

REPORT NUMBER: 3015-MGA-03-003

HS No  
630848

**SAFETY COMPLIANCE TESTING FOR  
FMVSS NO. 301S  
FUEL SYSTEM INTEGRITY – SCHOOL BUSES**

**2003 Mid Bus Guide  
School Bus  
NHTSA No.: C30903**

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



**Final Report Date: September 26, 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-220)  
WASHINGTON, D.C. 20590**

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10/01/03  
Date of Acceptance

**Technical Report Documentation Page**

1. Report No. 301S-MGA-03-003		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 301S School Bus Compliance Testing of 2003 Mid Bus Guide NHTSA No.:C30903				5. Report Date September 26, 2003	
				6. Performing Organization Code MGA	
7. Author(s) Chris Novak, Project Technician Michael Janovicz, Project Manager				8. Performing Organization Report No. 301S-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-D-01057	
12. Sponsoring Agency Name and Address  U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance (NVS-221) 400 Seventh St., S.W. Room 6115 Washington, D.C. 20590				13. Type of Report and Period Covered Final Report 8/11/03 to 9/26/03	
				14. Sponsoring Agency Code NVS-220	
15. Supplementary Notes					
16. Abstract A compliance test was conducted on the subject 2003 Mid Bus Guide School Bus, NHTSA No. C30903 in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301-02 for the determination of FMVSS 301S compliance.  TEST FAILURES:  NONE					
17. Key Words  Compliance Testing Safety Engineering FMVSS 301S				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	
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 46	22. Price

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## **SECTION 1**

### **PURPOSE OF COMPLIANCE TEST AND SUMMARY**

A fuel system integrity test was performed on a MY2003 Mid Bus Guide School Bus, NHTSA No. C30903, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-301-02 to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 301S, "Fuel System Integrity - School Buses".

Based on the test results, the MY2003 Mid Bus Guide School Bus, NHTSA No. C30903 appears to meet the requirements of FMVSS 301S testing.

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

**SECTION 2**  
**COMPLIANCE TEST DATA**

The following data sheets document the results of testing on the MY2003 Mid Bus Guide School Bus, NHTSA No. C30903.

**DATA SHEET 1**  
**SCHOOL BUS DATA**

Test Vehicle: **2003 Mid Bus Guide School Bus**  
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30903**  
Test Date: **8/11/03**

**GENERAL VEHICLE IDENTIFICATION**

School Bus Manufacturer:	Mid Bus	
School Bus Model:	Guide	
Build Date:	12/02	
Incomplete Vehicle Manufactured By:	Chevrolet	
Build Date for Bus Chassis:	9/02	
School Bus GVWR (kg):	5,443	
School Bus GAWR Front (kg):	1,951	
School Bus GAWR Rear (kg):	3,901	
School Bus VIN:	1GBJG31U431110295	
No. of Designated Seating Positions (DSP) including Driver:	26 (1 driver, 24 seat positions, 1 wheel chair location)	
School Bus NHTSA No.:	C30903	
Bus Body Color:	Yellow	
Engine Displacement	6.0 L	
No. of Cylinders:	8	
Fuel Pump Actuation:	Electric Pump "ON" with key	
School Bus Width (mm):	2,438	
School Bus Length (mm):	7,150	
Bus Unloaded Vehicle Weight (UVW) (kg):	3,618	
Bus Occupant Load:	1,350 kg – Passenger 68 kg – Driver 68 kg - Wheelchair 1,486 kg - Total	
Target Bus Test Weight (SBTW) (kg):	5,104	
Actual (SBTW) (kg):	5,108	
School Bus Tire Manufacturer:	Uniroyal	
	Front	Rear
Rec. Cold Tire Inflation Pressure (kpa):	448	448
Tire Size:	LT225/75R16	LT225/75R16
Load Range:	D	D

**DATA SHEET 1 (CONTINUED)**

**SCHOOL BUS DATA**

Test Vehicle: **2003 Mid Bus Guide School Bus**  
 Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30903**  
 Test Date: **8/11/03**

**GENERAL VEHICLE IDENTIFICATION**

**SCHOOL BUS ATTITUDE**

	Units	LF	RF	LR	RR
As Received:	mm	NR	NR	NR	NR
Pre-Test:	mm	838	840	793	796
Post-Test:	mm	866	844	766	806

NR = Not Recorded

Weight of Fuel:	0.84 kg/liter (7.03 lbs./gallon)
Fuel Tank Capacity (liters/kg):	132 liters/111kg (35 gallons/246 lbs.)
Tank Test Volume (liters/kg):	126.1 liters/105.9 kg (33.3 gallons/234lbs.)

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)*		
		Front	Rear	Total	Front	Rear	Total
Left	kg	802	1,032		909	1,739	
Right	kg	734	1,050		830	1,630	
Ratio	%	42.5	57.5		34.0	66.0	
Totals	kg	1,536	2,082	3,618	1,739	3,369	5,108

COMMENTS: 68.0 kg was added as the ballast of the wheel chair plus an occupant

Recorded By: Chris Hand

Approved By: Michael J. [Signature]

Date: September 26, 2003



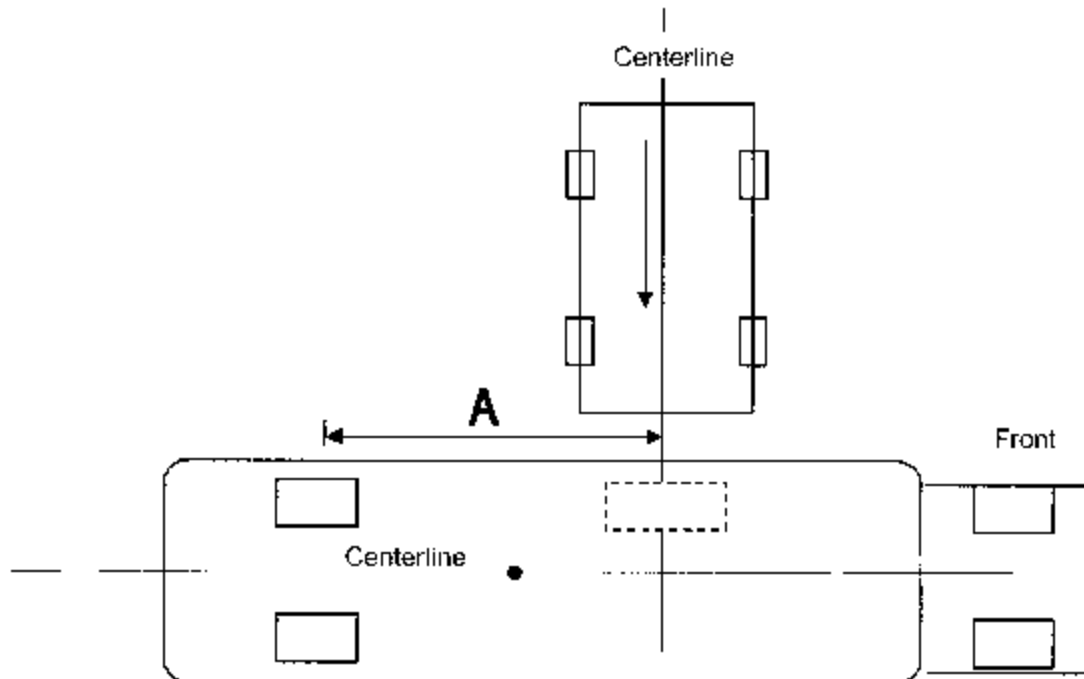
**DATA SHEET 2**  
**SCHOOL BUS IMPACT DATA**

Test Vehicle: **2003 Mid Bus Gulde School Bus**  
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30903**  
Test Date: **8/11/03**

Time of Impact:	1:17 am
Ambient Temperature (°C)	22.4
Barrier Velocity – Speed Trap 1 (kph):	47.3
Barrier Velocity – Speed Trap 2 (kph):	47.1
Barrier Penetration:	405 mm

**INDICATE IMPACT POINT BELOW:**



**LEGEND:** Red dotted line indicates location of fuel tank  
Arrow indicates point and angle of barrier impact ( $C_L$  of arrow coincides with  $C_L$  of monorail).  
**A = Distance from Rear Axle CL to Barrier CL = 1,512 mm**  
**Impact Point Deviation: 0 mm Down, 12 mm Left**

**DATA SHEET 2 (CONTINUED)**  
**SCHOOL BUS IMPACT DATA**

Fuel Spillage Noted:	No
Failure, if applicable:	None

**Stoddard Solvent Spillage Measurements**

Timeframe	Description	Allowable Spillage	Measured Spilled	Results
T <sub>0</sub> - T <sub>1</sub>	Time Zero to Cessation of Motion	31 grams (1 ounce)	0	<b>PASS</b>
T <sub>1</sub> - T <sub>2</sub>	Cessation of Motion to 5 minutes after Cessation of Motion	156 grams (5 ounces)	0	<b>PASS</b>
T <sub>2</sub> - T <sub>3</sub>	5 Minutes after Cessation of Motion to 30 minutes after Cessation of Motion	31 grams (1 ounce) per minute 933 grams (30 ounces) Total Allowed	0	<b>PASS</b>

ADDITIONAL FAILURE DETAILS: None

TEST NOTES: The gas cap broke into two pieces during the impact. Half remained on the fuel filler neck and the other half fell onto the impact cart during the crash event.

Recorded By: Chris Howard

Approved By: [Signature]

Date: September 26, 2003

**SECTION 4**  
**INSTRUMENTATION AND EQUIPMENT LIST**

Test Vehicle: **2003 Mid Bus Guide School Bus**  
Test Lab: **MGA Research-Wisconsin Operations**

NHTSA No.: **C30903**  
Test Date: **8/11/03**

Equipment	Description	Serial No.	Cal. Date	Next Cal. Date
Counter/Timer	DCI	939095	10/25/02	10/25/03
Counter/Timer	DCI	939094	10/25/02	10/25/03
Stop Watch	Cole Parmer	9441010	3/28/03	3/28/04
Vehicle Scales	GSE	212091 & 212092	6/9/03	12/9/03
Tire Pressure Gauge	Dill	MGA06133	10/16/02	10/16/03
Tape Measure	Stanley Powerlock 5M	146	4/9/03	10/9/03
Temp. Indicator	Fluke Probe with Multimeter	944939	10/16/02	10/16/03
Fluke Meter	Fluke	76270715	10/8/02	10/8/03

**SECTION 5  
PHOTOGRAPHS**

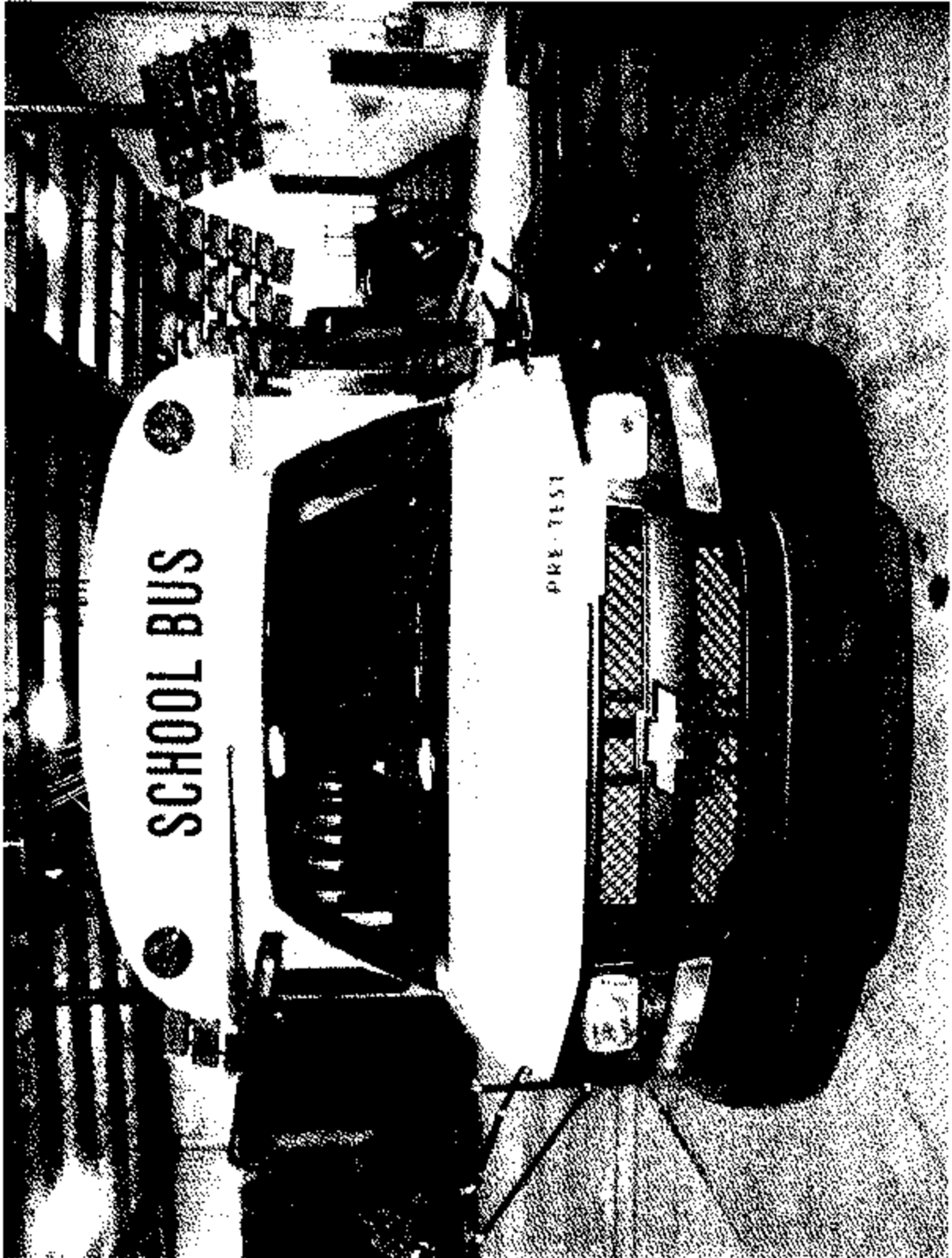
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Test Vehicle: 2003 Mid Bus Guide School Bus

Procedure: FMVSS 301S

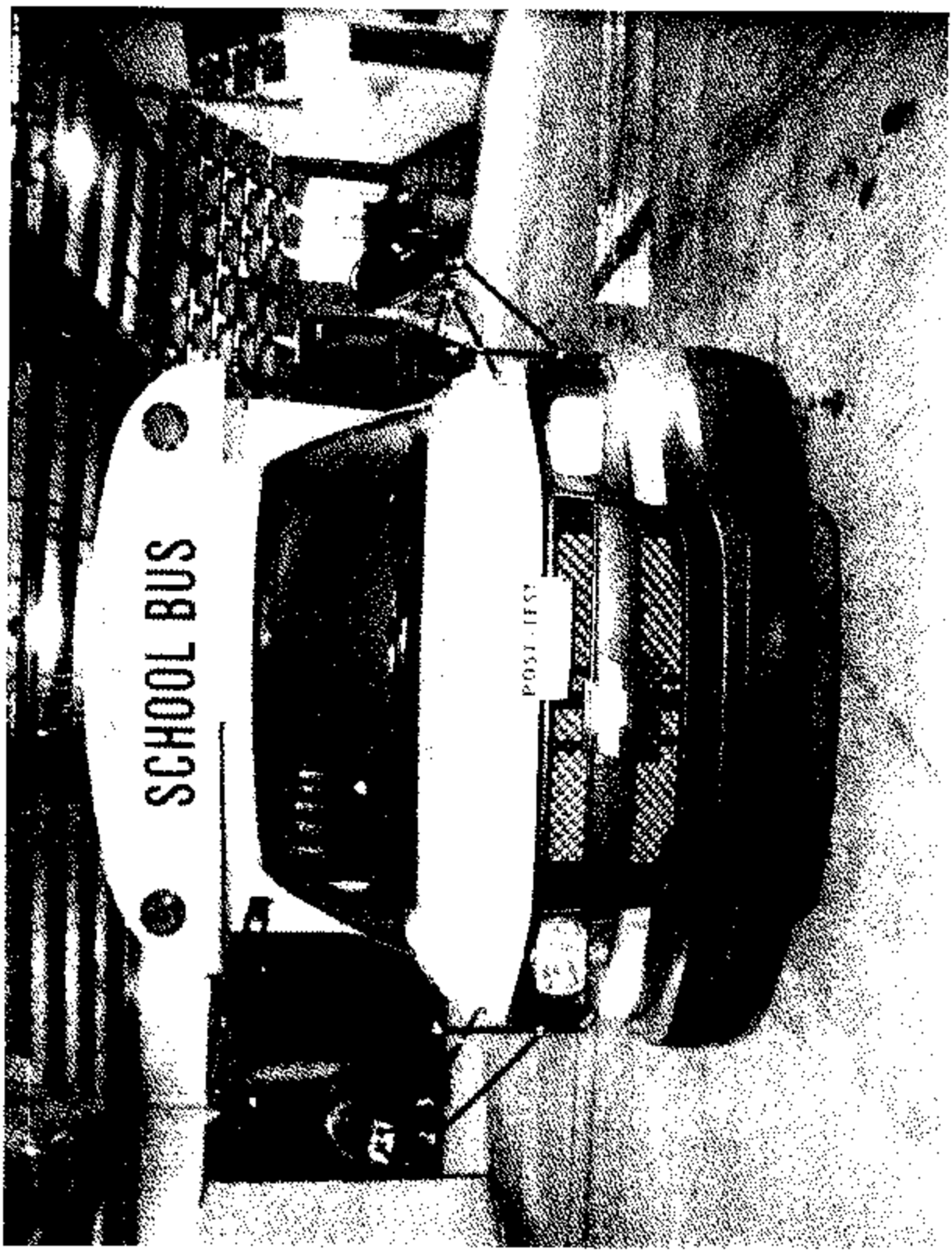
NHTSA No.: C30903



Pre-Test Front View of School Bus

Test Vehicle: 2003 Mid Bus Guide School Bus  
Procedure FMVSS 301S

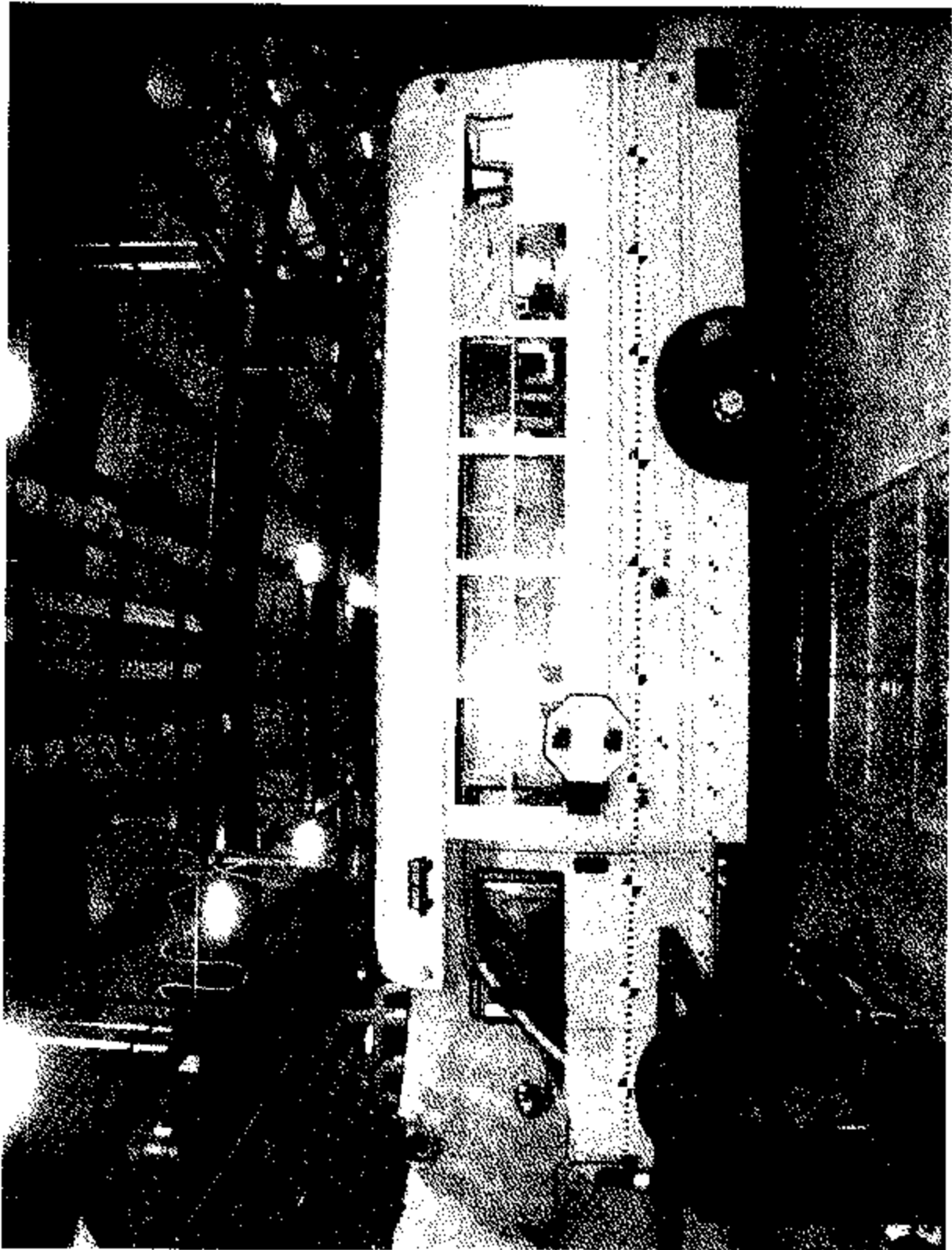
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Post-Test Front View of School Bus

Test Vehicle: 2003 Mid Bus Guide School Bus  
Procedure: FMVSS 301S

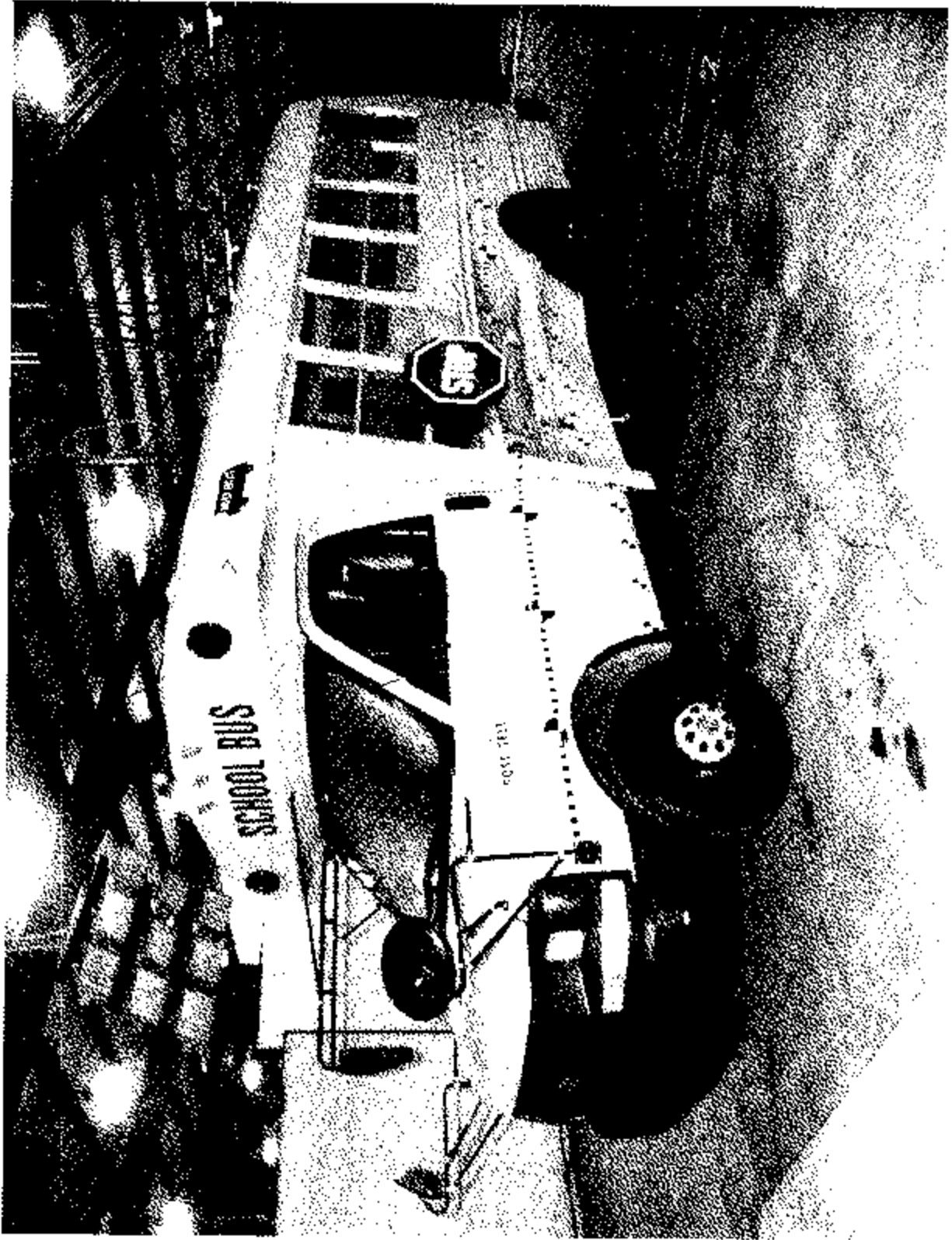
NHTSA No.: C30903



Pre-Test Left Side of School Bus

Test Vehicle: 2003 Mid Bus Guide School Bus  
Procedure: FMVSS 301S

NHTSA No.: C30903



Post-Test Left Side of School Bus



Test Vehicle: 2003 Mid Bus Guide School Bus  
Procedure: FMVSS 301S

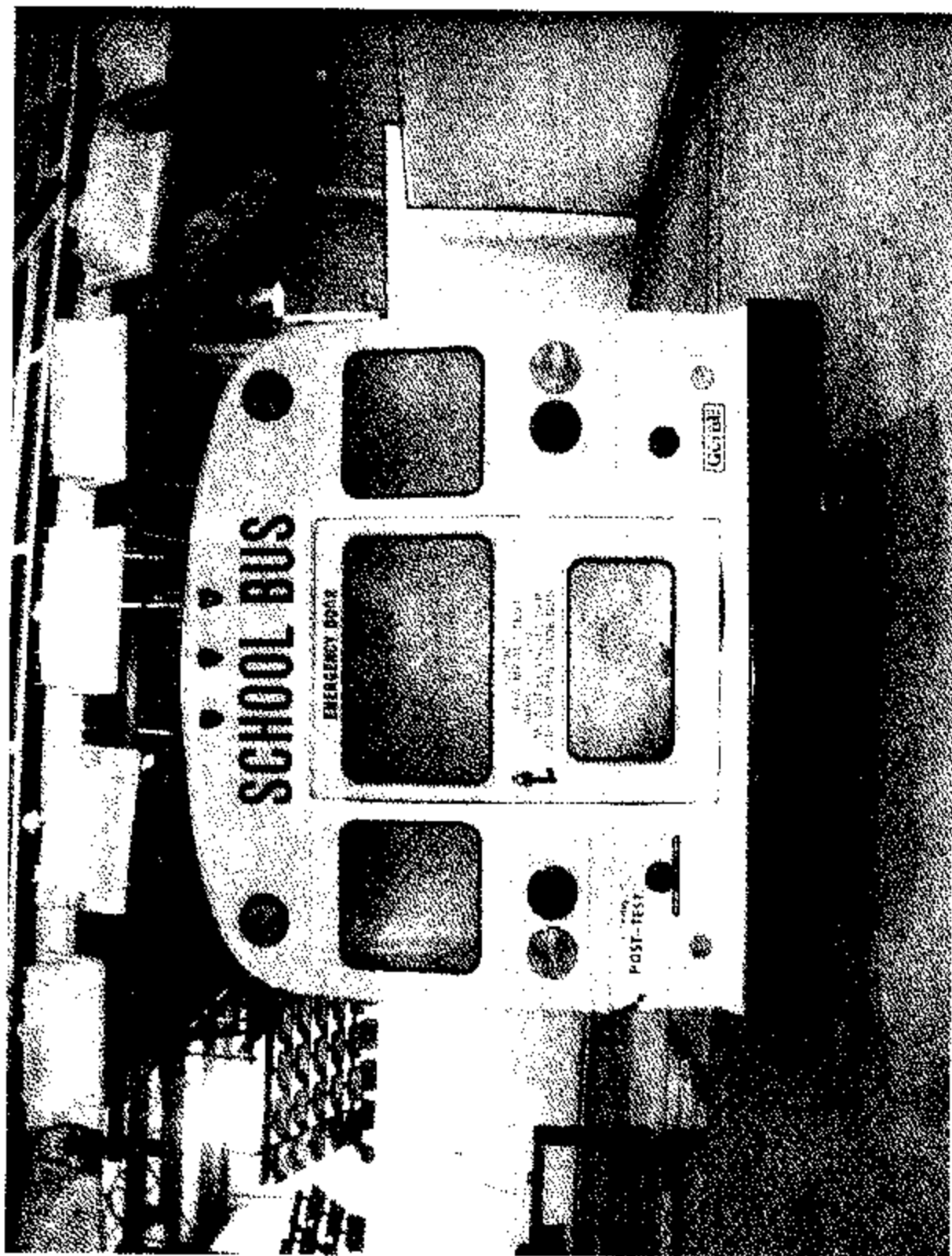
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Pre-Test Rear View of School Bus

Test Vehicle: 2003 Mid Bus Guide School Bus  
Procedure: FMVSS 301S

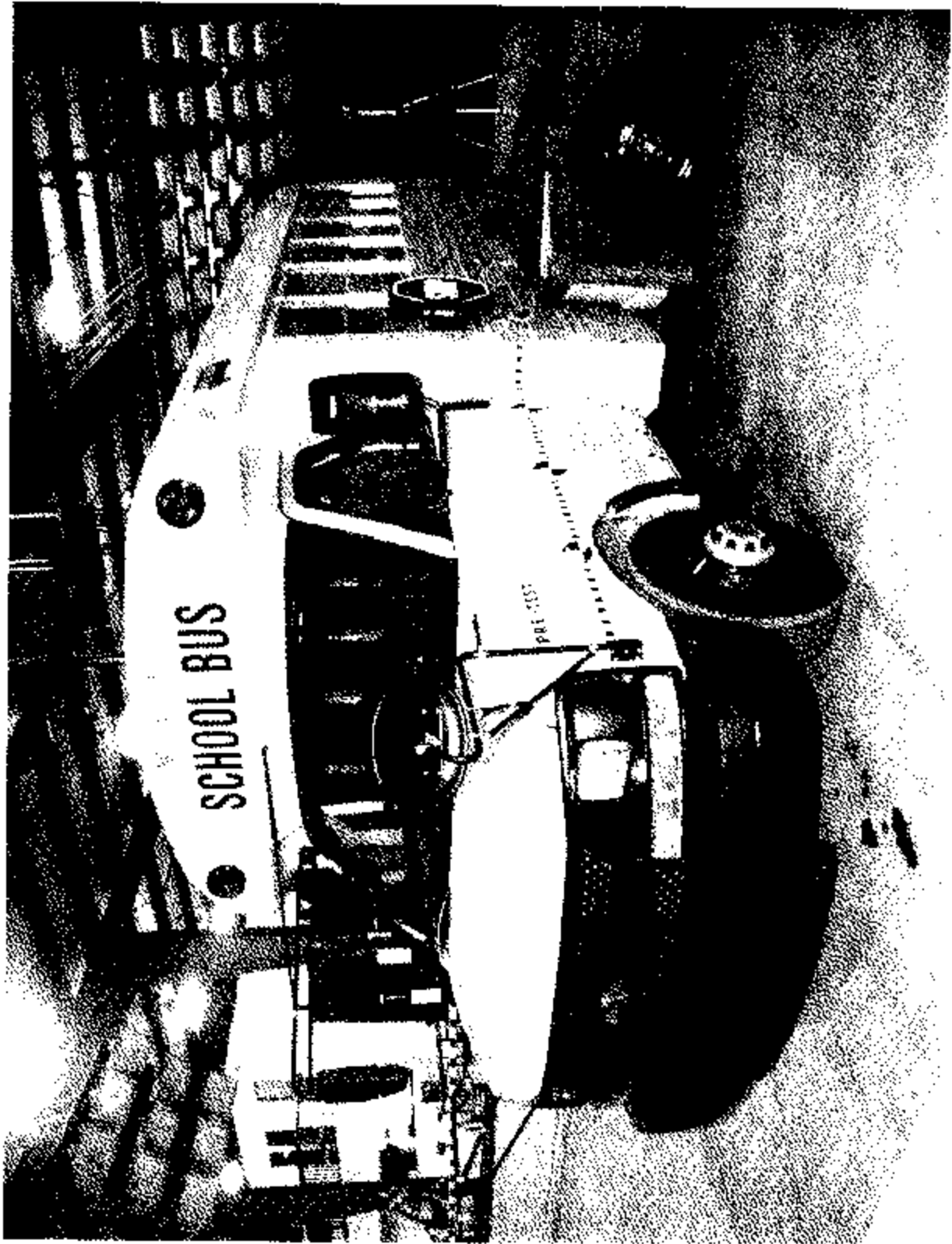
NHTSA No.: C30903



Post-Test Rear View of School Bus

Test Vehicle: 2003 Mid Bus Guide School Bus  
Procedure: FMVSS 301S

NHTSA No.: C30903



Pre-Test Left Front ¾ View of School Bus

Test Vehicle: 2003 Mid Bus Guide School Bus

Procedure: FMVSS 301S

NHTSA No.: C30903



Post-Test Left: Front ¾ View of School Bus



Test Vehicle: 2003 Mid Bus Guide School Bus  
Procedure: FMVSS 301S

NHTSA No.: C30903



Pre-Test Impact Target

Test Vehicle: 2003 Mid Bus Guide School Bus  
Procedure: FMVSS 301S

NHTSA No.: C30903



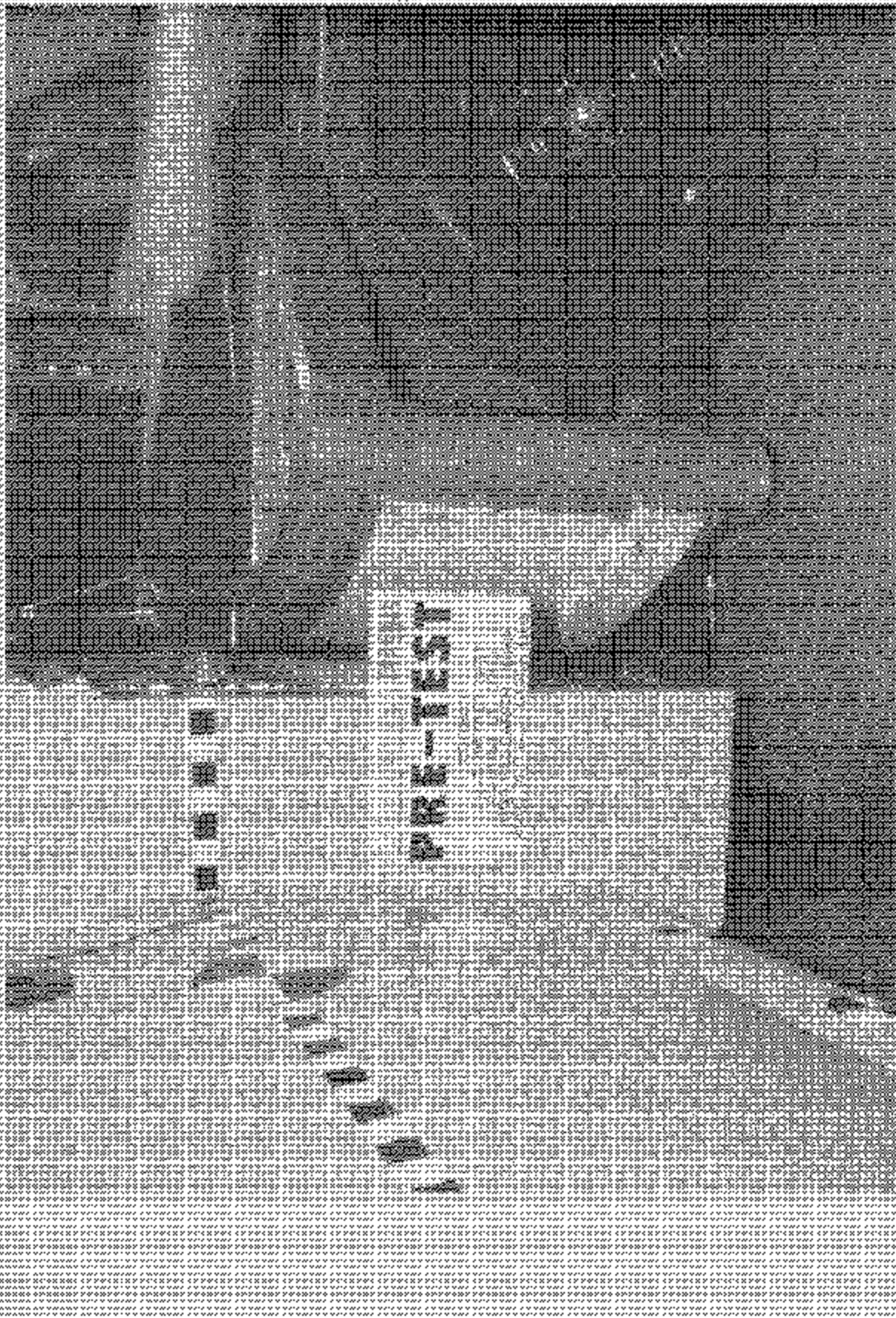
Post-Test of Impact Location

Test Vehicle: 2003 Mid Bus Guide School Bus  
Procedure: FMVSS 301S

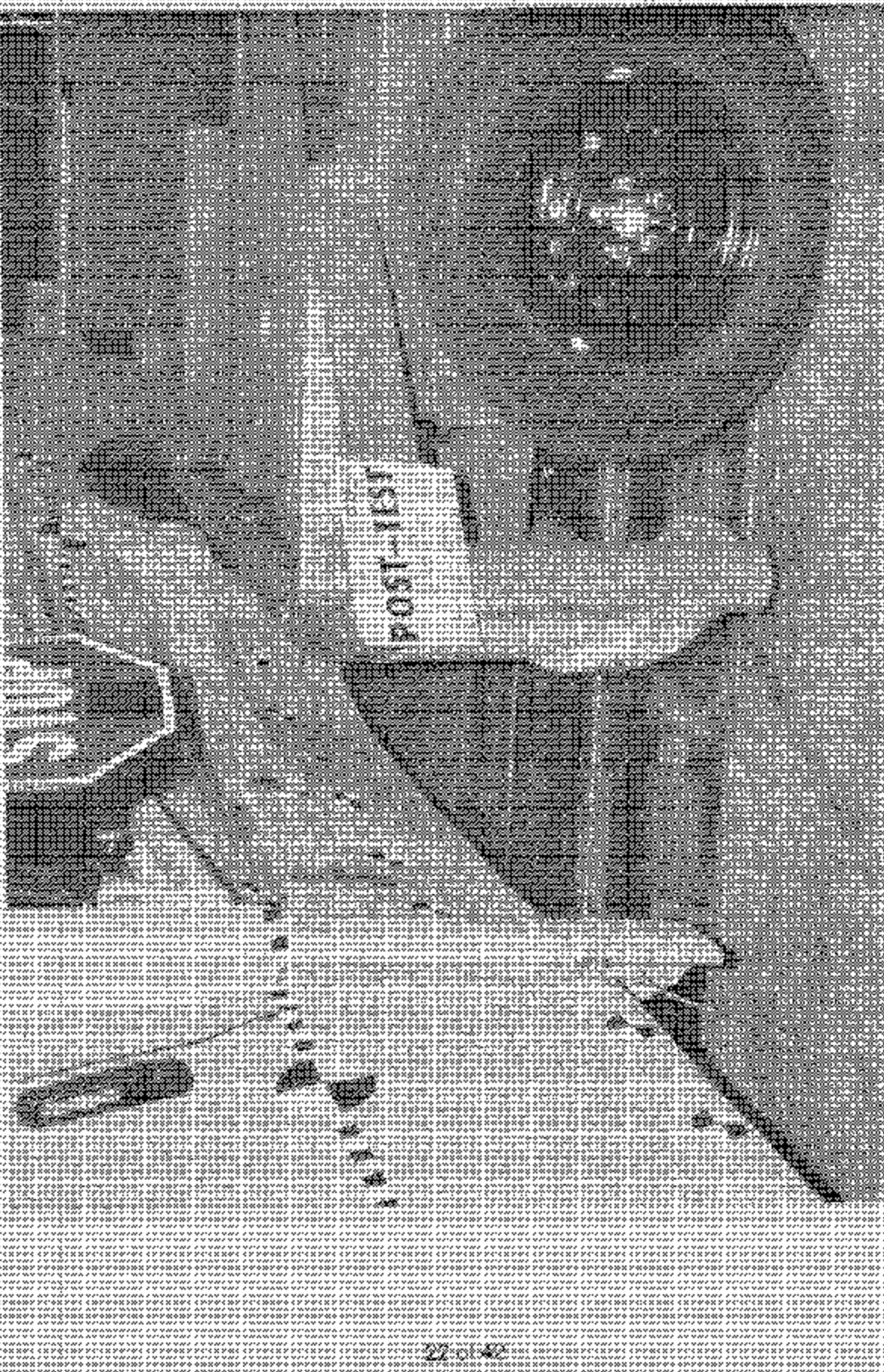
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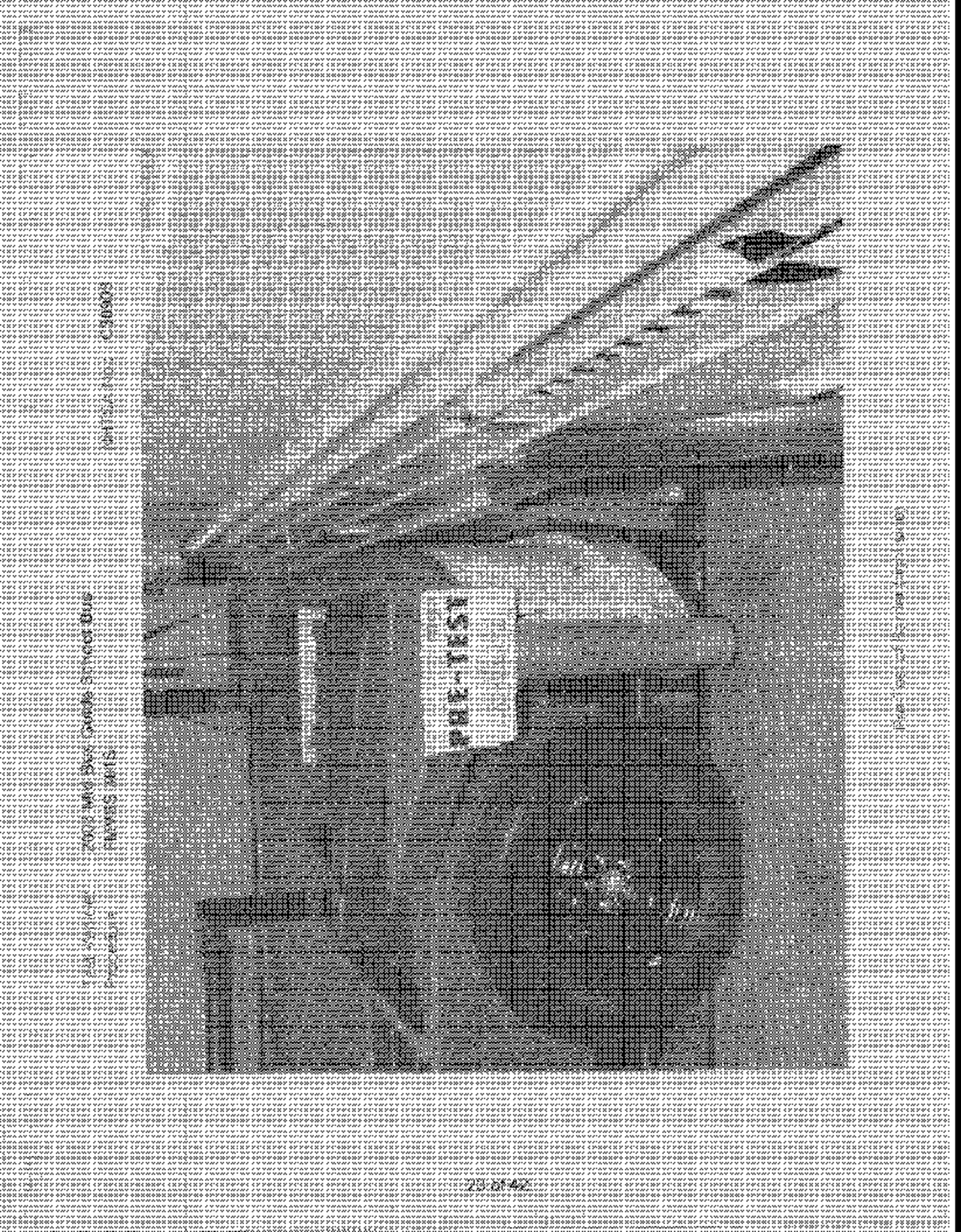






RESTAURANT

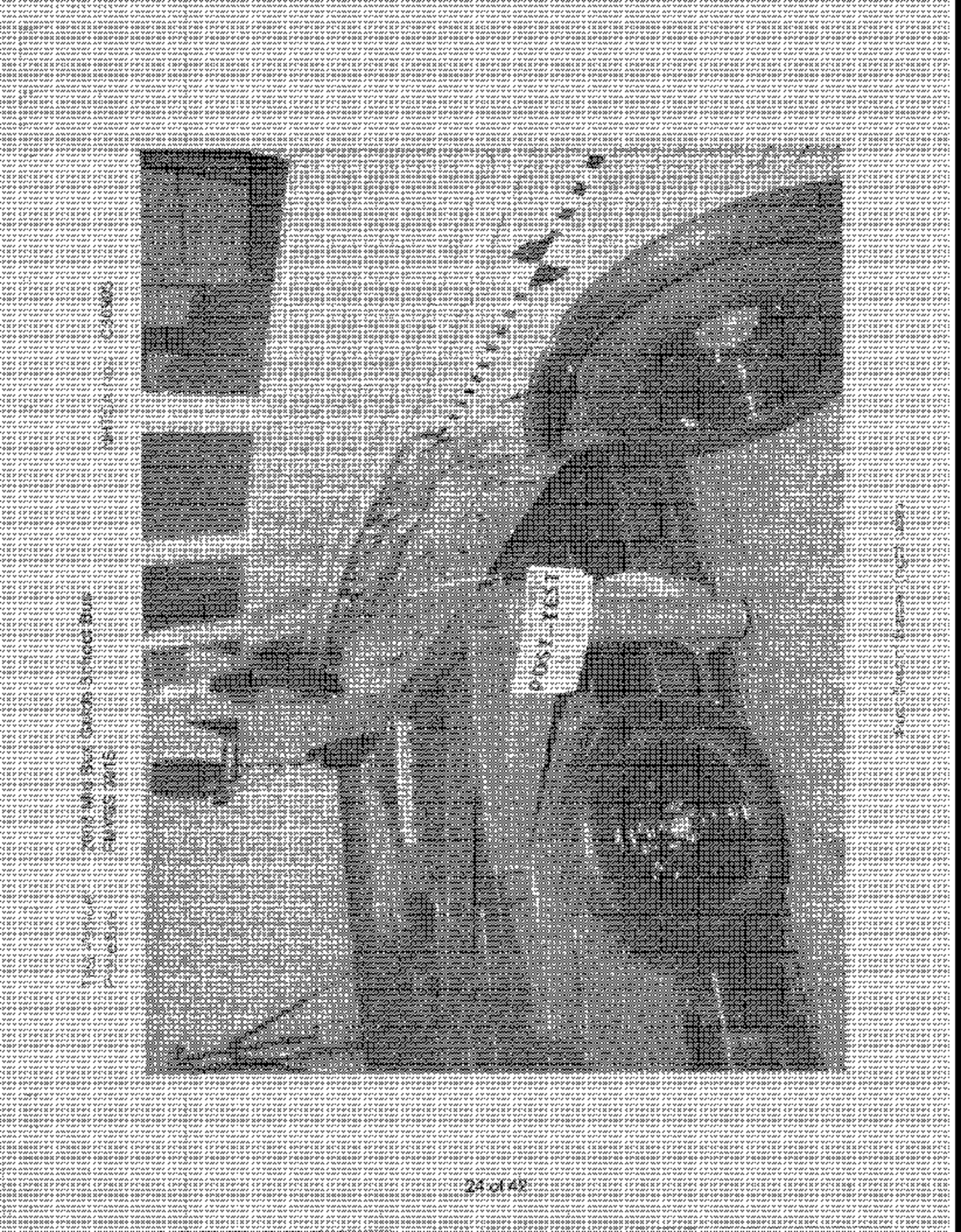


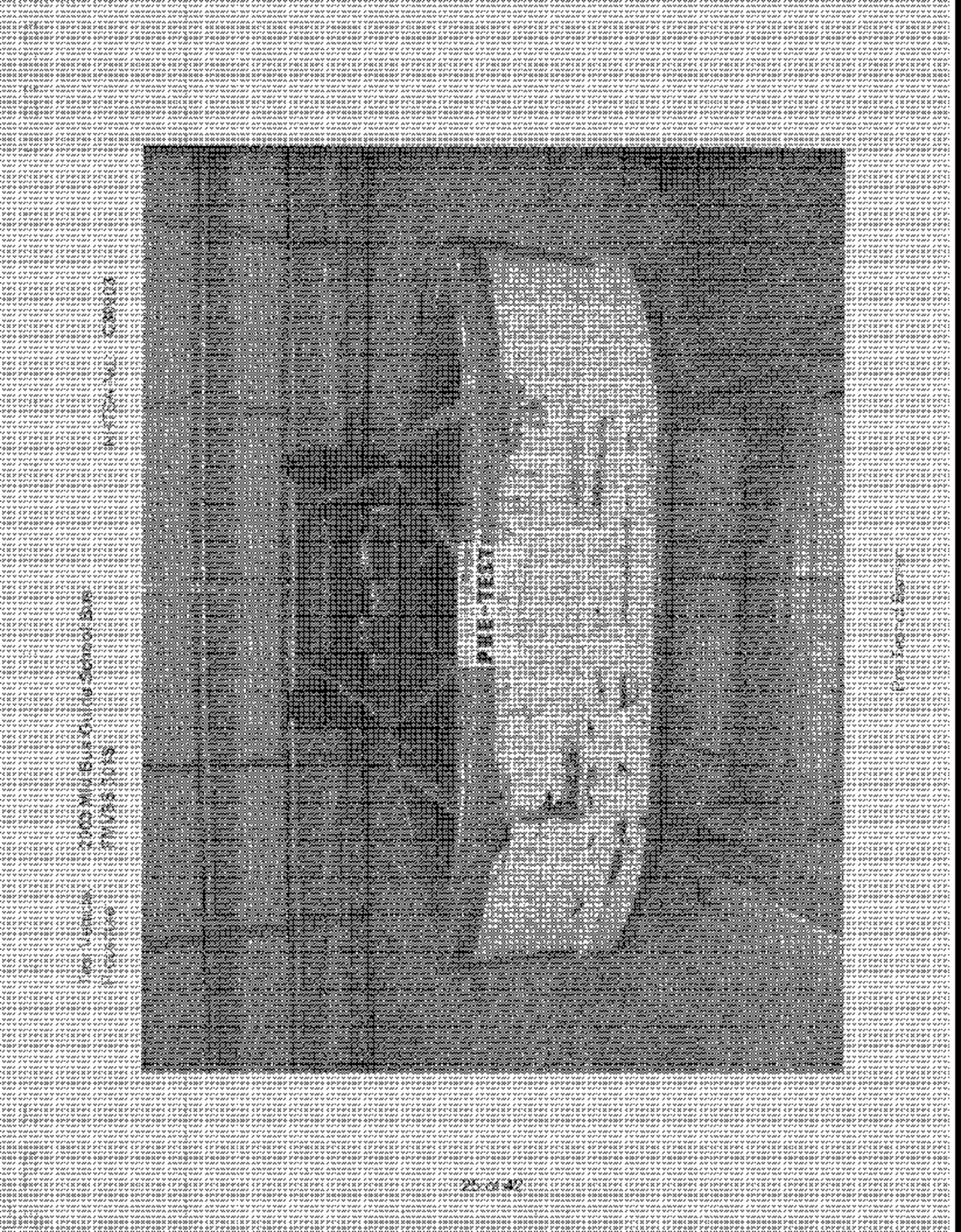


CROSS

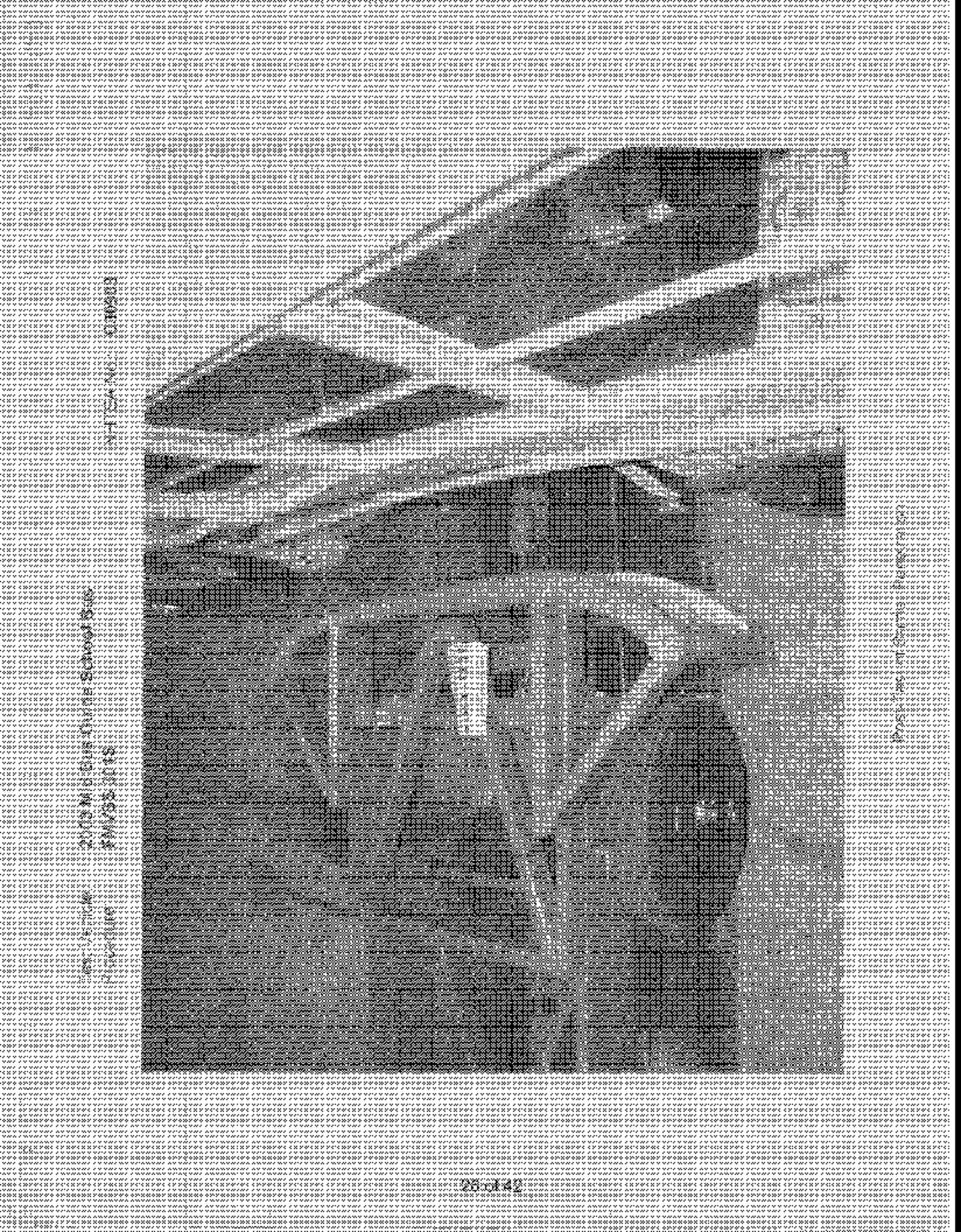
LITERATURE

LITERATURE





PREST



2015 Middle-Grade School Bites

PREPARED BY

PAWS&BONES



# PRE-TEST

CREATED BY  
ANNA IMPACT  
AUGUST 11, 2015  
ANNA RESEARCH CENTER  
ANN ARBOR, MI 48106-1500



Test Vehicle: 2003 Mid Bus Glider School Bus  
Propulsion: FMVSS 3013

MILITARY No. 030503

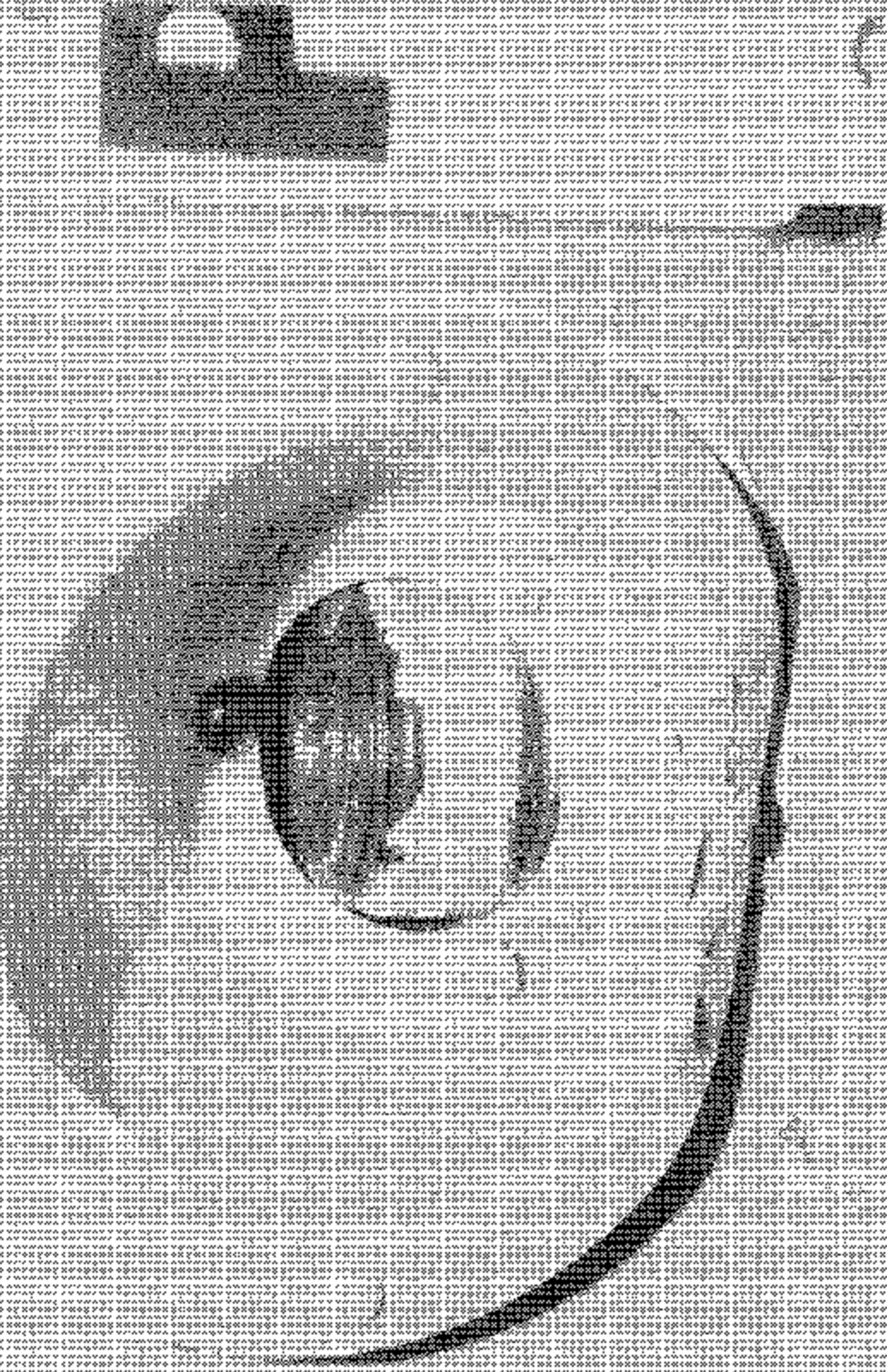


FOR THE USE OF THE MILITARY



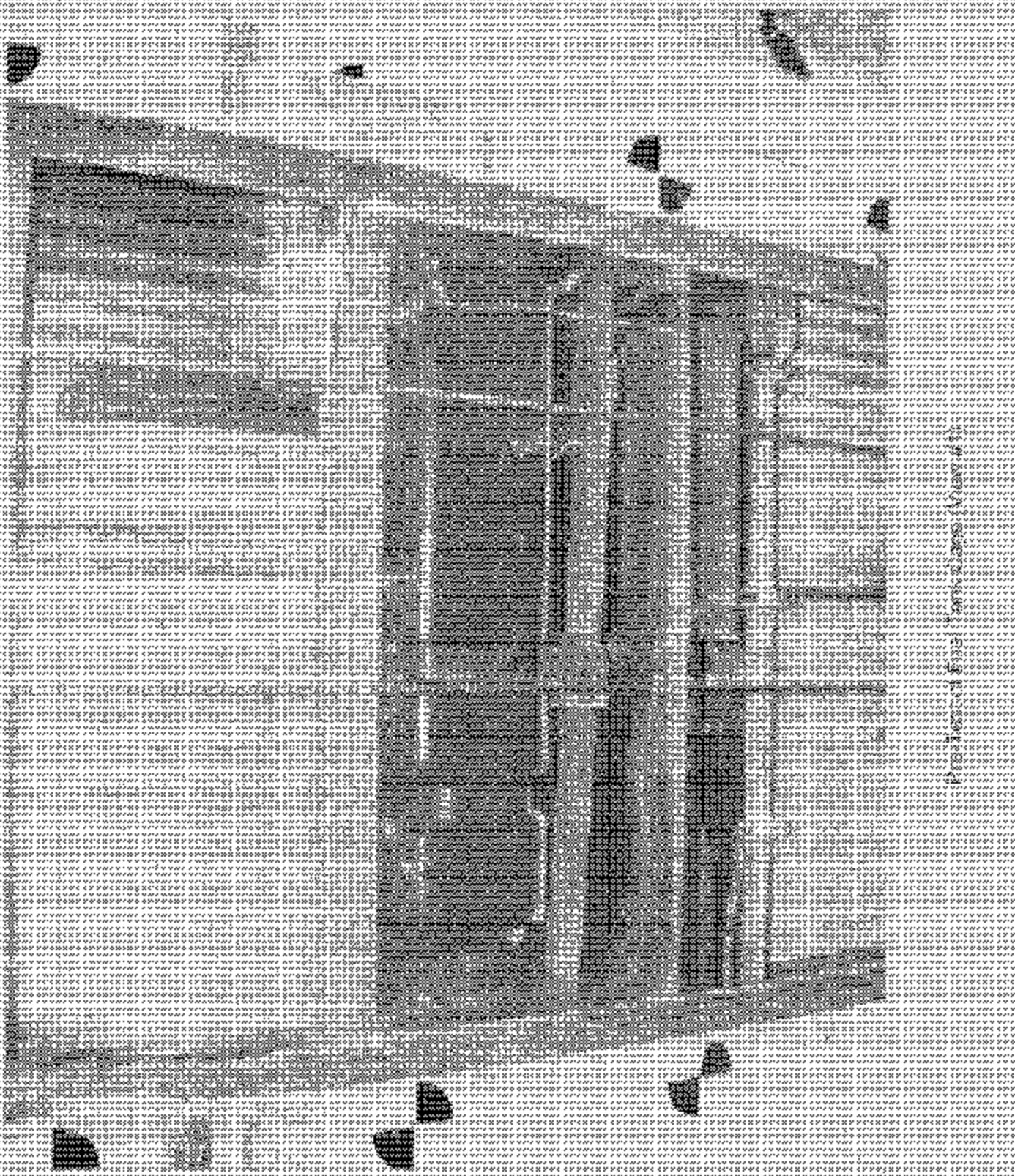
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Proc'd Date: FMVSS 2018

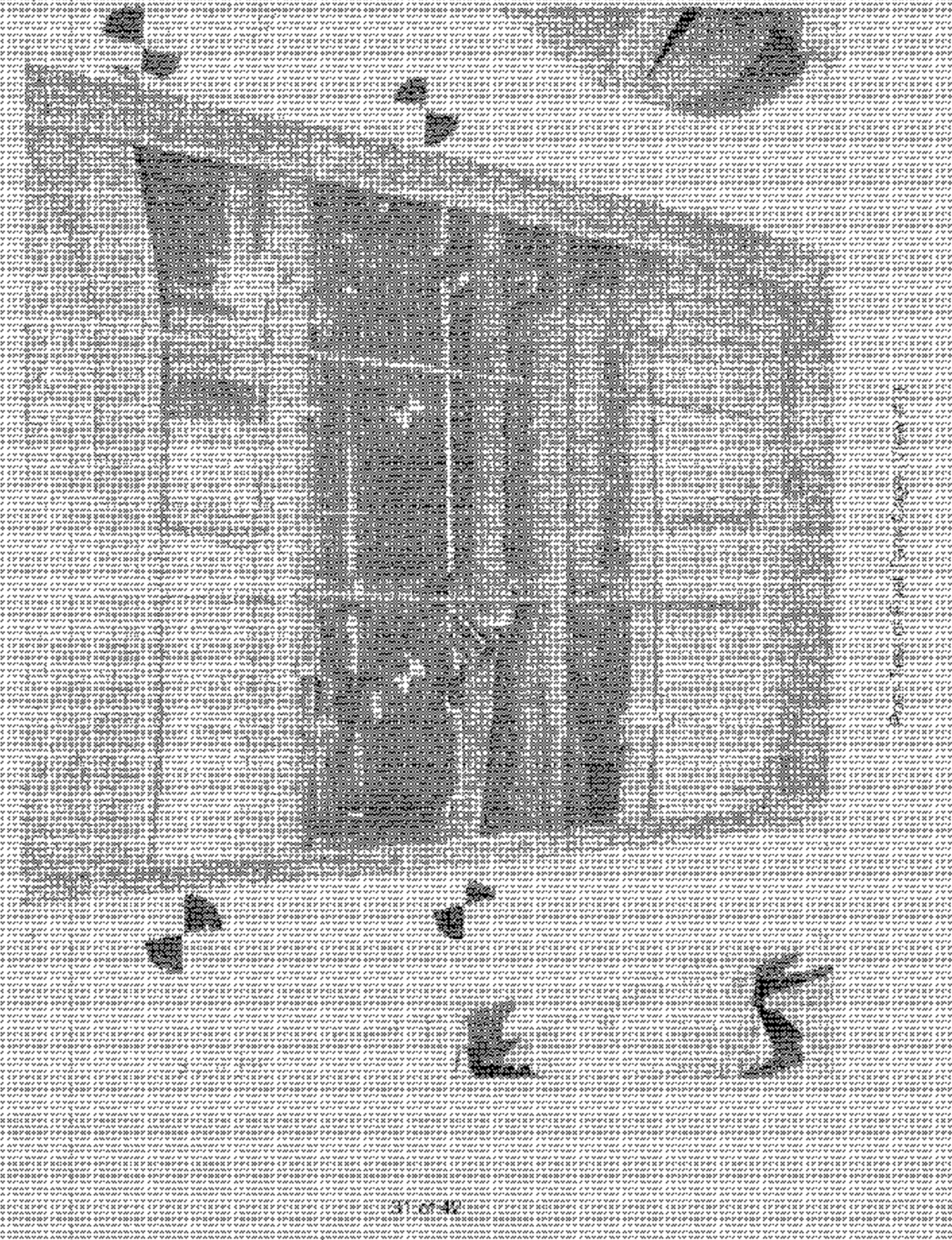
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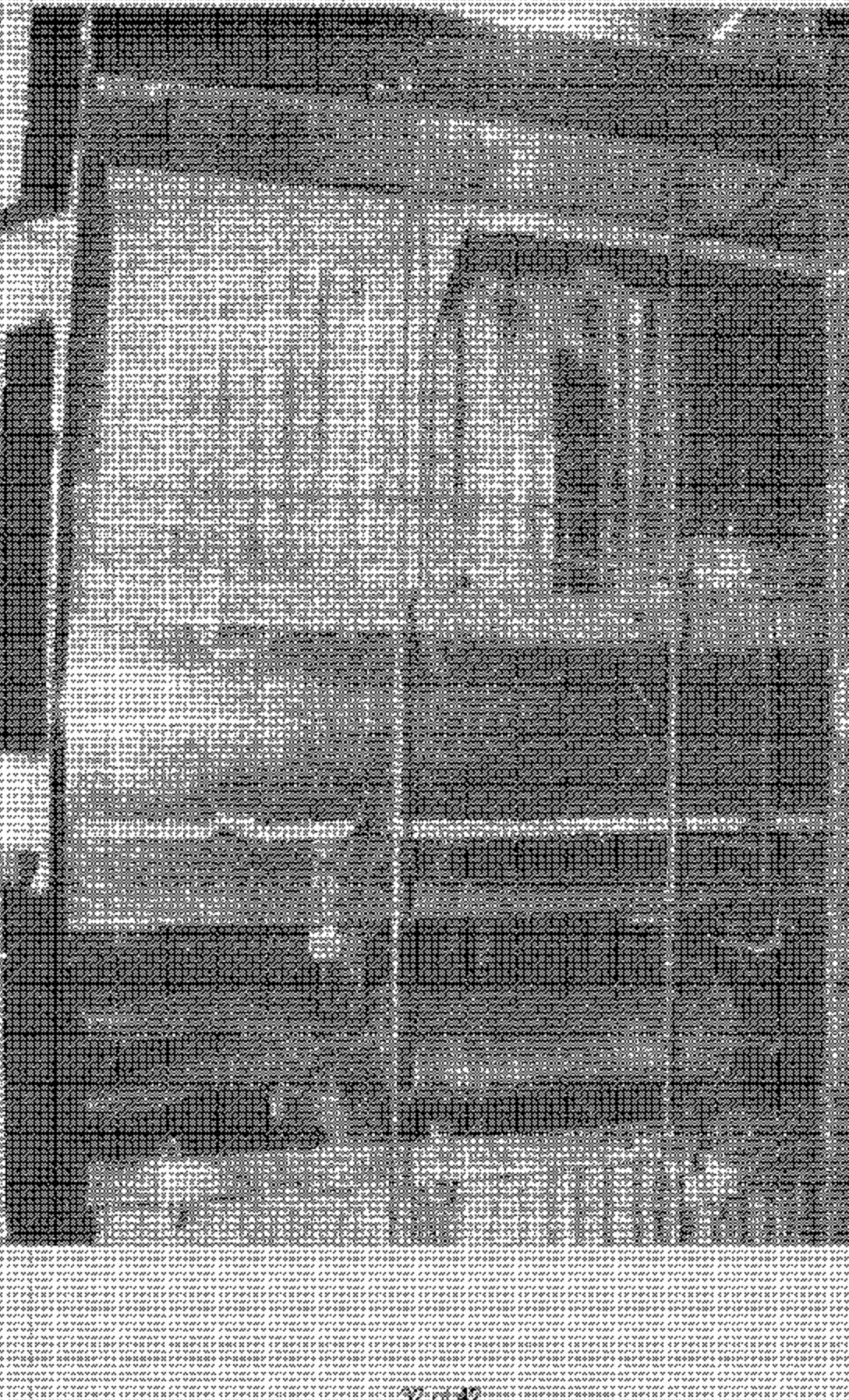


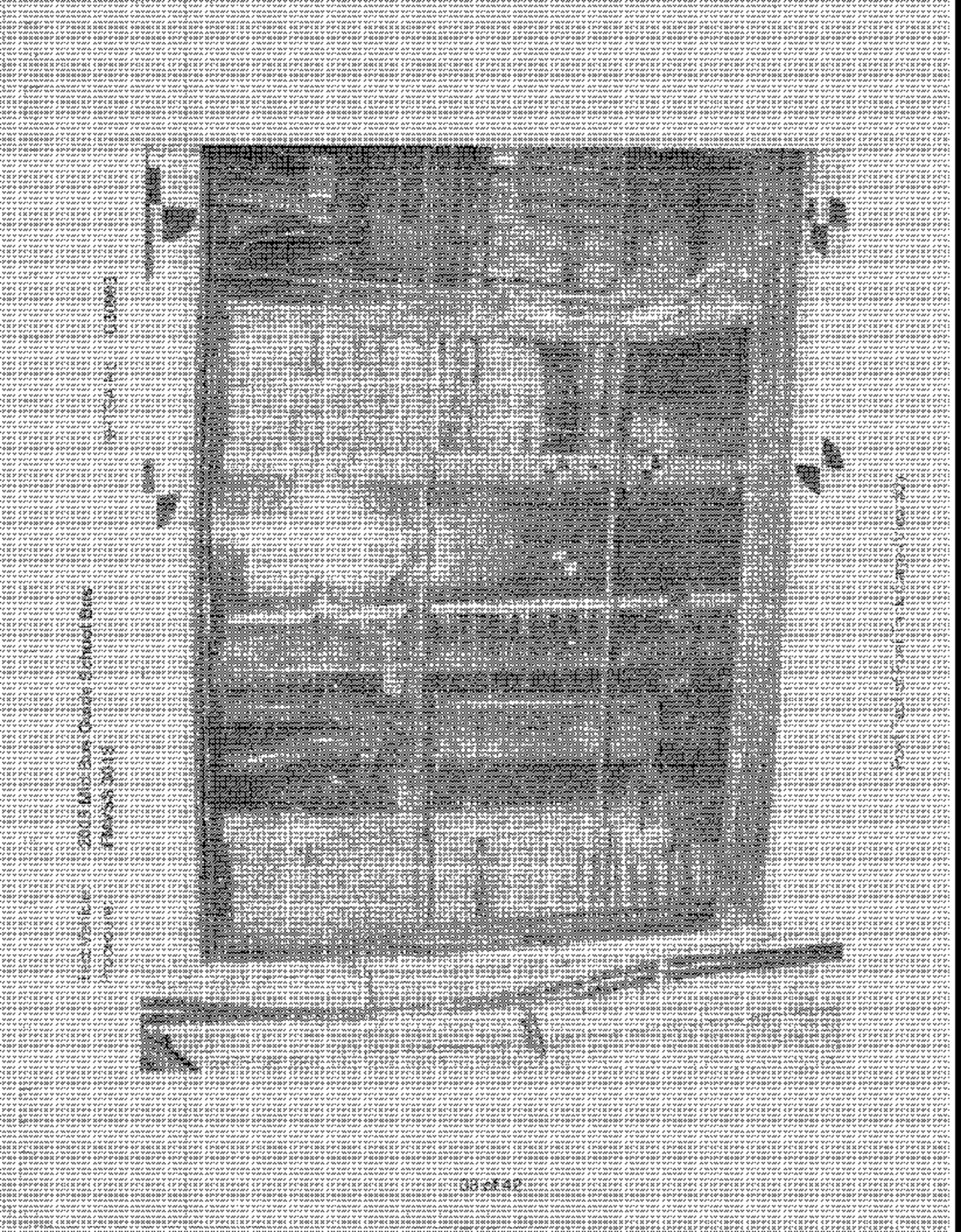
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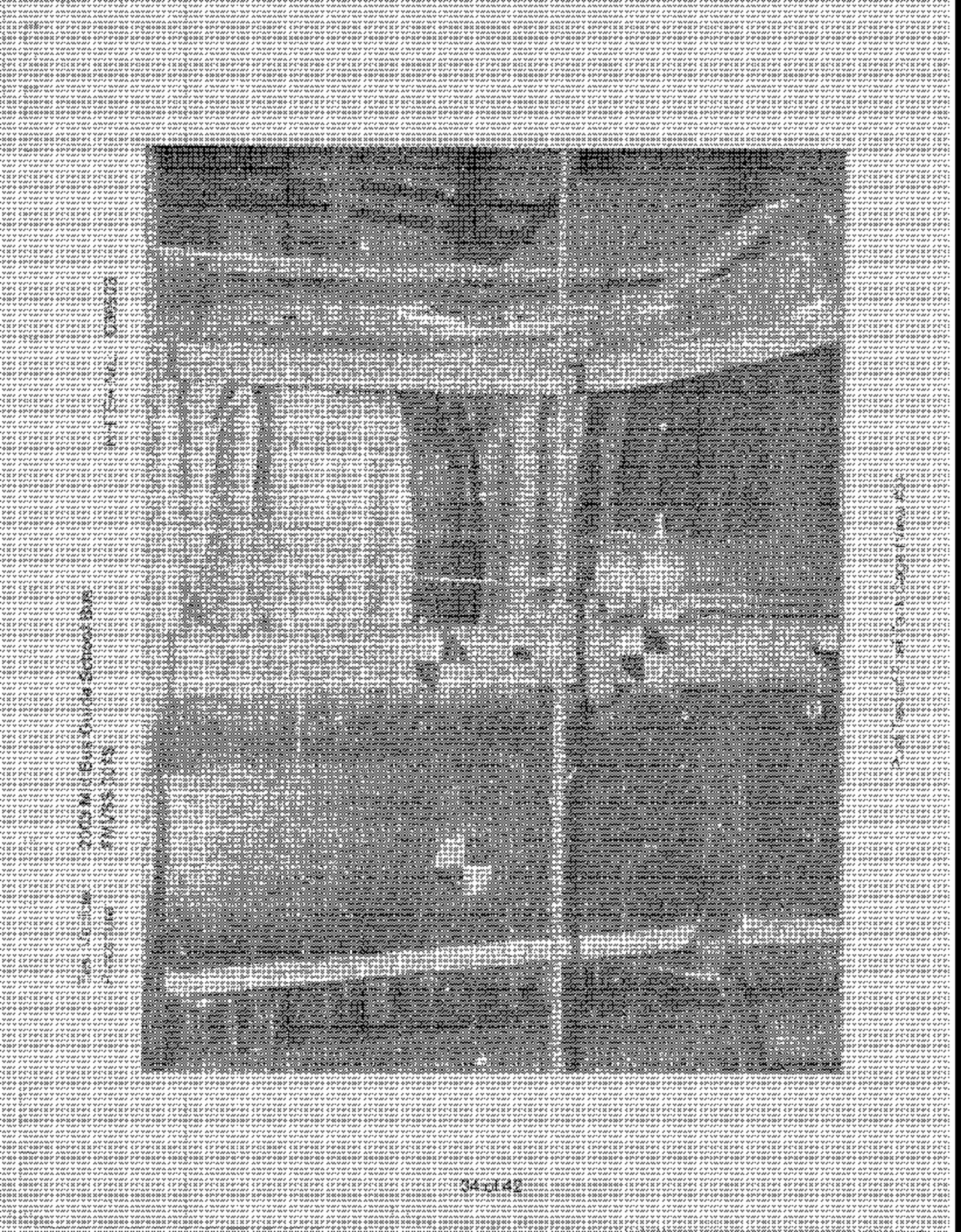
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U.S. AIR FORCE  
OFFICE OF THE SECRETARY  
WASHINGTON, D.C.

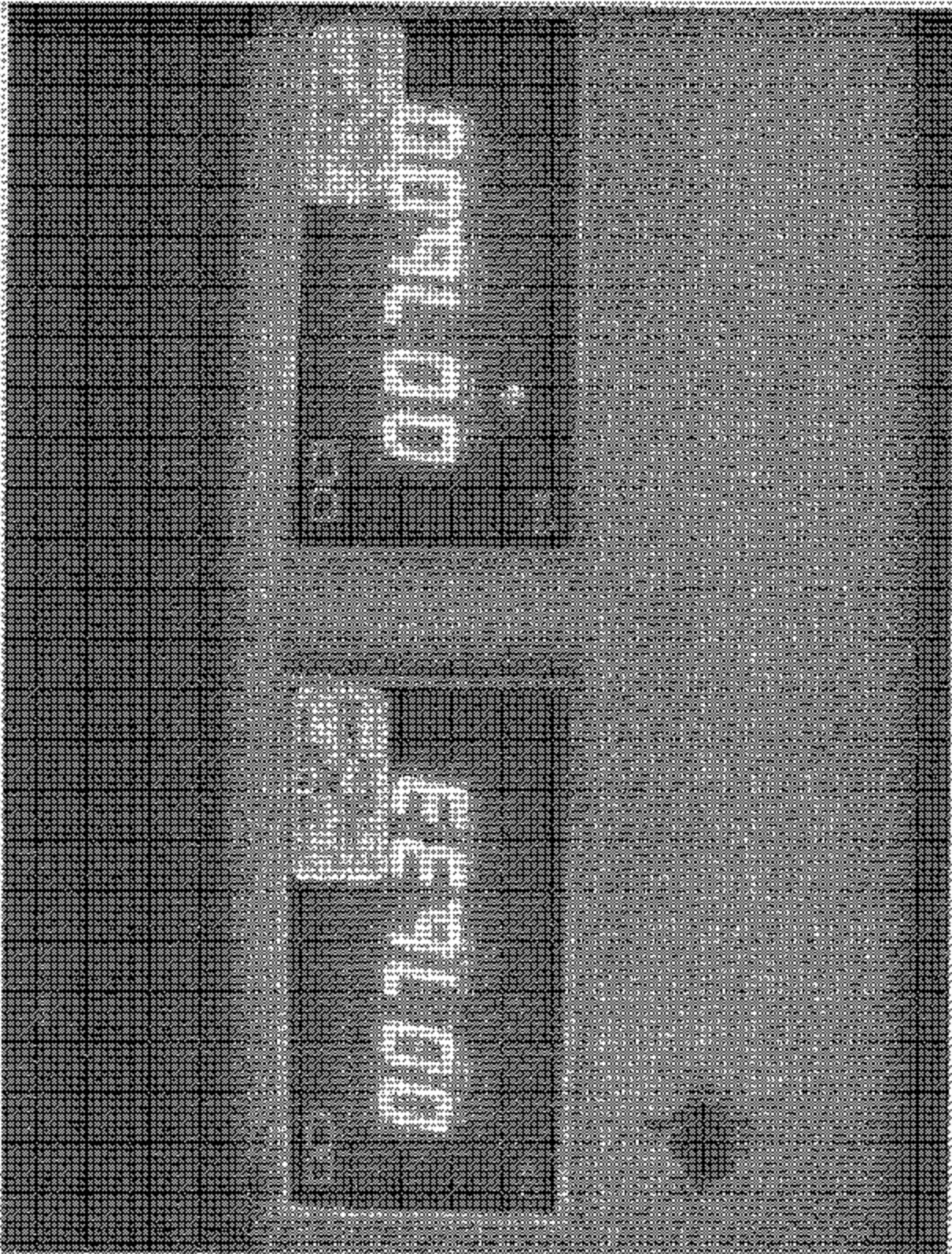


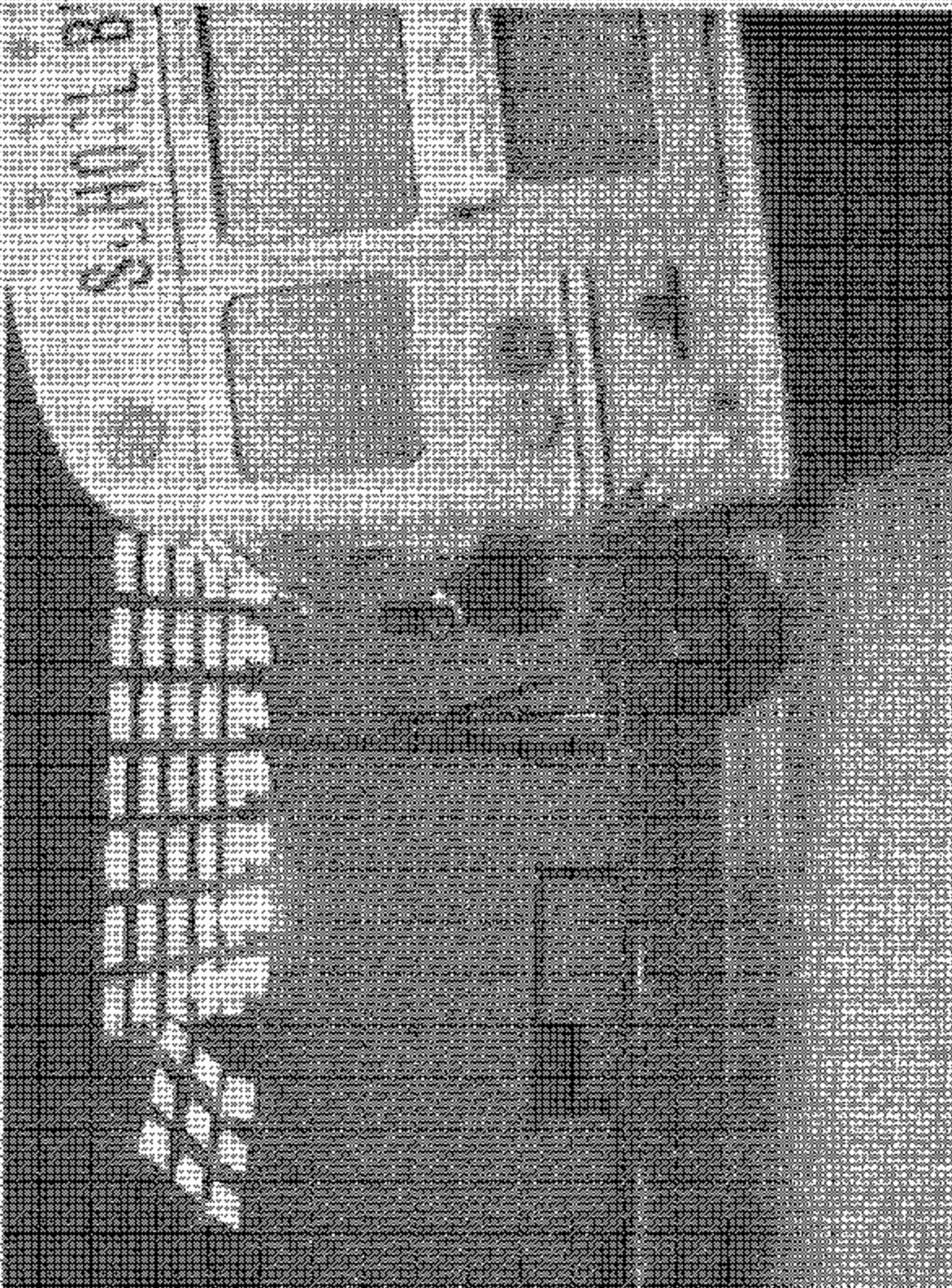




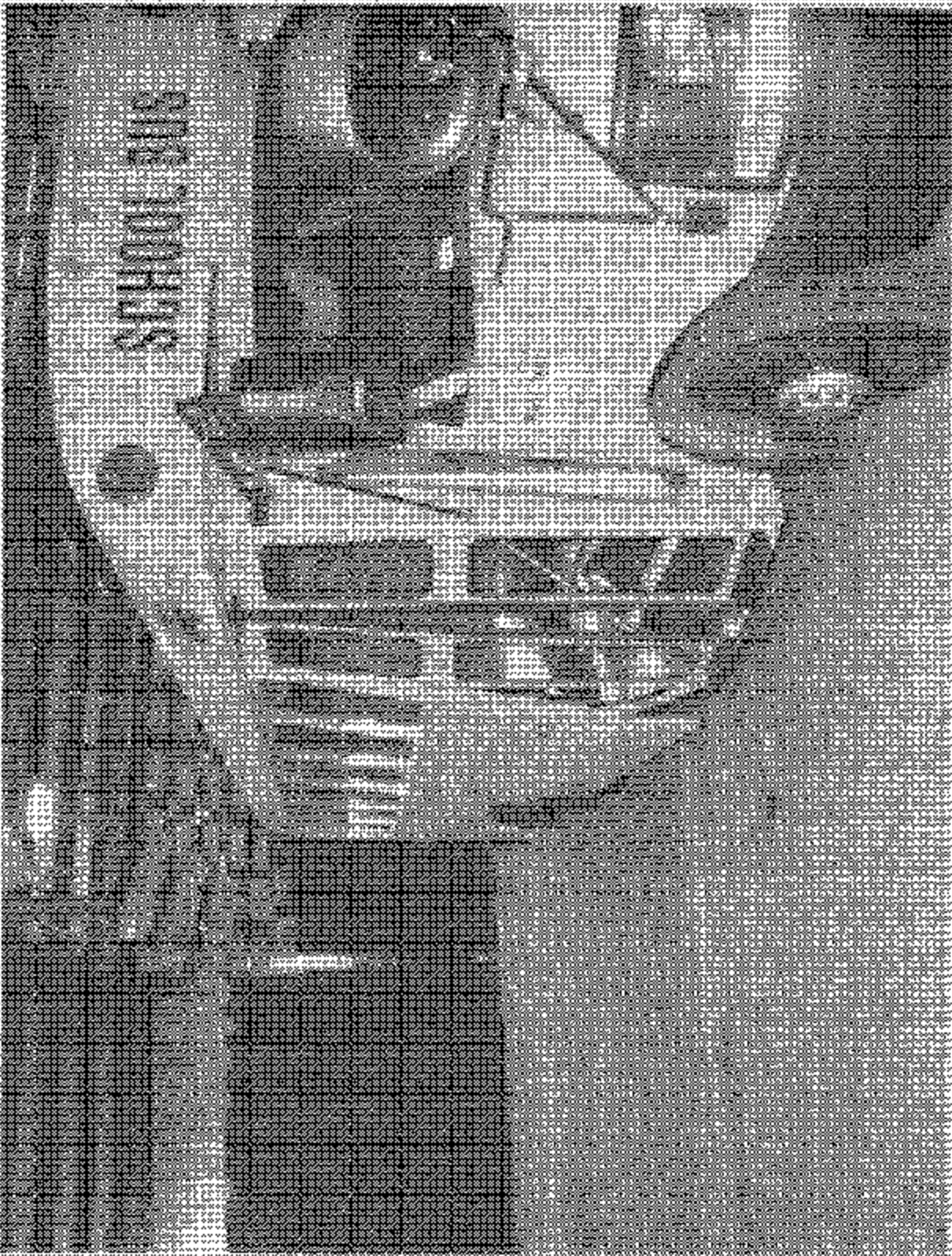


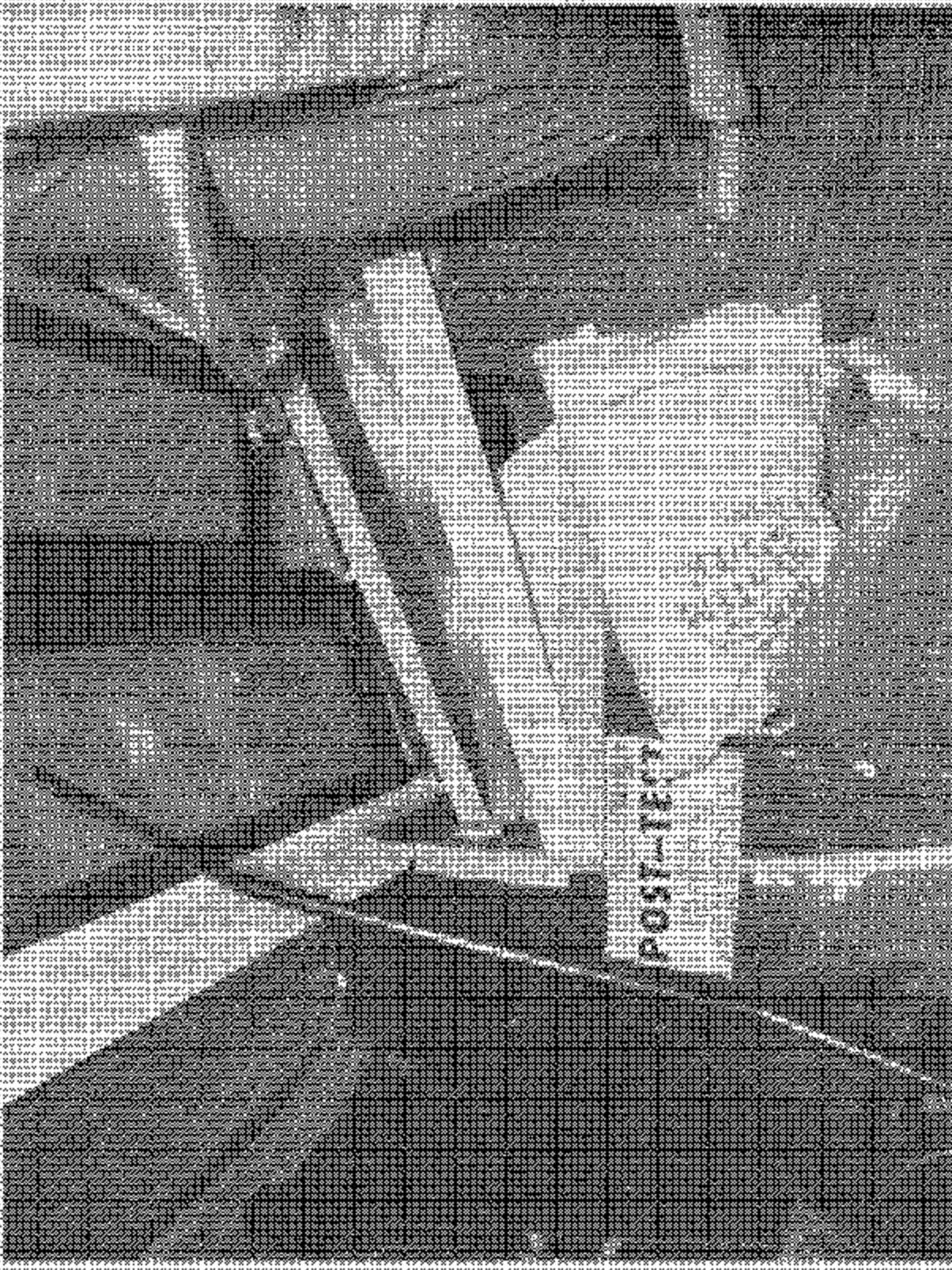








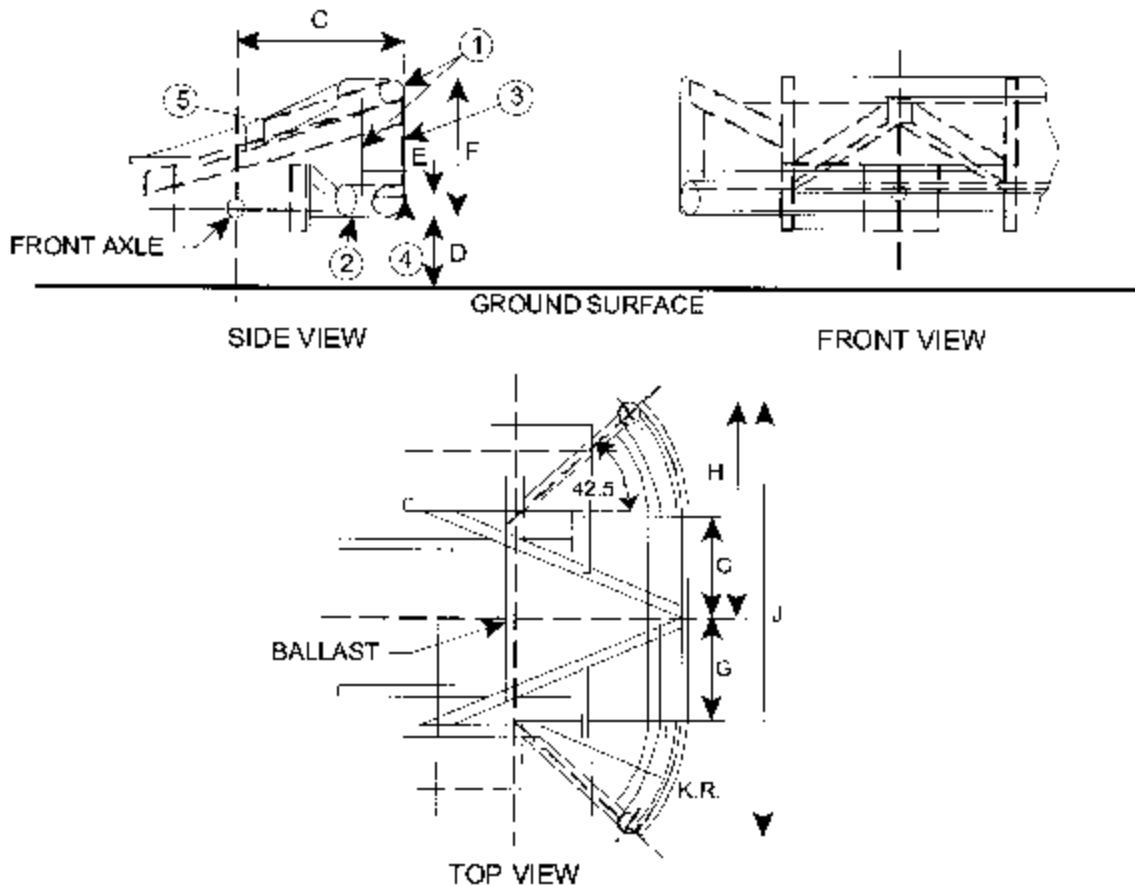




POST-120

**SECTION 6  
BARRIER INFORMATION**

## CONTOURED IMPACT SURFACE FOR COMMON CARRIAGE



DIMENSIONS SHOWN IN TABLE ON NEXT PAGE

**NOTES:**

1. Upper Frame 4.0 in. dia x 0.25 in. wall (102 mm dia x 6 mm wall)  
Steel Tubing (3 Sides)
2. Lower Frame 6.0 in. dia x 0.50 in. wall (152 mm dia x 13 mm wall)  
Steel Tubing
3. Face Plate 0.75 in. (19 mm) thick cold rolled steel
4. Leading Edge 1.0 s 4.0 in. (25 x 102 mm) steel band, sharp  
edges broken
5. All Inner Reinforcements 4.0 x 2.0 x 0.19 in. (102 x 51 x 5 mm)  
steel tubing

Total Weight = 4,000 ± 50 lbs (1,814.1 ± 22.7 kg)

Weight at each Rear Wheel =  
900 ± 25 lbs (408.2 ± 11.3 kg)

Weight at each Front Wheel =  
1,100 ± 25 lbs (499.0 ± 11.3 kg)

**Moments of Inertia:**

$I_x = 271 \pm 13.6 \text{ slug-ft}^2 (367 \pm 18.4 \text{ kg-m}^2)$

$I_z = 3,475 \pm 174 \text{ slug-ft}^2 (4,711 \pm 236 \text{ kg-m}^2)$

DIMENSIONS FOR CONTOURED IMPACT SURFACE

LETTER	INCHES	MILLIMETERS
A	54.0	1372
B	15.8	401
C	30.0	762
D	5.25	133
E	3.75	95
F	24.75	629
G	18.0	457
H	39.0	991
J	78.0	1981
K	30.0	762

# S.E.A., Inc. VIMF

Vehicle Inertia Measurement Facility

Test Date 04-01-2003  
Date Printed 04-01-2003

Year 2003  
Make MGA  
Model FMVSS 301

Project # MGA  
VIN

VIMF Test # 1750  
Track Width 1527.8  
Roof Height 769.6  
Wheel Base 3044.2

Description Bus car. Tire pressure RF 25 psi, LF, RR, LR 24 psi.

## Load

Left Front Right Front Front Pressure

485.3	496.7	0.0
421.7	401.3	0.0

Lateral CG = 0 mm



Long. CG = 1382 mm

Total Weight  
1794.4

Left Rear Right Rear Rear Pressure Tire Description Goodyear Power Steak E78-15

Applied Weights (kg)	Platform Angle (deg)	Motion Relative to Platform (mm)	CG Height (mm)
0.0	0.047	0.000	0.0
157.1	4.082	-0.413	401.0
308.9	7.721	-0.935	401.1
157.1	-3.952	0.484	401.0
308.9	-7.815	0.941	401.6
			<b>401.3</b>

SSF = 1.804

Period (sec)	Platform Amplitude (deg)	Relative Motion (mm)	Pitch Inertia (kg-m <sup>2</sup> )
4.878	3.937	0.378	4540
4.978	4.113	0.330	4540
4.974	4.039	0.320	4540
			<b>4540</b>

Period (sec)	Platform Amplitude (deg)	Relative Motion (mm)	Yaw Inertia (kg-m <sup>2</sup> )	Roll/Yaw Product (kg-m <sup>2</sup> )
5.286	3.119	0.229	4856	-7
3.288	3.013	0.217	4866	-6
3.385	3.131	0.229	4854	-7
			<b>4859</b>	<b>-7</b>

Period (sec)	Platform Amplitude (deg)	Relative Motion (mm)	Roll Inertia (kg-m <sup>2</sup> )
1.103	2.785	1.069	383
1.105	2.734	1.184	383
1.105	2.849	1.171	382
			<b>383</b>