REPORT NUMBER 225-GTL-08-009

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 225 CHILD RESTRAINT ANCHORAGE SYSTEMS LOWER AND TETHER ANCHORAGES

VOLVO CAR CORPORATION
2008 VOLVO XC90, MPV
NHTSA NO. C85900

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

November 14, 2008

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
1200 NEW JERSEY AVE., SE
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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2008 Volvo XC90 MPV was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 225 testing to determine if the vehicle was in compliance with the requirements of the standard. The purpose of this standard is to establish requirements for child restraint anchorage systems to ensure their proper location and strength for the effective securing of child restraints, to reduce the likelihood of the anchorage systems' failure and to increase the likelihood that child restraints are properly secured and thus more fully achieve their potential effectiveness in motor vehicles.

1.1 The test vehicle was a 2008 Volvo XC90 MPV. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: YV4CN982281432584

B. NHTSA No.: C85900

C. Manufacturer: VOLVO CAR CORPORATION

D. Manufacture Date: 08/07

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 225 testing during the time period October 22-28, 2008.

SECTION 2

COMPLIANCE TEST RESULTS

2.0 TEST RESULTS

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures, TP-225-01 dated 11 April 2005.

Based on the test performed, the 2008 Volvo XC90 MPV appears to meet the requirements of FMVSS 225 testing.

SECTION 3

COMPLIANCE TEST DATA

3.0 TEST DATA

The following data sheets document the results of testing on the 2008 Volvo XC90 MPV.

DATA SHEET 1
SUMMARY OF RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 22-28, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

A. VISUAL INSPECTION OF TEST VEHICLE

Upon receipt for completeness, function, and discrepancies or damage which might influence the testing.

RESULTS: OK FOR TEST

B. REQUIREMENTS FOR CHILD RESTRAINT SYSTEMS AND TETHER ANCHORAGES

	PASS	FAIL
DSP a	X	
DSP b	X	
DSP c	X	

C. LOCATION OF TETHER ANCHORAGES

	PASS	FAIL
DSP a	X	
DSP b	X	
DSP c	X	

D. LOWER ANCHORAGE DIMENSIONS

	PASS	FAIL
DSP a	X	
DSP b	N/A	N/A
DSP c	X	

DATA SHEET 1 CONTINUED
SUMMARY OF RESULTS

E. CONSPICUITY AND MARKING OF LOWER ANCHORAGES

	PASS	FAIL
DSP a	X	
DSP b	N/A	N/A
DSP c	X	

F. STRENGTH OF TETHER ANCHORAGES

	PASS	FAIL
DSP a	X	
DSP b	X	
DSP c	N/A	N/A

G. STRENGTH OF LOWER ANCHORAGES (Forward Force)

	PASS	FAIL
DSP a	N/A	N/A
DSP b	N/A	N/A
DSP c	X	

H. STRENGTH OF LOWER ANCHORAGE (Lateral Force)

	PASS	FAIL
DSP a	N/A	N/A
DSP b	N/A	N/A
DSP c	N/A	N/A

I. OWNER'S MANUAL PASS: X FAIL:

REMARKS:

NOTE:

RECORDED BY: G. Farrand DATE: 10/28/08
APPROVED BY: D. Messick

DATA SHEET 2
REQUIREMENTS FOR CHILD RESTRAINT ANCHORAGE SYSTEMS
AND TETHER ANCHORAGES

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 22, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

Number of rows of seats: 2
Number of rear, forward-facing designated seating positions: 3
Number of required CRAS (lower anchorages only, for convertibles/school buses): 2
Number of required tether anchorages (can be additional CRAS): 3
Is the vehicle a convertible? NO
Is the vehicle a school bus? NO

Does the vehicle have a CRAS (lower anchorage only, for convertibles/school buses) installed at a front passenger seating position? NO

If NO, skip to next question.
If YES, does the vehicle have rear designated seating positions? _____
If NO, does the vehicle have an air bag on-off switch or a special exemption for no passenger air bag?
If NO = FAIL If YES = PASS
If Yes, does the vehicle meet the requirements of S4.5.4.1 (b) of S208 and have and air bag on-off switch or a special exemption for no passenger air bag?____
Record the distance between the front and rear seat back:_____
If Distance <720 mm and vehicle has an air bag on-off switch or special exemption = PASS
If Distance ≥ 720 mm or no air bag on-off switch or no special exemption = FAIL

Does the vehicle have rear designated seating position(s) where the lower bars of a CRAS are prevented from being located because of transmission and/or suspension component interference?
NO
If NO, skip to next question.
If YES, does the vehicle have a tether anchorage at a front passenger seating position?
YES = PASS NO = FAIL (S5(e))

Number of provided CRAS (lower anchorage only, for convertibles/school buses), indicate if a built-in child restraint is counted as a CRAS: 2

Is the number of provided CRAS (lower anchorages only, for convertible/school buses) greater than or equal to the number of required CRAS (lower anchorages only, for convertibles/school buses)?
YES
YES = PASS NO = FAIL (S4.4(a) or (b) or (c))

DATA SHEET 2 CONTINUED

If the vehicle has 3 or more rows of seats is a CRAS (lower anchorage only for convertibles/school buses) provided in the second row: N/A

YES = PASS NO = FAIL (S4.4(a)(1))

Number of provided tether anchorages (can be additional CRAS) indicate if a built-in child restraint is counted as tether anchorage (NOTE: a built-in child restraint can only be counted toward either the required number of CRAS or tether anchorages, not both): 3

Is the number of provided tether anchorages greater than or equal to the number of required tether anchorages? YES

YES = PASS NO = FAIL (S4.4 (a) or (b) or (c))

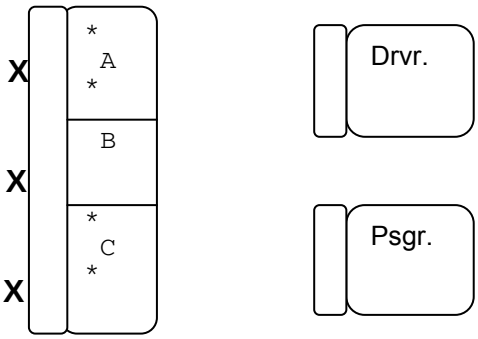
If the vehicle has 3 or more rear dsps and a non-outboard dsp, is a tether anchorage or CRAS provided at a non-outboard dsp? YES

YES = PASS NO = FAIL (S4.4 (a)(2))

Are all tether and lower anchorages available for use at all times when the seat is configured for passenger use? YES

YES = PASS NO = FAIL (S4.6 (b))

Provide a diagram showing the location of lower anchorages and/or tether anchorages.



X = Top Tether
***** = Lower Anchors

RECORDED BY: G. Farrand DATE: 10/22/08

APPROVED BY: D. Messick

DATA SHEET 3
LOCATION OF TETHER ANCHORAGES

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 22, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

DESIGNATED SEATING POSITION: ROW 2 LEFT, RIGHT AND CENTER POSITIONS

Detailed description of the location of the tether anchorage:
LOCATED ON SEAT BACK.

Based on visual inspection, is the tether anchorage within the shaded zone? YES
If YES = PASS, skip to next section
If NO, After constructing the shaded zone, is the tether anchorage within the shaded zone?

If YES = PASS, skip to next section
If NO, Is it possible to locate a tether anchorage within the shaded zone without removing a seating component?
If YES = FAIL (S6.2.1)
If NO, Is a tether routing device provided?
If YES = PASS
IF NO = FAIL (S6.2.1.2)

Is the tether anchorage recessed? YES
If NO, skip to next question
If YES, is it outside of the tether strap wraparound area? YES
YES = PASS NO = FAIL (S6.2.1)

Does the tether anchorage permit attachment of a tether hook? YES
YES = PASS NO = FAIL (S6.1(a))

Is the tether anchorage accessible without the need for any tools other than a screwdriver or coin?
YES
YES = PASS NO = FAIL (S6.1(b))

After the tether anchorage is accessed, is it ready for use without the need for tools? YES
YES = PASS NO = FAIL (S6.1(c)

Is the tether anchorage sealed to prevent the entry of exhaust fumes into the passenger compartment? YES
YES = PASS NO = FAIL (S6.1(d))

If the DSP has a tether routing device, is it flexible or rigid? N/A

DATA SHEET 3 CONTINUED

DESIGNATED SEATING POSITION: ROW 2 LEFT, RIGHT AND CENTER POSITIONS

If the DSP has a flexible tether routing device, after installing SFAD2 record the tether strap tension:
N/A (Must be 60 N ± 5 N)

If the DSP has a flexible tether routing device, record the horizontal distance between the torso reference plane and the routing device: N/A
Greater than or equal to 65mm = PASS Less than 65mm = FAIL

If the DSP has a rigid tether routing device, record the horizontal distance between the torso reference plane and the routing device: N/A
Greater than or equal to 100mm = PASS Less than 100mm = FAIL

COMMENTS:

RECORDED BY: G. Farrand DATE: 10/22/08

APPROVED BY: D. Messick

DATA SHEET 4
LOWER ANCHORAGE DIMENSIONS

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 22, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

DESIGNATED SEATING POSITION: ROW 2 LEFT SIDE (DSP A)

Outboard Lower Anchorage bar diameter: 6.02 mm
6mm ± 0.1 mm = PASS Other size = FAIL (S9.1.1(a))

Inboard Lower Anchorage bar diameter: 6.02 mm
6mm ± 0.1mm = PASS Other size = FAIL (S9.1.1(a))

Are the bars straight, horizontal and transverse? YES
YES = PASS NO = FAIL

Length of the straight portion of the bar (outboard lower anchorage): 25 mm
Length ≥25mm = PASS Length <25mm = FAIL(S9.1.1(c) (i))

Length of the straight portion of the bar (inboard lower anchorage): 25 mm
Length ≥25mm = PASS Length <25mm = FAIL(S9.1.1(c) (i))

Length between the anchor bar supports (outboard lower anchorage): 34 mm
Length ≤60mm = PASS Length >60mm = FAIL(S9.1.1(c) (ii))

Length between the anchor bar supports (inboard lower anchorage): 34 mm
Length ≤60mm = PASS Length >60mm = FAIL(S9.1.1(c) (ii))

CRF Pitch angle: 18.3°
Angle = 15º±10º = PASS Angle≠15º±10º = FAIL (S9.2.1)

CRF Roll angle: 0.4°
Angle = 0º±5º = PASS Angle≠0º±5º = FAIL (S9.2.1)

CRF Yaw angle: 0.0°
Angle = 0º±10º = PASS Angle≠0º±10º = FAIL (S9.2.1)

Distance between point Z on the CRF and the front surface of outboard anchor bar: 68 mm
Distance ≤70mm = PASS Distance > 70mm = FAIL

Distance between point Z on the CRF and the front surface of inboard anchor bar: 68 mm
Distance ≤70mm = PASS Distance > 70mm = FAIL

DATA SHEET 4 CONTINUED

DESIGNATED SEATING POSITION: ROW 2 LEFT SIDE (DSP A)

Distance between SgRP and the front surface of outboard anchor bar: 145 mm
Distance ≥ 120mm = PASS Distance < 120mm = FAIL

Distance between SgRP and the front surface of inboard anchor bar: 143 mm
Distance ≥ 120mm = PASS Distance < 120mm = FAIL

Based on visual observation, would a 100 N load cause the anchor bar to deform more than 5 mm?
NO

If NO = PASS
If YES = FAIL (S9.1.1(g)), Provide further description of the attachment of the anchor bar:

COMMENTS:

RECORDED BY: G. Farrand DATE: 10/22/08

APPROVED BY: D. Messick

DATA SHEET 4A
LOWER ANCHORAGE DIMENSIONS

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 22, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

DESIGNATED SEATING POSITION: ROW 2 RIGHT SIDE (DSP C)

Outboard Lower Anchorage bar diameter: 6.02 mm
6mm ± 0.1 mm = PASS Other size = FAIL (S9.1.1(a))

Inboard Lower Anchorage bar diameter: 6.02 mm
6mm ± 0.1mm = PASS Other size = FAIL (S9.1.1(a))

Are the bars straight, horizontal and transverse? YES
YES = PASS NO = FAIL

Length of the straight portion of the bar (outboard lower anchorage): 25 mm
Length ≥25mm = PASS Length <25mm = FAIL(S9.1.1(c) (i))

Length of the straight portion of the bar (inboard lower anchorage): 25 mm
Length ≥25mm = PASS Length <25mm = FAIL(S9.1.1(c) (i))

Length between the anchor bar supports (outboard lower anchorage): 34 mm
Length ≤60mm = PASS Length >60mm = FAIL(S9.1.1(c) (ii))

Length between the anchor bar supports (inboard lower anchorage): 34 mm
Length ≤60mm = PASS Length >60mm = FAIL(S9.1.1(c) (ii))

CRF Pitch angle: 17.9°
Angle = 15º±10º = PASS Angle≠15º±10º = FAIL (S9.2.1)

CRF Roll angle: 0.0°
Angle = 0º±5º = PASS Angle≠0º±5º = FAIL (S9.2.1)

CRF Yaw angle: 0.0°
Angle = 0º±10º = PASS Angle≠0º±10º = FAIL (S9.2.1)

Distance between point Z on the CRF and the front surface of outboard anchor bar: 63 mm
Distance ≤70mm = PASS Distance > 70mm = FAIL

Distance between point Z on the CRF and the front surface of inboard anchor bar: 63 mm
Distance ≤70mm = PASS Distance > 70mm = FAIL

DATA SHEET 4A CONTINUED

DESIGNATED SEATING POSITION: ROW 2 RIGHT SIDE (DSP C)

Distance between SgRP and the front surface of outboard anchor bar: 144 mm
Distance ≥ 120mm = PASS Distance < 120mm = FAIL

Distance between SgRP and the front surface of inboard anchor bar: 142 mm
Distance ≥ 120mm = PASS Distance < 120mm = FAIL

Based on visual observation, would a 100 N load cause the anchor bar to deform more than 5 mm?
NO

If NO = PASS
If YES = FAIL (S9.1.1(g)), Provide further description of the attachment of the anchor bar:

COMMENTS:

RECORDED BY: G. Farrand DATE: 10/22/08

APPROVED BY: D. Messick

DATA SHEET 5
CONSPICUITY AND MARKING OF LOWER ANCHORAGES

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 22, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

DESIGNATED SEATING POSITION: ROW 2 LEFT AND RIGHT SIDE (DSP A AND C)

MARKING (Circles)

Diameter of the circle: 15.0 mm
Diameter ≥13mm = PASS Diameter <13mm = FAIL (S9.5(a)(1))

Does the circle have words, symbols or pictograms? PICTOGRAM
NO skip to next question
YES, are the meaning of the words, symbols or pictograms explained in the owner's manual? YES
YES = PASS NO = FAIL (S9.5(a)(2))

Where is the circle located? Seat back or seat Cushion: Seat Back

For circles on seat backs, vertical distance from the center of the circle to the center of the anchor bar: 70 mm
Distance between 50&100mm = PASS Other Distance=FAIL (S9.5(a)(3))

For circles on seat cushions, horizontal distance from the center of the circle to the center of the bar: N/A
Distance between 75&125mm= PASS Other Distance=FAIL (S9.5(a)(3))

Lateral distance from the center of the circle to the center of the anchor bar: 10 mm
Distance≤25mm = PASS Distance >25mm = FAIL (S9.5(a)(3))

CONSPICUITY (No Circles)

Is the anchor bar or guide visible when viewed from a point 30º above the horizontal in a vertical longitudinal plane bisecting the anchor bar or guide? N/A
YES = PASS NO = FAIL (S9.5(b))

If there is a guide, is it permanently attached? N/A
YES = PASS NO = FAIL (S9.5(b))

DATA SHEET 5 CONTINUED

DESIGNATED SEATING POSITION: ROW 2 LEFT SIDE AND RIGHT SIDE (DSP A & C)

Is there a cap or cover over the anchor bar? N/A

If YES, Is the cap or cover marked with words, symbols or pictograms? _____

If NO = FAIL (S9.5(b))

If YES, is the meaning of the words, symbols or pictograms explained in the owner's manual?

YES = PASS NO = FAIL (S9.5(b))

If NO, there are no requirements for having a cover.

RECORDED BY: G. Farrand DATE: 10/22/08

APPROVED BY: D. Messick

DATA SHEET 6
STRENGTH OF TETHER ANCHORAGES

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 28, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE
TEST NO: 6103

DESIGNATED SEATING POSITION: ROW 2 LEFT SIDE (DSP A)

SFAD: 2

Seat Back Angle: 26º

Location of seat back angle measurement: 2D Template

Head Restraint Position: UP

D-ring Position: N/A

Force at Point X (lower front crossmember for SFAD2) while securing belts and tether: 135 N

Lap belt tension: N/A (SFAD 1 only)

Tether strap tension: 65 N

Angle (measured above the horizontal at 500 N): 10º

Separation of tether anchorage at 500 N: NO
NO = PASS YES = FAIL (S6.3.1)

Force application rate: 575 N/S

Time to reach maximum force (24-30 s): 26 sec.

Maximum force (14,950 N ± 50 N): 14,928 N

Tested simultaneously with another DSP? NO

COMMENTS:

RECORDED BY: G. FARRAND DATE: 10/28/08

APPROVED BY: D. MESSICK

DATA SHEET 6A
STRENGTH OF TETHER ANCHORAGES

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 28, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE
TEST NO: 6105

DESIGNATED SEATING POSITION: ROW 2 CENTER (DSP B)

SFAD: 1

Seat Back Angle: 28º

Location of seat back angle measurement: 2D Template

Head Restraint Position: UP

D-ring Position: N/A

Force at Point X (lower front crossmember for SFAD2) while securing belts and tether: 135N

Lap belt tension: 60 N (SFAD 1 only)

Tether strap tension: 60 N

Angle (measured above the horizontal at 500 N): 10º

Separation of tether anchorage at 500 N: NO
NO = PASS YES = FAIL (S6.3.1)

Force application rate: 575 N/S

Time to reach maximum force (24-30 s): 26 sec.

Maximum force (14,950 N ± 50 N): 14,980 N

Tested simultaneously with another DSP? NO

COMMENTS:

RECORDED BY: G. FARRAND DATE: 10/28/08

APPROVED BY: D. MESSICK

DATA SHEET 7
STRENGTH OF LOWER ANCHORAGES (Forward Force)

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 28, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE
TEST NO: 6104

DESIGNATED SEATING POSITION: ROW 2 RIGHT SIDE (DSP C)

Seat Back Angle: 26º

Location of seat back angle measurement: 2D Template

Head Restraint Position: N/A

Force at lower front crossmember for SFAD2 while tightening rearward extensions: 135 N

Angle (measured above the horizontal at 500 N): 10º

Force application rate: 423 N/S

Time to reach maximum force (24-30 s): 26 sec.

Maximum force (14,950 N ± 50 N): 10,973 N

Displacement, H1 (at 500N): 0

Displacement, H2 (at maximum load): 82.6 mm

Displacement of Point X: 82.6 mm (H2-H1)
Displacement > 175 mm = FAIL (S9.4.1(a))

Tested simultaneously with another DSP? NO

Distance between adjacent DSP's: 405 mm

COMMENTS:

RECORDED BY: G. FARRAND DATE: 10/28/08

APPROVED BY: D. MESSICK

DATA SHEET 8
OWNER'S MANUAL

VEH. MOD YR/MAKE/MODEL/BODY: 2008 VOLVO XC90 MPV
VEH. NHTSA NO: C85900; VIN: YV4CN982281432584
VEH. BUILD DATE: 08/07; TEST DATE: OCTOBER 22, 2008
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

Description of which DSP's are equipped with tether anchorages and child restraint anchorage systems: YES

PASS X FAIL

Step-by-step instructions for properly attaching a child restraint system's tether strap to the tether anchorage. Diagrams are required. YES

PASS X FAIL

Description of how to properly use the tether anchorage and lower anchor bars: YES

PASS X FAIL

If the lower anchor bars are marked with a circle, an explanation of what the circle indicates as well as any words or pictograms: YES

PASS X FAIL

COMMENTS:

RECORDED BY: G. Farrand DATE: 10/22/08

APPROVED BY: D. Messick

SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST

EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
COMPUTER	AT&T	486DX266	BEFORE USE	BEFORE USE
LOAD CELL	INTERFACE	215709	01/08	01/09
LINEAR TRANSDUCER	SERVO SYSTEMS	20	BEFORE USE	BEFORE USE
SEAT BELT LOAD CELL	TRANSDUCER	135	BEFORE USE	BEFORE USE
SEAT BELT LOAD CELL	TRANSDUCER	137	BEFORE USE	BEFORE USE
LEVEL	STANLEY	42-449	BEFORE USE	BEFORE USE
FORCE GAUGE	CHATILLON	8761	BEFORE USE	BEFORE USE
CALIPER	N/A	Q9322365	BEFORE USE	BEFORE USE
CRF	MEASUREMENT FIXTURE	GTL CRF	BEFORE USE	BEFORE USE
SFAD 1	FORCE APPLICATION DEVICE	GTL SFAD 1	BEFORE USE	BEFORE USE
SFAD 2	FORCE APPLICATION DEVICE	GLT SFAD 2	BEFORE USE	BEFORE USE

SECTION 5

PHOTOGRAPHS

2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.1
LEFT SIDE VIEW OF VEHICLE

2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.2
RIGHT SIDE VIEW OF VEHICLE

2008 VOLVO XC90
NHTSA NO. C85900
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FIGURE 5.3
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE

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FIGURE 5.4
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE

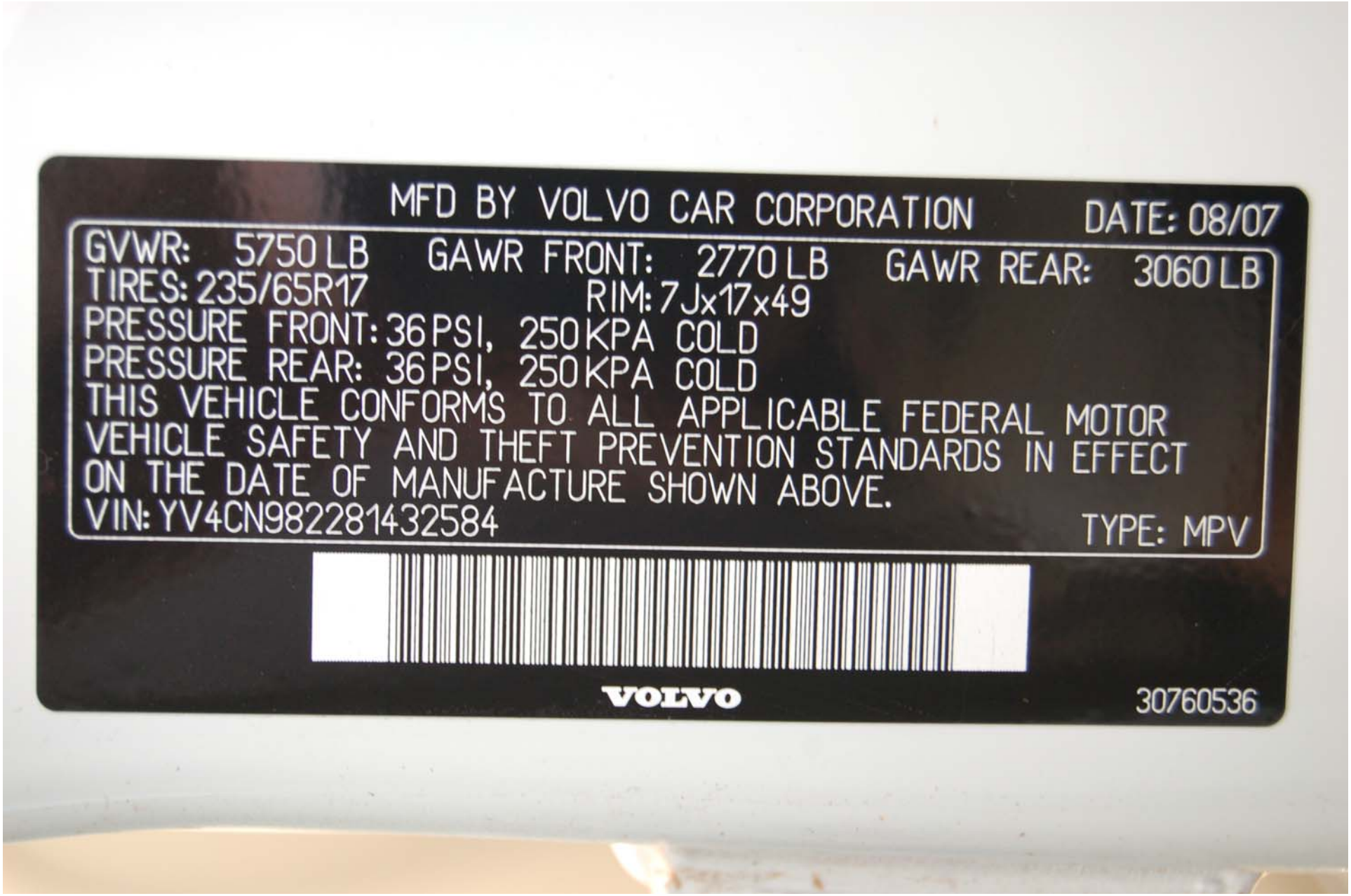

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FIGURE 5.5
VEHICLE CERTIFICATION LABEL

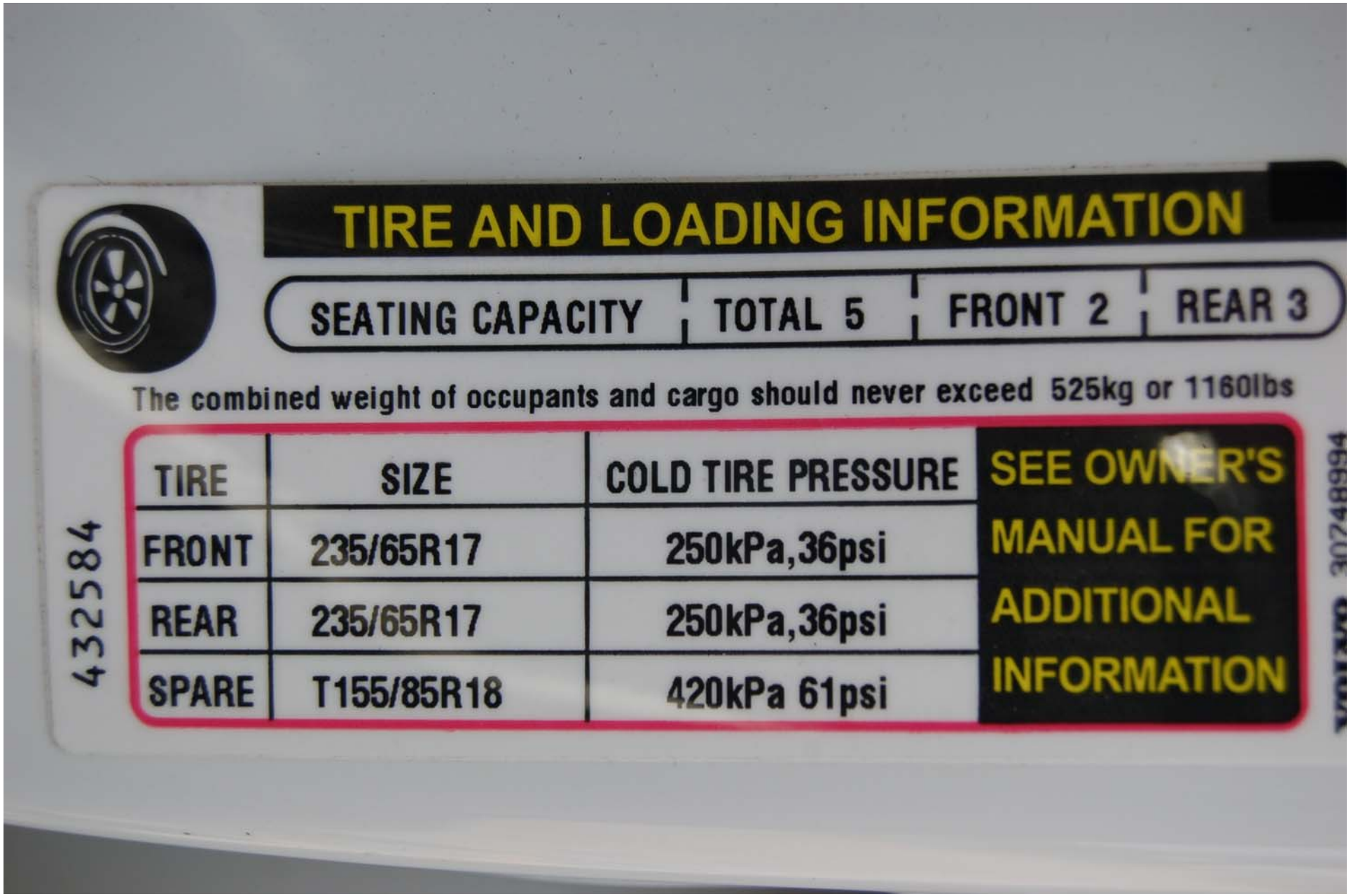

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FIGURE 5.6
VEHICLE TIRE INFORMATION LABEL

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FIGURE 5.7
VISIBILITY OF LOWER ANCHORS

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FIGURE 5.8
ROW 2, LEFT SIDE, OUTBOARD LOWER ANCHOR,
PRE-TEST

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FIGURE 5.9
ROW 2, LEFT SIDE, INBOARD LOWER ANCHOR,
PRE-TEST

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FIGURE 5.10
ROW 2, LEFT SIDE, TOP TETHER ANCHOR, PRE-TEST

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FIGURE 5.11
ROW 2, CENTER, TOP TETHER ANCHOR, PRE-TEST

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FIGURE 5.12
ROW 2, RIGHT SIDE, INBOARD LOWER ANCHOR,
PRE-TEST

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FIGURE 5.13
ROW 2, RIGHT SIDE, OUTBOARD LOWER ANCHOR,
PRE-TEST

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FIGURE 5.14
ROW 2, RIGHT SIDE, TOP TETHER ANCHOR, PRE TEST

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FIGURE 5.15
OVERALL VIEW OF ROW 2 SEATING POSITIONS,
PRE-TEST

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FIGURE 5.16
ROW 2, LEFT SIDE WITH CRF

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FIGURE 5.17
ROW 2, LEFT SIDE WITH 2-D TEMPLATE

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FIGURE 5.18
ROW 2, LEFT SIDE TOP TETHER ROUTING

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FIGURE 5.19
ROW 2, RIGHT SIDE WITH CRF

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NHTSA NO. C85900
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FIGURE 5.20
ROW 2, RIGHT SIDE WITH 2-D TEMPLATE

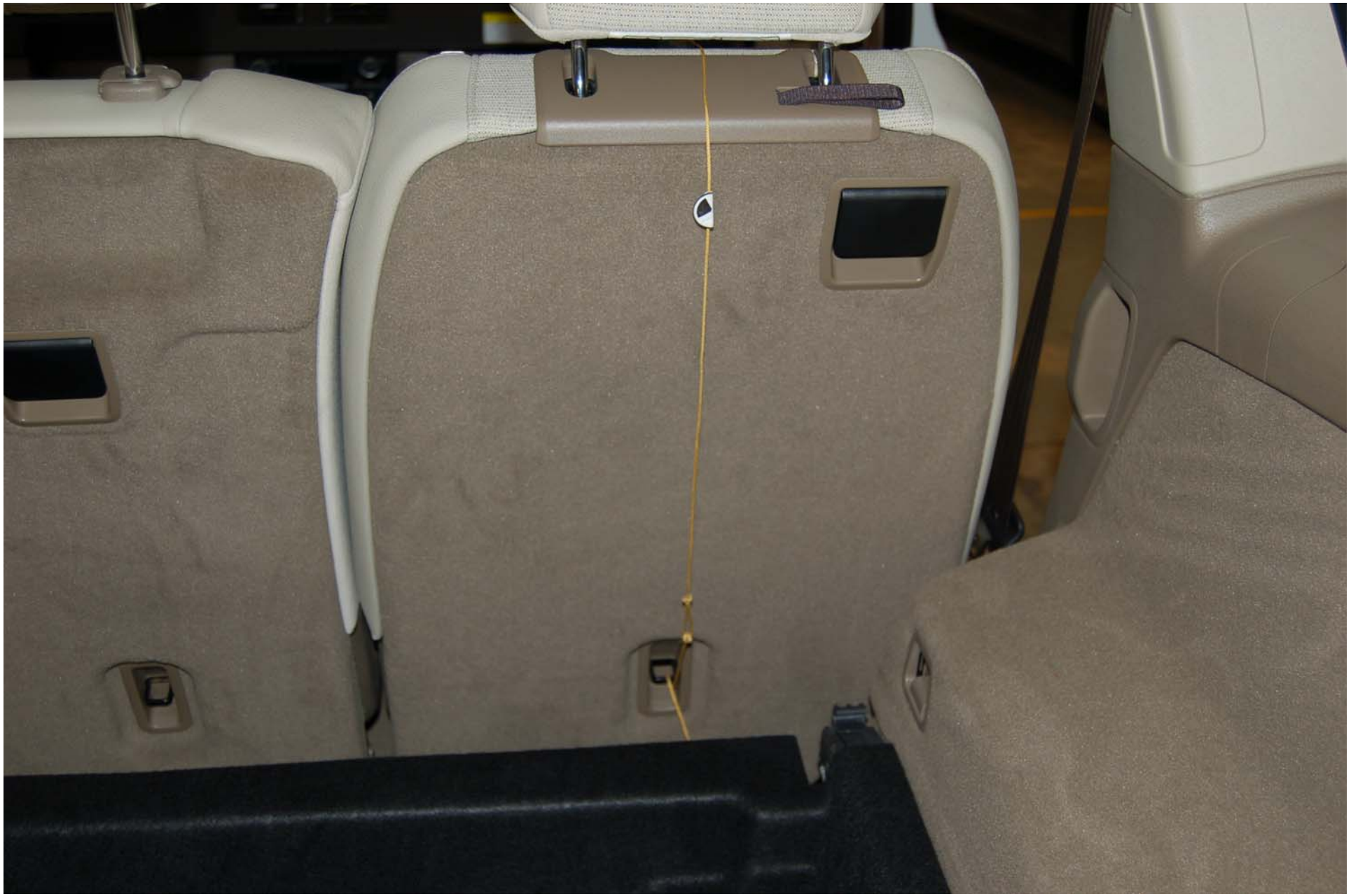

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FIGURE 5.21
ROW 2, RIGHT SIDE TOP TETHER ROUTING

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FIGURE 5.22
ROW 2, CENTER WITH 2-D TEMPLATE

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FIGURE 5.23
ROW 2, CENTER TOP TETHER ROUTING

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FIGURE 5.24
ROW 2, RIGHT SIDE, OUTBOARD CRF MEASUREMENT

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FIGURE 5.25
ROW 2, LEFT SIDE INBOARD CRF MEASUREMENT

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FIGURE 5.26
ROW 2, LEFT SIDE OUTBOARD CRF MEASUREMENT

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FIGURE 5.27
MEASUREMENT OF SYMBOL

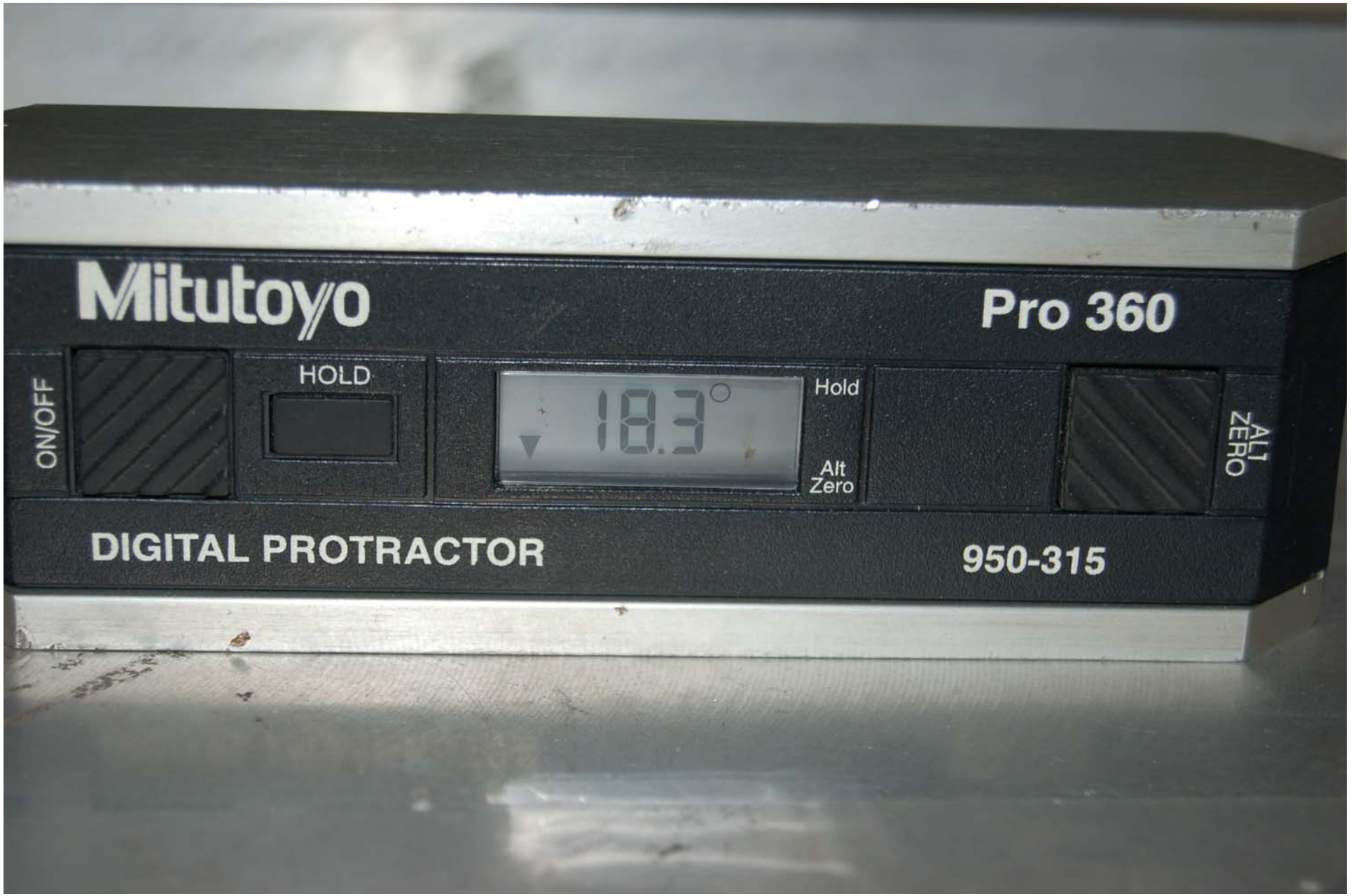

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FIGURE 5.28
ROW 2, LEFT SIDE PITCH MEASUREMENT

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FIGURE 5.29
ROW 2, RIGHT SIDE PITCH MEASUREMENT

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FIGURE 5.30
ROW 2, LEFT SIDE OUTBOARD SRP MEASUREMENT

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FIGURE 5.31
ROW 2, LEFT SIDE, INBOARD SRP MEASUREMENT

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FIGURE 5.32
ROW 2, RIGHT SIDE OUTBOARD SRP MEASUREMENT

2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.33
ROW 2, RIGHT SIDE, INBOARD SRP MEASUREMENT

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FIGURE 5.34
¾ LEFT FRONT VIEW OF VEHICLE IN TEST RIG

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NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.35
¾ RIGHT FRONT VIEW OF VEHICLE IN TEST RIG

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FMVSS NO. 225

FIGURE 5.36
PRE-TEST, ROW 2, LEFT SIDE WITH SFAD 2

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NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.37
PRE-TEST, ROW 2, LEFT SIDE WITH SFAD 2

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NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.38
POST TEST, ROW 2, LEFT SIDE WITH SFAD 2

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NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.39
POST TEST, ROW 2, LEFT SIDE WITH SFAD 2

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NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.40
PRE-TEST, ROW 2, RIGHT SIDE WITH SFAD 2

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NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.41
POST TEST, ROW 2, RIGHT SIDE WITH SFAD 2

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FMVSS NO. 225

FIGURE 5.42
PRE-TEST, ROW 2, CENTER WITH SFAD 1

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NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.43
PRE-TEST, ROW 2, CENTER WITH SFAD 1

2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.44
POST TEST, ROW 2, CENTER WITH SFAD 1

2008 VOLVO XC90
NHTSA NO. C85900
FMVSS NO. 225

FIGURE 5.45
POST TEST, ROW 2, CENTER WITH SFAD 1

APPENDIX A
OWNER'S MANUAL RESTRAINT INFORMATION

01 Child safety

Automatic Locking Retractor/Emergency Locking Retractor

To make child seat installation easier, each seat belt (except for the driver's belt) is equipped with a locking mechanism to help keep the seat belt taut.

When attaching the seat belt to a child seat:

- Attach the seat belt to the child seat according to the child seat manufacturer's instructions.
- Pull the seat belt out as far as possible.
- Insert the seat belt latch plate into the buckle (lock) in the usual way.
- Release the seat belt and pull it taut around the child seat.
  A sound from the seat belt retractor will be audible at this time and is normal.

The belt will now be locked in place.

This function is automatically disabled when the seat belt is unlocked and the belt is fully retracted.

⚠ WARNING

Do not use child safety seats or child booster cushions/backrests in the front passenger's seat. We also recommend that children who have outgrown these devices sit in the rear seat with the seat belt properly fastened.

Volvo's recommendations

Why does Volvo believe that no child should sit in the front seat of a vehicle? It's quite simple really. A front airbag is a very powerful device designed, by law, to help protect an adult.

Because of the size of the airbag and its speed of inflation, a child should never be placed in the front seat, even if he or she is properly belted or strapped into a child safety seat. Volvo has been an innovator in safety for over seventy-five years, and we'll continue to do our part. But we need your help. Please remember to put your children in the back seat, and buckle them up.

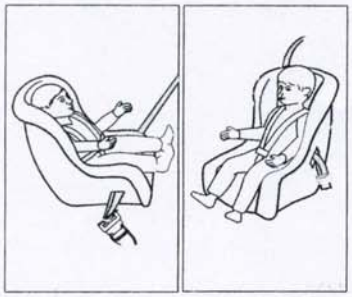
Volvo has some very specific recommendations:

- Always wear your seat belt.
- Airbags are a SUPPLEMENTAL safety device which, when used with a three-point seat belt can help reduce serious injuries during certain types of accidents. Volvo recommends that you do not disconnect the airbag system in your vehicle.
- Volvo strongly recommends that everyone in the vehicle be properly restrained.
- Volvo recommends that ALL occupants (adults and children) shorter than 4 feet 7 inches (140 cm) be seated in the back seat of any vehicle with a front passenger side airbag.
- Drive safely!

Child restraint systems 01

Child restraints

Infant seat



Convertible seat

Booster cushion

There are three main types of child restraint systems: infant seats, convertible seats, and booster cushions. They are classified according to the child's age and size.

The following section provides **general information** on securing a child restraint using a three-point seat belt. Refer to pages 41and 42 for information on securing a child restraint using ISOFIX lower anchors and/or top tether anchorages.

⚠ WARNING

A child seat should never be used in the front passenger seat of any vehicle with a front passenger airbag - not even if the "Passenger airbag off" symbol near the rear-view mirror is illuminated (on vehicles equipped with Occupant Weight Sensor). If the severity of an accident were to cause the airbag to inflate, this could lead to serious injury or death to a child seated in this position.

⚠ WARNING

Always refer to the child restraint manufacturer's instructions for detailed information on securing the restraint.

01 **Child restraint systems**

WARNING

- When not in use, keep the child restraint system secured or remove it from the passenger compartment to help prevent it from injuring passengers in the event of a sudden stop or collision.
- A small child's head represents a considerable part of its total weight and its neck is still very weak. Volvo recommends that children up to age 4 travel, properly restrained, facing rearward. In addition, Volvo recommends that children should ride rearward facing, properly restrained, as long as possible.

Infant seats 01

Securing an infant seat with a seat belt

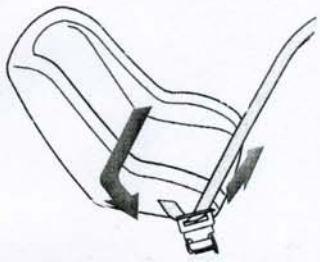
Do not place the infant seat in the front passenger's seat

Refer to page 41 and 42 for information on securing a child restraint using ISOFIX lower anchors and/or top tether anchorages.

1. Place the infant seat in the rear seat of the vehicle.

WARNING

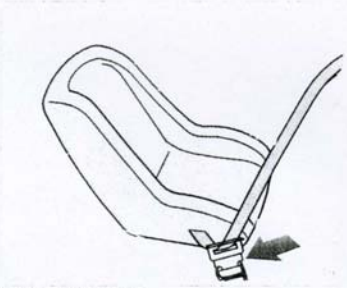
- An infant seat must be in the rear-facing position only.
- The infant seat should not be positioned behind the driver's seat unless there is adequate space for safe installation.



Positioning the seat belt through the infant seat

2. Attach the seat belt to the infant seat according to the manufacturer's instructions.
3. Fasten the seat belt by inserting the latch plate into the buckle (lock) until a distinct click is audible.

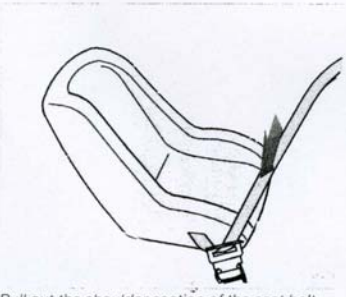
01 Infant seats



Fasten the seat belt

WARNING

A child seat should never be used in the front passenger seat of any vehicle with a front passenger airbag - not even if the "Passenger airbag off" symbol near the rear-view mirror is illuminated (on vehicles equipped with Occupant Weight Sensor). If the severity of an accident were to cause the airbag to inflate, this could lead to serious injury or death to a child seated in this position.



Pull out the shoulder section of the seat belt

4. Pull the shoulder section of the seat belt out as far as possible to activate the belt's automatic locking function.
5. Press the infant seat firmly in place, let the seat belt retract and pull it taut. A sound from the seat belt retractor's automatic locking function will be audible at this time and is normal. The seat belt should now be locked in place.

The locking retractor will automatically release when the seat belt is unbuckled and allowed to retract fully.

Ensure that the seat is securely in place

6. Push and pull the infant seat to ensure that it is held securely in place by the seat belt.

WARNING

It should not be possible to move the child restraint more than 1 in. (2.5 cm) in any direction.

The infant seat can be removed by unbuckling the seat belt and letting it retract completely.

Convertible seats 01

Securing a convertible seat with a seat belt

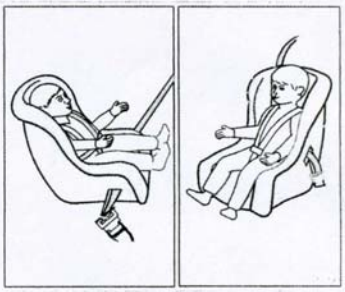
Do not place the convertible seat in the front passenger's seat

Refer to page 41 for information on securing a child restraint using ISOFIX lower anchors and/or top tether anchorages.

Convertible seats can be used in either a forward or rearward-facing position, depending on the age and size of the child.

WARNING

Always use a convertible seat that is suitable for the child's age and size. See the convertible seat manufacturer's recommendations.



Route the seat belt through the convertible seat

WARNING

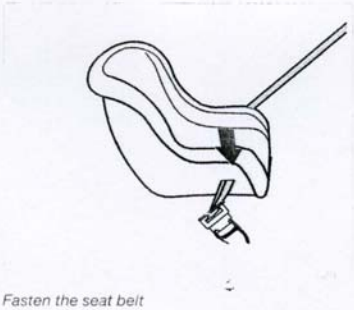
A small child's head represents a considerable part of its total weight and its neck is still very weak. Volvo recommends that children up to age 4 travel, properly restrained, facing rearward. In addition, Volvo recommends that children should ride rearward facing, properly restrained, as long as possible.

1. Place the convertible seat in the rear seat of the vehicle.

01 **Convertible seats**

WARNING

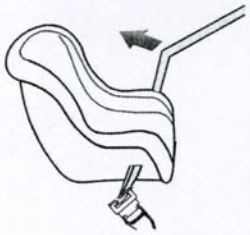
- Convertible child seats should be installed in the rear seat only.
- A rear-facing convertible seat should not be positioned behind the driver's seat unless there is adequate space for safe installation.



Fasten the seat belt

2. Attach the seat belt to the convertible seat according to the manufacturer's instructions.
3. Fasten the seat belt by inserting the latch plate into the buckle (lock) until a distinct click is audible.
4. Pull the shoulder section of the seat belt out as far as possible to activate the belt's automatic locking function.
5. Press the convertible seat firmly in place, let the seat belt retract and pull it taut. A sound from the seat belt retractor's automatic locking function will be audible at this time and is normal. The seat belt should now be locked in place.

Convertible seats 01



Pull out the shoulder section of the seat belt

The locking retractor will automatically release when the seat belt is unbuckled and allowed to retract fully.

6. Push and pull the convertible seat to ensure that it is held securely in place by the seat belt.

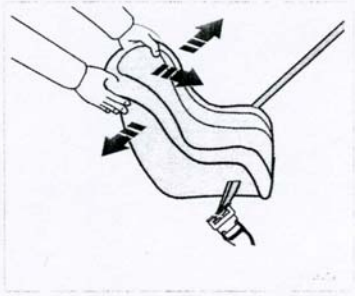
WARNING

It should not be possible to move the child restraint more than 1 in. (2.5 cm) in any

The convertible seat can be removed by unbuckling the seat belt and letting it retract completely.

WARNING

A child seat should never be used in the front passenger seat of any vehicle with a front passenger airbag - not even if the "Passenger airbag off" symbol near the rear-view mirror is illuminated (on vehicles equipped with Occupant Weight Sensor). If the severity of an accident were to cause the airbag to inflate, this could lead to serious injury or death to a child seated in this position.



Ensure that the seat is securely in place

01 **Booster cushions**

Securing a booster cushion

Position the child correctly on the booster cushion

Positioning the seat belt

Booster cushions are recommended for children who have outgrown convertible seats.

1. Place the booster cushion in the rear seat of the vehicle.
2. With the child properly seated on the booster cushion, attach the seat belt to or around the cushion according to the manufacturer's instructions.
3. Fasten the seat belt by inserting the latch plate into the buckle (lock) until a distinct click is audible.
4. Ensure that the seat belt is pulled taut and fits snugly around the child.

⚠ WARNING

- The hip section of the three-point seat belt must fit snugly across the child's hips, not across the stomach.
- The shoulder section of the three-point seat belt should be positioned across the chest and shoulder.
- The shoulder belt must never be placed behind the child's back or under the arm.

ISOFIX lower anchors 01

Using the ISOFIX lower child seat anchors

ISOFIX lower child restraint anchors

Lower anchors for ISOFIX-equipped child seats are located in the second row, outboard seats, hidden below the backrest cushions. Symbols on the seat back upholstery mark the anchor positions (see the illustration above).

To access the anchors:

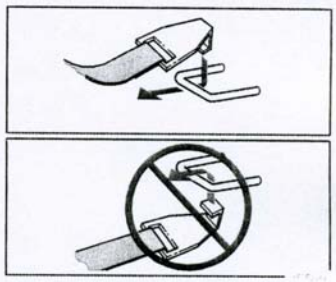
1. Put the child restraint in position.
2. Kneel on the child restraint to press down the seat cushion and locate the anchors by feel.
3. Fasten the attachment on the child restraint's lower straps to the ISOFIX lower anchors.
4. Firmly tension the lower child seat straps according to the manufacturer's instructions.

⚠ WARNING

The ISOFIX lower child restraint anchors are only intended for use with child seats positioned in the outboard seating positions. These anchors are not certified for use with any child restraint that is positioned in the center seating position. When securing a child restraint in the center seating position, use only the vehicle's center seat belt.

i

- The rear seat's center position is not equipped with ISOFIX lower anchors. When installing a child restraint in this position, attach the restraint's top tether strap (if it is so equipped) to the top tether anchorage point (see the information on page 42) and secure the restraint with the vehicle's center seat belt (see the information beginning on page 35).
- Always follow your child seat manufacturer's installation instructions, and use both ISOFIX lower anchors and top tethers whenever possible.



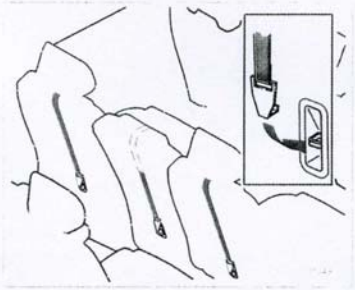
Fasten the attachment correctly to the ISOFIX lower anchors

⚠ WARNING

Be sure to fasten the attachment correctly to the anchor (see the illustration above). If the attachment is not correctly fastened, the child restraint may not be properly secured in the event of a collision.

01 Top tether anchors

Top tether anchors



Top tether anchorage points

Your vehicle is equipped with child restraint top tether anchorages in all second row seat positions (second-row seats only in 7-seat models).

Using the top tether anchorages

- Place the child restraint on the rear seat.
- Route the top tether strap under the head restraint and fasten its attachment to the anchorage.

⚠ WARNING

Be sure to fasten the child tether attachment correctly to the anchor. If it is not correctly fastened, the child seat may not be properly restrained in the event of a collision.

- Firmly tension the top tether strap according to the child restraint manufacturer's instructions. Tension the top tether strap only after the lower anchor straps or the seat belt have been firmly tensioned.

See page 41 for securing the child restraint to ISOFIX lower anchors.

⚠ WARNING

- Never route a top tether strap over the top or around the head restraint. It should always be routed under the head restraint.
- Child restraint anchorages are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seat belts or harnesses. The anchorages are not able to withstand excessive forces on them in the event of collision if full harness seat belts or adult seat belts are installed to them. An adult who uses a belt anchored in a child restraint anchorage runs a great risk of suffering severe injuries should a collision occur.
- Do not install rear speakers that require the removal of the top tether anchors or interfere with the proper use of the top tether strap.

Child restraint registration and recalls 01

Registering a child restraint

Child restraints could be recalled for safety reasons. You must register your child restraint to be reached in a recall. To stay informed about child safety seat recalls, be sure to fill out and return the registration card that comes with new child restraints.

Child restraint recall information is readily available in both the U.S. and Canada. For recall information in the U.S., call the U.S. Government's Auto Safety Hotline at 1-800-424-9393. In Canada, visit Transport Canada's Child Safety website at http://www.tc.gc.ca/roadsafety/childsafety/menu.htm.

01 Integrated booster cushion

Integrated booster cushion (option)

Volvo's own integrated booster cushion has been specially designed to help safeguard a child seated in the rear seat. When using an integrated booster cushion, the child must be secured with the vehicle's three-point seat belt.

Use this booster cushion only with children who weigh between 33 and 80 lbs (15 and 36 kg) and whose height is between 38 and 54 in (97 and 137 cm). In Canada, Transport Canada's weight recommendation is 40-80 lbs (18-36 kg).

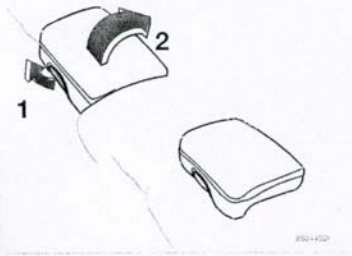
The booster cushion is designed to raise the child higher, so that the shoulder strap crosses over the child's collarbone, not over the child's neck. If using a booster cushion does not result in proper positioning of the shoulder strap, then the child should be placed in a properly secured child restraint (see the information beginning on page 33). The shoulder belt must never be placed behind the child's back or under the arm.

WARNING

- DEATH or SERIOUS INJURY can occur.
- Follow all instructions on the booster cushion and in the vehicle's owner's manual.
- MAKE SURE THE BOOSTER CUSHION IS SECURELY LOCKED BEFORE THE CHILD IS SEATED.
- Use this booster cushion only with children who weigh between 33 and 80 lbs (15 and 36 kg) and whose height is between 38 and 54 in (97 and 137 cm). In Canada, Transport Canada's weight recommendation is 40-80 lbs (18-36 kg).
- In the event of a collision while the integrated booster cushion was occupied, the entire booster cushion and seat belt must be replaced. The booster cushion should also be replaced if it is badly worn or damaged in any way. This work should be performed by an authorized Volvo retailer only.

Canada only: This cushion may be referred to as a built-in booster cushion.

The booster cushion must be pressed down before the backrest can be folded down.



Raising

1. Pull the handle at the front of the cushion (1) forward.
2. Move the seat belt latch aside before raising the cushion.
3. With both hands push the cushion rearward (2).
4. Push the cushion until it locks in place.

Lowering

1. Pull the handle at the front of the cushion (1) forward.
2. Pull the seat forward and press it down

APPENDIX B

MANUFACTURER'S DATA

FORM – 225
Rev. 03/20/07

SEAT REFERENCE POINT (SRP) AND TORSO ANGLE DATA

FMVSS No. 225
(All dimensions in mm[1])

MODEL YEAR: 2008 / MAKE: VOLVO / MODEL: XC90 / BODY STYLE: 5-SEAT

SEAT STYLE: FRONT ROW: SEPARATE / SECOND ROW: SEPARATE / THIRD ROW: N/A

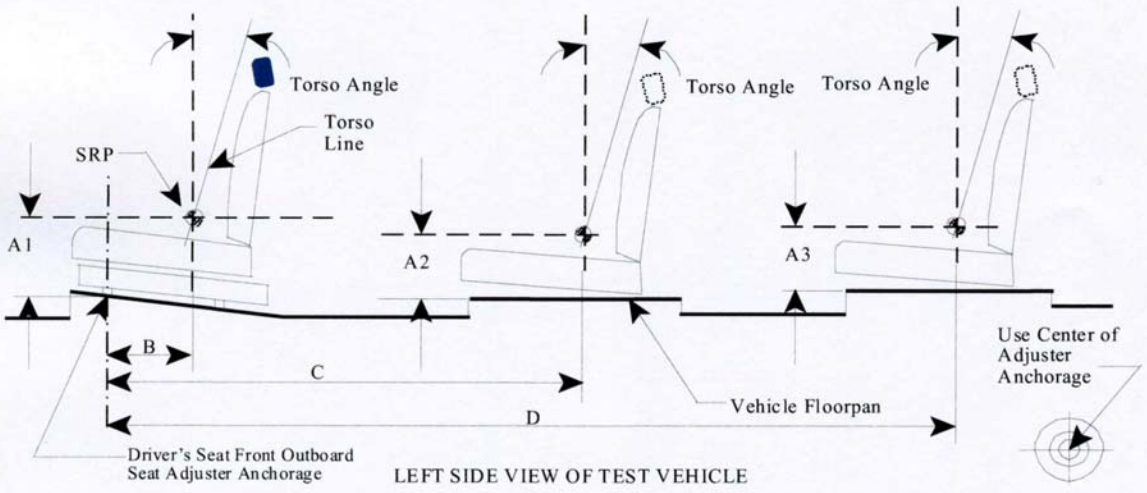


Table 1. Seating Positions[1] and Torso Angles

		Left (Driver Side)	Center (if any)	Right
A1		(Driver) 247.6	NA	(Front Passenger) 247.6
A2		244.3	274.3	244.3
A3		NA	NA	NA
B		342.4	NA	342.4
C		1187.4	1150.4	1187.4
D		NA	NA	NA
Torso Angle (degree)	Front Row	25 degrees	NA	25 degrees
	Second Row	27 degrees	27 degrees	27 degrees
	Third Row	NA	NA	NA

Note: All dimensions are in mm. If not, provide the unit used.

SEATING REFERENCE POINT

FMVSS No. 225
(All dimensions in mm)

MODEL YEAR: 2008 / MAKE: VOLVO / MODEL: XC90 / BODY STYLE: 5-SEAT

SEAT STYLE: FRONT ROW: SEPARATE / SECOND ROW: SEPARATE / THIRD ROW: N/A

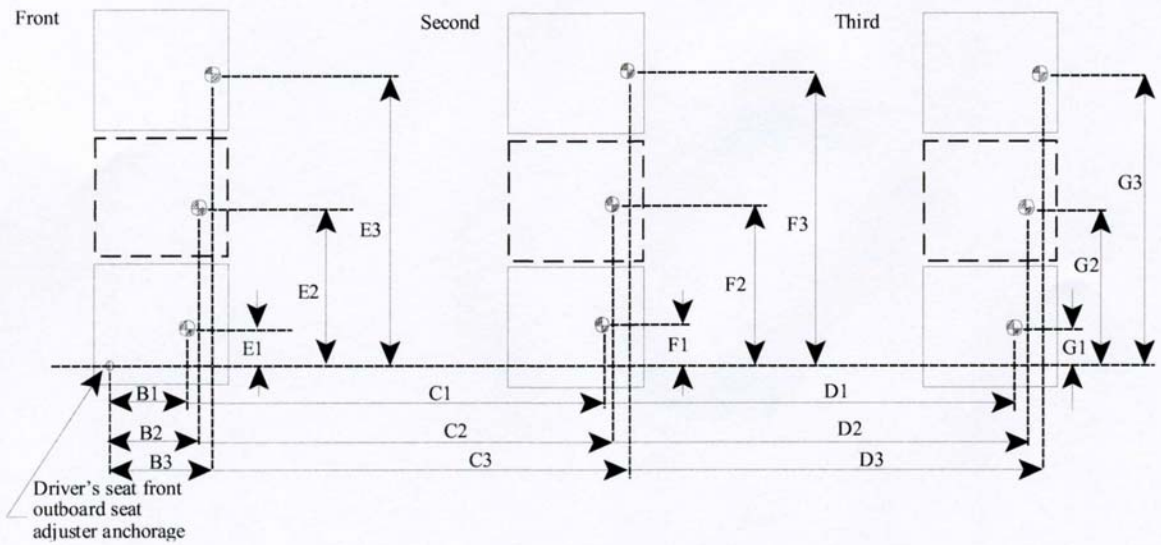


Table 2. Seating Reference Point and Tether Anchorage Locations

Seating Reference Point (SRP)		Distance from Driver's front outboard seat adjuster anchorage[1]
Front Row	B1	342.4
	E1	215
	B2	NA
	E2	NA
	B3	342.4
	E3	995
Second Row	C1	1187.4
	F1	190
	C2	1150.4
	F2	605
	C3	1187.4
	F3	1020
Third Row	D1	NA
	G1	NA
	D2	NA
	G2	NA
	D3	NA
	G3	NA

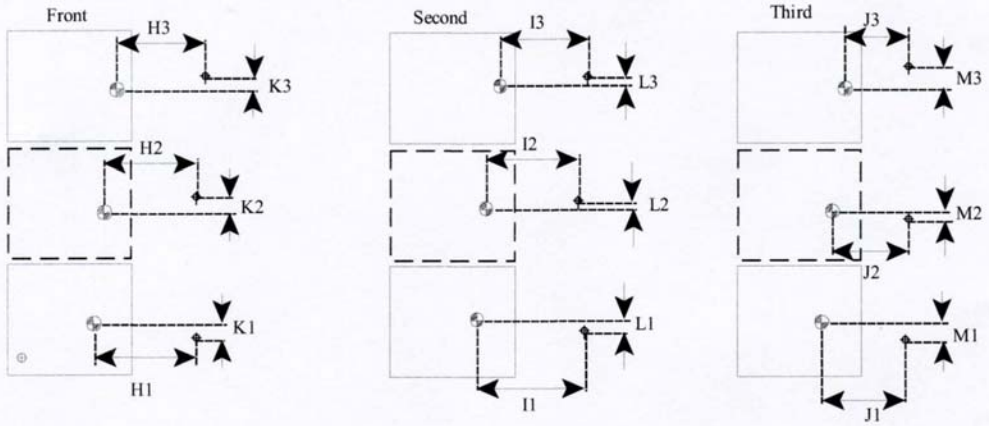
Note: Use the center of anchorage.

TETHER ANCHORAGE LOCATIONS

FMVSS No. 225
(All dimensions in mm)

MODEL YEAR: 2008 / MAKE: VOLVO / MODEL: XC90 / BODY STYLE: 5-SEAT

SEAT STYLE: FRONT ROW: SEPARATE / SECOND ROW: SEPARATE / THIRD ROW: N/A



: SRP
: Tether anchorage

Note: The location shall be measured at the center of anchorage.

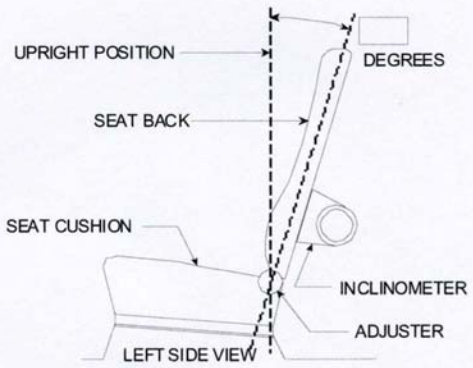
Table 3. Seating Reference Point and Tether Anchorage Locations

Seating Reference Point (SRP)	Distance from SRP	
Front Row	H1	NA
	K1	NA
	H2	NA
	K2	NA
	H3	NA
	K3	NA
Second Row	I1	228
	L1	0
	I2	261.3
	L2	0
	I3	228
	L3	0
Third Row	J1	NA
	M1	NA
	J2	NA
	M2	NA
	J3	NA
	M3	NA

Note: Use the center of anchorage.

NOMINAL DESIGN RIDING POSITION

For adjustable driver, passenger, 2nd row and 3rd row seat backs, describe how to position the inclinometer to measure the seat back angle. Include a description of the location of the seat back adjustment latch detent if applicable. Indicate if applicable, how the detents are numbered (Is the first detent "0"or "1"?). Indicate if the seat back angle is measured with the dummy in the seat.



Seat back angle for driver's seat = 16.1 degrees.

Measurement Instructions:

A tangent from upper area of crashpad to lower area. Use a plate which covers whole crashpad and measure angle of plate.

Seat back angle for passenger's seat = 16.1 degrees.

Measurement Instructions:

Same as drivers seat.

Seat back angle for 2nd row seat = 22.7 degrees.

Measurement Instructions:

Outer seat : Measure angle of crashpad in upper flat area around flatfold handle.

Center seat : Measure angle of lower flat area around top tether hook.

Seat back angle for 3rd row seat = NA.

Measurement Instructions:

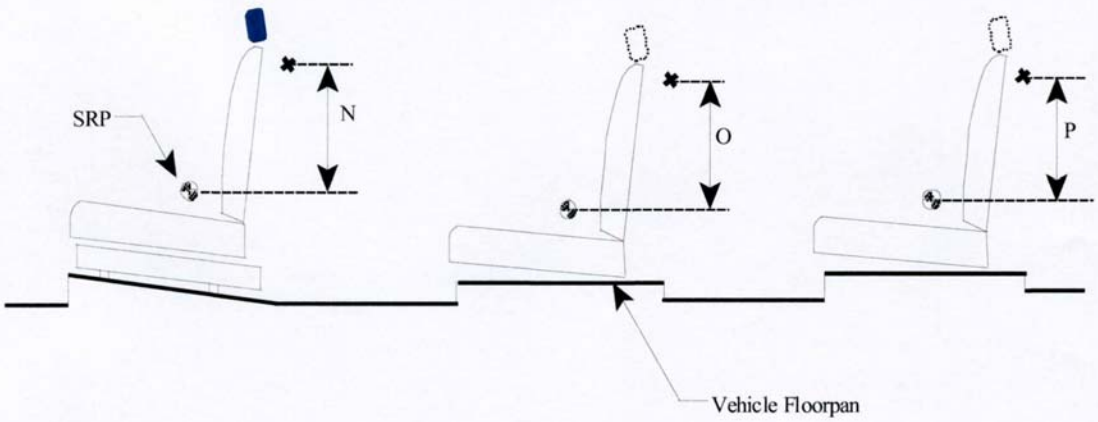
NA

TETHER ANCHORAGE LOCATIONS - VERTICAL

FMVSS No. 225
(All dimensions in mm)

MODEL YEAR: 2008 / MAKE: VOLVO / MODEL: XC90 / BODY STYLE: 5-SEAT

SEAT STYLE: FRONT ROW: SEPARATE / SECOND ROW: SEPARATE / THIRD ROW: N/A



LEFT SIDE VIEW OF TEST VEHICLE

FORM – 225

Table 4. Vertical Dimension For The Tether Anchorage

Seating Row	Vertical Distance from Seating Reference Point	
Front Row	N1 (Driver)	N/A
	N2 (Center)	N/A
	N3 (Right)	N/A
Second Row	O1 (Left)	-38.4 (Tether is lower than SRP)
	O2 (Center)	-68.7 (Tether is lower than SRP)
	O3 (Right)	-38.4 (Tether is lower than SRP)
Third Row	P1 (Left)	N/A
	P2 (Center)	N/A
	P3 (Right)	N/A

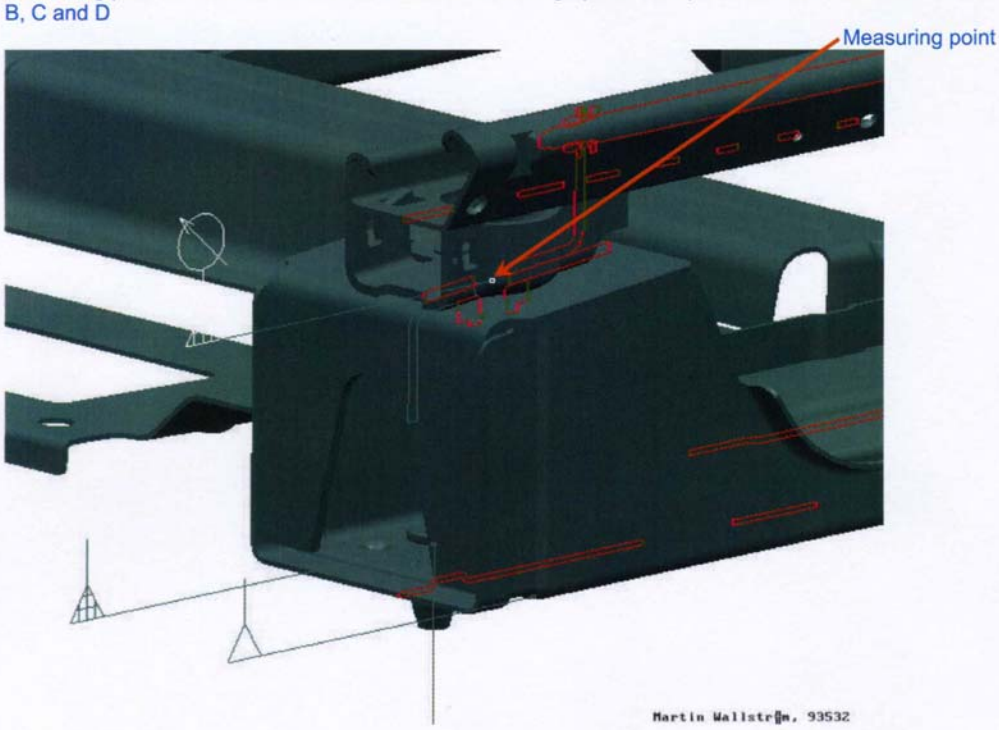
Note: All dimensions are in mm. If not, provide the unit anchorage.

For each vehicle, provide the following information:

1. How many designated seating positions exist in the vehicle? There are 5
2. How many designated seating positions are equipped with lower anchorages and tether anchorages? Specify which position(s). There are 2. Rear outboard seating positions (Positions 4 & 6)
3. How many designated seating positions are equipped with tether anchorages? Specify which positions(s). There are 3 Second row left, center and outer.
4. Lower Anchorages Marking and Conspicuity: Whether the anchorages are certified to S9.5(a) or S9.5(b) of FMVSS No. 225. The anchorages are certified to S9.5(a).

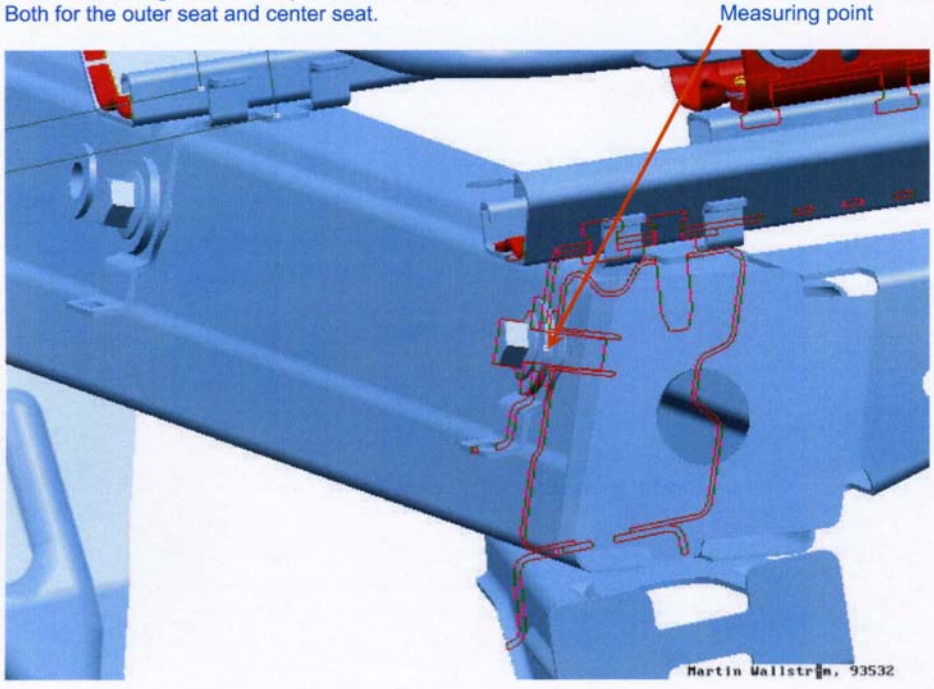
Fixation of the front seat.

Measuring point for front seat is the seat chassie anchorage point. This point we have used as base for measure A, B, C and D

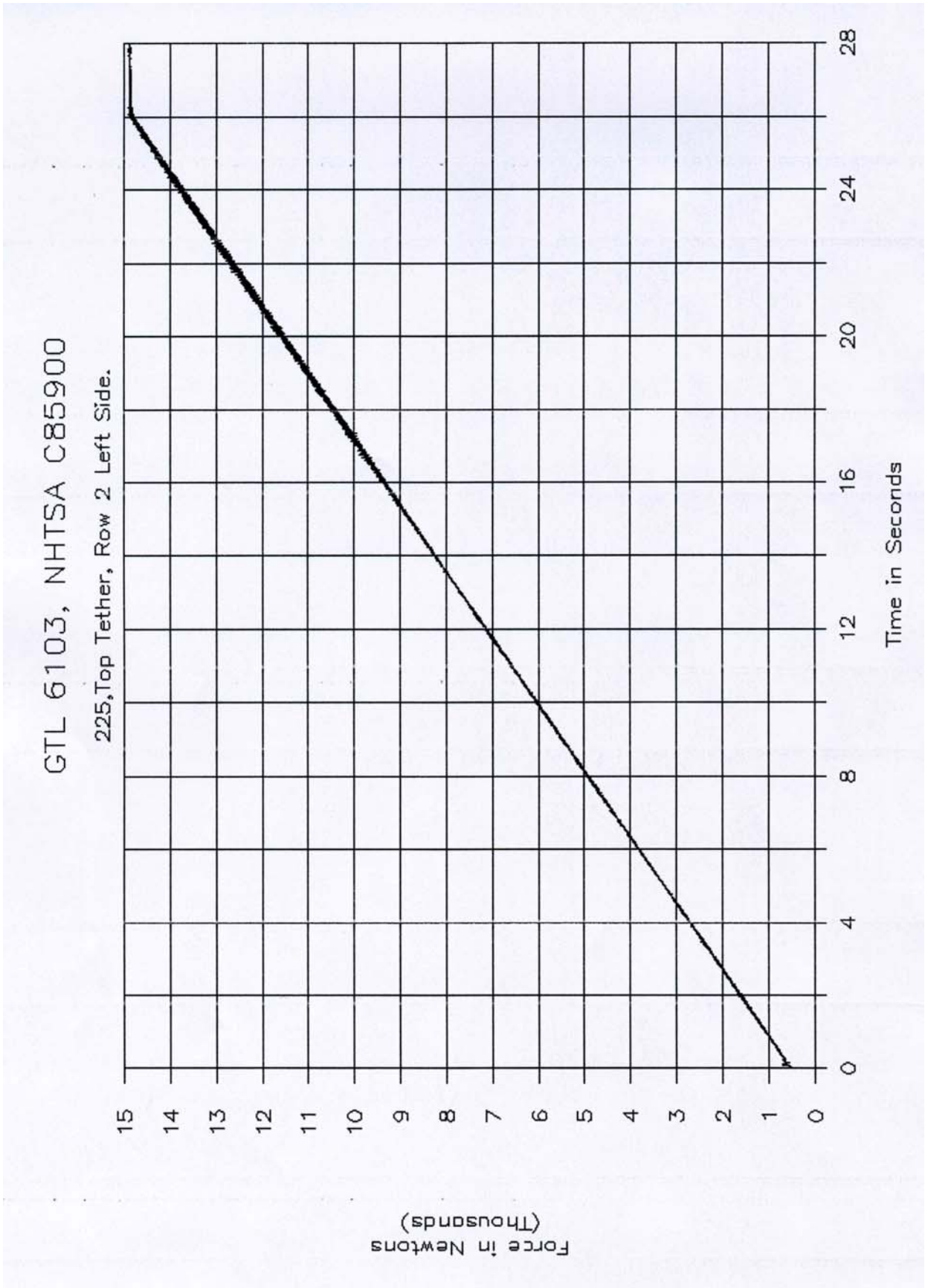


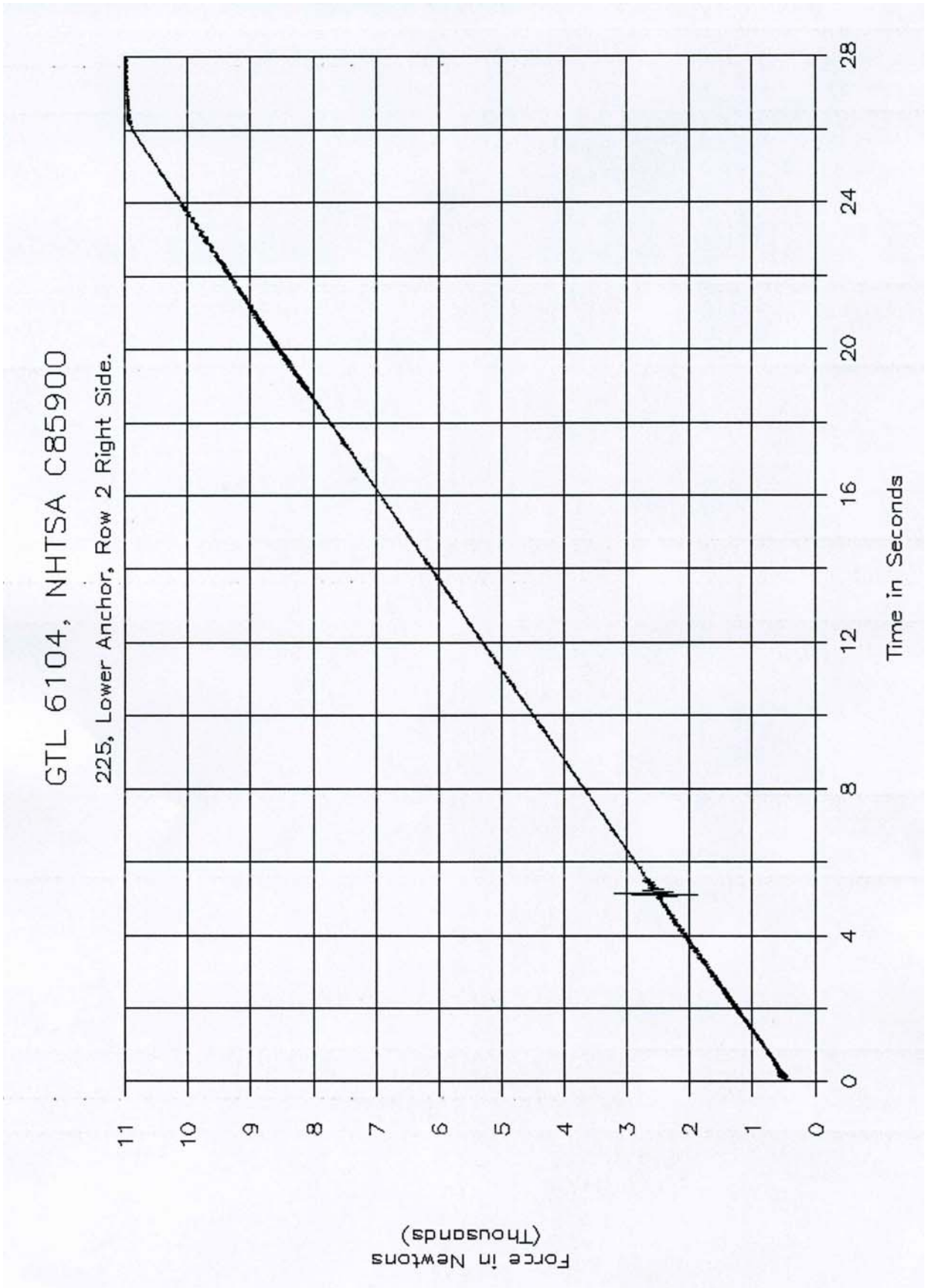
Fixation of the 2nd row seat.

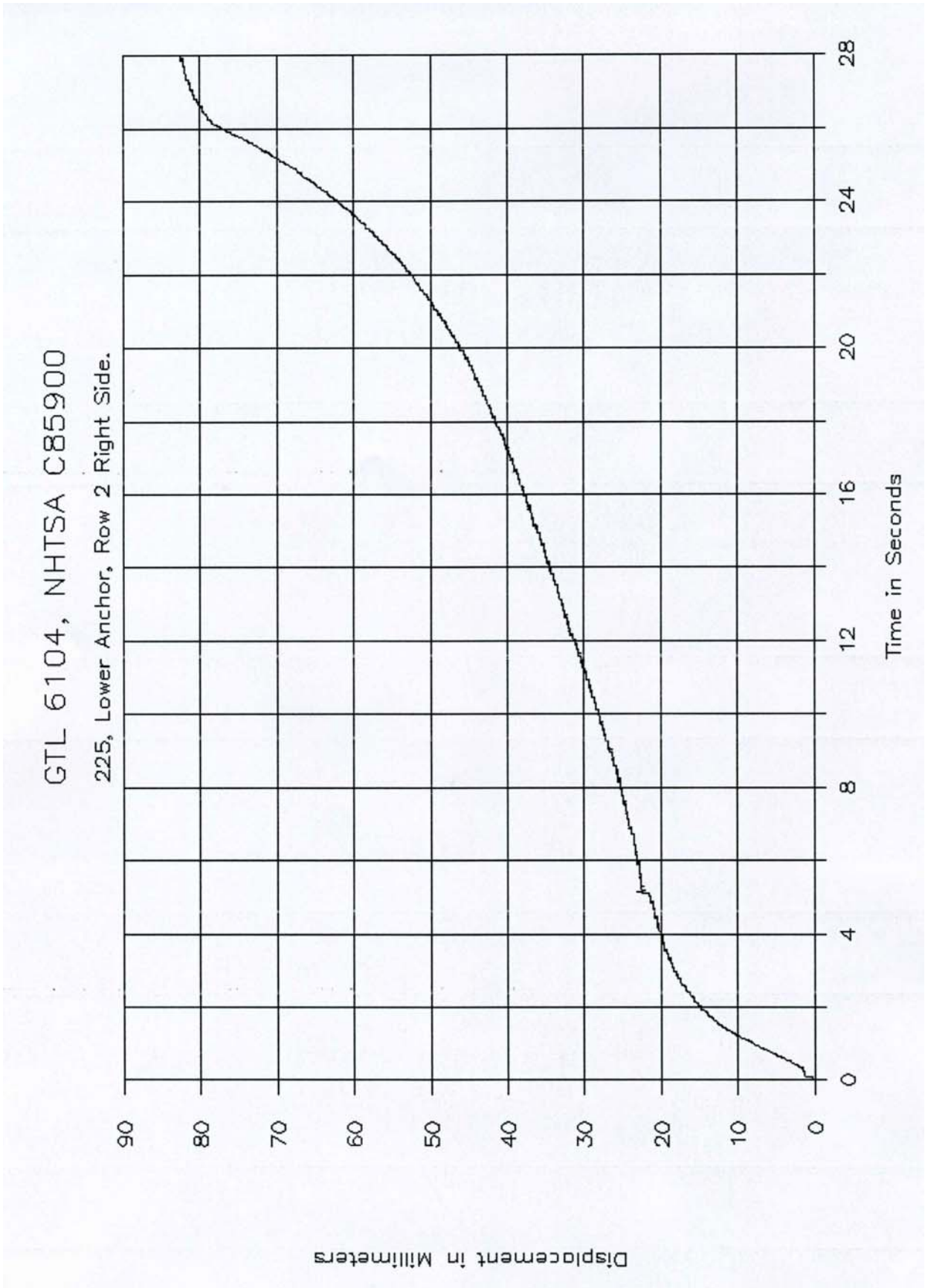
Instead of having vehicle floorpan as reference in the A2 measure we have used the front fixation point of the seat. Both for the outer seat and center seat.

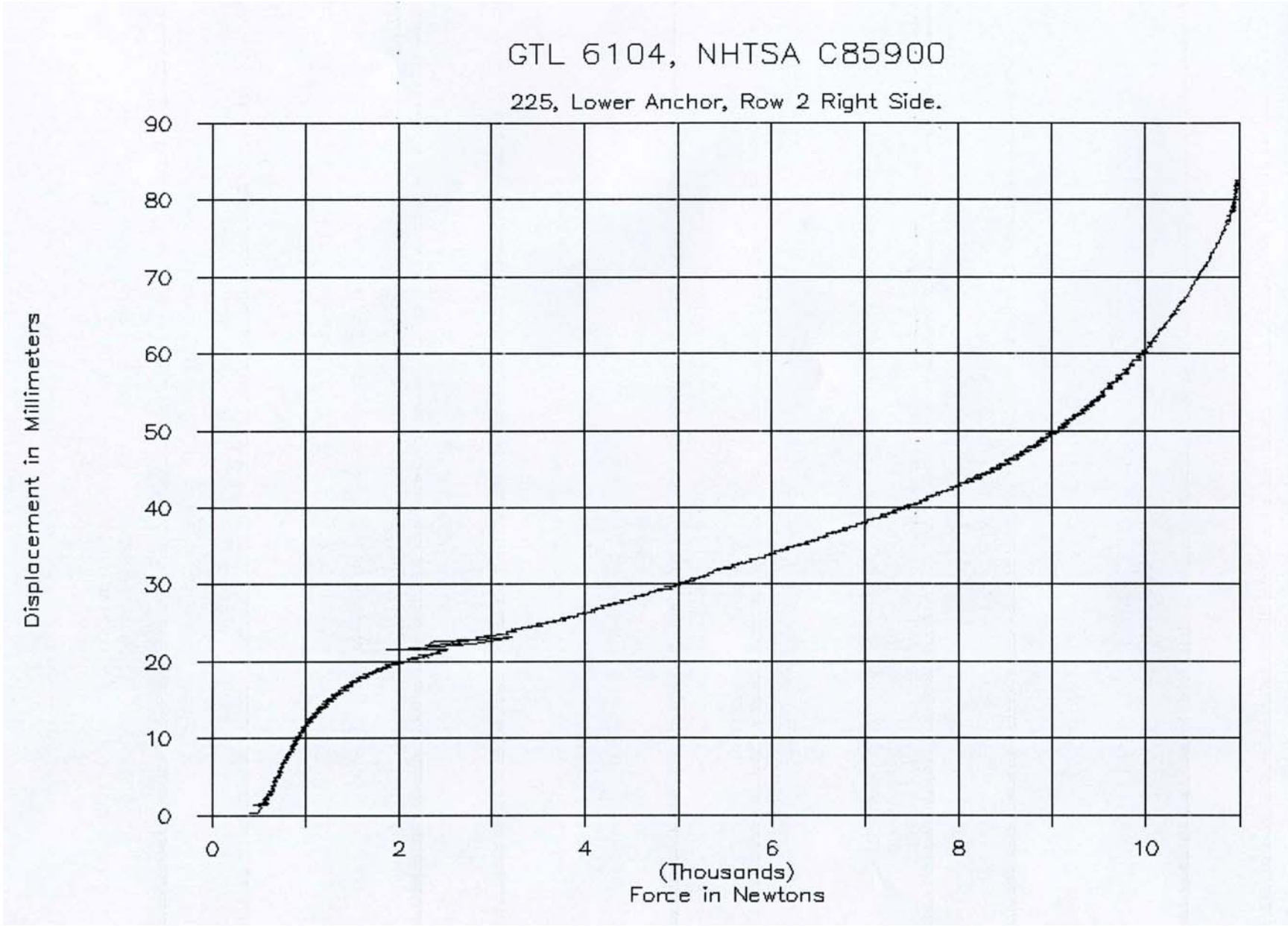


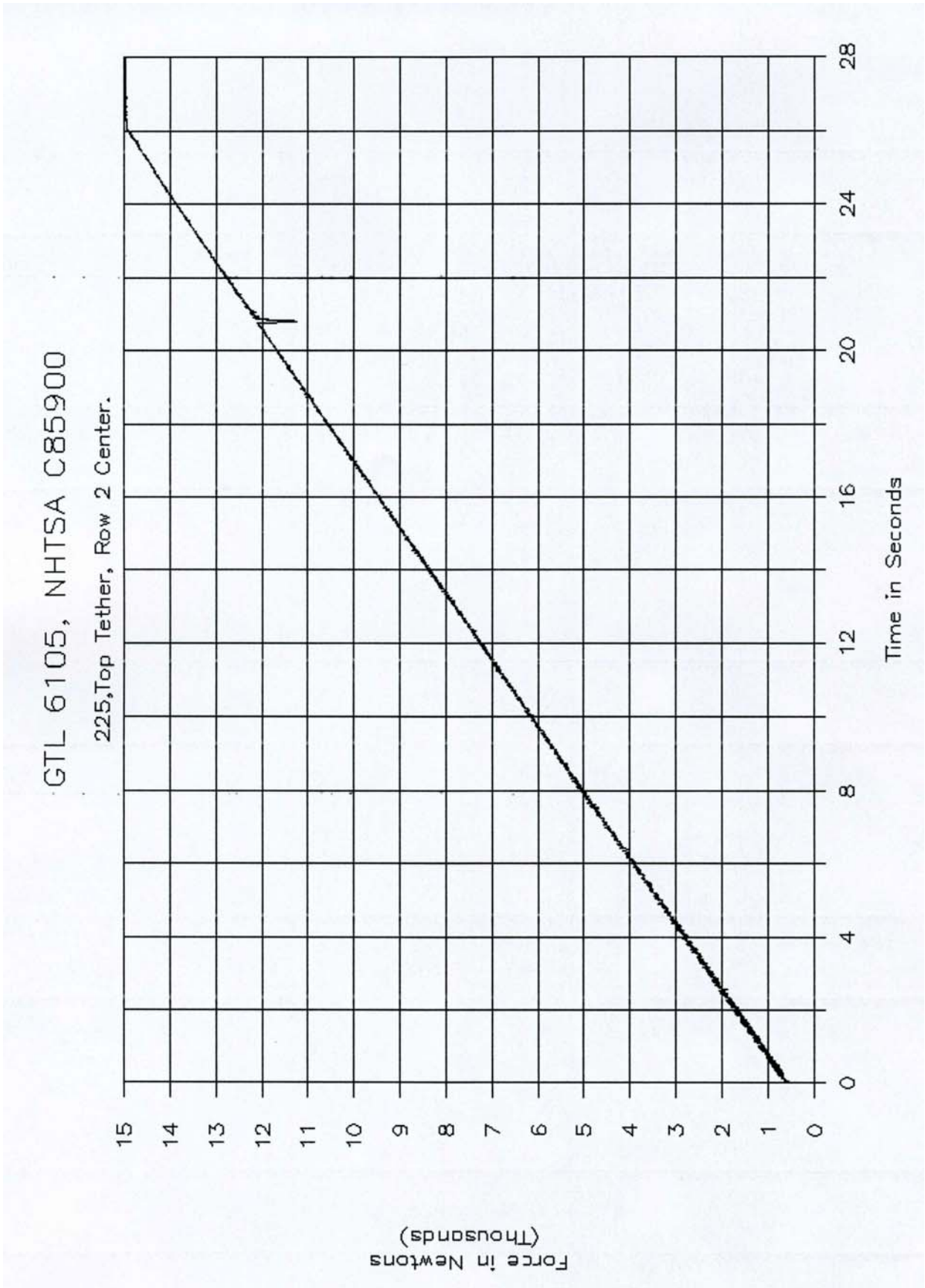
APPENDIX C
PLOTS


GTL 6103, NHTSA C85900
225,Top Tether, Row 2 Left Side.
Force in Newtons
(Thousands)
Time in Seconds
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0
4
8
12
16
20
24
28


GTL 6104, NHTSA C85900
225, Lower Anchor, Row 2 Right Side.
Force in Newtons
(Thousands)
Time in Seconds
0
1
2
3
4
5
6
7
8
9
10
11
0
4
8
12
16
20
24
28


GTL 6104, NHTSA C85900
225, Lower Anchor, Row 2 Right Side.
Displacement in Millimeters
Time in Seconds
0
10
20
30
40
50
60
70
80
90
0
4
8
12
16
20
24
28


GTL 6104, NHTSA C85900
225, Lower Anchor, Row 2 Right Side.
Displacement in Millimeters
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
(Thousands)
Force in Newtons


GTL 6105, NHTSA C85900
225,Top Tether, Row 2 Center.
Force in Newtons
(Thousands)
Time in Seconds
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0
4
8
12
16
20
24
28