

Volvo AB, Göteborg, Sweden

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Source – Volvo AB, Göteborg, Sweden

Introduction

The Volvo 1800 S is a two-door sports car. The car is a two-seater but there is space for a further two passengers in the rear seat. The body is of integral construction so there is no frame as such. The front and rear suspension, the engine and the transmission are attached directly to the body. The body surface is cellulose applied over a rust-protective primer.

The car is protected from theft by having the ignition switch and the ignition coil connected through the medium of armored cable.

The instruments have been located on the instrument panel so that they are very easy to see and in keeping with the sports character of the car: revolution counter, temperature gauge for oil as well as water, loud tone horn, etc. The operation of the various controls and adjusting instructions for the seats, etc are described in this chapter in more detail.

Description

Engine

The engine is a four-cylinder, water-cooled gasoline engine with overhead valves. The max output is 108 b.h.p (SAE), the compression ration 10:1 and the capacity 1.78 litres (108.6 cu.in)

Fuel system

The engine is fitted with twin 1 ¾" SU horizontal carburettors. The fuel is fed from the tank to the carburettors by a fuel pump driven by a cam on the engine camshaft. There is a fuel filter incorporated in the fuel pump and this filter traps any water and other impurities in the fuel.

Lubricating system

Engine lubrication is taken care of by means of a gear pump, which sucks oil from the oil pan on the lower part of the engine and forces it through the oil cleaner out to all the lubricating points on the engine. The oil is cooled in an oil cooler, water from the engine cooling system circulating through the mantle on the oil cooler,

Cooling system

The engine is water-cooled and has a pressure system. Cooling water circulation is taken care of by a pump, which is fitted, on the fan shaft. A thermostat, which does not open until the temperature reaches 76 oC (ca 170 oF) prevents the cooling water from passing through the radiator before the engine has reached its normal operating temperature.

Steering gear

The car is fitted with a cam and roller type steering gear. Movements of the steering wheel are transmitted via the worm on the steering rod to the roller on the pitman arm shaft, which, in its turn, influence the wheels through the medium of the steering rods.

Brakes

The car is fitted with two independent brake systems, a foot brake system and a hand brake system.

Hand brake system

This is mechanical and only influences the brakes on the rear wheels. Movement of the hand brake lever is transmitted through a series of pull rod and cables to the rear wheel brake levers which then apply the brakes.

Foot brake system

This is hydraulic and influences all four wheels. The hydraulic system consists of a master cylinder filled with brake fluid which, when the brake pedal is depressed, transfers the brake pressure through the fluid in the line to a further brake cylinder which further increases the pressure before it continues to the brake cylinder at the wheels. The plungers in these wheel cylinders are pressed outwards and the brakes are applied.

The front wheel brakes are of the disc type and the rear wheel brakes of the drum type.

Wheels and tires

The car is fitted with pressed steel wheels with hubcaps. All the wheels are carefully balanced. The tires are the braced tread type with inner tubes specially designed for the stresses occurring at high speed. The tire size is 165x15.

Electrical system

The electrical system has a voltage of 12 volts and is fitted with a voltage control generator. The starter motor is operated from the instrument panel through the ignition key. The key is also used to switch on the other electrical equipment. The cables to the headlights, parking lights and internal lighting, however, are not connected over the ignition key switch but can be used independently of the ignition key.

Lighting

Lighting on the front of the car consists of the headlights with full and dimmed beams as well as the combined lamps for directional signal flashes and the parking lights.

Lighting at the rear consists of combined lamps for the directional signals and the taillights and the brake warning lights. There are also two lamps for rear license plate lighting.

Internal lighting consists of two lamps located at the rear side pillars. There are bulbs for indirect instrument lighting. For bulb replacement see page 24.

Fuses

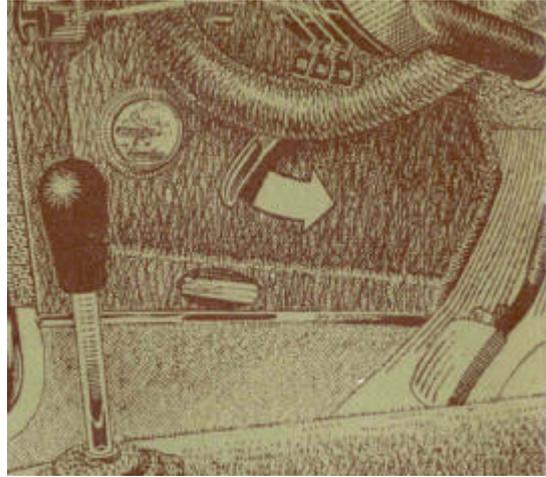
The electrical equipment is protected by means of three 35 A fuses, located in fuse boxes on the left-hand wheel housing.

1 Flasher and parking light left	21 Fuses	42 Heater controls
2 Headlight, left	22 Revolution counter	43 Cigarette lighter
3 Horn	23 Fuel gauge	44 Map-reading lamp
4 Loud tone horn	24 Clock	45 Door switch
5 Headlight right	25 Brake switch	46 Switch for roof lamp
6 Flasher and parking light right	26 Instrument lighting	47 Door switch
7 Relay for headlight signalling	27 Instrument lighting	48 Roof lamp
8 Horn relay	28 Instrument lighting	50 Tail light, left
9 Distributor	29 Windshield washers	51 Fuel gauge sender
10 Generator	30 Windshield wipers	52 License plate lighting
11 Charging relay	31 Warning lamp, charging	53 Tail gate, right
12 Foot dimmer switch	32 Warning lamp directional signals	A=White
13 Horn button	33 Warning lamp, full headlights	B=Black
14 Lever for loud tone horn	34 Heater	C=Blue
15 Ignition coil	35 Switch, map-reading lamp	D=Green
16 Starter motor	36 Instrument lighting	E=Light green
17 Battery	37 Instrument lighting	F=Yellow
18 Directional signal switch	38 Instrument lighting	G=Brown
19 Flasher devise, directional signals	39 Controls for windshield washers and windshield wipers	H=Red
20 Revolution counter sender	40 Lighting switch	I=Purple
	41 Ignition switch	

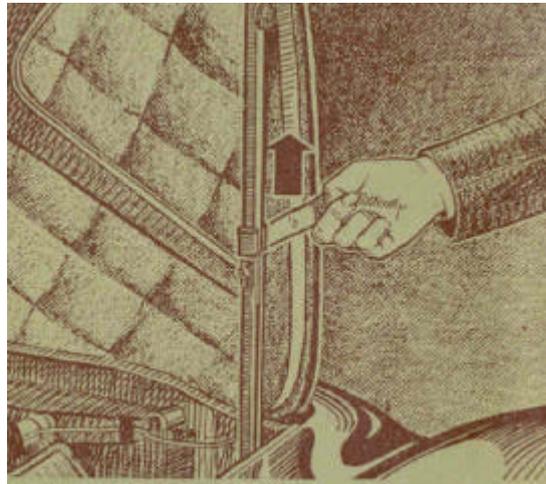
Body

Hood

The hood is fitted with a locking device, which is operated from the driving seat by means of a handle to the left under the instrument panel. This releases the hood, which can then be lifted up after the handle has been moved forward and downward.



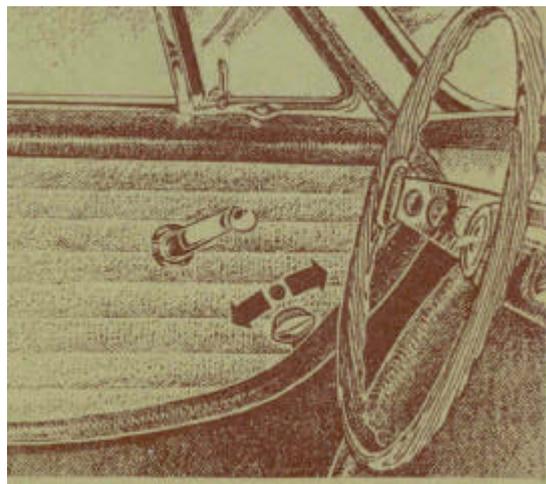
The hood remains in its lifted position by means of a stay, which is automatically locked by a built-in catch, when the hood is lifted all the way up. When the hood is to be lowered again, the catch sleeve is moved upward at the same time as the hood is lifted to its outer position and then lowered.



Doors and locks

The car is fitted with key locks for both doors, the luggage compartment and the fuel tank cap. Before the doors can be opened, the button in the door handle must be pressed in. The doors can be locked from the inside by moving the handle forward as shown in the illustration. To open the door, move the handle to the rear.

If you happen to lose your keys, contact your nearest Volvo dealer who will supply you with new keys if you inform them of the code number that was on the missing keys.



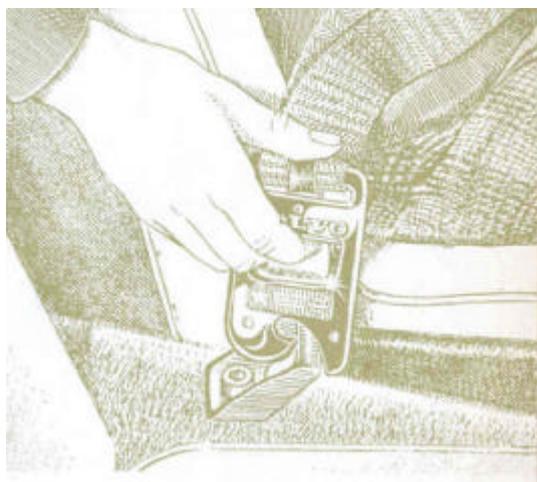
Safety belts

Standard equipment on this vehicle includes safety belts for both the front seats. Make a habit of fitting the belts as soon as you get into the car. The length of each belt can be easily adjusted by means of the part attached to the floor. Adjust the length of the belt very carefully. It should not be too tight, but on the other hand, should not be too loose since it will then not function properly.



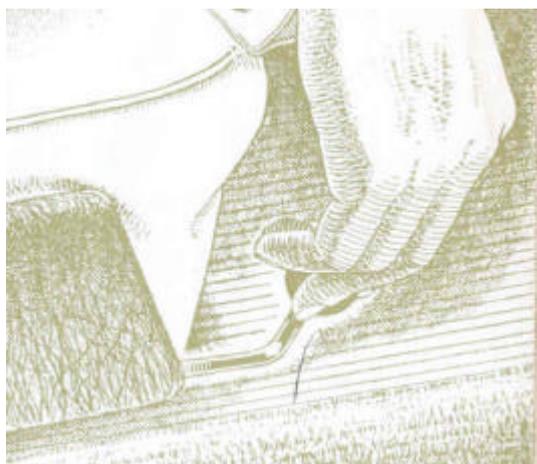
The belt is taken down from the button on which it hangs by pressing in the spring-loaded handle in the slot. The belt is then fitted with one part round the waist and the other part over the shoulder and the breast and it is then clipped into position on the fitting between the seats. To remove the belt, press in the spring-loaded handle in the slot.

Check now and then that the bolts retaining the belt are well tightened. If the belts have become dirty they can be cleaned with water and synthetic detergent.

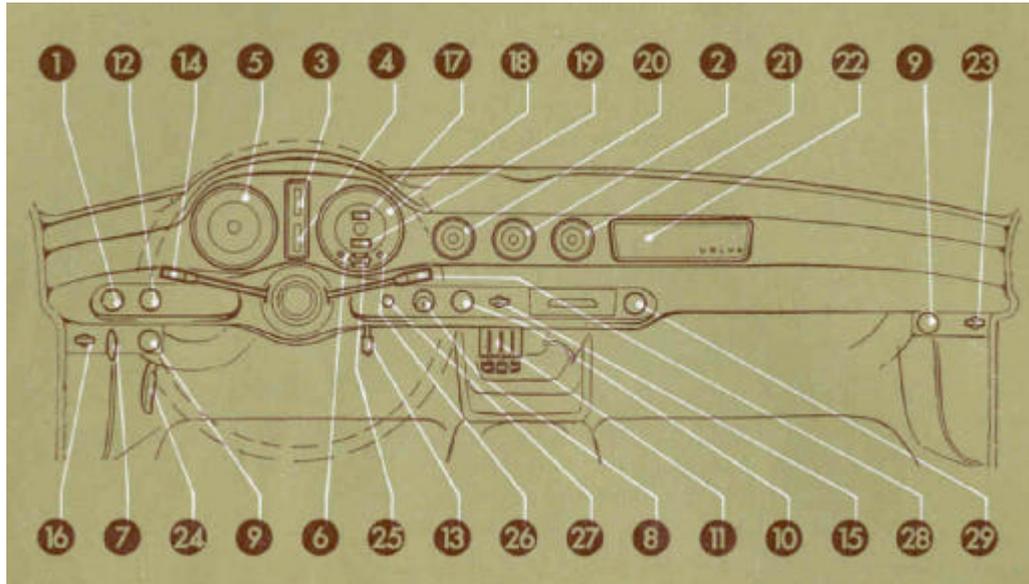


Adjusting the seats

The front seats can be adjusted backwards and forwards after the handle on the adjuster rail has been moved to one side. Exert pressure with your feet on the floor and move the seat to the most comfortable position. The angle of the backrest can be adjusted by means of the screw at the bottom behind the seat.



Instruments and operating controls



- | | | |
|---|--|--|
| 1. Control for windshield wipers and windshield washers | 10. Fan controls | 20. Fuel gauge |
| 2. Oil pressure gauge | 11. Heater and ventilation controls | 21. Clock |
| 3. Temperature gauge for cooling water | 12. Lighting switch | 22. Recess for radio |
| 4. Temperature gauge for engine oil | 13. Zero setting control for trip meter | 23. Switch for map reading lamp |
| 5. Revolution counter | 14. Directional signal switch with built headlight flasher | 24. Hood catch |
| 6. Warning lamp for charging | 15. Overdrive switch | 25. Warning lamp for directional signals |
| 7. Choke control | 16. Switch for inner lighting | 26. Warning lamp for full headlights |
| 8. Ignition switch with built in starter | 17. Trip meter | 27. Warning lamp for overdrive |
| 9. Control for direct ventilation | 18. Speedometer | 28. Lever for loud tone horn |
| | 19. Mileometer | 29. Cigarette lighter |

1 Control for windshield wipers and windshield washers

The windshield wipers are electrical and can be set to two speeds by pulling out the control. If pulled out to the first notch, the wipers run at half speed, and if pulled out two notches, they run at full speed. When the control is pushed in the whole way, the windshield wipers automatically stop in their parked position.

Turning the control knob in a clockwise direction operates the windshield washers. The windshield washers can be used even when the windshield wipers are switched off. The fluid container for the windshield washers is located under the hood and contains about one litre.

Never let the windshield wipers run on a dry and dusty surface since this can easily scratch the glass.

2 Oil pressure gauge

The oil pressure is dependent on the temperature of the oil and the engine speed. Since the engine is fitted with an oil cooler, there can be some slight delay before the oil pressure gauge gives a reading. If the engine is cold, it will show relatively high pressure, which is normal. If the pressure should at any point go down to zero, the engine must be stopped immediately and the reason determined. See under "driving" page 13 &15

3 Temperature gauge for cooling water

The temperature gauge shows the temperature of the cooling water and thus the working temperature of the engine. The temperature should normally be 70-90C (158-196F). If it should indicate a high temperature for a long time, this can depend upon the fact that the cooling system channels are blocked and are preventing circulation or that the thermostat has been damaged. In such cases the cooling system should be cleaned (see 21) or the thermostat should be replaced.

4 Temperature gauge for engine oil

The oil temperature is a function of the engine speed and can vary quite considerably. Temperatures above 130C (265F), however, should not be permitted.

5 Revolution counter

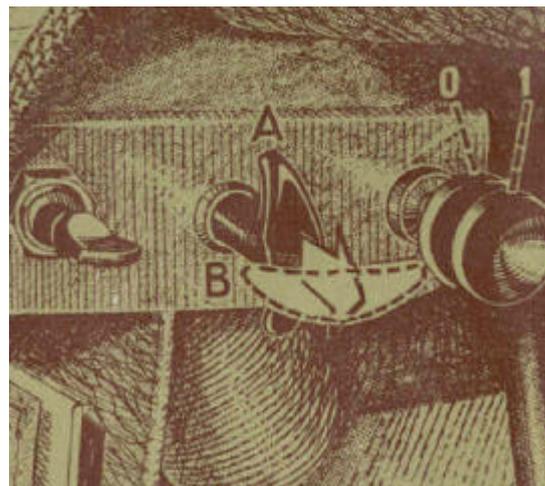
The revolution counter shows the engine speed in revolutions per minute. The indicator should not go up as far as the red field on the instrument.

6 Warning lamp for charging

The lamp lights up when the battery is discharging which is normal at idling speed. If you accelerate a little, the lamp should go out. Should the lamp remain on while you are driving, this usually means that there is some fault in the electrical system or that the fan belt is insufficiently tensioned and is slipping on the generator pulley. The result of this will be poor charging.

7 Choke control

To use the choke control pull it out vertically (A) and lock it by turning it quarter of a turn (B). To return the control, twist it back to its vertical position. When the engine is thoroughly warmed up the choke control should be all the way in. See under "Driving", page 13



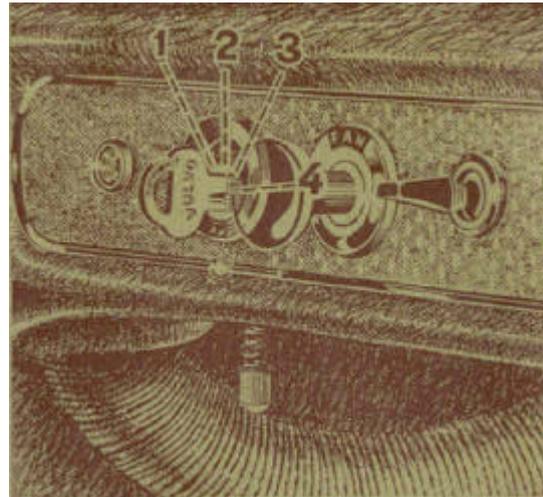
8 Ignition switch with built in starter

1 *Radio position*. In this position all the electrical equipment in the car can be used without having the engine running.

2 *Neutral position*

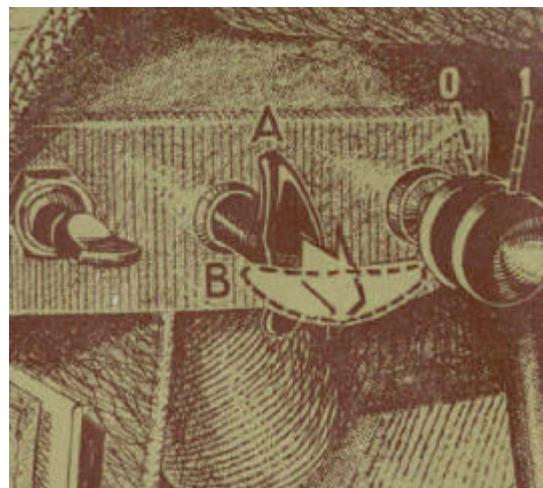
3 *Running position*

4 *Starting position*. To start the engine turn the key to this position and the starter motor will be cut in. As soon as the engine starts release the key which will then return to position 3.



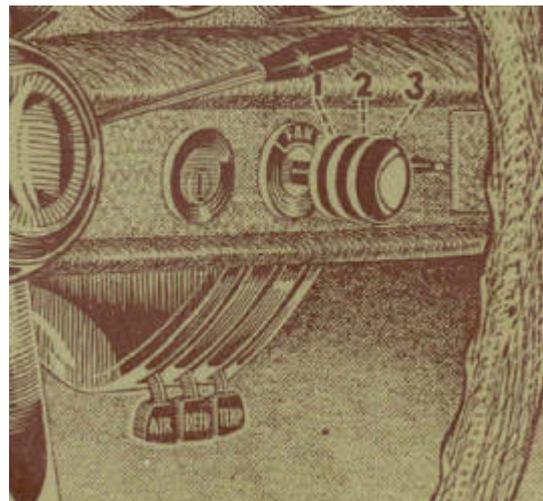
9 Control for direct ventilation

There are two scuttles for direct ventilation, one on the right side and one on the left side. These are controlled by means of the knob which is pulled out to position 1.



10 Fan control

The fan control has three positions. In position 1 the fan is switched off, in position 2 it runs at full output and in position 3 it runs at half output. The temperature and the distribution of air are controlled by means of the fan control.



11 Heater and ventilation controls

The heater and ventilation system is controlled by means of three levers.

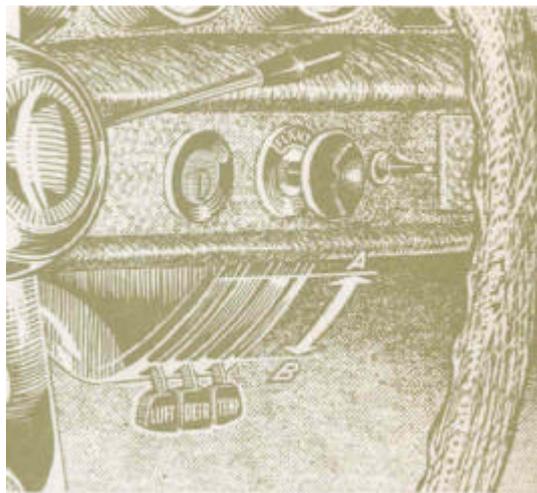
“AIR” = Stream of air inside the car

“DEFR” = Air to the windshield

“TEMP” = Control for the temperature of the incoming air.

The controls are closed in their upper position and fully open in their lower position.

The fan can then be used to increase the flow of cold or warm air. The heater is connected to the engine cooling system and also to a thermostat which maintains a constant temperature.



When the “Temp” control is altered, there will be a slight delay before the thermostat in the heater has stabilised itself at the desired temperature. In very cold weather, particularly if the car is full of passengers, there can be misting on the windows. The best way to get rid of this or to avoid it is to have the ventilator window fully or partially open at the same time as the fan motor is running at full output and the defroster control in its fully open position.

12 Lighting switch

HEADLIGHTS

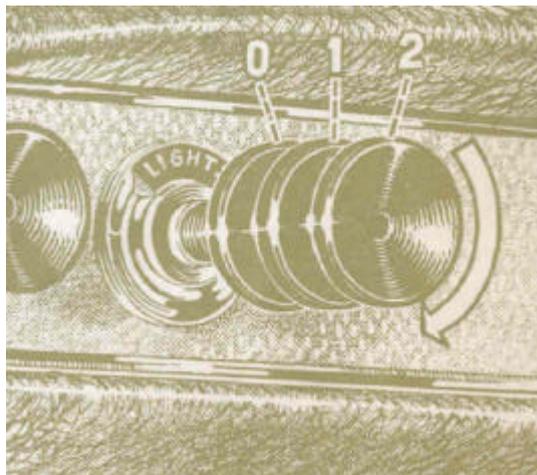
The headlights on the car are operated by means of a pull control on the instrument panel as well as by a foot dimmer switch to the left on the floor plate.

Position 0 = Off

Position 1 = Parking lights

Position 2 = Full or dimmed headlights depending on position of the foot dimmer switch.

The headlights are switched from full to dimmed and visa versa by depressing the foot dimmer switch.



INSTRUMENT LIGHTING

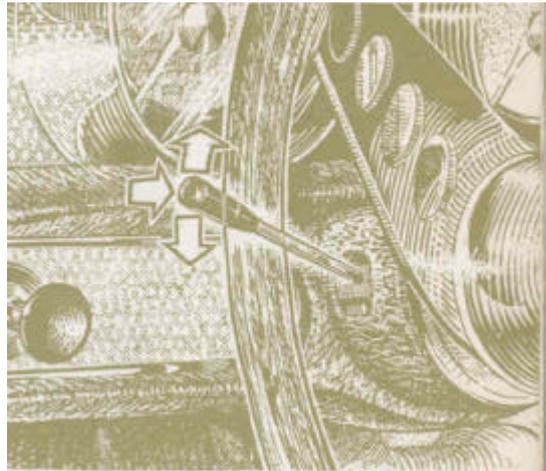
Turning the headlight switch knob can regulate the intensity of the instrument lighting. The further the knob is turned in a clockwise direction, the stronger the instrument lighting will be.

13 Zero-setting control for trip meter

The trip meter is set to zero by pressing up the button and turning it

14 Directional signal switch with headlight flasher

In the directional signal switch there is a built-in switch which lights the headlights on full beam when the switch is pulled upwards towards the steering wheel.



Driving

The driving of your 1800 S should not cause any trouble whatsoever if you follow our advice and instructions in this book. You will soon find out that everything has been well arranged so that you can feel relaxed and drive fast without sacrificing the safety. The brakes and the road holding properties of the car are in direct proportion to the speed at which it is capable of travelling.

The instruments are located so that you can see them at a glance. Stop the car immediately if something should go wrong. It may be a minor point but if it is not remedied in time it can lead to expensive and time-taking repairs.

When you drive your car, always have a little consideration for other road users.

Running in

While it is new you should obviously not run your Volvo as fast as it can go. The reason for this is that during the first period all the vital parts of the car become bedded in so that they can stand up stresses even better. Do not utilise full output for more than short periods during the first 300 miles (500km). It is particularly important that the engine should not be loaded too hard during the very first miles

Keep an eye on the cooling water temperature

When an engine is new, the cooling water temperature can easily go up if the engine is subjected to hard loading. For this reason you should keep an eye on the temperature gauge during the first period.

Inspections during the running-in period

After 600 miles (1000km) operation, the car should be taken to a Volvo workshop for the first guarantee inspection which is free of charge. The control procedures and adjustments carried out here include an oil change in the engine. It is very important to ensure that this oil change is carried out since the oil becomes contaminated comparatively rapidly during the first period.

When the car has been driven 1500 miles (2500km) it should be taken back to the workshop for the final guarantee inspection. The servicing procedure shown in the warranty booklet is then carried out.

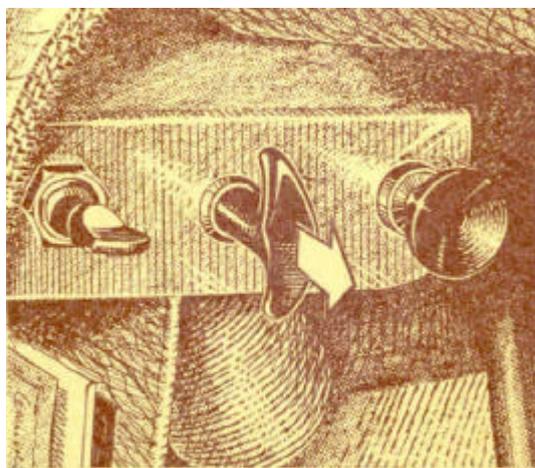
After 300 miles (5000km) the car should be given all-round lubrication and the oil in the engine, transmission and rear axle should be changed. At the same time as the oil in the engine is changed, new oil cleaner should also be replaced with a new unit. The transmission and the rear axle should be carefully cleaned out with flushing oil. Following this mileage, oil changes should be carried out at the intervals shown in the maintenance scheme on page 16 and in the lubrication chart at the end of this book.

All Volvo engines are test-run before delivery, partly in test benches and partly in vehicles on test tracks. We have therefore carefully checked that all clearance is satisfactory and we can thus accept no responsibility for seizing of pistons or bearings depending on careless running in.

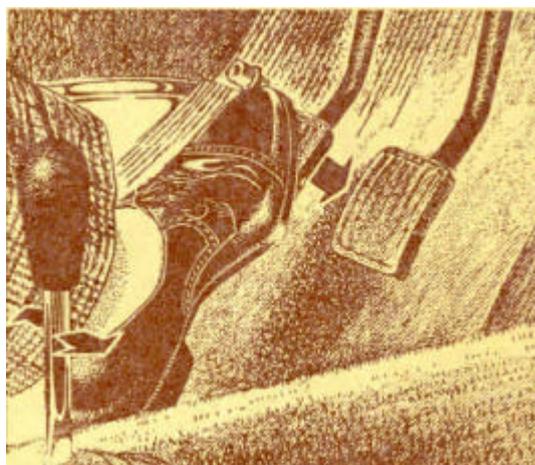
Starting the engine

Cold engine

1. Pull out the choke control the whole way
2. Depress the clutch pedal
3. Turn the ignition key to the starting position. Release the key as soon as the engine starts.
4. Push in the choke control as the engine warms up. Do not let the engine run to fast. In order to get the engine to run evenly when you start driving, it may sometimes be necessary to pull out the choke control a little. Use the choke as little as possible while you are driving. By the time the engine is fully warmed up, the choke control should be pushed right in again.



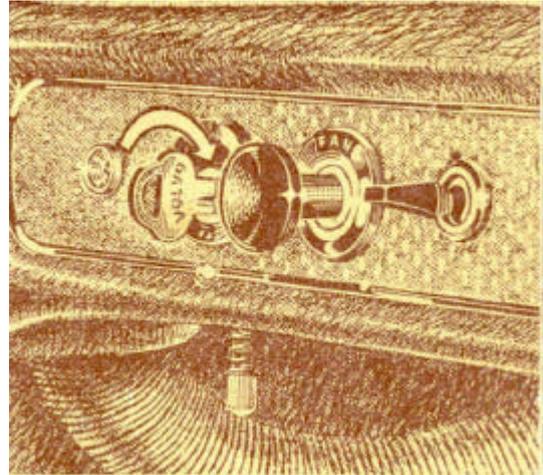
When the engine is started from cold it is important to attain the normal working temperature as quickly as possible in order to avoid unnecessary cold starting wear. For this reason, do not run the engine to long on idling speed, it will attain its working temperature more rapidly when it is subject to loading.



Warm engine

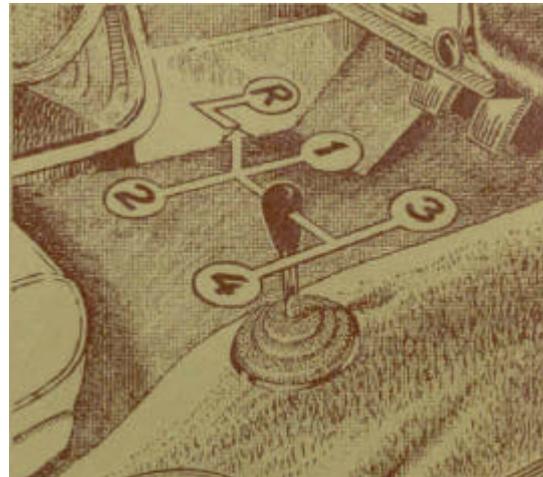
1. Depress the clutch pedal
2. Turn the ignition key to the starting position. Release the key as soon as the engine starts.

You can drive the car as soon as the oil gauge shows a reading. Since the engine is fitted with an oil cooler there can be a slight delay before the oil pressure gauge shows a reading. If the engine is cold, the gauge will show a relatively high reading, which is however normal.



Gear shifting

The transmission is synchronised on all gears. If the synchronising is to work, in a satisfactory way, the clutch must be fully depressed. Let the engine speed go down when shifting to a higher gear, and increase it when shifting to a lower gear. If the engine is to work in the best possible way it is important to suit the point at which the gear shifting is carried out to the speed of the car so that engine speed is maintained within certain limits, neither too high, nor too low. If the engine speed is too low, the result will be poor pulling power and unfavourable loading of the engine and power train.

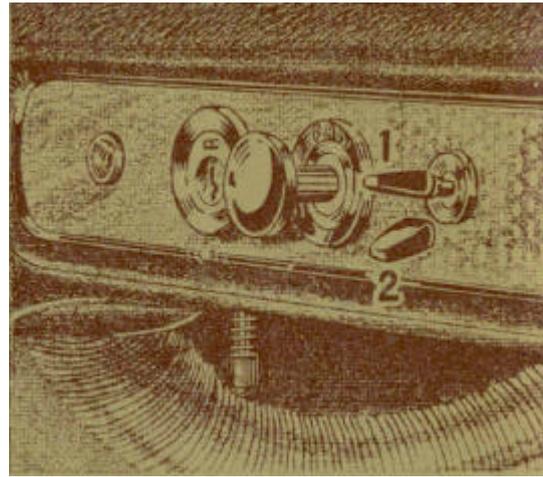


If the engine speed is too high, on the other hand, fuel consumption will be higher, the pulling power of the engine will be decreased and better acceleration will not be obtained. The normal speed range for the engine is 1500-5000 r.p.m. Do not exceed 6500 r.p.m.

Never let the engine labour in a high gear but shift down in good time. If you need good pulling power, however, and the engine is working easily under slight acceleration, this does not prevent you from going down below 1500 r.p.m.

Overdrive

The overdrive (model 18335) which can be engaged when you are running in fourth speed, is operated by means of a switch on the instrument panel. The overdrive is engaged when the switch is moved up. No extra operation of the clutch or accelerator are normally necessary when engaging and disengaging the overdrive. Engagement is, however, easier if the accelerator is kept depressed. When shifting from overdrive to fourth speed, light pressure on the clutch ensures a smoother shift. When the overdrive is engaged, the warning lamp on the instrument panel lights up.



Advice concerning driving

Starting in a garage

Always open the garage doors when you start the car in your garage. The reason for this is that the exhaust gases from the engine always contain the poisonous gas carbon monoxide, which is particularly dangerous, since it is both invisible and odourless.

Air containing only 0.2% carbon monoxide can be fatal if it is breathed in for half an hour

Oil pressure

The oil pressure is dependent on the oil temperature and the engine speed. If the oil pressure should go down to zero at any time, the engine must be stopped immediately. After very hard driving with oil temperature up to about 120C (250F) the oil pressure at idling speed can go down to 0.5 kg/cm² (7lb/sq.in.) which is however quite normal.

Braking

Try to use the brakes a little as possible. Instead use the engine as a brake by releasing the accelerator pedal in good time. Violent braking is only justified in dangerous situations and even in such cases the wheels should never be locked. Remember that the best braking result is obtained if the wheels are permitted to rotate slightly.

Even acceleration and gently braking are typical characteristics of a good driver and also result in the most economical running.

Tires

When the car is delivered, it is fitted with tires that stand up to the stresses occurring during high-speed driving. It is however, very important to maintain the correct air pressure in the tires, particularly when you are driving long distances at a high average speed. It is better to have too much than too little air in the tires. A tire becomes heated up more quickly if it contains too little air. If the temperature in the tires becomes excessively high, the cord and rubber start to separate from each other and this can have catastrophic consequences.

Servicing

Before the car 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 addition to this there are two cost-free guarantee inspections after 600 miles (1000km) and 1500 miles (2500km). The warranty booklet, which is supplied together with the car, contains two coupons, which entitle you to these inspections. If possible let the dealer who supplied the car carry out this work. If our six months guaranty is to apply one condition is that the car has otherwise been serviced in accordance with the instructions in this book.

The servicing of the car should then follow the procedure in the service book, which is based on a system of coupons with all-round lubrication and service inspections after every 3000 miles (5,000 km). You can obtain this book from your dealer or directly from Volvo by sending in the coupon available in the end of the warranty booklet.

In all countries where Volvos are sold, there are ultra-modern workshops with specially trained personnel at your service. All these workshops receive a continuous supply of technical information through the Volvo organisation concerning repairs and adjustments, and they are also in possession of special tools designed at the Volvo factory. Our dealers are therefore best equipped to give your car first-class service, concerning both maintenance and repairs.

The car is serviced in accordance with the service book for fixed prices and the workshop stamp in the service book is evidence of how the car is being serviced, this being a very important point as far as its second-hand value is concerned. If you would prefer to carry out some of the simpler servicing yourself, this chapter contains a little advice about when and how this work is carried out.

Maintenance scheme

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

O = Service workshop operation

X = Operation you can carry out yourself

Operation	Carried out			See Note below
	3,000 miles 5,000 km	6,000 miles 10,000 km	12,500 miles 20,000 km	
Lubricant				
1 Chassis lubrication as shown in lubricating chart	X	X	O	
2 Check oil level in engine				X When tanking
3 Change oil in engine	X			X Spring and fall
4 Check oil level in transmission	X		X	
5 Change oil in transmission	X 1)			
6 Check oil level in rear axle	X 2)			
7 Check oil level in steering box	X			
8 Check brake fluid level	X			
9 Check clutch fluid level				
Engine				
10 Clean oil filter cap		X		
11 Change oil cleaner	O 1)	O		

12 Check valve clearance	○			
13 Clean fuel filter	X			
14 Change air cleaners			X	
15 Check fan belt		○		
16 Check cooling water level				X When tanking
17 Clean out cooling system				X Spring and fall
18 Check spark plugs	○			
19 Change spark plugs			○	
20 Check distribution and ignition timing setting	○			
21 Clean carburettor	○			
Electrical system				
22 Check battery electrolyte level				X When tanking
23 Check state of charge of battery	X			
24 Check headlight alignment		○		
Power train				
25 Clean overdrive strainer			X	
26 Check clutch yoke free play	○			
Brakes				
27 Check the brakes	○			
28 Overhaul the brakes			○	
Front end				
29 Check the front wheel alignment		○		
30 Check ball joints tie rod etc			○	
Wheels and tires				
31 Check tire air pressure				X When tanking
32 Check tighten wheel nuts		○		
Body				X see page 27
33 washing				X see page 27
34 Polishing				X see page 27
35 Cleaning				

- 1) Only after the first 3,000 miles (5,000 km)
- 2) The oil is only changed once: after 3,000 miles (5,000km)

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

- a) Lighting, including brake stop lights
- b) Directional signal flashers
- c) Horn

Lubrication

Lubrication is the most important procedure in servicing a vehicle. The cost of lubricant is insignificant compared with the cost of repairs caused by neglected lubrication. Our recommendations here are based on many years of experience. It is impossible to avoid wear completely but wear can be decreased and prevented to a great extent by regular and careful lubrication.

1 Chassis lubrication

The chassis should be lubricated after certain mileage, according to the instructions in the lubrication chart at the end of this book. All the control linkages on the throttle system, hand brake, etc, should also be sparingly lubricated.

2 Check the oil level in the engine

The oil level in the engine should be checked every time tanking is carried out. This should be done while the engine is warm and the oil level is checked by using a dipstick on the left side of the engine. Dry off the dipstick first to avoid a faulty reading.

The oil level should be between the two marks on the dipstick. It should never be permitted to go down below the lower mark but, on the other hand, it should not be above the upper mark since abnormally high oil consumption will be the result. If necessary, top up with oil of the same type as already being used in the engine, through the oil filler cap on the rocker arm cover.

3 Change the engine oil

The intervals between oil changes depend to a great extent on the driving conditions. During the summer or when the car is being mainly used for long-distance running, it is sufficient to change the oil every 3,000 miles (5,000 km). During the winter and when the car is being used under unfavourable conditions with continuous stopping and starting, the oil should be changed after every 1,500 miles (2,500 km). At the same time the carburettor-damping cylinder should be lubricated with SAE 20 engine oil, see page 22. During the running-in period the oil should also be changed after the first 600 miles (1,000 km)

Oil grade	Viscosities			Oil capacity	
	Below 0C (32F)	0C – 30C (32F – 90F)	Above 30C (90F)	When changing oil	Including oil cleaner
For Service	SAE 10W *	SAE 20 *	SAE 30 *	3.25 litres	3.75 litres

*) or SAE 10 W - 30 multi-grade oil

4 Transmission

5 The oil level in the transmission should be checked after every 3,000 miles (5,000 km). The oil level should be up to the filler hole.

The oil in the transmission should be changed after every 12,500 miles (20,000 km). (In the case of a new or reconditioned transmission, the oil should be changed after the first 3,000 miles (5,000 km) and the transmission should also be carefully rinsed out with flushing oil)

The old oil should be drained off immediately after the car has been run while the oil is still warm. Every other time the oil is changed, the transmission should be cleaned out with flushing oil before the new oil is added.

When draining off the oil from a transmission fitted with an overdrive, note that there is an extra drain plug under the overdrive marked "Drain". When oil is being added it takes some time for the oil to run into the overdrive and for this reason the filling should be carried out relatively slowly. Each time the oil is changed, the overdrive oil strainer should be cleaned – see servicing procedure 25 page 25

Do not use hypoid oil in the transmission.

Transmission oil	Oils grade	Viscosity	Oil capacity
M40	Transmission oil	SAE 80 (all year round)	0.75 litres
M 41	Engine oil	SAE 30 (all year round)	1.8 litres

6 Rear axle

The oil level in the rear axle should be checked after every 3,000 miles, (5,000 km). The oil level should be up to the filler hole.

The oil in the rear axle should be changed after the first 3,000 miles (5,000 km). The old oil is drained off by removing the cover on the back of the housing, and this

should be done immediately after the car has been run while the oil is still warm. The rear axle should then be carefully rinsed out with flushing oil before new oil is added. After this the oil level only needs checking and topping up carried out if necessary.

Oils grade	Viscosity	Oil capacity
Hypoid oil	SAE 80 (all year round)	1.3 litres

7 Steering box

The oil level in the rear axle should be checked after every 3,000 miles, (5,000 km). The oil level should be up to the filler plug. If necessary, top up with new oil of the same grade and viscosity at the already used. The oil in the steering box usually only needs changing when reconditioning of the unit is being carried out. Should the oil however, be changed for some reason, the old oil should be sucked out, by inserting suitable device through the filler hole.

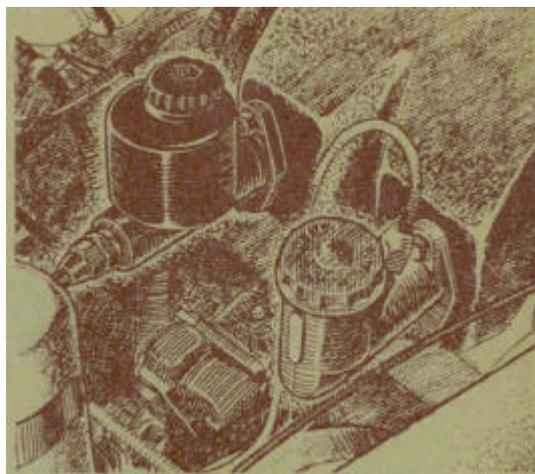
Oils grade	Viscosity	Oil capacity
Hypoid oil	SAE 80 (all year round)	0.2 litres

8 Brake fluid

9 Clutch fluid

The fluid level in the brake and clutch control hydraulic system should be checked after every 3,000 miles, (5,000 km). The fluid should be up to a point about $\frac{3}{4}$ " (15-20mm) below the upper edge of the containers.

Use only brake fluid satisfying the conditions laid down in SAE 70 R3

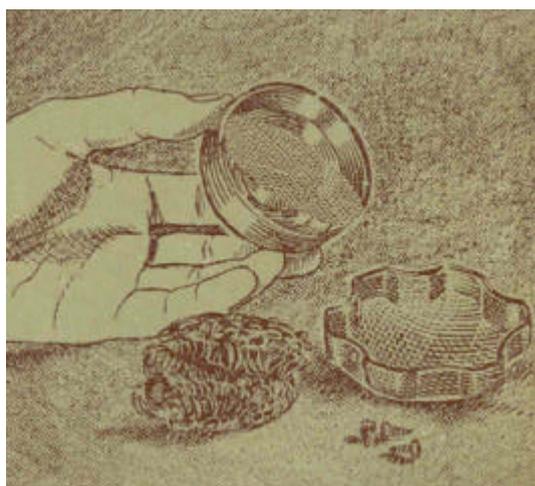


Engine

10 Clean the oil filler cap

The oil filler cap is fitted with a filter to evacuate water vapour and the gases that leak past the piston rings. If this filter should be blocked by dust from the air being sucked in, there will be excess of pressure in the crankcase and this can result in oil leakage. For this reason, this filter should be cleaned after every 6,000 miles (10,000 km). In case of very dusty roads, cleaning should be carried out more often.

Loosen the three screws round the cap and then take off the upper part. Remove the filter and clean the whole assembly thoroughly in clean gasoline.



11 Change the oil cleaner

The engine is fitted with a full flow type oil cleaner, this meaning that all the oil passes through the cleaner on the way from the oil pump to the various lubrication points. Impurities in the oil thus collect in the cleaner and gradually block it. For this

reason it must be changed at regular intervals, after about every 6,000 miles (10,000km). This operation should preferably be carried out by a Volvo workshop. If the oil cleaner is changed without the engine oil being changed, 0.5 litres should be added to the engine.

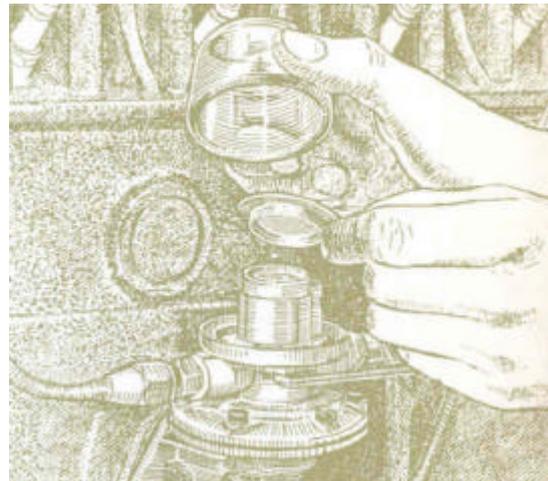
12 Valve clearance

Let your Volvo workshop check the engine valve clearance after every 3,000 miles (5,000 km). Excessively small valve clearance can easily cause burned valves.

13 Clean the fuel filter

In order to avoid dirty fuel from being pumped into the carburetors, the fuel filter should also be serviced. Due to the accessible location of the filter, it is very easy to clean.

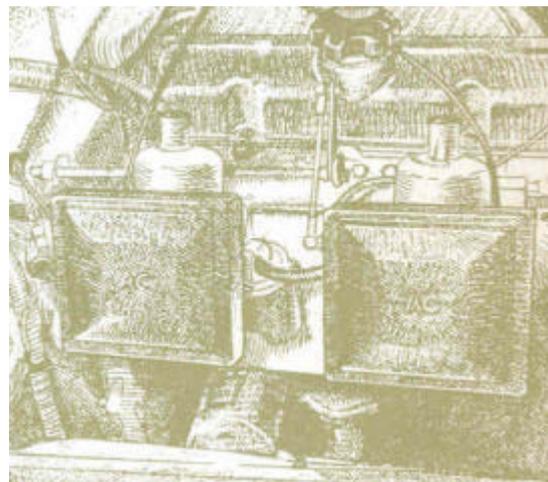
The fuel filter should be cleaned after every 3,000 miles (5,000 km). Loosen the nut and move the bail to one side. Remove the glass bowl and strainer and clean these parts. When the filter is being re-fitted, make sure that the gasket seals properly



14 Change the air cleaners

The air cleaners on the SU carburetors should be replaced with new units after every 12,500 miles (20,000 km). The old unit should be thrown away since the cleaner and the filter are built together in one unit. When driving on dusty roads, it may be advisable to change the air cleaners more often, for example every 6,000 miles (10,000km)

NOTE. The ventilation air to the lower part of the carburettor suction chambers, passes the air cleaner through the two upper holes in the cleaner so it is important to see that the gasket and the air cleaner are fitted correctly in each case, since otherwise these holes will be blocked



15 Check the fan belt tension

After about every 6,000 miles (10,000km) you should let your Volvo Workshop check that the fan belt tension is correct. Due to wear or dirt, this belt can start slipping and the result will be poor cooling and poor generator output. You can easily check the tension by pulling the tips of the fan in their correct direction of rotation. There should be a definite resistance to movement (at a pulling power of 12-14 lb= 5.5-6.5 kg). before the belt starts slipping. A simple but not so reliable way of testing belt tension is to press the fan belt with your thumb at a point midway between the generator and the fan. It should be possible to press down the belt about 1/6" = 3-4 mm with normal thumb pressure.

16 Check the cooling water level

The engine cooling water level should be checked each time the fuel tank is filled. Water is added through the filler opening on the top of the radiator. Be careful when you remove the radiator cap. There are two positions on the cap, one to decrease pressure in the system and a second position to remove the cap.

In order to avoid deposits in the cooling system, only clean water should be used (not containing calcium or iron) together with some rust preventing agent. Rust preventive agent with a mineral oil base must not be used since it can damage the hoses. See page 31 for anti-freeze

Never add cold water to a hot engine. The sudden difference in temperature can cause cracks in the cast material.

17 Clean the cooling system

If the cooling system is to function in an effective manner, all the channels in the engine and the radiator must be free from deposit and impurities. The deposits that build up consist of the salts always present in normal water.

Cleaning can conveniently be carried out in connection with filling or draining of anti-freeze in the fall and spring (see page 31) If necessary, however, the cooling system can be cleaned more often.

18 Check the spark plugs

The spark plugs should be cleaned at a Volvo workshop after every 3,000 miles (5,000 km) and the electrode gaps are checked at the same time.

The plugs can be cleaned by using a brush or a sand blaster and should be blown clean with compressed air. The electrode gap should be 0.028" (0.7 mm). After the spark plugs have been cleaned and adjusted they should be tested in a spark plug tester.

19 Replace the spark plugs

When the electrodes have been burnt down by about 50% all the spark plugs should be replaced. This corresponds to about 12,500 miles (20,000 km). This replacement should preferably be carried out at a Volvo workshop since the spark plugs should be tightened with a torque wrench.

When fitting new spark plugs, make sure that you fit the right type (see page 32).

20 Ignition system

The distributor contact breaker gap and the engine ignition timing setting should be checked at a workshop after every 3,000 miles (5,000 km).

All adjusting work in the engine ignition system should be carried out by a workshop owning the correct equipment for this work. A distributor is among the most sensitive units in the engine and careless handling can lead to decreased engine output, high fuel consumption, in the worst case, serious damage to the engine

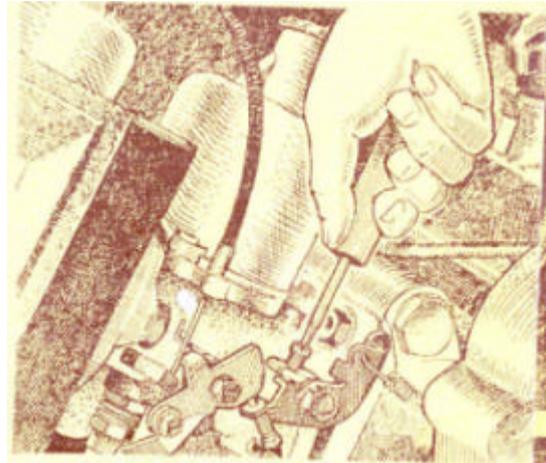
21 Carburettors

The engine is fitted with a carburettor system consisting of two coupled SU carburettors of the horizontal type. The carburettor throttles are connected by means

of a shaft so that movements of the accelerator pedal influence both the carburetors simultaneously.

IDLING SETTING

The engine idling setting is correctly adjusted before the car is delivered from the factory and should not be altered later. Should adjustment be necessary it should be carried out by a Volvo workshop so that the engine delivers the highest output. Provisional adjustment can, however, be listening to the induction sound on the carburetors while the setting screws on the carburetors are screwed inwards or outwards to increase or decrease the idling speed. When the setting is correct induction sound on both the carburetors should be the same.



LUBRICATION OF DAMPING CYLINDERS

Each time the engine oil is changed, the nut on the top of each carburettor should be removed and the damping plungers should be taken out. Engine oil with the viscosity SAE 20 of a standard grade (that is to say not multi-grade oil) should then be added so that the inner tube is full but not the part above this.

Fuel

The gasoline used as fuel should be at least 97 octane. If gasoline with too low octane value is used, knocking or glow ignition can result. When the engine is supplied from the Volvo factory it has been adjusted for operation on 97 octane fuel.

Electrical system

22 Check the battery electrolyte level

If it is to function correctly, the battery should be regularly checked to ensure that the electrolyte level is not too low. This check can conveniently be carried out when the car is being tanked. The electrolyte level should be about $\frac{1}{2}$ " (5-10 mm) above the cell plates. If necessary, top up with distilled water. Never add too much since this can cause the acid to splash over and cause damage in the engine compartment. Never check the electrolyte level by using a lighted match. The gases formed in the cells are very explosive.

23 Check the state of charge of the battery

The state of charge of the battery should be checked after every 3,000 miles (5,000 km). This check is carried out with the help of a hydrometer, which shows the specific gravity of the battery acid. This varying with the state of charge of the battery, see page 33 As the same time as the state of charge is checked, the terminals and the terminal bolts should be checked to make sure that they are well tightened and they should be smeared with grease or vaseline. If necessary they can be dried with a cloth or brushed with a steel brush before being greased.

24 Check headlight alignment

The alignment of headlights should be checked in a Volvo workshop after every 6,000 miles (10,000 km). Remember that the section of the road lit up by the headlights can vary depending on the loading of the car.

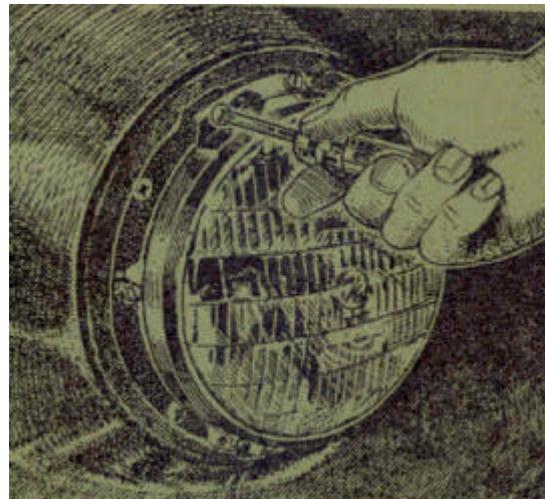
Replacement of bulbs

The replacement of bulbs in the various lighting units is shown on the following pages. Some of the bulbs have two functions, for example the headlight bulbs which have filaments for both full and dimmed lights. The guide pins on the sockets of these bulbs are either of different thickness or they are staggered so that the bulbs can only be fitted in one determined position. Certain makes of bulbs have a "Top" mark which should be turned upwards.

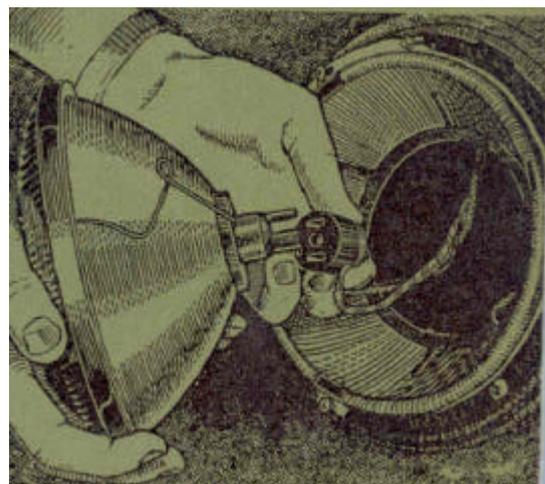
When fitting bulbs, you should never touch the glass with your fingers. The reason for this is that grease, oil etc. can be carbonised by the heat from the bulb and this cause damage to the reflector.

REPLACING THE HEADLIGHT BULBS

1. Loosen the screw on the underside of the rim with a screw driver
2. Pull out the bottom part of the rim slightly and lift upwards so that the retainer catch releases it's grip.
3. Loosen the three screws retaining the inner ring (upper picture). These screws do not need to be completely removed. The inner ring can then be removed by turning it in an anticlockwise direction. Then lift out the insert.

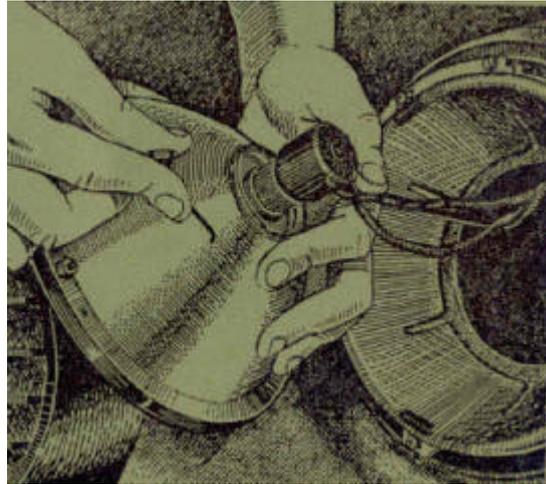


4. The insert is more convenient to deal with if the cable plug is removed (centre picture)



5. Loosen the spring which retains the bulb holder.
6. Take out the bulb holder and loosen the bulb by pushing it inwards and then turning it in a clock-wise direction. When fitting the new bulb, remember that the pins on the socket have different widths.
7. When the bulb holder is being re-fitted in the insert, make sure that the little catch engages in it's notch.

On vehicles fitted with Sealed Beam headlights, follow the instructions under points 1-4 and then replace the complete unit.

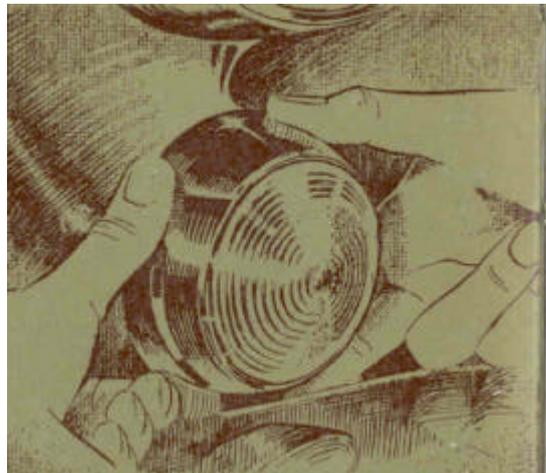


REPLACING THE BULBS IN THE INNER LIGHTING UNITS

The bulbs are accessible after the shade has been removed by pulling it outwards

REPLACING THE BULBS IN THE FRONT PARKING LIGHT FLASHER

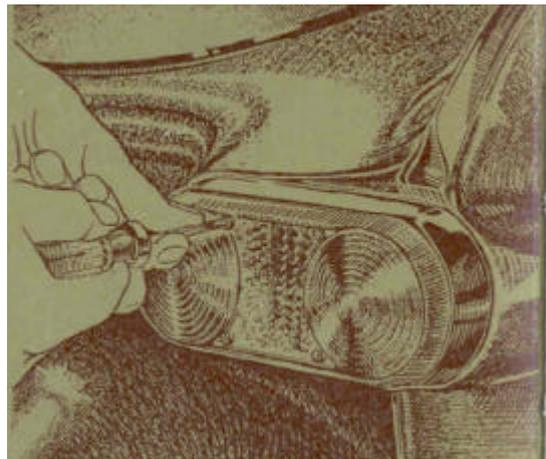
First loosen the glass in the rim. These units can be loosened at the same time, by turning in an anti-clockwise direction. The bulb is now accessible for replacement. The bulb has a bayonet fitting but remember that the pins on the socket are in different positions.



REPLACEMENT OF BULBS FOR THE DIRECTIONAL SIGNAL/TAIL LIGHTS AND STOPLIGHTS

Loosen the screws with a Philips screwdriver and remove the glass.

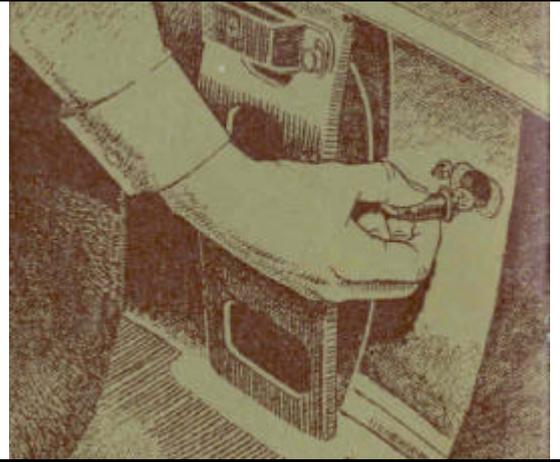
The bulbs are now accessible for replacement. The outer bulb is the directional signal and the tail lights, the inner bulb is the stoplight



REPLACING THE BULB FOR THE LICENSE PLATE LIGHTING

The bulbs for the license plate lighting are accessible from the inside of the luggage compartment.

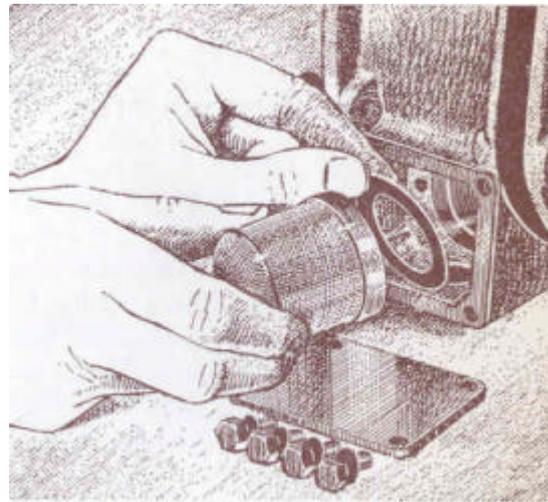
The bulb holder is loosened simply by pressing it to one side after which the bulb, which has a bayonet fitting, can be removed.



Power Transmission

25 Cleaning the overdrive oil strainer

The oil strainer is behind a cover on the left side of the overdrive (see picture) and should be cleaned each time the oil in the transmission is changed (that is about every 12,500 miles, 20,000 km). The oil strainer should be cleaned in gasoline or white spirit and blown dry, preferably with compressed air. Check that the gaskets are in good condition before you fit the strainer and the cover.



26 Checking the clutch yoke free travel

In order to avoid risk of the clutch slipping, the clutch yoke free travel should be checked at regular intervals and adjusted if necessary after every 3,000 miles (5,000 km). If the clutch does not disengage in a satisfactory manner, the free travel of the clutch pedal should also be checked. See page 33 for data. The clutch should be checked and adjusted in a Volvo workshop, which has the equipment for this purpose.

28 Overhauling the brakes

After every 12,500 miles (20,000 km) the brakes should be examined at a Volvo workshop for wear. If the car is used for hard driving, this should be done more often. It is possible that the brake linings can be fully worn and should this happen there is a risk for the brake discs and the brake drums becoming damaged, so it is important to have this overhaul carried out at the above-mentioned intervals.

Front end

29 Checking the front wheel alignment

Correct front wheel alignment is of vital importance for the steering of the car. Faulty adjustment can also mean unnecessary heavy tire wear.

For this reason you should let your Volvo workshop carry out a regular check on the front wheel alignment, for example after every 6,000 mile (10,000 km). If the car has been involved in a collision or heavy impact and it is suspected that the front end may have been influenced, the car should be taken as quickly as possible to a workshop for a check of the front wheel alignment. Volvo workshops have special measuring equipment for this purpose and can therefore carry out this control very quickly. The front wheel alignment angles are shown on page 33

30 Checking the ball joints, tie rod etc.

After every 12,500 miles (20,000 km) the car should be taken to a Volvo workshop for a check of the front end concerning looseness in the ball joints, steering gear etc. At the same time the front wheel bearings should be disassembled and cleaned and then packed with grease (see the lubrication chart at the end of this book)

Wheels and tires

31 Check the tire air pressure

Make a habit of checking the tire air pressure regularly. The best way to do this is to check the pressure at a service station while the car is being tanked. Use a gauge for this purpose. See page 33 for the correct air pressure. Do not forget the spare wheel. Even if the spare wheel is not used, the pressure can go down and the tire can be flat just as you need it. Do not let the spare wheel remain unused for a long length of time, but change it around at regular intervals with the other tires.

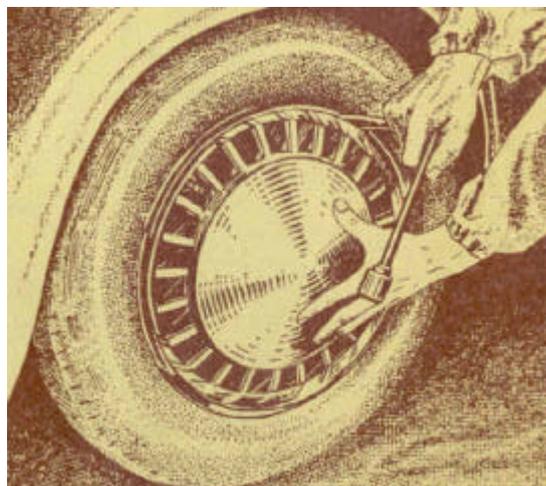
32 Check tightening the wheel nuts, balancing

After every 6,000 mile (10,000 km) the wheel nuts should be tightened to a torque of 72-100 lb.ft (10-14 kgm). At the same time the wheels should be re-balanced if necessary.

If the inspection of the tires shows that there are particularly worn spots and unusual wear on the tread, the car should be taken immediately to a Volvo workshop for the wheels to be re-balanced.

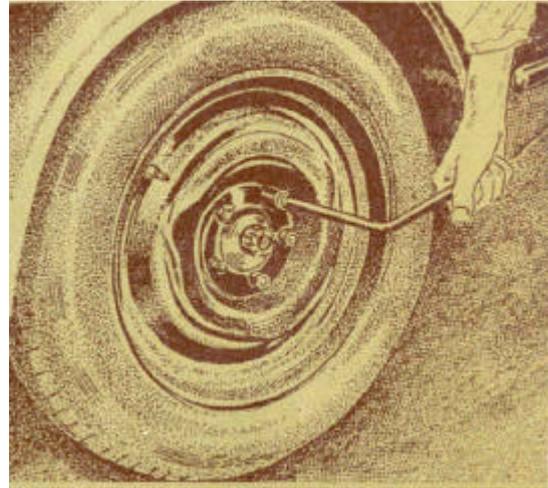
Changing a wheel

Before the car is jacked up, the hand brake should be applied. Lay some blocks and stones in front of and behind the wheels that remain on the ground as a further safety measure. Remember that the hand brake only influences the rear wheels



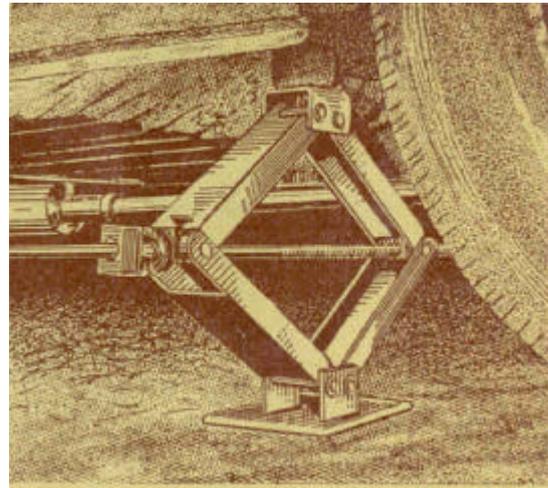
REMOVING

1. Lever off the hub cap with the help of the spade shaped lever.
2. Loosen the wheel nuts slightly with the help of a socket wrench. All the wheels have right hand thread nuts which can be loosened by turning in an anti-clockwise direction.
3. Place the jack in the jack recess nearest to the wheel that is to be lifted up. Lift the side of the car so high that the wheel is clear off the ground.
4. Remove the wheel nuts completely and lift off the wheel. Be careful when lifting up the wheel, so as not to damage the thread on the wheel bolts.



FITTING

1. Lift on the new wheel and tighten the nuts. The lower the car and finally tighten the nuts. Tighten the nuts alternately.
2. Fit the hub cap by striking smartly with the hand a little at a time until it is firmly in position



Body

33 Washing

When the car is new it should be washed often to harden the surface finish. Otherwise the car should be washed as soon as it is dirty or dusty. If dirt and dust are allowed to be in contact with the surface finish for a length of time, damage can result.

While the car is being washed it should stand so that it is not in direct sunshine since otherwise drying patches can result. First rinse off the underside of the body with a jet of water and use a soft brush if necessary. Then rinse down the whole body with a light jet until the dirt has softened up. Don not be sparing with the water. The dirt is then washed off with a sponge using plenty of water.

If washing with water alone is not sufficient, washing agents can be used. Be careful when choosing a washing agent since some of them can be detrimental to the surface finish.

Whenever a washing agent is used, the car should be well rinsed down with clear water afterwards.

After washing, the car should be carefully dried off with a soft, clean charmois leather.

34 Polishing and waxing

The car should be polished when the surface finish appears to be a little dull and normal washing is not sufficient to make it shine again. Under normal conditions it is sufficient to polish the car a couple of times a year, on condition that it is carefully serviced and washed as soon as it is dirty or dusty.

The car should be carefully washed and dried off before polishing. If polish should be applied on a dirty or dusty surface, the result can easily be scratches on the surface finish. Avoid polishing in direct sunshine since the result of this can be a smeary surface. Use only a good quality polish intended for synthetic finish.

Polishing a couple of times a year is generally sufficient to give the surface finish of the car the maintenance it needs. If you want to wax the car yourself, be careful to see that the surface is absolutely clean before the wax is applied. The car should also be newly polished. Be careful when using solvents since these can be very damaging to the surface finish. Waxing may not be carried out before at least one year has past after the vehicle has been delivered.

CHROMED PARTS

The bumpers, the radiator grille and the hub caps are chromed and should be washed with clean water as soon as they are dirty. This is particularly important if you drive a lot on gravel roads which are treated with chemicals to keep the dust down or if you are driving a lot near the sea. After washing you can apply wax or anti-rust preparation

TOUCHING UP THE UNDERBODY SEALING, GRAVEL DAMAGE, ETC.

At the same time as you rinse off the underbody, the underbody sealing should be examined. Should it need touching up, make sure that this is done before there is any rust damage on the metal.

Paint spraying makes great demands on workshop equipment and professional skill and for this reason, you should take the car to Volvo workshop if any extensive damage needs touching up.

Always have minor damages remedied as soon as possible since otherwise there is a risk of rusting.

35 Cleaning

CLEANING THE UPHOLSTERY

If there are any dirty patches on the upholstery, Remove these by following the instructions under "Removing stains". Neither gasoline nor carbon tetrachloride should be used on the parts of the upholstery which consist of textile reinforced plastic. These plastic parts should be washed with tepid soap solution, or, in more difficult cases, with some household detergent.

To remove stains, use a clean rag moistened with a little of the recommended cleaning agent. Start on the outer edges of the stain and work in towards the centre. This will avoid a ring being left afterwards.

When using carbon tetrachloride, always air out the car well afterwards.

CLEANING THE FLOOR MATS

The floor mats should be taken out at least twice a year and cleaned. This is particularly important during the winter since it is easy for snow and ice to be brought into the car on the feet of the passengers and the mats should then often be removed for drying. At the same time remove gravel and dirt from the floor plating under the mats.

If the rubber mats have become stained, they can be cleaned with methylated spirits which is then rinsed off with water.

Removing stains

BATTERY ACID

If any battery acid is spilt on the upholstery, the stain must be removed immediately, since otherwise a hole can be corroded in the upholstery. The best thing to use is ammonia, but if no ammonia is available, you can rinse the stain with water. Treat the stain as soon as possible with ammonia which should be rinsed off with water.

BLOOD

Rub the stain with a rag moistened with cold water and make sure that a clean part of the rag is used at all time. If the stain does not disappear, it can be rubbed with a little ammonia. After about a minute, rinse off with cold water.

CHOCOLATE

Rub the stain with a rag moistened with tepid water. If the stain does not disappear completely, rub with carbon tetrachloride.

GREASE

Rub the stain with a cloth moistened with carbon tetrachloride. Do not use gasoline since this will leave a mark on the material.

FRUIT JUICE

Rub hard with a rag moistened in hot water and allow the stain to dry. Then use carbon tetrachloride.

ICE CREAM

Rub the stain with a rag moistened with hot water. When the stain is dry, rub with carbon tetrachloride.

LIPSTICK

Pour a little carbon tetrachloride onto the stain and then press on a clean piece of plotting paper. Repeat the procedure until the stain has disappeared.

CHEWING GUM

Loosen up the chewing gum with carbon tetrachloride and then scrape off with a blunt knife, before it has dried.

VOMIT

Dry the stains with cold water before they have dried. Then wash with tepid soap solution and go over the surface with cold water. Finally treat the stain with a rag moistened with carbon tetrachloride.

URINE

Wash with warm soap solution and then rinse off with cold water. After this pour a little dilute ammonia (1 part ammonia to 5 parts water) over the stain. Allow the ammonia to remain for a minute or so and then dry off with a moist cloth.

Servicing before a long distance trip

If you are thinking of travelling abroad with your vehicle or taking a long trip you should have it overhauled first in a Volvo workshop. You will enjoy your journey better if you know that your car is in perfect trim. But even if something should go wrong, your journey need not to be spoiled. Wherever you go you will have a Volvo workshop within easy distance to take care of your car. The regular servicing of your car need not be neglected while you are driving abroad. All Volvo service workshops abroad are fitted out to give your car the service it needs.

IF YOU PREFER TO LOOK OVER YOUR CAR YOURSELF, THE FOLLOWING TIPS ARE WORTH NOTING.

1. Give the car thorough all-round lubrication
2. Flush out the engine cooling system and check the hose clips
3. Examine the tires carefully. Replace worn tires
4. If you are not sure whether the engine is functioning perfectly and that the fuel consumption is normal, you can save both time and money by having a thorough check carried out
5. Examine the state of charge of the battery and clean the terminals
6. Check the brakes, the front wheel alignment and steering gear.
7. Check over the tool kit and check the spare wheel.
8. Check the lighting and adjust your headlights for the left or right hand traffic where necessary,

Procedure in cold weather

When cold weather is on the way, it is time to think of the winter servicing of your car. The first night frost can come as a very unpleasant surprise unless you are prepared. Most people know that anti-freeze should be added to the cooling system but do not forget that the water in the windshield washer container can also freeze. Moisture in the door locks can also freeze.

Engine cooling system

Some suitable anti-freeze should be added to the cooling system in good time before the cold weather. The most usual anti-freeze is methylated spirits or ethylene glycol, methylated spirits having the disadvantage that it evaporates at normal engine temperature. Ethylene glycol is more permanent and is therefore preferable. Pure ethylene glycol, however, has a corrosive effect on the engine cooling system and for this reason the anti-freeze glycol available on the market also contains additives to prevent corrosion. For technical reasons these additives cannot be added in greater quantity than are necessary for one winter season. Under unfavourable conditions they can even be used up more quickly, for example, if there is sludge, rust or flushing agent left in the cooling system. Never use the same glycol for more than one winter season. The cooling system should be carefully cleaned out before anti-freeze is added. Drain of the complete cooling system including the heater and rinse out with water, steam (at a pressure of 14 lb/sq.in.= 1kg/sq.cm) or suitable cleaning agent.

COOLING SYSTEM DRAIN COCKS

Four cocks should be opened when the cooling water is drained off. They are located as follows:

At the rear on the right side of the engine block

Under the oil cooler

Under the heater

Low down on the left side of the radiator

MIXING TABLE FOR ETHYLENE GLYCOL AND WATER

Cooling system capacity	Necessary amount of ethylene glycol for frost protection down to:				
	-10C 14 F	-15C 5F	-20C -5F	-30C -22F	-40C -40F
9 litres	2.0	2.75	3.25	4.25	5.0

The maximum depression on freezing point, -56C (-69F) is obtained by adding 6.1 litres of glycol.

Engine lubrication system

During the winter engine oil with viscosity of SAE 10W should be used in the engine lubrication system. This lighter oil reaches the lubrication points in the engine more easily at low temperatures and also facilitates cold starting. If you are driving mainly short stretches during the winter, the engine oil should be changed more often than normal, for example after every 1,500 miles (2,500 km)

Electrical system

The electrical system in the car is subjected to greater stresses during the winter than during the warm summer months. The lighting and the starter motor are used more and this means higher current consumption, and since the capacity of the battery is considerably lower with low air temperature, it must be checked more often and re-charged when necessary. If the battery voltage is excessively low, there is a risk of frost damage to the battery.

Brake system

During the winter the brakes are more subjected to splash and condensation water. This can result in the hand brake freezing when it is applied. For this reason the hand brake should not be applied when the car is parked but first gear or reverse should be engaged instead.

Windshield washers

At the same time as the engine cooling system has anti-freeze added, the water in the windshield washer container should also have anti-freeze added. 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 to lubricate the lock in good time with some anti-freeze preparation.

Specifications

This chapter contains the technical data you may have use for as owner of the car. Consult your dealer if you require more information.

Dimensions and weights

Length..... 4400 mm

Width.....	1700 mm
Height.....	1285 mm
Wheel base.....	2450 mm
Track front.....	1315 mm
Track rear.....	1315 mm
Ground clearance.....	155 mm
Turning circle.....	9500 mm
Curb weight (including driver).....	1200 kg

Capacities

Fuel tank.....	approx 45 litres
Cooling system.....	approx 9 litres
Engine, when changing oil.....	approx 3.25 litres
Engine, including oil cleaner.....	approx 3.75 litres
Transmission M40.....	approx 0.75 litres
Transmission M41.....	approx 1.8 litres
Rear axle.....	approx 1.3 litres
Steering box.....	approx 0.2 litres

Engine

Type designation.....	B18 B
Output (SAE).....	108 b.h.p at 5,800 r.p.m.
Max torque (SAE).....	15.2 kgm at 4,000 r.p.m.
Number of cylinders.....	4
Bore.....	84.14 mm
Stroke.....	80 mm
Displacement.....	1.78 litres
Compression ratio.....	10:1
Valves.....	Overhead
Valve clearance, warm and cold engine Inlet.....	0.50-0.55 mm
exhaust.....	0.50-0.55 mm
Idling speed	600-800 r.p.m.
Carburettors, make and designation.....	S.U-HS 6

Cooling system

Type.....	Pressure
Thermostat starts to open at.....	75-78 C
fully open at.....	89 C
Fan belt, designation.....	HC 38x35"

Ignition system

Order of firing.....	1-3-4-2
Ignition setting stroboscope at 1500 r.p.m. 97 octane (research method).....	14-19 before TDC
100 octane.....	17-19 before TDC
Spark plug types.....	Bosch W22 T-1
Spark plug gap.....	0.7-0.8 mm
Spark plug tightening torque.....	3.8-4.2 kgm
Distribution dwell angle.....	60 degrees

Electrical system

Voltage.....	12V
Battery type.....	Bolinden 107GM or corresponding type
Battery capacity.....	60 Ah

Battery electrolyte, specific gravity.....	1.275-1.285
Battery electrolyte, specific gravity when recharging necessary.....	1.230
Starter motor, rated output.....	1 h.p.
Fuses.....	35 A (3)

Lamp bulbs (12V)

Headlights (2).....	45/40W
Directional signals/parking lights front (2)...	20/5W
Directional signals/tail lights (2).....	20/5W
Brake stoplights (2).....	20W
License plate lighting (2).....	6W
Internal lighting (2).....	5W
Instrument lighting (6).....	2.4W
Map-reading lamp (1).....	
Warning lamp directional signal.....	2.4W
Warning lamp, full headlights.....	2.4W
Warning lamp, charging.....	2.4W
Warning lamp, overdrive.....	2.4W

Power train

Clutch

Clutch yoke free travel.....	About 3-4 mm
Clutch pedal travel.....	140 mm

Transmission

Type designation.....	M40	M41
Ratio 1 st	3.13:1	3.13:1
Ratio 2 nd	1.99:1	1.99:1
Ratio 3 rd	1.36:1	1.36:1
Ratio 4 th	1:1	1:1
Overdrive.....		0.76:1
Reverse.....	3.25:1	3.25:1

Rear axle

Type.....	Spiral bevel (hypoid)	
Ratio.....	4.1:1	4.56:1

Front wheel alignment

(unloaded car but including fuel, water and spare wheel)

Toe-in.....	4 mm
Camber.....	0+1 degree
Caster.....	0+1 degree
King pin inclination (with 0 degree camber).....	8 degrees

Wheels and tires

Wheel size.....	4 ½ J x 15L
Type of tires.....	Braced tread with inner tube
Tire size.....	165-15
Tire pressure (cold tires)	
Front.....	1.8 kg/sq.cm
Rear.....	2.0 kg/sq.cm

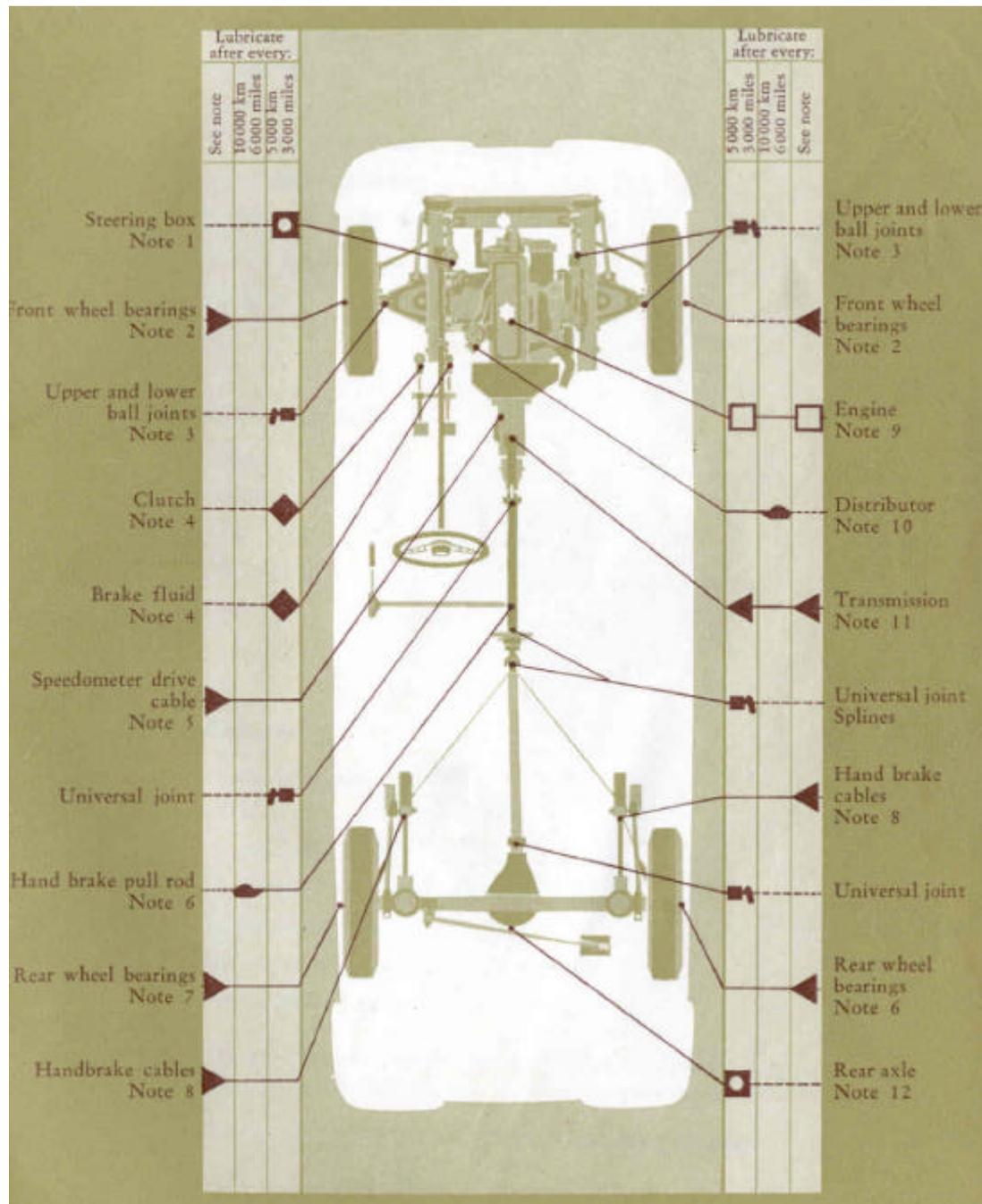
Tool kit

Jack with lever	Pliers
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Wheel wrench
 Socket wrench with lever
 Adjustable wrench

Screwdriver
 Philips screwdriver
 Tool bag

Lubrication chart



SYMBOLS	
	<p><i>Engine oil</i> Grade: "For Service MS" Viscosity: Below 0° C (32° F) SAE 10 W*) Between 0° and 30° C (32°—90° F) SAE 20*) Above 30° C (90° F) SAE 30*)</p>
	<p><i>Rear axle oil</i> Grade: Hypoid oil Viscosity: SAE 80</p>
	<i>Chassis lubricant</i>
	<p><i>Special lubricant</i> See notes</p>
	<p><i>Brake fluid</i> Grade: SAE 70 R 3</p>
	<i>Light engine oil</i>

Notes for lubrication chart

Note 1. Check that the oil is up to the filler plug

Note 2. The front wheel bearings should be disassembled after every 12,500 miles (20,000 KM) or at least once a year. Clean the bearings thoroughly and pack with heat-resistant bearing grease

Note 3. On a certain production series of this car, the ball joint is designed so that no lubrication is required and no nipple is fitted in this case.

Note 4. Check that the fluid level is about $\frac{3}{4}$ " (15-20 mm) below the upper edge of the container.

Note 5. After every 12,500 miles (20,000 km), disconnect the drive cable from the instrument, pull about 20cm out of the sleeve, dry it off and smear with a thin layer of grease. Do not use oil since this can seep up into the instrument.

Note 6. Lubricate the pull rod at the cotter pin with light engine oil.

Note 7. After every 25,000 miles (40,000 km), or at least every other year, disassemble the rear wheel bearings, clean them and pack in with heat-resistant bearing grease

Note 8. Have the handbrake cables lubricated with graphite grease a couple of times a year

Note 9. Check the oil level when tanking or at least every 14 days. Change the oil every 3,000 miles (5,000 km) as well as spring and fall when changing over to oil of other viscosity. Each time the engine oil is changed, top up the carburettor cylinders,

Note 10. After every 6,000 miles (10,000 km) drop a little light engine oil on the felt wick under the rotor in the distributor. The rotor can be lifted off the shaft after the distributor cap has been removed. At the same time, lubricate the outside edge of the cam with a very thin layer of vaseline.

Note 11. Check the oil level every 3,000 miles (5,000 km) and change the oil after every 12,500 miles (20,000 km)

Lubricant:

Car without overdrive (M40 Transmission): SAE 80 transmission oil (not hypoid oil)

Car with overdrive (M41) Transmission): SAE 30 engine oil. The overdrive drain plug is marked "Drain". Fill up with oil relatively slowly so that the oil runs down into the overdrive. Check that the oil level does not go down when it comes up to the filler hole.

Note 12. Check the oil level every 3,000 miles (5,000 km). Change the oil after the first 3,000 miles (5,000 km). After this, the oil level only need checking and topping up when necessary.