HSNG. 637421

REPORT NUMBER 103-GTL-04-003

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 103 WINDSHIELD DEFROSTING AND DEFOGGING SYSTEMS

NISSAN MOTOR CO., LTD.
2004 NISSAN MAXIMA, PASSENGER CAR
NHTSA NO. C45207

GENERAL TESTING LABORATORIES, INC.
1623 LEEDSTOWN ROAD
COLONIAL BEACH, VIRGINIA 22443

SEPTEMBER 13, 2004

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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Accepted By: [signature]

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9. Performing Organization Name and Address General Testing Laboratories, Inc. 1623 Leedstown Road Colonial Beach, Va 22443		10. Work Unit No. (TRAIS) N/A 11. Contract or Grant No. DTNH22-01-C-11025
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Admin. Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 7th Street, S.W., Room 6115 Washington, DC 20590		13. Type of Report and Period Covered Final Test Report August 7-8, 2004 14. Sponsoring Agency Code NVS-220
15. Supplementary Notes		
16. Abstract Compliance tests were conducted on the subject, 2004 Nissan Maxima Passenger Car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-103-13 for the determination of FMVSS 103 compliance. Test failures identified were as follows: NONE		
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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2004 Nissan Maxima Passenger Car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 103 testing to determine if the vehicle was in compliance with the requirements of the standard. All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedure, TP-103-13 dated 26 June 1996 and General Testing Laboratories, Inc. (GTL) Test Procedure, "Windshield Defrosting and Defogging Systems – Passenger Vehicles, Multipurpose Vehicles, Trucks and Buses".

1.1 TEST VEHICLE

The test vehicle was a 2004 Nissan Maxima Passenger Car. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 1N4BA41E94C854759

B. NHTSA No.: C45207

C. Manufacturer: NISSAN MOTOR CO., LTD.

D. Manufacture Date: 09/03

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 103 testing on August 7-8, 2004.

SECTION 2

COMPLIANCE TEST PROCEDURE AND SUMMARY OF RESULTS

2.0 GENERAL

The 2004 Nissan Maxima 4-door passenger car, NHTSA No. C45207 was subjected to FMVSS No. 103 tests on August 7-8, 2004. Photographs of the test vehicle are shown in Figures 5.1 through 5.4. The manufacturer's certification and tire information labels are shown in Figures 5.5 and 5.6. The test instrumentation and instrument panel setups are depicted in Figures 5.7 and 5.8. Figures 5.9 through 5.14 depict the windshield pre and post test defrost conditions.

2.1 TEST PROCEDURE

Prior to test the test vehicle was inspected for completeness, systems operability, and appropriate fuel and liquid levels, i.e., oil and coolant to include antifreeze protection. The vehicle was then photographically documented as required by the DOT/NHTSA test procedure. The windshield patterns for areas A, B and C had been furnished prior to testing and these areas were outlined on the windshield with a marker. The vehicle was then installed in the cold chamber and pre-conditioned for a 14-hour minimum, 0° ±5° F temperature soak for the first test run. After the pre-condition, the hood was raised to assure engine coolant and lubricant were stabilized within the test temperature range for a minimum of 2 hours.

At the end of the 2-hour minimum stabilization period, the entire windshield was sprayed evenly with 0.010 ounces of water per square inch of glass area. Refer to Section 3, Compliance Test Data, for test specifics such as total amount of water sprayed, spray gun identification, and air pressure regulation. The vehicle soak continued for an additional 30 minutes minimum but no more than 40 minutes after the windshield was sprayed.

At the conclusion of the additional soak time the vehicle's engine was started and operated at a target speed of 1500 -1600 rpm or at the manufacturer's specification if different as noted on data sheets. The defroster blower was turned on to the high speed setting with the heater selector in the de-ice (defrost) position, and the temperature control in the maximum temperature position. All doors and windows were closed. The heater air intake was fully open and the vehicle's hood closed. At no time during the test were the windshield wipers used.

At start of testing and during test, at each 5-minute interval after engine start, cold chamber, engine coolant, heater coolant in and defroster air left/defroster air right temperatures were recorded. Likewise at each 5-minute interval the boundary of the defrosted area was marked on the inside surface of the windshield. The test was run for a maximum of 40 minutes from engine start, or until such time as 100 percent windshield clearance was achieved. Photographs were made of the windshield at the pre-test frosted state and 20-minute and 25-minute intervals. Post test actions included placing a vellum pattern on the windshield and tracing the windshield's 5-minute interval defrosted area boundary lines onto the vellum pattern.

After the traces were obtained, the windshield was again thoroughly cleaned and the vehicle engine coolant and lubricant stabilization period at 0° ±5° F temperature commenced for the second test which entailed a repeat of the procedure discussed. The windshield patterns for both tests were used subsequently to determine the cleared area percentages.

2.2 SUMMARY OF RESULTS

Based on the test performed, the test vehicle appears to be in compliance with the requirements of FMVSS 103.

SECTION 3

COMPLIANCE TEST DATA

3.0 TEST RESULTS

The following data sheets document the results of testing on the 2004 Nissan Maxima.

SUMMARY DATA SHEET
FMVSS 103, WINDSHIELD DEFROSTING AND DEFOGGING SYSTEMS

VEH. MOD YR/MAKE/MODEL/BODY: 2004 NISSAN MAXIMA PASSENGER CAR
VEH. NHTSA NO: C45207; VIN: 1N4BA41E94C854759
VEH. BUILD DATE: 09/03 TEST DATE: AUGUST 7-8, 2004
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

WINDSHIELD AREA: 2086.7 in^2 AREA C = 278 in^2 AREA D = 278 in^2 AREA A = 1206 in^2

MANUFACTURER'S WINDSHIELD PATTERN USED: Yes X No

ENGINE THERMOSTAT NOMINAL REGULATING TEMPERATURE: 180 °F

HEATER-DEFROSTER SYSTEM INCLUDES AIR CONDITIONER: YES X NO

DESCRIBE UNUSUAL FEATURES OF DEFROSTING SYSTEM:

DESCRIBE UNUSUAL FEATURES OF TEST CAR: NONE

DESIGNATION	AREA PERCENT DEFROSTED					
	TEST 1	TEST 2	AVG	REQ'D	PASS	FAIL
CRITICAL AREA C AT 20 MINUTES	100%	100%	100%	80% MINIMUM	PASS	
PASSENGER AREA D AT 25 MINUTES	100%	100%	100%	80% MINIMUM	PASS	
TOTAL AREA A AT 40 MINUTES	100%	100%	100%	95% MINIMUM	PASS	

REMARKS:

RECORDED BY: DATE: 08/18/04

APPROVED BY:

FMVSS 103 TEST DATA RECORD – TEST RUN NO. 1

VEH. MOD YR/MAKE/MODEL/BODY: 2004 NISSAN MAXIMA PASSENGER CAR
VEH. NHTSA NO: C45207; VIN: 1N4BA41E94C854759
VEH. BUILD DATE: 09/03 ; TEST DATE: AUGUST 7, 2004
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

If 1st Test Run, chamber conditioned 17 hours @ 0° ±5° F (14 hrs. min.)

Cold Soak Period: 17 HOURS

Time engine coolant and lubricant remained stabilized at 0° F: 15 hrs. 0 minutes

Water Spray Gun and Nozzle Type: BINKS #66

Spray Gun Pressure: 50 psi (50 psi ± 3 psi)

Water used: 20.8 fluid oz. (0.010 ounces per square inch of windshield area)

Soak Period Between Ice Application and Test Start: 47 minutes (30 to 40 minutes)
Note: Long soak due to engine not starting at 35 minutes

Engine Speed: 1550 to 1600 rpm (Target engine speed 1500 to 1600 rpm)

Wind at specified location in front of windshield: 1.0 mph (0 to 2 mph)

Number of Vehicle Occupants: 2 (2 maximum)

Describe window openings, if any: NONE

TIME FROM START (minutes)	MOTOR VOLTAGE (volts)	TEMPERATURE, °F					DEFROSTED AREA, %		
		TEST ROOM	ENGINE WATER	HEATER WATER IN	DEFROSTER AIR DRVR	DEFROSTER AIR PSGR	A	C	D
0	13.5	-5.0	-5.0	5.0	-3.9	-3.9	0%	0%	0%
5	14.5	-4.5	104.5	108.7	82.3	86.5	2.8%	0%	0%
10	14.2	-2.6	147.8	156.7	123.7	126.2	45.9%	60.3%	35.7%
15	14.0	-0.4	180.5	186.9	150.9	153.5	97.8%	100%	100%
20	13.8	1.5	186.0	188.6	156.7	159.0	100%	100%	100%
25									
30									
35									
40									

REMARKS:

RECORDED BY: [signature] DATE: 08/18/04
APPROVED BY: [signature]

FMVSS 103 TEST DATA RECORD – TEST RUN NO. 2

VEH. MOD YR/MAKE/MODEL/BODY: 2004 NISSAN MAXIMA PASSENGER CAR
VEH. NHTSA NO: C45207; VIN: 1N4BA41E94C854759
VEH. BUILD DATE: 09/03 ; TEST DATE: AUGUST 8, 2004
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

If 1st Test Run, chamber conditioned 22 hours @ 0° ±5° F (14 hrs. min.)

Cold Soak Period: 22 HOURS

Time engine coolant and lubricant remained stabilized at 0° F: 18 hrs. 0 minutes

Water Spray Gun and Nozzle Type: BINKS #66

Spray Gun Pressure: 50 psi (50 psi ± 3 psi)

Water used: 20.8 fluid oz. (0.010 ounces per square inch of windshield area)

Soak Period Between Ice Application and Test Start: 33 minutes (30 to 40 minutes)

Engine Speed: 1500 to 1600 rpm (Target engine speed1500 to 1600 rpm)

Wind at specified location in front of windshield: 1.0 mph (0 to 2 mph)

Number of Vehicle Occupants: 2 (2 maximum)

Describe window openings, if any: NONE

TIME FROM START (minutes)	MOTOR VOLTAGE (volts)	TEMPERATURE, °F					DEFROSTED AREA, %		
		TEST ROOM	ENGINE WATER	HEATER WATER IN	DEFROSTER AIR DRVR	DEFROSTER AIR PSGR	A	C	D
0	13.5	-4.7	-4.6	-4.6	-4.2	-4.2	0%	0%	0%
5	14.5	-4.5	102.0	105.6	80.1	83.4	1.2%	0%	0%
10	14.3	-2.8	140.1	155.5	122.8	126.0	44.2%	42.1%	39.8%
15	14.2	-1.1	160.3	168.2	132.3	138.7	98.0%	100%	100%
20	13.8	0.4	179.4	172.2	141.2	144.4	100%	100%	100%
25									
30									
35									
40									

REMARKS:

RECORDED BY: _____ DATE: 08/18/04
APPROVED BY: _____

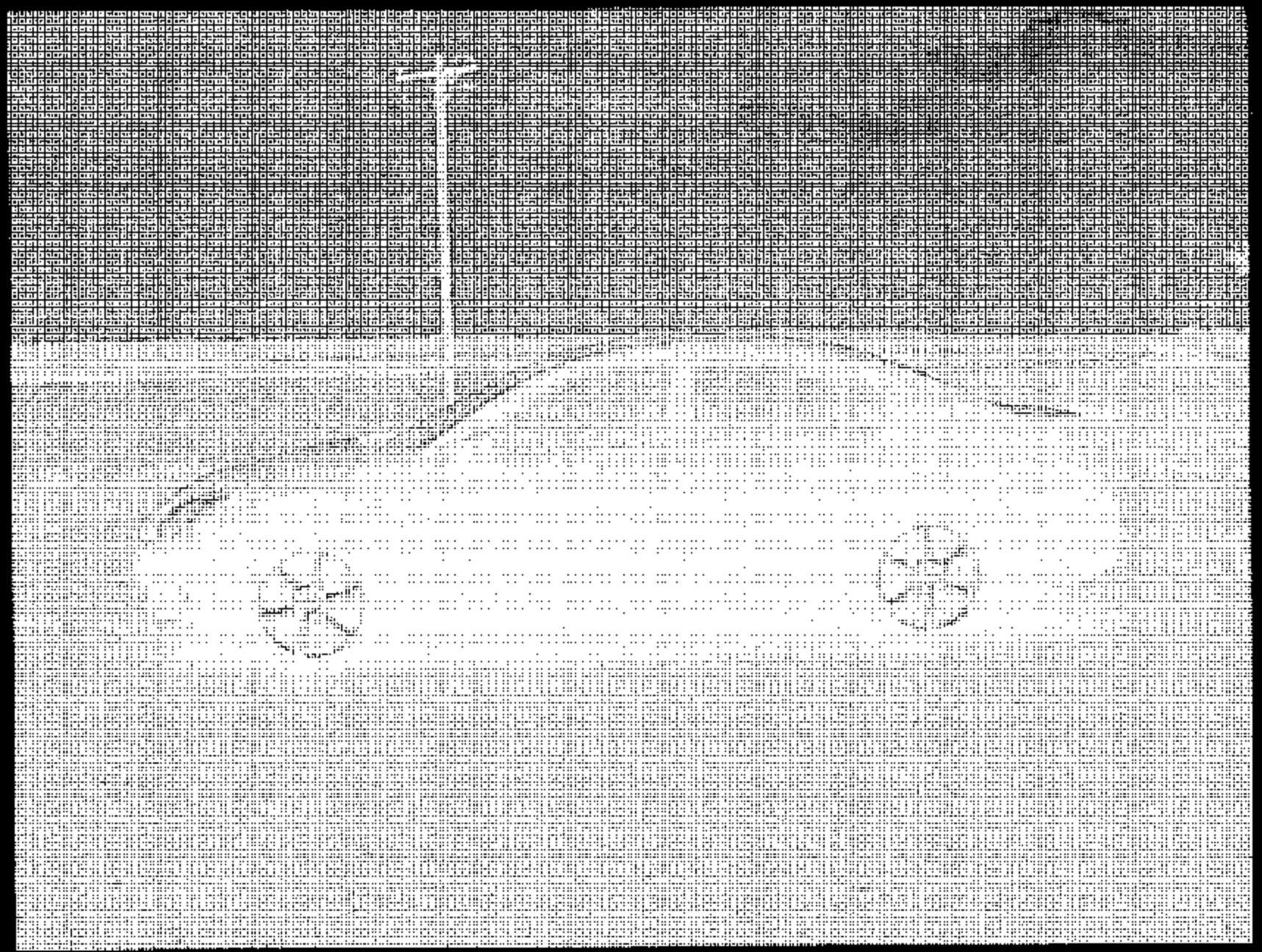
SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST

EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
TIMER	ACCU-SPLIT	ACT2	07/04	07/05
TEMPERATURE READOUT	OMEGA	43P	03/04	03/05
TEMPERATURE RECORDER	OMEGA	CT91	03/04	03/05
SPRAY GUN	BINKS	6655	BEFORE USE	BEFORE USE
ANEMOMETER	HASTINGS	RM-1, 46	05/04	05/05
AIR PRESSURE GAGE	BINKS	0-160	02/04	02/05
SCALE	METTLER	200A4M	02/04	02/05
TACHOMETER	MONARCH	ACT-3	07/04	07/05
GRADUATED BEAKER	PHOTAX	N/A	N/A	N/A
EVENT RECORDER	COMPUTER	GEO1	BEFORE USE	BEFORE USE
DATA LOGGER	FLUKE	7471026	03/04	03/05

SECTION 5

PHOTOGRAPHS



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 103

FIGURE 6.1
LEFT SIDE VIEW OF VEHICLE

2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 103

FIGURE 5.2
RIGHT SIDE VIEW OF VEHICLE

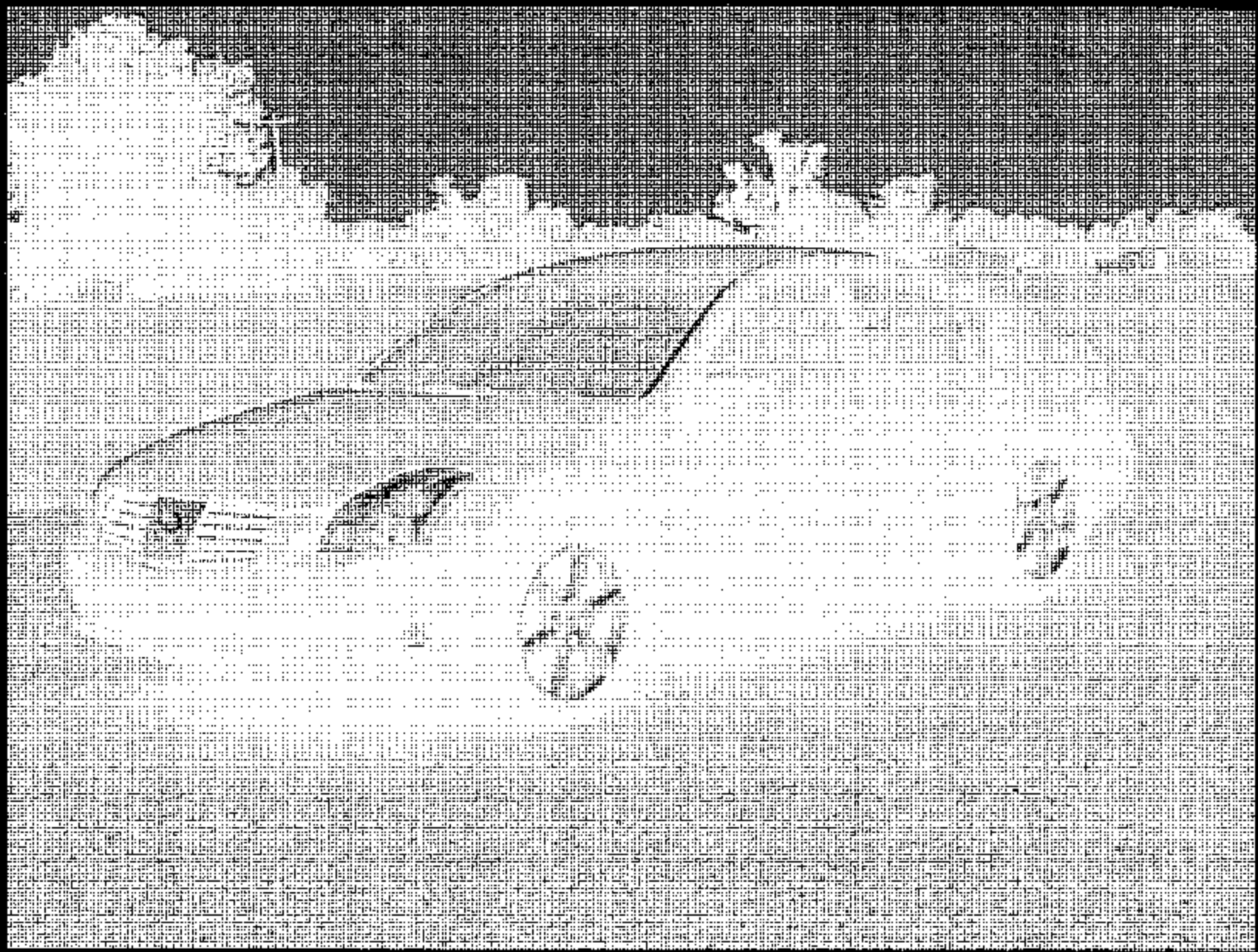


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FIGURE 5.3
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE

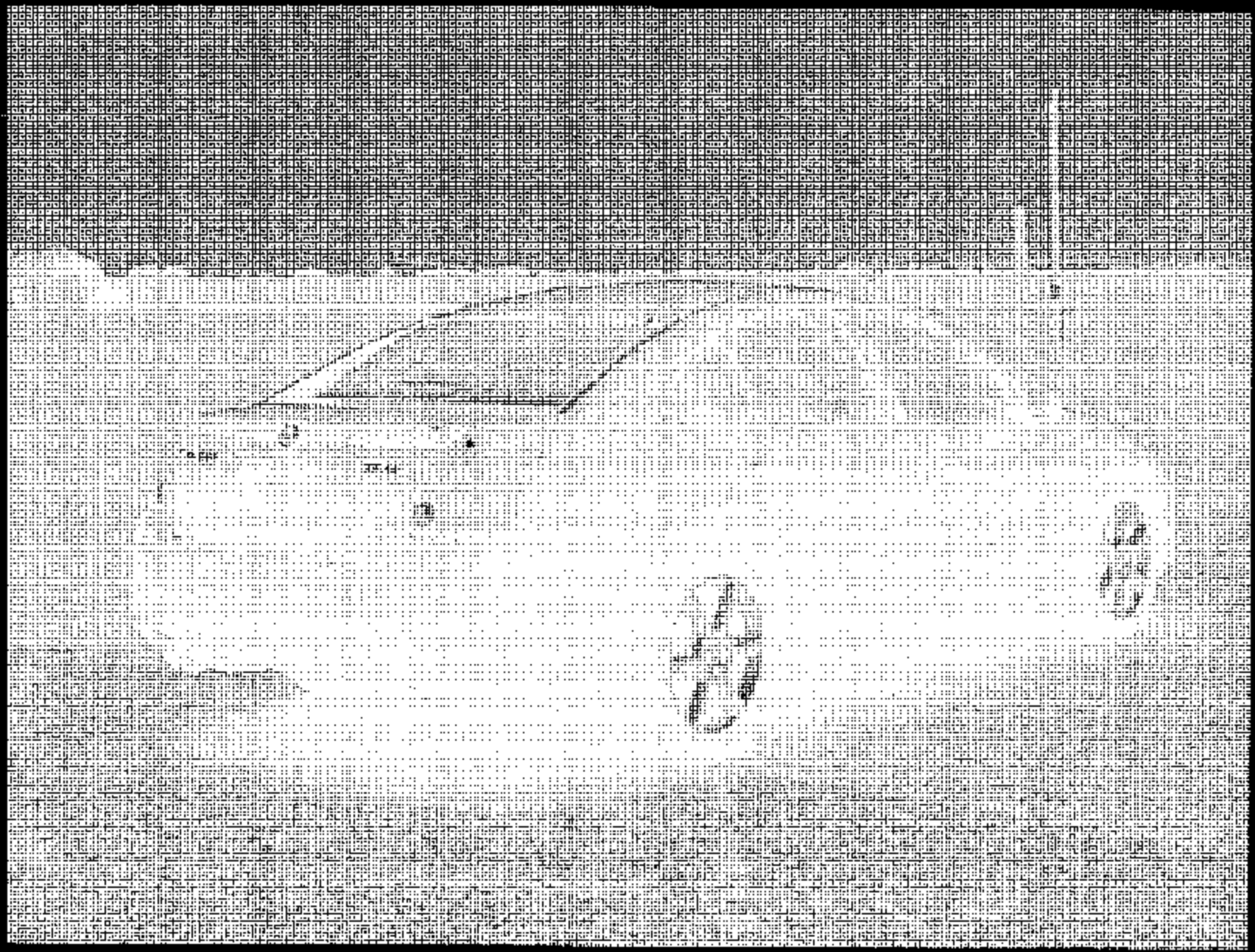

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FIGURE 5.4
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE

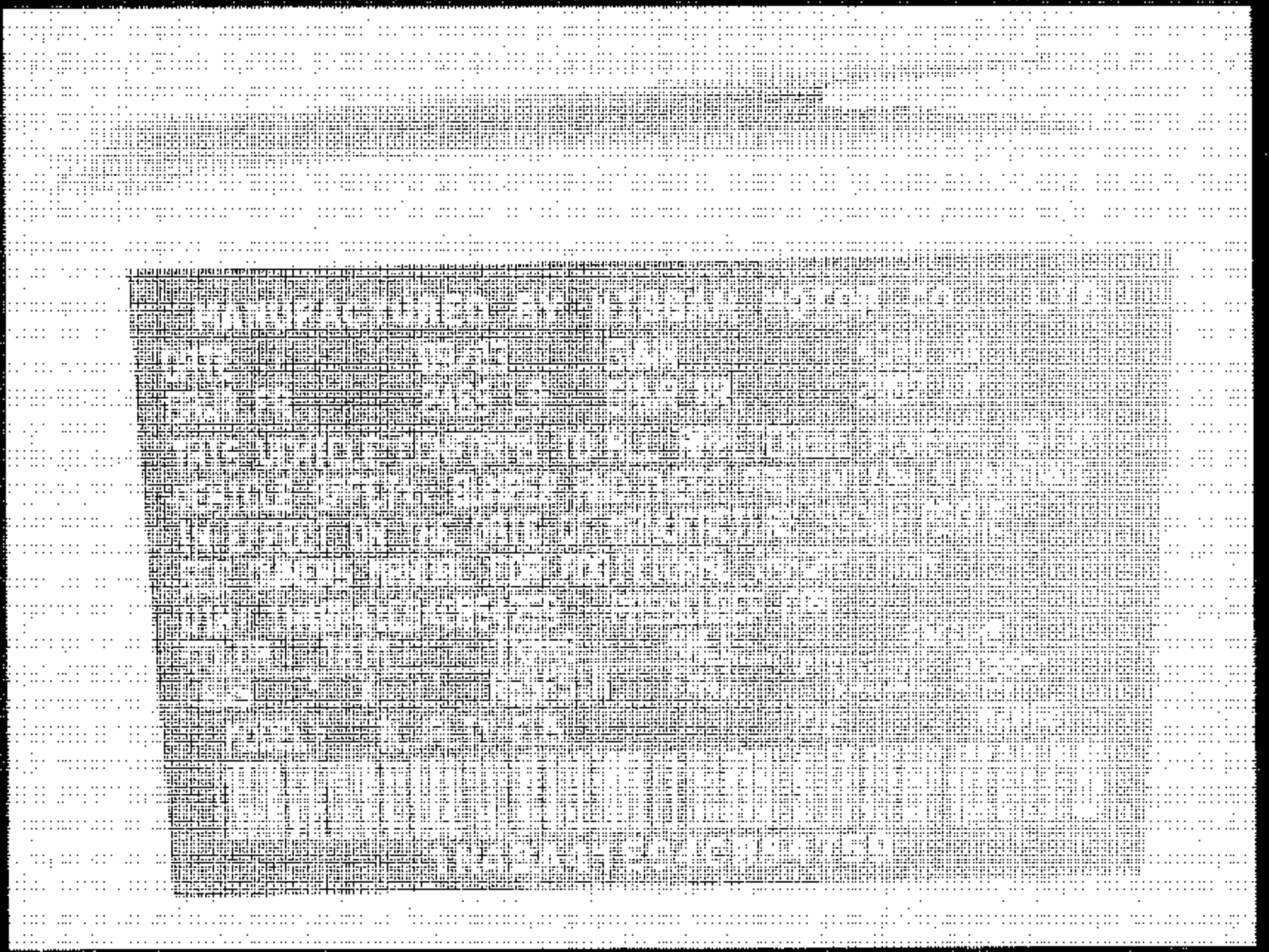

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FIGURE 5.5
VEHICLE CERTIFICATION LABEL

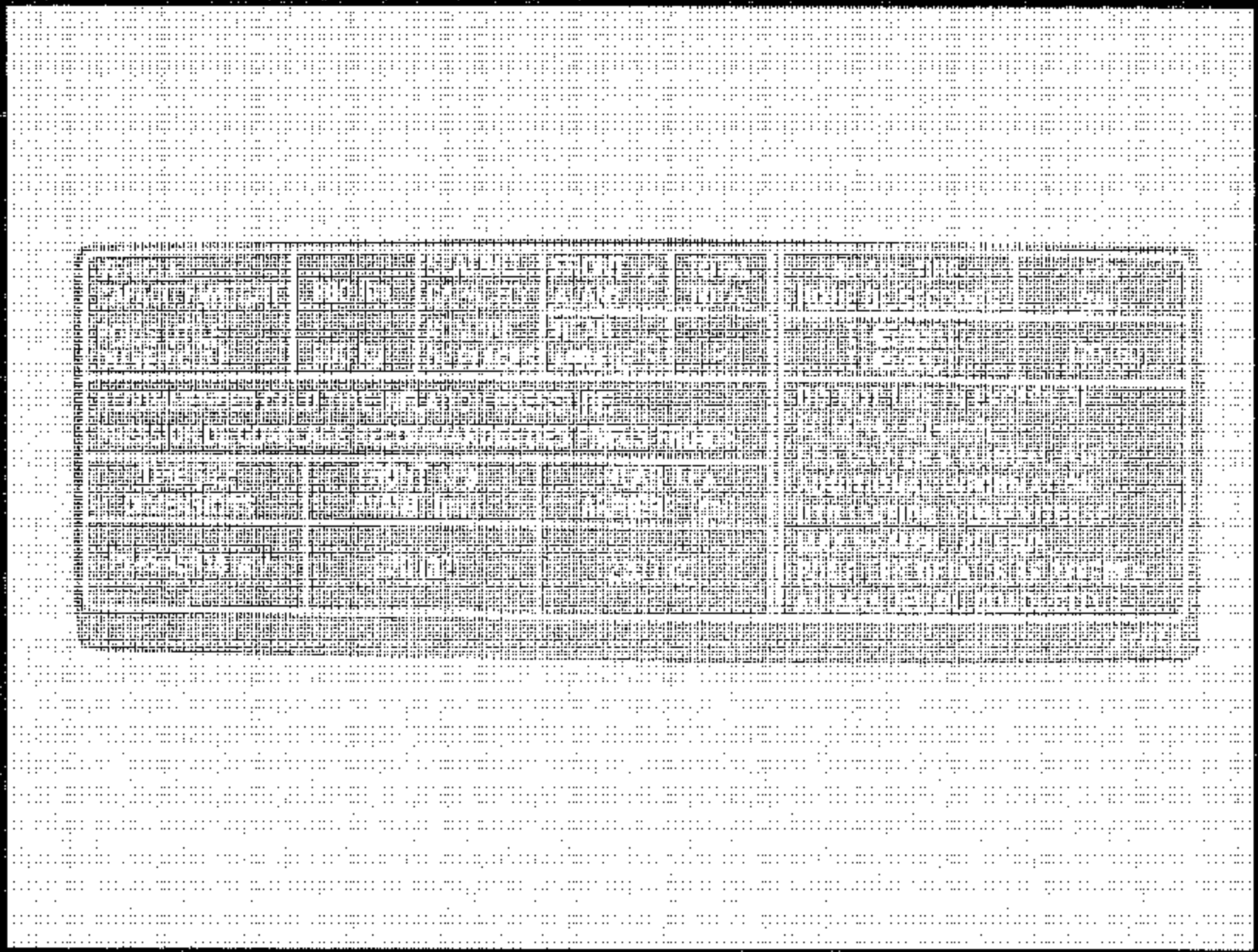

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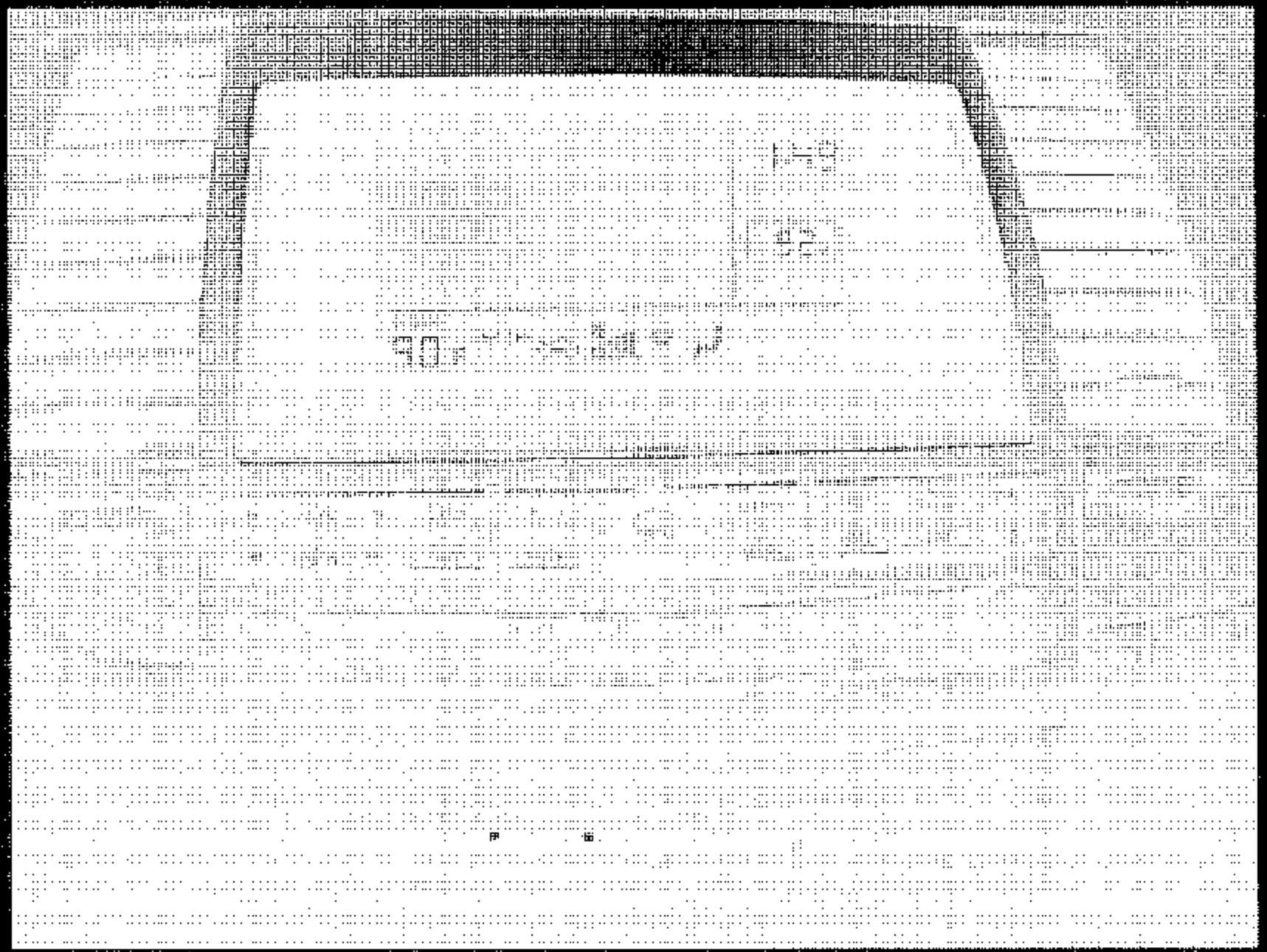
FIGURE 5.6
VEHICLE TIRE INFORMATION LABEL



2004 NISSAN MAXIMA
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FIGURE 5.7
CLOSE-UP VIEW OF DEFROSTER CONTROL
SETTING ON DASH

2004 NISSAN MAXIMA
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FIGURE 5.6
INSTRUMENTATION SET-UP

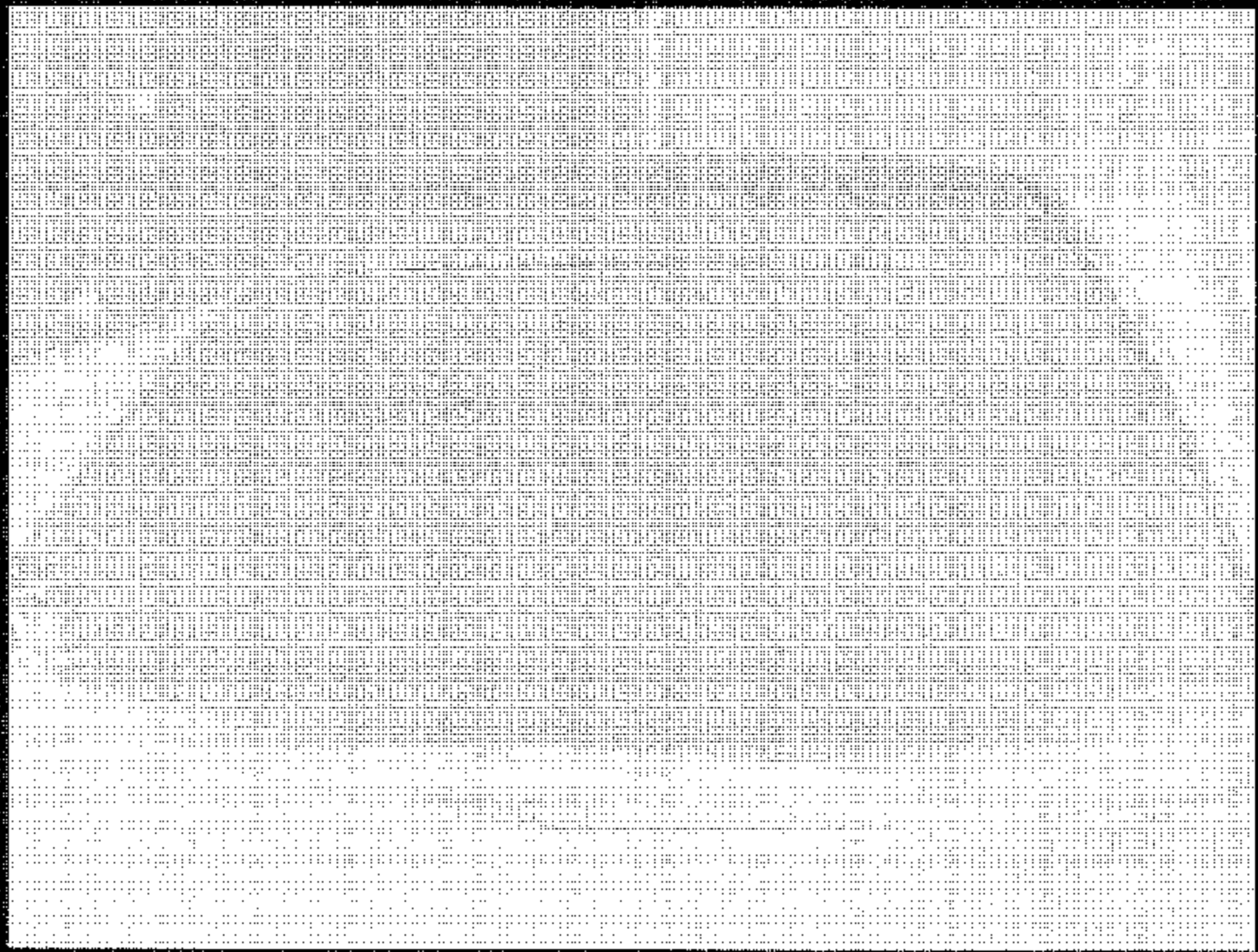

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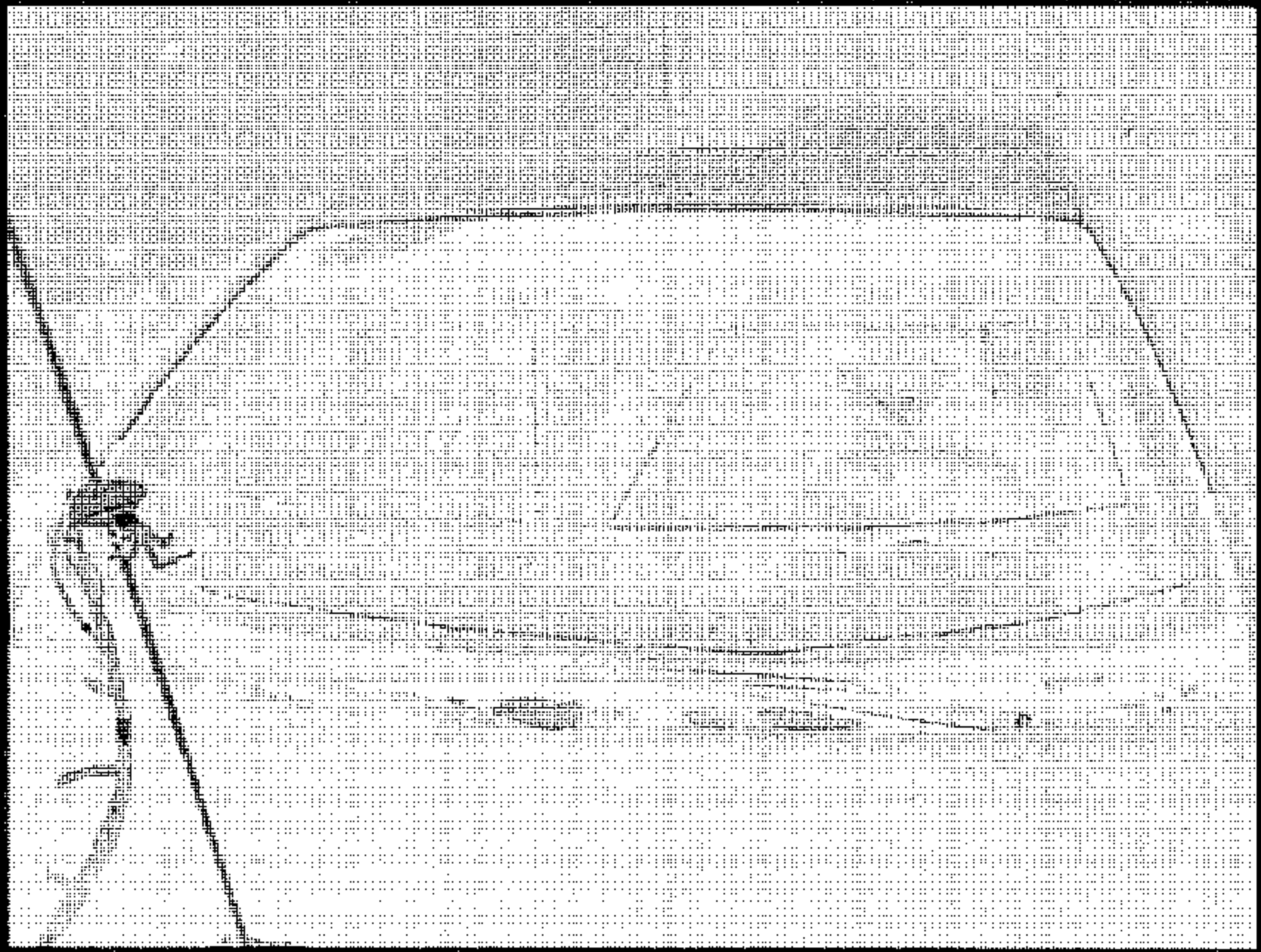
FIGURE 6.9
WINDSHIELD, PRE-TEST FROSTED STATE
TEST #1



2004 NISSAN MAXIMA
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FIGURE 5.10
DEFROSTED AREA AT 20 MINUTES TEST #1
END OF TEST

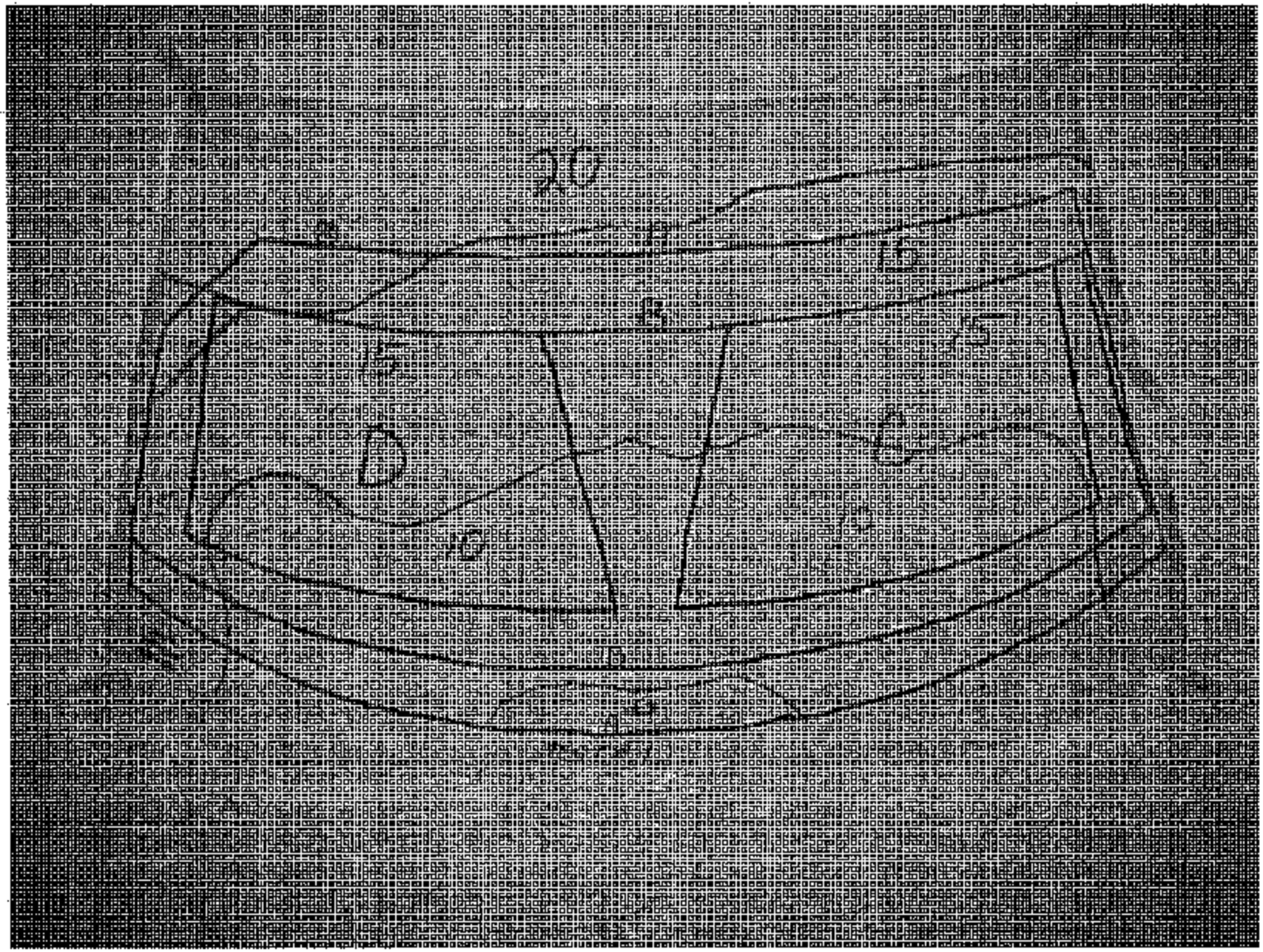

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FIGURE 5.11
WINDSHIELD VELLUM PATTERN, POST TEST #1

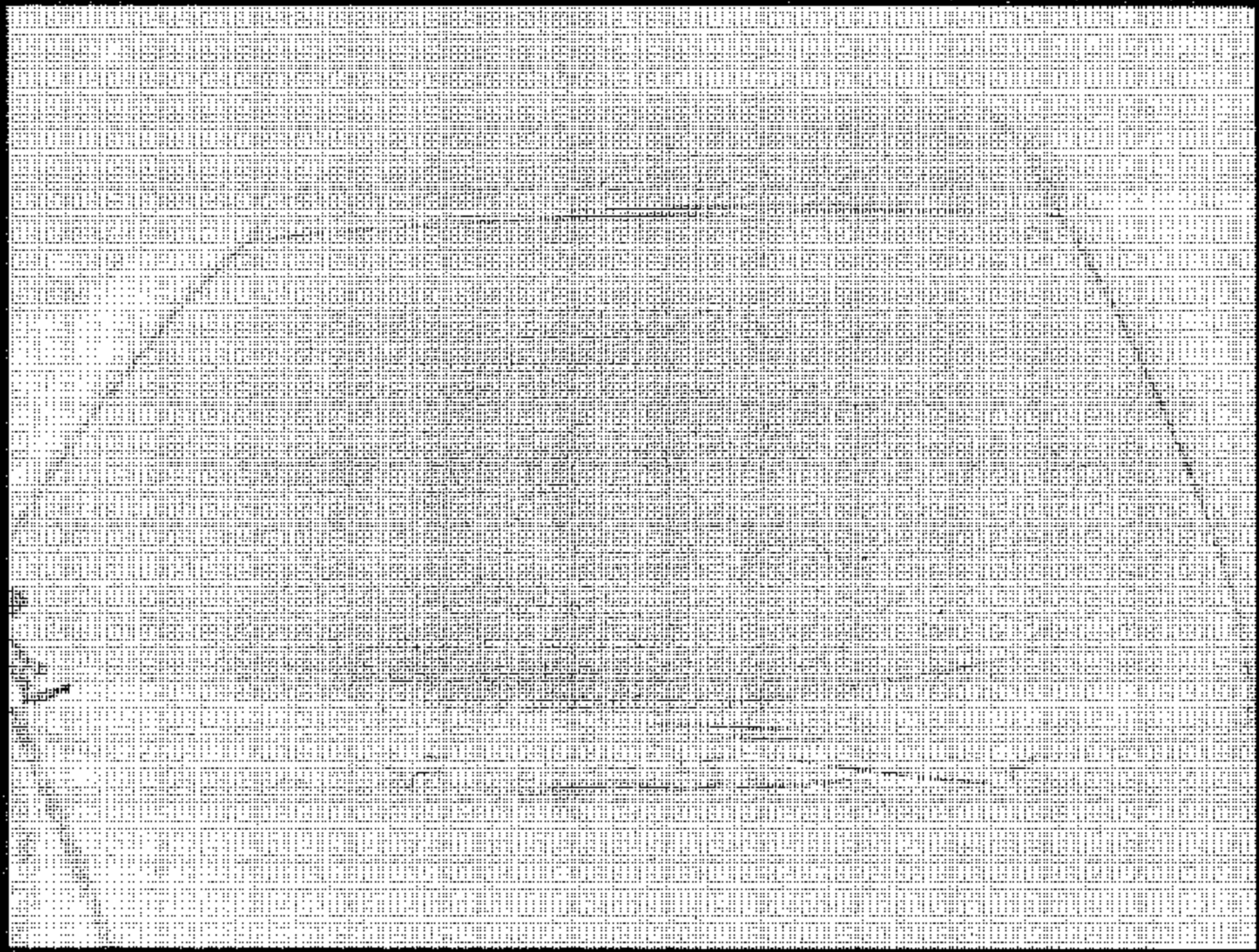

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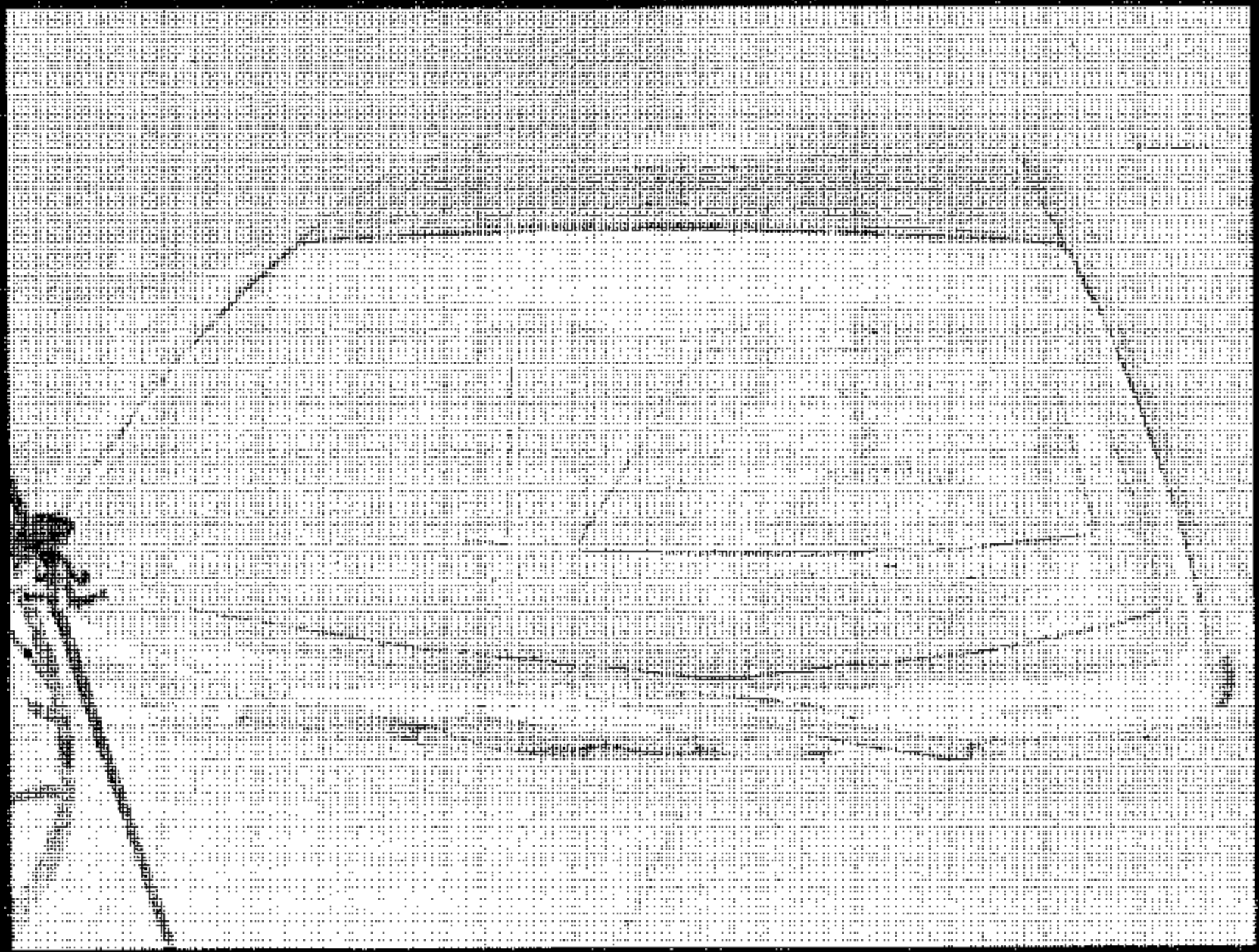
FIGURE 5.12
WINDSHIELD, PRE-TEST FROSTED STATE
TEST #2



2004 NISSAN MAXIMA
NHTSA NO. C45207
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FIGURE 5.13
DEFROSTED AREA AT 20 MINUTES TEST #2
END OF TEST

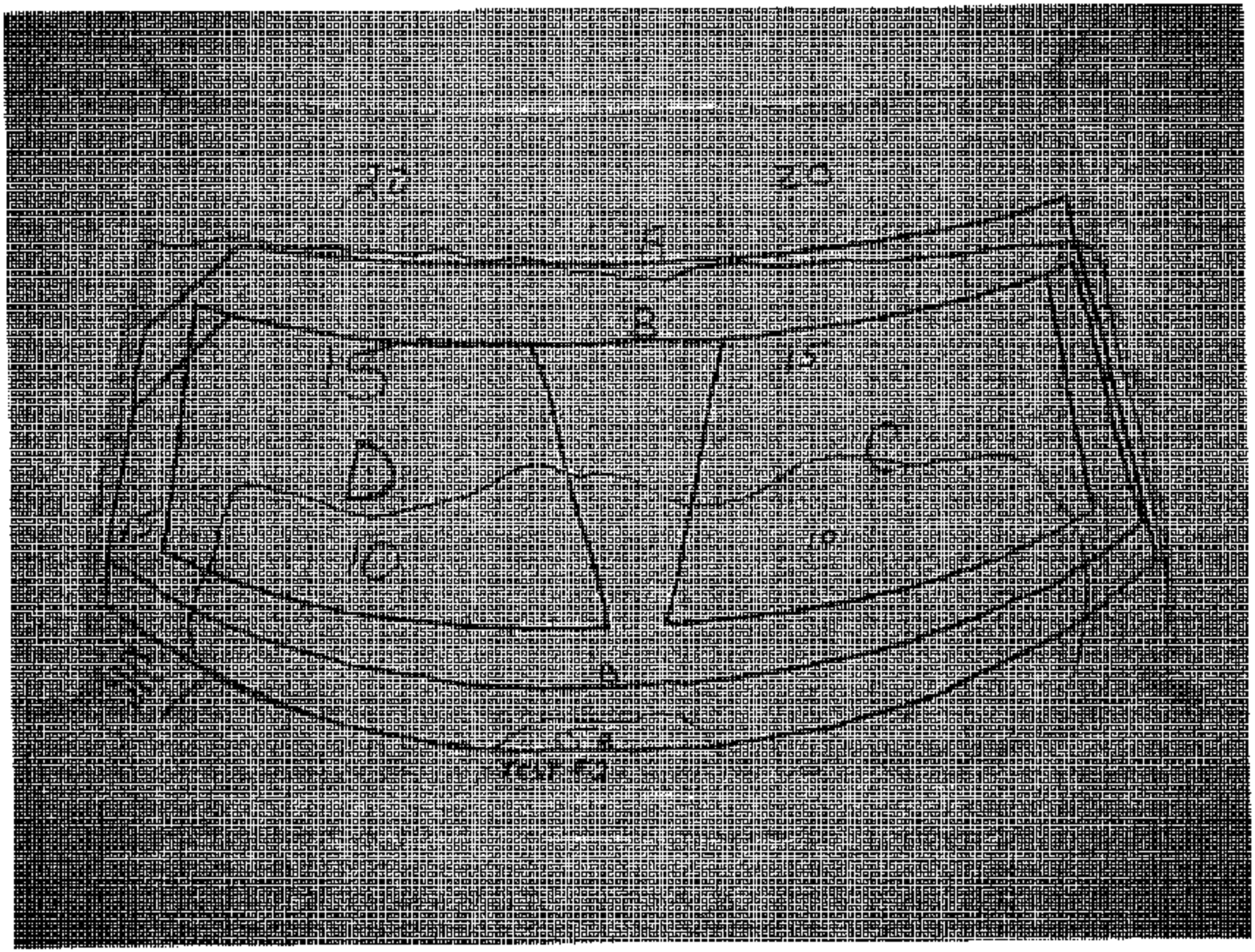

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FIGURE 5.14
WINDSHIELD VELLUM PATTERN, POST TEST #2

SECTION 6

OWNER'S MANUAL DEFROSTER INSTRUCTIONS

flow distribution and fan speed are also controlled automatically.

3. You can individually set driver and front passenger side temperature using each temperature control button. When the DUAL button or passenger side temperature button is pushed, the DUAL indicator will come on. To turn off the passenger side temperature control, push the DUAL button.

eating (A/C OFF)

e air conditioner does not activate. When you ed to heat only, use this mode.

Push the A/C button. (A/C OFF will be displayed and A/C indicator will turn off.)

Push the temperature control button up or down to set the desired temperature.

The temperature of the passenger compartment will be maintained automatically. Air flow distribution and fan speed are also controlled automatically.

Do not set the temperature lower than the outside air temperature. Otherwise the system may not work properly.

Not recommended if windows fog up.

Dehumidified defrosting or defogging

1. Push the defroster button on. The indicator light on the button will come on.
2. Push the temperature control button up or down to set the desired temperature.

- To quickly remove ice from the outside of the windows, set the fan speed to maximum.
- As soon as possible after the windshield is clean, push the AUTO button to return to the automatic mode.
- When the front defroster button is pushed, the air conditioner will automatically be turned on at outside temperatures above 23°F (−5°C). The air conditioning system will continue to operate until the fan control dial is turned to OFF or the vehicle is shut off, even if the air flow control button is used to select a position other than position. This dehumidifies the air which helps defog the windshield. The air recirculate mode automatically turns off, allowing outside air to be drawn into the passenger compartment to further improve the defogging performance.

MANUAL OPERATION

Fan speed control

Push the fan control button to manually control the fan speed.

Push the AUTO button to return to automatic control of the fan speed.

Air recirculation

Push the air recirculation button to recirculate interior air inside the vehicle. The indicator light on the button will come on.

The air recirculation cannot be activated when the air conditioner is in the front defrosting mode.

Fresh air

Push the button to draw outside air into the passenger compartment. The indicator light on the button will come on.

Automatic intake air control

In the AUTO mode, the intake air will be controlled automatically. To manually control the intake air, push the air recirculate or fresh air button. To return to the automatic control mode, push the same button for about 2 seconds. The indicator lights (both air recirculate and fresh air buttons) will flash twice, and then the intake air will be controlled automatically.