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

TRANSPORTATION, DESIGN AND MANUFACTURING, INC.
2003 FORD E350 XLT SUPER DUTY 11 PASSENGER VAN
NHTSA NO. C30209

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

OCTOBER 27, 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 6111 (NVS-228)
WASHINGTON, D.C. 20590
This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: Dellie Messick
Approved By: Alan Ayer
Approval Date: 10/27/03

FINAL REPORT ACCEPTANCE BY OVSC:
Accepted By: [Signature]
Acceptance Date: 10/28/03
1. Report No. 110(IND)-GTL-03-039
2. Government Accession No. 
3. Recipient's Catalog No. 

4. Title and Subtitle

5. Report Date
October 27, 2003

GTL

7. Author(s)
Grant Farrand, Project Engineer
Debbie Messick, Project Manager

8. Performing Organ. Rcp#
GTL-DOT-03-110(INDICANT)-039

9. Performing Organization Name and Address
General Testing Laboratories, Inc.
1623 Leedstown Road
Colonial Beach, Va 22443

10. Work Unit No. (TRAIS)

11. Contract or Grant No.
DTNH22-01-C-11025

12. Sponsoring Agency Name and Address
U.S. Department of Transportation
Safety Enforcement
Office of Vehicle Safety Compliance (NVS-220)
400 7th Street, S.W., Room 6111
Washington, DC 20590

13. Type of Report and Period Covered
Final Test Report
June 04, 2003

NVS-120 & NVS 220

15. Supplementary Notes

16. Abstract
This test was conducted on the subject 2003 Ford E350 XLT Super Duty Van 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.

17. Key Words
Vehicle Testing
Safety Engineering
FMVSS 110

18. Distribution Statement
Copies of this report are available from NHTSA NHTSA Technical Reference Div., Rm. 5108 (NPO-230)
400 7th St., S.W. Washington, DC 20590
Telephone No. (202) 366-4946

19. Security Classif. (of this report)
UNCLASSIFIED

20. Security Classif. (of this page)
UNCLASSIFIED

21. No. of Pages
27

22. Price

Form DOT F 1700.7 (8-72)
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
</tr>
</tbody>
</table>

5.1 ¾ Frontal View of Vehicle  
5.2 Incomplete Vehicle Manufacturer Label  
5.3 Manufacturer Label  
5.4 Tire Showing Brand  
5.5 Tire Showing Model  
5.6 Tire Showing Size, Load Index and Speed Symbol  
5.7 Tire Showing Max Load Rating  
5.8 Tire Showing Max Inflation Pressure  
5.9 Vehicle Ballasted to Simulate Normal Load Condition Part 1  
5.10 Vehicle Ballasted to Simulate Normal Load Condition Part 2  
5.11 Vehicle Ballasted to Simulate Normal Load Condition Part 3

APPENDIX – Normal Load Occupation Distribution
SECTION 1

INTRODUCTION

1.0 PURPOSE OF INDICANT TEST

A 2003 Transportation, Design and Manufacturing, Inc. (TDM), Ford E350 XLT Super Duty Van 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 TDM Ford E350 XLT Super Duty Van. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 1FDNE31S83HA76088

B. NHTSA No.: C30209

C. Manufacturer: TRANSPORATION, DESIGN AND MANUFACTURING INC.

D. Manufacture Date: 03/03

1.2 TEST DATE

The test vehicle was subjected to testing on June 04, 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 TDM Ford E350 XLT 11 passenger van is a bus 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 TDM FORD E350 11 PSGR. VAN
VEHICLE NHTSA NO.: C30209 VIN: 1FDNE31S83HA76088
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 06/04/03

REQUIREMENT

YES/NO

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). NO (See Remarks)

REMARKS: TDM, the final stage manufacturer, attached an incorrect final stage manufacturer certification label to this vehicle (see figure 5.3). TDM was contacted and plans to issue a revised combined certification and tire information label as required by 49CFR Part 567 Certification, and FMVSS 120. Tire selection and rims for motor vehicles other than passenger cars. The vehicle rating, axle ratings, tire size and inflation pressure specified on the attached Ford Incomplete vehicle label are correct data for this vehicle.

RECORDED BY: A. AYB DATE: 06/04/03
APPROVED BY: D. MARET
DATA SHEET 2  
TEST VEHICLE INFORMATION/RECEIVING INSPECTION

LABORATORY: GENERAL TESTING LABORATORIES  DATE: 00/04/03

VEHICLE MODEL YEAR/MAKE/MODEL/BODY STYLE: 2003 TDM FORD E350 11 PSGR. VAN

MANUFACTURE DATE: 03/03  NHTSA NO.: C30209  BODY COLOR: WHITE

VIN: 1FDNE31S83HA76088  VEHICLE TYPE: BUS

GVWR 3946 kg (8700 lbs)  GAWR(Fr) 1837 kg (4050 lbs)  GAWR(Rr) 2431 kg (5360 lbs)

BELTED SEATING POSITIONS: FRONT 2  MID 2  REAR 3  OTHER 4

ENGINE DATA: 10 Cylinders 6.8 Liters  ___ Cubic inches

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

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

INSTALLED TIRE DATA: Size: LT245/75R16  Mfr. - GOODYEAR WRANGLER

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

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

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

REMARKS: According to the representatives at TDM, the vehicle and axle ratings on Ford's Incomplete vehicle label are the correct ratings for this vehicle.

RECORDED BY: [Signature]  DATE: 06/04/03

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

VEHICLE MAKE/MODEL/BODY STYLE: 2003 TDM FORD E350 11 PSGR. VAN
VEHICLE NHTSA NO.: C30209
VIN: 1FDNE31S63HA70086
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 06/04/03

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

Tire Pressure:
LF 415 KPA (60 psi) LR 550 KPA (80 psi)
RF 415 KPA (60 psi) RR 550 KPA (80 psi)

A. MEASURED CURB WEIGHT WITH INSTALLED OPTIONS AND ACCESSORIES

<table>
<thead>
<tr>
<th></th>
<th>LF 731 KG (1611 LB)</th>
<th>LR 680 KG (1499 LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RF 727 KG (1603 LB)</td>
<td>RR 654 KG (1441 LB)</td>
</tr>
<tr>
<td>Front Axle</td>
<td>1458 KG (3214 LB)</td>
<td>Rear Axle</td>
</tr>
<tr>
<td>Total Vehicle</td>
<td>2791 KG (6154 LB)</td>
<td></td>
</tr>
</tbody>
</table>

B. MEASURED VEHICLE WEIGHT IN NORMAL LOAD CONDITION

(1) Seating Capacity (from Tire Information Placard) = \_\_\_\_ N/A
Seating Capacity (# of belted seating positions) = \_\_\_\_ 11

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

(3) Total Normal Occupant Load \_\_\_\_ 340 KG (750 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 799 KG (1781 LB)</th>
<th>LR 784 KG (1728 LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RF 797 KG (1758 LB)</td>
<td>RR 751 KG (1655 LB)</td>
</tr>
<tr>
<td>Frt Axle</td>
<td>1536 KG (3519 LB)</td>
<td>Rr Axle</td>
</tr>
<tr>
<td>Total Vehicle</td>
<td>3131 KG (6902 LB)</td>
<td></td>
</tr>
</tbody>
</table>
(5) Calculated Vehicle Normal Load on the Tire
Front Tires (measured front axle normal load/2) = 798 KG (1750 LB)
Rear Tires (measured front axle normal load/2) = 767 KG (1681 LB)

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

<table>
<thead>
<tr>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed Tire Size</td>
<td>LT245/75R16</td>
</tr>
<tr>
<td>Max. Load Rating on Sidewall</td>
<td>1380KG (3042 LBS)</td>
</tr>
<tr>
<td>Reduced Sidewall Load Rating (if applicable)*</td>
<td>N/A</td>
</tr>
<tr>
<td>High Speed Test Load (88% of sidewall max. load rating)</td>
<td>1214KG (2677 LBS)</td>
</tr>
<tr>
<td>Optional Tire Size(s)</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: A. Ayly DATE: 06/04/03
APPROVED BY: D. Mersa
DATA SHEET 4
TIRE INFORMATION LABEL OR PLACARD

VEHICLE MAKE/MODEL/BODY STYLE: 2003 TDM FORD E350 11 PSGR. VAN
VEHICLE NHTSA NO.: G30209; VIN: 1FDNE31S83HA76088
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 06/04/03

A. Vehicle Type from Certification Label: BUS (See Remarks)

B. Identify Vehicle Labeling:
   Vehicle has a combined Certification Tire Information Label ( ) Yes (X) No (See Remarks)
   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:

   LT245/75R16  FRONT - 415 kPa (60 psi)
   REAR - 550 kPa (80 psi)

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

REMARKS: TDM, the final stage manufacturer, attached an incorrect final stage manufacturer certification label to this vehicle (see figure 5.3). TDM was contacted and plans to issue a revised combined certification and tire information label as required by 49 CFR Part 567 Certification, and FMVSS 120, Tire selection and rims for motor vehicles other than passenger cars. The vehicle rating, axle ratings, tire size and inflation pressure specified on the attached Ford Incomplete vehicle label are correct data for this vehicle.

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

RECORDED BY: A. ___________________ DATE: 06/04/03
APPROVED BY: D. ___________________
DATA SHEET 5
VEHICLE TIRE DATA

VEHICLE MAKE/MODEL/BODY STYLE: 2003 TDM FORD E350 11 PSGR. VAN
VEHICLE NHTSA NO.: G30209 ; VIN: 1FDNE31S83HA76088
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 06/04/03

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

INFORMATION FROM TIRE SIDEWALL:

Right Front Tire

Tire Size Designation

Tire Load Index/Speed Symbol

Maximum Inflation Pressure

Maximum Load Rating

Mfr. Name or Brand & Code

Tube or Tubeless

Treadwear/Traction/Temp. Grades

Sidewall (Plies & Composition)

Tread (Plies & Composition)

Serial Number: Right Front - DOT MD11 MMMY 0403

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

REMARKS:

RECORDED BY: A. [Signature] DATE: 06/04/03
APPROVED BY: D. [Signature]
# Section 4

## Instrumentation and 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>02/03</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
2003 FORD E350 XLT 11 PASSENGER BUS
NHTSA NO. C30209
FMVSS NO. 110 (INDICANT)

FIGURE 5.3
MANUFACTURER LABEL
2003 FORD E350 XLT 11 PASSENGER BUS
NHTSA NO. C30209
FMVSS NO. 110 (INDICANT)

FIGURE 5.6
TIRES SHOWNING SIZE, LOAD INDEX AND SPEED SYMBOL
2003 FORD E350 XLT 11 PASSENGER BUS
NHTSA NO. C36209
FMVSS NO. 110 (INDICANT)

FIGURE 5.9
VEHICLE BALLASTED TO SIMULATE NORMAL LOAD CONDITION (PART 1)
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 indiact 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.