owner's manual

VOLVO 164

VOLVO 164

Operating Instructions
Description
Servicing

AB VOLVO • GÖTEBORG, SWEDEN

FOREWORD

This owner's manual deals with all the variations of the Volvo 164 with model year designation W.

Before you start driving your new Volvo please read through this manual carefully. It contains all the information you need to be able to drive and service your vehicle in the best possible way. By following the instructions given in this manual you will find that your Volvo will come up to all the expectations concerning economical operation and excellent performance that you have every right to expect of a top-quality vehicle.

This is not intended to be a comprehensive technical manual and does not claim to make the reader a perfect car mechanic. It will, however, show you how to look after your vehicle so that trouble in the future can be avoided. The better you know your Volvo, the better service it can give you. Even for an experienced motorist it can contain some valuable information.

For a more detailed mechanical description and repair procedures, we refer you to the special Service Manual for the car which can be purchased from the dealer.

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INTRODUCTION

Volvo Service Organization

To get the most out of the invested capital represented by a car, it must be looked after and serviced regularly. Volvo has gone to a great deal of trouble in the design and selection of material to ensure that the car in question only requires a minimum of servicing. We rely, however, on your co-operating with regard to the future maintenance of your vehicle. To help you with this, Volvo has built up a world-wide service organization. All Volvo dealers have specially trained personnel and receive a continuous supply of technical information from the Volvo Service Organization concerning repairs and adjustments. They have also special tools, designed at the Volvo factory. Moreover, all Volvo dealers have a comprehensive stock of parts which is a guarantee that the part you get is genuine Volvo. That is why our dealers are in the best possible position to give your vehicle first-class service concerning both maintenance operations and repairs. You should also refer to your dealer for any information about your Volvo that is not included in this manual.

Volvo not only has a workshop within easy reach in your own country, it also has a widely distributed service network in other countries.

Warranty and Service Booklet

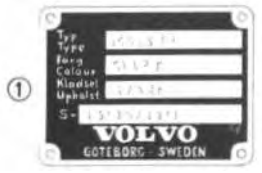
A warranty and service booklet accompanies each vehicle when it is delivered. This booklet contains a coupon entitling you to a service inspection after 1 500 miles (2 500 km). If possible, let the dealer who supplied the vehicle carry out this service inspection. Any of our dealers, however, can do this if required.

If our six-month guarantee is to apply, we make one absolute condition and that is that the above-mentioned inspection is carried out at roughly the mileage shown and that the vehicle has been looked after in accordance with the instructions given in this book.

Service Inspections

After the 1 500 miles (2 500 km) service inspection has been carried out, you should come to some arrangement with your dealer concerning continued, regular service inspections in accordance with the suggestions made in our Service Book. Thorough and regular servicing is of vital importance for the performance and length of life of the vehicle.

Always use genuine Volvo parts.



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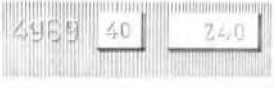

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Type designations

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

1. Vehicle type designation, code number for colour and upholstery: on bulkhead.

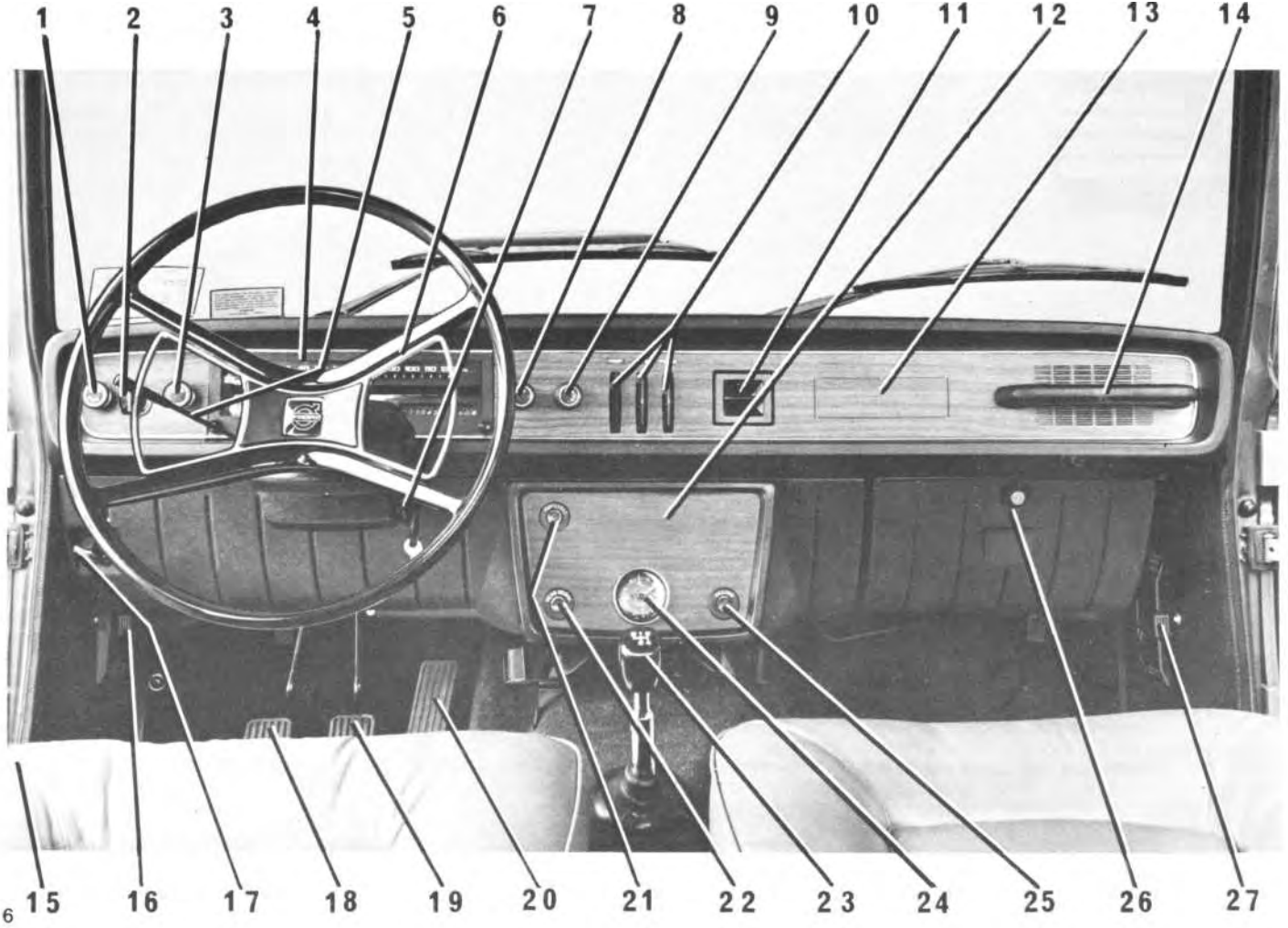
2. Body number.

3. Type and model year designation (W) as well as chassis number: stamped on right door pillar and also on the floor plate behind the petrol tank.

4. Type designation, serial number and part number of engine: stamped on engine left-hand side. The final figures of the part number are stamped on a plate. The serial number then follows with all its figures stamped on the block.

5. Type designation, serial number and part number of gearbox: underneath gearbox.

6. Final drive reduction ratio, part number and serial number: on a plate on left-hand side of final drive.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INSTRUMENTS AND CONTROLS

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2. Choke control (not B30E)
3. Light switch
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The instrument and controls are described in more detail in the following pages with a reference to the numbers in the picture opposite. Note that variations may occur between different markets.

1 Windscreen wiper and washer switch

The windscreen wipers are operated electrically and can be adjusted to two speeds. Normal speed is attained by pulling the switch out to the first position. This speed is recommended for normal driving in rainy weather or snow. When the switch is pulled out fully, the wipers operate at full speed. Full speed is only recommended when driving in heavy rain or when driving at high speed in the rain.

When the switch is pressed fully in, the wiper blades stop in their parking position. The windscreen washers are operated by turning the switch clockwise. The switch automatically returns to its initial position on being released. The fluid container for the washers is located in the engine compartment and holds about 1'/2 litres (2 3/4 Imp.pints = 3'/2 US pints).

2 Choke control

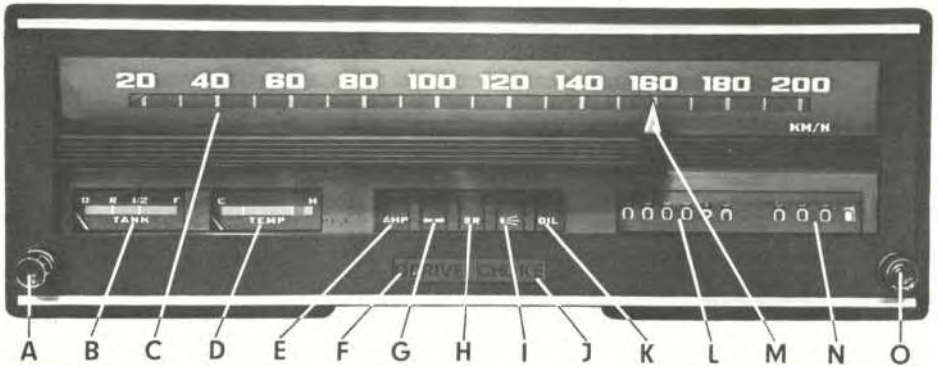
The choke control is used when the engine is started from cold. When the control is pulled out about 10-15 mm ('/2"), the idling speed is increased. Pulling the control out further enriches the fuel-air mixture. The warning lamp (4J) on the instrument panel lights when the choke is pulled out.

3 Lighting switch

The headlights are operated by means of a push-pull type switch on the dashboard as well as a lever (5) on the steering column.

All the lights are extinguished when the lighting switch is pushed fully in. Pulling it out to the half-way position, switches on the parking lights, and when it is fully out, the full or dipped headlights are switched on, depending on the position of the lever (5).

Since the lighting system is not connected across the ignition switch, the lights will function irrespective of whether the ignition key is in position or not.



4 Instrument panel

A Panel light switch
B Fuel gauge
C Speedometer
D Coolant temperature gauge
E Warning light, charging
F Warning lamp, overdrive
G Warning lamp, turn indicators
H Warning light, parking brake and brake circuits
I Warning lamp, fullbeam headlights
J Warning lamp, choke
K Warning lamp, oil pressure
L Mileometer
M Speed warning indicator
N Trip meter
O Trip meter reset knob

A Panel light switch

Turning the knob clockwise or anticlockwise increases or dims the lighting on the instrument panel.

B Fuel gauge

The fuel gauge is graduated "full", "half", "reserve" and "empty". The red field between "reserve" and "empty" is a reminder that the tank should be filled. When the gauge pointer is on "reserve", there are approx. 8 litres (2 Imp. galls = 2'/2 US galls) in the tank. The gauge pointer registers when the ignition is switched on.

D Coolant temperature gauge

The temperature gauge shows the temperature of the coolant and thus indicates the working temperature of the engine. The gauge pointer should normally remain within the green sector.
During town driving and idling when the weather is particularly warm, the temperature gauge pointer may enter the field marked with oblique red dash lines.
Should the pointer repeatedly point to the completely red field, the coolant and fan belt tension should be checked.

E Warning light, charging

This lights red when the battery is discharging. Should it light during driving, either there is some fault in the electrical system or the fan belt is not sufficiently tensioned and is thus slipping on the alternator pulley, causing poor charging.

F Warning lamp, overdrive

The lamp gives a steady green light when the overdrive is engaged. Concerning engaging and disengaging overdrive, see page 22.

H Parking brake warning light (functions also as warning light for both service brake circuits)

This lights red when the parking brake is applied and the ignition is on.
The light also functions as a warning light should a failure arise in one of the brake circuits. If the light goes on during driving, the car should be driven without delay to a workshop for a check on the brake system. Observe due care when driving under such conditions.

J Warning lamp, choke

The lamp gives a steady amber light when the choke control is pulled out. Drive as short a distance as possible with the choke out.
Vehicles with the B 30 E engine do not have this warning lamp.

K Oil pressure warning light

This lights red when the engine oil pressure is too low. When the ignition is switched on, the light should go on and then go out again when the engine starts. Never start driving until the light goes out. If the light goes on during driving, stop the engine and find out the reason for this. In most cases it means that the oil level is too low. After hard driving it may happen that the warning light comes on when the engine is idling. This is normal providing it goes out again when engine speed is increased.

L Mileometer

The mileometer shows the total distance covered in miles. After 999999 miles it returns to zero and starts to go round again.

M Speed warning indicator

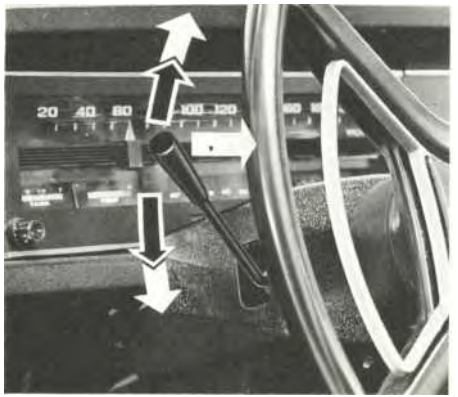
The speed warning indicator is mounted on the speedometer and consists of a manually adjustable sliding arrow. Its purpose is to remind the driver of the particular maximum permissible speed in connection with speed limit regulations.

N Trip meter

The trip meter measures distances of up to maximum 999 miles. The window furthest to the right shows tenths of a mile and is therefore useful for measuring short distances.

0 Trip meter reset knob

The trip meter is set to zero by pushing in the knob.



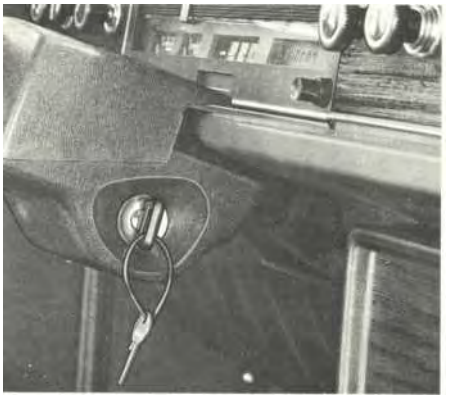
5 Turn indicator switch lever, dimmer and headlight flasher

The switch lever on the left-hand side of the steering column just below the steering wheel controls the turn indicators, dipped headlights and headlight flasher. The switch has a so-called "stop point" for changing lanes. In other words, when changing lanes or passing, move the switch up or down to the stop point and hold it there with the hand. The respective indicator should start blinking. When the lever is released, if automatically returns to neutral. When making a turn, move the lever past the stop point as far as it can go. It will return to neutral when the steering wheel straightens out the car again. To switch from main beam to dipped beam and vice versa, move the lever towards the steering wheel and then release. Here the lighting switch (3) should be pulled fully out.

The lever is also used for flashing with mainbeams when the headlights are not switched on. The headlight flasher is switched on by moving the lever towards the steering wheel and it remains switched on until the lever is released.

7 Combined ignition switch and steering wheel lock

The switch has four positions: (0) Locking position, (1) Intermediate position, (II) Driving position and (III) Starting position. The key can be taken out of the lock only in the Locking position. Removing the key automatically locks the steering wheel.



With the key in the Intermediate position, the steering wheel is unlocked and certain electrical components are switched on.

To start the engine, turn the key to the Starting position and this engages the starter motor. As soon as the engine starts, release the key which automatically returns to the Driving position.

If the car is parked in such a way as to make it difficult to unlock the steering wheel, unlocking can be made easier by slightly turning the steering wheel one way and then the other.

8 Fan switch

The fan is operated by means of a push-pull switch which can be set at two different positions. Pushing the switch fully in stops the fan, pulling it out to the first position operates the fan at full speed and when pulled fully out, the fan operates at half speed.

The overpressure in the air intake is relatively small. Therefore, at speeds below 80 kmph (50 mph), the fan should be allowed to operate at full speed if maximum air capacity is desired. On the other hand, however, the fan should not be used if cooling air is required on a hot summer's day. Instead, open both the fresh-air controls (16, 27), the defroster control "DEFR" and the ventilation control "FLOOR".

9 Cigarette lighter

To use the cigarette lighter, push it in. The lighter releases automatically when it attains sufficient heat.

10 Heater/ventilation controls

The control on the left, TEMP, regulates the temperature of the air in the car. The middle control, DEER, regulates the air flow to the windscreen. And the control to the right, FLOOR, regulates the air flow to the front seat and rear seat floor.

The temperature, also the air flow, is increased by moving the controls downwards whereby a red strip marked down the middle of the control in question indicates the size of the opening. Note that when altering the temperature control, there will be a slight delay before the desired temperature is reached.

To avoid or remove mist on the windows, set the fan and defroster controls at maximum output. However, the fresh-air controls (16, 27) should be closed. Try to avoid water on the floor and under the mats as this increases the humidity and thereby misting, particularly during the wintertime.

15 Parking brake

The parking brake lever is on the outside of the driving seat and operates on the rear wheels only. When the parking brake is applied and the ignition is on, a red warning light (4, H) shows on the instrument panel.

Remember that the footbrake warning system is also connected to this light. Should the light show when the parking brake is not on, this may be due to a failure in one of the brake circuits. If this is the case, drive immediately (but with due care) to a workshop for a check.

16, 27 Fresh-air controls

Pushing the control forwards opens fresh-air intake vents on the driver's or passenger's side. Note that the fan should not be operating if cool air is desired through these vents.

17 Bonnet release handle

The bonnet lock is released by pulling out the handle situated to the extreme left under the dashboard. This will release the bonnet which is still retained by the safety catch.

The bonnet is opened by inserting the fingers under the front edge and pressing up the catch as shown in the picture. Check that the bonnet locks properly when closed.
The location of the bonnet when closed can be adjusted if necessary by screwing in or out the rubber plugs underneath the bonnet at the front end and on the mudguards below the windscreen.

21 Switch for foglights

The foglights are switched on by pushing in the switch, providing that the parking or dipped headlights are on.
The foglights are switched off by pushing in the switch again.
Because of regulations on certain markets, the foglights are connected across the parking and fullbeam headlight or only across the parking lights.

22 Switch for electrically heated rear window

In order to obtain a clear view through the rear window during cold and damp weather, your Volvo is fitted with an electrically heated rear window.

Heating is by means of wires on the inside of the rear window.

Avoid placing anything on the rear shelf which could damage these wires.

The heating for the rear window is switched on by pushing in the switch. This lights a warning lamp in the switch.

Pushing in the switch again switches off the heating.

Switch off the heating when the rear window is free from mist and ice in order not to overload the battery unduly.

24 Clock

The clock is operated electrically. To reset it, push in the re-setting knob and turn the hands.

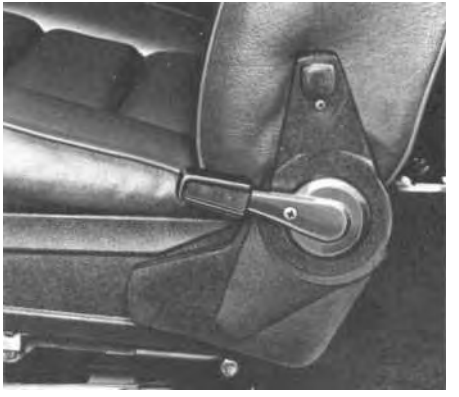
The clock is not fitted on certain variants.

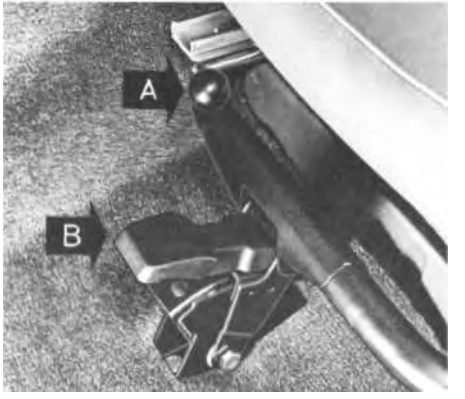
25 Switch for emergency warning flashers

All the four warning lights start flashing simultaneously when the switch is pushed in. A warning lamp mounted in the switch blinks in unison. The warning lights are connected across the ignition and these operate irrespective of whether the ignition is switched on or not.

Pushing in the switch again will switch off the warning flashers.

These warning lights should be used only when you have to stop the car where is possible danger to other traffic. Note that regulations governing the use of these lights may vary in different countries.





INTERIOR AND BODY

Front seats

Lumbar support

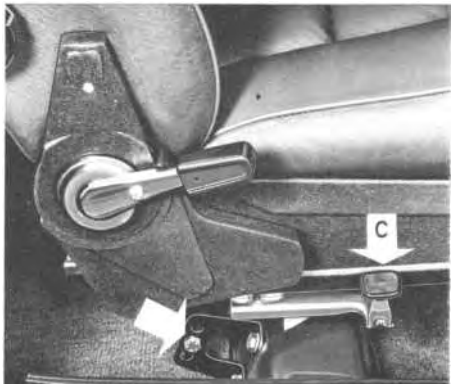
The front seats are provided with an adjustable lumbar support. This is operated by means of the knob on the right side of the backrest. To tension the lumbar support, and thus exert more pressure against the small of the back, turn the knob clockwise, "FIRM", and to relieve the pressure against the small of the back, turn the knob anti-clockwise, "SOFT".
Bench-type front seats have the knob mounted on each side of the seat.

Backrest adjustment

The front seat backrest is adjusted with the lever on the outside of the backrest (see picture). Lift up the lever, adjust to the desired angle, and lock the backrest there by pushing down the lever.
The backrest can be folded backwards to a comfortable rest or repose angle.

Length and height adjustment driver's seat

The driver's seat can be adjusted forwards-backwards by lifting catch A upwards. Exert leverage with your feet on the floor and slide the seat to the desired position.
Adjustment is made vertically by lifting catch B upwards and then setting the seat to one of the four height positions. If necessary, the seat can then be adjusted longitudinally.



Length and height adjustment front passenger's seat

The front passenger's seat can be adjusted forward-backwards by pressing down latch C on the outside of the seat. Vertically the seat is adjustable to three different positions. Remove the seat cushion to get to the bolts in the seating bracket. Remove the two bolts holding the seating frame to the seating brackets. Place the frame in the desired position and refit the bolts in the suitable holes.

In connection with this adjustment, it may be desirable or necessary to adjust the inclination angle of the entire seat. This is done with the eyelet bolt at the front under the seat frame. Remove the bolt which goes through the eyelet screw and fold the seat backwards. Then release the locknut in the floor of the car and adjust the eyelet screw to the desired position. Re-lock securely the eyelet screw with the locknut.

Head restraints

The front seats are provided with adjustable head restraints. If the head restraint is to fulfil its function properly, it is important that it is correctly adjusted, that is, it supports against the head and not only against the neck. After adjusting lock the head restraints by turning the plastic nuts clockwise.

Safety belts

Always use the safety belt for all types of driving. Remember that it is possible even in slow city traffic to incur serious injury from sudden, unexpected stopping.

Automatically retracting inertia safety belts

The Volvo 164 is equipped with automatically retracting inertia safety belts.
To fit the belt, pull out the webbing slowly. If the webbing is pulled out too quickly, the emergency-locking retractor reacts and locks the belt. Normally the safety belt retractor is "unlocked". Locking takes place when the webbing is pulled out rapidly or when the car is braked suddenly.

Should the webbing lock when being pulled out, slacken off slightly and then continue pulling out more slowly. Place one strap round the waist and the other across the shoulder - chest and secure the belt by pushing the buckle tongue into the locking slot in the lock between the seats. An audible clicking sound is a sign that the belt is locked.
Make sure that the webbing fits comfortably across the body and is not twisted.
The belt is released by pulling up the lever in the locking device. Make a habit of letting the roller roll up the webbing on removing the belt.

Safety belts in rear seat

As standard, the car has attachments for safety belts in the rear seat. The belts are fastened by pushing the buckle tongue on the strap into the lock in the other. The belts are released by pulling back the spring loaded sleeve and separating the straps.
When not being used, the side belts should be attached to the hooks on the rear window, see picture next page.

If the belt requires lengthening, first slacken the upper section of the belt and take hold of the adjusting piece with one hand and pull out the lap strap to the desired length. Tidy up belt slackness by pulling in the upper part of the double section.

To shorten the belt, pull in the upper section of the lap belt.

Remember

Do not let the belt lie on the floor otherwise it will get entangled and dirty as well as hinder getting in and out of the vehicle.

Now and again check that the bolts anchoring the belts are properly tightened and that the belt is otherwise in good condition. Water mixed with some synthetic washing agent can be used for cleaning the belt. If the belt is exposed to violent stretching, for example, in connection with a collision, it should be replaced even though it may appear to be undamaged. Also replace the belt if well worn or damaged.

Never modify or repair the belt on your own, but have this done by a Volvo workshop.

The door locks have been designed with a view to providing maximum possible protection against freezing during the wintertime. As an extra measure, however, you should lubricate the locks regularly during very cold weather with a suitable anti-freeze agent. If the lock is already frozen, be careful not to break the key in the lock. Instead, heat the key and immediately place it in the lock. This should unfreeze the lock. Should you lose the car keys, contact your nearest Volvo dealer for new ones and quote the code number of the keys which have been lost.

Doors and locks

The car is fitted with a lock and keyhole on each of the front doors.
All the doors can be locked on the inside by pushing down the lock button on the window ledge. On the front doors this lock button lifts automatically when the door is opened from the inside. On the rear doors, however, the lock button must first be pulled up before the doors can be opened from the inside. This is an advantage if children are in the back seat.

The front doors can be locked from the outside by pushing the lock button on the window ledge down and shutting the door while keeping the outside handle pulled out as shown in the picture. To lock the rear doors it is not necessary to keep the door handle pulled out.

Do not leave the keys in the car.

Rearview mirror

The inside rearview mirror can be switched to anti-dazzle by pushing back the knob.

Interior lighting

1. The light comes on when either front door is opened.
2. The light is always off.
3. The light is always on.

Luggage compartment

The luggage compartment is locked with the same key as that used for the doors. The lid is opened by turning the handle clockwise and lifting the lid up at the same time. Note that the key must be removed from the lock in order to turn lock knob. The lid is balanced and will remain stationary in its opened position. The spare wheel is securely held in position to the right in the compartment. The jack and tool kit are fastened to the spare wheel. Under the floor of the compartment to the left there is sufficient space for an extra spare wheel, for stowing tools or a reserve fuel can.

Sun-roof

Certain models are fitted with a sun-roof. The sun-roof is opened and closed by a winding handle. When not in use, the handle is folded in the recess in the roof between both the sun visors.
To close the sun-roof, wind it forwards fully, then wind back the handle a little and fold it into the recess in the roof.

STARTING AND DRIVING

Running-in

When the vehicle is new, we recommend that a certain amount of caution be observed during the running-in period, for it is during this time that the movable parts of the car must be properly bedded in so as to obtain smooth and durable sliding surfaces. The maximum permissible speed, therefore, should not be exceeded:

	below the first 1000 km (600 miles)		between 1000 and 2000 km (600 and 1200 miles)	
1st speed	30 kmph	(20 mph)	50 kmph	(30 mph)
2nd speed	55 kmph	(35 mph)	75 kmph	(45 mph)
3rd speed	80 kmph	(50 mph)	100 kmph	(60 mph)
4th speed	110 kmph	(70 mph)	130 kmph	(80 mph)

Avoid driving at low speed in high gear and using the kick-down (on vehicles with automatic transmission) during the first 2000 km (1200 miles).

Running-in inspections

After 2 500 km (1 500 miles) the vehicle should be taken to a Volvo workshop for the warranty inspection. Included with the checks and adjustments then made is a change of oil in the engine, transmission and rear axle. It is very important to ensure that this oil change is carried out since during the running-in period the engine oil usually collects a lot of impurities. Subsequent oil changes should be carried out at approximately those intervals indicated in the maintenance scheme on page 40 and in the lubricating chart at the end of the book.

Before being delivered, all Volvo engines are test-run on test benches and in the vehicles on test tracks. We are therefore assured that all clearances are satisfactory and we thus accept no responsibility for damage caused by careless running-in.

Before your first drive

Before you begin driving your new Volvo, we would advise you to become familiar with the vehicle and the various instruments and controls used during driving. When you are comfortably seated with the safety belt fastened and are acquainted with the location of the various controls, you are ready to begin driving.

Start the engine B 30 A as follows:

1. Check that the parking brake is on and the gear lever is in neutral (position N or P, autom. transmissions).
2. When the engine is cold, pull the choke control out fully.
3. Always make a habit of depressing the clutch pedal until the engine starts.
4. Turn the ignition key to the starting position. Release the key as soon as the engine has started.
5. Push in the choke control until the best idling speed is obtained. As the engine becomes warmer push in the control more and more. Drive for as short a period as possible with the choke out. Thanks to the preheating arrangement the engine should run smoothly already a couple of minutes or so after starting. When the engine is warm, the control should be pushed right in.
   When starting a warm engine. Depress the accelerator pedal halfway.
   If the engine does not start immediately, tramp the pedal to the bottom and keep it there until the engine starts.
   Never race up an engine immediately after starting from cold.

Start the engine B 30 E (injection engine) as follows:

1. Check that the parking brake is on and the gear lever is in neutral (position N or P, autom. transmission).
2. Always make a habit of depressing the clutch pedal until the engine starts.
3. Turn the ignition key to the starting position. Release the key as soon as the engine has started.

   Note. Do not depress the accelerator pedal if the engine is cold. If the engine stops, start it again without depressing the accelerator pedal.
   If the engine is warm, the accelerator pedal should be pressed down about half-way. Avoid repeated short attempts to start. (In the case of each new attempt, the starting valve functions and causes fuel to be injected into the inlet duct.) Instead, allow the starter motor to operate for a rather longer time (but not more than 15-20 seconds) each time.

   Never race up an engine immediately after starting from cold.

Starting in garage

Before starting your car in a garage, always open the garage doors. The exhaust gases from the engine contain carbon monoxide gas which is poisonous and particularly dangerous since it is invisible and odorless.

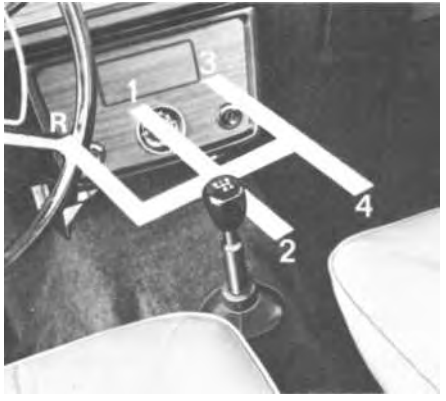
Warming up the engine

Experience has shown that engines in vehicles used for frequent stopping and starting are subject to abnormally rapid wear. The reason for this is that the engine is not given a chance to reach its normal working temperature. When the engine is cold, it should just be taken up to its normal working temperature as quickly as possible. Therefore, do not idle the engine too long but start driving with a light load on the engine as soon as the oil pressure light has gone out.

Driving with the luggage compartment lid open

While driving with the luggage compartment lid partly or fully open, exhaust gases can be sucked into the car through the trunk. Normally, this involves no risk to the passengers. However, the following advice should be followed on such occasions:

1. Keep all windows closed.
2. Set the fresh air and defroster controls to the fully-opened position and the fan switch to full speed.

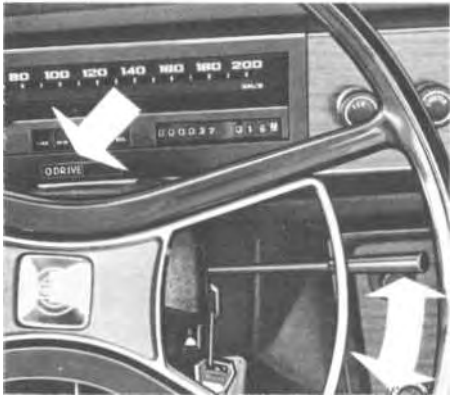


Gear-changing

The Volvo 164 is fitted with a gearbox with or without overdrive, or an automatic transmission.
The gearbox is synchronized on all forward gears. If synchronization s to function satisfactorily, the clutch pedal must be fully depressed. Never let the engine drag in high gear. Change down in good time.

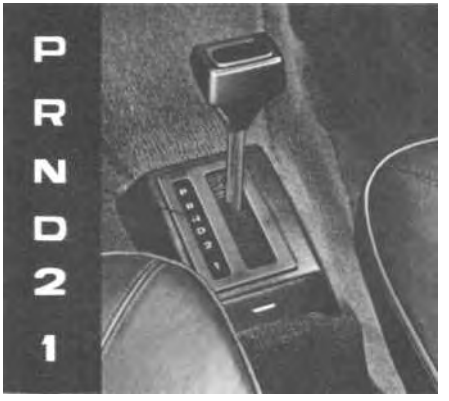
Floor-mounted gear lever

Gear-changing with a floor-mounted gear lever is quite conventional and the different gear positions are shown in the picture above.



Overdrive

The overdrive, which can be engaged on fourth gear, is operated by means of a lever to the right under the steering wheel. Moving the lever downwards engages and upwards disengages the overdrive. No extra operation of the clutch pedal or accelerator position is maintained steady. When disengaging the overdrive, light pressure on the clutch pedal helps to make this operation more smooth.
The overdrive should not be used at speeds below 60 kmph (38 mph).

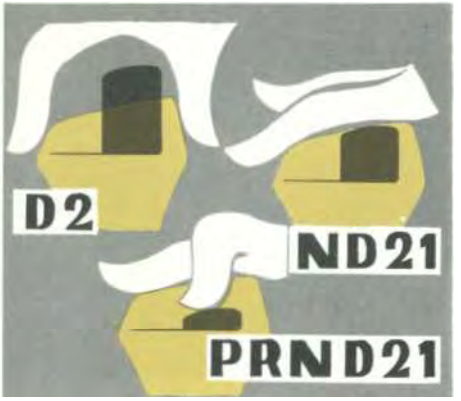


Automatic transmission

The gear selector positions are marked on the console next to the gear selector.

P = Parking
R • Reverse
N • Neutral
D • Driving
1
2 • Low gear

The gear selector can be moved freely between positions D and 2 while the other positions are provided with a gate which is "opened" with the button on the knob of the gear selector.



To change from D and 2 to positions N or 1 press lightly on the button with the palm of the hand. With the button in this position, the selector lever can thus be moved between the four positions, 1, 2, D and N.

Changing to positions R and P requires more force on the button with, e.g., the thumb. This manipulation is also required to move the lever out of P position. In other words, when the button is pushed down fully, the selector lever can be moved freely between all the transmission positions.

P-position

The P position is selected for parking with or without the engine running. When parking on a hill, the parking brake should also be applied.

In P position, the gearbox is mechanically locked. The P position may only be selected when the car is standing still.

R-position

The R position is used for reversing. The R position may only be selected when the car is standing still.

N-position

The N position is the neutral position, that is, no gear is engaged.

D-position

Position D is the normal driving position. The car starts off here in first gear and automatically upchanges to second and third gear according to road speed and accelerator position. With decreasing vehicle speed, you get automatic downchange from third to second and first.

Position 2

In position 2 there is automatic up- and downshifting between first and second. But no upshifting to third.

Position 2 can be used to obtain immediate downshifting (to second) and when upshifting between second and third is not desired on, e.g., the following occasions:

- with certain kinds of highway driving
- with slow town driving
- when driving in hilly country
- when overtaking
- in order to increase engine braking

Do not select position 2 for speeds above 115 kmph (72 mph) for the B 30 A and 130 kmph (80 mph) for the B 30 E engines respectively.

Position 1

At position 1 downshifting takes place automatically but no upshifting.

If position 1 is selected at high speed, second engages. It is only when the speed has dropped to about 10 kmph (6 mph) that first engages. First can also be obtained by kick-down below about 55 kmph (35 mph). Position 1 can be used when you want to engage first gear but do not want to shift up. Such a situation would be, e.g., when driving in hilly country where maximum engine braking can be obtained in position 1. Do not select position 1 for speeds above 115 kmph (72 mph) for the B 30 A and 130 kmph (80 mph) for the B 30 E engines respectively.

Kick-down

When the accelerator pedal is depressed past full throttle position, kick-down is obtained, that is, there is an immediate shifting down to the next lower gear. As soon as a maximum speed for this gear has been reached or if the accelerator pedal is eased from the kick-down position, automatic shifting takes places to the next higher gear.

Driving

Starting the engine

Move the selector lever to position P or N. A starter contact prevents the engine from starting if the selector lever is moved to any of the other positions.

Starting off is as follows:

1. Check that the parking brake is on or depress the brake pedal (otherwise the car will start to move slowly when the selector lever is moved to any of the driving positions).
2. Move the selector lever to the intended driving position.
3. Release the parking brake and depress the accelerator pedal.

The car is stopped in the usual way by taking your foot off the accelerator pedal and depressing the brake pedal. No need to touch the selector lever.

If the car has to be extricated from snow, loose sand, etc., it can be "rocked" loose by moving the selector lever alternately between the D and R positions under continuous light accelerator pressure.

Remember

Do not select the P or R positions when the car is moving.
Do not select D, 2,1 or R at engine speeds higher than idling when the car is standing still.
Do not select 2 or 1 at speeds above 115 kmph (72 mph) for the B 30 A and 130 kmph (80 mph) for the B 30 E engine.

Towing

If necessary, the car can be towed with the selector lever in position N, providing the gearbox is correctly adjusted and the oil is as the right level. Maximum permissible speed when towing is 30 kmph (20 mph). The longest distance the car may be towed is 30 km (20 miles). If you have to tow your car longer than this distance or if you suspect a fault in the transmission, the rear wheels should be raised or the propeller shaft disconnected in order to avoid damage to the transmission.
Current regulations pertaining to max. speed when towing must be observed.
If your car has an automatic transmission, it cannot be started by towing.
If the battery is flat, the assist starter battery cables should be used instead.
NOTE. Always wire the plus cable from the assist starter battery to the plus pole on the car battery and the minus cable to the minus pole.

MANUAL GEARBOX

Recommended max. and min. speeds, kmph (mph) for the different gears.

Engine	1st gear	2nd gear
B 30 A	0—50 (0—30)	20—85 (15—53)
B 30 E	0—55 (0—35)	20—90 (15—55)

Engine	3rd gear	4th gear
B 30 A	35—125 (22—78)	45 (28) * —
B 30 E	35—140 (22—85)	45 (28) * —

* 60 kmph (38 mph) with overdrive engaged.

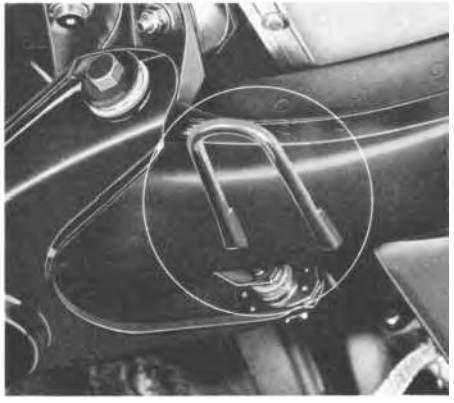
AUTOMATIC TRANSMISSION

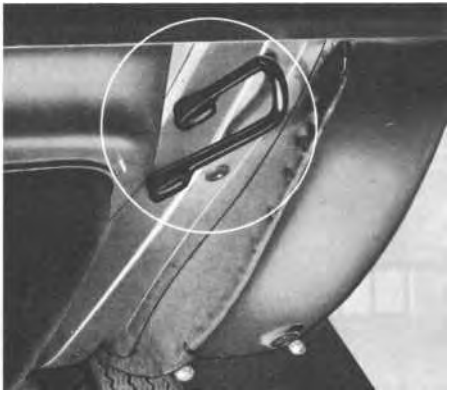
Gear speeds at full throttle, kick-down, kmph (mph)

Gear	B 30 A	B 30 E
1—2	65 (40)	75 (47)
2—3	117 (73)	130 (80)

Max. speed when kick-down downshifting, kmph (mph)

Gear	B 30 A	B 30 E
3—2	104 (65)	110 (69)
3—1	53 (33)	55 (35)





Towing

Attach the tow line to one of the towing eyelets fitted underneath the car. At the front, the towing eyelet is situated at the right-hand side (left picture) on the front axle member, and the rear eyelet on the right spare wheel housing (right picture). During towing, the tow line should be kept stretched to avoid unnecessary jerking. Concerning towing a car with automatic transmission, see page 24.

Starting by towing

The towing car should start smoothly and be driven at even speed in 2nd gear. Switch on the ignition, and pull out the choke if the engine is cold. Engage 3rd or 4th gear and gradually release the clutch pedal. Once the engine starts running, depress the clutch pedal. Attention! A car with an automatic transmission cannot be started by towing, see recommendations on page 24.

Note: Certain countries have regulations on max. speed when towing.

IMPORTANT ABOUT BRAKING

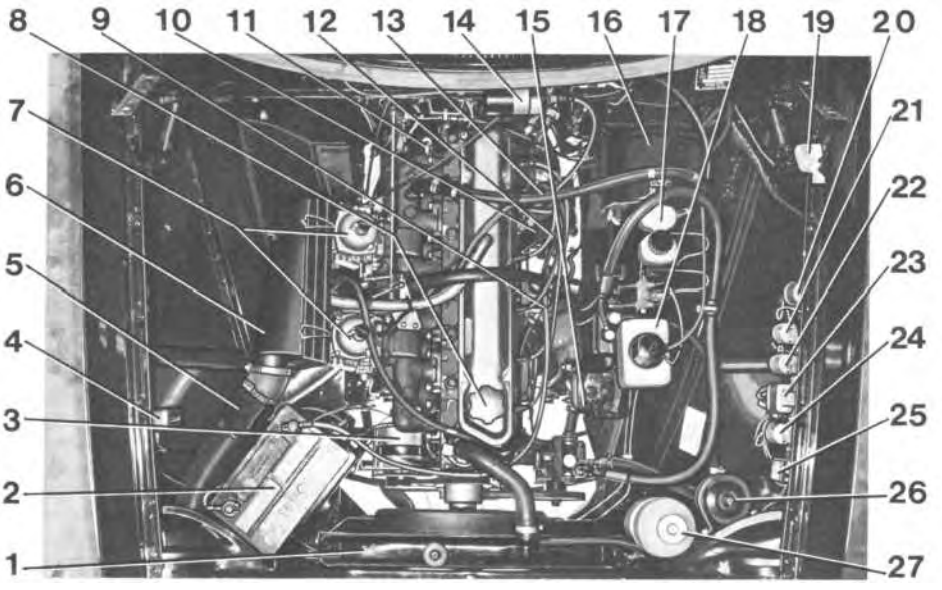
When you driver your car in the rain or through pools of water, also when washing the car, water can splash on the brake discs and linings and thereby alter the friction properties of the brake linings so that a certain delay in braking effect can sometimes be noticed.

If you drive some distances in rain or slush, you should depress the brake pedal lightly now and again in order to heat up the brake linings and remove the moisture on them. This should also be done after washing the car and after starting in very damp weather.

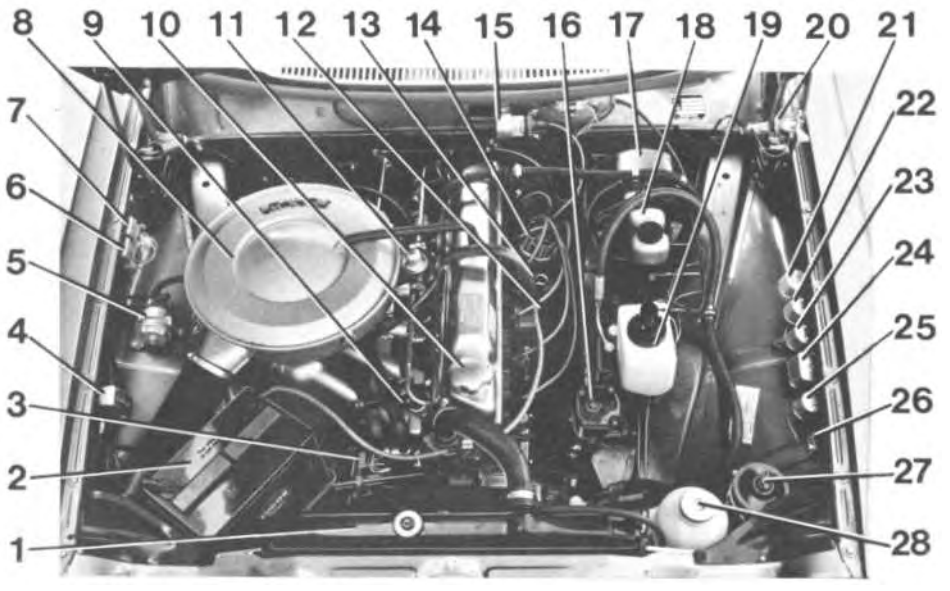
When the brake servo is not functioning, e.g., on rolling the car with the engine switched off, pressure on the brake pedal must be 3 to 4 times greater if the same braking effect is to be achieved as when the servo is functioning.
Note that the brake pedal travel will be short and stiff.

If one of the brake circuits should stop functioning (the red warning lamp H, see page 9, lights) double pressure on the brake pedal is required in order to achieved with normal pedal pressure. Note that here the pedal stroke will be long but the pedal will then feel stiff and hard in the braking position. The car should be taken as soon as possible to a workshop for a check on the brake system.

Engine compartment, B 30 A engine

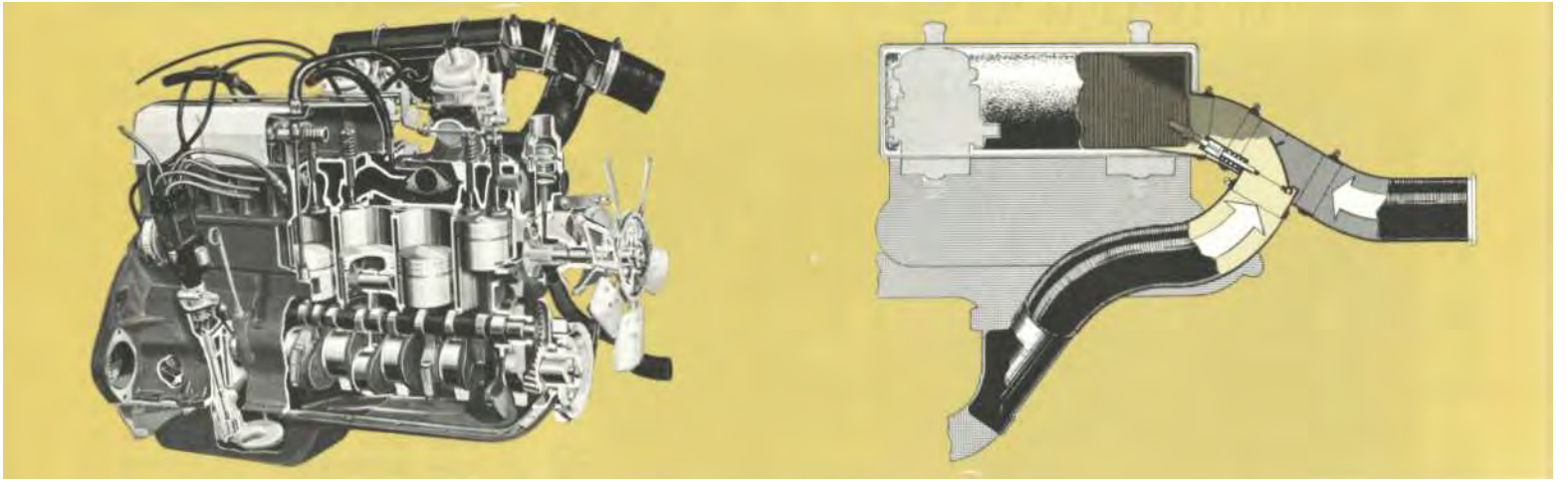


1. Radiator
2. Battery
3. Alternator
4. Charging regulator
5. Flap housing for air preheating
6. Air cleaner
7. Carburettor
8. Oil filler cap
9. Fuel filter
10. Starter motor
11. Oil dipstick, automatic transmission
12. Oil dipstick, engine
13. Distributor
14. Ignition coil
15. Steering box, servo steering
16. Brake servo
17. Brake fluid container
18. Windscreen wiper motor and fluid container
19. Engine compartment light
20. Relay for foglights
21. Relay for reversing lights (starter relay BW 35)
22. Main relay, ignition
23. Step relay for fullbeam and dipped headlights
24. Relay for horn
25. Fusebox for foglights
26. Oil container for servo steering
27. Expansion tank, cooling system



Engine compartment B 30 E

1. Radiator
2. Battery
3. Alternator
4. Charging relay
5. Pressure sensor
6. Relay for fuel pump
7. Main relay for fuel injection
8. Air cleaner
9. Injectors
10. Oil filler cap
11. Pressure regulator
12. Starter motor
13. Oil dipstick
14. Distributor
15. Ignition coil
16. Steering box, servo steering
17. Brake servo
18. Brake fluid container
19. Windscreen washer fluid container
20. Engine compartment light
21. Relay for foglights
22. Relay for reversing lights
23. Main relay for ignition
24. Step relay for fullbeam-dipped
25. Relay for horn
26. Fusebox
27. Oil container for servo steering
28. Expansion tank



ENGINE

The engine is a six-cylinder, water-cooled carburetor unit with overhead valves. The engine has a very rigid cylinder block made of special cast iron and is cast in one piece. The cylinder liners are machined directly in the block. The cylinder head has separate inlet and exhaust ports, one for each valve.

The statically and dynamically balanced crankshaft is carried in seven main bearings.

Lubricating system

Engine lubrication is taken care of by a gear pump located in the oil sump. The pump is driven by a gear from the camshaft. From the pump the oil is forced through the full-flow type oil filter and then along oilways to the various lubricating points. A relief valve is built into the oil pump and prevents the oil pressure from reaching excessively high values. The oil filter is of the full-flow type, that is, all the oil passes through the filter before continuing on to the engine lubricating points. The B 30 E is fitted with an oil cooler.

Fuel system, B 30 A

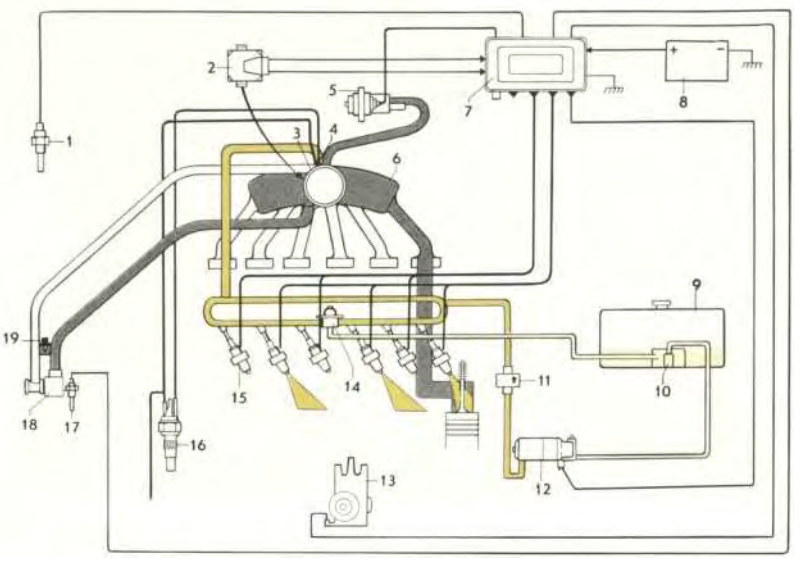
The engine is fitted with twin Zenith-Stromberg carburettors. The diaphragm-type fuel pump draws fuel from the tank and pumps it to the carburettors. A filter built into the fuel pump removes any impurities in the fuel.

Air preheating, B 30 A

The engine has thermostatically controlled air preheating. This keeps the intake air temperature constant and thus counteracts ice forming in the carburetors and makes for shorter warming-up of engine after cold starting. Some markets do not have air preheating.

Fuel system B 30 E

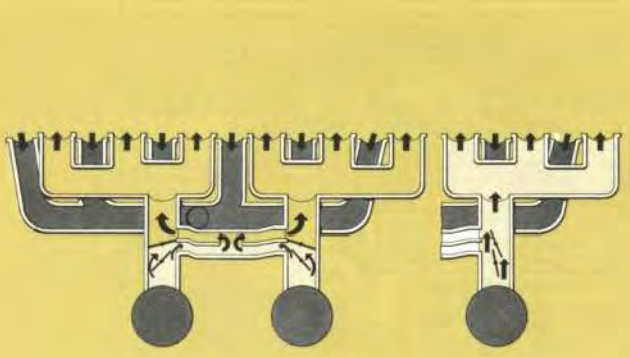
The B 30 F engine is fitted with an electronic fuel injection system.
This system includes an electronic control unit (7) which converts the impulses from the various sensors in the engine to control signals which regulate the six solenoid-actuated fuel injectors (15). The control signals influence the opening times of the injectors and thereby the amount of fuel injected.
The mixture of fuel and air is modified the whole time according to the conditions under which the engine is running. Engine speed is governed by the triggering contacts (13) in the distributor, the operating temperature by the sensor (17) for the coolant, the temperature of the induced air by the sensor (1) and the engine load by the pressure sensor (5) which is connected to the inlet duct. In addition, the control unit is provided with information concerning the position of the throttle valve by means of the throttle valve switch (2). This information is "computerized" in the control unit and re-transmitted in the form of control impulses to the injectors.
Fuel is injected into the inlet ports in the cylinder head just before the intake valves. The fuel is delivered to the injectors via an electric fuel pump (12) which maintains a constant pressure of 2 kp/cm^2 (30 psi) in the fuel line with the help of a pressure regulator (14).

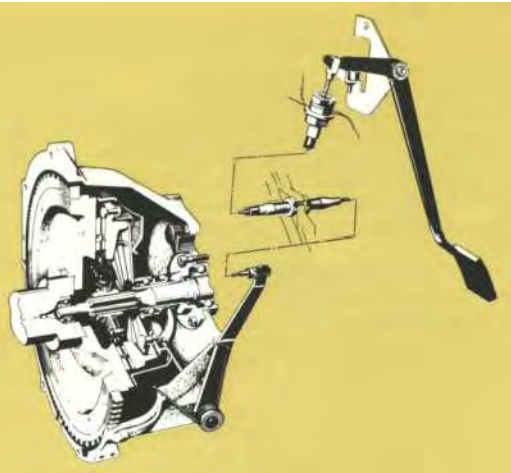


Principle of operation, fuel injection system B 30 E

1. Temperature sensor for induction air
2. Throttle valve switch
3. Throttle housing
4. Cold start valve
5. Pressure sensor
6. Inlet duct
7. Control unit (electronic)
8. Battery
9. Fuel tank
10. Fuel filter, suction side
11. Fuel filter, discharge side
12. Fuel pump
13. Triggering contacts in distributor
14. Pressure regulator
15. Injectors
16. Thermal timer contact
17. Temperature sensor for coolant
18. Auxiliary air regulator
19. Idling adjusting screw

Partial vacuum in inlet duct
Fuel at atmospheric pressure
Fuel under 2 kp/cm^2 (30 psi) overpressure





Exhaust emission control

The engine is fitted with an exhaust emission control system which produces a more exact and leaner mixture ratio between fuel and air resulting in a more complete combustion and thereby cleaner exhaust gases.
The system on the B 30 A engine consists of specially adapted carburettors and an intake manifold provided with a preheating chamber and control throttles.
When driving at low speed, the throttles are closed so that the fuel-air mixture passes the preheating chamber.
When higher output is required, the throttles open and fuel flows directly to the cylinders.
On the B 30 E, exhaust emission control is provided by the electronic fuel injection system.

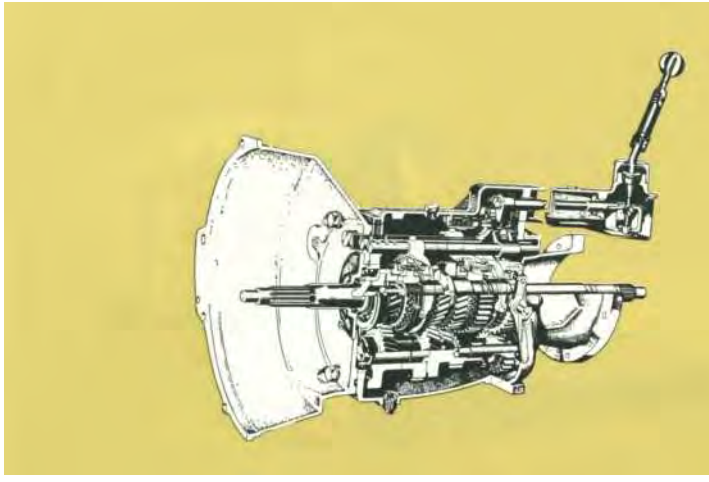
Cooling system

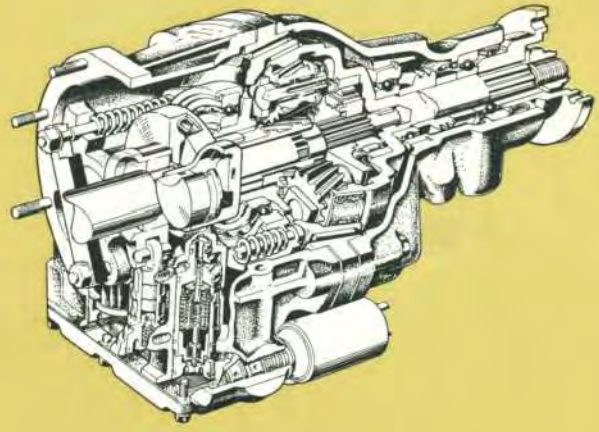
The cooling system is of the sealed pressure type and incorporates a circulation pump.
When the engine is cold, the coolant circulates only inside the engine. As the engine warms up, a thermostat valve starts opening the outlet to the radiator.
An expansion tank prevents air from circulating with the coolant as this would cause corrosion in the cooling system. The fan is driven via a slip coupling which keeps the fan speed at about max. 2 500 rpm.

POWER TRANSMISSION

Clutch

The function of the clutch is to transmit the power from the engine to the gearbox.
The clutch is of the single dry plate type.
Pressure on the pressure plate is obtained from a diaphragm spring which in turn is controlled mechanically by the clutch pedal via the trove-out yoke. (Hydraulic operation for vehicles with right-hand drive.)





Gearbox

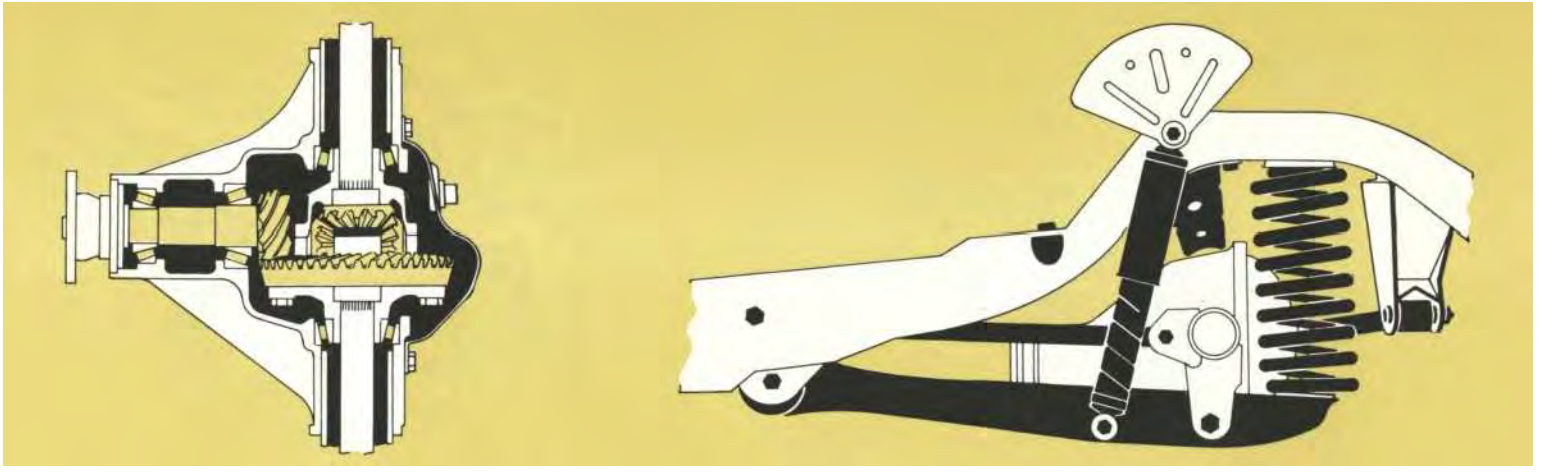
The gearbox has synchromesh on all forward gears. Since the gearbox is fitted with helical gears and gear lever is rubber-insulated, good sound insulation is obtained.

Automatic transmission

As an alternative, your Volvo can be fitted with a BW35 automatic transmission. In principle it consists of two main components - a hydraulic torque converter and a hydraulically operated epicyclic gearbox with a control system. The converter serves as a clutch and as an extra gear between engine and gearbox.

Overdrive

Certain variants of the Volvo 164 are fitted with an overdrive. With the overdrive, it is possible to reduce the engine speed while maintaining road speed. This is less wearing on the engine and reduces fuel consumption at the same time.



Propeller shaft

The propeller shaft, which is the connecting link between the gearbox and the rear axle, is divided into two sections. The forward section is flexibly mounted at its rear end in a rubberized ring.

Final drive

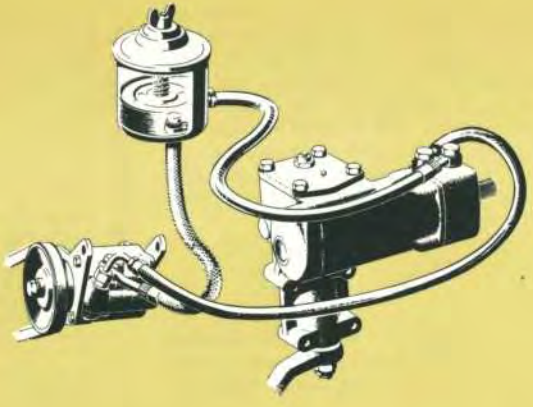
Engine torque is transmitted via the propeller shaft to the rear wheels through the rear axle. The rear axle is of the hypoid type, that is, the drive pinion lies below the centre line of the drive shafts.

Limited slip

On certain markets, a limited slip differential can be obtained as extra equipment. A rear axle with a limited slip automatically transmits the tractive power to the wheel having the best road grip when a wheel begins to spin. Except for the differential unit, the rear axle is similar in design to a conventional rear axle.
Do not rotate a jacked-up rear wheel if the other rear wheel is still on the ground. Due to the differential unit, there is still drive on the wheel in contact with the ground. Rotating the jacked-up rear wheel would thus move the other rear wheel and may cause the car to topple off the jack.

Rear axle

The rear axle is carried on two support arms the front ends of which are bolted to the body. The rear axle casing is secured to the support arms by means of levers. Two torque rods are journalled on the casing and the body. A torque rod prevents lateral movement of the body and rear axle in relation to each other.



FRONT END AND STEERING

Front end

The front suspension units are mounted on a strong box member. The member is bolted firmly to the front section of the body. The front wheels are journalled in tapered roller bearings. The front springs consist of coil springs in which telescopic shock absorbers are fitted. The car is provided with stabilizers secured to the lower control arms and to the body.

Servo steering

The servo cylinder and guide valves are built into the cam-and-roller type steering gear. When the steering wheel is turned, the guide valves direct the pressure oil from the servo pump to one of the sides of the piston in the servo cylinder. The resultant pressure on the piston side affected assists in turning the steering wheel.

ELECTRICAL SYSTEM

The electrical system is of the 12-volt type and is fitted with a voltage-regulated alternator. The starter motor is operated by means of the ignition switch. This switch is also the main switch for the rest of the electrical system. The headlights, parking lights and interior lighting, however, are not wired via the ignition switch so they can be switched on and off without switching on the ignition key.

Lighting

The front lighting on the vehicle consists of two headlights (full and dipped beam) together with two turn indicators and parking lights.

At the rear, the lighting consists of two tail lights, turn indicators, brake warning lights and reversing lights. There are also two lights for the rear license plate.

The car is also fitted with marker lights mounted on the side of the fenders.

The interior lighting consists of a roof light and one in the glove compartment.

The engine compartment and luggage compartment also have a light which goes on automatically when the bonnet or luggage compartment lid is opened.

Concerning replacement of bulbs, see pages 52-55.

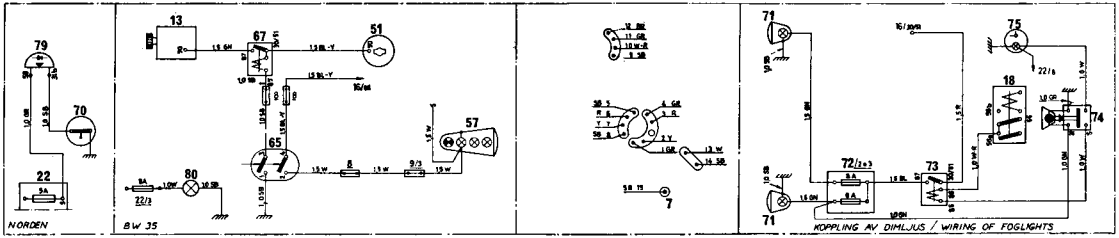
Wiring diagram (B 30 A)

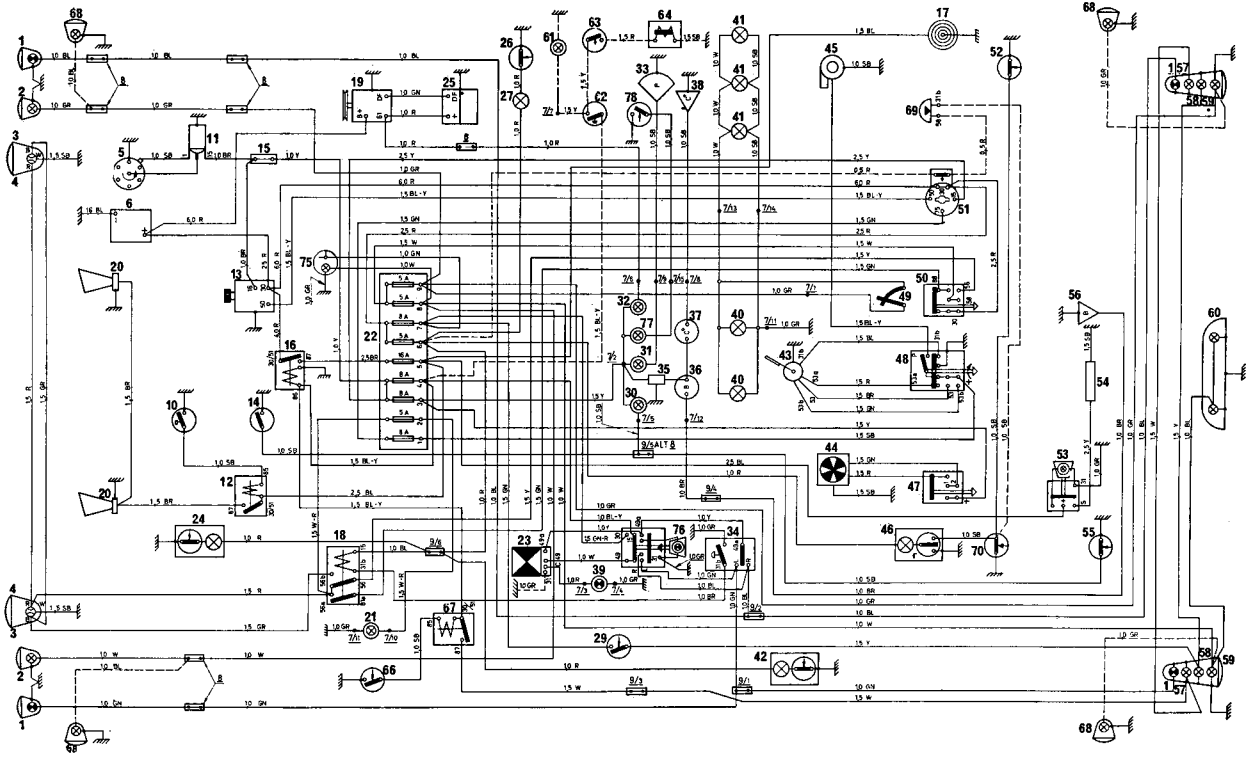
1. Turn indicator lights 32 Cp
2. Parking lights 5 W
3. Dipped lights 40 W
4. Mainbeam lights 45 W
5. Distributor
6. Battery 12 V 60 Ah
7. Connection to instrument
8. Terminal
9. Part of 6-pol. terminal block
10. Horn ring
11. Ignition coil
12. Horn ring
13. Starter motor 1 hp
14. Brake warning switch
15. Resistance
16. Main relay, ignition switch
17. Cigarette lighter
18. Step relay for mainbeam/dipped lights and headlight flasher
19. Alternator 12 V 55 A
20. Horn
21. Control lamp for mainbeam 1.2 W
22. Fusebox
23. Flasher unit
24. Engine compartment lighting 18 W
25. Charging control
26. Switch for glove locker lighting
27. Bulb for glove locker lighting
29. Brake switch
30. Warning lamp for parking brake 1.2 W
31. Warning lamp for oil pressure 1.2 W
32. Warning lamp for charging 1.2 W
33. Oil pressure sensor signal
34. Switch for turn indicators and flasher
35. Voltage stabilizer
36. Fuel gauge
37. Temperature gauge
38. Temperature pick-up
39. Warning lamp, flasher 1.2 W
40. Instrument panel lighting 2x3 W
41. Lighting for heater controls 3X1.2 W
42. Luggage compartment lighting 18 W
43. Windscreen wipers
44. Heater
45. Windscreen washer
46. Roof light 10 W
47. Heater switch
48. Rheostat for instrument and wiper switch
49. Rheostat for instrument lighting
50. Lighting switch
51. Ignition switch
52. Door switch
53. Switch for electrically heated rear window
54. Electrically heated rear window
55. Switch for parking brake control
56. Fuel level indicator unit
57. Reversing lights 15 W
58. Brake stop lights } 32/4 cp
59. Rear lights
60. License plate lighting 2x5 W
61. Warning light for overdrive, 1.2W
62. Switch for overdrive
63. Switch for overdrive, on transmission
64. Solenoid for overdrive
65. Switch on transmission, BW 35
66. Switch for reversing lights only for M 400 and 410
67. Relay for reversing lights on M 400, M 410 and starter relay on BW 35
68. Side marker lights
69. Warning buzzer, ignition key
70. Door switch, left
71. Foglights
72. Fusebox for foglights
73. Relay for foglights
74. Switch for foglights
75. Clock with bulb, 2 W
76. Switch, emergency warning flashers
77. Warning lamp choke
78. Contact, choke control
80. Gear positions light, autom. transmission

SB = Black	R = Red
W = White	BR = Brown
Y = Yellow	BL = Blue
GN = Green	GN-R = Green-Red
GR = Gray	BL-Y = Blue-Yellow
	W-R = White-Red

Differences may occur for different markets.

The wiring diagram shows the foglights connected across the parking and dipped lights. On certain markets they are connected across the parking and main beam lights. On this occasion the white-red lead between the foglight relay (73) and the stop relay (18) is connected to 56 b. If the foglights are connected across only the parking lights, the lead goes to 56.


NORDEN
BW 35
KOPPLING AV DIMLJUS / WIRING OF FOGLIGHTS

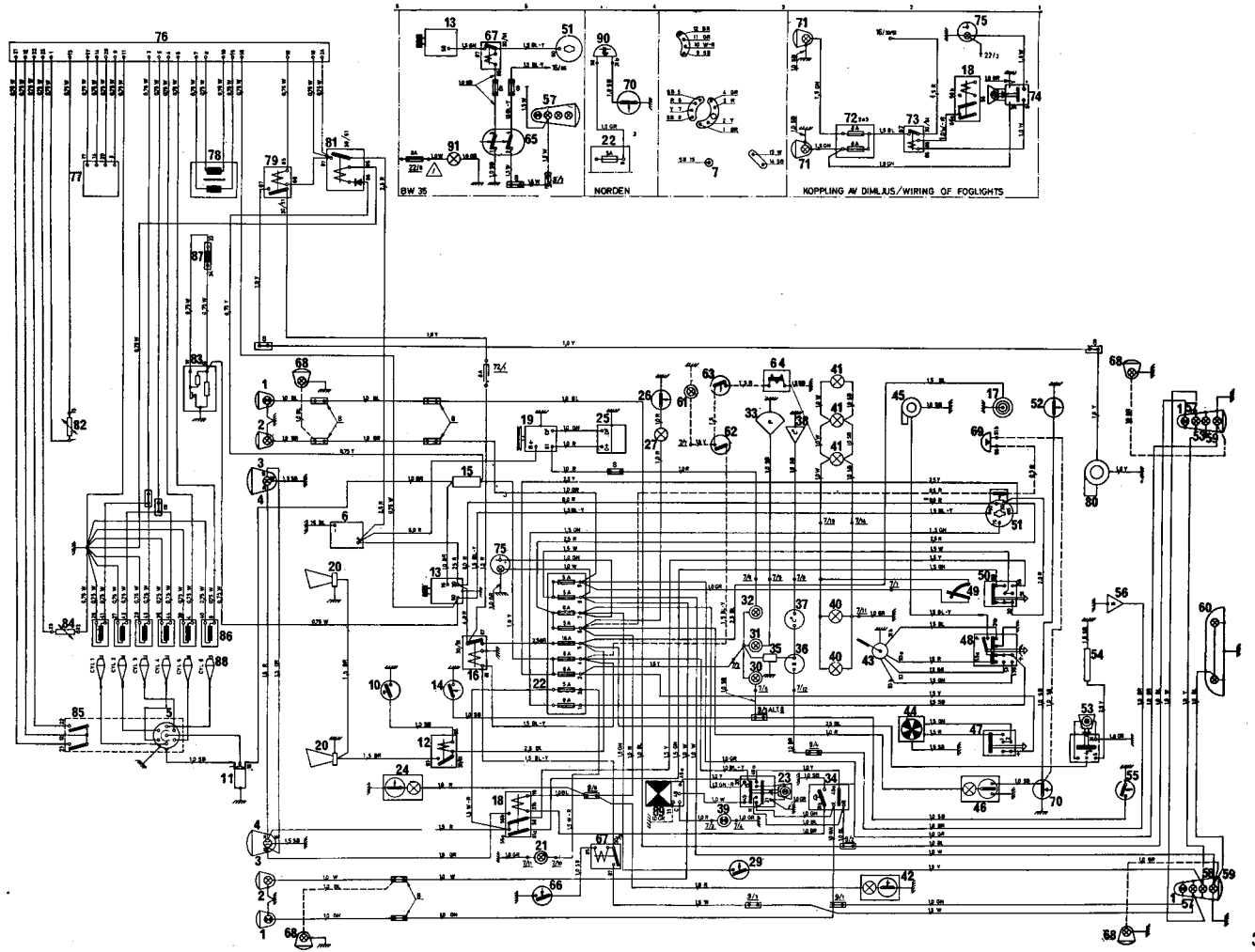


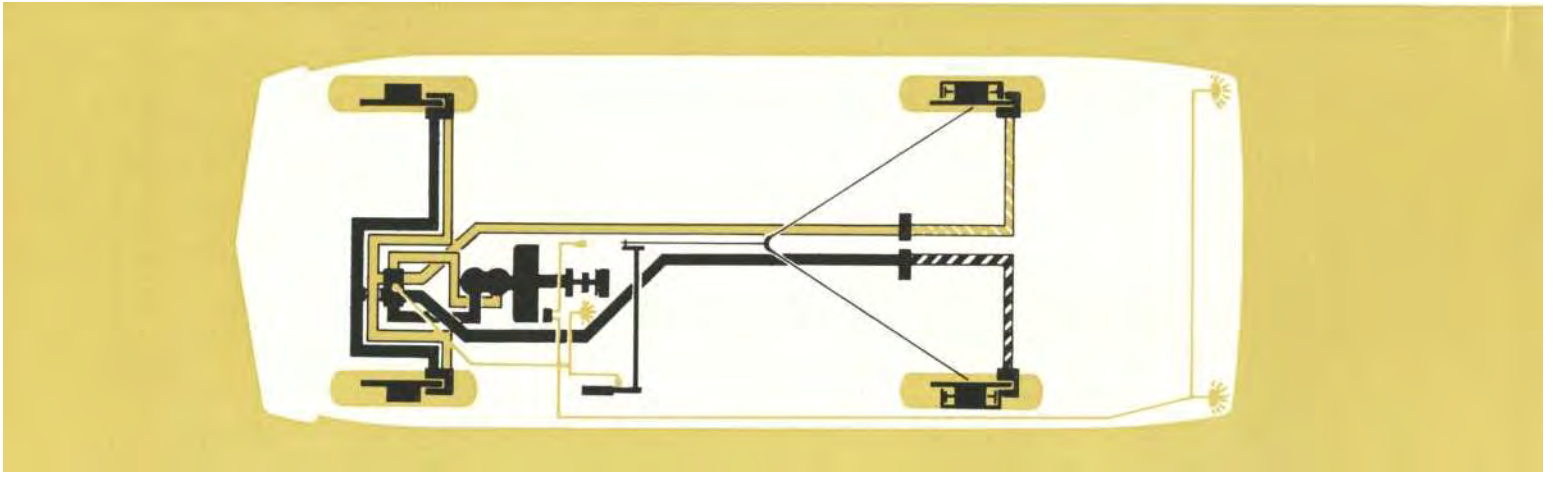
Wiring diagram (B 30 E)

1. Turn indicators 32 cp
2. Parking lights 5 W
3. Dipped headlights 40 W
4. Mainbeam headlights 45 W
5. Distributor
6. Terminal at instrument panel
8. Connector
9. Part of 6-pole terminal board
10. Horn ring
11. Ignition coil
12. Relay for horn
13. Starter motor 1 hp
14. Brake warning switch
15. Resistor
16. Main relay, ignition switch
17. Cigarette lighter
18. Step relay for mainbeam and dipped headlights, mainbeam flasher
19. Alternator 12 V 55 A
20. Horn
21. Warning lamp, mainbeams, 1.2 W
22. Fusebox
23. Switch, emergency warning flashers
24. Engine compartment light 18 W
25. Charging regulator
26. Switch for glove locker light
27. Glove locker light bulb
29. Brake contact
30. Warning lamp, brakes, 1.2 W
31. Warning lamp, oil pressure, 1.2 W
32. Warning lamp, battery charging, 1.2 W
33. Oil pressure sensor
34. Switch for turn indicators and mainbeam flasher
35. Voltage stabilizer
36. Fuel gauge
37. Temperature gauge
38. Temperature sensor
39. Warning lamp, blinkers, 1.2 W
40. Instrument light, 2x3 W
41. Light for heating controls, 3x1.2 W
42. Luggage compartment light, 18 W
43. Windscreen wipers
44. Heater
45. Windscreen washer
46. Interior light, 10 W
47. Heater switch
48. Switch, windscreen wipers and washer
49. Rheostat for instrument panel light
50. Lighting switch
51. Ignition switch
52. Door switch
53. Switch, elec. heated rear window
54. Elec. heated rear window
55. Switch, parking brake light
56. Fuel level sender
57. Reversing lights, 15 W
58. Brake stop lights 15 W
59. Rear lights, 3214 cp
60. License plate light 2x5 W
61. Warning lamp for overdrive 1.2W
62. Switch for overdrive
63. Switch on gearbox for overdrive
64. Control solenoid for overdrive
65. Switch on transmission, BW 35
66. Switch on transmission, BW 35
66. Switch for reversing lights
67. Relay for reversing lights on M 400
68. Side marker lights 4 cp (only USA) M 410 and start relay for BW 35
69. Warning buzzer for ignition switch (only USA)
70. Door switch, left
71. Foglights 55W
72. Fusebox for foglights
73. Relay for foglights
74. Switch for foglights
75. Clock with bulb 2 W
76. Control unit
77. Throttle control switch
78. Pressure sensor
79. Relay for fuel pump
80. Fuel pump
81. Main relay for fuel pump
82. Temperature sensor I
83. Thermal timer contact
84. Temperature sensor II
85. Release contact
86. Injectors
87. Cold start valve
88. Spark plugs
89. Flasher device
90. Warning buzzer, light
91. Gear positions light, autom. transmission

SB = Black
W = White
GN = Green
G R = Gray
R = Red
BR = Brown
BL = Blue
GN-R = Green-Red
BL-Y = Blue-Yellow
W-R = White-Red
Y = Yellow

Note that variations can exist for different markets. The wiring diagram shows the foglights wired across the parking and dipped headlights. On certain markets, they are wired across the parking and mainbeam headlights. Where this is the case, the white-red cable between the foglight relay (73) and the step relay (18) is connected to 56 b. If the foglights are connected across the parking lights only, the cable is then wired to 56.


BW 35
NORDEN
KOPPLING AV DIMLJUS/WIRING OF FOGLIGHTS



BRAKES

The brake system is of the two-circuit type with disc brakes all round. The system is provided with a tandem-type master cylinder and a directly-operating booster cylinder. When the brake pedal is depressed, the master cylinder operates mechanically via the booster cylinder, this increasing the pedal force about three times. The brake pressure is transmitted hydraulically from the master cylinder through the brake to the wheel cylinders. The pistons in these are then pressed outwards and apply the brake pads. The pressure lines to the rear wheel brakes are provided with a reducer valve which prevents the rear wheels from locking before the front wheels. The principle of the two-circuit system is that both the front wheels are connected to one rear wheel, that is, should there be a failure in one of the circuits, there is always braking power on both front wheels and the other rear wheel. So at normal pedal pressure the braking effect of one of the circuits is 50 %, but when pedal pressure is increased, about 80 % of the full braking power can be obtained in the one circuit. This provides maximum safety and prevents lateral dragging and rear-end lurching. With the engine stopped, the booster assists the braking a further two or three times after which the pedal pressure must be increased about three times as much in order to obtain a braking power corresponding to the braking power available with the engine running. The parking brake operates the rear wheels mechanically as the brake discs have also been designed as brake drums in order to incorporate the shoes for the parking brake.

GENERAL

Before the vehicle was delivered from the factory it was subjected to a very thorough inspection. Your dealer, in his turn, carried out a further delivery inspection in accordance with the specifications of the Volvo Factory. In addition to this there is a service inspection after 2 500 km (1500 miles) when the oil in the engine, transmission and rear axle is changed. Subsequent servicing of the vehicle should follow the routine in the service book which is based on service inspections every 10000 km (6 000 miles). The simplest way to provide the vehicle with the servicing it requires is to have all the servicing done by a Volvo workshop. The workshop stamp in the service book will show when the vehicle was serviced.

When the car was being designed particular attention was given to the "safety details" (e.g. front end, brakes and steering). They are calculated to withstand the severest stresses with a wide safety margin. However, if you use your car for hard driving, you should take the precaution of checking these parts for fatigue cracks during the useful lifetime of the car, for instance, when the parts concerned are being reconditioned. If you prefer to carry out the simpler servicing procedures yourself or if you are sometimes obliged to have them done by a workshop outside the Volvo organization, this chapter contains same advice as to when and how they should be carried out. For the sake of convenience, the servicing procedures have been summarized in a maintenance schedule in the next two pages.

MAINTENANCE SCHEME

In the maintenance scheme below the servicing procedures have been given certain numbers which refer to the detailed descriptions on the following pages.

Some of the work must be carried out by skilled mechanics or requires the use of special tools and these have been marked 0.

Operation	Carried out every 10,000 km 6000 miles	Carried out every 40,000 km 25,000 miles	See note below
LUBRICATION			
1. Lubricate body	●		● Once a year
2. Check oil level in engine			● When filling up with fuel
3. Change oil in engine	●[1]		See page 37
4. Carburettors, filling oil in the damping cylinders	●		
5. Check oil level in gearbox	●		
6. Change oil in gearbox		●[1]	
7. Check oil level in overdrive	●		
8. Change oil in overdrive		O[1]	
9. Check oil level in automatic transmission	●		
10. Check oil level rear axle	●		
11. Change oil in rear axle			●[2]
12. Check oil level in rear axle with limited slip differential	●		
13. Change oil in rear axle with limited slip differential			●[2]
14. Check oil level in servo steering	●		
15. Check brake fluid level (Also clutch fluid level, with r-h drive vehicle)			● When filling up with fuel
ENGINE			
16. Servicing crankcase ventilation		●	
17. Replace oil filter	O		
18. Clean fuel filter, B 30 A	●		
19. Change fuel filter, B 30 E			O 20 000 km (12 000 miles)
20. Change air cleaner filter, B 30 A		●	
21. Change air cleaner filter, B 30 E		●	
22. Check valve clearances	O		
23. Carry out compression test	O		
24. Check fan belt	O		
25. Check coolant level			● When filling up with fuel

[1]) Also after the first 2500 km (1500 miles) during running-in.

[2]) Only after the first 2500 km (1500 miles).

In addition to the servicing procedures mentioned in this scheme you should also check regularly the following from the point of view of traffic safety:

a) lighting, including brake warning light
b) turn indicator lights
c) horn

Operation	Carried out every 10,000 km 6000 miles	40,000 km 25,000 miles	See note below
26. Change coolant			● Every other year
27. Check spark plugs	O		
28. Check ignition contact breakers	O		
29. Check ignition timing setting	O		
ELECTRICAL SYSTEM			
30. Check electrolyte level in battery			● Every other week
31. Check state of charge of battery	O		
32. Check headlight alignment	O		
POWER TRANSMISSION			
33. Check release arm travel	O		
34. Check propeller shaft	O		O Once a year

Operation	Carried out every 10,000 km 6000 miles	40,000 km 25,000 miles	See note below
BRAKES			
35. Check brakes	O		
36. Replace booster cylinder air filter and overhaul brakes			O Every 3 years
FRONT END			
37. Check front wheel alignment	O		O Once a year
38. Check ball joints, steering rods etc.	O		O Once a year
WHEELS AND TYRES			
39. Check tyre pressure			● Every other week
BODY			
40. Washing			See page 59
41. Polishing			See page 60
42. Anti-rust treatment			See page 60
43. Cleaning			See page 61

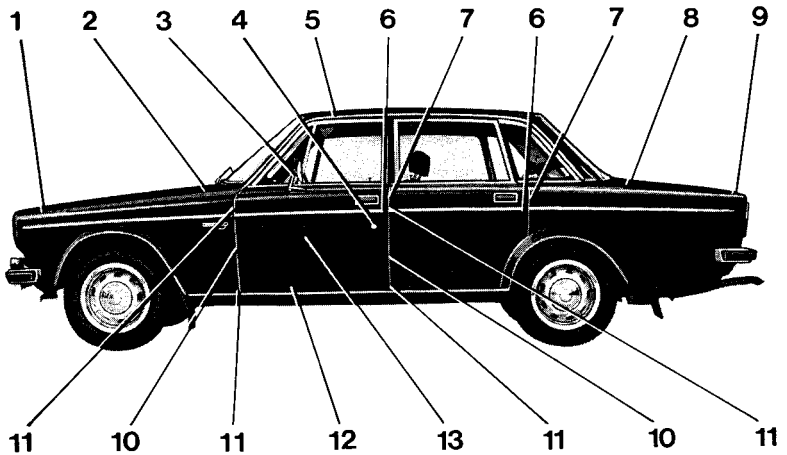
LUBRICATION

Chassis maintenance

To simplify maintenance of your Volvo, the vehicle has been equipped with ball joints, steering rods and propeller shafts of such a construction that they do not require regular lubrication. This has been possible due to the fact that points that normally require lubricating have been packed with very durable grease at the factory and then carefully sealed, this obviating the need for subsequent lubrication.

Oil should be changed or the oil level checked after every 10000 km (6000 miles) in accordance with the lubricating chart at the end of the book. The measures taken in this inspection are also to be found in the lubricating chart.

Always use only first-class lubricants of a well-known make. The right lubricants in the right quantity at the right time will increase both the lifetime and the reliability of your car.

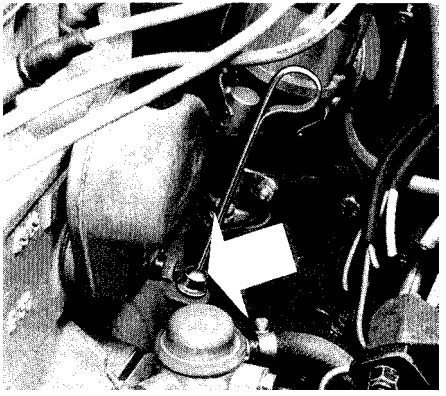


1 Body lubrication

In order to avoid rattle and unnecessary wear, the body should be lubricated once a year. The hinges on the bonnet, doors and luggage compartment lid as well as door stops should be lubricated every 10 000 km (6000 miles*). Moreover, during the winter months the locks on the doors and luggage compartment lid should be given some anti-freeze to prevent them from freezing up.

* Included in the 10 000 km (6000 miles) inspection.

No.	Lubricant point	Lubricant
1.	Bonnet catch	Paraffin wax
2.	Bonnet hinges*	Oil
3.	Ventilator window catches and hinges	Oil
4.	Key holes	Lock oil
5.	Sun-roof wind breaker	Oil
6.	Strikes plates	Paraffin wax
7.	Door lock outer sliding surfaces	Paraffin wax
8.	Luggage compartmen hinges*	Oil
9.	Luggage compartment lock Key holes	Oil Lock oil
10.	Door checks*	Paraffin wax
11.	Door hinges*	Grease
12.	Driving seat slide rails and catches	Paraffin wax
13.	Window lifts Locks Accessible after door upholstery panels have been removed)	Oil and grease Silicon grease



2 Check the oil level in the engine

The oil level in the engine should be checked each time the fuel tank is filled. The check should be carried out with the engine switched off but warm and, in order to obtain comparable values, about one minute after the engine has been stopped. Wipe the dipstick before measuring. The oil level should be between the two marks on the dipstick. It must never be permitted to go down below the lower mark, but on the other hand, it should not be above the upper mark since oil consumption will then be abnormally high. If necessary, top up by filling through the oil filler hole in the rocker arm casing with new oil of the same type already in the engine.

The distance between the marks on the dipstick correspond to approx. 2 litre (2 qts) oil.

3 Changing the engine oil

With a new or reconditioned engine, the oil should be changed after the first 2 500 km (1 500 miles). Subsequent oil changing is according to the intervals given below. The intervals will depend to a great extent on the type of oil used. For engine lubrication, oil grade "For Service MS", is to be used. As far as viscosity is concerned, multigrade oil is recommended. These oils are better suited for demanding driving conditions, for example continuous driving in city traffic with incessant stopping and starting or with lengthy idling periods.

For engine oil with viscosity SAE 10 W-30 (multigrade), 10 W-40 or 20 W-50, the oil should be changed every 10 000 km (6000 miles) or at least twice a year. If engine oil with viscosity SAE 10 W (single-grade), 20/20 W or 30 is used, the oil should be changed every 5 000 km (3000 miles), or at least twice a year.

At very low temperatures below -18° C _ -40°F) multigrade oil SAE 5 W-20 is recommended. However, this oil should not be used when the temperature is continuously above 0° C (32° F).

The old oil is drained off by removing the drain plug on the pan. Draining should take place after driving when the oil is still warm.

Viscosity Oil grade	Temperatur range	Oil change intervals km (miles)	Oil capacities
SAE 10 W-30 10 W-40 20 W-50 "For Service MS"	all year round for all temp. above —10°C (14°F)	10,000 (6000) (or however at least twice a year)	No oil filter 5.2 litres 9.2 Imp. pints 11.0 US pints
SAE 10 W 20/20 W 30 "For Service MS"	below —10°C (14°F) between —10°C and +30°C (14 and 80°F) above 30°C (80°F)	5000 (3000) (or at least twice a year)	With oil filter 6.0 litres 10.6 Imp. pints 12.6 US pints

[1]) Change the oil after the first 2500 km (1500 miles) during running-in.

4 Carburettors

At each oil change check that the oil level in the centre spindle of the carburettors is about 6 mm ('/4") from the top of the spindle. If it is not, fill up with Automatic Transmission Fluid.

5-6 Gearbox M 400

The oil in the gearbox should be checked after every 10 000 km (6000 miles). The oil level should be up to the filler hole. If necessary top up with the recommended oil.
After every 40 000 km (24000 miles) the oil in the gearbox should be changed. In the case of a new or reconditioned gearbox the oil should also be changed after the first 2500 km (1500 miles) and the gearbox thoroughly flushed with the same type of oil subsequently used. The old oil should be drained off immediately after the vehicle has been run while the oil is still warm.

7-8 Gearbox with overdrive M 410

For cars fitted with an overdrive, the oil level should be checked and the oil changed parallel with similar procedure for the gearbox. The overdrive and the gearbox have a common oil level and oil filler hole. Make sure when topping-up that the oil runs over into the overdrive. The oil is drained out by removing the gearbox drain plug and the cap for the overdrive oil strainer. At each oil change the oil filter of the overdrive should be cleaned. This should be done by a Volvo workshop.

Oil, ATF

Oil grade	Viscosity	Oil capacity
Gear oil alt.	SAE 90 At temperatures below —10°C (14°F) SAE 80	0.6 litre 1.1 Imp. pints 1.3 U.S. pints
Engine oil	SAE 40	

Oil grade	Viscosity	Oil Capacity
Engine oil	SAE 30 or Multigrade SAE 20 W-40	1.4 litres 2.5 Imp. pints 3.0 U.S. pints

9 Automatic transmission BW 35

The oil in the automatic transmission should normally not be changed but the oil level should be checked every 10 000 km (6000 miles). The filler pipe with graduated dipstick is to be found under the bonnet just in front of the cowl.

N.B. The dipstick has different graduation marks for a warm and cold transmission. When the oil level is being checked, the car should be standing level. With the engine idling in position "P", the level should be between the upper and lower graduation marks on the dipstick. When topping-up is necessary, use only Automatic Transmission Fluid, Type F.

If this oil is not available, Type A or Dexron may be used.

The dipstick should be wiped with a nylon cloth, paper, etc. Cloths which leave fluff on the dipstick must be avoided.

For cars used for hard driving, or in hilly countries, etc., preventive service should be carried out by an authorized Volvo workshop every 40 000 km (24000 miles).

Oil grade	Oil capacity
Automatic Transmission Fluid, Type F (If unavailable, Type A or Dexron)	8.4 litres 14.8 Imp.pints 17.7 US pints

10-11 Rear axle

The oil level in the rear axle should be checked after every 10 000 km (6 000 miles). The oil level should be up to the filler hole. If necessary top up with the recommended oil. The oil in the rear axle should be changed after the first 2 500 km (1 500 miles). The old oil is drained off by removing the bottom plug. After this only the oil level need be checked and topping-up with recommended oil carried out if required.

The oil should then be warm and the magnetic plug must be well cleaned. It is of great importance to the lifetime of the final drive that particles and impurities from running-in are removed.

Oil grade	Viscosity	Oil capacity
Rear axle oil acc. to MIL-L-2105 B	SAE 90 At temperatures continuously below —10° C (+14° F), SAE 80	1.6 litres 2.8 Imp.pints 3.4 US pints

12-13 Limited slip

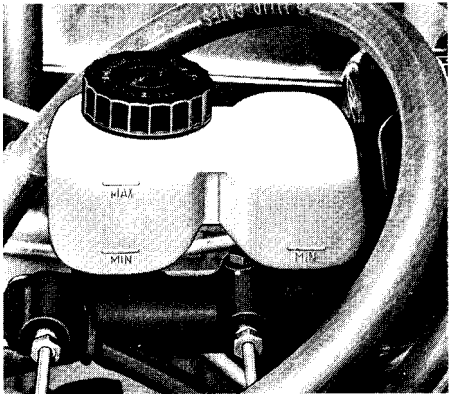
Cars fitted with a limited slip differential are delivered from the factory with a rear axle oil according to the American Military Standard MIL-L-2105 B provided with an additive for rear axles with limited slip. A similar type of oil should be used for level checking and oil changing are to be subsequent topping-up and changing. Oil carried out at the same intervals and in the same way as for a rear axle without limited slip.

Rear axle oil MIL-L-2105 B must be provided with additive for limited slip differential.

14 Servo steering

The oil level in the servo steering should be checked every 10 000 km (6000 miles). Before checking wipe the oil container clean. Then remove the cap and check the level with the engine not running. The oil level should be about '/4" (5-10 mm) above the level mark in the container. If the level is lower than this, top up with oil, with the engine stopped to prevent air from being sucked into the container. Start the engine and recheck the oil level, which should now fall to the level mark. When the engine and re-check the oil level, which about 5-10 mm ('/4") above the mark.
The oil and filter in the servo steering do not need replacing other than during repairs or reconditioning.

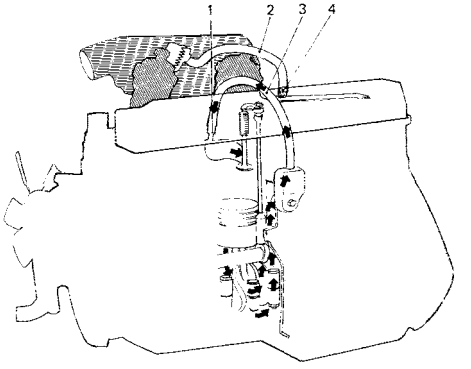
Oil grade	Oil capacity
ATF Type A or Dexron	1.2 liters 2.1 Imp. pints 2.5 US pints



15 Brake fluid

The brake system is fitted with a tandem-type brake fluid container with a section for each circuit but with the same filler hole. The brake fluid level should be between the "Max" and "Min" marks.
(For right-hand drive, check also clutch fluid level.)

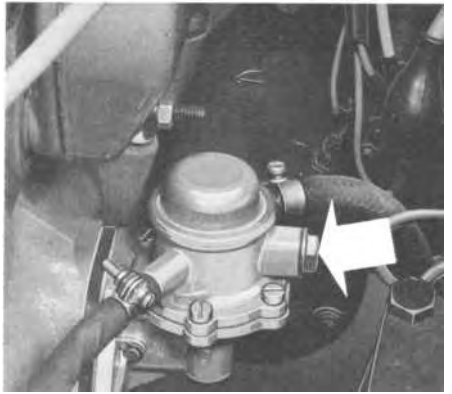
Brake fluids meeting the requirements according to SAE J 1703 should be used for the hydraulic brake system. Brake fluid with designation SAE 70 R 3 can also be used.

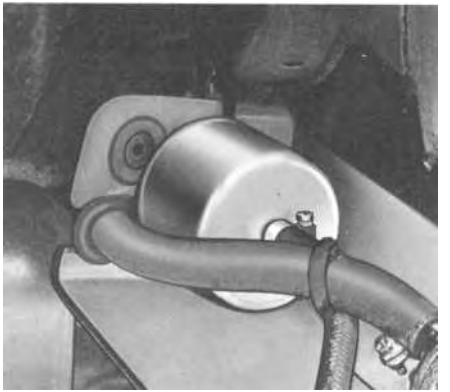


ENGINE

16 Crankcase ventilation

The engine is provided with positive crankcase ventilation which prevents the gases in the crankcase from being released into the atmosphere. Instead, they are sucked into the intake manifold and take part in the combustion process whereupon they are blown out through the exhaust pipe together with the other combustion gases.
Every 40 000 km (24 000 miles) remove and clean the nozzle (1), the hoses (2 and 3) and the flame protector (4). Rubber hoses should also be replaced if they are in a poor condition.





17 Oil filter

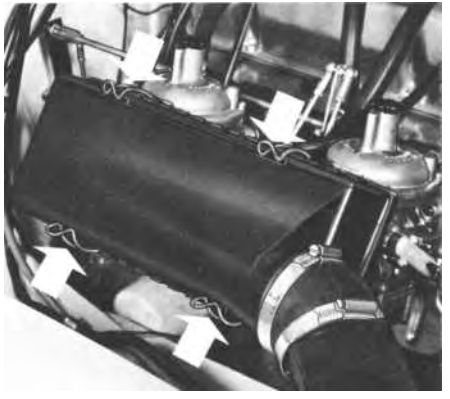
The engine is fitted with a full-flow type oil filter, which means that all the oil passes through the filter on its way from the oil pump to the various lubricating points. Impurities in the oil are collected in the filter and gradually block it. For this reason, the filter must be changed every 10 000 km (6 000 miles). Scrap the old filter then. If the oil filter is replaced without the engine oil being changed, the engine should be topped up with 0,5 litre (1 pint) of oil.

18 Fuel filter (B 30 A)

The fuel filter should be cleaned after every 10 000 km (6000 miles). Loosen the screw, remove the cover and the filter and clean them. Check that the gasket is not damaged and make sure that it seals properly when the plug with filter is re-fitted.

19 Fuel filter (B 30 E)

The fuel filter is located under the car close to the fuel tank. This filter is to be changed after every 20 000 km (12000 miles). The filter is replaced as one complete unit.
Clean the fuel lines and the surrounding components before carrying out the change. When changing the filter, pinch the fuel lines to prevent fuel from running out. Notice when fitting the new filter that the arrow on the filter housing is to point in the direction of flow. Filter replacement should be carried out by an authorized Volvo workshop.



20 Air cleaner (B 20 A)

The air cleaner consists of a plastic cover with replaceable paper insert. The insert should be replaced every 40 000 km (24000 miles. With continuous driving in dusty conditions, it may be necessary to change the cleaner more often. No kind of cleaning whatsoever should be carried out between the above intervals.
To replace, disconnect the hose clamp for the air preheating unit and also the clips holding the air cleaner cover. The insert is then accessible for removal. Make sure when fitting the top section that the thermostat body for the intake air is not damaged.

21 Air cleaner (B 30 E)

The air cleaner consists of a container with a replaceable paper insert. The insert should be replaced after every 40 000 km (24 000 miles). When driving regularly in dusty, areas, the insert should be replaced more often. No other servicing is required between the above intervals.
To replace the insert, undo all the clasps securing the cleaner cover, take off the cover and the insert is accessible for replacement.
When re-fitting the cover on the cleaner make sure that the arrow points on the cover and the lower section of the air cleaner coincide with one another.

22 Valves

The valve clearance should be checked after every 10 000 km (6 000 miles).
The check should be carried out in a workshop.

23 Compression test

To get some idea of the condition of the engine, a compression test should be carried out after every 10 000 km (6 000 miles). This test should preferably be carried out in a workshop.

24 Drive belts

The belt tension can be checked by pressing in the fan belt at a point midway between the alternator and the fan. It should be possible to press down the belt there about 10 mm (3/8") with normal pressure (7,5-11 kp=55-80 lb). The check can suitably be carried out in a Volvo workshop.
Also check the tension on the drive belt for the servo pump. It should be possible to depress the belt about 5 mm (3/16").

25 Check the coolant level

The cooling system must be well filled with coolant and not leak if it is to operate at maximum efficiency. Check the coolant level when filling up with fuel. The level should be between the "Max" and "Min" marks on the expansion tank. The check should be carried out with particular thoroughness when the engine is new or the cooling system has been empty.

Do not remove the filler cap other than for topping-up with coolant. Frequent removal may prevent coolant circulation between the engine and the expansion tank during engine warming up and cooling.

Topping up with coolant

Top up with coolant by filling the expansion tank when its level has gone down to the "Min" mark. Use all the year round a mixture of 50 % reliable anti-freeze and 50 % water. Top up to the "Max" mark.

NOTE. Do not top up with water only, particularly during the wintertime. Water by itself reduces both the rust-protective and anti-freeze qualities of the coolant. It can also cause damage to the cooling system if ice should form in the expansion tank.

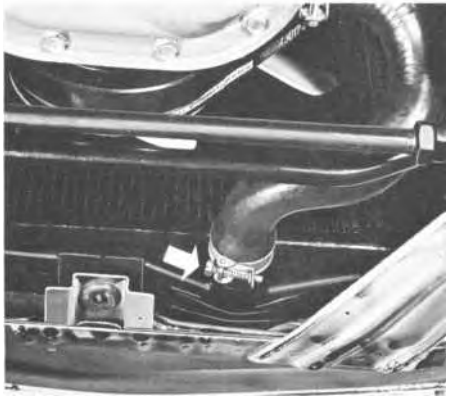
NOTE. In very warm parts of the country where there is little risk of frost, water can be used without anti-freeze.

26 Changing the coolant

The coolant retains its properties for approx. 2 years when it should be changed. A suitable time to do this would be in the autumn to preclude any damage by frost during the coming winter. To drain the cooling system, unscrew the drain plug located on the right-hand side of the engine and disconnect the hose connected to the bottom of the radiator. On the B30E the drain cock is located on the oil cooler.

The expansion tank is emptied by removing it from its brackets and lifting it to a sufficient height so that the coolant can flow into the radiator.

Before filling with new coolant, flush the entire system with clean water.



The cooling system is filled with coolant through the filler opening on top of the radiator. When this is being done, the heater control should be set to max, heat to ensure that the entire system is filled.
Fill the radiator to the top and fit on the cap. Then fill the expansion tank to the "Max" level or slightly above this.

Run the engine for a short period, switch off the ignition and allow the engine to cool. Check that the radiator is full and that the coolant in the expansion tank is at "Max". If necessary, top up the system.

27 Check the spark plugs

The spark plugs should be changed every 12 000 miles (20000 km)
Tightening should preferably be done with a torque wrench. When fitting new plugs, be sure to fit the right type.

B30A
Bosch W 200 T 35 or corresponding
B 30 E
Bosch W 225 T 35 or corresponding

When changing the plugs, check that the suppresser connectors are in good condition. Cracked or damaged connectors should be replaced.

28-29 Ignition system

The distributor contact breaker gap and the engine ignition timing should be checked every 10 000 km (6000 miles). All adjusting work should be done by a workshop with the proper equipment. The distributor is one of the most sensitive units in the engine and careless handling can lead to decreased engine output and high fuel consumption or even serious damage to the engine.

Fuel

Fuel with an octane rating of at least 97 (ROT*) should be used for the B 30 E engine. For the B 30 A engine fuel with an octane rating of min 97 (ROT*) can be used. When driving chiefly in town traffic, fuel with an octane rating of 100 (ROT*) is recommended for the B 30 A engine. On certain markets where it is difficult to get fuel with these ratings, the engine can be adjusted accordingly for lower octane fuel.

* ROT = Research Method

Special instructions when working on the electronic fuel injection system

1. Never let the engine run without the battery being connected.
2. Never use a high speed battery charger as a starting aid.
3. When using a high speed charger to charge the battery in the vehicle, the battery should be disconnected from the rest of the electrical system.
4. The control unit must not overheat above +85° C (185° F). The control unit must not be connected up (the engine started) when the ambient temperature exceeds +70° C (158° F). (With paintwork, etc., when the vehicle is being stove-heated, it may not be driven out of the oven, it must be conveyed out. If there is risk of temperatures exceeding +85° C (185° F), the control unit must first be removed.)
5. The ignition should be switched off before connecting up or disconnecting the control unit.
6. For all work with fuel lines, great care must be taken to ensure that no dirt enters the system. Even small dust particles can jam injectors.

Any work to be done on the electronic fuel injection system should be carried out by an authorized Volvo workshop which has the proper equipment for doing this.

ELECTRICAL SYSTEM

30 Check the battery electrolyte level

The electrolyte level should be checked regularly. A suitable time to do this when the fuel tank s being filled. The electrolyte level should be 5-10 mm (3/16-3/8") above the top of the cell plates. If the level is too low, top up with distilled water. Never check the electrolyte level by lighting a match. The gases formed in the cells are highly explosive.

31 Check the state of charge of the battery

The state of charge of the battery should be checked after every 10 000 km (6000 miles). The check is made with the help of an hydrometer which shows the specific gravity of the battery acid. See page 66. At the same time, check the lead terminals and terminal studs to make sure that they are tight, coated with grease and that the battery is firmly fixed.

32 Check headlight alignment

The alignment of the headlights should be checked in a workshop after every 10 000 km (6000 miles).

This car is fitted with an alternator.

When changing the battery or when carrying out work involving the electrical system, the following should be observed.

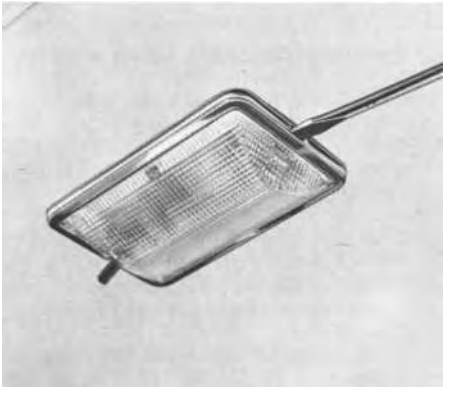
1. A battery connection to the wrong terminal will damage the rectifiers. Before connections are made, check the polarity of the battery with a voltmeter.

2. If assist batteries are used for starting, they must be properly connected to prevent the rectifiers from being damaged.
The negative lead from the assist battery for starting must be connected to the negative terminal stud of the car battery and the positive lead from the assist battery for starting to the positive terminal stud.

3. If a rapid charger is used for charging the battery, the car battery leads should be disconnected.
A rapid charger may not be used as an aid in starting.

4. Never disconnect the battery circuit (for example, to change the battery) while the engine is running, as this will immediately ruin the alternator.
Always make sure that all the battery connections are properly tightened.

5. If any electrical welding work is to be carried out on the vehicle, the ground lead and all the connecting cables of the alternator must be placed as near the welding point as possible.



Changing roof light bulb

To change the bulb in the roof light, press in the catch in the lamp housing. This is done with a screwdriver which is inserted in the opening on the right-hand side of the housing. Then pull the lamp housing out of its attachment and the bulb is accessible for replacement.

Replacement of bulbs

To obtain maximum lighting effect and to forestall the chances of lights going out, the headlight bulbs should be changed every year, suitable during the autumn.
The replacement of bulbs in the various lighting units is shown on the following pages. Make sure when fitting lamps that the guide pin on the socket fits into its corresponding recess.
When fitting bulbs, do not touch the glass with your fingers. The reason for this is that grease, oil or any other impurities can be carbonized onto the bulb and damage the reflector.

Replace bulbs for instrument lighting and heater control lighting

Owing to the location of the bulbs, they should be replaced by a Volvo workshop.

Replacing the headlight bulbs

The headlight bulbs are replaced from inside the engine compartment in the following way:

1. Remove the contact for the bulb holder.
2. Remove the rubber sleeve.
3. Remove the spring which fixes the lamp holder in the correct position.
4. Lift out the bulb holder with the bulb complete as one unit. When fitting the bulb holder spring into the insert, make sure that the guide pin engages in its notch.
   Do not touch the bulb with your hand.

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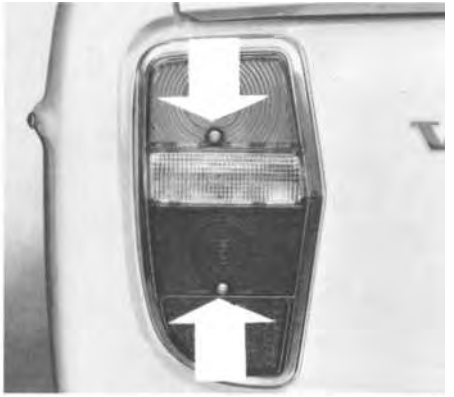
Replacing bulb for luggage and engine compartments light

Slacken the screw securing the bulb holder. The bulb is then accessible for replacement.

Replacing the bulbs for the front turn indicator flashers and the parking lights

Remove the two Philips screws which hold the glass. The bulbs can now be removed by pressing them inwards and then turning them a little anti-clockwise. The inner bulb is for the parking light, the outer for the flasher.



Replacing the bulbs for the rear turn indicator flashers, parking lights, stop lights and reversing lights

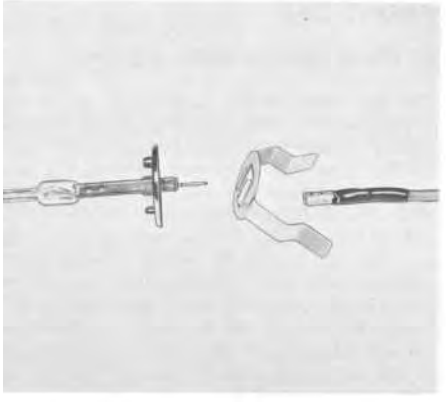
Remove the two Philips screws which hold the glass. The bulbs can now be removed by pressing them inwards and turning them slightly anti-clockwise at the same time. The top bulb is the flasher, the one under that is the reversing light, the next one under that the stop light and the one at the bottom the rear light. Make sure that the sealing strip fits well against the glass when it is refitted.

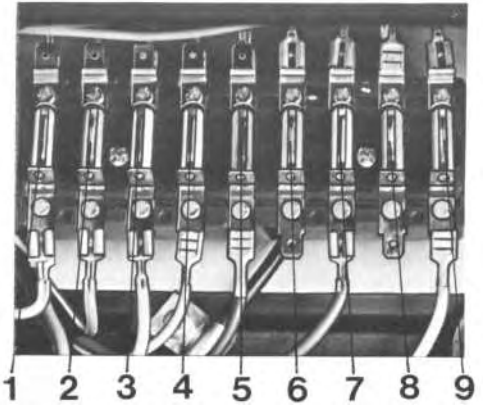
Replacing the bulbs for the license plate light

The two bulbs for the license plate light are mounted on a holder located under the trunk lock.
Loosen the two screws which hold the glass and remove it. The bulb is now accessible for changing.

Replacing the bulb for the glove locker

The bulb is located under the dashboard above the glove locker door. To replace the bulb, first press it in slightly and then turn it anti-clockwise.





Replacing the foglight bulbs

The bulbs for the foglights are replaced from inside the engine compartment. Remove the protection covering the space over the headlight and foglight. Squeeze together the spring holding the bulb and lift out the spring and bulb. The bulb is now accessible for replacement.

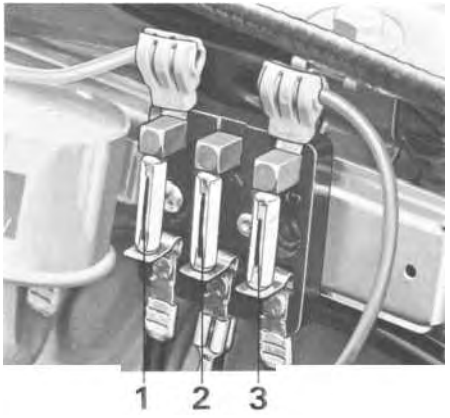
Because of the two bosses on the bulb socket, the bulb can only be fitted in one way.

Changing fuses

The electrical equipment is protected by a number of fuses located in a space under the instrument panel and accessible when the control panel in front of the gear lever is folded down. This is done by slightly slackening anti-clockwise the screws at the upper corners of the panel with a screwdriver or small coin.

If a fuse has to be replaced, always make sure that the new one is of the correct rating. Should fuses blow repeatedly at the same point, do not fit a stronger fuse. Instead have a workshop check the electrical system.

1.	Windscreen wipers, washers	8A
2.	Warning lamp, fullbeam headlights	5A
3.	Heater fan, temperature, fuel gauge, warning lamp for brakes, oil pressure, battery charging, choke.	8A
4.	Blinkers, reversing lights, overdrive	8A
5.	Horn, elec. heated rear window, cigarette lighter	16A
6.	Interior light, glove locker light, engine compartment light, luggage compartment light.	5A
7.	Emergency warning flashers, brake lights, clock	8A
8.	Rear light, left and parking light. Clock light. License plate light. Gear positions light, automatic transmission.	5A
9.	Rear light, right, and parking light. Instrument panel light, warning buzzer light	5A



On the Volvo 164 E there is also an extra fusebox located in the engine compartment on the left-hand wheel arch.

The fuse protects:

1. Foglight, right 8 A
2. Foglight, left 8 A
3. Fuel pump relay 8A

POWER TRANSMISSION

33 Checking the clutch yoke play

To avoid risk of the clutch slipping, the clutch yoke travel should be checked and adjusted if necessary every 10 000 km (6000 miles).

34 Check the propeller shaft

After every 10 000 km (6000 miles) or once a year the rubber seal on the spline shaft and the universal joints should be checked. If the rubber seal is damaged, it should be replaced and the new seal filled with molybdenum disulphide grease.

BRAKES

35 Check the brakes

After every 10 000 km (6 000 miles) the vehicle should be taken to a Volvo workshop for a check on the function of the brakes.

36 Replacing the booster cylinder air filter and overhauling the brakes

Every third year or 60 000 km (36 000 miles) the car should be taken to a Volvo workshop for replacement of the booster cylinder air filter.
The brake system seals should also be replaced at the same time.

FRONT END

37 Check the front wheel alignment

Correct front wheel alignment is of vital importance for the steering of the vehicle. Faulty adjustment can mean heavy wear on the tyres. For this reason, have the front wheel alignment checked regularly at your local Volvo workshop every 10 000 km (6 000 miles). If the vehicle has been in collision involving heavy impact and it is suspected that the wheel alignment may have been affected, take the vehicle to a Volvo workshop for a check on the front wheel alignment as soon as possible. Volvo workshops have special measuring equipment for this purpose and can carry out this control very quickly. The front wheel alignment angles are shown on page 67.

38 Check the ball joints, steering rods, etc.

After every 10 000 km (6 000 miles) the vehicle should be taken to a workshop for a check on the front end concerning excessive play in the ball joints, steering gear, etc.
After every 10 000 km (6000 miles) or at least once a year, the ball joint seal should also be checked for damage and leakage. When new seals are fitted they should be filled with the recommended grease.

WHEELS AND TYRES

General

The car is fitted with pressed steel wheels. All wheels are accurately balanced. Wheel rims are of size 5'/2 J 15" F.H. The tyres are 165 SR 15 or 165 HR 15 tubeless.

The maximum permissible speed for 165 SR 15 tyres is 180 kmph (115 mph) and 210 kmph (131 mph) for 165 HR 15.

Radial tyre types should always be used. Throughout its lifetime, the car tyre should if possible have the same direction of rotation. In other words, it should be kept on the same side of the car all the while in use. This is of particular importance for studded winter tyres, since a change in direction of rotation can cause the studs to loosen and fall off the tyre.

Studded snow tyres should also have a running-in period of between 500-1000 km (300-600 miles). During this period avoid hard driving on bends and high speeds, also hefty braking and hasty accelerations.

Rapid links must not be fitted since the space between the brake calipers and wheel rims will not permit this.

Check the tyres at regular intervals for damage and abnormal wear, also for stones which can fasten in the thread. Have them balanced if necessary. Poorly balanced wheels will rapidly increase the wear on tyres as well as make for poor travelling comfort.

The tyres have a so-called "wear indicator in the form of a number of specially patterned sections in the thread. When about 1.5 mm (1/16") is left on the thread in these sections, these sections show up and warn the car owner in good time that the tyre is showing signs of wear.

39 Check the tyre pressure

Make a habit of checking the pressure in the tyres regularly. The simplest way to do this is to check the pressure at a service station while filling up with fuel. See page 67 for the correct air pressure. Do not forget the spare wheel when checking the air pressure.

During driving, the temperature of the tyres rises and also the air pressure in relation to the speed of the vehicle and its load. Normally the air pressure should only be checked when the tyres are cold. When the tyres are warm, a change in pressure should take place only when air must be pumped into the tyres.

Excessively low air pressure is one of the most common reasons for tyre wear. Tyres which are insufficiently inflated also result in difficult steering and high fuel consumption. Too high air pressure tends to make for poor riding comfort.

Be careful when parking the car next to the pavement not to damage the tires against the pavement kerb.

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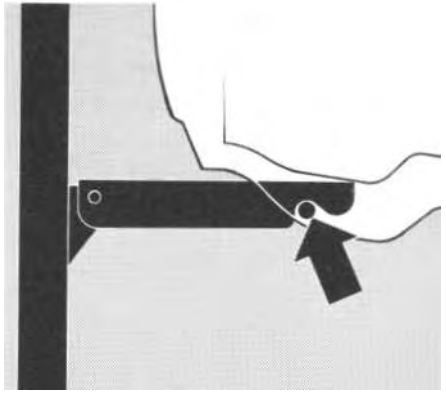

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Changing a wheel

The spare wheel is stowed in a recess to the right in the luggage compartment. The jack and tool kit are kept next to the spare wheel. Before the vehicle is jacked up, the parking brake should be applied and one of the gears engaged.

Removing

1. Unscrew the wheel cap crosshead screw and remove the wheel cap.
2. Loosen the wheel nuts 1/2-1 turn with the help of the box spanner and tommy bar in the tool kit. All the nuts have right-hand threads which are loosened by turning them in an anti-clockwise direction.
3. Insert the lifting arm of the jack in the appropriate jack attachment of the wheel to be changed. Make sure the arm goes in all the way. Jack up the side of the car far enough to lift the wheel off the ground.
4. Unscrew the wheel nuts completely and lift off the wheel. Be careful when lifting off the wheel that the threads of the studs are not damaged.
   Remove the hub cap.

Fitting

1. Fit the hub cap on the wheel rim from the inside according to the above picture and clean the contact surfaces between wheel and hub.
2. Lift on the wheel.
   Tighten the nuts until the wheel makes good contact with the flange.
3. Lower the vehicle and tighten the nuts alternately.
4. Fit the wheel cap.

Do not rotate the raised wheel if the car is fitted with a limited slip differential as this will also move the other rear wheel on the ground, so that the car may topple off the jack.

BODY

40 Washing

The car should be washed often since such things as dirt, dust, dead insects, tar spots, etc, usually adhere firmly to the body and may damage the paintwork. Washing also helps to counteract rusting. During the winter, special care should be taken to ensure that all road salt residue is washed off as soon as possible, otherwise corrosion can occur.

When washing the car, make sure that it is not exposed to direct sunlight since this can cause drying patches. Begin by softening up the dirt on the underside of the body with a jet of water and use if necessary a soft brush. Then rinse down the whole body with a light jet until the dirt has loosened up. After this, wash off the dirt with a sponge using plenty of water. Start on the roof of the vehicle and work down the body. Use preferably lukewarm but not hot water.

A detergent can be used to facilitate washing. Special detergents are now available on the market - even dish-washing fluids can be used. A suitable mixture is about 5-10 cl (1½-3½ fl. ozs.) of fluid dish washer to 10 liters (2.6 US galls=2.2 Imp. galls) of water. Asphalt spots and tar pitting can easily be removed with white spirit or equivalent, but this should be done after the washing.

When a detergent is used, the car should be well rinsed down with clean water afterwards. Begin with the roof of the car and work down the body. Then dry carefully with a soft clean chamois leather. Use different leathers for the windows and the remainder of the car, otherwise using the same leather can cause greasy smears on the windows.

When washing the car, remember to clean the draining holes in the doors and bottom sills.

Note. When washing the car in a washing bay, the ventilation controls should be closed. In certain cases, the air intakes for the car heater should be covered.

41 Polishing (waxing)

The vehicle does not need polishing until the surface finish begins to lose its lustre and normal washing is no longer sufficient to make it shine again and remove the layer of dirt on the surface. Under normal conditions it is sufficient to polish the vehicle a couple of times a year on condition that it is carefully looked after and thoroughly washed as soon as it has become dirty or dusty. Before the vehicle is polished, it should be carefully washed and dried to avoid scratches on the paintwork.

Before applying wax, make sure that the surface is absolutely clean.

It may often be necessary to use white spirit for cleaning.

Waxing should neither be considered as a substitute for polishing nor as a necessary protection for the paintwork against unfavourable weather. For the most part waxing is not necessary until one year after delivery of the car.

Touching-up surface finish damage

The touching-up of any extensive damage to the synthetic finish requires the use of special equipment and skill, so that the repairing of any such damage should be entrusted to a Volvo workshop. Minor damage caused by flying stones, etc. and small scratches can, however, be attended to by the owner himself.

Damage caused by flying stones requires immediate attention if rusting is to be avoided. Always make a habit, therefore, of checking the finish regularly and touch-up if required. Volvo dealers can supply you with suitable touching-up paint n tins or spray bottles. Always make sure that you get the right colour. Touching-up is as follows:

1. If flying stones should penetrate to the metal of the bodywork, the damaged surface is to be scraped completely clean with a penknife or similar. If, however, the paintwork is not damaged by stones, then all that is needed is light scraping to remove the dirt.

2. In the event of severe damage due to flying stones, it is necessary to treat the spot concerned with anti-rust primer. The primer should cover completely the scratches and the edges rubbed off.

3. When the anti-rust primer has dried, genuine Volvo paint is applied. Stir the paint well or shake the spray bottle thoroughly before use. Apply several thin coats of the paint, allowing it to dry thoroughly between each application.

Chromed parts

Chromium-plated and anodized parts should be washed with clean water as soon as they become dirty. This is particularly important if you drive on gravel roads which are treated with chemicals to keep the dust down or in the winter when salt is used to melt the snow. After the car has been washed, apply wax or anti-rust preparation.

42 Rustproofing

Your Volvo is rustproofed at the factory.

Inspection and any touching-up of the rustproofing should be done at regular intervals and at least once a year. The enclosed body sections should also be rustproofed by means of spray application at least once a year.

If any touching-up of the rustproofing is necessary, this should be done immediately to prevent moisture from seeping in and consequently damaging it.

43 Cleaning the upholstery

Leather upholstery can be cleaned with a damp cloth, eventually with a mild soap solution.
For more difficult spots, consult an expert for choice of cleaning agent.

Fabric-plastic is washed with a mild soap solution or, in more difficult cases, with some household detergent.

Petrol, white spirit, carbon tetrachloride or similar cleaning agent must not be used on leather upholstery, since these are harmful both to the leather and fabric-plastic.

Cleaning the floor mats

The floor mats should be hoovered or swept clean regularly. Especially during the wintertime, they should be taken out and dried.
Clean thoroughly where the mats were on the floor.
Spots on textile mats can be removed with a mild detergent.

BEFORE A LONG-DISTANCE TRIP

If you are thinking of taking a long journey with your car, you should have it checked at a Volvo workshop. You will enjoy your journey better if you know that your car is in perfect trim. Irritating incidents can be avoided as well as expensive and time-absorbing stoppages. Wherever you go there should be a Volvo workshop within easy call to attend to your car if required. However, it is always a good idea before making a trip to ensure that, at least on a minor scale, you have with you a comprehensive touring kit. This is particularly the case if you anticipate widely varying conditions as regards climate, roads and the prevalence of much dust. Many workshops stock special kits for this purpose. Remember when filling up with fuel to observe the existing fuel recommendations. If you prefer to look over your vehicle yourself, the following tips are worthwhile noting:

1. Check the brakes, front wheel alignment and steering gear.
2. Check the engine and drive units with regard to fuel, oil, coolant leakage.
3. Examine the tyres carefully. Replace worn tyres.
4. Check that the engine is running satisfactorily and that the fuel consumption is normal.
5. Examine the state of charge of the battery and clean the terminals.
6. Check the tool equipment.
7. Check the lighting.

COLD WEATHER

When cold weather is on the way, it is time to think of the winter servicing of your car. The first night of frost can come as a unpleasant surprise unless preventive precautions have been taken.

Engine cooling system

A good quality anti-freeze should be used all the year round. Thus, the cooling system should always contain water plus anti-freeze and rust inhibitor, even during the summer.
Experience has also shown that extremely weak anti-freeze solutions (10-25%) are very unfavourable from the point of view of rust protection. For this reason, the quantity of anti-freeze should amount to about 50 % of the coolant, that is, 6.2 litres (11 Imp. pints = 13 US pints), this lowering the freezing point to -35° C (-31° F).
Radiator spirit is not recommended as an anti-freeze agent since it evaporates at normal engine temperature.

Engine lubricating system

During the winter multigrade oil or engine oil SAE 10 W should be used for the engine lubricating system. At very low temperatures (below -20°C = -4°F) multigrade oil SAE 5W-20 is recommended. These oils reach the lubricating points in the engine more easily at low temperature and also facilitate cold starting. See page 43.

Engine fuel system

During the wintertime with large variation in temperature, condensation water forms in the fuel tank and this can impair the running of the engine. This can be eliminated by adding suitable carburettor spirit (but not methylated spirit) to the fuel. Add spirit before filling the fuel tank with fuel. Also, there is less risk of condensation water forming if the tank is kept well-filled.

Electrical system

The electrical system in the vehicle is subjected to greater stresses during the winter than during the warm summer months. The lighting and starter motor are used more and since the capacity of the battery is also considerably lower at low air temperature, the state of charge must be checked more often and, if necessary, the battery charged. If the battery voltage is excessively low, there is risk of the battery being damaged by frost.

Brake system

During very cold weather the brakes are subjected to splash and condensation water which can result in the parking brake freezing up if left on.
When you park the car, do not apply the parking brake but engage first gear or reverse and if possible place blocks behind the wheels. See also page 25.

Windscreen washer

Just as anti-freeze is added to the cooling system during the winter to prevent frost damage, anti-freeze should also be added to the water container for the windscreen washers. This is particularly important because the windscreen during the winter frequently becomes dirty and is often splashed with water which rapidly freezes and thus necessitates the frequent use of the windscreen washers and wipers. Your Volvo dealer can supply you with suitable anti-freeze for this purpose.

Anti-freeze for door locks

A frozen door lock is one of the most irritating things that can happen to a car owner. Many valuable minutes early in the morning can be wasted warming up keys and melting ice in locks. Remember this in good time and lubricate the locks in advance with some suitable anti-freeze agent. Such agents are now available in small handy tubes which can easily find room in a handbag or coat pocket.

WHEN THE ENGINE STALLS OR WILL NOT START

The information given below is only intended to serve as a guide in localizing and temporarily correcting minor faults. After having carried out any such measures, have them checked and adjusted by an experienced mechanic.

The engine does not start although starter motor turns it over at normal speed

1. Check to make sure there is fuel in the tank.
2. (B 30 A) If the engine is hot, start the engine with the accelerator pedal fully depressed.
3. (B30 E) Check to make sure the fuel pump is functioning properly. This is done by turning the ignition key to driving position. This will run the pump for 1 to 1 1/2 seconds. If the pump does not function, check to make sure that the pump fuse is not blown.
4. (B30 E) Attn. Do not touch the accelerator pedal if the engine is cold.
   If the engine is hot, start it with the accelerator pedal depressed halfway. Avoid repeated short attempts at starting. Instead, let the starter motor run a little longer (max. 15-20 seconds) at each try.
5. With damp weather, when flashover is possible, wipe the spark plug isolators clean. Release the distributor cap and wipe it dry.
   Check to make sure that the ignition leads are properly fitted in the distributor head and ignition coil.
6. (B 30 A) Check to make sure that the fuel pipe connections to pump and carburetor do not leak and that fuel reaches the carburetor.
7. (B30 E) Check to make sure that all contacts for sensors and injectors are properly fitted.
8. If the engine turns over without starting, there may be too much fuel in the cylinders, with damp plugs as a result. Screw out the plugs and wipe them dry. Check the electrode gap.

If the engine still does not start

1. Remove the ignition lead from each plug in turn. Hold the end of the lead about 1/4" from the cylinder block while turning round the engine with the ignition switched on. If there is a strong, spark, the fault is probably in the spark plugs, so these should be changed.
2. If only a weak spark is obtained or none at all, check to see whether the ignition leads are properly inserted in the distributor and ignition coil.
3. Remove the distributor cap, check and clean all contact surfaces. Check that the contact breakers close properly when the engine is turned over. If the contact breaker arm shaft binds, oil it very sparingly.

If the engine misfires, the reason can be:

1. That one of the ignition leads has loosened in the distributor cover or from the spark plug.
2. That one or more of the spark plugs is coated with soot or oiled up, in which case the plug concerned should be cleaned or changed and the spark plug gap adjusted.
3. That the distributor cap and rotor arm are cracked or damaged.
4. That one of the ignition leads is in poor condition.
5. That the ignition points gap in the distributor is insufficient or non-existent.
6. That the ignition points are badly burned.
7. Fault in fuel systems electronic unit (B 30 E). This must be checked by a workshop.

How to start your car on a downgrade

Switch on the ignition, pull out the choke if required, engage 3rd gear or even 4th and let the car roll downwards with the clutch pedal depressed. When the speed is up to 15-20 kmph (9-12 mph) and not before, release the clutch pedal slowly.
Being towed: Secure the towline to the towing loop. The car is towed at an even speed in 2nd gear. Try starting as suggested in the previous paragraph.
Warning! Do not attempt to start a car with automatic transmission by rolling it downhill or towing it. See recommendations on page 24.

MEASUREMENTS AND WEIGHTS

Note. Variations can occur due to regulations on different markets.

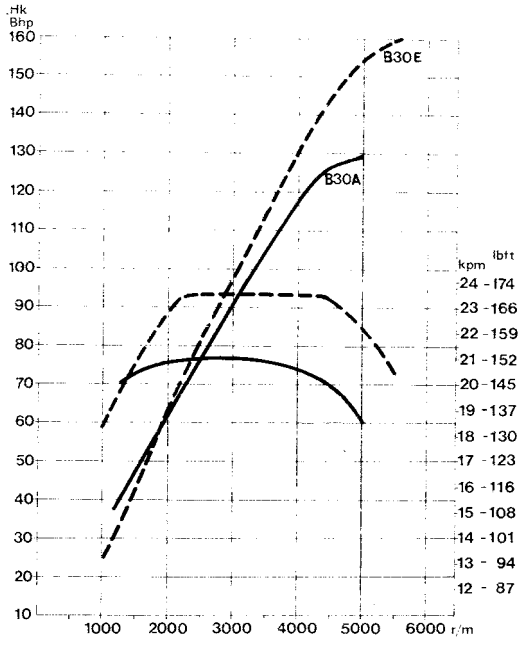
Length	4705 mm	185″
Width	1705 mm	67″
Height unladen (ready to drive)	1437 mm	56.5″
Wheelbase	2720 mm	107″
Ground clearance, fully laden	125 mm	4.9″
Track, front	1350 mm	53.2″
rear	1350 mm	53.2″
Turning circle	10.3 m	33.8 ft

Kerb weight (incl. driver)	1425—1470 kg (3135—3210 lb) depending on vehicle type
Permissible total weight	1850 kg (4070 lb)
Permissible load (excl. driver)	380—425 (835—935 lb) depending on vehicle type
Permissible axle pressure, front	900 kg (1980 lb)
rear	1000 kg (2200 lb)
Permissible roof rack load	100 kg (220 lb)
Max. permissible trailer weight	1200 kg (2640 lb)

ENGINE

	B 30 A	B 30 E
Type designation		
Output (DIN)	130 hp/5000 rpm	160 hp/5500 rpm
Output (SAE)	145 hp/5500 rpm	175 hp/5800 rpm
Max. torque (DIN)	21 kpm (152 lbft) 2500 rpm	23.5 kpm (170 lbft) 2500 rpm
Max. torque (SAE)	22.5 kpm (163 lbft) 3000 rpm	24.5 kpm (177 lbft) 2500 rpm
Number of cylinders	6	6
Bore	88.90 mm (3.50″)	88.90 mm (3.50″)
Stroke	80 mm (3.15″)	80 mm (3.15″)
Displacement	2.978 litres	2.978 litres
Compression ratio	9.3:1	10.0:1
Valves	Overhead	Overhead
Valve clearance, warm and cold inlet	0.50—0.55 mm (0.020—0.022″)	0.50—0.55 mm (0.020—0.022″)
exhaust	0.50—0.55 mm (0.020—0.022″)	0.50—0.55 mm (0.020—0.022″)
Idling speed (warm engine)	800 rpm (700 rpm with BW 35)	900 rpm (800 rpm with BW 35)

Output and torque diagram



Fuel system

Carburettor, type	Horizontal
designation	Zenith-Stromberg 175 CD 2 SE

Cooling system

Type	closed system Positive pressure (approx. 0.7 kp/cm^2 = 10 psi)
Thermostat, begins to open at	82° C (180° F)
fully open at	90° C (195° F)
Fan belt, designation	HC-38×888 HC-38×988

Ignition system

Firing order	1—5—3—6—2—4
Ignition setting stroboscope setting (vacuum governor disconnected)	
B 30 A	10° BTDC at 600—800 rpm
B 30 E	10° BTDC at 700—800 rpm
Spark plugs, B 30 A	Bosch W 200 T 35*
B 30 E	Bosch W 225 T 35*
spark plug gap	0.7—0.8 mm (0.028—0.032″)
tightening torque	3.5—4.0 kpm (25—29 lbft)
Distributor, direction of rotation	Anti-clockwise
ignition points gap	0.25 mm (0.010″)

* or corresponding

Electrical system

Voltage	12 V
Battery, type	Tudor 6 EX4 F o.p.*
capacity	60 Ah
electrolyte, specific gravity	1.28
recharged at	1.21
Alternator max. output	770 W
max. current	55 A
Starter motor, output	1 hp

* or corresponding

Lamp bulbs (12 V)	**Power**	**Socket**	**Number**
Headlights	45/40 W	P 45 T	2
Foglights	55 W	P 14,5 s	2
Parking lights, front	5 W	Ba 15 s	2
Flashers, front and rear	32 cp	Ba 15 s	4
Stop lights — Rear lights	32/4 cp	BAY 15 d	2
Reversing lights	15 W	Ba 15 s	2
License plate light	5 W	SV 8.5	2
Interior light	10 W	SV 8.5	1
Glove compartment light	2 W	Ba 9 s	1
Engine and luggage compartment lights	18 W	SV 8.5	2
Instrument light	3 W	W 2.2 d	2
Light, heater controls	1.2 W	W 1.8 d	3
Clock light	2 W	Ba 7 s	1
Side marker lights	5 W	Ba 15 s	4
Warning lamps:			
charging	1.2 W	W 1.8 d	1
turn indicators	1.2 W	W 1.8 d	1
brakes	1.2 W	W 1.8 d	1
headlights	1.2 W	W 1.8 d	1
oil pressure	1.2 W	W 1.8 d	1
elec. heated rear window	1.2 W	W 1.8 d	1
overdrive	1.2 W	W 1.8 d	1
emergency warning flashers	1.2 W	W 1.8 d	1
choke	1.2 W	W 1.8 d	1
Shift positions, autom. transm.	1.2 W	W 1.8 d	1

Fuses (in ordinary fusebox)

4	5 A
4	8 A
1	16 A

Fuse (in fusebox, engine compartment)

3	8 A (B 30 E)

POWER TRANSMISSION

Clutch

Release lever free travel approx. 4—5 mm ($^3/_{16}$″)
with right-hand drive 2—3 mm ($^3/_{32}$″)

Gearbox

Type designation	**M 400**	**M 410**	**BW 35**	
Reduction ratios:				
1st speed	3.54:1	3.54:1	2.39:1	× the converter ratio
2nd speed	2.12:1	2.12:1	1.45:1	× the converter ratio
3rd speed	1.34:1	1.34:1	1:1	× the converter ratio
4th speed	1:1	1:1	—	× the converter ratio
(with overdrive)	—	0.797:1	—	× the converter ratio
Reverse	3.54:1	3.54:1	2.09:1	× the converter ratio

Rear axle

Type	Hypoid bevel gear	
Reduction ratio	3.73:1	3.31:1 (for BW 35)

Vehicle speed, kmph (mph) at 1000 engine rpm

Final drive Gearbox	3.73 M 400	3.73 M 410
1st speed	8.9 (5.5)	8.9 (5.5)
2nd speed	14.8 (9.3)	14.8 (9.3)
3rd speed	23.5 (14.6)	23.5 (14.6)
4th speed	31.5 (19.6)	31.5 (19.6)
4th speed +overdrive	—	39.5 (24.6)
Reverse	8.9 (5.5)	8.9 (5.5)

FRONT WHEEL ALIGNMENT

The alignment values apply to an unladen car but include fuel, coolant and spare wheel.

Toe-in	2—5 mm ($^1/_8$″)
Camber	0 to +$^1/_2$°
Caster	0 to +1°
King pin inclination	7.5°

WHEELS AND TIRES

Rim size	5$^1/_2$ J 15 F.H.
Tyre size	165 SR 15, 165 HR 15

Air pressure cold tyres, psi (kp/cm^2)	Front	Rear
1—3 persons	27 (1.9)	27 (1.9)
Fully loaded	29 (2.0)	34 (2.4)

For sustained high speed driving over 75 mph, the pressure must be increased by 0.3 kp/cm^2 (4 psi). However, total pressure must not exceed 2.5 kp/cm^2 (36 psi).

CAPACITIES

Fuel tank	58 litres (12.8 Imp. galls = 15.3 US galls)
Cooling system	12.4 litres (2.7 Imp. galls = 3.3 US galls) (of which expansion tank 1.5 litres = 3.2 Imp. pints = 2.6 US pints)

Oil capacity,

engine, at oil change	5.2 litres (9.0 Imp. pints = 11.0 US pints)
incl. oil filter	6.0 litres (10.6 Imp. pints = 12.6 US pints)
transmission (M 400)	0.6 litre (1.1 Imp. pints = 1.3 US pints)
(M 410)	1.4 litres (2.5 Imp. pints = 3.0 US pints)
(BW 35)	8.4 litres (14.8 Imp. pints = 17.7 US pints)
rear axle	1.6 litres (2.8 Imp. pints = 3.4 US pints)
servo steering	1.2 litres (2.1 Imp. pints = 2.5 US pints)

TOOL KIT

Box spanner for wheel nuts and spark plugs
Tommy bar for box spanner
Philips screwdriver
Open-end spanners (2)

Symbols

Brake fluid
Grade: SAE J 1703.
SAE 70 R3
can also be used

Rear axle oil
Grade: Hypoid oil
Viscosity: See page 45

Special lubricants
See resp. note

Light engine oil

Engine oil
Grade: For Service MS
Viscosity: Multigrade
See also page 43

Notes to lubricating chart

Note 1. The wheel bearings are packed at the factory with a special type of grease intended to last the entire lifetime of the bearings. In connection with such workshop operations involving uncovering the wheel bearings, the bearings should be cleaned and then lubricated with high-class, durable grease according to the instructions in the service manual. Except on the above occasion, subsequent adding or changing of lubricant is not required.
The rear wheel bearings are lubricated, so changed of lubricant is unnecessary. After the bearings have been removed, however they should be lightly greased with wheel bearing grease.

Note 2. Servo steering: Check that the oil level in the servo steering oil container is 5-10 mm (5 1/6") above the level mask. Use Automatic Transmission Fluid. Type A or Dexron.

Note 3. Check that the fluid reaches up to the MAX mark. (For right-hand drive, check also clutch fluid level.)

Note 4. Lubricate the felt wick under the rotor and fill a few drops of light engine oil into the lubricating cup.

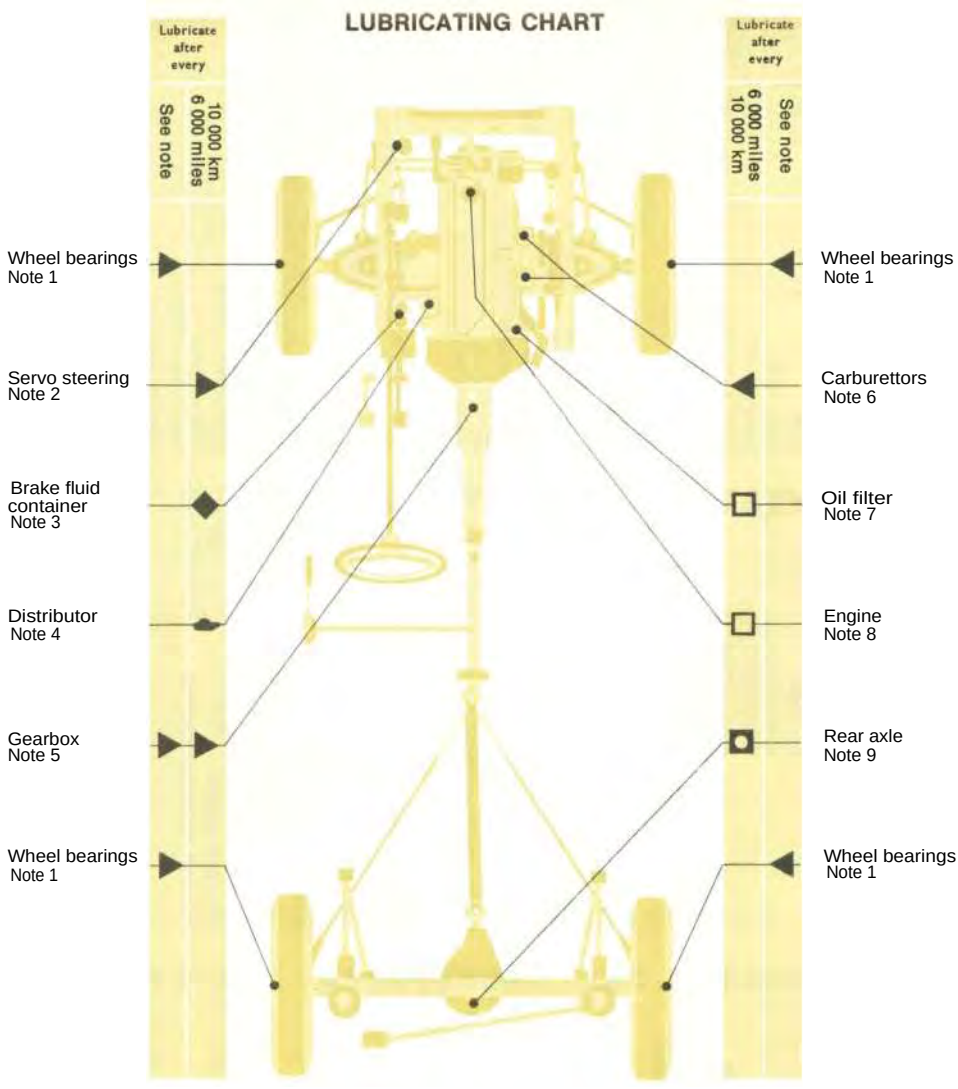
Note 5. Check every 10 000 km (6000 miles) that the oil reaches up to the filler plug. Concerning oil change, see page 44.
NOTE. The type of gearbox will decide the type of lubricant to be used.

Note 6. At every engine oil change check that the oil level in the centre spindle of the carburettors reaches up to about 1/4" (6 mm) from the edge of the spindle. Use Automatic Transmission Fluid (ATF).

Note 7. Change the oil filter every 10 000 km (6 000 miles). See page 47.

Note 8. Check the oil level when filling the tank. Concerning oil changing, see page 43.

Note 9. Check every 10 000 km (6000 miles) that the oil reaches up to the filler plug. Concerning lubricant for rear axle with differential lock, see page 45.



Oil capacities

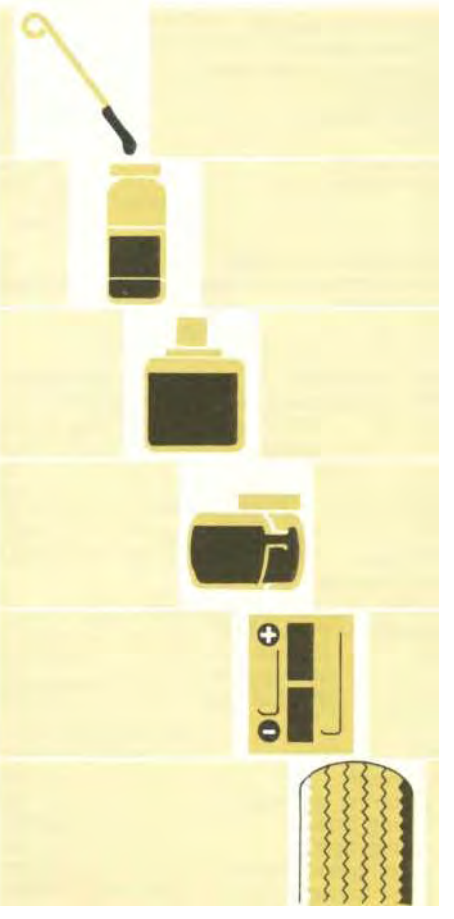
Engine excl. oil filter	approx. 5.2 litres (9.0 Imp. pints = 11.0 US pints)
incl. oil filter approx.	approx. 6.0 litres (10.6 Imp. pints = 12.6 US pints)
Gearbox, M 400	approx. 0.6 litre (1.1 Imp. pints = 1.3 US pints)
M 410	approx. 1.4 litres (2.5 Imp. pints = 3.0 US pints)
BW 35	approx. 8.4 litres (14.8 Imp. pints = 17.7 US pints)
Rear axle	approx. 1.6 litres (2.8 Imp. pints = 3.4 US pints)
Steering box (meth.)	approx. 0.6 litre (1.1 Imp. pints = 1.3 US pints)
Servo steering	approx. 1.2 litres (2.1 Imp. pints = 2.5 US pints)

WHEN FILLING THE TANK

Check to make sure you get the right octane rating, that is,

B 30 E: 97 octane
B 30 A: 97 octane

When driving for the most part in town traffic, fuel with an octane rating of 100 is recommended for the B 30 A engine.



Also check:

1. Oil level in engine
   The level should be between the marks on the dipstick.
   If necessary top up with multigrade oil, see also page 43.

2. Coolant level
   The level should be between the MAX and MIN marks on the expansion tank.
   If necessary top up with a mixture of 50 % anti-freeze and 50 % water.

3. Water level in windscreen washer container
   The windscreen washer container should always be well filled. (During the winter with water and anti-freeze.)

4. Brake fluid level
   Without taking off the cap, check that the level is above the MIN mark.
   If necessary top up with brake fluid SAE J 1703.

Every other time the following should also be checked:

1. Acid level in battery
   The level should be up the lower edge on the slit tubes in the cover.

2. Pressure in tyres
   Recommended tyre pressure, see page 67.

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