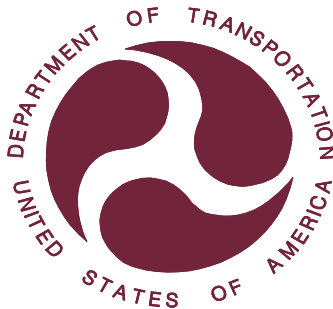


REPORT NUMBER 110-STF-08-003

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

VOLVO CAR CORPORATION
2008 VOLVO XC90
FOUR-DOOR MPV
NHTSA NO. C85900

U.S. DOT SAN ANGELO TEST FACILITY
131 COMANCHE TRAIL, BUILDING 3527
GOODFELLOW AFB, TEXAS 76908



April 22, 2008

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
NVS-220
OFFICE OF VEHICLE SAFETY COMPLIANCE
1200 NEW JERSEY AVENUE, SE
WASHINGTON, D.C. 20590

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Prepared By: Doris Beebe

Approved By: Ken H. Gale

Accepted By: John L. Linneman

Acceptance Date: 4/22/08

1. Report No. 110-STF-08-003	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 110 Compliance Testing of 2008 Volvo XC90 four-door MPV, NHTSA No. C85900		5. Report Date April 22, 2008	
		6. Performing Organization Code STF	
7. Author(s) Jack Stewart, Junior Systems Analyst		8. Performing Organization Rep# STF-DOT-08-110-003	
9. Performing Organization Name and Address U.S. DOT San Angelo Test Facility 131 Comanche Trail, Building 3527 Goodfellow AFB, Texas 76908		10. Work Unit No. (TRAVIS)	
		11. Contract or Grant No.	
12. Sponsoring Agency Name and Address United States Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance 1200 New Jersey Avenue, SE Washington, DC 20590		13. Type of Report and Period Covered Final Test Report February 11 through February 13, 2008	
		14. Sponsoring Agency Code NVS-220	
15. Supplementary Notes			
16. Abstract Compliance tests were conducted on the subject 2008 Volvo XC90 four-door MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-110T-02 for the determination of FMVSS 110 compliance. Test failures identified were as follows: rim labeling and marking failures (S110, S4.3.3, S4.4.2(a), (b) and (c)), and vehicle certificate location (49 CFR 567, <i>Certification</i>).			
17. Key Words Compliance Testing Safety Engineering FMVSS 110		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division NPO-411, Room E12-100 1200 New Jersey Avenue, S.E. Washington, DC 20590 Email: tis@dot.gov FAX: 202-493-2833	
19. Security Classification (of this report) UNCLASSIFIED		21. No. of Pages 50	22. Price
20. Security Classification (of this page) UNCLASSIFIED			

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SECTION 1
INTRODUCTION

1.1 PURPOSE OF COMPLIANCE TEST

A 2008 Volvo XC90 four-door MPV was tested to determine if the vehicle was in compliance with the requirements of FMVSS 110. All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure, TP-110T-02, dated August 31, 2007.

This standard establishes requirements to ensure that applicable vehicles are equipped with tires of adequate size and load rating and rims of appropriate size and type designation. This standard also establishes location, content, and format requirements for the Vehicle Placard and optional Tire Inflation Pressure Label.

1.2 TEST VEHICLE

The test vehicle was a 2008 Volvo XC90 four-door MPV. Nomenclatures applicable to the test vehicle are:

- A. Vehicle Identification Number: YV4CN982281432584
- B. NHTSA Number: C85900
- C. Manufacturer: Volvo Car Corporation
- D. Manufacture Date: 08/2007

1.3 TEST DATE

The test vehicle was tested February 11 through February 13, 2008.

SECTION 2

TEST PROCEDURE AND SUMMARY OF RESULTS

2.1 TEST PROCEDURE

The test vehicle was inspected for completeness, systems operability, and appropriate fuel and liquid levels, i.e. oil and coolant. The vehicle was then photographically documented as required by the NHTSA/OVSC Test Procedure. Tire sidewall information was recorded. The owner's manual was reviewed. Pertinent information from the tire and rim was photographed.

Subsequent events included weighing the vehicle to establish delivered Unloaded Vehicle Weight and the distribution of weight on the front and rear axles and each wheel position. At each step of the ballasting procedure, data was recorded. Vehicle was ballasted to Normal Load, Full Occupant Load, and Maximum Vehicle Load weight. Ballast was photographically documented for Normal and Maximum Vehicle Load weight. The vehicle maximum load on each wheel was measured. Data from each tire furnished with the vehicle were recorded. Tire size information was taken from vehicle certification label and vehicle placard. The right front wheel was removed from the vehicle and the tire was dismounted from the rim. The rim was measured from flange to flange, and rim markings were photographically documented. The owner's manual was checked for all required information on tire loading, and on general tire and loading parameters.

2.2 SUMMARY OF RESULTS

The Volvo XC90 test vehicle appears to be in compliance with all FMVSS 110 requirements tested except for:

1. The DOT symbol was not present on the rim as specified in FMVSS 110 S4.4.2(c)
2. The designation that indicates source of rim's published nominal dimension was not present as specified in FMVSS 110 S4.4.2(a)
3. The Vehicle Certification label was not located as required by 49 CFR 567, *Certification*.
4. Rim size designation marking does not meet rim requirements of FMVSS 110, S4.3.3 and S4.4.2(b).

SECTION 3

TEST DATA

DATA SUMMARY SHEET (1 of 2)

VEHICLE MAKE/MODEL/BODY STYLE: 2008 Volvo XC90 four-door MPV

VEHICLE NHTSA NUMBER: C85900 VIN: YV4CN982281432584

VEHICLE TYPE: MPV DATE OF MANUFACTURE: 08/2007

LABORATORY: US DOT San Angelo Test Facility

LIGHT TRUCK TYPE REQUIREMENTS

PASS/FAIL

General (Data Sheet 2)

The vehicle must be equipped with tires that meet the requirements of S139. (S110, S4.1)

PASS

Tire Load Limits (Data Sheet 2)

The sum of the maximum load ratings of the tires fitted to an axle is not less than the gross axle weight rating (GAWR) of the axle system as specified on the certification label. When passenger car tires are installed, each tire's load rating is reduced by dividing it by 1.10 before determining the sum of the maximum load ratings of the tires fitted to an axle. (S110, S4.2.2.1, S4.2.2.2)

PASS

When passenger car tires are installed, the vehicle normal load on the tire is not greater than the value of 94 percent of the de-rated load rating at the vehicle manufacturer's recommended cold inflation pressure for that tire. When LT tires are installed, the vehicle normal load on the tire is not greater than the value of 94 percent of the load rating at the vehicle manufacturer's recommended cold inflation pressure for that tire. (S110, S4.2.2.3(a), (b))

PASS

Rim (Data Sheet 3)

Each rim is constructed to the dimensions of a rim referred to in FMVSS 139 that is listed by the manufacturer of the tires as suitable for use with those tires. (S110, S4.4.1(a))

PASS

Each rim is properly marked. (S110, S4.4.2)

FAIL

DATA SUMMARY SHEET (2 of 2)

Certification, Placard, and Tire Inflation Pressure Labels (Data Sheet 4)

The placard and tire inflation pressure label (if provided) are affixed and located correctly, and display the information and format required. (S110, S4.3)

PASS

The Part 567 certification label shows the size designation of the tires and and rims appropriate for the vehicle including the tire size(s) listed on the vehicle placard and, if provided, tire inflation pressure label. (S110, S4.3.3)

FAIL

No inflation pressure other than the maximum permissible inflation pressure is shown on the placard and, if any, tire inflation pressure label unless as required. (S110, S4.3.4)

PASS

Vehicle Weight Distribution (Data Sheet 5)

The Gross Vehicle Weight Rating (GVWR) is not less than the sum of the unloaded vehicle weight, rated cargo load, and 68 kg times the vehicle's designated seating capacity. However, for school buses, the minimum occupant weight allowance is 54 kg. (49 CFR 567, *Certification*)

PASS

Owner's Manual (Data Sheet 6)

Owner's manual or other document has discussion of Vehicle Placard, Loading and Tires. (575.6(a)(4))

PASS

Owner's manual includes exact statement relating to "Steps for Determining Correct Load Limits". (575.6(a)(5))

PASS

RECORDED BY: Jack R. Stewart

DATE: February 13, 2008

APPROVED BY: Kenneth H. Yates

DATA SHEET 1
TEST VEHICLE INFORMATION / RECEIVING INSPECTION

VEHICLE MAKE/MODEL/BODY STYLE: 2008 Volvo XC90 four-door MPV

VEHICLE NHTSA NUMBER: C85900 TEST DATE: February 11, 2008

VIN: YV4CN982281432584 MANUFACTURE DATE: 08/2007

GVWR: 2,608 kg (5,750 lbs) GAWR (front): 1,256 kg (2,770 lbs)

GAWR (rear): 1,388 kg (3,060 lbs)

SEATING POSITIONS: FRONT 2 MID N/A REAR 3

ODOMETER READING AT START OF TEST: 114 km (71 mi)

ENGINE DATA: 6 Cylinders 3.2 Liters Cubic Inches

TRANSMISSION DATA: X Automatic Manual 6 No. of Speeds

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

CHECK APPROPRIATE BOXES FOR INSTALLED VEHICLE EQUIPMENT:

<input checked="" type="checkbox"/>	Air Conditioning	<input checked="" type="checkbox"/>	Traction Control	<input checked="" type="checkbox"/>	Clock
<input checked="" type="checkbox"/>	Tinted Glass	<input checked="" type="checkbox"/>	Tachometer	<input checked="" type="checkbox"/>	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	<input checked="" type="checkbox"/>	Rear Window Defroster	<input checked="" type="checkbox"/>	Driver Air Bag
<input checked="" type="checkbox"/>	Power Door Locks	<input type="checkbox"/>	Sun Roof or T-Top	<input checked="" type="checkbox"/>	Passenger Air Bag
<input checked="" type="checkbox"/>	Power Seat(s)	<input checked="" type="checkbox"/>	Tilt Steering Wheel	<input checked="" type="checkbox"/>	Side Curtain Air Bag(s)
<input checked="" type="checkbox"/>	Power Brakes	<input checked="" type="checkbox"/>	Stereo	<input checked="" type="checkbox"/>	Front Disc Brakes
<input checked="" type="checkbox"/>	Antilock Brake System	<input type="checkbox"/>	Telephone	<input checked="" type="checkbox"/>	Rear Disc Brakes
<input type="checkbox"/>	Navigation System	<input type="checkbox"/>	Trailer Hitch	<input type="checkbox"/>	Other -

REMARKS: None

RECORDED BY: Jack R. Stewart DATE: February 11, 2008

APPROVED BY: Kenneth H. Yates

DATA SHEET 2 (1 of 2)
VEHICLE RIM IDENTIFICATION AND LOAD LIMITS

VEHICLE MAKE/MODEL/BODY STYLE: 2008 Volvo XC90 four-door MPV

VEHICLE NHTSA NUMBER: C85900 VIN: YV4CN982281432584

LABORATORY: US DOT San Angelo Test Facility TEST DATE: February 11, 2008

All tires on the vehicle (excluding the spare) are the same make and model: (X) YES () NO

All tires on the vehicle (excluding the spare) are the same size: (X) YES () NO

Spare tire is the same size as all other tires: () YES (X) NO

Tire Sidewall	Right Front	Left Rear (If different)	Spare Tire (If different)
Manufacturer and Model	<u>Pirelli Scorpion Zero</u>	<u></u>	<u>Continental</u>
Tire Size Designation	<u>P235/65R17</u>	<u></u>	<u>T155/85R18</u>
Load Index/Speed Symbol	<u>104H</u>	<u></u>	<u>115M</u>
Maximum Inflation Pressure	<u>300 kPa (44 psi)</u>	<u></u>	<u>420 kPa (60 psi)</u>
Maximum Load Rating	<u>900 kg (1,984 lbs)</u>	<u></u>	<u>1,215 kg (2,679 lbs)</u>
Tread/Traction/Temperature	<u>420/A/A</u>	<u></u>	<u>N/A</u>
Tires Have "DOT" Markings	<u>Yes</u>	<u></u>	<u>Yes</u>

Serial Number: Right Front XND4JOO22707 Left Front XND4JOO22707

Right Rear XND4JOO22707 Left Rear XND4JOO22707

Spare CPAWAMRP2107

DATA SHEET 2 (2 of 2)
VEHICLE TIRE IDENTIFICATION AND LOAD LIMITS

MOUNTED TIRE VS. AXLE RATING COMPARISON (at sidewall maximum inflation pressure)		
	FRONT AXLE	REAR AXLE
A. GAWR from certification label	1,256 kg (2,770 lbs)	1,388 kg (3,060 lbs)
B. Tire Maximum Load Rating from above	900 kg (1,984 lbs)	900 kg (1,984 lbs)
C. Reduced tire load rating if applicable*	818 kg (1,804 lbs)	818 kg (1,804 lbs)
D. (No. of tires) x (Tire load rating de-rated if appropriate)	1,636 kg (3,608 lbs)	1,636 kg (3,608 lbs)
Is "D" equal to or greater than "A"? (Yes/No)	Yes	Yes

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

DATA INDICATES COMPLIANCE:

PASS/FAIL: PASS

REMARKS: None

RECORDED BY: Jack R. Stewart

DATE: February 11, 2008



APPROVED BY: Kenneth H. Yates

**DATA SHEET 3
VEHICLE RIM IDENTIFICATION**

VEHICLE MAKE/MODEL/BODY STYLE: 2008 Volvo XC90 four-door MPV

VEHICLE NHTSA NUMBER: C85900 VIN: YV4CN982281432584

LABORATORY: US DOT San Angelo Test Facility TEST DATE: February 11, 2008

Rim Markings	RIGHT FRONT	LEFT REAR (if different)
A. Source of published dimensions (letter designation)	None	
B. Rim Size Designation	7Jx17x49	
C. Does rim contain DOT symbol? (Yes/No)	No	
D. Manufacturer's name, symbol or trademark (copy format)		
E. Date of manufacture or symbol (copy format)		
F. Letter height (not less than 3 mm)	5 mm	
G. Lettering (impressed or embossed)	Embossed	
H. Are all rim markings legible? (Yes/No)	Yes	
Do items A-C appear on weather side of rim (Yes/No)	No - B only	
Do all markings comply with requirements (Yes/No)	No	

Rim Measurements	RIGHT FRONT	LEFT REAR (If different)
Rim width	17.8 cm (7.0 in)	
Rim diameter	43.2 cm (17 in)	
Rim measurements same as rim markings?	Yes	

Rims are suitable for tires on vehicle? (X)YES () NO

Reference source used for tire/rim match verification:

2005 European Tyre and Rim Technical Organisation Yearbook

DATA INDICATES COMPLIANCE: PASS/FAIL: FAIL

REMARKS: See Section 6 for rim labeling and marking failure reports.

RECORDED BY: Jack R. Stewart

DATE: February 11, 2008

APPROVED BY: Kenneth H. Yates

DATA SHEET 4 (1 of 3)
VEHICLE PLACARD AND TIRE INFLATION PRESSURE LABEL

VEHICLE MAKE/MODEL/BODY STYLE: 2008 Volvo XC90 four-door MPV

VEHICLE NHTSA NUMBER: C85900 VIN: YV4CN982281432584

LABORATORY: US DOT San Angelo Test Facility TEST DATE: February 11, 2008

Identification of Vehicle Labeling

	(Yes/No)	Location	PASS/FAIL
1. Certification Label*	<u>Yes</u>	<u>Back of driver's side B pillar</u>	<u>FAIL</u>
2. Vehicle Placard*	<u>Yes</u>	<u>Front of driver's side B pillar</u>	<u>PASS</u>
3. Tire Inflation Pressure Label*	<u>N/A</u>		

* Labels must be located as specified in section 12.4 of test procedure.

Vehicle Placard

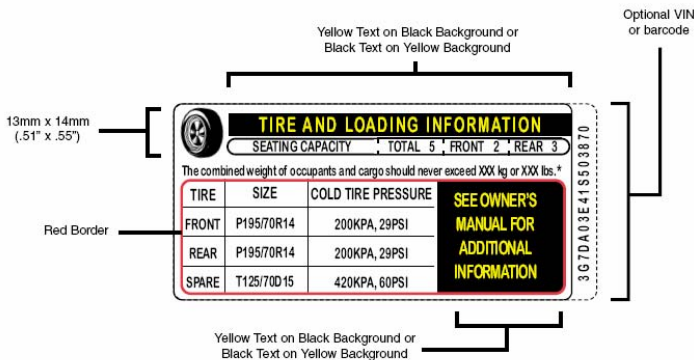


FIGURE 1
(70 FR 14425)

Tire Inflation Pressure Label

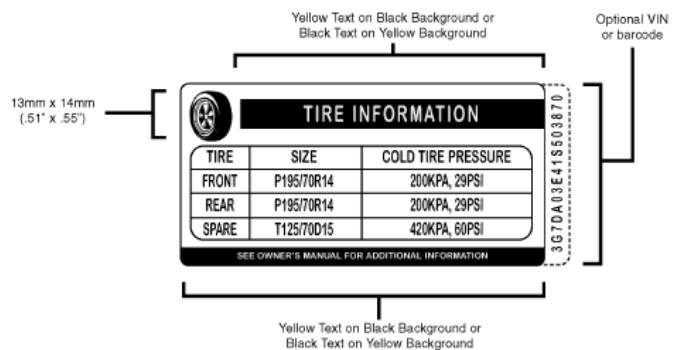


FIGURE 2
(70 FR 14426)

Labeling Notes:

1. Tire size and pressure can be omitted from the Vehicle Placard if same data is displayed on a Tire Inflation Pressure Label.
2. The Alphanumeric Identifier or Barcode is optional. It can be located vertically, along the right edge or the left edge of the placard or the label, or horizontally, along the bottom edge of the placard or the label.
3. Tire size can include the tire load range identification symbol ("XL" or "reinforced", "B", "C", "D", "E", or "F"), the load index number, and the speed rating symbol, located immediately to the right of the tire size designation.
4. The tire "SIZE" heading can be replaced with "ORIGINAL TIRE SIZE" or "ORIGINAL SIZE."
5. The "SPARE" tire heading can be replaced with "SPARE TIRE."
6. For full size spare tires, the recommended cold tire inflation pressure can be replaced with "SEE ABOVE".
7. If no spare tire is provided, the word "NONE" is to replace the manufacturer's cold tire inflation pressure.

Vehicle Placard has the exact color and format as specified in the above Figure 1 and text is in English language. (X) YES () NO

**DATA SHEET 4 (2 of 3)
VEHICLE PLACARD AND TIRE INFLATION PRESSURE LABEL**

Vehicle Placard and, if provided, **Tire Inflation Pressure Label** are permanently affixed.
(X) YES () NO

Vehicle Placard Information:

Combined weight of occupants and cargo 525 kg (1,160 lbs)

Seating Capacity: Total 5 ; Front 2 ; Rear 3

Is the number of belted seating positions the same as the labeled seating capacity? (X) YES () NO

Is the tire size and pressure provided? (X) YES () NO

Tire Information:

Tire Size: Front P235/65R17 ; Rear P235/65R17

Tire Inflation Pressure: Front 250 kPa (36 psi) ; Rear 250 kPa (36 psi)

Are the sizes of the installed tires the same as the sizes of the labeled tires?
(X) YES () NO

Is the labeled cold tire inflation pressure equal to or less than the sidewall labeled maximum cold tire inflation pressure?

Front axle: (X) YES () NO Rear axle: (X) YES () NO

Vehicle Certification Label information:

	Tire Size	Rim Size Designation	Rim Suitable for Tire?*
Front Axle	<u>P235/65R17</u>	<u>7Jx17x49</u>	<u>Yes</u>
Rear Axle	<u>P235/65R17</u>	<u>7Jx17x49</u>	<u>Yes</u>

*Referenced source used for tire/rim match verification:

2005 European Tyre and Rim Technical Organisation Yearbook

DATA SHEET 4 (3 of 3)
VEHICLE PLACARD AND TIRE INFLATION PRESSURE LABEL

Is (Are) tire size(s) listed on the vehicle placard and/or tire inflation pressure label also listed on the certification label with suitable rim size? (X) YES () NO

LABELED TIRE CAPACITY AT SPECIFIED PRESSURE		
GVWR <u>2,608 kg (5,750 lbs)</u>	FRONT AXLE	REAR AXLE
A. GAWR from certification label	1,256 kg (2,770 lbs)	1,388 kg (3,060 lbs)
B. Tire load rating of labeled tire size at labeled inflation pressure*	900 kg (1,984 lbs)	900 kg (1,984 lbs)
C. Reduced tire load rating if applicable**	818 kg (1,804 lbs)	818 kg (1,804 lbs)
D. (No. of tires) x (Tire load rating de-rated if appropriate)	1,636 kg (3,608 lbs)	1,636 kg (3,608 lbs)
Is "D" equal to or greater than "A"?	Yes	Yes

*Reference source used for determining load rating:

2005 European Tyre and Rim Technical Organisation Yearbook

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

DATA INDICATES COMPLIANCE:

PASS/FAIL: FAIL

REMARKS: Certification label is attached on rear of B pillar, not on front closest to driver seating position. Rim size labeled on certification label is incorrectly formatted.

RECORDED BY: Jack R. Stewart

DATE: February 11, 2008

APPROVED BY: Kenneth H. Yates

DATA SHEET 5 (1 of 4)
CURB WEIGHT, NORMAL LOAD WEIGHT & MAXIMUM VEHICLE WEIGHT

VEHICLE MAKE/MODEL/BODY STYLE: 2008 Volvo XC90 four-door MPV

VEHICLE NHTSA NUMBER: C85900 VIN: YV4CN982281432584

LABORATORY: US DOT San Angelo Test Facility TEST DATE: February 12, 2008

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

* Transmission, windshield washer, brake fluid, engine oil, etc.

Tire Pressures: LF 250.1 kPa (36.3 psi) LR 250.1 kPa (36.3 psi)
(cold, prior to loading vehicle) RF 250.1 kPa (36.3 psi) RR 250.1 kPa (36.3 psi)

A. MEASURED CURB WEIGHT WITH INSTALLED OPTIONS AND ACCESSORIES

Measured Unloaded Vehicle Weight

LF 556.1 kg (1,226 lb) LR 454.5 kg (1,002 lb)
RF 548.8 kg (1,210 lb) RR 441.3 kg (973 lb)
Front Axle 1,104.9 kg (2,436 lb) Rear Axle 895.8 kg (1,975 lb)
Total Vehicle Weight 2,000.7 kg (4,411 lb)

B. MEASURED VEHICLE NORMAL LOAD WEIGHT

(1) Seating Capacity from Vehicle Placard = 5

(2) Normal Load Number of Occupants 3

Occupant Distribution: Front Seat 2 Second Seat 1

(3) Total Normal Occupant Load 204 kg (450 lb)
[# of occupants x 68 KG per occupant]

(4) Measured Normal Load on Axles

LF 604.2 kg (1,332 lb) LR 508.5 kg (1,121 lb)
RF 598.7 kg (1,320 lb) RR 494.0 kg (1,089 lb)
Front Axle 1,202.9 kg (2,652 lb) Rear Axle 1,002.4 kg (2,210 lb)
Total Vehicle Weight 2,205.3 kg (4,862 lb)

DATA SHEET 5 (2 of 4)
CURB WEIGHT, NORMAL LOAD WEIGHT & MAXIMUM VEHICLE WEIGHT

(5) Calculated Vehicle Normal Load on the Tire

Front Tires [measured front axle normal load/2] = 601.5 kg (1,326 lbs)

Rear Tires [measured rear axle normal load/2] = 501.2 kg (1,105 lbs)

(6) Measured Normal Load on Tire vs. Value of 94% of Load Rating for that Tire at Specified Pressure

MEASURED NORMAL LOAD ON TIRE VS. VALUE OF 94% OF LOAD RATING FOR THAT TIRE AT SPECIFIED PRESSURE		
	FRONT AXLE	REAR AXLE
A. Calculated Vehicle Normal Load on the Tire from (5)	601 kg (1,326 lbs)	501 kg (1,105 lbs)
B. Tire load rating of installed tire size at recommended inflation pressure*	900 kg (1,984 lbs)	900 kg (1,984 lbs)
C. Reduced tire load rating if applicable**	818 kg (1,804 lbs)	818 kg (1,804 lbs)
D. 94% of tire load rating, de-rated if appropriate)	769 kg (1,695 lbs)	769 kg (1,695 lbs)
Is "D" equal to or greater than "A"?	Yes	Yes

*Reference source used for tire/rim match verification:

2005 European Tyre and Rim Technical Organisation Yearbook

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

Vehicle Normal Load on the tire is not greater than 94% of the Recommended Cold Inflation Load Rating.

PASS/FAIL

Front Tires PASS

Rear Tires PASS

C. MEASURED VEHICLE WEIGHT WITH FULL OCCUPANT LOAD

Seating Capacity: Total 5 ; Front 2 ; Rear 3

Full Occupant Load 340 kg (750 lbs)

[# of occupants x 68 KG per adult occupant and 54 KG per student occupant]

LF 624.6 kg (1,377 lb) LR 557.0 kg (1,228 lb)

RF 610.5 kg (1,346 lb) RR 549.8 kg (1,212 lb)

Front Axle 1,235.1 kg (2,723 lb) Rear Axle 1,106.8 kg (2,440 lb)

Total Vehicle Weight 2,341.9 kg (5,163 lb)

DATA SHEET 5 (3 of 4)
CURB WEIGHT, NORMAL LOAD WEIGHT & MAXIMUM VEHICLE WEIGHT

D. MEASURED MAXIMUM VEHICLE LOAD WEIGHT

(1)	Vehicle Capacity Weight (from placard)	<u>525 kg (1,160 lbs)</u>
(2)	Full Occupant Load (from above)	<u>340 kg (750 lbs)</u>
(3)	Luggage/Cargo Load (subtract (2) from (1))	<u>185 kg (410 lbs)</u>
(4)	Measured Vehicle Maximum Load on Axles	
	LF <u>615.5 kg (1,357 lb)</u>	LR <u>661.8 kg (1,459 lb)</u>
	RF <u>599.2 kg (1,321 lb)</u>	RR <u>652.3 kg (1,438 lb)</u>
Front Axle	<u>1,214.7 kg (2,678 lb)</u>	Rear Axle <u>1,314.1 kg (2,897 lb)</u>
	Total Vehicle Weight <u>2,528.8 kg (5,575 lb)</u>	

DATA SHEET 5 (4 of 4)
VEHICLE WEIGHT DISTRIBUTION

ITEM	Tire or Vehicle Rating*	Unloaded Vehicle Weight		Vehicle Weight with Normal Occupant Load		Vehicle Weight with Full Occupant Load		Vehicle Maximum Weight with Occupants and Cargo	
		Measured	Over-load	Measured	Over-load	Measured	Over-load	Measured	Over-load
Left Front Tire	818 kg (1,804lbs)	556.1 kg (1,226 lbs)	no	604.2 kg (1,332 lbs)	no	624.6 kg (1,377 lbs)	no	615.5 kg (1,357 lbs)	no
Right Front Tire	818 kg (1,804 lbs)	548.8 kg (1,210 lbs)	no	598.7 kg (1,320 lbs)	no	610.5 kg (1,346 lbs)	no	599.2 kg (1,321 lbs)	no
Front Axle (GAWR)	1,256 kg (2,770 lbs)	1,104.9 kg (2,436 lbs)	no	1,202.9 kg (2,652 lbs)	no	1,235.1 kg (2,723 lbs)	no	1,214.7 kg (2,678 lbs)	no
Left Rear Tire	818 kg (1,804 lbs)	454.5 kg (1,002 lbs)	no	508.5 kg (1,121 lbs)	no	557.0 kg (1,228 lbs)	no	661.8 kg (1,459 lbs)	no
Right Rear Tire	818 kg (1,804 lbs)	441.3 kg (973 lbs)	no	494.0 kg (1,089 lbs)	no	549.8 kg (1,212 lbs)	no	652.3 kg (1,438 lbs)	no
Rear Axle (GAWR)	1,388 kg (3,060 lbs)	895.8 kg (1,975 lbs)	no	1,002.4 kg (2,210 lbs)	no	1,106.8 kg (2,440 lbs)	no	1,314.1 kg (2,897 lbs)	no
Total Vehicle (GVWR)	2,608 kg (5,750 lbs)	2,000.8 kg (4,411 lbs)	no	2,205.4 kg (4,862 lbs)	no	2,341.9 kg (5,163 lbs)	no	2,528.8 kg (5,575 lbs)	no

*Vehicle and axle weight ratings (GVWR & GAWR) are located on the vehicle certification label. Vehicle tire load ratings are based upon the inflation pressure specified on the Vehicle Placard or Tire Inflation Pressure Label for each respective axle, as determined from the appropriate Tire and Rim reference manual. If a passenger car tire is installed on a multipurpose passenger vehicle (MPV), truck or bus, the tire's load rating is reduced by dividing by 1.10

DATA INDICATES COMPLIANCE:

PASS/FAIL: PASS

REMARKS: None

RECORDED BY: Jack R. Stewart

DATE: February 12, 2008

APPROVED BY: Kenneth H. Yates

DATA SHEET 6 (1 of 2)
OWNER'S MANUAL REQUIREMENTS

VEHICLE MAKE/MODEL/BODY STYLE: 2008 Volvo XC90 four-door MPV

VEHICLE NHTSA NO. C85900 VIN: YV4CN982281432584

LABORATORY: US DOT San Angelo Test Facility TEST DATE: February 11, 2008

Owner's Manual Discusses:

Part 575.6(a) Paragraph	Required Discussion Topic	Discussed in Manual? (YES/NO)	Page Numbers
(4)(i)	Tire labeling, including a description and explanation of each marking on the tires provided with the vehicle, and information about the location of the Tire Identification Number (TIN).	YES	178, 179
(4)(ii)	(A) Description and explanation of recommended cold tire inflation pressure.	YES	174, 175
	(B) Description and explanation of FMVSS 110 Vehicle Placard and Tire Inflation Pressure Label and their location(s).	YES	172
	(C) Description and explanation of adverse safety consequences of under-inflation including tire failure.	YES	172
	(D) Description and explanation for measuring and adjusting air pressure to achieve proper inflation.	YES	173
(4)(iii)	Glossary of tire terminology, including "cold tire pressure," "maximum inflation pressure," and "recommended inflation pressure," and all non-technical terms defined in S3 of FMVSS 110 & 139.	YES	179
(4)(vi)	Tire care, including maintenance and safety practices.	YES	170, 171
(4)(v)	(A) Description and explanation of locating and understanding load limit information, total load capacity, seating capacity, towing capacity, and cargo capacity.	YES	180, 181
	(B) Description and explanation for calculating total and cargo load capacities with varying seating configurations including quantitative examples showing/illustrating how the vehicle's cargo and luggage capacity decreases as the combined number and size of occupants increases.	YES	180
	(C) Description and explanation for determining compatibility of tire and vehicle load capabilities.	YES	170, 181
	(D) Description and explanation of adverse safety consequences of overloading on handling and stopping and on tires.	YES	135

DATA SHEET 6 (2 of 2)
OWNER'S MANUAL REQUIREMENTS

The following statement, in the English language, is provided verbatim in the Owner's Manual. Reference Part 575.6(a)(5) YES (X) NO ()

Steps for Determining Correct Load Limit

- (1) Locate the statement "The combined weight of occupants and cargo should never exceed XXX kg or XXX lbs." on your vehicle's placard.
- (2) Determine the combined weight of the driver and passengers that will be riding in your vehicle.
- (3) Subtract the combined weight of the driver and passengers from XXX kg or XXX lbs.
- (4) The resulting figure equals the available amount of cargo and luggage load capacity. For example, if the "XXX" amount equals 1400 lbs. and there will be five 150 lb passengers in your vehicle, the amount of available cargo and luggage load capacity is 650 lbs. (1400-750 (5x150) = 650 lbs.)
- (5) Determine the combined weight of the luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity calculated in Step 4.
- (6) If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult this manual to determine how this reduces the available cargo and luggage load capacity of your vehicle.

DATA INDICATES COMPLIANCE:

PASS/FAIL: PASS

REMARKS: Part 575.6(a)(4)(v)(D) was located in the Fuel Requirements section of the owner's
manual under 'Starting and Driving'.

RECORDED BY: Jack R. Stewart

DATE: February 11, 2008

APPROVED BY: Kenneth H. Yates

SECTION 4

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TABLE 1 – EQUIPMENT INFORMATION LIST

EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO	CAL. DATE	NEXT CAL. DATE
PLATFORM SCALE (BALLAST)	HOWE RICHARDSON	MODEL #6401 SERIAL #0181- 5509-26	8/14/2007	8/14/2008
AIR PRESSURE GAUGE	ASHCROFT GENERAL PURPOSE DIGITAL GAUGE	MODEL #D1005PS 02L 100 PSI SERIAL #20017398- 01	12/20/2007	12/20/2008
FLOOR SCALES (VEHICLE)	INTERCOMP SW DELUXE SCALES	PART #100156 SERIAL #27032382	8/14/2007	8/14/2008

SECTION 5
PHOTOGRAPHS



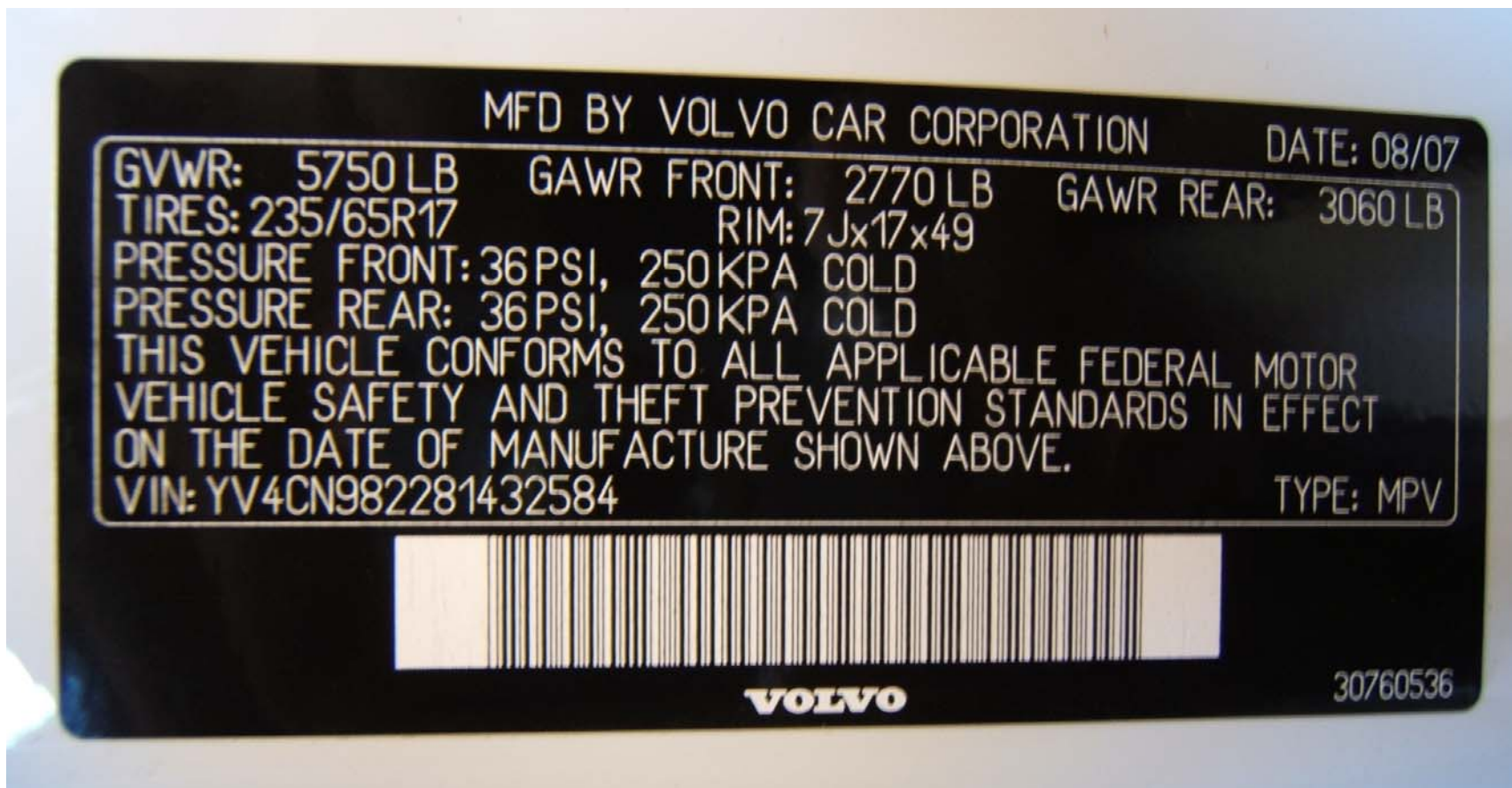
2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.1
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE



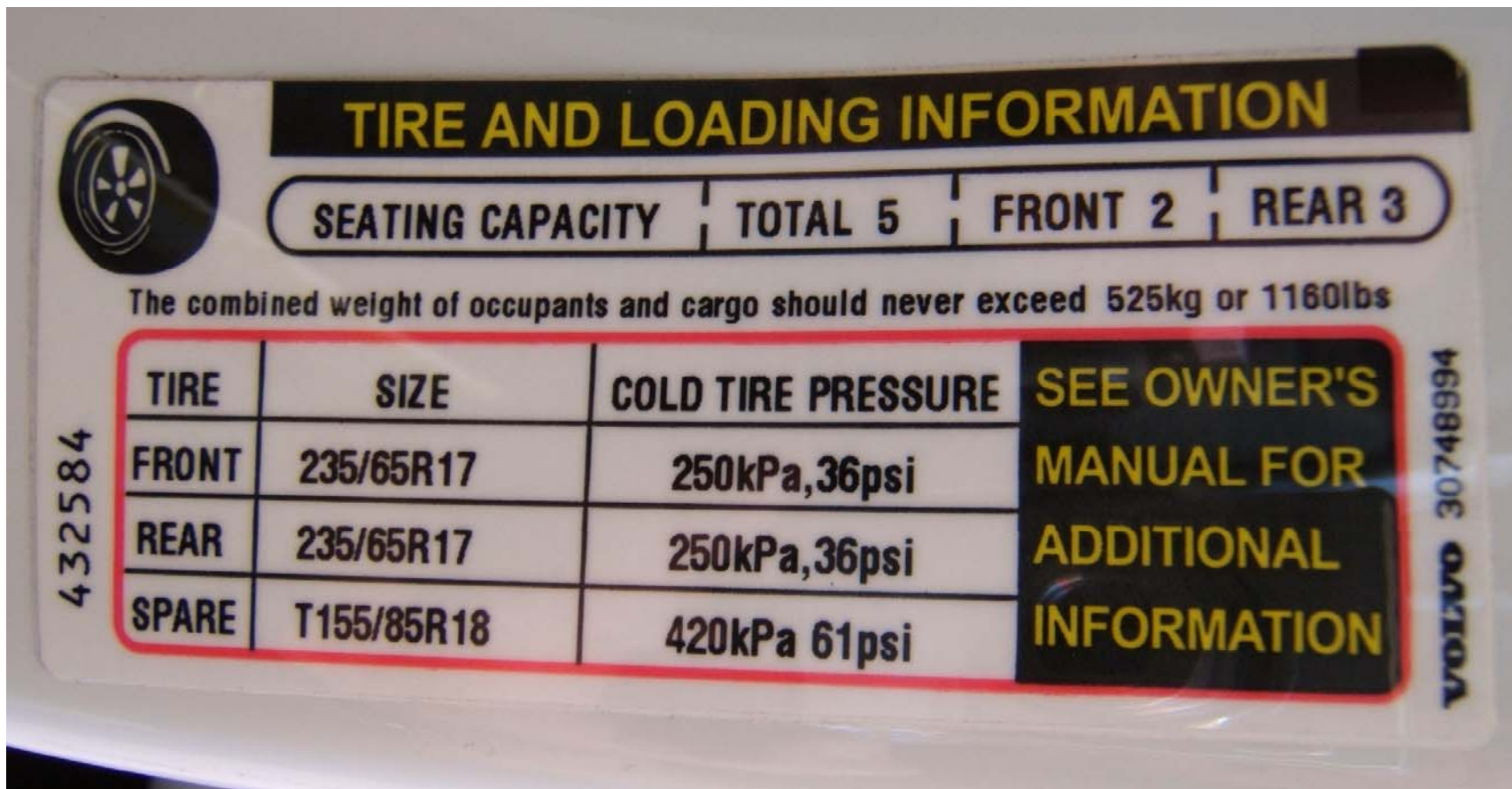
2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.2
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO.110

FIGURE 5.3
VEHICLE CERTIFICATION LABEL



2008 VOLVO XC90
 NHTSA NO. C85900
 FMVSS NO.110

FIGURE 5.4
 VEHICLE PLACARD



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.5
TIRE SHOWING BRAND



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.6
TIRE SHOWING MODEL



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.7
TIRE SHOWING SIZE, LOAD INDEX, AND SPEED SYMBOL



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.8
TIRE SHOWING MAX LOAD RATING AND MAX INFLATION PRESSURE



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.9
TIRE SHOWING CONSTRUCTION



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.10
TIRE SHOWING SERIAL NUMBER



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.11
RIM CONTOUR FOR FULL WIDTH OF CROSS SECTION



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.12
RIM SHOWING MANUFACTURER NAME



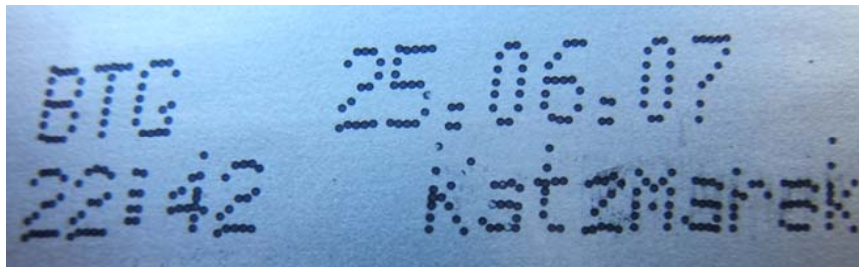
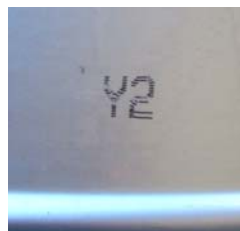
2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.13
RIM SHOWING MANUFACTURE DATE



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.14
RIM SHOWING SIZE



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.15
RIM MARKINGS



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.16
VEHICLE REAR SEAT BALLASTED
FOR NORMAL LOAD



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.17
VEHICLE FRONT SEAT BALLASTED
FOR NORMAL AND MAXIMUM LOAD



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.18
VEHICLE REAR SEAT BALLASTED
FOR MAXIMUM LOAD



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.19
REAR OF VEHICLE SHOWN BALLASTED FOR MAXIMUM LOAD



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.20
VEHICLE ON WEIGHT SCALES



2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 110

FIGURE 5.21
CERTIFICATION LABEL SHOWN ON
BACK OF DRIVER'S SIDE B PILLAR

SECTION 6
FAILURE REPORTS

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS NUMBER: 110 TEST DATE: February 11 through 13, 2008

LABORATORY: US DOT San Angelo Test Facility

LABORATORY PROJECT ENGINEER'S NAME: Kenneth H. Yates

TEST SPECIMEN DESCRIPTION: 2008 Volvo XC90 four-door MPV

NHTSA VEHICLE NUMBER: C85900 VIN: YV4CN982281432584

MANUFACTURER: Volvo Car Corporation

TEST FAILURE DESCRIPTION: DOT symbol required by FMVSS 110, S4.4.2(c), is not present, as verified by FMVSS 110 testing.

FMVSS REQUIREMENT, PARAGRAPH : S110, S4.4.2(c)

Each rim shall be marked with "the symbol DOT, constituting a certification by the manufacturer of the rim that the rim complies with all applicable motor vehicle safety standards."

NOTIFICATION TO NHTSA (COTR): John Finneran

DATE: February 11, 2008 BY: Kenneth H. Yates

REMARKS: None

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS NUMBER: 110 TEST DATE: February 11 through 13, 2008

LABORATORY: US DOT San Angelo Test Facility

LABORATORY PROJECT ENGINEER'S NAME: Kenneth H. Yates

TEST SPECIMEN DESCRIPTION: 2008 Volvo XC90 four-door MPV

NHTSA VEHICLE NUMBER: C85900 VIN: YV4CN982281432584

MANUFACTURER: Volvo Car Corporation

TEST FAILURE DESCRIPTION: The designation that indicates source of rim's published nominal dimension is not present. This is a violation of FMVSS S110, S4.4.2(a) verified by FMVSS 110/120 testing.

FMVSS REQUIREMENT, PARAGRAPH : S110, S4.4.2(a)
Each rim shall be marked with "a designation which indicates the source of the rim's published nominal dimensions..."

NOTIFICATION TO NHTSA (COTR): John Finneran

DATE: February 11, 2008 BY: Kenneth H. Yates

REMARKS: None

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS NUMBER: 571.110/567.4 TEST DATE: February 11 through 13, 2008

LABORATORY: US DOT San Angelo Test Facility

LABORATORY PROJECT ENGINEER'S NAME: Kenneth H. Yates

TEST SPECIMEN DESCRIPTION: 2008 Volvo XC90 four-door MPV

NHTSA VEHICLE NUMBER: C85900 VIN: YV4CN982281432584

MANUFACTURER: Volvo Car Corporation

TEST FAILURE DESCRIPTION: As verified by FMVSS 110 testing, the vehicle certification label is not affixed to the front of the driver's side of the B-pillar as required by FMVSS 567.4(c).

See Figure 5.21.

FMVSS REQUIREMENT, PARAGRAPH : S567.4

"..... the label shall be affixed to either the hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver's seating position....."

NOTIFICATION TO NHTSA (COTR): John Finneran

DATE: February 11, 2008 BY: Kenneth H. Yates

REMARKS: None

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS NUMBER: 110 TEST DATE: February 11 - 13

LABORATORY: US DOT San Angelo Test Facility

LABORATORY PROJECT ENGINEER'S NAME: Kenneth H. Yates

TEST SPECIMEN DESCRIPTION: 2008 Volvo XC90 four-door MPV

NHTSA VEHICLE NUMBER: C85900 VIN: YV4CN982281432584

MANUFACTURER: Volvo Car Corporation

TEST FAILURE DESCRIPTION: Rim size designation marking does not meet rim

requirements of FMVSS 110, S4.3.3 and S4.4.2(b), as verified by FMVSS 110 testing and

2007 Tire and Rim Association Yearbook.

FMVSS REQUIREMENT, PARAGRAPHS : S4.3.3 and S4.4.2(b)

S4.3.3 – “Additional labeling information for vehicles other than passenger cars. Each vehicle

shall show the size designation and, if applicable, the type designation of rims (not necessarily

those on the vehicle) appropriate for the tire appropriate for use on that vehicle.” Example:

“GAWR: Front-1,299 kilograms (2,864 pounds) with P265/70R16 tires, 16 x 8.00 rims at 248 kPa

(36 psi) cold single.”

S4.4.2(b) - Each rim shall be marked with the “rim size designation, and in the case of

multi-piece rims, the rim type designation. For example: 20 x 5.50, or 20 x 5.5.”

NOTIFICATION TO NHTSA (COTR): John Finneran

DATE: February 11, 2008 BY: Kenneth H. Yates

REMARKS: None