

REPORT NUMBER: 301S-MGA-2007-003

**SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 301S
FUEL SYSTEM INTEGRITY - SCHOOL BUSES**

**MID BUS INC.
2006 MID BUS GUIDE DW SCHOOL BUS
NHTSA NO. C60901**

**PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105**

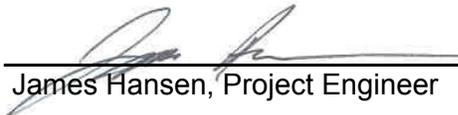


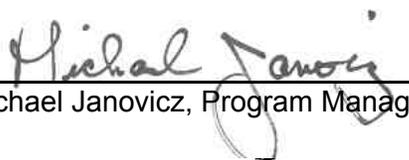
FINAL REPORT DATE: JULY 3, 2007

FINAL REPORT

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U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NVS 220
1200 NEW JERSEY AVENUE, S.E.
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Prepared by:  Date: July 3, 2007
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July 3, 2007
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16. Abstract A compliance test was conducted on the subject 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901 in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301S-02 for the determination of FMVSS 301S compliance. Test failures were as follows: None			
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SECTION 1
PURPOSE OF COMPLIANCE TEST AND SUMMARY

A fuel system integrity test was performed on a MY 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-301S-02 to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 301S, "Fuel System Integrity - School Buses".

Based on the test results, the MY 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901 appears to meet the requirements of FMVSS 301S testing.

This program is sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-02-D-01057.

SECTION 2
COMPLIANCE TEST DATA

The following data sheets document the results of testing on the MY 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901.

DATA SHEET 1
SCHOOL BUS DATA

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

GENERAL VEHICLE IDENTIFICATION

School Bus Manufacturer:	Mid Bus Inc.	
School Bus Model:	CSD-7450-C-063336/ Mid Bus Guide	
Build Date:	9/06	
Incomplete Vehicle Manufactured By:	Chevrolet Motor Division	
Build Date for Bus Chassis:	9/06	
School Bus GVWR (kg):	5,579	
School Bus GAWR Front (kg):	1,951	
School Bus GAWR Rear (kg):	3,901	
School Bus VIN:	1GBJG31U461237309	
No. of Designated Seating Positions (DSP) including Driver:	28	
School Bus NHTSA No.:	C60901	
Bus Body Color:	Yellow	
Engine Displacement	6.0L	
No. of Cylinders:	8	
Fuel Pump Actuation:	Electrical Pump "ON" with ignition	
School Bus Width (mm):	2406	
School Bus Length (mm):	6505	
Bus Unloaded Vehicle Weight (UVW) (kg):	3632.4	
Bus Occupant Load:	1458 kg - Passenger 54 kg - Driver 1512 kg - Total	
Target Bus Test Weight (SBTW) (kg):	5156.5	
Actual (SBTW) (kg):	5148.8	
School Bus Tire Manufacturer:	Uniroyal	
	Front	Rear
Rec. Cold Tire Inflation Pressure (kpa):	450	450
Tire Size:	LT225/75R16	LT225/75R16
Load Range:	D	D

DATA SHEET 1 (CONTINUED)

SCHOOL BUS DATA

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
 Test Date: **06/27/07**

GENERAL VEHICLE IDENTIFICATION

SCHOOL BUS ATTITUDE

	Units	LF	RF	LR	RR
As Delivered:	mm	891	887	864	832
As Tested:	mm	874	868	833	814
Post-Test:	mm	874	911	840	833

Fuel Tank Capacity (liters):	124.9
Tank Test Volume (liters):	112.6

TEST VEHICLE WEIGHTS

	Units	As Delivered			As Tested		
		Front	Rear	Total	Front	Rear	Total
Left	kg	760.7	1085.9		738.5	1805.3	
Right	kg	719.0	1066.9		813.3	1791.7	
Ratio	%	40.7	59.3		30.1	69.9	
Totals	kg	1479.7	2152.8	3632.5	1551.8	3597.0	5148.8

COMMENTS: NONE

Recorded By: *Jordan Hayes*

Approved By: *[Signature]*

Date: 06/27/2007

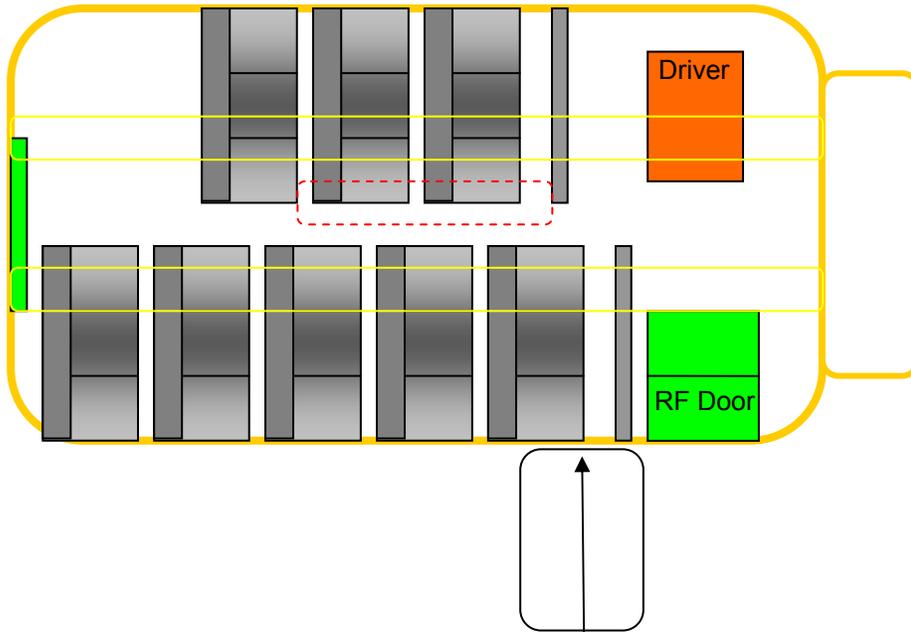
DATA SHEET 2
SCHOOL BUS IMPACT DATA

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

Time of Impact:	10:45 am
Ambient Temperature (°C)	21.1
Barrier Velocity – Speed Trap 1 (kph):	47.9
Barrier Velocity – Speed Trap 2 (kph):	47.8
Barrier Penetration:	482.6 mm

INDICATE IMPACT POINT BELOW:



LEGEND: Red dotted line indicates location of fuel tank
Arrow indicates point and angle of barrier impact (C_L of arrow coincides with C_L of monorail).

DESCRIPTION: Fuel tank is located just inboard of the left frame rail and in between the front and rear axles.

DATA SHEET 2 (CONTINUED)
SCHOOL BUS IMPACT DATA

Fuel Spillage Noted:	No
Failure, if applicable:	None

Stoddard Solvent Spillage Measurements

Timeframe	Description	Allowable Spillage	Measured Spilled	Results
T ₀ – T ₁	Time Zero to Cessation of Motion	31 grams (1 ounce)	0	PASS
T ₁ – T ₂	Cessation of Motion to 5 minutes after Cessation of Motion	156 grams (5 ounces)	0	PASS
T ₂ – T ₃	5 Minutes after Cessation of Motion to 30 minutes after Cessation of Motion	31 grams (1 ounce) per minute 933 grams (30 ounces) Total Allowed	0	PASS

COMMENTS: None

Recorded By: *Jordan Hayes*

Approved By: *[Signature]*

Date: 06/27/2007

**SECTION 3
INSTRUMENTATION AND EQUIPMENT LIST**

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

Equipment	Description	Serial No.	Cal. Date	Next Cal. Date
Counter/Timer	Newport	4420534	12/12/06	12/12/07
Counter/Timer	Newport	4420532	12/12/06	12/12/07
Vehicle Scales	GSE	004804	09/11/06	09/11/07
Tape Measure	Stanley Powerlock 8M	278	3/26/07	9/26/07

**SECTION 4
PHOTOGRAPHS**

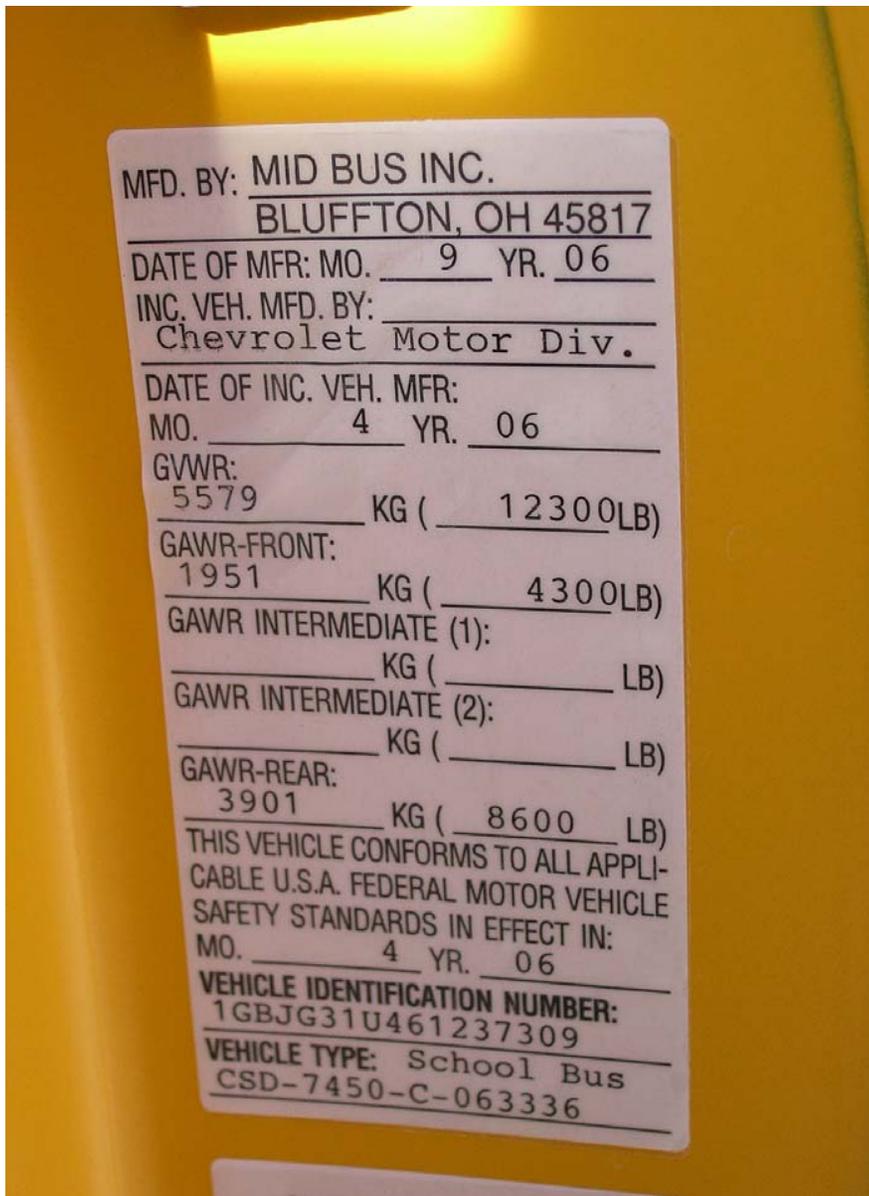
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Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



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Vehicle Certification Label

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Tire-Rim Information Label

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Front View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Front View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Left Front Three-Quarter View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Left Front Three-Quarter View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Right Front Three-Quarter View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Right Front Three-Quarter View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Left Side View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Left Side View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

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Pre-Test Right Side View of School Bus

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION

NHTSA No.: C60901
Test Date: 06/27/07



Post-Test Right Side View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Rear View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Rear View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Left Rear Three-Quarter View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Left Rear Three-Quarter View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Right Rear Three-Quarter View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Right Rear Three-Quarter View of School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Cart Positioned by School Bus

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION

NHTSA No.: C60901
Test Date: 06/27/07



Post-Test Cart and School Bus

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

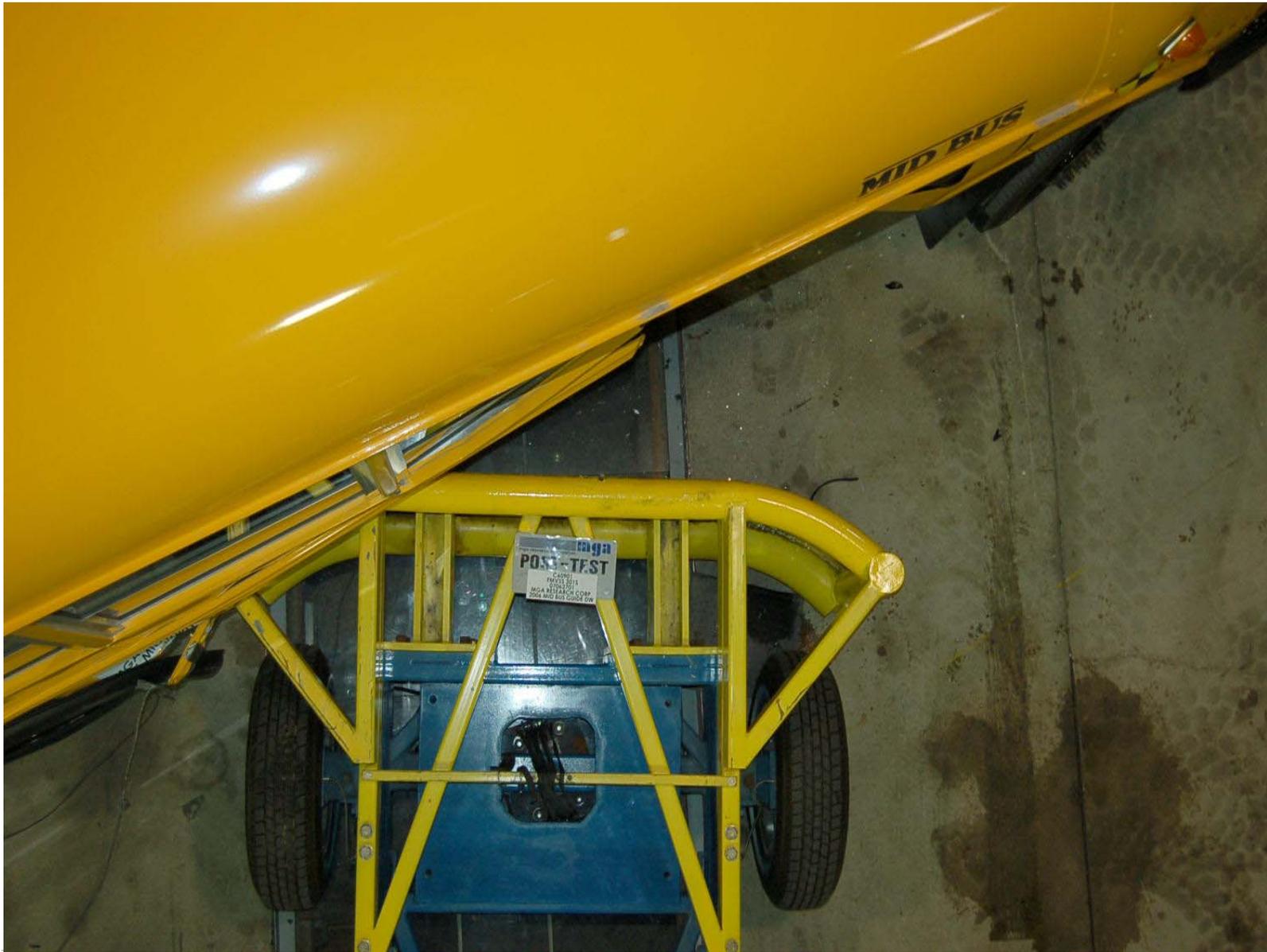
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Test Date: **06/27/07**



Pre-Test Cart Positioned by School Bus (overhead view)

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Cart and School Bus (overhead view)

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Impact View 1

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

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Post-Test Impact View 2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Right Front Three-Quarter View of School Bus w/out Cart

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Right Rear Three-Quarter View of School Bus w/out Cart

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION

NHTSA No.: C60901
Test Date: 06/27/07



Pre-Test Fuel Filler Cap

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION

NHTSA No.: C60901
Test Date: 06/27/07



Post-Test Fuel Filler Cap

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

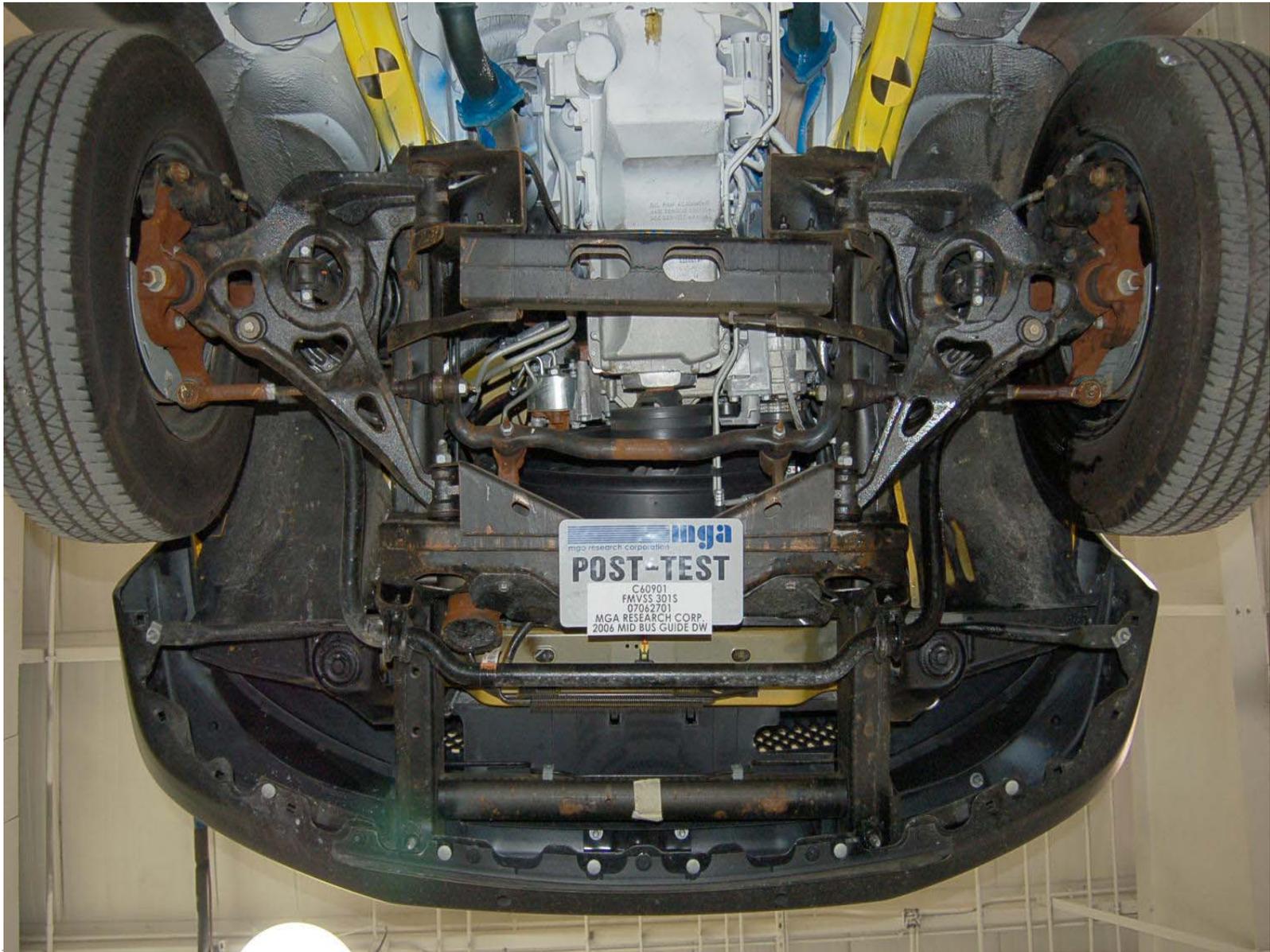
NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Front Underbody

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Front Underbody

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

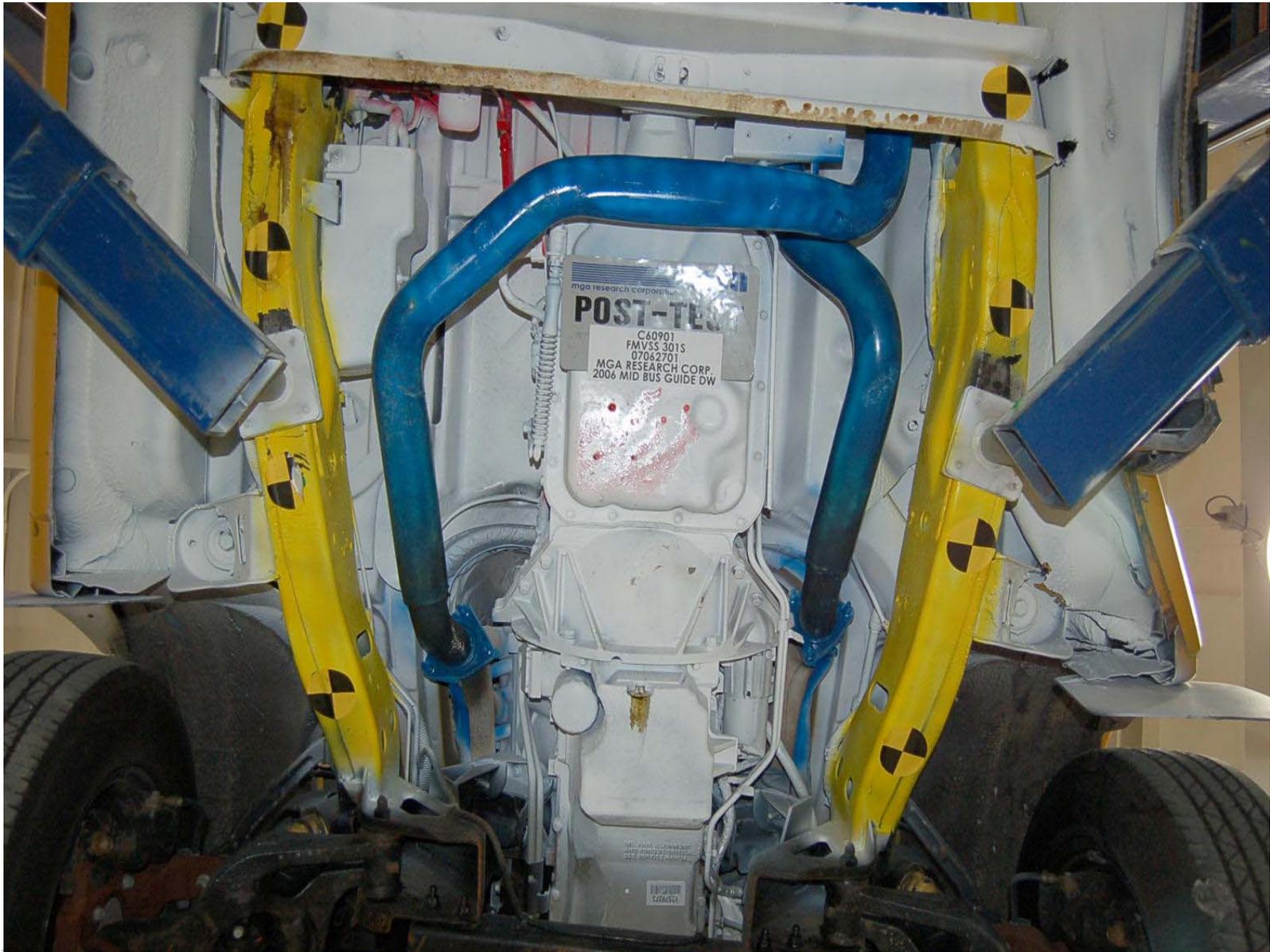
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Pre-Test Mid Front Underbody

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

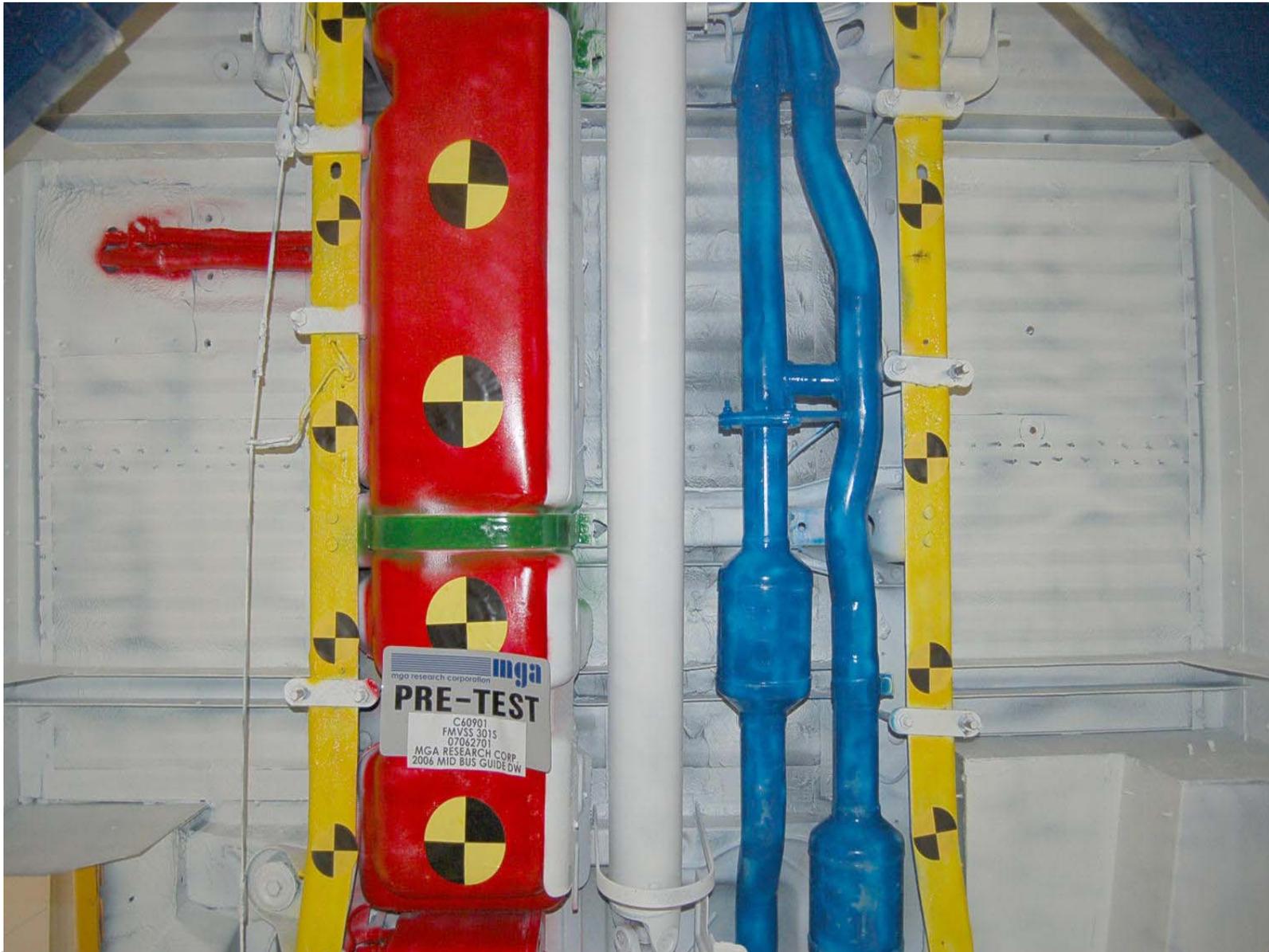
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Post-Test Mid Front Underbody

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

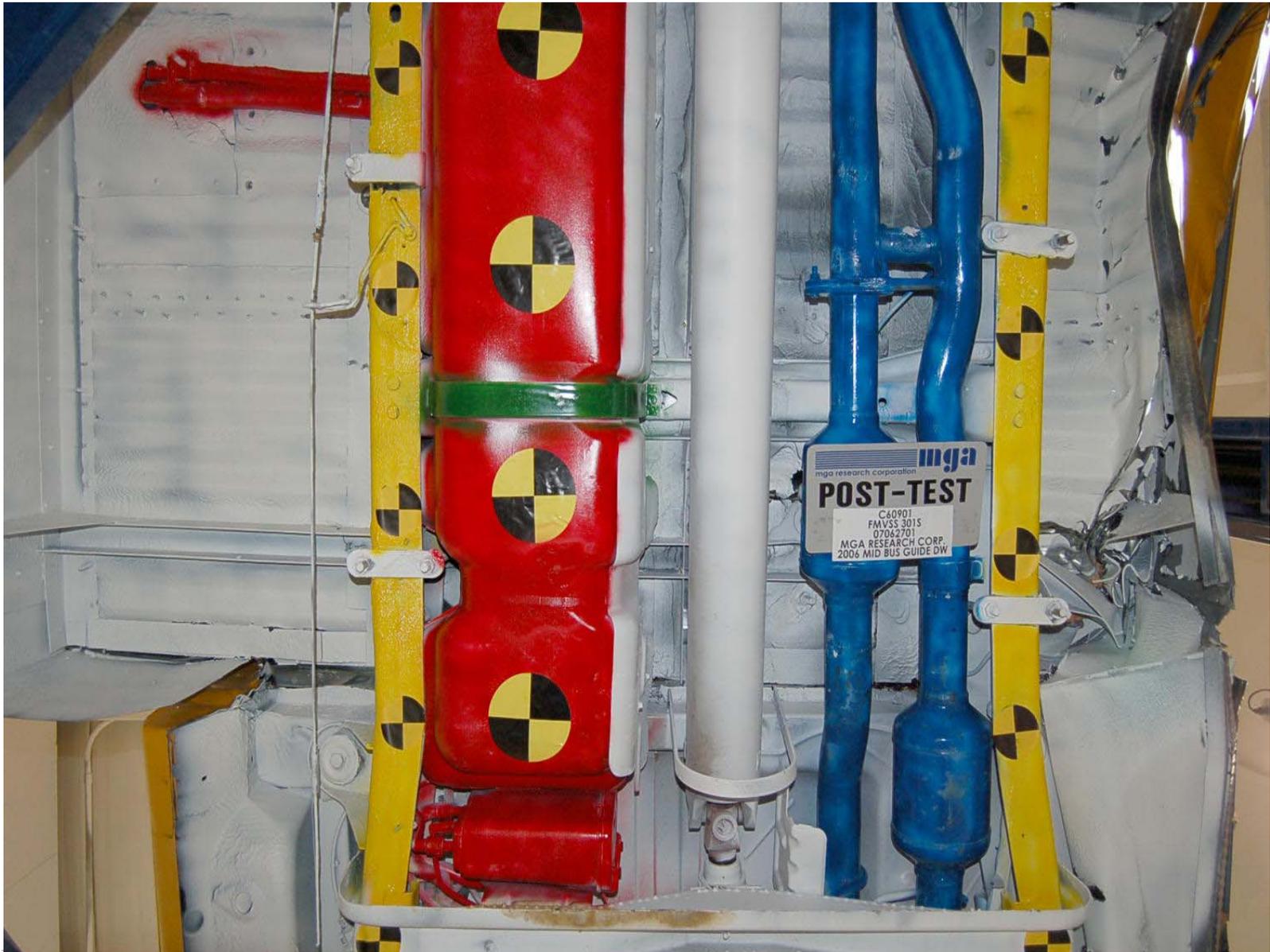
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Test Date: **06/27/07**



Pre-Test Mid Underbody

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Mid Underbody

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

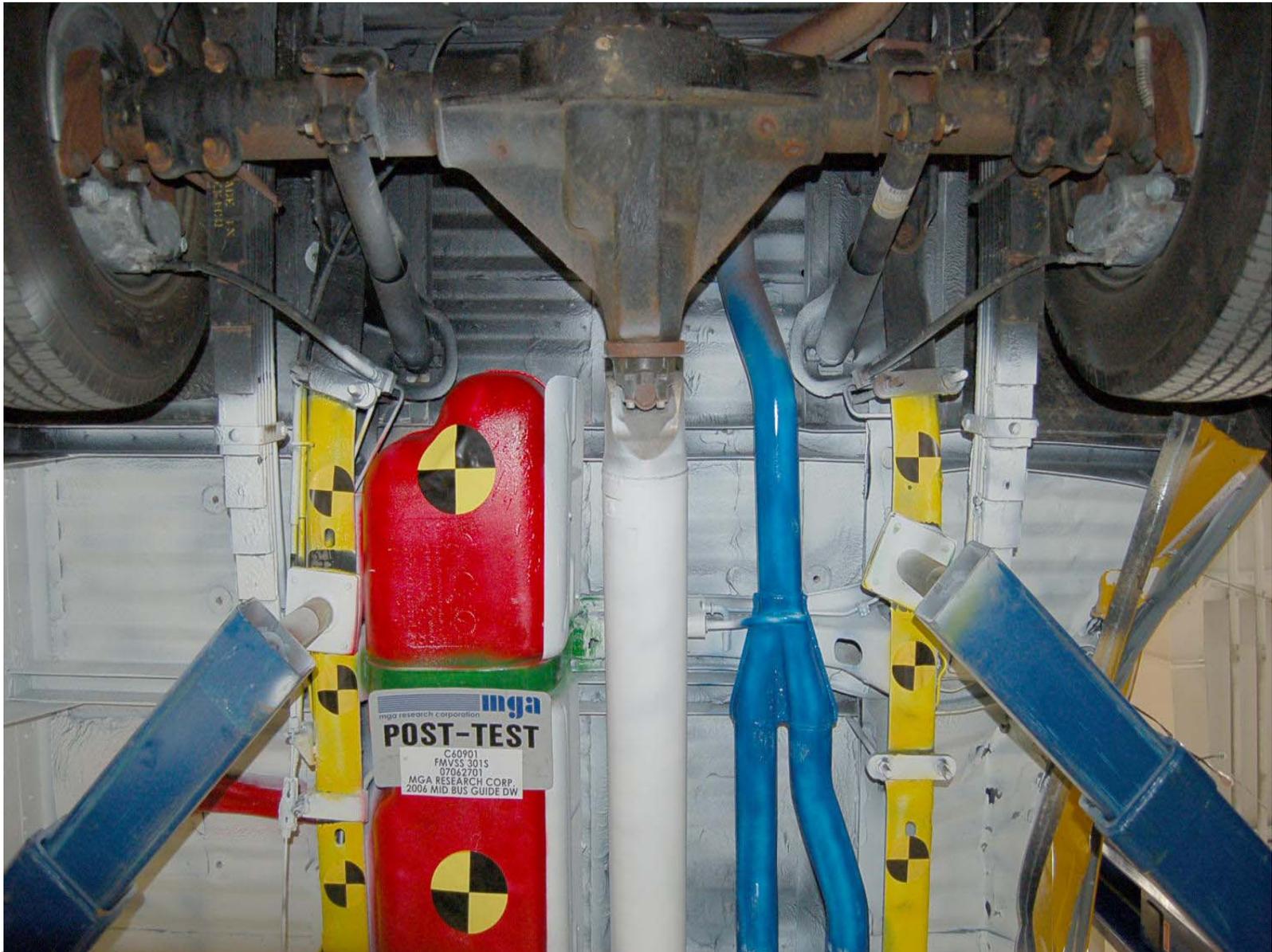
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Test Date: **06/27/07**



Pre-Test Mid Rear Underbody

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Mid Rear Underbody

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

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Pre-Test Rear Underbody View 1

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Rear Underbody View 1

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

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Pre-Test Rear Underbody View 2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

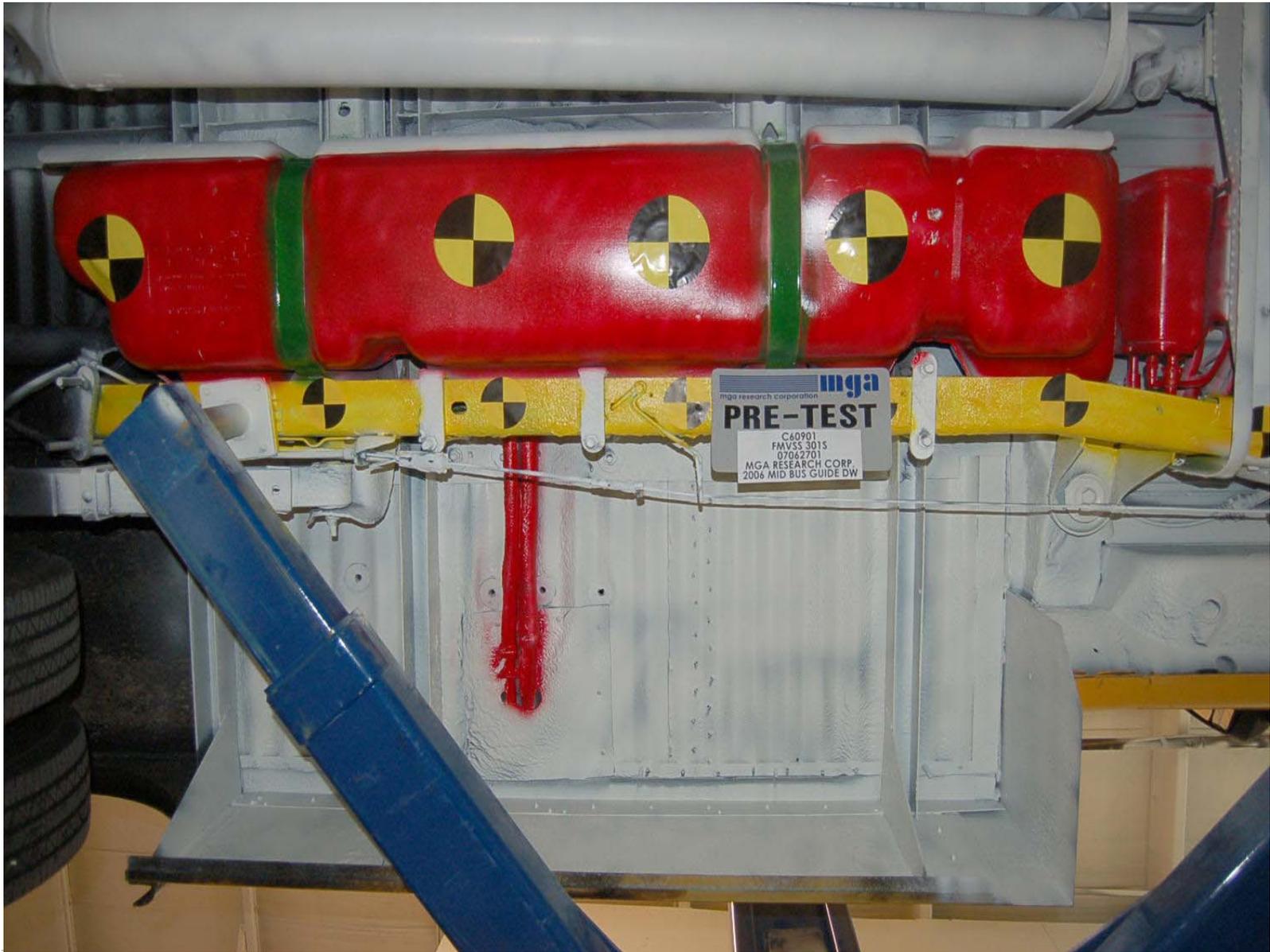
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Post-Test Rear Underbody View 2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Fuel Tank

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

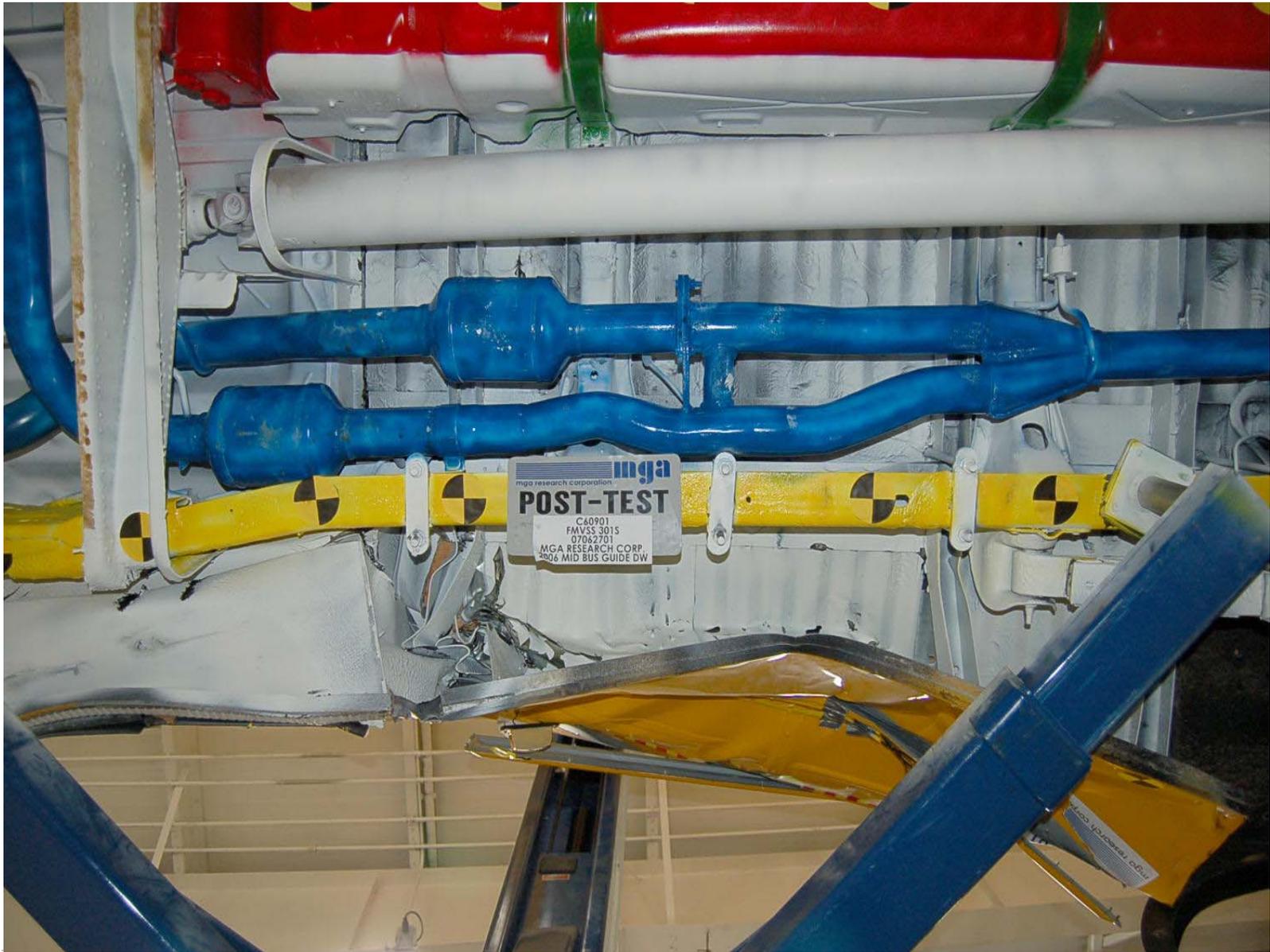


Post-Test Fuel Tank

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

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Post-Test Damage Underbody View 1

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Post-Test Damage Underbody View 2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test View of Ballast Weight View 1

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION

NHTSA No.: C60901
Test Date: 06/27/07



Pre-Test View of Ballast Weight View 2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



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Pre-Test Cart Front View

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Cart Left Front View

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60901**
Test Date: **06/27/07**

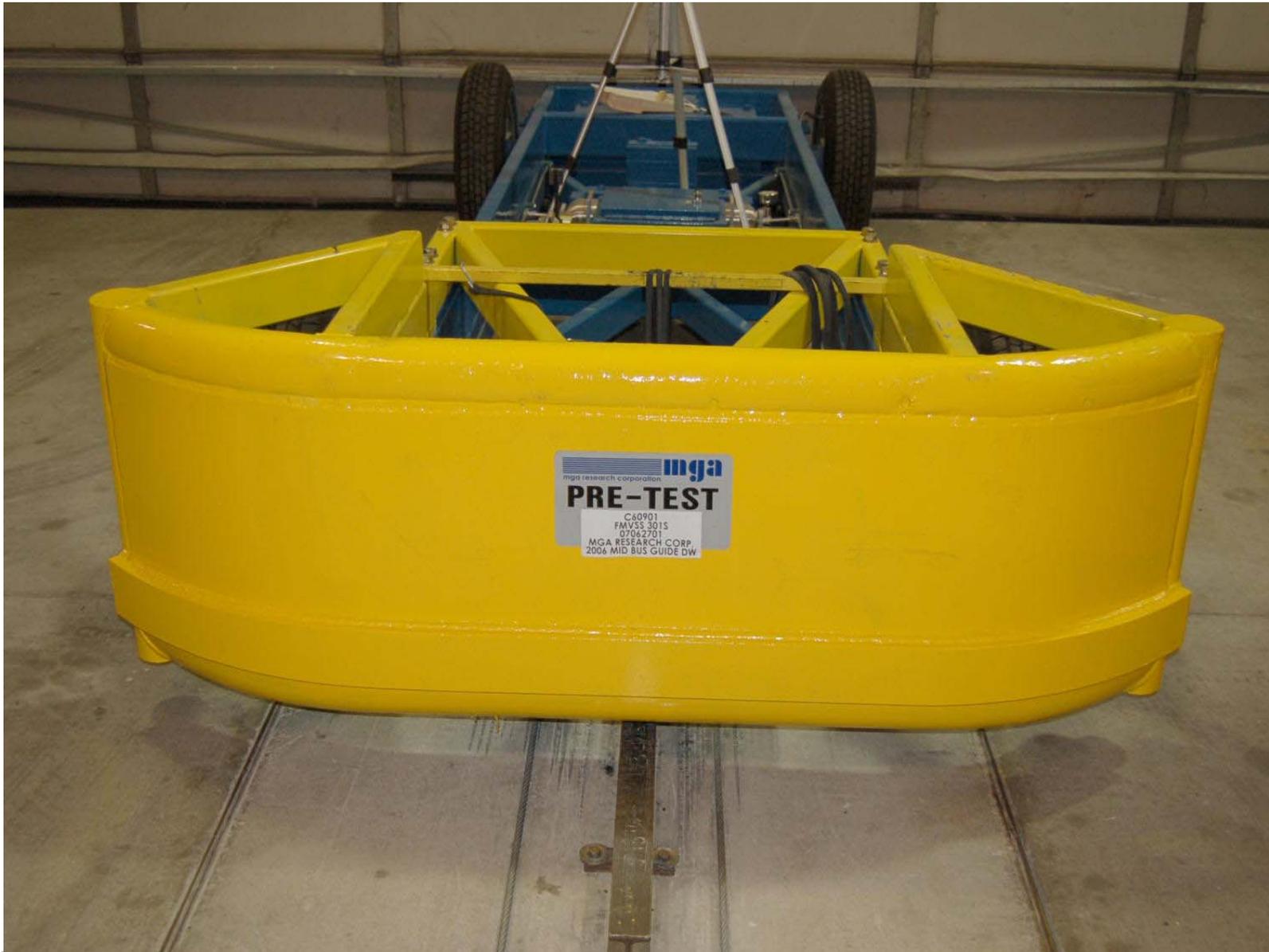


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Pre-Test Cart Right Front View

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

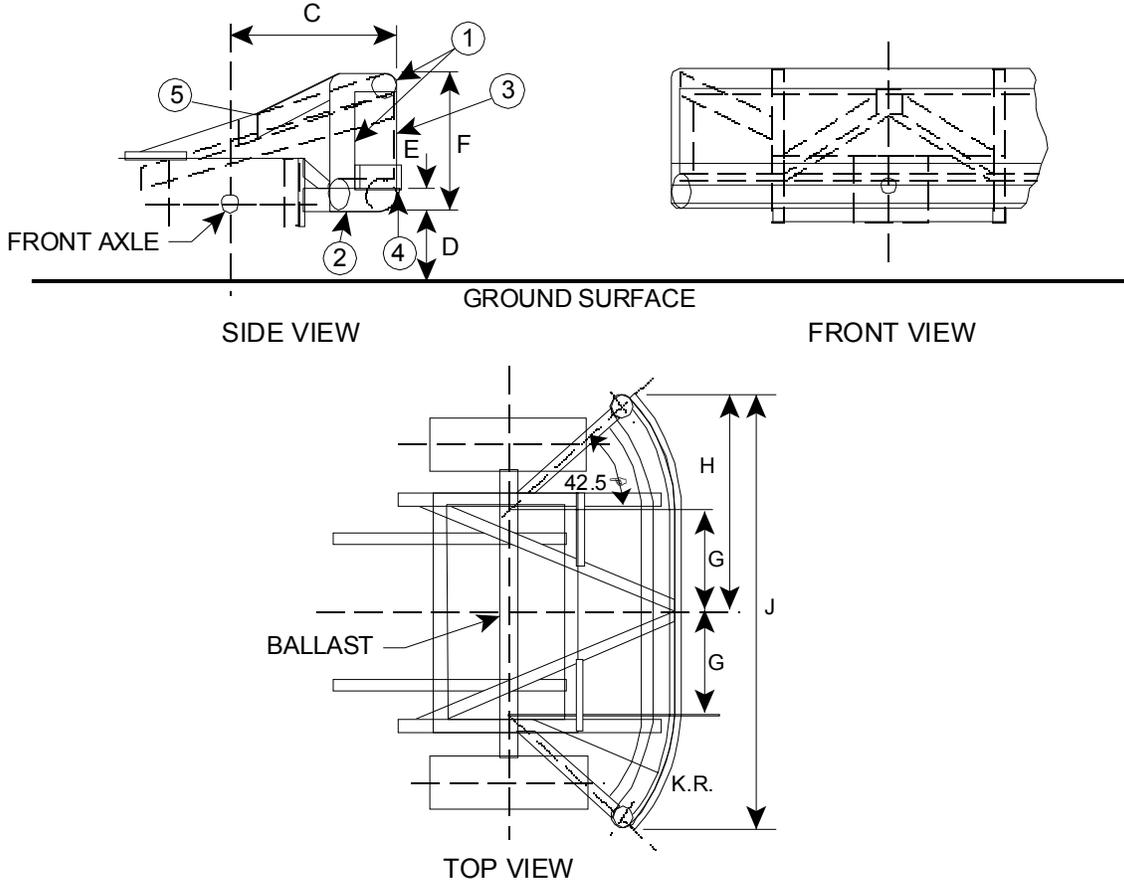
NHTSA No.: **C60901**
Test Date: **06/27/07**



Pre-Test Cart Front Overhead View

SECTION 5
BARRIER INFORMATION

CONTOURED IMPACT SURFACE FOR COMMON CARRIAGE



DIMENSIONS SHOWN IN TABLE ON NEXT PAGE

NOTES:

1. Upper Frame 4.0 in. dia x 0.25 in. wall (102 mm dia x 6 mm wall)
Steel Tubing (3 Sides)
2. Lower Frame 6.0 in. dia x 0.50 in. wall (152 mm dia x 13 mm wall)
Steel Tubing
3. Face Plate 0.75 in. (19 mm) thick cold rolled steel
4. Leading Edge 1.0 s 4.0 in. (25 x 102 mm) steel band, sharp
edges broken
5. All Inner Reinforcements 4.0 x 2.0 x 0.19 in. (102 x 51 x 5 mm)
steel tubing

Total Weight = 4,000 ± 50 lbs (1,814.1 ± 22.7 kg)

Weight at each Rear Wheel =
900 ± 25 lbs (408.2 ± 11.3 kg)

Weight at each Front Wheel =
1,100 ± 25 lbs (499.0 ± 11.3 kg)

Moments of Inertia:

$I_x = 271 \pm 13.6 \text{ slug-ft}^2 (367 \pm 18.4 \text{ kg-m}^2)$

$I_z = 3,475 \pm 174 \text{ slug-ft}^2 (4,711 \pm 236 \text{ kg-m}^2)$

DIMENSIONS FOR CONTOURED IMPACT SURFACE

LETTER	INCHES	MILLIMETERS
A	54.0	1372
B	15.8	401
C	30.0	762
D	5.25	133
E	3.75	95
F	24.75	629
G	18.0	457
H	39.0	991
J	78.0	1981
K	30.0	762