

REPORT NUMBER: 131-MGA-03-002

1/4

MS#
636409

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

**BlueBird Bus Corporation
2003 Bluebird All American
NHTSA # C30900**

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



Test Date: November 25, 2002

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 (NSA-221)
WASHINGTON, D.C. 20590**

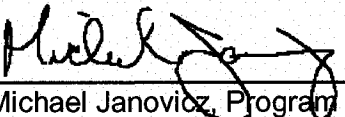
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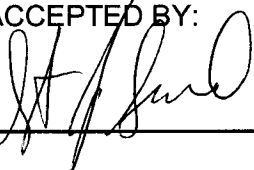
Prepared by: 
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Date: December 13, 2002

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Date: December 13, 2002

FINAL REPORT ACCEPTED BY:



12/23/02
Date of Acceptance

Technical Report Documentation Page

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SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted by the MGA Research Corporation-Wisconsin Operations on a 2003 Bluebird All American school bus, NHTSA NO. C30900, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-131SB1 to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 131, "School Bus Pedestrian Safety Devices."

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

SECTION 2
TEST DATA SUMMARY

Based on the tests performed, the 2003 Bluebird All American school bus, NHTSA No. C30900 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: **2003 Bluebird All American**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30900**
 Test Date: **11/25/02**

VIN No.	1BABNBPA33F210494	Chassis Cab	No
No. of Stop Signal Arms	1	Forward Control	No
Pass. Capacity (driver included)	84	Rear Engine	Yes
Stop Signal Arm Manufacturer	SMC Specialty Mfg	Wheelbase (meters)	6.934
Tire Size (on bus)	11R22.5		

DATA FROM CERTIFICATION LABEL

Final Stage Manufacturer	Bluebird	Date of Mfg.	8/02
Incomplete Vehicle Manufacturer	Not Found	Date of Mfg.	Not Found
GVWR (kg)	13,511	GAWR Front (kg)	4,926
		GAWR Rear (kg)	8,585

TEST SUMMARY

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**

Test Vehicle: **2003 Bluebird All American**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30900**
Test Date: **11/25/02**

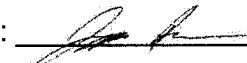
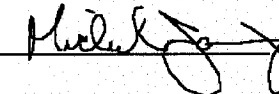
DIMENSIONS OF STOP SIGNAL ARM (S5.1)

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

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

	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	PASS

Tested By:  Approved By: 
Date: December 13, 2002

**FMVSS 131 – DATA SHEET 2
SURFACE CONTENT AND LABELING**

Test Vehicle: **2003 Bluebird All American**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30900**
Test Date: **11/25/02**

SURFACE CONTENT AND LABELING (S5.2)

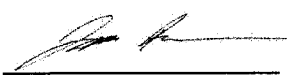
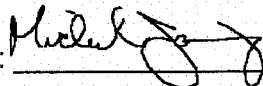
	Forward Signal Arm		Rearmost Signal Arm	
	Front Side	Aft Side	Front Side	Aft Side
Color RED except for border & legend (Yes/No)	YES	YES	N/A	N/A
Color of border is WHITE (Yes/No)	YES	YES	N/A	N/A
Color of word "STOP" is WHITE (Yes/No)	YES	YES	N/A	N/A
Word "STOP" is in upper case letters (Yes/No)	YES	YES	N/A	N/A
Width of border (≥ 12 mm)	15 mm	15 mm	N/A	N/A
Percent of border obscured by mounting brackets, clips, or bolts, or other components ($15\% \leq$)*	0%	12.4%	N/A	N/A
Height of letters (≥ 150 mm)	151 mm	152 mm	N/A	N/A
Stroke width of letters (≥ 20 mm)	25 mm	25 mm	N/A	N/A

* = 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:  Approved By: 

Date: December 13, 2002

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

Test Vehicle: **2003 Bluebird All American**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30900**
 Test Date: **11/25/02**

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	NO	NO	N/A
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%¹	3.5%¹	NO	N/A

Test Notes:

¹ Percentages do not include area obscured by red flashing lights.

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

Test Vehicle: **2003 Bluebird All American**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30900**
 Test Date: **11/25/02**

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	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	N/A	N/A
Red lamps form the complete shape of each letter of the legend. (Yes/No)	N/A	N/A	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	N/A	N/A
The shape of each letter remains constant (Yes/No)	N/A	N/A	N/A	N/A
Net stroke width > 15 mm (stroke width minus lamp width)	"S"	N/A	N/A	N/A
	"T"	N/A	N/A	N/A
	"O"	N/A	N/A	N/A
	"P"	N/A	N/A	N/A
Lamps on each side of the signal arm flash (60-120 flashes/min.)	N/A	N/A	N/A	N/A
Lamps current "on" time of 30% to 75% of the total flash cycle	N/A	N/A	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	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	N/A	N/A

Lamp Type	Filament
	Gaseous Discharge
	Light emitting diode

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

Test Vehicle: **2003 Bluebird All American**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30900**
Test Date: **11/25/02**

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	N/A	N/A
One lamp at extreme top and another at extreme bottom (Yes/No)	YES	YES	N/A	N/A
Lamps on each side of the signal arm flash alternately (60-120 flashes/min.)	YES ¹	YES ¹	N/A	N/A
Lamps current "on" time of 30% to 75% of the total flash cycle.	YES	YES	N/A	N/A
Total current "on" time for two terminals shall be between 90 and 110% of the total flash cycle.	YES	YES	N/A	N/A
If Xenon short-arc lamps-"off" time before each flash of at least 50% of total flash cycle.	N/A	N/A	N/A	N/A
Symbol "DOT" on each lamp lens (Yes/No)	YES	YES	N/A	N/A
Additional markings on lamp lenses	SMC-194 FMVSS 131	SMC-194 FMVSS 131	N/A	N/A

MARKINGS ON THE FLASHER

Make	Weldon Technologies	Serial No.	Unknown
Model	7000 Electronic Lamp Light	Date of Mfg.	Unknown

Test Notes:

¹ Flash rate was 84 /minute.

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:  Approved By: 

Date: December 13, 2002

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

Test Vehicle: **2003 Bluebird All American**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30900**
 Test Date: **11/25/02**

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 - 90°	N/A
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 - 88.7°	N/A
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	33 mm	N/A
Measure top corner furthest from school bus	34 mm	N/A
Vertical centerline of signal arm not less than 228.6 mm away from side of bus	348 mm	N/A
Stop signal arm(s) installed on left side of bus (Yes, No, or Not Applicable)	YES	N/A

TEST RESULTS		PASS, FAIL, or N/A
S5.4	Stop Signal Arm Installation	PASS

Tested By:  Approved By: 

Date: December 13, 2002

**FMVSS 131 DATA SHEET 5
STOP SIGNAL ARM OPERATION (\$5.5)**

Test Vehicle: **2003 Bluebird All American**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30900**
Test Date: **11/25/02**

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	N/A
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	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 > 10 min.)	N/A	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 > 60 sec.)	N/A	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	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:  Approved By: 

Date: December 13, 2002

**SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST**

SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: **2003 Bluebird All American**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30900**
Test Date: **11/25/02**

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	101
Range	0 to 150 mm	0 to 360 degrees	0 to 8 m
Accuracy	0.01 mm	0.1 degree	1 mm
Cal. Date	8/22/02	11/15/02	10/28/02
Cal. Due	2/22/03	05/15/03	04/28/03

**SECTION 5
PHOTOGRAPHS**

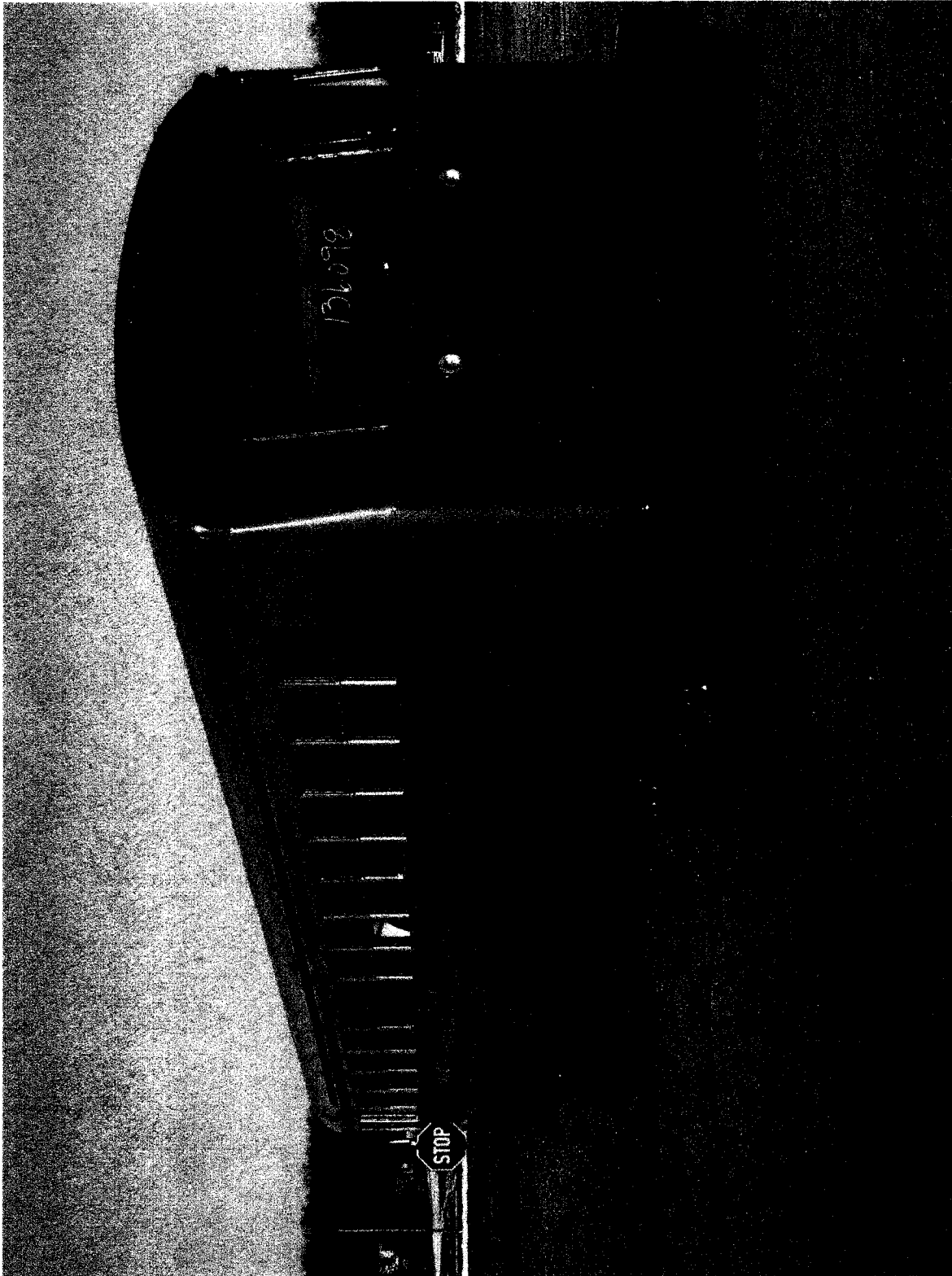
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Photograph 1:
Left Front 3/4 View of Vehicle with Stop Signal Arm
extended

Test Vehicle: 2003 Bluebird All American
Procedure: FMVSS 131
NHTSA No.: C30900



Photograph 2:
Left Rear $\frac{3}{4}$ View of Vehicle with Stop Arm
extended

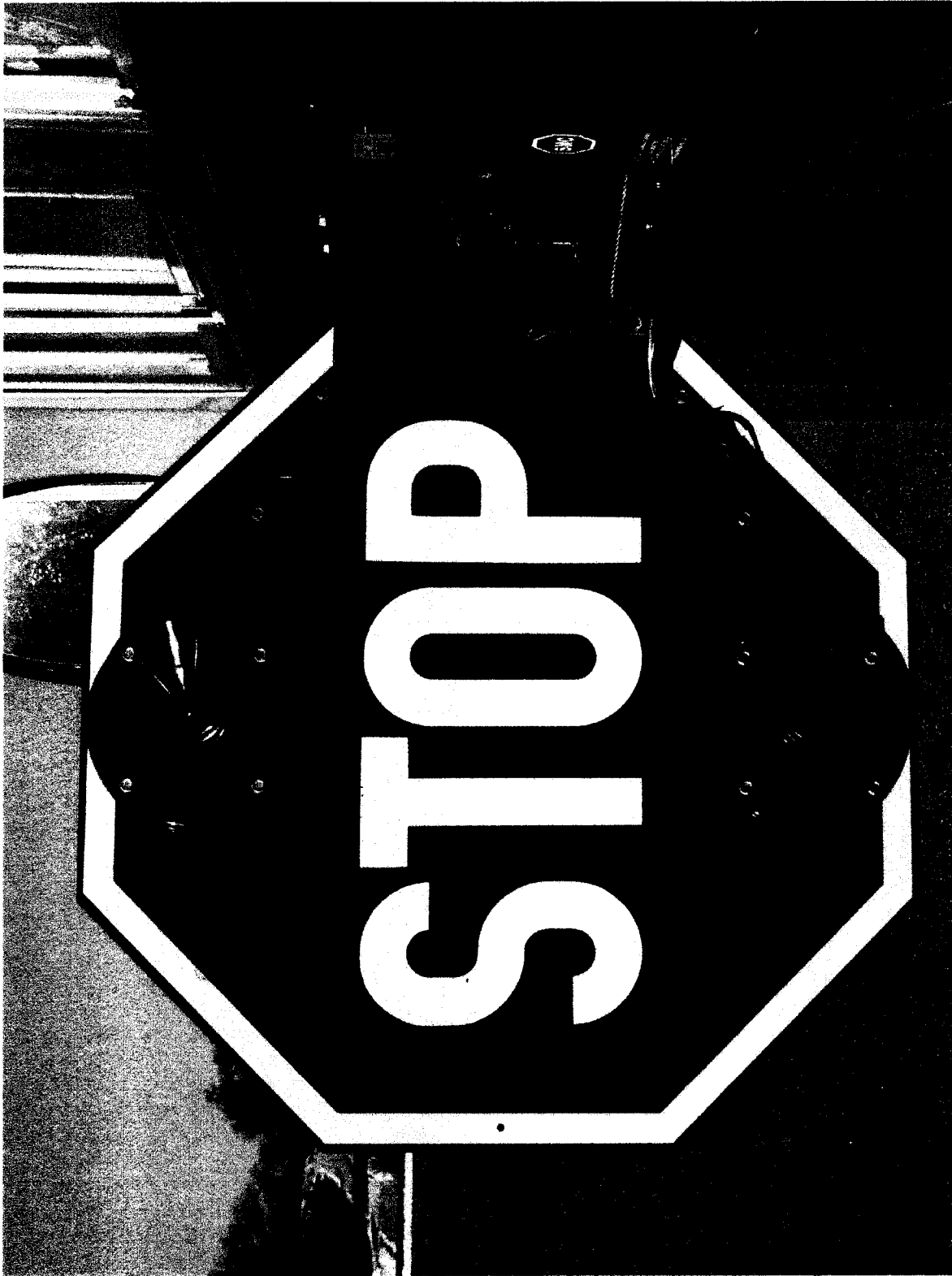
Test Vehicle: 2003 Bluebird All American
Procedure: FMVSS 131
NHTSA No.: C30900



Test Vehicle:
Procedure:
NHTSA No.:

2003 Bluebird All American
FMVSS 131
C30900

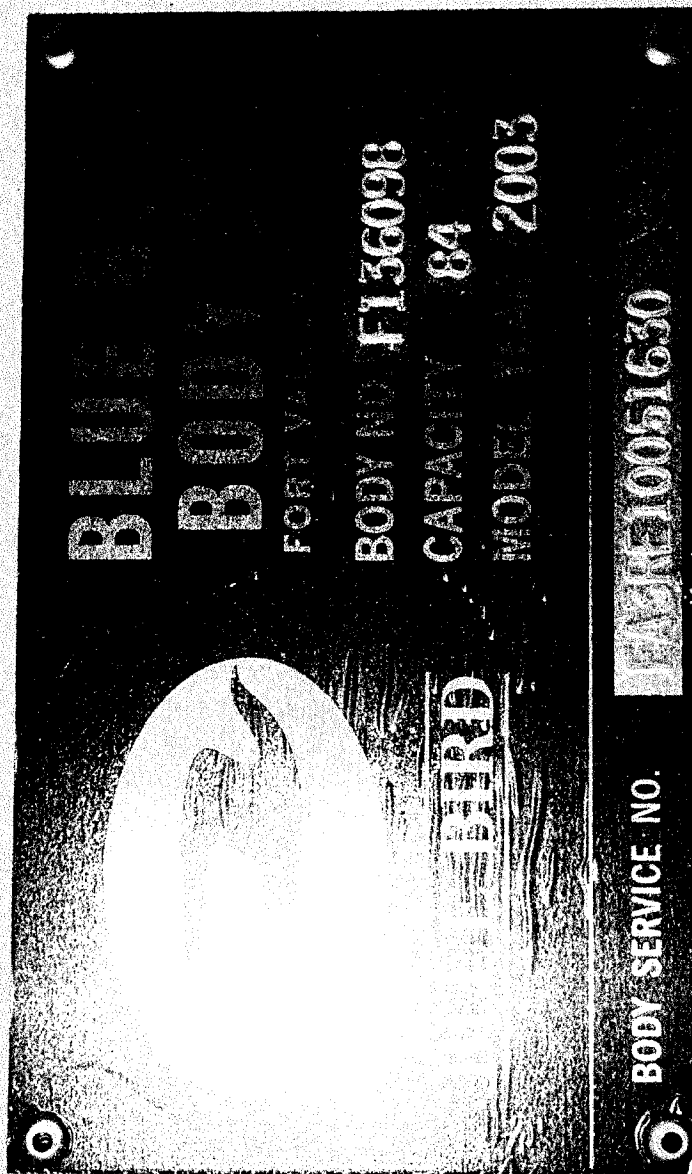
Photograph 3:
Close-up View of Forwardmost Stop Signal Device
from Front



Test Vehicle:
Procedure:
NHTSA No.:

2003 Bluebird All American
FMVSS 131
C30900

Photograph 4:
Close-up View of Forwardmost Stop Signal Device
from Back



Photograph 5:
Close-up of Certification Label

Test Vehicle: 2003 Bluebird All American
Procedure: FMVSS 131
NHTSA No.: C30900

Test Vehicle:
Procedure:
NHTSA No.:

BACKING LOAD TEST IN ACCORDANCE WITH UTAH STATE SCHOOL BUS STANDARDS IN EFFECT AT TIME OF MANUFACTURE.

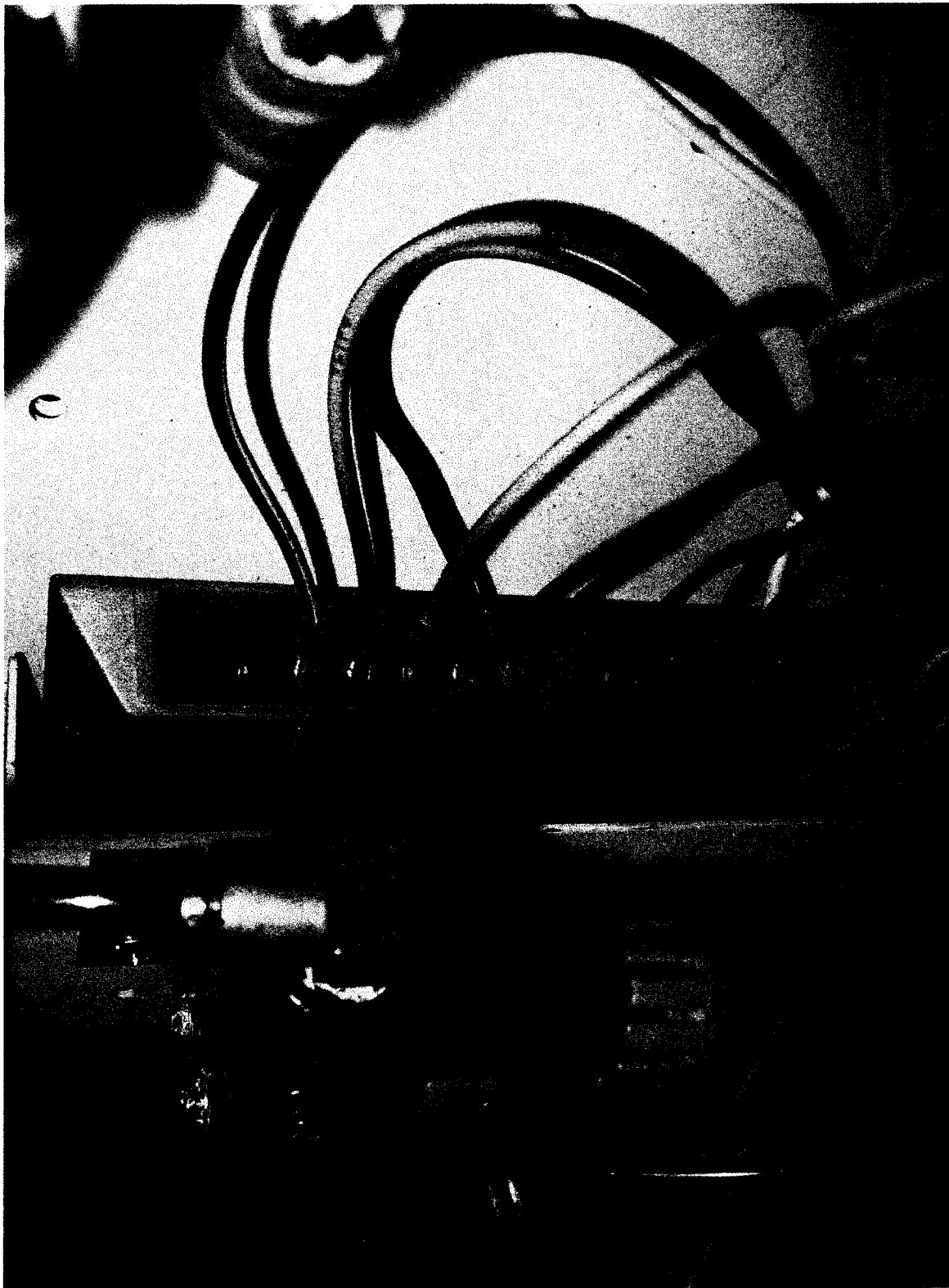
FURNISH INFORMATION BELOW WHEN

CHASSIS SERIAL	210494	ENGINE SERIAL	46231252
TRANSMISSION	6510380766	CATALYST NO. & DATE	N/A
FRONT AXLE	0045442		0043875
REAR AXLE	0050197		0043877
REAR AXLE RATIO	5.38		0053236

CHASSIS SERVICE NO. F A Z R E 10114325

Test Vehicle: 2003 Bluebird All American
Procedure: FMVSS 131
NHTSA No.: C30900

Photograph 6:
Close-up of Vehicle Placard



Photograph 7:
Close-up of Flasher

Test Vehicle: 2003 Bluebird All American
Procedure: FMVSS 131
NHTSA No.: C30900



Test Vehicle:
Procedure:
NHTSA No.:

2003 Bluebird All American
FMVSS 131
C30900

Photograph 8:
View of Device that Activates Automatic Extension
of the Stop Arm Signal and Warning Lights