VOLVO 480

OWNER'S MANUAL

1989

VOLVO

Personal information

Name .....

Address .....

.....

.....

Tel. No .....

Insurance Company .....

.....

Insurance Policy No .....

Your Volvo dealer

Name .....

Address .....

.....

.....

Tel. No .....

Garage Manager .....

Tel. No .....

Car Information

Type Designation .....

Chassis No .....

Engine No .....

Registration No .....

Finding your way in the Owner's Manual

The contents have been divided into the seven sections listed here. The sections can be located in the book by the **coloured** blocks.

The first right-hand page of each section has an introduction and a **detailed** list of the section contents.

The **titles** at the top of every page are designed to allow texts to be located when thumbing-through the manual.

The **index** on pages 102 to 104 indicates the exact page on which detailed information can be found.

contents

introduction	pages
Model variants	2
Car keys	3
Dashboard layout	4
Index	**102-104**

driving controls
Instruments, controls and switches
Pages 4 - 22

fittings and facilities
Seats, seat belts, doors and luggage space
Pages 23 - 35

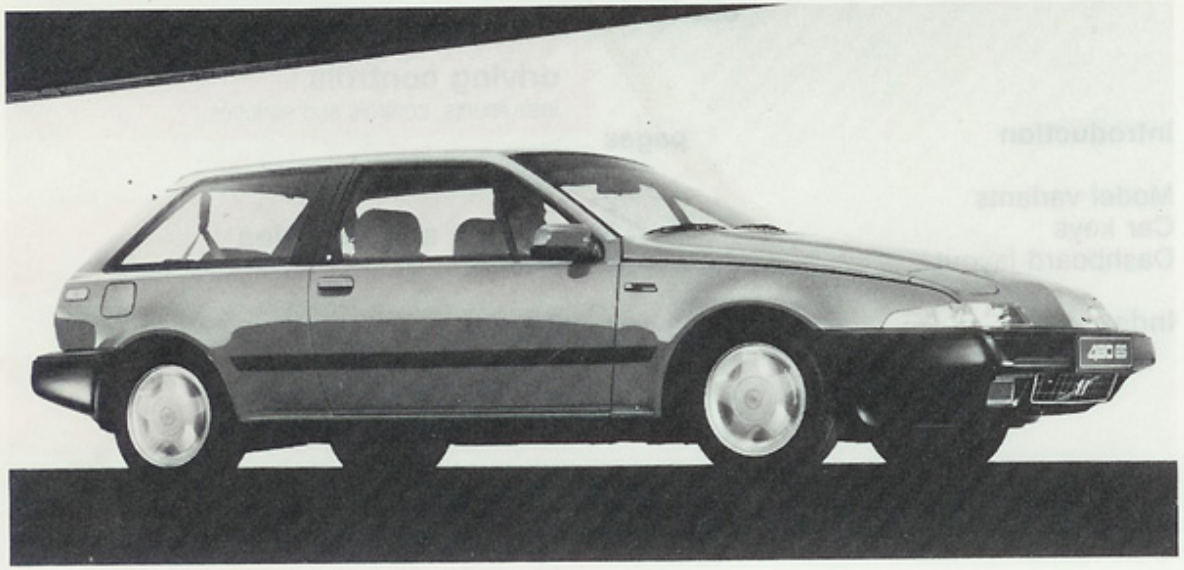
starting and driving
Procedures, tips and warnings
Pages 36 - 47

what to do if...
A tyre is flat, a bulb has blown...
Pages 49 - 68

car care
Keeping your car spic and span
Pages 69 - 75

maintenance
Service, routine checks, precautions
Pages 76 - 95

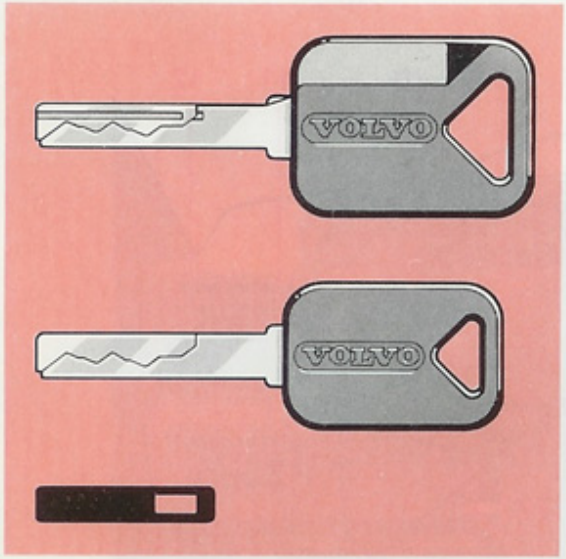
specifications
Summary of technical data
Pages 96 - 101



Model variants

It should be noted that there are certain differences between the **model variants in different countries** so that you may find features described which are not present on your car. In case of any doubt please contact your Volvo dealer.

The specifications and constructional data as well as the illustrations contained in this manual are not binding. We reserve the right to make alterations without prior notification.



Car keys

The car is supplied with two normal keys which fit all locks, and a third ''Service key''. This key fits the door locks and the ignition but does not allow access to the lockable compartments in the dashboard and the tunnel console.
The car keys are supplied with a separate number tag as a security measure. Remove the tag from the keys and keep it in a safe place as a permanent record of the **key number**.

Important

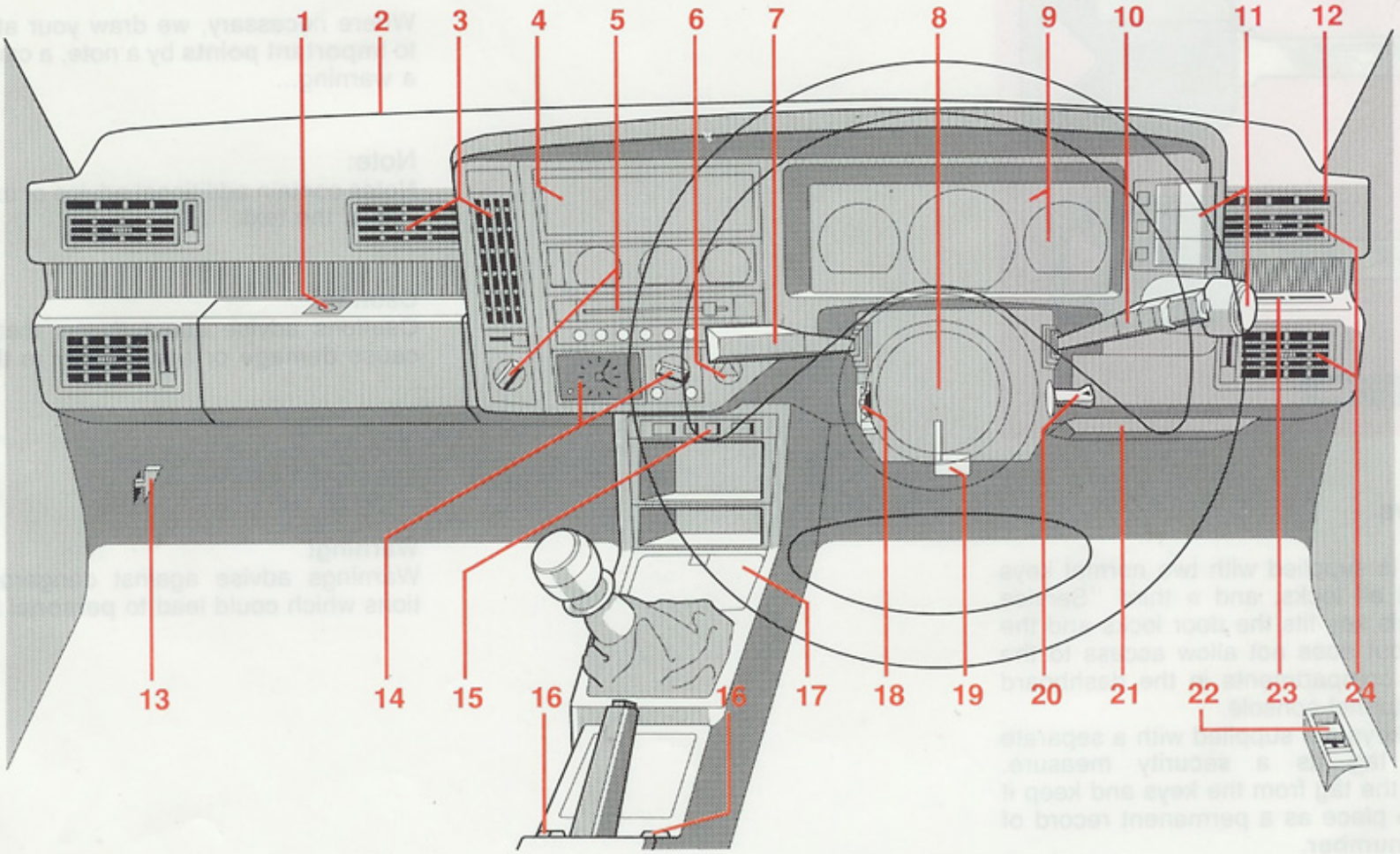
Where necessary, we draw your attention to **important points** by a note, a caution or a warning...

Note:
Notes contain additional advice or explanation of the text.

Caution!
Cautions advise about things that could cause **damage** or undue wear to the car.

Warning!
Warnings advise against dangerous actions which could lead to **personal injury.**

dashboard layout



Described on page:

1 Lockable glove compartment
2 Windscreen defroster 18, 19
3 Adjustable central vents 18, 19
4 Space for radio 15
5 Heater controls 19, 21
6 Hazard warning switch 12
7 Direction indicators, headlamp dip and flash 12
8 Horn
9 Instrument panel with information centre 8 to 10
10 Windscreen wash/wipe 13
11 Switches for lighting and heated rear window 16, 17
12 Side window defroster 18

13 Bonnet release 34
14 Channel selector, information centre and clock 11
15 Switches on central console 17
16 Switches on handbrake panel 22, 32
17 Ashtray and cigar lighter 25
18 Dashboard lighting dimmer 17
19 Steering wheel height adjustment 27
20 Ignition switch/steering wheel lock 14
21 Fuses 57
22 Tailgate and fuel cap cover release 32, 35
23 Coin tray 15
24 Adjustable side vents 18, 19

This section contains a detailed description of all the instruments and controls that are the first concern of the **driver**.
Please note, however, that variations are possible between various market versions due, among other factors, to varying legislation.

section contents **page**

Dashboard layout 4, 5
Instruments and warning lights 6, 7
Information centre and channel selector 8 to 11
Clock 11
Steering column stalks 12, 13
Ignition switch 14
Lighting switches 16, 17
Car heater controls 18, 19
Air-conditioning controls 20, 21
Mirrors 22

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Indicator lamps

1 hazard warning lights
2 fasten seat belts!
3 door, bonnet or tailgate open!

4 bulb failure
5 windscreen washer level
6 not in use
7 fuel reserve
8 oil level/temperature
9 coolant temperature

10 vehicle lighting
11 fog lamps
12 rear fog lamps
13 heated rear window
14 main beam

15 ABS (optional, see page 40)
16 Parking brake
17 Brake fluid level
18 battery charge
19 oil pressure

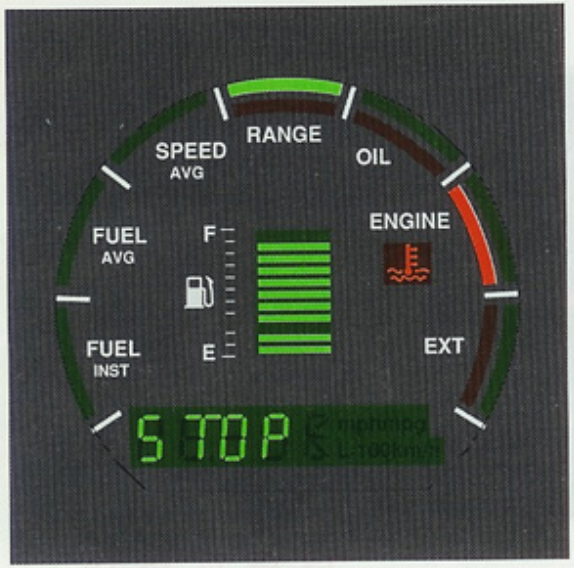
These warning lamps, in particular, should never light up when driving

Brake fluid level
The brake fluid level in the reservoir is below the minimum level.
Stop the car, see section: ''What to do if...''.

Battery charge failure
This lamp should never light up when the engine is running. If it does, have the alternator belt and charging circuit checked.

Oil pressure
The engine oil pressure is too low. Switch off the engine immediately and check the oil level in the engine, see Section ''Maintenance''.

Engine temperature
The engine coolant temperature is too high. Stop the car and check the coolant level, see section ''What to do if...''.



coolant temperature, warning

The information centre

This display system is seven instruments combined into one dial. The display shows information for the channel with its green segment lit up.

While the car is driven, the information centre presents information in three ways: automatically, continuously or on demand.

Automatically...

... you will be shown the engine oil level and the ambient air temperature (if this is below 4 °C) when starting the engine.

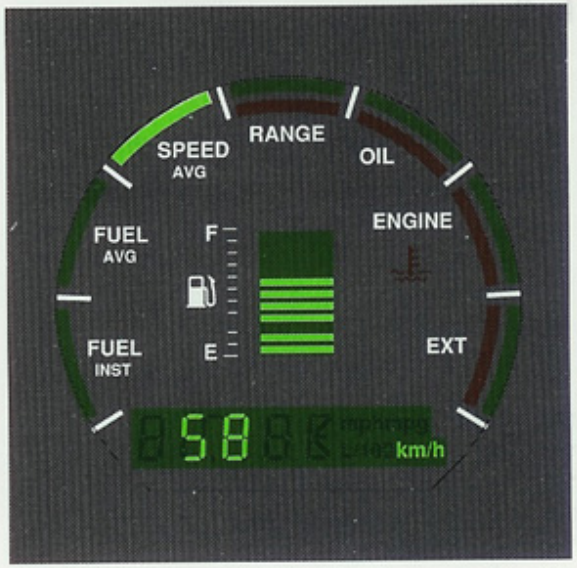
... you will be warned by a red signal while driving if:
- the fuel reserve is low (RANGE)
- the oil temperature is too high (OIL)
- the engine temperature is too high (ENGINE)
- the ambient air temperature indicates ice-forming conditions (EXT)

and you will be shown the relevant information.

Continuously...

... while driving you will see your fuel supply on the bar graph

... the absence of **red** will tell you that all essential systems are in order.



average speed

On demand...

... by turning the channel selector you can call up information about:

FUEL INST	your present fuel consumption
FUEL AVG	your average fuel consumption
SPEED AVG	your average speed
RANGE	the car's remaining action radius
OIL	the engine oil temperature
ENGINE	the engine coolant temperature
EXT	the ambient air temperature

Start checks, information centre

Turning the ignition key triggers off the start check sequence:

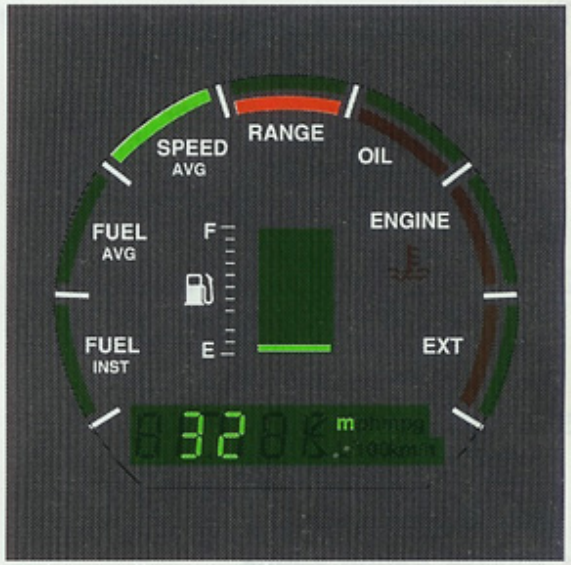
During the first five seconds...
OIL (engine oil level*) message displayed: ''OK'' or ''CHECK''.

Then for five seconds...
RANGE (action radius) message displayed:
the distance in kilometres or miles that can be driven with the remaining fuel.

And then...
if no red segment is lit up, the ambient temperature is displayed if under 4°C.
If below −4°C, the temperature is displayed for 30 seconds only, when the message will be displayed for the channel to which the **channel selector** has been set.

Then for five seconds there will be repeated...
the engine oil level read-out **if more than** 1.0 litres below (''CHECK'' and OIL green segment lit up),
or...
the action radius read-out **if less than** 70 kilometres (40 miles) remaining (RANGE red and green segments lit up).

* The most reliable **oil level** reading is obtained with a cold engine and the car standing on a level surface.



action radius, warning

Bar graph fuel gauge

Fuel reserve! **(two green bars)**:
when the action radius drops below 70 kilometres (40 miles) the RANGE **red segment** lights up and the action radius is displayed continuously.

Fuel urgent! **(one bar only)**:
when the action radius drops below 15 kilometres (9 miles) the message becomes: ''– – –''.

The functions of each channel in detail

1 FUEL INST **Econometer**
Continuous reading of **fuel consumption,** updated every 30 metres. Calculated from the amount of fuel being injected into the engine and the distance covered.

2 FUEL AVG **Average fuel consumption**
Average fuel consumption calculated from the moment that the information centre memory was reset.

3 SPEED AVG **Average speed**
Average speed calculated for the distance covered from the moment the memory was reset.

4 RANGE **Action radius**
Gives the distance the car can travel with the amount of fuel remaining in the tank. This is calculated from the average fuel consumption value of the last 30 kilometres.
Warning function is activated when the action radius drops below 70 kilometres (40 miles), see ''Fuel gauge'' page 9.

5 OIL **Oil temperature**
Gives the temperature of the engine oil. If the temperature read-out displays ''COLD'', this indicates that the engine has not reached its working temperature (see page 38).

Warning function is activated if the oil temperature exceeds 140 °C (284 °F). The red warning segment lights up and the temperature read-out displays ''STOP'' continuously.

Note:
Oil **level** information is given only during the vehicle start check sequence.

6 ENGINE **Coolant temperature**
Gives the temperature of the engine coolant when the car is in motion.

Warning function is activated if the coolant temperature exceeds 115 °C (240 °F). The red warning segment and the symbol light up and the temperature read-out displays ''STOP'' continuously.

7 EXT **Ambient air temperature**
Gives the outside air temperature at about 40 centimetres above the road surface when the car is in motion.

Warning function is activated if the air temperature drops below 4°C (39°F) to draw your attention to the possibility of ice road surfaces.
The red warning segment lights up and the ambient air temperature is displayed continuously.

At temperatures below **– 4°C** (25°F) the warning function operates as a reminder for 30 seconds only.

Warning signals

Channels four to seven have **warning functions** as well.
In the event of ''alert'' signals from **more than one** channel arriving simultaneously, the display of engine conditions will have priority.

Fault

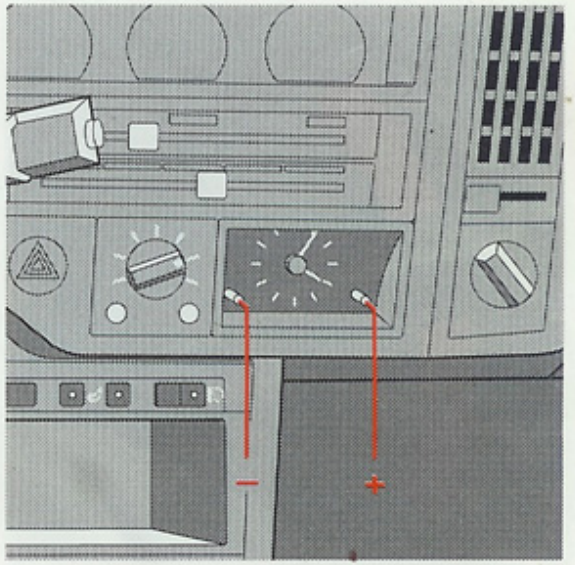
If the OIL, ENGINE or EXT channel displays ''CHECK'' continuously, this can indicate that there is a malfunction. Have the instrument checked by a Volvo workshop.

Channel selector switch, control buttons

A Selects one of the seven channels (the segment of the selected channel lights up green).

B Selects message in:
m, mph, mpg, °F (Fahrenheit)
or message in:
km, L/100 km, km/h, (Celsius)
Use a pin to change the setting.

C Resets the reference point for the values:
average speed
average fuel consumption
Depress for at least **two seconds** to reset each function independently.



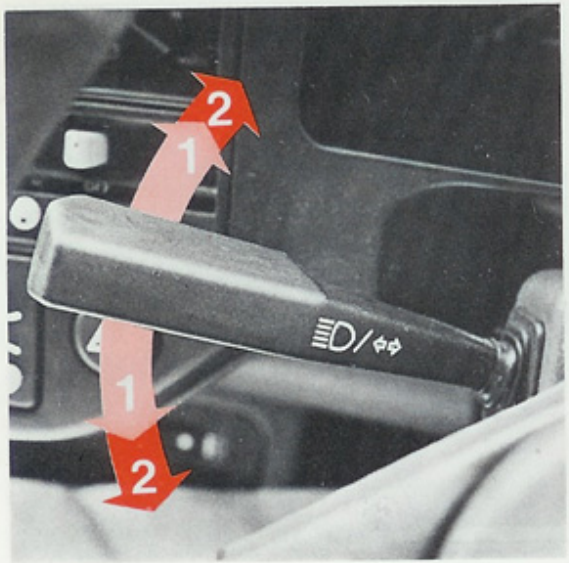
Adjusting the clock

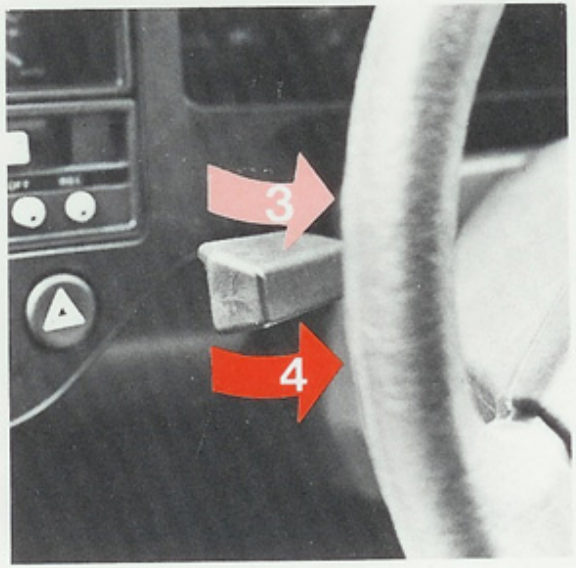
To set the console clock forward:
— Depress the **plus** button momentarily to advance a minute at time.

— To make a bigger correction, **hold** the button in, when the hands will accelerate after the first five seconds.

To set the console clock back:
— Operate the **minus** button in the same way.

direction indicators, headlamp and hazard warning switches





Left-hand steering column stalk

Lane changing, overtaking (1)
light pressure upwards or downwards.

Normal turns (2)
right turn: stalk upwards
left turn: stalk downwards.

Main beam flasher (3)
Pull towards the steering wheel.

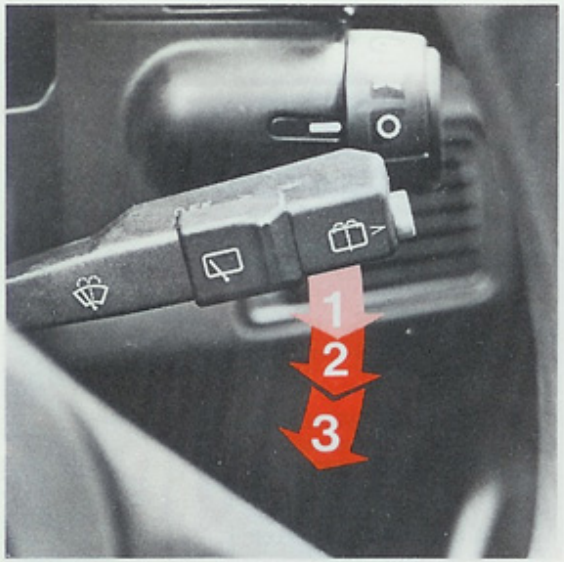
With retracted headlamps:
long range lamps come on instead of main beams.
With ignition key removed:
headlamps burn for 30 seconds.

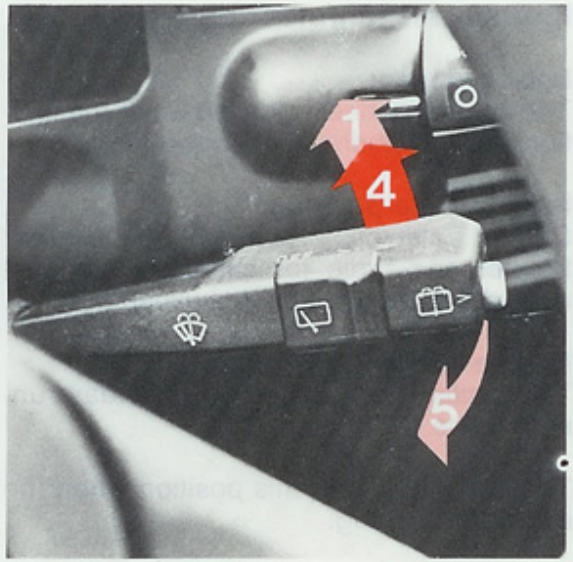
Main beam/dipped beam (4)
(headlamps and ignition switched on).

Hazard warning switch

Use the hazard warning installation in accordance with local regulations.

Note:
Bulb failure warning: if a **direction indicator** lamp fails, the turn signal arrows will flash with shorter intervals.





Right-hand steering column stalk

Wipers, single sweep (1)
Slightly depress the lever (or during intermittent: lift).

Wipers, normal speed (2)

Wipers, high speed (3)

Wipers, intermittent sweep (4)
The wipers make single sweeps at intervals of six seconds.

The wipers will sweep continuously during full throttle acceleration.

Windscreen washers (5)
When applied for longer than about 0.2 seconds, the wipers make a few sweeps automatically.
If the headlamps are deployed, the headlamp power wash programme will start (if more than 5 minutes since previous use).

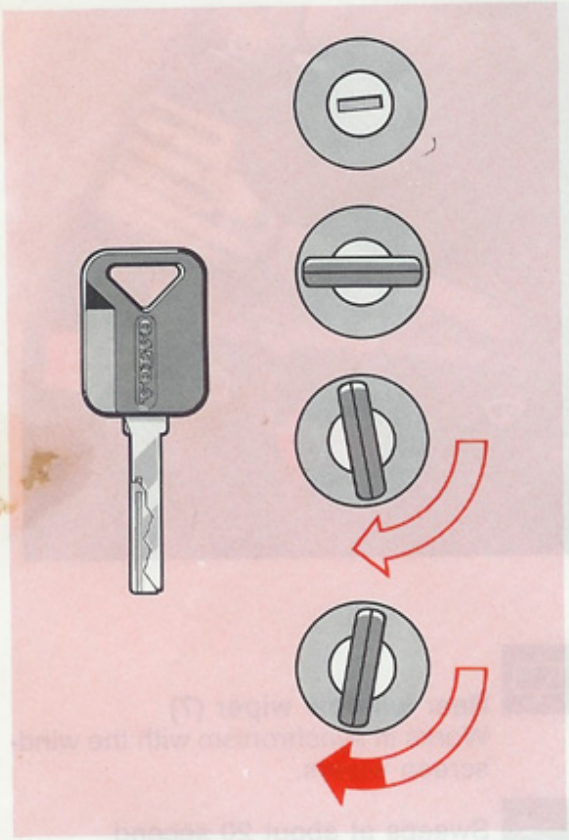
Rear window washer (6)
Washer operates, followed by a few sweeps of the wiper.

Rear window wiper (7)
Works in synchronism with the windscreen wipers.

Sweeps at about 20 second intervals.

Sweeps at about six second intervals.

In either position, and when only the windscreen wipers are running, it will sweep continuously while **reverse gear** is engaged.



Steering wheel lock

If difficulty is encountered in turning the key due to the lock position on the steering wheel, turn the wheel a little to the left or to the right while turning the key.

Ignition switch/steering wheel lock

Lock position:
The steering wheel is locked when the ignition key is withdrawn from the lock.

Intermediate position:
Certain electrical components, **heater blower** and radio for example, are connected but the ignition is switched off.*

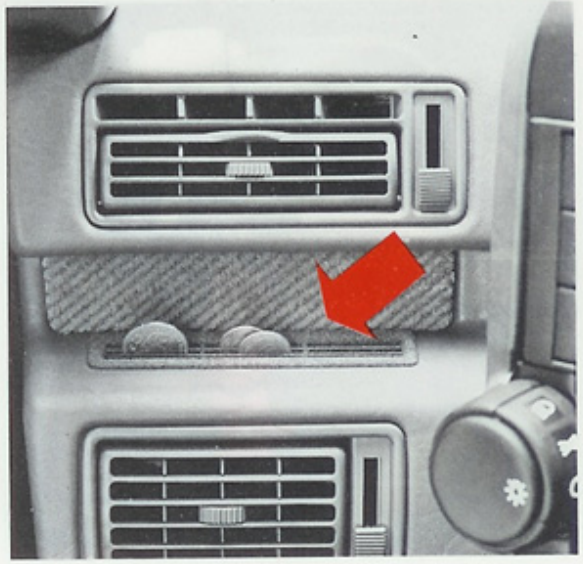
Engine-running position:
The ignition is switched on. The day running lights come on.

The key remains in this position when the engine is running.

Start position:
Release the key as soon as the engine starts. It automatically springs back to the "engine-running position".

* Do not leave the car with the ignition key in the **intermediate** position!

Start inhibitor
If the engine fails to start, the key must be turned back to the **lock position** before using the starter once more.



Coin tray

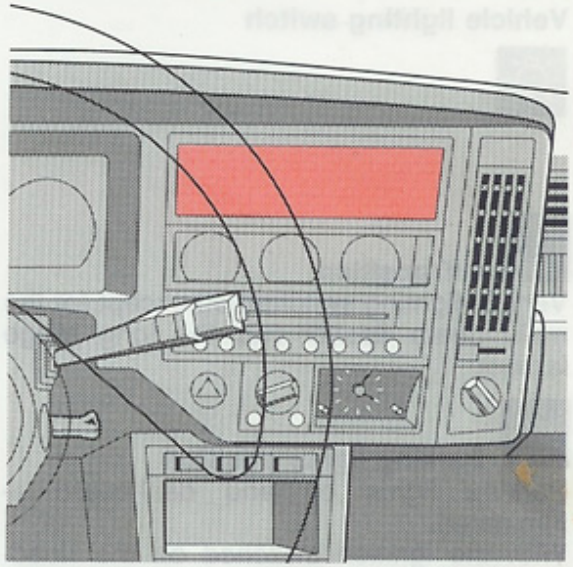
Boost pressure gauge
(turbo-engine cars only)

The rest position of the needle is between the white and yellow segments of the scale.

Needle deflects to the **left** (-1) **white** segment:
The best fuel **economy** is achieved within this range.

Needle deflects to the **right** (**yellow** segment: the turbo compressor is providing boost pressure.

If the needle deflects further into the **red** (+1) segment:
this is a **warning** that pressure in the intake manifold is **too high**.
Drive the car carefully to a Volvo dealer for inspection.



Radio, additional instruments

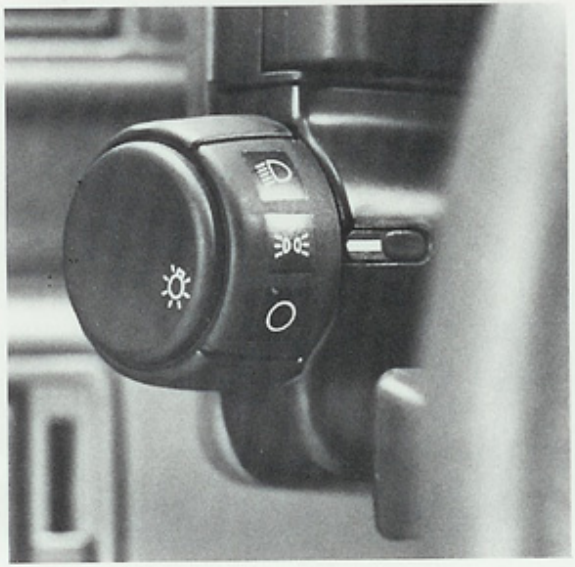
The car is **pre-wired** to accept various combinations of radio, radio/cassette player and speakers.

Vehicle lighting switch

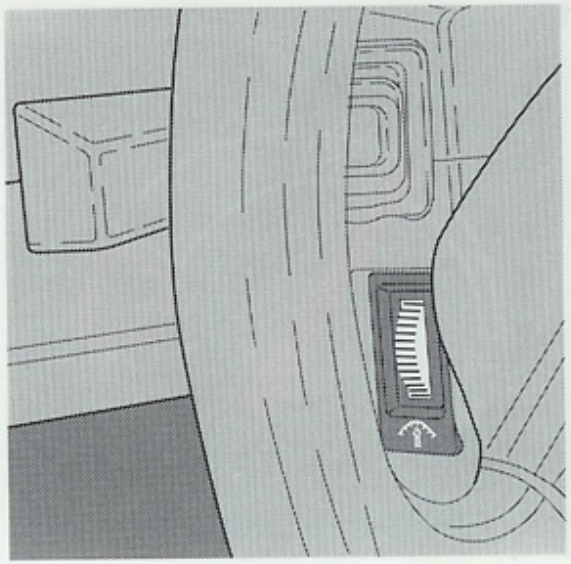
Off position
Vehicle lighting switched off except for the main beam flasher (via the long range lamps).

Parking lights position
Parking lights on and dashboard illuminated.
With the ignition switched on the headlamp dimmed dip beams will come on.

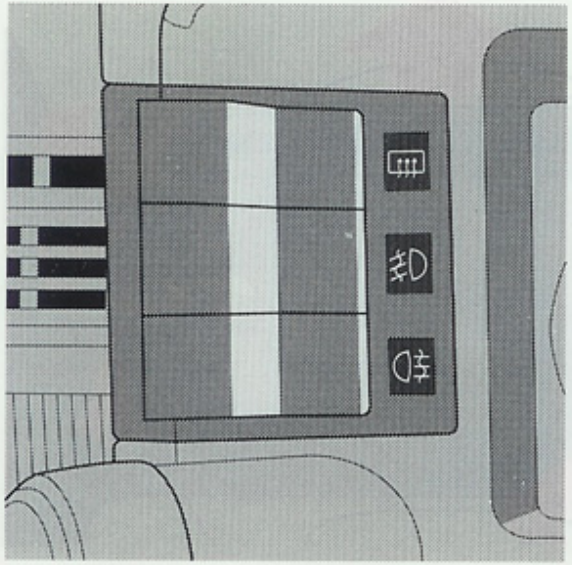
Main lighting position
(With the ignition switched on)
All vehicle lighting **on,**
headlamps deployed with (full) dipped or main beams, controlled by the left-hand steering column stalk.



Bulb failure warning
The bulb failure indicator will light up if a bulb for a headlamp (dipped beam), parking light, running light, tail light or brake light fails.
The indicator lights up every time the engine is started and stays on until the brake pedal is used.



Dimmer
(On the left side of the steering column, opposite the ignition switch.)
When the **vehicle lighting** is switched on, this controls the brightness of the instrument and dashboard illumination.



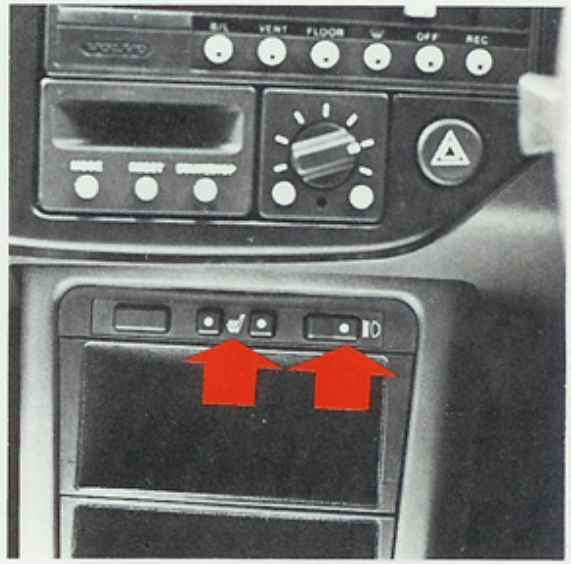
Three switches above the lighting switch:

Rear window and door mirror heating switch
Depress momentarily: the heated rear window operates for 12 minutes.

To switch on **permanently**: depress until the buzzer sounds (after two seconds).
To switch off: depress once more. The rear window and the mirror de-icers are also disconnected when the ignition is switched off.

Fog lamp switch
Fog lamps operate only when the vehicle lighting is switched on (some countries: only when the dipped headlamps are switched on).

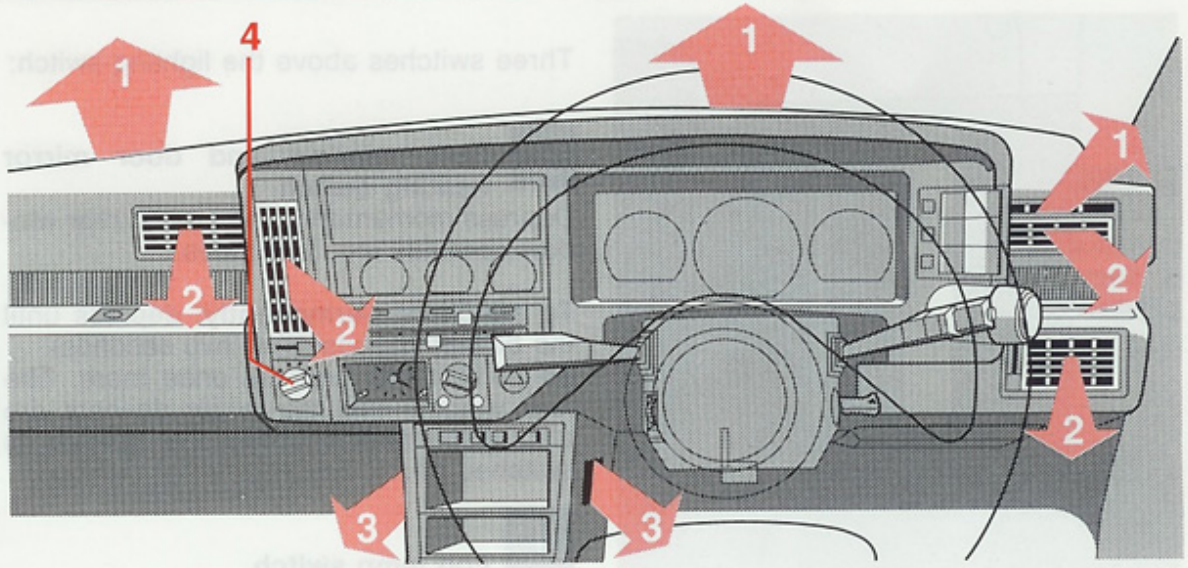
Rear fog lamp switch
Operates only when the vehicle lighting is switched on.



Central console switches

Long range headlamps
Switch on: lamps come on together with the headlamp main beams.

Electrically heated front seats
Switch depressed: the seat heating comes on automatically at temperatures below 14 °C and cuts out at approximately 27 °C.



Cars with air-conditioning:
see page 20.

Air distribution

1 (Defrost) air through the defroster vents.

VENT **2** (Adjustable vents) air through the adjustable vents where open.

FLOOR **3** (Floor vents) air through the vents **under** the dashboard.

4 Blower fan speed control

Choice of four speeds and OFF.

5 Temperature control

Progressive from cold (fully right) to hot (fully left).

Heater control panel

Air distribution control progressive between:

1  Air to defrosters

2 VENT Air to adjustable vents

3 FLOOR Air to floor vents (3)

4  Blower fan speed control

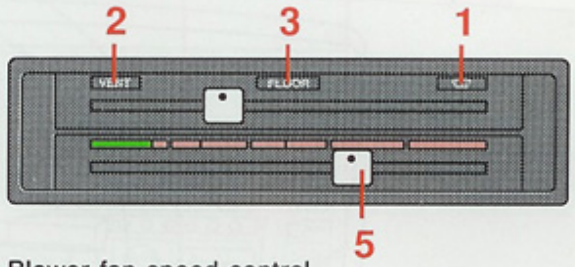
0: off
2: slow
3: normal
3: fast
4: maximum speed

With a cold engine, the best result is obtained with fan speed 2.

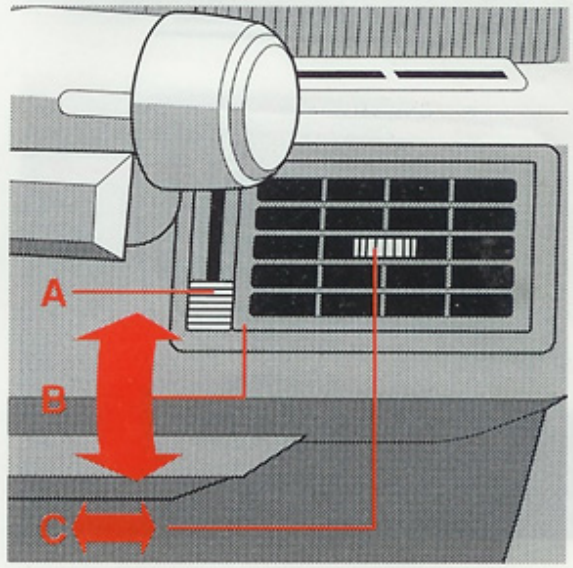
5  Temperature control

Progressive from cold (fully right) to hot (fully left).

Heater control panel



Blower fan speed control



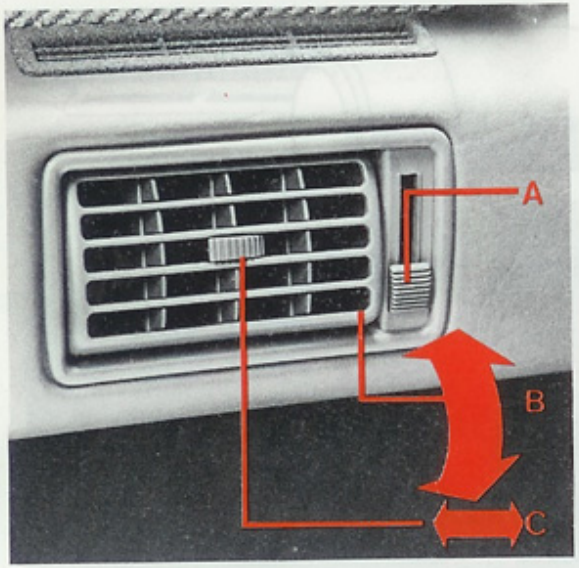
Adjustable air vents

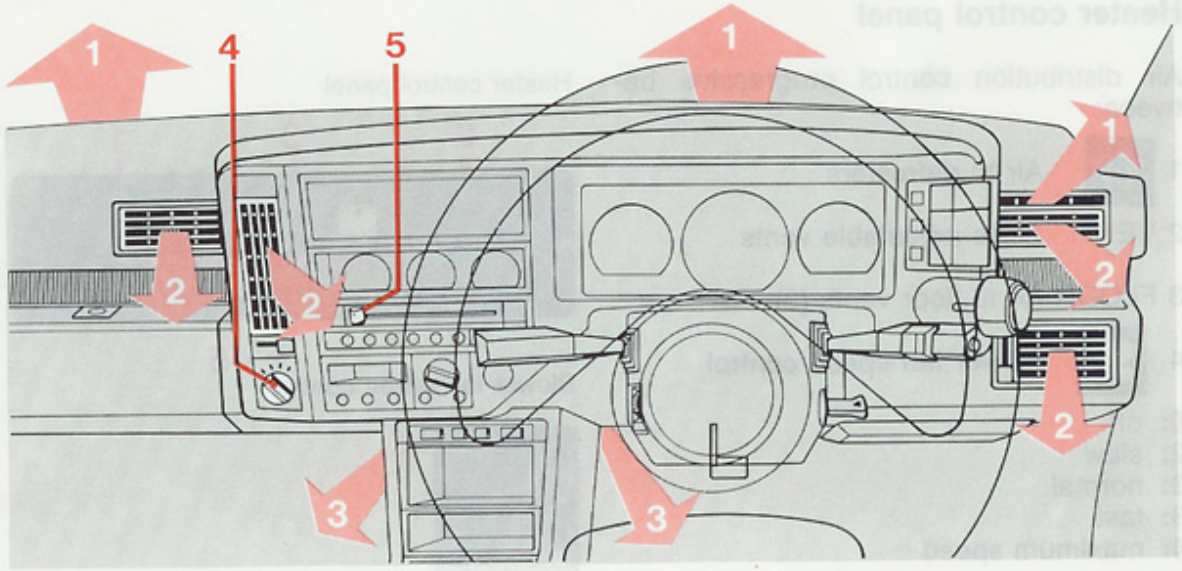
A Air volume
down: closed
up: fully open

B Air direction

C Air direction

These can be opened or closed independently (with control **A**).





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FLOOR **3** (Floor vents) air through the vents **under** the dashboard.

4 Blower fan speed control

Choice of four speeds and OFF.

5 Temperature control

Progressive from cold (fully right) to hot (fully left).

Selector buttons

One **only** of the following seven buttons will engage at the same time.

. . . for air-conditioning:

AC Air to the adjustable vents where open (2).

AC MAX As above, but with the highest fan speed and the recirculation mode engaged.

. . . for air distribution:
(air-conditioning switched off)

B/L Air to VENT and FLOOR (2 and 3).

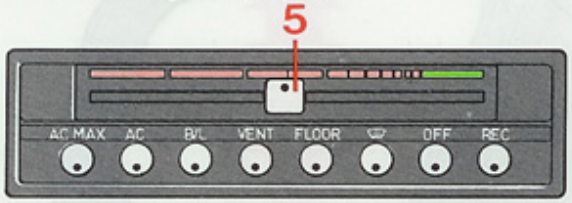
 Air to defrosters (1).

VENT Air to the adjustable vents where open (2).

FLOOR Air to the floor vents (3).

OFF Fan speed **0**: fan switched off.
Fan speeds **1 - 4:** air recirculated at the lowest fan speed.

Air-conditioning control panel



Blower fan speed control

The last button to the right operates **independently:**

REC **90%** of the air is recirculated through the car,
10% is refreshed.

Use for short periods to:
— warm-up the car quickly
— cool-down the car quickly with air-conditioning
— avoid excessive dust or fumes entering the car.

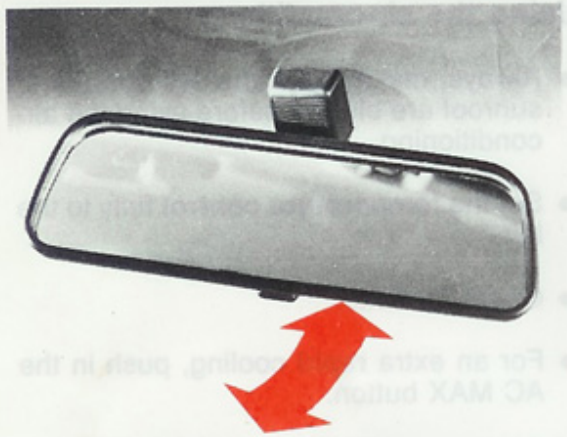
Using the air-conditiong

- Always make sure the windows and sunroof are **closed** before using the air-conditioning.
- Set the **temperature control** fully to the left.
- Open air vents.
- For an extra **rapid** cooling, push in the AC MAX button.
- When the desired temperature has been reached, push in the AC button.

Adjust the fan speed and temperature controls as required.

- **Turbo cars fitted with air conditioning:** we recommend that the air conditioning be switched off in extreme conditions (steep climbs and high temperatures) when towing with a trailer weight of more than 400 kg.

Caution!
It is important to have the air-conditioning system inspected by a Volvo workshop once a year.

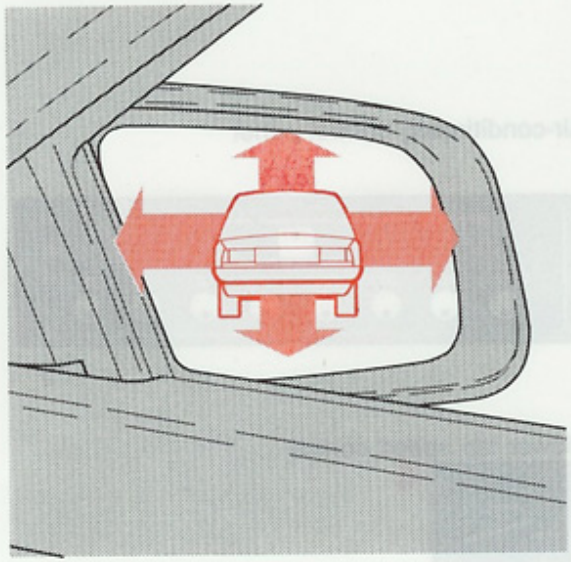


Interior rear view mirror

Anti-dazzle position: pull back the lever.

Warning!

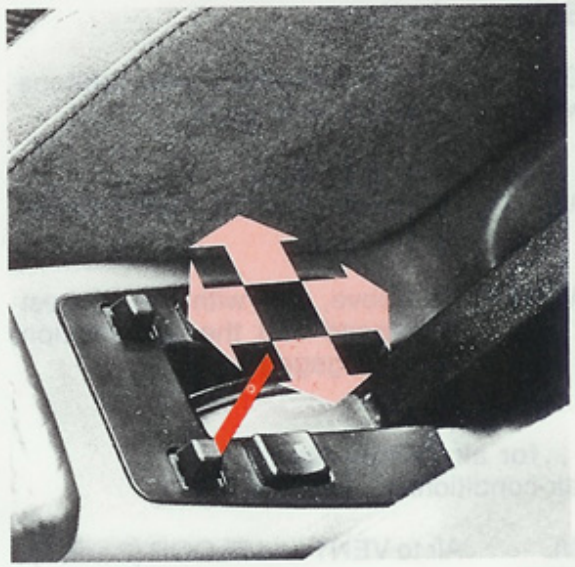
Always adjust the driving mirrors **before** you drive away.



Door mirrors

For safety reasons, it is possible for the mirror to be dislodged from its mounting.

To reposition the mirror, align the pegs with their retaining springs and give a light blow with the hand at right-angles to the car.

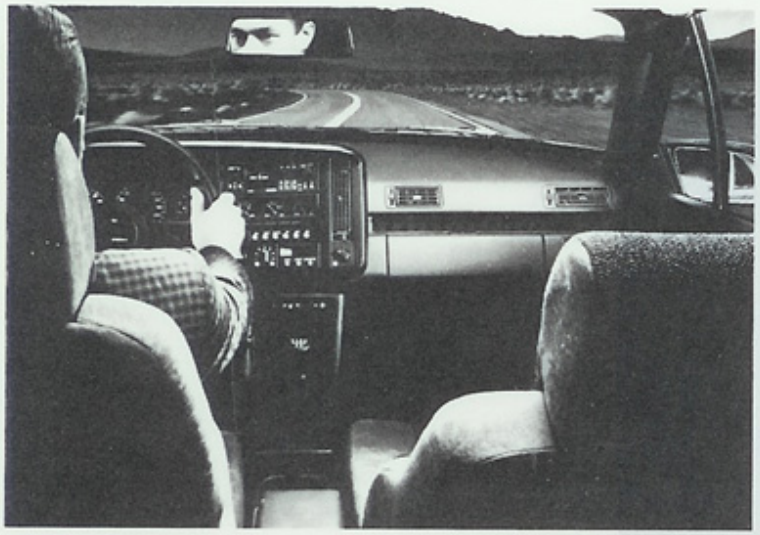


Door mirror adjustment

The mirrors can be adjusted in four directions using the "joystick" switches.

Door mirror de-icers

The mirror heaters operate simultaneously with the rear window heater.



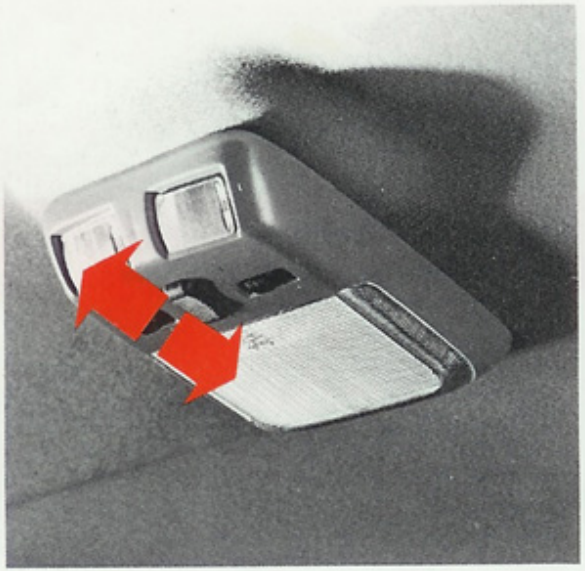
fittings and facilities

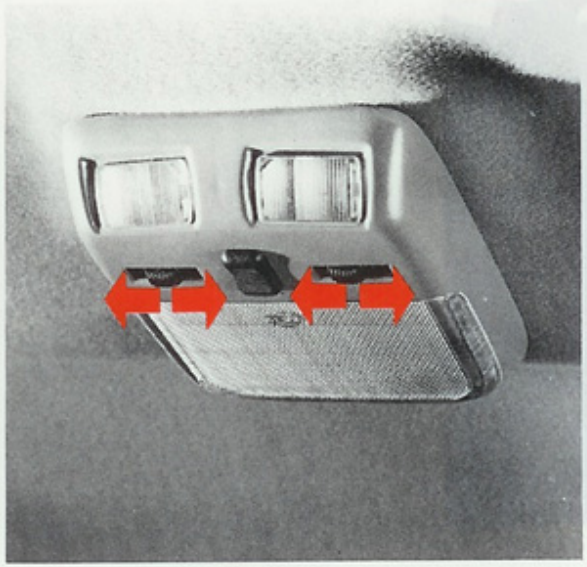
Seats, seat belts, doors and luggage space

This section describes the rest of the controls, fittings and facilities inside and outside the car, which both **driver and passengers** can use.

section contents **page**

Courtesy lights	24
Cigar lighter and ashtrays	25
Front seat adjustment	26
Steering wheel height	27
Seat belts	28
Rearseats	29
Doors and locks	30, 31
Windows, tailgate	32
Storage space in the car	33
Engine bonnet	34
Fuel filler cap	35





Courtesy lights

Rear: the light remains on

Middle: the light is **off** permanently.

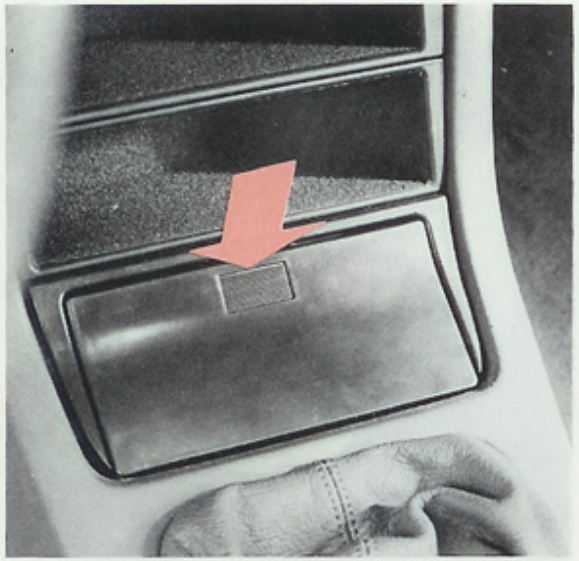
Forward: (courtesy) the light and the ignition switch illumination light up when a door is open.
The light will remain on for 15 seconds after the doors have been closed.

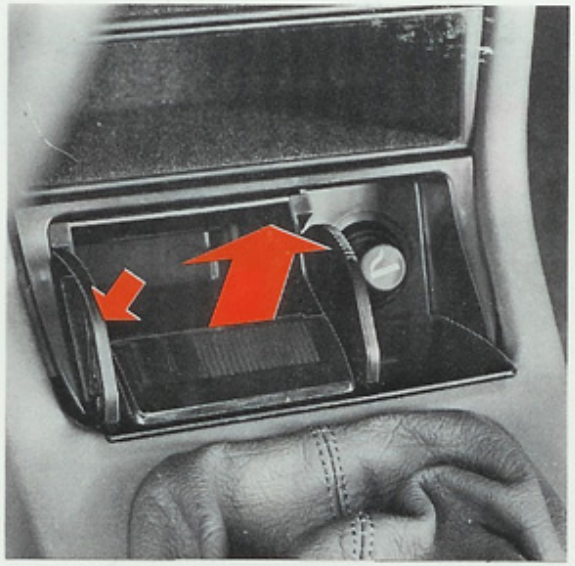
Map reading lamps

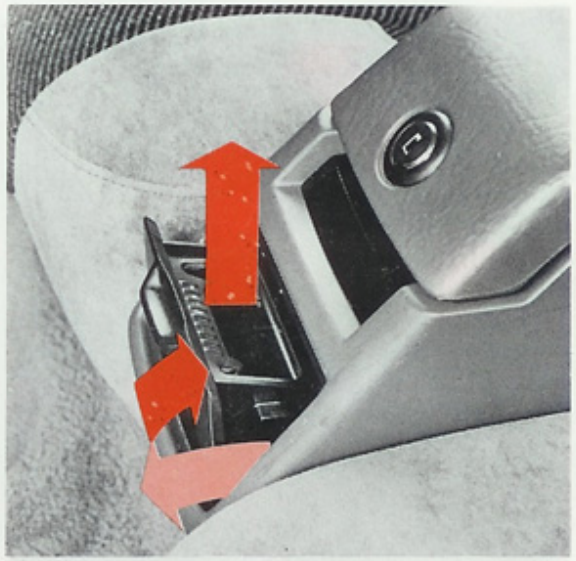
Inwards: light remains **on**

Middle: off

Outwards: courtesy position







Ashtray

Lightly depressing the lid will cause it to open.

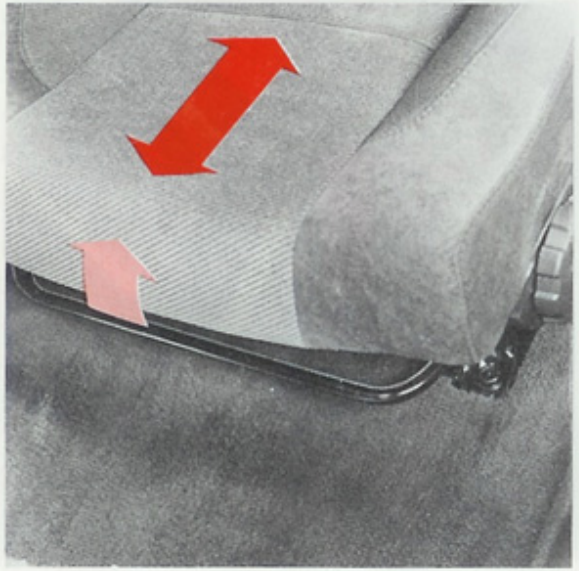
The **cigar lighter** is inside the ashtray compartment.

To remove the ashtray: open and, gripping the lid firmly, pull upwards.

After emptying, push back into place with the lid open.
If the lid will not close: remove the ashtray once more and push back the lever at the left.

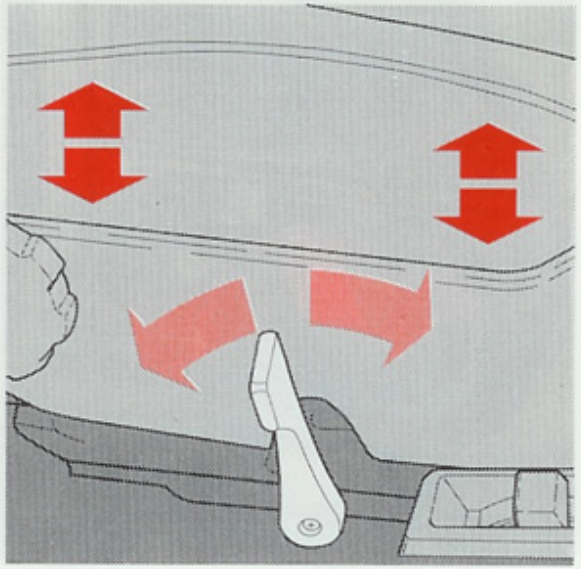
Ashtray rear

To remove: hold the lid in the vertical position and pull straight upwards.



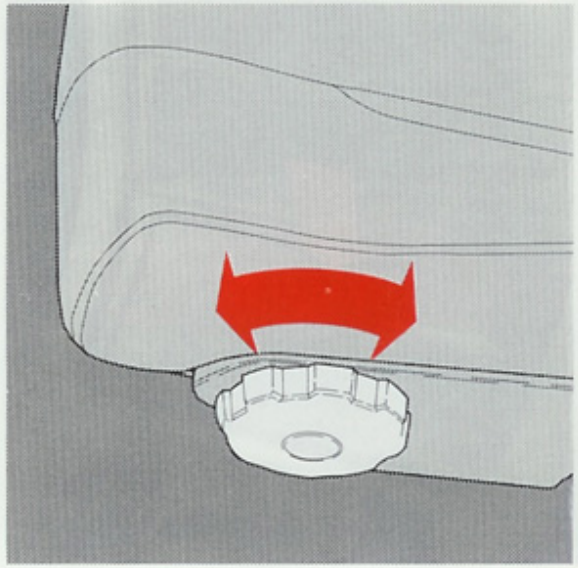
Fore-and-aft adjustment

Warning!
Always make any seat adjustments **before** you drive away, **never** while driving!



Driving seat cushion height

Lever backwards: adjusts front of seat cushion.
Lever forwards: adjusts rear of seat cushion.

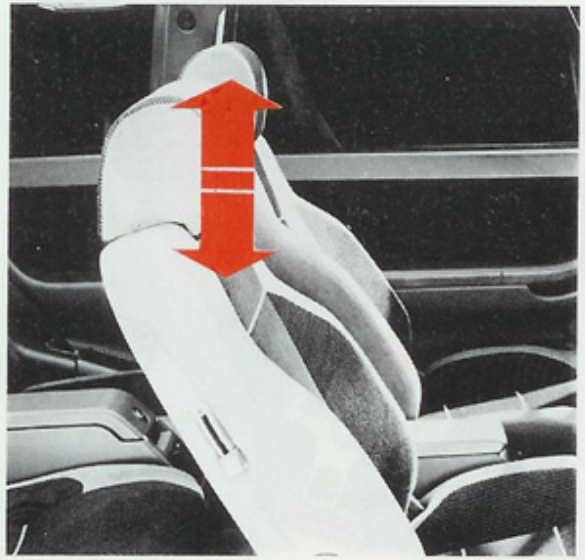


Backrest rake

Turn the knob forwards or backwards.

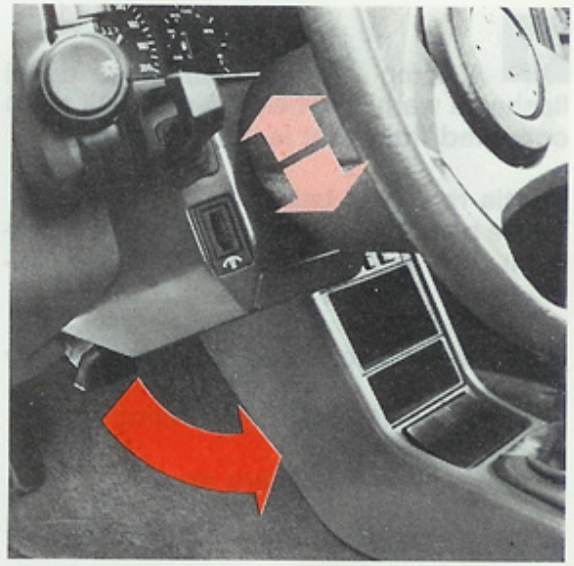
Lumbar support

Turn the knob clockwise to make the backrest firmer, anti-clockwise to make it softer.



Head restraint height

- The head restraint is adjustable to one of three "click" positions.
- The best protection is given when the top of the head restraint is level with the base of the skull (ear level).



Steering wheel height

- Pull the handle backwards to the stop.
- Adjust the height of the steering wheel.
- Push the handle forwards to the stop.

Warning!
Adjust the steering wheel **before** you drive away, **never** while driving!

A lamp on the instrument panel flashes a warning when the seat belt of an **occupied** front seat is not fastened.

Inertia reel seat belts
These belts allow greater freedom of movement but the reel **locks** the belt immediately:

- if the webbing is pulled out too quickly
- when braking and accelerating
- if the car is at a sharp angle
- when cornering

To fasten:

- Pull the belt slowly from its holder.
- Push the tongue into the lock until you hear a "click" and feel the latch engage.
- The lower part of the belt must rest **low on the hips** and not be loose. If necessary, obtain a snug fit by pulling up the shoulder portion of the belt.

Slackness in a belt **reduces the protection** afforded to the wearer.

To release

- Press in the **red** button.
- Allow the belt to retract **fully** into its holder.

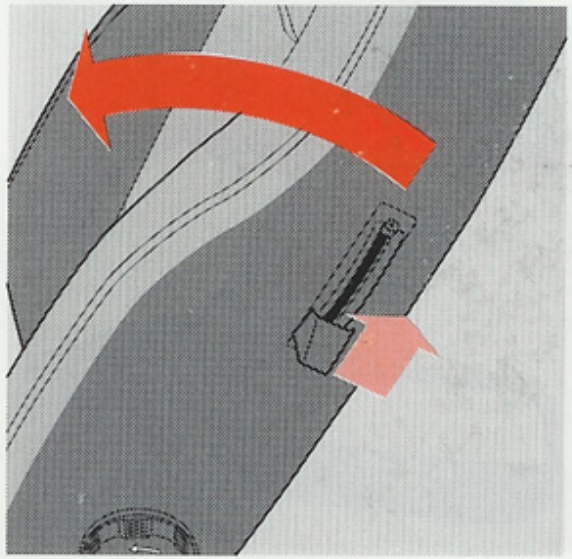
The belt must not be twisted!

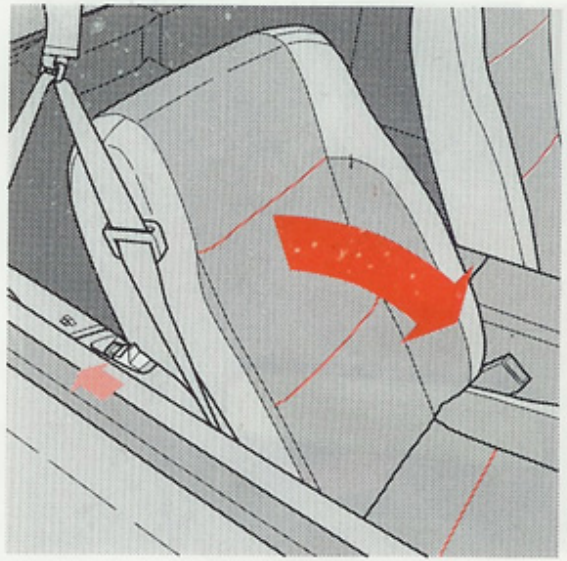
Seat belt check

- Check the locking mechanism of the inertia reel by pulling the belt quickly.
- The locking action of the belts should also be checked now and again when driving, for example when braking and cornering.

It should **not be possible** to pull out the belt in the cases mentioned above.

- Inspect the belts periodically for signs of abrasion or wear.





Warning!
Never use a **clip** or any other device intended to prevent the belt mechanism from taking up slack. This may prevent the belt from operating correctly in an emergency and could result in unnecessary injury to the wearer.

Backrest release

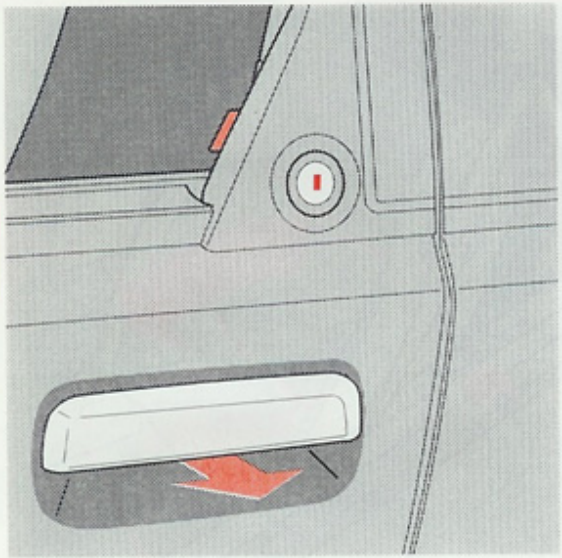
Tip the front seat backrest forwards. If necessary, fold down the seat belt swing-arm.

Rear seats

The rake of the backrests can be adjusted to one of three angles. They can also be folded forward to increase luggage capacity.

- Push the lever backwards to adjust.

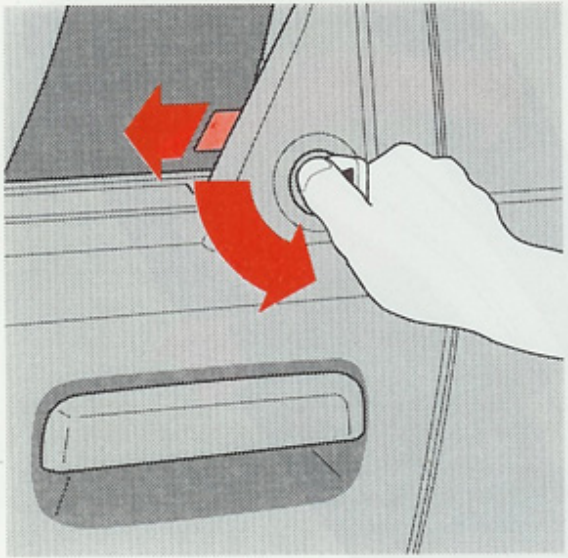
Caution!
To prevent damage when folding back the rear seat, hold the webbing of the seat belt to one side.



Keyhole lighting

Lifting the latch of the driver's door switches on the keyhole light.

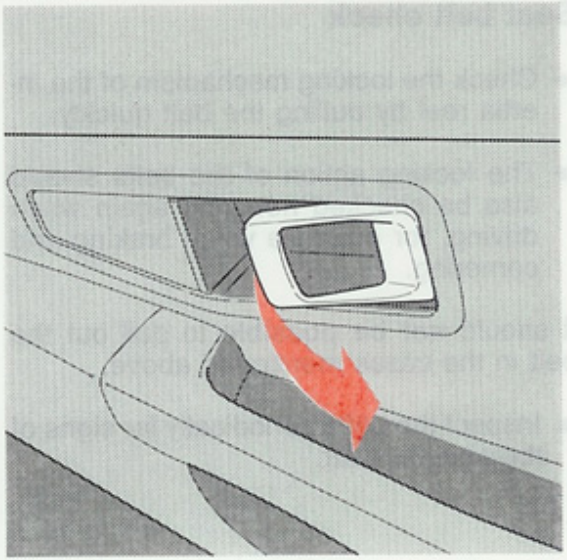
The keyhole light will remain on for 15 seconds after the door has been closed.



Door lock

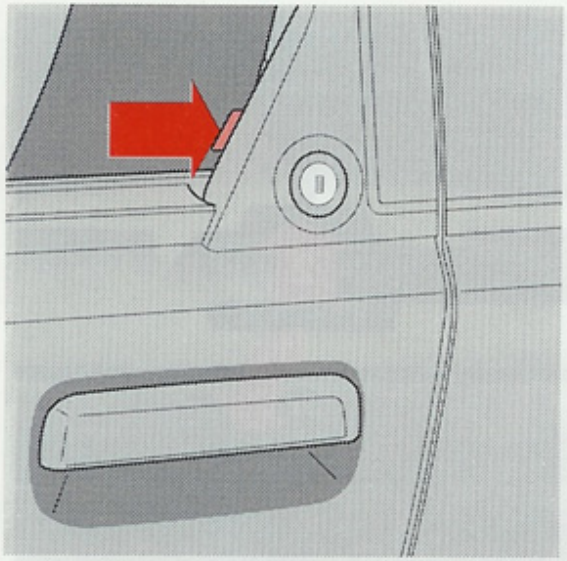
Unlocking a door with a key switches on the interior courtesy lights and disarms the anti-theft alarm system.

The red tab is visible when the door is unlocked.



Opening a door from the inside

Pulling out the catch opens a door, whether or not it has been locked.



Locking a door from the inside

Lock the door by pushing in the red tab. The locking tab on the driver's door cannot be pushed in when the door is open.
This prevents the door being locked while the keys are still in the car. The position of the tabs enables you to see at a glance whether the doors are locked.

Warning!
Remember that **if the doors are locked** while driving and the car is involved in an accident, it will be difficult for others to reach you!

Leaving the car in darkness

The car interior (and keyhole) lighting will remain on for 15 seconds after the door is closed to facilitate locking the car.

If the headlamp flasher is operated before closing the door, the long range lamps will stay on for 30 seconds to light your way to the front door, for example.

Central door locking

On cars fitted with this system, the locks on the doors and the tailgate can be controlled from the driver's door. It is operated with the car key or the locking knob on the driver's door.

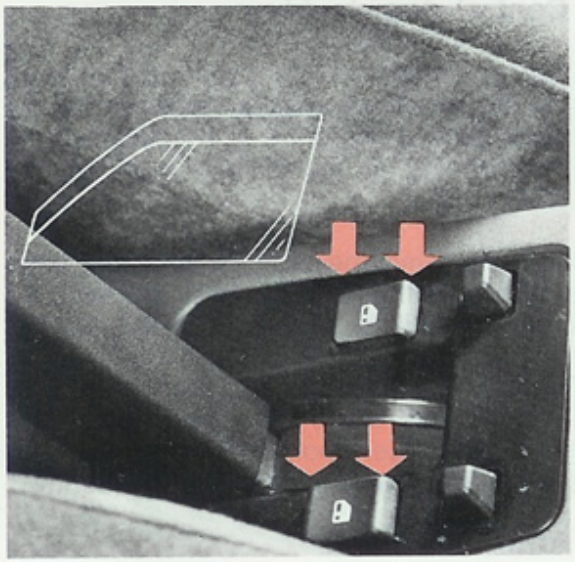
Lock: locking the driver's door locks the doors and the tailgate from the outside. They can still be opened from the inside.

Unlock: unlocking the driver's door unlocks both doors from the outside. The front passenger door and tailgate can also be unlocked with the key independently.

Anti-theft alarm

The anti-theft alarm system is set on ''alert'' whenever the driver's door is locked **with the key.** The alarm will be triggered by tampering with the doors, the tailgate, the engine bonnet or the ignition switch.

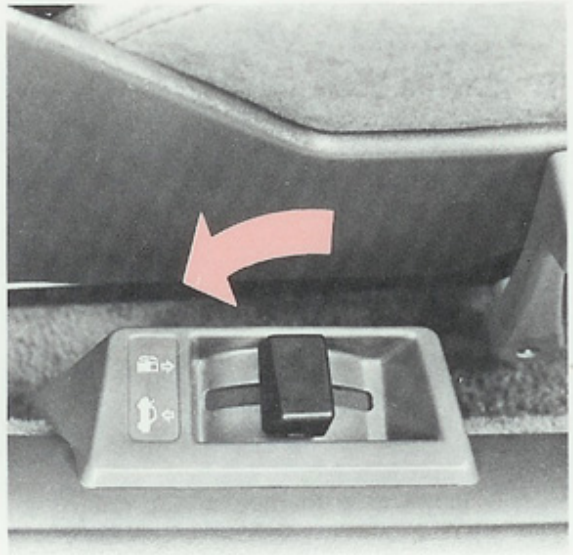
The alarm can only be **stopped** by unlocking the **driver's door** with the **key**.



Power windows

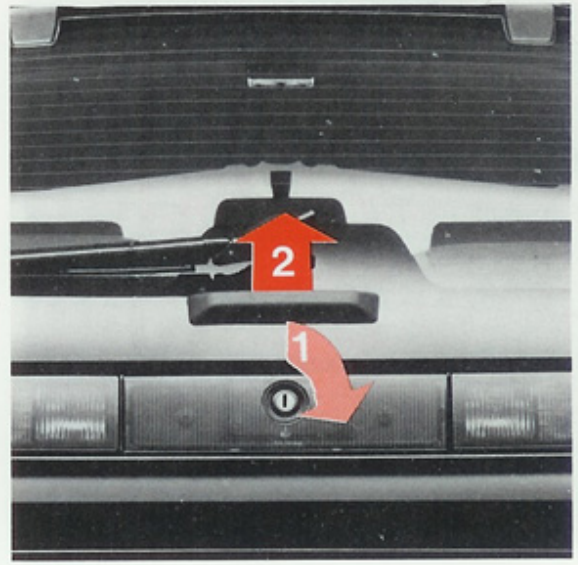
The electric power windows can be lowered or raised by using the rocker switches on the handbrake console (with the ignition switched on).

With children in the car, check that nobody can get a hand trapped when you are raising a window.



Opening the tailgate from the inside

Push **forwards** the lever on the driver's door sill.



Opening the tailgate from the outside

This can only be done using the key.

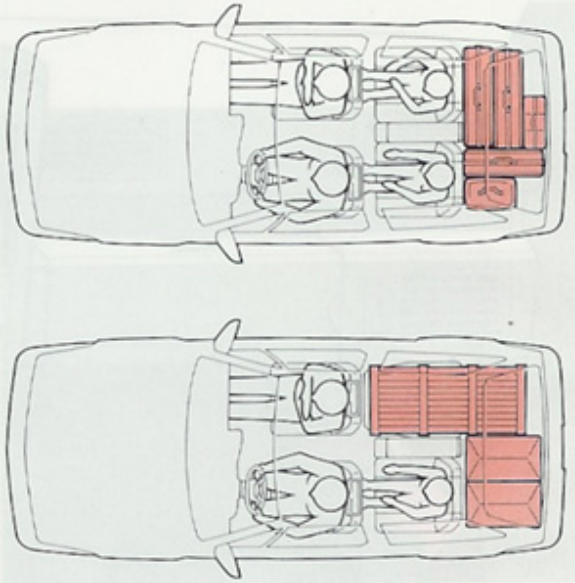
The tailgate locks automatically when closed. The anti-theft alarm, when in use, is automatically reset.

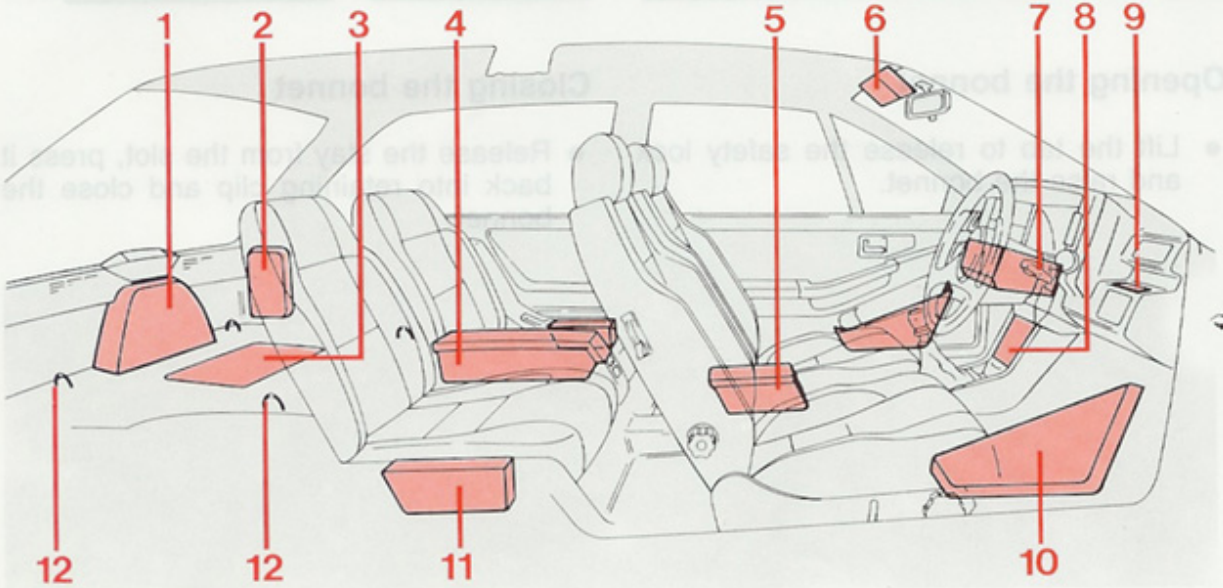
Stowing away oddments

1 Spare wheel, warning triangle
2 Corner cubbies in the boot
3 Stowage well for tool kit
4 Rear storage locker
5 Storage compartment in the armrest
6 Ticket holder in the back of the sun visor
7 Lockable glove compartment
8 Storage space in the centre console
9 Coin tray
10 Door bins
11 Side panel bins
12 Anchorage eyes (accessory)

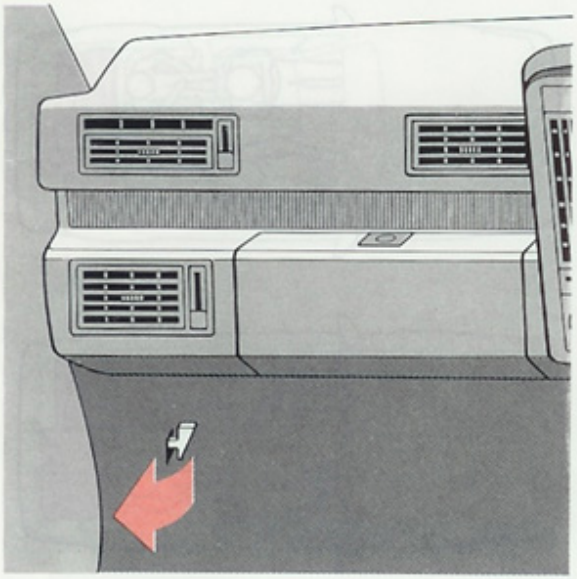
Luggage stowage tips:

- When loading luggage, stow heavy items as far **forward** as possible. This helps to maintain good weight distribution.
- Never place heavy articles under the **seats.** These can fly forward and cause injury in the event of a collision or during heavy breaking.



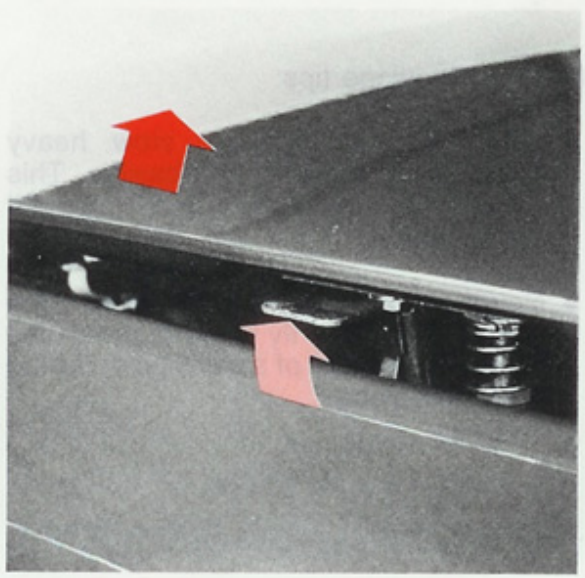


- The rear seat backrests can be folded forward individually. This allows various luggage stowage possibilities with capacity up to 660 dm³ (23 cu.ft.) with both seats folded.
- A bulky parcel in the boot can be secured with straps or cord using four **anchorage eyes** (accessory) at the corners of the boot floor (12).



Releasing the bonnet

- Pull the handle under the left-hand side of the dashboard.

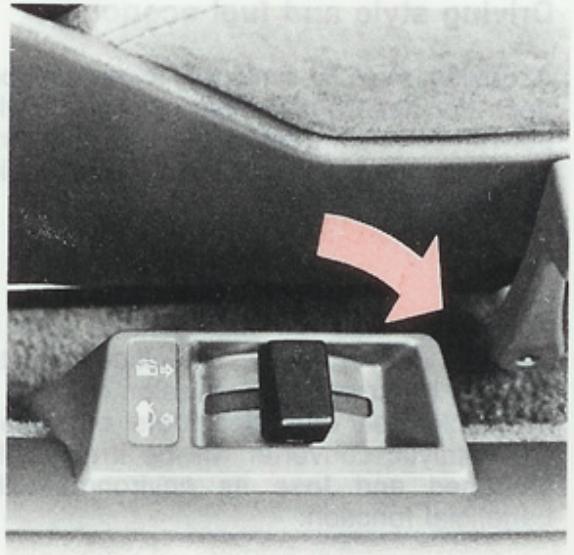


Opening the bonnet

- Lift the tab to release the safety lock and raise the bonnet.

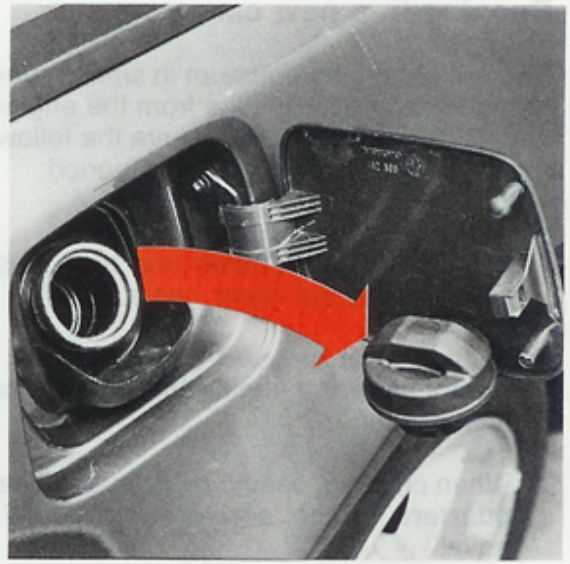
Closing the bonnet

- Release the stay from the slot, press it back into retaining clip and close the bonnet.



Access to fuel cap

The fuel cap flap is on the right-hand rear wing.
To open the flap: pull **back** the lever on the driver's door sill.



Fuel filler cap

Unscrew the cap and stow it on the clip.

After filling the tank, screw on the cap until a ''click'' is heard and close the flap.

Running-in a new car

You will obtain the optimum in smooth performance and a longer life from the engine and transmission if you observe the following rules during the running-in period:

- **use the accelerator gently**
  Avoid hard acceleration and high revs, especially in the lower gears.
- **change gear in good time**
  Do not allow the engine to labour in too high a gear.
- When cruising, use no more than **three-quarters** of the accelerator's pedal's travel.
- **Always** drive gently until the engine has reached **normal working temperature,** especially after a cold start.

The engine may be regarded as run-in after 1000 km, but it is adviseable to wait until the car has covered 2000 km before driving at maximum speeds for long periods.

Driving style and fuel economy

A driving style to limit fuel consumption does not necessarily mean driving slowly but rather driving **smoothly** and with anticipation. Avoid flying starts or heavy braking whenever possible.

Fuel

If your car has an engine fitted with a catalytic converter (see specifications) to achieve lower exhaust emission levels: use exclusively **unleaded fuels,** otherwise the catalytic converter will be irreparably damaged and **lose** its environmentally beneficial function.

Attention to the following points, when conditions make it possible, will also contribute to fuel economy:

- warm up the engine quickly (a cold engine uses more fuel, see page 38).
- drive at **constant** speed on motorways.
- try to avoid driving **short** distances with a cold engine.
- avoid carrying **unnecessary** loads.
- avoid continuing to drive with **winter tyres** or a **roof rack** when no longer needed.
- avoid driving the car with **defects** (see section ''maintenance'').

section contents

	page
Running-in the car	36
Driving style and fuel economy	36
Starting an injection engine	38
Use of gears	39
Use of the handbrake	40
Tips on:	
electronics in the 480 ES	41
driving with a luggage rack	42
the braking system, ABS, tyres	43
towing a caravan or trailer	44, 45
passenger safety	46
seat belts	46, 47
winter weather conditions	47

starting and driving

Procedures, tips and warnings

This section deals with the practical aspects of driving with this car, including important safety precautions and tips on economy.

Engine working temperature

The difference in oil temperature between an engine that has stood in a garage overnight and one that has been running for half an hour or more is considerable. A consequence is that an engine does not feel ''happy'' until it begins to reach its normal working temperature.
In this engine with fuel injection the warm-up period adjustments are taken care of automatically by electronic circuits, so that the **start procedure** is the same whether the engine is cold or hot.

Warning!
Always open the garage door fully before starting the engine. The exhaust gases contain the odourless, invisible gas **carbon monoxide,** which is very poisonous.

Starting the engine

1 Check that the **handbrake** is applied.

2 Move the gear lever to **neutral.**

3 Depress the **clutch pedal.**
(Do not depress the accelerator!)

4 Turn the ignition key to **''start''.**
Release the key as soon as the engine starts.

If the engine fails to start at once, depress the accelerator pedal **halfway** and hold it in this position until the engine does start.

Avoid repeated **short** attempts to start!
Every time the starter motor is engaged, fuel is injected into the engine.
Let the starter motor run a little longer, instead, but not more than 15 to 20 seconds each time.

Caution!
Never race the engine directly after a cold start!

Warm-up the engine quickly!

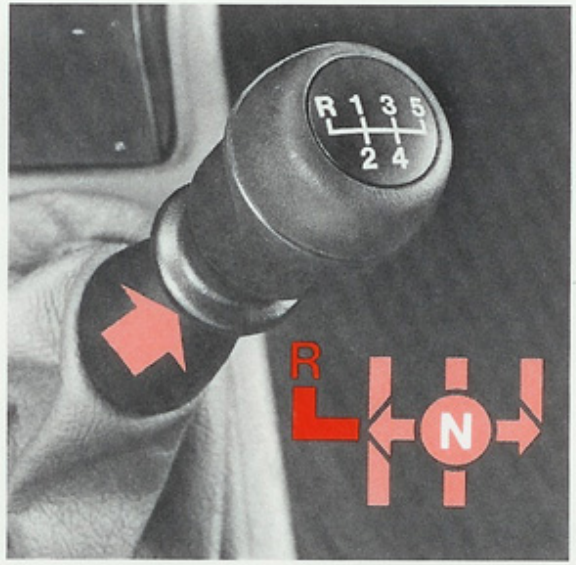
Experience has shown that engines in cars used regularly for short trips, whereby the engine is frequently switched on and off, are subject to more rapid wear.
This is because the engine does not have the opportunity to reach its normal operating temperature.

It is therefore important that the engine reaches its normal working temperature as quickly as possible.
Do not try to warm up the engine by letting it idle for a time or by **revving** up in neutral, but drive off as soon as possible without subjecting the engine to excessive load.

Turbo

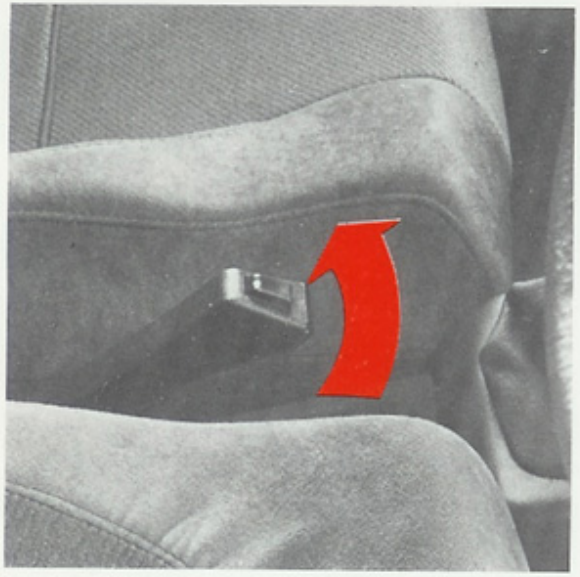
The turbo compressor and the fuel injectors are included in the engine's cooling system and this continues to operate for a time after the engine has been switched off. Nevertheless, if the engine is **switched off** while the turbine rotor is spinning at high speed, there can be a **risk** of heat damage and/or turbine seizure due to lack of lubrication.
Especially if you stop the car directly after a period of **fast driving,** letting the engine idle for a time is important to allow the turbine vanes to cool down while the rotor is still receiving lubrication.

Do not race the engine just before switching off!



For smooth gear changing

- Depress the clutch pedal **completely**.
- **1st** and **2nd** gear: first move the gear lever fully left and then into **1st** or **2nd** gear.
  3rd and **4th** gear: move the gear lever forwards or back from neutral (N).
- **5th** gear: first move the gear lever fully right and then into **5th** gear.
- **Reverse gear (R):** lift the collar under the gear lever knob with two fingers, move the gear lever fully to the left and then forward into reverse.



Handbrake

Always use the handbrake when **parking** the car. For extra safety, put the car in gear as well.

Handbrake warning lamp

If the handbrake is applied, this lamp lights up as soon as the ignition is switched on. This is a warning against driving with the handbrake applied.

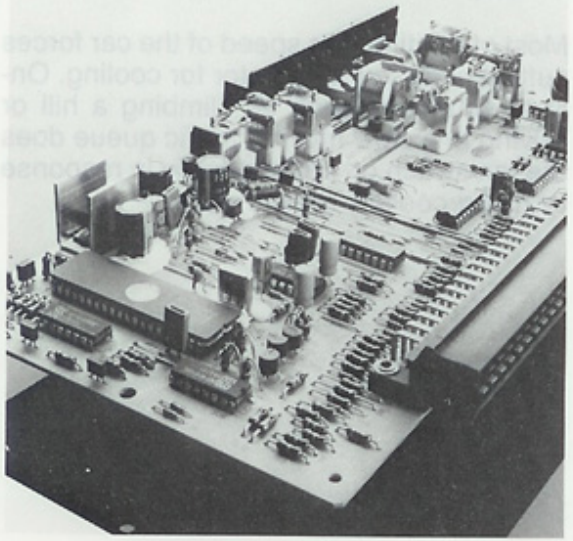
ABS system fault

The ABS braking system prevents the wheels from locking.
If this **lamp lights up** while the car is being driven there is a fault in the system. Should this occur, slow down and carefully check the operation of the brakes, see page 43.

Have the brake system checked by a Volvo workshop as soon as possible.

About this car

The 480 ES represents a new generation of cars in which the use of **electronic circuits** is a basic part of their design concept. Consequently certain things not normally expected by the driver can happen. While these are described elsewhere in the manual, it will be useful to list the most important effects for you at this point.



Electronic circuits cause a number of things to work automatically...

How did that happen?

- Start the engine and the instrument panel will display the **information** you normally check before driving (page 9).
- **Accelerate** hard while the windscreen wipers are set to intermittent sweep and they will run temporarily at full speed. Similarly, the rear wiper on intermittent sweep will run continuously when you engage **reverse** gear.
- Having stepped out of the car and switched off the engine at the end of a long run, you may hear a **buzzing sound** begin under the bonnet.
  The engine temperature has risen after the airflow cooling ceased so the thermo-electric fan has started up.
- If you accidentally trigger off the anti-theft alarm system, remember that the alarm can only be stopped by **unlocking** the driver's door **with the key** (page 31).

Electronic circuits make some controls work in a different way...

How does this work?

- The rear window heater has a push-switch.
  Push in and the heater will come on for **twelve minutes**, after this you will see the indicator lamp go out.
  Hold the switch in until a "bleep" is heard and the heater will stay on **continuously** - until the engine is switched off (page 17).
- The headlamp flasher switch not only flashes the main beams or the driving lamps. Operate the flasher just before locking the car at night and the lamps will burn for **half-a-minute** to give you light to find your way to the porch for example (page 31).
- You can make the **retractable headlamps** stay up for cleaning or lamp bulb replacement, see page 58.

Driving and steering

At a specified kerb weight, your car has a steering characteristic which is neutral with a slight tendency towards understeer. This and the good weight distribution ensure good stability when cornering and reduce the risk of rear wheel skid.

Remember that these properties can alter with the load. The pressure of the tyres is also of the greatest importance for the car's operation. We would therefore advise you to follow our recommendations in the section "maintenance".

We would also advise against fitting different makes of tyre on the car or different types, for example radial and cross-ply tyres. This practice can radically alter the handling characteristics of a vehicle.

Driving with the tailgate open

When driving with the tailgate open, especially with a load extending out of the back of the car, **exhaust fumes** (including carbon monoxide) could be sucked into the car.
To prevent any risk to the occupants, first close all windows, then set the heater and fan controls to give powerful ventilation through the defrosters.

Driving with a roof rack fitted

- Use a sturdy rack which is designed for your Volvo and can be securely fitted to the car roof.
- It is not advisable to leave the rack fitted to the car when the rack is not being used. This adds to the wind resistance and thus increases fuel consumption.
- Spread the load **evenly** over the rack.
- Place the heaviest load **nearest** the car roof.
- Anchor the load **securely:** use a luggage net.
- Drive smoothly.
- Remember that the car's centre of gravity alters with the weight of the load on the roof rack, thus **changing** the driving characteristics.
- Cross wind sensitivity increases with the **size** of the load.
- The **maximum** permissible roof rack load is 75 kg.

A hot engine

Avoid switching off a very hot engine. When stopping at a motorway service area after a long period of fast driving, for example, let the engine idle for a minute or so before switching off. This allows the cooling system to distribute the heat away from the hottest parts of the engine.

Noise in the engine compartment

A faint hissing sound from the engine compartment after switching off a hot engine will be due to the **Thermo electric fan,** injector cooling and auxiliary water pump. This is thermostatically controlled by the temperature of the coolant and so will continue to run until the engine has cooled sufficiently.

Most of the time the speed of the car forces sufficient air to the radiator for cooling. Only in situations such as climbing a hill or driving in a slow moving traffic queue does the fan switch on automatically in response to rising coolant temperature.

Brakes

Severe use of brakes

When driving in mountainous areas, the brakes can be exposed to severe loading. Since the car's speed is also quite often very low the brakes are not cooled as efficiently as when driving on level roads. In order to avoid excessive loading of the brakes, you should engage the same gear as you would have used to ascend the hill.

In this way, the braking power of the engine is more effectively used and it is only necessary to make use of the foot brake now and again.

Moisture on the brakes

In rainy weather or when washing the car it is possible for water to splash on to the brake linings. This can alter the **braking behaviour** of the car.
In such situations it is, therefore, advisable to depress the brake pedal lightly a few times immediately after driving away. The heat thus generated will then evaporate any moisture on the linings.

The brake servo does not funcion

If your car is being towed or is coasting to a halt with the engine switched off*, you must depress the brake pedal approximately four times harder than normal because the brake servo is in that case inoperative. **The brake pedal feels stiff and heavy.** Start braking **earlier** than you would under normal conditions.

* For cars with the ABS braking system, see further on.

Failure of one of the brake circuits

The brake fluid level warning lamp will light up. The pedal travel increases slightly and can feel softer but the pedal pressure required to obtain normal braking does not increase noticeably. Check the brake fluid reservoir, see page 56.

ABS braking system

On cars fitted with the ABS (anti-wheel locking) braking system, a certain vibration is felt when braking hard. This is normal and informs the driver that the system is operating.
Remember that while braking is more stable with the ABS system and braking distances can be shorter, the driver's braking reaction time remains the same! It should be noted that the ABS system does **not** function at road speeds below 3 mph.

If the ABS system breaks down, the warming lamp on the dashboard will light up. Should this occur, slow down and **carefully** check the operation of the brakes.
If a control system fault is the cause, the brakes will continue to **work** as in a normal car but without the anti-wheel locking function. If the (electrical) **servo system** has failed, however, the brake pedal will feel stiff and heavy as described above in "The brake servo does not function".
Have the brake system checked by a Volvo workshop as soon as possible.

Tyres

To avoid unnecessary tyre wear:

- Maintain the correct tyre pressure, never lower than the recommended figure. A lower tyre pressure will increase the build-up of heat in the tyre and may give a risk of tread separation.
- Drive smoothly, avoid flying starts, high-speed cornering and heavy braking.
- Remember that tyre wear increases with speed.
- Do not change round the wheels unless you really have to.
- Do not drive with faulty front wheel alignment.
- Do not drive with the wheels unbalanced.
- Do not scrape the tyres (or the rims!) against the kerb when parking.

When preparing your car for towing a caravan, remember that...

- It is very important that the towing bracket on the car should be of an approved type. (In some countries it is necessary to obtain an approval certificate for the towing bracket after it has been fitted on the car.)

  Volvo dealers have towing brackets designed and tested by Volvo for your car and will install one for you together with the necessary electrical connections.

model transmission	480 manual
maximum permissible trailer weight, braked trailer	900 kg*
trailer without brake	50% car kerb weight
maximum tow ball loading	45 kg
minimum tow ball loading	5% trailer weight with a minimum of 25 kg

- It is important that the loads of both car and trailer are **correctly distributed** for towing. The pressure (or weight) exerted by the caravan or trailer on the tow ball of the towing bracket can be controlled by the distribution of the load in the trailer. This pressure must never be more than the maximum nor less than the minimum values given here because:

  too much weight on the tow ball causes the car to assume a "nose up" attitude which impairs the steering characteristics and upsets the headlamp beam setting;

  too little weight on the tow ball causes the caravan to be less stable, making steering and braking less easy, especially in conditions with cross winds.

  * For turbo cars fitted with air conditioning see "When in hilly country.." on page 45.

- Note that due to the leverage effect of the towing bracket extending out of the rear of the car, about **one and a half times** the tow ball load is added to the rear axle loading, and this amount should be **substracted** from the maximum load permitted in the car and/or on the rear axle (see section "Specifications").
  For this reason it is frequently preferable to stow luggage in the caravan rather than in the car, so avoiding the risk of overloading the car's suspension.

- Special rear view mirrors should be fitted with longer arms to provide unobstructed rear vision, since the caravan or trailer is generally wider than the car.

When preparing for a caravan trip...

- The **stability** of the car/caravan combination will be improved if luggage in the caravan (particularly heavy items) is stowed on the **floor,** preferably above the axle and, of course, distributed to give the correct tow ball loading (see the table). If heavy items of luggage are carried in the car, these should be placed as far forward as possible in the boot.

- The tow ball head should be cleaned regularly and lightly greased in order to prevent unnecessary wear.

- The car should be properly **run-in** (after 2000 km) before using it to tow a caravan long distances.

When towing...

- Acceleration will be **reduced** in comparison with normal acceleration.

- Brake distances will be **longer** than normal.

- There will be an **increase** in fuel consumption due to the greater weight and increased wind resistance.

- A car/caravan combination is apt to be **sensitive** to cross winds.

- The legislation regarding **maximum speed** with a caravan or trailer does vary from country to country.

Avoid hard braking!

When in hilly country...

- The output of a car engine and consequently a car's pulling ability is generally reduced at **high altitudes.**

- Long, deep **descents** put an extra heavy load on the brakes. The risk of overheating can be minimized by selecting a lower gear and adjusting the speed of the vehicle accordingly.

- It is important to ensure that the clutch does not overheat, especially when frequently **stopping and starting** on inclines.
  Avoid slipping the clutch more than is strictly necessary.

- **Turbo cars fitted with air conditioning:** we recommend that the air conditioning be switched off in extreme conditions (steep climbs and high temperatures) when towing with a trailer weight of more than 400 kg.

Children in the car

An adult with a fastened seat belt in a Volvo is assured of good protection in the event of an accident, a sudden swerve or heavy braking. Here we advise you how to protect your children in the best possible way from injury in accidents.

Remember that, irrespective of age and size, a child must always be safely restrained in the car. Above all, small children should not sit on the laps of grown-ups.

In many countries there is legislation governing how and where children should be carried in a car.
Find out the regulations existing in your country.

Children from the age when they can sit and to a height of about 117 cm (up to 18 kg)
Children in this group should always travel in a child safety seat. The seat you use should comply with the regulations in force in your country.
Never use the type of seat which is simply hooked over or suspended from the rear seat backrest. The child safety seat may be installed against the backrest but must be secured independently to the bodywork of the car.

Children taller than 117 cm (heavier than 18 kg)
When the child has outgrown the child safety seat, it should use the rear seat with the standard seat belt fastened. The best way to protect the child here is to place it on a cushion. This helps the seat lap belt to be worn as far down the hips as possible. A specially designed and tested booster cushion for this purpose can be obtained from your Volvo dealer.

Mothers to-be

Women who are pregnant should take special care when using a seat belt. The belt should be positioned in such a way as to avoid any possible pressure on the abdomen. The lower belt should be worn as low and snug over the hips as possible.

The use of seat belts is described in detail on page 28.

Care of seat belts

Warning

- Never make **alterations or additions** to the belt. Especially avoid using clips or any other devices intended to prevent the belt mechanism from **taking up slack.** In an emergency these may hinder the correct operation of the belt and this could result in unnecessary **injury** to the wearer.

- Have a belt **changed** if one of the straps is frayed or damaged. Consult your Volvo dealer for advice.

- If a seat belt has been exposed to **considerable strain** - for example in a collision - then the **entire seat belt*** must be replaced. Even if it appears undamaged, its energy absorbing properties will have been reduced.

  ***Entire seat belt:** this means the seat belt including the retracting and locking mechanisms, plus all anchorage bolts.

Use **exclusively** water with synthetic detergent to clean seat belts.

Cold weather precautions

Actions advised and points worth noting at the beginning of the cold season in countries with severe winters:

- Make sure that the engine coolant contains sufficient **antifreeze**.

- Use a lower temperature range **oil** for the engine lubricating system; see section ''maintenance''.

- The **battery** is subjected to greater stress during the winter because of the more intensive use of lights, etc. Have the battery capacity checked frequently.

- To prevent the **screenwash reservoir** from freezing, mix the water with an antifreeze solution designed for screenwashers.
  This is most important since dirt is often splashed on to the windscreen and headlamps during winter driving, thus requiring frequent use of the washers and wipers.

- To prevent the possibility, under certain weather conditions, of doors freezing shut, treat the rubber door seals with talcum powder.

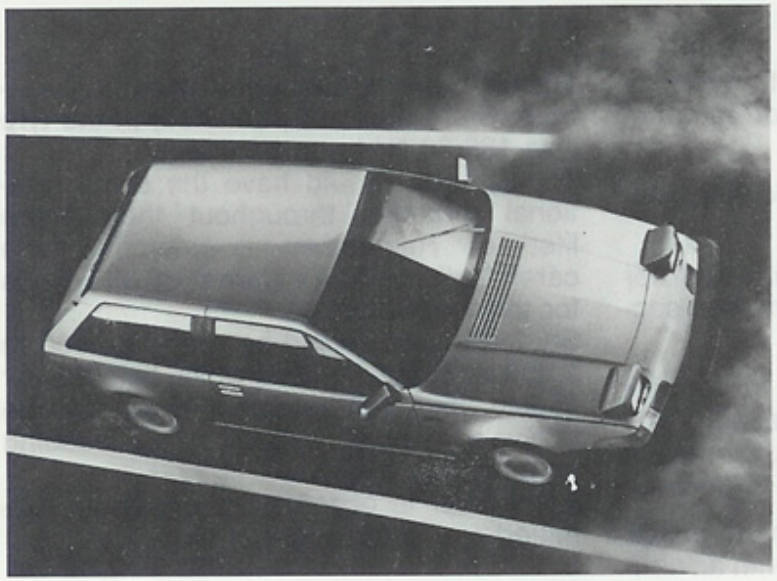
- Tyre treads worn down to **less than 2 mm** have very poor grip in **rain or snow.** Check the tyre tread wear.

Winter equipment

Winter tyres and studded tyres (in countries where they are permitted) in the tyre size 185/60 R14 can be fitted.
These tyres should have the same rotational direction throughout their entire lifetime. Remember to identify them carefully if you fit a different set of wheels for the winter period.
Studded tyres should be run-in for 500 to 1,000 kilometres, during which time the car should be driven as smoothly as possible to give the studs the opportunity of bedding properly into the tyre.
Remember to observe the maximum permitted speed for winter tyres.

Snow chains can be fitted on the front wheels provided that they have fine links and do not project so much from the tyre that they scrape the brake lines or other components. In order to prevent the possibility of an alloy rim being damaged (scuffed) by the snow chain, place canvas or sacking between the chain elements and the wheel.

Note:
60 kilometres per hour is the maximum permissible speed with snow chains fitted.



section contents **page**

Spare wheel and tools 50
The lightweight spare wheel 51

What to do if. . .
. . . if a tyre is flat
changing a wheel 52, 53

. . . if the engine will not start,
jump-starting with an
auxiliary batery 54
tow-starting and towing the car 55

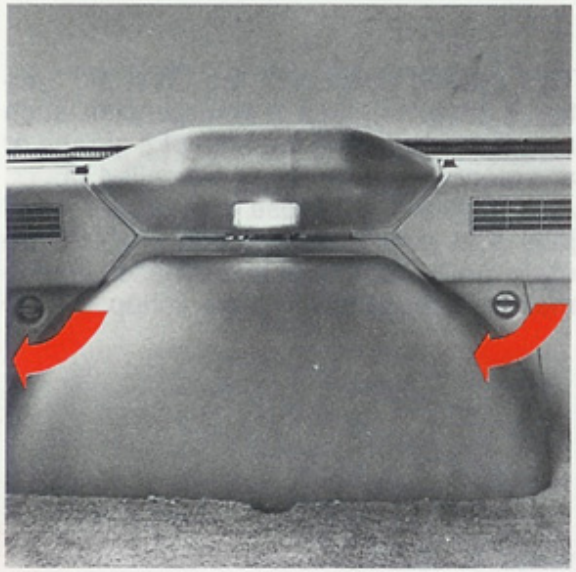
. . . if the engine overheats 56
. . . if the brake lamp lights up 56
. . . if a fuse has blown 57
. . . if a lamp has failed 58 to 67

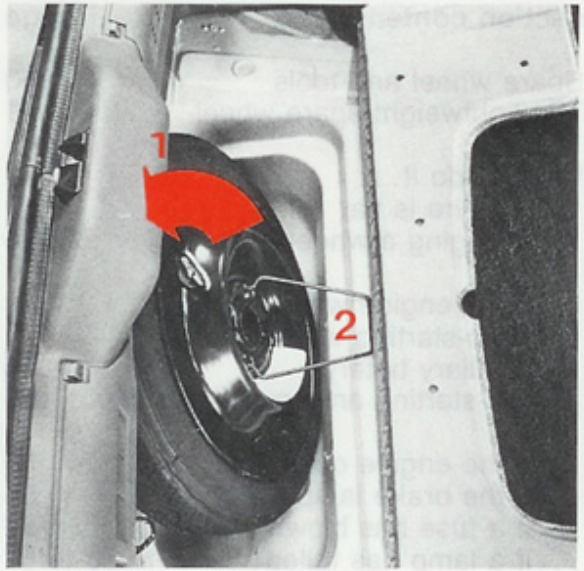
Replacing a bulb in...
a parking light or
a direction indicator light 58, 59
a headlamp 60 to 62
a number plate light 63
a lamp in the tail light cluster 64, 65
a courtesy light 66
a boot light 67

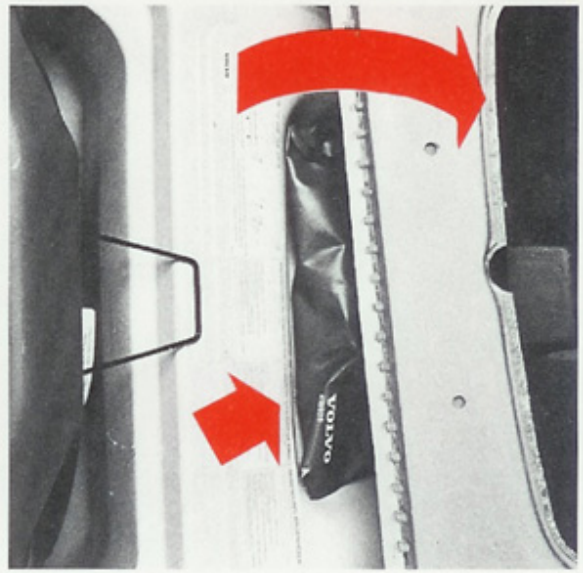
Replacing a wiper blade 68
Aligning washer jets 68

This section deals with the "first aid" action a driver can take in emergencies, such as a flat tyre, before the help of a garage or a motorway patrol has to be called in.
Also included are those less urgent small jobs and simple replacements which are often more convenient to do oneself than to make a special trip to a workshop.

what to do if. . .
A tyre is flat, a bulb has blown. . .







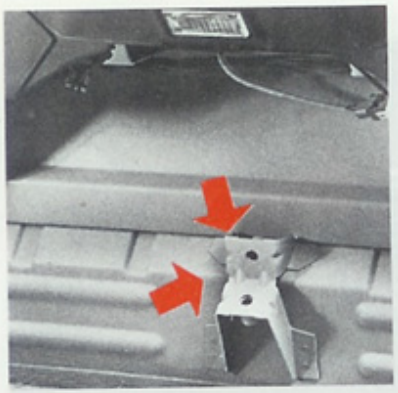
Spare wheel and tools

The lightweight spare wheel, tools and advance warning triangle are stowed in the boot.
To reach them:

- Twist the two catches to vertical and remove the wheel well cover
- Fold the rear part of the boot carpet forward.
- Unscrew the wheel retaining bolt (1) and the boot carpet support (2).
- Lift out first the warning triangle, if present.
- Lift out the spare wheel.
- Lift the tool kit from the well under the boot carpet.

The **tool kit** contains:

- emergency jack
- jack handle
- wheel bolt brace/hub cap tool
- special crosshead screwdriver



Stowing wheel and tools

- Close the jack completely and stow with the rest of the tools in the well under the boot carpet.
- Place the wheel in the wheel well.

Anchoring a standard wheel

A normal wheel can only stand upright in the wheel well with its outer side facing the rear.

- Thread the retaining bolt through a wheel bolt hole and screw into the horizontal thread of the wheel support.

Anchoring a lightweight spare wheel

- Turn the wheel until one of the holes is at the 12 o'clock position and screw the retaining bolt into the oblique thread of the wheel support. Place the warning triangle, if present, in front of the wheel.

Special purpose spare wheel

Your car may be equipped with a spare wheel fitted with a special purpose lightweight tyre, type T 105/70 R14.

Warning!

- The special purpose spare wheel may be used only as a temporary replacement for a wheel with a flat tyre and must be **replaced as soon as possible** with a standard wheel.
- A car should never be driven fitted with **more than one** special purpose wheel.
- Drive with caution! Remembert that this tyre used in combination with standard tyres can affect the handling character of the car.
- We advise that you observe a **maximum speed** of 80 kilometres per hour (50 mph) when this spare wheel is in use.

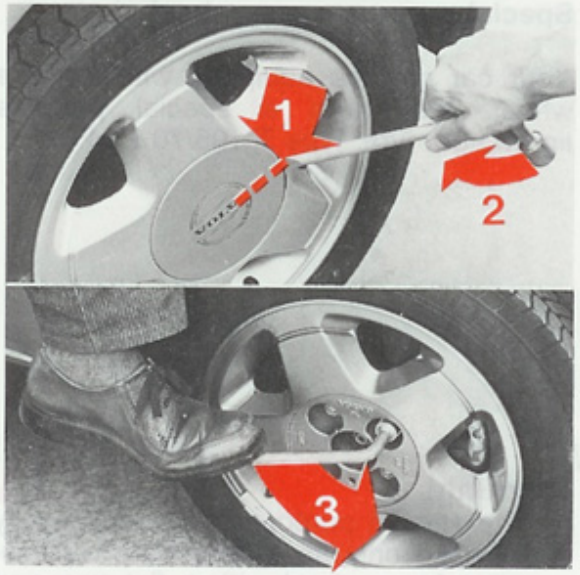
This tyre is identified by the letters "TEMPORARY USE ONLY" on the tyre wall and is fitted on a steel wheel finished in black enamel. The tyre pressure must always be **420 kPa (60 psi)** regardless of where the wheel is mounted on the car and irrespective on the loading of the car.

Your Volvo dealer can supply a replacement tyre of this specification should this be necessary.

Preparation

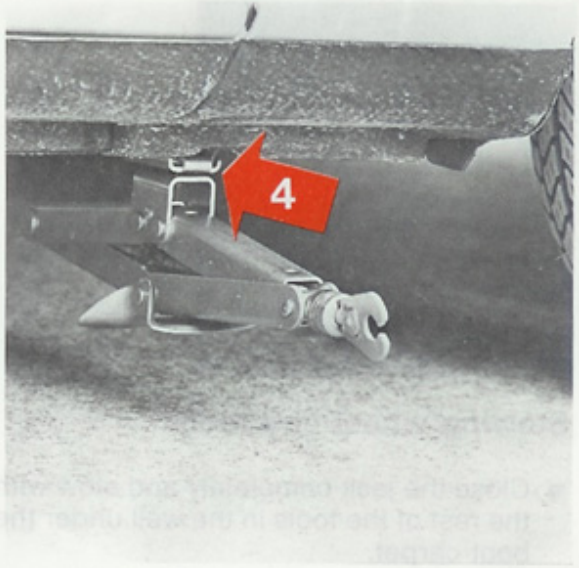
- Park the car on a firm and level surface. Apply the handbrake and engage first gear.
- If necessary, set up the advance warning triangle.
- Chock the wheels which will remain on the ground with wooden blocks, bricks or similar.
- Fetch the jack, jack handle and wheel-bolt brace from their stowage point, see page 50.
- Place the specially shaped handle of the wheel-bolt brace into the recess in the hub disc (1) to prise it out (2).
- Use the wheel-bolt brace to slacken each bolt half a turn. Try to use your own weight to loosen the bolts, this will then require less muscular effort (3).

Note:
If circumstances have forced you to change a wheel with the car on **soft ground**, place a plank under the supporting foot of the jack.



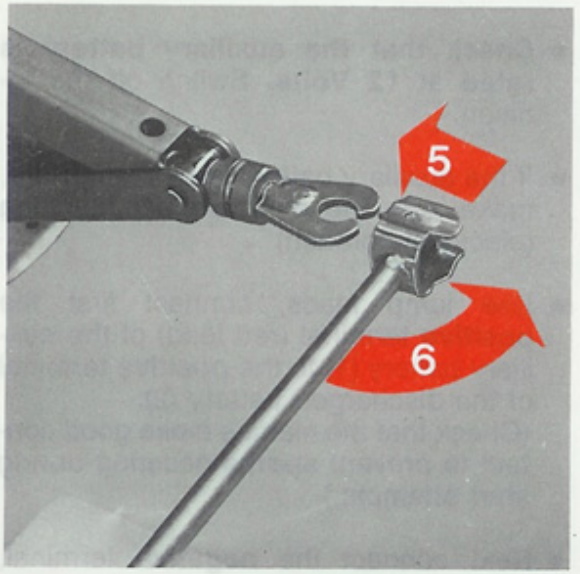
- Slide the jack into the jacking point (4) nearest the wheel to be raised.

front wheel: under the car, just in front of the leading edge of the door
rear wheel: under the car, just behind the trailing edge of the door.



Caution!
Make sure the jack is pushed well into the **jacking point.**

Check that the doors are closed and **remain closed** while the car is supported by the jack!



Jacking the car

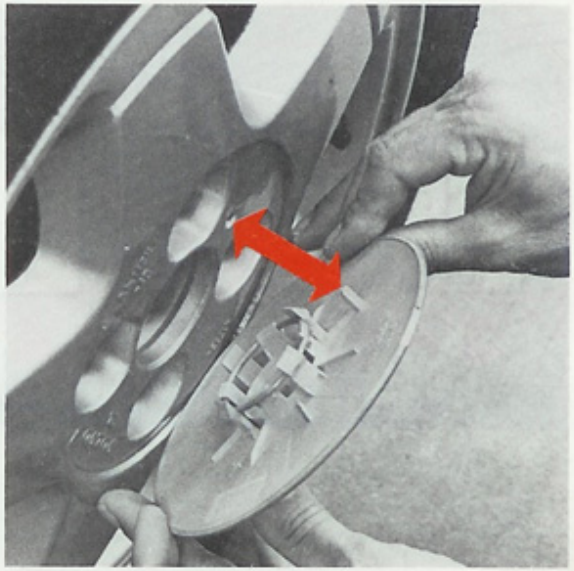
- Fit the jack handle into the jack slot (5 and 6).
- Extend the jack by turning the handle clockwise until the foot stands **firmly** on the ground.
- Jack up the car until the wheel is clear of the ground.
- Remove the wheel bolts and take off the wheel.

Warning!
When you use the jack:

- Always apply the parking brake and engage first gear.
- Place **chocks** in front of and behind the wheels which are on the ground!
- Never crawl **under** the car when it is jacked up!

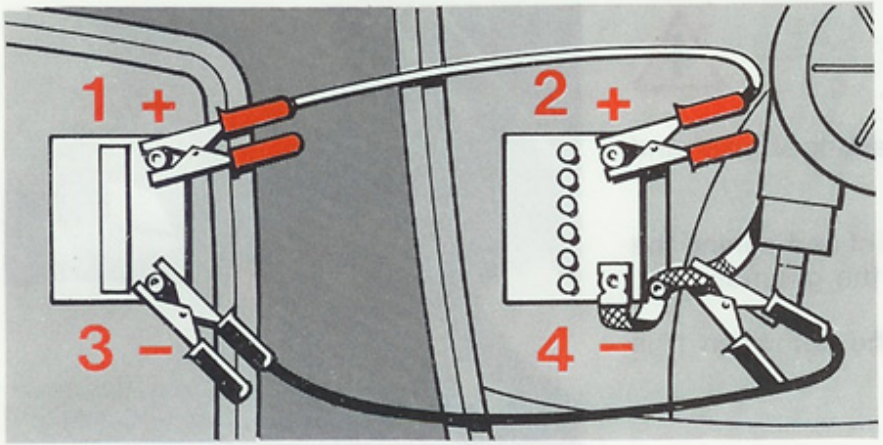
Fitting a wheel

- Position the wheel over the hub, lining up with the holes for the wheel bolts.
- Fit the wheel bolts finger-tight.
- Lower the car and remove the jack.
- Final-tighten the bolts crosswise.
- Hold the hub disc so that the **peg** is aligned with the hole in the wheel and push firmly into position.
- Stow away the changed wheel and tools, see page 51.
- Stow away the warning triangle.



Caution!
The jack supplied with the car **should only** be used for changing a wheel with the car on firm ground.

With any other work requiring the car to be in the jacked-up position, see section ''maintenance''.



Warning!
Please note that car batteries give off a mixture of hydrogen and oxygen gases which is **very explosive!** There have been instances of sparks produced by faulty connection of batteries causing a battery to explode, resulting in **personal injury** as well as material damage.

Starting with an auxiliary battery

If the battery is flat, an auxiliary battery may be used for starting the engine.

To avoid any risk of explosion, we strongly recommend that you **carefully** follow the procedure described here.

- **Check that the auxiliary battery is rated at 12 Volts.** Switch off the ignition.
- If the auxiliary battery is in another car, make sure the cars are not touching (electrical contact!)
- Use jump leads, connect first the **positive** terminal (red lead) of the auxiliary battery (1) to the **positive** terminal of the discharged battery (2).
  (Check that the clamps make good contact to prevent **sparks** occuring during start attempts.)
- Next connect the **negative** terminal, black lead (3), to the braided earth cable as **far as possible from** the battery (4).
- Start the engine of the assisting car and allow it to run for a few minutes at higher than idling speed (around 1500 rpm).
- Start the engine.
  Do not move the clamps during start attempts!

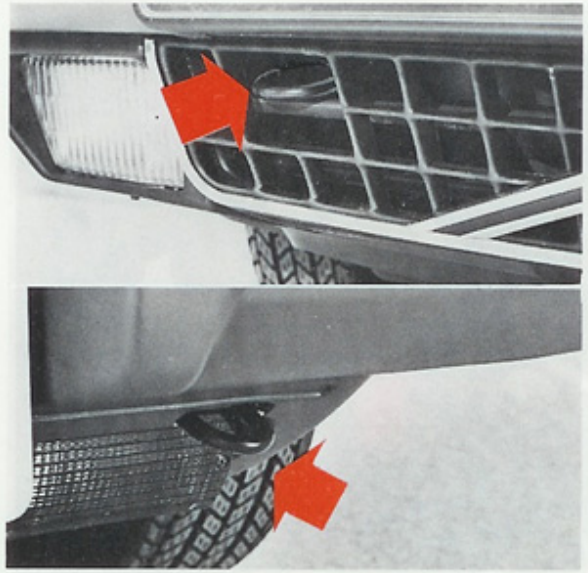
  Do not lean over the batteries!
- After the car has started, remove the clamps in **reverse** order, i.e. 4, 3, 2, 1 on the diagram.

Starting the engine by towing

This is only possible on cars with a **manual gearbox.** The towing car is started and driven at a **constant** speed.

In the towed car:

- Switch on the ignition.
- Depress the clutch pedal and engage third or fourth gear. Wait until the car picks up speed and let the clutch pedal come up gradually.
- As soon as the engine starts, depress the clutch pedal once more.



Towing eyes

Towing eyes are provided at the front and rear of the car for the attachment of a towing cable.

Note:
In most countries vehicles on tow are subject to regulations regarding **maximum towing speed.**

Towing the car

The car can, if necessary, be towed any distance after the following precautions have been taken:

- **Place the gear level in neutral.**
- **Leave the car key in the lock.**
  Set the ignition switch in the "**engine running**" position (see page 14).
- With the engine stopped, the **brake servo*** (and the power steering) will not work so that more pedal pressure will have to be applied when braking.

It will feel as if the brakes take longer to react, so adjust your speed and remember to **start braking** sooner!

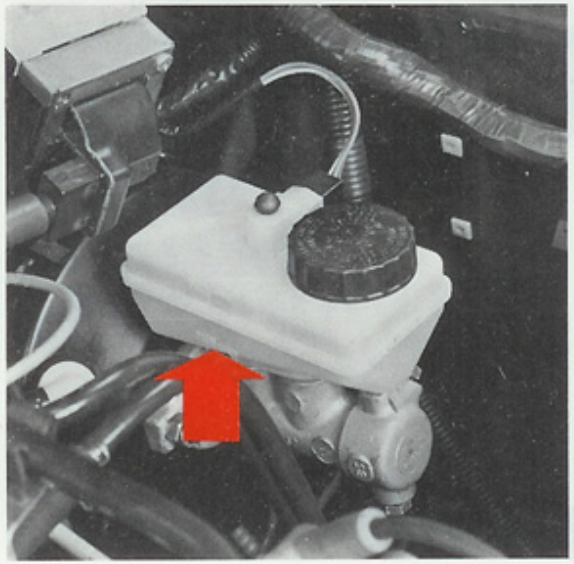
Note:
* For cars with the ABS braking system and therefore an electrical servo system, this will apply **only** if the battery is flat as well.

Engine overheating

If the coolant temperature gauge indicates an excessive temperature, stop the car and switch off the engine as soon as possible.

Check the engine coolant level (see page 92). If the coolant level is too low, **wait** until the engine has cooled off before attempting to top-up. Plain water can be used to top-up in an **emergency** but have the cooling system checked by a Volvo workshop at the **earliest** opportunity.

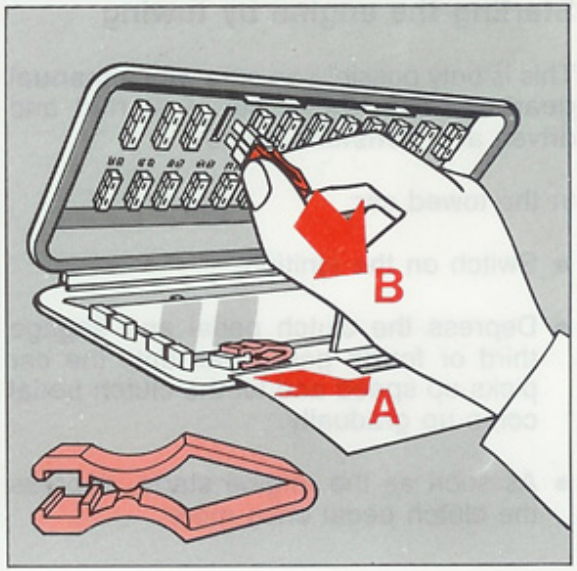
If the coolant level is correct, check whether the alternator belt has too much play or is defective (also see page 95).



Brake fluid level lamp

If the **warning lamp** comes on, **stop** immediately and check the level of fluid in the brake reservoir (see section "maintenance" for location).

- If there is some fluid in the reservoir proceed at low speed with due caution to the nearest service station.
- If the reservoir is empty, **do not drive on.**
  Have the vehicle towed to a service station for an inspection of the brake system.



Fuse box under the dashboard

The fusebox under the right-hand side of the dashboard has a mirror lid and special tongs for the removal of fuses.

- To remove the tongs: slide sideways out of the clip (A).
- Use the tongs to grip the fuse and pull it straight up (B).

Always replace a fuse with one of the **same** rating **(never a higher rating!).**

You will find a spare fuse of each rating in the lid of the fuse box.
If fuses repeatedly burn out, have the electrical system tested by a Volvo workshop.

Caution!
Fuse number 26 is a **special** 30 Ampere fuse for the motor of the ABS braking system. If this fuse burns out, it **must never** be replaced by a normal fuse. Take the car for a check of the ABS system by a Volvo dealer.

No.	Components served	Amps
1	Courtesy lights, boot light, engine compartment light, glove compartment and ignition switch lighting, cigar lighter, clock and radio	15
2	Fog lamps, headlamp flasher system	20
3	Heater blower (maximum speed)	30
4	Headlamp retracting motors	30
5	Brake lights, central locking system, **fuel injector cooling fan (turbo), auxiliary water pump (engine cooling)**	15
6	Rear fog lamps	7.5
7	ABS system relay	30
8	Left-hand headlamp, main beam	7.5
9	Right-hand headlamp, main beam and indicator lamp	7.5
10	Left-hand parking and tail lights, dashboard illumination	7.5
11	Right-hand parking and tail lights, number plate lights	7.5
12	Left-hand headlamp, dipped beam	7.5
13	Right-hand headlamp, dipped beam and fog lamp switch	15
14	Air-conditioning compressor and fan	30
15	Heated rear window, heated door mirrors	15
16	Long range headlamps, horn	20
17	Direction indicators	15
18	Headlamp washing system	20
19	Alternator, oil pressure gauge, clock lighting, instrument illumination and indicator lamps	7.5
20	Reversing lights, heating controls, seat heater elements and **relay, auxiliary water pump**	30
21	ABS system	3
22	Lighting switch and belt lock illumination	15
23	Wiper motors, washer pumps, sun roof	15
24	Power windows, power mirrors	30
25	Air-conditioning and/or heater blower, radio	20
26	Motor, ABS system (see note)	–
—	(mounted on fuel pump relay connector) fuel pomp	20
—	(mounted on oxygen sensor system relay) oxygen sensor	20

Handling bulbs

Never touch the glass of a halogen bulb with your fingers. Grease, oil or other impurities can be carbonized on the bulb and cause damage to the headlamp reflector.

Headlamp alignment

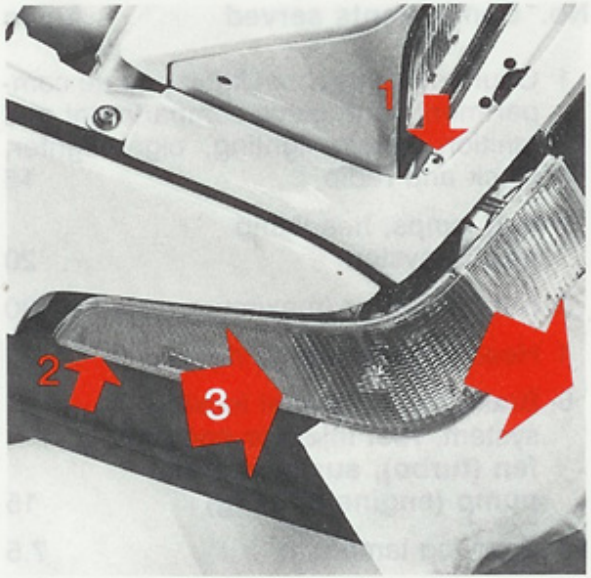
The alignment of headlamps is very critical and must meet legal requirements in most countries. We advise, therefore, that alignment should only be carried out by your Volvo workshop.

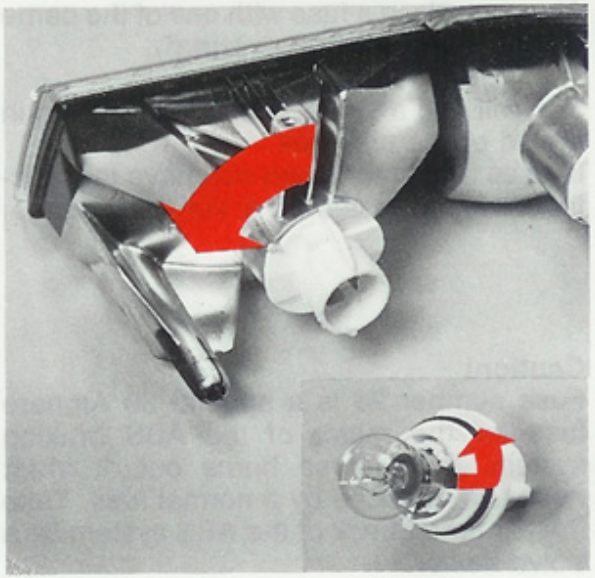
To retain the **headlamps** in a raised position:

- Switch **on** the ignition
- Switch the main lighting on
- **Release** the bonnet*
- Switch **off** the ignition
- Switch **off** the main lighting

Warning!

* To prevent the headlamps being set in motion by accident, the **engine bonnet** should be opened or, at least, released from the lock.

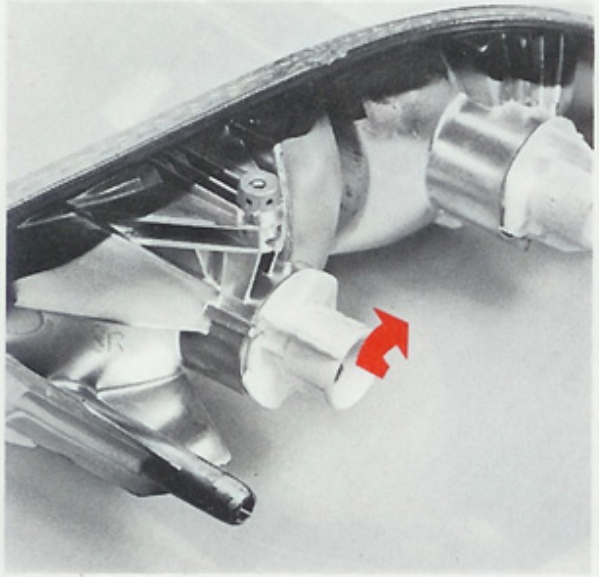


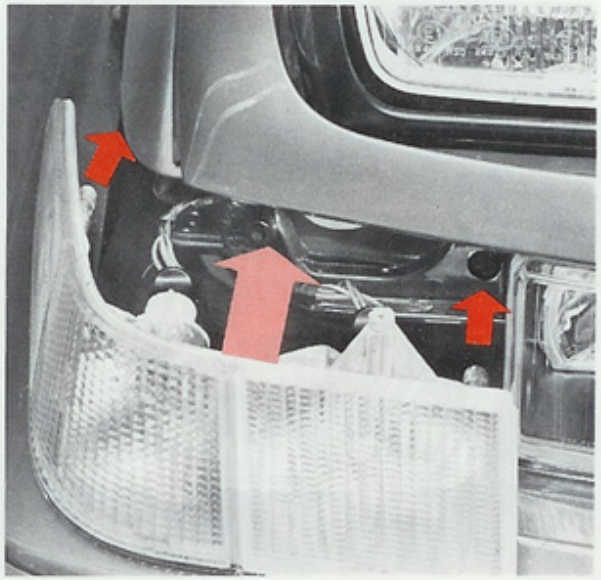


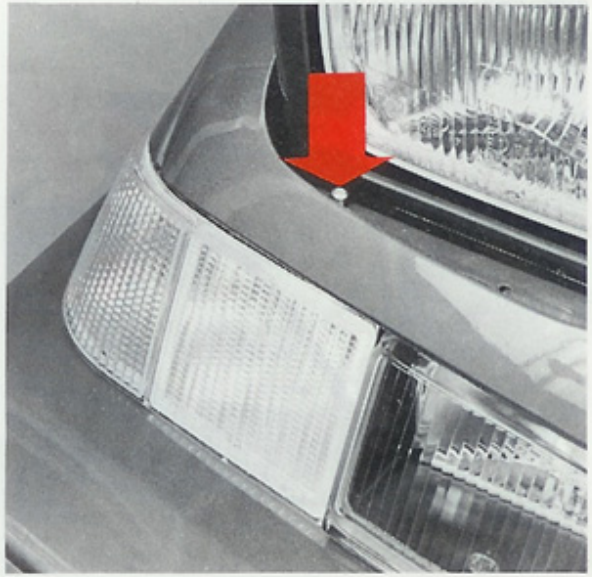
Indicator lights or parking-/day running lights

- Raise the headlamps (see column one).
- Remove the crosshead retaining screw **1.**
- To avoid the possibility of paintwork damage, lay a piece of cloth between the bumper and the lamp cluster.
- Introduce a screwdriver between lamp cluster and bumper at point **2** to push in the retaining spring. At the same give a blow with the hand at point **3,** to allow the lamp cluster to be moved forwards.
- Pull the lamp cluster out completely.
- Remove the lamp fitting by twisting anti-clockwise.
- Remove the lamp bulb by depressing and twisting anti-clockwise.

Bulb	Rating	Socket
Direction indicator	21 W	BA15s
Parking-/day running light	4/21 W	BAZ15d







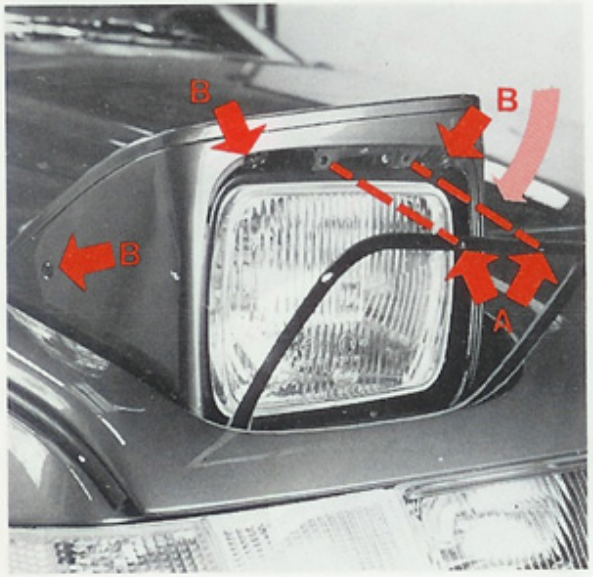
Fitting a bulb

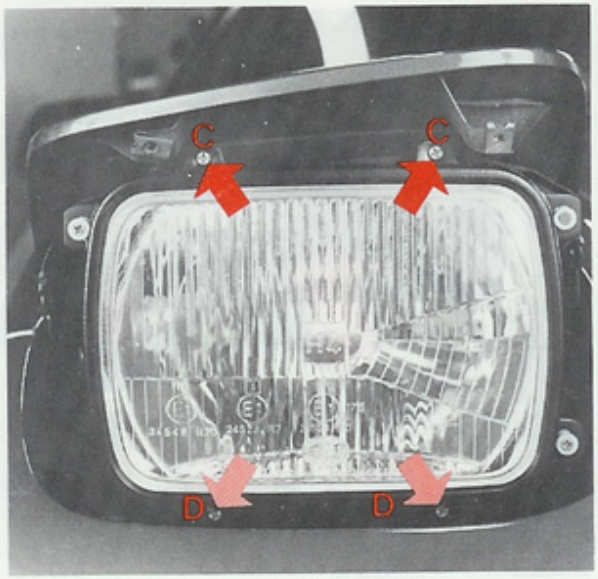
- Replace lamp bulb (twist clockwise).
- Position the lamp fitting as shown in the illustration, push-in and turn clockwise.

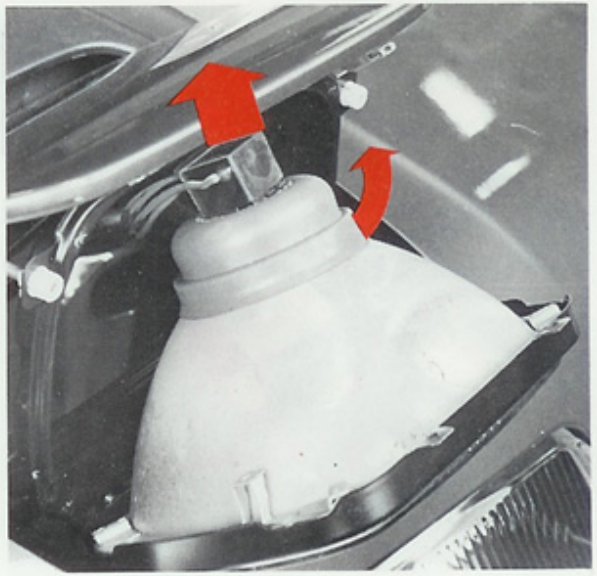
Note:
Parking-/day running lights are double-filament bulbs and will fit only one way in the lamp fitting.

Replacing a lamp cluster

- Line-up the two pegs on the lamp cluster unit with the locating holes and slide back into position.
- Replacing the retaining screw.
- Lower the headlamps by closing the engine bonnet.



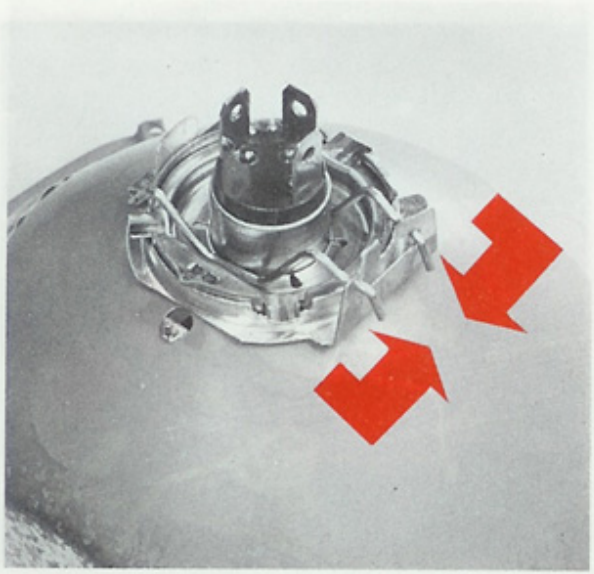


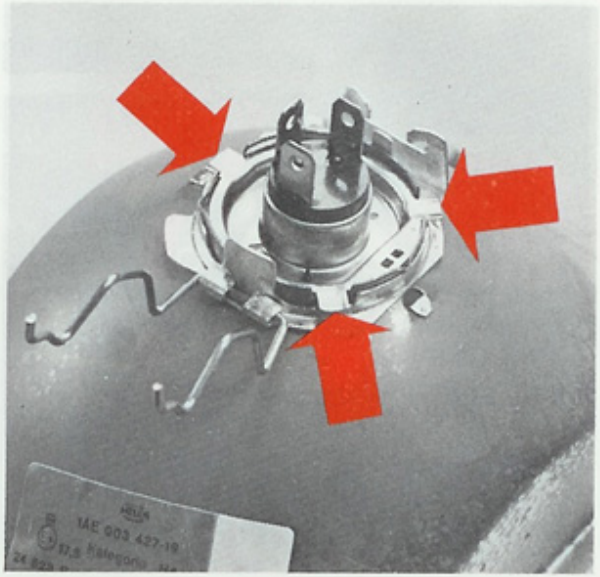


To change a headlamp bulb

- Set the headlamps in the raised position as described on page 58.
- Remove the two screws **A** from the headlamp surround and remove.
- Use the crosshead screwdriver supplied with the **tool kit** to loosen the two captive screws of the inner lamp surround **C** and loosen the two captive screws **D** at the bottom.
- Remove the inner (metal) surround and lift out the lamp unit.
- Pull off the contact block.
- Remove the dust cap.

Bulb	Rating	Socket
Headlamp	60/55 W	B43t



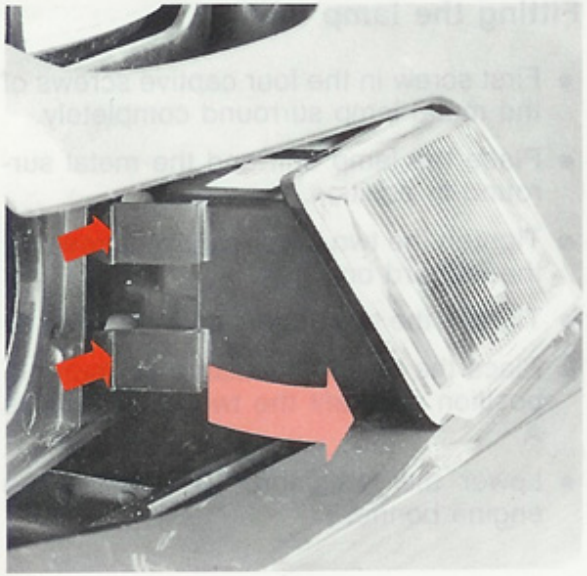


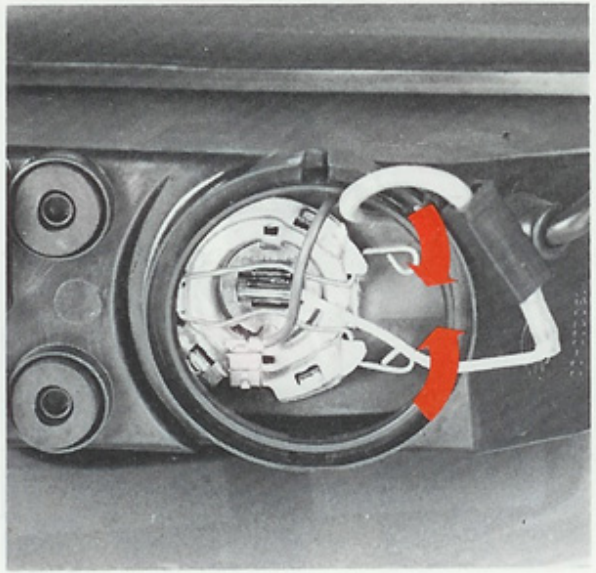
Fitting the lamp unit

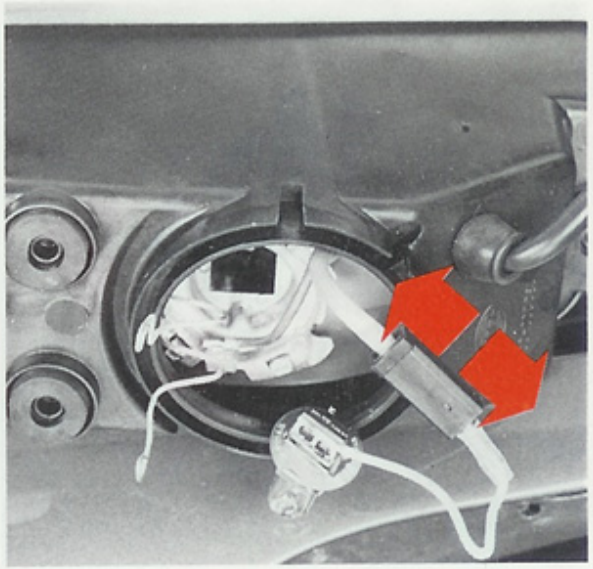
- First screw in the four captive screws of the metal lamp surround completely.
- Place the lamp unit and the metal surround in position.
- Tighten the two lower captive screws **D**, the inboard one first.
- Tighten the two upper captive screws **C**.
- Place the plastic headlamp surround in position and refit the two black screws **A**.
- Lower the headlamps by closing the engine bonnet.

Removing the bulb

- Release the retaining spring by pushing the arms firmly downwards and inwards, using the screwdriver if necessary.
- Swing open the spring and lift out the bulb.
- Taking care not to touch the quartz glass envelope, place the new halogen bulb in position. Make sure that the three tags engage their corresponding recesses.
- Replace the retaining spring, the **dust cap** and the contact block.





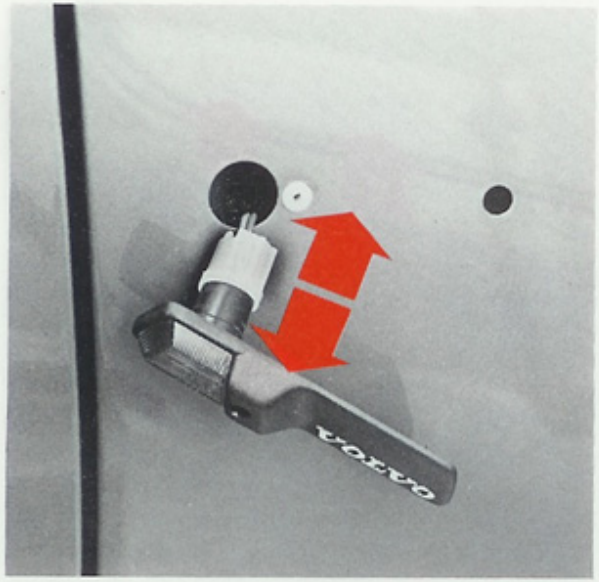


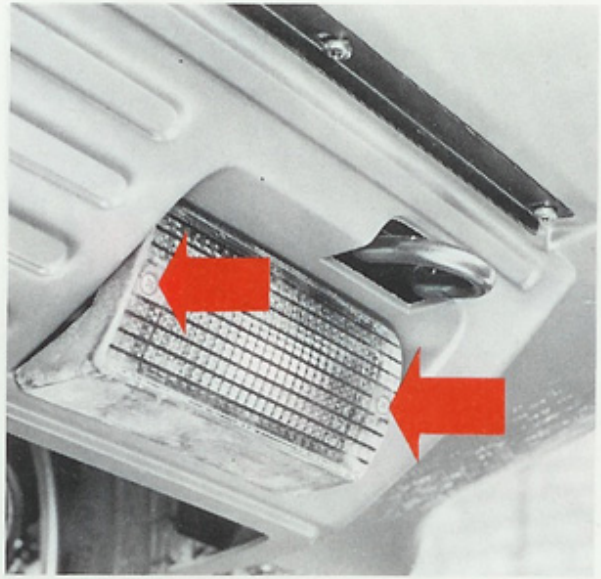
Long range headlamps

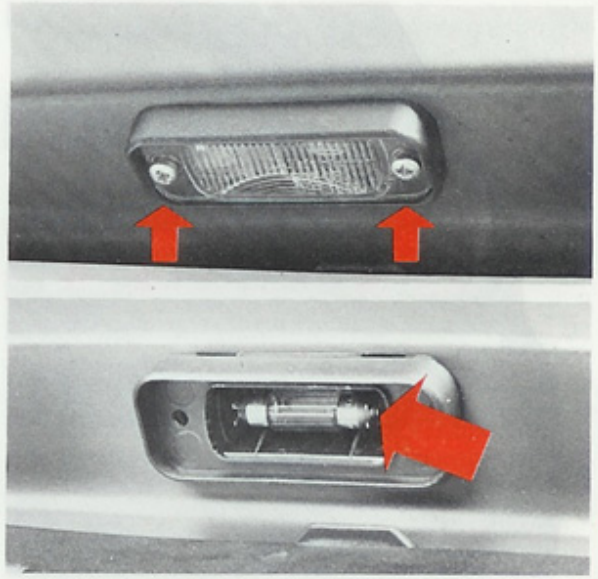
- Remove the front light cluster as described on pages 58 and 59.
- Remove the longe range headlamp by pushing in the two clips and tipping out the housing.
- Remove the rubber cap and ease the wiring out from behind the bulb holder.
- Release the retaining spring by pushing each arm down and inwards over the lugs.
- Swing the spring open and lift out the bulb.
- Disconnect the wire which is attached to the bulb.

Bulb	Rating	Socket
Long range lamp	55 W	H3

- Replace the halogen bulb, being careful not to touch the quartz glass envelope.
- Replace the retaining spring, reconnect and push back the wiring.
- Fit the rubber cap and position the headlamp housing which will click into place.
- Replace the front light cluster as described on page 59.







Direction indicator, side repeaters

- Remove the locating screw and lift out the lamp housing assembly.
- Pull off the lamp fitting and remove the bulb by pulling it out.
- Fit a new bulb and push the fitting back in the housing.
- Press the housing back into place and refit the screw.

Bulb	Rating	Socket
Direction indicator, repeater	5 W	W2

Rear fog lamps

Remove the lamp lens (two screws) for access to the lamp.

Fog lamps

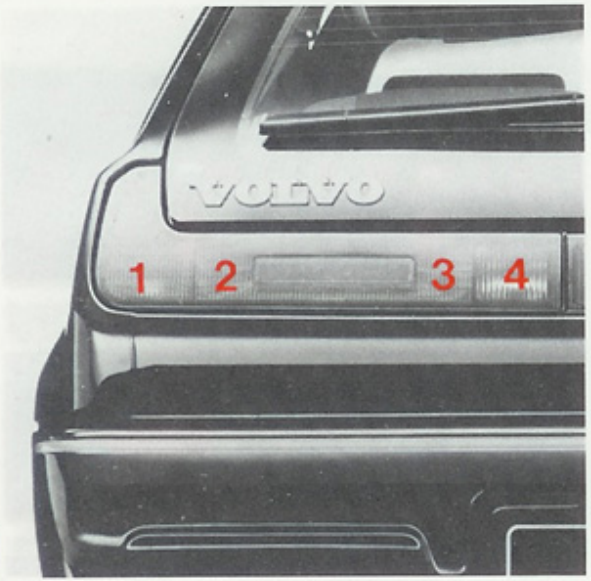
The bulbs of the fog lamps mounted in the spoiler are only accessible from underneath the car. Let your Volvo workshop replace them whenever necessary.

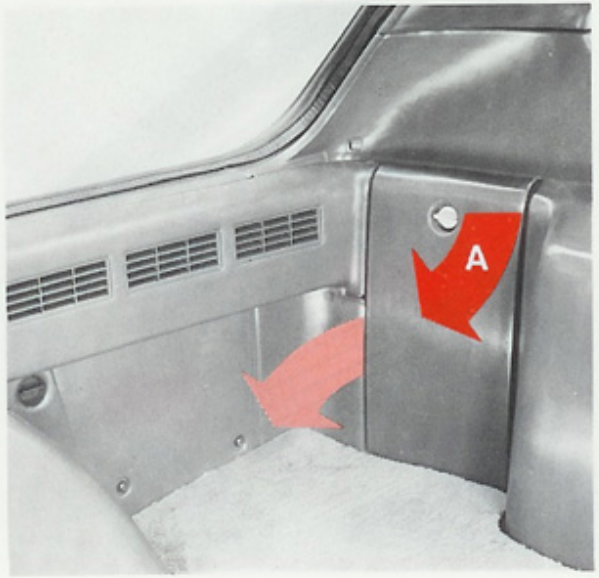
Bulb	Rating	Socket
Rear fog lamp	21 W	BA 15s
Fog lamp	55 W	P 22

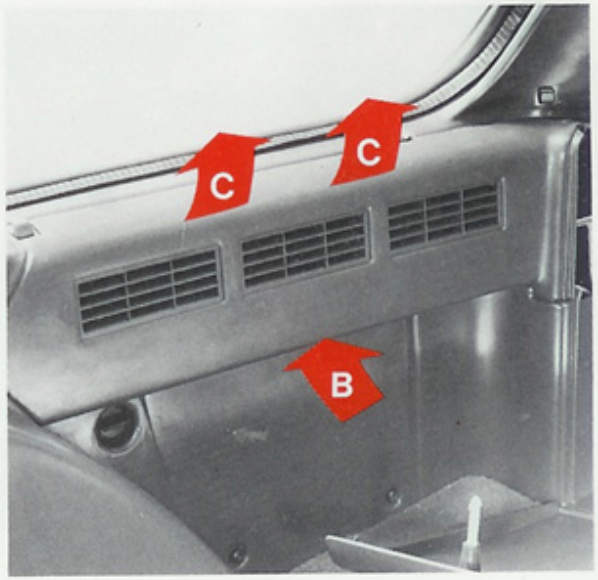
Number plate lights

- Remove the lens by loosening the two screws.
- Press the new bulb between the spring clips.
- Replace the lens and frame with the ''half moon'' pattern to the front.
- Replace the screws.

Bulb	Rating	Socket
Number plate light	5 W	S 8.5







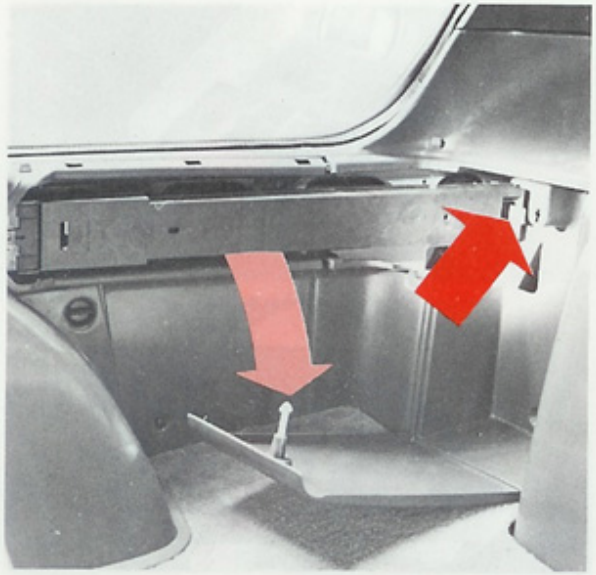
Tail lights

Access to the bulbs in the tail light clusters is from inside the boot.

Bulb	Rating	Socket
1 Direction indicator	21 W	BA15s
2 Tail/brake light	5/21 W	BAY15d
3 Tail/brake light	5/21 W	BAY15d
4 Reversing light	21 W	BA15s

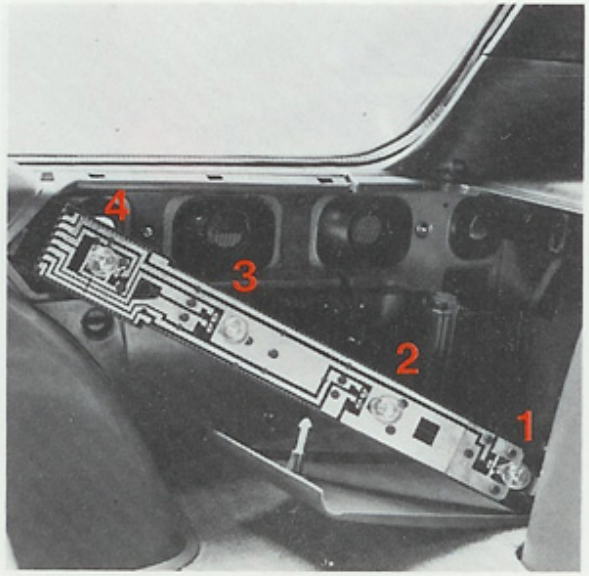
To replace a bulb

- Switch off the ignition and the lighting switch.
- Open the tailgate.
- Remove the lid of the stowage cubby (twist the catch A).
- Remove the cover of the tail light fitting (click fit) by pressing the lower edge (B) upwards so that the top can be lifted over the catches (C).



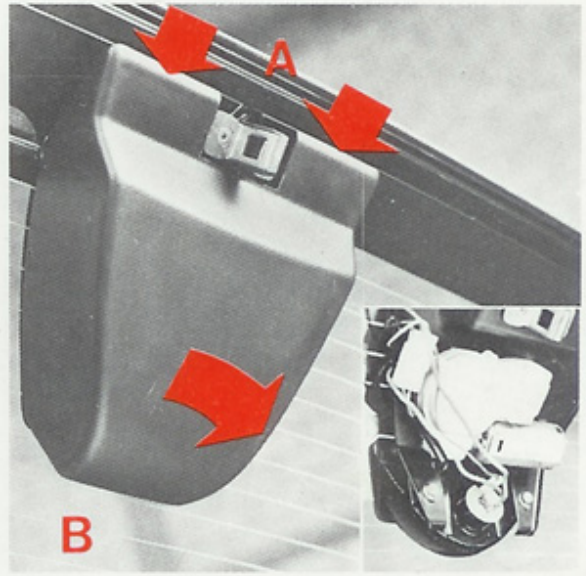
- Press the tab into the corner and pull the light cluster fitting out.
- Push and twist the bulb anti-clockwise to remove.
- Fit a new bulb of the same rating.

Note:
Numbers 2 and 3 are double-filament bulbs and will fit only one way in the bulb holder.



Replacing the tail light fitting

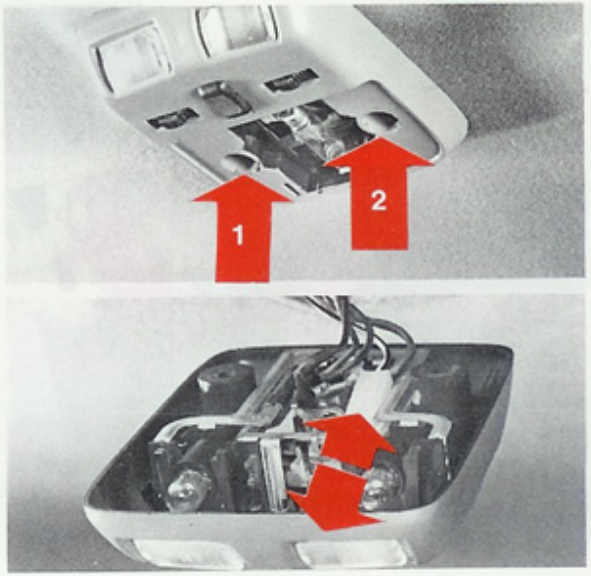
- Locate the fitting so that the hook falls into the aperture at the innermost lamp and click into position.
- Check that the bulb is now working.
- Replace the cover and the corner cubby lid.



Central brake light

- For access to the central brake light remove the cover of the tailgate wiper motor. Press in catches (A) and tip out of the hinge (B).
- Pull out the lamp fitting.
- Push and twist the bulb anti-clockwise to remove and fit a new bulb of the same rating.
- Replace cover by locating the hinge and clicking the cover into position.

Bulb	Rating	Socket
Central brake light	21 W	BA15s



Interior light unit

Note that one bulb contact will be **live** unless the battery or fuse number I is disconnected. This applies also to the reading lamps, glove compartment, boot and engine compartment lighting.

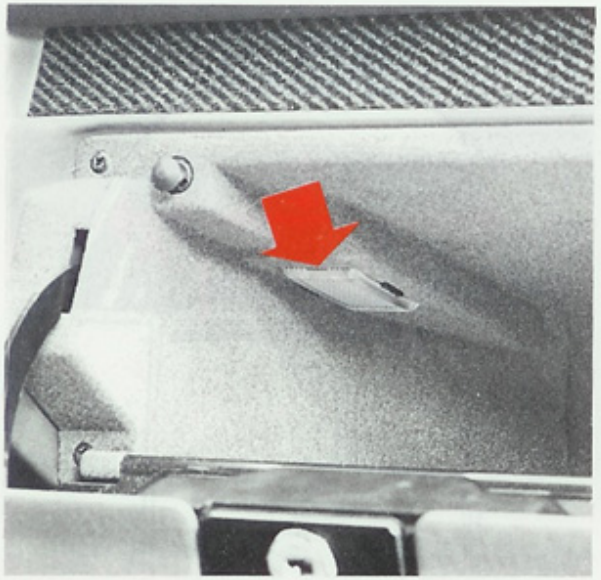
Bulb	Rating	Socket
Courtesy light	10 W	S8.5
Reading lamp	5 W	W 2

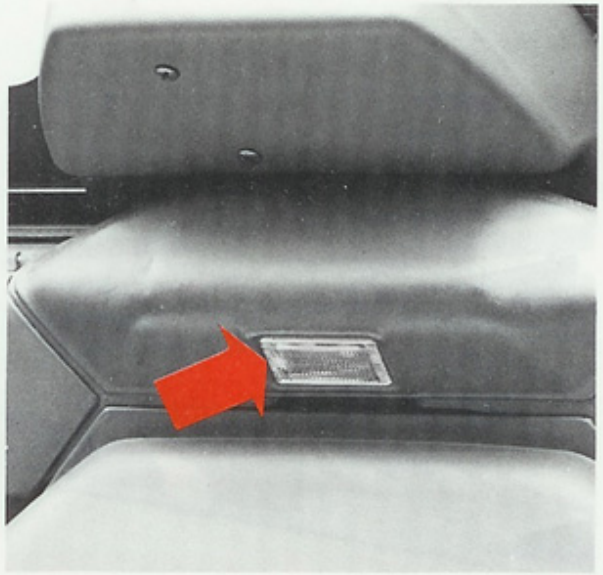
Courtesy light bulb:

- To remove the lens, insert a screwdriver in the slot and twist.
- Press the new bulb between the spring clips and push the lens back into position.

Map reading lamps:

- Remove the lens as described for the courtesy light.
- Remove the screws 1 and 2 and slide out the interior light fitting.
- Pull out the faulty bulb and replace.
- Replace screws 1 and 2.
- Push the lens back into position.



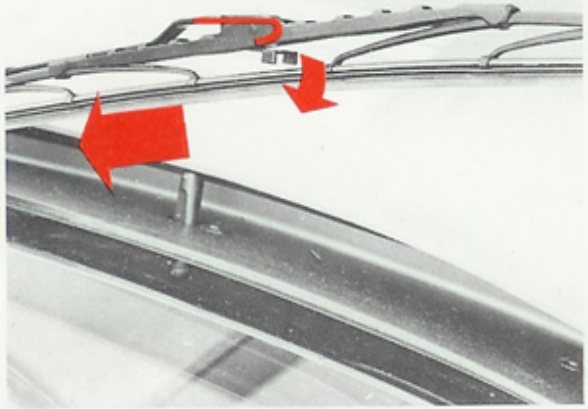


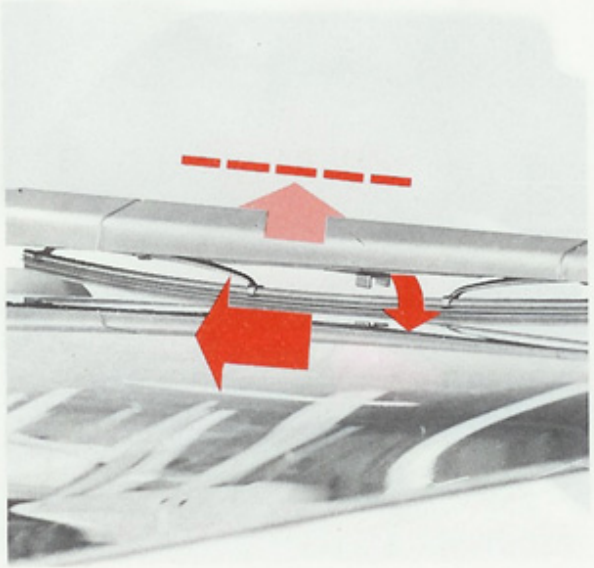
Glove compartment and boot lights

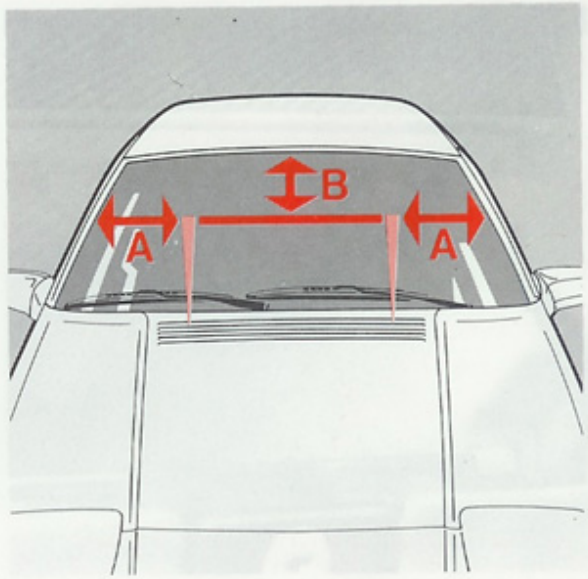
- Remove the fitting by inserting a screwdriver in the slot and easing the fitting out of its aperture.
- Press the new bulb between the spring clips and push the fitting back into place.

Bulb	Rating	Socket
Glove compartment and boot lights	3 W	S 7

Note:
The lamps bulbs which illuminate the instrument panel and various controls, the keyhole and ignition illumination, are fitted in such a way that it is preferable to let your Volvo workshop replace them whenever necessary.







Wiper blades

To remove a windscreen wiper blade, lift the plastic clip at the pivot and slide the blade back along the wiper arm.

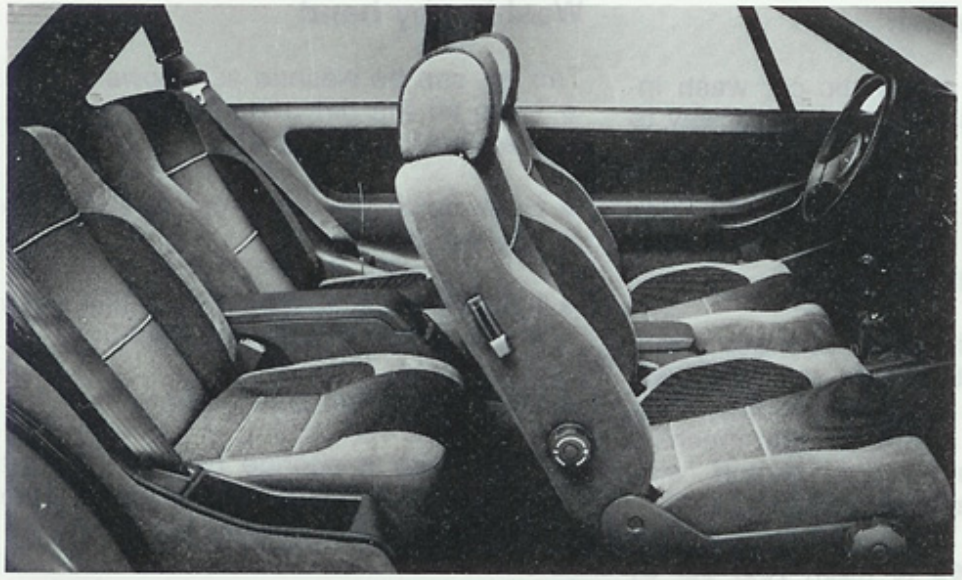
The rear window wiper blade has the same fitting. It is easier to reach with tailgate in the open position.
Lift the arm **a little** to reach the pivot.

Caution!
For reasons of safety, you should change the windscreen wiper blades as soon as they start to leave marks on the windscreen or fail to wipe efficiently and cleanly.

Regular cleaning of the wiper blades improves their efficiency.

Alignment of washer jets

The washer jets can be adjusted if required by sticking a safety pin into the nozzles.
Align the jets so that:
A is between 25 and 35 cm (10-14 inches) and B between 10 and 20 cm (4-8 inches).



This section describes what you can do to keep the bodywork and interior of your car in tip-top condition; also, what measures you can take to prevent the onset of bodywork corrosion.

car care

Keeping your car spic and span.

section contents **page**

Washing the car	70
Polishing the car	71
Cleaning the upholstery	72
Cleaning carpets and floor mats	72
Touching-up the rustproofing	73
Touching-up the paintwork	74, 75

Washing the car

The car should be washed as frequently as possible, particularly during the winter when road salt and moisture could possibly start corrosion.
Never wash the car in the sun or when the bonnet is warm after driving.

Caution!
When driving the car away immediately after washing, depress the brake pedal gently a few times to remove any moisture on the brakes.

Automatic car wash

- The use of an automatic car wash installation is a simple and quick way to clean your car.
- Be sure to use an installation that has clean **brushes** and cleans the **underbody** thoroughly.
- Before driving into an automatic wash, make sure that outside rear windows, auxiliary lamps etc., are secure, otherwise there is a risk of the machine dislodging them. You should also remove or retract the aerial.
- It is a good idea to wash your car by hand as well about twice a year, before and after the winter for example. This provides an opportunity to inspect the car for minor paint damage, which can be dealt with immediately, and to check for possible "blind spots" in the automatic wash procedure.

Note:
We recommend that you do not pass your car through an automatic wash during the first six months because the **paint** will not have hardened sufficiently.

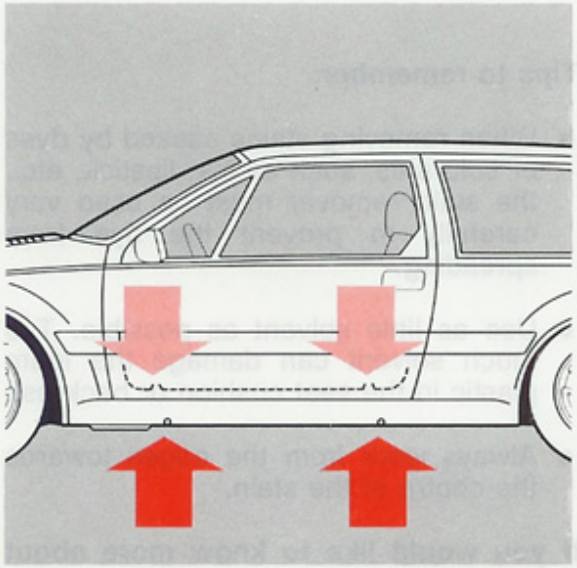
Washing by hand

The car can be washed as follows:
- Hose off the dirt underneath the body, the wheel housings etc.
- Hose down the entire car to soften up any dirt etc.
- If the car is exceptionally dirty, first wash it with a cold degreasing agent.
- Hose down with cold water.
- Wash with a sponge (with or without detergent) using plenty of water. Use preferably warm but not hot water.

Suitable detergent:
Car wash detergent or a dessert spoon of ordinary dish-washing fluid to 10 litres of water.

- Dry with a clean soft-chamois leather.

When washing the car, remember to check that the drain holes in the doors and sills are still open (see opposite page).
Spots on trim mouldings around windows, wings and doors can be removed with a suitable polish (never use abrasive cutting paste or steel wool).



Drain holes

When washing the car, remember to remove dirt from all drainage holes.

Alloy wheels

Wash alloy wheels regularly with warm or cold water. Never use abrasive cleaning agents.

Polishing and waxing

You should polish and wax your car when the surface finish begins to lose its lustre and when normal washing is no longer sufficient to restore its original shiny finish.
In most cases it is not necessary to polish the car until one year after delivery; waxing can, however, be done earlier if so desired.
Wash and dry the car thoroughly before polishing and/or waxing.

Use turpentine substitute for removing asphalt or tar spots. Bigger spots can be removed with a fine grinding paste intended for the car's paintwork.
First polish with the polishing agent and then wax, either with a fluid or solid wax. A number of agents contain both polishing agent and wax. Dull surfaces should first be polished and then waxed.

After polishing the car, check that no **drain holes** have been blocked.

Caution!
Never use **petrol** for cleaning any parts of the car made of synthetic materials (plastics).
Certain ingredients in petrol will effect the plastic of light fittings, for example, eventually causing cracks to form in the material.

Cleaning the upholstery

Dirty upholstery can be cleaned with a modern foam detergent. It is easier to remove stains before they have dried and penetrated the fabric.
Stains should be removed by **dissolving** and not by rubbing or scraping.

Cleaning the seat belts

Use **exclusively** water and a synthetic detergent.

Stains on leather and vinyl trim

Never try to remove a stain by rubbing or scraping.
Never use powerful stain removers. For difficult stains careful use can be made of turpentine substitute. After removal, rinse with a weak solution of soap and lukewarm water.

Stains in fabrics and floor mats

Treat the stains as quickly as possible. Remove the largest part of the stain with a blunt knife. Vacuum around the stains so that surrounding dirt will not be dissolved. Moisten a clean rag with the solvent. Then soak up the solvent and the stains with a wad of dry cotton wool.

Stain removers

Ammonia solution: 1 teaspoon of ammonia (approx. 1 : 9) is mixed with with 3 dl of water.

Ammonia-soap solution: the above-mentioned ammonia solution is mixed with with 1 dl of soapy water.

Perchloroethene-petroleum: mix equal parts of perchloroethene and white spirit (chemically pure petroleum distillate). Perchloroethene-petroleum should not be used for damp materials. When used, this solution must first evaporate before the stain can be wiped clean with water.

Methylated spirit

Turpentine substitute

Warning!

Perchloroethene fumes are extremely toxic. Make sure that the car is properly ventilated when using these preparations. Also bear in mind that white spirit, methylated spirit and turpentine substitute are inflammable liquids!

Tips to remember:

- When removing stains caused by dyes or colorants, such as ink, lipstick, etc., the stain remover must be used very carefully to prevent the dye from spreading.
- Use as little solvent as possible. Too much solvent can damage the foam plastic in the seat cushion or backrest.
- Always work from the edges towards the centre of the stain.

If you would like to know more about cleaning the upholstery of your car, your Volvo dealer will be pleased to give you full information.

Cleaning the instrument panel glass

To avoid damaging the instrument panel glass, only clean water without chemical additives should be used for cleaning.
Other liquids such as petrol, paraffin etc, must not be used.

Rustproofing

Your Volvo was rustproofed at the factory. A thick durable anti-corrosion compound was applied to the outside of the underbody and to the wheel housings. A low viscous, penetrating anti-corrosion agent was used for beams and box-sections.

There are two very effective methods of maintaining this protection.

— Keep your car clean. Clean the underbody, chassis components*, wheel arches and the edges of the wings, using water at high pressure.
— Inspect and, if necessary, touch-up the rustproofing.

* Note:
Chassis components such as spring mountings, suspension strut assemblies and reaction rods.

Inspection

The invisible rustproofing (used for beams and boxed-in sections) must be inspected for the first time after **three years** and thereafter at least every third year.
To obtain a fully acceptable result, all internal cavities, beams and end sections must be finely sprayed at a workshop with correct spraying equipment.
Rustproofing maintenance should be carried out at temperatures above + 10 °C. Consult your Volvo dealer and let them carry out any necessary work.

The external rustproofing

You should have the visible (external) rustproofing checked at regular intervals. If it is necessary to touch-up the rustproofing, this should be done immediately to prevent moisture ingress.
The car should be washed and dried thoroughly before touching-up with spray-on or brush-on rustproofing compounds. Use an oil can with a flexible spout for parts which are difficult to reach.

Three types of rustproofing compounds are available:

A) Low viscous (spray-on) for seams under the car
B) Low viscous (transparent), for visible parts
C) Thick (brush-on), for the parts of the underbody and wheel housings which are exposed to the most wear.

Parts of the car which may need to be touched-up and the recommended rustproofing compound are:

- visible welded seams and panel joints (type B).
- underbody and wheel housings, especially the seams between the floor and the door sills (type A, followed by type C).
- door hinges (type B)

After completion of all work on the vehicle, remove excess rustproofing compound with a cloth moistened in white spirit and check that no **drain holes** have been blocked, see page 71.

Caution!
Special procedures are required for repairs to metallic finishes and for painting components made of synthetic materials. These repairs are best performed by a specialist.

If the car is to be passed through a paint drying oven, electronic components such as the Central Electronic Module and the Engine Management System unit should preferably be removed.

Paintwork maintenance
Damage to the paintwork on **metal** parts requires immediate treatment in order to avoid the formation of rust. It is a good idea to make a habit of regularly checking the paintwork, for example after washing the car, and to touch-up when necessary.

Minor stone-chip damage (up to the size of a small coin) and scratches, can be touched-up with a brush.
Major damage requires workshop equipment and specialist skills. Such work is best performed by your dealer.
Damage to **wing edges** (around the wheel arches) and **door sills** can be touched-up with the aid of an aerosol spray, provided that not too high a demand is placed on the finish.

Scratches and minor stone-chip damage

Material:
- Primer
- Paint: supplied in a tin or a paint pen
- Brush
- Masking tape

If the damage has not penetrated down to the metal and there is still a layer of undamaged enamel, scour away any dirt and apply the paint to the damaged spot.

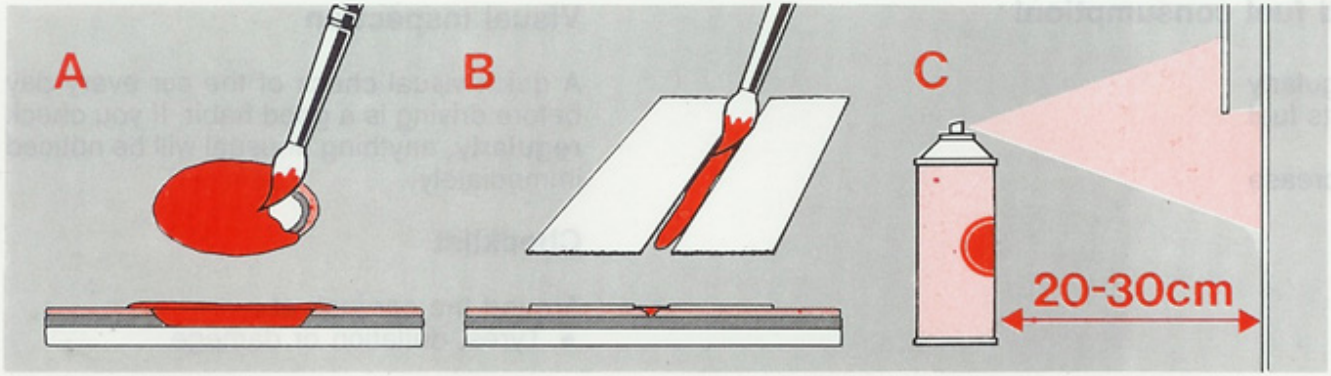
If the damage has penetrated down to the metal, proceed as follows:

1 Remove any dirt and paint flakes by applying and then removing masking tape from the damaged area.
2 Stir the primer well and apply to the damaged area with a fine brush or matchstick **A**.
3 When the primer has dried, apply a surface coat with a brush. Make sure that the paint has been well stirred and apply it thinly in several layers, allowing it to dry between each application.

For **scratches,** proceed as already described, but it may be adviseable to use masking tape to protect the surrounding paintwork **B**.

Colour code

To be sure that you always obtain the correct colour, use the **colour code number** shown on the type designation plate near the radiator (see "6" in illustration on page 96). Original Volvo synthetic enamels are available from your dealer.



Damage to wing edges and door sills

Material:

- Primer: aerosol spray
- Paint: aerosol spray
- Masking tape

When large surfaces have to be repainted, suitably mask the surrounding area with tape or paper.
Remove this masking immediately after spraying the final coat, before the paint dries.

Proceed as follows:

1 Remove the paint flakes using masking tape.

2 Shake the aerosol spray for at least 1 minute. Spray on the primer. Move the spray can slowly and regularly from side to side over the spot, about 20-30 cm (8-12 inches) from the surface **C**. Suitably mask the surrounding area.

3 When the primer has dried, apply the surface enamel in the same way. Spray on several times and allow the paint to dry a few minutes between each coat.

Note:
When touching-up the paintwork of the car, it should be clean and dry and have a temperature above + 15 °C.

Note
Wait 24 hours before applying the finishing touch.

Good servicing maintains good fuel consumption!

Remember that keeping your car regularly serviced has a favourable effect on its fuel consumption.
Some of the factors which can increase fuel consumption are:

- a blocked air filter
- worn spark plugs
- dirty engine oil and a blocked oil filter
- incorrect valve clearances
- ''sticking'' brakes
- insufficient tyre pressure
- faulty front wheel alignment

All these points and many more should be checked and, if necessary, put right during **Major Service** at the Volvo workshop.

Visual inspection

A quick visual check of the car every day before driving is a good habit. If you check **regularly,** anything unusual will be noticed immediately.

Checklist

Around the car look at...
- Tyres, deflation or damage
- Lighting
- Wipers

Under the bonnet, check the level of the...
- Coolant expansion tank
- Brake fluid reservoir
- Washer tank
- Oil level
- Power assisted steering fluid reservoir.

And look out for...
- Oil or coolant leakage
- Wear on belts and hoses
- Corrosion at battery terminals

In this section we describe the **Volvo Service Programme** and those routine checks that you can make to assure yourself that the car is mechanically in good order. Furthermore, we describe the important **precautions** that should always be taken when working on the car.

We give the most essential information about the types and quantities of Volvo recommended **lubricants and fluids** to be used. This can be useful if a non-Volvo garage must be consulted in an emergency or you wish to carry out the work yourself.

section contents **page**

Service and fuel economy	76
Service and warranty	78
Service and emissions control	80 to 83
Important precautions	84, 85
Engine compartment	86
Engine oil	88, 89
Transmission oil	90
Bodywork lubrication	90
Battery maintenance, brake fluid	91
Washer fluid	92
Engine coolant	92, 93
Tyre pressure	94

maintenance
Service, routine checks, precautions

The Volvo Service Programme

Pre-delivery Service
Your Volvo underwent a thorough quality check and was carefully test run and adjusted before leaving the factory. Prior to being handed over to you, it was subjected to a comprehensive **Pre-delivery Service** by your Volvo dealer in order to ensure that it fully meets Volvo standards.

Warranty Service
Your Volvo will be given a free Warranty Service by your Volvo dealer on submission of the coupon in your Service Record book.
The Warranty Service Inspection should be carried out between 1,000 and 2,000 kilometres (600 and 1,200 miles).

Minor and Major Services
In order to benefit continuously from the high level of safety and reliability that your Volvo can provide, you should follow the **Volvo Service Programme** detailed in your Service Record book.
We strongly recommend that the work listed in these service schedules should be entrusted to your Volvo dealer who has the expertise, technical information and equipment to ensure that the work is done to the high level of quality that you, as a Volvo owner, will expect.

You can also rest assured that your Volvo dealer will use only genuine Volvo replacement parts which are of the same high quality as the parts used during the original manufacture of your Volvo.

The Volvo Service Programme has been designed for Volvo cars being used under **average conditions.**

It consists of a **Minor Service** every six months, or at a maximum of 10,000 km (6,000 miles) with high mileage use, and a **Major Service** once a year, or at a maximum of 20,000 km (12,000 miles).

If you feel that the uses to which you put your Volvo are not average, consult your Volvo dealer; he will be happy to advise you of any special maintenance that may be required.

Important

If our warranty is to apply, we make the absolute conditions:

that the above-mentioned warranty inspection is carried out at approximately the correct mileage,

that the car maintenance is carried out in accordance with the instructions in this manual,

and that both service inspections and repairs are done by a Volvo workshop.

Bear in mind that...

- regular servicing is necessary to keep your car in good order from both the **reliability** and the traffic **safety** aspects.
- neglecting a service can result in your car **emitting exhaust gases** with an unacceptably high level of substances harmful to the environment.
- servicing is best done by a **Volvo workshop,** since it has trained personnel familiar with the products and has specialized tools and reliable service literature from Volvo.
- your **Service Record** book should be **stamped** after each service. A ''well-stamped'' service booklet is an indication that the car has been well cared for and normally raises its market value.

Service manuals

If you are technically interested and require more detailed information than is given in this booklet, we would refer you to our Service manuals which can be purchased from your Volvo dealer. The manuals contain precise information about repairs and adjustments as well as the design and function of the components in your car. They are the manuals that are used by Volvo workshops.

Your car and the environment

Volvo has long been concerned with the effect of motor vehicles on the environment, and has been at the forefront in the development of the various measures to reduce the level of pollutants in exhaust gas, such as making engines suitable for the use of unleaded fuel.

On the following four pages, you will find information about how these pollutant level reducing measures work, and also about the minimum service requirements necessary to ensure that they will continue to function properly.

You can find which of the pollutant emission control measures are fitted to the engine in your own car in the engine specifications.

To ensure low emissions we recommend . . .

with regard to Servicing . . .

- that the vehicle be regularly serviced in accordance with the Volvo Service programme as described on page 78 of this manual and in the service booklet:
  We recommend that you plan service appointments to occur just before the official vehicle test.

with regard to engine components...

- that the valve clearances are correct.
- that the engine lubrication system is in order.
  Changing the engine oil and the oil filter are described on page 88.
- that the cooling system is working efficiently. Service measures for the cooling system are described on page 93, while those for engine drive belts on page 95.
- that the exhaust system does not leak and that the components are in good condition.

with regard to fuel system . . .

- that the fuel lines and connections do not leak.
- that fuel fillter and air filter are not blocked.
- that the injection system is correctly adjusted to keep the carbon monoxide (CO) level in the exhaust gas within the stipulated limits.
- that engine control mechanisms work smoothly.
- that the correct fuel is used. Engine fuel requirements: see section "Specifications", page 99.
  Use **exclusively unleaded petrol** for an engine fitted with a catalytic converter.

with regard to the ignition system...

- that the spark plugs are not cracked and have the correct electrode gap.
- that the distributor is lubricated and the distributor cap and rotor are free of cracks.
- that the ignition leads and vacuum lines are securely connected and in good condition.

The measures listed on this page are those included in the yearly **Major Service** which are concerned with the control of exhaust emissions.

Engine components

Valves	check, adjust
Inlet and Exhaust manifolds	tighten, check leakage
Engine belts	check condition and check tension
Engine oil*	change
Engine oil filter*	replace
Exhaust system	check for leakage, condition and suspension

Fuel system

Air filter	replace (40,000 km)
Fuel filter	replace (40,000 km)
Fuel system lines and connections*	check for leakage
Injection system	check for leakage, adjust idle*
Carbon monoxide, exhaust gas*	check, adjust
Engine controls*	lubricate

Ignition system

Spark plugs	replace
Distributor, cap and rotor	check
Coil and spark plug leads	check
Vacuum lines	check

Positive crankcase ventilation

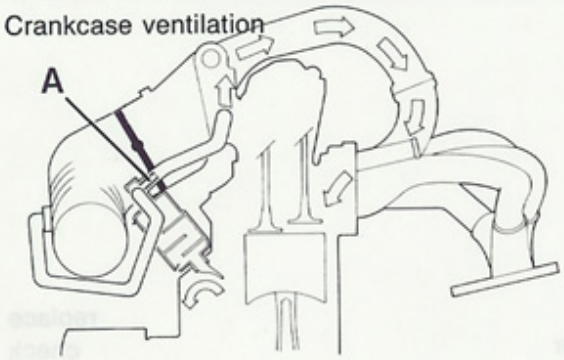
Crankcase ventilation	check (40,000 km)

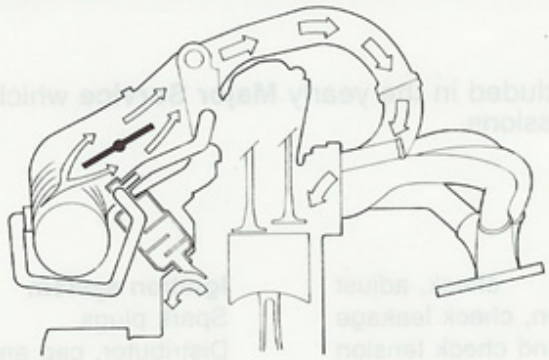
Exhaust gas recirculation system

EGR System	check operation and clean (40,000 km)

* included in the Warranty Service Inspection

Crankcase ventilation





Positive Crankcase Ventilation

The function of the crankcase ventilation is to prevent engine crankcase gases from being released into the atmosphere.
These gases are sucked in through the intake manifold and take part in the combustion.
The pipe to the inlet manifold is provided with a calibrated nipple (A). When the engine is idling the crankcase fumes are sucked into the inlet manifold (high depression). At full power (low depression) the fumes are led through the throttle body housing.

Checking the crankcase ventilation

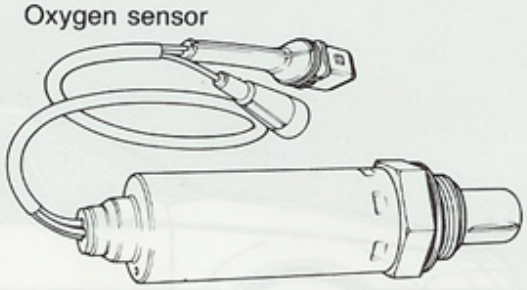
Every 40,000 km check the rubber hoses for condition and clogging. If cracked, the rubber hoses must be replaced, if clogged, they must be cleaned. The calibrated nipple (A) must be removed and cleaned.

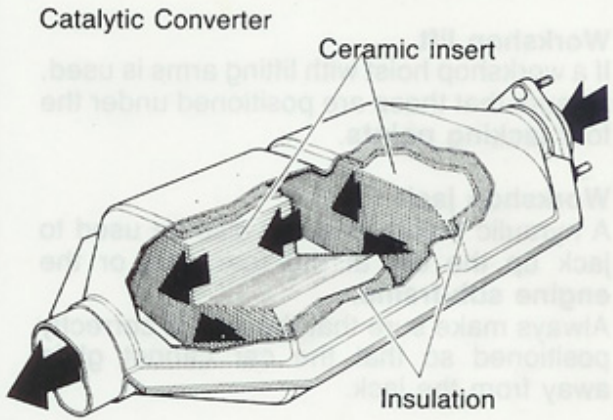
Catalytic Converter

This is a supplementary device placed in the exhaust system to help reduce the amount of exhaust emissions.

The device consists of a container with a ceramic material insert, designed to let the exhaust gases pass through channels in the insert. The channel walls are covered by a thin layer of noble metals such as platinum and rhodium. These metals act as catalysts, initiating a chemical reaction without actually taking part in it. The toxic exhaust emissions content will increase if the Catalytic Converter is damaged.
There are two types of Catalytic Converter: an unregulated 3-way converter and the more efficient 3-way Catalytic Converter regulated by an Oxygen sensor feedback system.

Maintenance
Normally this system does not require any maintenance.





Oxygen sensor feedback system

This part of the emission control system regulates a Catalytic Converter.
An **oxygen sensor** monitors the composition of the exhaust gases leaving the engine.
This information is fed into an electronic unit which continually adjusts the air-fuel ratio to provide optimum conditions for combustion. This enables efficient reduction of the three major pollutants (hydrocarbons, carbon monoxide and nitrous oxides) by a suitable catalytic converter to occur.

Maintenance
Normally this system does not require any maintenance.

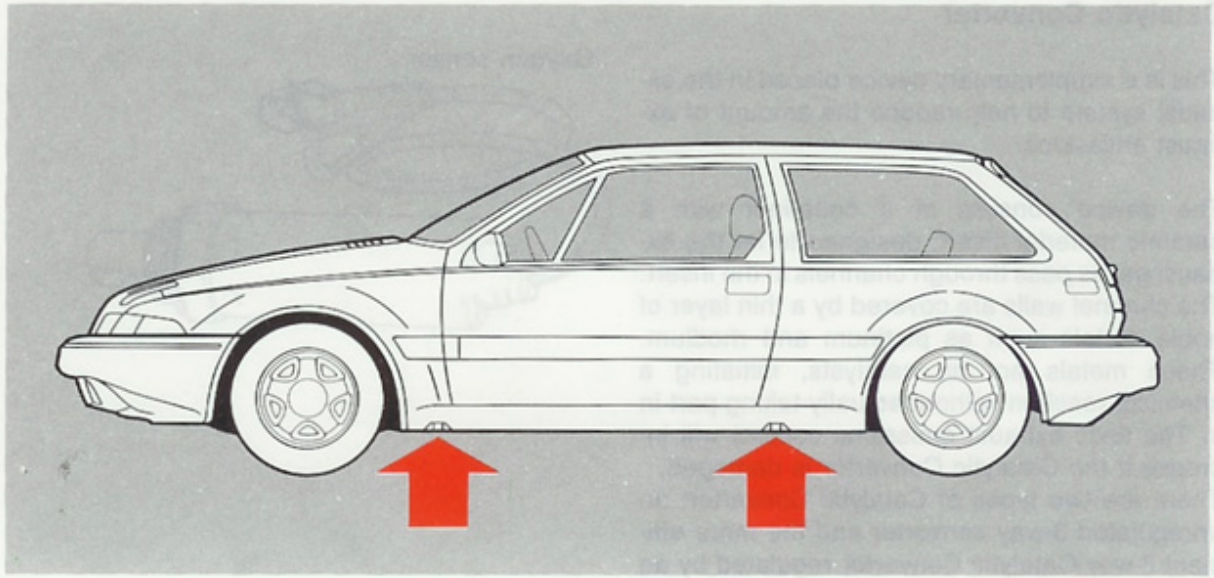
Caution!
Vehicles fitted with a Catalytic Converter must use **unleaded fuel** exclusively. Otherwise the functioning of Catalytic Converter will deteriorate and become **ineffective.**

Bear in mind that the Catalytic Converter which is located under the car, becomes **very hot** when driving and takes some time to cool down. If you park the car over dry grass or leaves, for example, these could easily **catch fire.**

Jacking up the car

Workshop lift
If a workshop hoist with lifting arms is used, be sure that these are positioned under the four **jacking points**.

Workshop jack
A hyraulic trolley jack can also be used to jack up the car at the rear axle or the **engine sub-frame.**
Always make sure that the jack is correctly positioned so that the car cannot glide away from the jack.



Caution:
Never jack up the car beneath the oil sump or a suspension wishbone.

If the car is to be jacked up on **one** jacking point only, the **doors must remain closed!**

Warning!

- The jack supplied with the car should be used only for changing a wheel and with the car on firm ground.
- With any other work requiring the car to be in the jacked-up position, use a garage jack and place axle stands or blocks under the car where it is raised.
- Never crawl under the car when it is supported only by a jack!

Warning!

Take note of the following before doing any work on the car:

Important precautions

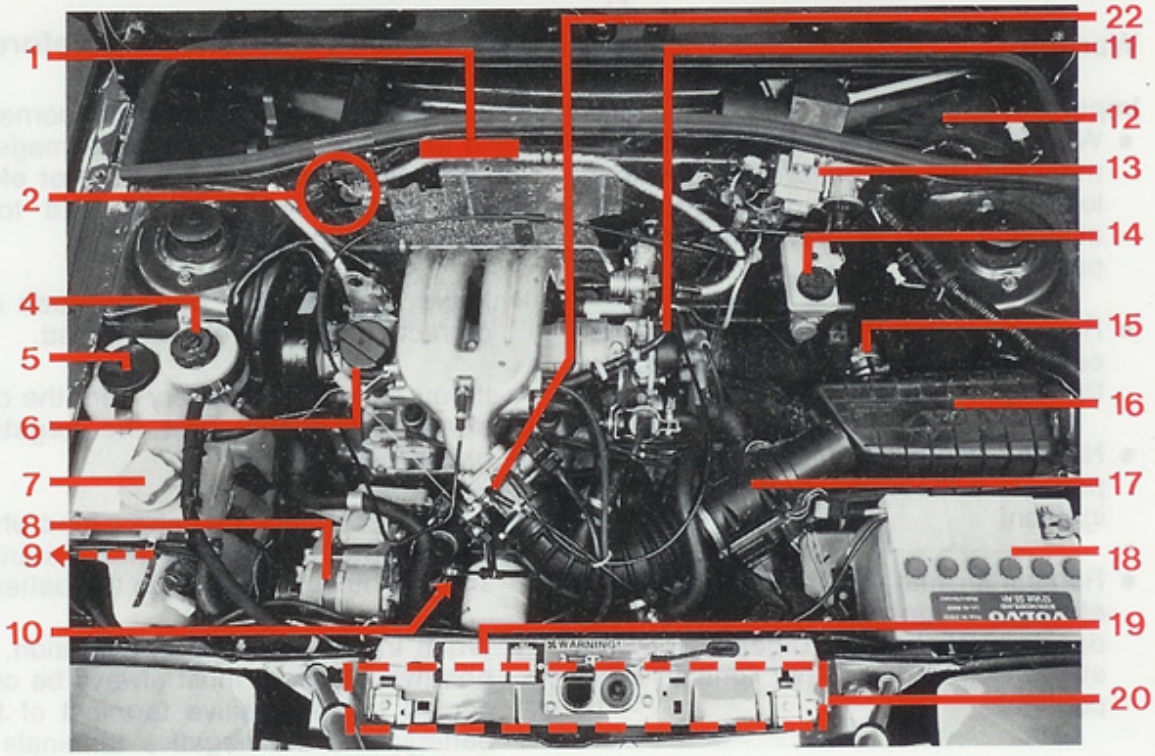
- When working in the engine compartment with the engine running, beware of loose clothing etc. being caught by the alternator belt or any other rotating parts!
- Remember that the electric cooling fan can start working again some time **after** the engine has been switched off!
- Never disconnect any electrical components without first **switching off** the ignition!
- Remember that the cars are fitted with **electronic ignition** systems, so that **dangerously high voltages** are present at the coil and at other ignition components.

The following points should be borne in mind to avoid the possibility of damage to the **alternator, charging circuits or electronic ignition** which could lead to a lengthy and expensive repair.

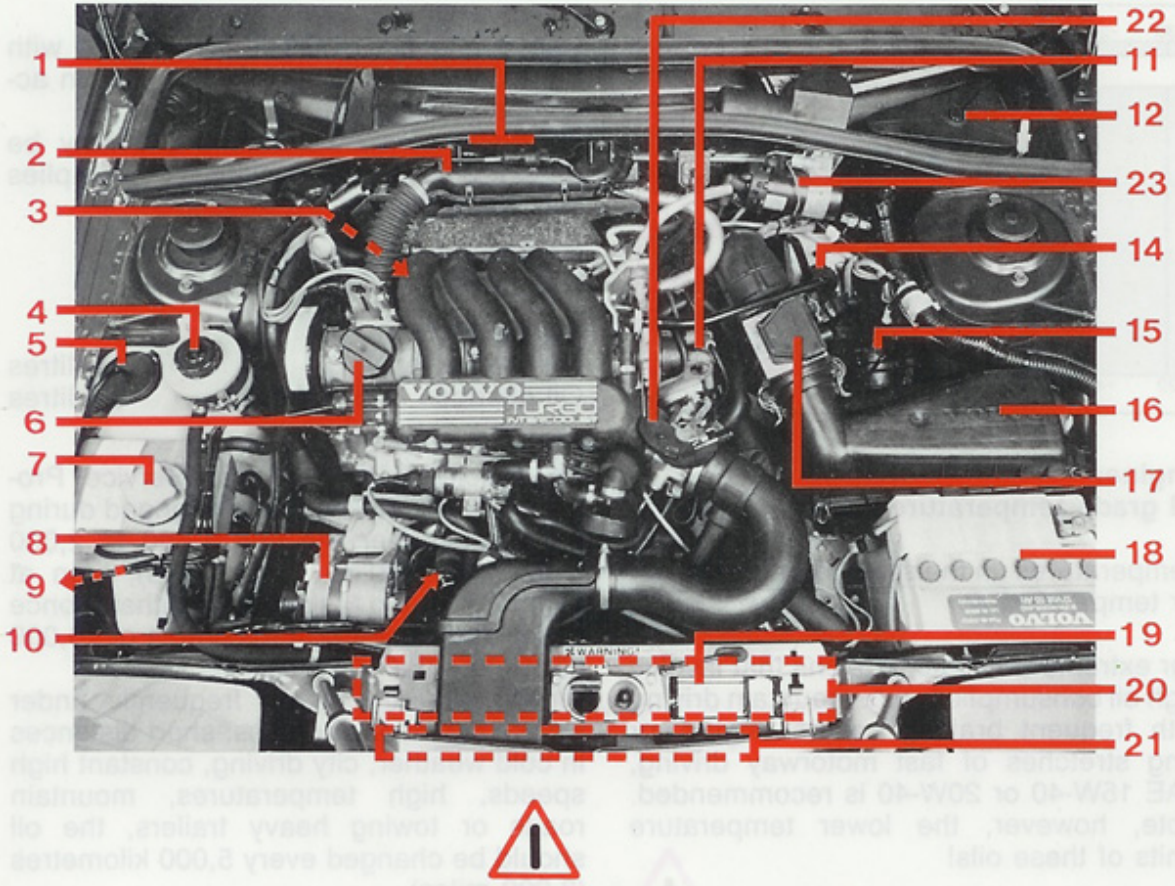
- Make sure that the **battery leads** are correctly and securely connected.
- If you remove the battery from the car, always disconnect **first** the **negative** battery lead.
- Never disconnect the battery lead when the **engine is running** (for instance, should you wish to change the battery).
- When the alternator is in operation, its **positive terminal** must always be connected to the positive terminal of the battery; and the negative terminals of the alternator and battery must be connected to earth.
- Never connect the **field connection** of the alternator or the regulator (DF-terminal) or that of the connecting lead to earth.
- If you use another battery to help you start the car, make sure that the **correct** procedure, as described on page 54, is followed.
- Never disconnect or connect the electronic ignition unit, the multi-pin plug of the Central Electronic Module (CEM) or the Engine Management System unit **with the ignition switched on!**
- If **electric welding** is being done on the car, disconnect the battery earth lead, all the alternator and voltage regulator leads, the CEM, the Engine Management System unit.
- If a **quick charger** is used, disconnect the battery leads. It should be switched off when connecting or disconnecting leads.
- Remember that a quick charger **must not** be used as an aid for starting.

1.7 litre injection engine, B 18 E + F

1 Chassis number (VIN number)
2 Airpressure sensor
4 Hydraulic fluid reservoir, power-assisted steering
5 Windscreen/headlamp washer reservoir
6 Oil filler cap
7 Cooling system expansion tank
8 Alternator and voltage regulator
9 Charcoal canister, Fuel evaporative loss control system (in right wing) B 18 F
10 Oil dipstick
11 Distributor
12 Relays and lamp failure warning unit
13 Electronic ignition unit
14 Brake fluid reservoir
15 Auxiliary water pump B 18 F
16 Air filter
17 Air mass meter, fuel injection system
18 Battery
19 Type designation plate
20 Cooling system radiator
22 Throttle body housing



Warning!
Thermo-electric cooling fan (all engines): The fan can start working again some time **after** the engine has been switched off!

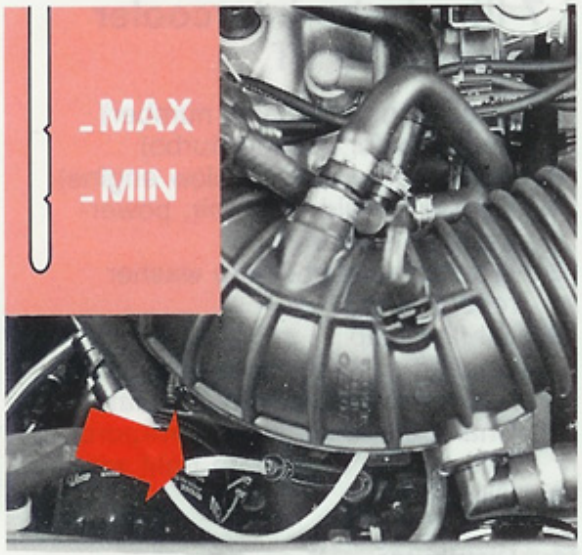


1.7 litre turbo intercooler engine, B 18 FT

1 Chassis number (VIN number)
2 Fuel injector cooling (turbo)
3 Turbo compressor (below engine)
4 Hydraulic fluid reservoir, power-assisted steering
5 Windscreen/headlamp washer reservoir
6 Oil filter cap
7 Cooling system expansion tank
8 Alternator and voltage regulator
9 Charcoal canister, Fuel evaporative loss control system (in right wing)
10 Oil dipstick

11 Distributor
12 Relays and lamp failure warning unit
14 Brake fluid reservoir
15 Auxiliary water pump
16 Air filter
17 Air mass meter, fuel injection system
18 Battery
19 Type designation plate
20 Cooling system radiator
21 Intercooler (turbo)
22 Throttle body housing
23 Ignition coil

Warning!
The exhaust driven turbo compressor becomes extremely hot. Spilling oil on the hot surfaces can **cause fire!**

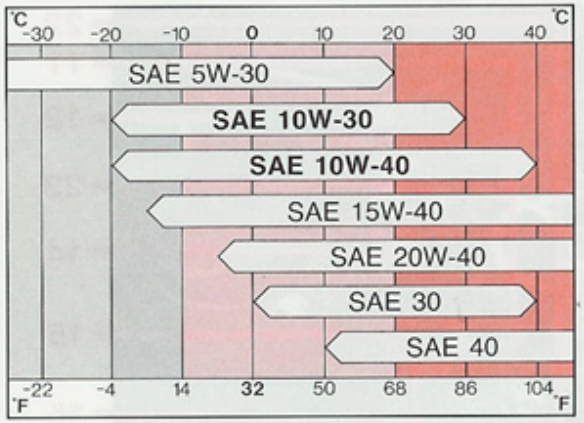


Checking the oil level

Check the oil level regularly with the engine cold. This should be done with the car standing on a level surface.
Wipe the dipstick before checking the level. The oil should be neither below the MIN nor above the MAX marks on the dipstick.

Topping-up the oil

Always fill with the same type of oil as is already in the engine. To top-up from MIN to MAX (with a cold engine) needs approximately:
1.7-litre injection engine: 1.8 litres



Engine:
oil grade temperature range

Temperatures on the scale refer to ambient air temperature.

For extreme driving conditions that involve high oil consumption, e.g. mountain driving with frequent braking on the engine, or long stretches of fast motorway driving, SAE 15W-40 or 20W-40 is recommended. Note, however, the lower temperature limits of these oils!

Warning

— Prolonged and repeated contact may cause serious skin disorders, wash thoroughly after contact.
— Keep out of reach of children.
— Use autorised waste disposal facilities, or garages that provide facilities for receipt of used oil.

Oil quality

Use quality G2 or G3 in accordance with the CCMC service specification (SF in accordance with API).
Synthetic or semi-synthetic oils may be used provided their specification complies with the above.

Engine oil grades (viscosity)

See table.

Oil capacity

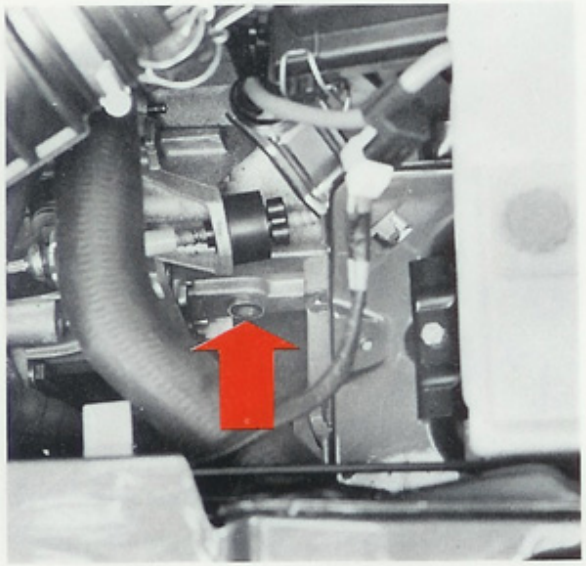
Oil change only:	4.8 litres
Oil changes and new filter:	5.3 litres

Frequency of oil changes

As specified in the Volvo Service Programme, the oil should be changed during running-in, after the first 1,000 to 2,000 kilometres (600 to 1,200 miles); then at every Minor and Major Service, that is once every six months or a maximum of 10,000 kilometres (6,000 miles).
When cars are driven frequently under severe conditions such as: short distances in cold weather, city driving, constant high speeds, high temperatures, mountain roads or towing heavy trailers, the oil should be changed every 5,000 kilometres (3,000 miles).

Oil filter

The oil filter must be changed also at every Minor and Major Service, once every six months or a maximum of 10,000 kilometres (6,000 miles).



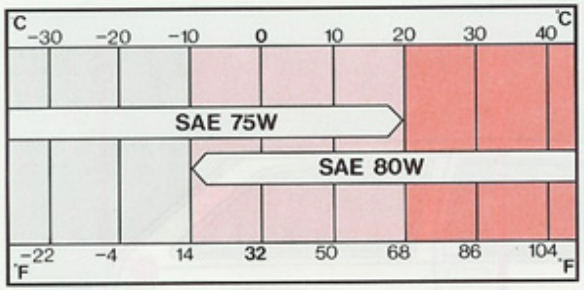
Transmission oil level

The **oil** level should be up to the level/filler plug.

The oil is **added** through the level/filler plug hole.

Add oil **slowly** to ensure good distribution.

Always fit new **washers** when replacing plugs to prevent the possibility of oil leakage.



Transmission:
oil grade temperature range

Temperatures on the scale refer to ambient air temperature.

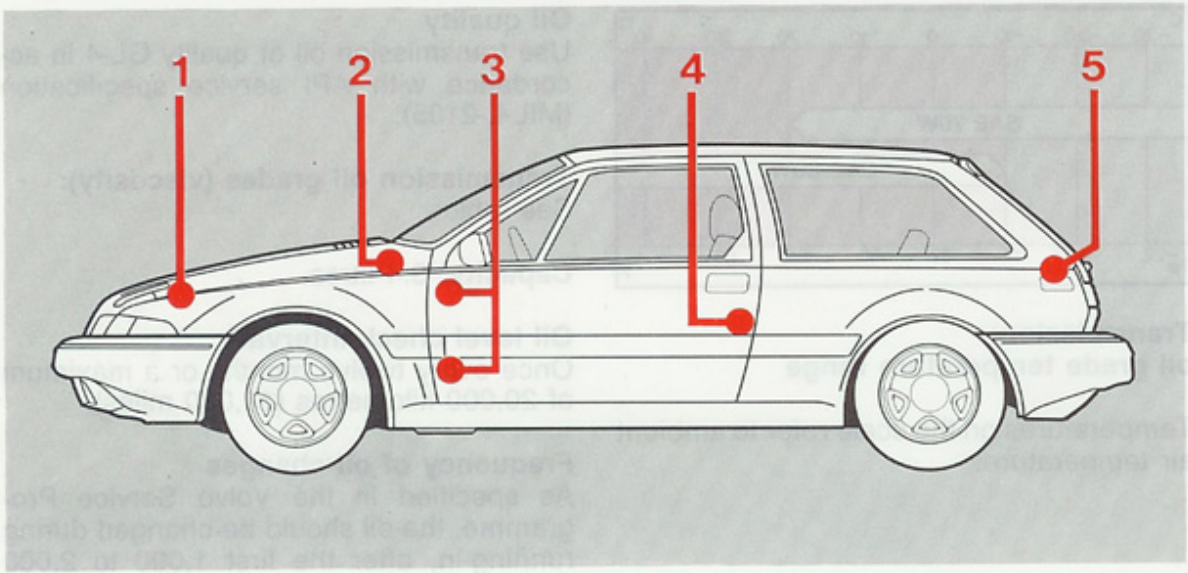
Oil quality
Use transmission oil of quality GL-4 in accordance with API service specification (MIL-L-2105).

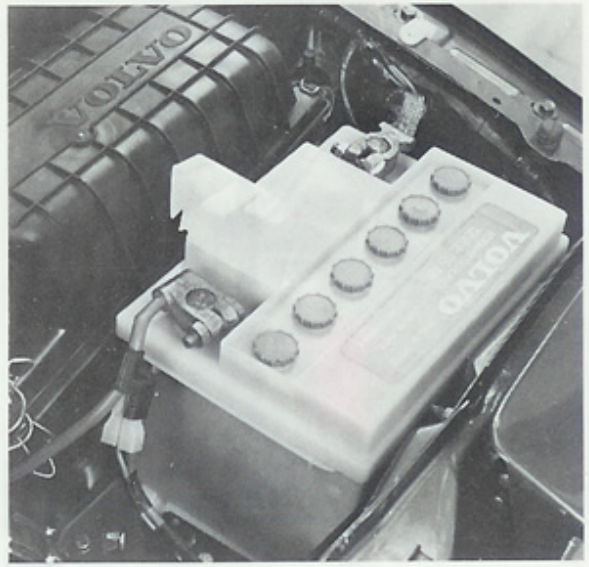
Transmission oil grades (viscosity):
See table.

Capacity: 3.4 litres.

Oil level check interval
Once every twelve months or a maximum of 20,000 kilometres (12,000 miles).

Frequency of oil changes
As specified in the Volvo Service Programme, the oil should be changed during running-in, after the first 1,000 to 2,000 kilometres (600 to 1,200 miles); then at every sixth Minor and Major Service, that is once every three years or a maximum of 60,000 kilometres (36,000 miles).





Lubricating the bodywork

Lubricating these points of the body a few times a year will avoid possible squeaks or rattles and will prevent unnecessary wear. Use lubricants **sparingly** to prevent them reaching places where they will not be welcome. Treating the rubber door seals with talcum powder before the winter will keep them in good condition.

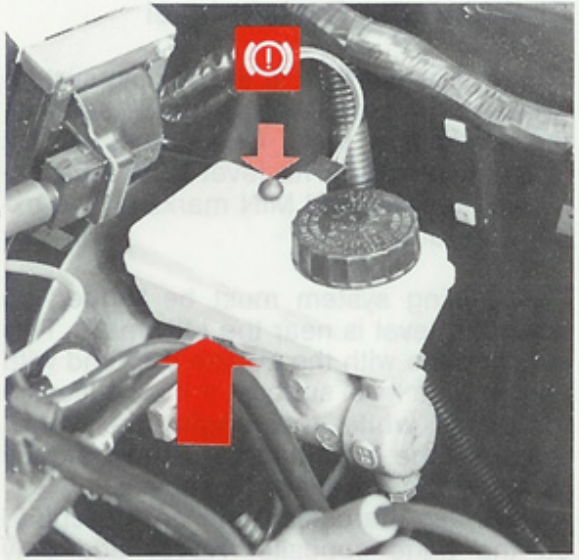
No.	Lubrication point	Lubricant
1	Engine bonnet catch	paraffin wax
2	Engine bonnet hinges	grease
3	Hinges and door check mechanism	grease
4	Door striker plates	paraffin wax
5	Tailgate striker plate	paraffin wax

Battery

With the car on a level surface, check that the electrolyte level is just above the cell plates.
Use **distilled** water only for topping-up, **never** use acid.
Do this in a well ventilated area with the ignition switched off!

Battery fumes are explosive!

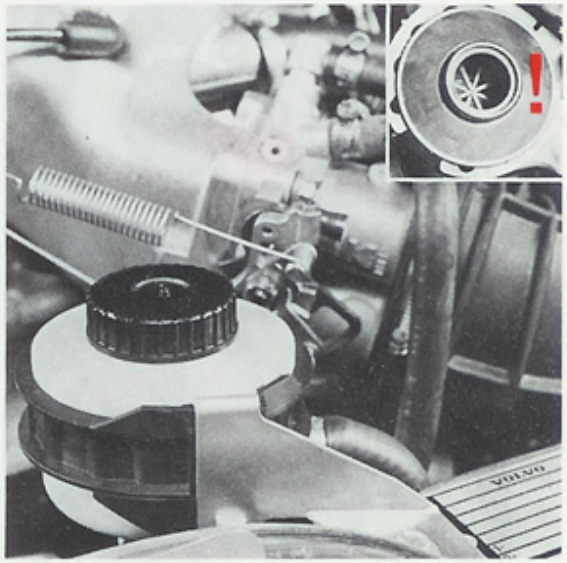
Grease the battery terminals and clamps regularly with vaseline.



Brake fluid change

Normally you should ask your Volvo workshop to change the brake fluid once every second year, preferably before the winter. However, when frequent and arduous use of the brakes is involved, for instance, when the car is regularly used in a district with long mountain descents etc, the brake fluid should be changed every year.

Volvo brake fluid: specification
DOT 4 (SEA J 1703).



Checking brake fluid level

The translucent brake fluid reservoir facilitates regular checking of the brake fluid level.
The brake fluid level should never fall below the minimum line (MIN). If you find the brake fluid level has fallen below the minimum, check brake operation and have the brake system inspected by a Volvo workshop as soon as possible.

Only Volvo brake fluid should be used to top-up the system.

Checking the brake fluid level warning system

The correct operation of the warning mechanism for low brake fluid can be checked as follows (you will need the help of a second person):

sit in the driver's seat, start the engine and run the engine at idle. When the rubber button on the reservoir is depressed, the brake fluid warning lamp should light up.

Power-assisted steering

Remove the cap to check the fluid level. If the level falls to below the grating, have the power-assisted steering system inspected by a Volvo workshop.

Fluid quality: ATF type A/A or F, or Dexron.

Fluid level check: once every six months or at a maximum of 10,000 km.

Screenwash reservoir

The windscreen and rear window washers have a common reservoir in the engine compartment which holds approximately 2.3 litres (4 pints); or in cars with headlamp washing system, approximately 4.0 litres (7 pints).

Keep well filled with water. During the time of year when frost can be expected, use a mixture of water and screenwash anti-freeze.

Checking the coolant level

The level of the fluid in the cooling system (when the engine is cold) can be seen on the expansion tank. Check the coolant level **frequently.** The level should be between the MAX and MIN marks on the expansion tank.

The cooling system must be **topped-up** when the level is near the MIN mark. This is best done with the engine cold and with the car on a level surface. If it is necessary to top-up **while the engine is warm, unscrew the expansion tank cap slowly to allow the pressure to escape.**
Always use the coolant mixture described on the page opposite. **Never** add only water as the anti-freeze properties of the coolant will be **reduced in effectiveness.** Use exclusively Volvo antifreeze.

If it is frequently necessary to top-up, have the cooling system checked by a Volvo workshop.

Caution!
Never mix **different** types of antifreeze!

Never add only water!

Volvo antifreeze protects the cooling system in three ways. Besides preventing freezing, it increases the boiling point and it prevents corrosion of the various materials present in the components of the engine and its cooling system.

Coolant mixture

For protection against frost down to **minus 18 °C,** use a mixture of 34% **Volvo antifreeze type C (blue-green)** and 66% pure water.
For protection against frost down to minus 30 °C (in northern Europe, for example) use a mixture of 50% Volvo antifreeze type C (blue-green) and 50% water.

Cooling system capacity
1.7-litre injection engines: approx. 7 litres (12 pints)

Use only Volvo antifreeze **type C (blue-green).**

Coolant change

Under normal conditions the coolant should be changed every two years. We recommend that you ask your Volvo workshop to drain, flush and refill the cooling system **every second autumn.**

The Volvo Service Programme provides a check on the level and the freeze point of the coolant at least once a year.

Correcting the tyre pressure

Tyre pressures should only be corrected when the **tyres are cold**. With warm tyres, this should only be done when the pressure is too low. The reason for this is that after driving for some miles, the temperature of the air in the tyres rises and with it the pressure.

Check the tyre pressures regularly
Do not forget to check the spare wheel as well.
It is very important **never** to have tyre pressures **lower** than that given in the table.

Tyre pressure (cold tyres)
in kPa (psi)

Model	Tyre size	front	rear
480 ES normal	185/60 HR 14	210 (30)	190 (27)
480 ES full load	185/60 HR 14	210 (30)	210 (30)
lightweight spare wheel*	T 105/70 R 14	420 (60)	420 (60)

*Maximum permissible speed: 80 km/h (50 mph).

kPa: kilopascal,
100 kPa = 1 kg/cm² = 14 psi

Caution!

The ''H'' of HR 14 indicates the speed range of the tyre (''R'' indicates: radial). ''H'' tyres are intended for use at speeds up to 210 km/h (130 mph) and so are suited to the maximum speed of your car.
Never fit tyres with a lower speed range for general use!
Observe the lower speed range of tyres for special purposes such as **winter tyres.**

Tread wear indicator

The tyres have tread wear indicators in the form of sections of the tyre pattern with a slightly less deep tread (see arrows). When these sections become visible, it is high time to change the tyres.
Remember that tyre treads worn down to less than 2 mm (1/12 ″) have very poor road grip in rain or snow.

Drive belt check

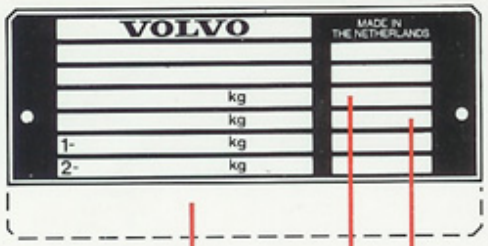
Check the drive belts regularly to make sure that they are clean and in good condition.

Worn or dirty belts can cause slippage resulting in insufficient cooling (water pump) and insufficient charging of the battery (alternator). The efficiency of an air conditioning unit, if fitted, will be seriously impaired.

Belt tension

The tension of a belt is important. An incorrectly tensioned belt can cause damage to the engine. Belt tensioning must be carried out with **special equipment.**

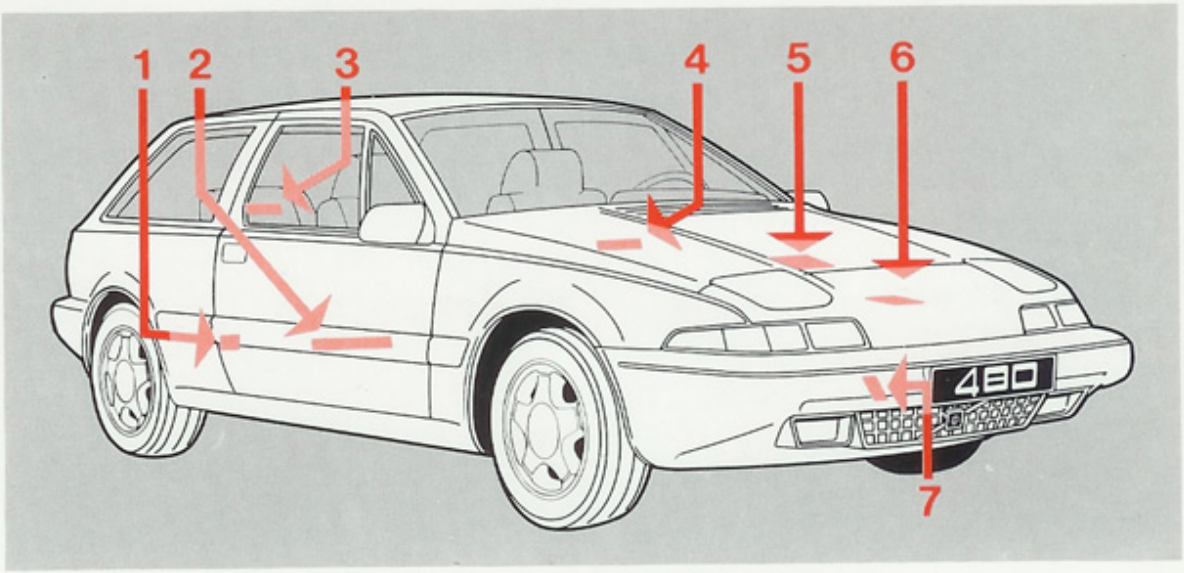
If you find excessive slack, have the belt(s) serviced by a Volvo workshop as soon as possible.



(Australia) built date

paint colour code

upholstery colour code



Chassis and engine number

In all correspondence concerning your vehicle and when ordering parts, the model, chassis and engine number should always be quoted.

1 Tyre pressure
Under the lock on the driver's door, gives tyre pressure and load data.

2 Service data
In the storage well for the tools:
This gives data of certain components.

3 Second chassis number position
On the centre of the boot rear wall.

4 Chassis number (VIN)
Stamped in the engine bulkhead.

5 Engine adjustments data for emissions
On the inner surface of the bonnet.

6 Type designation plate
Under the bonnet above the radiator.
Indicates: variant, model year, chassis number, upholstery and paint colour code, maximum load data.

7 Engine number
Next to the dipstick on the engine block, indicates engine number and type designation.

(**3** and **5** apply to certain markets only.)

International measurement units

The SI system (Système International d'Unités) is used in the specifications in the following pages.
Formerly used units are also shown between brackets in some cases.
The international units:

Output - kW (kilowatts)

100 kW = approx. 136 hp (horsepower)

Torque - Nm (Newton metres)

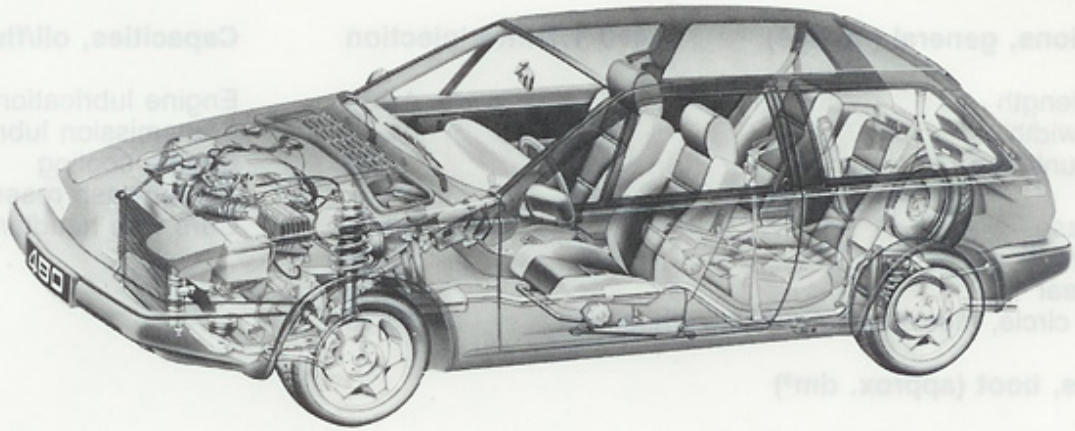
100 Nm = approx. 10 kgm (kilogram metre)

Engine displacement - dm^3

(dm^3 is equivalent to 1 litre)

Pressure (fluids, gases) - kPa (kilo Pascal)

100 kPa = approx. 1 kg/cm^2 (kilogram per cm^2).



In the following pages all the most useful data, whether or not previously mentioned in the manual, is brought together for easy reference.

section contents **page**

Identification numbers 96
Dimensions, volumes and weights 98
Engine specification 99
Electrical system, bulbs 100
Transmission and suspension 101

Dimensions, general (metres)	480 1.7-litre injection
Overall length	4.258
Overall width	1.71
Height, unladen	1.32
Wheelbase	2.504
Track, front	1.42
Track, rear	1.43
Turning circle, measured at outside wheel	10.10

Capacities, oil/fluid (litres)	480 1.7-litre injection
Engine lubrication	5.3
Transmission lubrication	3.4
Engine cooling	7.0
Screenwash reservoir	2.3 (4 pints)
Cars with headlamp washing system	4.0 (7 pints)

Volumes, boot (approx. dm³)

Boot, loaded to the height of the rear seat backrests	160 (5.5 cu. ft.)
Boot, maximum with both rear seats down	660 (23 cu. ft.)

Weights (kilograms)	B18 E	B 18 F	B 18 FT
Transmission	manual		
Kerb weight	1008	1021	1078
Maximum permissible total weight	1355	1390	1415
Maximum permissible (braked*) trailer weight	900	900	900*
Maximum axle load, front	700	775	800
Maximum axle load, rear	605	630	630
Maximum permissible roof load	75	75	75
Maximum load on towing bracket	45	45	45

* Unbraked trailer: 50% kerb weight

* see page 45

Electrical system		
12 Volt with Central Electronic Module (CEM)		
Battery 12 V		
Max. capacity		55 Ah
Electrolyte		
relative density (gr/cm³)		1.28
recharge at		1.15
Earth connection		negative
Alternator		
(with built-in voltage regulator)		
max. current at 14 V		60 A
Starter motor	E	F/FT
output	1000 W	850 W
Fuses: see page 57		

Bulbs, 12 V	**Rating, watts**	**Socket**	**Number**
Headlamps, halogen (H4)	60/55	B43t	2
Driving lamps, fog lamps (H3)	55	P22	4
Parking-/day running lights	4/21	BAZ 15d	2
Direction indicators	21	BA 15s	4
Direction indicators, side repeaters	5	W2	2
Tail/brake lights	5/21	BAY 15d	4
Reversing lights, rear fog lamps and central brake light	21	BA 15s	5
Rear number plate lighting	5	S 8.5	2
Courtesy light	10	S 8.5	1
Reading lamps, roof	5	W2	2
Keyhole, heater control panel and seat belt lock lights	-	(LED)	11
Glove box and ignition switch lighting	3	S7	2
Indicator lamps, instrument panel	1.2	W1	17
Instrument lighting	3	W2	3
Information centre lighting (halogen)	3	W2	1
Hazard warning switch lighting	0.36	W1	1
Illuminated switches	1.2	W1	8
Boot light	3	S7	1

Engine type

Service code designation		**B 18 E(E) 104**	**B 18 E(D) 104**	**B 18 F (106)**	**B 18 FT (M) 107**
According to 80/1269/ECE (ISO)	Maximum output	80 kW(109 pk) at 5800 r/min	78 kW (106 pk) at 5800 r/min	70 kW (95.2 pk) at 5400 r/min	88 kW (120 pk) at 5400 r/min
	Maximum torque	140 Nm (14.3 kgm) at 4000 r/min	139 Nm (14.1 kgm) at 4000 r/min	140 Nm (14.7 kgm) at 4100 r/min	175 Nm (17.8 kgm) at 3600 r/min
Bore and stroke		81 mm, 83.5 mm	81 mm, 83.5 mm	81 mm, 83.5 mm	81 mm, 83.5 mm
Displacement and compression ratio		1721 cc/10.5:1	1721 cc/10.5:1	1721 cc/9.5:1	1721 cc/8.1:1
Valve clearences, cold	inlet valve	0.20-0.25 mm	0.20-0.25 mm	0.20-0.25 mm	0.20-0.25 mm
	exhaust valve	0.40-0.45 mm	0.40-0.45 mm	0.40-0.45 mm	0.45-0.55 mm
Fuel, minimum octane rating					
	leaded petrol	96 RON	not permitted	not permitted	96 RON
	unleaded petrol	95 RON	95 RON	95 RON	95 RON
Fuel tank capacity (litres), approx.		48	48	48	48
Fuel system	type	multi point injection	multi point injection	multi point injection	multi point injection
	make	Bendix	Bendix	Bosch	Bosch
	service code	Fenix 3.2	Fenix 3.2	LH 2.2	LH 2.2
Idling speed,	manuel gearbox	800 ± 50 r/min	800 ± 50 r/min	800 ± 50 r/min	800 ± 50 r/min
	with airconditioning	900 ± 50 r/min	900 ± 50 r/min	900 ± 50 r/min	900 ± 50 r/min
Cooling system, thermostat opens at		89 °C	89 °C	89 °C	89 °C
Engine cooling fan		Thermo-electric	Thermo-electric	Thermo-electric	Thermo-electric
Electronic ignition,	service code	Fenix 100620	Fenix 100620	Bendix 416A	Bosch EZ 210 K
	firing order	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Spark plugs,	Volvo No.	2342458-1	2342458-1	3343251-9	3343241-0
Electrode gap and tightening torque		0.7 mm/25-30 Nm	0.7 mm/25-30 Nm	0.7 mm/25-30 Nm	0.7 mm/25-30 Nm
Emission system					
Crankcase ventilation		•	•	•	•
3-way catalytic converter (oxy-cat)		—	•	—	—
3-way catalytic converter and oxygen sensor (Lambda sensor)		—	—	•	—
Fuel pump resisenlation system		—	—	•	—

B 18 FT 107 88 kW (120 pk) at 5400 r/min.
175 Nm (17.8 kgm) at 4200 r/min.
81 mm, 83.5 mm 1721 cc/8.1:1
0.20-0.25 mm 0.45-0.55 mm
not permitted 95 RON
48 multi point injection Bosch LH 2.2 800 ± 50 r/min 900 ± 50 r/min
89°C Thermo-electric Bosch EZ 210 K 1-3-4-2 3343241-0 0.7 mm/25-30 Nm
•
—
•
•

Transmission

Reduction ratios gearbox

Gear	E/F M53-407E	FT M 54-373E
1st	3.09:1	3.09:1
2nd	1.86:1	1.84:1
3rd	1.32:1	1.32:1
4th	0.97:1	1.97:1
5th	0.79:1	0.76:1

Final drive

Reduction ratios		
	E/F	4.07:1
	FT	3.73:1

Read speed at 1,000 engine rpm

Gear km/h	E/F	FT
1st	8.4	9.2
2nd	14.1	15.4
3rd	19.7	21.4
4th	26.9	29.2
5th	34.3	37.2

These are theoretical values and can vary in practice due to factors such as **tyre size**, tyre pressure and amount of wear.

Recommended minimum and maximum speeds km/h

Gear	minimum	maximum
1st	—	45 km/h
2nd	20 km/h	75 km/h
3rd	30 km/h	105 km/h
4th	40 km/h	—
5th	60 km/h	—

index

ABS system 40, 43, 57
Accelerator 36, 38
"AC MAX" 21
Aerosol paint spray 75
Air-conditioning controls 20-21
Air filter 76, 86
Air vents 18, 20
Alloy rims 71
Alternator 85, 86, 99
Alternator belt tension 95
Ambient air temparature 11
Anti-blocking brakes 40 43, 57
Anti-dazzle setting, mirror 22
Antifreeze 93
Anti-theft alarm 31
Ashtrays 25
Automatic car wash 70
Auxiliary battery start 54
Average speed 10

Backrest adjustments 26
Back seat, folding 29
Battery 47, 54, 85, **90**
Battery charge failure light 7
Battery charger 85
Belts, seat **28**, 29, 46, 47
Blade, wiper 68
Blower control 19, 21
Bonnet 5, 34, 58, 87
Bonnet light 67
Booster cables 54
Boost pressure gauge 15
Boot 33, 98
Boot lid 32, 42
Boot light 67
Brake fluid level 56, 91
Brake indicator lamp 7, 40, 43
Brake lights 64, 65
Brake servo 43, 55
Brakes **43**, 70, 91, 101
Brakes, anti-blocking system 40, 43, 57
Bulb failure warning 7, 12, **16**
Bulbs, lamp 58, 99
Burglar alarm 31

Capacities 98
Capacity, fuel tank 10, 100
Caravan, driving with 44, 45
Carbon monoxide 38, 42
Car jack 50, 52
Catalytic converter 83, 100
Central locking system 31
Changing a wheel 52, 53
Chassis number 86, 96
"CHECK" display 8, 11
Child safety 46
Cigar lighter 25
Cleaning car interior 72
Cleaning seat belts 29, 72
Clock 5, 11
Closing bonnet 34
Clutch pedal 39, 45, 55
Coin tray 14
"COLD" display 10
Cold weather 47
Colour code, paint 74, 96
Control switches 17
Coolant 51, 92, 93
Coolant temperature 10
Cooling fan 42, 86
Corrosion 73-75
Courtesy light 24, 66
Cubbies, boot 33, 64

Dashboard layout 4
Dashboard switches 16, 17
Data plate 86, 96
Defrosters 18, 20
Demister, rear window 17
Dimensions 98
Dimmer, instrument 16
Dipstick, engine oil 86, **88**
Dip switch, headlamps 12
Direction indicators 12
Direction indicator lamp bulbs 12, 58, 64
Distributor 86
Do it yourself, precautions 85
Door locks 30, 31
Drain holes 70
Driving lamps **17**, 31, 62
Driver's seat heating 17
Driving mirrors 22

Earth connection 85, 99
Economical driving **36**, 76
Econometer 10
Electrical system, precautions 85
Electrical system, specification 99
Electric cooling fan 42, 86
Electric window lifters 32
Electronics in the car 41
Emergency start 54
Engine bonnet 34, 58, 87
Engine compartment 85, 86
Engine compartment, noise in 42
Engine number 96
Engine, oil 8, 88
Engine, running in 36, 45
Engine, specification 100
Engine, starting **38**, 54, 55
Engine, temperature 10, **38**, 42
Engine, warming up 38
Exhaust gases 38, 42, 79
Expansion tank 92, 93
Exterior rear view mirrors 22, 44

Facia, see dashboard 4, 16, 17
Fan, engine cooling 42, 86
Fan, ventilation 18, 20
Final drive (axle ratio) 101
Flash, headlights 12, 31

Flat battery 54, 55
Flat tyre, changing wheel 52
Floor mats, cleaning 72
Fog lamps 17, 63
Folding rear seats 29, 33
Front seats 26, 29
Fuel consumption 10, **36,** 76
Fuel filler cap 35
Fuel gauge 9
Fuel tank capacity 10, 100
Fuses 57, 87
Fumes, exhaust 38, 42, 79

Gear lever 38, **39,** 55
Gearbox 101
Gearbox reductions 101
Generator, see alternator 85, 86, 99
Generator belt, see alternator belt 95
Glove box, light bulb 67
Greasing 90

Handbrake 40
Hazard warning installation 12
Headlamps 12, 58, 60, 61
Headlamp dip and flash 12
Headlamp washers 13
Head restraints 27
Heated rear window 17
Heating controls 18, 19
Helper battery 54
Hill climbs (caravan) 45
Horns 5
Hub discs 52, 53

Idling speed 100
Ignition 85, 100
Ignition switch **14,** 38, 55
Indicator lamps 7, 9, 10
Inertia reel seat belts **28,** 29, 47
Information centre 8-11
Instrument lighting dimmer 16
Instruments 6-11, 72
Interior lighting 24, 66
Interior mirror 22
Intermediate position, ignition switch 14
International units 97

Jacking the car 52, 84
Jump leads 54

Keyhole lighting 30
Key number tag 2
Keys 2, 14, 30, 31

Lamp bulb ratings 10
Lamp bulbs, fitting 58-67
Lamp bulbs, dashboard 67, 99
Lamp bulb failure indicator 7, 12, **16**
Lead free fuel 83
Lighting switch 16
Lightweight spare wheel 50, 51
Locks, door 30
Lock, steering wheel 14
Lock, tailgate 32
Long range lamps 12, **17,** 31, 58
Low temperatures 47
Lubrication, bodywork 90
Lubrication, engine 8, 88
Luggage capacity 33, 98
Luggage stowage 33, 42

Major Service 78
Map reading lamps 24, 66
Mats, cleaning 72
Measuring units 97
Mileage recorder 6
Minor Service 78
Mirror adjustment 22
Moisture on brakes 43, 70

Number plate lights 63

Octane rating, petrol 100
Oil filler cap 86
Oil filter 88
Oil grades 88, 87
Oil level 88
Oil pressure 7
"OK" display 8

Paint colour code 74, 96
Paintwork damage 74, 75
Parking brake, see handbrake 40
Parking lights 16, 58
Petrol economy 10, **36,** 76
Petrol filler cap 35
Petrol, octane rating 100
Petrol tank, capacity 100
Plastic parts, painting 74
Plugs, spark 100
Polishing car 71
"Pop-up" headlamps 58, 60, 61
Power steering 55, 86, 91
Power windows 32
Precautions, cleaning agents 72
Precautions, electrical system 85
Precautions, exhaust fumes 38, 42
Precautions, jacking car 52, 85
Precautions, moisture on brakes 43
Precautions, on tow 55
Precautions, seat belts 29, 47

Precautions, winter weather 47

Radiator coolant 56, 92, 93
Radio connections 15
Rapid charger 85
Reading lights 24, 66
Rear axle ratio 101
Rear fog lamps 17, 63
Rear seat backrests 29, 33
Rear view mirrors 22
Rear window heater 17
Recirculation button (REC) 21
Repair manuals 79
Repairs, precautions 85
Reservoir, brake fluid 91
Reservoir, screenwash 47, 92
Resetting digital clock 11
Retractable headlamps 58, 60, 61
Rev-counter 6
Reverse gear 39
Reversing lights 64
Roof rack 36, **42**
Running-in 36, 45
Rustproofing 73

Safety, children in the car 46
Scratches, touching-up 74
Screenwash reservoir 47, 92
Seat belts **28**, 29, 46, 47
Seats, front 26, 27
Seats, rear 29, 33
Service booklet 78
Service data plate 96
Service inspections 78
Service manuals 79
Small-change holder 15
Snow chains 47
Spark plugs 100
Special purpose spare wheel 50, 51
Speedometer 6
Spots, long range **17**, 31, 62
Stalk levers 12, 13
Start checks, information centre 8
Starting by towing 55
Starting engine **38**, 54, 55
Start inhibitor, ignition 14
Steering wheel height adjustment 27
Steering wheel lock 14, 55
"STOP" display 10
Stopwatch mode, clock 11
Stowing oddments 33
Studded tyres 36
Synthetic materials, painting 74

Tailgate 32, 42
Tail light bulbs 64, 65
Tar spots, removal 71
Temperature, coolant 10
Temperature gauge, air 10
Temperature range, antifreeze 93
Temperature range, engine oils 88
Throttle, see accelerator 36, 38
Tools 50
Touching-up paintwork 74, 75
Tow bar weight 44
Towing 55
Towing a caravan 44, 45
Towing bracket 44
Towing eyes 55
Trailer weight 44
Transmission 89, 101
Tread wear indicator 94
Turn indicators
see direction indicators 12
Turbo 15, 21, 38, 45, 87
Turning circle 98
Type designation plate 86, 96
Tyre, flat 50-53
Tyre pressure 42, **94**
Tyre wear 94
Tyres 42, 43, 47, 51, 94

Upholstery, cleaning 72
Upholstery, colour code 74

Vehicle lighting 16, 17
Ventilation controls 18-21
Viscosity, oils 87, 88
Visual check 76
Volvo Service Programme 78

Warming-up engine 38
Warning lamps, brake fluid 7, 56, 91
Warning lamps, red 7
Warranty 78
Washing car 70
Water temperature (coolant) 10
Weights 98
Welding 85
Wheels, changing 52, 53
Windows lifts 32
Windscreen defrosters 18, 20
Windscreen washers 13, 68
Windscreen wash reservoir 47, 92
Windscreen wipers 13
Winter tyres 47
Wiper blades, changing 68
Working temperature, engine 10, **38**, 42

PRINTED IN THE NETHERLANDS

fuel consumption, Volvo 480 - 1989 model year

MODEL (Engine)	FUEL CONSUMPTION MPG		
	URBAN CYCLE	90 kph (56 mph)	120 kph (75 mph)
480 ES (1.7 litre) manual	27.2	50.5	40.4
480 Turbo (1.7 litre) manual	26.2	48.7	37.7

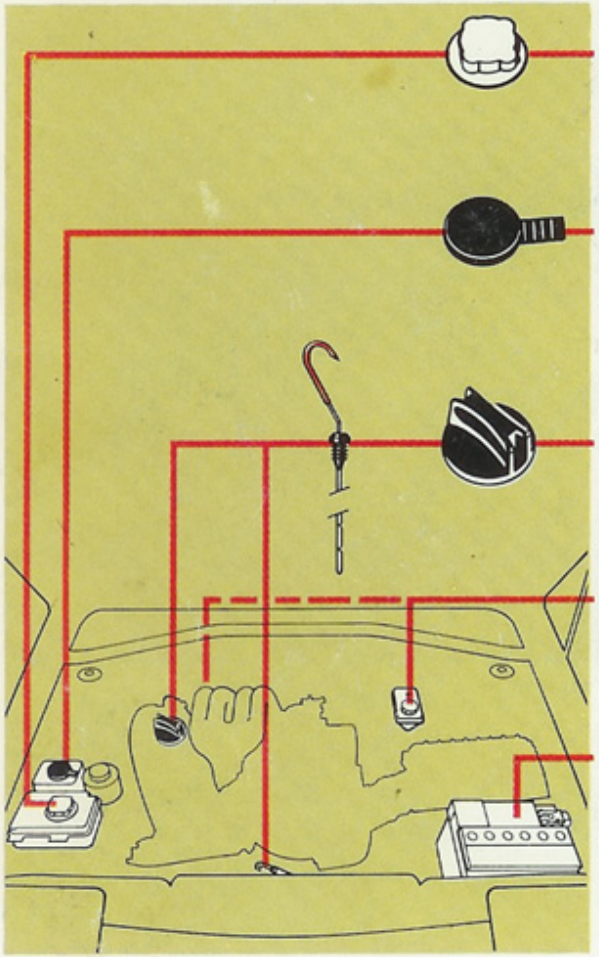
The results given above do not express or imply any guarantee of the fuel consumption of this particular car. The car itself has not been tested individually and there are inevitably differences between individual cars of the same model. In addition, this car may incorporate particular modifications. Furthermore the driver's style, the road and traffic conditions, as well as the extent to which the car has been driven and the standard of maintenance will affect its fuel consumption.

Manufacturer's note: the fuel consumption figures shown are obtained from cars tested by an EEC government agency following strict procedures in laboratory-simulated conditions. These test procedures allow consumers to make accurate comparisons between other makes and models. However, since it is not possible to reproduce exactly the conditions during normal motoring, a comparison between these results and those of everyday driving is not valid.

Should you have any cause for concern, your Volvo dealer has the expertise and equipment to ensure that your car is performing normally.

When changing the battery -
negative off first
positive on first

Garage forecourt information...



Coolant
Top-up with a mixture of one part Volvo antifreeze type C and two parts water.
(Also see page 93)

Screenwash reservoir
Fill with water.
(Also see page 92)

Engine oil (cold engine)
Check that the level is between MAX and MIN on the dipstick.
Top-up with **Multigrade oil.**
(Also see page 88)

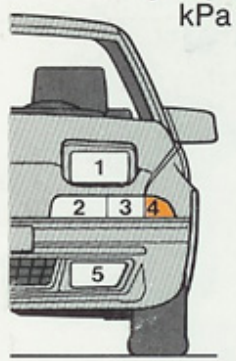
Brake fluid
Without removing the cover, check that the level is above the MIN mark.
Brake fluid: DOT 4.
(Also see page 91)

Battery
Check that the level is just above the cell plates.
(Also see page 90)
Top-up with **distilled** water only.
Warning: battery fumes are explosive!

Minimum octane

Leaded petrol:	**96**
Unleaded petrol:	95

Tyre pressure (cold tyres)
kPa (psi)



210 (30) 190 (27)

210 (30) 210 (30)

Lamp bulbs

1 (H4)	60/55 W	B43t
2 (H3)	55 W	P 22
3	4/21 W	BAZ 15d
4	21 W	BA 15s
5 (H3)	55 W	P 22
6	5/21 W	BAY 15d
7,8*	21 W	BAY 15s

* (also central brake light)

Changing a wheel, pages 50-53.

Fitting bulbs: pages 58-67.

VOLVO

AUTODIVISIE VOLVO CAR BV • HELMOND HOLLAND

1989

TP 2938/1 (ENGLISH, R.H.D.) 7 000.6.88 KONINKLIJKE VAN POLL - ROOSENDAAL DE WIT BOEKBINDERS - EINDHOVEN