

REPORT NUMBER: 217-MGA-05-005

**SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 217
SCHOOL BUS EMERGENCY EXITS AND WINDOW
RETENTION AND RELEASE**

**Blue Bird Corporation
2005 Vision School Bus
NHTSA No.: C50901**

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



Final Report Date: July 8, 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 6116 (NVS-224)
WASHINGTON, D.C. 20590**

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Prepared by:  Date: July 8, 2005
James Hansen, Project Engineer

Reviewed by:  Date: July 8, 2005
John Roberts, Program Manager

FINAL REPORT ACCEPTED BY:



7/14/05
Date of Acceptance

Technical Report Documentation Page

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16. Abstract Compliance tests were conducted on the subject 2005 Blue Blrd Vision School Bus, NHTSA No. C50901, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-217-06 for the determination of FMVSS 217 compliance. Test failures were as follows: None					
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SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted on a MY2005 Blue Bird Vision School Bus, NHTSA No. C50901, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-217-06 to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 217, "School Bus Emergency Exits and Window Retention and Release".

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 MY2005 Blue Bird Vision School Bus, NHTSA No. C50901 did appear to meet the requirements of FMVSS 217. See Data Sheet 1 for Test Summary on the following page.

**DATA SHEET 1
TEST SUMMARY**

GENERAL VEHICLE IDENTIFICATION

Model Year/Make/Model:	2005/ Blue Bird / Vision	
NHTSA No.:	C50901	
GVWR:	13612 kg	
Build Date for Bus Chassis:	09/04	
VIN:	1BAKGCKH05F227003	
Chassis VIN:	1BAKGCKH05F227003	
Seating Capacity:	36 Passengers/ 2 Wheel Chair / 1 Driver	
Type of Bus:	School Bus	
Tire Pressure from tire placard (at capacity):	Front: 723 kPa	Front: 723 kPa
Odometer Reading:	1813 Miles	

	PASS/FAIL
§5.1 WINDOW RETENTION	PASS
§5.2 PROVISION OF EMERGENCY EXITS	PASS
Meets minimum exit provisions	PASS
Meets all other exit requirements	PASS
Meets requirements for additional exits	PASS
§5.2.3.1.A EMERGENCY EXIT DOOR OPERATIONAL REQUIREMENTS	PASS
§5.3 EMERGENCY EXIT RELEASE	PASS
Forces to unlatch the emergency exits	PASS
Forces to open the emergency exits	PASS
§5.4 EMERGENCY EXIT OPENING	PASS
§5.5 EMERGENCY EXIT LABELING AND IDENTIFICATION	PASS
§5.6 TAPE REFLECTIVITY (49CFR §71.131)	NOT TESTED

COMMENTS: NONE

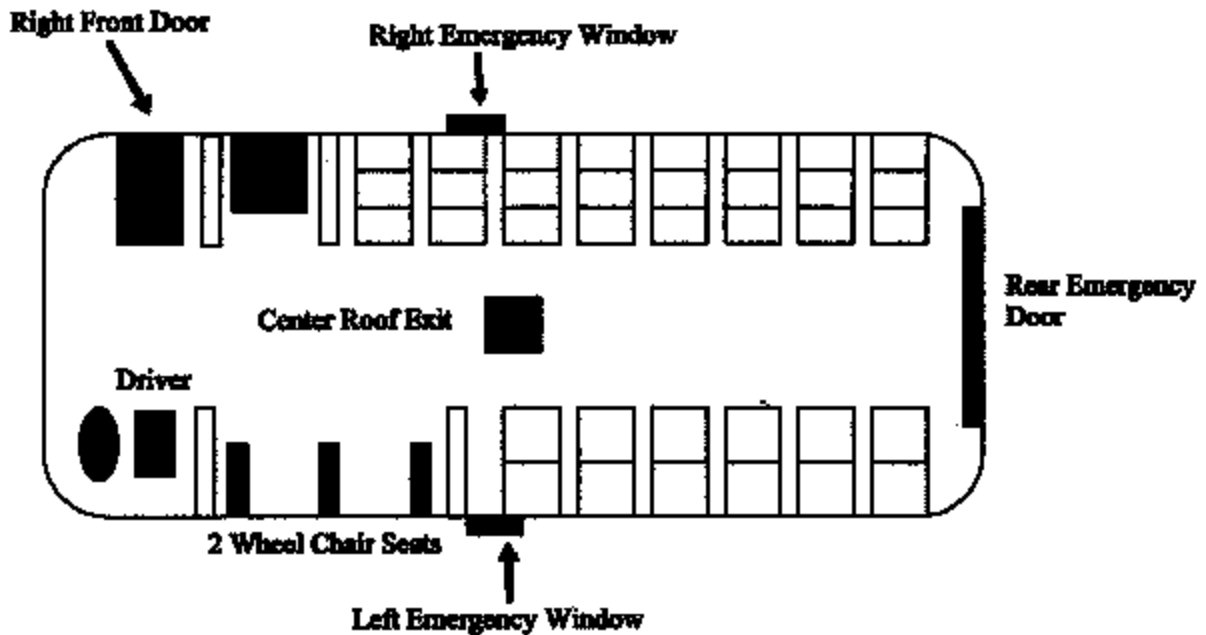
SECTION 3
COMPLIANCE TEST DATA

The following data sheets document the results of testing on the 2005 Blue Bird Vision School Bus, NHTSA No. C50901.

DATA SHEET 2
PROVISION OF EMERGENCY EXITS

Test Vehicle: **2006 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60901**
 Test Date: **06/27/06**



		Height (mm)	Width (mm)
1	Right Center Emergency Window	647	609
2	Left Center Emergency Exit	647	609
3	Center Roof Emergency Exit	571	577
4	Rear Emergency Exit Door	1295	958

Seating Capacity: 39 (Including Driver)

	PASS/FAIL
Bus meets minimum emergency exit provision, based upon Table 1	PASS


Comments: **NONE**

DATA SHEET 2 (CONTINUED)
PROVISION OF EMERGENCY EXITS

		PASS/FAIL
1	Rear Emergency Door – opens outward and is hinged on the right side (either side, if the bus has a GVWR of 10,000 pounds or less)	PASS
2	Side Emergency Door – hinged on its forward side. No more than one side emergency exit door is located, in whole or in part, within the same post and roof bow panel space.	N/A
3	Rear Push Out Window – provides a minimum opening clearance 41 cm high and 122 cm wide (16" x 48")	N/A
4	Roof Exit – is hinged on its forward side, and operable from both the inside and outside the vehicle	PASS
5	There is an even number of side emergency exit windows on each side of bus.	PASS
6	The bus is not equipped with both sliding and push-out windows, (except for buses equipped with rear push out emergency exit windows).	PASS
7	A right side emergency exit door, if any, is located as near as practicable to the midpoint of the passenger compartment.	N/A

COMMENTS: NONE

Recorded By: 

Approved By: 

Date: 06/27/05

**DATA SHEET 3
EMERGENCY EXIT DOOR OPERATIONAL REQUIREMENTS**

Test Vehicle: **2005 Blue Bird Vision School Bus**
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C50901**
Test Date: **06/27/05**

		PASS/FAIL
1	The engine starting system does NOT operate if any Emergency Exit is LOCKED	N/A
2	All Emergency Door and Roof Exits can be released by one person (from inside and outside of bus)	PASS
3	When the Release Mechanism is NOT in the closed position and the vehicle ignition is in the "ON" position, there is a continuous warning sound audible at the Driver's DSP and in the vicinity of the Emergency Door(s) having the unclosed mechanism.	PASS
4	Emergency exit release mechanism does not use remote controls or central power systems	PASS

COMMENTS:

Recorded By: 

Approved By: 

Date: 06/27/05

**SHEET 4A
EMERGENCY EXIT IDENTIFICATION AND LABELING**

Test Vehicle: 2005 Blue Bird Vision School Bus
 Test Lab: MGA Research-Wisconsin Operations

NHTSA No.: C50901
 Test Date: 06/27/05

EMERGENCY EXIT LABELING - INTERIOR

Exit Location	Left Window	Right Window	Rear Door	Roof Exit Center
Exit Description	Exit Window	Exit Window	Exit Door	Roof Hatch
Letter Height (cm)	5.0	5.0	5.0	5.0
Background Color	Silver	Silver	Silver	White
Location Inside	Above Window	Above Window	Top of Window	On Hatch
Pass/Fail	PASS	PASS	PASS	PASS

OPERATING INSTRUCTIONS - INTERIOR

Exit Location	Left Window	Right Window	Rear Door	Roof Exit Center
Instructions	Emergency Exit To Open Pull Handle Push Out Window	Emergency Exit To Open Pull Handle Push Out Window	Emergency Exit To Open Pull up Handle Push Out Door	To Exit Turn Handle and Push
Letter Height (cm)	1.4	1.4	1.4	1.4
Letter Color	Black	Black	Black	Red
Background Color	Silver	Silver	White	White
Distance From Release (cm)	1	1	0	0
Reflective Tape Color	N/A	N/A	N/A	N/A
Reflective Tape Width	N/A	N/A	N/A	N/A
Pass/Fail	PASS	PASS	PASS	PASS

COMMENTS: NONE

Recorded By: 

Approved By: 

Date: 06/27/05

**DATA SHEET 4B
EMERGENCY EXIT IDENTIFICATION AND LABELING**

Test Vehicle: **2005 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C50901**
 Test Date: **06/27/05**


EMERGENCY EXIT LABELING - EXTERIOR


Exit Location	Left Window	Right Window	Rear Door	Roof Exit Center
Exit Description	Exit Window	Exit Window	Exit Door	Roof Hatch
Letter Height (cm)	5.0	5.0	5.0	5.0
Background Color	Silver	Silver	Silver	White
Location Outside	Top of Window	Top of Window	Top of Door Window	Center of Hatch
Pass/Fail	PASS	PASS	PASS	PASS

OPERATING INSTRUCTIONS - EXTERIOR

Exit Location	Left Window	Right Window	Rear Door	Roof Exit Center
Instructions	Emergency Exit Operates from Inside Only	Emergency Exit Operates from Inside Only	N/A	Turn Handle and Lift
Letter Height (cm)	2.5	2.5	N/A	1.8
Letter Color	Black	Black	N/A	Black
Background Color	Silver	Silver	N/A	White
Distance From Release (cm)	N/A	N/A	N/A	0.5
Reflective Tape Color	Yellow	Yellow	Yellow	Yellow
Reflective Tape Width	2.5	2.5	2.5	2.5
Pass/Fail	PASS	PASS	PASS	PASS

COMMENTS:

Recorded By: 

Approved By: 

Date: 06/27/05

**DATA SHEET 4 (CONTINUED)
EMERGENCY EXIT IDENTIFICATION AND LABELING**

Test Vehicle: **2005 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C50901**
 Test Date: **06/27/05**

		PASS/FAIL
1	Each required Emergency Exit is labeled with the words "Emergency Exit" or "Emergency Door" as appropriate in letters at least 5 cm high (2") of a color that contrasts with its background.	PASS
2	Emergency Doors – The designation "Emergency Exit" or "Emergency Door" is located at the top of, or directly above the exit door on both inside and outside surfaces of the bus.	PASS
3	Roof Exits – The designation for roof exits is located on an inside surface of the exit, or within 30 cm (11.8") of the roof exit opening.	PASS
4	Emergency Window Exits – The designation is located at the top of, or directly above, or at the bottom of the emergency window exit on both the inside and outside surfaces of the bus.	PASS
5	Exit Operating Instructions indicate all motions required to unlatch and open the exit, in letters at least 1 cm (.39") high and of a color that contrast with its background and shall be located within 15 cm (5.9") of the release mechanism on the inside surface of the bus.	PASS
6	Each required Emergency Exit opening is outlined around its perimeter with a 2.5 cm (1") wide retroreflective tape of red, white, or yellow color.	PASS

COMMENTS:

Recorded By: 

Approved By: 

Date: 06/27/05

**DATA SHEET 5
TAPE RELECTIVITY TEST**

Test Vehicle: 2005 Blue Bird Vision School Bus
Test Lab: MGA Research-Wisconsin Operations

NHTSA No.: C50901
Test Date:

- _____ Color of retroreflective tape (white, red, or yellow)
- _____ Glass bead retroreflective element material – Fill in Part A
- _____ Prismatic retroreflective element material – Fill in Part B

**SPECIFIC INTENSITY PER UNIT AREA
(Candela Per Foot Candle Per Square Foot)**

Observation Angle	Entrance Angle	Min. Req'd. Intensity	Recorded Intensity	Pass/Fail
Part A – Glass Bead				
Part B - Prismatic				

This section of tape passes the REFLECTIVITY requirement. Yes___ No___

COMMENTS: NOT TESTED

Recorded By: _____

Approved By: _____

Date:

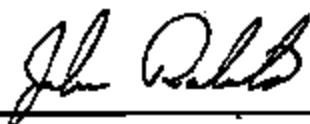
**DATA SHEET 6A
FORCE TESTS TO UNLATCH THE EMERGENCY EXITS - INTERIOR**

Test Vehicle: **2005 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60901**
 Test Date: **06/27/06**

Exit Location	Exit Description	High/Low Force Area	Maximum Force Requirement Newtons	Actual Force Measured (N)	Motion(s) required to Release Exit	Actual Motion(s) to Release Exit	PASS/FAIL
Left Window	Exit Window	Low	89	1. 56.1	Rotary	Pull Up	PASS
				2. 56.1			
				3. 55.8			
				Average: 56			
Right Window	Exit Window	Low	89	1. 41.6	Rotary	Pull Up	PASS
				2. 42.6			
				3. 42.8			
				Average: 42.3			
Rear Door	Exit Door	High	178	1. 17.3	Straight	Pull Up	PASS
				2. 17.6			
				3. 18.1			
				Average: 17.6			
Roof Exit Center	Roof Hatch	High	178	1. 42.8	Rotary	90° Turn	PASS
				2. 38.7			
				3. 38.0			
				Average: 39.8			

COMMENTS: NONE

Recorded By: 

Approved By: 

Date: 06/27/06


**DATA SHEET 6B
FORCE TESTS TO UNLATCH THE EMERGENCY EXITS - EXTERIOR**

Test Vehicle: **2006 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C50901**
 Test Date: **08/27/05**

Exit Location	Exit Description	High/Low Force Area	Maximum Force Requirement Newtons	Actual Force Measured (N)	Motion(s) required to Release Exit	Actual Motion(s) to Release Exit	PASS/FAIL
Rear Door	Exit Door	High	178	1. 73.2	Rotary	90° Counter Clockwise Turn	PASS
				2. 66.4			
				3. 74.5			
				Average: 71.3			
Roof Center Exit	Roof Hatch	High	178	1. 29.9	Rotary	90° Counter Clockwise Turn	PASS
				2. 31.7			
				3. 35.3			
				Average: 32.3			

COMMENTS: NONE

Recorded By: 

Approved By: 

Date: 08/27/05

**DATA SHEET 7A
FORCE TESTS TO OPEN THE EMERGENCY EXITS - INTERIOR**

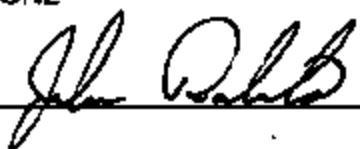
Test Vehicle: **2005 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**


NHTSA No.: **C60901**
 Test Date: **06/27/05**

Exit Location	Exit Description	High/Low Force Area	Maximum Force Requirement Newtons	Actual Force Measured (N)	Motion(s) required to Open Exit	Actual Motion(s) to Open Exit	Passage of Ellipsoid or Parallelepiped	PASS/FAIL
Left Window	Exit Window	Low	89	1. 36.6	Straight	Push Outward	Ellipsoid	PASS
				2. 33.6				
				3. 38.0				
				Average: 36.1				
Right Window	Exit Window	Low	89	1. 27.1	Straight	Push Outward	Ellipsoid	PASS
				2. 34.0				
				3. 35.6				
				Average: 32.2				
Rear Door	Exit Door	High	178	1. 47.5	Straight	Push Outward	Parallelepiped	PASS
				2. 49.0				
				3. 47.4				
				Average: 47.9				
Roof Exit Center	Roof Hatch	High	178	1. 60.3	Straight	Push Up	Ellipsoid	PASS
				2. 53.0				
				3. 55.5				
				Average: 56.2				

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Describe in the comments section if more than one force and motion are required to unlatch the exit.
 COMMENTS: NONE

Recorded By: 

Approved By: 

Date: 06/27/05

**DATA SHEET 7B
FORCE TESTS TO OPEN THE EMERGENCY EXITS - EXTERIOR**

Test Vehicle: **2005 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**


NHTSA No.: **C50901**
 Test Date: **08/27/05**

Exit Location	Exit Description	High/Low Force Area	Maximum Force Requirement Newtons	Actual Force Measured (N)	Motion(s) required to Open Exit	Actual Motion(s) to Open Exit	Passage of Ellipsoid or Parallelepiped	PASS/FAIL
Rear Door	Exit Door	High	178	1. 31.1	Straight	Pull Outward	Parallelepiped	PASS
				2. 36.6				
				3. 35.8				
				Average: 34.5				
Roof Exit Center	Roof Hatch	High	178	1. 68.8	Straight	Pull Outward	Ellipsoid	PASS
				2. 74.7				
				3. 77.0				
				Average: 73.5				

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Describe in the comments section if more than one force and motion are required to unlatch the exit.

COMMENTS: NONE

Recorded By: 

Approved By: 

Date: 08/27/05

**DATA SHEET 8
EMERGENCY EXIT EXTENSION**

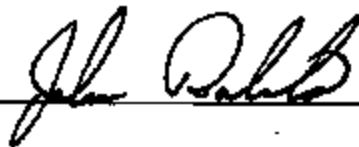
Test Vehicle: **2005 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C50901**
 Test Date: **06/27/05**

		PASS/FAIL
1	Exit(s) can be extended by a single person.	PASS
2	Each emergency exit door is equipped with a positive door opening device that meets the requirements (outlined in Section S5.4.1 (3) of FMVSS 217).	PASS
3	There is a 30 cm (11.81") wide clear aisle space for each side emergency door exit.	N/A
4	There is no seat or barrier which extend past the side door opening	N/A
5	For flip-up seat adjacent to the side emergency door exit it automatically assumes and retain a vertical position when not in use, so that no portion of the seat bottom is within the 30 cm (11.81") aisle clearance space	N/A
6	There is no obstruction of door latch mechanism for the rear emergency door.	PASS

COMMENTS: NONE

Recorded By: _____



Approved By: _____



Date: 06/27/05

**DATA SHEET 9
WINDOW RETENTION TEST**

Test Vehicle: **2005 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C50901**
 Test Date: **08/27/05**

1	Test Window Identification:	Right Side Window 9
2	Provide a detailed description of the window such as fixed, push out, single or double glazed, horizontal or vertical sliding, etc.	Vertical Sliding Non-Emergency Exit
3	Provide the horizontal and vertical glazing dimensions for each panel.	24.75" W X 13.75" H
4	Did the window pass the retention requirements? Describe how the window structure and glazing withstood the force per the PASS/FAIL criteria:	PASS, Max Displacement 48mm.
5	Did the window pass the force tests to unlatch and open the exit after the completion of the retention test?	N/A

COMMENTS:

Recorded By: 

Approved By: 

Date: 08/27/05

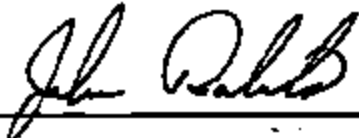
**DATA SHEET 9 (CONTINUED)
WINDOW RETENTION TEST**

Test Vehicle: 2005 Blue Bird Vision School Bus
Test Lab: MGA Research-Wisconsin Operations

NHTSA No.: C50901
Test Date: 06/27/05

1	Test Window Identification:	Rear Door Upper Window		
2	Provide a detailed description of the window such as fixed, push out, single or double glazed, horizontal or vertical sliding, etc.	Fixed		
3	Provide the horizontal and vertical glazing dimensions for each panel.	33.25' W X 20' H		
4	Did the window pass the retention requirements? Describe how the window structure and glazing withstood the force per the PASS/FAIL criteria:	PASS, Glazing shattered at 1596N		
5	Did the window pass the force tests to unlatch and open the exit after the completion of the retention test?	Unlatch Force Measured (N)	Open Force Measured (N)	Pass/ Fail
		1. 15.8	1. 35.2	PASS
		2. 15.9	2. 38.5	PASS
		3. 15.8	3. 38.2	PASS

COMMENTS:

Recorded By: 

Approved By: 

Date: 06/27/05

**SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST**

Test Vehicle: **2005 Blue Bird Vision School Bus**
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C60901**
 Test Date: **06/27/05**

Equipment	Description	Model/Serial No.	Cal. Date	Next Cal. Date
Head Form	MGA	217	When Used	When Used
A/D Interface	Metabyte	DAS-1802	—	—
Sphere	MGA	Sphere – 1A	When Used	When Used
Load Cell	Dillon	DMLC1120014	05/19/05	11/19/05
Inclinometer	Digital Protractor	Pro 360 / Comp Lab	02/21/05	08/21/05
Linear Potentiometer	Ametek	P40A/0504-21782	05/23/05	11/23/05
Digital Calipers	Mitutoyo	CD-8" cs/ 0441288	04/01/05	10/01/05
Steel Tape	Stanley	Powerlock / 101	05/31/05	11/31/05
Camera	Sony	DSC-S75	—	—
Ellipsoid	MGA	ELLIP – 1A	When Used	When Used
Parallelepiped	MGA	PARA – 1A	When Used	When Used
Force Gauge	Dillon	DFGS-R-ND / F31754	05/19/05	11/19/05

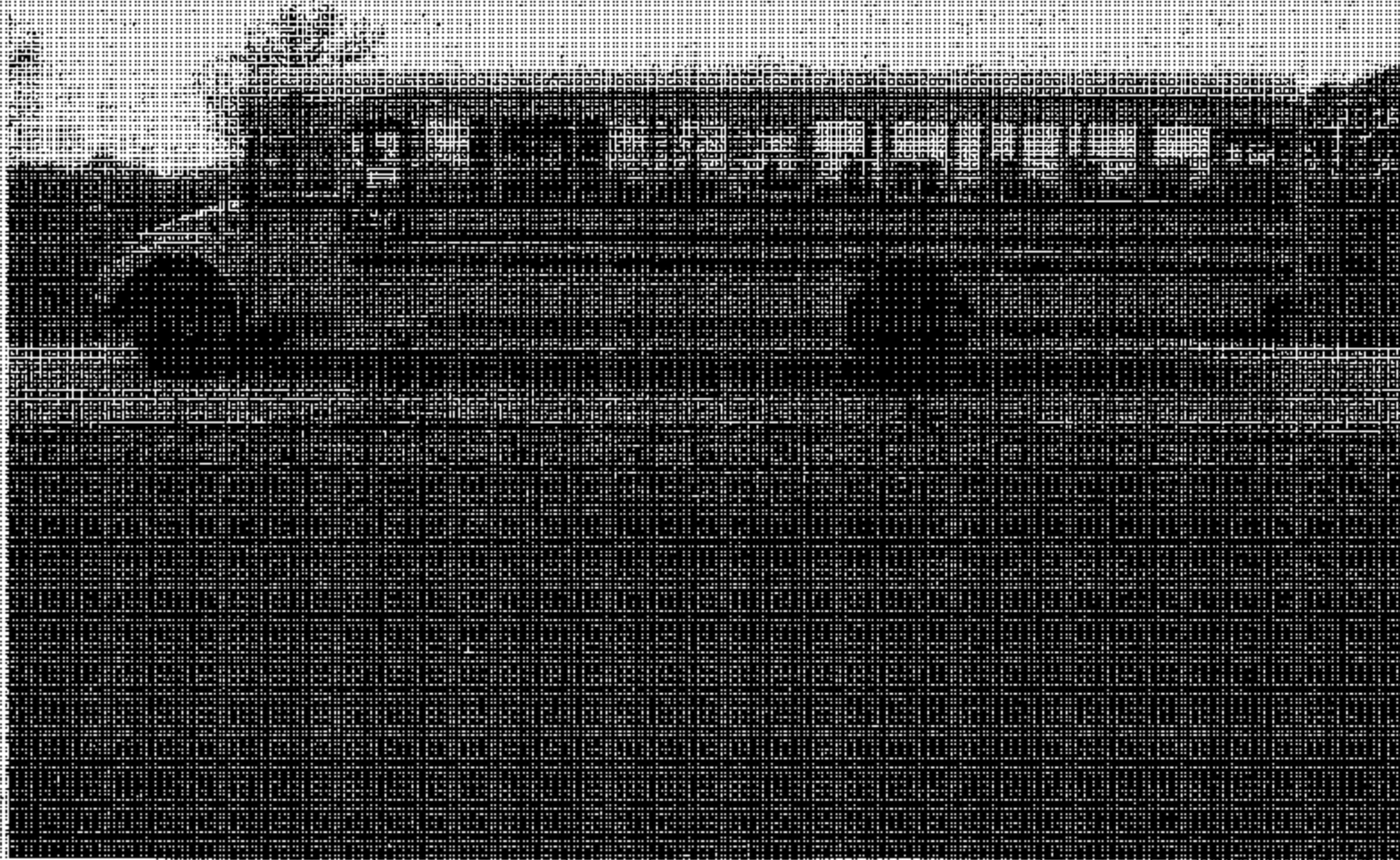
**SECTION 6
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Test Vehicle: 2006 Blue Mini Vision School Bus
Procedure: FMVSS #17

NHTSA No.: Q50801



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Exterior Left Side View of School Bus

Test Vehicle: 2005 Blue Bird Vision School Bus
Procedure: FMVSS 217

NHTSA No.: C60001

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Exterior Right Front 3/4 View of School Bus

Test Vehicle: 2005 Blue Hino Vision School Bus
Procedure: FMVSS 217

NHTSA No.: Q50901



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Exterior Left Rear 1/4 View of School Bus

Test Vehicle: 2005 Blue Bird Vision School Bus
Procedure: FMVSS 217

NHTSA No.: 0309901



Test Vehicle: 2005 Blue Ford Vision School Bus
Private: FVYSS 217

NHTSA No: CS00K1



Test Vehicle: 2005 Blue Bird Vision School Bus
Procedure: FMVSS 217

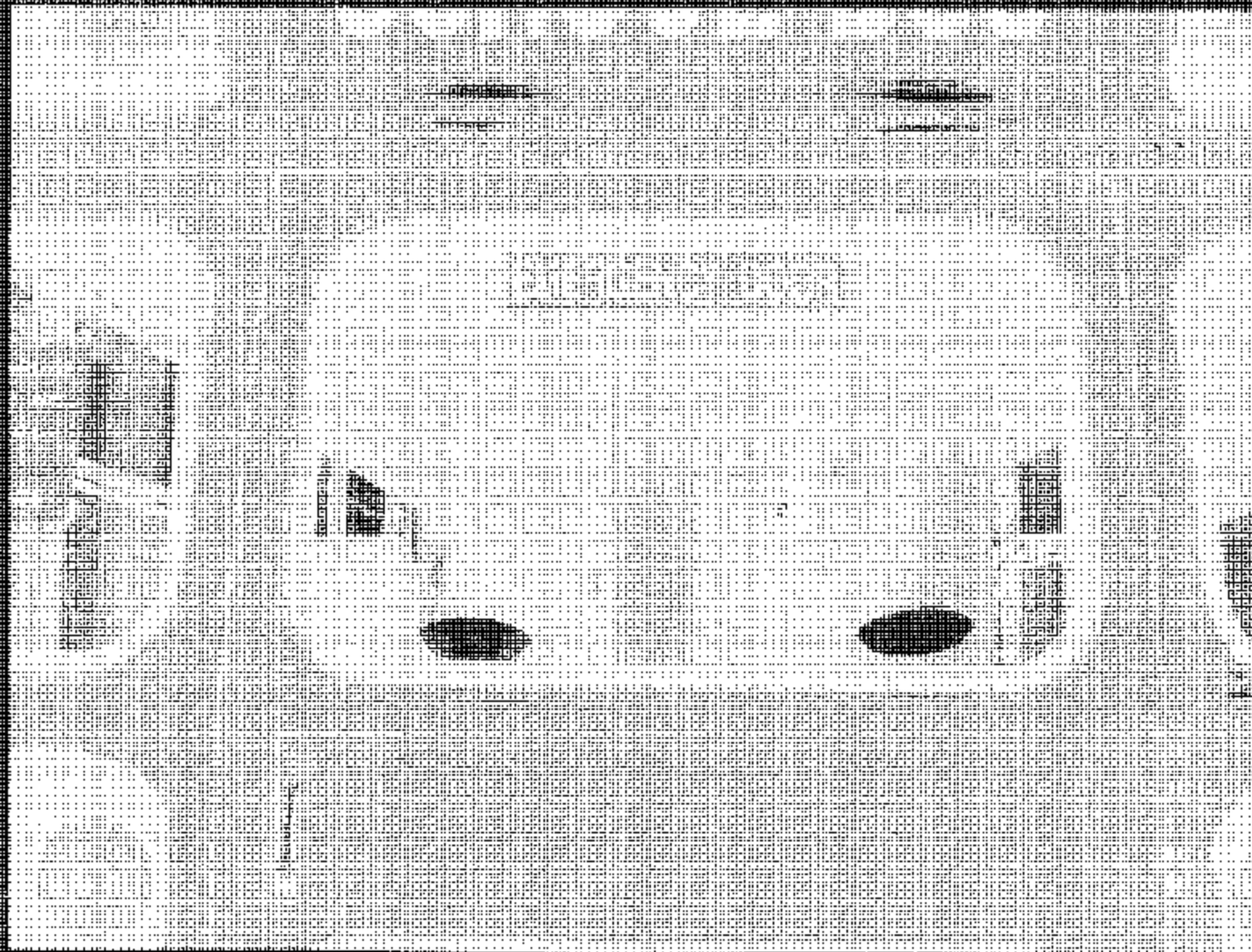
NHTSA No.: C50001



Interior View of Front View Displaying Seating Arrangement

Test Vehicle: 2005 Blue Bird Vision School Bus
Procedure: FMVSS 217

NEHTSA No.: C-00501



Test Vehicle: 2015 Blue Bird Vision School Bus
Procedure: FMVSS 217

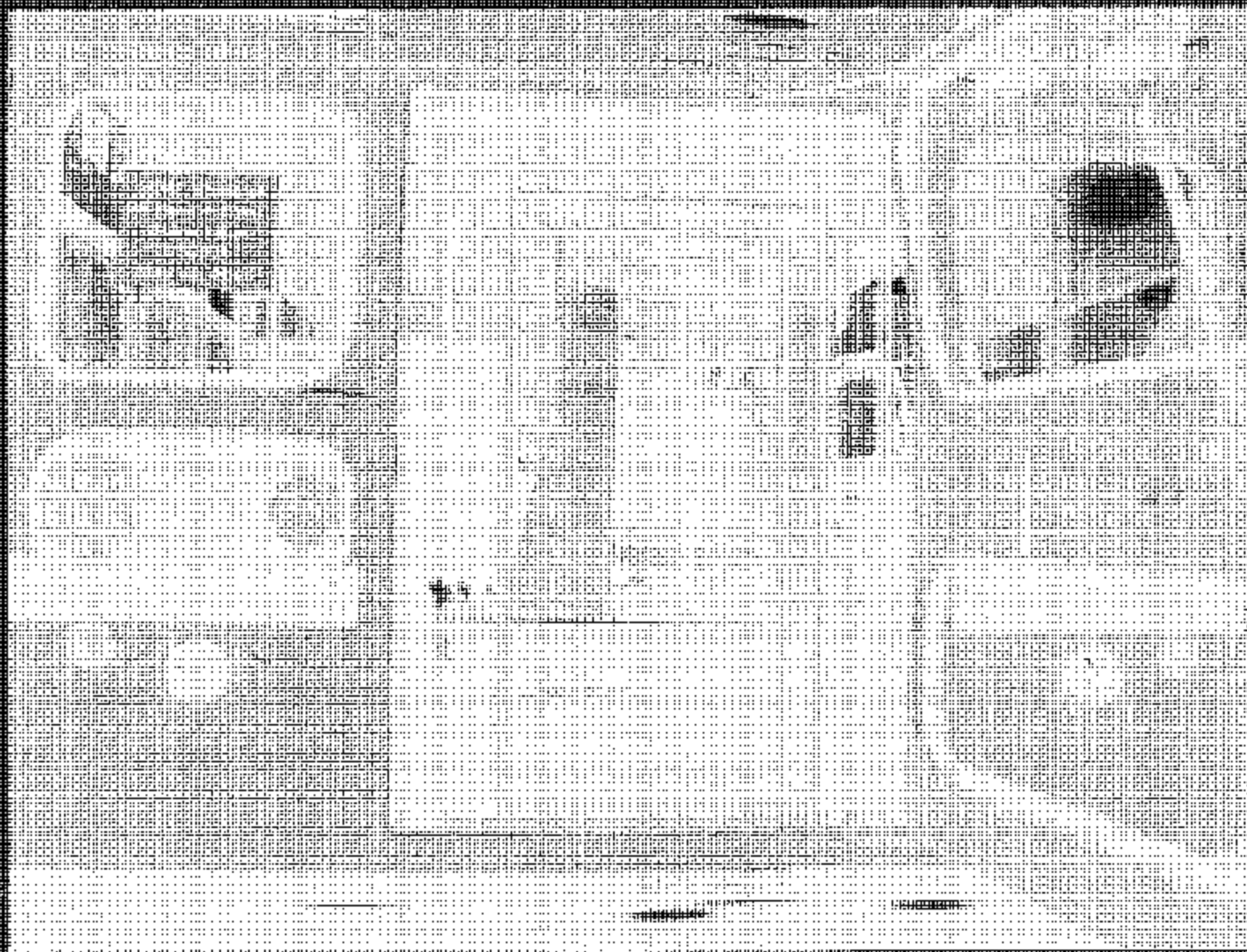
NHTSA No.: 049891



Roar Exit Door Identification (Inside View)

Test Vehicle: 2005 Blue Bird Vision School Bus
Proceeding: FMVSS 217

NHTSA No.: C90001

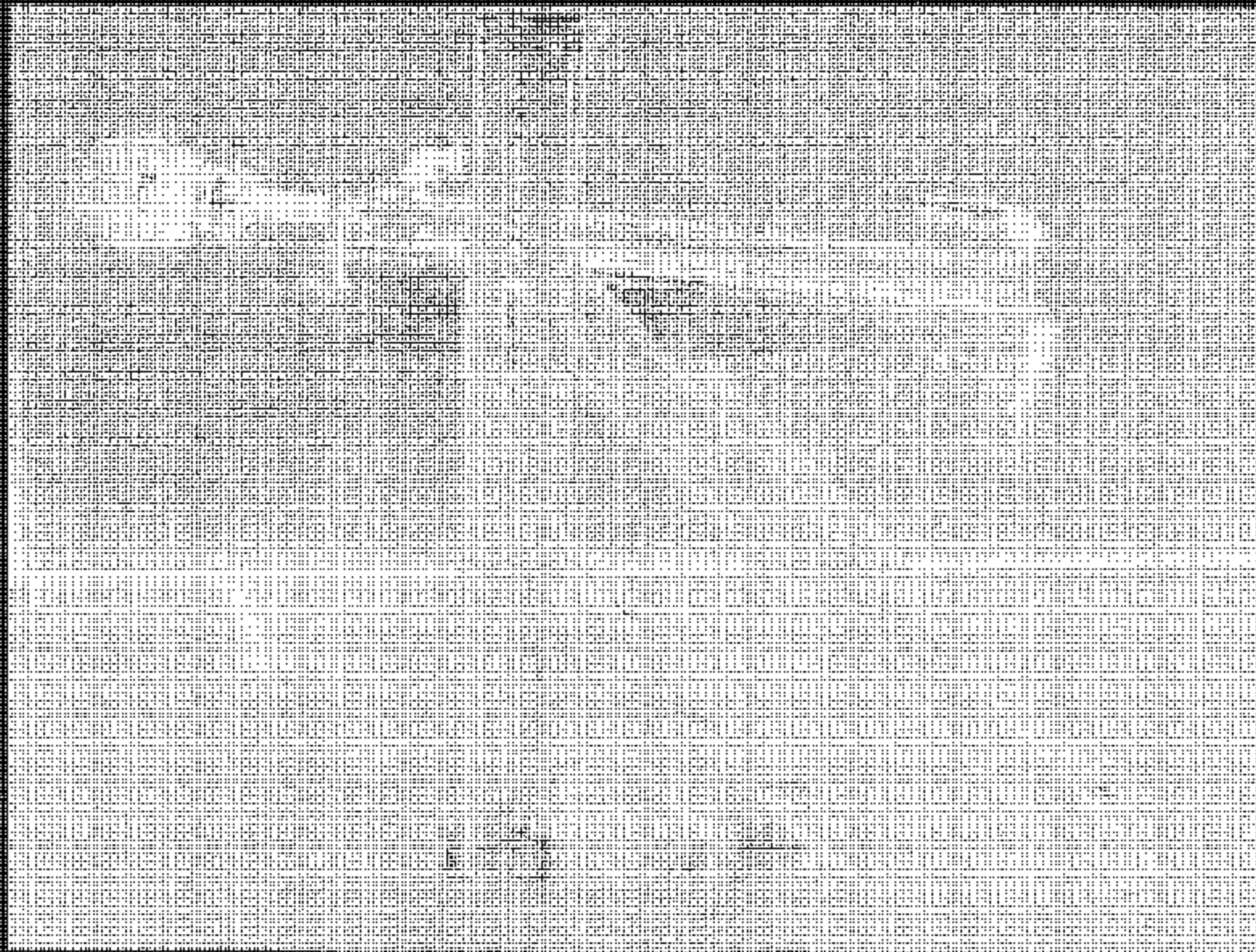


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Rear Chock Emergency Exit Parabolic and Conditions

Test Vehicle: 2005 Blue Bird Vitek School Bus
Procedure: FMVSS 217

NEITSA No. CAS001



Loading Figure

Test Vehicle: 2005 Blue Bird Vision School Bus
Procedure: FMVSS 217

NHTSA No.: 050941



Test Vehicle: 2008 Blue Ford Vision School Bus
Procedure: FMVSS 217

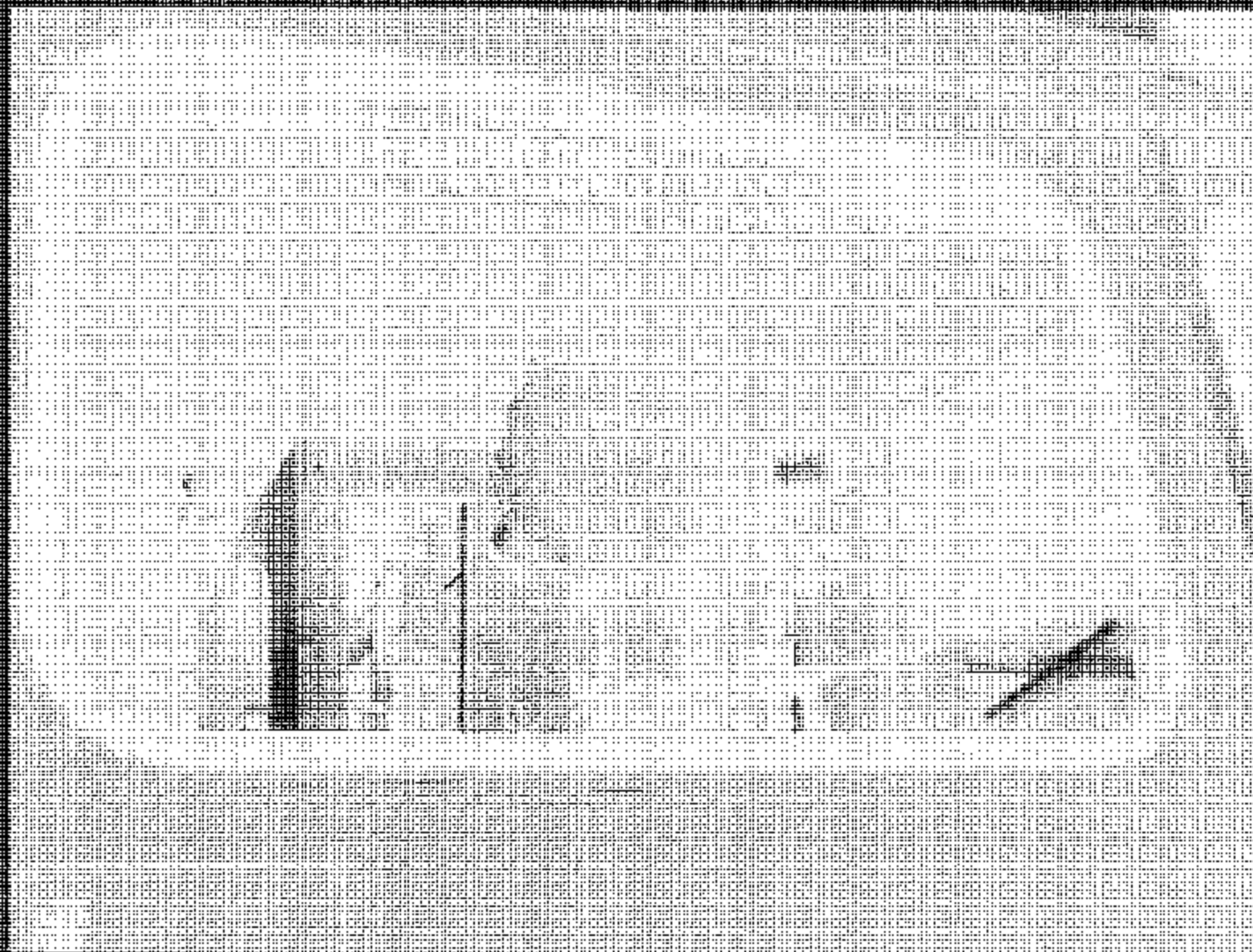
NHTSA No. C60701



23

Test Vehicle: 2005 Blue 2001 Vision School Bus
Practice: FMVSS E17

NHTSA No.: 053941



Retention Test of Rear Door Window (Pre-Test)

Test Vehicle: 2005 Blue Bird Vinton School Bus
Procedure: FMVSS 217

NEHTSA No.: C40901

34



Rotation Test of Rear Door Window (Post-Test)

Test Vehicle: 2006 Blue Blind Vision School Bus
Procedure: FMVSS 217

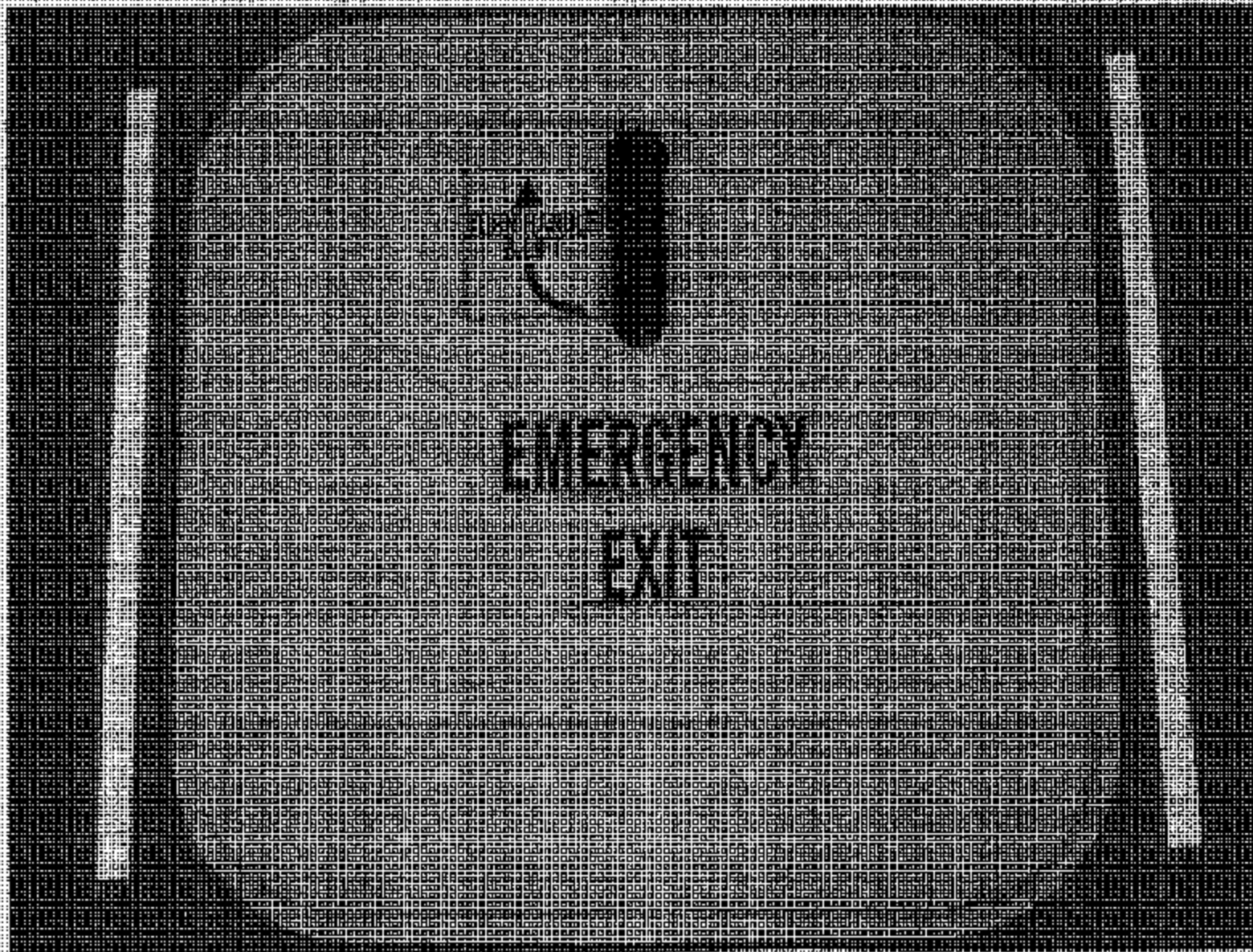
NHTSA No.: 07-0801



Red Exit Identification Inside View

Test Vehicle: 2006 Blue Bird Vision School Bus
Procedure: FMVSS 217

NHTSA No.: C60901



Roof Exit Identification Outside View

Test Vehicle: 2006 Blue Bird Vision School Bus
Procedure: FMVSS 217

NHTSA No. C604M

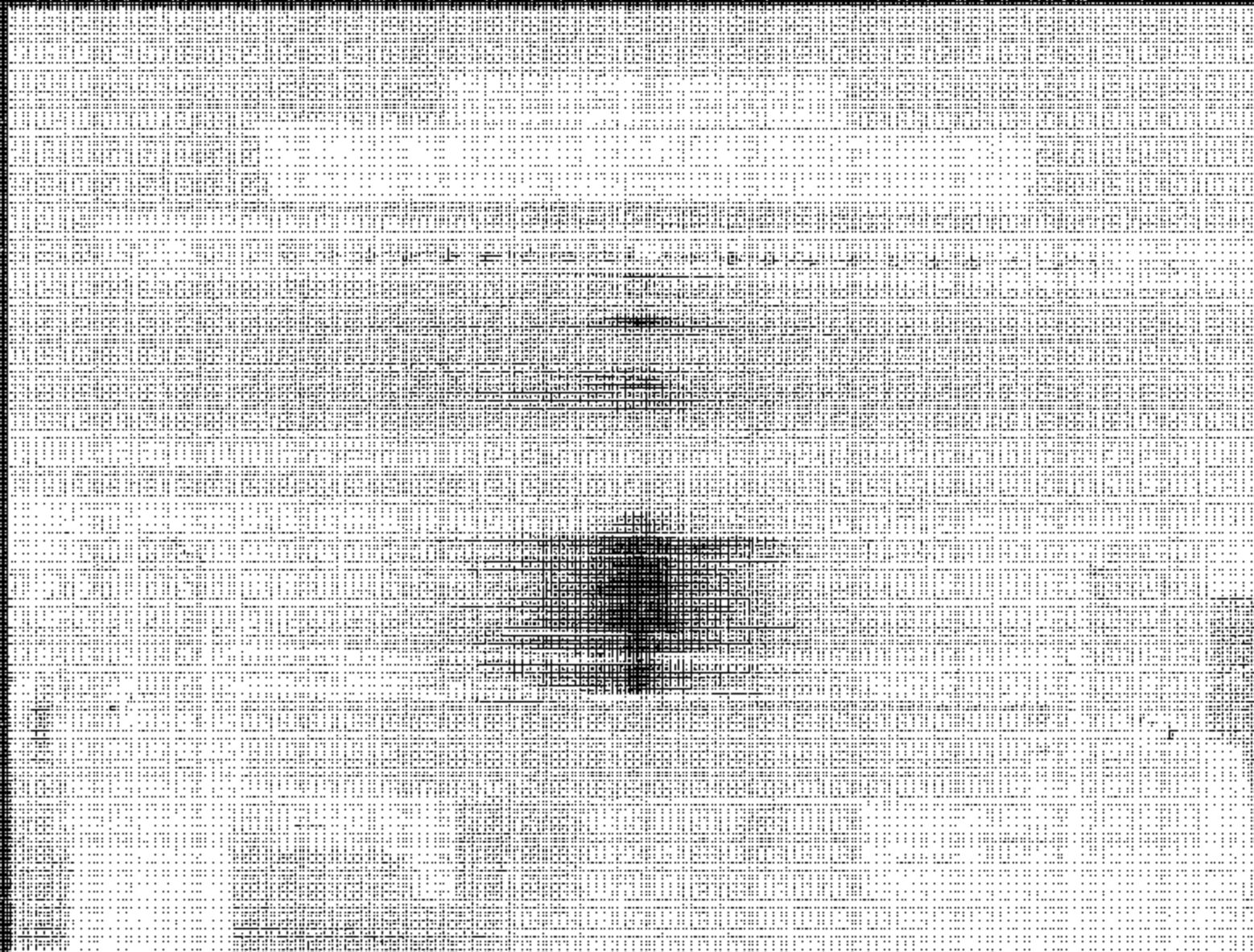


Roof Exit Edge-to-Edge Clearance

28

Test Vehicle: 2005 Blue Bird Vision School Bus
Procedure: FMVSS 217

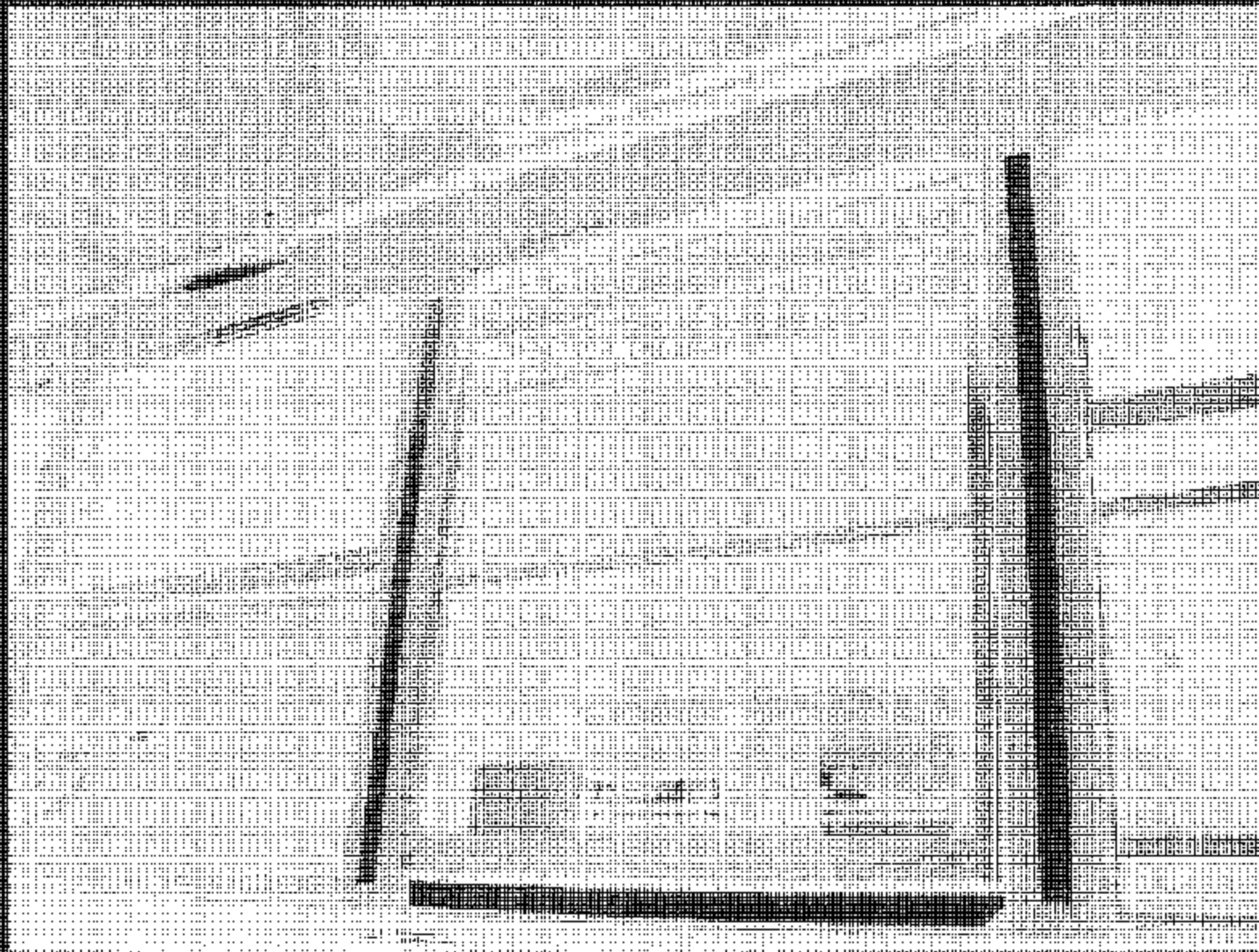
NHTSA No: CS0991



Left Emergency Exit Window Identification Inside View

Test Vehicle: 2002 Blue Ford Vision School Bus
Procedure: FMVSS 217

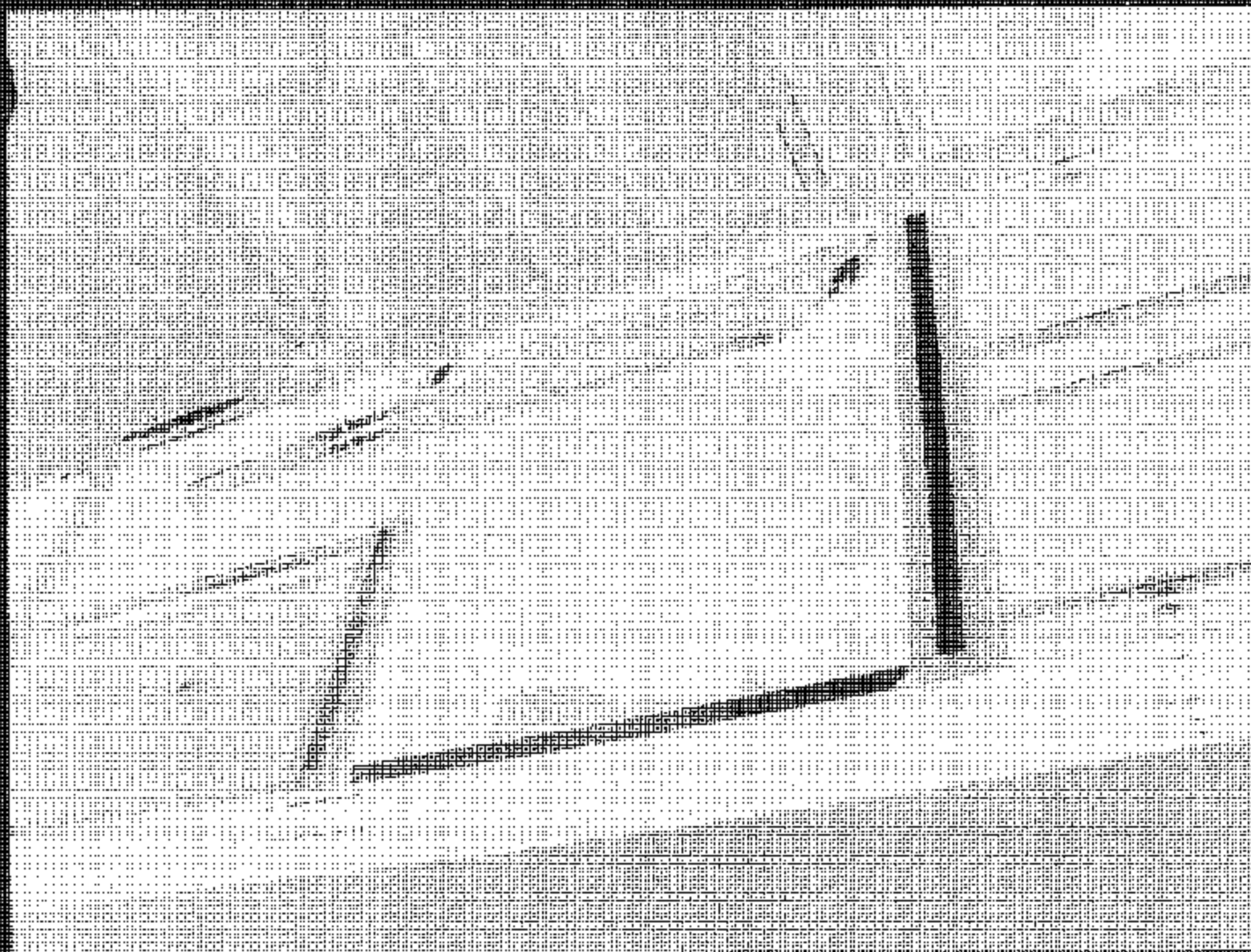
NHTSA No. C63941



Left Emergency Exit Window Front View Outside View

Test Vehicle: 2006 Blue Bird Vision School Bus
Procedure: FMVSS 217

NHTSA No.: C50041



Left Emergency Exit Window Release Sequence View

Test Vehicle: 2005 Blue Bird Vision School Bus
Procedure: FMVSS 217

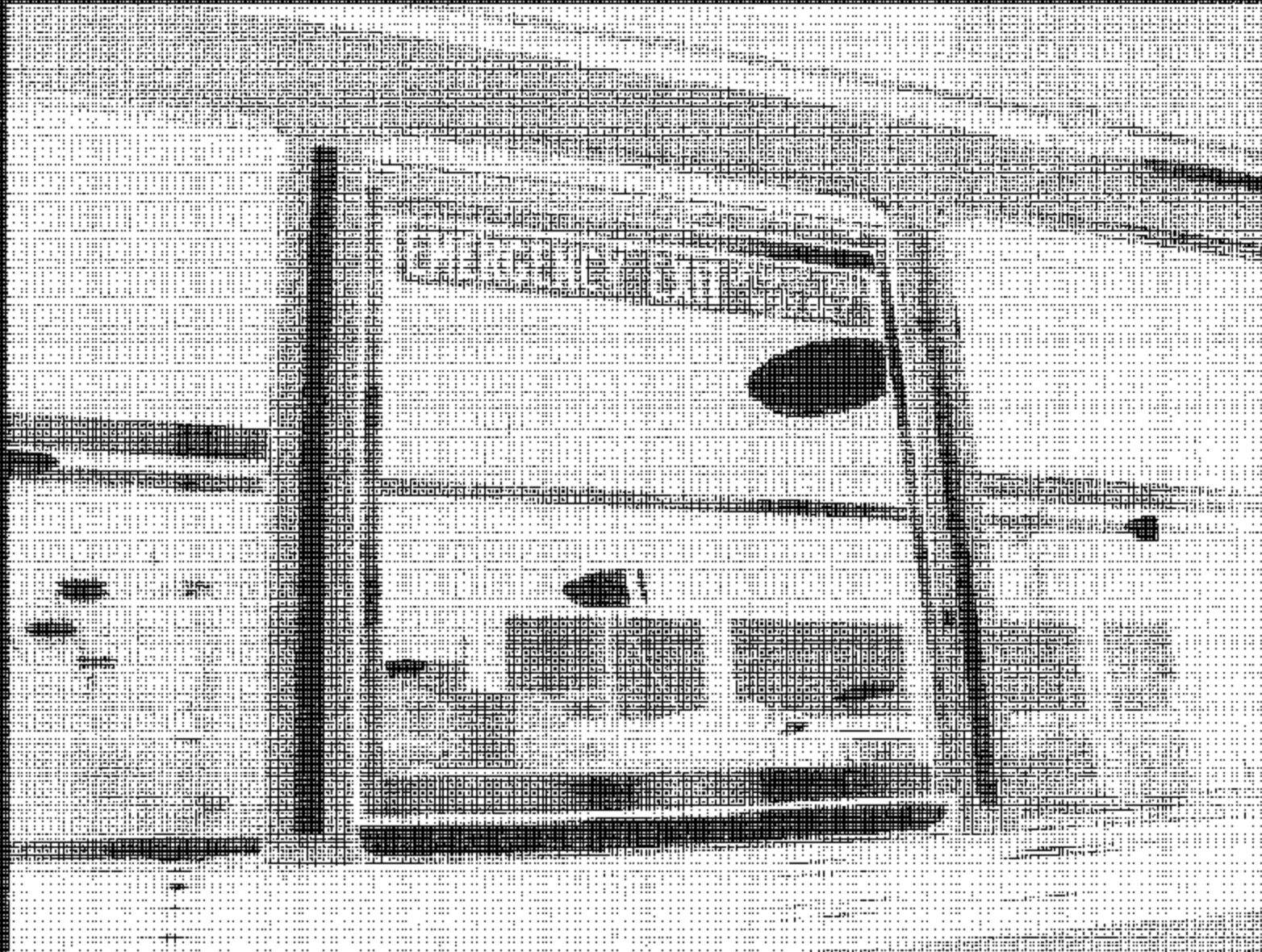
NHTSA No. GHS901



Right Emergency Exit Window Reinforcement Inside View

Test Vehicle: 2005 Blue Bird Vision School Bus
Procedure: FMVSS 217

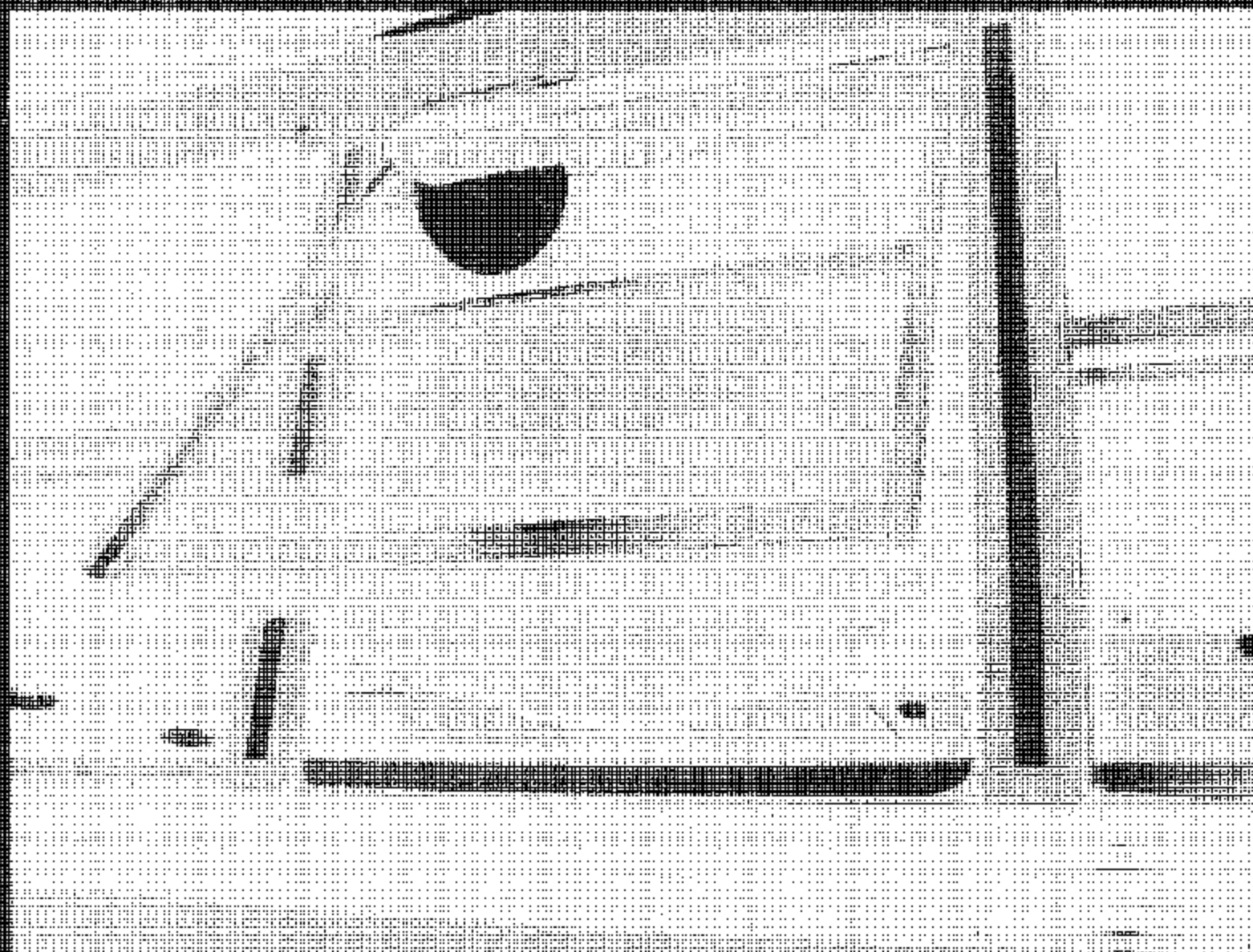
NHTSA No.: 050801



Right Emergency Exit Window Identification Outside View

Test Vehicle: 2005 Blue Bird Vision School Bus
Procedure: FMVSS 217

NHTSA No.: C66841



2005 Blue Bird Vision School Bus

**SECTION 6
TEST PLOTS**

