

# 2003 VOLVO XC90



## Introduction



Welcome to the world-wide family of Volvo owners. We trust that you will enjoy many years of safe driving in your Volvo, an automobile designed with your safety and comfort in mind. To help ensure your satisfaction with this vehicle, we encourage you to familiarize yourself with the equipment descriptions, operating

instructions and maintenance requirements/recommendations in this manual. We also urge you and your passengers to wear seat belts at all times in this (or any other) automobile. And, of course, please do not operate a vehicle if you may be affected by alcohol, medication or any impairment that could hinder your ability to drive.

Your Volvo is designed to meet all applicable safety and emission standards, as evidenced by the certification labels attached to the driver's door opening and on the left wheel housing in the engine compartment.

For further information please contact your retailer, or:

**In the USA:**

Volvo Cars of North America

Customer Relations

P.O. Box 914

Rockleigh, New Jersey 07647-0914

800-458-1552

**In Canada:**

Volvo Cars of Canada Ltd.

175 Gordon Baker Road

North York, Ontario M2H 2N7

800-663-8255

## General information

### Shiftlock

When your car is parked, the gear selector is locked in the **(P)**ark position. To release the selector from this position, turn the ignition key to position II (or start the engine), depress the brake pedal, press the button on the front side of the gear selector knob and move the selector from **(P)**ark.

### Keylock (automatic transmission)

When you switch off the ignition, the gear selector must be in the **(P)**ark position before the key can be removed from the ignition switch.

### Anti-lock Brake System (ABS)

The ABS system in your car performs a self-diagnostic test when the vehicle first reaches the speed of approximately 12 mph (20 km/h). The brake pedal will pulsate several times and a sound may be audible from the ABS control module. This is normal.

### Fuel filler door

The fuel filler door, located on the right rear fender, is connected to your vehicle's central locking system.

Press the button on the light switch panel (see [page 31](#)) when the car is at a standstill to unlock the fuel filler door. Please note that the fuel filler door will remain unlocked until the car begins to move forward. An audible click will be heard when the fuel filler door relocks.

## Fuel filler cap

After refueling, close the fuel filler cap by turning it clockwise until it clicks into place. If this cap is not closed tightly or if the engine is running when the car is refueled, the Malfunction Indicator Lamp ("Check Engine" light) may indicate a fault.

## Important information

Before you operate your vehicle for the first time, please familiarize yourself with the new engine oil consumption information on [page 84](#). You should also be familiar with the information in chapters one, two and eight of this manual.

Information contained in the balance of the manual is extremely useful and should be read after operating the vehicle for the first time. The manual is structured so that it can be used for reference. For this reason, it should be kept in the vehicle for ready access.

Do not export your Volvo to another country before investigating that country's applicable safety and exhaust emission requirements. In some cases it may be difficult or impossible to comply with these requirements. Modifications to the emission control system(s) may render your Volvo not certifiable for legal operation in the U.S., Canada and other countries.

All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of publication. Please note that some vehicles may be equipped differently, depending on special legal requirements. Optional equipment described in this manual may not be available in all markets.

Volvo reserves the right to make model changes at any time, or to change specifications or design, without notice and without incurring obligation.

### **CALIFORNIA Proposition 65 Warning**

Engine exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to the state of California to cause cancer, and birth defects or other reproductive harm. In addition, certain fluids contained in vehicles and certain products of component wear contain or emit chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm.

## Volvo and the environment

Volvo is committed to the well being of our customers. As a natural part of this commitment, we care about the environment in which we all live. Caring for the environment means an everyday involvement in reducing our

environmental impact.

Volvo's environmental activities are based on a holistic view, which means we consider the overall environmental impact of a product throughout its complete life cycle. In this context, design, production, product use, and recycling are all important considerations.

In production, Volvo has partly or completely phased out several chemicals including chlorofluorocarbons (CFCs), lead chromates, naphthenates, asbestos, mercury and cadmium; and reduced the amount of chemicals used in our plants 50% since 1991.

Volvo was the first in the world to introduce into production a three-way catalytic converter with Lambda Sond, now called oxygen sensor, in 1976. The current version of this highly efficient system reduces emissions of harmful substances (CO, HC, NO<sub>x</sub>) from the exhaust pipe by approximately 95% and the search to eliminate the remaining emissions continues. Volvo is the only automobile manufacturer to offer CFC-free retrofit kits for the air conditioning system of all models as far back as the 1975 Volvo 240. Advanced electronic engine controls, refined purification systems and cleaner fuels are bringing us closer to our goal.

After Volvo vehicles and parts have fulfilled their use, recycling is the next critical step in completing the life cycle. The metal content is about 75% of the total weight of a vehicle, which makes the vehicle among the most recycled industrial products. In order to have efficient and well controlled recycling, many Volvo variants have printed dismantling manuals, indicating the weight and material of individual components. For Volvo, all homogeneous plastic parts weighing more than 1.7 oz. (50 grams) are marked with international symbols that indicate how the component is to be sorted for recycling.

In addition to continuous environmental refinement of conventional gasoline-powered internal combustion engines, Volvo is actively looking at advanced technology alternative-fuel vehicles.

When you drive a Volvo, you become our partner in the work to lessen the car's impact on the environment.

To reduce your vehicle's environmental impact, you can:

- Maintain proper air pressure in your tires. Tests have shown decreased fuel economy with improperly inflated tires.
- Follow the recommended maintenance schedule in your Warranty and Service Records Information booklet.
- Drive at a constant speed.
- See an authorized Volvo retailer as soon as possible for inspection if the check engine (malfunction indicator) lamp illuminates, or stays on after the vehicle has started.
- Properly dispose of any vehicle-related waste such as used motor oil, used batteries, brake pads, etc.
- When cleaning your car, use Volvo's own car care products, all of which have systematically been adapted to the environment.

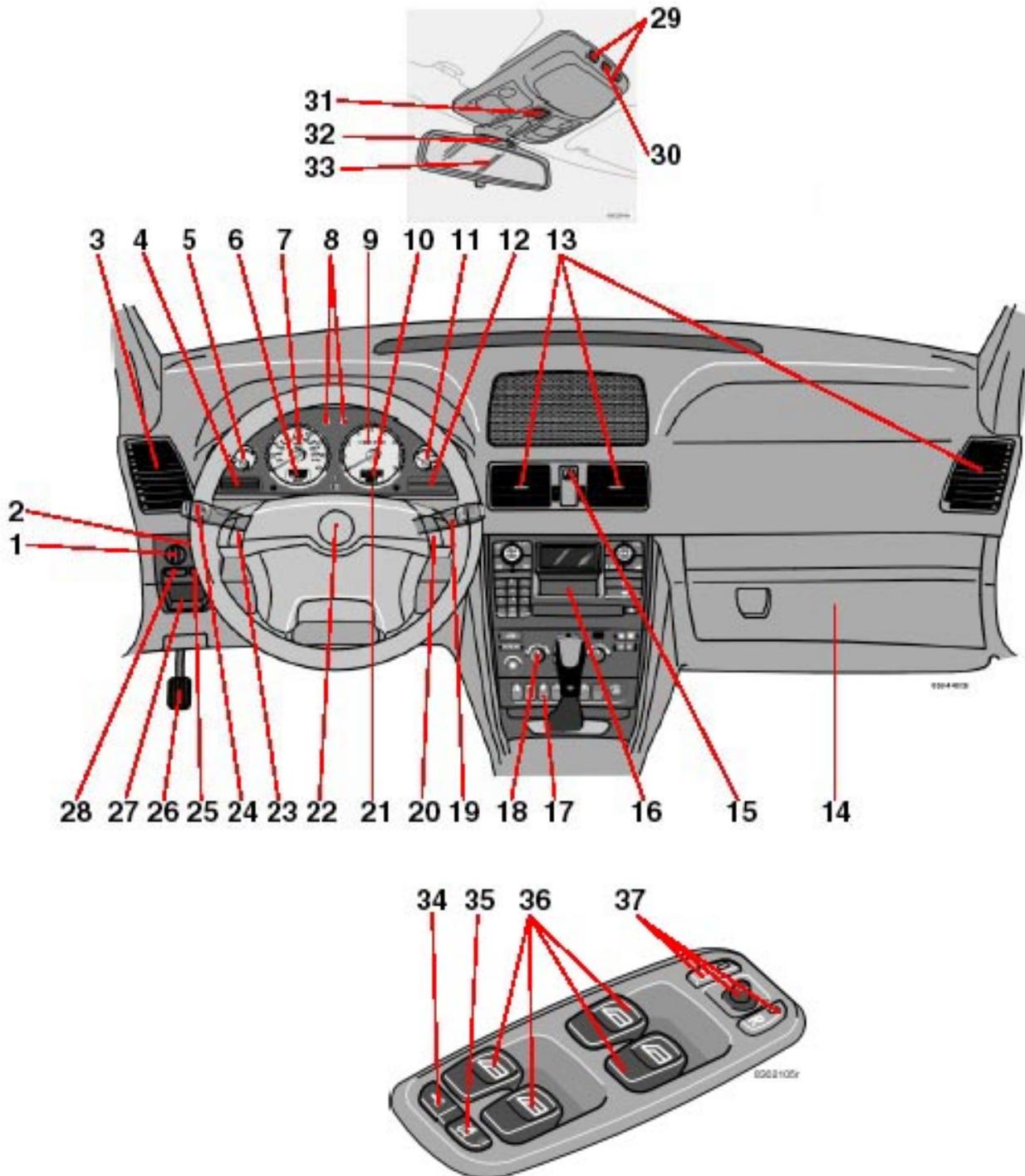
For additional information regarding the environmental activities in which Volvo Cars of North America, LLC. and Volvo Car Corporation are involved, visit our Internet Home Page at:

<http://www.volvocars.com>

**PremAir®**

On the surface of the radiator in the engine compartment, there is a special coating called PremAir®. PremAir® works as a catalytic converter, converting most of the ground-level ozone passing through the radiator into oxygen, thereby reducing harmful ground-level ozone.

## Instruments, switches and controls



*Control panel in driver's door (controls 34-37)*

- [1. Headlights/Parking lights 31](#)
- [2. Instrument lighting 31](#)
- [3. Panel vents 47](#)
- [4. Text window 28](#)
- [5. Temperature gauge 24](#)
- [6. Odometer/Trip odometer/Cruise control indicator 24, 37](#)
- [7. Speedometer iv](#)
- [8. Turn signal indicator lights 24](#)
- [9. Tachometer 24](#)
- [10. Ambient temperature gauge, clock, gear indicator 24](#)
- [11. Fuel gauge 24](#)
- [12. Indicator and warning symbols 25](#)
- [13. Panel vents 47](#)
- [14. Glove compartment 65](#)
- [15. Hazard warning flashers 35](#)
- [16. Audio system 159](#)
- [17. Switches in the center console 29](#)
- [18. Climate system controls 48](#)
- [19. Windshield wiper/washer lever 34](#)
- [20. Audio control buttons in steering wheel 161](#)
- [21. Instrument panel 24](#)
- [22. Horn iv](#)
- [23. Cruise control buttons in steering wheel 37](#)
- [24. Turn signals, High/low beams 33](#)
- [25. Front fog lights, Rear fog light 31](#)
- [26. Parking brake pedal 38](#)
- [27. Parking brake release handle 38](#)
- [28. Button for unlocking fuel filler door 31](#)
- [29. Reading lights 61](#)
- [30. Courtesy light 61](#)
- [31. Moonroof control \(option\) 43](#)
- [32. Seat belt reminder 27](#)
- [33. Rearview mirror 42](#)
- [34. Central locking button 77](#)
- [35. Lockout switch for rear seat power windows 41](#)
- [36. Power window controls 40](#)
- [37. Sideview mirror controls 42](#)

## Contents

# Contents

[Safety](#)

[Instruments and controls](#)

[Climate control](#)

[Interior](#)

[Locks and Alarm](#)

[Starting and driving](#)

[Vehicle care](#)

[Wheels and tires](#)

[Maintenance](#)

[Specifications](#)

[Audio](#)

[Index](#)

[Back Cover](#)



[Top of Page](#)

# 2003 VOLVO XC90

## Safety

pg. 1 Safety

<u>Seat belts</u>	<u>2</u>
<u>Airbags (Supplemental Restraint System)</u>	<u>4</u>
<u>Side airbags (SIPS airbags)</u>	<u>10</u>
<u>Inflatable Curtain (IC)</u>	<u>12</u>
<u>Roll-over Protection System</u>	<u>13</u>
<u>Inspection of airbags, Inflatable Curtains and seat belt pretensioners</u>	<u>14</u>
<u>Whiplash Protection System (WHIPS)</u>	<u>15</u>
<u>Child safety</u>	<u>17</u>
<u>Occupant safety, Reporting safety defects</u>	<u>21</u>

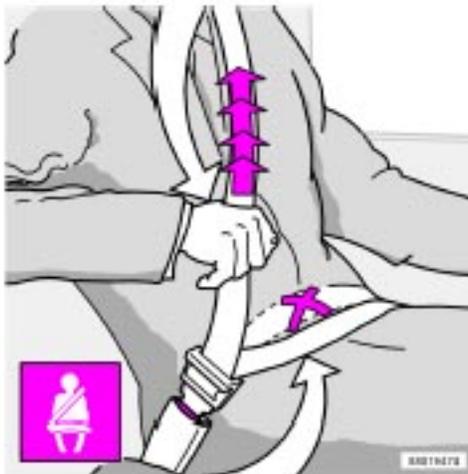
pg. 2 Safety

## Seat belts

Not wearing a seat belt is like believing "It'll never happen to me!" Volvo, the inventor of the three-point seat belt, urges you and all occupants of your vehicle to wear seat belts and ensure that children are properly restrained, using an infant, car or booster seat determined by age, weight and height. Volvo also believes no child should sit in the front seat of a vehicle.

**NOTE:** Most states and provinces make it mandatory for occupants of a vehicle to use seat belts. So, urging you to buckle up is not just our recommendation. The few moments it takes to buckle your seat belt may one day allow you to say "It's a good thing I was wearing my seat belt."

**NOTE:** A chime will sound several times if the driver has not fastened his/her seat belt.



*Extending the lap belt*

### **To buckle a seat belt:**

Pull the belt out far enough to insert the latch plate into the receptacle until a distinct click is heard. The seat belt retractor is normally "unlocked" and you can move freely, provided that the shoulder belt is not pulled out too far. The retractor will lock up as follows:

- if the belt is pulled out rapidly
- during braking and acceleration
- if the vehicle is leaning excessively
- when driving in turns

For the seat belt to provide maximum protection in the event of an accident, it must be worn correctly.

When wearing the seat belt remember:

- The belt should not be twisted or turned.
- The lap belt must be positioned low on the hips (not pressing against the abdomen).

Make sure that the shoulder belt is rolled up into its retractor and that the shoulder and lap belts are taut.

Before exiting the vehicle, check that the seat belt retracts fully after being unbuckled. If necessary, guide the belt back into the retractor slot.

### **Child seats:**

Please refer to [page 20](#) for information on securing child seats with the seat belts.



### **During pregnancy**

Pregnant women should always wear seat belts. Remember that the belt should always be positioned in such a way as to avoid any possible pressure on the abdomen. The lap portion of the belt should be located low, as shown in the above illustration.

#### **⚠ WARNING!**

##### **Seat belts:**

- Never use a seat belt for more than one occupant. Never wear the shoulder portion of the belt under the arm, behind the back or otherwise out of position. Such use could cause injury in the event of an accident. As seat belts lose much of their strength when exposed to violent stretching, they should be replaced after any collision, even if they appear to be undamaged.
- Never repair the belt on your own; have this work done by an authorized Volvo retailer only.
- Any device used to induce slack into the shoulder belt portion of the three-point belt system will have a detrimental effect on the amount of protection available to you in the event of a collision.
- The seat back should not be tilted too far back. The shoulder belt must be taut in order to function properly.
- 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.



*Sample label found on all seat belts with pretensioners*

## Airbags (Supplemental Restraint System)

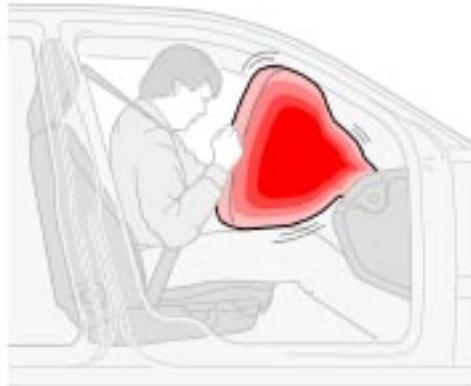


### Driver's side airbag

As an enhancement to the three-point seat belt system, your Volvo is equipped with a Supplemental Restraint System (SRS) to complement the three-point seat belt system. The inflatable airbag is installed folded up in the center of the steering wheel. The wheel is embossed with SRS.

**⚠ WARNING!**

Never drive an SRS equipped vehicle with your hands on the steering wheel pad/airbag housing.



**Passenger side airbag**

The airbag on the front passenger side is folded up in a compartment above the glove compartment. The panel is embossed SRS.

**⚠ WARNING!**

No objects, accessory equipment or stickers may be placed on, attached to, or installed near the SRS cover in the center of the steering wheel, the SRS cover above the glove compartment or the area affected by airbag deployment.



*Passenger side airbag - location*

**⚠ WARNING!**

As its name implies, SRS is designed to be a SUPPLEMENT to - not a replacement for - the three-point belt system. For maximum protection, wear seat belts at all times. Be aware that no system can prevent all possible injuries that may occur in an accident.

When installing any accessory equipment, make sure that the SRS system is not damaged. Do not attempt to service any component of the SRS yourself. Attempting to do so may result in serious personal injury. If a problem arises, take your vehicle to the nearest authorized Volvo retailer for inspection as soon as possible.

pg. 5 Safety



*SRS text on outside of both sun visors*



*SRS text on inside of both sun visors*



*SRS text on passenger's dash*



*SRS text at the end of the dash*

**NOTE:**

Deployment of SRS components occurs only one time during an accident. In a collision where deployment occurs, the airbags and seat belt pretensioners activate. Some noise occurs and a small amount of powder is released. The release of the powder may appear as smoke-like matter. This is a normal characteristic and does not indicate fire.

**NOTE:**

Volvo's dual-threshold, dual-stage airbags use special sensors that are integrated with the front seat buckles. The point at which the airbag deploys is determined by whether or not the seat belt is being used, as well as the severity of the collision. Collisions can occur where only one of the airbags deploys. If the impact is less severe, but severe enough to present a clear injury risk, the dual-stage airbags are triggered at 70% of their total capacity. If the impact is more severe, the dual-stage airbags are triggered at full capacity.

**⚠ WARNING!**

Do not use child safety seats or child booster cushions/backrests in the front passenger's seat. We also recommend that occupants under 4 feet 7 inches (140 cm) in height who have outgrown these devices sit in the rear seat with the seat belt fastened. Never drive with the airbags deployed. The fact that they hang out can impair the steering of your vehicle. Other safety systems can also be damaged. The smoke and dust formed when the airbags are deployed can cause skin and eye irritation in the event of prolonged exposure.

## Airbags (Supplemental Restraint System) (contd)

## **WARNING!**

Children must never be allowed in the front passenger's seat. 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. See [page 20](#) for guidelines.

Occupants in the front passenger's seat must never sit on the edge of the seat, sit leaning toward the instrument panel or otherwise sit out of position. The occupant's back must be as upright as comfort allows and be against the seat back with the seat belt properly fastened.

Feet must be on the floor, e.g. not on the dash, seat or out of the window. No objects or accessory equipment, e.g. dashboard covers, may be placed on, attached to, or installed near the SRS hatch (the area above the glove compartment) or the area affected by airbag deployment (see illustration on [page 4](#)).

There should be no loose articles, e.g. coffee cups, on the floor, seat or dashboard area. Never try to open the SRS cover on the steering wheel or the passenger side dash. This should only be done by an authorized Volvo service technician.

Failure to follow these instructions can result in injury to the vehicle occupants.



### **Warning light in the instrument panel**

A self-diagnostic system incorporated in the sensor monitors the SRS. This system does not, however, monitor the Side Impact Protection System (SIPS) airbags. If a fault is detected, the warning light will illuminate. The light is included in the warning/indicator light cluster in the instrument panel. Normally, the SRS warning lamp should light up when the ignition key is turned to positions I, II or III and should go out after 7 seconds or when the engine is started. Check that this light is functioning properly every time the vehicle is started.

The following items are monitored by the self-diagnostic system:

- Sensor unit
- Cable harness
- Gas generator

 **WARNING!**

If the SRS warning light stays on after the engine has started or if it comes on while you are driving, drive the vehicle to the nearest authorized Volvo retailer for inspection as soon as possible.

pg. 7 Safety

**When are the airbags deployed?**

The information on this page pertains to SRS (front) airbags only. For information about Side Impact Protection System (SIPS) airbags, please see [page 10](#). For Inflatable Curtain (IC) airbags, please see [page 12](#).

The SRS system is designed to deploy during certain frontal or front-angular collisions, impacts, or decelerations, depending on the crash severity, angle, speed and object impacted. The SRS sensor is designed to react to both the impact of the collision and the inertial forces generated by it and to determine if the intensity of the collision is sufficient for the seat belt pretensioners or airbags to be deployed.

If the airbags have been deployed, we recommend the following:

- Have the vehicle towed to an authorized Volvo retailer. Never drive with the airbags deployed.
- Have an authorized Volvo retailer replace the SRS system components.
- Use only new, Genuine Volvo Parts when replacing SRS components (airbags, seat belts, pretensioners, etc.).

**When are the airbags NOT deployed?**

Not all frontal collisions activate the SRS system. If the collision involves a nonrigid object (e.g., a snow drift or bush), or a rigid, fixed object at a low speed, the SRS system will not necessarily deploy. Front airbags do not normally deploy in a side impact collision, in a collision from the rear or in a rollover situation. The amount of damage to the bodywork does not reliably indicate if the airbags should have deployed or not.

**Seat belts - the heart of the Volvo safety system**

The heart of the Volvo safety system is the three-point seat belt (a Volvo invention)! In order for the SRS system to provide the protection intended, seat belts must be worn at all times by everyone in the vehicle. **The SRS system is a supplement to the seat belts.**

 **WARNING!**

Never drive with the airbags deployed. The fact that they hang out can impair the steering of your vehicle. Other safety systems can also be damaged. The smoke and dust formed when the airbags are deployed can cause skin and eye irritation in the event of prolonged exposure.

## Airbags (Supplemental Restraint System) (contd)

### **WARNING!**

If your vehicle has been subjected to flood conditions (e.g. soaked carpeting/standing water on the floor of the vehicle) or if your vehicle has become flood-damaged in any way, do not attempt to start the vehicle or put the key in the ignition before disconnecting the battery (see below). This may cause airbag deployment which could result in personal injury. **Have the vehicle towed to an authorized Volvo retailer for repairs.**

#### **Automatic transmission:**

Before attempting to tow the vehicle, use the following procedure to override the shiftlock system to move the gear selector to the neutral position.

- Switch off the ignition for at least 10 minutes and disconnect the battery
- Wait at least one minute
- Insert the key in the ignition and turn it to position II
- Press firmly on the brake pedal.
- Move the gear selector from **(P)**ark to the **(N)**eutral position.

There is no maintenance to perform on the SRS yourself. The month and year shown on the decal on the door pillar indicate when you should contact your Volvo retailer for specific servicing or replacement of airbags and seat belt pretensioners. This maintenance must be performed by an authorized Volvo retailer. Should you have any questions about the SRS system, please contact your authorized Volvo retailer or Volvo Customer Support:

#### **In the U.S.A**

Volvo Cars of North America

Customer Relations

P.O. Box 914

Rockleigh, New Jersey 07647-0914 800-663-8255

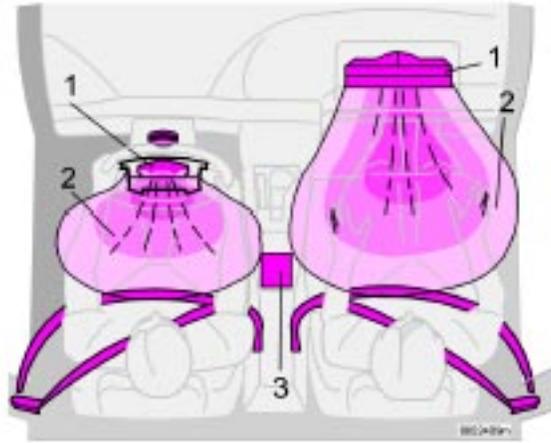
800-458-1552

#### **In Canada:**

Volvo Cars of Canada Ltd.

175 Gordon Baker Road

North York, Ontario M2H 2N7



### Front airbag (SRS) system

As an enhancement to the three-point seat belt system, your Volvo is equipped with a Supplemental Restraint System (SRS). The Volvo SRS consists of an airbag (2) on both the driver's and passenger's sides and seat belt pretensioners in both front door pillars. The system is designed to supplement the protection provided by the three-point seat belt system. All rear seat belts are also equipped with pretensioners. The SRS system is indicated by the "SRS" embossed on the steering wheel pad and above the glove compartment, and by decals on both sun visors and on the front and far right side of the dash. The airbags are folded and located in the steering wheel hub and above the glove compartment.

### Deployment:

The SRS airbags are designed to deploy during certain frontal or front-angular collisions, impacts, or decelerations, depending on the crash severity, angle, speed and object impacted. The airbags may also deploy in certain non-frontal collisions where rapid deceleration occurs.

The airbag system includes gas generators (1) surrounded by the airbags (2) and front seat belt pretensioners for both of the front seats. To deploy the system, the sensor (3) activates the gas generators causing the airbags to be inflated with nitrogen gas.

As the movement of the seats' occupants compresses the airbags, some of the gas is expelled at a controlled rate to provide better cushioning. Both seat belt pretensioners also deploy, minimizing any seat belt slack. The entire process, including inflation and deflation of the airbags, takes approximately two-tenths of a second.

### WARNING!

The SRS is designed to help prevent serious injury. Deployment occurs very quickly and with considerable force. During normal deployment and depending on variables such as seating position, one may experience abrasions, bruises, swellings, or other injuries as a result of airbag(s) deployment.

**Never** try to repair any part of the SRS or SIPS bag systems yourself. Any interference in the system could cause malfunction and serious injury. All work on these systems should be performed by an authorized Volvo retailer.

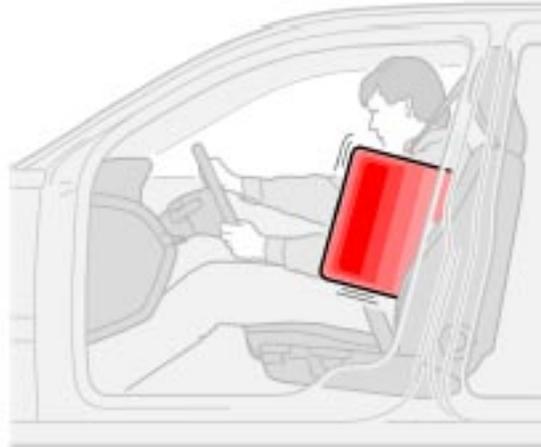


[Contents](#) | [Top of Page](#)

## Side airbags (SIPS airbags)



*SIPS airbag\**



### **SIPS airbag (front seats only)**

As an enhancement to the structural Side Impact Protection System built into your vehicle, the vehicle is also equipped with Side Impact Protection System (SIPS) airbags. The SIPS airbag system consists of airbag modules built into the sides of both front seat backrests, wires and gas generators/sensor units (see illustration on next page).

The SIPS airbag system is designed to help increase occupant protection in the event of certain side impact collisions. The SIPS airbags are designed to deploy only during certain side-impact collisions, depending on the crash severity, angle, speed and point of impact. The airbags are not designed to deploy in all side impact situations.

**NOTE:** SIPS airbag deployment (one airbag) occurs only on the side of the vehicle affected by the impact. The airbags are not designed to deploy in all side impact situations.

\*A SIPS airbag ' decal is also located at the end of the instrument panel on the driver's side of the vehicle.

 **WARNING!**

- The SIPS airbag system is a supplement to the Side Impact Protection System and the three-point seat belt system. It is not designed to deploy during collisions from the front or rear of the vehicle, and will only deploy in certain rollover situations.
- The use of seat covers on the front seats may impede SIPS airbag deployment.
- No objects, accessory equipment or stickers may be placed on, attached to or installed near, the SIPS airbag system or in the area affected by SIPS airbag deployment (see illustration in the center column above).
- Never try to open or repair any components of the SIPS airbag system. This should be done only by an authorized Volvo service technician.
- In order for the SIPS airbag to provide its best protection, both front seat occupants should sit in an upright position with the seat belt properly fastened.
- Failure to follow these instructions can result in injury to the occupants of the vehicle in the event of an accident.

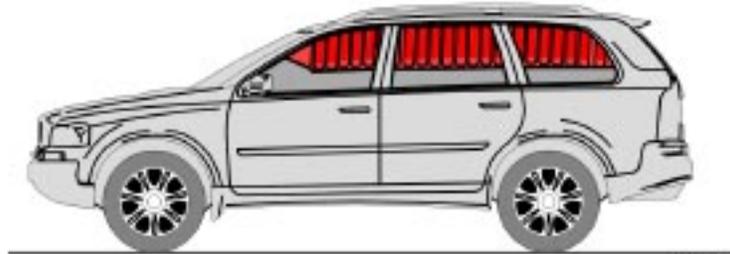
pg. 11 Safety



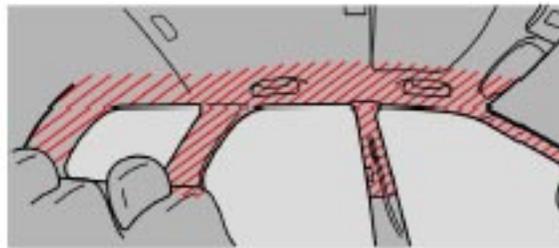
### The SIPS airbag system

This system consists of a gas generator (1), the side airbags (2), and electronic sensors/cables (3).

## Inflatable Curtain (IC)



*7-seat model shown*



### Volvo Inflatable Curtain (IC)

This system consists of Inflatable Curtains located along the sides of the roof liners, stretching from the front side windows to the rear edge of the rear side windows. It is designed to help protect the heads of the occupants of the front seats and the occupant of the outboard rear seating positions, including the outboard passenger in the optional third row of seats in certain side impact collisions. The Inflatable Curtains in the Volvo XC90 are also designed to help protect the occupants of the vehicle in a roll-over situation, and to help prevent them from being thrown from the vehicle if a roll-over occurs.

### NOTE:

In 5-seat models, the Inflatable Curtains extend to protect both rows of seats. 7-seat models, they extend to protect all three rows.

By design, the IC system deploys only on the side of the vehicle affected by the impact. However, in certain side impacts, or in a rollover situation, **BOTH** the Inflatable Curtains (IC) and the Side Impact Airbag System (SIPS-bag) will deploy, whereas, in some cases, **ONLY** the Inflatable Curtain (IC) will deploy. In cases where **BOTH** the IC and the SIPS-bag deploy, deployment will occur simultaneously. If the Inflatable Curtain deploys, it remains inflated for approximately 5 seconds.

**WARNING!**

The IC system is a supplement to the Side Impact Protection System. It is not designed to deploy during collisions from the front or rear of the vehicle. The Inflatable Curtains are designed to deploy only during certain side-impact collisions, depending on the crash severity, angle, speed and impact. The Inflatable Curtains are not designed to deploy in all side impact situations. Never try to open or repair any components of the IC system. This should be done only by an authorized Volvo service technician. In order for the IC to provide its best protection, both front seat occupants and all outboard rear seat occupants should sit in an upright position with the seat belt properly fastened; adults using the seat belt and children using the proper child restraint system. Only adults should sit in the front seats. Children must never be allowed in the front passenger seat. See [page 20](#) for guidelines. Failure to follow these instructions can result in injury to the vehicle occupants in an accident.

When the backrest(s) in the rear seat(s) are folded down, the vehicle should not be loaded to a level higher than 2 inches (5 cm) below the upper edge of the side windows. Objects placed higher than this level could impede the function of the Inflatable Curtain.

pg. 13 Safety

## Roll-over Protection System

Volvo's Roll-over Protection System has been developed to help prevent the vehicle from rolling over in the event of sudden evasive maneuvers, skids, etc and to offer enhanced protection if a roll-over occurs.

The system works in two ways:

- The stabilizing system Roll Stability Control (RSC) acts to minimize body roll.
- The system provides additional protection with a reinforced body, Inflatable Curtains for all outboard seating positions, and seat belt pretensioners for all seating positions.

RSC uses a gyro-sensor that registers the vehicle's angle of inclination and the speed at which this angle changes. Using this information, the control module calculates the risk of a roll-over. If there is an imminent roll-over risk, the Dynamic Stability and Traction Control (DSTC) system is activated, engine speed is reduced, and the brakes are applied to one or more of the wheels until the vehicle has regained stability.

If a roll-over occurs, RSC triggers the seat belt pretensioners and then deploys the Inflatable Curtains (which remain inflated for approximately 5 seconds). These curtains are designed to follow the contours of the side windows so that they position themselves between the occupants' heads and the sides of the vehicle.

pg. 14 Safety

# Inspection of airbags, Inflatable Curtains and seat belt pretensioners

The year and month specified on the decal in the door pillar(s) is the date when you should contact your Volvo retailer to inspect and, if necessary, replace the airbags and seat belt pretensioners. If you have any questions concerning either system, contact an authorized Volvo retailer.

*This is a sample decal of the one located in the rear left door opening.*

**Date for inspection of:**

*Driver's side airbag*

*Passenger side airbag*

*Side airbag on the driver's side*

*Side airbag on the passenger side*

*Inflatable Curtain on the driver's side*

*Inflatable Curtain on the passenger side*

**ATTENTION!**

THIS CAR IS EQUIPPED WITH AN SUPPLEMENTAL RESTRAINT SYSTEM: SIPS BAG AND INFLATABLE CURTAIN. TO PROVIDE CONTINUED RELIABILITY, CERTAIN ELEMENTS OF THE SUPPLEMENTAL RESTRAINT SYSTEM SHALL BE SERVICED OR REPLACED ACCORDING TO SPECIFICATIONS BELOW. SEE OWNERS MANUAL FOR FURTHER INFORMATION.

 **SRS VEHICLE**

**DRIVER AIRBAG**

YE OF 2000	JAN	APR	JUL	OCT
------------	-----	-----	-----	-----

**PASSENGER AIRBAG**

YE OF 2000	JAN	APR	JUL	OCT
------------	-----	-----	-----	-----

 **SIPS BAG**

**DRIVER SIPS BAG**

YE OF 2000	JAN	APR	JUL	OCT
------------	-----	-----	-----	-----

**PASSENGER SIPS BAG**

YE OF 2000	JAN	APR	JUL	OCT
------------	-----	-----	-----	-----

**IC INFLATABLE CURTAIN**

**DRIVER IC**

YEA 1 2001	JAN	AP 2	JUL	OCT
------------	-----	------	-----	-----

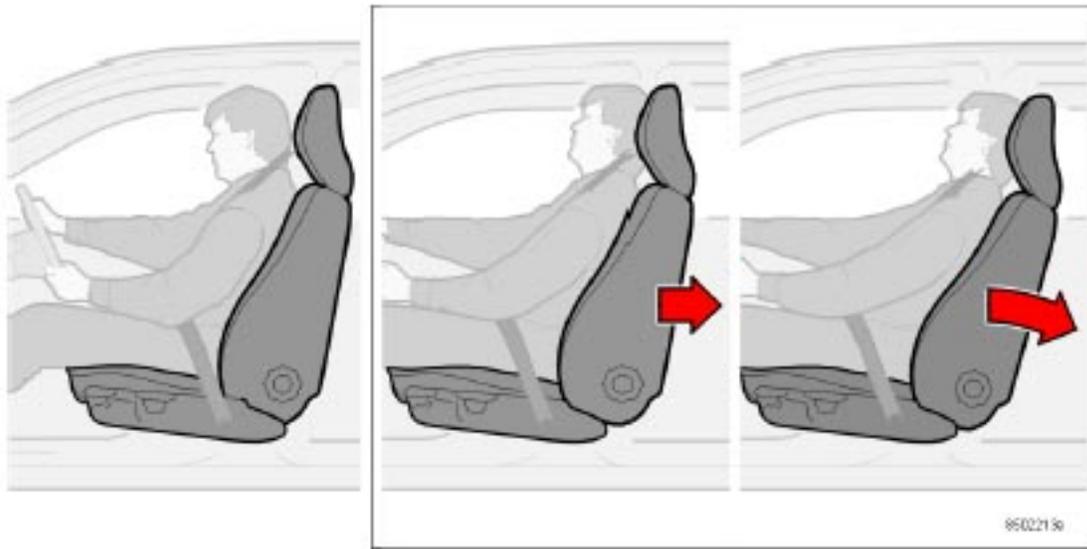
**PASSENGER IC**

YEA 1 2001	JAN	AP 2	JUL	OCT
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**VOLVO** 9433422

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## Whiplash Protection System (WHIPS)



### **Whiplash Protection System (WHIPS) - front seats only**

WHIPS consists of specially designed hinges and brackets on the front seat backrests and head restraints designed to help absorb some of the energy generated in a rear-end collision.

In the event of a collision of this type, the hinges and brackets of the front seat backrests are designed to change position slightly to allow the backrest/head restraint to help support the occupant's head before moving slightly rearward. This movement helps absorb some of the forces that could result in the whiplash effect.



### **WARNING!**

WHIPS is designed to supplement the other safety systems in your vehicle. For this system to function properly, the three-point seat belt must be worn. Please be aware that no system can prevent all possible injuries that may occur in an accident.

If your vehicle has been involved in a collision, the front seat backrests must be inspected by an authorized Volvo retailer even, if the seats appear to be undamaged. Certain components in the WHIPS system may need to be replaced. Do not attempt to service any component in the WHIPS system yourself.

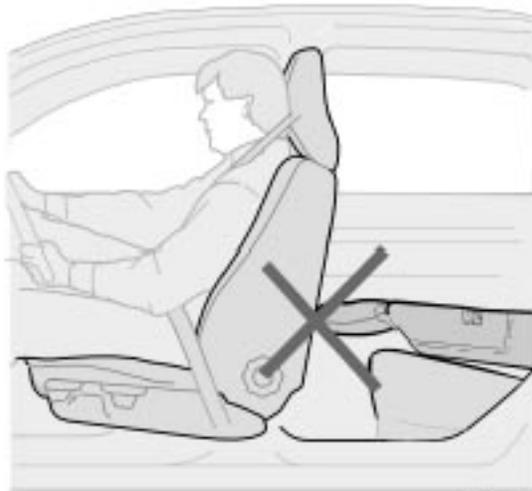
**⚠ WARNING!**

If the rear seat backrests are folded down, cargo must be secured to prevent it from sliding forward against the front seat backrests in the event of a collision from the rear. This could interfere with the action of the WHIPS system.

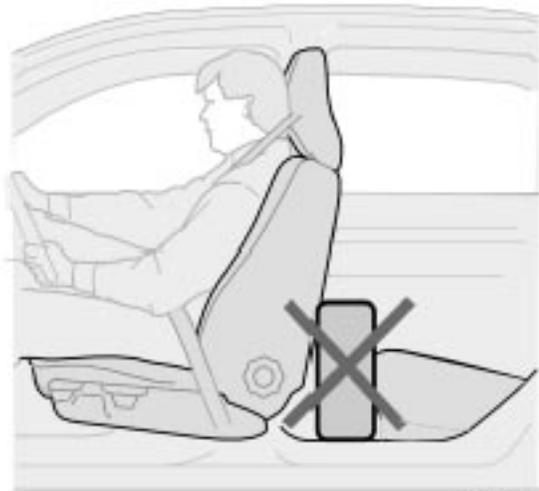
The WHIPS system is designed to function in certain collisions from the rear, depending on the crash severity, angle and speed.

Occupants in the front seats must never sit out of position. The occupant's back must be as upright as comfort allows and be against the seat back with the seat belt properly fastened.

pg. 16 Safety



8603474e



8603379e

**⚠ WARNING!**

Any contact between the front seat backrests and the folded rear seat could impede the function of the WHIPS system. If the rear seat is folded down, the occupied front seats must be adjusted forward so that they do not touch the folded rear seat.

Boxes, suitcases, etc. wedged behind the front seats (see illustration above) could impede the function of the WHIPS system.

pg. 17 Safety

**Child safety**

Volvo recommends the proper use of restraint systems for all occupants including children. Remember

that, regardless of age and size, a child should always be properly restrained in a vehicle.

Your vehicle is also equipped with ISOFIX attachments, which make it more convenient to install child seats (see [page 18](#)).

Restraint systems for children are designed to be secured in the vehicle by lap belts or the lap portion of a lap-shoulder belt. Such child restraint systems can help protect children in vehicles in the event of an accident only if they are used properly. However, children could be endangered in a crash if the child restraints are not properly secured in the vehicle. Failure to follow the installation instructions for your child restraint can result in your child striking the vehicle's interior in a sudden stop.

Holding a child in your arms is NOT a suitable substitute for a child restraint system. In an accident, a child held in a person's arms can be crushed between the vehicle's interior and an unrestrained person. The child could also be injured by striking the interior, or by being ejected from the vehicle during a sudden maneuver or impact. The same can also happen if the infant or child rides unrestrained on the seat. Other occupants should also be properly restrained to help reduce the chance of injuring or increasing the injury of a child. All states and provinces have legislation governing how and where children should be carried in a vehicle. Find out the regulations existing in your state or province. Recent accident statistics have shown that children are safer in rear seating positions than front seating positions when properly restrained. A child restraint system can help protect a child in a vehicle. Here's what to look for when selecting a child restraint system:

- It should have a label certifying that it meets applicable Federal Motor Vehicle Safety Standards (FMVSS 213) - or in Canada, CMVSS 213.
- Make sure the child restraint system is approved for the child's height, weight and development - the label required by the standard or regulation, or instructions for infant restraints, typically provide this information.
- In using any child restraint system, we urge you to carefully look over the instructions that are provided with the restraint. Be sure you understand them and can use the device properly and safely in this vehicle. A misused child restraint system can result in increased injuries for both the infant or child and other occupants in the vehicle.

When a child has outgrown the child safety seat, you should use the rear seat with the standard seat belt fastened. The best way to help protect the child here is to place the child on a cushion so that the seat belt is properly located on the hips (see [page 2](#)). Legislation in your state or province may mandate the use of a child seat or cushion in combination with the seat belt, depending on the child's age and/or size. Please check local regulations.

A specially designed and tested booster cushion (not available in Canada) for children between the age of 3 and approximately 10 years, weighing 33-80 lb (15-36 kg) and 38-54 inches (97-137 cm) in height, can be obtained from your Volvo retailer.

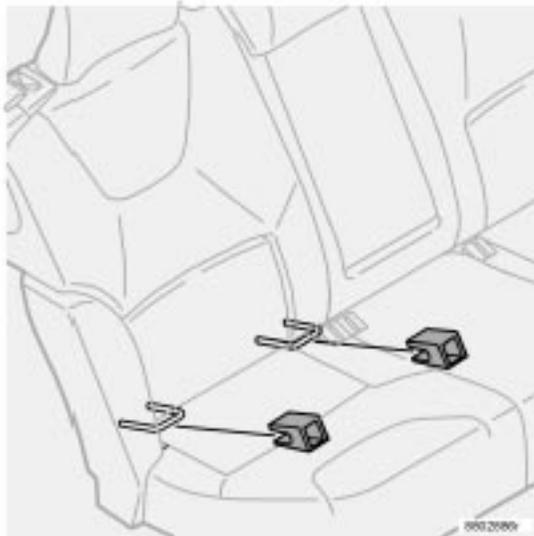


## WARNING!

- Do not use child safety seats or child booster cushions/backrests in the front passenger's seat. We also recommend that children under 4 feet 7 inches (140 cm) in height who have outgrown these devices sit in the rear seat with the seat belt fastened.
- Keep vehicle doors and the tailgate locked and keep keys out of a child's reach. Unsupervised children could lock themselves in an open tailgate and risk injury. Children should be taught not to play in vehicles.
- On hot days, the temperature in the vehicle interior can rise very quickly. Exposure to these high temperatures for even a short period of time can cause heat-related injury or death. Small children are particularly at risk.

pg. 18 Safety

## Child safety (contd)



*Isofix attachments*

### ISOFIX fasteners and seat guides

ISOFIX fasteners are installed in the second row of seats in the outboard positions. One set of ISOFIX guides is also provided. Consult your Volvo retailer for more information on child safety accessories.

When installing child seats in the second row of seats (in seven-seat models), we recommend that the seats in this row be moved to their rearmost position.



### **Integrated child booster cushion (option)**

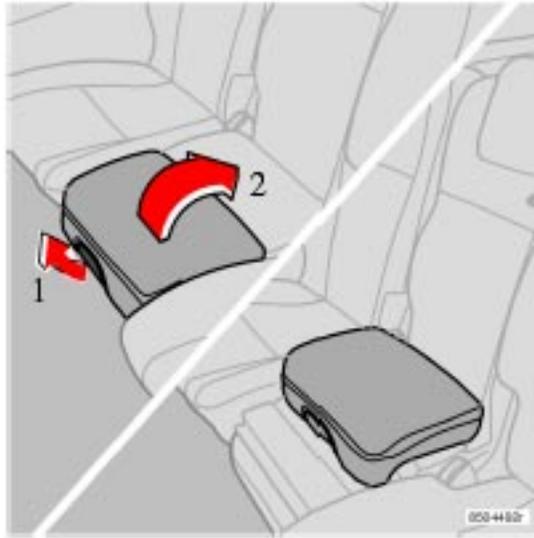
Volvo's own integrated booster cushion has been specially designed to help safeguard a child seated in the rear seat. When using an integrated booster cushion, the child must be secured with the vehicle's three-point seat belt. This child seat is designed for use only by children who weigh between 33 and 80 lb (15 and 36 kg) and whose height is between 38 and 54 in (97 and 137 cm).

The child should be properly seated on the booster cushion. 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 (see illustration). The shoulder belt must never be placed behind the child's back or under the arm.



### **WARNING!**

Failure to follow the manufacturer's instructions on the use of this child restraint system can result in your child striking the vehicle's interior during a sudden stop or crash. 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. The booster cushion should be cleaned while in place in the vehicle if possible. If not, please consult your Volvo retailer.



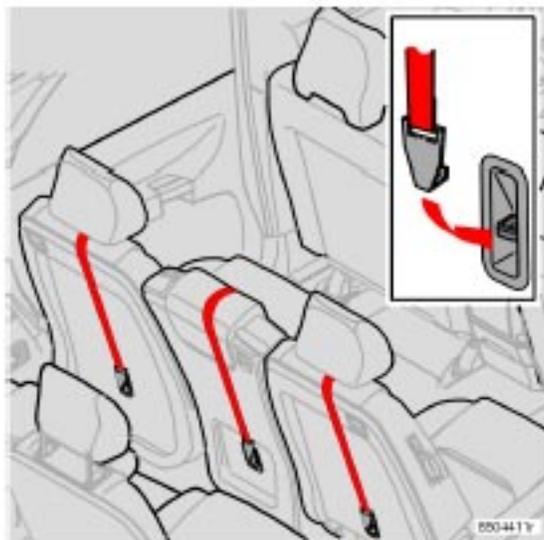
### **Integrated booster cushion Raising**

- Pull the handle at the front of the cushion (1) forward.
- With both hands push the cushion rearward (2).
- Push the cushion until it locks in place.

### **Lowering**

- Pull the handle at the front of the cushion (1) forward.
- Pull the seat forward and press it down until it locks in place.

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



*Child restraint anchorages*

### **Child restraint anchorages**

Volvo vehicles are equipped with child restraint top tether anchorages in the rear seats (second row of seats in seven-seat models). Refer to the child seat manufacturer's instructions for information on

securing the child seat.



### **WARNING!**

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 which would require the removal of the top tether anchors or interfere with the proper use of the top tether strap.

pg. 20 Safety

## **Child safety (contd)**

### **Keeping child seats in place (ALR/ ELR\*)**

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.

### **Important!**

## **Why Volvo believes 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 fifty 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 ALL children sit in the rear seat of any vehicle and that they be properly restrained.
- A child should NEVER sit in the front passenger seat of any vehicle equipped with a passenger-side front airbag.
- Volvo recommends that ALL occupants (adults and children) shorter than four feet seven inches (140 cm) be seated in the back seat of any vehicle with a front passenger side airbag.

Drive safely!

\* Automatic Locking Retractor/Emergency Locking Retractor

pg. 21 Safety

## **Occupant safety, Reporting safety defects**

### **Seat belt maintenance**

Check periodically that the seat belts are in good condition. Use water and a mild detergent for cleaning. Check seat belt mechanism function as follows: attach the seat belt and pull rapidly on the strap.

### **Volvo concern for safety**

Safety is Volvo's cornerstone. Our concern dates back to 1927 when the first Volvo rolled off the production line. Three-point seat belts (a Volvo invention), safety cages, and energy-absorbing impact zones were designed into Volvo vehicles long before it was fashionable or required by government regulation. We will not compromise our commitment to safety. We continue to seek out new safety features and to refine those already in our vehicles. You can help. We would appreciate hearing your suggestions about improving automobile safety. We also want to know if you ever have a safety concern with your vehicle. Call us in the U.S. at: 800-458-1552 or in Canada at: 800-663-8255.

### **Occupant safety**

How safely you drive doesn't depend on how old you are, but rather on:

- How well you see.
- Your ability to concentrate.
- How quickly you make decisions under stress to avoid an accident.

The tips listed below are suggestions to help you cope with the ever changing traffic environment.

- Never drink and drive.
- If you are taking any medication, consult your physician about its potential effects on your driving abilities.
- Take a driver-retraining course.
- Have your eyes checked regularly.
- Keep your windshield and headlights clean.
- Replace wiper blades when they start to leave streaks.
- Take into account the traffic, road, and weather conditions, particularly with regard to stopping distance.

### **Reporting Safety Defects in the U.S.**

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Volvo Cars of North America. If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your retailer, or Volvo Cars of North America. To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1- 800-424-9393 (or 202-366-0123 in Washington, D.C. area) or write to: NHTSA, U. S. Department of Transportation, Washington D.C. 20590. You can also obtain other information about motor vehicle safety from the Hotline.

Volvo strongly recommends that if your vehicle is covered under a service campaign, safety or emission recall or similar action, it should be completed as soon as possible. Please check with your local retailer or Volvo Cars of North America, LLC if your vehicle is covered under these conditions.

NHTSA can be reached at:

Internet:

<http://www.nhtsa.dot.gov>

Telephone:

1-888-DASH-2-DOT (1-888-327-4236) (toll free)

1-800-424-9393 (toll free)

1-202-366-0123 (in Washington DC area)



[Contents](#) | [Top of Page](#)

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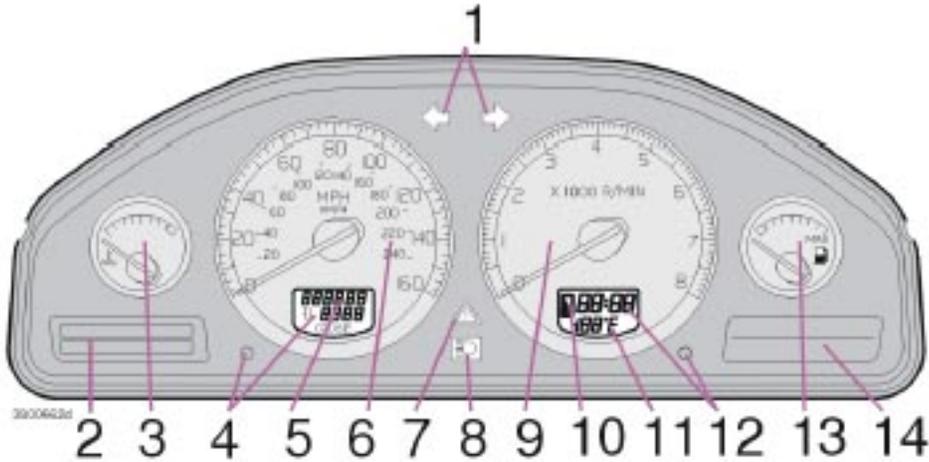
**Safety**

pg. 23 Instruments and controls

<u>Instrument panel</u>	<u>24</u>
<u>Indicator and warning symbols</u>	<u>25</u>
<u>Switches in center console</u>	<u>29</u>
<u>Steering wheel adjustment</u>	<u>30</u>
<u>Lighting panel</u>	<u>31</u>
<u>Manually unlocking the fuel filler door</u>	<u>32</u>
<u>Turn signals</u>	<u>33</u>
<u>Hazard warning flashers, rear window/sideview mirror defroster, heated front seats</u>	<u>35</u>
<u>Trip computer (option)</u>	<u>36</u>
<u>Cruise control</u>	<u>37</u>
<u>Parking brake, Opening/closing the hood</u>	<u>38</u>
<u>Opening the tailgate, Auxiliary 12-volt sockets</u>	<u>39</u>
<u>Electrically operated windows</u>	<u>40</u>
<u>Rearview mirror/power folding sideview mirrors</u>	<u>42</u>
<u>Electrically operated moonroof (option)</u>	<u>43</u>

pg. 24 Instruments and controls

# Instrument panel



## 1. Turn signal indicators - right - left

## 2. Text window

The text window displays information and warning messages.

## 3. Temperature gauge

The pointer should be approximately midway on the gauge when driving. **Do not drive the vehicle if the warning light is on.** The text window will provide you with additional information. If the engine temperature remains high, check coolant level - see [page 127](#).

## 4. Trip odometer

The trip odometers are used for measuring shorter distances. The right-hand digit gives tenth of a mile/kilometer. Press the button for more than 2 seconds to reset. Change between trip odometers 1 and 2 using one short press on the button.

## 5. Odometer

## 6. Speedometer

## 7. Warning symbol

## 8. High beam indicator

## 9. Tachometer

The tachometer shows engine speed in thousands of revolutions per minute (rpm). Do not drive continuously with the needle in the red area of the dial, which indicates maximum allowable engine rpm range. Instead, shift to a higher gear or slow the vehicle down. The engine management system will

automatically prevent excessively high engines speeds. This will be noticeable as a pronounced unevenness in engine speed.

### 10. Gear and driving mode indicator

The currently selected driving mode is displayed here. If you use the optional Geartronic function on the automatic transmission, the currently selected gear will be displayed.

### 11. Ambient temperature gauge

This display indicates the air temperature outside your vehicle. A "snowflake" symbol in the text window is displayed when the temperature is in the range of 23 -36° F (-5 -+2° C). Please note that this symbol does not indicate a fault with your vehicle. At low speeds or when the vehicle is not moving, the temperature readings may be slightly higher than the actual ambient temperature.

### 12. Clock/set button

Turn the button to set the clock.

### 13. Fuel gauge

The fuel tank holds approximately 19 US gals (72 liters). When a warning light in the gauge comes on, there are approximately 1.8 US gal. (8 liters) of fuel remaining in the tank.

### 14. Indicator and warning symbols

pg. 25 Instruments and controls

## Indicator and warning symbols

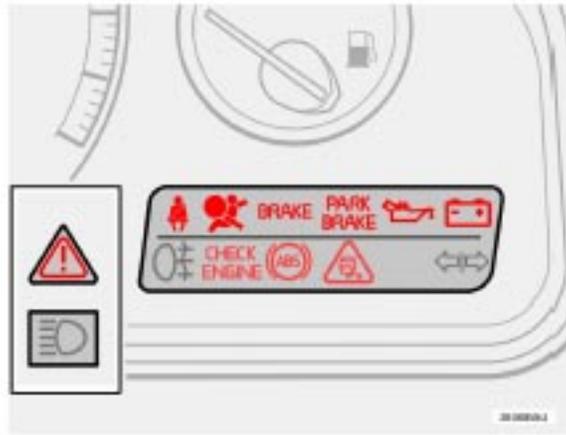
The indicator and warning symbols light up when you turn the ignition key to the driving position (position II) before starting. This shows that the symbols are functioning. When the engine starts, all symbols go out. If the engine is not started within 5 seconds, all symbols except **CHECK ENGINE** and  go out. The symbol for the parking brake goes out when the parking brake is released.

### Warning symbol in center of instrument panel

This symbol shines as a red or yellow light depending on the severity of the fault that has been detected.

**Red symbol** -Stop the vehicle as soon as possible in a suitable location and read the message shown in the text window.

**Yellow symbol** -Follow the instructions shown in the text window.



## Anti-lock brake system ABS

If the warning light comes on, there is a malfunction of the ABS system (the standard braking system will still function). The vehicle should be driven to a Volvo retailer for inspection. See [page 96](#) for additional information.

pg. 26 Instruments and controls

## Indicator and warning symbols (contd)

### **BRAKE** Brake failure warning light

If the light comes on while driving or braking, stop immediately, open the hood and check the brake fluid level in the reservoir. See [page 128](#) for reservoir position and [page 132](#) for instructions.

 Canadian models are equipped with this warning light.

**If the BRAKE and ABS warning lights come on at the same time, this could indicate a fault in the brake system.**

- Stop the vehicle in a suitable place and switch off the engine.
- Restart the engine.
- If both warning lights go off, no further action is required.
- If both lights are still on after the engine has been restarted, switch off the engine again and check the brake fluid level (see [page 128](#) for the location of the brake fluid reservoir).

## **WARNING!**

The If the fluid level is below the MIN mark in the reservoir or if a "Brake failure - Service urgent" message is displayed in the text window: **DO NOT DRIVE**. Have the vehicle towed to an authorized Volvo retailer and have the brake system inspected.



- If the brake fluid level is above the MIN mark, drive carefully to an authorized Volvo retailer and have the brake system inspected Volvo retailer and have the brake system inspected.

## **DSTC**

The Dynamic Stability and Traction Control system (DSTC) is explained in greater detail on [pages 97 and 98](#). This system consists of several functions:



### **Risk for slippery conditions**

If the warning light comes on and stays on, this indicates that traction with the road surface is reduced. Drive with caution.

If this light **flashes**, it indicates that the DSTC system is working to restore traction to one or more of the wheels.

### **Reduced Stability Control**

If the green indicator light in the DSTC button goes out, DSTC has reduced effect because the system had been switched off with the button in the center console. The text DSTC SPIN CONTROL OFF will be displayed in the text window.

### **Reduced anti-spin function**

 If the yellow indicator light comes on and remains on, DSTC's Stability Control function has been switched off due to excessively high brake temperature. The text TRACTION CONTROL TEMPORARILY OFF will be displayed in the text window.

### **Fault in the DSTC system**

If the yellow indicator light remains on, there is a fault in the system. The text ANTI-SKID SERVICE REQUIRED will be displayed.

- Stop the vehicle in a safe place and switch off the engine. Restart the engine.
- If the indicator light goes off, no further action is necessary.

If the indicator light remains on, drive to an authorized Volvo retailer to have the system inspected.

pg. 27 Instruments and controls

## Indicator and warning symbols (contd)

### **Supplemental Restraint system (SRS)**

If the light comes on (or stays on after the vehicle has started), the SRS diagnostic system has detected a fault. Drive to an authorized Volvo retailer for an inspection of the system. See the SRS section for more information.

### **Generator warning light**

If the light comes on while the engine is running, have the charging system checked.

 **Seat belt reminder** This symbol lights up to indicate that the driver has not fastened his/her seat belt.

### **PARK BRAKE PARKING BRAKE**

This light will be on when the parking brake is applied. The parking brake lever is situated between the front seats.

 Canadian models are equipped with this symbol.

### **Rear fog light**

This light indicates that the fog light is on.

### **Turn signal indicator - trailer (certain models)**

If you are towing a trailer, this light will flash simultaneously with the turn signals on the trailer. If the light does not flash when signaling, neither the trailer's turn signals nor the vehicle's turn signals are

functioning.

### Oil pressure warning light

**If the light comes on while driving, stop the vehicle and then stop the engine immediately and check the engine oil level** See [page 130](#). If the light stays on after restart, have the vehicle towed to the nearest authorized Volvo retailer. After hard driving, the light may come on occasionally when the engine is idling. This is normal, provided it goes off when the engine speed is increased.

### **CHECK ENGINE Malfunction indicator light**

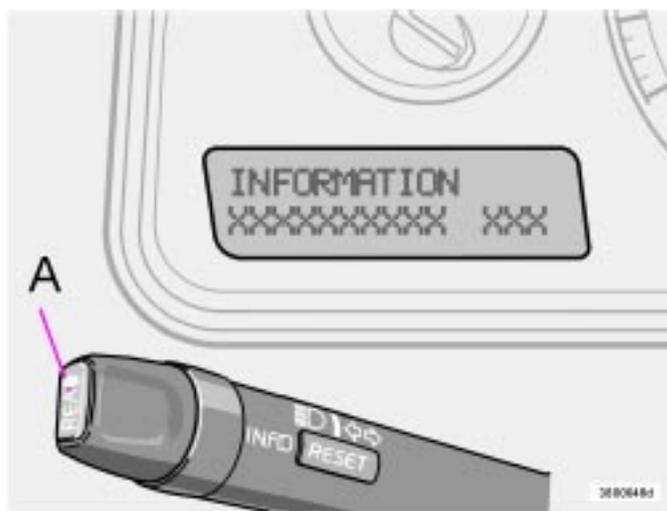
On-Board Diagnostics II (OBDII): As you drive, a computer called "OBDII" monitors your vehicle's engine, transmission, electrical and emission systems. The CHECK ENGINE light will light up if the computer senses a condition that potentially may need correcting. When this happens, please have your vehicle checked by a Volvo retailer as soon as possible.

A CHECK ENGINE light may have many causes. Sometimes, you may not notice a change in your vehicle's behavior. Even so, an uncorrected condition could hurt fuel economy, emission cleanliness, and driveability. Extended driving without correcting the cause could even damage other components in your vehicle.

 Canadian models are equipped with this warning light.

pg. 28 Instruments and controls

## Indicator and warning symbols (contd)



### Messages in the text window

When a warning light in the instrument panel comes on, a message is also displayed in the text window. After you have read the message, you can erase it by pressing button A (see illustration).

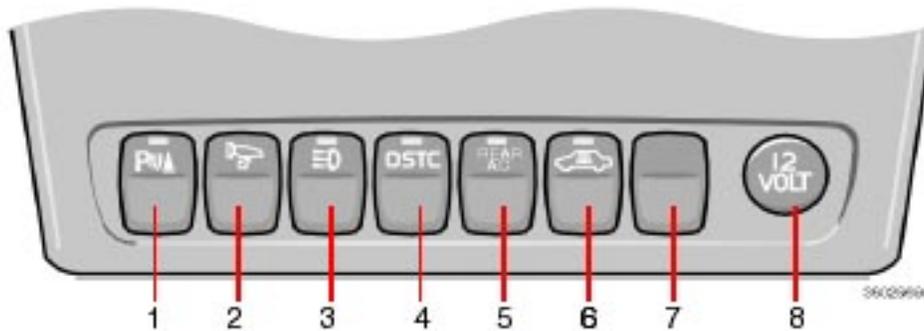
**NOTE:** Certain messages cannot be erased until the condition has been corrected.

If a warning message is displayed when e.g. you are using the trip computer, this message must be erased before you can access the function of your choice. Press button A to erase the warning message.

You can scroll through the stored messages by pressing button A (see illustration). The text window can be cleared (the message will be returned to memory) by pressing button A again.

<b>Message</b>	<b>Meaning:</b>
STOP SAFELY:	Stop and switch off the engine - to help prevent serious risk of damage.
STOP ENGINE:	Stop and switch off the engine - to help prevent serious risk of damage.
SERVICE URGENT:	Take your vehicle to an authorized Volvo retailer for inspection as soon as possible.
SEE MANUAL:	Refer to your owner's manual. For additional information, please contact your Volvo retailer.
SERVICE REQUIRED:	Take your vehicle to an authorized Volvo retailer for inspection at your convenience (but preferably before the next scheduled maintenance).
FIX NEXT SERVICE:	Have the system affected inspected at the next scheduled maintenance.
TIME FOR REGULAR SERVICE	This light will come on at 7,500 mile (12,000 km) intervals, after 750 hours of driving or after 12 months, whichever occurs first, to remind the driver that the maintenance interval has been exceeded. The light will stay on for 2 minutes after start until reset by the servicing retailer.

## Switches in center console



*The positions of these buttons may vary, depending on the specifications of your vehicle*

### 1. Reverse warning system (option)

This system provides an audible warning if you back the vehicle to within approximately 5 feet (1.5 meters) of an object. See [page 99](#) for more information.

**NOTE:** The system activates automatically when the engine is started, and can be deactivated by pressing this button (e.g. when towing a trailer) or reactivated if necessary.

### 2. Folding sideview mirrors (option)

Press the button and release it to fold the sideview mirrors in or out. When the button is pressed while the mirrors are folded in, there will be a delay of several seconds before the mirrors begin to move outward.

### 3. Auxiliary lights

This button is used to switch on auxiliary lights (if installed). An LED in the switch will light up to indicate that the auxiliary lights are illuminated.

### 4. Dynamic Stability Traction Control system (DSTC)

This button is used to switch off DSTC's stability Control function. When the LED in the button is ON, all DSTC functions are active. See [pages 97 and 98](#) for additional information.

**NOTE:** To avoid inadvertently switching off the Stability Control function, the button must be pressed for at least half a second. The text "SPIN CONTROL OFF" will be displayed in the text window and the green indicator light in the button will go out. All DSTC functions will be automatically be on when the engine is started.



### **WARNING!**

The Please be aware that the vehicle's handling characteristics may be affected if the Stability Control function is switched off.

### 5. Rear seat air conditioning (option)

This button controls the optional rear seat air conditioning system on seven-seat models. See [page 48](#) for more information.

## 6. Temporarily disconnecting the alarm sensors (option)

See [page 81](#) for more details.

## 7. Not in use

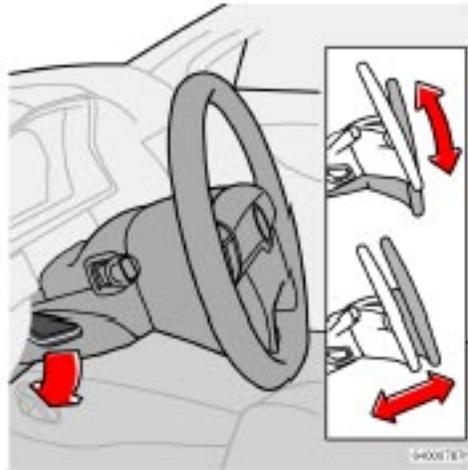
## 8. 12 volt socket

This 12 volt socket can be used to plug in certain accessories such as cellular telephones, etc. The ignition key must be in position 1 (or higher) for the auxiliary socket to function.

**NOTE:** The auxiliary sockets can also be used for cigarette lighters, which are available as accessories at your Volvo retailer.

pg. 30 Instruments and controls

# Steering wheel adjustment



## Steering wheel adjustment

Both the height and the reach of the steering wheel can be adjusted to a comfortable position for the driver. Pull down the lever on the left of the steering column. Adjust the steering wheel to a suitable position and press the lever back into place to lock the steering wheel in the new position. Check that the steering wheel is locked in the new position.

 **WARNING!**

The Never adjust the steering wheel while driving.

pg. 31 Instruments and controls

## Lighting panel

### A - Headlights and parking lights

 All lighting off.

Models with daytime running lights:

Low beam headlights will automatically come on if the ignition key is in position II. Front and rear parking lights, tail lights, side marker lights, and license plate lights will also be on. Volvo recommends the use of daytime running lights. If, however, you would prefer to have these lights turned off (USA only), please consult your Volvo retailer. Please note that the use of daytime running lights is mandatory in Canada.

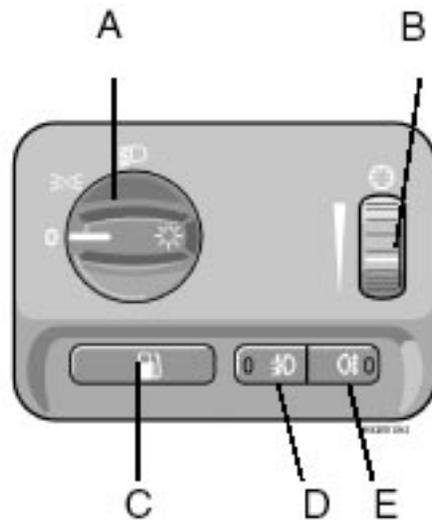
 Parking lights on. **The parking lights should be switched off when you leave the vehicle to help avoid battery drain.**

 Headlights, parking lights, license plate lights and instrument panel illumination are on if the ignition key is in position II.

If the headlight switch is in this position, all lights will go out when the ignition is switched off.

The headlight switch must be in this position before the high beams will function.

Switch from high to low beams and vice versa by pulling the turn signal switch lever on the left side of steering column toward you.



### **B - Instrument lighting**

Move the thumb wheel up to increase brightness or down to decrease brightness. There is also an instrument panel illumination sensor (see illustration on [page 48](#)) which automatically adjusts the level of illumination. The symbols have maximum illumination in daylight (only the background lighting can be adjusted). At night, both the symbol light and background lighting can be adjusted.

### **C - Unlocking the fuel filler door**

Press this button when the vehicle is at a standstill to unlock the fuel filler door. Please note that the fuel filler door will remain unlocked until the vehicle begins to move forward. An audible click will be heard when the fuel filler door relocks. See also [page 86](#).

**NOTE:** If the fuel filler door does not unlock after the button has been pressed, please see [page 32](#) for information on manually unlocking this door.

### **D - Front fog lights**

The front fog lights will function only in combination with the low beam headlights. The fog lights turn off when the ignition is switched off. A light in the switch indicates when the front fog lights are on.

### **E - Rear fog light**

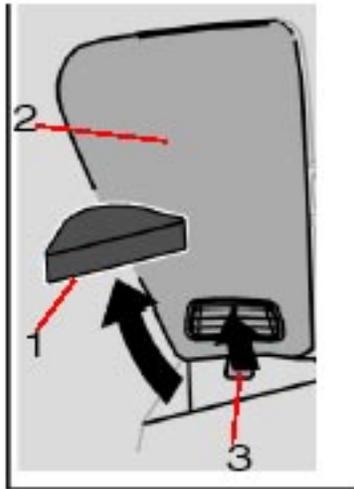
The rear fog light is considerably brighter than the normal tail lights and should be used only when conditions such as fog, rain, snow, smoke or dust reduce visibility for other vehicles to less than 500 ft (150 meters).

A light in the switch indicates when the rear fog light is on.

The rear fog light will only function in combination with the high/low beam headlights.

By design, there is one rear fog light only, located in the driver's side tail light cluster.

## Manually unlocking the fuel filler door

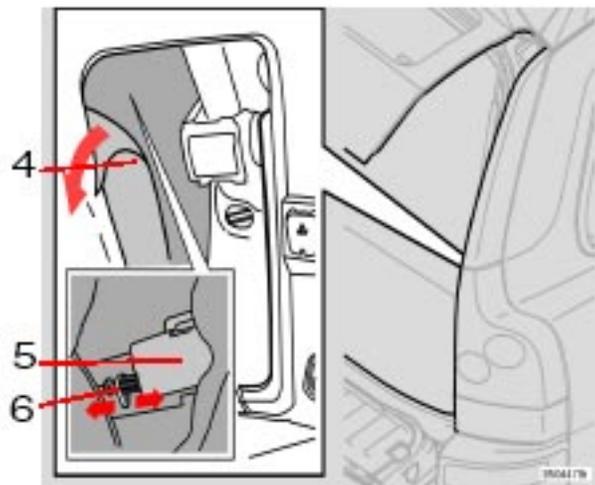


*Panel on passenger's side of cargo area*

## Manually unlocking the fuel filler door

**NOTE:** Cotton gloves are available in the tool kit located in the spare wheel well.

1. Open the upper and lower sections of the tailgate, and fold up the rear section of the cargo area floor.
2. If the vehicle is equipped with the optional grocery bag holder, detach the holder's bands.



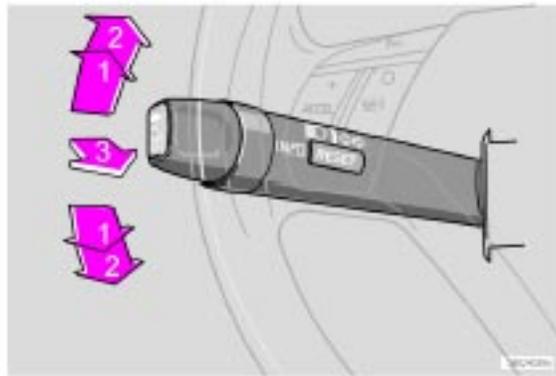
3. Remove the corner panel (1) from the floor of the cargo area.
4. Open the cover (2) in the side panel by pulling the tab (3) upward/outward.

5. Pull down the insulating material (4) to access the fuel filler door motor (5).

6. Move the catch (6) rearward to unlock the fuel filler door lock, or move it forward to lock the filler door.

pg. 33 Instruments and controls

## Turn signals



### 1. Lane change

In maneuvers such as lane changing, the driver can flash the turn signals by moving the turn signal lever to the first stop and holding it there. The lever will return to the neutral position when released.

### 2. Signal lever engaged for normal turns

### 3. High/low beam switch (headlights on).

Move the lever towards the steering wheel and release it.

### Headlight flasher (headlights off).

Move the lever towards the steering wheel. The headlight high beam will be on until the lever is released.

**NOTE:** If the turn signal indicator flashes faster than normal, check for a burned-out turn signal bulb.

## Exterior courtesy lights

### Home safe lighting

When you leave your vehicle at night, you can make use of the courtesy lighting function:

- Remove the key from the ignition switch.
- Pull the turn signal lever towards the steering wheel (as when using the headlight flasher function).
- Exit the vehicle and lock the doors.

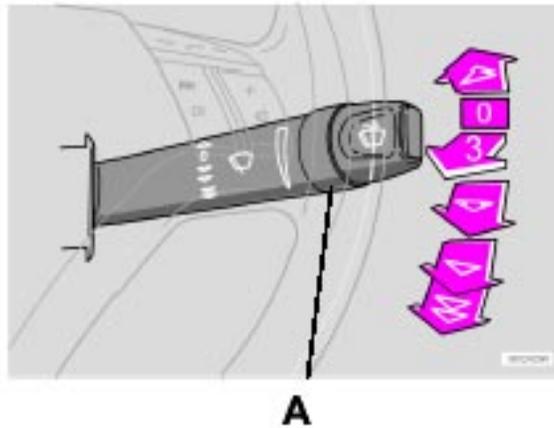
The headlights, parking lights, license plate lights and the lights in the sideview mirrors will now come on and remain on for 30, 60 or 90 seconds (the time interval is at your discretion and can be changed by an authorized Volvo retailer).

### Approach lighting

When approaching the vehicle at night, press the yellow button in the central locking remote control (see illustration on [page 75](#)). This lights up the interior courtesy lights, parking lights, license plate lights and the lights in the sideview mirrors.

pg. 34 Instruments and controls

## Windshield wipers



### Windshield wipers off

If the lever is in the 0 position and you move it upwards, the wipers will sweep one stroke at a time for as long as you hold the lever up.

### "Single sweep" position

Move the lever slightly upward from the 0 position for one sweep of the wipers. The lever return automatically to 0 when released.

### Intermittent wiper function

With the lever in this position, you can set the wiper interval by twisting the control ring (A) upward to increase wiper speed or downward to decrease the speed.

### Rain sensor (option)

The rain sensor replaces the intermittent wiper function and automatically regulates wiper speed according to the amount of water on the windshield. The **sensitivity** of the sensor can be adjusted by

twisting collar **A** upward or downward.

**Activating the rain sensor function:**

1. Switch on the ignition.
2. Move the windshield wiper lever to the intermittent position.

The rain sensor is deactivated when the ignition is switched completely off.

**To reactivate the rain sensor function:**

1. Switch on the ignition.
2. Move the windshield wiper lever to position 0 and then back to the intermittent position.

**CAUTION**

**When washing the vehicle in an automatic car wash, move the windshield wiper lever to position 0 to deactivate the rain sensor.** If the rain sensor is left on, the wipers will activate in the car wash and could be damaged.

 Wipers operate at "normal" speed

 Wipers operate at "high" speed

**3 - Windshield washer/headlight washer (certain models)**

Pull the lever toward you and release it. High pressure jets mounted in the bumper will spray the headlights.



[Contents](#) | [Top of Page](#)

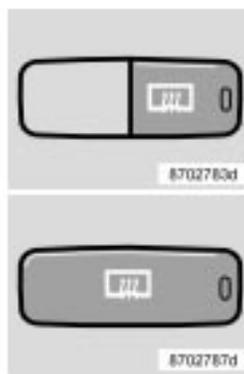
## Hazard warning flashers, rear window/sideview mirror defroster, heated front seats



### Hazard warning flashers

The four-way flasher should be used to indicate that the vehicle has become a traffic hazard. To activate the flashers, press the triangular button in the center dash. Press the button again to turn off the flashers.

**NOTE:** Regulations regarding the use of the hazard warning flasher may vary, depending on where you live.



### Sideview mirror and rear window defroster

Press the switch to start heating the rear window and sideview mirrors to remove ice or condensation. An LED in the switch will light up.

A timer automatically switches off the heating to the sideview mirrors after approximately 4 minutes and to the rear window after approximately 12 minutes. The LED will go out correspondingly.



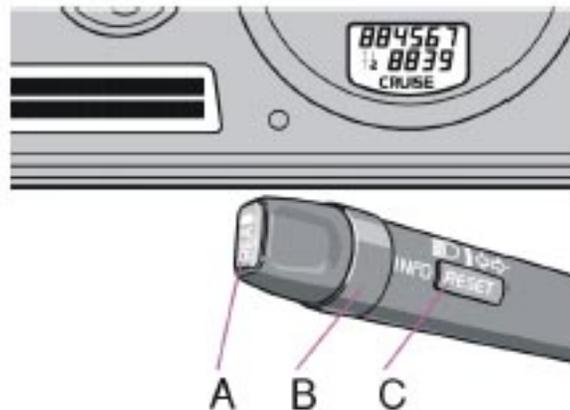
## Heated front seats (option)

- The front seat heating can be switched on and off as required.
- Press the switch once for maximum seat heating. Both LED's in the switch will be lit.
- Press the switch a second time for comfort heating. One LED in the switch will be lit.
- Press the switch a third time to turn the heating off completely.

The seat heating for the passenger seat should be switched off when the seat is not occupied.

pg. 36 Instruments and controls

## Trip computer (option)



The trip computer stores information gathered from several systems in your vehicle and has four menus that can be displayed in the text window.

- Driving distance on current fuel reserve
- Average fuel consumption
- Current fuel consumption
- Average speed
- Current speed in mph (Canadian models only)

**NOTE:** Warning messages from the vehicle's monitoring systems will override the trip computer function. If a warning message is displayed in the text window while you are using the trip computer, you must acknowledge the message by pressing button A. Press button A again to return to the trip computer function.

## Trip computer controls and functions.

The four\* trip computer functions can be accessed by twisting control B one step at a time in either direction. Twisting a fifth\*\* time returns you to the original function.

The trip computer can be reset (current data will be erased from system memory) by pressing RESET (button C).

### 1. Driving distance on current fuel reserve

This function shows the approximate distance that can be driven on the fuel remaining in the tank. This calculation is based on average fuel consumption during the last 12 miles (20 km) of driving and the amount of fuel remaining in the tank when the reading was taken.

When the driving distance on current fuel reserve is less than 12 miles (20 km), "----" will be displayed in the text window.

### 2. Average fuel consumption

This value indicates fuel consumption since the last time the trip computer was reset (by pressing RESET, button C). When the engine is switched off, information on fuel consumption is stored and remains in system memory until the RESET (button C) is pressed again.

### 3. Current fuel consumption

This value indicates the current fuel consumption, based on readings taken once per second. When the vehicle is not moving, "----" will be displayed.

### 4. Average speed

This value indicates average speed since the last time the trip computer was reset (by pressing RESET, button C). When the engine is switched off, information on average speed is stored and remains in system memory until the RESET (button C) is pressed again.

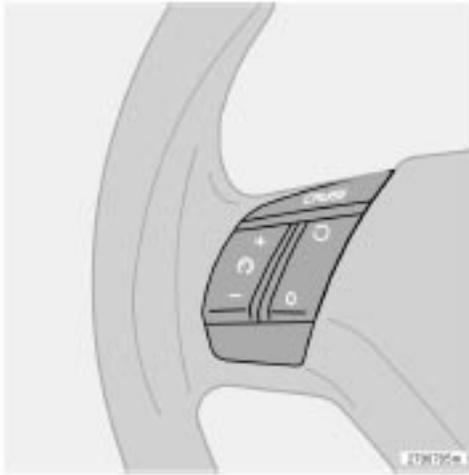
### 5. Current speed in miles per hour (Canadian models only)

This function provides the driver with an instantaneous conversion of the vehicle's current speed from km/h to mph.

\* Five functions on Canadian models

\*\* A sixth time on Canadian models

## Cruise control



## Cruise control

The cruise control panel is located on the left side of the steering wheel hub.

### Engaging cruise control/setting speed

- Press the CRUISE button. The word CRUISE will be displayed in the window in the lower section of the speedometer.
- Press + or - to set the current speed
- Increase or decrease speed as desired

**NOTE:** Cruise control will not function at speeds below 22 mph (35 km/h).

### Braking

Cruise control is automatically disengaged when the brake pedal is depressed. The currently set speed is stored in memory. Quickly pressing resume will return the vehicle to the previously set speed.

### Acceleration

- Momentary acceleration, such as when passing another vehicle, does not affect cruise control operation. The vehicle will automatically return to the previously set speed when you release the accelerator pedal.
- When the cruise control is already engaged, the vehicle's speed can be increased or decreased by holding down + or - until the vehicle reaches the desired speed. One short press on either symbol corresponds to a speed change of approximately 1 mph (1.6 km/h).

### Disengaging cruise control

Cruise control can also be disengaged by:

- Pressing the CRUISE button.
- Putting the gear selector in (N)eutral.

**NOTE:** Cruise control is automatically disengaged if the engine is switched off, if the gear selector is

placed in (N)eutral, if the vehicle's speed drops to under 70% of the currently set speed or if the wheels start to spin.

### Temporarily disengaging cruise control

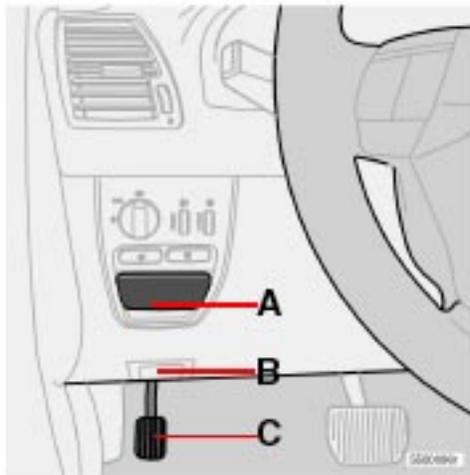
- Press 0 to temporarily disengage cruise control. Press "resume"  to return to the previously set speed.
- Press the brake pedal. Press "resume"  to return to the previously set speed.

### WARNING!

The Cruise control should not be used in heavy traffic or when driving on wet or slippery roads, or when driving on unpaved or uneven road surfaces. Cruise control may not maintain set speed on steep downgrades.

pg. 38 Instruments and controls

## Parking brake, Opening/closing the hood

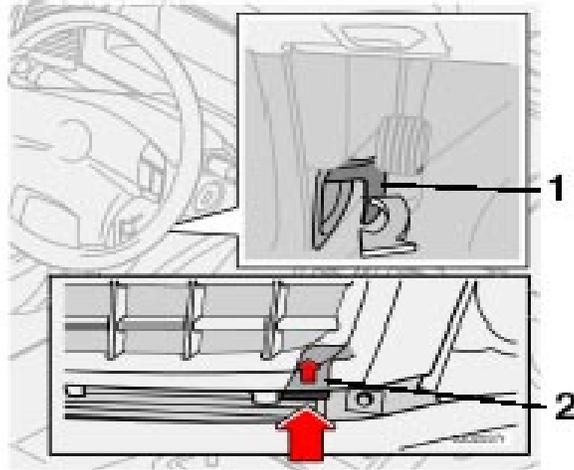


### Parking brake

- To apply the parking brake, press the pedal (C). The brake is applied to the rear wheels. The indicator light in the instrument panel will light up to indicate that the parking brake is applied.
- Release the parking brake pulling out the lower edge of the release handle (A).
- If you inadvertently pull the plastic cover (B), it can be pressed back into place.

**⚠ WARNING!**

Always use the parking brake when parking. On hills, also turn the front wheels toward the curb. The indicator light in the instrument panel will light up even if the parking brake is applied only slightly. Be sure to press down on the pedal sufficiently.



*Opening the hood*

**Opening/closing the hood**

1. Pull the lever (1) located under the left side of the dashboard to release the hood lock.
2. Lift the hood slightly.
3. Press up the release control (2) located under the front edge of the hood and lift.

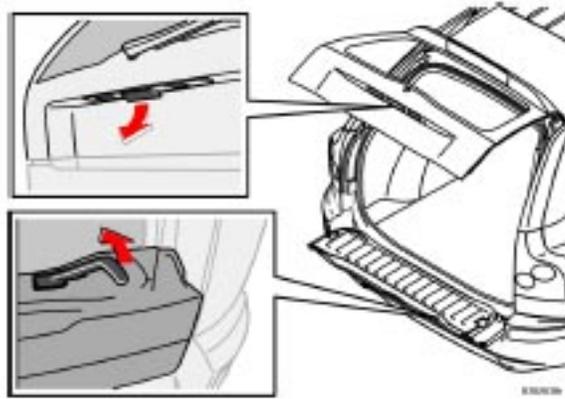
To close the hood, place your hand on it and press down until the hood locks in the closed position.

**⚠ WARNING!**

- Do not grasp the ribs in the grille when closing the hood. If your fingers protrude through the grille, they could be injured on components in the engine compartment as the grille closes. We recommend pressing down on the hood to close it.
- Check that the hood locks properly when closed!

pg. 39 Instruments and controls

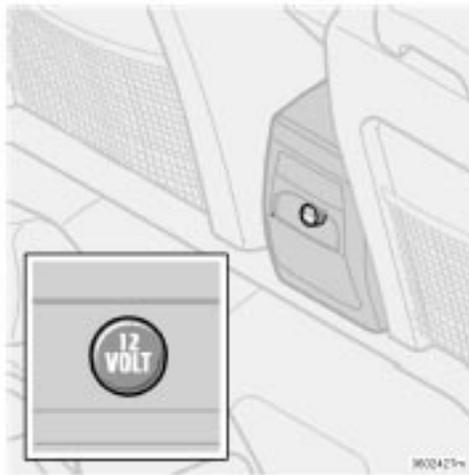
**Opening the tailgate, Auxiliary 12-volt sockets**



### Opening the tailgate

To open the upper section of the tailgate, pull the handle (A) downward.

To fold down the lower section of the tailgate, pull handle (B) upward.



*12-volt socket at the rear of the center console*

### Auxiliary 12-volt sockets

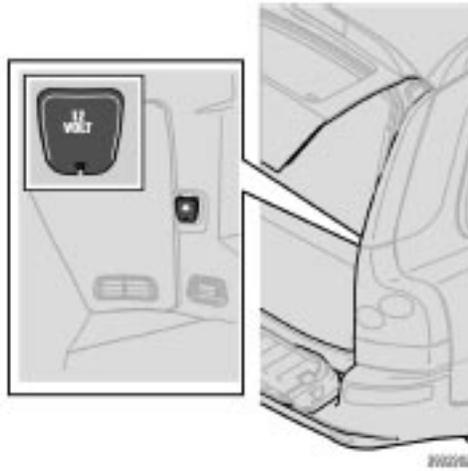
These 12 volt sockets can be used to plug in certain accessories such as cellular telephones, etc.

### 12-volt socket in the cargo compartment

Fold down the lid to use the socket.

### NOTE!

- If the 12-volt sockets are used while the engine is not running, there is a risk that the vehicle's battery will be discharged.



*12-volt socket in the cargo compartment*

- If the ignition is switched off and a device drawing more than 0.1A is connected to a socket, a battery warning will be displayed in the text window.
- The covers should be kept on when the auxiliary sockets are not in use.
- Maximum current from the sockets is 15A.

### **Ashtrays/cigarette lighter**

The auxiliary sockets can also be used for cigarette lighters.

Ashtrays and lighters are available as accessories. Please contact your Volvo retailer.

pg. 40 Instruments and controls

## **Electrically operated windows**

The electrically operated windows are controlled by buttons in the arm rests.

- The ignition switch must be ON\* (ignition key in position I, II or the engine running) for the electrically operated windows to function.
- To lower: Press down the front edge of the button to the first detent ("stop").
- To raise: Lightly pull up the front edge of the button to the first detent ("stop").

\* The electrically operated windows will also function after the ignition has been switched off as long as neither of the front doors has been opened.

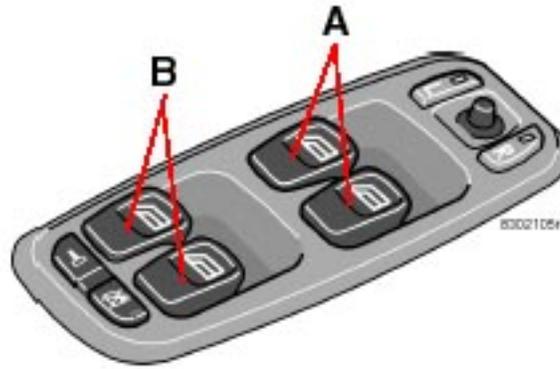
### **Auto up/down function (front doors only):**

Either front door window can be opened or closed automatically.

**Auto down:** Press the front part of the button as far down as possible and release it immediately. To stop the window at any time, pull the button up.

**Auto up:** Pull the front part of the button up as far as possible and release it immediately. To stop the

window at any time, press the button down.

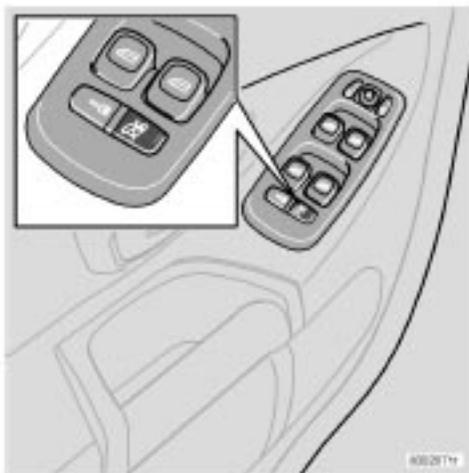


**NOTE:** If a window is obstructed during auto-up, it will automatically reverse direction and return to its starting position. If a window is repeatedly obstructed during auto-up operation, an overload protection circuit breaker will temporarily halt window function. The window will return to normal function after a brief cool-down period.

**⚠ WARNING!**

- Always remove the ignition key when the vehicle is unattended.
- Make sure that children's hands are clear before raising the windows.
- Never leave children unattended in the vehicle.

pg. 41 Instruments and controls



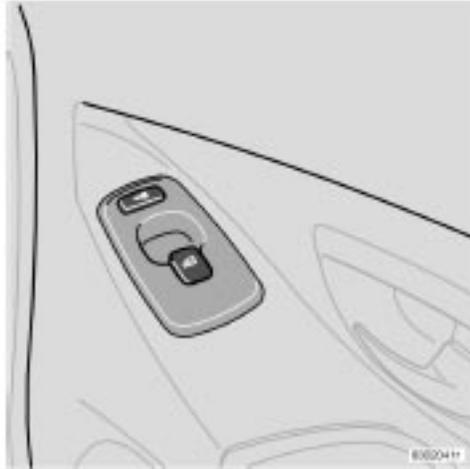
*Lockout switch for rear windows*

### **Lockout switch for rear windows**

The electrically operated rear door windows can be disabled by a switch located on the driver's door (see illustration).

**If the light in the switch is OFF:** The rear door windows can be raised or lowered with the buttons on the rear door armrests or with the buttons on the driver's door armrest.

**If the light in the switch is ON:** The rear door windows can only be raised or lowered with the buttons on the driver's door armrest.



### **Electrically operated window in the front passenger's seat**

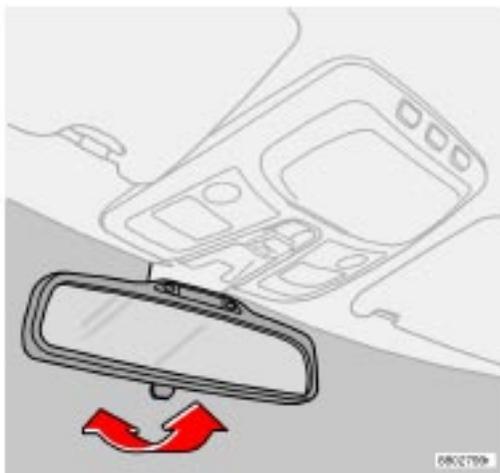
The control for the electrically operated window in the front passenger's seat operates that window only.



### **Electrically operated windows in the rear doors.**

The rear door windows can be operated with the control on each door and the switch on the driver's door. If the light in the switch for blocking electrically operated windows in the rear doors (located in the driver's door control panel) is on, the rear door windows can only be operated from the driver's door.

## Rearview mirror/power folding sideview mirrors



### Rearview mirror

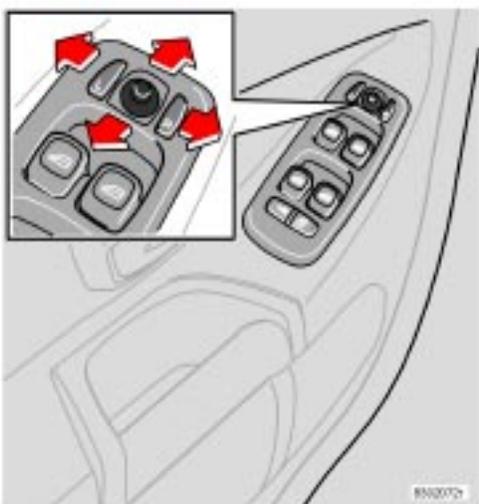
**A** Normal position

**B** Night position, reduces glare from following headlights

### Autodim function (option)

The autodim function reacts to headlights from following traffic and automatically reduces glare.

**NOTE:** The autodim function is automatically switched off when the gear selector is placed in the Reverse position.



### Electrically operated sideview mirrors

The mirror control switches are located on the driver's door armrest.

**Driver's side:** Press the L button (a light in the switch will go on) to activate the adjustment control. Use this control to adjust the driver's door mirror.

**Passenger's side:** Press the R switch (a light in the switch will go on) to activate the adjustment control. Use this control to adjust the passenger's door mirror. After you have adjusted the mirror(s), press the L or R switch again (the LED will go out) to deactivate the adjustment control.

### **WARNING!**

The mirrors should always be adjusted prior to driving. Objects seen in the passenger's side wide-angle sideview mirror are closer than they appear to be.

### **Mirror memory function (with the central locking system) - option**

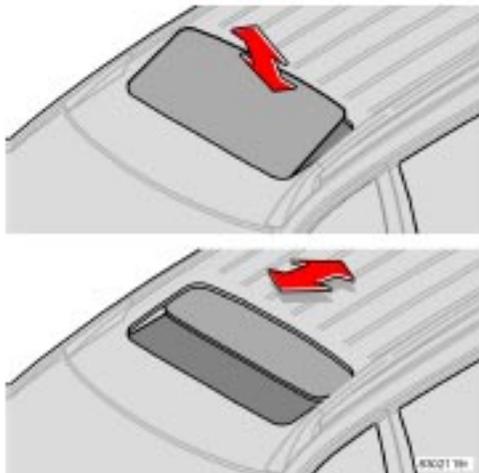
If you lock the vehicle and later unlock it with the **same** remote control and open the driver's door, the sideview mirrors (and the driver's seat) will automatically move to the position they were in when you left the vehicle. This feature will work in the same way with all of the remote control transmitters (up to 3) that you use with your vehicle. This feature will not function if you lock your vehicle with the key.

### **Folding in the sideview mirrors**

The sideview mirrors can be folded in toward the side of the car when parking in narrow spaces, etc. Press the button in the center console (see [page 29](#) for the position of the button) to fold in the mirrors. The mirrors must be returned to their normal position manually.

pg. 43 Instruments and controls

## **Electrically operated moonroof (option)**



## Electrically operated moonroof

To operate the moonroof, the ignition key must first be turned to the intermediate or drive position (position I, II or the engine running).

- To slide open the moonroof: Pull the switch back to the first detent ("stop") and hold it until the moonroof has opened to the position you prefer.
- Pull and hold the switch again to open the moonroof completely.
- AUTO open: Pull the switch as far back as possible and release it to automatically slide open the moonroof to the "comfort"\* position. Pull the switch again to open the moonroof completely.



- To close the moonroof: Push the switch forward to the first detent ("stop") and hold it until the moonroof has closed completely.
- AUTO close: Push the switch forward as far as possible and release it to automatically close the moonroof.
- Ventilation position (opening the rear edge of the moonroof): With the moonroof closed, push up the rear section of the switch.

To close, pull the front section of the switch straight down until the moonroof has closed completely.

### WARNING!

- Never open/close the moonroof if it is obstructed in any way when in operation.
- Never allow a child to operate the moonroof.
- Never extend any object or body part through the open moonroof, even if the vehicle's ignition is completely switched off.
- Never leave a child alone in a vehicle.

**CAUTION**

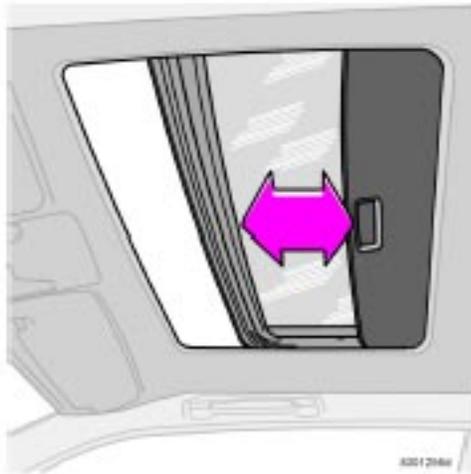
- Remove ice and snow before opening the moonroof.
- Do not operate the moonroof if it is frozen closed.
- Never place heavy objects on the moonroof.

pg. 44 Instruments and controls

## Electrically operated moonroof (option) (contd)

**NOTE:** If the moonroof is obstructed during auto-close operation, it will automatically reverse direction and return to its starting position. If the moonroof is repeatedly obstructed during auto-close operation, an overload circuit breaker will temporarily halt moonroof function. The moonroof will return to normal function after a brief cool-down period.

\* A position where the moonroof is not quite fully open which helps alleviate "rumbling" wind noise.



### Visor

The optional moonroof also features a sliding visor. The visor slides open automatically when the moonroof is opened, and must be closed manually



[Contents](#) | [Top of Page](#)

# 2003 VOLVO XC90

## Climate control

pg. 45 Climate control

[Climate control system-general information](#) [46](#)

[Air distribution](#) [47](#)

[Electronic Climate Control \(ECC\)](#) [48](#)

pg. 46 Climate control

## Climate control system-general information

### Condensation on the inside of the windows

Keeping the insides of the windows clean will help reduce the amount of condensation that forms on the windows. Use a commercial window cleaning agent to clean the windows.

### Ice and snow

Always keep the air intake grille at the base of the windshield free of snow.

### Cabin air filter

Replace the cabin air filter with a new one at intervals shown in your Warranty and Service Records Information booklet. The filter should be replaced more often when driving under dirty and dusty conditions. The filter cannot be cleaned and therefore should always be replaced with a new one.

### Sensors

The sunlight sensor on the dashboard and passenger compartment temperature sensor in the ECC control panel should not be covered in any way as this could cause incorrect information to be sent to the ECC system.

### Parking the vehicle in warm weather

If your vehicle has been parked in the sun in warm weather, opening the windows and moonroof (option) for several minutes before driving will help release the warm air from the passenger compartment. When the engine is running, close the windows and moonroof and use the recirculation function for several minutes to enable the air conditioning to cool the compartment as quickly as possible.

### Windows and optional moonroof

The ECC system will function best if the windows and optional moonroof are closed. If you drive with the moonroof open, we recommend that you manually adjust the temperature and blower control (the LED in the AUTO switch should be off).

## Acceleration

The air conditioning is momentarily disengaged during full-throttle acceleration.

## Climate control maintenance

All maintenance on the climate control systems should be carried out by an authorized Volvo service technician only.

## Refrigerant

Volvo cares about the environment. The air conditioning system in your vehicle contains a CFC-free refrigerant - R134a. This substance will not deplete the ozone layer. The system contains 2.2 lbs (1000 g) R134a and uses PAG oil.

## Passenger compartment blower

Approximately 50 minutes after the ignition is turned off, the blower may come on automatically, and run for seven minutes, to remove condensation in the A/C evaporator.

## Blower function to reduce battery drain

The climate system's blower functions normally while the engine is running.

However, when the engine is switched off (even if the ignition is switched to positions I or II), the blower control will be automatically switched off to avoid unnecessary battery drain. The following points pertain if the *ignition key is on* but the *engine is not running*:

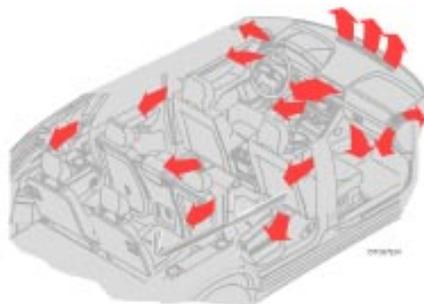
- To restart the blower, turn the control knob to the setting of your choice.
- After approximately 2 minutes, the blower speed will be reduced to avoid battery drain.

You can reset the blower speed at any time. Please be aware that the system has been designed to reduce the blower's speed again after 2 minutes, until the engine is started. If the battery becomes drained:

- LOW BATTERY, FAN IS REDUCED will be displayed in the text window in the instrument panel.
- The yellow warning light in the instrument panel (see [page 25](#)) will also light up.

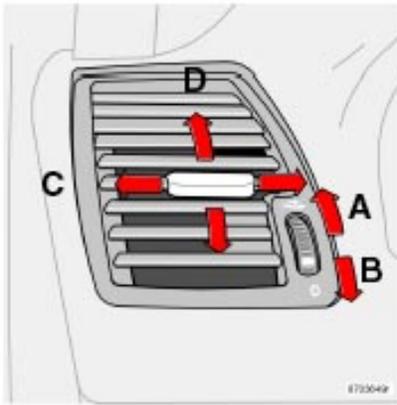
pg. 47 Climate control

## Air distribution



## Air distribution

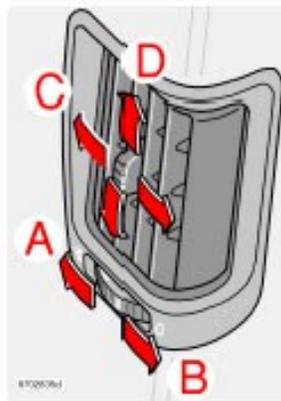
The incoming air is distributed through the ventilation points in the passenger compartment shown above.



### Air vents in the dash

- A Open
- B Closed
- C Horizontal air flow
- D Vertical air flow

- Direct the outer air vents toward the side windows to defrost.
- In cold weather, close the air vents in the center of the dashboard to direct as much air as possible toward the windows.



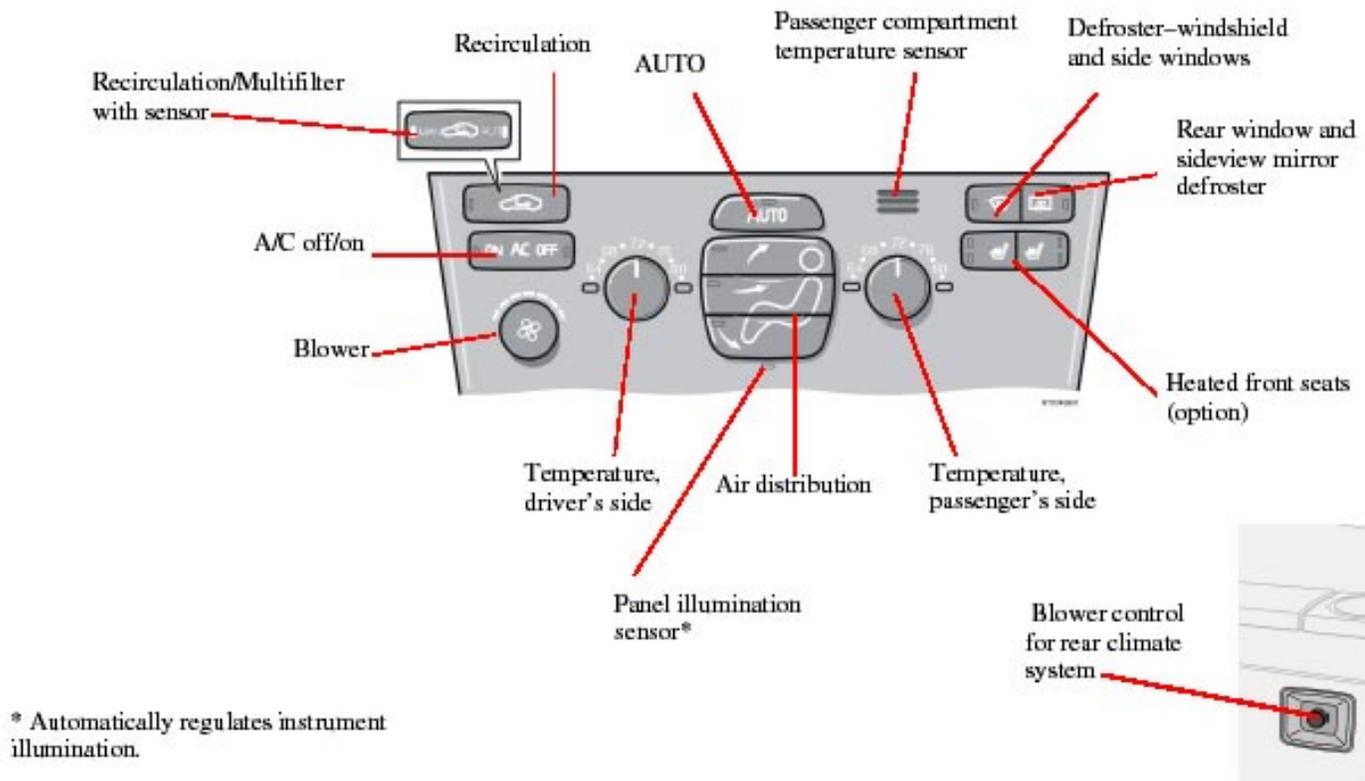
### Air vents in the door pillars

- A Open
- B Closed
- C Horizontal air flow
- D Vertical air flow

- Direct the outer air vents toward the side windows to defrost.

pg. 48 Climate control

## Electronic Climate Control (ECC)

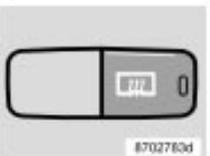


## pg. 49 Climate control



### AUTO

This function automatically regulates the Electronic Climate Control system so that the selected temperatures are maintained. The blower, heating, air distribution (air flow) and air conditioning are controlled. If you prefer to manually set any of these functions, the remaining functions will still be controlled automatically. Pressing the AUTO button overrides any settings that were previously made manually.



### Rear window and sideview mirror defrosters

This function defrosts/de-ices the rear window and sideview mirrors. The LED in the switch will light up to indicate that the heating function is engaged. See [page 35](#) for additional information on this function.

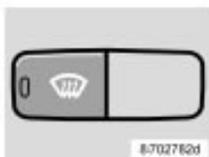
**Never use ice scrapers made of metal as the can easily scratch the mirror surface.**



### Temperature

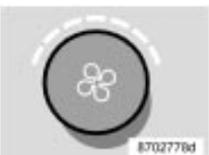
These controls are used to individually set the temperature for both sides of the passenger compartment. Please note that the compartment will not be heated or cooled faster by setting the temperature higher or lower than necessary.

Set the control to the temperature you prefer.



### Defroster

This function defrosts/de-ices the windshield and front side windows. The LED in the switch will light up to indicate that the defrost function is engaged. Blower speed increases automatically and the air in the passenger compartment is dehumidified. Recirculation will not function while defrost is engaged.



### Blower control\*

Turn the control clockwise to increase or counterclockwise to decrease the blower speed. Pressing the AUTO switch will automatically regulate blower speed and override manual adjustment.

**NOTE:** Turning the blower control counterclockwise until an orange LED comes on will turn both the blower and the air conditioning off.

\* See also [page 46](#).

pg. 50 Climate control

## Electronic Climate Control (ECC) (contd)

### Air distribution



Air flow to windows

Air through panel vents

Air through floor vents

Press **AUTO** to automatically regulate air flow or press any combination of the controls shown in the illustration to manually adjust air flow. An LED in the switch will light up if an air flow control has been pressed.



### Heated front seats (option)

- Press the switch once for maximum seat heating. Both LEDs in the switch will be lit.
- Press the switch a second time for comfort heating. One LED in the switch will be lit.
- Press the switch a third time to turn the heating off completely. The LED will go off.

The seat heating for the passenger seat should be switched off when the seat is not occupied.



### A/C - ON/OFF

Press the switch to turn the air conditioning on or off. The "ON" or "OFF" LED will light up to indicate if the system is switched on or off. Other functions will still be regulated automatically (if the **AUTO** switch is on).

- The air conditioning functions only at temperatures above 32° F (0° C).
- While the Defroster function is selected, the air conditioning is temporarily activated to dehumidify the air, even if you have manually switched the air conditioning off. This will only function if the blower is not switched off.



### Recirculation

Press this switch to engage the recirculation function (air in the passenger compartment recirculates - no fresh air enters the compartment). The LED in the switch will light up to indicate that the function is engaged.

- Use this function if the outside air is contaminated with exhaust gases, smoke, etc or to heat/cool the vehicle quickly.
- Recirculation should not be used for more than 15 minutes. *If your windows begin to fog or mist, make sure that the recirculation function is switched off.*
- Selecting **Defroster** automatically switches recirculation off.
- **Timer mode activation:** (Vehicles equipped with the Interior Air Quality System have no timer mode) Press and hold the recirculation button for at least 3 seconds to activate a recirculation timer mode. The amber LED in the recirculation button will flash 5 times to show that the timer mode is being activated. In timer mode, each time the recirculation button is pressed, the climate control system will recirculate the air in the passenger compartment for 5-12 minutes, depending on the outside air temperature, and then revert back to fresh air.
- **Timer mode deactivation:** Press and hold the recirculation button for 3 seconds. The amber LED in the recirculation button will illuminate steadily for 5 seconds to show a return to "normal" mode.

## pg. 51 Climate control

- In normal mode, when the recirculation button is pressed, the climate control system will recirculate the air in the passenger compartment until the recirculation button is pressed again.
- **Timer mode memory:** If the vehicle is turned off while timer mode is active, timer mode will still be active when the vehicle is restarted.



### Interior Air Quality sensor (option)

Some vehicles are equipped with a multifilter and Air Quality sensor. The filter separates gases and particles, thereby reducing the amounts of odors and contaminants entering the vehicle. The Air Quality sensor detects increased levels of contaminants in the outside air. When the Air Quality sensor detects contaminated outside air, the air intake closes and the air inside the passenger compartment is recirculated, i.e. no outside air enters the vehicle. The filter also cleans recirculated passenger compartment air. When the ECC system is in the AUTO mode, the green LED will be on .

## Operation

Press  to operate the Air Quality sensor (normal setting).

### Or:

Select one of the following three functions by pressing  1, 2 or 3 times.

1. The AUT LED lights. The Air Quality sensor is now activated.
2. No LED lights. Recirculation is not activated unless needed to cool the passenger compartment in a warm climate.
3. The MAN LED lights. Recirculation is now activated.

### Keep in mind the following:

- Make it a rule to have the Air Quality sensor activated at all times.
- Recirculation is limited in cold climates to avoid fogging.
- If window fogging occurs, you should deactivate the Air Quality sensor.
- If fogging occurs, use the defroster functions for the windshield, side windows and rear window. See [page 49](#).
- The filter should be changed at the intervals recommended in the maintenance schedule. However, if the vehicle is used in a severely contaminated environment, it may be necessary to change the filter more frequently.

pg. 52 Climate control

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[Contents](#) | [Top of Page](#)

**2 0 0 3  
VOLVO  
XC90**

**Interior**

pg. 53 Interior

Front seats 54

Rear seats 58

Interior lighting 61

Floor mats 62

Storage compartments 63

Securing cargo 67

pg. 54 Interior

**Front seats**



### Manual height adjustment - front seat

The front edges of passenger seat cushions can be adjusted to seven different settings and the rear edges to nine different settings.

Lever (A) - adjusting the front edge of the seat.

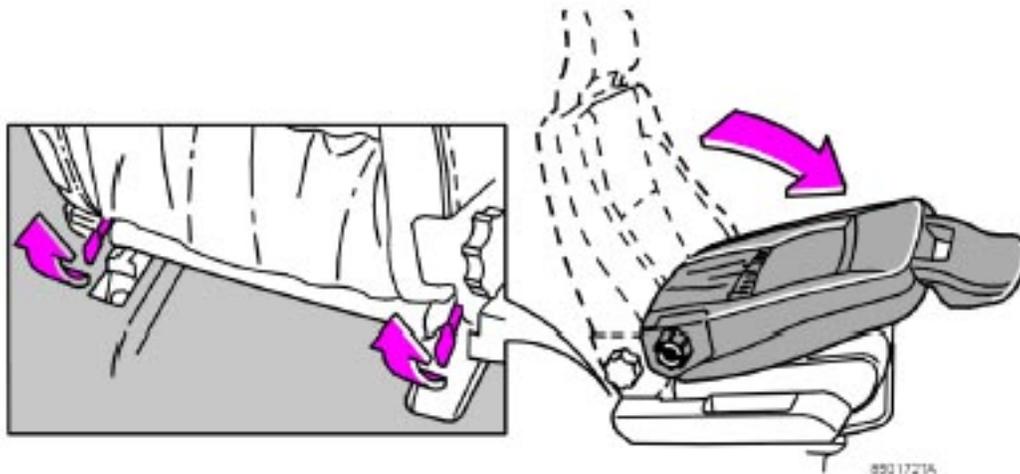
Lever (B) - adjusting the rear edge of the seat.

### Manual front-rear adjustment

The seat can be moved forward or rearward by pulling up on the front-rear adjustment bar. Check that the seat is securely locked into position after adjusting.

#### **WARNING!**

Do not adjust the seat while driving. The seat should be adjusted so that the brake pedal can be depressed fully. In addition, position the seat as far rearward as comfort and control allow.



### Folding the backrests in the front seat

The front passenger seat backrest can be folded to a horizontal position to make room for a long load. Fold the backrest as follows:

- Move the seat as far back as possible.
- Adjust the backrest to the upright position.
- Lift the catches on the rear of the backrest.
- Without releasing the catches, push the backrest forward.
- Move the seat as far forward as possible.

#### **WARNING!**

Cover sharp edges on the load to help prevent injury to occupants. Secure the load to help prevent shifting during sudden stops.

pg. 56 Interior

## Front seats (contd)

### Power seat

#### Operation

**Passenger seat:** The seat can only be adjusted if the ignition key is in position I, II or if the engine is running.

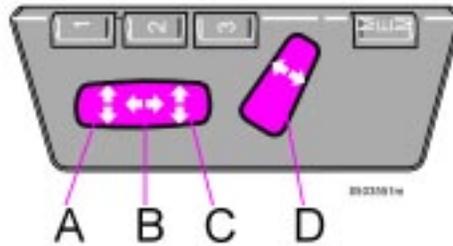
**Driver's seat:** The seat can be adjusted if the ignition key is in position I, II or if the engine is running. It can also be adjusted in the following circumstances:

1. Within 40 seconds of the ignition key being turned to position 0 or removed from the ignition switch.
2. After you have unlocked the driver's door with the key or remote control, the driver's seat can be adjusted during a 10 minute period **if the door remains open**. If the door is closed, the seat can be adjusted for 40 seconds. The ignition key can be in position 0 or not yet inserted in the ignition switch.

### Remote keyless entry system and driver's seat

The remote control transmitter also controls the electrically operated driver's seat in the following way:

- Adjust the seat to your preferences.
- When you leave your vehicle, lock it using the remote control.



*Power seat control panel*

The next time you unlock the driver's door with the same remote control (the one you used to lock the doors with) and open the driver's door, the driver's seat will automatically move to the position in which you left it.

The seat will move to this position even if someone else has adjusted it since you last unlocked the vehicle with the same remote control.

**NOTE:** This feature will work in the same way with all of the remote control transmitters (up to 3) that you use with your vehicle. This feature will not function if you lock your vehicle with the key.

### Seat adjustment

Adjust the power seat(s) with the two switches at the side of the seat as follows:

- A - Front edge of seat (raise/lower)
- B - Forward - rearward
- C - Rear edge of seat (raise/lower)
- D - Backrest tilt

**NOTE:** The power seats have an overload protector that activates if a seat is blocked by any object. If this occurs, switch off the ignition (key in position 0) and wait about 20 seconds before operating the seat again.

**Please refer to the following page for information on programming the memory function in the driver's seat.**

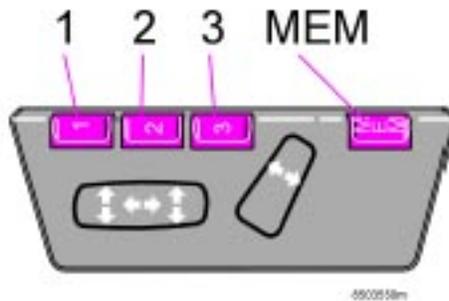
## Emergency stop

If the seat accidentally begins to move, press one of the buttons to stop the seat.

pg. 57 Interior

### WARNING!

- Because the driver's seat can be adjusted with the ignition off, children should never be left unattended in the vehicle.
- Movement of the seat can be STOPPED at any time by pressing any button on the power seat control panel.
- Do not adjust the seat while driving.
- The seat should be adjusted so that the brake pedal can be depressed fully. In addition, position the seat as far rearward as comfort and control allow.
- The seat rails on the floor must not be obstructed in any way when the seat is in motion.



## Programming the memory

*Please note that only the driver's seat is equipped with the memory function.*

Three seat positions can be programmed. To program a seat position:

1. Adjust the seat to the desired position.
2. Hold down the MEM button.
3. While holding down the MEM button, press button 1 to program the current position of the seat.

Buttons 2 and 3 can be programmed in the same way.

To move the seat to a programmed position, press and hold down button 1, 2 or 3 until the seat moves to the preset position and stops.

**As a safety precaution, the seat will stop automatically if the button is released before the seat has reached the programmed position.**

## Rear seats



### Entering the optional third row of seats

#### Tilting the outboard backrests in the second row of the seats:

Pull up the handle (1), hold it up, and tilt the backrest forward to move the seat. Return the backrest to the upright position to slide the seat back to its original position.

#### Forward/rearward seat adjustment

Lift the adjustment bar (2) to move the seat forward or rearward.



### Removing the center console (seven-seat models only)

In order to make it possible to move the center seat in the second row of seats as far forward as possible (seven-seat models only), the rear section of the center console can be removed.

- Pull the handle (see illustration above) and lift out the console.
- To return the console to its original position, slide it back into position until it clicks into place.



### **Sliding center seat - second row (seven-seat models only)**

The center seat in the second row can be moved farther forward than the outboard seats. This makes it possible for a child seated in this position to sit closer to the people in the front seats.

pg. 59 Interior



### **Head restraint - second row, center position**

The head restraint in the center position can be adjusted to 4 different heights.

**To raise** - pull the restraint up until it clicks into one of the four heights positions.

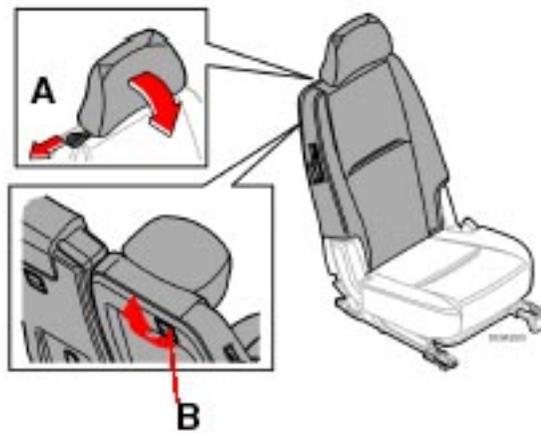
**To lower** - press the button at the base of the support (see illustration above) and press the head restraint down.

## **WARNING!**

- Please note that the lowest head restraint position is only intended for use when the backrest is to be folded down, or when the seat is not occupied.
- The head restraint is intended to help protect the head/neck in a collision. Ensure that it is properly adjusted for the occupant of the seat.

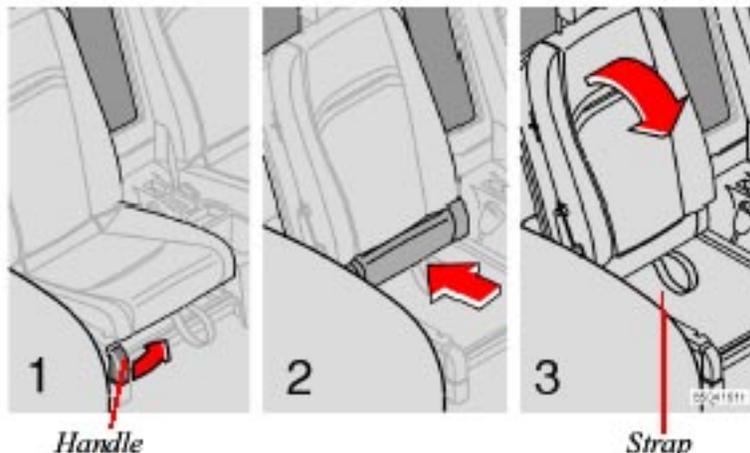
pg. 60 Interior

## Rear seats (contd)



### Folding the backrests - second row of seats

1. Move the seat(s) to their rearmost position (seven-seat models only).
2. Pull the loop (A) to fold down an outboard head restraint. Press down the center head restraint if necessary (see [page 59](#)).
3. Pull the handle (B) outward to release the backrest. The backrests are designed to lock at a 45 degree angle. Pull the handle again to continue pressing it down until it locks in the horizontal position. To return the backrests to the upright position, pull handle B and pull the backrest up.



## Folding the backrests - third row of seats (option)

### Folding down the backrest

If necessary, fold in the load anchorage eyelets before folding down the backrests.

1. Pull up the handle in illustration 1 above.
2. Push the seat cushion rearward, under the backrest.
3. Fold down the backrests\* (the head restraints fold down automatically) to the horizontal position.

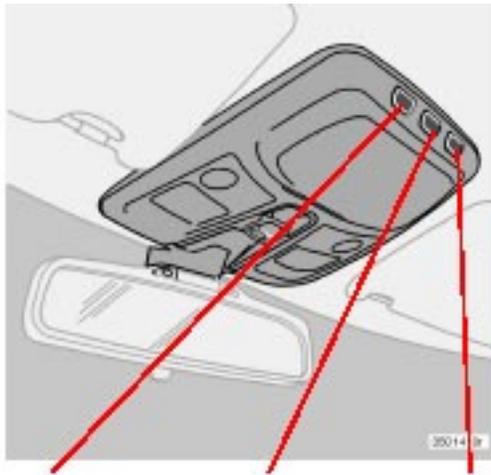
\* Please note that the head restraints in this row cannot be vertically adjusted.

### Returning the backrest to the upright position

- Fold up the backrest to the upright position.
- Grasp the strap (see illustration 3 above) and pull the seat cushion out until it locks in place. This also locks the backrest in the upright position.

pg. 61 Interior

## Interior lighting



*Reading light Courtesy light Reading light*

### Courtesy light/front reading lights

The courtesy/reading lights can be turned on or off by pressing the respective buttons. The courtesy light has a timer function which turns the light on for 30 seconds if:

- You unlock the vehicle from the outside with the key or remote control.
- You switch off the ignition (turn the key to position 0).

The courtesy light stays on for 10 minutes if one of the doors is left open after the vehicle is unlocked.

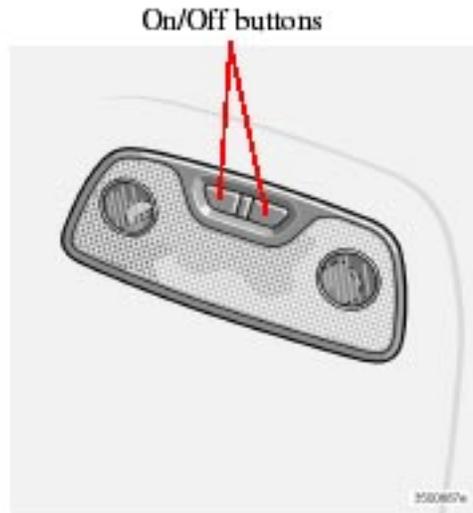
The courtesy light switches off if:

- The engine is started.
- The vehicle is locked from the outside with the key or remote control.

The courtesy light can be switched off or on in all situations by briefly pressing the button. When you switch the light on, it remains lit for 10 minutes.

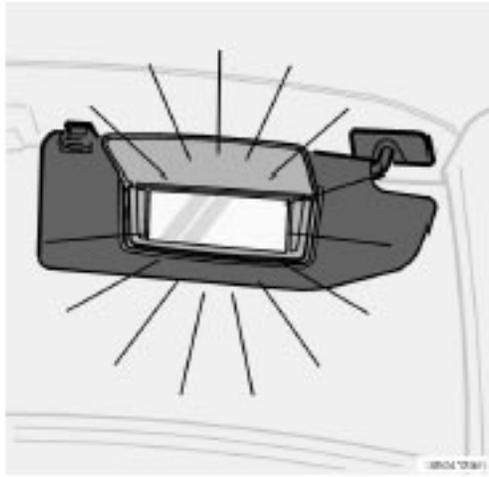
You can disconnect the automatic function by pressing the courtesy light button for more than 3 seconds. Briefly pressing the courtesy light button again automatically reconnects the function.

The courtesy light timer periods can be changed. Contact your Volvo retailer.



### Rear reading lights

- The reading lights can be switched on or off by pressing the respective buttons.
- **Seven-seat models:** Both reading lights for the third row of seats will switch on if one of the buttons is pressed.
- The reading lights switch off automatically after 10 minutes if the engine is not running.
- The lights can be switched off at any time by pressing the button.



## Vanity mirror

The light comes on when you open the cover.

## Floor Mats

Volvo offers floor mats specially manufactured for your vehicle. They must be properly placed and secured in the mat clips.

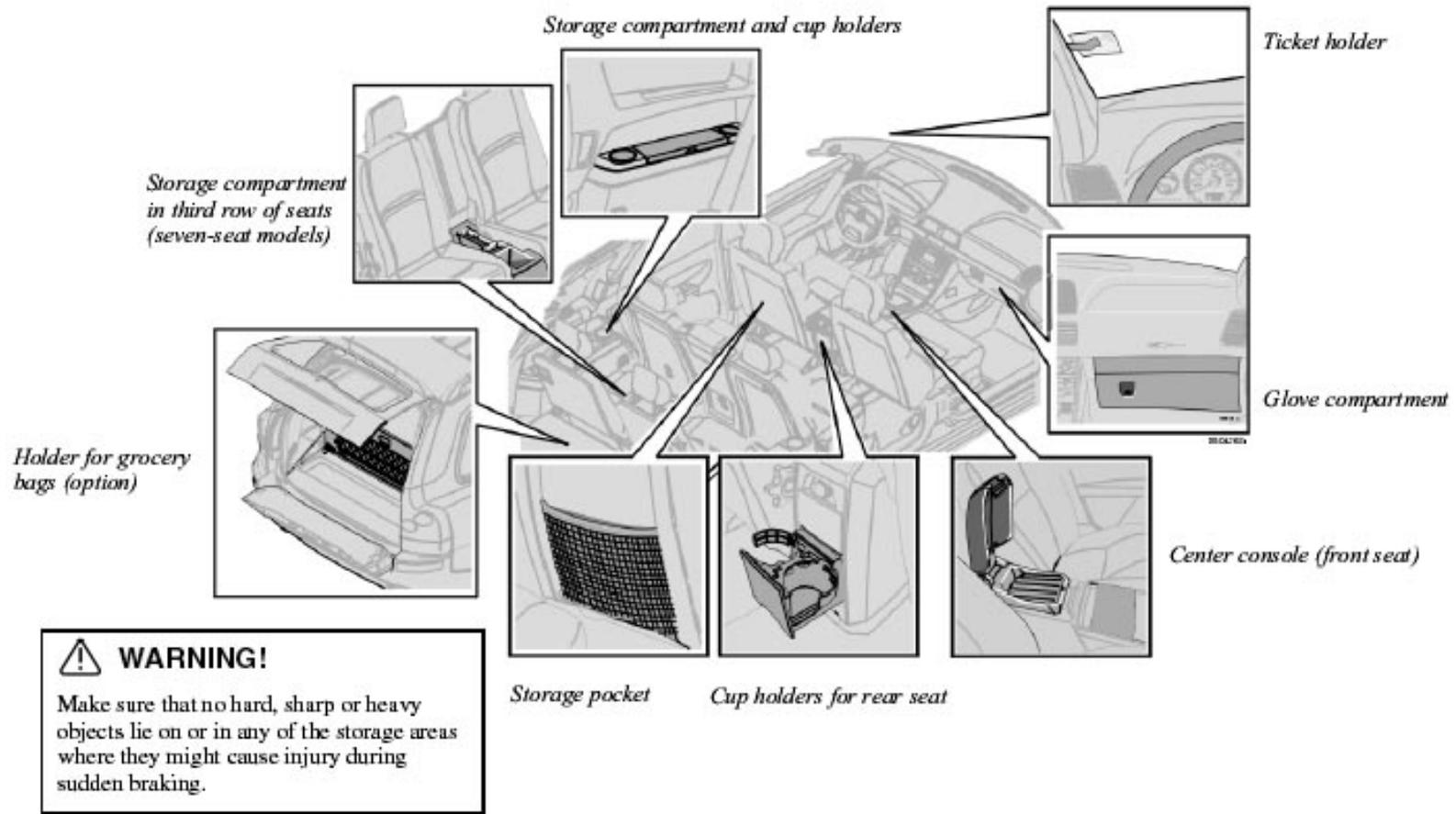
### **WARNING!**

An extra mat on the driver's floor can cause the accelerator pedal to catch. Check that the movement of the accelerator pedal is not impeded. No more than one protective floor covering may be used at one time.

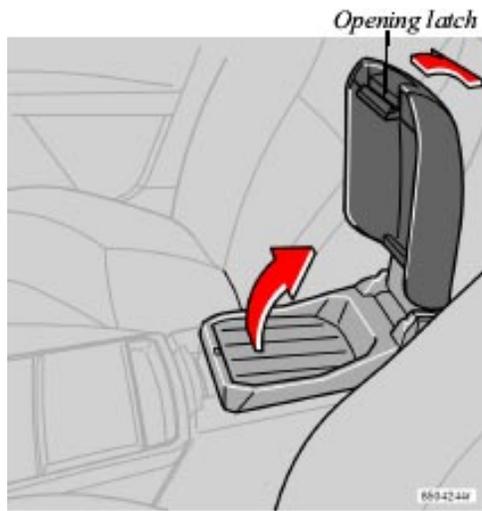


[Contents](#) | [Top of Page](#)

## Storage compartments



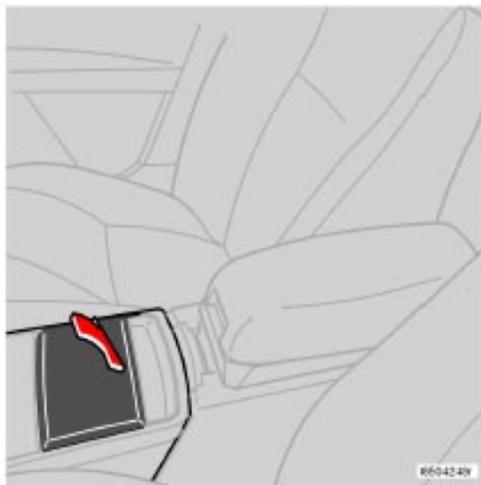
## Storage compartments (contd)



### **Storage compartment in the center console**

To open the lid on the storage compartment, press the lower edge of the opening latch (see illustration above). This lid can be folded back to form a small table area for rear seat passengers.

Lift the tray under the lid to expose the deep storage bin with slots for CD storage.



### **Cup holders for the front seats**

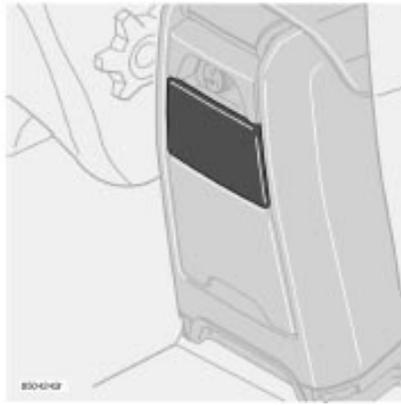
Two cup holders are provided for the front seat occupants. Press lightly on the cover to open it.

### **Ashtray (accessory)**

An ashtray insert is available from your Volvo retailer. This insert slides into either of the cup holders.

### **Pen holder**

There is a pen holder in the center console, in front of the gear selector.

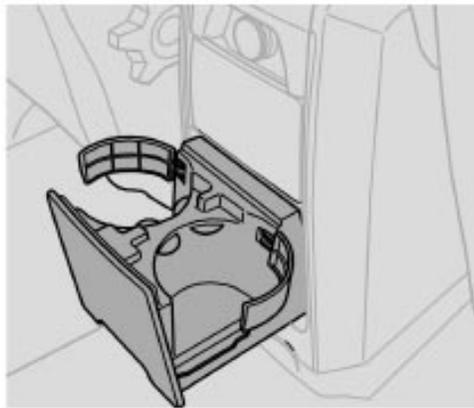


### **Storage compartment in rear side of center console**

Grasp the upper edge of cover and pull to open this compartment.

### **Ashtray (accessory)**

An ashtray insert is available from your Volvo retailer.



### **Cup holders for the rear seats**

- Grasp the lower edge of the panel to pull out the cup holders in the rear side of the center console.
- The cup holder insert can be removed to provide space for a large plastic bottle. Pull the insert straight up to remove it. Press down to reinsert it.



### **Glove compartment**

The glove compartment can be used to store things such as the owner's manual, maps, pens, etc.

## Storage compartments (contd)



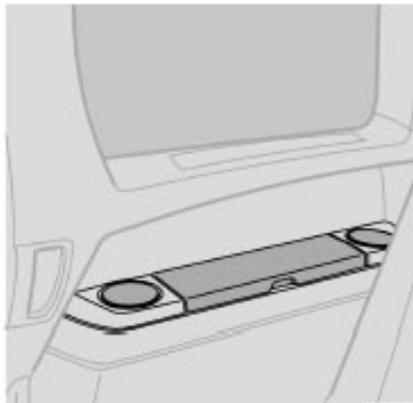
### Coat hanger

Use the coat hanger for clothes of normal weight.



### Storage space between rear seats (seven-seat models) - option

This storage space provides compartments for pens or other small items.



### Rear side storage compartments and cup holders (seven-seat models)

Lift the lid to access the storage compartment.

## Securing cargo



### Securing cargo

As a safety precaution, all cargo in your vehicle should be securely anchored to keep it from being thrown forward in the event of sudden braking, etc. The vehicle is equipped with eyelets in the cargo space to which straps or other cargo restraints can be attached. Consult your Volvo retailer about suitable accessories for this purpose.

#### **WARNING!**

The eyelets are not to be used as passenger restraints or as anchorages for child restraints.

**Remember that an object weighing 44 lbs (20 kg) produces a force of 2,200 lbs (1,000 kg) in a head-on collision at 30 mph (50 km/h)!**

**Keep the following in mind when loading the vehicle:**

- Load the cargo **against** the backrest.
- Load heavy cargo as low as possible.
- If no one is sitting in the outboard rear seat(s), reinforce the backrest by fastening the seat belts.
- Never load cargo above the backrest without a cargo net.

#### **WARNING!**

When the rear backrest(s) are folded down, the vehicle should not be loaded to a level higher than 2 in. (5 cm) below the upper edge of the rear side windows. Objects placed higher than this level could impede the function of the Inflatable Curtain.



Attachment bracket

### Nylon cargo net (option)

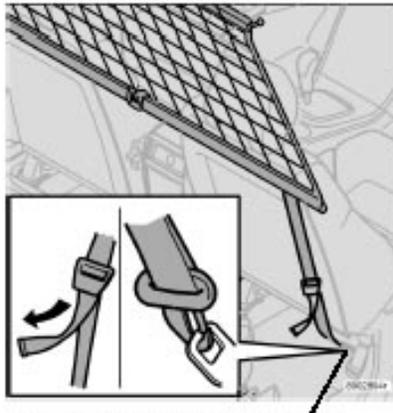
The Volvo XC90 can be equipped with a cargo net made of strong nylon fabric.

This net can be installed in two places:

- Behind the rear seat backrests (the second row of seats in seven-seat models)
- Behind the front seat backrests if the rear seat backrests (the second row of seats in seven-seat models) have been folded down.

If the vehicle is equipped with the cargo area cover, lift the cover out of the vehicle before installing the cargo net.

1. The upper and lower rods of the cargo net are hinged. Position the rods so that they are straight and lock in position.



Attachment eyelet in front seat rail

2. Insert the end of the upper rod in one of the attachment brackets (see illustration above).
3. Insert the other end of the rod in the attachment bracket on the opposite side of the vehicle.
4. Attach the lower straps to the eyelets on the floor if the net has been installed in the rear attachment brackets. Use the eyelets in the front seat rails if the net has been installed in the forward attachment brackets.

**NOTE:** On seven-seat models: When using the net in the rear attachment brackets, be sure it is installed in front of the side armrests.

5. Adjust the straps to pull the net taut.



### Folding and storing the cargo net

Press the release buttons on the hinges (1 in the illustration above) and fold the net. The cargo net can be stored under the floor of the cargo area on five-seat models.

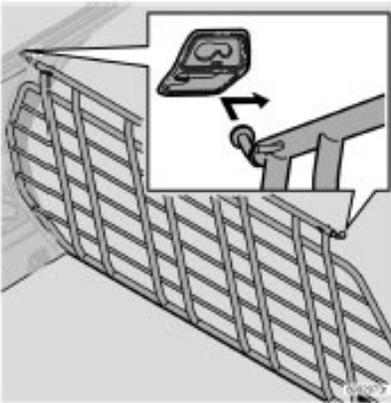
#### **WARNING!**

Be sure the cargo net is properly inserted in the attachment brackets and the straps are correctly attached to the eyelets and pulled taut.

Do not use the net if it is damaged in any way.

When it is not in use, store the net so that it cannot be thrown forward in the event of sudden braking, etc.

pg. 69 Interior

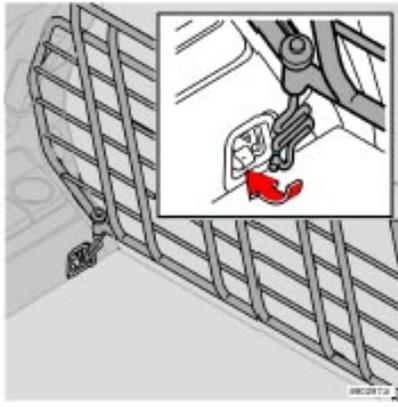


### Steel grid (accessory)

#### To install the grid:

##### *Upper attachments*

1. Lift in the grid through the tailgate or through one of the rear passenger doors (in this case, fold down the rear seat backrests/backrests in second row of seats in seven-seat models).
2. Insert one of the grid's upper attachments into an attachment bracket above one of the rear passenger doors (see illustration above).
3. Push the grid's attachment into the forward position in the attachment bracket (see inset illustration above) to lock the attachment in place.
4. Insert the grid's other upper attachment in the attachment bracket above the opposite rear passenger door, and press the attachment into the forward position in the attachment bracket to lock it in place.



### Lower attachments

1. Insert the lower attachment bracket through the steel grid's lower mount from underneath.
2. Install the spring on the attachment bracket and tighten the knob.
3. Secure the attachment bracket hook in the lower cargo eyelet. Turn the knob to tension the attachment bracket in the cargo eyelet.
4. Repeat the operation on the opposite side.
5. Tighten both attachment brackets alternatively.
6. Place the protective caps on the threads above the knobs.

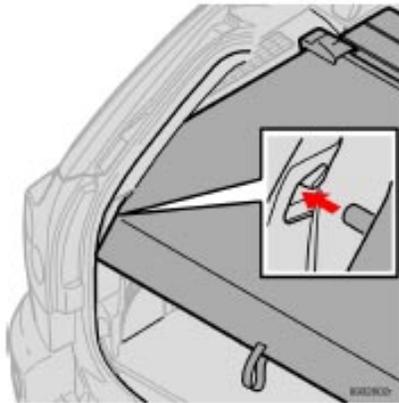
### **WARNING!**

#### **Seven-seat models:**

- The backrests of the optional third row seats must be folded down when installing the steel grid.
- The steel grid is installed behind the second row of seats in seven-seat models. To avoid the risk of injury, no one should be allowed to sit in the third row of seats when the steel grid is in place in the vehicle.

pg. 70 Interior

## Securing cargo (contd)



### Cargo area cover

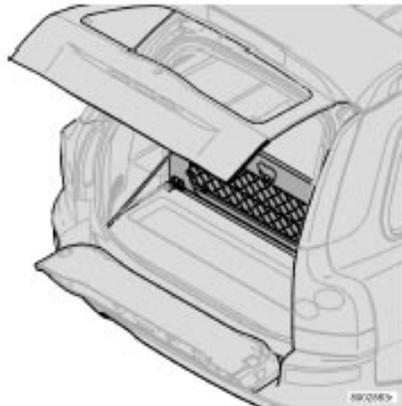
#### **Installing the cargo area cover:**

Press the end pieces of the cargo area cover down in the holders.

Pull out the cargo area cover and hook it in the holes in the rear cargo area pillars (see illustration above).

**Removing the cargo area cover:**

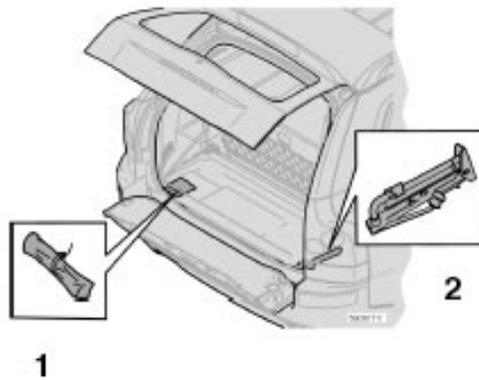
Press the end pieces of the cover inward. Pull up and lift out.



**Grocery bag holder (five-seat models only)**

1. Fold down the lower section of the tailgate.
2. Fold up the rear section of the cargo compartment floor.
3. Hang or secure your grocery bags by means of the straps or holders.

pg. 71 Interior



**Compartments under the cargo area floor - five-seat models**

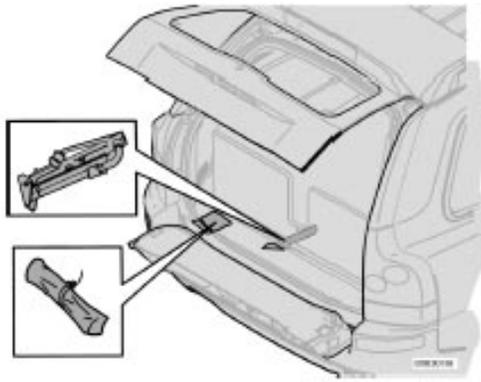
Fold up the rear section of the cargo area floor and lift out the recessed cover to access these compartments.

If the vehicle is equipped with the optional grocery bag holder:

Fold up the rear section of the cargo area floor, disconnect the grocery bag holder's retaining cords and lift out the grocery bag holder.

The following items are stored under the cargo area floor:

1. Tool bag (including the crank for the jack)
2. Jack



### Compartments under the cargo area floor - seven-seat models

Fold up the rear section of the cargo area floor to access these compartments.

If the vehicle is equipped with the optional grocery bag holder:

Fold up the rear section of the cargo area floor, disconnect the grocery bag holder's retaining cords and fold up the lower section of the floor.

The following items are stored under the cargo area floor:

1. Tool bag (including the crank for the jack)
2. Jack

#### **CAUTION**

Do not store objects in the area for the rear seat cushions (when the backrests are to be folded down). This could damage the cushions.

pg. 72 Interior

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[Contents](#) | [Top of Page](#)

**2 0 0 3  
VOLVO  
XC90**

**Locks and Alarms**

pg. 73 Locks and Alarm

[Keys and remote controls](#) [74](#)

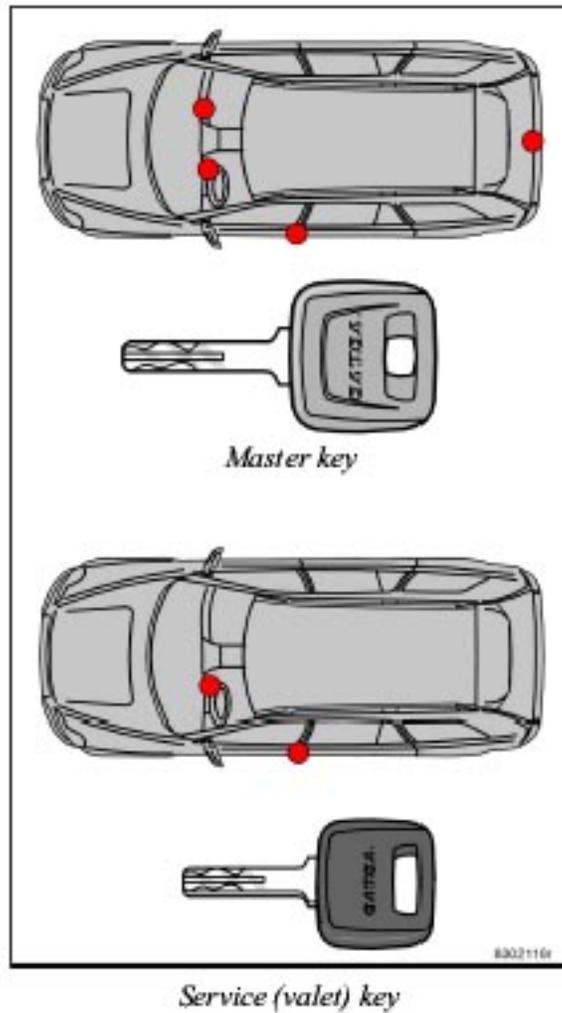
[Locking and unlocking](#) [77](#)

[Child safety locks](#) [79](#)

[Alarm](#) [80](#)

pg. 74 Locks and Alarm

**Keys and remote controls**



## Keys

Two keys are provided with your vehicle; a master key and a service (valet) key. The master key, the remote control, and the central locking button may all be used to lock and unlock all of your vehicle's locks.

The service key will operate only the driver's door and the ignition switch. It is intended to help deter unwanted entry into the glove compartment and tailgate.

## To use your keys:

- Turn the key once to unlock the **driver's door only**.
- Turn the key again (within 10 seconds) to unlock all doors and the tailgate.
- One turn with the key towards lock in the drivers door locks all doors, tailgate.
- Use the switch on the driver's door armrest to lock/unlock the vehicle from the inside.

**⚠ WARNING!**

If the doors are locked while driving, this may hinder rapid access to the occupants of the vehicle in the event of an accident. (Also see information on "Child safety locks").

**NOTE:** To help prevent accidentally locking the keys in the vehicle, the central locking system is designed to unlock the doors immediately if the key is left in the ignition switch, the vehicle is locked using the lock button on the door and the door is then closed. A sound from the lock will be audible at this time.

*Please note that this function will not unlock the doors if the engine is running.*

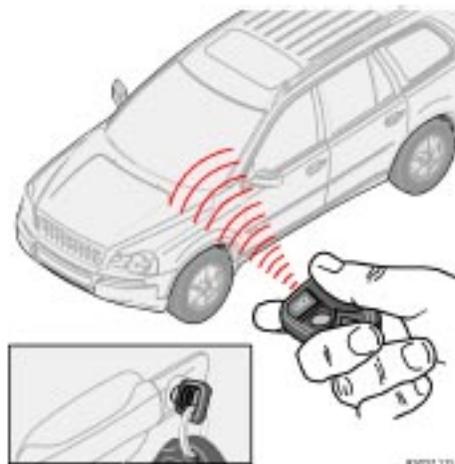
**Immobilizer (start inhibitor)**

Each of the keys supplied with your vehicle contains a coded transmitter. The code in the key is transmitted to an antenna in the ignition switch where it is compared to the code stored in the start inhibitor module. The vehicle will start only with a properly coded key. If you misplace a key, take the other keys to an authorized Volvo retailer for reprogramming as an antitheft measure.

**NOTE:** If two of the keys to your vehicle are close together, e.g., on the same key ring, when you try to start the vehicle, this could cause interference in the immobilizer system and result in the vehicle not starting. If this should occur, remove one of the keys from the key ring before trying to start the vehicle again.

This device complies with part 15 of the FCC rules. Operation is subject to the following condition: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

pg. 75 Locks and Alarm



## Remote controls

Your vehicle is equipped with a remote control transmitter. This transmitter uses a radio signal to allow "keyless" entry into the passenger compartment or the tailgate. You will be supplied with two coded key ring transmitters, which will enable you to lock/unlock all doors and the tailgate from a distance of 10-15 feet (3- 5 meters).

On vehicles equipped with an alarm, the alarm will also be activated/deactivated by this system.

The vehicle can also be locked/unlocked with the key.



### ***Buttons in remote control:***

*1-Lock, 2-Unlock, 3-Unlock tailgate,  
4-"Panic" function, \*, 5-Approach lighting*

As an extra security precaution in certain situations (valet parking, etc.), Volvo recommends that the transmitter not be included when the keys are given to anyone. The service key can be used instead. If one of the transmitters is misplaced, contact the nearest authorized Volvo retailer for assistance.

## Using the remote control

- Press the LOCK button once to lock all doors and tailgate.
- Press the UNLOCK button once to unlock the driver's door and fuel filler door. Wait for at least 1 second and press this button again (within 10 seconds) to unlock all doors and the tailgate.
- To unlock the tailgate (without unlocking the doors), press the Unlock tailgate button twice within 3 seconds.

## NOTE:

- Airbag deployment will automatically unlock the doors.
- The keys may also be used to lock and unlock the doors, and to activate and deactivate the alarm system.
- To avoid leaving your keys in the vehicle, make a habit of always locking the vehicle with the remote control.

## Automatic re-locking

If the doors are unlocked, the locks will automatically reengage (re-lock) and the alarm will rearm after 2 minutes unless a door or the tailgate has been opened.

\* See [page 80](#) for more information on this function.

### pg. 76 Locks and Alarm

- FCC ID:LQNP2T-APU This device complies with part 15 of the FCC rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- Canadian 2306104388 Model 504 2927 by Donnelly Operation is subject to the following conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- Canadian 2306104388A Model 509 977 by Connaught Electronics Operation is subject to the following conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

### **WARNING!**

Never use the transmitter to lock the doors from inside the vehicle.

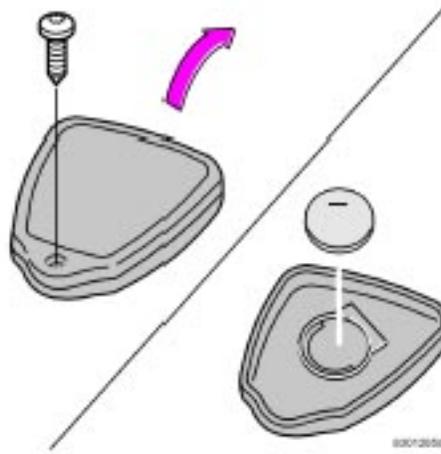
Doing so would **ACTIVATE**:

- the break-in alarm, which would sound if one of the doors were opened
- the optional interior motion and inclination alarm sensors.

Doing so would **DEACTIVATE**:

- the moonroof and interior courtesy light controls.
- the central locking buttons on the front door armrests, although the interior door handles would still function to allow occupants to leave the vehicle.

Disabled features would remain disabled until the remote were used again to unlock the vehicle. In addition, locking an occupied vehicle would hinder rapid access to the occupants in an accident or emergency.



### Replacing the battery in the remote control

If the range of the transmitter is noticeably reduced, this indicates that the battery is weak and should be replaced.

#### To replace the battery

- Remove the screw on the transmitter cover with a small screwdriver.
- Remove the cover carefully pressing it rearward/upward.
- Replace the battery with a new 3-volt, CR 2032 battery. The battery should be inserted with the minus side upward. Avoid touching the contact surfaces of the battery with your fingers.
- Reinstall the cover and tighten the screw to help protect the transmitter.

pg. 77 Locks and Alarm

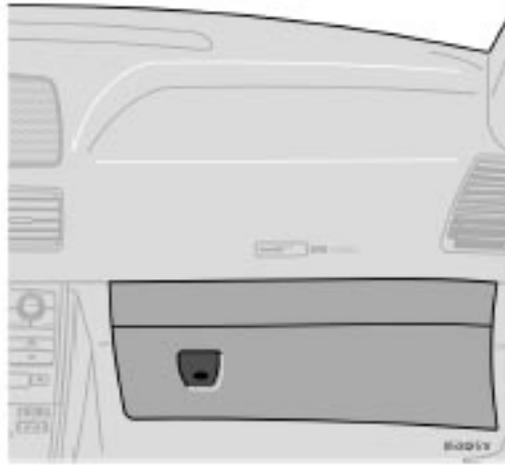
## Locking and unlocking



### Locking and unlocking the vehicle from the inside

The switch on the driver's door armrest can be used to lock or unlock all doors and the tailgate, and to

set the alarm.

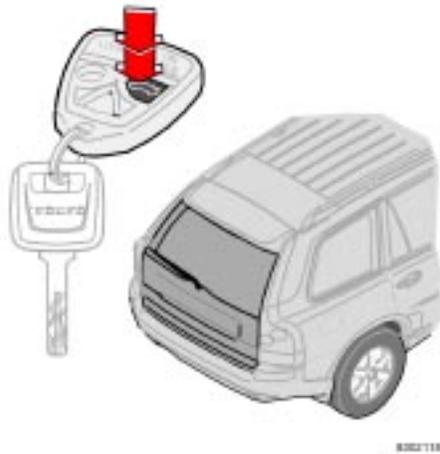


### Locking the glove compartment

The glove compartment can be locked with the master key.

pg. 78 Locks and Alarm

## Locking and unlocking (contd)



### Unlocking the tailgate

The tailgate lock is incorporated in the central locking system and is locked or unlocked when all doors are locked/unlocked.

The tailgate can be unlocked by:

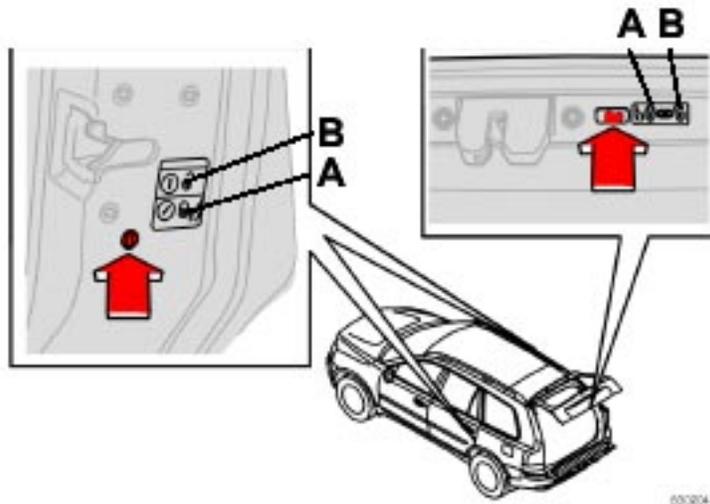
- Pressing UNLOCK on the remote control twice.
- Using the central locking button on the driver's door.

- Pressing **twice** on the remote control's tailgate unlock button (see illustration above).

### Automatic relocking:

- If you use the tailgate unlock button to unlock the tailgate without opening it, it will automatically relock after approximately 2 minutes.
- However, if you open the tailgate and close it again, it will remain unlocked and the alarm will not be rearmed. Press the lock button on the remote control to relock the tailgate and rearm the alarm.

pg. 79 Locks and Alarm



## Child safety locks

### Manual child safety locks - rear doors/tailgate

The controls are located on the rear door jambs and at the lower edge of the tailgate. Use a screwdriver to adjust these controls.

**A** The door/tailgate cannot be opened from the inside. Normal operation from the outside.

**B** The door/tailgate locks function normally.

### **WARNING!**

Remember, in the event of an accident, the rear seat passengers cannot open the doors from the inside with the buttons in position A.

pg. 80 Locks and Alarm

# Alarm

## Alarm

The alarm is automatically armed whenever you lock your vehicle.

When armed, the alarm continuously monitors a number of points on the vehicle. The following conditions will set off the alarm:

- The hood is forced open.
- The tailgate is forced open.
- A door is forced open.
- The ignition switch is tampered with.
- If there is movement in the passenger compartment (if the vehicle is equipped with the optional movement sensor).
- The vehicle is lifted or towed (if the vehicle is equipped with the optional inclination sensor).
- The battery is disconnected (while the alarm is armed).
- The siren is disconnected when the alarm is disarmed.

## Arming the alarm

Press the LOCK button on the remote control, lock the vehicle using the key in the driver's door or press the central lock button on one of the front doors with the door open. One long flash of the turn signals will confirm that the alarm is armed.

## Disarming the alarm

Press the UNLOCK button on the remote control or unlock the doors with the key.

## Turning off (stopping) the alarm

If the alarm is sounding, it can be stopped by pressing the UNLOCK button on the remote control or by unlocking the driver's door with the key.

## Audible/visual alarm signal

An audible alarm signal is given by a battery powered siren. The alarm cycle lasts for 25 seconds.

The visual alarm signal is given by flashing all turn signals and turning on the interior lighting for approximately 5 minutes.

## "Panic" button

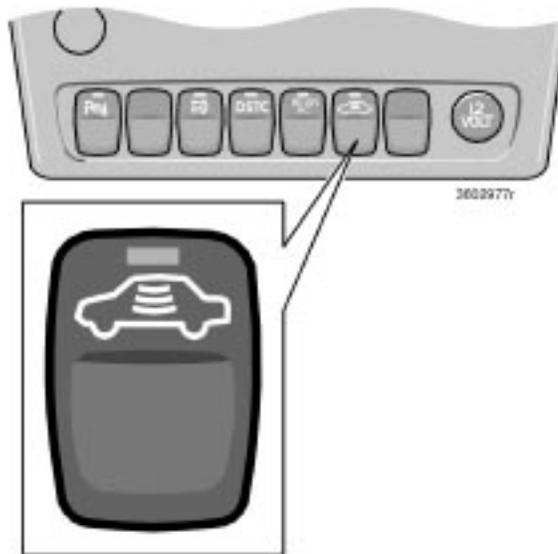
In an emergency situation, this feature can be used to attract attention.

Activate the "panic" button by pressing the red button on the remote control (see illustration on [page 75](#)) for at least 3 seconds or by pressing this button twice within 3 seconds. The turn signals will flash, the interior lights will go on and the vehicle's horn will sound.

The function can be turned off by pressing any of the buttons on the remote control or will stop automatically after 25 seconds. When a button is pressed, there is a 5 second delay before the panic alarm is deactivated.

**NOTE:** This button will NOT unlock the vehicle.

pg. 81 Locks and Alarm



### **Temporarily turning off the alarm sensor(s) - option**

This button will only be found in vehicles equipped with the accessory inclination and/or movement sensors.

In certain situations it may be desirable to turn off the accessory inclination and movement alarm sensors if, for example, you drive your vehicle onto a ferry where the rocking of the boat could trigger the alarm or if a pet is left in the vehicle with the doors locked.

### **To temporarily turn off the inclination and movement alarm sensors from the alarm system:**

From the time the ignition key is turned from the Drive position (position II) until you lock the vehicle, you can press the button in the center console\*. The LED in the switch will light up and a message will be displayed in the text window to indicate that the sensors are disconnected.

The vehicle can then be locked in the usual way to set the alarm.

**NOTE:** The optional sensors are automatically reconnected to the alarm system the next time the vehicle is unlocked and then locked again. LED alarm status signals The status of the alarm system is

indicated by the red LED at the top of the dash:

- LED off - the alarm is not armed
- LED flashes once per second - the alarm is armed
- LED flashes rapidly before the ignition is switched on - the alarm has been triggered
- **Fault in the alarm system:** If a fault has been detected in the alarm system, a message will be displayed in the text window. Contact your Volvo retailer.

### **Automatic re-lock/re-arm system**

If the vehicle is unlocked with the remote, the vehicle will re-lock and the alarm will re-arm after 2 minutes unless a door or the tailgate has been opened.

\* The position of this button may vary, depending on the specifications of your vehicle.

pg. 82 Locks and Alarm

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[Contents](#) | [Top of Page](#)

**2 0 0 3  
VOLVO  
XC90**

**Starting and driving**

pg. 83 Starting and driving

[Refueling](#) [84](#)

[Starting the vehicle](#) [87](#)

[General information](#) [89](#)

[Automatic transmission with Geartronic](#) [91](#)

[All Wheel Drive](#) [94](#)

[Brake system](#) [95](#)

[Dynamic Stability Traction Control \(DSTC\)](#) [97](#)

[Rear Parking Assistance](#) [99](#)

[Towing](#) [100](#)

[Jump starting](#) [102](#)

[Towing a trailer](#) [103](#)

[Detachable trailer hitch - installing/  
removing](#) [105](#)

[Load carriers](#) [106](#)

[Cold weather precautions](#) [107](#)

[Before a long distance trip](#) [108](#)

## ENGINE OIL

Although some oil consumption occurs during normal engine operation, more oil is consumed when the engine is new as the internal parts generate higher friction while wearing-in to each other. From the time the engine is new until the first maintenance is performed, the oil consumption could be higher than normal. For this reason, it is especially important to check the oil every time you refuel your vehicle during this period. See [page 130](#).

## Fuel requirements

### Octane rating

Volvo engines are designed for optimum performance on unleaded premium gasoline with an AKI octane rating of 91 or above. AKI (ANTI KNOCK INDEX) is an average of the Research Octane Number, RON, and the Motor Octane Number, MON.  $((RON + MON)/2)$ . The minimum octane requirement is AKI 87 (RON 91).

### Deposit control gasoline (detergent additives)

Volvo recommends the use of detergent gasoline to control engine deposits. Detergent gasoline is effective in keeping injectors and intake valves clean. Consistent use of deposit control gasolines will help ensure good driveability and fuel economy. If you are not sure whether the gasoline contains deposit control additives, check with the service station operator.

**NOTE:** Volvo does not recommend the use of external fuel injector cleaning systems.

### Unleaded fuel

Each Volvo has a three-way catalytic converter and must use only unleaded gasoline. U.S. and Canadian regulations require that pumps delivering unleaded gasoline be labelled "UNLEADED". Only these pumps have nozzles which fit your vehicle's filler inlet. It is unlawful to dispense leaded fuel into a vehicle labelled "unleaded gasoline only". Leaded gasoline damages the three-way catalytic converter and the heated oxygen sensor system. Repeated use of leaded gasoline will lessen the effectiveness of the emission control system and could result in loss of emission warranty coverage. State and local vehicle inspection programs will make detection of misfueling easier, possibly resulting in emission test failure for misfueled vehicles.

**NOTE:** Some U.S. and Canadian gasolines contain an octane enhancing additive called methylcyclopentadienyl manganese tricarbonyl (MMT). If such fuels are used, your Emission Control System performance may be affected, and the Check Engine Light (malfunction indicator lamp) located on your instrument panel may light. If this occurs, please return your vehicle to an authorized Volvo retailer for maintenance.

## Gasoline containing alcohol and ethers

## "Oxygenated fuels"

Some fuel suppliers sell gasoline containing "oxygenates" which are usually alcohols or ethers. In some areas, state or local laws require that the service pump be marked indicating use of alcohols or ethers. However, there are areas in which the pumps are unmarked. If you are not sure whether there is alcohol or ethers in the gasoline you buy, check with the service station operator. To meet seasonal air quality standards, some areas require the use of "oxygenated" fuel.

Volvo allows the use of the following "oxygenated" fuels; however, the octane ratings listed on this page must still be met.

**Alcohol - Ethanol:** Fuels containing up to 10% ethanol by volume may be used. Ethanol may also be referred to as Ethyl alcohol, or "Gasohol".

**Ethers - MTBE:** Fuels containing up to 15% MTBE may be used.

pg. 85 Starting and driving

## **Carbon Monoxide - Important Warning**

Carbon monoxide is a poisonous, colorless, and odorless gas. It is present in all exhaust gases. If you ever smell exhaust fumes inside the vehicle, make sure the passenger compartment is ventilated, and immediately return the vehicle to your retailer for correction.

## **Fuel Formulations**

Do not use gasoline that contains lead as a knock inhibitor, and do not use lead additives. Besides damaging the exhaust emission control systems on your vehicle, lead has been strongly linked to certain forms of cancer. Many fuels contain benzene as a solvent. Unburned benzene has been strongly linked to certain forms of cancer. If you live in an area where you must fill your own gas tank, take precautions. These may include:

- standing upwind away from the filler nozzle while refueling
- refueling only at gas stations with vapor recovery systems that fully seal the mouth of the filler neck during refueling
- wearing neoprene gloves while handling a fuel filler nozzle.

## **Use of Additives**

With the exception of gas line antifreeze during winter months, do not add solvents, thickeners, or other store-bought additives to your vehicle's fuel, cooling, or lubricating systems. Overuse may damage your engine, and some of these additives contain organically volatile chemicals. Do not needlessly expose yourself to these chemicals.



### **Fuel filler door**

Press the button on the light switch panel (see illustration on [page 31](#)) when the vehicle is at a standstill to unlock the fuel filler door. Please note that the fuel filler door will remain unlocked until the vehicle begins to move forward. An audible click will be heard when the fuel filler door relocks.

If you intend to leave your vehicle while it is being refueled, this feature enables you to lock the doors/tailgate while leaving the fuel filler door unlocked.

You can also keep the vehicle locked if you remain inside it during refueling. The central locking button does not lock the fuel filler door. Be sure the fuel filler door is not obstructed and is completely closed after refueling. Open the fuel filler cap slowly during hot weather.

**NOTE:** During a transitional period, a small number of service stations may still have fuel nozzles that are not compatible with the fuel filler neck on vehicles equipped with the evaporative control system.

### **Refueling**

The fuel tank is designed to hold approximately 19 US gals (72 liters), with sufficient volume left over to accommodate possible expansion of the fuel in hot weather. Be aware that the "usable" tank capacity will be somewhat less than the specified maximum. When the fuel level is low, such factors as ambient temperature, the fuel's "Reid vapor pressure" characteristics, and terrain can affect the fuel pump's ability to supply the engine with an adequate supply of fuel. Therefore, it is advisable to refuel as soon as possible when the needle nears the red zone, or when the fuel warning light comes on.

**CAUTION**

- Do not refuel with the engine running \*. Turn the ignition off or to position I. If the ignition is on, an incorrect reading could occur in the fuel gauge
- After refueling, close the fuel filler cap by turning it clockwise until it clicks into place\*.
- Allow for fuel expansion by not overfilling the tank. Overfilling could also cause damage to the emission control systems.
- Avoid spilling gasoline during refueling. In addition to causing damage to the environment, gasolines containing alcohol can cause damage to painted surfaces, which may not be covered under the New Vehicle Limited Warranty.
- Do not use gasolines containing methanol (methyl alcohol, wood alcohol). This practice can result in vehicle performance deterioration and can damage critical parts in the fuel system. Such damage may not be covered under the New Vehicle Limited Warranty.

\* If the fuel filler cap is not closed tightly or if the engine is running when the vehicle is refueled, the Check Engine Light (malfunction indicator lamp) may indicate a fault. However, your vehicle's performance will not be affected. Use only Volvo original or approved fuel filler caps.

pg. 87 Starting and driving

**Starting the engine**

1. Fasten the seat belt.

** WARNING!**

Before starting, check that the seat, steering wheel and mirrors are adjusted properly. Make sure the brake pedal can be depressed completely. Adjust the seat if necessary. See [pages 54, 56](#).

2. Apply the parking brake if not already set. The gear selector is locked in the **(P)**ark position (Shiftlock).

Manual transmission: the clutch must be fully depressed.

3. Without touching the accelerator pedal, turn the ignition key\* to the starting position. Allow the starter to operate for up to 10 seconds. Release the key as soon as the engine starts. If the engine fails to start, repeat this step.

**NOTE:**

- On certain models, when the vehicle is started, idle speed may be noticeably higher than normal for a short period, depending on the temperature of the engine.

This has been done to help bring components in the emission control system to their normal operating temperature as quickly as possible, which enables them to function normally.

- For cold starts at altitudes above 6000 ft (1800 meters), depress the accelerator pedal halfway and turn the key to the starting position. Release the pedal slowly when the engine starts.

4. To release the gear selector from the **(P)**ark position, the engine must be running (or the ignition key must be in position II) and the brake pedal must be depressed.

5. Select the desired gear. The gear engages after a very slight delay which is especially noticeable when selecting R.

**NOTE:** Your vehicle is equipped with a Keylock system. When the engine is switched off, the gear selector must be in the **(P)**ark position before the key can be removed from the ignition switch.

When starting in cold weather, the transmission may shift up at slightly higher engine speeds than normal until the automatic transmission fluid reaches normal operating temperature.

Do not race a cold engine immediately after starting. Oil flow may not reach some lubrication points fast enough to prevent engine damage.

\* If two of the keys to your vehicle are close together, e.g., on the same key ring, when you try to start the vehicle, this could cause interference in the immobilizer system and result in the vehicle not starting. If this should occur, remove one of the keys from the key ring before trying to start the vehicle again.

## CAUTION

### Automatic transmission

The engine should be idling when you move the gear selector. Never accelerate until after you feel the transmission engage! Accelerating immediately after selecting a gear will cause harsh engagement and premature transmission wear.

Selecting **P** or **N** when idling at a standstill for prolonged periods of time will help prevent overheating of the automatic transmission fluid.

## WARNING!

Always place the gear selector in Park and apply the parking brake before leaving the vehicle. Never leave the vehicle unattended with the engine running.

Always open garage doors fully before starting the engine inside a garage to ensure adequate ventilation. The exhaust gases contain carbon monoxide, which is invisible and odorless but very poisonous.

## Ignition switch and steering wheel lock

**0 Locked position:** Remove the key to lock the steering wheel \*.



### WARNING!

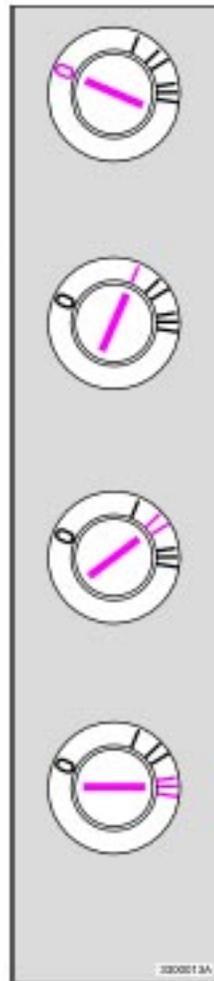
Never turn the key to position 0 while driving or when the vehicle is being towed.

**I Intermediate position\*\* - "radio position":** Certain accessories, radio, etc. on, daytime running lights off.

**II Drive position:** The key position when driving. The vehicle's entire electrical system is connected.

**III Start position:** Release the key when the engine starts. The key returns automatically to the Drive position.

**A chime will sound if the key is left in the ignition and the driver's door is opened.**



## Steering wheel lock

The steering wheel lock might be under tension when the vehicle is parked.

Turn the steering wheel slightly to free the ignition key.

**In order to help reduce vehicle theft, make sure the steering wheel lock is engaged before leaving the vehicle.**


**WARNING!**

Never switch off the ignition (turn the ignition key to position 0) or remove the key from the ignition switch while the vehicle is in motion. This could cause the steering wheel to lock, which would make the vehicle impossible to steer.

\* The gear selector must be in the **(P)**ark position (automatic transmission).

\*\* Please be aware that leaving the key in this position will increase battery drain.

pg. 89 Starting and driving

## General information

### Economical driving conserves natural resources

Better driving economy may be obtained by thinking ahead, avoiding rapid starts and stops and adjusting the speed of your vehicle to immediate traffic conditions. Observe the following rules:

- Bring the engine to normal operating temperature as soon as possible by driving with a light foot on the accelerator pedal for the first few minutes of operation. A cold engine uses more fuel and is subject to increased wear.
- Whenever possible, avoid using the vehicle for driving short distances. This does not allow the engine to reach normal operating temperature.
- Drive carefully and avoid rapid acceleration and hard braking.
- Use the transmission's **(D)**rive position as often as possible and avoid using "kickdown" to help improve fuel economy.
- Do not exceed posted speed limits.
- Avoid carrying unnecessary items (extra load) in the vehicle.
- Maintain correct tire pressure. Check tire pressure regularly (when tires are cold).
- Remove snow tires when threat of snow or ice has ended.
- Note that roof racks, ski racks, etc, increase air resistance and also fuel consumption.
- At highway driving speeds, fuel consumption will be lower with the air conditioning on and the windows closed than with the air conditioning off and the windows open.
- Using the onboard trip computer's fuel consumption modes can help you learn how to drive more economically.

### Other factors that decrease gas mileage are:

- Dirty air cleaner
- Dirty engine oil and clogged oil filter
- Dragging brakes
- Incorrect front end alignment

Some of the above mentioned items and others are checked at the standard Maintenance intervals.

## Weight distribution affects handling

At the specified curb weight your vehicle has a tendency to understeer, which means that the steering wheel has to be turned more than might seem appropriate for the curvature of a bend. This ensures good stability and reduces the risk of rear wheel skid. Remember that these properties can alter with the vehicle load. The heavier the load in the cargo area, the less the tendency to understeer.

### **WARNING!**

**Driving with the tailgate open:** Driving with the tailgate open could lead to poisonous exhaust gases entering the passenger compartment. If the tailgate must be kept open for any reason, proceed as follows

- Close the windows
- Set the ventilation system control to air flow to floor, windshield and side windows and blower control to its highest setting.

### **CAUTION**

Drive slowly and carefully if going through standing water (i.e. flooded roadways, etc.). Damage to the engine could result if excess water is drawn in through the air intake system. Never drive the vehicle in water deeper than 18 inches (48 cm).

pg. 90 Starting and driving

## General information (contd)

### **Handling, roadholding**

Vehicle load, tire design and inflation pressure all affect vehicle handling. Therefore, check that the tires are inflated to the recommended pressure according to the vehicle load. See "Tire pressure" section.

Loads should be distributed so that capacity weight or maximum permissible axle loads are not exceeded.

### **Driving on rough/unpaved surfaces**

The Volvo XC90 is designed primarily for onroad driving, and it has excellent handling characteristics on very rough or unpaved roads.

When driving on poorly maintained or unpaved roads, please keep the following in mind:

- Reduce speed on rough surfaces to minimize possible damage to the vehicle's underbody.
- When driving on soft surfaces such as dry sand or snow, try to avoid stopping if at all possible.

 **WARNING!**

Avoid driving diagonally across steep inclines as this could increase the risk of a roll-over. Try to drive straight up or down the slope.

If the road is very steep, avoid turning the vehicle around to help avoid the risk of rolling over. Back the vehicle up or down the incline instead.

**NOTE:** Avoid driving on steep inclines if the fuel tank is nearly empty. If the flow of fuel to the engine is interrupted due to the vehicle's angle of inclination, this could result in damage to the three-way catalytic converter. We recommend keeping the fuel tank at least half full when driving on steep inclines.

**Driving through water**

- The vehicle should not be driven through water that is deeper than 18 inches (48 cm). Driving through deeper water could result in damage to transmission components or the differential, or to the engine if excess water is drawn in through the air intake system.
- Drive slowly and avoid stopping when driving through water.
- After having driven through water, apply the brakes lightly several times to remove water, mud, etc from the brake discs.
- Never allow the vehicle to stand in water above the door sills. This could result in damage to the electrical system.

**Conserving electrical current**

Keep the following in mind to help minimize battery drain:

- When the engine is not running, avoid turning the ignition key to position II (see [page 88](#)). Many electrical systems (the audio system, the optional infotainment/navigation systems, power windows, etc) will function with the ignition key in position I. This position reduces drain on the battery.
- Please keep in mind that using systems, accessories, etc that consume a great deal of current when the engine is not running could result in the battery being completely drained.

**NOTE:** A warning message will be displayed in the text window in the instrument panel when the battery charge is low.

pg. 91 Starting and driving

**Automatic transmission with Geartronic**



*5-cylinder turbo models*

### **P Park**

Use this position when starting the engine or parking the vehicle.

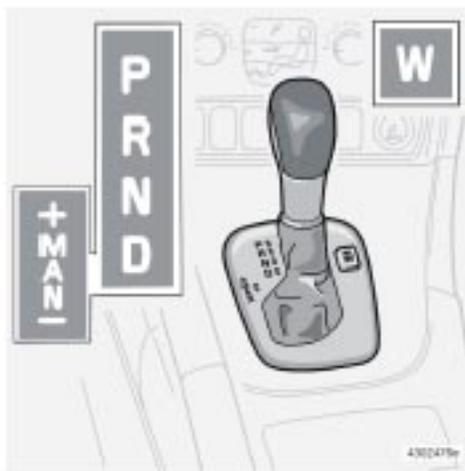
**Never use P while the vehicle is in motion.**

The parking brake should also be set whenever the vehicle is parked.

**The gear selector is mechanically locked in the P position (SHIFTLOCK).** To release the gear selector from this position, the engine must be running (or the ignition key must be in position II) and the brake pedal must be depressed.

### **N (Neutral)**

Neutral - no gear engaged. Use the parking brake.



*6-cylinder turbo models*

**⚠ WARNING!**

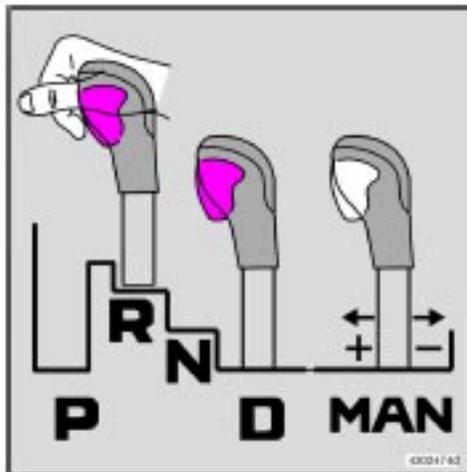
Never leave the vehicle unattended when the engine is running. If, by mistake, the gear selector is moved from P, the vehicle may start moving.

**R (Reverse)**

Never engage **R** while the vehicle is moving forward.

**D (Drive)**

D is the normal driving position and should be used as often as possible to help improve fuel economy. The vehicle should not be moving when shifting from **R** to the **D** position.



*Shiftgate positions*

**NOTE:**

- 5-cylinder turbo engine: 5 forward speeds.
- 6-cylinder turbo engine: 4 forward speeds.

**Automatic transmission - shift gate positions**

You can move the gear selector freely between the (**MAN**)ual and (**D**)rive positions while driving.

Depress the button on the front of the gear selector knob to move between the R, N, D, and P positions.

pg. 92 Starting and driving

**Automatic transmission with Geartronic (contd)**

**Manual shifting - Geartronic**

You can move the gear selector freely between the (**MAN**)ual and (**D**)rive positions while driving.

- Models equipped with a 5-cylinder turbo engine have five forward speeds. Models equipped with a 6-cylinder turbo engine have four forward speeds
- A "lock-up" feature on gears 3 and 4 (and 5, if equipped) reduces engine speed and help saves fuel.

The currently selected gear will be displayed in the instrument panel (see [page 24](#)).

- To access the **(MAN)**ual shifting position from **(D)**rive, move the gear selector to the left to **MAN**.
- To return to the **(D)**rive position from **MAN**, move the gear selector to the right.

### **While driving**

If you select the **(MAN)**ual position while driving, the gear that was being used in the **(D)**rive position will also initially be selected in **(MAN)**ual position.

- Move the gear selector forward (toward "+") to shift to a higher gear or rearward (toward "-") to shift to a lower gear.
- If you hold the gear selector toward "-", the transmission will downshift one gear and will utilize the braking power of the engine. If the current speed is too high for using a lower gear, the downshift will not occur until the speed has decreased enough to allow the lower gear to be used.
- If you slow down to a very low speed, the transmission will automatically shift down.
- When starting in the **(MAN)**ual position, 3rd gear is the highest gear that may be selected.

### **Kickdown**

Automatic shift to a lower gear (kickdown) is achieved by depressing the accelerator pedal fully and briskly. An upshift will occur when approaching the top speed for a particular gear or by releasing the accelerator pedal slightly. Kickdown can be used for maximum acceleration or when passing at highway speeds.

**NOTE:** The gear selector must be in the D (Drive) position for kickdown to function.

### **Automatic transmission - adaptive system**

The automatic transmission is controlled by an adaptive control system that constantly monitors the way in which the transmission functions. It senses and adapts each gear shift for optimal performance. The system also monitors your particular driving style and adapts gear shifting accordingly.



*5-cylinder turbo models*

### **W - Winter/Wet driving mode - enhanced vehicle traction**

- Mode W will only function if the gear selector is in the (D)rive position.
- Press the button at the base of the gear selector to engage/disengage this driving mode (see illustration).
- When the W driving mode is engaged, this is displayed in the instrument panel (see [page 24](#)). This mode may be selected for starting/moving off on slippery roads.



*6-cylinder turbo models*

## **All Wheel Drive**

### **All Wheel Drive (AWD) - general information**

Your Volvo can be equipped with permanent All Wheel Drive (option), which means that power is distributed automatically between the front and rear wheels. Under normal driving conditions, most of the engine's power is directed to the front wheels. However, if there is any tendency for the front wheels

to spin, an electronically controlled coupling distributes power to the wheels that have the best traction.

### **Tire dimensions**

Volvo recommends that you always drive on tires of the same brand, size, construction (radial), tread pattern, load-, speed-, traction-, temperature-, and treadwear rating. Never drive on mixed tires, except for brief periods when the temporary spare tire is in use. Always use properly inflated tires of correct dimensions. Tire size and inflation pressures are shown on the tire pressure label located inside the fuel filler door.

### **Tire Rotation**

Volvo recommends rotating the tires every 7,500 miles (12,000 km). Tires should be rotated front-to-back/back-to-front only. Tires must maintain the same direction of rotation throughout their lifetime, and should never be rotated from one side of the vehicle to the other.

### **Temporary Spare**

The temporary spare tire is for temporary, lowspeed, short-distance use only. Replace it with a full-sized tire as soon as possible, in accordance with "Tire Rotation" in the previous paragraph. Do not drive on the temporary spare at speeds above 50 m.p.h. (80km/h) or for distances greater than 50 miles (80 km).

Never install snow chains on a temporary spare.



[Contents](#) | [Top of Page](#)

## Brake system

### **BRAKE Brake circuit malfunction**

The brake system is a hydraulic system consisting of two master cylinders and two separate brake circuits. If a problem should occur in one of these circuits, it is still possible to stop the vehicle with the other brake circuit.

If the brake pedal must be depressed farther than normal and requires greater foot pressure, the stopping distance will be longer.

A warning light in the instrument panel will light up to warn the driver that a fault has occurred.

If this light comes on while driving or braking, stop immediately and check the brake fluid level in the reservoir.

**NOTE:** Press the brake pedal hard and maintain pressure on the pedal - do not pump the brakes.

### **WARNING!**

If the fluid level is below the MIN mark in the reservoir or if a "Brake failure - Service urgent" message is displayed in the text window: **DO NOT DRIVE**. Have the vehicle towed to a Volvo retailer and have the brake system inspected.

**NOTE:** When the vehicle is at a standstill and the engine is idling, e.g. at a traffic light and the brake pedal is depressed, the pedal may go down slightly. This is a normal function of the power-assisted brake system.

### **Power brakes function only when the engine is running**

The power brakes utilize vacuum pressure which is only created when the engine is running. Never let the vehicle roll to a stop with the engine switched off.

If the power brakes are not working, the brake pedal must be pressed approximately four times harder than usual to make up for the lack of power assistance. This can happen for example when towing your vehicle or if the engine is switched off when the vehicle is rolling. The brake pedal feels harder than usual.

### **Water on brake discs and brake pads affects braking**

Driving in rain and slush or passing through an automatic car wash can cause water to collect on the brake discs and pads. This will cause a delay in braking effect when the pedal is depressed. To avoid such a delay when the brakes are needed, depress the pedal occasionally when driving through rain, slush, etc. This will remove the water from the brakes. Check that brake application feels normal. This should also be done after washing or starting in very damp or cold weather.

### **Severe strain on the brake system**

The brakes will be subject to severe strain when driving in mountains or hilly areas, or when towing a trailer. Vehicle speed is usually slower, which means that the cooling of the brakes is less efficient than when driving on level roads. To reduce the strain on the brakes, shift into a lower gear and let the engine help with the braking. Do not forget that if you are towing a trailer, the brakes will be subjected to a greater than normal load.

pg. 96 Starting and driving

## **Brake system (contd)**



### **Anti-lock brakes (ABS)**

If the warning lamp lights up there is a malfunction of the ABS system (the standard braking system will however function) and the vehicle should be driven cautiously to a Volvo retailer for inspection. The Anti-lock Braking System (ABS) helps to improve vehicle control (stopping and steering) during severe braking conditions by limiting brake lockup. When the system "senses" impending lockup, braking pressure is automatically modulated in order to help prevent lockup, which could lead to a skid.

**This system performs a self-diagnostic test when the engine is started and when the vehicle first reaches a speed of approximately 12 mph (20 km/h).** The brake pedal will pulsate several times and a sound may be audible from the ABS control module. This is normal.

To obtain optimal effect from the ABS system, constant pressure should be kept on the brake pedal, keep constant pressure on the brake pedal. Do not pump the brake pedal.

The switching of the ABS modulator will be audible and the brake pedal will pulsate during braking. Please be aware that ABS does not increase the absolute braking potential of the vehicle. While control will be enhanced, ABS will not shorten stopping distances on slippery surfaces.

### **ABS with EBD (Electronic Brake Force Distribution)**

EBD is an integrated part of the ABS system. EBD regulates the hydraulic pressure to the rear brakes to help provide optimal braking capacity. The brake pedal will pulsate during braking, which is normal.

If the BRAKE and ABS warning lights come on at the same time, this could indicate a fault in the brake system.

- Stop the vehicle in a suitable place and switch off the engine.
- Restart the engine.
- If both warning lights go off, no further action is required.
- If both lights are still on after the engine has been restarted, switch off the engine again and check the brake fluid level (see [page 128](#) for the location of the brake fluid reservoir).
- If the brake fluid level is above the MIN mark, drive carefully to an authorized Volvo retailer and have the brake system inspected.

### **WARNING!**

If the fluid level is below the MIN mark in the reservoir or if a "Brake failure - Service urgent" message is displayed in the text window: **DO NOT DRIVE**. Have the vehicle towed to a Volvo retailer and have the brake system inspected.

pg. 97 Starting and driving

## Dynamic Stability Traction Control (DSTC)



The DSTC system on the Volvo XC90 consists of a number of functions:

### 1. Traction control (TC)

This function is designed to help reduce wheel spin by transferring power from a drive wheel that begins to lose traction to the wheel on the opposite side of the vehicle (on the same axle). TC monitors and compares the rotational speed of the drive wheels. If one of the drive wheels shows a tendency to spin, the difference in speed is immediately detected. This triggers the Anti-lock Brake System, which brakes the spinning wheel until the difference in rotational speed is corrected.

TC is most active at low speeds, and a pulsating sound will be audible when the system is regulating wheel spin. This is quite normal.

This is one of the DSTC system's permanent functions and is not affected when the DSTC button on the center control panel is pressed.

### 2. Spin control (SC)

The spin control function is designed to help prevent the drive wheels from spinning while the vehicle is accelerating. This is done by temporarily reducing engine torque to the drive wheels, which helps

improve tractive force. Under certain circumstances, such as when driving with snow chains, or driving in deep snow or loose sand, it may be advisable to temporarily switch off this function for maximum tractive force. This is done by pressing the DSTC button on the center control panel for at least a half a second.

**When the SC function has been switched off:**

- The text window will briefly display "DSTC SPIN CONTROL OFF"
- The LED in the DSTC button will be off.

**3. Active Yaw Control (AYC)**

This function helps maintain directional stability, for example when cornering, by braking one or more of the wheels if the vehicle shows a tendency to skid or slide laterally. This is done by activating the Anti-lock Braking System. A pulsating sound will be audible when the function is active, which is quite normal. If you apply the brakes while this function is active, the brake pedal will feel stiffer than usual.

This is also one of the DSTC system's permanent functions and is not affected when the DSTC button on the center control panel is pressed.

**4. Roll Stability Control (RSC)**

RSC utilizes a gyro-sensor to monitor the vehicle's angle of inclination, and the rate at which this angle changes. If necessary, RSC activates the Anti-lock Brake System to brake one or more of the wheels to help maintain stability. A pulsating sound will be audible when the function is active, which is quite normal. If you apply the brakes while this function is active, the brake pedal will feel stiffer than usual.

This is one of the DSTC system's permanent functions and is not affected when the DSTC button on the center control panel is pressed.

pg. 98 Starting and driving

## Dynamic Stability Traction Control (DSTC) (contd)

**The DSTC button**

The DSTC button in the center control panel is used to switch the Spin Control (SC) function on or off.

The button must be pressed for at least a half second to prevent SC from being switched off inadvertently.

When the system has been switched off, the green indicator lamp in the button will go out and "DSTC SPIN CONTROL OFF" will be displayed in the text window.

All DSTC functions are (re)activated each time the engine is started.



### The Stability Control indicator light

**The Stability Control indicator light will come on for approximately 2 seconds** when the ignition is switched on as the system performs a self-diagnostic test.

#### The Stability Control indicator light will flash when:

- Traction Control is actively functioning to help avoid drive-wheel spin.
- Spin Control is actively functioning to help avoid loss of traction during acceleration.
- Active Yaw Control is actively functioning to help avoid skids or lateral slides.
- Roll Stability Control is actively functioning to help avoid a roll-over situation.

#### The warning symbol in the instrument panel

##### A steady yellow glow indicates:

- That the system has been automatically disengaged due to a fault. "ANTI SKID SERVICE REQUIRED" be displayed in the text window. An authorized Volvo retailer should check the system.
- In the event of high brake temperature, "TRACTION CONTROL TEMPORARILY OFF" will be displayed in the text window. The system will automatically switch on again when the brakes have cooled.

### Emergency Brake Assistance (EBA)

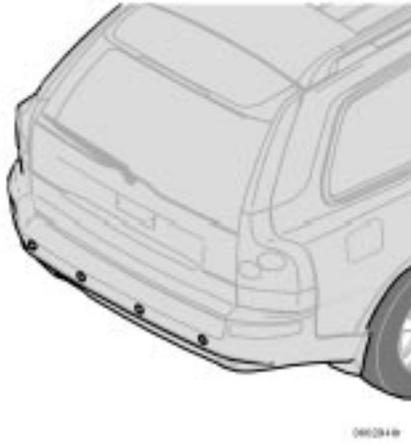
The EBA function is an integrated part of the DSTC system. EBA is designed to provide full brake effect immediately in the event of sudden, hard braking. The system is activated by the speed with which you depress the brake pedal.

#### NOTE:

- When the EBA system is activated, the brake pedal will go down and pressure in the brake system immediately increases to the maximum level. Maintain full pressure on the brake pedal in order to utilize the system completely. EBA is automatically deactivated when the brake pedal is released.
- When the vehicle has been parked for some time, the brake pedal may sink more than usual when the engine is started. This is normal and the pedal will return to its usual position when it is released.

pg. 99 Starting and driving

## Rear Parking Assistance

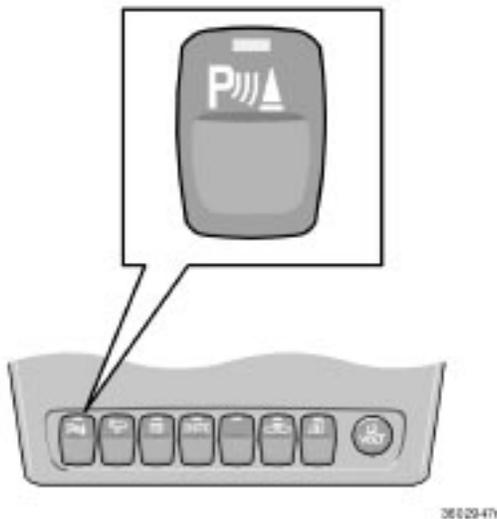


Rear Parking Assistance (option) is used to assist you when backing into parking spaces, etc by providing an audible tone as you back up. The system is automatically activated when you select reverse gear.

It utilizes ultrasound sensors located in the rear bumper to measure the distance to a vehicle or other object, or a person who may be behind the vehicle.

#### **When the system is active:**

1. The audio system's volume will be reduced.



2. An intermittent signal will be audible from the audio system's speakers to indicate that as you back up, you are approaching a person, object, parked vehicle, etc. The signals begin when the vehicle is at a distance of approximately 5 feet (1.5 meters) from an object/person, etc.
3. At a distance of approximately 1 foot (30 cm), the signal will become constant.

#### **Switching off the system**

Towing a trailer, carrying bicycles in a tailgate-mounted carrier, etc, could trigger the reverse warning system.

## To temporarily off the system

- Press the button in the center control panel (see illustration above). The LED in the button will go out to indicate that the system is not in active mode.
- Press the button again to reactivate the system.

## Faults in the system

If a fault should occur in the system, the LED in the button will be switched off and a message will be displayed in the text window.

## Cleaning the sensors

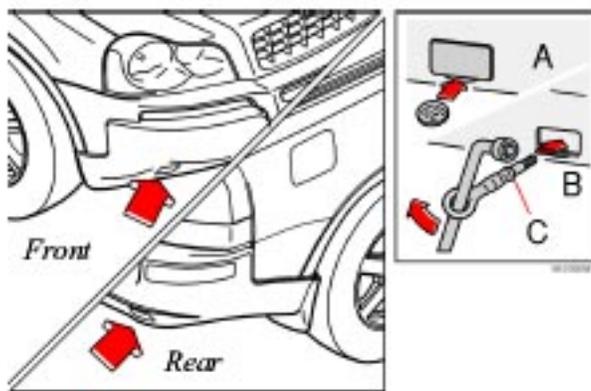
For the system to function properly, the sensors should be kept clean. They can be cleaned with car washing detergent and a sponge.

### **WARNING!**

This system is designed to be a supplementary aid when the vehicle is backing up. It is not, however, intended to replace the driver's attention and judgement.

pg. 100 Starting and driving

## Towing



*Positions for attaching towing eyelets*

## Emergency towing

The towing eyelet is located in the tool bag, under the floor of the cargo area. This eyelet must be screwed into the positions provided on the right sides of either the front or rear bumper (see illustrations).

### To attach the towing eyelet:

**A** Use a coin to pry open the lower edge of the cover (A).

**B** Screw the towing eyelet (C) in place (B), first by hand and then using the tire iron until it is securely

in place.

After the vehicle has been towed, the eyelet should be removed and returned to the tool bag. Press the cover back into position.

### Precautions when the vehicle is in tow

- The steering wheel must be unlocked. Turn the ignition key to position I or II.
- The gear selector must be in position N.
- Maximum speed: 50 mph (80 km/h). Do not exceed the maximum allowable towing speed.
- Maximum distance with front wheels on ground: 50 miles (80 km).
- While the vehicle is being towed, try to keep the tow rope taut at all times.
- The vehicle should only be towed in forward direction.

### CAUTION

- Please check with state and local authorities before attempting this type of towing, as vehicles being towed are subject to regulations regarding maximum towing speed, length and type of towing device, lighting, etc.

- If the vehicle's battery is dead, do not attempt to start the vehicle by pushing or pulling it as this will damage the three-way catalytic converter(s). The engine must be jump started using an auxiliary battery (see [page 102](#)).

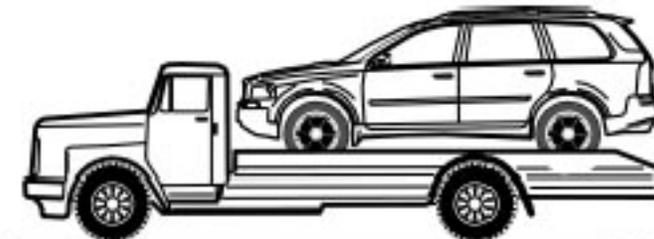
- If the vehicle is being towed on a flat bed truck, the towing eyelets must not be used to secure the vehicle on the flat bed. Consult the tow truck operator.

### WARNING!

- Remember that the power brakes and power steering will not function when engine is not running. The braking and steering systems will function but the brake pedal pressure required is 3 - 4 times above normal and greater steering effort must be exerted.

- The towing eyelets must not be used for pulling the vehicle out of a ditch or for any similar purpose involving severe strain. Do not use the towing eyelets to pull the vehicle up onto a flat bed tow truck.

pg. 101 Starting and driving



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## Towing vehicles with front wheel drive/All Wheel Drive

Volvo recommends the use of flat bed equipment.

If wheel lift equipment must be used, please use extreme caution to help avoid damage to the vehicle. **In this case, the vehicle should be towed with the rear wheels on the ground if at all possible.**

If it is absolutely necessary to tow the vehicle with the front wheels on the ground, please refer to the towing information on the previous page.

### CAUTION

Sling-type equipment applied at the front will damage radiator and air conditioning lines.

It is equally important not to use sling-type equipment at the rear or apply lifting equipment inside the rear wheels; serious damage to the rear axle may result.

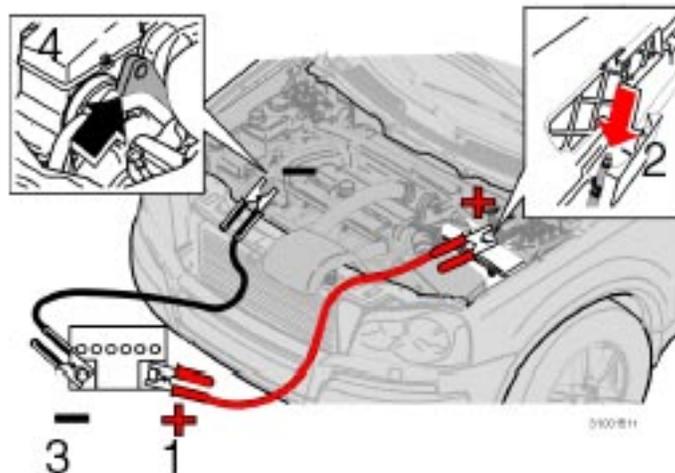
If the vehicle is being towed on a flat bed truck, the towing eyelets must not be used to secure the vehicle on the flat bed. Consult the tow truck operator.

### ⚠ WARNING!

Do not use the towing eyelets to pull the vehicle up onto a flat bed tow truck.

pg. 102 Starting and driving

## Jump starting



## Jump starting

Follow these instructions to jump start your vehicle's dead battery or to jump start another vehicle's dead battery using your vehicle. Although your vehicle's battery is located under the floor of the cargo area, jumper cables should be connected in the **engine compartment**, to the points shown in the illustrations.

If the 12-volt auxiliary battery to be used is in another vehicle, check that the vehicles are not touching to prevent premature completion of a circuit. Be sure to follow jump starting instructions provided for the other vehicle.

**To jump start your vehicle:**

- Switch off the ignition.
- First connect the auxiliary battery positive (+) terminal (1) to the positive (+) terminal in your vehicle's engine compartment (2), located under a small black plastic cover attached to the fuse box cover, marked with a "+" sign. Remove the cover on the main fuse box if necessary to access this terminal. Then connect the auxiliary battery's negative (-) terminal (3) to the ground point in your vehicle's engine compartment (4).
- Start the engine in the assisting vehicle, then start the engine in the vehicle with dead battery.
- After the engine has started, first remove the negative (-) terminal jumper cable. Then remove the positive (+) terminal jumper cable.

 **WARNING!**

**PROPOSITION 65 WARNING!**

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and reproductive harm. Wash hands after handling

 **WARNING!**

- Do not connect the jumper cable to any part of the fuel system or to any moving parts. Avoid touching hot manifolds.

Never expose the battery to open flame or electric spark.

- Do not smoke near the battery.

- Batteries generate hydrogen gas, which is flammable and explosive.

- Battery fluid contains sulphuric acid. Do not allow battery fluid to contact eyes, skin, fabrics or painted surfaces. If contact occurs, flush the affected area immediately with water. Obtain medical help immediately if eyes are affected.

- Failure to follow the instructions for jump starting can lead to personal injury.

## Towing a trailer

Volvo recommends the use of Volvo trailer hitches that are specially designed for the vehicle.

- Maximum trailer weights recommended by Volvo are:

All models - trailers without brakes: 1,650 lbs (750 kg)

Models with all wheel drive - trailers with brakes: 4,960 lbs (2250 kg)

Models with front wheel drive - trailers with brakes: 3,970 lbs (1800 kg)

Observe the legal requirements of the state/province in which the vehicles are registered.

- All Volvo models are equipped with energy-absorbing shock-mounted bumpers. Trailer hitch installation should not interfere with the proper operation of this bumper system.

Trailer towing does not normally present any particular problems, but take into consideration:

- Increase tire pressure to recommended full. See section "Wheels and tires."
- When your vehicle is new, avoid towing heavy trailers during the first 620 miles (1,000 km).
- Recommended hitch tongue load is: Trailer weights **below** 2,650 lbs (1,200 kg) - 110 lbs (50 kg)  
Trailer weights **above** 2,650 lbs (1,200 kg) - 198 lbs (90 kg)
- Maximum speed when towing a trailer: 50 mph (80 km/h).
- Engine and transmission are subject to increased loads. Therefore, engine coolant temperature should be closely watched when driving in hot climates or hilly terrain. Use a lower gear and turn off the air conditioner if the temperature gauge needle enters the red range.
- If the automatic transmission begins to overheat, a message will be displayed in the text window.
- Avoid overload and other abusive operation.
- Hauling a trailer affects handling, durability, and economy.
- It is necessary to balance trailer brakes with the towing vehicle brakes to provide a safe stop (check and observe state/local regulations).
- Do not connect the trailer's brake system directly to the vehicle's brake system.
- More frequent vehicle maintenance is required.
- Remove the ball and drawbar assembly when the hitch is not being used.
- Volvo recommends the use of synthetic engine oil when towing a trailer over long distances or in mountainous areas.

**⚠ WARNING!**

Bumper-attached trailer hitches must not be used on Volvos, nor should safety chains be attached to the bumper.

Trailer hitches attaching to the vehicle rear axle must not be used.

Never connect a trailer's hydraulic brake system directly to the vehicle brake system, nor a trailer's lighting system directly to the vehicle lighting system. Consult your nearest authorized Volvo retailer for correct installation.

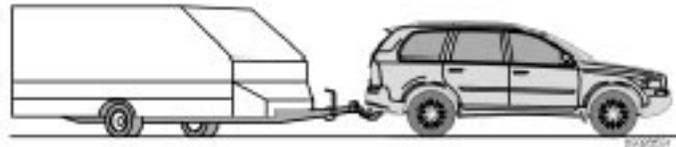
When towing a trailer, the trailer's safety wire must be correctly fastened to the hole or hook provided in the trailer hitch on the vehicle. The safety wire should never be fastened to or wound around the drawbar ball.

pg. 104 Starting and driving

## Towing a trailer (contd)

### NOTE!

- When parking the vehicle with a trailer on a hill, apply the parking brake before putting the gear selector in (P)ark. When starting on a hill, put the gear selector in (D)rive before releasing the parking brake.
- If you use the manual (Geartronic) shift positions while towing a trailer, make sure the gear you select does not put too much strain on the engine (using too high a gear).
- The drawbar assembly/trailer hitch may be rated for trailers heavier than the vehicle is designed to tow. Please adhere to Volvo's recommended trailer weights.

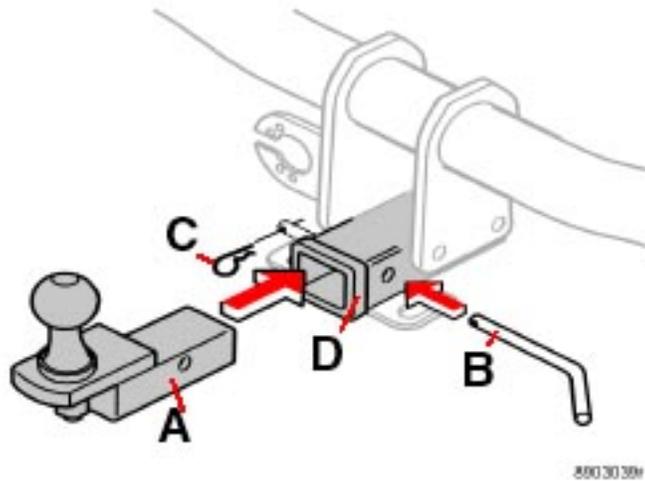


### Leveling

If your vehicle is equipped with automatic levelling, the rear suspension always retains the correct ride height regardless of the load. When the vehicle is stationary, the rear suspension lowers, which is normal.

pg. 105 Starting and driving

## Detachable trailer hitch - installing/removing



*A-ball holder, B-locking bolt, C-cotter pin,  
D-hitch assembly*

### **Installing the ball holder**

1. If necessary, remove the cotter pin from the locking bolt and slide the locking bolt out of the hitch assembly.
2. Slide the ball holder into the hitch assembly.
3. Align the hole in the ball holder with the one in the hitch assembly.
4. Slide the locking bolt through the hitch assembly/ball holder.
5. Insert the cotter pin in the hole at the end of the locking bolt.

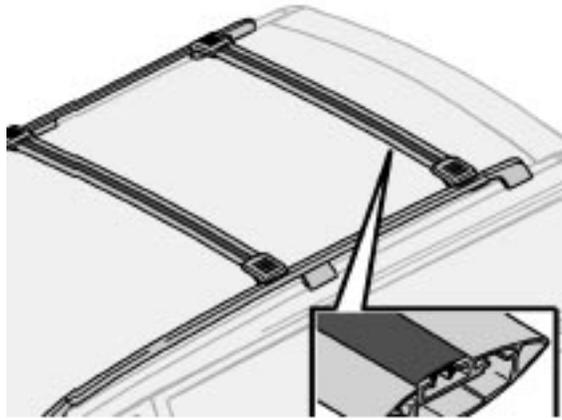
### **Removing the ball holder**

1. Remove the cotter pin from the locking bolt and slide the locking bolt out of the ball holder/hitch assembly.
2. Pull the ball holder out of the hitch assembly.

**NOTE:** A cover for the hitch assembly can be purchased from your Volvo retailer.

pg. 106 Starting and driving

## **Load carriers**

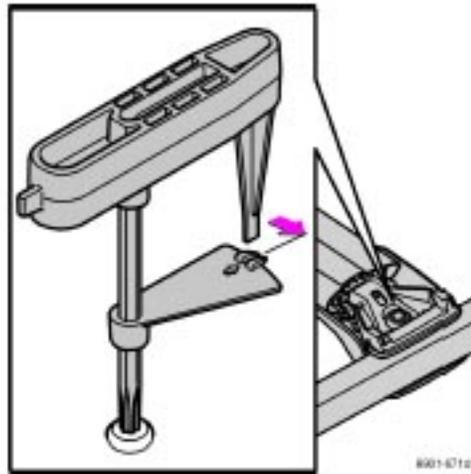


### Positioning the load carriers

Make sure that the wing-shaped load carriers are installed on the roof rails with the rounded edge forward (see the inset illustration above). The load carriers are identical and can be placed anywhere along the roof rails.

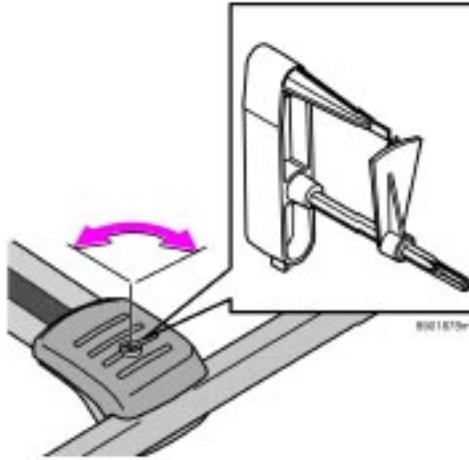
When not in use, we recommend that the front load carrier be placed approximately 2 inches (5 cm) in front of the center roof rail anchorage point and the rear load carrier approximately 1.5 inches (3.5 cm) in front of the rear rail anchorage. This will help to reduce wind noise.

**NOTE:** Volvo accessories mounted on these load carriers will require T-track mounting hardware for correct installation. Please consult your Volvo retailer.



### Installing the load carriers

Make sure that the load carrier is pressed firmly out against the roof rail. Screw the load carrier in place. Use the supplied torque wrench and tighten to the mark on the wrench (corresponding to 6 Nm). See illustration.



### Load carrier cover

The vehicle's ignition key or the stud on the edge of the supplied torque wrench can be used to undo or tighten the cover. Turn a quarter turn (90 degrees). See illustration.

pg. 107 Starting and driving

## Cold weather precautions

If you wish to check your vehicle before the approach of cold weather, the following advice is worth noting:

- Make sure that the engine coolant contains 50 percent antifreeze. Any other mixture will reduce freeze protection. This gives protection against freezing down to  $-31^{\circ}\text{F}$  ( $-35^{\circ}\text{C}$ ). See section "Coolant". **The use of "recycled" antifreeze is not approved by Volvo. Different types of antifreeze must not be mixed.**
- Volvo recommends using only genuine Volvo antifreeze in your vehicle's radiator. Your Volvo retailer stocks plenty of Volvo engine coolant to help protect your vehicle during cold weather.
- Try to keep the **fuel tank** well filled - this prevents the formation of condensation in the tank. In addition, in extremely cold weather conditions it is worthwhile to add fuel line de-icer before refueling.
- The viscosity of the **engine oil** is important. Oil with low viscosity (thinner oil) improves cold-weather starting as well as decreasing fuel consumption while the engine is warming up. For winter use, 5W-30 oil, particularly the synthetic type\*, is recommended. Be sure to use good quality oil but do not use cold-weather oil for hard driving or in warm weather. See section "Engine oil" for more information.
- The load placed on the **battery** is greater during the winter since the windshield wipers, lighting, etc. are used more often. Moreover, the capacity of the battery decreases as the temperature drops. In very cold weather, a poorly charged battery can freeze and be damaged. It is therefore advisable to check the state of charge more frequently and spray an antirust oil on the battery posts.
- Volvo recommends the use of **snow tires** on all four wheels for winter driving - see section "Wheels and tires."
- To prevent the **washer fluid reservoir** from freezing, add washer solvents containing antifreeze (see

[page 128](#) for the location of the washer fluid reservoir).

This is important since dirt is often splashed on the windshield during winter driving, requiring the frequent use of the washers and wipers. Volvo Washer Solvent should be diluted as follows:

Down to 14° F (-10° C): 1 part washer solvent and 4 parts water

Down to 5° F (-15° C): 1 part washer solvent and 3 parts water

Down to 0° F (-18° C): 1 part washer solvent and 2 parts water

Down to -18° F (-28° C): 1 part washer solvent and 1 part water

- Use Volvo Teflon Lock Spray in the locks.

**NOTE:** Avoid the use of de-icing sprays as they can cause damage to the locks.

### **W Winter/Wet driving modeEnhanced vehicle traction**

- Mode W will only function if the gear selector is in the (D)rive position.
- Press the button at the base of the gear selector to engage/disengage this driving mode.
- An LED in the button will light up to indicate that W is engaged and this will also be displayed in the instrument panel (see [page 24](#)).
- This mode may be selected for starting/moving off on slippery roads.

\* Synthetic oil is not used when the oil is changed at the normal maintenance intervals except at owner request and at additional charge. Please consult your Volvo retailer.

pg. 108 Starting and driving

## **Before a long distance trip**

It is always worthwhile to have your vehicle checked at a Volvo retailer before driving long distances. Your retailer will also be able to supply you with bulbs, fuses, spark plugs and wiper blades for your use in the event that problems occur.

As a minimum, the following items should be checked before any long trip:

- Check that engine runs smoothly and that fuel consumption is normal.
- Check for fuel, oil, and fluid leakage
- Check transmission oil level\*.
- Check condition of drive belts.
- Check state of the battery's charge.
- Examine tires carefully (the spare tire as well), and replace those that are worn. Check tire pressures.
- The brakes, front wheel alignment, and steering gear should be checked by your Volvo retailer only.
- Check all lights, including high beams.
- Reflective warning triangles are legally required in some states/provinces.
- Have a word with your Volvo retailer if you intend to drive in countries where it may be difficult to obtain the correct fuel.

- Consider your destination. If you will be driving through an area where snow or ice are likely to occur, consider snow tires.

\* To prevent injury from contact with hot surfaces, do not inspect your vehicle's transmission fluid yourself. Have your vehicle's transmission fluid level inspected by a qualified Volvo service technician.

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[Contents](#) | [Top of Page](#)

# 2003 VOLVO XC90

## Vehicle care

pg. 109 Vehicle care

[Washing and cleaning the vehicle](#) [110](#)

[Paint touch up](#) [112](#)

pg. 110 Vehicle care

## Washing and cleaning the vehicle

- The vehicle should be washed at regular intervals since dirt, dust, insects and tar spots adhere to the paint and may cause damage. It is particularly important to wash the vehicle frequently in the wintertime to prevent corrosion, when salt has been used on the roads.
- When washing the vehicle, do not expose it to direct sunlight. Use lukewarm water to soften the dirt before you wash with a sponge, and plenty of water, to avoid scratching.
- Bird droppings: Remove from paintwork as soon as possible. Otherwise the finish may be permanently damaged.
- A detergent can be used to facilitate the softening of dirt and oil.
- A water-soluble grease solvent may be used in cases of sticky dirt. However, use a wash place equipped with a drainage separator.
- Dry the vehicle with a clean chamois and remember to clean the drain holes in the doors and rocker panels.
- Tar spots can be removed with kerosene or tar remover after the vehicle has been washed.
- A stiff-bristle brush and lukewarm soapy water can be used to clean the wiper blades. Frequent cleaning improves visibility considerably.
- Wash off the dirt from the underside (wheel housings, fenders, etc.).
- In areas of high industrial fallout, more frequent washing is recommended.
- After cleaning the engine, the spark plug wells should be inspected for water and blown dry if necessary.

**Suitable detergents:** Special vehicle washing detergents should be used. A suitable mixture is about 2.5

fl. oz. (8.5 cl) of detergent to 2.6 US gal. (10 liters) of warm water. After washing with a detergent the vehicle should be well rinsed with clean water.

**Bumpers:** Wash the bumpers with the same cleaning agent used on the rest of the vehicle. Never clean the bumpers with gasoline or paint thinner. Difficult spots can be removed with denatured alcohol. To avoid scratches, do not dry the bumpers with paper.

**NOTE:** When washing the vehicle, remember to remove dirt from the drain holes in the doors and sills.

### CAUTION

- During high pressure washing, the spray mouthpiece must never be closer to the vehicle than 13" (30 cm). Do not spray into the locks.
- When washing or steam cleaning the engine, avoid spraying water or steam directly on the electrical components or toward the rear side of the engine.

### Special moonroof cautions:

- Always close the moonroof and visor before washing your vehicle.
- Never use abrasive cleaning agents on the moonroof.
- Never use wax on the rubber seals around the moonroof.

### WARNING!

When the vehicle is driven immediately after being washed, apply the brakes several times in order to remove any moisture from the brake linings.

Engine cleaning agents should not be used when the engine is warm. This constitutes a fire risk.

pg. 111 Vehicle care

### Automatic washing - simple and quick

- We do NOT recommend washing your vehicle in an automatic wash during the first six months (because the paint will not have hardened sufficiently).
- An automatic wash is a simple and quick way to clean your vehicle, but it is worth remembering that it may not be as thorough as when you yourself go over the vehicle with sponge and water. Keeping the underbody clean is most important, especially in the winter. Some automatic washers do not have facilities for washing the underbody.
- Before driving into an automatic car wash, make sure that side view mirrors, auxiliary lamps, etc, are secure, and that any antenna(s) are retracted or removed. Otherwise there is risk of the machine dislodging them.

### Polishing and Waxing

- Normally, polishing is not required during the first year after delivery, however, waxing may be

beneficial.

- Before applying polish or wax the vehicle must be washed and dried. Tar spots can be removed with kerosene or tar remover. Difficult spots may require a fine rubbing compound.
- After polishing use liquid or paste wax.
- Several commercially available products contain both polish and wax.
- Waxing alone does not substitute for polishing a dull surface.
- A wide range of polymer-based waxes can be purchased today. These waxes are easy to use and produce a long-lasting, high-gloss finish that protects the bodywork against oxidation, road dirt and fading.
- Do not polish or wax your vehicle in direct sunlight (the surface of the vehicle should not be warmer than 113° F (45° C)).

### **Cleaning the upholstery**

- The fabric can be cleaned with soapy water or a detergent. For more difficult spots caused by oil, ice cream, shoe polish, grease, etc., use a clothing/fabric stain remover.
- The plastic in the upholstery can be cleaned with a soft cloth and mild soap solution.
- Leather upholstery/suede-like upholstery (alcantera™) can be cleaned with a soft cloth and mild soap solution. For more difficult spots, Volvo offers a leather care kit.
- Under no circumstances should gasoline, naphtha or similar cleaning agents be used on the plastic or the leather since these can cause damage.

### **Cleaning the seat belts**

Clean only with lukewarm water and a mild soap solution.

### **Cleaning floor mats**

The floor mats should be vacuumed or brushed clean regularly, especially during winter when they should be taken out for drying. Spots on textile mats can be removed with a mild detergent.

### **Bear in mind**

- Take extra care when removing stains such as ink or lipstick since the coloring can spread.
- Use solvents sparingly. Too much solvent can damage the seat padding.
- Start from the outside of the stain and work toward the center.

pg. 112 Vehicle care

## **Paint touch up**

Paint damage requires immediate attention to avoid rusting. Make it a habit to check the finish regularly - when washing the vehicle for instance. Touch-up if necessary.

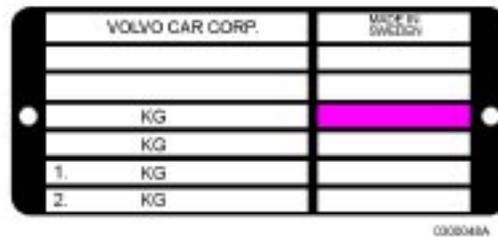
Paint repairs require special equipment and skill. Contact your Volvo retailer for any extensive damage.

Minor scratches can be repaired by using Volvo touch-up paint.

**NOTE:** When ordering touch-up paint from your Volvo retailer, use the paint code indicated on the model plate. The plate is located in the engine compartment.

### Color code

Make sure you have the right color. The color code number is on the data plate in the engine compartment.



### Minor stone chips and scratches

Material:

- Primer - can
- Paint - touch-up pen
- Brush
- Masking tape
- If the stone chip has not gone down to the bare metal and an undamaged color coat remains, you can add paint immediately after removing dirt.

**NOTE:** When touching up the vehicle, it should be clean and dry. The surface temperature should be above 60° F (15° C).

### Minor scratches on the surface

If the stone chip has not penetrated down to the metal and an undamaged layer of paint remains, the touch-up paint can be applied as soon as the spot has been cleaned.

### Deep scratches

1. Place a strip of masking tape over the damaged surface. Pull the tape off so that any loose flakes of paint adhere to it.
2. Thoroughly mix the primer and apply it with a small brush.

When the primer surface is dry, the paint can be applied using a brush. Mix the paint thoroughly; apply several thin paint coats and let dry after each application.



3. If there is a longer scratch, you may want to protect surrounding paint by masking it off.



[Contents](#) | [Top of Page](#)

# 2 0 0 3 VOLVO XC90

## Wheels and tires

pg. 113 Wheels and tires

[General information](#) [114](#)

[Tire pressure](#) [116](#)

[Tread wear indicators](#) [117](#)

[Uniform Tire Quality Grading](#) [118](#)

[Changing wheels](#) [119](#)

pg. 114 Wheels and tires

## General information

### General information about wheels and tires

Your vehicle is equipped with tires according to the tire information label on the inside of the fuel filler door. All tires have a dimension designation. The following is an **example** of a tire designation:

225/70R16.

225 section width (mm)

70 relationship between section height and width

R radial tire

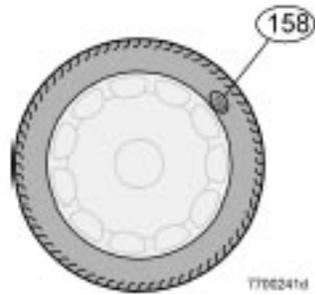
16 wheel rim diameter (inches)

The tires have good road holding characteristics and offer good handling on dry and wet surfaces. It should be noted however that the tires have been developed to give these features on snow/ice-free surfaces.

**Certain models are equipped with "all-season" tires, which provide a somewhat higher degree of road holding on slippery surfaces than tires without the "all-season" rating.**

However, for optimum road holding on icy or snow-covered roads, we recommend suitable winter tires on all four wheels. When replacing tires, be sure that the new tires are the same size designation, type (radial) and preferably from the same manufacturer, on all four wheels. Otherwise there is a risk of altering the vehicle's roadholding and handling characteristics.

**NOTE:** When storing wheel/tire assemblies (e.g. winter tires and wheels), either stand the assemblies upright, or suspend them off the ground. Laying wheel/tire assemblies on their sides for prolonged periods can cause wheel and/or tire damage.



### **New tires**

Remember that tires are perishable goods. As of 2000, manufacturing year and week will be indicated with 4 digits (e.g. 0015 means that the tire is manufactured year 2000, week 15).

### **Improving tire economy:**

- Maintain correct tire pressure. See the tire pressure label on the inside of the fuel filler door.
- Drive smoothly: avoid fast starts, hard braking and tire screeching.
- Tire wear increases with speed.
- Correct front wheel alignment is very important.
- Unbalanced wheels impair tire economy and driving comfort.
- If tires are rotated, they must be kept on the same side of the vehicle so that they revolve in the same direction as before rotation.
- Hitting curbs or potholes can damage the tires and/or wheels permanently.

### **Flat spots**

All tires become warm during use. After cooling, when the vehicle is parked, the tires have a tendency to distort slightly, forming flat spots. These flat spots can cause vibrations similar to the vibrations caused by unbalanced wheels. They do, however, disappear when the tire warms up. The degree to which flat spots form depends on the type of cord used in the tire. In cold weather, it takes longer for the tire to warm up and consequently longer for the flat spot to disappear.

**CAUTION**

The vehicle must not be driven with wheels of different dimensions or with a spare tire other than the one that came with the vehicle. The use of different size wheels can seriously damage your vehicle's transmission.

pg. 115 Wheels and tires

**Snow chains**

Snow chains can be used on your Volvo with the following restrictions:

- Snow chains should be installed on front wheels only. Use only Volvo approved snow chains.
- If accessory, aftermarket or "custom" tires and wheels are installed and are of a size different than the original tires and wheels, chains in some cases **CANNOT** be used. Sufficient clearances between chains and brakes, suspension and body components must be maintained.
- Some strap-on type chains will interfere with brake components and therefore **CANNOT** be used.
- **All Wheel Drive models:** Snow chains should only be installed on the **front** wheels. Only chains adapted for AWD models should be used.

**NOTE:** Consult your Volvo retailer for additional snow chain information.

**CAUTION**

- Check local regulations regarding the use of snow chains before installing.
- Always follow the chain manufacturer's installation instructions carefully. Install chains as tightly as possible and retighten periodically.
- Never exceed the chain manufacturer's specified maximum speed limit. (Under no circumstances should you exceed 31 mph 50 km/h)
- Avoid bumps, holes or sharp turns when driving with snow chains.
- The handling of the vehicle can be adversely affected when driving with chains. Avoid fast or sharp turns as well as locked wheel braking.

**Snow tires, studded tires\***

Tires for winter use:

Owners who live in or regularly commute through areas with sustained periods of snow or icy driving conditions are strongly advised to fit suitable winter tires to help retain the highest degree of traction.

It is important to install winter tires on all four wheels to help retain traction during cornering, braking, and accelerating. Failure to do so could reduce traction to an unsafe level or adversely affect handling. Do not mix tires of different design as this could also negatively affect overall tire road grip.

Volvo recommends 225/70 R16 (235/65 R17 on seven-seat models with the T6 turbo engine) winter tires on all four wheels.

Winter tires wear more quickly on dry roads in warm weather. They should be removed when the winter driving season has ended.

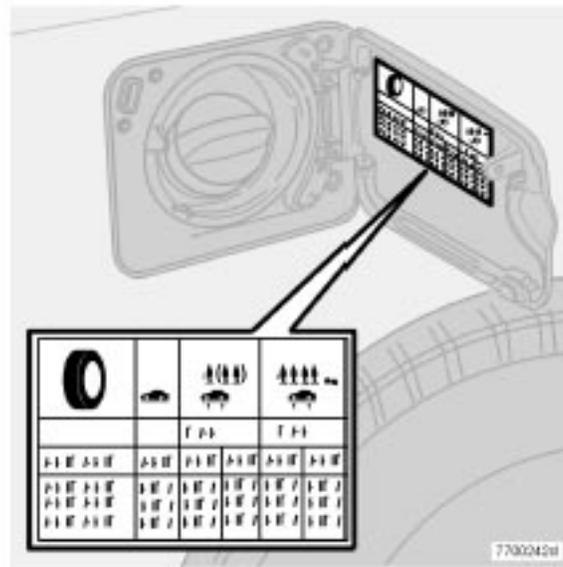
Studded tires should be run-in 300-600 miles (500 -1000 km) during which the vehicle should be driven as smoothly as possible to give the studs the opportunity to seat properly in the tires. The tires should have the same rotational direction throughout their entire lifetime. In other words, if you wish to rotate the wheels, make sure that the same wheels are always on the same side of the vehicle.

**NOTE:** Please consult state or provincial regulations restricting the use of studded winter tires before installing such tires.

\* Where permitted

pg. 116 Wheels and tires

## Tire pressure



*Tire pressure label*

### Checking and correcting tire pressure

The tire pressure label is located on the inside of the fuel filler door.

- Check the tire pressure regularly.
- The tire pressure should be corrected only when the tires are cold.

- With warm tires, correct only when the pressure is too low. The tire temperature rises after driving just a few miles.

### Vehicle loading

The tires on your Volvo will perform to specifications at all normal loads when inflated as recommended on the tire information label located on the inside of the fuel filler door. This label lists both tire and vehicle design limits. Do not load your vehicle beyond the load limits indicated.

#### **WARNING!**

Improperly inflated tires will reduce tire life, adversely affect vehicle handling and can possibly lead to failure resulting in loss of vehicle control without prior warning.

### Temporary Spare

The spare tire in your vehicle is called a "Temporary Spare".

Recommended tire pressure (see decal on Fuel filler door) should be maintained irrespective which position on the vehicle the Temporary Spare tire is used on. In the event of damage this tire, a new one can be purchased from your Volvo retailer.

#### **WARNING!**

Current legislation prohibits the use of the Temporary Spare" tire other than as a temporary replacement for a punctured tire. It must be replaced as soon as possible by a standard tire. Road holding and handling may be affected with the "Temporary Spare" in use. Do not exceed 50 mph (80 km/h). Do not drive farther than 50 miles (80 km) on a temporary spare tire.

#### **CAUTION**

The vehicle must not be driven with wheels of different dimensions or with a spare tire other than the one that came with the vehicle. The use of different size wheels can seriously damage your vehicle's transmission.

The temporary spare tire is for temporary, low-speed, short-distance use only. Replace it with a full-sized tire as soon as possible, in accordance with "Tire Rotation" in the previous paragraph. Do not drive on the temporary spare at speeds above 50 m.p.h. (80km/h) or for distances greater than 50 miles (80 km). Never install snow chains on a temporary spare.

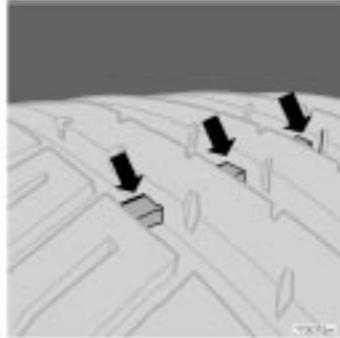
**NOTE:** Certain models may be equipped with a full-size spare tire. When used, it should be inflated to the same pressure as the tire it is replacing.

## Tire Rotation

Volvo recommends rotating the tires every 7,500 miles (12,000 km). Tires should be rotated front-to-back/back-to-front only. Tires must maintain the same direction of rotation throughout their lifetime, and should never be rotated from one side of the vehicle to the other.

pg. 117 Wheels and tires

## Tire wear indicators



### Tires have tread wear indicators

The tires have wear indicator strips running across or parallel to the tread. When approx. 1/16 inches (1.6 mm) is left on the tread, these strips become visible and indicate that the tire should be replaced.

Tires with less than 1/16" (1.6 mm) tread have a very poor grip in rain or snow.

When replacing worn tires, it is recommended that the tire be identical in type (radial) and size as the one being replaced. Using a tire of the same make (manufacturer) will prevent alteration of the driving characteristics of the vehicle.

pg. 118 Wheels and tires

## Uniform Tire Quality Grading

**ALL PASSENGER VEHICLE TIRES MUST CONFORM TO FEDERAL SAFETY REQUIREMENTS IN ADDITION TO THESE GRADES**

**Quality grades can be found, where applicable, on the tire sidewall between the tread shoulder and maximum section width. For example:**

**Treadwear 200 Traction AA Temperature A**

## TREADWEAR

The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course. For example, a tire graded 150 would wear one and one half (1 1/2) times as well on the government course as a tire graded 100. The relative performance of tires depends upon the actual conditions of their use, however, and many depart significantly from the norm due to variation in driving habits, maintenance practices and differences in road characteristics and climate.

## TRACTION

The traction grades, from highest to lowest, are AA, A, B, and C, as measured under controlled conditions on specified government test surfaces of asphalt and concrete. A tire marked C may have poor traction performance.

**WARNING!**

The traction grade assigned to this tire is based on braking (straight-ahead) traction tests and is not a measure of cornering (turning) traction.

## TEMPERATURE

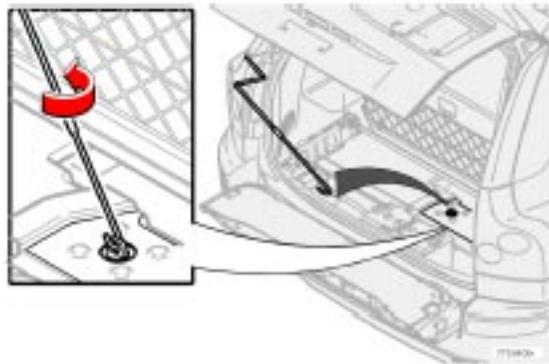
The temperature grades are AA (the highest), A, B, and C, representing the tire's resistance to the generation of heat and its ability to dissipate heat when tested under controlled conditions on specified indoor laboratory test wheel. Sustained high temperature can cause the material of the tire to degenerate and reduce tire life, and excessive temperature can lead to sudden tire failure. The grade C corresponds to minimum level of performance that all passenger vehicle tires must meet under the Federal Motor Safety Standard No. 109. Grades B and A represent higher levels of performance on the laboratory test wheel than the minimum required by law.

**WARNING!**

The temperature grade for this tire is established for a tire that is properly inflated and not overloaded. Excessive speed, underinflation, or excessive loading, either separately or in combination, can cause heat buildup and possible tire failure.

pg. 119 Wheels and tires

## Changing wheels



*Lowering the spare wheel*

## Changing wheels - lowering the spare wheel

The spare wheel is located under the floor of the rear cargo compartment. It can be lowered using the crank that is stored in the tool bag.

### **WARNING!**

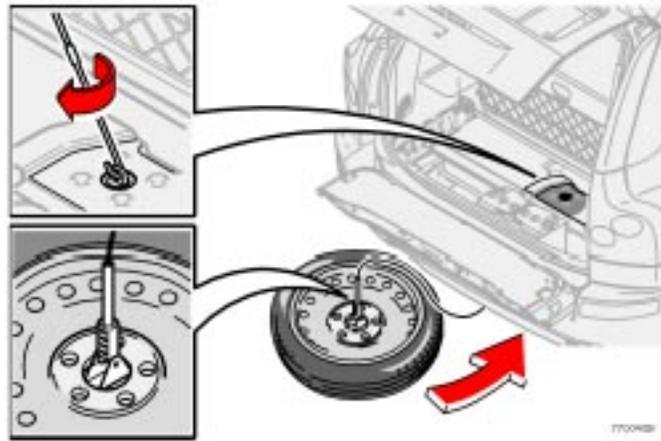
When raising or lowering the spare wheel, please keep in mind that components in the exhaust system may be very hot.

### **Lowering the spare wheel:**

1. Fold down the lower section of the tailgate.
2. Fold up the rear section of the floor in the cargo compartment.
3. Take the two sections of the crank from the tool bag and connect them to each other.
4. Insert the hooked end of the crank in the spare wheel retaining attachment (see the illustration above).
5. Lower the spare wheel under the vehicle by turning the crank counterclockwise until it is not possible to turn it further.
6. Pivot the toggle at the end of the cable 90 degrees to release it from the spare wheel.
7. Crank up the cable again by turning the crank clockwise.
8. Place the wheel with the flat tire in the vehicle's cargo compartment. There is a plastic storage bag for this purpose in the tool bag.

### **CAUTION**

When the spare wheel is mounted on the vehicle, the retaining cable could damage the underside of the vehicle if it is not retracted.



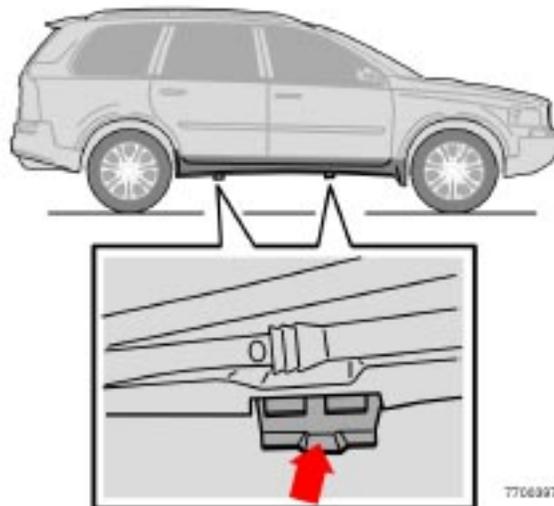
*Returning the spare wheel to its storage compartment*

**NOTE:** The space under the vehicle is designed to hold the special spare wheel only. Other fullsize wheels will not fit in this compartment.

### **Returning the spare wheel to the storage compartment**

1. Use the crank (turn it counterclockwise) to lower the spare wheel's retaining cable.
2. Pass the toggle at the end of the cable through the center hole in the spare wheel. Pivot the toggle 90 degrees so that when raised, the wheel will rest on the toggle.
3. Retract the retaining cable slightly by slowly turning the crank clockwise several times.
4. Position the wheel so that it is not obstructed by components in the exhaust system.
5. Continue to raise the wheel by turning the crank clockwise. Raise the wheel a little bit at a time and guide it around the rear axle until it is securely seated in the storage area.
6. When it is no longer possible to turn the crank any further, check that the spare wheel is securely in position in the storage compartment.

pg. 120 Wheels and tires



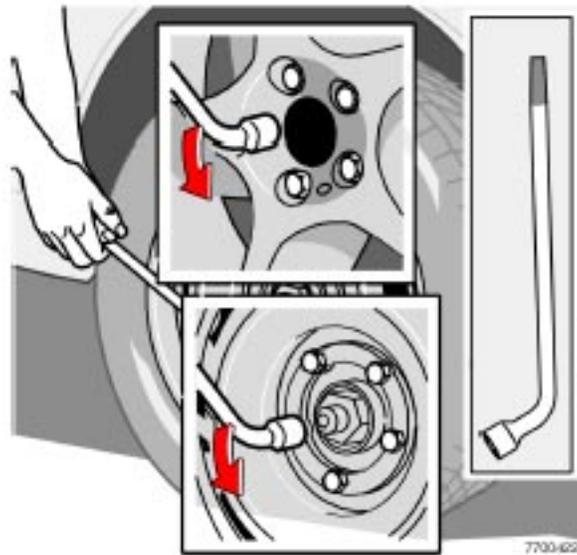
*Jack attachment points*

## Changing a wheel

There are two attachment points for the jack on each side of the vehicle. These attachment points are under the center of each door. The jack is located in the storage compartment under the cargo area floor (to the right in five-seat models and in the center in seven-seat models), and the crank is stored in the tool bag.

### WARNING!

- There is an attachment point on each side of the vehicle located under the pillars between the front and rear doors. This point is used during the production process only, and is NOT intended for attaching the jack.
- The undersides of accessory running boards are not intended for attaching the jack.



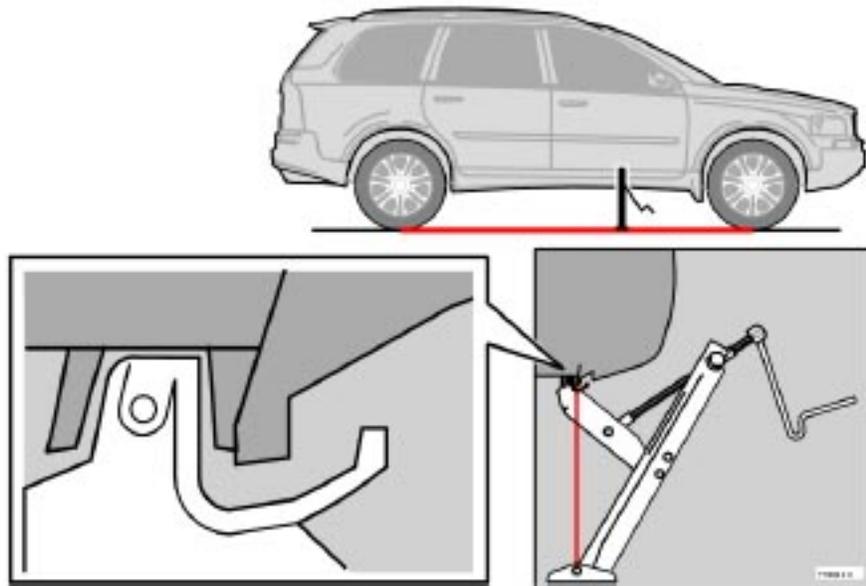
### To change a wheel:

1. Park the vehicle on a firm, level, nonslippery surface.
2. Engage the parking brake and put the gear selector in the Park position.
3. Loosen the wheel bolts by exerting downward pressure on the lug wrench.
4. Remove the wheel cap (where applicable) using the lug wrench in the tool kit.
5. With the wheels still on the ground, use the lug wrench to loosen the wheel bolts 1/2 - 1 turn. Turn the bolts counterclockwise to loosen the bolts.

**CAUTION**

- The vehicle must not be driven with wheels of different dimensions or with a spare tire other than the one that came with the vehicle. The use of different size wheels can seriously damage your vehicle's transmission.
- Correct tightening torque on wheel bolts must be observed.
- The wheel bolts should never be greased or lubricated.
- Extended, chromed wheel bolts must not be used with steel rims, as they make it impossible to fit the hub caps.

pg. 121 Wheels and tires



*Attaching the jack*

- Position the jack correctly on the bar in the attachment (see illustration above) and crank while simultaneously guiding the base of the jack to the ground. The base of the jack must be flat on a level, firm, non-slippery surface. Before raising the vehicle, check that the jack is still correctly positioned in the attachment.
- Raise the vehicle until the wheel to be changed is lifted off the ground.
- Unscrew the wheel bolts completely and carefully remove the wheel so as not to damage the threads on the studs.

**NOTE:** To avoid excessive wear and the necessity of rebalancing, mark and reinstall wheels in the same location and position as before removal. To lessen the chance of imbalance, each wheel hub is equipped with a guide stud to ensure that a removed wheel can be reinstalled in its original position (as when changing over to winter tires/wheels).

**Installing the wheel**

- Clean the contact surfaces on the wheel and hub.

- Lift the wheel and place it on the hub.
- Install the wheel bolts and tighten handtight. Using the lug wrench, tighten crosswise until all bolts are snug.
- Lower the vehicle to the ground and alternately tighten the bolts crosswise to 102 ft. lbs. (140 Nm).
- Install the wheel cap (where applicable).

 **WARNING!**

- The jack must correctly engage the bar in the jack attachment. The vehicle's weight must not rest on the jack attachment. See illustration "*Attaching the jack*" above. Be sure the jack is on a firm, level, non-slippery surface.
- Never allow any part of your body to be extended under a vehicle supported by a jack.
- Use the jack intended for the vehicle when replacing a wheel. For any other job, use stands to support the side of the vehicle being worked on.
- Apply the parking brake and put the gear selector in the (P)ark position (or reverse on manual transmissions).
- Block the wheels standing on the ground, use rigid wooden blocks or large stones. The jack should be kept well-greased.

pg. 122 Wheels and tires

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[Contents](#) | [Top of Page](#)

# 2003 VOLVO XC90

## Maintenance

pg. 123 Maintenance

[Volvo maintenance](#) [124](#)

[Working on your vehicle](#) [126](#)

[Engine compartment](#) [128](#)

[Oils and fluids](#) [129](#)

[Battery maintenance](#) [134](#)

[Bulbs](#) [137](#)

[Fuses](#) [145](#)

pg. 124 Maintenance

## Volvo Maintenance

Maintenance Volvo advises you to follow the maintenance program outlined in the Warranty and Service Records Information booklet. This maintenance program contains inspections and services necessary for the proper function of your vehicle. The maintenance services contain several checks which require special instruments and tools and therefore must be performed by a qualified technician. To keep your Volvo in top condition, specify time-tested and proven Genuine Volvo Parts and Accessories.

### **The Federal Clean Air Act - U.S.**

The Federal Clean Air Act requires vehicle manufacturers to furnish written instructions to the ultimate purchaser to assure the proper servicing and function of the components that control emissions. These services, which are listed in the "Warranty and Service Records Information booklet," are not covered

by the warranty. You will be required to pay for labor and material used.

## **Maintenance**

Your Volvo passed several major inspections before it was delivered to you, in accordance with Volvo specifications. The maintenance outlined in the Warranty and Service Records Information booklet, many of which will positively affect your vehicle's emissions, should be performed as indicated. It is recommended that receipts for vehicle emission maintenance be retained in case questions arise concerning maintenance.

Inspection and maintenance should also be performed anytime a malfunction is observed or suspected.

[Page 125](#) provides more information about maintenance of emission-related components.

## **Applicable warranties - U.S./Canada**

In accordance with applicable U.S. and Canadian regulations, the following list of warranties is provided.

- New Vehicle Limited Warranty
- Parts and Accessories Limited Warranty
- Corrosion Protection Limited Warranty
- Seat Belt and Supplemental Restraint Systems Limited Warranty
- Emission Design and Defect Warranty
- Emission Performance Warranty These are the federal warranties; other warranties are provided as required by state/provincial law. Refer to your separate Warranty and Service Records Information booklet for detailed information concerning each of the warranties.

pg. 125 Maintenance

## **Periodic maintenance helps minimize emissions**

Periodic maintenance will help keep your vehicle running well. Your Warranty and Service Records Information booklet provides a comprehensive periodic maintenance schedule up to 150,000 miles (240,000 km) of vehicle maintenance. The schedule includes components that affect vehicle emissions. This page describes some of the emission-related components.

### **Engine air filter**

The engine air filter cleans particles from air entering the engine. Replace the engine air filter cartridge with a new one every 37,500 miles (60,000 km) under normal driving conditions. Replace the cartridge more often when the vehicle is driven under dirty and dusty conditions. The cartridge cannot be cleaned, and should always be replaced with a new one.

### **Fuel filter**

The fuel filter should be replaced at 120,000 miles (193,000 km). The filter is replaced as a complete unit. Replace more frequently if contaminated fuel is introduced into the tank, or if there is reason to suspect that this has occurred.

### **Fuel system, including filler cap, tank, lines, and connections**

The ability of the fuel system to contain hydrocarbons depends upon a leak-free system. Inspect fuel lines every 30,000 miles (48,000 km). Check for proper sealing of the fuel filler cap, which contains "O" ring seals.

**NOTE:** If the fuel filler cap is not closed tightly or if the engine is running when the vehicle is refueled, the Check Engine light (Malfunction Indicator) may indicate a fault. However, your vehicle's performance will not be affected. Use only Volvo original or approved fuel filler caps.

### **Timing belt**

For proper functioning of the engine and emission control systems, the timing belt and belt pretensioner must be replaced every 120,000 miles (193,000 km). Engine damage will occur if the belt fails.

### **PCV system**

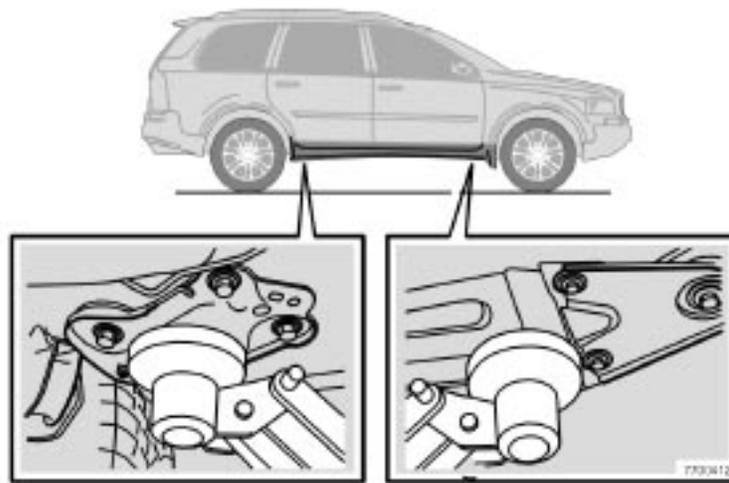
(on turbocharged models)

The nipple in the intake manifold and the filter at the end of the PCV hose in the air cleaner should be inspected and cleaned at 120,000 miles (193,000 km), and again at 150,000 miles (240,000 km).

### **Spark plugs**

The spark plugs should be replaced every 60,000 miles (96,000 km) under normal driving conditions. City driving or fast highway driving may necessitate replacement sooner.

Under normal driving conditions, spark plugs require no maintenance between replacement intervals. When installing new plugs, be sure to use the right type and to tighten them correctly. When changing the plugs, clean the terminals and rubber seals. Also check that the suppressor connectors are in good condition. Cracked or damaged connectors should be replaced.



*Reinforced lifting points*

## Working on your vehicle

### Hoisting the vehicle

If a garage jack is used to lift the vehicle, the two jack attachment points should be used. They are specially reinforced to bear the weight of the vehicle (see the illustration above). A garage jack can also be placed under the front of the engine support frame. Take care not to damage the splash guard under the engine. Ensure that the jack is positioned so that the vehicle cannot slide off it. Always use axle stands or similar structures. The car's gross vehicle weight is between 5770 lb (2630 kg) and 6080 lb (2760 kg). Use a jack and stands rated for this weight.

If a two-post hoist is used to lift the vehicle, the front and rear lift arm pads should be centered under the reinforced lift plates on the inboard edge of the sill rail (see illustration).

### **Please note the following before you begin working on your vehicle:**

#### **Battery (see also [page 136](#) for more information on handling the battery)**

- Ensure that the battery cables are correctly connected and tightened.
- Never disconnect the battery when the engine is running (e.g. when replacing the battery).
- The battery contains acid that is both corrosive and poisonous. It is important that the battery is handled in an environmentally friendly way. Let your Volvo retailer assist you.
- Never use a fast charger to charge the battery. The battery cables should be disconnected when recharging.

 **WARNING!**

The ignition system has very high voltage! The voltage in the ignition system is dangerous!

Do not touch spark plugs, ignition cables or the ignition coil when the engine is running or the ignition is switched on!

**The ignition should be switched off when:**

- Conducting engine tests.
- Replacing parts in the ignition system, such as spark plugs, ignition coil, distributor, ignition cables, etc.
- Never try to repair any part of the SRS/ SIPS/WHIPS/IC systems yourself. Any interference in the system could cause malfunction and serious injury. Any work should only be performed by an authorized Volvo workshop.

pg. 127 Maintenance

**Belt check**

Check the belt regularly to make sure it is in good condition and is clean. A worn or dirty belt can cause poor cooling and low alternator output as well as impair the operation of the power steering and the air conditioning unit.

**NOTE:** The drive belt is equipped with a self-tensioning mechanism and requires no adjustment between changes.

 **WARNING!**

The engine must not be running when this check is performed.

**Check coolant level**

The cooling system must be filled with coolant and not leak to operate at maximum efficiency. Check the coolant level regularly. The level should be between the "MAX" and "MIN" marks on the expansion tank. The check should be made with particular thoroughness when the engine is new or when the cooling system has been drained.

Do not remove the filler cap other than for topping up with coolant. Frequent removal may prevent coolant circulation between the engine and the expansion tank during engine warm up and cooling.

**Changing coolant**

Normally, the coolant does not need to be changed. If the system must be drained, consult your Volvo retailer.

**NOTE:** Do not top off with water only. This reduces the rust-protective and antifreeze qualities of the coolant and has a lower boiling point. It can also cause damage to the cooling system if it should freeze. Top off with Volvo Genuine Coolant/Antifreeze only (a 50/50 mix of water and antifreeze).

### CAUTION

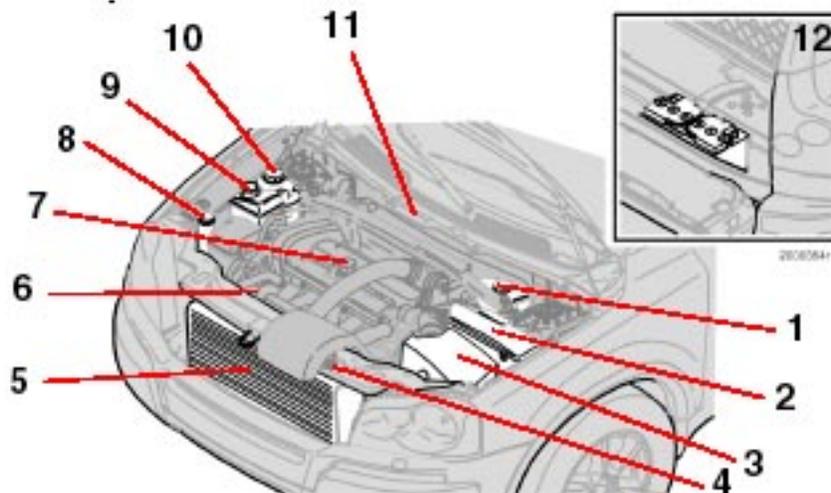
The cooling system must always be kept filled to the correct level. If it is not kept filled, there can be high local temperatures in the engine which could result in damage. Different types of antifreeze/coolant may not be mixed.

### WARNING!

Never remove the radiator cap while the engine is warm. Wait until the vehicle cools.

pg. 128 Maintenance

## Engine compartment



### Engine compartment

1. Brake fluid reservoir
2. Relay/fuse box
3. Air cleaner
4. Cooling fan
5. Radiator

6. Dipstick - engine oil
7. Filler cap - engine oil
8. Washer fluid reservoir
9. Power steering fluid reservoir
10. Expansion tank - coolant
11. Data plate
12. Battery (under floor in rear cargo area)

**WARNING!**

The cooling fan (4) may start or continue to operate (for up to 6 minutes) after the engine has been switched off.

pg. 129 Maintenance

## Oil and fluids

### Oil quality

Engine oil must meet the minimum ILSAC specification GF-2, including ACEA A1, API SJ, SJ/CF and SJ/Energy Conserving.

Your Volvo has been certified to standards using ILSAC oil specification GF-2 5W-30. Volvo recommends use of oil with a quality rating equal to or higher than ILSAC GF-2. Equivalent and better oils include ACEA A1, API SJ, SJ/CF, and SJ/Energy conserving. Lower quality oils may not offer the same fuel economy, engine performance, or engine protection.

Volvo Cars recommends Castrol.

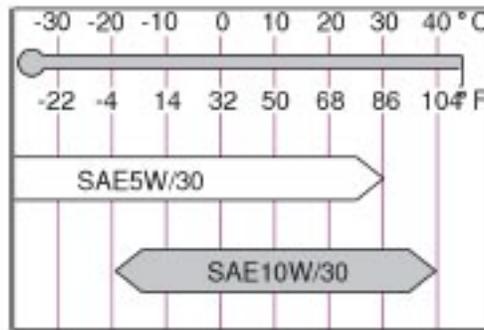
Depending on your driving habits, premium or synthetic oils may provide superior fuel economy and engine protection. Consult your Volvo retailer for recommendations on premium or synthetic oils.

### Oil additives must not be used.

**NOTE:** Synthetic oil is not used when the oil is changed at the normal maintenance is carried out. This oil is only used at customer request, at additional charge. Please consult your Volvo retailer.

### Operation in hot climates.

When temperatures exceed 86° F (30° C) in your area, Volvo recommends, for the protection of your engine, that you use a heavier weight oil, such as SAE 10W-30. See the viscosity chart below.



## Oil viscosity (stable ambient temperatures)

### Operation in temperate climates

Incorrect viscosity oil can shorten engine life. Under normal use when temperatures do not exceed 86° F (30° C), SAE 5W-30 will provide good fuel economy and engine protection. See the viscosity chart at right.

### Extreme engine operation

Synthetic oils meeting SAE 10W-30 and complying with oil quality requirements are recommended for driving in areas of sustained temperature extremes (hot or cold), when towing a trailer over long distances, and for prolonged driving in mountainous areas.

### Changing oil and oil filter

Oil and oil filter changes should be made at 7,500 mile (12,000 km) intervals.

### Volvo does not recommend the use of oil additives.

**Synthetic oil is not used when the oil is changed at the normal maintenance intervals except at owner request and at additional charge. Please consult your Volvo retailer.**



- The API Service Symbol "donut" is divided into three parts:
- The top half describes the oil's performance level.
- The center identifies the oil's viscosity.
- The bottom half tells whether the oil has demonstrated energy-conserving properties in a standard test in comparison to a reference oil.

## Oil and fluids (contd)

### Checking the oil level

The oil level should be checked every time the vehicle is refueled. This is especially important during the period up to the first maintenance.

#### CAUTION

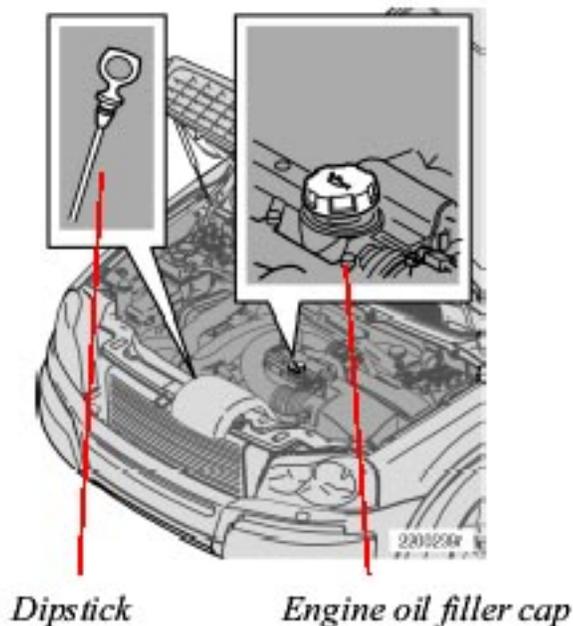
Not checking the oil level regularly can result in serious engine damage if the oil level becomes too low.

Park the vehicle on a level surface and wait for at least 5 minutes after the engine has been switched off. Be sure the oil level is maintained between the upper and lower marks on the dipstick. Low oil level can cause internal damage to the engine and overfilling can result in high oil consumption. The distance between the dipstick marks represents approx. 1.6 US qt (1.5 liter). The oil should preferably be checked when cold, before the engine has been started.

**NOTE:** The engine must be stopped when checking the oil.

#### **WARNING!**

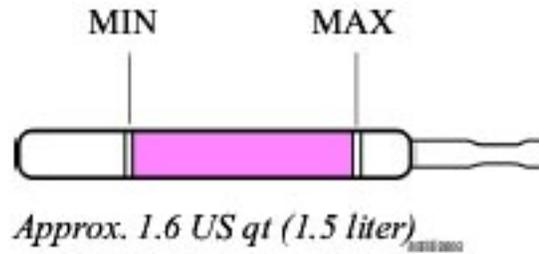
Do not allow oil to spill onto or come into contact with hot exhaust pipe surfaces.



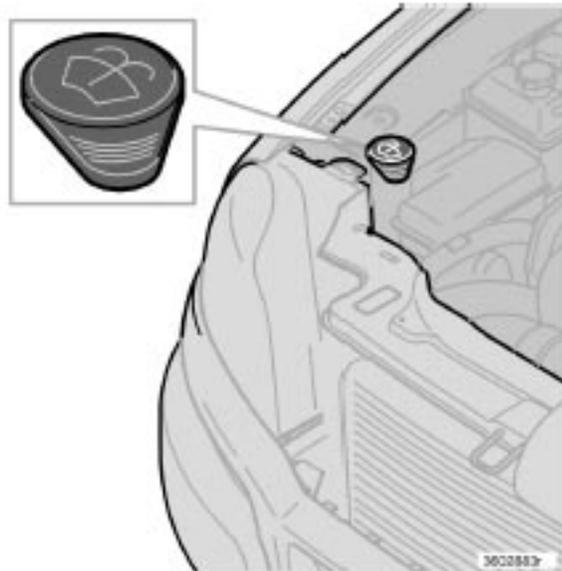
### Adding oil (topping up)

- Add oil of the same kind as already used.

- Capacity (including filter): 5-cylinder turbo engine - 6.1 US qt (5.8 liters).  
6-cylinder turbo engine - 7 US qt (6.7 liters)
- The oil filter should be replaced at every oil change.



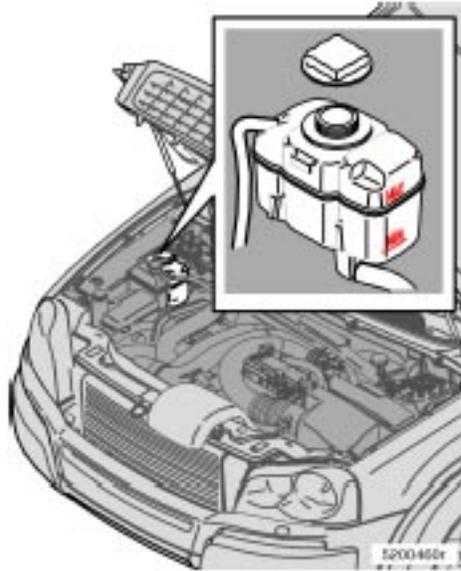
pg. 131 Maintenance



*Washer fluid reservoir*

### **Washer fluid reservoir**

The washer fluid reservoir is located in the engine compartment and holds approx. 6.8 US qt (6.5 liters). During cold weather, the reservoir should be filled with windshield washer solvent containing antifreeze.



*Coolant reservoir*

### Changing coolant

Normally, the coolant does not need to be changed. If the system must be drained, consult your Volvo retailer.

**NOTE:** Do not top off with water only. This reduces the rust-protective and antifreeze qualities of the coolant and has a lower boiling point. It can also cause damage to the cooling system if it should freeze. Top off with Volvo Genuine Coolant/Antifreeze only (a 50/50 mix of water and antifreeze).

### CAUTION

The cooling system must always be kept filled to the correct level. If it is not kept filled, there can be high local temperatures in the engine which could result in damage. Different types of antifreeze/coolant may not be mixed.

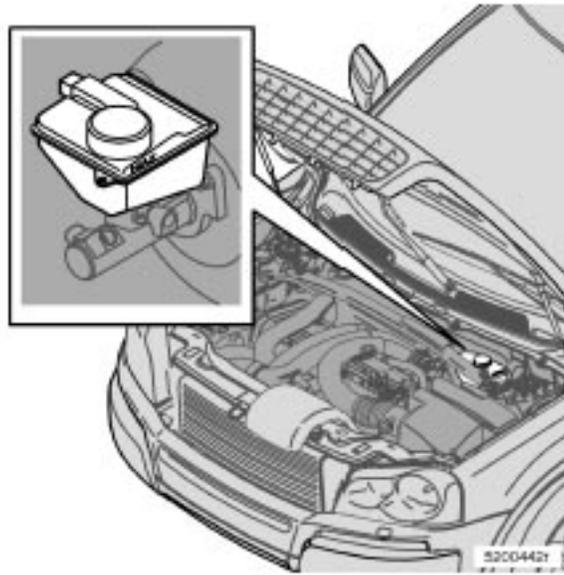
Check coolant regularly!

### WARNING!

- Never remove the radiator cap while the engine is warm. Wait until the vehicle cools.
- If it is necessary to top up the coolant when the engine is warm, unscrew the expansion tank cap slowly so that the overpressure dissipates.

pg. 132 Interior

## Oil and fluids (contd)



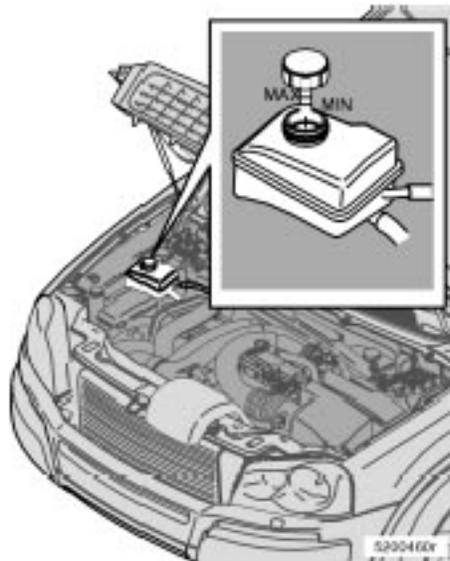
### **Brake fluid reservoir**

The brake fluid should always be above the MIN mark on the side of the reservoir. Check, without removing the cap, that there is sufficient fluid in the reservoir.

**Fluid type :** DOT 4+ boiling point >536°F (280°C), P/N 9437433

**Replace :** Every second year or 30,000 miles (48,000 km). The fluid should be replaced once a year or every 15,000 miles (24,000 km) when driving under extremely hard conditions (mountain driving, etc.)

Always entrust brake fluid changing to an authorized Volvo retailer.

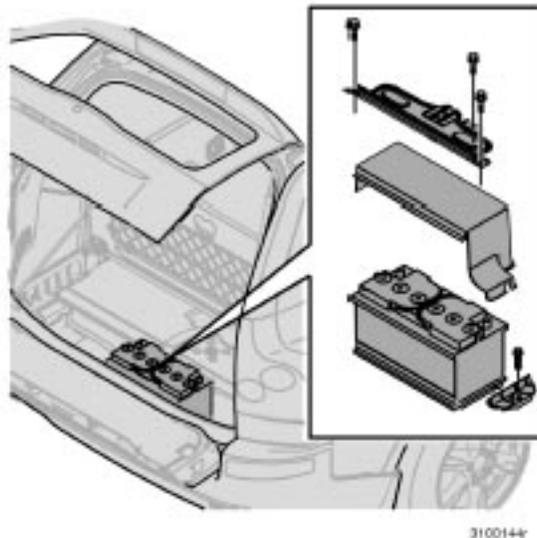


### **Power steering fluid reservoir**

The fluid level should always be between the MIN and MAX marks. **Fluid type :** ATF

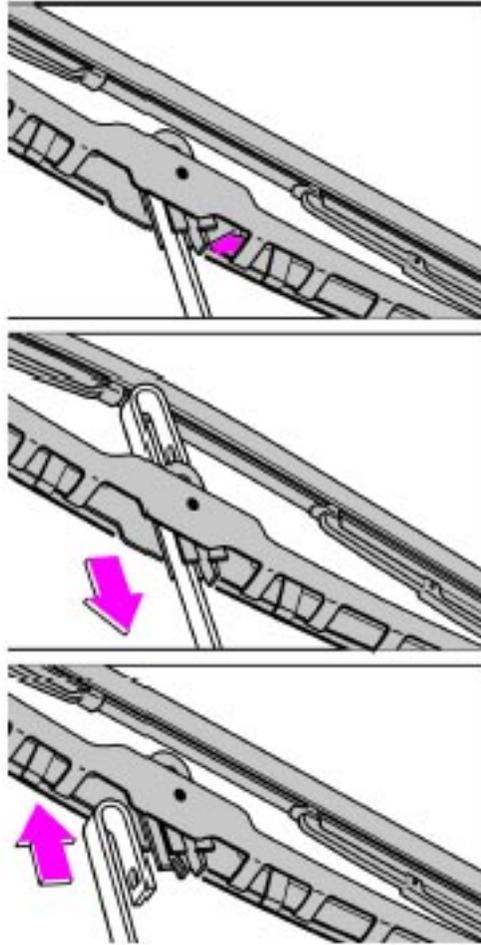
**Replace :** No fluid change required

**NOTE:** If a problem should occur in the power steering system or if the vehicle has no electrical current and must be towed, it is still possible to steer the vehicle. However, keep in mind that greater effort will be required to turn the steering wheel.



pg. 133 Interior

## Wiper blades

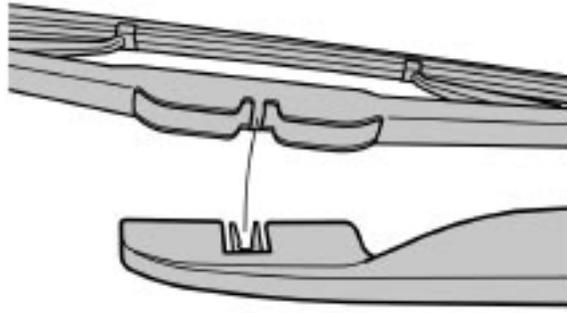


**NOTE:** The driver's side wiper blade is straight. The passenger's side wiper blade is curved to match the curve at the base of the windshield.

### Replacing windshield wiper blades

1. Lift the wiper arm off the windshield and hold the blade at a 45° to the arm. Press the end of the plastic clip located on the arm.
2. Slide the wiper blade along the arm to release it from the hook. The entire hooked part of the wiper arm must pass through the opening in the wiper blade.
3. Pull the old blade free of the wiper arm. Install the new blade (installation is the reverse of removal) and make sure that it is properly attached to the wiper arm (clicks into place).

**NOTE:** For reasons of safety, you should change the windshield wiper blades as soon as they start to leave marks on the windshield or fail to wipe efficiently and cleanly. To obtain maximum lifetime from a set of wiper blades, clean them with a stiff-bristle brush and warm, soapy water as part of a normal car wash.

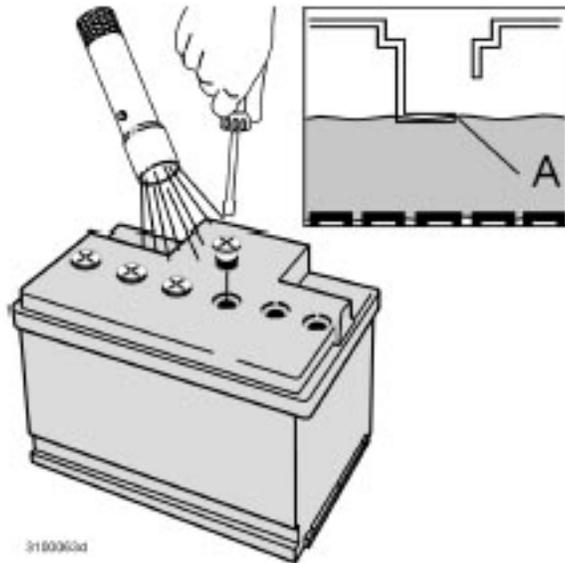


### **Tailgate wiper blade**

1. Pull the wiper blade out, away from the tailgate window.
2. Pull the wiper blade outward, toward the tailgate.
3. Press the new wiper blade into place. Check that it is properly secured.



[Contents](#) | [Top of Page](#)



## Battery Maintenance

The battery in your vehicle is located under the floor of the cargo compartment.

Driving habits and conditions, climate, the number of starts, etc. all affect the service life and function of the battery. In order for your battery to perform satisfactorily, keep the following in mind:

- Check the fluid level in each cell in the battery every 24 months or every 15,000\* miles (24,000 km), whichever is sooner. The fluid should be at the level shown in the illustration above (A)\*\*.
- Use a screw driver to open the caps and a flashlight to inspect the level.
- If necessary, add distilled water. The level should never be above the indicator (A\*\*).
- The fluid level should be checked if the battery has been recharged.
- After inspection, be sure the cap over each battery cell is securely in place.
- Check that the battery cables are correctly connected and properly tightened. Route ventilation hose through opening in floor (see [page 135](#))
- Never disconnect the battery when the engine is running, for example when changing the battery.
- The battery should be disconnected from the vehicle when a battery charger is used directly on the battery.
- However, if the battery is being charged via the connecting points in the engine compartment (see [page 102](#)), the battery must be connected.

\* More frequently in warm climates.

\*\* The level indicator inside the battery could be designed in various ways. See illustration.



Wear protection goggles



See owner's manual for details



Keep away from children



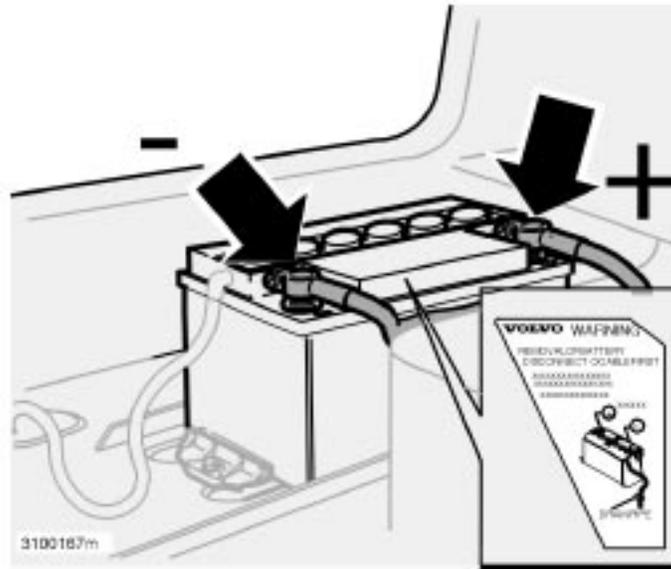
Corrosive



No smoking, no open flames, no sparks

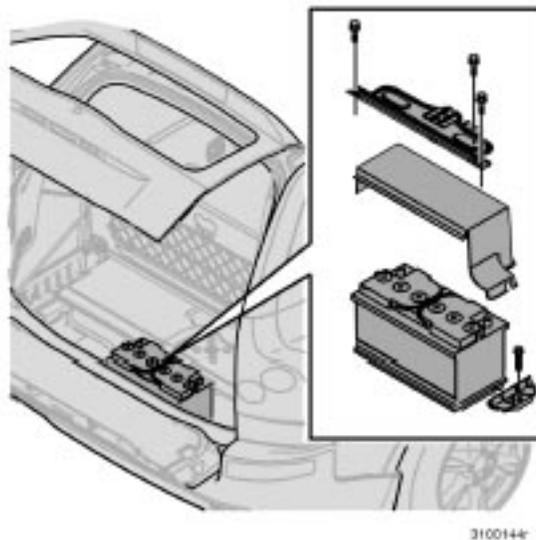


Explosion



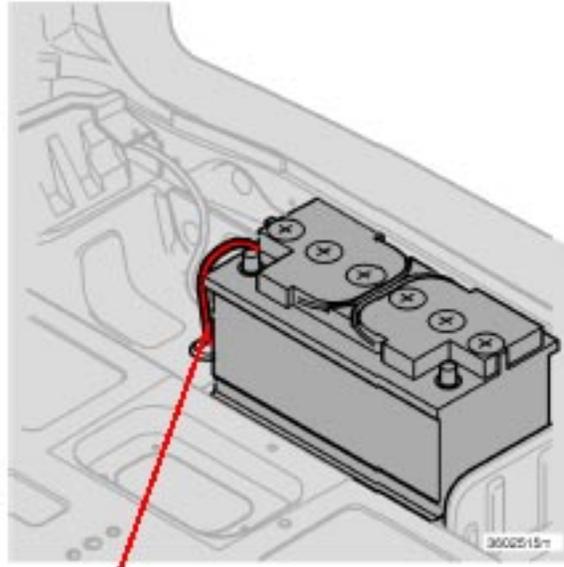
## Replacing the battery

1. Switch off the ignition.
2. **Wait at least 5 minutes after switching off the ignition before disconnecting the battery** so that all information in the vehicle's electrical system can be stored in the control modules.
3. Remove the retaining bracket and unscrew the cover over the battery. Wait at least 5 minutes after switching off the ignition before disconnecting the battery so that all information in the vehicle's electrical system can be stored in the control modules.
4. Disconnect the negative (ground) cable first.



5. Disconnect the positive cable and pull the ventilation hose (see next page) from the battery.
6. Lift out the old battery and put a new battery into place.
7. Connect the positive cable first.
8. Connect the negative (ground) cable.
9. Be sure that the ventilation hose (see below) is securely connected to the battery and that the other end of the hose is properly routed through the ventilation opening in the floor of the battery compartment.

10. Reinstall the cover and retaining bracket and screw it securely in place.



*ventilation hose*

**⚠ WARNING!**

- Never expose the battery to open flame or electric spark.
- Do not smoke near the battery.
- Battery fluid contains sulfuric acid. Do not allow battery fluid to contact eyes, skin, fabrics or painted surfaces. If contact occurs, flush the affected area immediately with water. Obtain medical help immediately if eyes are affected.

pg. 136 Maintenance

**Battery Maintenance (contd)**

**⚠ WARNING!**

**Ventilation hose:** The battery generates hydrogen gas, which is flammable and explosive. The battery is fitted with a ventilation hose which vents hydrogen gas out of the battery compartment through a ventilation opening in the bottom of this compartment. If the battery must be replaced, it is essential that the ventilation hose is properly connected to the battery and that it is routed through the ventilation opening provided (see illustration).

Be sure the ventilation hose is free of debris. Only use replacement batteries equipped with a ventilation hose. Consult your Volvo retailer.

**NOTE:** After the battery has been disconnected or replaced, lock and unlock the vehicle with the central

locking system's remote control to reactivate such features as the power windows, moonroof, courtesy lighting, etc.

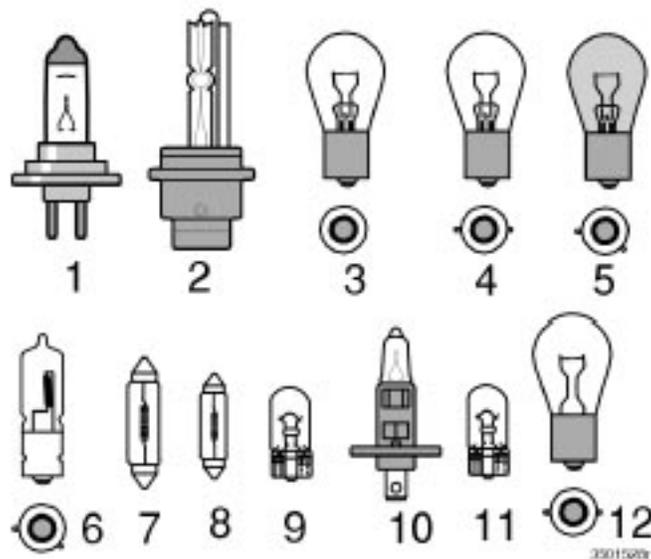
**⚠ WARNING!**

**PROPOSITION 65 WARNING!**

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and reproductive harm. Wash hands after handling.

pg. 137 Maintenance

## Bulbs



**The following bulbs are used in the vehicle:**

1. Low beam/high beam - 55W H7
2. Bi-Xenon headlight (option) - 35W D2R
3. Backup light - 21 W BA15
4. Brake light - 21W BA15
5. Turn signals, rear - PY21W(amber bulb)
6. Turn signals, front - H21W
7. Door step courtesy light/cargo area lighting - W5W
8. Vanity mirror - 1,2W
9. License plate lighting/parking light in headlight/side marker light, rear W5W  
Side turn signal - W5W (amber bulb)
10. Fog lights, front - 55W H1
11. Fog light, rear - 21W BA5

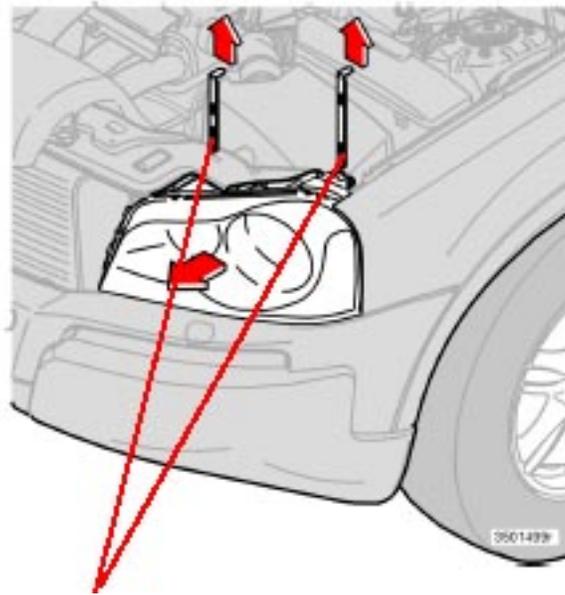
## 12. Parking lights, rear - P21/4W

- Never touch the glass of bulbs 1, 2, 3, 10 with your fingers. Grease and oils from your fingers evaporate in the heat and will leave a deposit on the reflector, quickly damaging it.
- Bi-Xenon headlight bulbs (option) contain trace amounts of mercury. These bulbs should always be disposed of by an authorized Volvo retailer.

### **WARNING!**

Bi-Xenon headlights (option) - due to the high voltage used by these headlights, these bulbs should only be replaced by an authorized Volvo service technician.

pg. 138 Maintenance



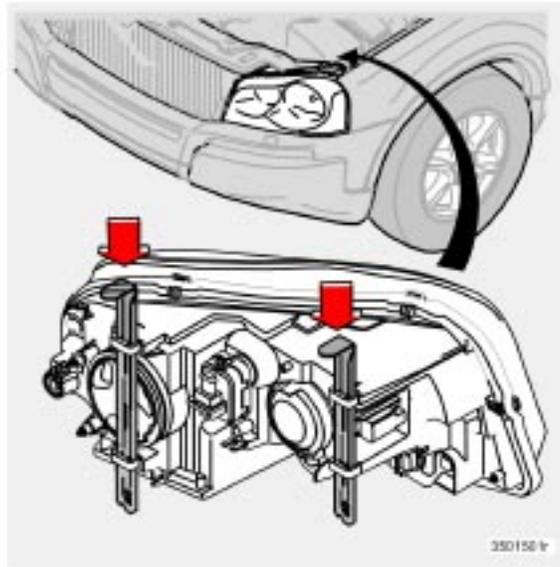
*Retaining pins*

### **Replacing high/low beams/turn signal/parking light bulbs**

The entire lamp housing must be lifted out when replacing these bulbs.

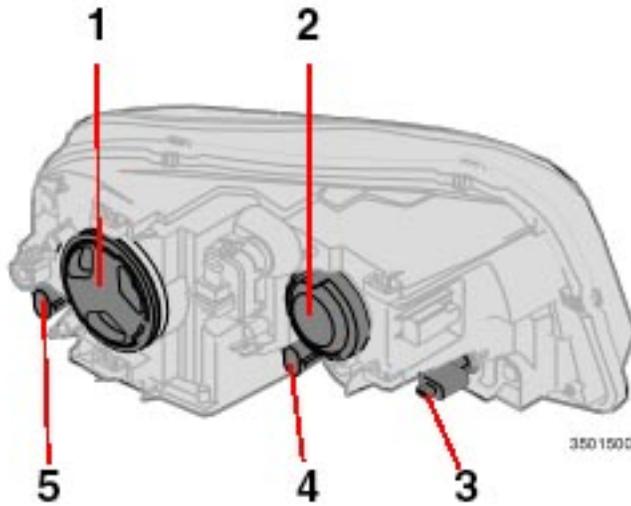
To lift out the lamp housing:

1. Switch off the ignition.
2. Open the hood.
3. Pull up the retaining pins (see the illustration above).
4. Lift out the lamp housing.



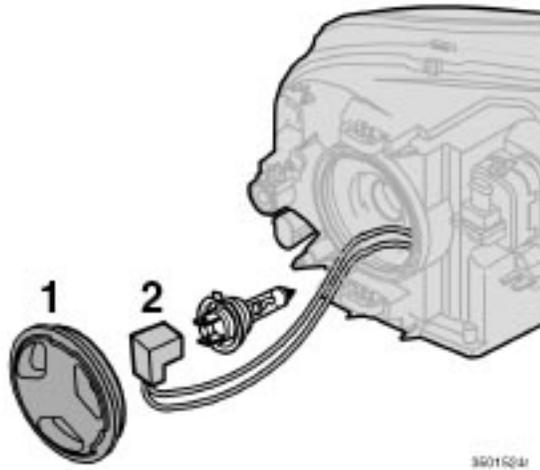
**CAUTION**

- Do not touch the glass on the halogen bulbs with your fingers. Grease, oil, or any other impurities can be carbonized onto the bulb and cause damage to the reflector.
- Be sure to use bulbs of the correct type and voltage.



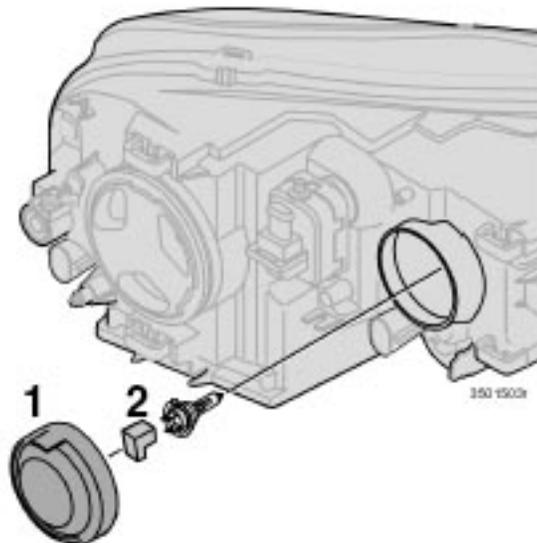
**Location of the bulbs in the headlight housing**

1. Low beam headlight/Bi-Xenon headlight (option)
2. High beam headlight
3. Turn signal
4. Parking light
5. Side marker light



### Replacing the low beam bulb

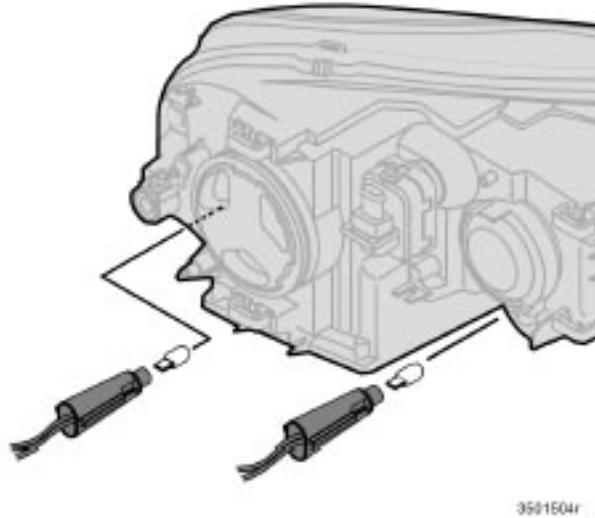
1. Remove the plastic cover over the bulb (1) by turning it counterclockwise.
2. Pull the connector from the lamp housing (2).
3. Loosen the bulb's retaining spring by first moving it to the right and then moving it out of the way.
4. Pull out the bulb from the holder.
5. Insert the new bulb (without touching the glass) in the holder.
6. Move the retaining spring up and push it slightly to the left until it seats properly.
7. Press the bulb holder into place on the headlight housing.
8. Reinstall the plastic cap. The letters "HAUT" on the cap must be upward.



### Replacing the high beam bulb

1. Remove the rubber cover over the bulb (1) by pulling it off.
2. Pull the connector from the lamp housing (2).
3. Loosen the bulb's retaining spring by first moving it to the right and then moving it out of the way.
4. Pull out the bulb from the holder.

5. Insert the new bulb (without touching the glass) in the holder.
6. Move the retaining spring up and push it slightly to the left until it seats properly.
7. Press the bulb holder into place on the headlight housing.
8. Press the rubber cover into place.

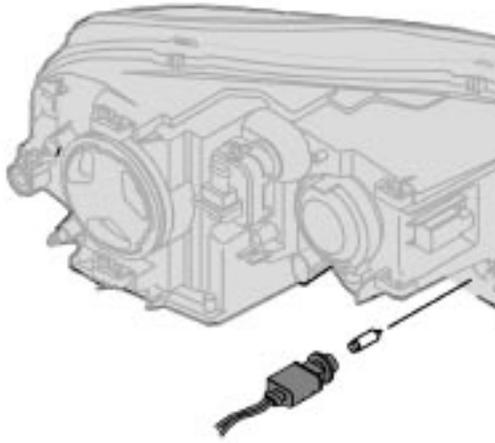


### **Replacing the parking light/side marker light bulbs**

1. Turn the lamp holder approximately 1/4 turn counterclockwise and pull it out of the headlight housing.
2. Pull the bulb straight out.
3. Align the guide lugs on the side of the base of the new bulb in the grooves in the holder and press it into place.
4. Press the lamp holder into the place in the headlight housing and turn it approximately 1/4 turn clockwise.

pg. 140 Maintenance

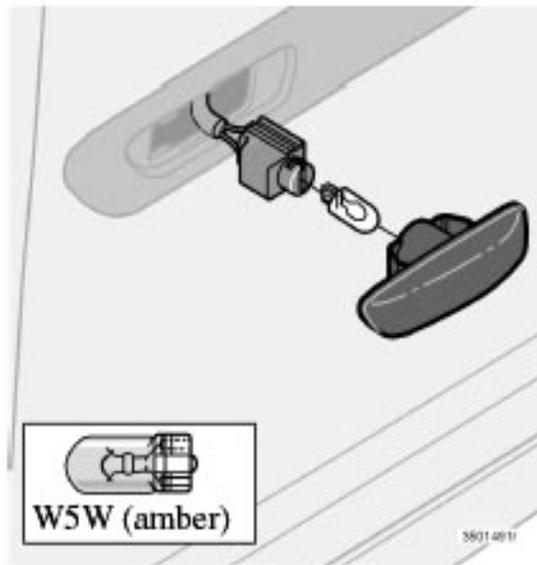
## **Bulbs (contd)**



36015271

### Replacing the turn signal bulb

1. Turn the lamp holder approximately 1/4 turn counterclockwise and pull it out of the headlight housing.
2. Press in the bulb slightly and pull it out of the holder.
3. Align the guide lugs on the side of the base of the new bulb in the grooves in the holder. Press it in and turn it slightly clockwise.
4. Press the lamp holder into the place in the headlight housing and turn it approximately 1/4 turn clockwise.

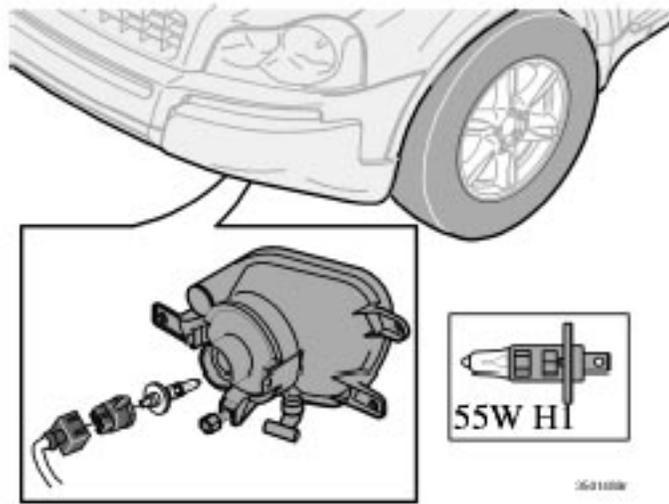


W5W (amber)

36014011

### Replacing the side turn signal bulb

1. Switch off the ignition.
2. Pry out the lens by inserting a small screw driver under the lower edge.
3. Turn the lamp holder 1/4 turn counterclockwise and pull it straight out.
4. Pull the bulb straight out of the holder.
5. Press the new bulb into the holder.
6. Reinsert the bulb holder in the lens and turn 1/4 turn clockwise.

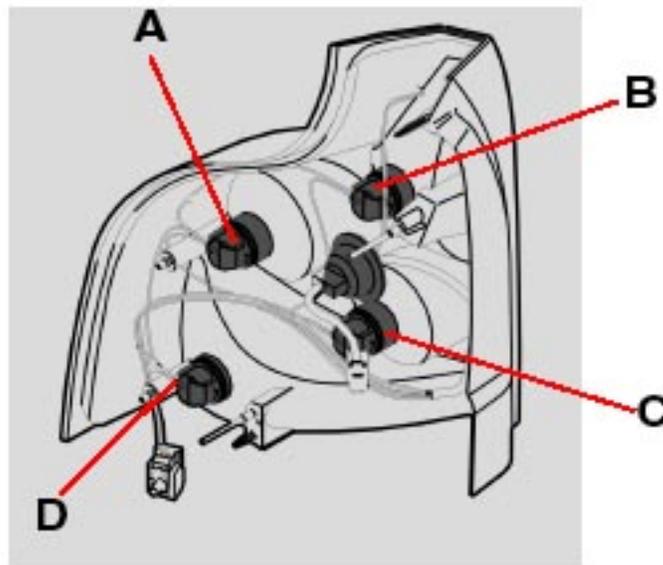


### Front fog lights

**Avoid touching the glass on the bulb with your fingers.**

1. Switch off the ignition.
2. Turn the bulb holder slightly counterclockwise to release it.
3. Replace the bulb. The shape of the foot of the bulb corresponds to the shape of the bulb holder.
4. Reinstall the bulb holder by turning it slightly clockwise. The side of the holder marked "TOP" should face upward.

pg. 141 Maintenance



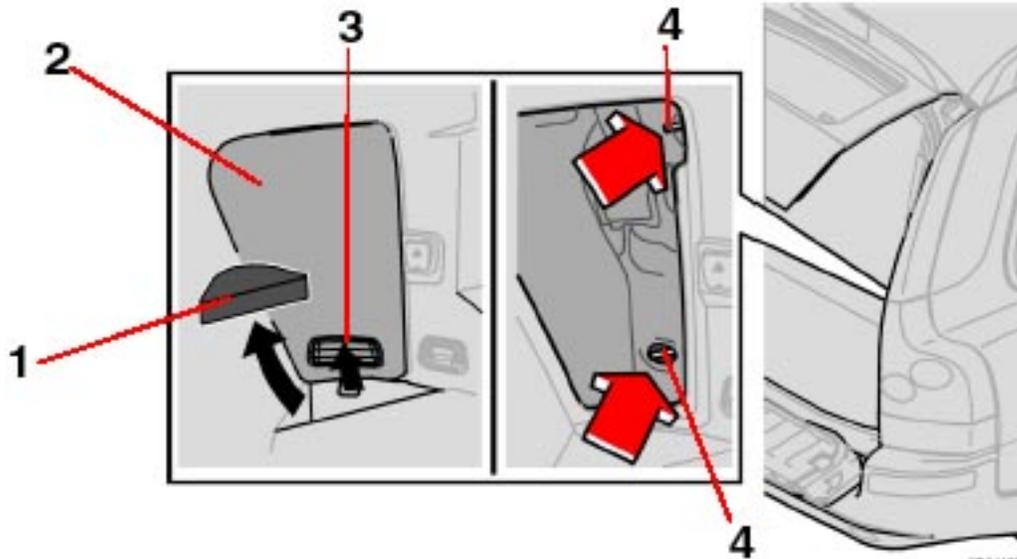
### Location of tail light bulbs

- A - Turn signal - PY 21 W (amber)
- B - Brake light - 21W BA 15
- C - Back-up light - 21 W BA 15
- D - Turn signal - PY 21 W (amber)

## D - Parking light - P21 4W

**Replacing bulbs in the tail light cluster**

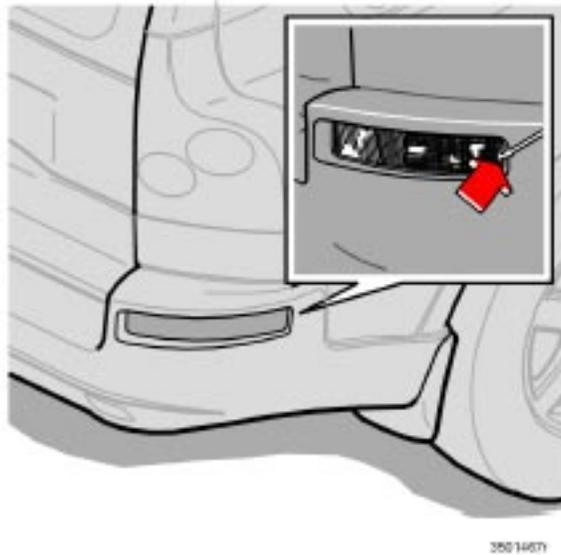
1. Switch off all lights and turn ignition key to position 0.
2. Fold down the lower section of the tailgate, and fold up the rear section of the cargo area floor.



3. If the vehicle is equipped with the optional grocery bag holder, detach the holder's bands.
4. Remove the corner panel (1 in the illustration above).
5. Open the cover (2) in the side panel by pulling the tab (3) upward/outward.
6. Loosen the bolts (4) with the 10 mm wrench (found in the tool bag).
7. Pull the entire tail light housing straight out.
8. Disconnect the wiring.
9. Place the tail light housing on a soft cloth to avoid scratching the lens.
10. Turn the lamp holder(s) counterclockwise and pull out.
11. Turn the bulb counterclockwise and remove. Insert a new bulb.
12. Place the lamp holder in the groove and turn clockwise.
13. Press wiring back into place.
14. Align the tail light housing with the holes for the retaining bolts and press it into place.
15. Tighten the retaining bolts.
16. Reinsert the side and corner panels.

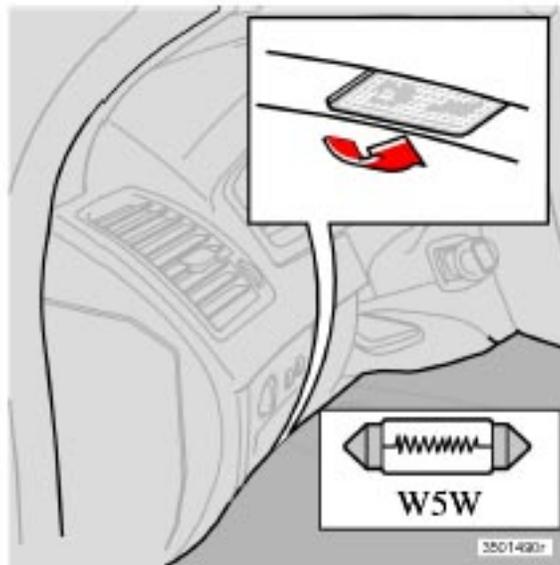
pg. 142 Maintenance

**Bulbs (contd)**



### Rear fog light

1. Switch off the ignition.
2. Carefully insert a small screwdriver (see illustration above)
3. Pry out the lamp housing.
4. Turn the bulb holder counterclockwise and pull out the bulb.
5. Insert a new bulb and press the lamp housing back into place.



### Door step courtesy lights

The door step courtesy lights are located under the dashboard on the driver's and passenger's sides. To replace a bulb:

1. Carefully insert a screwdriver and pry out the lens.
2. Replace the defective bulb.
3. Reinstall the lens.



### **Cargo compartment light**

1. Carefully insert a screwdriver and pry out the lens.
2. Pry out the bulb and replace it.
3. Press the lens back into place.

pg. 143 Maintenance



### **Front courtesy lights**

These bulbs may be difficult for you to replace yourself. We recommend that you let an authorized Volvo retailer replace these bulbs if necessary.



### **Rear reading lights**

These bulbs may be difficult for you to replace yourself. We recommend that you let an authorized Volvo retailer replace these bulbs if necessary.

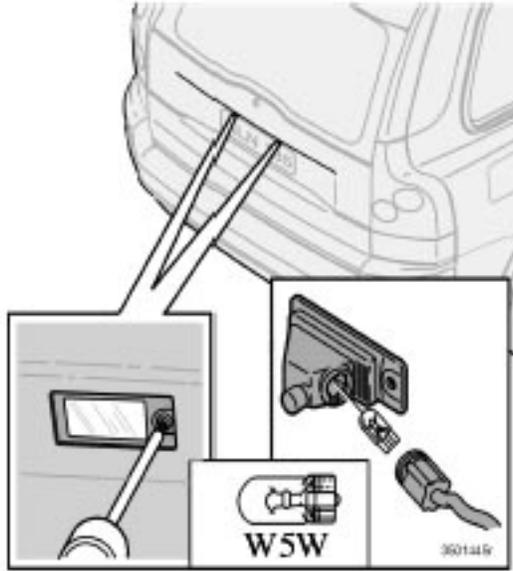
**NOTE:** Other bulbs may be difficult for you to replace yourself. Let an authorized Volvo retailer replace these bulbs if necessary.



### **Vanity mirror lights**

1. Carefully insert a screwdriver and pry out the lens.
2. Pry out the bulb and replace it.
3. Carefully press the lower edge of lens onto the four tabs and press the upper edge of the lens into place.

## Bulbs (contd)

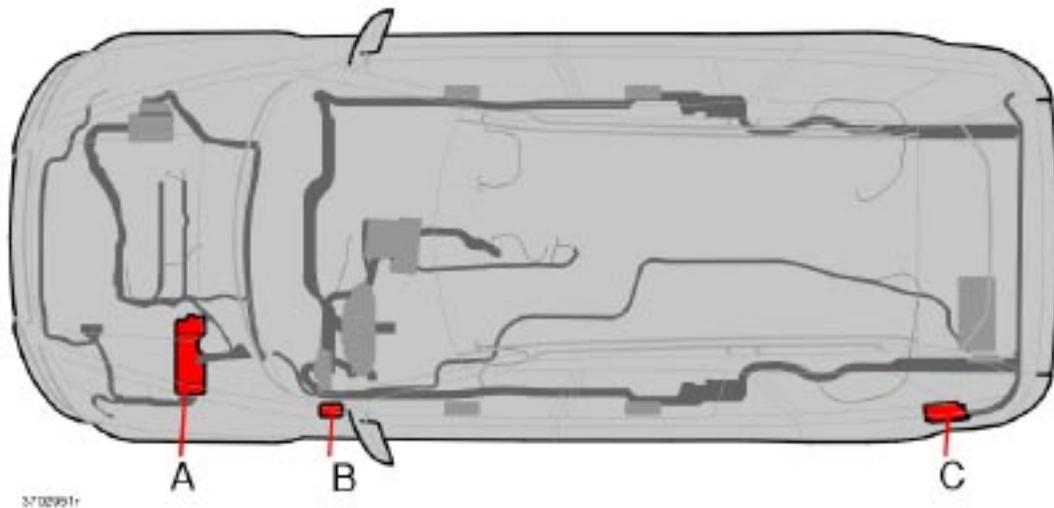


### License plate lights

1. Switch off the ignition.
2. Loosen the screws with a Torx screwdriver.
3. Turn the bulb holder counterclockwise and pull it out.
4. Pull out the defective bulb and insert a new one.
5. Reinsert the bulb holder into the housing and turn it clockwise.
6. Reinstall the housing and screw it into place.

pg. 145 Maintenance

## Fuses



## Replacing fuses

If an electrical component fails to function, it is possible that a fuse has blown.

The fuse boxes are located in three different places:

A - Relays/fuse box in the engine compartment

B - Fuse box in the passenger compartment

C - Relays/fuse box in the cargo compartment.

A label on the inside of each cover indicates the amperage and the electrical components that are connected to each fuse.

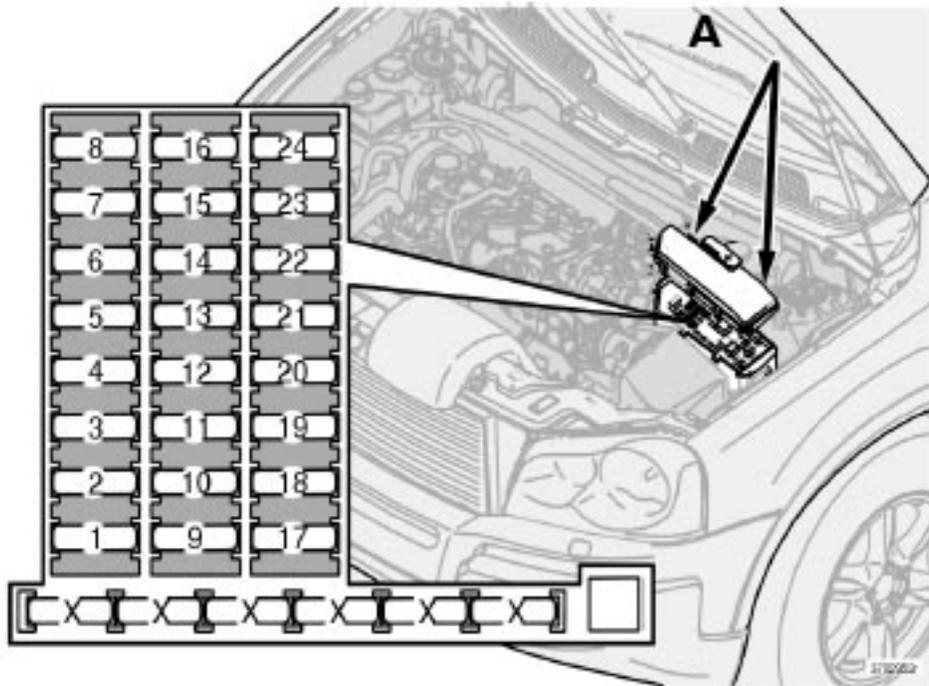
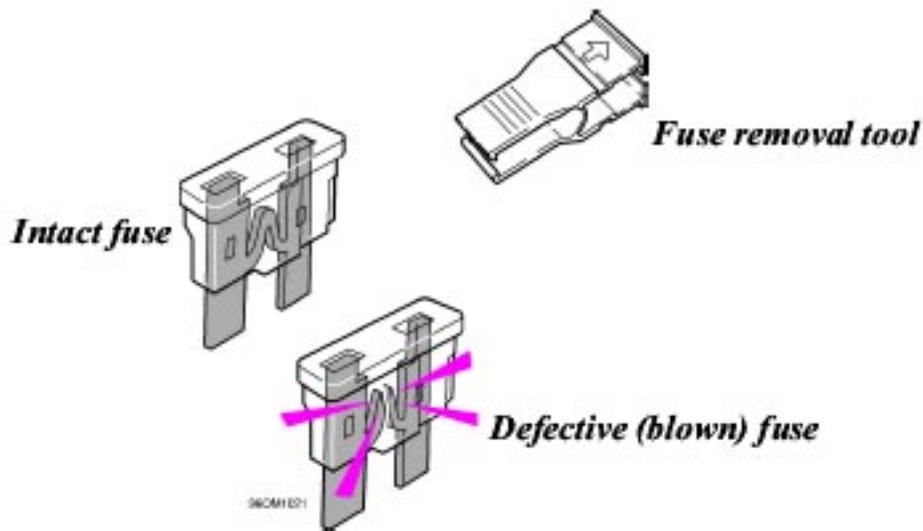
The easiest way to see if a fuse is blown is to remove it. Pull the fuse straight out. If a fuse is difficult to remove, you will find a special fuse removal tool in the passenger compartment fuse box. From the side, examine the curved metal wire (see next page) to see if it is broken. If so, put in a new fuse of the **same color and amperage** (written on the fuse). Spare fuses are stored in the fuse box in the engine compartment and the passenger compartment. If fuses burn out repeatedly, have the electrical system inspected by an authorized Volvo retailer.

### **WARNING!**

Never use fuses with higher amperage than those stated on the following pages. Doing so could overload the vehicle's electrical system.

pg. 146 Maintenance

## Fuses (contd)



*A-To open, press the plastic catches on the rear side of the fuse box cover and lift.*

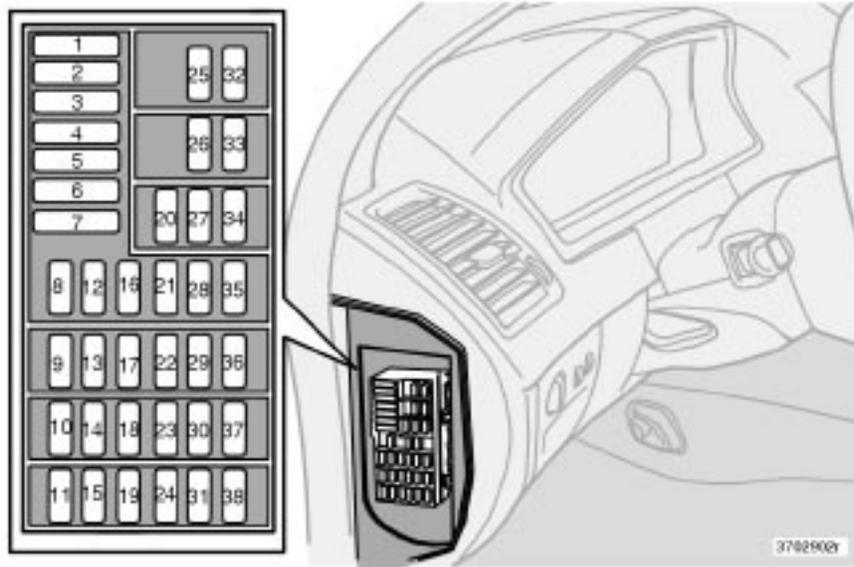
### **Relay/Fuse box in the engine compartment**

When replacing fuses, be sure to replace a blown fuse with a new one of the same color and amperage (written on the fuse).

### **Fuses in the engine compartment**

<b>No.</b>	<b>Amperage</b>
1. Accessories	25
2. -	

3. Vacuum pump	15
4. Oxygen sensors	20
5. Crankcase ventilation heater, solenoid valves	10
6. Mass air flow sensor, engine control module, injectors	15
7. -	
8. A/C compressor, accelerator pedal position sensor, E-box fan	10
9. Horn	15
10. Tailgate washer	10
11. A/C compressor, ignition coils	20
12. Brake light contact	5
13. Windshield wipers	25
14. ABS/DSTC	30
15. Headlight washers	25
16. Windshield washers	15
17. Low beam, right	10
18. Low beam, left	10
19. ABS/DSTC	30
20. High beam, left	15
21. High beam, right	15
22. Starter motor	25
23. Engine control module, system relay	5
24. -	



### Fuses in the passenger compartment

Fuses are located inside the access panel on the end face of the dashboard. There are also a number of spare fuses.

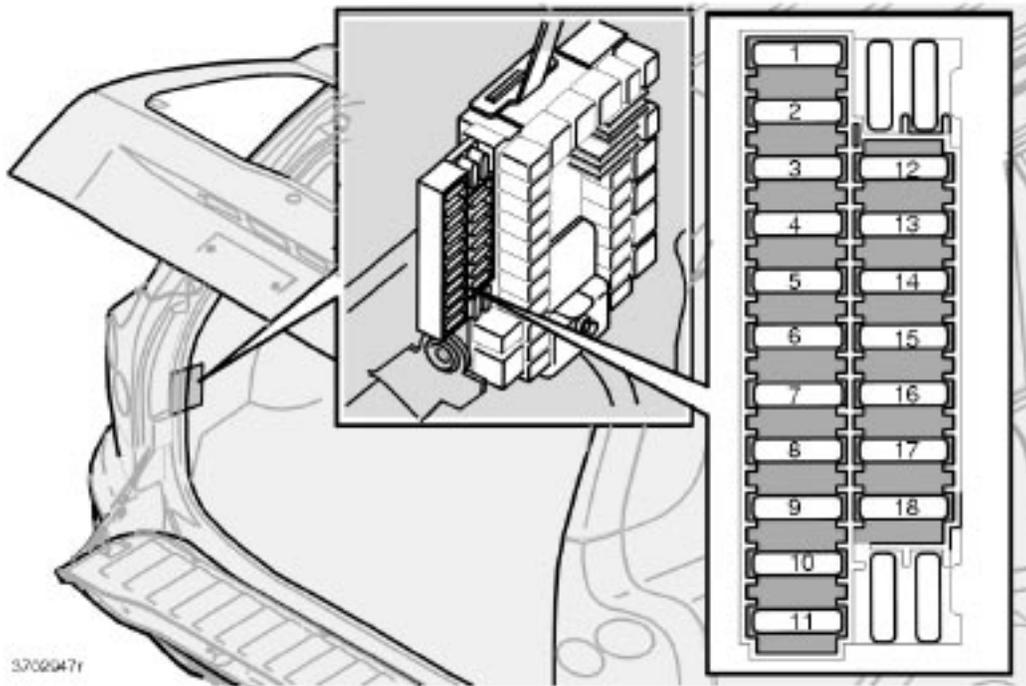
No.	Amperage
1. Blower - climate system	30
2. Audio amplifier	30
3. Power driver's seat	30
4. Power passenger's seat (option)	30
5. Driver's door - central locking, power windows, door mirror	25
6. Front passenger's door - central locking, power windows, door mirror	25
7. Rear side doors - power windows, child safety locks	30
8. -	
9. -	
10. Power passenger's seat	5
11. Electric socket 12V	15
12. Ignition switch (30-feed), central electronic module, starter motor relay, SRS, antenna ring, engine management system	10
13. -	
14. Electronic module (ceiling), courtesy lighting (ceiling)	10
15. -	
16. Speed-sensitive power steering (T6 only)	5
17. ABS/DSTC	5
18. Heated driver's seat (option)	15

19. Heated front passenger's seat (option)	15
20. Infotainment system	10
21. Relay extended D1 feed: climate control system, power driver's seat, instrument panel	10
22. Headlight switch module, climate control system, onboard diagnostic connector, steering wheel lever modules	5
23. Turn signals	20
24. Automatic transmission - shift inhibitor, extended D2 feed	10
25. Fuel pump	15
26. Moonroof (option)	15
27. Central electronic module, vanity mirror lighting, courtesy lighting, glove compartment lighting, alarm siren*	10
28. Alarm siren*	5
29. -	
30. Daytime running lights	10
31. Daytime running lights	10
32. Left front/rear parking lights	7.5
33. Right front/rear parking lights, license plate lights	7.5
34. Front fog lights	15
35. -	
36. High beam headlights	20
37. Navigation system (option), DVD player	10
38. Low beam headlights, Bi-Xenon headlights (option)	15

Please be aware that if these fuses are not intact, or have been removed, the alarm will not sound.

pg. 148 Maintenance

## Fuses (contd)



## Fuses in the cargo compartment

No.	Amperage
1. Rear electrical module, cargo compartment lighting	10
2. Rear fog light	10
3. Brake lights	15
4. Backup lights	10
5. Rear window defroster, relay 15I - accessories (rear)	5
6. Tailgate release	10
7. Electric socket 12V in cargo compartment	15
8. Central locking rear doors/tailgate, fuel filler door	20
9. Trailer hitch (30 feed)	15
10. Antenna	5
11. Accessory control module (AEM)	15
12. Washer - tailgate window	15
13. Subwoofer/rear A/C (option)	15
14. Brake lights	7.5
15. Trailer hitch (15I feed), reverse warning system (option)	20
16. -	
17. All Wheel Drive control module	7.5



[Contents](#) | [Top of Page](#)

**2 0 0 3  
VOLVO  
XC90**

**Specifications**

pg. 149 Specifications

[Label information](#) [150](#)

[Dimensions and weights](#) [151](#)

[Capacities](#) [152](#)

[Lubricants](#) [153](#)

[Cooling system](#) [153](#)

[Suspension](#) [153](#)

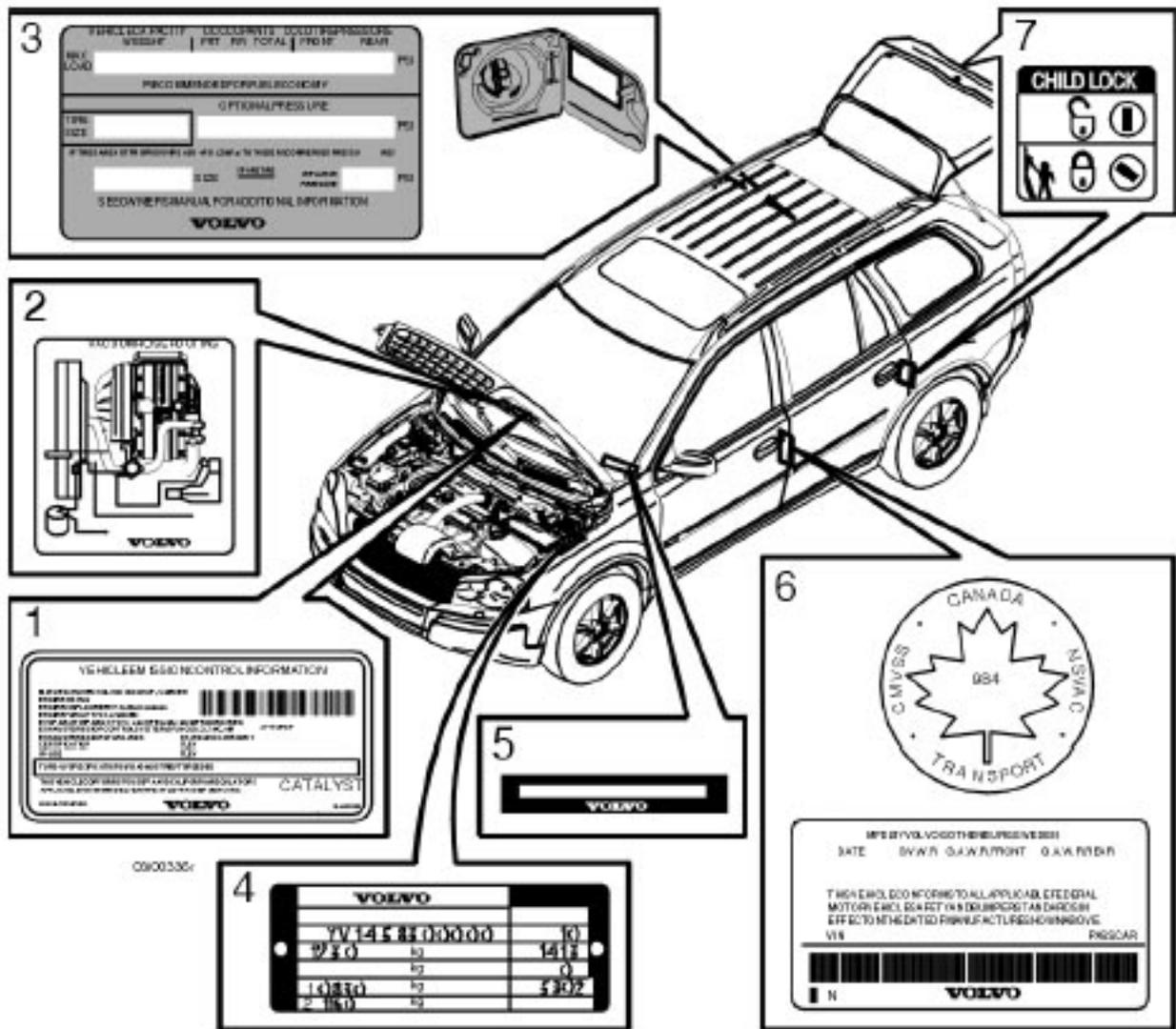
[Electrical system](#) [155](#)

[Bulbs](#) [156](#)

[Engine specifications, Transmission](#) [157](#)

*All specifications are subject to change without prior notice.*

pg. 150 Specifications



## 1 Vehicle Emission Control Information

Your Volvo is designed to meet all applicable emission standards, as evidenced by the certification label on the underside of the hood. For further information regarding these regulations, please consult your Volvo retailer.

## 2 Vacuum hose routing (underside of hood)

## 3 Loads and Tire Pressures (on inside of fuel filler door)

## 4 Model plate

Vehicle Identification Number (VIN). Codes for color and upholstery, etc. The plate is located in the engine compartment, on the inside of the left front fender.

## 5 Vehicle Identification Number (VIN) \*

The VIN plate is located on the top left surface of the dashboard. The VIN is also stamped on the right hand door pillar.

## **6 Federal Motor Vehicle Safety Standards (FMVSS) specifications (USA) and Ministry of Transport (CMVSS) standards (Canada)**

Your Volvo is designed to meet all applicable safety standards, as evidenced by the certification label on the facing side of the driver's door. For further information regarding these regulations, please consult your Volvo retailer.

## **7 Child safety latch label**

\*The Vehicle Identification Number (VIN) should always be quoted in all correspondence concerning your vehicle with the retailer and when ordering parts.

pg. 151 Specifications

# **Dimensions and weights**

## **Dimensions**

Length	188.9 in (479.8 cm)
Width	74.7 in (189.8 cm)
Height	70.2 in (178.4 cm)
Wheelbase	112.5 in (285.7 cm)
Front track	64.3 in (163.4 cm)
Rear track	63.9 (162.4 cm)
Turning circle	39-40 ft. (11.9-12.3 m)

## **Cargo capacity**

### **With optional 3rd row of seats folded down:**

5-seat: 41.6 cu ft (1178 litres)

7-seat: 43.3 cu ft (1225 litres)

### **Behind 1st row of seats, with 2nd (and optional 3rd) row of seats folded down:**

5-seat: 84.9 cu ft (2403 litres)

7-seat: 85.1 cu ft (2410 litres)

### **Behind 1st row of seats, with front passenger seat, 2nd row (and optional 3rd row) of seats folded**

**down:**

5-seat: 92.0 cu ft (2606 litres)

7-seat: 93.2 cu ft (2640 litres)

**U.S.A.****Canada****Gross vehicle weight\***

5-cyl turbo: 5-seat-5770 lb/7-seat-6005 lb

2630 kg/2720 kg

6-cyl turbo: 5-seat-5880 lb/7-seat-6080 lb

2680 kg/2760 kg

**Capacity weight**

5-seat: 1150 lb

525 kg

7-seat: 1210 lb

550 kg

**Permissible axle weight, front\***

5-cyl turbo: 5-seat-2730 lb/7-seat-2820 lb

1240 kg/1280 kg

6-cyl turbo: 5-seat-2860 lb/7-seat-2880 lb

1300 kg/1310 kg

**Permissible axle weight, rear\***

5-cyl turbo: 5-seat-3150 lb/7-seat-3240 lb

1430 kg/1470 kg

6-cyl turbo: 5-seat-3150 lb/7-seat-3240 lb

1430 kg/1470 kg

**Curb weight**

5-seat: 4450-4620 lb

2035-2100 kg

7-seat: 4605-4775

2095-2160

\* Permissible axle weight or gross vehicle weight must never be exceeded.

pg. 152 Specifications

**Max. loads**

Max. roof load 220 lb 100 kg

Max. trailer  
weight:**without** brakes 1,650 lb (750 kg)**with** brakes 3970 lb (1800 kg)<sup>1</sup>4960 lb (2250 kg)<sup>2</sup>

198 lb (90 kg)

Max. tongue weight

1) Vehicles with front wheel drive (FWD)

2) Vehicles with all wheel drive (AWD), see also [page 103](#)

### **WARNING!**

When adding accessories, equipment, luggage and other cargo to your vehicle, the total capacity weight must not be exceeded.

## Capacities

<b>Fuel tank</b>	19 US gals. (72 liters), minimum octane requirement - AKI 87 (RON 91) - unleaded fuel (See also <a href="#">page 84</a> )
<b>Engine oil</b>	
B5254T2	6.1 US qts. (5.8 liters)
B6294T	7.1 US qts. (6.7 liters)
<b>Transmission oil</b>	
Automatic (AW 55-50 5- speed)	7.9 US qts. (7.5 liters)
Automatic (GM 4-speed)	13.4 US qts (12.7 liters)
<b>Miscellaneous</b>	
Power steering	0.9 US qts. (0.9 liters)
Windshield washer reservoir	6.9 US qts. (6.5 liters)
Brake fluid	0.63 US qts. (0.6 liters)
Air conditioning system	Front - 2.2 lb. (1 kg), Rear (option) 2.9 lb. (1.3 kg) R 134a

pg. 153 Specifications

## Lubricants

### Engine oil

Meeting minimum ILSAC specification GF-2, including ACEA A1, API SJ, SJ/CF and SJ/ Energy Conserving.

**Oil additives must not be used.**

### Transmission

#### Oil grade:

4-speed automatic (on models with 6-cylinder turbo engines):  
Dexron III G (Volvo P/N 1161521).

5-speed automatic (on models with 5-cylinder turbo engines):  
Volvo synthetic transmission oil Volvo P/N 1161540.

Different types of oil should never be mixed.

### **Power steering**

**Grade:** ATF

### **Brake fluid**

**Fluid type:** DOT 4+ boiling point >536°F (280°C), P/N 9437433

## **Cooling system**

**Type** Positive pressure, closed system.

**Coolant** Volvo original coolant/antifreeze

**Volume** 5-cyl. turbo 9.3 US qts. (8.8 liters)  
6-cyl. turbo 11.2 US qts (10.6 liters)

The thermostat begins to open at 194°F (90°C).

## **Suspension**

### **Rear suspension**

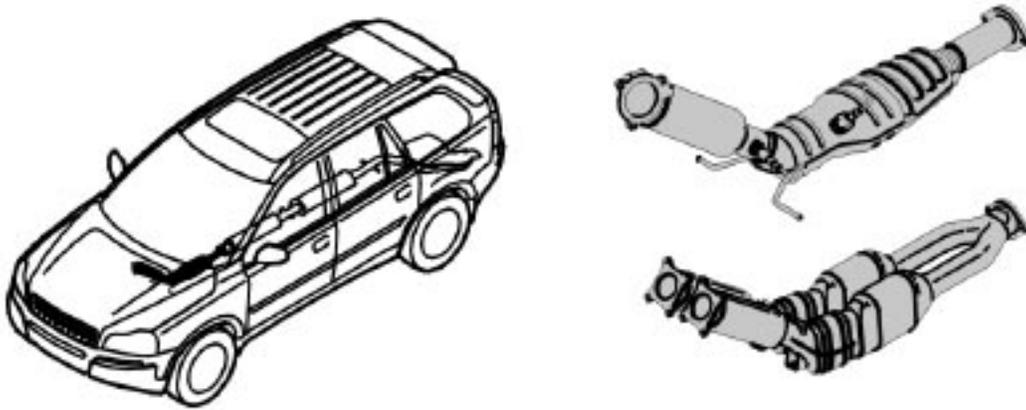
Individual rear wheel suspension with longitudinal support arms, double link arms and track rods.

### **Front suspension**

Spring strut suspension with integrated shock absorbers and control arms linked to the support frame.

Power-assisted rack and pinion steering. Safety type steering column.

pg. 154 Specifications



### Three-way catalytic converter cautions

- Keep your engine properly tuned. Certain engine malfunctions, particularly involving the electrical, fuel or distributor ignition systems, may cause unusually high three-way catalytic converter temperatures. Do not continue to operate your vehicle if you detect engine misfire, noticeable loss of power or other unusual operating conditions, such as engine overheating or backfiring. A properly tuned engine will help avoid malfunctions that could damage the three-way catalytic converter.
- Do not park your vehicle over combustible materials, such as grass or leaves, which can come into contact with the hot exhaust system and cause such materials to ignite under certain wind and weather conditions.
- Excessive starter cranking (in excess of one minute), or an intermittently firing or flooded engine can cause three-way catalytic converter or exhaust system overheating.
- Remember that tampering or unauthorized modifications to the engine, the Electronic Control Module, or the vehicle may be illegal and can cause three-way catalytic converter or exhaust system overheating. This includes:
  - Altering fuel injection setting or components.
  - Altering emission system components or location or removing components.
  - Repeated use of leaded fuel.

**NOTE:** Unleaded fuel is required for vehicles with three-way catalytic converters.

pg. 155 Specifications

### Electrical system

12-volt system with voltage controlled generator. Single wire system in which the chassis and engine block are used as conductors, grounded on the chassis.

Battery	<b>2.5T</b>	<b>T6</b>
Voltage	12 V	12 V

Cold start capacity (CCA)	520 A	600 A
Reserve capacity (RC)	90 min	115 min

If you must replace your battery, be sure to replace it with a battery of the same cold start capacity and reserve capacity as the original (See the decal on the battery).

<b>Generator max. current</b>	140 A*	160 A
<b>Starter motor, power</b>	1.4 kW	1.7 kW
<b>Spark plugs</b>	P/N272313-8 or equivalent	
Gap	0.028-0.032 in.	0.7-0.8 mm
Tightening torque	22 ft. lbs.	(30 Nm)
Firing order	1-2-4-5-3	1-5-3-6-2-4

\* Models equipped with the optional rear A/C unit have 160 A generators.

pg. 156 Specifications

## Bulbs

<b>Bulbs</b>	<b>Output Socket</b>	
Low beam	55 W	H7
High beam	55 W	H7
Bi-Xenon headlights (option)	35 W	D2R
Fog lights, front	55 W	H 1
Parking lights, front	5W5	W2.1x9.5d
Turn signals, front	21 W	PY (amber)
Turn signals, rear	21 W	PY (amber)
Parking lights, rear	5 W	BA15
Brake light	21 W	BA15
Back up lights	21 W	BA15
Fog light, left rear	5 W	BA15
License plate lighting	5 W	W 2.1x9.5 d

Courtesy lighting, front	5 W	SV 8.5
Cargo compartment lighting	5 W	SV 8.5
Glove compartment lighting	3 W	BA 9
Vanity mirror	1.2 W	SV 5.5

pg. 157 Specifications

## Engine specifications, Transmission

	<b>B5254T2</b>	<b>B6294T</b>
Output (kW/rps)	154/83	200/85
- (hp/rpm)	208/5000	268/5100
Torque (Nm/rps)	320/25-75	380/30-83
- (ft. lbs./rpm)	236/1500-4500	280/1800-5000
No. of cylinders	5	6
Bore (mm)	83	83
Stroke (mm)	93.2	90
Cylinder displacement, liters	2.52 (153.8 cu in)	2.92 (178.3 cu in)
Compression ratio	9.0:1	8.5:1

### Charge air cooler (Intercooler)

Turbocharged engines employ a turbocompressor to force air into the engine inlet manifold and a charge air cooler to cool the compressed inlet air. The resulting increase in air flow raises pressure in the intake manifold and increases engine power over that developed by the normally-aspirated engine. The charge air cooler (which resembles a radiator) is located between the turbo-compressor and inlet manifold.

### Fuel system

The engine is equipped with a multiport fuel injection system.

### Gear ratios

<b>Gear</b>	<b>AW55-51 5-speed</b>	<b>GM4T65 4-speed</b>
<b>1st</b>	4.66:1	3.28:1
<b>2nd</b>	3.03:1	1.76:1
<b>3rd</b>	1.98:1	1.12:1

<b>4th</b>	1.14:1	0.79:1
<b>5th</b>	1.02:1	-
<b>Reverse</b>	5.11:1	2.67:1
<b>Final drive</b>	2.86:1	3.69:1

pg. 158 Specifications

### **Volvo On Call Roadside Assistance**

Your new Volvo comes with a four year ON CALL roadside assistance. Additional information, features, and benefits are described in a separate information package in your glove compartment.

If you have misplaced your package, dial:

In the U.S.A.

1-800-638-6586 (1-800-63-VOLVO)

In Canada:

1-800-263-0475

### **Technician certification**

In addition to Volvo factory training, Volvo supports certification by the National Institute for Automotive Excellence (A.S.E.). Certified technicians have demonstrated a high degree of competence in specific areas. Besides passing exams, each technician must also have worked in the field for two or more years before a certificate is issued. These professional technicians are best able to analyze vehicle problems and perform the necessary maintenance procedures to keep your Volvo at peak operating condition.



[Contents](#) | [Top of Page](#)

# 2003 VOLVO XC90

## Audio

pg. 159 Audio

[Audio system](#) [160](#)

[Audio system controls](#) [161](#)

[Audio functions](#) [164](#)

[Radio functions](#) [168](#)

[Menu settings and selections](#) [174](#)

[CD player](#) [175](#)

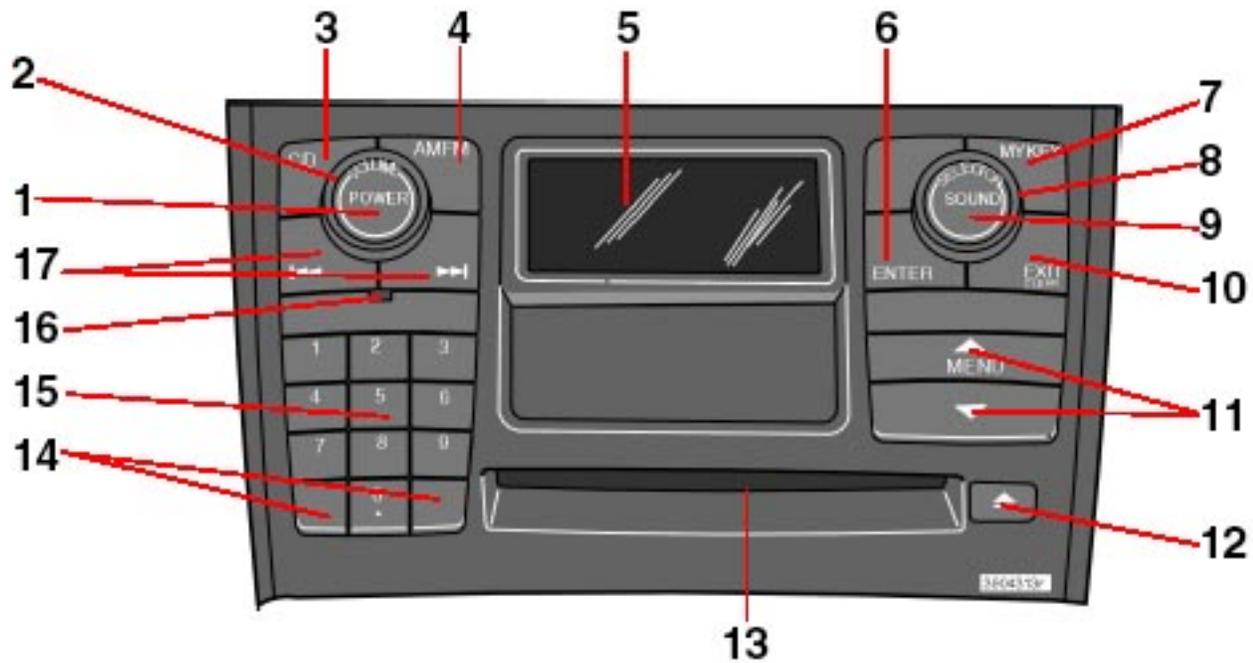
[CD changer \(option\)](#) [177](#)

[CD player](#) [179](#)

[HomeLink® Universal Transceiver](#) [180](#)

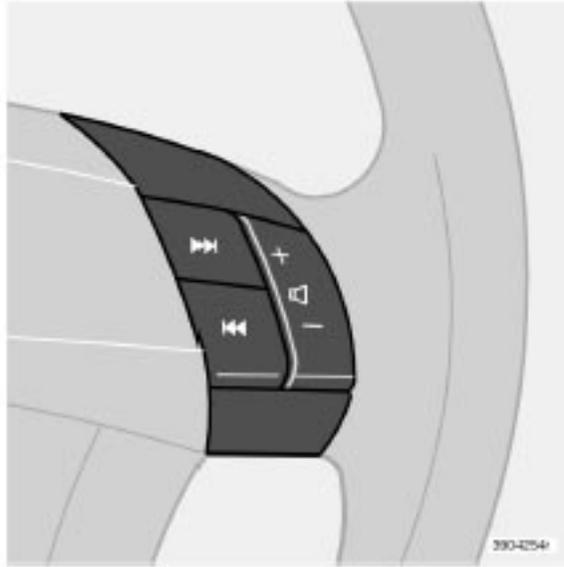
pg. 160 Audio

## Audio system



1. On/Off
2. Volume
3. CD player
4. AM/FM - for switching between FM1, FM2 and AM
5. Display
6. ENTER - select in the menu or activate a selection
7. MY KEY - programmable key for your favorite function
8. SELECTOR - select sound source
9. SOUND - make sound settings
10. EXIT/CLEAR - step back in the menu or cancel a selection
11. Menu selections
12. CD eject
13. CD player, CD changer (option)
14. MY KEY - programmable keys for your favorite functions
15. Station preset buttons/CD changer discs (1-6)
16. Infrared (IR) port - for the optional audio/navigation system remote control
17. Seek/change tracks or stations

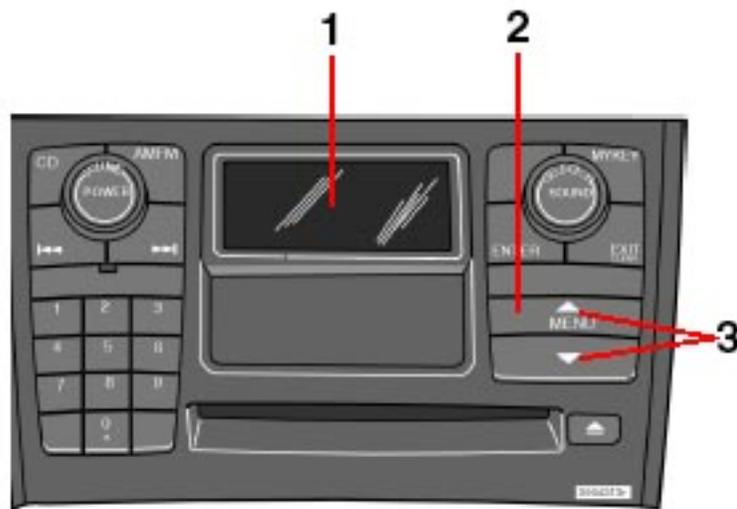
## Audio system controls



### Steering wheel keypad (option)

The four buttons on the steering wheel keypad can be used to control the audio system. The steering wheel keypad can be used to adjust volume, shift between preset stations and change CD tracks.

- Press the  or  buttons briefly to search for a radio station, or to go to the next/previous track on a CD
- Press and hold down these buttons to search within a track.



### Display

The display (1) shows the currently selected function, menu selections, etc. Clean the display with a dry, soft, lint-free cloth. Do not use cleaning agents.

### Accessing and using menus

In menu mode, you can change settings and program new functions in the audio system. The various

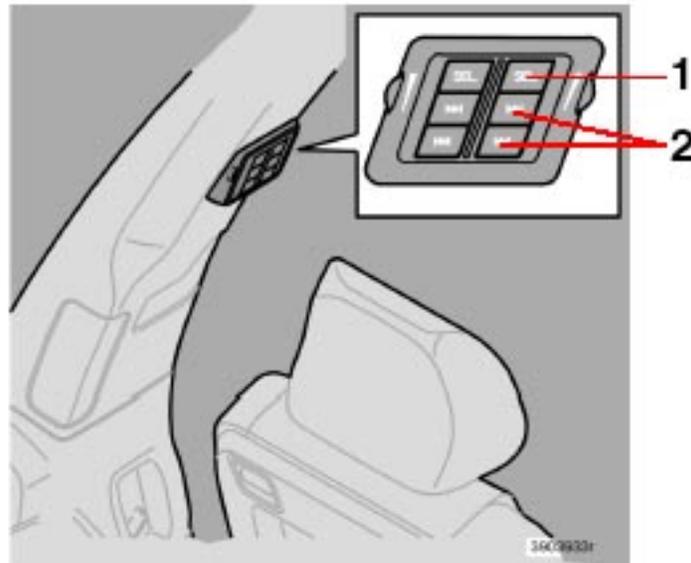
menu alternatives are shown in the display.

Press the menu button (2) to enter menu mode. Use the menus as follows:

- Use the menu keys (3) to navigate up or down in the menus. Dots in the display indicated that there are more menu selections from which to choose.
- One long press on EXIT/CLEAR exits menu mode.
- A short press on the EXIT/CLEAR enables you to cancel, undo, or answer no to a menu selection, or to go back in the menu structure.
- Pressing ENTER confirms a menu selection, or takes you to the next submenu.

pg. 162 Audio

## Audio system controls (contd)



### Rear headphone connectors and controls (option)

The door panels behind the second row of seats can be equipped with headphone connectors for passengers in the second and optional third row of seats. Several people can listen to different sound sources, such as CDs or the radio at the same time without disturbing each other. Two sets of headphones can be plugged into each connector.

- Use the SEL button (1) to step between the sound sources.
- Press the arrow keys (2) briefly to change CD tracks or switch between preset stations.
- Hold down the arrow keys to fast forward/reverse, or search for the previous/next strong radio station.
- Hold down the SEL button to turn off the sound.

For the best sound reproduction, we recommend headphones with impedance between 16-32 ohm. The sensitivity of these should be equal to or greater than 102 dB. The headphone connections are intended

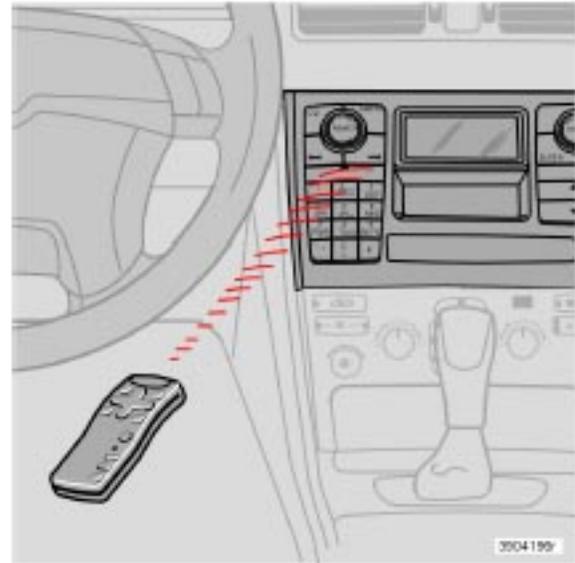
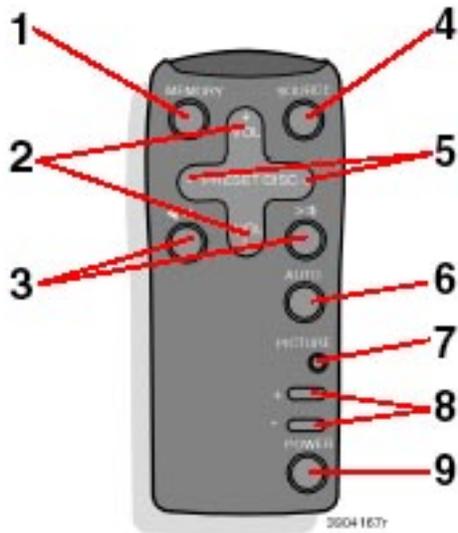
for 3.5 mm contacts and are located under the lower edge of the socket.

All headphones are automatically turned off when the ignition is switched off. They must be manually restarted when the ignition is switched on again.

### Headphones - limitations

- The headphones will only work when the ignition key is in position I or higher.
- If a set of headphones is connected to the same source that is being sent through the speakers, the headphone controls cannot be used to change track or station. This is to prevent the driver from being distracted by an unexpected change in music.
- If the driver selects the same sound source as someone listening to this source through headphones, the driver takes control of the sound source.
- Only one disc in the optional CD changer, and one track on the CD can be played at a time.
- Headphone users can choose from among the preset radio stations (AM, FM1, FM2) previously set by the driver.
- If FM is played in the speakers, AM is not available and vice versa.

pg. 163 Audio



### Remote control (option)

1. Memory - stores radio stations that have been found by a search

**To store a station:** - Press the memory button (1). The preset station number will flash 4 times in the display

- While the preset number is flashing, use the + or - buttons (5) to select a position at which to store the station

- Press button 1 again to store the station

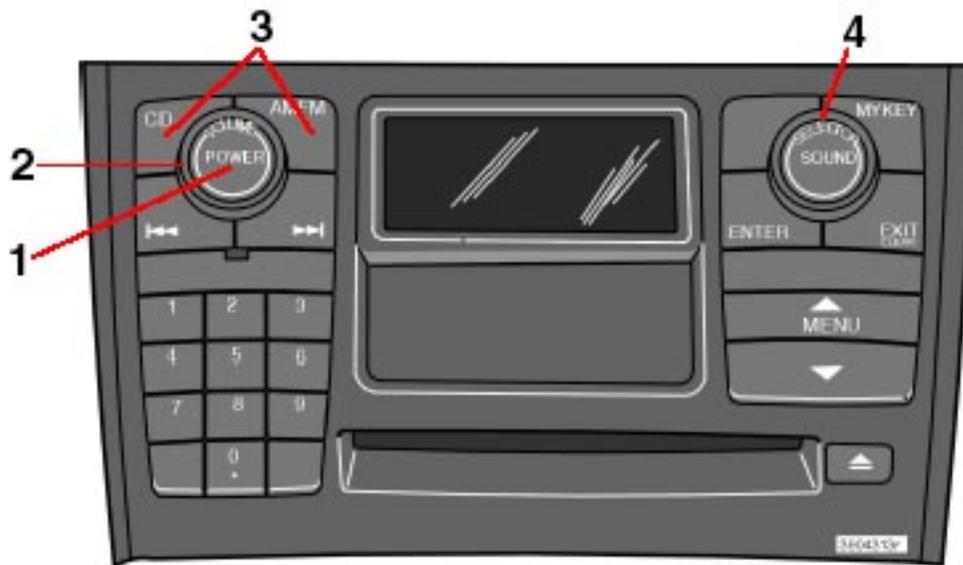
2. Volume
3. Forward/back - fast forward or back
4. Source - step between sound sources
5. Preset/disc - selects among CD's (in the optional CD changer) or preset radio stations
6. Auto store - searches for and stores the strongest radio stations
7. Not in use
8. Not in use
9. Power - off/on

Point the remote control toward the IR port on the radio panel (see the illustration on [page 160](#)).

**NOTE:** If the remote control does not function properly, check the batteries (AAA or R03).

pg. 164 Audio

## Audio functions



### On/Off button

To activate the system:

1. Turn the ignition key to position I.
2. Press the POWER button (1) to switch the audio system on or off.

**NOTE:** If you switch off the ignition while the audio system is on, the system will be on when the ignition is switched on again.

## Volume control

Turn the knob (2) clockwise or counterclockwise to raise or lower the volume. The volume control is electronic and has no end position. Volume can also be raised (+) or lowered (-) using the optional steering wheel keypad.

## Pause mode

If the volume is turned off, the CD player will go into pause mode. Re-activate the player by turning up the volume.

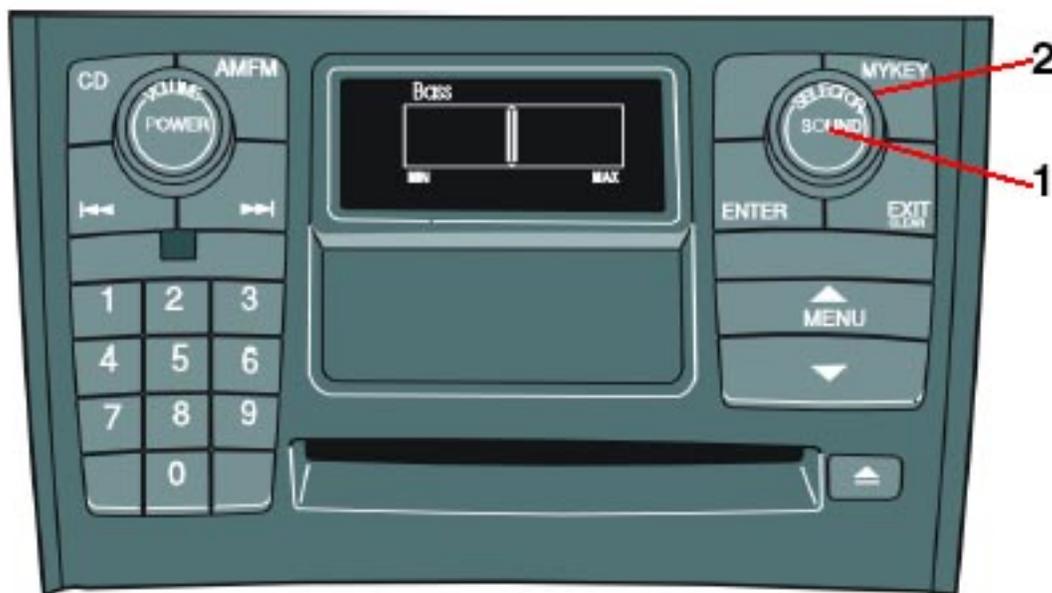
## Selecting a sound source

A sound source can be selected either with the the function buttons (3) - CD, AM/FM, or with the SELECTOR control (4). To select a sound source:

- Turn the SELECTOR control to choose FM1, FM2, AM, CD, CD changer (option)
- Press the AM/FM button repeatedly to choose between FM1, FM2, AM
- Press the CD button to change to the CD player or optional CD changer

The selected sound source will be shown in the display.

pg. 165 Audio



## Sound settings

1. Press the SOUND button (1) repeatedly until you come to the setting that you wish to change. Choose BASS, TREBLE, FADER, BALANCE, SUBWOOFER (option), CENTER (option) or SURROUND (option).
2. Use the SELECTOR control (2) to adjust the level of the setting you have selected. The display shows a scale from min. to max. position. The center indicates the normal position.

**NOTE:**

- Volume for the center speaker can only be set if Dolby Pro Logic II (DPL II) or three-channel stereo (3-CH) is selected in the menu.
- Volume for the subwoofer can only be set if SUBWOOFER is selected in the menu.
- Volume for the surround sound can only be set if Dolby Pro Logic II (DPL II) is selected in the menu.

<b>Setting</b>	<b>Shown in the display</b>
Bass	BASS
Treble	TREBLE
Balance between the right and left speakers	BALANCE
Balance between the front and rear speakers	FADER
Bass speaker level	SUBWOOFER (option)
Center speaker level	CENTER (option)
Surround sound level	SURROUND (option)

pg. 166 Audio

**Audio function (contd)****SURROUND MODE**

Dolby Surround Pro Logic II (DPL II), 3-channel stereo (D-CH) - option

Dolby Surround Pro Logic II together with a center speaker in the dashboard offers you a sound experience very close to a live performance. The normal left-right stereo channels are divided to left-center-right. In addition, surround sound is produced by the rear speakers. This surround sound mirrors

the resonance of a concert hall. Dolby Surround Pro Logic II (DPL2) works in CD and FM mode. 3-channel stereo (3-CH) is recommended for AM radio broadcasts. DPL2 is only available on the highest level audio system -Premium Sound. Use the following instructions to select PRO LOGIC II, 3-CHANNEL, or to turn these functions off.

1. Select AUDIO SETTINGS in the menu.
2. Press ENTER.
3. Select SURROUND MODE
4. Press ENTER.
5. Select PRO LOGIC II, 3-CHANNEL, or OFF.

The symbol  PL II is shown in the display. 3-CH is shown when 3-channel stereo is selected.

Dolby noise reduction is manufactured under license from Dolby Laboratories Licensing Corporation.

"Dolby", "Pro Logic" and the double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation. The Dolby Pro Logic Surround System is manufactured under licence from Dolby Laboratories Licensing Corporation.

pg. 167 Audio



### **Bass speaker - SUBWOOFER (option)**

The subwoofer helps the system provide fuller sound and deeper bass.

1. Select AUDIO SETTINGS in the menu and press ENTER.
2. Select SUBWOOFER and press ENTER. See [page 165](#) for information on setting the subwoofer level.

### **Equalizer FR**

**EQ - FRONT** This function is used to fine-tune the sound from the front speakers.

1. Select AUDIO SETTINGS in the menu and press ENTER.
2. Select Equalizer FR and press ENTER.
3. Use the menu selection buttons to set the level or use the SELECTOR control.
4. Press ENTER to select the next frequency. You can select five frequencies.
5. Press ENTER until you come to the menu mode to save the changes you have made.

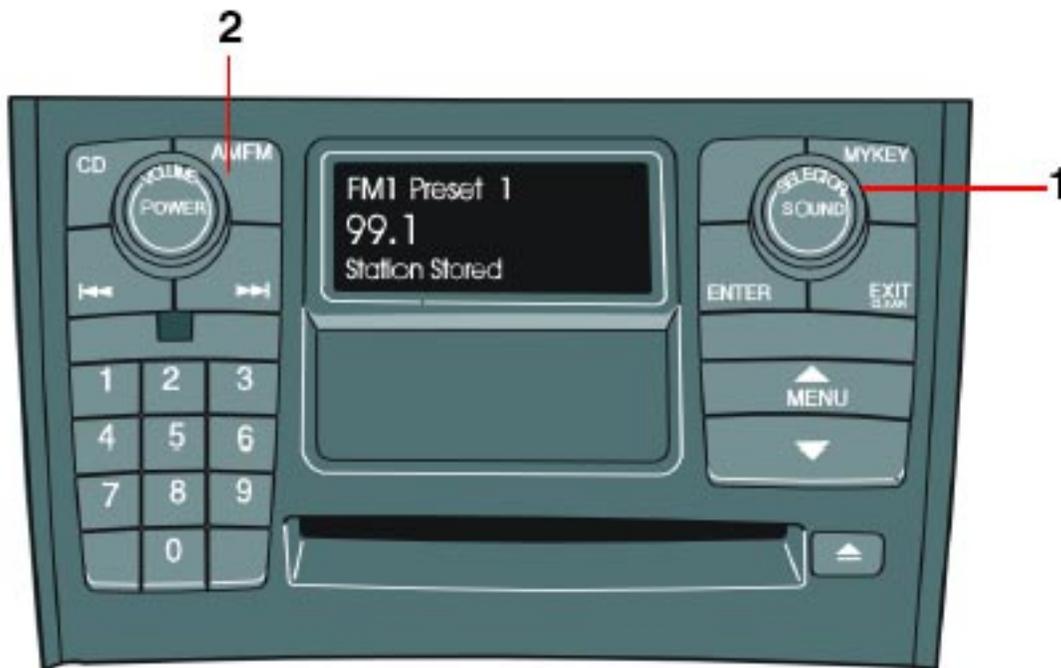
### Equalizer RR

**EQ - REAR** This function is used to fine-tune the sound from the rear speakers.

1. Select AUDIO SETTINGS in the menu and press ENTER.
2. Select EQ- REAR and press ENTER.
3. Use the menu selection buttons to set the level or use the SELECTOR control.
4. Press ENTER to select the next frequency. You can select five frequencies.
5. Press ENTER until you come to the menu mode to save the changes you have made.

pg. 168 Audio

## Radio functions



### Station search

1. Choose radio mode AM/FM1/FM2 using the SELECTOR control (1) or the AM/FM button (2).
2. Press briefly on  or  to search for the next strong station. The radio will search for the next

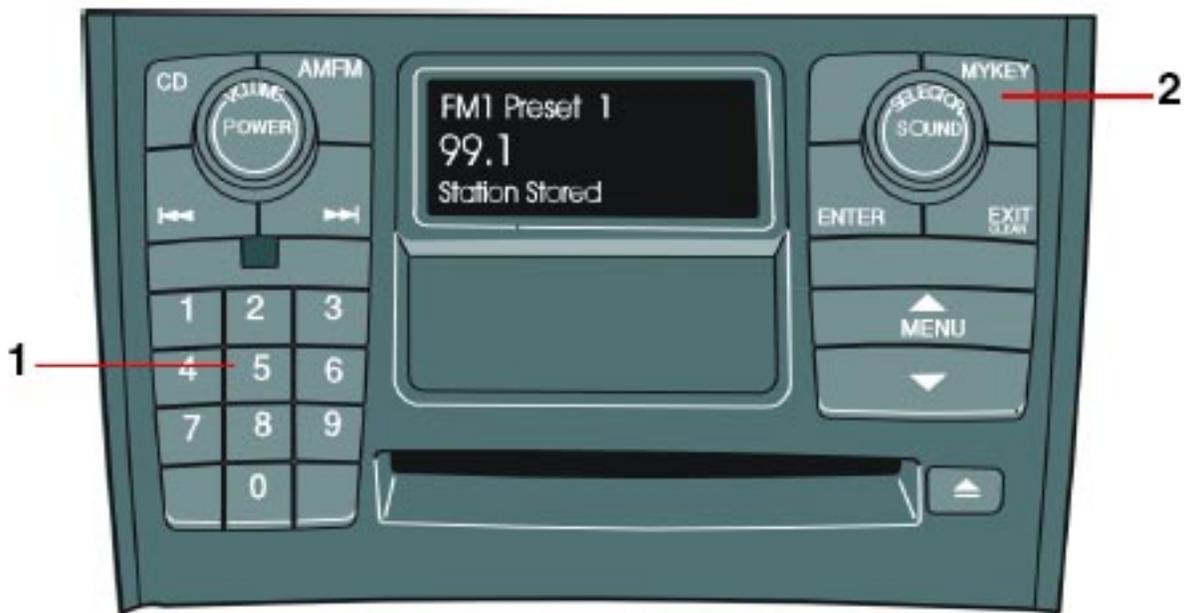
audible station and then stop.

3. Press one of the buttons again to start a new search.

### Manually search for a known frequency

1. Press and hold the  or  button (or the corresponding buttons on the steering wheel keypad). MAN will be shown in the display. The radio will slowly scroll in the desired direction and then increase speed after a few seconds.
2. Release the button when the desired frequency is displayed.
3. If you need to adjust the frequency, press briefly on  or .
4. The manual search function is available for five seconds after you last pressed the button.

pg. 169 Audio



### Storing stations

To store a selected station under one of the station setting buttons 0-9 (1):

1. Set the desired station.
2. Press the button under which the station is to be stored and keep it depressed. The sound will be interrupted for several seconds and STATION STORED is shown in the display. The station is now stored.

You can store up to 10 stations each for AM, FM1 and FM2, i.e. a total of 30 stations.

## Radio Frequency band

FM 87.7 - 107.9 MHz

AM 530 - 1710 kHz

## MY KEY - programming a shortcut

Use the MY KEY buttons (2) to program a favorite function from the menu, such as SCAN, AUTOSTORE, etc. See [page 174](#) for the functions that can be programmed with the MY KEY button.

1. Use the MENU buttons to scroll among the functions.
2. Select the desired function from the menu by holding one of the MY KEY buttons depressed for more than two seconds.
3. When MY KEY STORED is shown in the display, the function has been stored.
4. Activate the function by briefly pressing the MY KEY button with which the functions was stored.

Repeat steps 1-4 to store new functions on the MY KEY buttons.

**NOTE:** The MY KEY buttons can only be programmed for one shortcut function at a time.

pg. 170 Audio

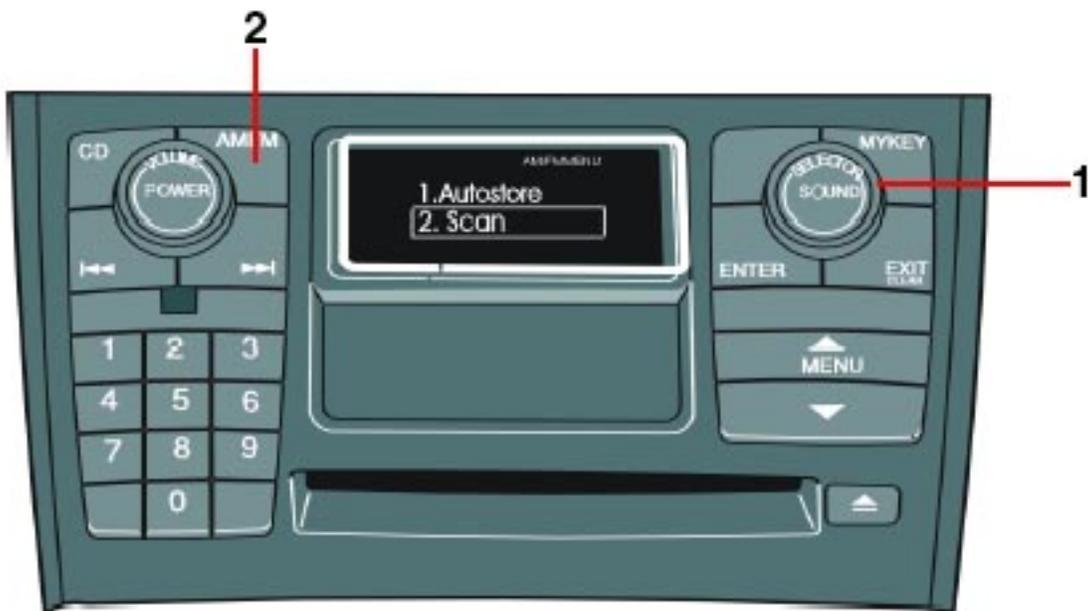


## Automatically storing stations - AUTOSTORE

This function automatically searches for, and stores up to 10 strong AM or FM stations in a separate memory. If more than 10 stations are found, the 10 strongest ones will be stored. The function is especially useful in areas in which you are not acquainted with radio stations or their frequencies.

1. Choose radio mode using the SELECTOR control or the AM/FM button.
2. Press the MENU button (2).
3. Select AUTOSTORE and press ENTER.
4. Select AST SEARCH and press ENTER.
5. AUTOSTORING is shown in the display and a number of strong stations (max. 10) from the set frequency band are now automatically stored in the autostore memory. If there are no stations with sufficient signal strength, NO AST FOUND is displayed.
6. The stored stations are available under the buttons 0-9 (1).
7. When the radio is in autostore mode, AUTO is shown in the display. AUTO disappears when you return to the normal radio mode.
8. Return to normal radio mode by pressing the AM/FM button or EXIT/CLEAR.
9. To access previously stored stations, carry out steps 1-3 but select AST MODE in step 4 and press ENTER.

pg. 171 Audio



### Scanning - SCAN

This function automatically searches for the next strongest AM and FM stations.

1. Choose radio mode using the SELECTOR control (1) or the AM/FM button (2).
2. Press the MENU button.
3. Select SCAN to start searching and press ENTER. When the radio finds a station, it stops there for about 8 seconds and then continues its search.
4. Press the EXIT/CLEAR button to stop scanning.



### Program type/Format - PTY

The PTY function allows you to find programs that suit your taste. Use the PTY function to select from among the different program types shown in the list.

Which PTY does the set station have?

1. Select RADIO SETTINGS using the SELECTOR control and press ENTER.
2. Select PTY in the menu and press ENTER.
3. Select SHOW PTY TEXT and press ENTER. The PTY of the selected station is now shown in the display.

**NOTE:** Not all radio stations have PTY designations.

Program type	Text displayed
Switch off/ deactivate	CLEAR ALL PTY
News	NEWS
Information	INFORMATION
Sports	SPORT
Talk	TALK
Rock	ROCK
Classic rock	CLASSIC ROCK
Adult hits	ADULT HITS
Soft rock	SOFT ROCK

Top 40	TOP 40
Country	COUNTRY
Oldies	OLDIES
Soft	SOFT
Nostalgia	NOSTALGIA
Jazz	JAZZ
Classical	CLASSICAL
Rhythm & Blues	RHYTHM & BLUES
Soft R&B	SOFT R&B
Language	LANGUAGE
Religious music	RELIGIOUS MUSIC
Religious talk	RELIGION TALK
Personality	PERSONALITY
Public	PUBLIC
College	COLLEGE
Weather	WEATHER

### **Radio text**

Certain stations broadcast program information, which can be shown in the display.

1. Press the MENU button.
2. Select RADIOTEXT in the menu and press ENTER.
3. Select RADIOTEXT again to deactivate.



### Search for a specific program type - PTY

This function enables you to search for a certain type of program by searching through the entire waveband.

1. Select FM1 or FM2 and press the MENU button.
2. Select RADIO SETTINGS and press ENTER.
3. Select PTY and press ENTER.
4. Choose SELECT PTY and press ENTER.
5. Press ENTER for one or more of the listed program types to select. The PTY symbol is displayed and lights up when you make your first selection and the radio goes into PTY mode.
6. When you have made all of your selections, press EXIT/CLEAR to exit the PTY list.
7. Select SEARCH PTY and press ENTER. If the radio finds a station with the selected program type, this station will be played.
8. If the radio finds a station that does not match your selections, continue the search with the  and  buttons.
9. If no station with the selected program type is found, the radio will return to the previously tuned frequency. PTY will remain in standby mode.
10. To deactivate the PTY standby mode, select CLEAR PTY and press ENTER. The PTY symbol then disappears and the radio returns to the normal operating mode.

### PTY standby

To set the radio in PTY standby, repeat steps 1-6.



[Contents](#) | [Top of Page](#)

## Menu settings and selections

### Main menus/submenus

#### RADIO (FM)

1. AUTOSTORE\*
  - 1.1. AST MODE
  - 1.2. AST SEARCH
2. SCAN\*
3. RADIO TEXT
4. RADIO SETTINGS
  - 4.1. PTY
    - 4.1.1. SELECT PTY
    - 4.1.2. SEARCH PTY
    - 4.1.3. SHOW PTY
  - 4.2. AF (default setting is OFF)
  - 4.3. RESET ALL
5. AUDIO SETTINGS
  - 5.1. SURROUND MODE\* (option)
    - 5.1.1. Pro Logic II (default)
    - 5.1.2. 3CH
    - 5.1.3. OFF
  - 5.2. SUBWOOFER\* (option)
  - 5.3. EQ FRONT (option)
  - 5.4. EQ REAR (option)
  - 5.5. RESET ALL

#### RADIO (AM)

1. AUTOSTORE
  - 1.1. AST MODE
  - 1.2. AST SEARCH
2. SCAN\*
3. AUDIO SETTINGS
  - 3.1. SURROUND MODE (option)
    - 3.1.1. Pro Logic II
    - 3.1.2. 3CH
    - 3.1.3. OFF
  - 3.2. SUBWOOFER (option)
  - 3.3. EQ FRONT (option)
  - 3.4. EQ REAR (option)
  - 3.5. RESET ALL

## **CD (single disc)**

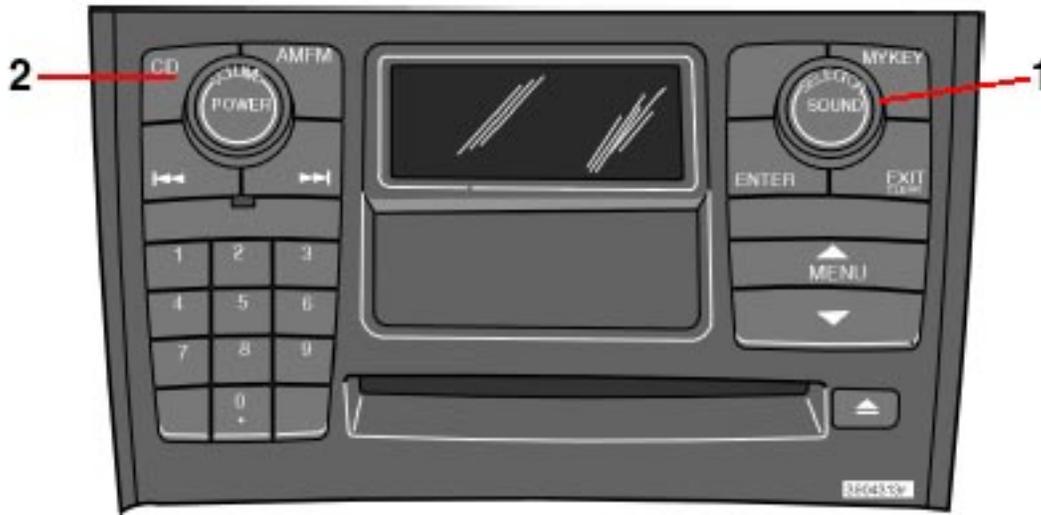
1. RANDOM\*
2. SCAN\*
3. AUDIO SETTINGS\*
  - 3.1. SURROUND MODE\* (option)
    - 3.1.1. Pro Logic II (default)
    - 3.1.2. 3CH
    - 3.1.3. OFF
  - 3.2. SUBWOOFER\* (option)
  - 3.3. EQ FRONT (option)
  - 3.4. EQ REAR (option)
  - 3.5. RESET ALL

## **CDX (CD changer - option)**

1. RANDOM\*
  - 1.1. OFF
  - 1.2. SINGLE DISC
  - 1.3. ALL DISCS
2. SCAN\*
3. DISC TEXT
4. AUDIO SETTINGS\*
  - 4.1. SURROUND MODE\* (option)
    - 4.1.1. Pro Logic II (default)
    - 4.1.2. 3CH
    - 4.1.3. OFF
  - 4.2. SUBWOOFER\* (option)
  - 4.3. EQ FRONT (option)
  - 4.4. EQ REAR (option)
  - 4.5. RESET ALL

\* These functions can be programmed with MY KEY (see [page 169](#)).

## **CD player**



### Starting the CD

1. Select the CD mode using the SELECTOR control (1) or the CD button (2).
2. Insert a CD into the player.

### Changing tracks

Press  to go to the next track or  to go to the previous track. The track number is shown in the display. If you have a keypad in the steering wheel, you can use the arrow keys in the same way.

### Searching within a track

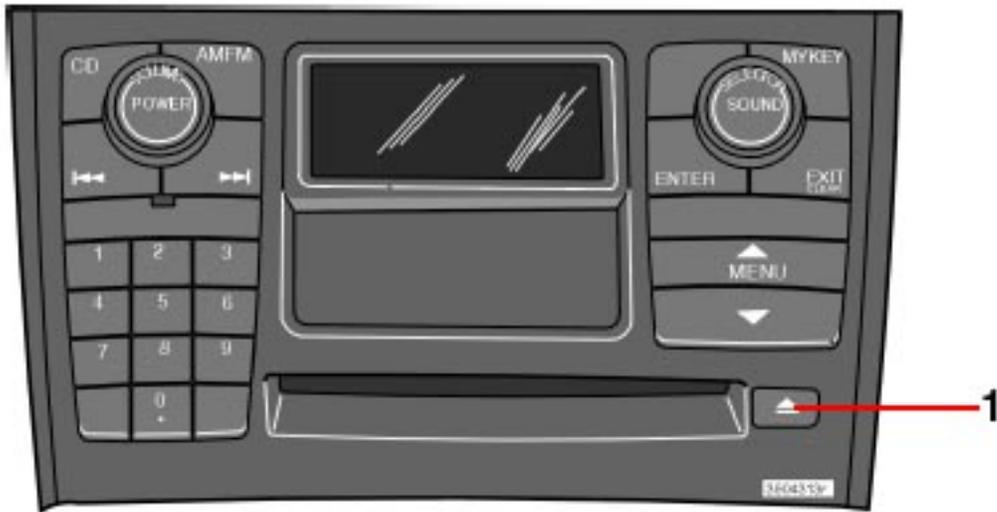
Press and hold down  or  to search within a track or the whole disc. The search continues as long as the buttons are depressed. If you have a keypad in the steering wheel, you can use the arrow keys in the same way.

### Random play

This function plays the tracks on a CD in random order (shuffle).

1. Press the MENU button.
2. Select RANDOM and press ENTER.
3. RND is shown in the display as long as the function is activated.
4. Go into the menu and select RANDOM OFF to stop random play, or press EXIT.

## CD player (contd)



**SCAN** This function plays the first ten seconds of each track.

1. Press the MENU button.
2. Select SCAN and press ENTER.
3. Press EXIT/CLEAR to listen to an entire track.

### Disctext

Certain CDs contain information about the disc, such as the titles of the tracks, etc. This information can be shown in the display by activating the DISCTEXT function.

1. Press the MENU button.
2. Select DISCTEXT in the menu and press ENTER.
3. Any information that may be stored on the disc will be displayed.
4. To deactivate this function, select DISCTEXT and press ENTER.

**NOTE:** This function is only available on the CD changer.

### CD eject

Press button 1 to eject the CD.

**NOTE:** For reasons of traffic safety, you have 12 seconds in which to remove the ejected disc. After that, the disc automatically reinserts into the player.

## CD changer (option)



### CD changer (option)

The CD changer can hold up to six discs.

1. Choose CD mode using the SELECTOR control or the CD button.
2. Select an empty slot with the number keys 1-6 (1). The display indicates which slots are empty.
3. Insert a disc into the changer.

To insert a new disc, you must first select an available empty slot in the CD changer. Make sure **INSERT DISC** is displayed before inserting a new disc.

### Selecting disc number

Use the station setting buttons 1-6 (1) to select which disc is to be played. The number of the disc and the track are shown in the display.

### SCAN

This function plays the first ten seconds of each track and only functions on the currently selected disc.

1. Press the MENU button.
2. Select SCAN and press ENTER.

Press EXIT/CLEAR to listen to an entire track.

### Changing tracks

Press  to go to the next track or  to go to the previous track. The track number is shown in the display. If you have a keypad in the steering wheel, you can use the arrow keys in the same way.

### Searching within a track

Press and hold down  or  to search within a track or the whole disc. The search continues as long as the buttons are depressed. If you have a keypad in the steering wheel, you can use the arrow keys in the same way.

pg. 178 Audio

## CD changer (option) (contd)



### Random play

This function offers two alternatives for playing the tracks on the disc(s) in the CD changer in random order (shuffle).

- Random one (random order on the currently selected disc)
- Random all (random order on all of the CD's in the changer)

### To play tracks in random order:

1. Press the MENU button.
2. Select RANDOM and press ENTER.
3. Select SINGLE DISCS or ALL DISCS to play tracks randomly from one or all of the discs in the CD changer.
4. RND or RND ALL is shown in the display for as long as the function is activated.

**NOTE:** Press  to play the next randomly selected track. This can only be done on the currently selected disc.

5. Press EXIT to stop random play.

## Ejecting one disc

A **short press** on the EJECT button (1) will eject the CD that is currently playing.

**NOTE:** For reasons of traffic safety, you have 12 seconds in which to remove the ejected disc. After that, the disc automatically reinserts into the player.

## Ejecting all discs

A **long press** on the EJECT button (1) starts the EJECT ALL function.

The text EJECTING ALL will be displayed and the entire magazine will be emptied disc by disc.

**NOTE:** - The EJECT ALL function can only be used while the vehicle is at a standstill and will be cancelled if the vehicle begins to move.

- For reasons of traffic safety, you have 12 seconds in which to remove the ejected disc. After that, the disc automatically reinserts into the player.

pg. 179 Audio

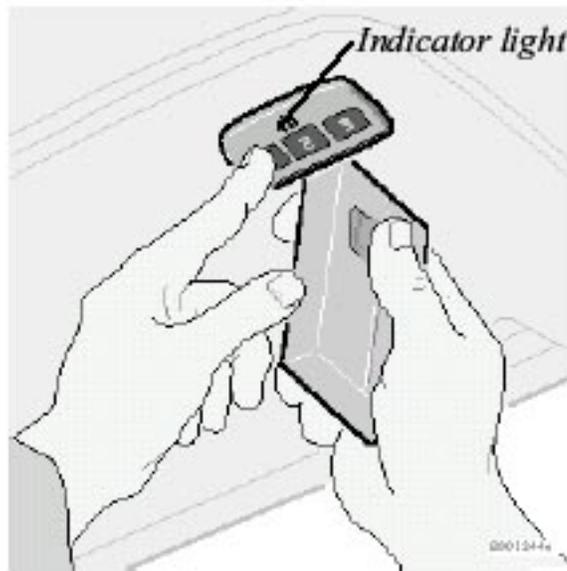
## Audio systems - general information

### Compact disc care

- Before using a new CD for the first time, remove any burrs in the center/outer edge by running the stem of a pen or similar object around the hole/edge of the disc.
- Use CD standard EN 60908 discs only. Discs not meeting this standard may cause problems with system (poor sound). CDR discs can cause listening problems due to the quality of the disc or recording equipment used.
- Keep the discs clean. Wipe them with a soft, clean, lint-free cloth, working from the center outwards. If necessary, dampen the cloth with a neutral soap solution. Dry thoroughly before using.
- Never use cleaning spray or antistatic liquid. Use only cleaners specifically made for CD's.
- Use discs of the correct size only (3.5" discs should never be used).
- Do not put tape or labels on the disc itself. They could become stuck in the player.
- Volvo does not recommend the use of plastic outer rings on the disc.
- Condensation may occur on discs/optical components of the changer in cold winter weather. The disc can be dried with a clean, lint-free cloth. Optical components in the CD changer may, however, take up to one hour to dry off.
- Never attempt to play a disc which is damaged in any way.
- When not in use, the discs should be stored in their covers. Avoid storing discs in excessive heat, direct sunlight or dusty locations.

pg. 180 Audio

# HomeLink® Universal Transceiver



*Hand-held transmitter*

## HomeLink® Universal Transceiver

HomeLink® is an advanced system that can be programmed to learn the codes of three different remote controlled-devices (e.g., garage door openers, remote lighting, entry door lock). HomeLink®'s sun visor-mounted transceiver, powered by your vehicle's electrical system, may then be used in place of your hand-held remote controls.

**NOTE:** For your security, the HomeLink® Universal Transceiver is designed to not function if you lock your vehicle from the outside.

## Programming the transceiver

1. The ignition switch must be turned to the "accessory" position (II) before programming the HomeLink® Universal Transceiver.
2. Begin by erasing all 3 factory default channels. Hold down the two outside buttons (buttons 1 and 3 in the illustration) on the HomeLink® Universal Transceiver for about 20 seconds, until HomeLink®'s indicator light begins to flash. Then release the buttons.
3. Hold your hand-held transmitter (garage door opener, for example) 2 to 5 in. (5 to 12 cm) away from the HomeLink® surface, keeping the indicator light in view. For placement questions, contact HomeLink® toll-free 1-800-355-3515 (Internet: [www.HomeLink.com](http://www.HomeLink.com)).
4. Using two hands, push and hold both your hand-held transmitter's button and the transceiver button you wish to program. The indicator light will flash first slowly, then rapidly. Rapid flashing tells you the HomeLink® button has been successfully programmed. Release both buttons.

5. If you are programming a rolling code-equipped device (e.g., garage door opener or entry door lock), refer to "Programming rolling codes" on the next page to complete the programming process.

Repeat steps 3 and 4 to program the other two transceiver buttons.

If, after several attempts, you are unable to successfully train the HomeLink® Universal Transceiver to learn your hand-held transmitter's signal, contact HomeLink® toll-free 1-800-355-3515 (Internet: [www.HomeLink.com](http://www.HomeLink.com)).

pg. 181 Audio

### **WARNING!**

- If you use HomeLink® to open a garage door or gate, be sure no one is near the gate or door while it is in motion.
- Do not use the HomeLink® Universal Transceiver with any garage door opener that lacks safety "stop" and "reverse" features as required by federal safety standards. (This includes any garage door opener model manufactured before April 1, 1982) A garage door opener that cannot "detect" an object, signalling the door to "stop" and "reverse" does not meet current federal safety standards. Using a garage door opener without these features increases the risk of serious injury or death. For more information on this matter, call toll-free 1-800-355-3515 (Internet: [www.HomeLink.com](http://www.HomeLink.com)).

**NOTE: Canadian residents:** During programming, your hand-held transmitter may automatically stop transmitting. To successfully train HomeLink®, continue to hold the HomeLink® button. At the same time, repeatedly press and hold your hand-held transmitter's button at two-second intervals until HomeLink® has learned your transmitter's code. The HomeLink® indicator light will flash first slowly, and then rapidly to indicate that the button has been successfully programmed.

### **Determining if your garage door uses a rolling code**

Determine, in one of the following ways, if your garage door uses a rolling code system and is manufactured after 1996:

- Refer to the garage door opener owner's manual for verification.
- If your hand-held transmitter appears to program the HomeLink® Universal Transceiver but the programmed button does not activate the garage door, your garage door opener may have a rolling code.
- Press the programmed HomeLink® button. If the garage door opener has the rolling code feature, the HomeLink® indicator light flashes rapidly and then glows steadily after approximately 2 seconds.

### **To train a rolling code garage door opener,**

follow these instructions after programming the desired transceiver button according to "Programming

the transceiver." The help of a second person may make training easier.

1. Locate the training button on the garage door opener motor head unit. The location and color of the training button may vary. If you encounter difficulty, refer to the garage door opener owner's manual or call toll-free 1-800-355-3515 (Internet: [www.HomeLink.com](http://www.HomeLink.com)).
2. Press the "training" button on the garage door opener motor head unit until the "training" light comes on.
3. Press and release the programmed HomeLink® button. Press and release the programmed HomeLink® button a second time to complete the training process.
4. Some garage door openers may require you to do this procedure a third time to complete the training.
5. The programmed button on your HomeLink® Universal Transceiver should now operate your garage door opener. The original hand-held transmitter can also be used, as desired, to operate the garage door. The remaining two HomeLink® buttons can be programmed in the same way. In the event of any problems in programming the HomeLink® Universal Transceiver, call toll-free 1-800-355-3515 (Internet: [www.HomeLink.com](http://www.HomeLink.com)).

### **Operating the HomeLink® Universal Transceiver**

Once programmed, the HomeLink® Universal Transceiver can be used in place of your handheld transmitters.

To operate, the key must be turned to the "accessory" position (II) or the engine must be running. Press the programmed HomeLink® button to activate the garage door, driveway gate, security lighting, home security system, etc.

pg. 182 Audio

Your original hand-held transmitters may, of course, be used at any time.

### **Erasing programmed buttons**

Individual buttons cannot be erased. To erase all three programmed buttons:

1. Turn the ignition key to the "accessory" position (II).
2. Hold down the two outside buttons on the HomeLink® Universal Transceiver for about 20 seconds, until HomeLink®'s indicator light begins to flash.
3. Release both buttons. The HomeLink® buttons can be reprogrammed using the procedures described on the previous page.

### **Reprogramming a single HomeLink® button**

1. Press and hold the desired HomeLink® button. Do not release the button until step 3 has been completed.
2. When the indicator light begins to flash slowly (after approximately 20 seconds), position your hand-held transmitter 2 to 5 in. (5 to 12 cm) away from the HomeLink® surface.

3. Press and hold the hand-held transmitter button. The HomeLink® indicator light will flash first slowly, then rapidly. When the indicator light flashes rapidly, release both buttons. The previously programmed device has now been erased and the new device can be activated by pressing the HomeLink® button that has just been programmed. This procedure will not affect any other programmed HomeLink® buttons.

**NOTE:**

- Retain the original transmitter(s) for future programming procedures (e.g., if you purchase a new vehicle).
  - For your own security, erase all programmed buttons on the HomeLink® Universal Transceiver when you sell your vehicle.
  - Metallic sun protection films should not be used on any windows in a vehicle equipped with HomeLink® Universal Transceiver. This could interfere with the transceiver's function.
- 



[Contents](#) | [Top of Page](#)

# 2003 VOLVO XC90

## Index

pg. 183-186 Index

12-volt sockets [39](#)

### A

A/C (air conditioning) [50](#)

ABS [ii](#), [25](#), [96](#)

Adjustable steering wheel [30](#)

Advanced user functions [172](#)

Air bags - dual threshold/stage [5](#)

Air cleaner [128](#)

Air distribution [47](#), [50](#)

Air Quality sensor [51](#)

Air vents [47](#)

Airbag - Side Impact (SIPS) [10](#)

Airbags (front) [4](#)

Alarm [73](#), [80](#)

All Wheel Drive [94](#)

All Wheel Drive - towing [101](#)

Anti-lock Brake System (ABS) [ii](#), [25](#)

Approach lighting [33](#)

Ashtray [39](#), [64](#)

Audio [159](#)

AUTO (climate control) [49](#)

Automatic climate control, ECC [48](#)

Automatic gearbox [89](#)

Auxiliary 12-volt socket [39](#)

Auxiliary lamps [29](#)

Average speed [36](#)

AWD [94](#)

## **B**

Bass [165](#)

Battery [126](#), [133](#), [155](#)

Battery - replacing [135](#)

Battery drain - avoiding [90](#)

Battery maintenance [134](#)

Belt check [127](#)

Blower (fan) [49](#)

Booster cushion [17](#)

Brake circuit [95](#)

Brake system [26](#), [95](#)

Bulbs [137](#), [156](#)

## **C**

Capacities [152](#)

Carbon Monoxide - Important Warning [85](#)

Catalytic converter [154](#)

CD changer [177](#)

Ceiling lighting [143](#)

Center console - storage compartments [64](#)

Central locking system - remote control [75](#)

Changing coolant [127](#)

Changing oil and oil filter [129](#)

Check Engine warning light [27](#)

Child restraint anchorages [18](#)

Child safety [17](#)

Child safety locks [79](#)

Child seat (Isofix fasteners) [18](#)

Climate control systems - general information [46](#)

Clock [24](#)

Coat hanger [66](#)

Coin compartment [64](#)

Cold weather precautions [107](#)

Coolant [131](#)

Coolant - changing [127](#), [131](#)

Coolant - checking level of [127](#)

Cooling system [153](#)

Courtesy light [61](#)

Cruise control [37](#)

Cup holder [64](#), [65](#)

Cup holder in rear seat [64](#)

Current fuel consumption [36](#)

## **D**

Defroster [49](#)

Dimension designation (tires) [114](#)

Direction indicators [33](#)

Dolby Pro Logic II (DPL II) [165](#)

Door mirror defroster [35](#)

Driving economically [89](#)

DSTC [29](#), [97](#)

Dual-threshold air bags [5](#)

## **E**

ECC [48](#)

Economical driving [89](#)

Electric socket [29](#)

Electrical current - conserving [90](#)

Electrical system [155](#)

Engine [128](#)

Engine - starting [87](#)

Engine compartment [128](#)

Engine oil [129](#)

Engine oil, capacity [152](#)

Engine specifications [157](#)

Engne oil - checking [130](#)

Environment [iii](#)

## **F**

Fader [165](#)

Federal Clean Air Act [124](#)

FIX NEXT SERVICE [28](#)

Floor mats [62](#)

Fog light [27](#)

Folding sideview mirrors [42](#)

Front seat - backrest [55](#)

Front seats [54](#)

Front seats - heated [35](#)

Front seats - manual adjustment [54](#)

Front seats - power [56](#)

Front suspension [153](#)

Fuel [ii](#), [84](#)

Fuel filler cap [ii](#), [86](#)

Fuel filler door [ii](#), [86](#)

Fuel filler door - unlocking [31](#)

Fuel filler door - unlocking manually [32](#)

Fuel Formulations [85](#)

Fuel gauge [24](#)

Fuel tank, capacity [152](#)

Fuses [145](#)

## **G**

Gasoline [84](#)

Geartronic [91](#)

Geartronic - kickdown [92](#)

Geartronic - manual shifting [92](#)

General information [ii](#)

Generator warning light [27](#)

Glove compartment [65](#)

## **H**

Handling [90](#)

Hazard warning flashers [35](#)

Headlight flasher [33](#)

Headlight washer [34](#)

Headlight wiper blades [133](#)

Headlights [31](#)

Headphones [162](#)

Heated front seats [35](#), [50](#)

High beam "flash" [33](#)

High beam indicator [24](#)

High/low beams - replacing [138](#)

Hoisting the car [126](#)

Home Safe System [33](#)

Hood - opening [38](#)

## **I**

IC [12](#)

Immobilizer (start inhibitor) [74](#)

Indicator and warning symbols [24](#), [25](#)

Inflatable Curtain [12](#)

Instrument lighting [31](#)

Instrument panel [24](#)

Interior [53](#)

Interior Air Quality sensor [51](#)

Interior lighting [61](#)

Intermittent wiping [34](#)

Introduction [i](#)

Isofix fasteners (child seats) [18](#)

## **J**

Jump starting [102](#)

## **K**

Keylock [ii, 87](#)

Keys [74](#)

## **L**

LED illumination [33](#)

Lighting panel [31](#)

Locking [77](#)

Locking steering wheel [88](#)

Locks [73](#)

Long distance trips [108](#)

Lubricants [153](#)

## **M**

Maintenance services [124](#)

Malfunction indicator light [27](#)

Messages in the display [28](#)

Moonroof (electrically operated) [43](#)

Multifilter with air quality sensor [51](#)

## **O**

Occupant safety [21](#)

Octane rating [84](#)

Odometer [24](#)

Oil pressure [27](#)

Oil quality [129](#)

Oil viscosity [129](#)

Opening the hood [38](#)

Opening the tailgate [39](#)

## **P**

P Park [91](#)

Paint [112](#)

Paint - color code [112](#)

Paintwork damage [112](#)

Parking brake [27, 38](#)

Parking lights [31](#)

Polishing [111](#)

Power seat [56](#)

Power steering fluid [132](#)

Power moonroof [43](#)

PROPOSITION 65 WARNING [102](#), [136](#)

## **R**

Radiator [128](#)

Rain sensor - windshield wipers [34](#)

Reading lights [61](#)

Rear fog lights [31](#)

Rear seat air condition [29](#)

Rear suspension [153](#)

Rear window defroster [35](#)

Rearview mirror/door mirrors [42](#)

Recirculation [50](#)

REDUCE SPEED [28](#)

Refrigerant (A/C system) [46](#)

Refueling [84](#), [86](#)

Remote control - central locking system [75](#)

Reporting safety defects [21](#)

Reverse warning system [29](#)

Roadholding [90](#)

Roll Stability Control (RSC) [97](#)

## **S**

Safety [1](#)

Safety defects - reporting [21](#)

Seat belt [2](#)

Seat belt maintenance [21](#)

Seat belt reminder [42](#)

Seat belts (keeping child seats in place) [20](#)

SEL button [162](#)

Service [124](#)

Service key [74](#)

Service reminder [27](#)

SERVICE REQUIRED [28](#)

SERVICE URGENT [28](#)

Shiftlock [ii](#), [87](#)

Side airbags [10](#)

Sideview mirrors [42](#)

SIPS airbags [10](#)

Snow chains [115](#)

Snow tires [115](#)

Spare tire - accessing [119](#)

Spare tires [116](#)

Spark plugs [155](#)

Specifications [149](#)

Speedometer [24](#)

Spoiler lights [31](#)

SRS [4](#)

Start inhibitor (immobilizer) [74](#)

Starting the car [87](#)

Steering [88](#)

Steering wheel adjustment [30](#)

Steering wheel lock [88](#)

Stone chips [112](#)

STOP [28](#)

STOP ENGINE [28](#)

Storage compartments [64](#)

Studded tires [115](#)

Supplemental Restraint System (SRS) [4](#)

Supplemental Restraint System (SRS) - warning light [27](#)

Suspension [153](#), [155](#)

Switches in the center console [29](#)

## T

Tachometer [24](#)

Tailgate - locking/unlocking [78](#)

Tailgate - opening [39](#)

Temperature [49](#)

Temperature gauge [24](#)

Temporary spare tires [116](#)

Text window - messages [28](#)

Three-way catalytic converter [154](#)

TIME FOR REGULAR SERVICE [28](#)

Tire economy [114](#)

Tire economy - improving [114](#)

Tire Rotation [116](#)

Tires [114](#)

Tires - tread wear indicators [117](#)

Towing [100](#)

Towing - cars with All Wheel Drive [101](#)

Towing a trailer [103](#)

Trailer indicator lamp [27](#)

Trailer towing [103](#)

Transmission - Geartronic [91](#)

Treble [165](#)

Trip computer [36](#)

Trip odometer [24](#)

Turn signals - normal turns [33](#)

Type designations [150](#)

## U

Uniform Tire Quality Grading [118](#), [121](#)

Unlocking [77](#)

Use of Additives [85](#)

## V

Valet key [74](#)

Vanity mirror [62](#)

Vehicle Identification Number (VIN) [150](#)

Vehicle loading [116](#)

VIN (Vehicle Identification Number) [150](#)

Volvo and the environment [iii](#)

## W

W - Winter [93](#)

Warning symbol in center of dashboard [25](#)

Warranties [124](#)

Washer fluid reservoir [128](#), [131](#)

Washing the car [110](#)

Waxing [111](#)

Weights [151](#)

Wheels [114](#)

WHIPS [15](#)

Windows [40](#)

Windshield washer [34](#)

Windshield washer fluid reservoir [131](#)

Windshield wipers [34](#)

Windshield wipers (rain sensor function) [34](#)

Winter tires [114](#)

Winter/Wet driving mode [107](#)

Wiper blades [133](#)

Back cover

## Accessory Installation - Important Warning

- We strongly recommend that Volvo owners install only genuine, Volvo-approved accessories, and that accessory installations be performed only by the factory-trained technicians at your authorized Volvo retailer.
- Genuine Volvo accessories are tested to ensure compatibility with the performance, safety, and emission systems in your vehicle. Additionally, your authorized Volvo retailer knows where accessories may and may not be safely installed in your Volvo. In all cases, please consult your authorized Volvo

retailer before installing any accessory in or on your vehicle.

- Accessories that have not been approved by Volvo may or may not be specifically tested for compatibility with your vehicle. Additionally, an inexperienced installer may not be familiar with some of your vehicle's systems.
- Any of your vehicle's performance and safety systems could be adversely affected if you install accessories that Volvo has not tested, or if you allow accessories to be installed by someone unfamiliar with your vehicle.
- Damage caused by unapproved or improperly installed accessories may not be covered by your new vehicle warranty. See your Warranty and Service Records Information booklet for more warranty information. Volvo assumes no responsibility for death, injury, or expenses that may result from the installation of nongenuine accessories.

### **Driver Distraction**

- Driver distraction results from driver activities that are not directly related to controlling the vehicle in the driving environment. Your new Volvo is, or can be, equipped with many feature-rich entertainment and communication systems. These include hands-free cellular telephones, navigation systems, and multipurpose audio systems. You may also own other portable electronic devices for your own convenience. When used properly and safely, they enrich the driving experience. Improperly used, any of these could cause a distraction.
- For all of these systems, we want to provide the following warning that reflects the strong Volvo concern for your safety:
- Never use these devices or any feature of your vehicle in a way that distracts you from the task of driving safely. Distraction can lead to a serious accident. In addition to this general warning, we offer the following guidance regarding specific newer features that may be found in your vehicle:
- Never use a hand-held cellular telephone while driving. Some jurisdictions prohibit cellular telephone use by a driver while the vehicle is moving.
- If your vehicle is equipped with a navigation system, set and make changes to your travel itinerary only with the vehicle parked.
- Never program your audio system while the vehicle is moving. Program radio presets with the vehicle parked, and use your programmed presets to make radio use quicker and simpler.
- Never use portable computers or personal digital assistants while the vehicle is moving. A driver has a responsibility to do everything possible to ensure his or her own safety and the safety of passengers in the vehicle and others sharing the roadway. Avoiding distractions is part of that responsibility.

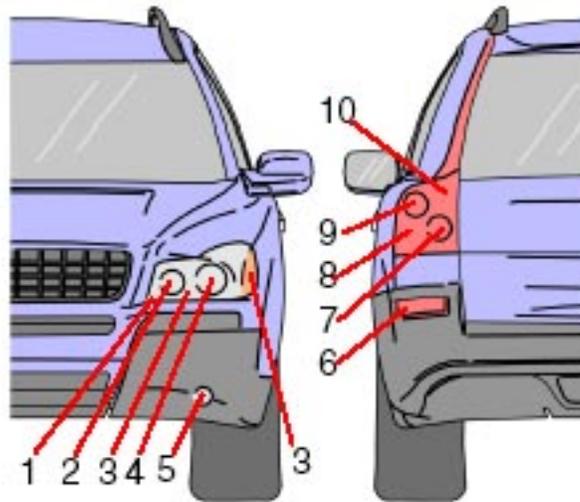


**The following should be checked regularly:\***

1. Washer fluid reservoir should be filled with water and solvent (wintertime: windshield washer anti-freeze). See [page 131](#).
2. Power steering - When cold, the level must not be above the COLD mark and when hot it must not be above the HOT mark. Top up if the level drops to the ADD mark with ATF fluid. See [page 132](#).
3. Coolant level should be between the expansion tank marks. Mixture: 50% antifreeze and 50% water. See [page 127](#).
4. Engine oil should be checked each time the vehicle is refueled. The oil level should be between the dipstick marks. The distance between the marks represents approx. 1.6 US qt. (1.5 liter). See [page 130](#).
5. Brake fluid - check, without removing the cap, that the level is above the MIN mark. Use brake fluid DOT 4+. See [page 132](#).

**Fuel octane rating, see [page 84](#).**

**Tire pressure, see [page 116](#), and the label located on the inside of the fuel tank cover.**



1 Turn signal	H21W amber
2 High beam	55W H7
3 Parking light	W5W
4 Low beam	55W H7
5 Fog light, front	55W H1
6 Fog light, rear	21W BA5
7 Back-up light	21W BA15
8 Parking light/tail light	P21 4W
9 Turn signal	PY21W amber
10 Brake light	21W BA15

See page [page 137 - 144](#) for more information on replacing bulbs.

# VOLVO

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[Contents](#) | [Top of Page](#)