

REPORT NUMBER: 131SB-MGA-2007-001

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

**IC Corporation
2007 IC BE 200 School Bus
NHTSA No. C70901**

**PREPARED BY:
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BURLINGTON, WI 53105**



Final Report Date: October 24, 2006

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No</u>
1	Purpose of Compliance Test	1
2	Test Data Summary	2
3	Compliance Test Data	4
	Data Sheet 1- Dimensions of Stop Signal Arm (S5.1)	5
	Data Sheet 2 - Surface Content and Labeling (S5.2)	6
	Data Sheet 3 - Conspicuity (S5.3)	7
	Data Sheet 4 - Stop Signal Arm Installation (S5.4)	10
	Data Sheet 5 - Stop Signal Arm Operation (S5.5)	11
4	Instrumentation and Equipment List	12
5	Photographs	13
<u>Appendix</u>		
	Appendix A - Owner's Manual Safety Description	A-1

SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted by the MGA Research Corporation-Wisconsin Operations on a 2007 IC BE 200 School Bus, NHTSA No. C70901, 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 2007 IC BE 200 School Bus, NHTSA No. C70901, 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: **2007 IC BE 200 School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C70901**
 Test Date: **8/16/06**

VIN	4DRAPAFK07A407251	Chassis Cab	No
No. of Stop Signal Arms	1	Rear Engine	No
Pass. Capacity (driver included)	20	Tire Size (on bus)	225/70R19.5F
Stop Signal Arm Manufacturer	Specialty Manufacturing		

DATA FROM CERTIFICATION LABEL

Final Stage Manufacturer	IC Corporation	Date of Mfg.	04/2006
Chassis Manufacturer	IC Corporation	Date of Mfg.	04/2006
GVWR (kg)	7938	GAWR Front (kg)	3175
		GAWR Rear (kg)	4762

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: **2007 IC BE 200 School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C70901**
 Test Date: **8/16/06**

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

	Forward Signal Arm (mm)	Rearmost Signal Arm (mm)
Diameter 1	494	---
Diameter 2	495	---
Diameter 3	495	---
Diameter 4	495	---
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: August 16, 2006

Approved By: Michael Janoy

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

Test Vehicle: **2007 IC BE 200 School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C70901**
 Test Date: **8/16/06**

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 (≥ 12 mm)	16 mm	16 mm	---	---
Percent of border obscured by mounting brackets, clips, or bolts, or other components ($15\% \leq$) *	0%	14%	---	---
Height of letters (≥ 150 mm)	151 mm	151 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: Jeff Koehler
 Date: August 16, 2006

Approved By: Michal Janovic

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

Test Vehicle: **2007 IC BE 200 School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C70901**
 Test Date: **8/16/06**

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 ¹	No 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 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: **2007 IC BE 200 School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C70901**
 Test Date: **8/16/06**

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: **2007 IC BE 200 School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C70901**
 Test Date: **8/16/06**

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	N/A – See test notes	Serial No.	N/A
Model	N/A	Date of Mfg.	N/A

Test Notes:

Bus is not equipped with a flasher unit. The flashing function is executed by the bus control system software.

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: Jeff Kachler Approved By: Michael Janoy
 Date: August 16, 2006

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

Test Vehicle: **2007 IC BE 200 School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C70901**
 Test Date: **8/16/06**

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 89°	---
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 89.7°	---
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	18 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	300 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: August 16, 2006

Approved By: Michael Janusz

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

Test Vehicle: **2007 IC BE 200 School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C70901**
 Test Date: **8/16/06**

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 Koehler
 Date: August 16, 2006

Approved By: Michael Janoy

SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: **2007 IC BE 200 School Bus**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C70901**
Test Date: **8/16/06**

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	2/28/06	3/10/2006	8/16/06
Cal. Due	8/28/06	9/10/2006	2/16/07

SECTION 5
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

<u>Photo No.</u>		<u>Page No.</u>
1	3/4 Frontal View from Left Side of Vehicle with Stop Signal Arm(s) Extended	15
2	Vehicle Certification Label and Tire Placard	16
3	Front Close Up View of Stop Signal Arm	17
4	Back Close Up View of Stop Signal Arm	18
5	Close Up View of the Switches That Allow Extension of the Stop Signal Arm(s)	19
6	Switch Console Relative to the Driver Seating Position	20

Test Vehicle: 2007 IC BE 200 School Bus
Procedure: FMVSS 131

NHTSA No.: C70901
Test Date: 8/16/06



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

Test Vehicle: 2007 IC BE 200 School Bus
Procedure: FMVSS 131

NHTSA No.: C70901
Test Date: 8/16/06

MANUFACTURED BY
IC CORPORATION

DATE OF MANUFACTURE 04 MO. 06 YR.

GVWR 7,938 KGS (17,500 LBS)

GAWR FRONT 3,175 KGS (7,000 LBS) WITH

225/70R19.5F	TIRES	12	PLY AT
655 KPa	(95	PSI) COLD	
RIMS	19.5X6.75	AXLE	SINGLE

GAWR REAR 4,762 KGS (10,500 LBS) WITH

225/70R19.5F	TIRES	12	PLY AT
655 KPa	(95	PSI) COLD	
RIMS	19.5X6.75	AXLE	DUAL

**THIS VEHICLE CONFORMS TO ALL
APPLICABLE FEDERAL MOTOR
VEHICLE SAFETY STANDARDS IN
EFFECT ON THE DATE OF
MANUFACTURE SHOWN ABOVE.**

VEHICLE IDENTIFICATION NO.
4DRAPAFK07A407251
VEHICLE TYPE
SCHOOL BUS # 407251

Photo 2 - Vehicle Certification Label and Tire Placard

Test Vehicle: **2007 IC BE 200 School Bus**
Procedure: **FMVSS 131**

NHTSA No.: **C70901**
Test Date: **8/16/06**



Photo 3 - Front Close Up View of Stop Signal Arm

Test Vehicle: 2007 IC BE 200 School Bus
Procedure: FMVSS 131

NHTSA No.: C70901
Test Date: 8/16/06



Photo 4 - Back Close Up View of Stop Signal Arm

Test Vehicle: 2007 IC BE 200 School Bus
Procedure: FMVSS 131

NHTSA No.: C70901
Test Date: 8/16/06



Photo 5 - Close Up View of the Switches That Allow Extension of the Stop Signal Arm(s)

Test Vehicle: 2007 IC BE 200 School Bus
Procedure: FMVSS 131

NHTSA No.: C70901
Test Date: 8/16/06



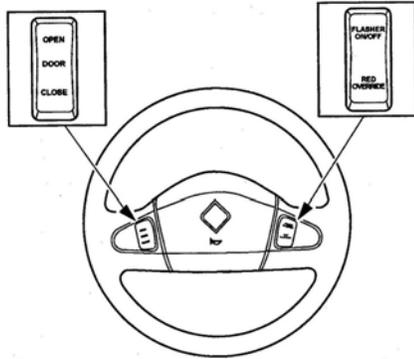
Photo 6 - Switch Console Relative to the Driver Seating Position

APPENDIX A
OWNER'S MANUAL SAFETY DESCRIPTION

SECTION 6 – PASSENGER CONTROL

Traffic Warning System (cont.)

Eight-Lamp Amber and Red Warning Lights (cont.)



ICB100056

Optional Rocker Switches



NOTE: These switches can be located on the left or right console switch panel.



NOTE: These rocker switches are an optional alternative to the steering wheel controls. When this option is chosen, the cruise / throttle switches move to the steering wheel location.

SEQUENTIAL SYSTEM

Press the "FLASHER ON/OFF" button to engage the amber warning lights.

The amber warning lights change automatically to the red warning lights when the entrance door is opened.

The red warning lights will deactivate when the door is closed and the vehicle travels faster than a preset road speed parameter.

SECTION 6 – PASSENGER CONTROL

Traffic Warning System (cont.)

Eight-Lamp Amber and Red Warning Lights (cont.)

NOTE: If the entrance door is reopened without pressing the "FLASHER ON/OFF" or the "RED OVERRIDE" buttons, the red warning lights will not activate.

To turn off the red warning lights while the door is open and the bus is not moving or traveling at a speed lower than the preset road speed parameter with the door closed, press the "RED OVERRIDE" button twice.

NON-SEQUENTIAL SYSTEM

With the master flasher switch in the "ON" position, press the "FLASHER ON/OFF" button to engage the amber warning lights. (If the master switch is not turned on there will be no activation of the lights or stop arm.)

The amber warning lights change automatically to the red warning lights when the entrance door is opened.

The red warning lights will deactivate when the doors are closed.

NOTE: If the door is reopened, the red lights will reactivate without pressing the "FLASHER ON/OFF" or the "RED OVERRIDE" buttons.

To turn off the red warning lights while the door is open and the bus is not moving, press the "RED OVERRIDE" switch twice or turn off the master flasher switch.

Flashing Stop Arm

Used to warn the public that students are boarding or leaving the bus



ICB100155