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REPORT NUMBER: 131-MGA-03-003

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

Mid Bus Inc.
2003 Mid Bus Guide School Bus
NHTSA # C30903

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

Final Report Date: June 11, 2003

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-221)
WASHINGTON, D.C. 20590

Prepared by: _____ Date: June 11, 2003
John Roberts, Project Technician

Reviewed by: _____ Date: June 11, 2003
Michael Janovicz, Program Manager

FINAL REPORT ACCEPTED BY:

_____

7/8/03

Date of Acceptance

Technical Report Documentation Page

1. Report No. 131-MGA-03-003	*2. Government Accession No.*	*3. Recipient's Catalog No.*
4. Title and Subtitle Final Report of FMVSS 131 Compliance Testing of 2003 Mid Bus Guide School Bus NHTSA No.: C30903		*5. Report Date* June 11, 2003 *6. Performing Organization Code* MGA
7. Author(s) John Roberts, Project Technician Michael Janovicz, Project Manager		*8. Performing Organization Rpt No.* 131-MGA-03-003
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 6111 Washington, D.C. 20590		*13. Type of Report and Period Covered* Final Report May 20 – June 11, 2003 *14. Sponsoring Agency Code* NVS-220
15. Supplementary Notes		

16. Abstract

Compliance tests were conducted on the subject, 2003 Mid Bus Guide 25 Passenger School Bus, NHTSA No.C30903 in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-131SB1 for the determination of FMVSS 131 compliance.

Test failures identified were as follows:

Stop arm does not automatically extend when overhead lights are flashing; bus is not equipped with audible warning denoting this situation.

17. Key Words Safety Bus Compliance Testing Safety Engineering FMVSS 131		*18. Distribution Statement* Copies of this report are available from: NHTSA Technical Information Services (TIS) Room 5108 (NPO-230) 400 Seventh Street, S.W. Washington, D.C. 20590 (202)366-4946	
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Form DOT F1700.7 (8-72)

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SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted by the MGA Research Corporation-Wisconsin Operations on a 2003 Mid Bus Inc. School Bus, NHTSA NO. C30903, 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 Mid Bus Inc. School Bus, NHTSA No. C30903 appears to meet all of the requirements of FMVSS 131 except as noted on page 25 (Laboratory Notice of Test Failure).

See Test Summary Data Sheet on the following page.

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

Test Vehicle: **2003 Mid Bus Guide School Bus** NHTSA No.: **C30903**
Test Lab: **MGA Research-Wisconsin Operations** Test Date: **5/20/03**

VIN No.	1GBJG31U431110295	Chassis Cab	Yes
No. of Stop Signal Arms	1	Forward Control	No
Bus Capacity (driver included)	25 + 1 w/c	Rear Engine	No
Stop Signal Arm Manufacturer	Transpec	Wheelbase (meters)	4.06
Tire Size (on bus)	LT225/75R16D		

DATA FROM CERTIFICATION LABEL

Final Stage Manufacturer	Mid Bus Inc.	Date of Mfg.	12/02
Incomplete Vehicle Manufacturer	Not Found	Date of Mfg.	Not Found
GVWR (kg)	5,443	GAWR Front (kg)	1,951
		GAWR Rear (kg)	3,901

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)	**FAIL**

SECTION 3
COMPLIANCE TEST DATA

FMVSS 131 – DATA SHEET 1
DIMENSIONS OF STOP SIGNAL ARM

Test Vehicle: **2003 Mid Bus Guide School Bus** NHTSA No.: **C30903**
Test Lab: **MGA Research-Wisconsin Operations** Test Date: **5/20/03**

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	[redacted]
Diameter 2	495	
Diameter 3	495	
Diameter 4	495	
Range (max. – min.)	0	

	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**

Recorded By: _____

Approved By: _____ Date: 6/11/03

FMVSS 131 – DATA SHEET 2
SURFACE CONTENT AND LABELING

Test Vehicle: **2003 Mid Bus Guide School Bus** NHTSA No.: **C30903**
Test Lab: **MGA Research-Wisconsin Operations** Test Date: **5/20/03**

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		
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)	15 mm	15 mm		
Percent of border obscured by mounting brackets, clips, or bolts, or other components (15% ≤) *	0%	12%		
Height of letters (≥ 150 mm)	157 mm	157 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**

Recorded By: _____

Approved By: _____ Date: 6/11/03

FMVSS DATA SHEET 3
CONSPICUITY (S5.3)

Test Vehicle: **2003 Mid Bus Guide School Bus** NHTSA No.: **C30903**
Test Lab: **MGA Research-Wisconsin Operations** Test Date: **5/20/03**

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]	[redacted]	
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 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: **2003 Mid Bus Guide School Bus** NHTSA No.: **C30903**
Test Lab: **MGA Research-Wisconsin Operations** Test Date: **5/20/03**

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)					
Red lamps form the complete shape of each letter of the legend. (Yes/No)					
Red lamps centered within stroke of each letter (yes/No) or Red lamps outline each letter in immediately surrounding area (Yes/No)					
The shape of each letter remains constant (Yes/No)					
Net stroke width > 15 mm (stroke width minus lamp width)	"S"				
	"I"				
	"O"				
	"P"				
Lamps on each side of the signal arm flash (60-120 flashes/min.)					
Lamps current "on" time of 30% to 75% of the total flash cycle					
Total current "on" time for the two terminals shall be between 90-110% of the total flash cycle.					
If Xenon short-arc lamps – "off" time before each flash of at least 50% of the total flash cycle.					

Lamp Type	X	Filament
		Gaseous Discharge
		Light emitting diode

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

Test Vehicle: **2003 Mid Bus Guide School Bus** NHTSA No.: **C30903**
Test Lab: **MGA Research-Wisconsin Operations** Test Date: **5/20/03**

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[1]	YES[1]		
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.				
Symbol "DOT" on each lamp lens (Yes/No)	NO	NO		
Additional markings on lamp lenses	NONE	NONE		

MARKINGS ON THE FLASHER

Make	Ramspec World Wide	Serial No.	Unknown
Model	4260	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**

Recorded By: _____

Approved By: _____ Date: 6/11/03

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

Test Vehicle:	**2003 Mid Bus Guide School Bus**	NHTSA No.:	**C30903**
Test Lab:	**MGA Research-Wisconsin Operations**	Test Date:	**5/20/03**

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 ± 5°	YES	[redacted]
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 ± 5°	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	130 mm	[redacted]
Measure top corner furthest from school bus	128 mm	
Vertical centerline of signal arm not less than 228.6 mm away from side of bus	385 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**

Recorded By: [signature]

Approved By: [signature] Date: 6/11/03

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

Test Vehicle: **2003 Mid Bus Guide School Bus** NHTSA No.: **C30903**
Test Lab: **MGA Research-Wisconsin Operations** Test Date: **5/20/03**

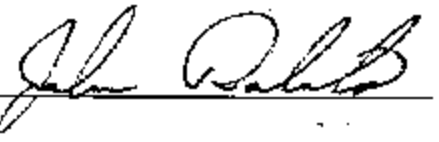
Stop Signal Arm(s) shall be automatically extended, at a minimum, whenever the red signal lamps on the bus required by FMVSS 108 are activated; except that a manual override device may be installed that prevents automatic extension.

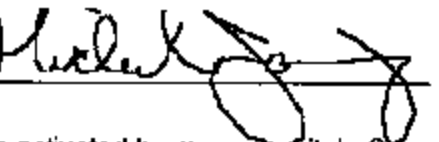
Requirements	Stop Signal Arm	
	Forward	Rearmost
Signal Arm(s) automatically extended when red lights are activated and override device is not activated. (Yes. No, or Not Applicable)	NO*	
If a MANUAL OVERRIDE DEVICE is installed, enter applicable data below:		
Mechanism for activating the override device is within reach of the school bus driver (Yes/No)	YES	
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.)	NO	
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.)		
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)		

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	**FAIL**

Recorded By: 

Approved By:  Date: 6/11/03

* Overhead lights activated by manual switch. Stop arm extends only when door is opened. Red flashing lights operate without stop extended and without an audible alarm notifying the driver of this situation.

SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

SECTION 4

INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: **2003 Mid Bus Guide School Bus** NHTSA No.: **C30903**
Test Lab: **MGA Research-Wisconsin Operations** Test Date: **5/20/03**

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	IP65	Pro 360	Powerlock
Serial # (s)	0004174	Complab	118
Range	0 to 150 mm	0 to 360 degrees	0 to 6 m
Accuracy	0.01 mm	0.1 degree	1 mm
Cal. Date	10/8/02	5/20/03	4/9/03
Cal. Due	10/8/03	11/20/03	10/9/03

SECTION 5
PHOTOGRAPHS

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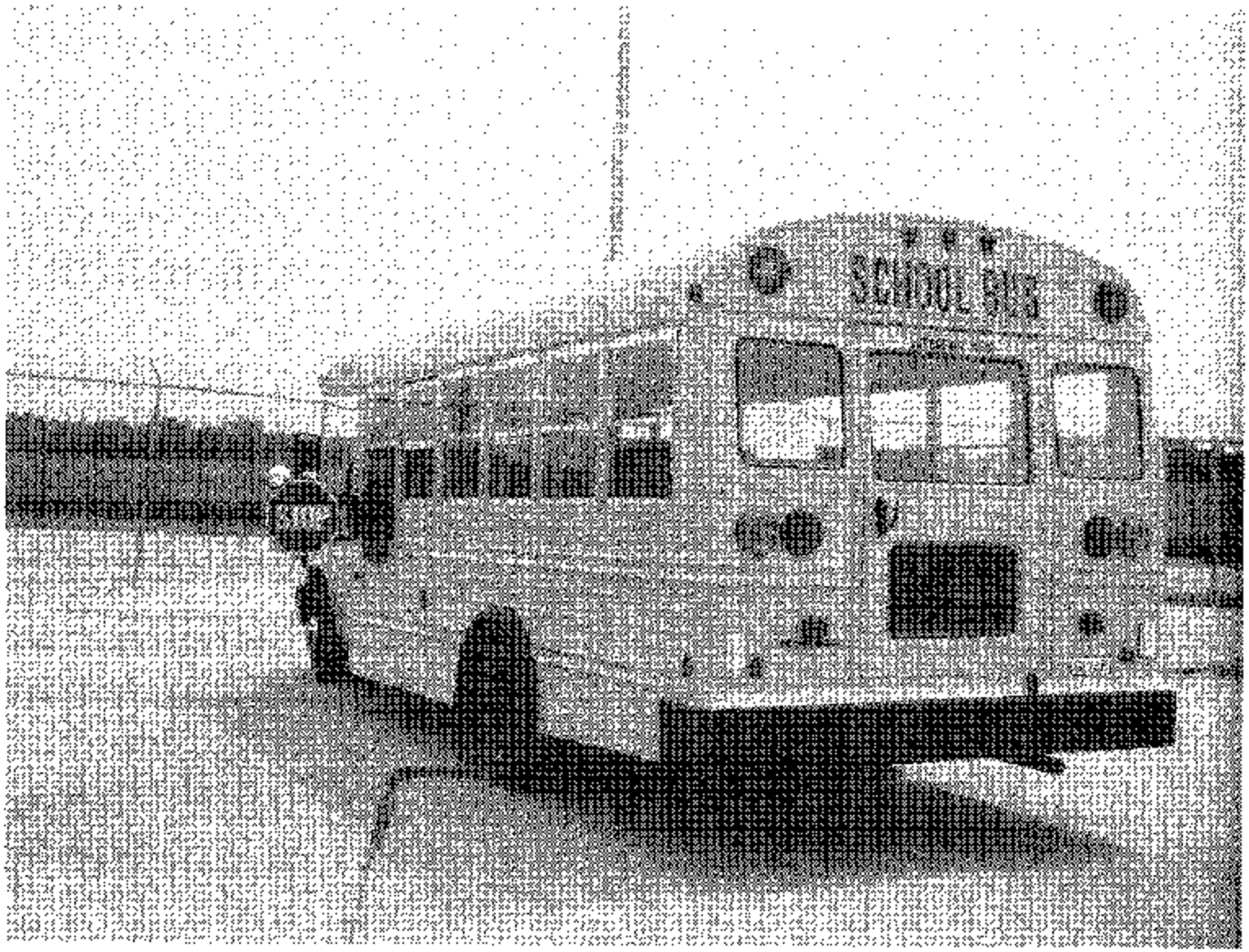
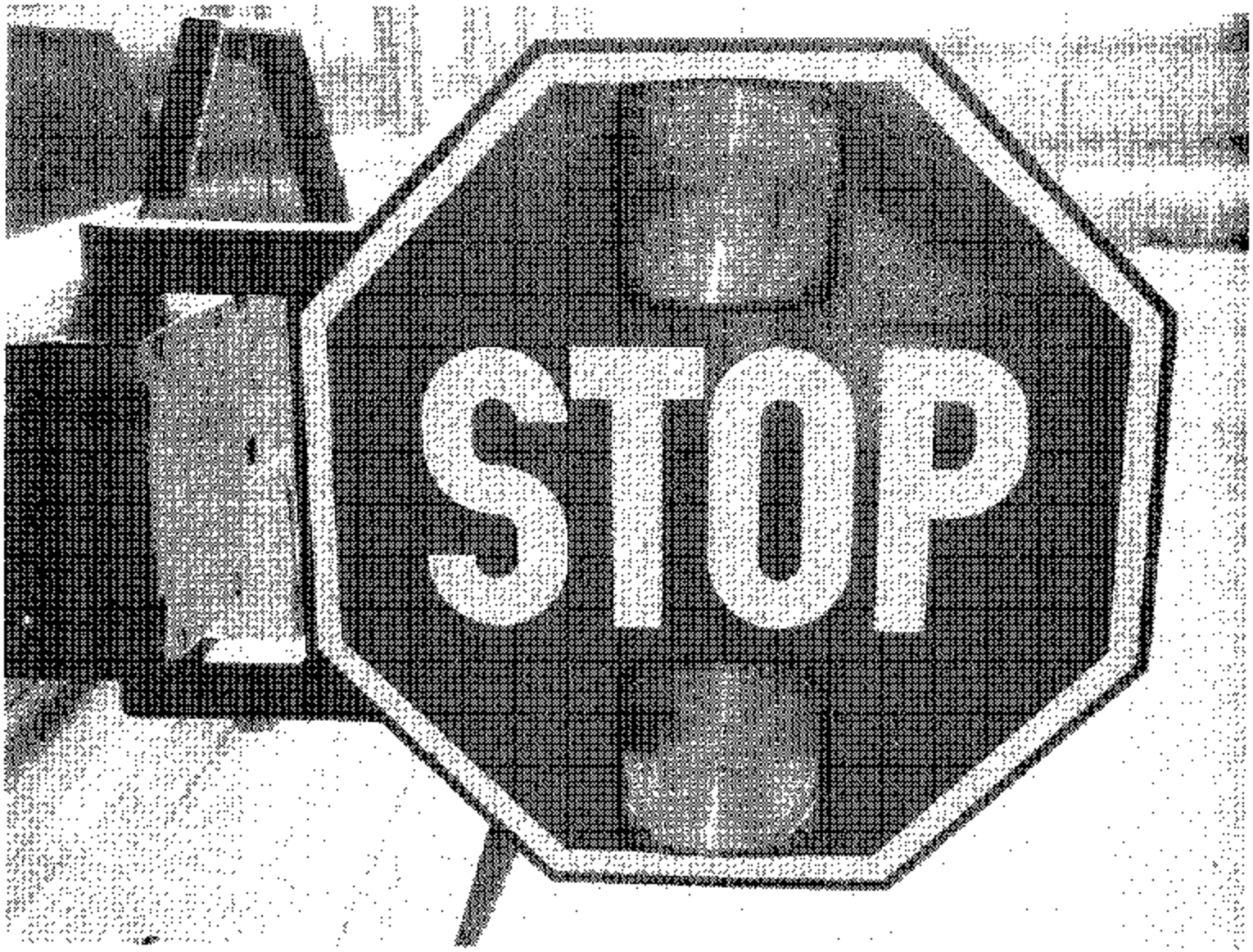
Test Vehicle: **2003 Mid Bus School Bus**
Procedure: **FMVSS 131** NHTSA No.: **C30903**

Left Front ¾ View of Vehicle with Stop Signal Arm extended

Test Vehicle: 2003 Mid Bus School Bus
Procedure: FMVSS 131 NHTSA No.. C30903



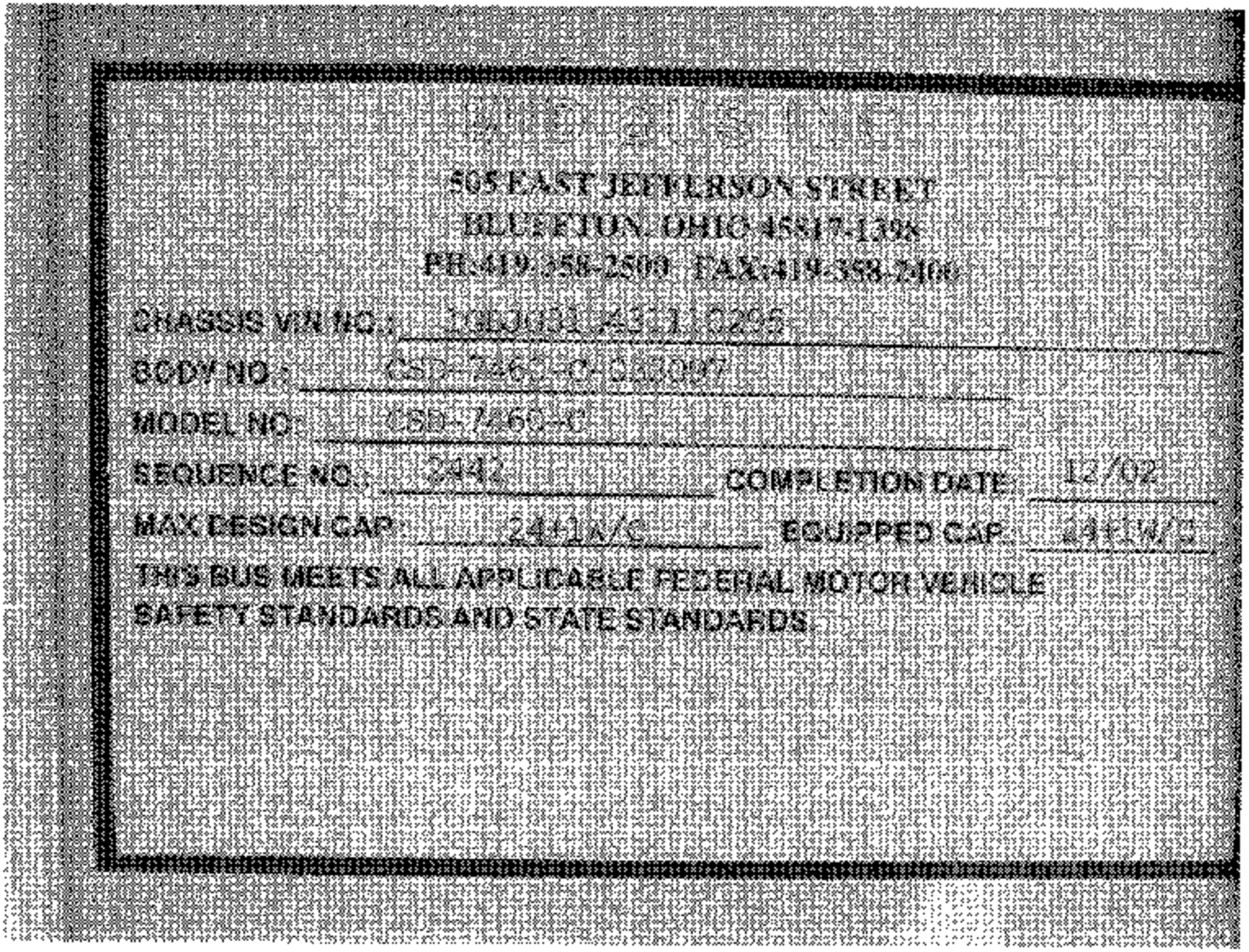
Left Rear ¾ View of Vehicle with Stop Signal Arm extended



Close-up View of Forwardmost Stop Signal Device from Front

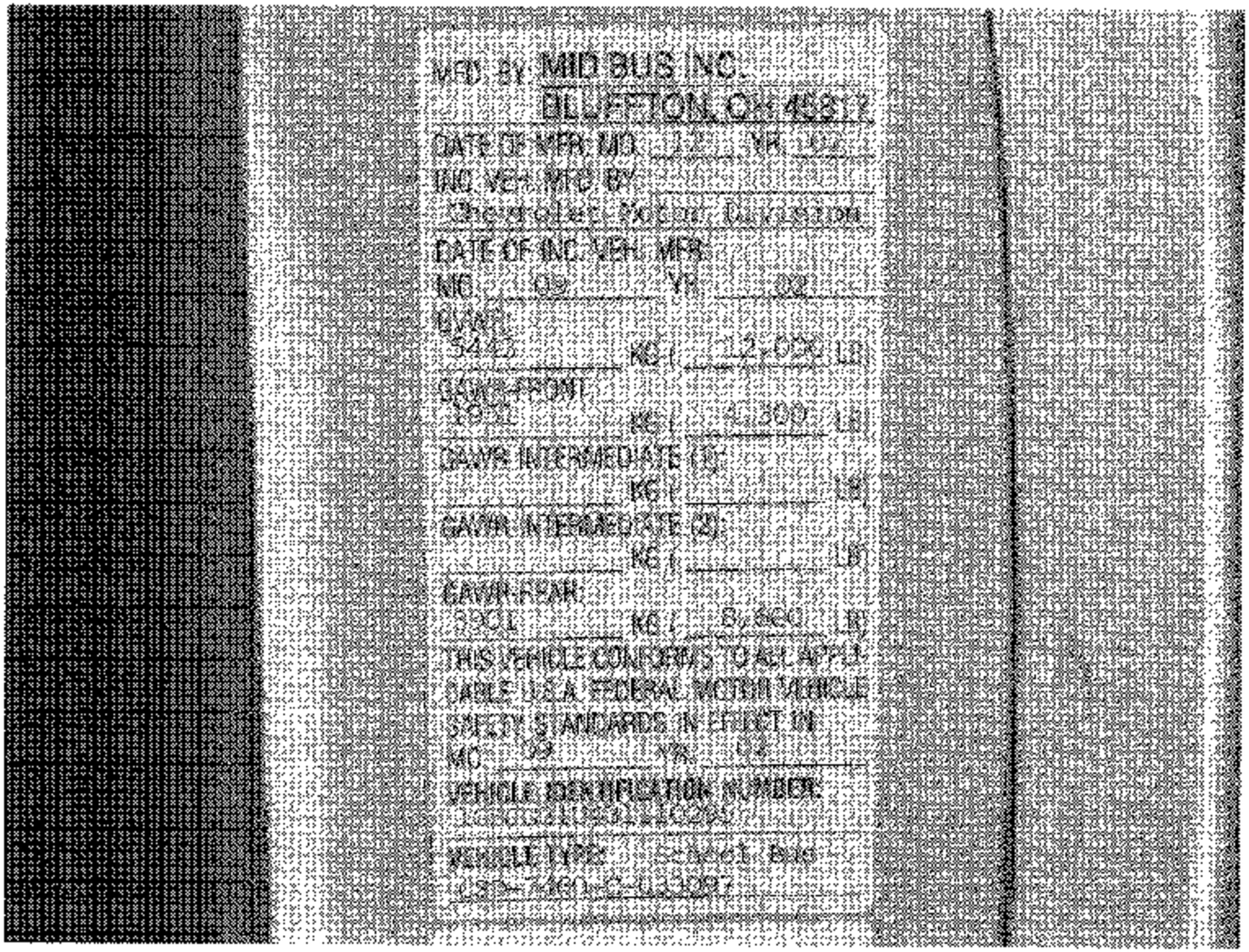
Test Vehicle: 2003 Mid Bus School Bus
Procedure: FMVSS 131 NHTSA No : C30903

Close-up View of Forward-most Stop Signal Device from Back



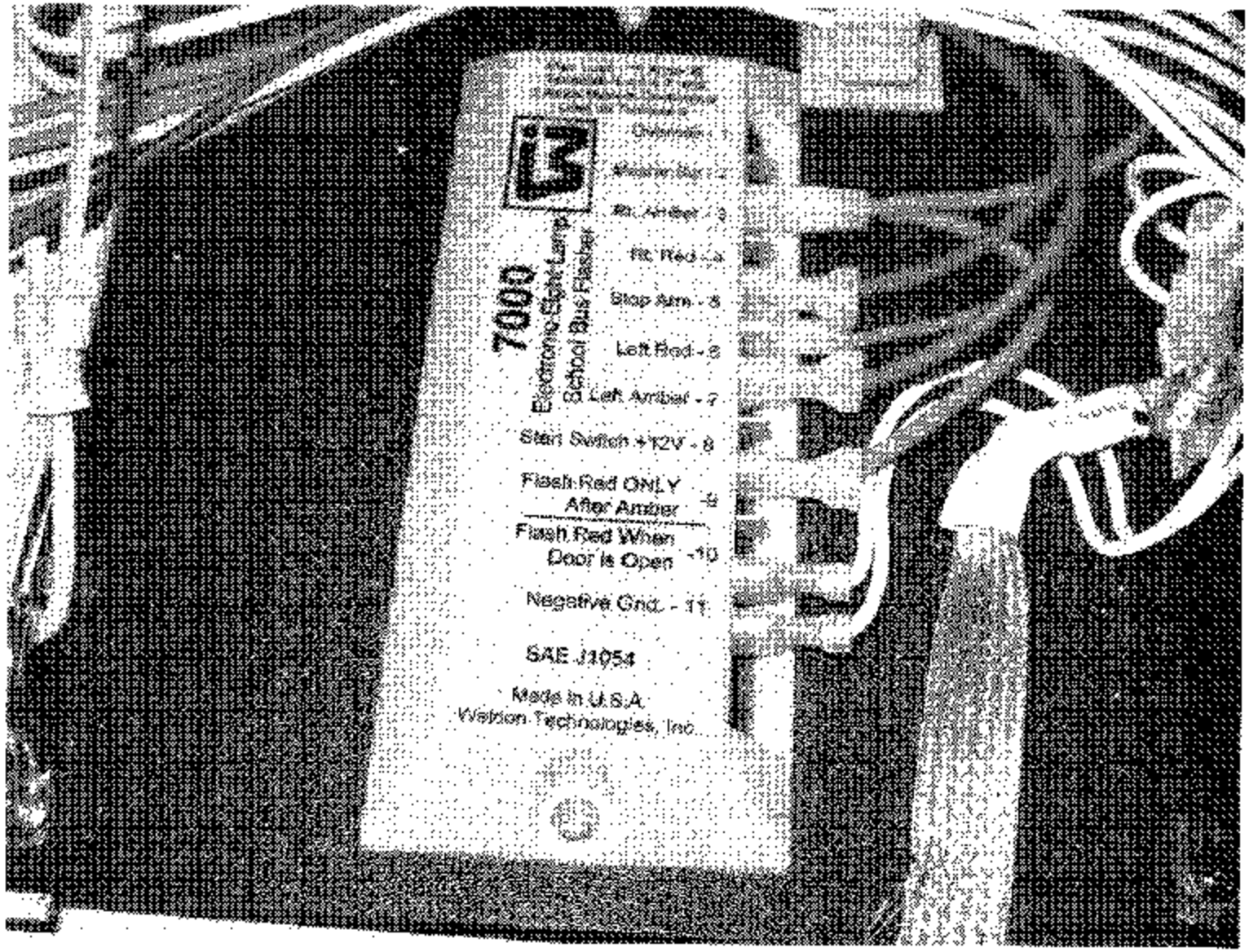
Close-up of Certification Label

Test Vehicle: **2003 Mid Bus School Bus**
Procedure: **FMVSS 131** NHTSA No.: **C30903**



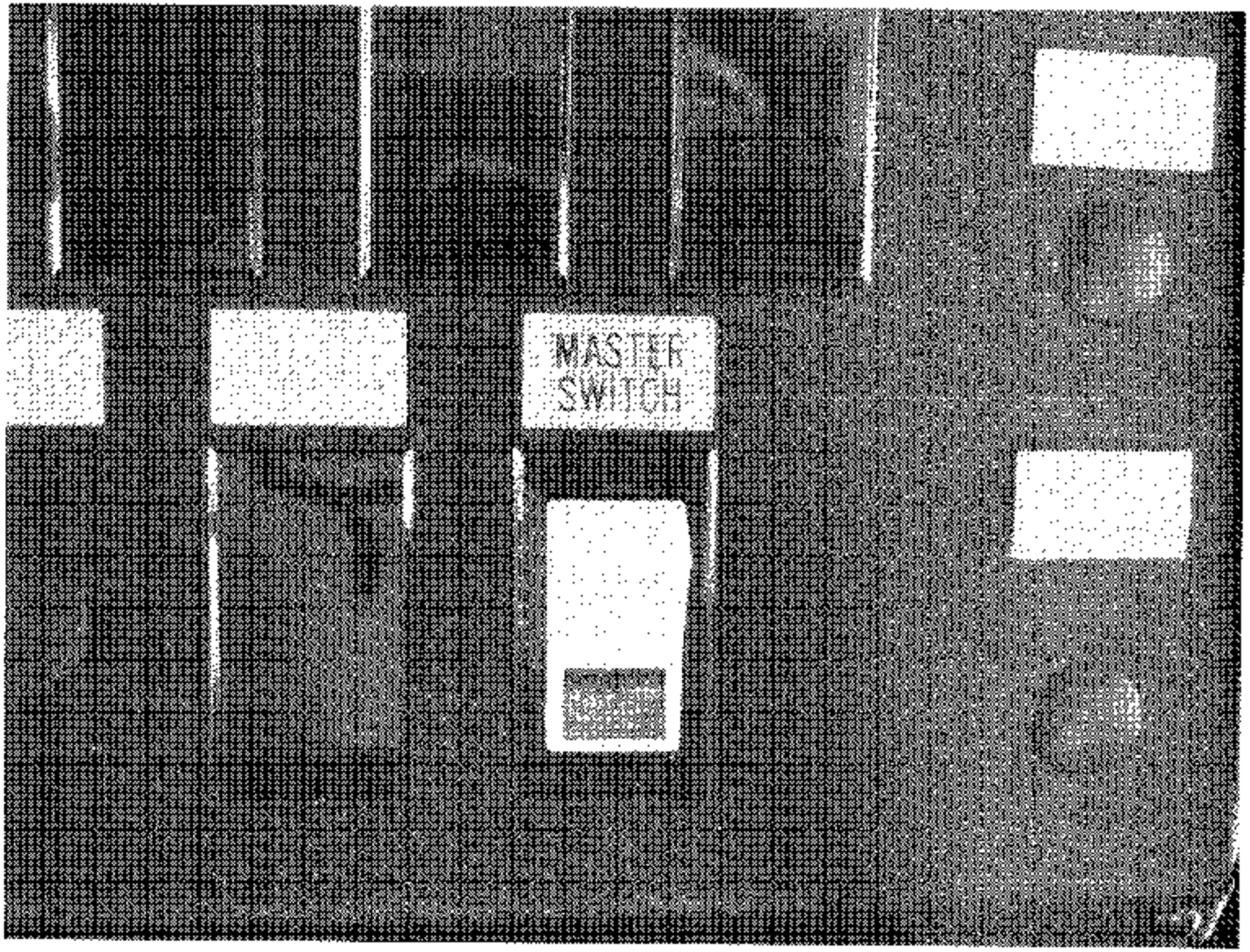
Close-up of Vehicle Placard

Test Vehicle: **2003 Mid Bus School Bus**
Procedure: **FMVSS 131** NHTSA No.: **C30803**



Close-up of Flasher

Test Vehicle: **2003 Mid Bus School Bus**
Procedure: **FMVSS 131** NHTSA No.: **C30903**



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

SECTION 6
LABORATORY NOTICE OF TEST FAILURE

mga research corporation

LABORATORY NOTICE OF TEST FAILURE TO OVSC

Test Procedure:	FMVSS 131	Test Date:	June 23, 2003
Test Vehicle:	2003 Mid Bus Guide	Test Lab:	MGA Research Corp.
NHTSA No.:	C30903	Project Engineer:	Michael Janovicz
Contract No.:	DTNH22-02-R-01057	Deliv. Order No.:	1
MFR.:	Mid Bus	VIN:	1GBJG31U431110295
Build Date.	12/02		

TEST FAILURE DESCRIPTION

The stop arm does not automatically extend when the overhead red lamps are flashing. In this case 49 CFR 571.131 requires that a warning sound be audible to the driver. This bus is not equipped with such a warning device.

FMVSS REQUIREMENTS DESCRIPTION

Paragraph S.5.5: "S5.5 The stop signal arm shall automatically extended in such a manner that it complies with S5.4.1, at minimum whenever the red signal lamps required by S5.1.4 of Standard No. 108 are activated; except that a device may be installed that prevents the automatic extension of a stop signal arm." ... "While the device is activated, continuous or intermittent signal audible to the driver shall sound."

Remarks: No remarks.

Notification to NHTSA (COTR): Stu Seigel

Date: June 23, 2003

By: