

REPORT NUMBER: 131SB-MGA-2007-002

**SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 131
SCHOOL BUS PEDESTRIAN SAFETY DEVICES**

**2006 US Bus School Bus
NHTSA No. C60900**

**PREPARED BY:
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Final Report Date: October 24, 2006

FINAL REPORT

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SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted by the MGA Research Corporation-Wisconsin Operations on a 2006 US Bus School Bus, NHTSA No. C60900, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-131SB-01 to determine compliance to the requirements of Federal Motor Vehicle Safety Standard (FMVSS) 131, "School Bus Pedestrian Safety Devices."

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

SECTION 2
TEST DATA SUMMARY

Based on the tests performed, the 2006 US Bus School Bus, NHTSA No. C60900, appears to meet all of the requirements of FMVSS 131. See Test Summary Data Sheets on the following pages.

FMVSS 131, SCHOOL BUS PEDESTRIAN SAFETY DEVICES

VEHICLE INFORMATION AND TEST SUMMARY

Test Vehicle: **2006 US Bus School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60900**
 Test Date: **9/25/2006**

VIN	1GBHG31V561226021	Chassis Cab	Yes
No. of Stop Signal Arms	1	Rear Engine	No
Pass. Capacity (driver included)	15	Tire Size (on bus)	225/75R16D
Stop Signal Arm Manufacturer	Transpec		

DATA FROM CERTIFICATION LABEL

Final Stage Manufacturer	US Bus Corporation	Date of Mfg.	08/2006
Incomplete Vehicle Manufacturer	General Motors Corporation	Date of Mfg.	03/2006
GVWR (kg)	4536	GAWR Front (kg)	1860
		GAWR Rear (kg)	3402

TEST SUMMARY

	Pass/Fail or N/A
Dimensional Requirements (S5.1)	PASS
Surface Content and Labeling (S5.2)	PASS
Conspicuity Requirements (S5.3)	PASS
Location and Position Requirements (S5.4)	PASS
Arm Operation Requirements (S5.5)	PASS

SECTION 3
COMPLIANCE TEST DATA

FMVSS 131 – DATA SHEET 1
DIMENSIONS OF STOP SIGNAL ARM (S5.1)

Test Vehicle: **2006 US Bus School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60900**
 Test Date: **9/25/06**

“Regular octagon” with diameter of at least 450 mm (point to point).

	Forward Signal Arm (mm)	Rearmost Signal Arm (mm)
Diameter 1	510	---
Diameter 2	510	---
Diameter 3	510	---
Diameter 4	509	---
Range (max. – min.)	1	---

REQUIREMENTS	Yes, No, N/A
Are all octagon diameter values ≥ 450 mm?	Yes
Is range of octagon diameter values ≤ 12 mm?	Yes
Are all octagon chord dimensions equal within 6 mm?	Yes

Test Results	Pass/Fail
S5.1 Dimensions of Stop Signal Arm	PASS

Tested By: Jeff Kachler
 Date: October 24, 2006

Approved By: Michael Janoj

FMVSS 131 – DATA SHEET 2
SURFACE CONTENT AND LABELING (S5.2)

Test Vehicle: **2006 US Bus School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60900**
 Test Date: **9/25/2006**

REQUIREMENTS	Forward Signal Arm		Rearmost Signal Arm	
	Front Side	Aft Side	Front Side	Aft Side
Color RED except for border & legend (Yes/No)	YES	YES	---	---
Color of border is WHITE (Yes/No)	YES	YES	---	---
Color of word "STOP" is WHITE (Yes/No)	YES	YES	---	---
Word "STOP" is in upper case letters (Yes/No)	YES	YES	---	---
Width of border (≥ 12 mm)	16 mm	16 mm	---	---
Percent of border obscured by mounting brackets, clips, or bolts, or other components ($15\% \leq$) *	0%	0%	---	---
Height of letters (≥ 150 mm)	156 mm	156 mm	---	---
Stroke width of letters (≥ 20 mm)	27 mm	27 mm	---	---

* = In addition to area obscured by 2 optional red lamps, if installed.

NOTE:

1. Front side of rearmost signal arm shall not contain any lettering or border.

Test Results		Pass/Fail
S5.2	Surface content and labeling	PASS

Tested By: Jeff Koehler
 Date: October 24, 2006

Approved By: Michal Janoj

**FMVSS DATA SHEET 3
CONSPICUITY (S5.3)**

Test Vehicle: **2006 US Bus School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60900**
 Test Date: **9/25/2006**

The Stop Signal Arm shall comply with either S5.3.1 or S5.3.2, or both.

REFLECTORIZED MATERIAL (S5.3.1)

Requirements	Forward Signal Arm		Rearmost Signal Arm	
	Front Side	Aft Side	Front Side	Aft Side
Entire surface of stop signal arm reflectorized except for mounting brackets, clips, bolts, or other necessary components. Front side of rearmost stop signal arm must not be reflectorized. (Yes/No)	Yes ¹	Yes ¹	---	---
Percent of entire surface obscured by mounting brackets, clips, bolts or other components necessary for mechanical or electrical operation. (7.5% max. each side)	0% ²	0% ²	---	---

Test Notes:

¹ Flashing lights are present meeting the requirements of S5.3.2.

² Percentages do not include area obscured by red flashing lights.

FMVSS 131 DATA SHEET 3...continued
CONSPICUITY (S5.3)

Test Vehicle: **2006 US Bus School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60900**
 Test Date: **9/25/2006**

Optional Illuminated Lettering (S5.3.1.1)

Item	Stop Signal Arm	
	Forward	Rearmost
Does the stop sign(s) have illuminated lettering? If optional illuminated lettering is installed, the following requirements apply in addition to reflectorized surface.	NO	---

Requirements	Forward Signal Arm		Rearmost Signal Arm	
	Front Side	Aft Side	Front Side	Aft Side
Only Red lamps used (Yes/No)	N/A	N/A	---	---
Red lamps form the complete shape of each letter of the legend. (Yes/No)	N/A	N/A	---	---
Red lamps centered within stroke of each letter (Yes/No) or Red lamps outline each letter in immediately surrounding area (Yes/No)	N/A	N/A	---	---
The shape of each letter remains constant (Yes/No)	N/A	N/A	---	---
Net stroke width \geq 15 mm (stroke width minus lamp width)	“S”	N/A	N/A	---
	“T”	N/A	N/A	---
	“O”	N/A	N/A	---
	“P”	N/A	N/A	---
Lamps on each side of the signal arm flash (60-120 flashes/min.)	N/A	N/A	---	---
Lamps current “on” time of 30% to 75% of the total flash cycle	N/A	N/A	---	---
Total current “on” time for the two terminals shall be between 90-110% of the total flash cycle.	N/A	N/A	---	---
If Xenon short-arc lamps – “off” time before each flash of at least 50% of the total flash cycle.	N/A	N/A	---	---

Lamp Type	x	Filament
		Gaseous Discharge
		Light emitting diode

FMVSS 131 DATA SHEET 3...continued
CONSPICUITY (S5.3)

Test Vehicle: **2006 US Bus School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60900**
 Test Date: **9/25/2006**

RED FLASHING LAMPS (S5.3.2)

Requirements	Forward Signal Arm		Rearmost Signal Arm	
	Front Side	Aft Side	Front Side	Aft Side
Red lamps centered on the vertical centerline (At least 2, enter quantity)	2 – YES	2 – YES	---	---
One lamp at extreme top and another at extreme bottom (Yes/No)	YES	YES	---	---
Lamps on each side of the signal arm flash alternately (60-120 flashes/min.)	YES	YES	---	---
Lamps current "on" time of 30% to 75% of the total flash cycle.	YES	YES	---	---
Total current "on" time for two terminals shall be between 90 and 110% of the total flash cycle.	YES	YES	---	---
If Xenon short-arc lamps-"off" time before each flash of at least 50% of total flash cycle.	N/A	N/A	---	---
Symbol "DOT" on each lamp lens (Yes/No)	YES	YES	---	---
Additional markings on lamp lenses	SAE I-95	SAE I-95	---	---

MARKINGS ON THE FLASHER

Make	InPower	Serial No.	N/A
Model	SBF-94	Date of Mfg.	N/A

TEST RESULTS		Pass/Fail or N/A
S5.3.1	Reflectorized Material	PASS
S5.3.1.1	Optional Illuminated Lettering	N/A
S5.3.2	Red Flashing Lamps	PASS

Tested By: Jeff Koehler

Approved By: Michael Janoy

Date: October 24, 2006

FMVSS 131 DATA SHEET 4
STOP SIGNAL ARM INSTALLATION (S5.4)

Test Vehicle: **2006 US Bus School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60900**
 Test Date: **9/25/06**

Dimensions and angles measured with Signal Arm in the extended position.

Requirements	Stop Signal Arm	
	Forward	Rearmost
Signal arm perpendicular to side of bus (Measure angle between vertical plane of side of bus and vertical plane of the signal arm.) $90 \pm 5^\circ$	YES 86°	---
Top edge of signal arm parallel to horizontal plane (Measure angle between vertical plane of side of bus and the top edge of the signal arm.) $90 \pm 5^\circ$	YES 88.6°	---
Top edge of signal arm not more than 152.4 mm from a horizontal plane tangent to lower edge of frame of passenger window immediately behind the driver's window:		
Measure top corner closest to the school bus	3 mm	---
Measure top corner furthest from school bus	5 mm	---
Vertical centerline of signal arm not less than 228.6 mm away from side of bus	384 mm	---
Stop signal arm(s) installed on left side of bus (Yes, No, or Not Applicable)	YES	---

TEST RESULTS		Pass/Fail or N/A
S5.4	Stop Signal Arm Installation	PASS

Tested By: Jeff Kaehler
 Date: October 24, 2006

Approved By: Michael Janusz

FMVSS 131 DATA SHEET 5
STOP SIGNAL ARM OPERATION (S5.5)

Test Vehicle: **2006 US Bus School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60900**
 Test Date: **9/25/06**

Stop Signal Arm(s) shall be automatically extended, at a minimum, whenever the red signal lamps on the bus required by FMVSS 108 are activated; except that a manual override device may be installed that prevents automatic extension.

Requirements	Stop Signal Arm	
	Forward	Rearmost
Signal Arm(s) automatically extended when red lights are activated and override device is not activated. (Yes, No, or Not Applicable)	YES	---
If a MANUAL OVERRIDE DEVICE is installed, enter applicable data below:		
Mechanism for activating the override device is within reach of the school bus driver (Yes/No)	N/A	---
While the override device is activated; there is a continuous or intermittent signal audible to the driver unless equipped with optional cut-off timing device (Measure duration \geq 10 min.)	N/A	---
If audible signal is equipped with optional cut-off timing device, it sounds for at least 60 seconds while the manual override is activated. (Measure 3 times, duration \geq 60 sec.)	N/A	---
If audible signal is equipped with optional cut-off timing device, it automatically recycles every time the service entry door is opened while the engine is running and the manual override is engaged. (Recycle 3 times, Yes/No each cycle)	N/A	---

Describe location and mode of operation of the manual override control, if installed:

No manual override device, which allowed overhead lights to flash and stop signal arm NOT to extend, was installed on this vehicle.

TEST RESULTS		Pass/Fail or N/A
S5.5	Stop Signal Arm Operation	PASS

Tested By: Jeff Kaehler
 Date: October 24, 2006

Approved By: Michael Janovic

SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: **2006 US Bus School Bus**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60900**
Test Date: **9/25/06**

Identify the instruments used during this test and record their make, model, serial number, range, accuracy, and calibration date.

	Digital Caliper	Inclinometer	Tape Measure
Make	Mitutoyo	Digital Protractor	Stanley
Model	CD-6"CS	Pro 360	Powerlock
Serial # (s)	04401288	Complab	269
Range	0 to 150 mm	0 to 360 degrees	0 to 8 m
Accuracy	0.01 mm	0.1 degree	1 mm
Cal. Date	9/11/06	9/25/06	8/16/06
Cal. Due	9/11/07	3/25/07	2/16/07

SECTION 5
PHOTOGRAPHS

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Test Vehicle: 2006 US School Bus
Procedure: FMVSS 131

NHTSA No.: C60900
Test Date: 9/25/06



Photo 1 - 3/4 Frontal View from Left Side of Vehicle with Stop Signal Arm(s) Extended

Test Vehicle: 2006 US School Bus
Procedure: FMVSS 131

NHTSA No.: C60900
Test Date: 9/25/06

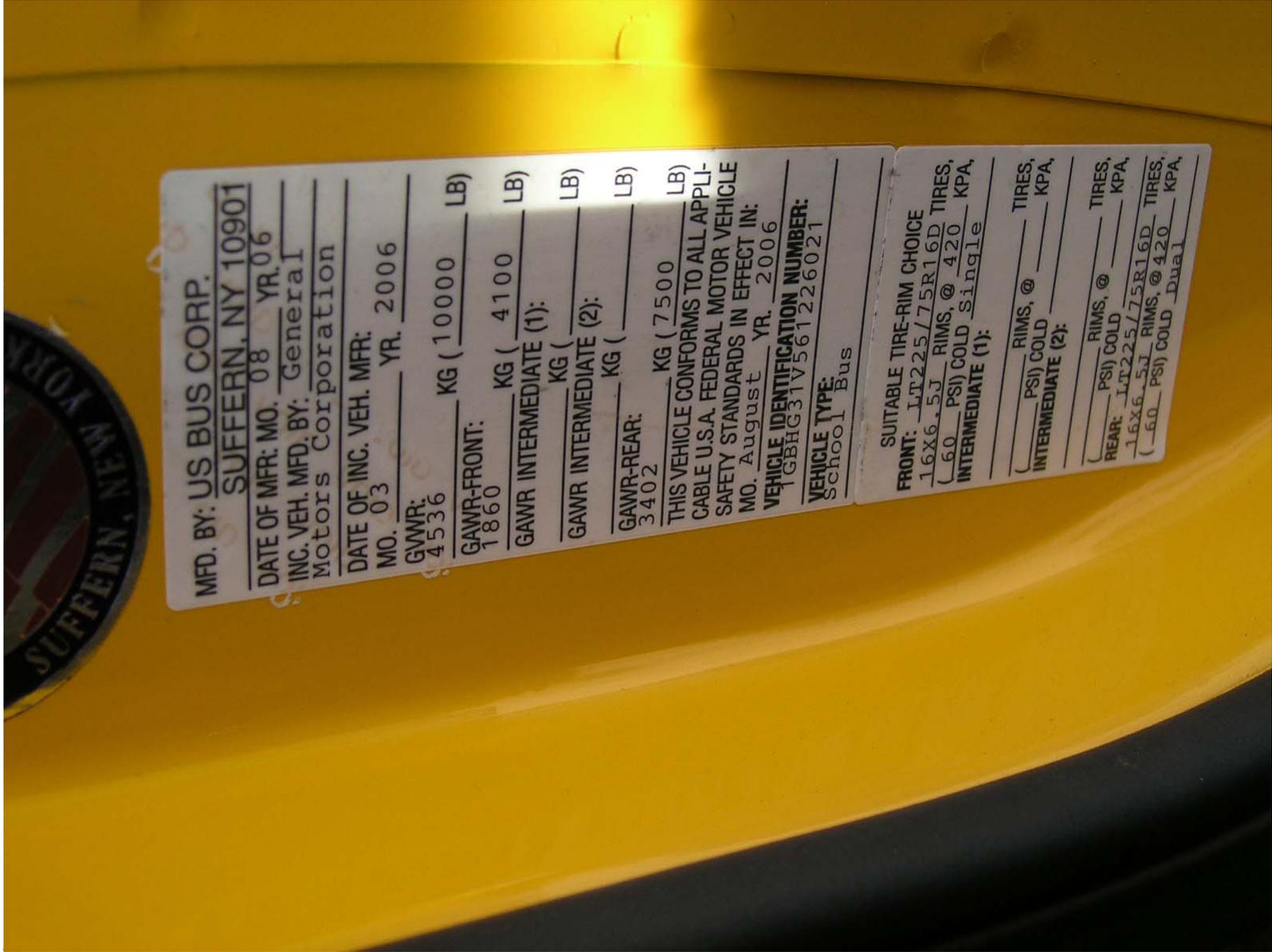


Photo 2 – Vehicle Certification Label and Tire Placard

Test Vehicle: 2006 US School Bus
Procedure: FMVSS 131

NHTSA No.: C60900
Test Date: 9/25/06

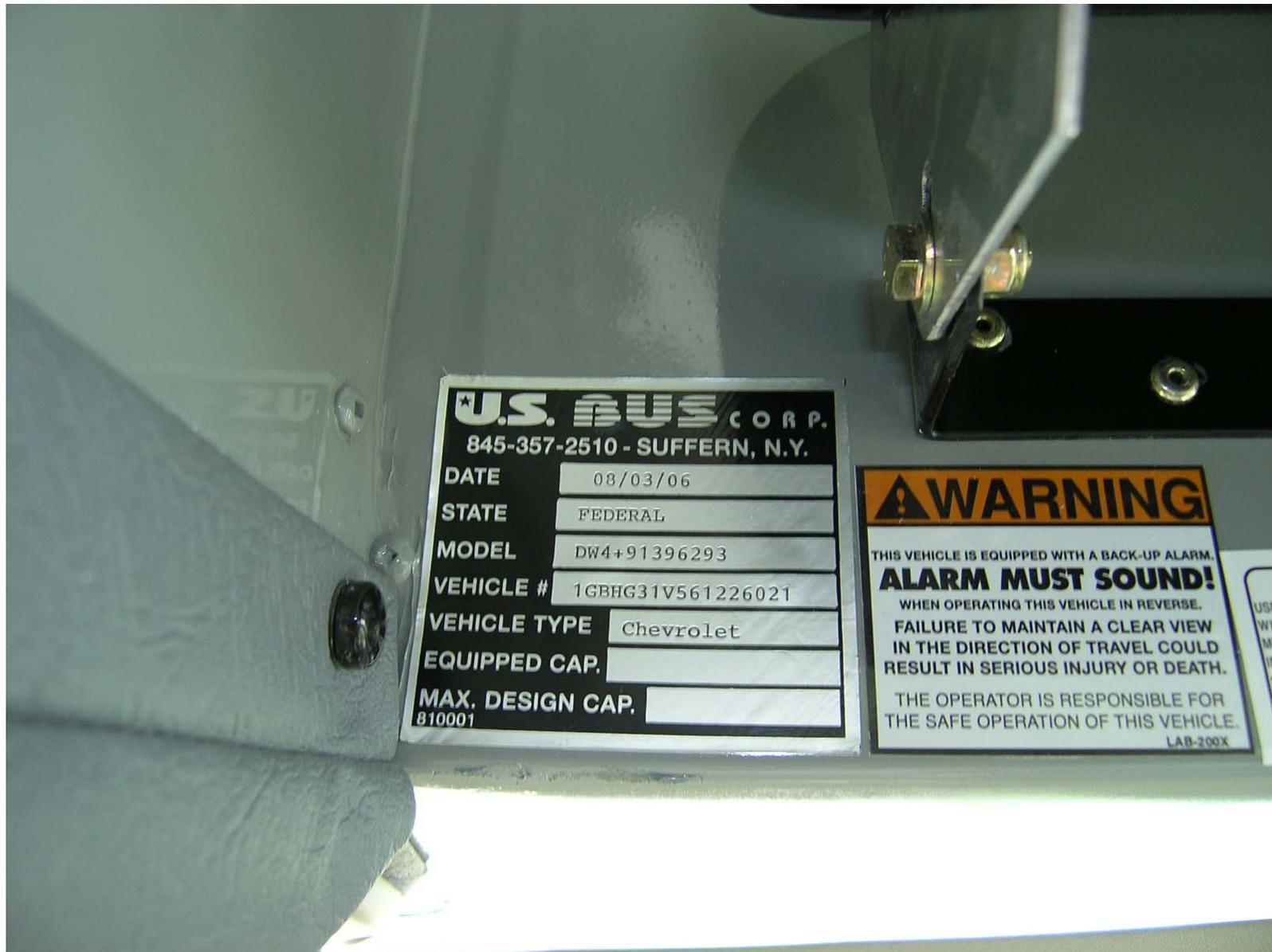


Photo 3 - Vehicle Identification Label

Test Vehicle: **2006 US School Bus**
Procedure: **FMVSS 131**

NHTSA No.: **C60900**
Test Date: **9/25/06**



Photo 4 - Front Close Up View of Stop Signal Arm

Test Vehicle: **2006 US School Bus**
Procedure: **FMVSS 131**

NHTSA No.: **C60900**
Test Date: **9/25/06**



Photo 5 - Back Close Up View of Stop Signal Arm

Test Vehicle: 2006 US School Bus
Procedure: FMVSS 131

NHTSA No.: C60900
Test Date: 9/25/06



Photo 6 - Close Up View of the Switches That Allow Extension of the Stop Signal Arm(s)

Test Vehicle: **2006 US School Bus**
Procedure: **FMVSS 131**

NHTSA No.: **C60900**
Test Date: **9/25/06**



Photo 7 - Switch Console Relative to the Driver Seating Position