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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NHTSA No. C45207

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August 7-8, 2004


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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: 08/03

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 in² AREA C = 278 in² AREA D = 278 in² AREA A = 1206 in²

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

<table>
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<tr>
<th>DESIGNATION</th>
<th>AREA PERCENT DEFROSTED</th>
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<td>TEST 1</td>
</tr>
<tr>
<td>CRITICAL AREA C AT 20 MINUTES</td>
<td>100%</td>
</tr>
<tr>
<td>PASSENGER AREA D AT 25 MINUTES</td>
<td>100%</td>
</tr>
<tr>
<td>TOTAL AREA A AT 40 MINUTES</td>
<td>100%</td>
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REMARKS:

RECORDED BY: [Signature]  DATE: 08/18/04
APPROVED BY: [Signature]
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 _1800_ 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___

<table>
<thead>
<tr>
<th>TIME FROM START (minutes)</th>
<th>MOTOR VOLTAGE (volts)</th>
<th>TEMPERATURE, °F</th>
<th>DEFROSTER AREA, %</th>
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<tr>
<td>TEST ROOM</td>
<td>ENGINE WATER</td>
<td>HEATER WATER IN</td>
<td>DEFROSTER AIR</td>
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<tr>
<td>0</td>
<td>13.5</td>
<td>-5.0</td>
<td>-6.0</td>
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<tr>
<td>10</td>
<td>14.2</td>
<td>-2.6</td>
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<td>-0.4</td>
<td>180.5</td>
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<td>20</td>
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REMARKS:

RECORDED BY: ______________________________ DATE: 08/18/04
APPROVED BY: ___________________________
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: 1N4BA41E94C854750
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 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

<table>
<thead>
<tr>
<th>TIME FROM START (minutes)</th>
<th>MOTOR VOLTAGE (volts)</th>
<th>TEMPERATURE, °F</th>
<th>DEFROSTED AREA, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>TEST ROOM</td>
<td>ENGINE WATER</td>
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<td>13.8</td>
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REMARKS:

RECORDED BY: ___________________________ DATE: 08/18/04
APPROVED BY: ___________________________
### Section 4
**Instrumentation and Equipment List**

**Table 1 - Instrumentation & Equipment List**

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<tr>
<th>Equipment</th>
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<td>Accu-Split</td>
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<td>Omega</td>
<td>43P</td>
<td>03/04</td>
<td>03/05</td>
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<td>Temperature Recorder</td>
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<td>CT91</td>
<td>03/04</td>
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<td>Binks</td>
<td>6655</td>
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<td>ACT-3</td>
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SECTION 5

PHOTOGRAPHS
FIGURE 5.7
CLOSE-UP VIEW OF DEFROSTER CONTROL SETTING ON DASH
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 temperatures 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.

Heating (A/C OFF)

The air conditioner does not activate. When you need 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 2°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 " infancy."
   - This dehumidifies the air which helps defog the windshield. The air recirculation 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.

Display screen, heater, air conditioner and audio systems 4-17