

REPORT NUMBER 110(IND)-GTL-03-039

**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-220)
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 Messich
Approved By: Alan Auh By DEM
Approval Date: 10/27/03

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: John J. [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 Final Report of FMVSS 110 (Indicant) Test of 2003 TRANSPORTATION, DESIGN AND MANUFACTURING, INC. FORD E350 XLT SUPER DUTY VAN NHTSA No. C30209	5. Report Date October 27, 2003	6. Performing Organ. Code GTL
	7. Author(s) Grant Farrand, Project Engineer Debbie Messick, Project Manager	8. Performing Organ. Rep# 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. (TR AIS)	
	11. Contract or Grant No. DTNH22-01-C-11025	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Admin. Safety Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 7 th Street, S.W., Room 6111 Washington, DC 20590	13. Type of Report and Period Covered Final Test Report June 04, 2003	
	14. Sponsoring Agency Code 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 7 th St., S.W. Washington, DC 20590 Telephone No. (202) 366-4946	
19. Security Classif. (of this report) UNCLASSIFIED	21. No. of Pages 27	22. Price
20. Security Classif. (of this page) UNCLASSIFIED		

TABLE OF CONTENTS

SECTION		PAGE
1	Introduction	1
2	Test Procedure and Summary of Results	2
3	Test Data	3
4	Test Equipment List	10
5	Photographs	11
	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: TRANSPORTATION, 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

<u>REQUIREMENT</u>	<u>YES/NO</u>
The vehicle is equipped with tires that meet the requirements of FMVSS 109 or FMVSS 119.	<u>YES</u>
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.	<u>YES</u>
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).	<u>N/A</u>
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).	<u>NO(See Remarks)</u>

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. Ayle

DATE: 06/04/03

APPROVED BY: D. Merrill

DATA SHEET 2
TEST VEHICLE INFORMATION/RECEIVING INSPECTION

LABORATORY: GENERAL TESTING LABORATORIES DATE: 06/04/03

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:

<input checked="" type="checkbox"/>	Air Conditioning		Traction Control	<input checked="" type="checkbox"/>	Clock
	Tinted Glass		All Wheel Drive		Roof Rack
<input checked="" type="checkbox"/>	Power Steering	<input checked="" type="checkbox"/>	Cruise Control	<input checked="" type="checkbox"/>	Console
<input checked="" type="checkbox"/>	Power Windows		Rear Window Defroster	<input checked="" type="checkbox"/>	Driver Air Bag
<input checked="" type="checkbox"/>	Power Door Locks		Sun Roof or T-Top	<input checked="" type="checkbox"/>	Passenger Air Bag
	Power Seat(s)		Tachometer	<input checked="" type="checkbox"/>	Front Disc Brakes
<input checked="" type="checkbox"/>	Power Brakes	<input checked="" type="checkbox"/>	Tilt Steering Wheel	<input checked="" type="checkbox"/>	Rear Disc Brakes
<input checked="" type="checkbox"/>	Antilock Brake System	<input checked="" type="checkbox"/>	AM/FM/CD		Other -

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: A. Aylor

DATE: 06/04/03

APPROVED BY: D. M. [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: 1FDNE31S83HA76088
 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

LF 731 KG (1611 LB) LR 680 KG (1499 LB)
 RF 727 KG (1603 LB) RR 654 KG (1441 LB)
 Front Axle 1458 KG (3214 LB) Rear Axle 1334 KG (2940 LB)
 Total Vehicle 2791 KG (6154 LB)

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)

LF 799 KG (1761 LB) LR 784 KG (1728 LB)
 RF 797 KG (1758 LB) RR 751 KG (1655 LB)
 Frt Axle 1596 KG (3519 LB) Rr Axle 1535 KG (3383 LB)

Total Vehicle 3131 KG (6902 LB)

DATA SHEET 3 – CONTINUED

- (5) Calculated Vehicle Normal Load on the Tire
 Front Tires (measured front axle normal load/2) = $\frac{798}{2}$ KG (1759 LB)
 Rear Tires (measured front axle normal load/2) = $\frac{767}{2}$ KG (1691 LB)

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

	Front	Rear
(a) Installed Tire Size	<u>LT245/75R16</u>	<u>LT245/75R16</u>
Max. Load Rating on Sidewall	<u>1380KG(3042 LBS)</u>	<u>1380KG(3042 LBS)</u>
Reduced Sidewall Load Rating (if applicable)*	<u>N/A</u>	<u>N/A</u>
High Speed Test Load (88% of sidewall max. load rating)	<u>1214KG(2677 LBS)</u>	<u>1214KG(2677 LBS)</u>
(b) Optional Tire Size(s)	<u>NONE</u>	<u>NONE</u>

* 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. ayth

DATE: 06/04/03

APPROVED BY: D. Murr

DATA SHEET 4
TIRE INFORMATION LABEL OR PLACARD

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

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

B. Identify Vehicle Labeling:

Vehicle has a combined Certification Tire Information Label Yes 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 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.

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. Aylh

DATE: 06/04/03

APPROVED BY: D. Mesa

DATA SHEET 5
VEHICLE TIRE DATA

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

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

INFORMATION FROM TIRE SIDEWALL:

Right Front Tire

Tire Size Designation LT245/75R16

Tire Load Index/Speed Symbol 120/116R

Maximum Inflation Pressure 550 kPa (80 psi)

Maximum Load Rating 1380 KG (3042 LBS)

Mfr. Name or Brand & Code GOODYEAR WRANGLER

Tube or Tubeless TUBELESS

Treadwear/Traction/Temp. Grades N/A

Sidewall (Plies & Composition) 2 PLY POLYESTER

Tread (Plies & Composition) 2 PLY POLYESTER
2 PLY STEEL
2 PLY NYLON

Serial Number: Right Front - DOT MD11 MMWV 0403

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

REMARKS:

RECORDED BY: A. Ayth

DATE: 06/04/03

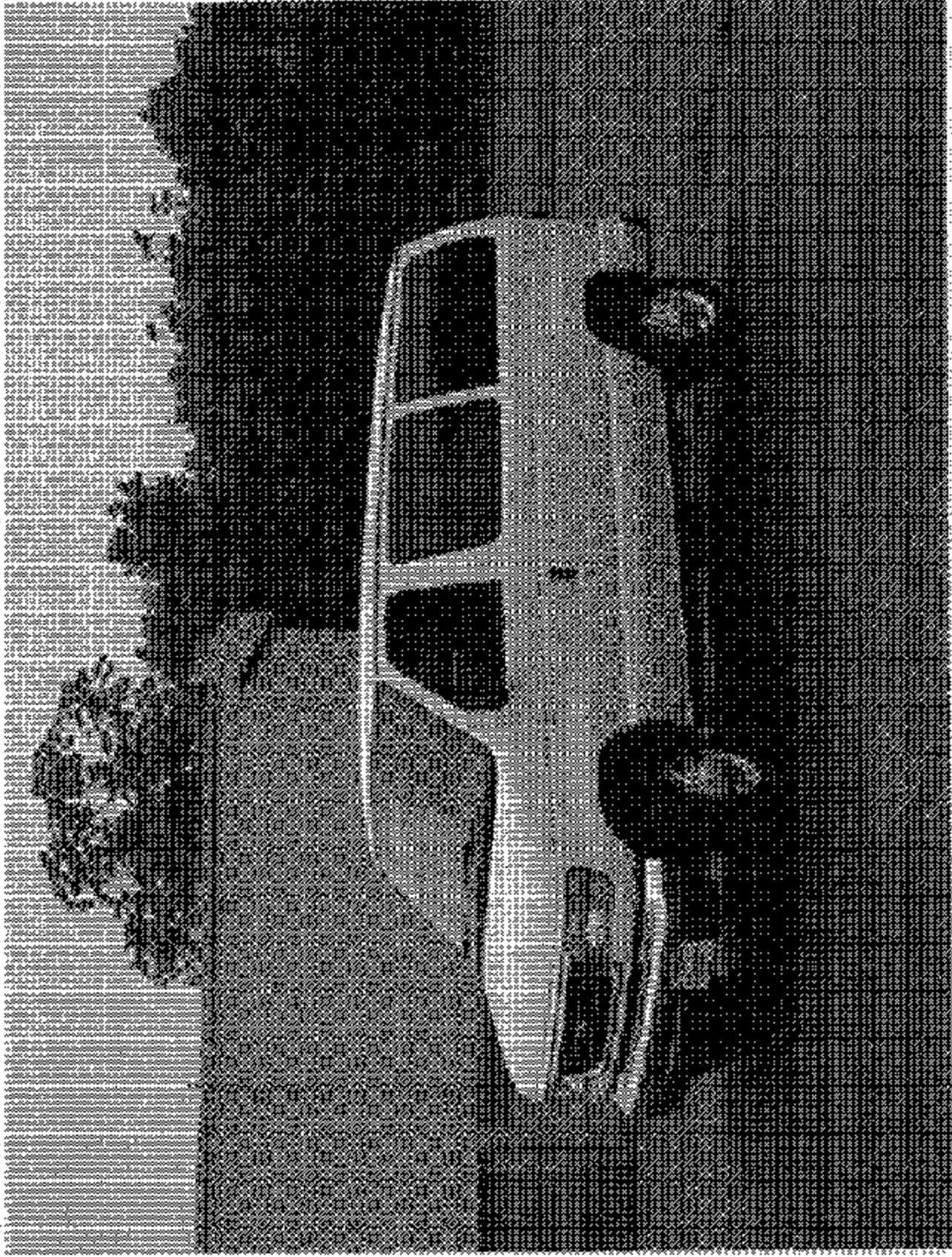
APPROVED BY: D. Messil

SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST

EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
PAD SCALES	#1 199744LF	199744LF	06/02	06/03
	#2 199744RF	199744RF	06/02	06/03
	#3 199744LR	199744LR	06/02	06/03
	#4 199744RR	19974RR	06/02	06/03
PRESSURE GAGE	WESKLER	0-100	02/03	05/04
SURFACE LEVEL	GTL	N/A	BEFORE USE	BEFORE USE

SECTION 5
PHOTOGRAPHS



2008 FORD E350 XLT 11 PASSENGER BUS
NHTSA NO. C30009
FMVSS NO. 110 (INDICANT)

FIGURE 5.1
¾ FRONTAL VIEW OF VEHICLE

INCOMPLETE VEHICLE LABEL BY FORD MOTOR COMPANY
 VIN: 1F0NEG1G821A26008
 MODEL: E350
 YEAR: 2003
 PLANT: WFO
 BODY: 110
 TRAILER: N
 WEIGHT: 11245 LBS
 GVWR: 16375 LBS
 GROSS WEIGHT: 16375 LBS
 GVW: 16375 LBS
 GVWR: 16375 LBS
 GVW: 16375 LBS

2003 FORD E350 XL T11 PASSENGER BUS
 NHTSA NO. C30209
 FMVSS NO. 110 (INDICANT)

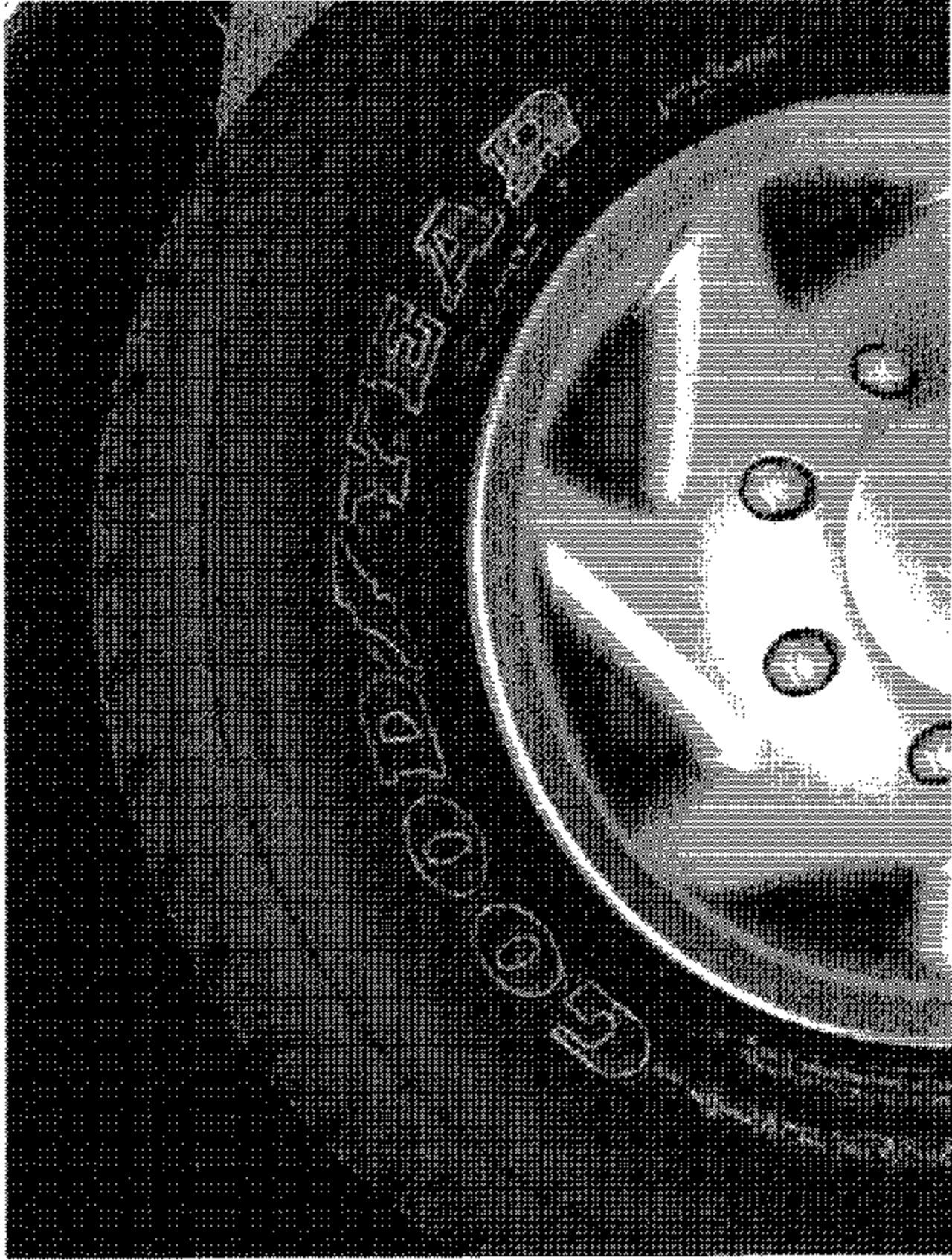


2003 FORD E350 XL T11 PASSENGER BUS
 NHTSA NO. C30209
 FMVSS NO. 110 (INDICANT)

FIGURE 5.2
 INCOMPLETE VEHICLE MANUFACTURER LABEL

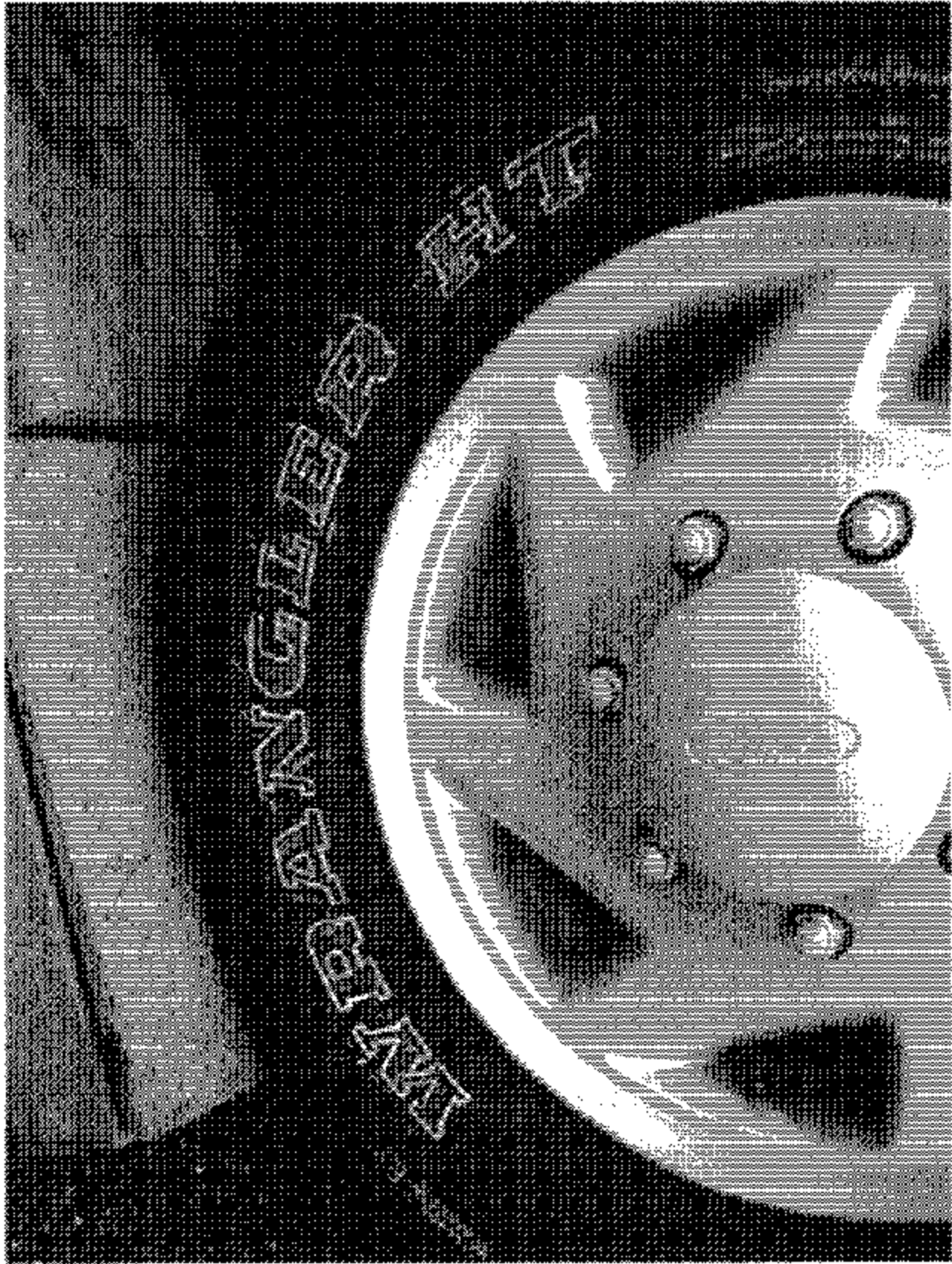
ALL OTHER IDENTIFICATION LABELS
THIS VEHICLE WAS ALTERED BY TRANSPORTATION DESIGN AND MANUFACTURING, PA
AND AS ALTERED, IT CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND EMISSIONS
STANDARDS APPLICABLE BY THE ALLOCATION
EXCESS WEIGHTS WEIGHTS WITHIN WEIGHTS, EXCEEDS EXCEEDS WEIGHTS
EXCEEDS WEIGHTS EXCEEDS WEIGHTS WITHIN WEIGHTS, EXCEEDS EXCEEDS WEIGHTS
EXCEEDS WEIGHTS EXCEEDS WEIGHTS WITHIN WEIGHTS, EXCEEDS EXCEEDS WEIGHTS
VIN 1FDNEE31882HA75088

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



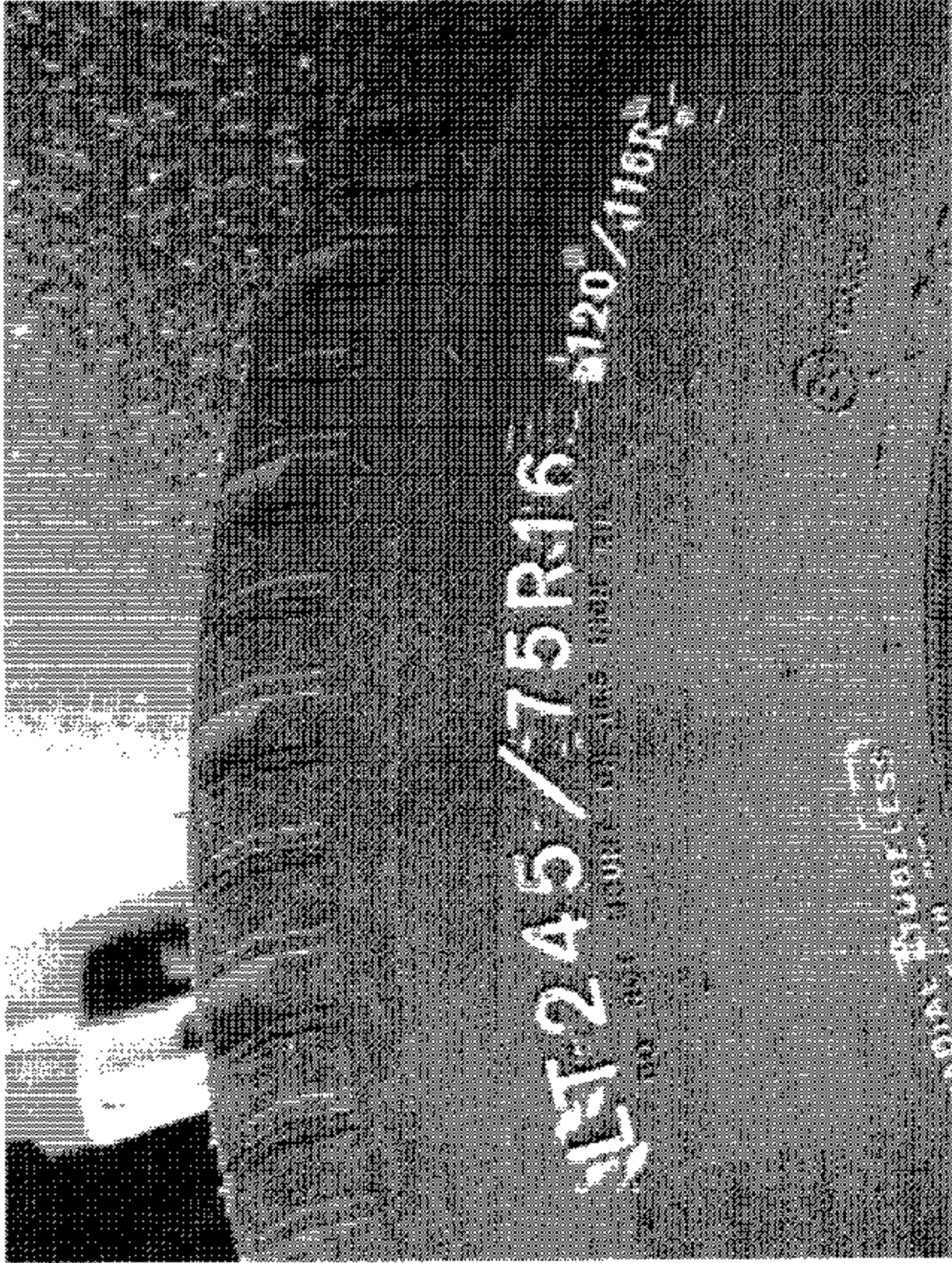
2003 FORD E350 XLT 11 PASSENGER BUS
NHTSA NO. C30208
FMVSS NO. 110 (INDICANT)

FIGURE 6.4
TIRE SHOWING BRAND



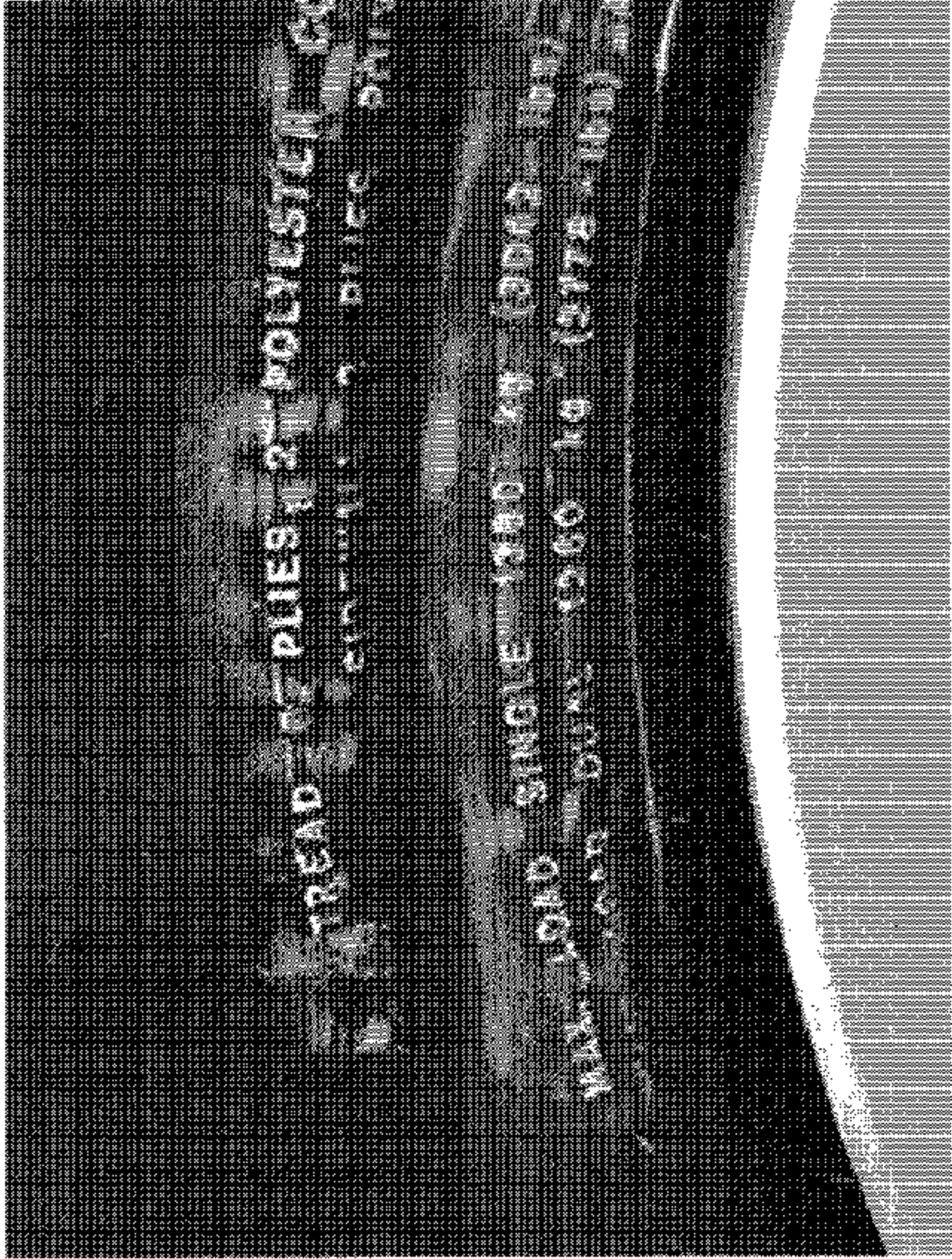
2003 FORD E350 XLT 11 PASSENGER BUS
NHTSA NO. C30209
FMVSS NO. 110 (INDICANT)

FIGURE 5.5
TIRE SHOWING MODEL



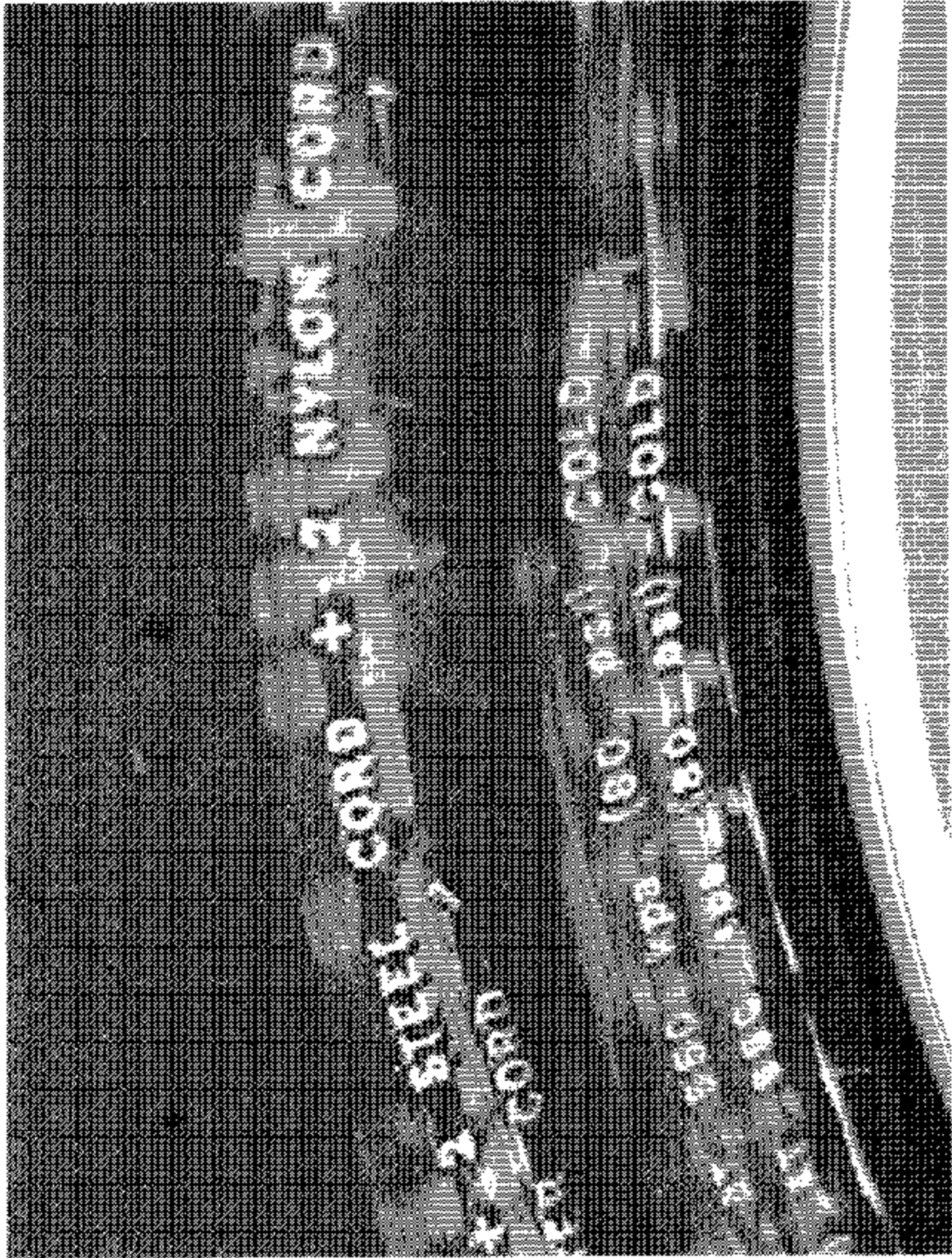
2003 FORD E360 XLT 11 PASSENGER BUS
NHTSA NO. C30209
FMVSS NO. 110 (INDICANT)

FIGURE 5.6
TIRE SHOWING SIZE, LOAD INDEX AND SPEED
SYMBOL



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

FIGURE 6.7
TIRE SHOWING MAX LOAD RATING



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

FIGURE 5.8
TIRE SHOWING MAX INFLATION PRESSURE



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

FIGURE 6.9
VEHICLE BALLASTED TO SIMULATE NORMAL
LOAD CONDITION (PART 1)



2003 FORD E350 XLT 11 PASSENGER BUS
NHTSA NO. C30208
FMVSS NO. 110 (INDICANT)

FIGURE 5.10
VEHICLE BALLASTED TO SIMULATE NORMAL
LOAD CONDITION (PART 2)



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

FIGURE 5.11
VEHICLE BALLASTED TO SIMULATE NORMAL
LOAD CONDITIONS (PART 3)

APPENDIX

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

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

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.