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

AUTO ALLIANCE INTERNATIONAL, INC
FOR
MAZDA MOTOR CORPORATION
2003 MAZDA 6, 4 DOOR PASSENGER CAR
NHTSA NO. C35401

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

SEPTEMBER 03, 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
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<tbody>
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<td>110(IND)-GTL-03-001</td>
<td></td>
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</table>

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<table>
<thead>
<tr>
<th>7. Author(s)</th>
<th>8. Performing Organ. Rep#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant Farrand, Project Engineer</td>
<td>GTL-DOT-03-110(INDICANT)-001</td>
</tr>
<tr>
<td>Debbie Messick, Project Manager</td>
<td></td>
</tr>
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<table>
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<th>9. Performing Organization Name and Address</th>
<th>10. Work Unit No. (TRAIS)</th>
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<tr>
<td>General Testing Laboratories, Inc.</td>
<td></td>
</tr>
<tr>
<td>1623 Leedstown Road</td>
<td></td>
</tr>
<tr>
<td>Colonial Beach, Va 22443</td>
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<table>
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<th>11. Contract or Grant No.</th>
<th>12. Sponsoring Agency Name and Address</th>
<th>13. Type of Report and Period Covered</th>
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<td></td>
<td>U.S. Department of Transportation</td>
<td>Final Test Report</td>
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<td>Safety Enforcement</td>
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<td></td>
<td>Office of Vehicle Safety Compliance (NVS-220)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 7th street, S.W., Room 6111</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Washington, DC 20590</td>
<td></td>
</tr>
</tbody>
</table>

15. Supplementary Notes

16. Abstract
This test was conducted on the subject, 2003 Mazda 6, 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.

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APPENDIX – Normal Load Occupation Distribution
SECTION 1

INTRODUCTION

1.0 PURPOSE OF INDICANT TESTING

A 2003 Mazda 6 4-door passenger car 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 Mazda 6 4-door passenger car. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 1YVFP80C335M20688

B. NHTSA No.: C35401

C. Manufacturer: AUTO ALLIANCE INTERNATIONAL FOR MAZDA MOTOR CORPORATION

D. Manufacture Date: 01/03

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 indicator test did not include any other requirements in FMVSS 110.

2.1 SUMMARY OF RESULTS

Test results are provided in Section 3.
SECTION 3
TEST DATA
DATA SHEET 1
SUMMARY

VEHICLE MAKE/MODEL/BODY STYLE: 2003 MAZDA 6 4-DOOR PASSENGER CAR
VEHICLE NHTSA NO.: C35401  VIN: 1YVFP80C335M20688
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.  

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.  

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).  

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).

REMARKS:

RECORDED BY: M. A. Aker  DATE: 05/23/03
APPROVED BY: D. W. M. Aker
DATA SHEET 2
TEST VEHICLE INFORMATION/RECEIVING INSPECTION

LABORATORY: GENERAL TESTING LABORATORIES

DATE: 05/23/03

VEHICLE MODEL YEAR/MAKE/MODEL/BODY STYLE: 2003 MAZDA 6, 4-DOOR

MANUFACTURE DATE: 01/03  NHTSA NO: C35401  BODY COLOR: PERMANENT WHITE

VIN: 1YVFP60C335M20588  VEHICLE TYPE: PASSENGER CAR

GVWR 1958 kg (4317 lbs)  GAWR(Fr) 1070 kg (2359 lbs)  GAWR(Rr) 888 kg (1958 lbs)

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

ENGINE DATA: ___ Cylinders 2.3 Liters  ___ Cubic inches

TRANSMISSION DATA:  X Automatic  ___ Manual  ___ No. of Speeds

FINAL DRIVE DATA:  ___ Rear Drive  ___ Front Drive  ___ 4 Wheel Drive

INSTALLED TIRE DATA: Size - P205/60R16  Mfr. - MICHELIN

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

<table>
<thead>
<tr>
<th></th>
<th>Air Conditioning</th>
<th>Traction Control</th>
<th>X</th>
<th>Clock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tinted Glass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X Power Steering</td>
<td>X Cruise Control</td>
<td></td>
<td></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></td>
<td>Power Door Locks</td>
<td>Sun Roof or T-Top</td>
<td>X</td>
<td>Passenger Air Bag</td>
</tr>
<tr>
<td>X</td>
<td>Power Seat Driver Side</td>
<td>X Tachometer</td>
<td>X</td>
<td>Front Disc Brakes</td>
</tr>
<tr>
<td></td>
<td>Power Brakes</td>
<td>X Tilt Steering Wheel</td>
<td></td>
<td>Rear Disc Brakes</td>
</tr>
<tr>
<td></td>
<td>Antilock Brake System</td>
<td>X AM/FM/CD</td>
<td></td>
<td>Other -</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 MAZDA 6 4-DOOR PASSENGER CAR  
**VEHICLE NHTSA NO.:** C35401  
**VIN:** 1YVFP80C335M20688  
**LABORATORY:** GENERAL TESTING LABORATORIES  
**TEST DATE:** 05/23/03

**Full Fluid Levels:**  
Fuel _____ Full ___; Coolant _____ Full ___; Other Fluids _____ Full ___

**Tire Pressure:**  
LF 220 KPA (32 psi)  
RF 220 KPA (32 psi)  
LR 220 KPA (32 psi)  
RR 220 KPA (32 psi)

**A. MEASURED CURB WEIGHT WITH INSTALLED OPTIONS AND ACCESSORIES**

<table>
<thead>
<tr>
<th></th>
<th>LF</th>
<th>KG (953 LB)</th>
<th>LR</th>
<th>KG (630 LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>432</td>
<td></td>
<td>286</td>
<td></td>
</tr>
<tr>
<td>RF</td>
<td>418</td>
<td></td>
<td>285</td>
<td></td>
</tr>
<tr>
<td>Front Axle</td>
<td>851</td>
<td></td>
<td>Rear Axle</td>
<td>571</td>
</tr>
<tr>
<td>Total Vehicle</td>
<td>1422</td>
<td>KG (3134 LB)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**B. MEASURED VEHICLE WEIGHT IN NORMAL LOAD CONDITION**

1. Seating Capacity (from Tire Information Placard) = 5  
   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)  
   LF 481 KG (1060 LB)  
   RF 463 KG (1020 LB)  
   LR 342 KG (755 LB)  
   RR 340 KG (749 LB)  
   Ft Axle 943 KG (2080 LB)  
   Rr Axle 682 KG (1504 LB)

   Total Vehicle 1626 KG (3584 LB)
DATA SHEET 3 – CONTINUED

(5) Calculated Vehicle Normal Load on the Tire
Front Tires (measured front axle normal load/2) = 472 KG (1040 LB)
Rear Tires (measured front axle normal load/2) = 341 KG (752 LB)

(6) High Speed Test Load from (X) FMVSS 109 (S5.5), or ( ) FMVSS 119 (S7.4)

Front | Rear
--- | ---
Installed Tire Size | P205/60R16 | P205/60R16
Max. Load Rating on Sidewall | 615 KG(1356 LBS) | 615 KG(1356 LBS)
Reduced Sidewall Load Rating | N/A | N/A
(if applicable)*

High Speed Test Load
(88\% of sidewall max. load rating)

Front | Rear
--- | ---
541 KG(1193 LBS) | 541 KG(1193 LBS)

(b) Optional Tire Size(s) | P215/50R17 93V | P215/50R17 93V
Max. Load Rating on Sidewall (from 2003 Tire and Rim Association Yearbook)
650 KG (1433 LBS) | 650 KG (1433 LBS)
Reduced Sidewall Load Rating (if applicable)*
N/A | N/A

High Speed Test Load
(88\% of sidewall max. load rating)

Front | Rear
--- | ---
572 KG(1261 LBS) | 572 KG(1261 LBS)

* 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 MAZDA 6 4-DOOR PASSENGER CAR
VEHICLE NHTSA NO.: C35401 VIN: 1YVFP80C33M20688
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 05/23/03

A. Vehicle Type from Certification Label: Passenger Car

B. Identify Vehicle Labeling:

Vehicle has a combined Certification Tire Information Label ( ) Yes (X) No
Is Label Permanently Affixed: ( ) Yes ( ) No
Label Location:
Description of Label: ____________________________________________

Vehicle has a separate Tire Information Label or Placard (X) Yes ( ) No
Is Label Permanently Affixed: (X) Yes ( ) No
Label Location: Driver's Side Lower B Pillar
Description of Label: White/Black Sticker

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

Vehicle Capacity Weight - 385 KG (850 LBS)

Designated Seating Capacity (DSC) - 5
Expressed In—
(1) Total No. of Occupants (X) Yes ( ) No
(2) Terms of Occupants for Each Seat Location (X) Yes ( ) No

Manufacturer's Recommended Tire Size and Cold Tire Inflation Pressure For Maximum Load Vehicle Weight:

P205/60R16
FRONT - 220 kPa (32 psi)
REAR - 220 kPa (32 psi)

P215/50R17
FRONT - 220 kPa (32 psi)
REAR - 220 kPa (32 psi)

Manufacturer's Recommended Tire Size and Cold Tire Inflation Pressure For Other Load Conditions: NONE

REMARKS:

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

VEHICLE MAKE/MODEL/BODY STYLE: 2003 MAZDA 6 4-DOOR PASSENGER CAR  
VEHICLE NHTSA NO.: C35401  
VIN: 1YVFP80C335M20688  
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:

<table>
<thead>
<tr>
<th>Tire Size Designation</th>
<th>P205/50R16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tire Load Index/Speed Symbol</td>
<td>91H</td>
</tr>
<tr>
<td>Maximum Inflation Pressure</td>
<td>300 kPa (44 psi)</td>
</tr>
<tr>
<td>Maximum Load Rating</td>
<td>615 KG (1356 LBS.)</td>
</tr>
<tr>
<td>Mfr. Name or Brand &amp; Code</td>
<td>MICHELIN ENERGY</td>
</tr>
<tr>
<td>Tube or Tubeless</td>
<td>TUBELESS</td>
</tr>
<tr>
<td>Treadwear/Traction/Temp. Grades</td>
<td>400/A/A</td>
</tr>
<tr>
<td>Sidewall (Plies &amp; Composition)</td>
<td>2 PLY POLYESTER</td>
</tr>
<tr>
<td>Tread (Plies &amp; Composition)</td>
<td>2 PLY POLYESTER</td>
</tr>
<tr>
<td></td>
<td>1 PLY POLYAMIDE</td>
</tr>
<tr>
<td></td>
<td>2 PLY STEEL</td>
</tr>
</tbody>
</table>

Serial Number: Right Front - DOT-APXV W1MX 0103

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

REMARKS:

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

APPROVED BY: [Signature]
## SECTION 4
### INSTRUMENTATION AND EQUIPMENT LIST

#### 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>
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</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>08/03</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
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 KG (120 LBS) in the seat and 14 KG (30 LBS) on the floor directly in front of the respective seat position.