SAFETY COMPLIANCE TESTING FOR FMVSS NO. 110 (INDICANT) TIRE SELECTION AND RIMS

GENERAL MOTORS DE MEXICO, S. DE R.L. DE C.V.
2003 BUICK RENDEZVOUS, MPV
NHTSA NO. C30106

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

SEPTEMBER 04, 2003
FINAL REPORT

PREPARED FOR

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
SAFETY ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 5111 (NVS-220)
WASHINGTON, D.C. 20590
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Prepared By: [Signature]

Approved By: [Signature]

Approval Date: 09/04/03

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: [Signature]

Acceptance Date: 09/11/03
**Abstract**

This test was conducted on the subject 2003 Buick Rendezvous MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-110-02 (partial), to gather data relating to the normal load requirements specified in FMVSS 110. NHTSA's Office of Safety Performance Standards requested this data to support the agency's TREAD tire rulemaking efforts.

**Key Words**

- Vehicle Testing
- Safety Engineering
- FMVSS 110

**Distribution Statement**

Copies of this report are available from NHTSA NHTSA Technical Reference Div., Rm. 5108 (NPO-230)
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**Supplementary Notes**

Form DOT F 1700.7 (8-72)
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<td>2</td>
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<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
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<td>5</td>
<td>11</td>
</tr>
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5.1 ¾ Frontal View of Vehicle
5.2 Vehicle’s Certification Label and Tire Information Label
5.3 Tire Showing Brand, Size, Load Index and Speed Symbol
5.4 Tire Showing Max Load Rating and Max Inflation Pressure
5.5 Vehicle Ballasted to Simulate Normal Load Condition

APPENDIX – Normal Load Occupation Distribution
SECTION 1

INTRODUCTION

1.0 PURPOSE OF INDICANT TEST

A 2003 Buick Rendezvous MPV was subjected to a FMVSS No. 110 (Indicant) test intended to gather data relating to the normal load requirements specified in FMVSS 110. NHTSA’s Office of Safety Performance Standards requested this data to support the agency’s TREAD tire rulemaking efforts.

1.1 TEST VEHICLE

The test vehicle was a 2003 Buick Rendezvous MPV. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 3G5DA03E03S560384

B. NHTSA No.: C30106

C. Manufacturer: GENERAL MOTORS DE MEXICO, S. DE R.L. DE C.V.

D. Manufacture Date: 12/02

1.2 TEST DATE

The test vehicle was subjected to testing on May 23, 2003.
SECTION 2

TEST PROCEDURE AND SUMMARY OF RESULTS

2.0 TEST PROCEDURE

The vehicle was inspected, photographed and filled with fuel. It was then weighed to establish total curb weight and the weights of all wheels were measured and recorded. The vehicle was then ballasted to its normal load condition (refer to appendix) and the weights of all wheels were measured and recorded. Tire information labeling data and tire sidewall data were recorded.

This indicant test did not include any other requirements in FMVSS 110.

2.1 SUMMARY OF RESULTS

Currently FMVSS 110 applies only to passenger cars. The subject Buick Rendezvous is a multipurpose passenger vehicle (MPV) and therefore it is not required to meet FMVSS 110 requirements. It was subjected to the normal load testing as executed for FMVSS 110 compliance verification for information only.
SECTION 3
TEST DATA
DATA SHEET 1
SUMMARY

VEHICLE MAKE/MODEL/BODY STYLE: 2003 BUICK RENDEZVOUS MPV
VEHICLE NHTSA NO.: C30106；VIN: 3G5DA03E03S560384
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 05/23/03

REQUIREMENT

The vehicle is equipped with tires that meet the requirements of FMVSS 109 or FMVSS 119.

YES

The vehicle normal load on the tire is not greater than the high speed performance test load specified in FMVSS 109 paragraph S5.5 or FMVSS 119 paragraph S7.4.

YES

For passenger cars, the tire information placard is permanently affixed to the glove compartment door or equally accessible location; and displays the required information (FMVSS 110, S4.3).

N/A

For vehicles other than passenger cars, a combined certification/tire information label or separate tire information label is permanently affixed to either the hinge pillar, door-latch post or to the inward-facing surface of the door next to the driver's seating position (FMVSS 120, S5.3).

YES

REMARKS:

RECORDED BY: M. A. _______________ DATE: 05/23/03

APPROVED BY: N. _______________
DATA SHEET 2
TEST VEHICLE INFORMATION/RECEIVING INSPECTION

LABORATORY: GENERAL TESTING LABORATORIES
DATE: 05/23/03

VEHICLE MODEL YEAR/MAKE/MODEL/BODY STYLE: 2003 BUICK RENDEZVOUS MPV

MANUFACTURE DATE: 12/02  NHTSA NO.: C30106  BODY COLOR: LIGHT DRIFTWOOD METALLIC

VIN: 3G5DA03E03S560384  VEHICLE TYPE: MPV

GVWR 2,430 kg (5,357 lbs)  GAWR(Fr) 1,230 kg (2,712 lbs)  GAWR(Rr) 1,210 kg (2,688 lbs)

BELTED SEATING POSITIONS: FRONT 2  MID N/A  REAR 3  OTHER N/A

ENGINE DATA: 6 Cylinders 3.4 Liters  ____ Cubic Inches

TRANSMISSION DATA: X Automatic  Manual  4 No. of Speeds

FINAL DRIVE DATA: ____ Rear Drive  X Front Drive  ____ 4 Wheel Drive

INSTALLED TIRE DATA: Size ____ P215/70R16  Mfr. ____ FIRESTONE

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT/MAKE SURE ALL OPTIONS ON WINDOW STICKER ARE LISTED:

<table>
<thead>
<tr>
<th>X</th>
<th>Air Conditioning</th>
<th>Traction Control</th>
<th>X</th>
<th>Clock</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Tinted Glass</td>
<td>All Wheel Drive</td>
<td>X</td>
<td>Roof Rack</td>
</tr>
<tr>
<td>X</td>
<td>Power Steering</td>
<td>X Cruise Control</td>
<td>X</td>
<td>Console</td>
</tr>
<tr>
<td>X</td>
<td>Power Windows</td>
<td>X Rear Window Defroster</td>
<td>X</td>
<td>Driver Air Bag</td>
</tr>
<tr>
<td>X</td>
<td>Power Door Locks</td>
<td>Sun Roof or T-Top</td>
<td>X</td>
<td>Passenger Air Bag</td>
</tr>
<tr>
<td></td>
<td>Power Seat(s)</td>
<td>X Tachometer</td>
<td>X</td>
<td>Front Disc Brakes</td>
</tr>
<tr>
<td>X</td>
<td>Power Brakes</td>
<td>X Tilt Steering Wheel</td>
<td>X</td>
<td>Rear Disc Brakes</td>
</tr>
<tr>
<td>X</td>
<td>Antilock Brake System</td>
<td>X AM/FM/CD</td>
<td>Other -</td>
<td></td>
</tr>
</tbody>
</table>

ARE ALL OPTIONS LISTED ON "WINDOW STICKER" PRESENT ON THE TEST VEHICLE:
(YES/NO) ____ Yes

REMARKS:

RECORDED BY: [Signature]     DATE: 05/23/03

APPROVED BY: [Signature]
DATA SHEET 3
CURB WEIGHT WITH OPTIONS AND NORMAL LOAD

VEHICLE MAKE/MODEL/BODY STYLE: 2003 BUICK RENDEZVOUS MPV
VEHICLE NHTSA NO.: C30106 ; VIN: 3G5DA03E035560384
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 05/23/03

Full Fluid Levels:
Fuel Full ; Coolant Full ; Other Fluids Full

Tire Pressure:
LF 240 KPA (35 psi) LR 240 KPA (35 psi)
RF 240 KPA (35 psi) RR 240 KPA (35 psi)

A. MEASURED CURB WEIGHT WITH INSTALLED OPTIONS AND ACCESSORIES

<table>
<thead>
<tr>
<th></th>
<th>LF</th>
<th>KG (1154 LB)</th>
<th>LR</th>
<th>KG (788 LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>523</td>
<td></td>
<td>357</td>
<td></td>
</tr>
<tr>
<td></td>
<td>529</td>
<td>KG (1167 LB)</td>
<td>350</td>
<td>KG (771 LB)</td>
</tr>
</tbody>
</table>

Front Axle 1053 KG (2321 LB) Rear Axle 707 KG (1559 LB)

Total Vehicle 1780 KG (3880 LB)

B. MEASURED VEHICLE WEIGHT IN NORMAL LOAD CONDITION

(1) Seating Capacity (from Tire Information Placard) = N/A
Seating Capacity (# of belted seating positions) = 5

(2) Normal Load # of Occupants from Appendix
Occupant Distribution: Front Seat- 2 Second Seat- 1
Third Seat - N/A Fourth Seat- N/A

(3) Total Normal Occupant Load 204 KG (450 LB)
(# of occupants x 68 KG per occupant)

(4) Measured Normal Load on each Wheel and Axles (Sum)

<table>
<thead>
<tr>
<th></th>
<th>LF</th>
<th>KG (1266 LB)</th>
<th>LR</th>
<th>KG (898 LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>574</td>
<td></td>
<td>407</td>
<td></td>
</tr>
<tr>
<td></td>
<td>582</td>
<td>KG (1283 LB)</td>
<td>401</td>
<td>KG (883 LB)</td>
</tr>
</tbody>
</table>

Frt Axle 1156 KG (2549 LB) Rr Axle 808 KG (1781 LB)

Total Vehicle 1964 KG (4330 LB)
(5) Calculated Vehicle Normal Load on the Tire
   Front Tires (measured front axle normal load/2) = 578 KG (1275 LB)
   Rear Tires (measured front axle normal load/2) = 404 KG (891 LB)

(6) High Speed Test Load from ( ) FMVSS 109 (S5.5), or (X) FMVSS 118 (S7.4)

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Installed Tire Size</td>
<td>P215/70R16</td>
<td>P215/70R16</td>
</tr>
<tr>
<td>Max. Load Rating on Sidewall</td>
<td>775 KG(1709 LBS)</td>
<td>775 KG(1709 LBS)</td>
</tr>
<tr>
<td>Reduced Sidewall Load Rating (if applicable)*</td>
<td>705 KG(1554 LBS)</td>
<td>705 KG(1554 LBS)</td>
</tr>
<tr>
<td>High Speed Test Load (88% of sidewall max. load rating)</td>
<td>620 KG(1368 LBS)</td>
<td>620 KG(1368 LBS)</td>
</tr>
<tr>
<td>(b) Optional Tire Size(s)</td>
<td>NONE</td>
<td>NONE</td>
</tr>
</tbody>
</table>

* If a passenger car tire is installed on a multipurpose passenger vehicle (MPV), truck or bus, the tire's load rating shall be reduced by dividing by 1.10.

REMARKS: The Vehicle Normal Load on the Tire is not greater than the High Speed Test Load.

RECORDED BY: [Signature]  DATE: 05/23/03
APPROVED BY: [Signature]
DATA SHEET 4
TIRE INFORMATION LABEL OR PLACARD

VEHICLE MAKE/MODEL/BODY STYLE: 2003 BUICK RENDEZVOUS MPV
VEHICLE NHTSA NO.: C30106
VIN: 3G5DA03E03S560384
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 05/23/03

A. Vehicle Type from Certification Label: MPV

B. Identify Vehicle Labeling:

Vehicle has a combined Certification Tire Information Label. (X) Yes ( ) No
Is Label Permanently Affixed: (X) Yes ( ) No
Label Location: Inside Driver's Side Door Jam
Description of Label: White/Black Sticker

Vehicle has a separate Tire Information Label or Placard ( ) Yes (X) No
Is Label Permanently Affixed: ( ) Yes ( ) No
Label Location: Description of Label:

C. Enter Information from Combined or Separate Tire Information Label/Placard

Vehicle Capacity Weight - N/A (see remarks)

Designated Seating Capacity (DSC) - N/A (see remarks)
Expressed In—
(1) Total No. of Occupants ( ) Yes ( ) No
(2) Terms of Occupants for Each Seat Location ( ) Yes ( ) No

Manufacturer’s Recommended Tire Size(s) and Cold Tire Inflation Pressure(s) for Maximum Load Vehicle Weight:

P215/70R16
FRONT - 240 kPa (35 psi)
REAR - 240 kPa (35 psi)

Manufacturer’s Recommended Tire Size(s) and Cold Tire Inflation Pressure(s) for Other Load Conditions: NONE

REMARKS: The vehicle labeling requirements of FMVSS 120 for an MPV do not include Vehicle Capacity Weight (VCW) or Designated Seating Capacity (DSP) as required by FMVSS 110 passenger car labeling.

RECORDED BY: [Signature] DATE: 05/23/03
APPROVED BY: [Signature]
DATA SHEET 5
VEHICLE TIRE DATA

VEHICLE MAKE/MODEL/BODY STYLE: 2003 BUICK RENDEZVOUS MPV
VEHICLE NHTSA NO.: C30106; VIN: 3G5DA03E03S560384
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 05/23/03

All tires on the vehicle are the same size: (Yes/No) Yes

INFORMATION FROM TIRE SIDEWALL:

Right Front Tire

Tire Size Designation: __ P215/70R16 __
Tire Load Index/Speed Symbol: 99S
Maximum Inflation Pressure: 300 kPa (44 psi)
Maximum Load Rating: 775 KG (1709 LBS.)
Mfr. Name or Brand & Code: FIRESTONE AFFINITY
Tube or Tubeless: TUBELESS
Treadwear/Traction/Temp. Grades: 400/B/B
Sidewall (Plies & Composition): 1 PLY POLYESTER
Tread (Plies & Composition): 1 PLY POLYESTER
2 PLY STEEL
Serial Number: Right Front - DOT-V609 BHT 4802

Tire has "DOT" markings: (X) YES ( ) NO ( ) UNDETERMINED

REMARKS:

RECORDED BY: ______________________ DATE: 05/23/03
APPROVED BY: ______________________
### TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DESCRIPTION</th>
<th>MODEL/ SERIAL NO.</th>
<th>CAL. DATE</th>
<th>NEXT CAL. DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAD SCALES</td>
<td>#1 199744LF</td>
<td>199744LF</td>
<td>06/02</td>
<td>06/03</td>
</tr>
<tr>
<td></td>
<td>#2 199744RF</td>
<td>199744RF</td>
<td>06/02</td>
<td>06/03</td>
</tr>
<tr>
<td></td>
<td>#3 199744LR</td>
<td>199744LR</td>
<td>06/02</td>
<td>06/03</td>
</tr>
<tr>
<td></td>
<td>#4 199744RR</td>
<td>199744RR</td>
<td>06/02</td>
<td>06/03</td>
</tr>
<tr>
<td>PRESSURE GAGE</td>
<td>WESKLER</td>
<td>0-100</td>
<td>05/03</td>
<td>05/04</td>
</tr>
<tr>
<td>SURFACE LEVEL</td>
<td>GTL</td>
<td>N/A</td>
<td>BEFORE USE</td>
<td>BEFORE USE</td>
</tr>
</tbody>
</table>
SECTION 5
PHOTOGRAPHS
THE VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 3G5DA08E03S569394

<table>
<thead>
<tr>
<th>MODEL YEAR</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIRE SIZE</td>
<td>225/60R16</td>
</tr>
<tr>
<td>SPEED LIMIT</td>
<td>105 MPH</td>
</tr>
<tr>
<td>COLD TIRE PRESSURE</td>
<td></td>
</tr>
<tr>
<td>FT</td>
<td>240 KPA (35 PSI)</td>
</tr>
<tr>
<td>R</td>
<td>240 KPA (35 PSI)</td>
</tr>
<tr>
<td>EA</td>
<td>240 KPA (35 PSI)</td>
</tr>
<tr>
<td>IAT</td>
<td>420 KPA (62 PSI)</td>
</tr>
</tbody>
</table>

GET OWNER'S MANUAL FOR MORE INFORMATION.

2003 BUICK RENDEZVOUS
NHTSA NO. C30106
FMVSS NO. 110 (INDICANT)

FIGURE 5.2
VEHICLE'S CERTIFICATION AND TIRE INFORMATION LABEL
## APPENDIX

Table 1 – Occupant Loading and Distribution for Vehicle Normal Load for Various Designated Seating Capacities

<table>
<thead>
<tr>
<th>Designated Seating Capacities, numbers of Occupants</th>
<th>Vehicle normal load, number of occupants</th>
<th>Occupant distribution in a normally loaded vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 through 4</td>
<td>2</td>
<td>2 in front</td>
</tr>
<tr>
<td>5 through 10</td>
<td>3</td>
<td>2 in front, 1 in second seat</td>
</tr>
<tr>
<td>11 through 15</td>
<td>5</td>
<td>2 in front, 1 in second seat, 1 in third seat, 1 in fourth seat</td>
</tr>
<tr>
<td>16 through 22</td>
<td>7</td>
<td>2 in front, 2 in second seat, 2 in third seat, 1 in fourth seat</td>
</tr>
</tbody>
</table>

NOTE: For the indicant test each seat was adjusted to its full down and mid forward to aft position with the seat back adjusted to a 25° reclined angle. Each designated seat position was ballasted with 54 KC (120 LBS) in the seat and 14 KG (30 LBS) on the floor directly in front of the respective seat position.