REPORT NUMBER 202a-GTL-10-004
SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 202aS
HEAD RESTRAINTS – STATIC REQUIREMENTS

VOLVO CAR CORPORATION
2010 VOLVO S40, PASSENGER CAR
NHTSA NO. CA5900

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

August 30, 2010
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
WASHINGTON, D.C. 20590
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Approval Date: 08/30/10

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: Edward E. Chan

Acceptance Date: ____________________
**Title and Subtitle**
NHTSA No. CA5900

**Report Date**
August 30, 2010

**Performing Organization Name and Address**
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Colonial Beach, Va 22443

**Sponsoring Agency Name and Address**
U.S. Department of Transportation
Enforcement
Office of Vehicle Safety Compliance (NVS-220)
1200 New Jersey Ave., S.E.
Washington, DC 20590

**Abstract**
Compliance tests were conducted on the subject, 2010 Volvo S40 4-door Passenger Car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-202aS-00 for the determination of FMVSS 202a compliance. Test failures identified were as follows:

NONE

**Key Words**
Compliance Testing
Safety Engineering
FMVSS 202aS
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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2010 Volvo S40 Passenger Car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 202a 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 head restraints to reduce the frequency and severity of neck injury in rear end and other collisions.

1.1 The test vehicle was a 2010 Volvo S40 Passenger Car. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: YV1382MS9A2493156

B. NHTSA No.: CA5900

C. Manufacturer: VOLVO CAR CORPORATION

D. Manufacture Date: 09/09

E. Color: White

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 202a testing during the time period July 01 through July 23, 2010.
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-202aS-00 dated 22 December 2004.

Based on the test performed, the 2010 Volvo S40 Passenger Car appeared to meet the requirements of FMVSS 202a testing.
SECTION 3

COMPLIANCE TEST DATA

3.0 TEST DATA

The following data sheets document the results of testing on the 2010 Volvo S40 Passenger Car.
**DATA SHEET 1 (1 of 2)**

**SUMMARY OF RESULTS**

**VEH. MOD YR/MAKE/MODEL/BODY STYLE:** 2010 VOLVO S40 PASSENGER CAR

**VEH. NHTSA NO.:** CA5900; **VIN:** YV1382MS9A2493156

**VEH. BUILD DATE:** 09/09; **TEST DATE:** July 1-23, 2010

**TEST LABORATORY:** GENERAL TESTING LABORATORIES

**OBSERVERS:** G. FARRAND, J. LATANE

---

**A. VISUAL INSPECTION OF TEST VEHICLE**

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

**RESULTS:** OK for testing. Due to manufacture date of vehicle, rear DSP’s are not required to meet 202a requirements.

---

**B. DIMENSIONAL REQUIREMENTS**

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**C. OWNER’S MANUAL**

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**D. REMOVABILITY**

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**E. NON-USE POSITION**

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#### SUMMARY OF RESULTS

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**RECORDED BY:** G. FARRAND  
**DATE:** 07/23/10  
**APPROVED BY:** D. MESSICK
DATA SHEET 2a (1 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: CA5900 TEST DATE: 07/06/10

Seat Location: FRONT DRIVER

Height Measurement

SAE J826 three-dimensional manikin torso angle: 25.2°

Striker to H-Point (mm): 141 mm Striker to H-Point angle: Down

Position the head restraint in the highest position of vertical adjustment.
Height, Hh (mm): 828 mm

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Position the head restraint in the lowest position of vertical adjustment.
Height, Hl (mm): 805 mm

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 763 mm

Width, W (mm): 200 mm

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm. N/A
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

Backset Measurement (Front Head Restraints Only)
Position the HRMD and record the following measurements.

HRMD torso angle: 24.9°
Striker to H-Point (mm): 145 mm Striker to H-Point angle: Down

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): 29 mm X PASS FAIL
Backset must be less than or equal to 55 mm.

Gap Measurement
Position the head restraint in the lowest position of vertical adjustment.
Number of gaps within the gap measurement zone: One
Least dimension of each gap (measured with a steel tape): 25 mm
Size of each gap (as measured with the spherical head form):
Gap Size N/A X PASS FAIL
Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: G. FARRAND DATE: 07/01/10
APPROVED BY: D. MESSICK
DATA SHEET 2a(1 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: CA5900 TEST DATE: 07/06/10

Seat Location: FRONT PASSENGER

Height Measurement

SAE J826 three-dimensional manikin torso angle: 25.4°

Striker to H-Point (mm): 125 mm (Ahead) Striker to H-Point angle: Down

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): 838 mm X PASS

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Position the head restraint in the lowest position of vertical adjustment.

Height, Hl (mm): 815 mm X PASS

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 773 mm

Width, W (mm): 195 mm X PASS

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm. N/A
DATA SHEET 2a (2 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: ______ 24.9º ________

Striker to H-Point (mm): ___ 123 mm ____ Striker to H-Point angle: ___ Down ___

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): ______ 26 mm ________ ___ X ___ PASS _________ FAIL

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: One

Least dimension of each gap (measured with a steel tape): 25 mm

Size of each gap (as measured with the spherical head form):

Gap Size ______ N/A _______ ___ X ___ PASS _________ FAIL

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: ___ G. FARRAND _________ DATE: ____ 07/06/10 _______

APPROVED BY: ___ D. MESSICK _________
DATA SHEET 2a (1 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: CA5900 TEST DATE: 07/06/10
Seat Location: REAR DRIVER

Height Measurement

SAE J826 three-dimensional manikin torso angle: 27.2°
Striker to H-Point (mm): 205 mm Striker to H-Point angle: Down

Position the head restraint in the highest position of vertical adjustment.
Height, Hh (mm): 812 mm X PASS

Hh > or = 800 mm for front seats.
If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Position the head restraint in the lowest position of vertical adjustment.
Height, Hl (mm): 769 mm X PASS

Hl > or = 750 mm for front seats and rear seats with head restraints.
If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 747 mm

Width, W (mm): 191 mm X PASS

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm. N/A
DATA SHEET 2a (2 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: ________________

Striker to H-Point (mm): __________  Striker to H-Point angle: _______

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): ________________  __________PASS __________FAIL

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: None

Least dimension of each gap (measured with a steel tape): N/A

Size of each gap (as measured with the spherical head form):

Gap Size ______________ N/A ________  _____ X _____ PASS _________ FAIL

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: G. FARRAND        DATE: 07/06/10
APPROVED BY: D. MESSICK
DATA SHEET 2a(1 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: _______ CA5900 _______ TEST DATE: _______ 07/06/10 _______

Seat Location: _______ REAR PASSENGER _______

Height Measurement

SAE J826 three-dimensional manikin torso angle: _______ 27.5° _______

Striker to H-Point (mm): _______ 200 mm _______ (Ahead) Striker to H-Point angle: _______ Down _______

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): _______ 810 mm _______ X _______ PASS _______ FAIL _______

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Position the head restraint in the lowest position of vertical adjustment.

Height, Hi (mm): _______ 767 mm _______ X _______ PASS _______ FAIL _______

Hi > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): _______ 745 mm _______

Width, W (mm): _______ 190 mm _______ X _______ PASS _______ FAIL _______

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm. N/A
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: ______________

Striker to H-Point (mm): __________   Striker to H-Point angle: ______

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm):___________________   _________PASS _________FAIL

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: None

Least dimension of each gap (measured with a steel tape): N/A

Size of each gap (as measured with the spherical head form):

Gap Size________________ N/A _________   ___ X ___ PASS _________FAIL

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: G. FARRAND     DATE: 07/06/10

APPROVED BY: D. MESSICK
Emphasize that all occupants should place their head restraint in a proper position prior to operating the vehicle in order to prevent the risk of serious injury.

PASS X FAIL

Description of the head restraint system and identification of which seats are equipped.

PASS X FAIL

If the head restraint is removable, instructions on how to properly remove and reinstall using a deliberate action distinct from any act necessary for adjustment.

PASS X FAIL N/A

Warning that all head restraints must be reinstalled properly to protect occupants.

PASS X FAIL

Describe the adjustment of the head restraints and/or seat back to achieve proper head restraint position relative the head. The description must include the following:

1) a presentation and explanation of the main components of the vehicle’s head restraints

2) the basic requirements for proper head restraint operation, including an explanation of the actions that may affect the proper functioning of the head restraints.

3) the basic requirements for proper positioning of a head restraint in relation to an occupant’s head position, including information regarding the proper positioning of the center of gravity of an occupant’s head in relation to the head restraint.

PASS X FAIL

Include copies of relevant pages from the owner’s manual in the final report.

REMARKS:

RECORDED BY: G. FARRAND DATE: 07/06/10

APPROVED BY: D. MESSICK
Are the head restraints removable?  

X  YES  NO

If removable, does removal REQUIRE an action distinct from actions to adjust the head restraint?

YES (PASS)  NO (FAIL)

Description of action(s) for head restraint adjustment:

Push in adjustment button on left head restraint support and raise or lower head restraint to wanted position.

Description of distinct action for removal:

FRONT SEATS: Push in adjustment button on left head restraint support while also pushing in the release button on the right head restraint support with a screw driver or key and simultaneously pull up on the head restraint.

REAR SEATS: Push in adjustment button on left head restraint support and pull up on head restraint. (A second action is not required)

REMARKS: *REAR SEATS DO NOT NEED TO MEET THESE REQUIREMENTS UNTIL 2011.
DATA SHEET 5
ENERGY ABSORPTION TEST

VEH. NHTSA NO.: CA5900 TEST DATE: 07/23/10
Seat Location: REAR DRIVER Type of head restraint: ADJUSTABLE
Test Number: 6775

635 mm Height Measurement for lower boundary of the impact zone

SAE J826 three-dimensional manikin torso angle: 27°
Striker to H-Point (mm): 205 mm Striker to H-Point angle: Down
Accelerometer identification: FZ03 Accelerometer type/brand: ENDEVCO
Last calibration date: 07/10

Head form vertical angle (-2° - +2°): 0.0
Distance between head form and target location (> or = 25 mm): 50 mm
Impact velocity (23.6 kph ± 0.5 kph): 23.4 KpH
Impact location: Centerline of head restraint, 690 mm up from “H” point.

Maximum deceleration (< or = 785 m/s² (80 g)): 30.2 PASS X FAIL

REMARKS:

RECORDED BY: G. FARRAND DATE: 07/23/10
APPROVED BY: D. MESSICK
DATA SHEET 6
HEIGHT RETENTION TEST
(ADJUSTABLE HEAD RESTRAINTS ONLY)

VEH. NHTSA NO.: CA5900
TEST DATE: 07/23/10

Seat Location: DRIVER
Test Number: 6780, 6781

Pre-test measurements

SAE J826 Manikin torso angle: 25°
Top of Head Restraint Height (mm): 828 mm
Striker to H-Point (mm): 141 mm
Striker to H-Point angle: Down

Description of height retention lock: Pushbutton release located on left side post.

Test measurements

Initial load (50 N ± 1 N): 50 N
Initial Displacement, D1 (mm): 6.2 mm
Initial Displacement (D1) < 25 mm: PASS X FAIL

Maximum load (495 N ± 5 N): 495 N
Maximum Displacement, D2 (mm): 24.0 mm

Return load (50 N ± 1 N): 50 N
Return Displacement, D3 (mm): 9.4 mm

Total displacement (D3-D1) < 13 mm: 3.2 mm PASS X FAIL

REMARKS:

RECORDED BY: G. FARRAND
DATE: 07/23/10

APPROVED BY: D. MESSICK
DATA SHEET 7
BACKSET RETENTION TEST

VEH. NHTSA NO.: CA5900          TEST DATE: 07/22/10

Seat Location: PASSENGER          Type of head restraint: ADJUSTABLE

Test Number: 6776, 6777, 6778, 6779

Pre-test measurements

SAE J826 Manikin torso angle: 25°          Top of Head Restraint Height (mm): 815 mm
Striker to H-Point (mm): 125 mm          Striker to H-Point angle: Down

Displacement torso reference line

Test device back pan angle: 25°

Distance from the H-point to the initial location of the load (0.290 ± 0.013 m): 0.29 m
Initial load (N): 1286 N          Initial moment (373 ± 7.5 Nm): 373 Nm

Backset retention and strength

Distance from the H-point to the head form tangency point (m): 0.750 m
Initial load (N): 50 N          Initial moment (37 ± 0.7 Nm): 37 Nm
Initial head form displacement, D1 (< or = 25 mm): 15.9 mm  PASS  X  FAIL
Load range to generate a 373 ± 7.5 Nm rearward moment (N): 497 N
Actual load applied (N): 497 N          Resultant moment (Nm): 373 Nm
Maximum Head form displacement, D2 (< or = 102 mm): 76.9 mm  PASS  X  FAIL
Final head form displacement, D3 (mm): 25.4 mm measured at (37 ± 0.7 Nm)
Total displacement (D3-D1) < 13 mm : 9.5 mm  PASS  X  FAIL
Maximum applied load (> or equal to 885 N): 885 N  PASS  X  FAIL

REMARKS:

RECORDED BY: G. FARRAND          DATE: 07/22/10
APPROVED BY: D. MESSICK
### TABLE 1 – INSTRUMENTATION & EQUIPMENT LIST

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DESCRIPTION</th>
<th>MODEL/ SERIAL NO.</th>
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<th>NEXT CAL. DATE</th>
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<td>J826 MANIKIN</td>
<td>ALDERSON RESEARCH LABS</td>
<td>3 DM/92</td>
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<td>33-890</td>
<td>04/10</td>
<td>04/11</td>
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<td>CHATILLON</td>
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<td>FZ03</td>
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<td>257818</td>
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FIGURE 5.1
LEFT SIDE VIEW OF VEHICLE
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.2
RIGHT SIDE VIEW OF VEHICLE
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.3
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.4
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
VIN: YV1382MS9A2493156
TYPE: PC
GVWR: 4320 LB
GAWR FRONT: 2380 LB
GAWR REAR: 2130 LB

MFD BY VOLVO CAR CORPORATION
DATE: 09/09

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY, BUMPER AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
<table>
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<th>TIRE</th>
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<th>COLD TIRE PRESSURE</th>
<th>SEE OWNERS MANUAL FOR ADDITIONAL INFORMATION</th>
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<tr>
<td>FRONT</td>
<td>205/50R17</td>
<td>240kPa, 35psi</td>
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<tr>
<td>REAR</td>
<td>205/50R17</td>
<td>240kPa, 35psi</td>
<td></td>
</tr>
<tr>
<td>SPARE</td>
<td>T125/85R16</td>
<td>420kPa, 61psi</td>
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FIGURE 5.7
PRE-TEST VIEW OF DRIVER SEAT HEAD RESTRAINT IN HIGHEST POSITION
FIGURE 5.8
PRE-TEST VIEW OF PASSENGER SEAT HEAD RESTRAINT IN LOWEST POSITION
FIGURE 5.9
PRE-TEST VIEW OF PASSENGER SEAT HEAD RESTRAINT IN HIGHEST POSITION
FIGURE 5.12
FRONT HEAD RESTRAINT GAP MEASUREMENT
FIGURE 5.13
PRE-TEST REAR DRIVER HEAD RESTRAINT IN HIGHEST POSITION
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.14
PRE-TEST REAR PASSENGER HEAD RESTRAINT IN LOWEST POSITION
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.15
PRE-TEST REAR PASSENGER HEAD RESTRAINT IN HIGHEST POSITION
FIGURE 5.16
REAR HEAD RESTRAINT ADJUSTMENT BUTTON
FIGURE 5.17
WIDTH MEASUREMENT ON FRONT DRIVER SEAT HEAD RESTRAINT
FIGURE 5.18
WIDTH MEASUREMENT ON FRONT PASSENGER SEAT HEAD RESTRAINT
FIGURE 5.19
WIDTH MEASUREMENT OF REAR DRIVER SEAT HEAD RESTRAINT
FIGURE 5.20
WIDTH MEASUREMENT OF REAR PASSENGER SEAT HEAD RESTRAINT
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.21
SAE J826 MANIKIN IN FRONT DRIVER SEAT
FIGURE 5.23
MEASUREMENT OF FRONT DRIVER SEAT BACKSET
FIGURE 5.24
SAE J826 MANIKIN IN FRONT PASSENGER SEAT
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.25
HRMD IN FRONT PASSENGER SEAT
FIGURE 5.26
MEASUREMENT OF FRONT PASSENGER SEAT BACKSET
2010 Volvo S40
NHTSA No. CA5900
FMVSS No. 202a

FIGURE 5.28
SAE J826 MANIKIN IN REAR PASSENGER SEAT

48
FIGURE 5.29
PRE-TEST SET-UP FOR HEIGHT RETENTION
FIGURE 5.30
HEAD RESTRAINT AT INITIAL 50 N LOAD
FIGURE 5.31
HEAD RESTRAINT AT FULL LOAD
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.33
HEAD RESTRAINT POST TEST HEIGHT RETENTION
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.34
PRE-TEST SET-UP FOR BACKSET RETENTION
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.35
BACK PAN LOADED TO 373 Nm
FIGURE 5.36
HEAD FORM AT INITIAL 37 Nm LOAD
FIGURE 5.37
HEAD FORM AT 373 Nm LOAD
2010 VOLVO S40
NHTSA NO. CA5900
FMVSS NO. 202a

FIGURE 5.41
PRE-TEST SET-UP FOR ENERGY ABSORPTION
FIGURE 5.43
POST TEST HEAD RESTRAINT FOR ENERGY ABSORPTION
SECTION 6
TEST PLOTS
GTL 6778
202, Head Restraint Retention, Headform
GTL 6779

202, Head Restraint Retention, Headform

Force in Newtons/Disp. in MM/10

(Thousands)

Time in Seconds
GTL 6780
202, Head Restraint Retention, Vertical

Time in Seconds

Force in Newtons/Disp. in MM/10
GTL 6781
202, Head Restraint Retention, Vertical

Time in Seconds

Force in Newtons/Disp. in MM/10

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

0 10 20 30 40 50 60 70 80 90 100
Adjusting the front seat head restraints

The front seat head restraints are designed so that they can be adjusted to two different height positions.

- When the vehicle leaves the factory, the front seat head restraints will be in the lower position.
- It is advisable to have the head restraints in the lower position if you wish to fold down the seat's backrest.

The head restraints should be put in the upper or lower position according to the height of the occupant of the seat.

The upper edge of the head restraint should be at least on a level with the upper-most point of the seat occupant's ear (see illustration).

To raise or lower a head restraint:

1. **Raising or lowering a head restraint**
   - Release the head restraint by pressing the release button underneath its left side, at the base of the support (see the illustration).
   - Move the head restraint until it clicks (locks) into the upper or lower position.

WARNING

- If a front seat head restraint has been removed, it must be put properly back in place and it must lock (click) into one of the available adjustment positions before the seat is occupied.
- The front seat head restraints must be in position and properly adjusted to the height of the person sitting in the seat when the vehicle is driven and when the front passenger's seat is occupied.

Removing a head restraint

The front seat head restraints can be removed, for example, when clearing the upholstery or if the front passenger's seat backrest is folded down to accommodate a long load. To do so:

1. Release the head restraint by pressing the release button underneath its left side, at the base of the support.
2. While holding the release button, press the locking button at the base of the head restraint's right support with a screwdriver, etc., and lift the head restraint until it can be removed completely.
Rear seat head restraints

Each of the rear seating positions is equipped with a head restraint that can be adjusted vertically to suit the height of the passenger. The upper edge of the head restraint should be at least on a level with the upper-most point of the seat occupant’s ear (see illustration).

⚠️ WARNING

The center rear seat head restraint should only be in its lowest position when this seat is NOT occupied. When the center position is occupied, the head restraint should be correctly adjusted to the passenger's height. The upper edge of the head restraint should be at least on a level with the upper-most point of the seat occupant’s ear.

- To raise: Slide the head restraint up to the desired height.
- To lower: Press the catch at the base of the right support and press the head restraint down.
- To remove: Pull the head restraint up far as possible. Press the catch at the base of the right support and pull the head restraint out of the its holders.

Folding down the rear seat backrests

Both sections of the rear seat backrest can be folded down, together or separately, to enable you to transport long objects. Before folding down the rear seat backrests, the outboard seat belts can be attached to the clothes hook as shown in the illustration.