

**REPORT NUMBER: 131SB-MGA-2007-003**

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

**Les Entreprises Michel Corbeil Inc.  
2006 Corbeil School Bus  
NHTSA No. C60902**

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



**Final Report Date: November 28, 2006**

**FINAL REPORT**

**PREPARED FOR:  
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
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Prepared by: Jeff Koehler Date: November 28, 2006  
Jeff Koehler, Program Manager

Reviewed by: Michael Janovicz Date: November 28, 2006  
Mike Janovicz, Project Engineer

FINAL REPORT ACCEPTED BY:

John J. Zimmerman

11/28/06  
Date of Acceptance

### Technical Report Documentation Page

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<b>16. Abstract</b> Compliance tests were conducted on the subject, 2006 Corbeil School Bus NHTSA No. C60902, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-131SB-01 for the determination of FMVSS 131 compliance.  Test failures identified were as follows: None			
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**SECTION 1**  
**PURPOSE OF COMPLIANCE TEST**

Tests were conducted by the MGA Research Corporation-Wisconsin Operations on a 2006 Corbeil School Bus, NHTSA No. C60902, 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 Corbeil School Bus, NHTSA No. C60902, 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 Corbeil School Bus**  
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60902**  
 Test Date: **10/9/06**

VIN	1FDSE35L66DA60778	Chassis Cab	Yes
No. of Stop Signal Arms	1	Rear Engine	No
Pass. Capacity (driver included)	21	Tire Size (on bus)	LT245/75R16
Stop Signal Arm Manufacturer	Specialty Manufacturing		

**DATA FROM CERTIFICATION LABEL**

Final Stage Manufacturer	Corbeil	Date of Mfg.	6/29/06
Incomplete Vehicle Manufacturer	Ford	Date of Mfg.	4/06
GVWR (kg)	4355	GAWR Front (kg)	1610
		GAWR Rear (kg)	2760

**TEST SUMMARY**

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

**SECTION 3**  
**COMPLIANCE TEST DATA**

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

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

NHTSA No.: **C60902**  
 Test Date: **10/9/06**

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

	Forward Signal Arm (mm)	Rearmost Signal Arm (mm)
Diameter 1	495	---
Diameter 2	495	---
Diameter 3	495	---
Diameter 4	495	---
Range (max. – min.)	0	---

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

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

Tested By: Jeff Koehler  
 Date: October 9, 2006

Approved By: Michael Janoy

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

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

NHTSA No.: **C60902**  
 Test Date: **10/9/06**

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 ( $\geq 12$ mm)	12.5 mm	14 mm	---	---
Percent of border obscured by mounting brackets, clips, or bolts, or other components* ( $\leq 15\%$ )	0%	14%	---	---
Height of letters ( $\geq 150$ mm)	150 mm	150 mm	---	---
Stroke width of letters ( $\geq 20$ mm)	24 mm	24 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	<b>PASS</b>

Tested By: Jeff Kachler  
 Date: October 9, 2006

Approved By: Michal Janovic

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

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

NHTSA No.: **C60902**  
 Test Date: **10/9/06**

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)	No <sup>1</sup>	No <sup>1</sup>	---	---
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% <sup>2</sup>	3.57% <sup>2</sup>	---	---

Test Notes:

<sup>1</sup> Flashing lights are present meeting the requirements of S5.3.2.

<sup>2</sup> Percentages do not include area obscured by red flashing lights.

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

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

NHTSA No.: **C60902**  
 Test Date: **10/9/06**

**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 Corbeil School Bus**  
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60902**  
 Test Date: **10/9/06**

**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)	NO	NO	---	---
Additional markings on lamp lenses	SMC-194C SAE J1133 FMVSS 131	SMC-194C SAE J1133 FMVSS 131	---	---

**MARKINGS ON THE FLASHER**

Make	InPower	Serial No.	0606121351
Model	SBF-94	Date of Mfg.	N/A

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

Tested By: Jeff Koehler Approved By: Michael Janoy  
 Date: October 9, 2006

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

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

NHTSA No.: **C60902**  
 Test Date: **10/9/06**

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 88.9°	---
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 89.6°	---
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	12 mm	---
Measure top corner furthest from school bus	15 mm	---
Vertical centerline of signal arm not less than 228.6 mm away from side of bus	365 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	<b>PASS</b>

Tested By: Jeff Koehler  
 Date: October 9, 2006

Approved By: Michael Janusz

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

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

NHTSA No.: **C60902**  
 Test Date: **10/9/06**

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	<b>PASS</b>

Tested By: Jeff Koehler  
 Date: October 9, 2006

Approved By: Michael Janoy

**SECTION 4**  
**INSTRUMENTATION AND EQUIPMENT LIST**

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

NHTSA No.: **C60902**  
Test Date: **10/9/06**

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

	<b>Digital Caliper</b>	<b>Inclinometer</b>	<b>Tape Measure</b>
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 Corbeil**  
Procedure: **FMVSS 131**

NHTSA No.: **C60902**  
Test Date: **10/09/06**



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

Test Vehicle: **2006 Corbeil**  
Procedure: **FMVSS 131**

NHTSA No.: **C60902**  
Test Date: **10/09/06**

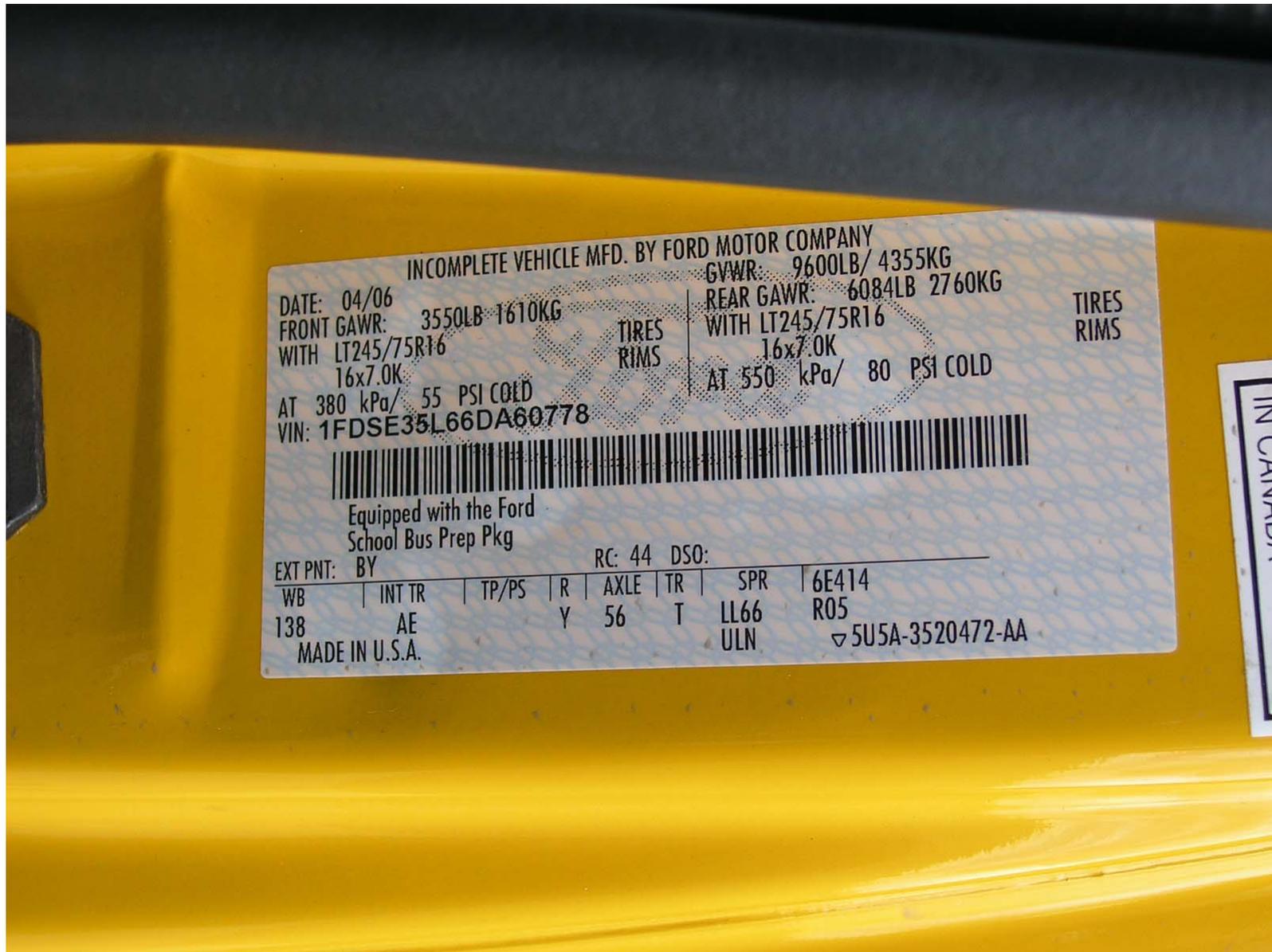


Photo 2- Incomplete Vehicle Manufacturer Label

Test Vehicle: **2006 Corbeil**  
Procedure: **FMVSS 131**

NHTSA No.: **C60902**  
Test Date: **10/09/06**

MFD.BY  
**Les Entreprises Michel Corbeil Inc.**

DATE OF MANUFACTURE 06/29/2006

INCOMPLETE VEHICLE MANUFACTURED BY:  
FORD

DATE INC. VEH. MFD. 04/01/2006

GVWR 9,600.00

GVWR FRONT 3,550.00Lbs WITH RIMS  
LT245/75R16E TIRES, 16 X 7.0K  
@ 55.00 PSI COLD

GVWR REAR 6,084.00Lbs WITH RIMS  
LT245/75R16E TIRES, 16 X 7.0K  
@ 80.00 PSI COLD

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S  
FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN  
EFFECT IN 06/29/2006

VEHICLE IDENTIFICATION NUMBER:  
1FDSE35L66DA60778

VEHICLE TYPE SCHOOL BUS

MODEL 754-NY-20-00WC-EMC

SERIAL GO-63959



Photo 3- Vehicle Certification Label

Test Vehicle: **2006 Corbeil**  
Procedure: **FMVSS 131**

NHTSA No.: **C60902**  
Test Date: **10/09/06**

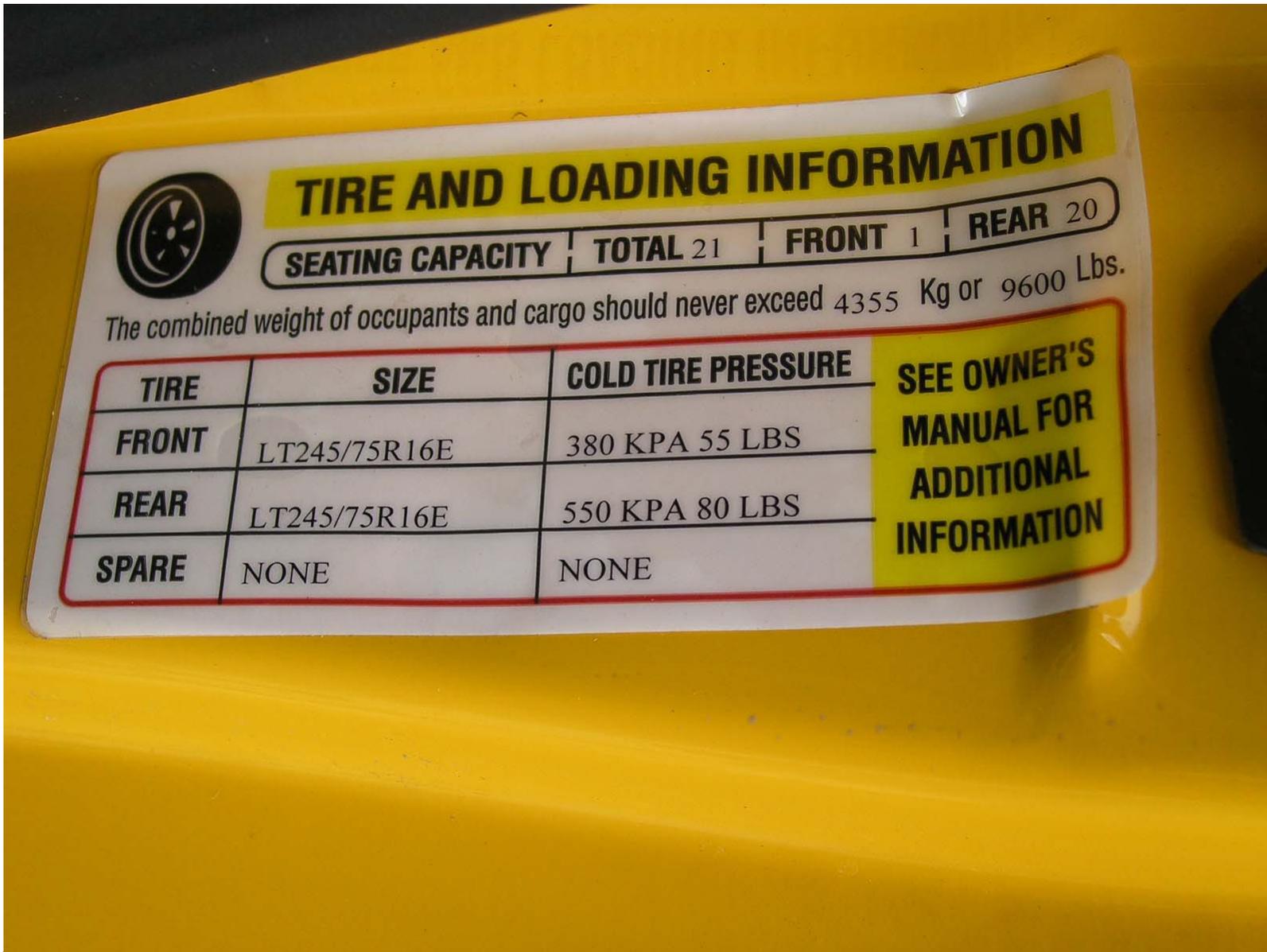


Photo 4- Vehicle Tire Placard

Test Vehicle: **2006 Corbeil**  
Procedure: **FMVSS 131**

NHTSA No.: **C60902**  
Test Date: **10/09/06**



Photo 5- Front Close Up View of Stop Signal Arm

Test Vehicle: **2006 Corbeil**  
Procedure: **FMVSS 131**

NHTSA No.: **C60902**  
Test Date: **10/09/06**



Photo 6- Back Close Up View of Stop Signal Arm

Test Vehicle: **2006 Corbeil**  
Procedure: **FMVSS 131**

NHTSA No.: **C60902**  
Test Date: **10/09/06**



Photo 7- Close Up View of the Switches That Allow Extension of the Stop Signal Arm(s)

Test Vehicle: **2006 Corbeil**  
Procedure: **FMVSS 131**

NHTSA No.: **C60902**  
Test Date: **10/09/06**



Photo 8- Switch Console Relative to the Driver Seating Position

Test Vehicle: **2006 Corbeil**  
Procedure: **FMVSS 131**

NHTSA No.: **C60902**  
Test Date: **10/09/06**



Photo 9- Flasher Unit