

REPORT NUMBER: 131-MGA-05-001

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

**Les Entreprises Michel Corbeil Inc.
2004 Corbeil 30 Passenger School Bus
NHTSA No. C40902**

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



Final Report Date: February 2, 2005

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW, ROOM 6115 (NVS-220)
WASHINGTON, D.C. 20590**

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Prepared by: 
James Hansen, Program Manager Date: February 2, 2005

Reviewed by: 
John Roberts, Project Engineer Date: February 2, 2005

FINAL REPORT ACCEPTED BY:

Date of Acceptance

Technical Report Documentation Page

1. Report No. 131-MGA-05-001	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 131 Compliance Testing of 2004 Corbeil 30 Passenger School Bus NHTSA No.: C40902		5. Report Date February 2, 2005	
		6. Performing Organization Code MGA	
7. Author(s) James Hansen, Program Manager John Roberts, Project Engineer		8. Performing Organization Report No. 131-MGA-05-001	
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.	
		11. Contract or Grant No. DTNH22-02-R-01057	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration; Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 Seventh St., S.W. Room 6115 Washington, D.C. 20590		13. Type of Report and Period Covered Final Report 1/7/2005 – 2/2/2005	
		14. Sponsoring Agency Code NVS-220	
15. Supplementary Notes			
16. Abstract Compliance tests were conducted on the subject, 2004 Corbeil 30 Passenger School Bus NHTSA No. C40902, 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			
17. Key Words Safety Bus Compliance Testing Safety Engineering FMVSS 131		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin., Technical Information Services (TIS), Room 2336 (NPO-405) 400 Seventh Street, S.W. Washington, D.C. 20590	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 26	22. Price

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SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted by the MGA Research Corporation-Wisconsin Operations on a 2004 Corbeil 30 Passenger School Bus, NHTSA No. C40902, 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 2004 Corbeil 30 Passenger School Bus, NHTSA No. C40902, appears to meet all of the requirements of FMVSS 131. See Test Summary Data Sheet on the following page.

**FMVSS 131, SCHOOL BUS PEDESTRIAN SAFETY DEVICES
VEHICLE INFORMATION AND TEST SUMMARY**

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C40902**
 Test Date: **1/7/05**

VIN	1FDXE45P14HA89660	Chassis Cab	Yes
No. of Stop Signal Arms	1	Forward Control	No
Pass. Capacity (driver included)	31	Rear Engine	No
Stop Signal Arm Manufacturer	BMR Manufacturing	Tire Size (on bus)	LT225/75R16

DATA FROM CERTIFICATION LABEL

Final Stage Manufacturer	Michel Corbeil Inc.	Date of Mfg.	05/2004
Incomplete Vehicle Manufacturer	Ford Motor Co.	Date of Mfg.	03/2004
GVWR (kg)	6373	GAWR Front (kg)	2087
		GAWR Rear (kg)	4286

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: **2004 Corbeil 30 Passenger School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C40902**
 Test Date: **1/7/05**

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

	Forward Signal Arm (mm)	Rearmost Signal Arm (mm)
Diameter 1	498	---
Diameter 2	498	---
Diameter 3	498	---
Diameter 4	498	---
Range (max. – min.)	0	---

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: Brian Roach
 Date: January 7, 2005

Approved By: John Walsh

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

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C40902**
 Test Date: **1/7/05**

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)	14 mm	14 mm	---	---
Percent of border obscured by mounting brackets, clips, or bolts, or other components ($15\% \leq$)*	0%	12.5%	---	---
Height of letters (≥ 150 mm)	155 mm	155 mm	---	---
Stroke width of letters (≥ 20 mm)	26 mm	26 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:

Brian Roach

Approved By:

John Walsh

Date: January 7, 2005

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

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C40902**
 Test Date: **1/7/05**

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	4% ²	---	---

Test Notes:

¹ Flashing lights prevent full reflectorization.

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

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

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C40902**
 Test Date: **1/7/05**

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	Filament
	Gaseous Discharge
	Light emitting diode

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

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C40902**
Test Date: **1/7/05**

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	BMR-1 SAE-IS- DOT	BMR-1 SAE-IS- DOT	---	---

MARKINGS ON THE FLASHER

Make	BMR Manufacturing	Serial No.	Unknown
Model	BMR-950	Date of Mfg.	4/27/04

Test Notes:

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	PASS

Tested By: Brian Road

Approved By: John Palato

Date: January 7, 2005

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

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C40902**
 Test Date: **1/7/05**

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 91.8°	---
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 86°	---
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	9 mm	---
Measure top corner furthest from school bus	8 mm	---
Vertical centerline of signal arm not less than 228.6 mm away from side of bus	308 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: Brian Reed
 Date: January 7, 2005

Approved By: John Walsh

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

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C40902**
Test Date: **1/7/05**

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 was installed on this vehicle which allowed overhead lights to flash and stop signal arm NOT to extend.

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

Tested By: Brian Road Approved By: John Palato
Date: January 7, 2005

**SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST**

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C40902**
 Test Date: **1/7/05**

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	Starrett	Digital Protractor	Stanley
Model	721	Pro 360	Powerlock
Serial # (s)	00410129	Complab	167
Range	0 to 150 mm	0 to 360 degrees	0 to 8 m
Accuracy	0.01 mm	0.1 degree	1 mm
Cal. Date	8/26/04	7/29/04	8/13/04
Cal. Due	2/26/05	1/29/05	2/13/05

**SECTION 5
PHOTOGRAPHS**

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Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
Procedure: **FMVSS 131**

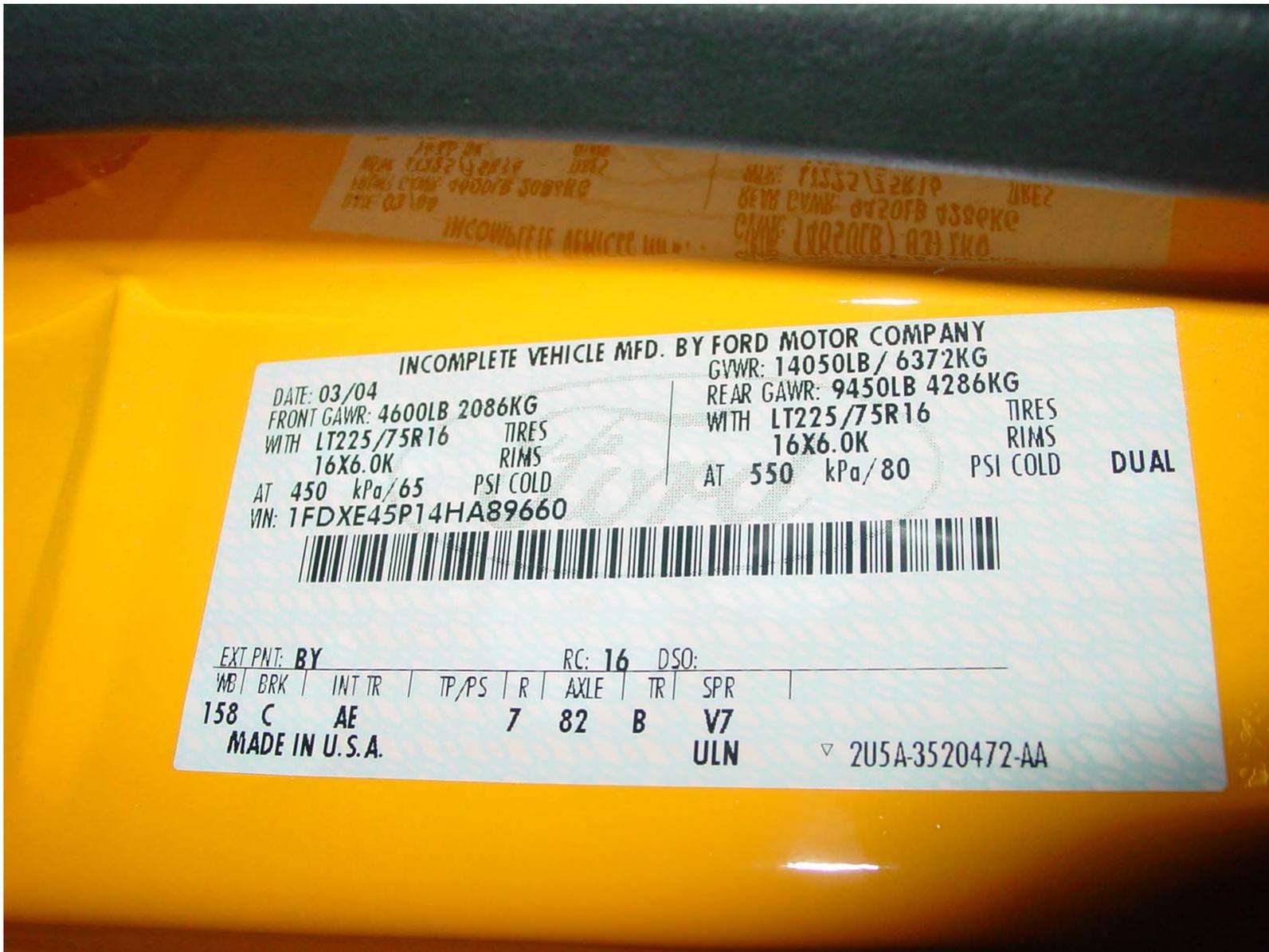
NHTSA No.: **C40902**



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

Test Vehicle: 2004 Corbeil 30 Passenger School Bus
Procedure: FMVSS 131

NHTSA No.: C40902



INCOMPLETE VEHICLE MFD. BY FORD MOTOR COMPANY
DATE: 03/04
FRONT GAWR: 4600LB 2086KG
WITH LT225/75R16 TIRES
16X6.0K RIMS
AT 450 kPa/65 PSI COLD
VIN: 1FDXE45P14HA89660

GVWR: 14050LB / 6372KG
REAR GAWR: 9450LB 4286KG
WITH LT225/75R16 TIRES
16X6.0K RIMS
AT 550 kPa/80 PSI COLD DUAL



EXT PNT: BY RC: 16 DSO:

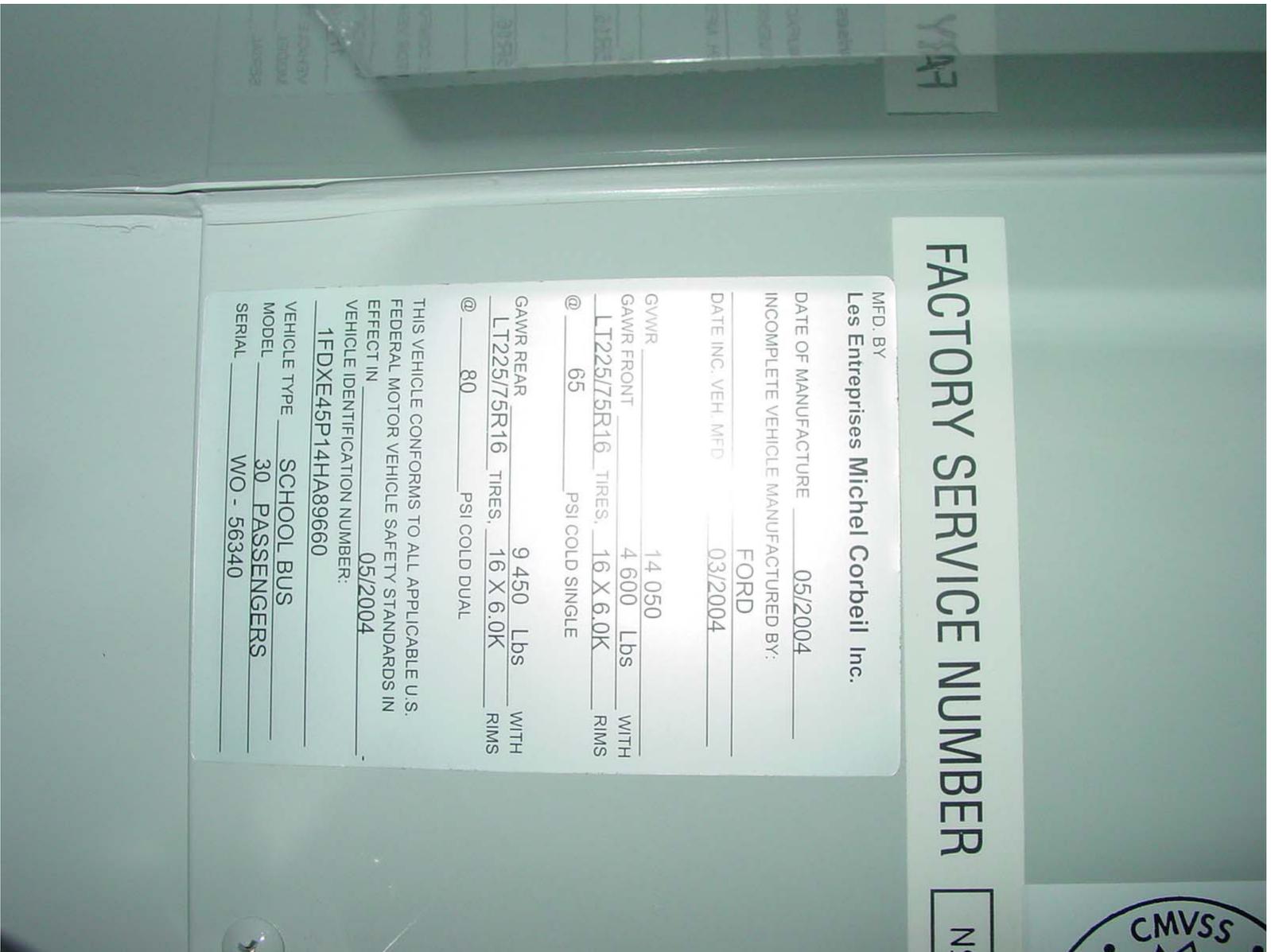
WB	BRK	INT TR	TP/PS	R	AXLE	TR	SPR
158	C	AE	7	82	B	V7	

MADE IN U.S.A. ULN ▽ 2U5A-3520472-AA

Incomplete Vehicle Manufacturer's Label

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
Procedure: **FMVSS 131**

NHTSA No.: **C40902**



Vehicle Certification Label and Tire Placard

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
Procedure: **FMVSS 131**

NHTSA No.: **C40902**



Front Closeup View of Stop Signal Arm

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
Procedure: **FMVSS 131**

NHTSA No.: **C40902**



Back Close Up View of Stop Signal Arm

Test Vehicle: 2004 Corbeil 30 Passenger School Bus
Procedure: FMVSS 131

NHTSA No.: C40902



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

Test Vehicle: **2004 Corbeil 30 Passenger School Bus**
Procedure: **FMVSS 131**

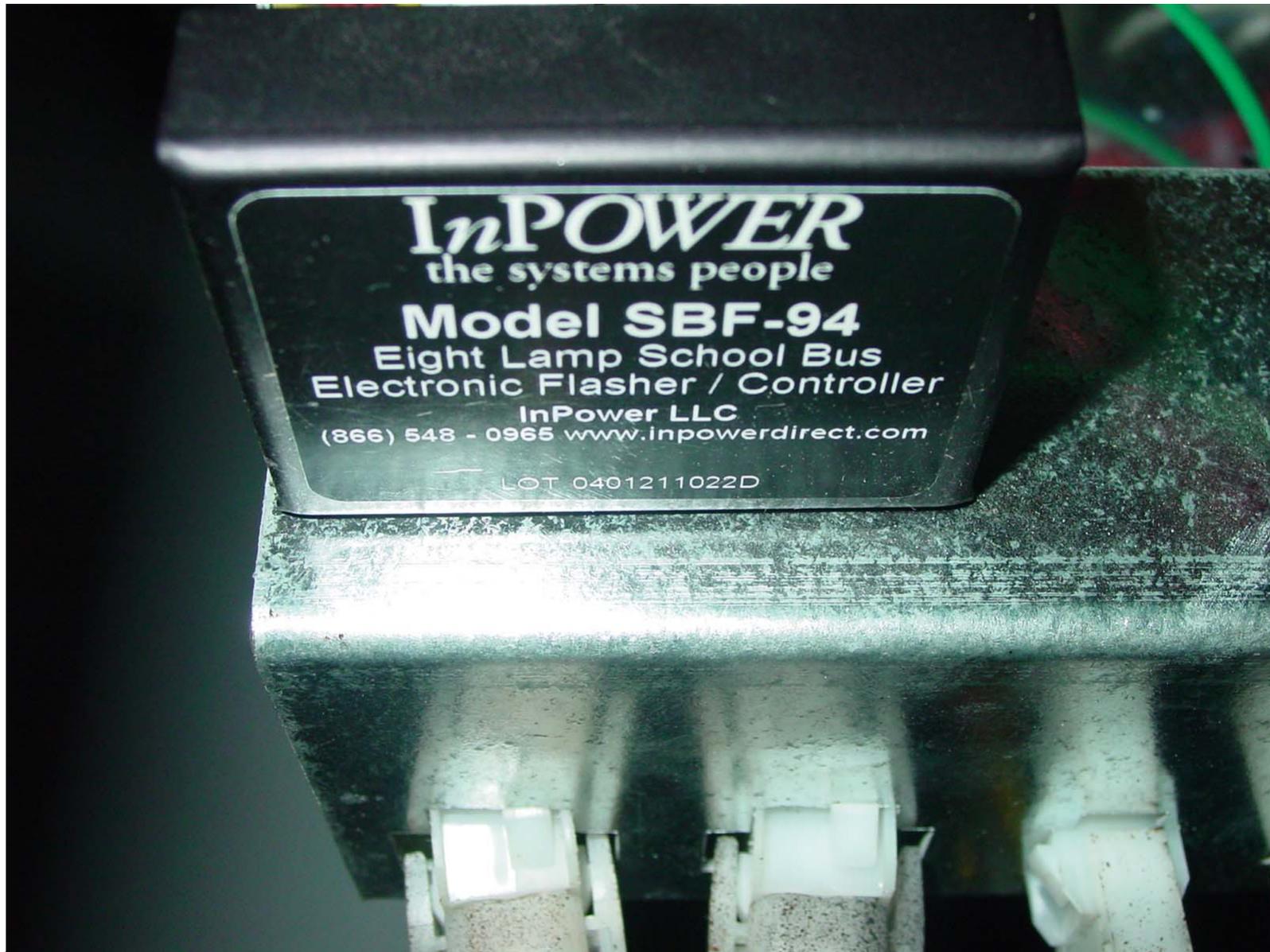
NHTSA No.: **C40902**



Switch Console Relative to the Driver Seating Position

Test Vehicle: 2004 Corbeil 30 Passenger School Bus
Procedure: FMVSS 131

NHTSA No.: C40902



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Close Up View of the Flasher