

REPORT NUMBER 104-GTL-07-002

# SAFETY COMPLIANCE TESTING FOR FMVSS NO. 104 WINDSHIELD WIPING AND WASHING SYSTEMS

NISSAN MOTOR CO., LTD.  
2007 NISSAN VERSA, PASSENGER CAR  
NHTSA NO. C75201

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



JANUARY 9, 2008

**FINAL REPORT**

**PREPARED FOR**

**U. S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
ENFORCEMENT  
OFFICE OF VEHICLE SAFETY COMPLIANCE  
1200 NEW JERSEY AVE., S.E.  
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Prepared By: Debbie Messick  
Approved By: [Signature]  
Approval Date: 1/9/08

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## SECTION 1

### PURPOSE OF COMPLIANCE TEST

#### 1.0 PURPOSE OF COMPLIANCE TEST

A 2007 Nissan Versa Passenger Car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 104 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-104-08 dated 26 June 1996 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-104-08A dated 4 April 1997.

1.1 The test vehicle was a 2007 Nissan Versa Passenger Car. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 3N1BC11E57L394885

B. NHTSA No.: C75201

C. Manufacturer: NISSAN MOTOR CO., LTD.

D. Manufacture Date: 12/06

#### 1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 104 testing on October 10, 2007.

## SECTION 2

### COMPLIANCE TEST PROCEDURE AND SUMMARY OF RESULTS

#### 2.0 GENERAL

The 2007 Nissan Versa passenger car, NHTSA No. C75201 was subjected to FMVSS No. 104 tests on October 10, 2007. The selected portions of FMVSS No. 104 tests used were as amplified in the following subparagraphs. The test vehicle was positioned in the test system with three water spray nozzles suspended in line with the center of the longitudinal axis of the windshield and horizontal left/right center of the windshield to provide an even distribution of spray to the entire windshield. The height of the nozzles was approximately 22 inches above the glazing surface.

#### 2.1 WIPER FREQUENCY TEST

The wiper frequency test was performed with the engine operating and with a minimum of 50 cubic inches per minute of water from the spray nozzles. The wiper frequency was measured at the low and high wiper speed settings with the engine operating at idle RPM and 2,000 RPM.

#### 2.2 WIPED AREA TEST

The test was conducted with the windshield wiper system operating at the high speed setting, engine at idle RPM and the spray nozzles spraying water at a minimum of 50 cubic inches per minute. The wiper blade wipe pattern was outlined on the glazing surface and then transferred to a windshield pattern. The wiped area was determined for areas A, B and C from the windshield pattern.

#### 2.3 CAPABILITY TEST

The windshield glazing surface was coated with a mixture of water and fine grade test dust. Within 15 seconds following application of the water-dust mixture, the windshield wiper and washing system was activated in the high speed mode for ten complete cycles. The vehicle's engine was operating at idle RPM. The cleared areas of the windshield were marked on the inside windshield surface. After ten complete cycles the system was deactivated and the wiped area transferred to a windshield pattern.

The glazing surface was cleaned and dried. The water dust mixture was re-applied and the test repeated.

The windshield patterns were used subsequently to determine the cleared area percentages.

#### 2.4 SUMMARY OF RESULTS

Based on the test performed, the test vehicle's windshield wiping and washing system appears to meet the requirements of FMVSS 104.

## SECTION 3

## COMPLIANCE TEST DATA

3.0 TEST RESULTS

The following data sheets document the results of testing on the 2007 Nissan Versa.

SUMMARY OF DATA  
FMVSS 104, WINDSHIELD WIPING AND WASHING SYSTEMS

VEH. MOD YR/MAKE/MODEL/BODY: 2007 NISSAN VERSA PASSENGER CAR  
 VEH. NHTSA NO: C75201; VIN: 3N1BC11E57L394885  
 VEH. BUILD DATE: 12/06 TEST DATE: OCTOBER 10, 2007  
 TEST LABORATORY: GENERAL TESTING LABORATORIES  
 OBSERVERS: GRANT FARRAND, JIMMY LATANE

WIPER TYPE: 2 SPEED ELECTRIC WITH DELAY

WASHER TYPE: HIGH PRESSURE ELECTRIC

WINDSHIELD AREAS: A = 927 in<sup>2</sup> B = 735 in<sup>2</sup> C = 246 in<sup>2</sup>

MANUFACTURER'S WINDSHIELD PATTERN USED: Yes X No     

ACCESSIBILITY:

- (1) Washer Control Accessible: Yes X No       
 (2) Wiper Control Accessible: Yes X No       
 (3) Washer Reservoir Filler Accessible: Yes X No

DESCRIBE UNUSUAL FEATURES OF WIPING AND WASHING SYSTEMS:

PERFORMANCE:

TEST	PASS	FAIL
WIPER FREQUENCY	X	
WIPED AREA	X	
WASHER CAPABILITY	X	

RECORDED BY: G. FARRAND

DATE: 10/11/07

APPROVED BY: D. MESSICK



FREQUENCY TEST DATA  
FMVSS 104 – WINDSHIELD WIPER SYSTEM

VEH. MOD YR/MAKE/MODEL/BODY: 2007 NISSAN VERSA PASSENGER CAR

VEH. NHTSA NO: C75201; VIN: 3N1BC11E57L394885

VEH. BUILD DATE: 12/06 TEST DATE: OCTOBER 10, 2007

TEST LABORATORY: GENERAL TESTING LABORATORIES

OBSERVERS: GRANT FARRAND, JIMMY LATANE

Water Hardness: 7.0 grains/gallon (12 max.); Date Certified: 09/07

Water Spray Flow Rate: 71.0 in<sup>3</sup>/min. (specified range = 50 to 100 in<sup>3</sup>/min.)

Ambient Air Temp.: 81 °F (50-100°F); Water Temp.: 77 °F (100°F max.)

Manufacturer's Recommended Engine Idle Speed: 700 rpm

RUN 1, MAXIMUM WIPER FREQUENCY TEST:

TIME	ENGINE SPEED	TOTAL CYCLES	AVG. CYCLES/MIN. (45 MINIMUM)
1 <sup>ST</sup> 3 minutes	<u>700</u> (idle ± 50 rpm)	212	70.7
2 <sup>ND</sup> 3 minutes	<u>2000</u> (2000 rpm ± 50 rpm)	208	69.3

Frequency at least 45 cycles/minute regardless of engine speed: Yes X No    

RUN 2, LOWER WIPER FREQUENCY TEST:

TIME	ENGINE SPEED	TOTAL CYCLES	AVG. CYCLES/MIN. (20 MINIMUM)
1 <sup>ST</sup> 3 minutes	<u>700</u> (idle ± 50 rpm)	140	46.7
2 <sup>ND</sup> 3 minutes	<u>2000</u> (2000 rpm ± 50 rpm)	140	46.7

Highest and lower frequency differ by at least 15 cycles/minute, and lower frequency is at least 20 cycles/minute regardless of engine speed: Yes X No    

REMARKS:

RECORDED BY: G. FARRAND

DATE: 10/10/07

APPROVED BY: D. MESSICK

WIPED AREA TEST DATA  
FMVSS 104 – WINDSHIELD WIPER SYSTEM

VEH. MOD YR/MAKE/MODEL/BODY: 2007 NISSAN VERSA PASSENGER CAR

VEH. NHTSA NO: C75201; VIN: 3N1BC11E57L394885

VEH. BUILD DATE: 12/06; TEST DATE: OCTOBER 10, 2007

TEST LABORATORY: GENERAL TESTING LABORATORIES

OBSERVERS: GRANT FARRAND, JIMMY LATANE

Air Temperature in test area = 81 °F (specified range of 50 to 100°F)

Air Velocity at windshield = .5 mph (specified range of 0 to 1 mph)

Engine speed = 700 rpm (manufacturer's recommended idle ± 50 rpm)

Temperature of water spray = 77 °F (100° F maximum)

Water spray flow rate = 71 in<sup>3</sup>/min. (specified range of 50 to 100 in<sup>3</sup>/min.)

Windshield wiper frequency = 46 cycles/min. (45 cpm minimum)

TEST RESULTS:

PERCENT WIPED				
WINDSHIELD AREA	ACTUAL	REQUIRED	PASS	FAIL
A	92.0%	80%	X	
B	94.1%	94%	X	
C	100%	99%	X	

REMARKS:

RECORDED BY: G. FARRAND

DATE: 10/10/07

APPROVED BY: D. MESSICK

CAPABILITY TEST DATA  
FMVSS 104 – WINDSHIELD WASHER SYSTEM

VEH. MOD YR/MAKE/MODEL/BODY: 2007 NISSAN VERSA PASSENGER CAR  
 VEH. NHTSA NO: C75201; VIN: 3N1BC11E57L394885  
 VEH. BUILD DATE: 12/06; TEST DATE: OCTOBER 10, 2007  
 TEST LABORATORY: GENERAL TESTING LABORATORIES  
 OBSERVERS: GRANT FARRAND, JIMMY LATANE

Air Temperature in test area = 80 °F (specified range of 70 to 80°F)

Washer reservoir fluid temperature = 75 °F (specified range of 70 to 80°F)

Air Velocity at windshield = .5 mph (specified range of 0 to 1 mph)

Engine speed = 700 rpm (manufacturer's recommended idle ± 50 rpm)

Number of windshield washer nozzles on the vehicle = 4

Windshield washer system activation coordinated with components of the wiper system:

Yes X No     

TEST RESULTS:

CLEARED AREA PERCENTAGES						
WINDSHIELD AREA	TEST 1	TEST 2	AVG	REQ'D*	PASS	FAIL
A	90.9	92.3	91.6	75%	X	
B	94.6	94.6	94.6	75%	X	
C	100	100	100	75%	X	

\*NOTE FOR REFERENCE ONLY: SAE 942b, revised Jul72, recommends capability to clear 80% of the total wash area and 90% of the wash area included in AREA C.

REMARKS:

RECORDED BY: G. FARRAND

DATE: 10/10/07

APPROVED BY: D MESSICK

SECTION 4  
INSTRUMENTATION AND EQUIPMENT LIST

TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST

EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
TIMER	ACCU-SPLIT	ACT1	10/07	10/08
TEMPERATURE READOUT	OMEGA	DP41	03/07	03/08
TEMPERATURE RECORDER	OMEGA	CT485	06/07	06/08
SPRAY SYSTEM	GTL	N/A	BEFORE USE	BEFORE USE
ANEMOMETER	OMEGA	HH-600	06/07	06/08
CYCLE COUNTER	GTL	GTL	BEFORE USE	BEFORE USE
SOFT WATER	N/A	N/A	10/07	10/08
TACHOMETER	MONARCH	ACT-3	08/07	08/08
TEST DUST	AC	GM FINE	CALIBRATED DUST	CALIBRATED BY VENDOR*

\*AC Inspection #503, Batch #1943, Measured with particle size roller analyzer.

SECTION 5  
PHOTOGRAPHS



2007 NISSAN VERSA  
NHTSA NO. C75201  
FMVSS NO. 104

FIGURE 5.1  
LEFT SIDE VIEW OF VEHICLE



2007 NISSAN VERSA  
NHTSA NO. C75201  
FMVSS NO. 104

FIGURE 5.2  
RIGHT SIDE VIEW OF VEHICLE



2007 NISSAN VERSA  
NHTSA NO. C75201  
FMVSS NO. 104

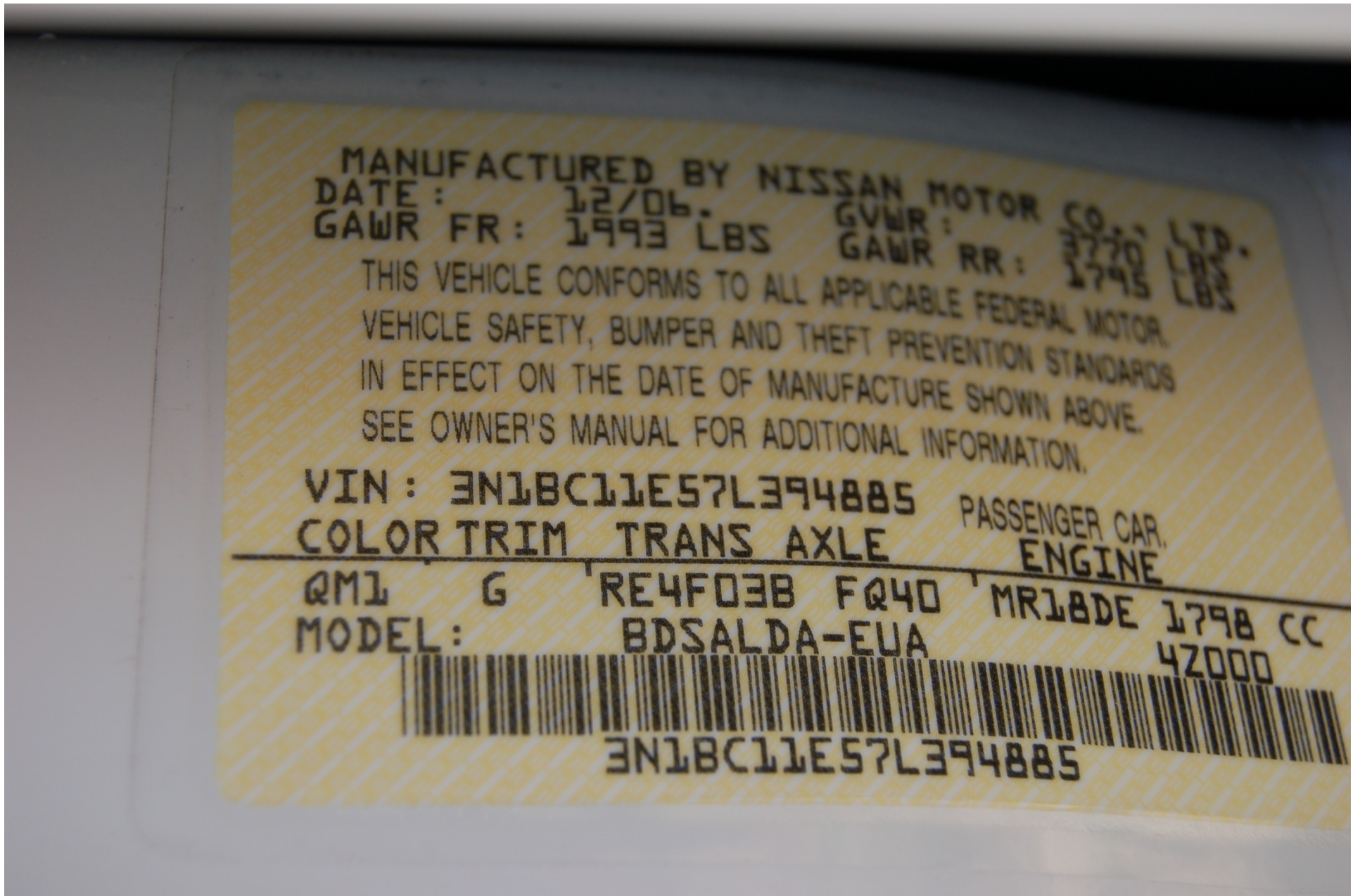
FIGURE 5.3  
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE





2007 NISSAN VERSA  
NHTSA NO. C75201  
FMVSS NO. 104

FIGURE 5.4  
¾ REAR VIEW FROM RIGHT SIDE VIEW OF VEHICLE



2007 NISSAN VERSA  
NHTSA NO. C75201  
FMVSS NO. 104

FIGURE 5.5  
VEHICLE CERTIFICATION LABEL



**TIRE AND LOADING INFORMATION  
PNEU ET INFORMATION DE CHARGEMENT**



SEATING CAPACITY NOMBRE DE PLACES	TOTAL TOTAL	5	FRONT AVANT	2
			REAR ARRIÈRE	3

The combined weight of occupants and cargo should never exceed 390 kg or 860 lbs.  
Le poids combiné d'occupants et de cargaison ne devrait jamais excéder 390 kg ou 860 lbs.

TIRE PNEU	ORIGINAL SIZE TAILLE ORIGINAL	COLD TIRE PRESSURE PRESSION DES PNEUS FROIDS
FRONT AVANT	P185/65R15 86H	230kPa, 33PSI
REAR ARRIÈRE	P185/65R15 86H	230kPa, 33PSI
SPARE DE SECOURS	T125/70D15	420kPa, 60PSI

**SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION.  
POUR D'AUTRES DÉTAILS, SE REPORTER AU MANUEL DU CONDUCTEUR.**

EM30A

2007 NISSAN VERSA  
NHTSA NO. C75201  
FMVSS NO. 104

FIGURE 5.6  
VEHICLE TIRE INFORMATION LABEL