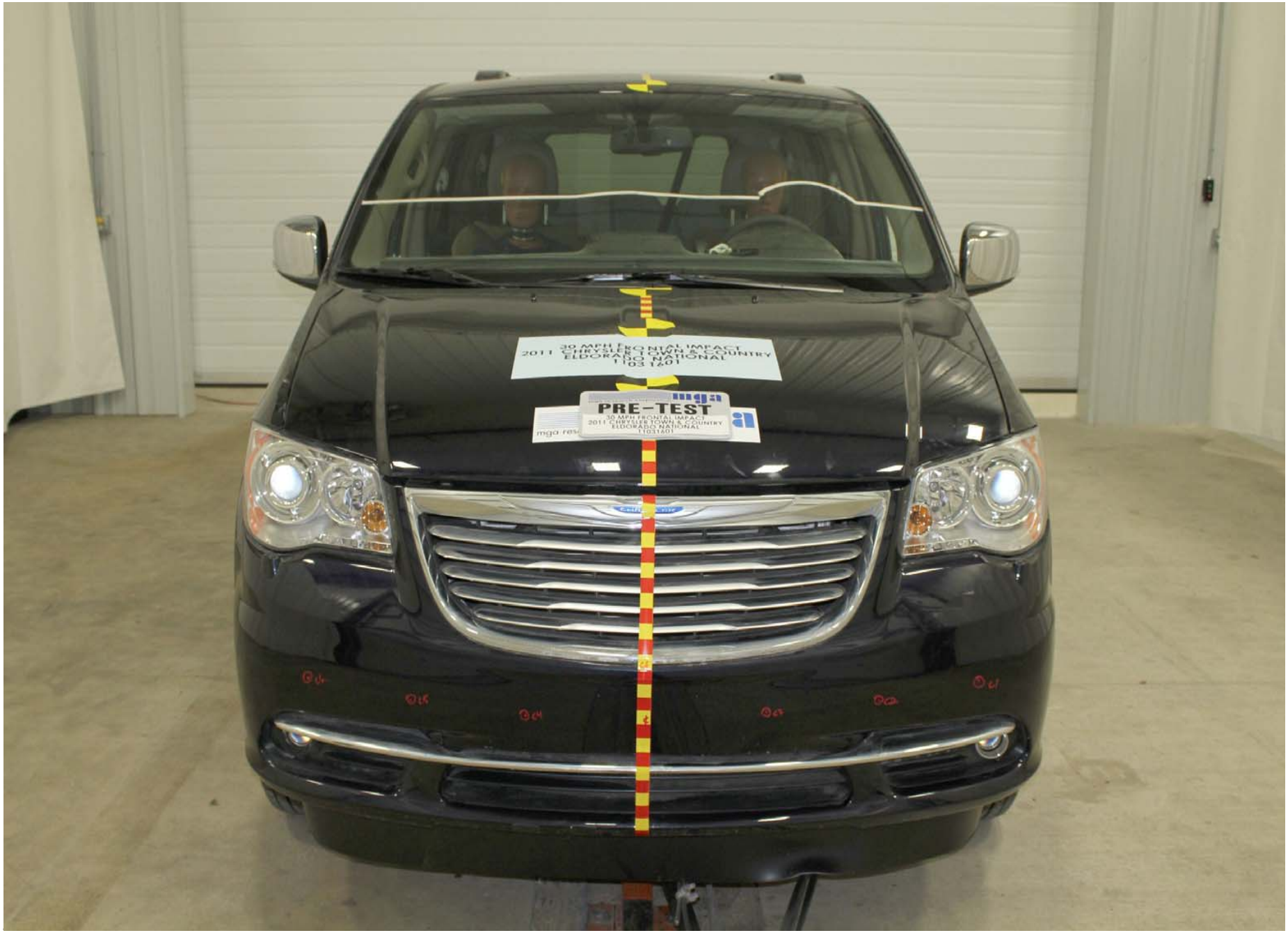


Eldorado Manufacturing Label



Vehicle Vin Label

Tire Placard



Pre-Test Front View of Test Vehicle

Post-Test Front View of Test Vehicle

Pre-Test Rear View of Test Vehicle

Post-Test Rear View of Test Vehicle

Pre-Test Left Side View of Test Vehicle

Post-Test Left Side View of Test Vehicle

Pre-Test Left Front Three-Quarter View of Test Vehicle

Post-Test Left Front Three-Quarter View of Test Vehicle

Pre-Test Left Rear Three-Quarter View of Test Vehicle

Post-Test Left Rear Three-Quarter View of Test Vehicle

Pre-Test Right Side View of Test Vehicle

Post-Test Right Side View of Test Vehicle

Pre-Test Right Front Three-Quarter View of Test Vehicle

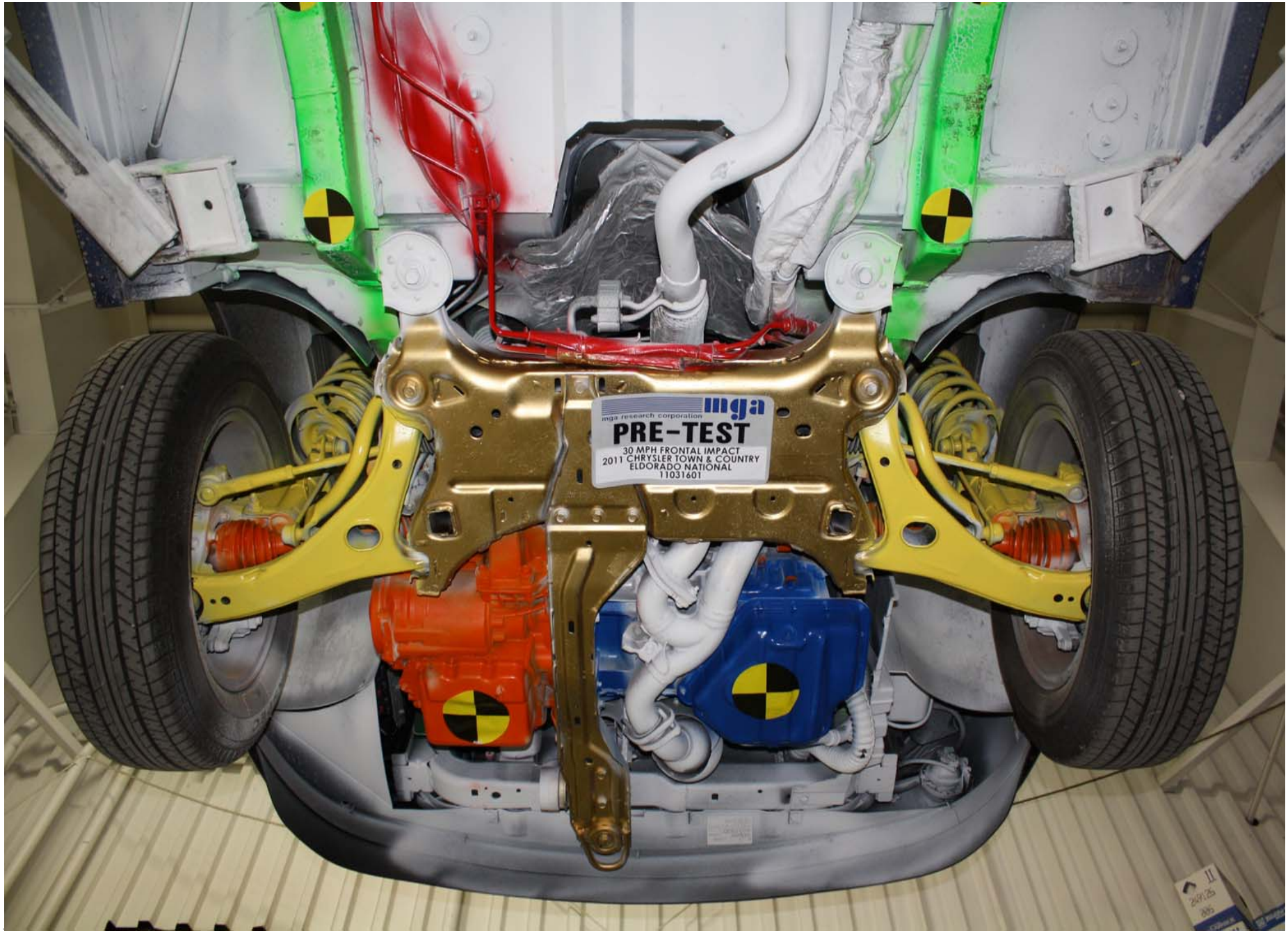
Post-Test Right Front Three-Quarter View of Test Vehicle

Pre-Test Right Rear Three-Quarter View of Test Vehicle

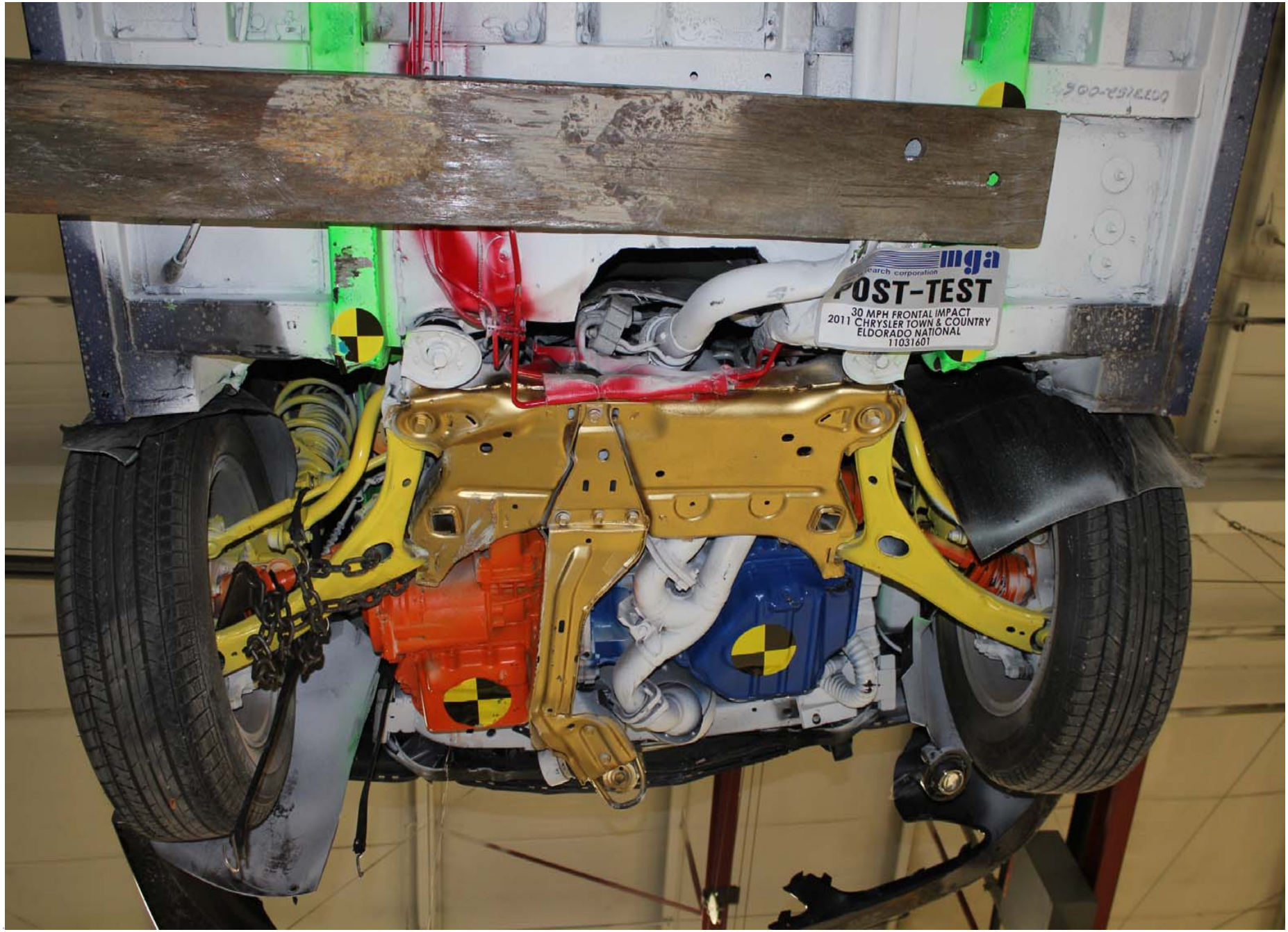
Post-Test Right Rear Three-Quarter View of Test Vehicle

Pre-Test Fuel Filler Cap View

Post-Test Fuel Filler Cap View



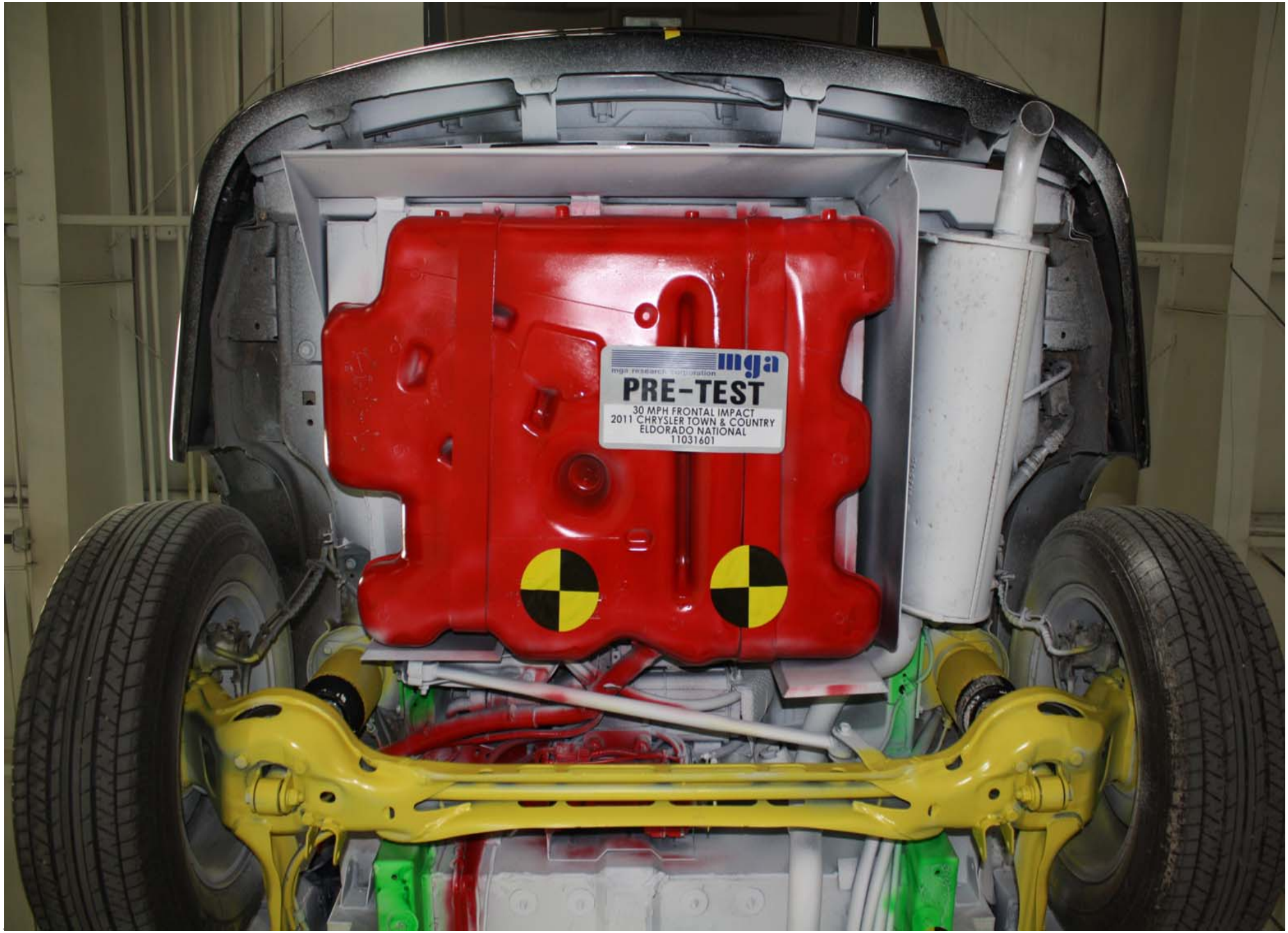
Pre-Test Front Underbody View



Post-Test Front Underbody View

Pre-Test Mid Underbody View

Post-Test Mid Underbody View



Pre-Test Rear Underbody View

Post-Test Rear Underbody View

Pre-Test Driver Dummy Position Left Side View

Post-Test Driver Dummy Position Left Side View

Pre-Test Driver Dummy Position Left Side View (Door Open)

Post-Test Driver Dummy Position Left Side View (Door Open)

Pre-Test Driver Dummy Seat Position

Post-Test Driver Dummy Seat Position

Pre-Test Passenger Dummy Position Right Side View

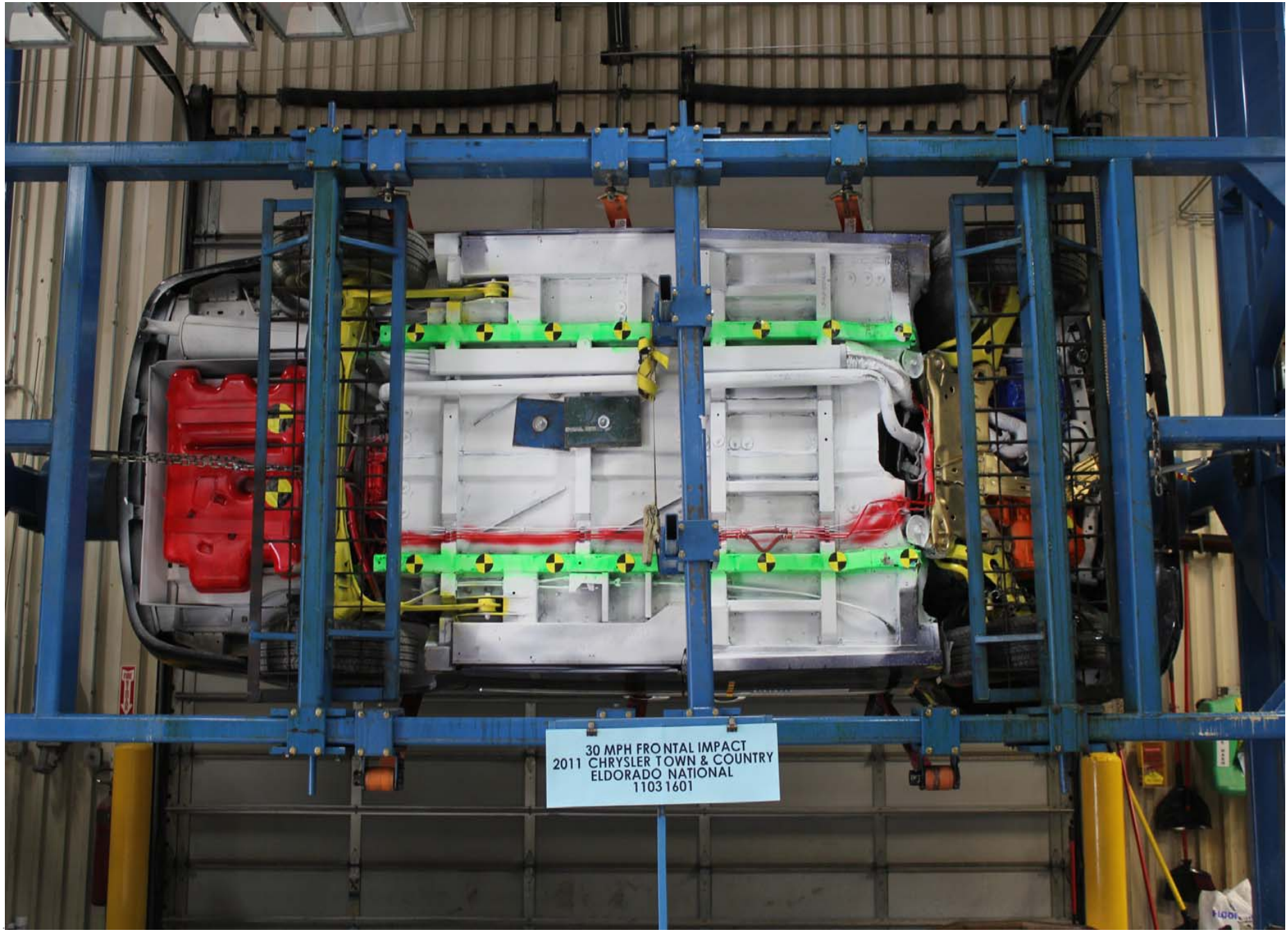
Post-Test Passenger Dummy Position Right Side View

Pre-Test Passenger Dummy Position Right Side View (Door Open)

Post-Test Passenger Dummy Position Right Side View (Door Open)

Pre-Test Passenger Dummy Seat Position

Post-Test Passenger Dummy Seat Position



Rollover 90 Degrees

Rollover 180 Degrees

Rollover 270 Degrees

Rollover 360 Degrees

Vehicle Impact