

REPORT NUMBER 110(IND)-GTL-03-014

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

**TOYOTA MOTOR CORPORATION
2003 TOYOTA RAV 4, MPV
NHTSA NO. C35111**

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SEPTEMBER 10, 2003

FINAL REPORT

PREPARED FOR

**U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
SAFETY ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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15. Supplementary Notes		
16. Abstract This test was conducted on the subject 2003 Toyota Rav 4 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.		
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SECTION 1

INTRODUCTION

1.0 PURPOSE OF INDICANT TEST

A 2003 Toyota Rav 4 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 Toyota Rav 4. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: JTEHH20V630222612

B. NHTSA No.: C35111

C. Manufacturer: TOYOTA MOTOR CORPORATION

D. Manufacture Date: 01/03

1.2 TEST DATE

The test vehicle was subjected to testing on June 11, 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 Toyota Rav 4 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 TOYOTA RAV 4 MPV

VEHICLE NHTSA NO.: C35111 ; VIN: JTEHH20V630222612

LABORATORY: GENERAL TESTING LABORATORIES

TEST DATE: 06/11/03

REQUIREMENTYES/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).

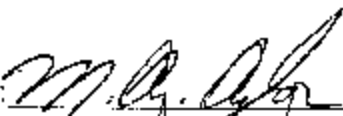
N/A

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).

YES

REMARKS:

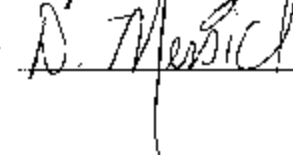
RECORDED BY:



DATE:

06/11/03

APPROVED BY:



DATA SHEET 2 TEST VEHICLE INFORMATION/RECEIVING INSPECTION

LABORATORY: GENERAL TESTING LABORATORIES DATE: 06/11/03

VEHICLE MODEL YEAR/MAKE/MODEL/BODY STYLE: 2003 TOYOTA RAV 4 MPV

MANUFACTURE DATE: 01/03 NHTSA NO.: C35111 BODY COLOR: WHITE

VIN: JTEHH20V630222612 VEHICLE TYPE: MPV

GVWR 1809 kg (3988 lbs) GAWR(Fr) 920 kg (2028 lbs) GAWR(Rr) 1010 kg (2227 lbs)

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

ENGINE DATA: 4 Cylinders 2.0 Liters Cubic Inches

TRANSMISSION DATA: X Automatic Manual 4 No. of Speeds

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

INSTALLED TIRE DATA: Size - P215/70R16 Mfr. - BRIDGESTONE

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

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

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

REMARKS:

RECORDED BY: *[Signature]*

DATE: 06/11/03

APPROVED BY: *[Signature]*

DATA SHEET 3
CURB WEIGHT WITH OPTIONS AND NORMAL LOAD

VEHICLE MAKE/MODEL/BODY STYLE: 2003 TOYOTA RAV 4 MPV

VEHICLE NHTSA NO.: C35111 ; VIN: JTEHH20V630222612

LABORATORY: GENERAL TESTING LABORATORIES

TEST DATE: 06/11/03

Full Fluid Levels:

Fuel Full ; Coolant Full ; Other Fluids Full

Tire Pressure: LF 200 KPA (29 psi) LR 200 KPA (29 psi)
 RF 200 KPA (29 psi) RR 200 KPA (29 psi)

A. MEASURED CURB WEIGHT WITH INSTALLED OPTIONS AND ACCESSORIES

LF <u>409</u> KG (902 LB)	LR <u>293</u> KG (645 LB)
RF <u>385</u> KG (849 LB)	RR <u>321</u> KG (709 LB)
Front Axle <u>794</u> KG (1751 LB)	Rear Axle <u>614</u> KG (1354 LB)
Total Vehicle <u>1408</u> KG (3105 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)

LF <u>452</u> KG (997 LB)	LR <u>351</u> KG (774 LB)
RF <u>430</u> KG (947 LB)	RR <u>376</u> KG (830 LB)
Frt Axle <u>882</u> KG (1944 LB)	Rr Axle <u>728</u> KG (1604 LB)
Total Vehicle <u>1609</u> KG (3548 LB)	

DATA SHEET 3 - CONTINUED

- (5) Calculated Vehicle Normal Load on the Tire
 Front Tires (measured front axle normal load/2) = 441 KG (972 LB)
 Rear Tires (measured front axle normal load/2) = 364 KG (802 LB)

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

	Front	Rear
(a) Installed Tire Size	P215/70R16	P215/70R16
Max. Load Rating on Sidewall	<u>775 KG(1709 LBS)</u>	<u>775 KG(1709 LBS)</u>
Reduced Sidewall Load Rating (if applicable)*	<u>705 KG(1554 LBS)</u>	<u>705 KG(1554 LBS)</u>
High Speed Test Load (88% of sidewall max. load rating)	<u>620 KG(1368 LBS)</u>	<u>620 KG(1368 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: M. D. [Signature]

DATE: 06/11/03

APPROVED BY: D. [Signature]

DATA SHEET 4
TIRE INFORMATION LABEL OR PLACARD

VEHICLE MAKE/MODEL/BODY STYLE: 2003 TOYOTA RAV 4 MPV
 VEHICLE NHTSA NO.: C35111 ; VIN: JTEHH20V630222612
 LABORATORY: GENERAL TESTING LABORATORIES
 TEST DATE: 06/11/03

A. Vehicle Type from Certification Label: MPV

B. Identify Vehicle Labeling:

Vehicle has a combined Certification Tire Information Label ☒ Yes ☐ No
 Is Label Permanently Affixed: ☒ Yes ☐ No
 Label Location: Driver's Side "B" Pillar
 Description of Label: Vinyl

Vehicle has a separate Tire Information Label or Placard ☒ Yes ☐ No
 Is Label Permanently Affixed: ☒ Yes ☐ No
 Label Location: Driver's Side "B" Pillar
 Description of Label: Vinyl

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

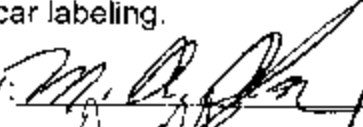
(2) Terms of Occupants for Each Seat Location ☐ Yes ☐ No

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

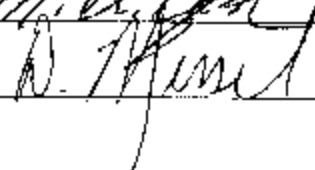
P215/70R16 FRONT - 200 kPa (29 psi)
 REAR - 200 kPa (29 psi)

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: 

DATE: 06/11/03

APPROVED BY: 

**DATA SHEET 5
VEHICLE TIRE DATA**

VEHICLE MAKE/MODEL/BODY STYLE: 2003 TOYOTA RAV 4 MPV
 VEHICLE NHTSA NO.: C35111 ; VIN: JTEHH20V630222612
 LABORATORY: GENERAL TESTING LABORATORIES
 TEST DATE: 06/11/03

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

INFORMATION FROM TIRE SIDEWALL:

Right Front Tire

Tire Size Designation	<u>P215/70R16</u>
Tire Load Index/Speed Symbol	<u>99S</u>
Maximum Inflation Pressure	<u>300 kPa (44 psi)</u>
Maximum Load Rating	<u>775 KG (1709 LBS.)</u>
Mfr. Name or Brand & Code	<u>BRIDGESTONE DUELER</u>
Tube or Tubeless	<u>TUBELESS</u>
Treadwear/Traction/Temp. Grades	<u>300/B/B</u>
Sidewall (Plies & Composition)	<u>1 PLY POLYESTER</u>
Tread (Plies & Composition)	<u>1 PLY POLYESTER</u> <u>2 PLY STEEL</u> <u>1 PLY NYLON</u>
Serial Number: Right Front -	<u>DOT-ELYV JNM 5102</u>

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

REMARKS:

RECORDED BY: *M. R. P. [Signature]*

DATE: 06/11/03

APPROVED BY: *R. Messic [Signature]*

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	05/03	05/04
SURFACE LEVEL	GTL	N/A	BEFORE USE	BEFORE USE

SECTION 5 PHOTOGRAPHS



2003 TOYOTA CAMRY
NHTSA NO. C35111
FRAVSS NO. 110 (INDICANT)

FIGURE 3-1
3/4 FRONTAL VIEW OF VEHICLE

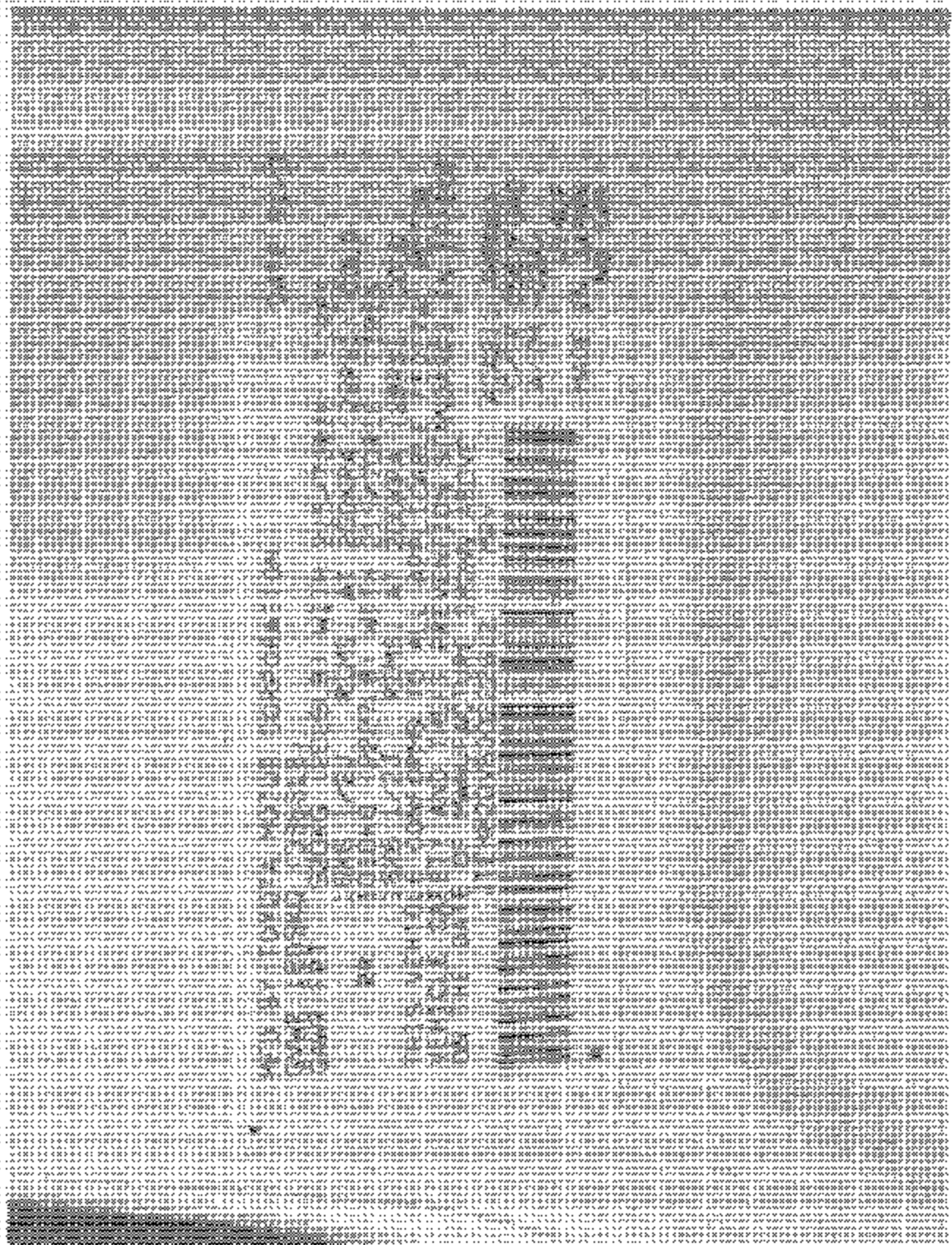
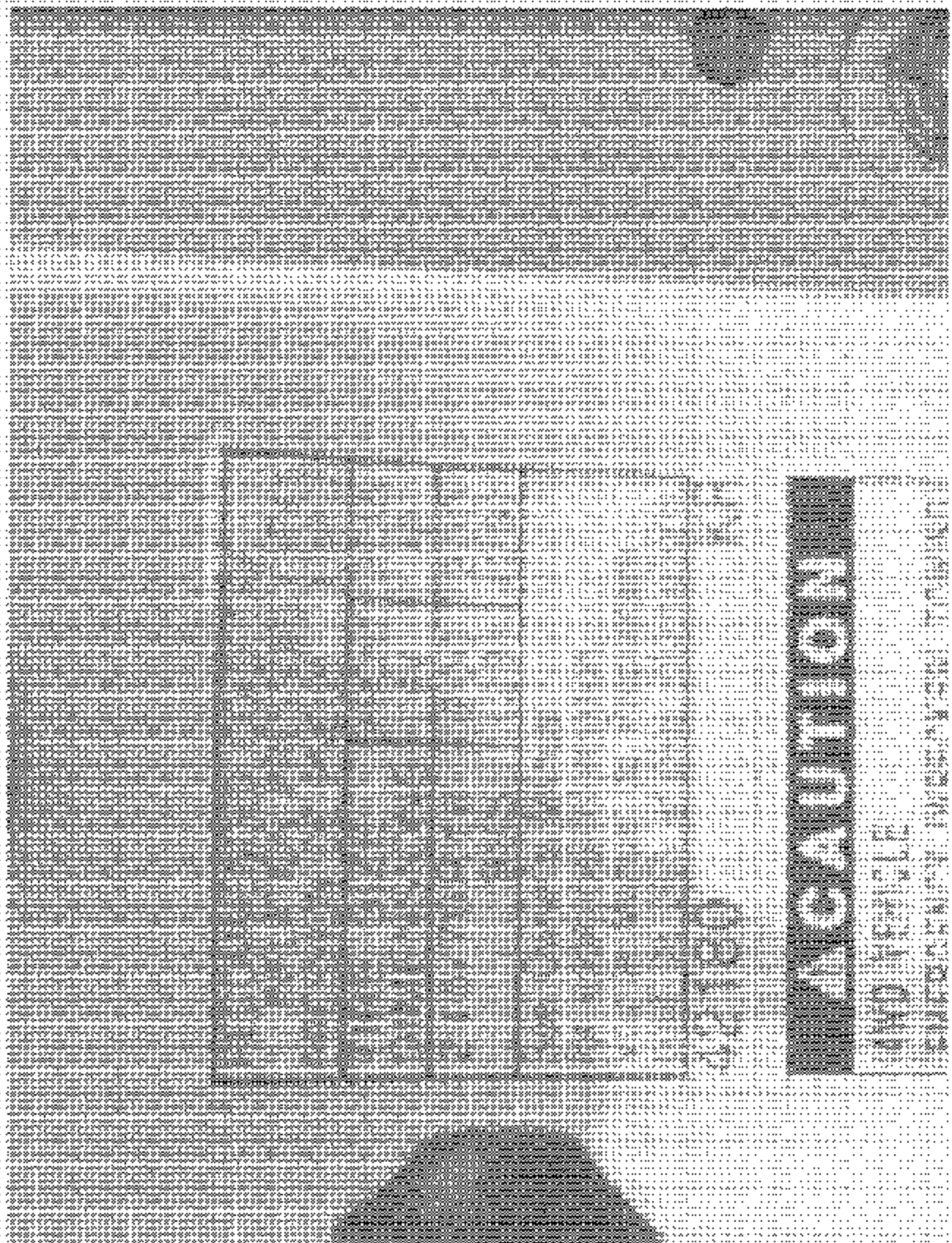


FIGURE 3.2
VEHICLES CERTIFICATION AND TIRE
INFORMATION LABEL

2003 TOYOTA RAV4
NHTSA NO. C35111
EPAVSS NO. 110 (INDICATE)



2003 TOYOTA RAV4

NHTSA NO. C35113

PLATES NO. 110 (INDICANT)

FIGURE 53

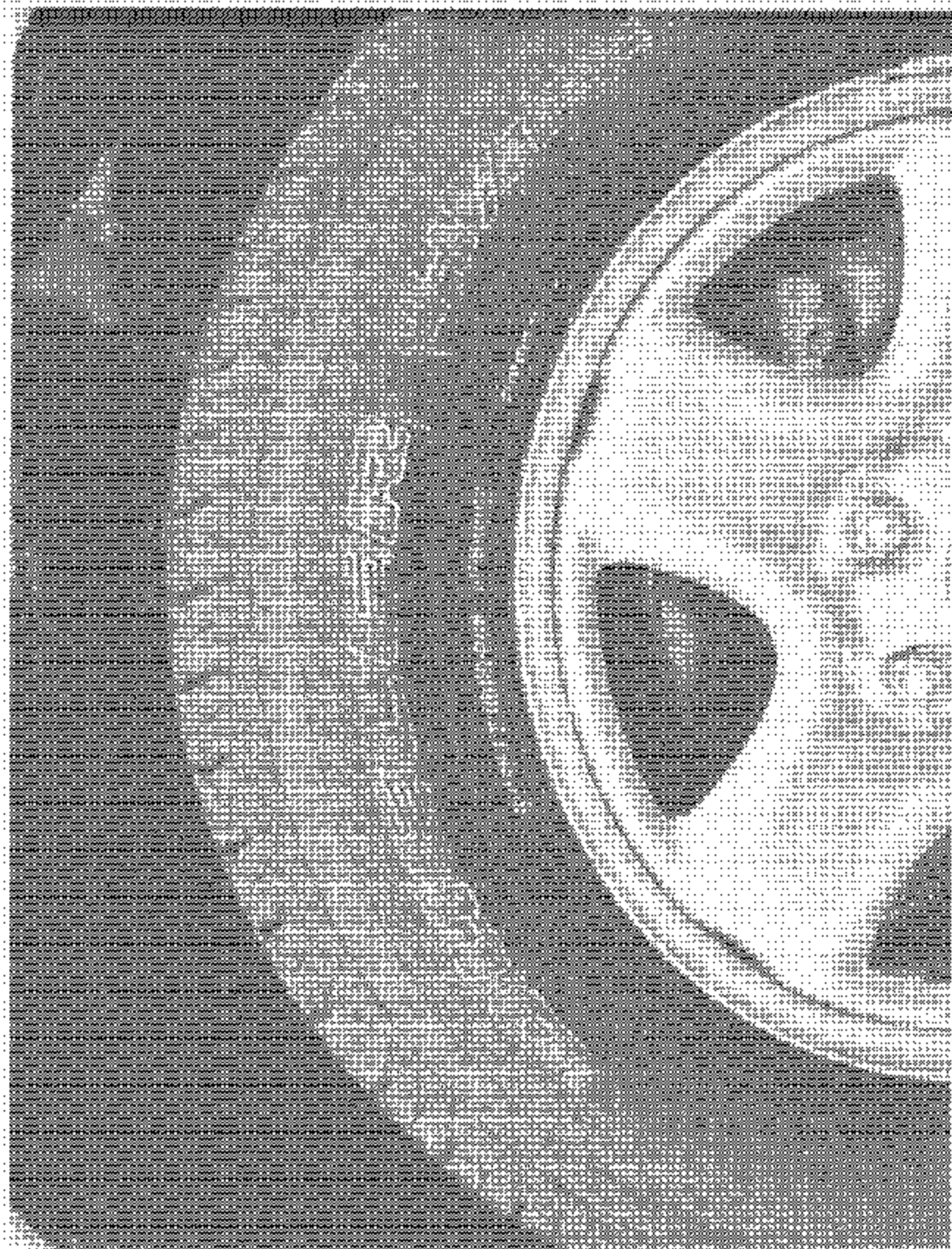
VEHICLES SEPARATE TYPE INFORMATION

LABEL



2003 TOYOTA TAY 4
NHTSA NO. C25147
EPA NO. 110 (INDICANT)

FIGURE 3A
TIRE SHOWING BRAND



2003 TOYOTA CAMRY
NHISA NO. C25111
FMVSS NO. F42 (MILKANE)

FIGURE 5.6
TYRE SHOWING MODEL



2007 TOYOTA RAV4
NHTSA NO. C35117
FMVSS NO. 110 (BRAKES)

FIGURE 60
TYRE SHOWING SIZE, LOAD INDEX AND SPEED
SYMBOL

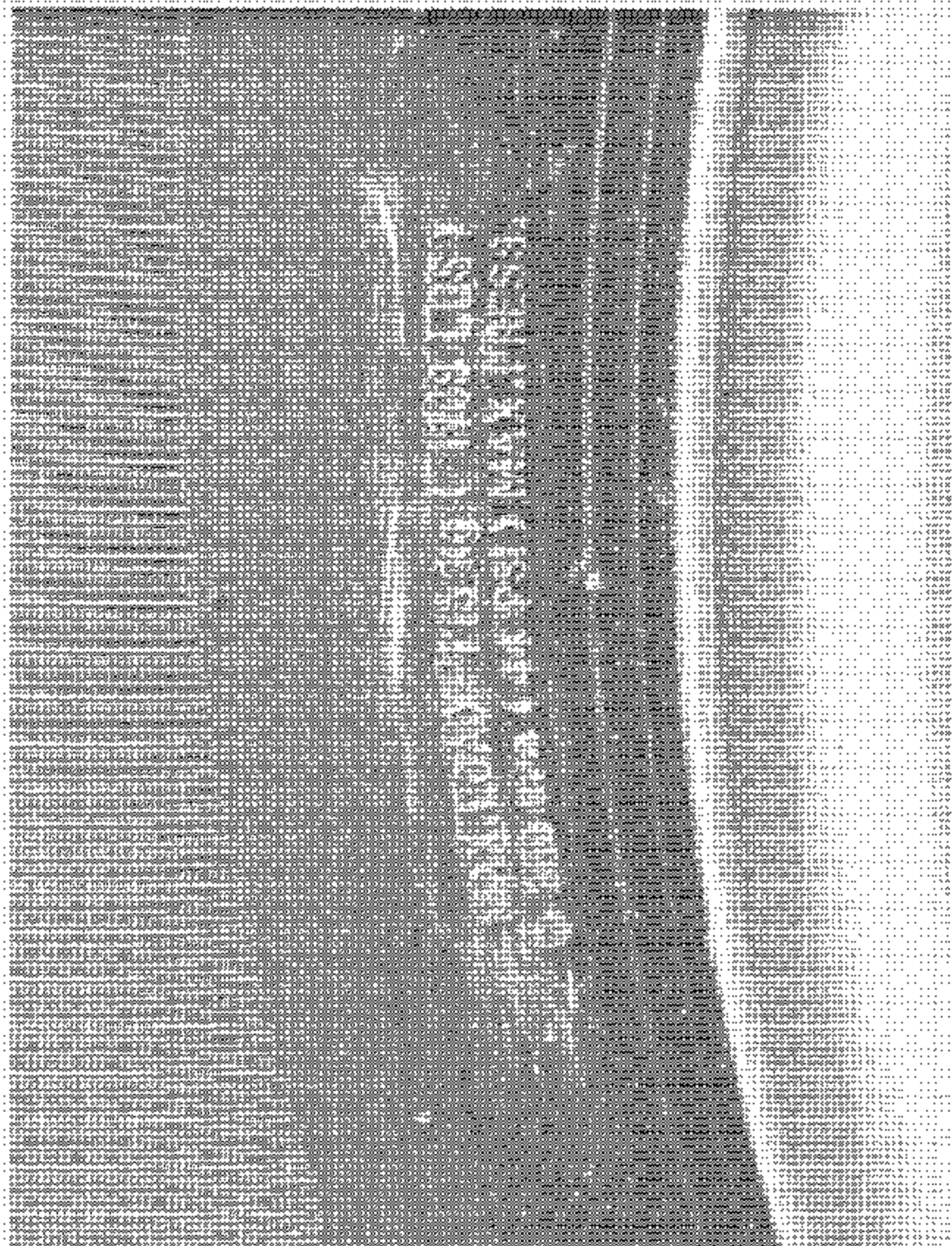
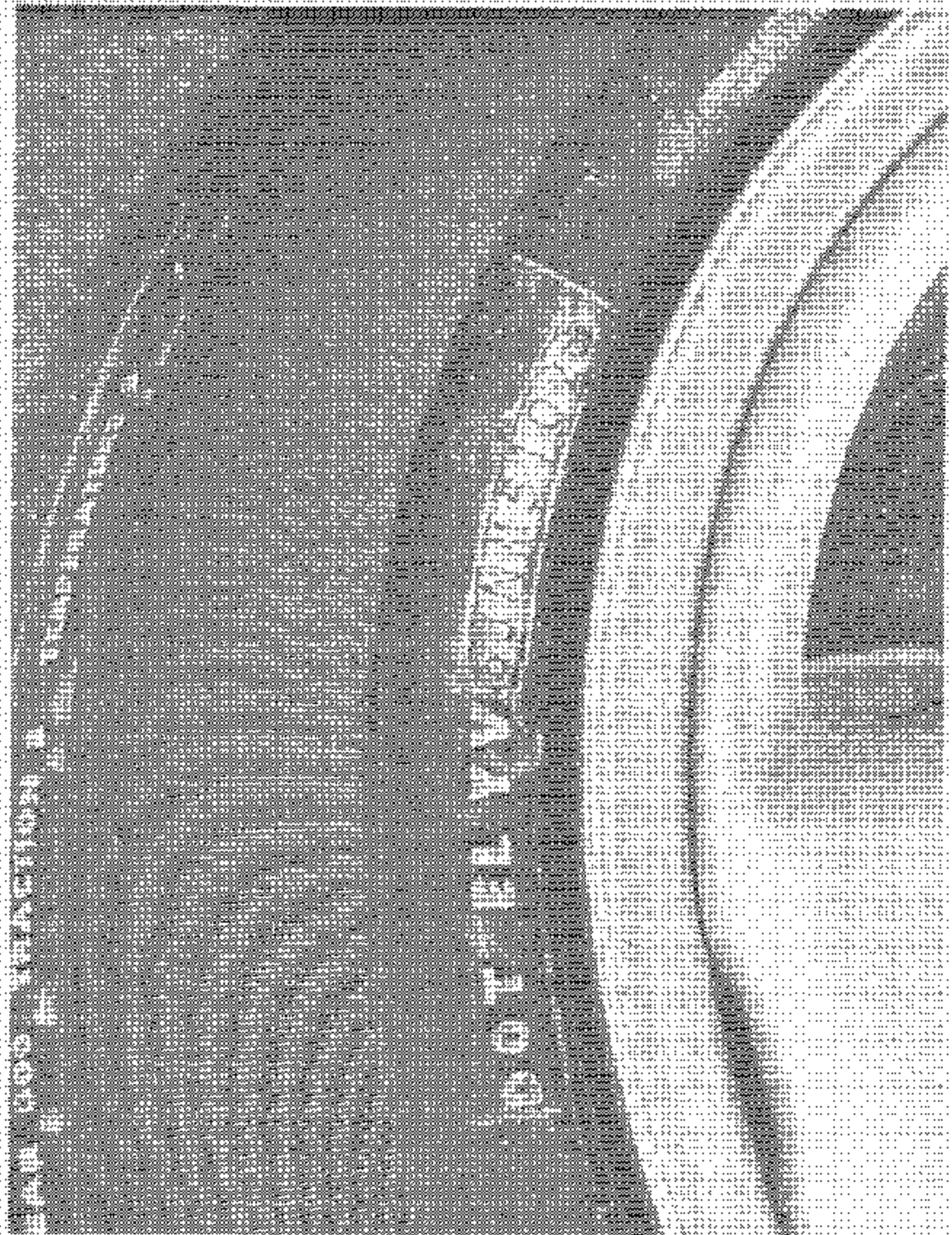


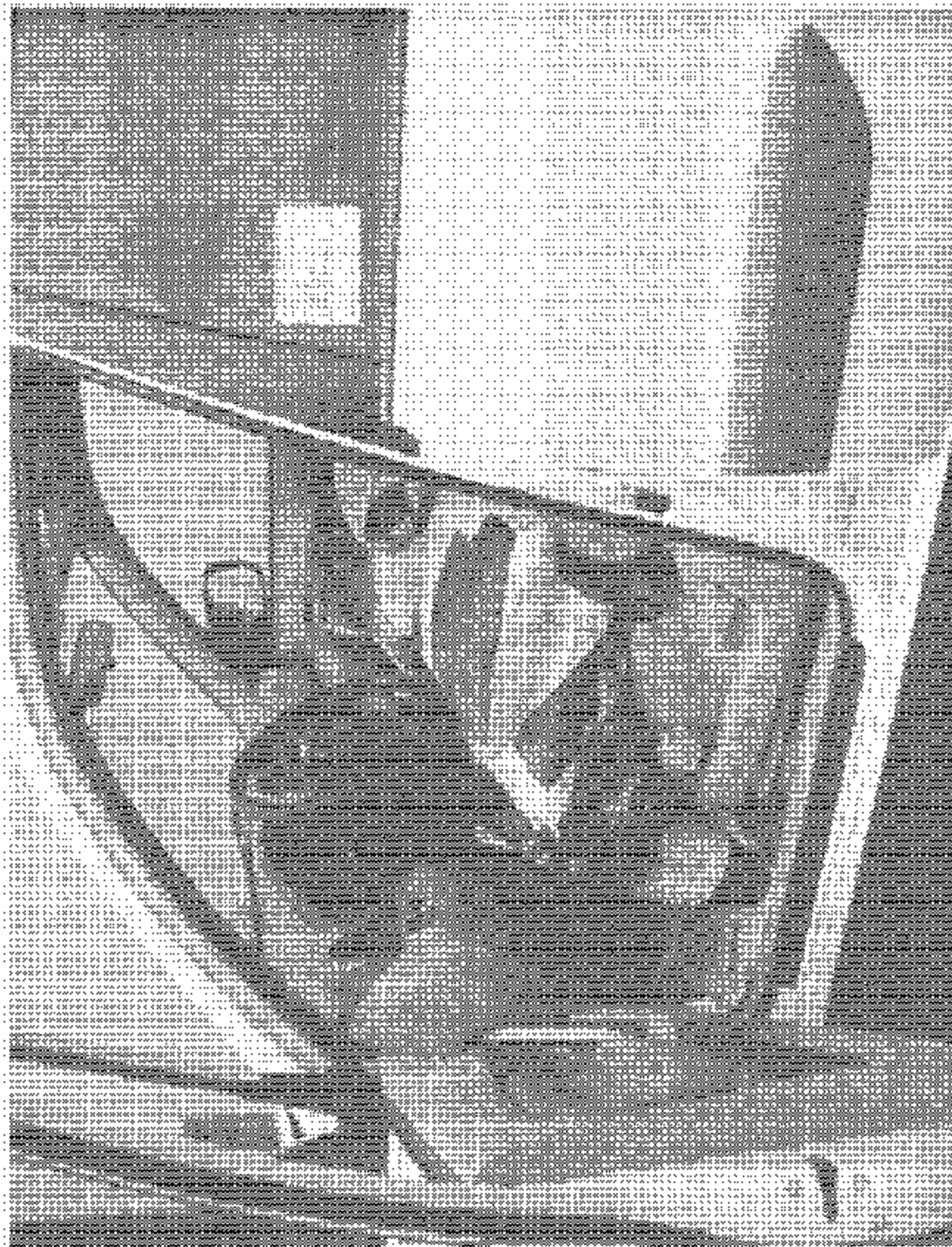
FIGURE 5-7
TIRE SHOWING MAX LOAD RATING AND MAX
INFLATION PRESSURE

2003 TOYOTA RAV4
NHTSA NO. D05111
FMVSS NO. 110 (INDICANT)



2003 TOYOTA RAV4
NHTSA NO. C35111
FMVSS NO. 110 (INDICANT)

FIGURE 2
TIRE SHOWING SERIAL NUMBER



2003 TOYOTA RAV4
NHIS# NO. 035117
PLATE# NO. 710 (MICHIGAN)

FIGURE 3-4
VEHICLE BALLASTED TO SIMULATE NORMAL
LOAD CONDITION

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.