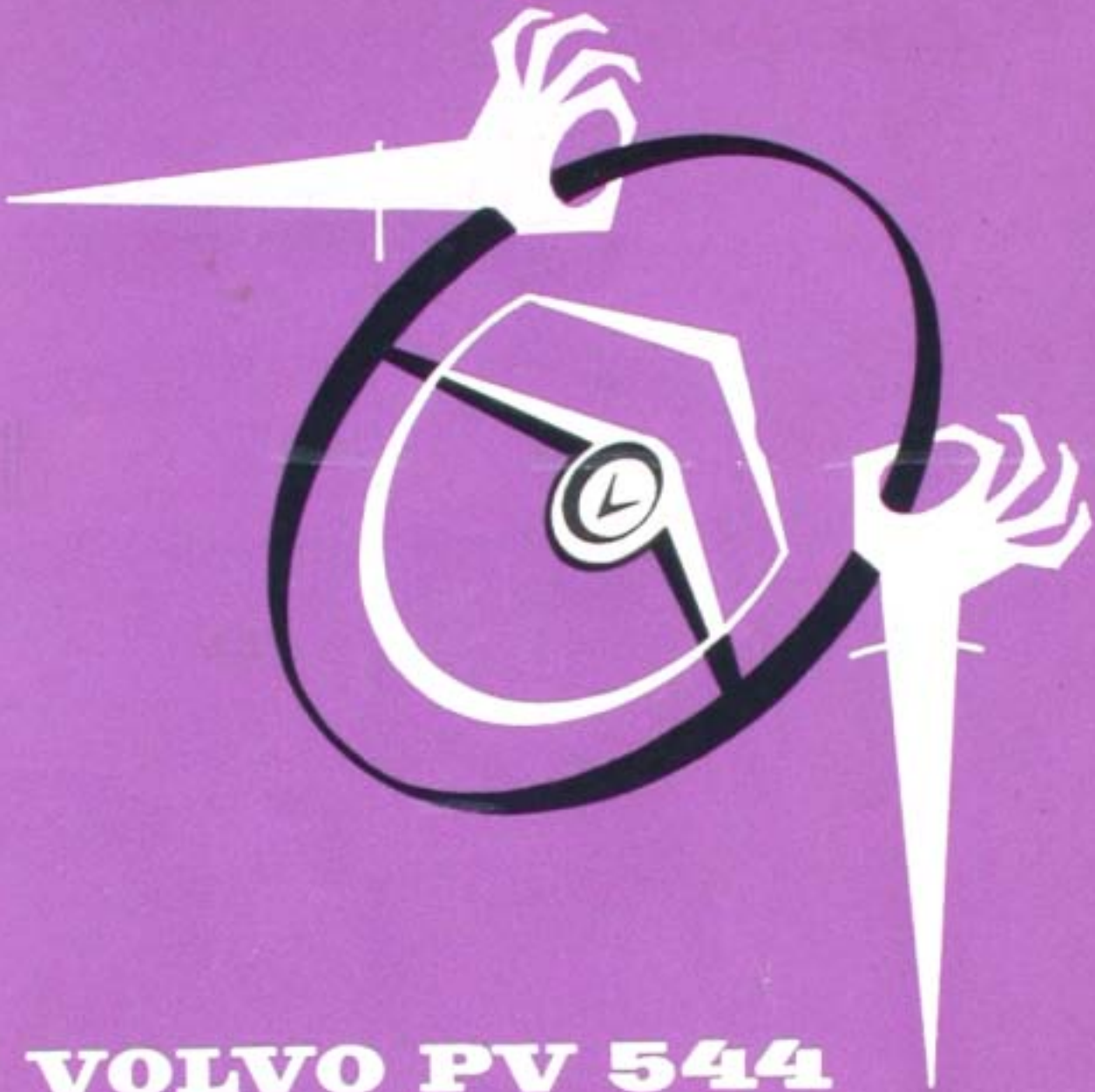

VOLVO PV 544
instruction book

VOLVO

VOLVO

Description
Driving
Maintenance

VOLVO

PV 544 B Special
PV 544 B Special de Luxe
PV 544 B Sport de Luxe

AB VOLVO GOTHENBURG SWEDEN
SERVICE DEPARTMENT
Cables: "Volvo, Gothenburg, Sweden"

Stop!

Before you start driving your new PV 544 we advise you to read through this instruction book carefully. It contains all the information you need to be able to drive and service your vehicle in the best possible way. If you follow the instructions given in this book, you will find that your PV 544 will come up to all the expectations concerning economical operation and excellent performance that you have every right to expect as far as a top-quality vehicle is concerned.

This instruction book is not intended to be a comprehensive technical manual and it is not guaranteed to make the reader into a perfect car mechanic. It will, however, show you how to look after your vehicle so that trouble in the future can be avoided.

Do not wait until something goes wrong before you start reading the instruction book. Read it now. The short time this takes will more than repay you in the long run. The better you know your PV 544, the better service it can give you. This book can contain some valuable information even for an experienced motorist.

Finally, we should like to express our appreciation for the confidence you have shown in the name of Volvo by selecting a Volvo vehicle. We are sure that the demands you make on your PV 544 will be more than satisfied apart from the fact that you will enjoy driving it and that it will give you faithful service for many, many miles.

Happy motoring!

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Volvo Service

Volvo Service organization

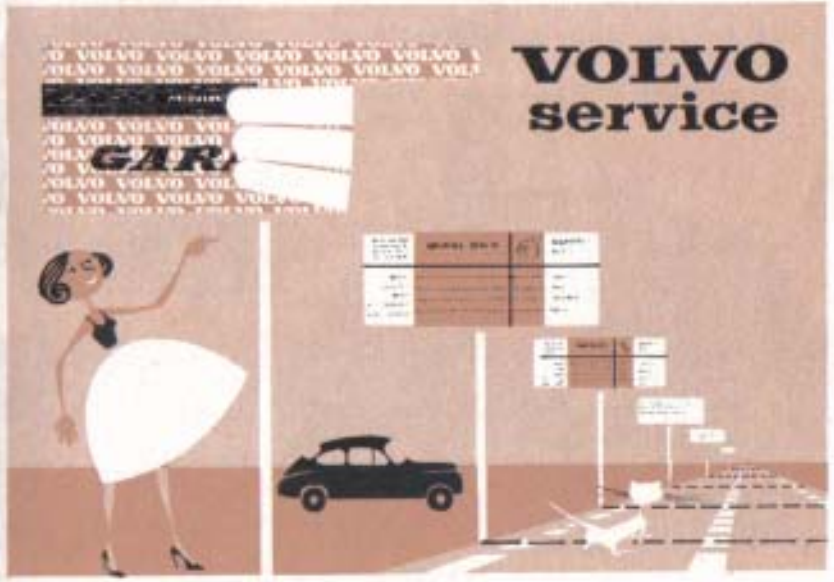
In order to get the most out of the invested capital represented by a car, it must be looked after and serviced rationally. Volvo has gone to a great amount of trouble in the design and selection of material to insure that the car in question only requires a minimum of servicing. All this work will be in vain unless we can count on your cooperation — that is to say, that you make sure that your vehicle gets the regular servicing it needs. In order to help you, 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 Volvo Service Organization concerning repair and adjustment work. They have also special tools, designed at the Volvo factory.

All Volvo dealers have a comprehensive stock of spare parts which is your guarantee for original Volvo spares. This is why our dealers are in the very best position to give your vehicle first-class service concerning both maintenance operations and repairs. You should also refer to your dealer if you need information about your Volvo that is not included in this instruction book.

It is not only in your own country that there is a Volvo workshop within easy reach but Volvo has also a widely distributed service network in other countries too.

Warranty and Service Booklet

A Warranty Booklet follows each vehicle when it is delivered. This book contains two coupons, entitling you to cost-free service inspections after 1000 km (600 miles) and 2500 km (1300 miles) running. If possible, let the dealer who supplied the vehicle carry out the service inspections. If necessary, however, any of our dealers can carry out the inspections. **If our six-month guarantee is to apply, we make one absolute condition and that is that the above-mentioned two cost-free inspections are carried out at roughly the mileages shown and that the vehicle has been looked after in accordance with the instructions in this book.**



After the two cost-free service inspections have been carried out, you should make an agreement 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.**

Description

The Volvo PV 544 is a two-door, five seater car. It has an integral body so that there is no chassis frame. The front and rear ends together with engine and transmission are fitted directly into the body.

The body is synthetically enamelled and provided with a rust-preventive primer.

The car is made thief-proof by the ignition switch and coil being connected • with an armored cable.

There are three types of this car:

Volvo Special, equipped with 60 h.p. engine (B16A), 3-speed transmission and with a rear axle ratio of 4.56:1.

Volvo Special de Luxe, equipped with 60 h.p. engine (B 16 A), 3-speed transmission and with a rear axle ratio of 4.56:1. The rear side windows can be opened and in addition the car has chromium-plated trim strips.

Volvo Sport de Luxe, equipped with 85 h.p. engine (B16 B), 4-speed transmission and with a rear axle ratio of 4.56:1. The equipment otherwise is the same as for the Volvo Special with the exception of the wheels which on this model are provided with chromium-plated trim rings.

Description

Type designations

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

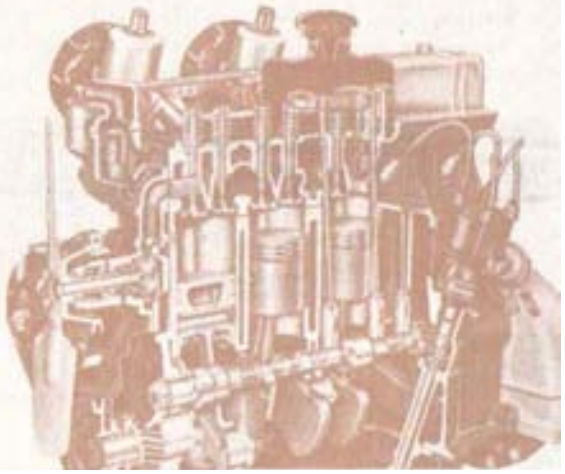
book deals with vehicles having the following :

Volvo Special	P544-11141B
Special de Luxe	P 544-11142 B
Sport de Luxe	P 544-11244 B

The vehicle type and chassis number are stamped on a nameplate attached to the right under the hood. The nameplate also indicates code numbers for color and upholstery.

The engine type designation and part number are given on the left-hand side of the cylinder block. The engine number, that is to say, the manufacturing serial number, is stamped on a tab above the part number. For identifying the engine, both the part number and serial number should be quoted, for example 495387-89237.

Engine



The engine ii t **toiir^TttlfiK^'&rburMor** engine with overhead **valves. The** pistons ire made of light-alloy and the upper **compreuion** ring on each piston is chromed. The main bearings and connecting rod bearings are replaceable. The crankshaft is statically and dynamically balanced.

Engine type B 16 A has an output *of* 66 h.p. and It equipped with Zenith down-draft carburetor,

Engine type B 16 B has an output **of 85** h.p. and ii **equipped with** twin SU horizontal carburetors.

Fuel system

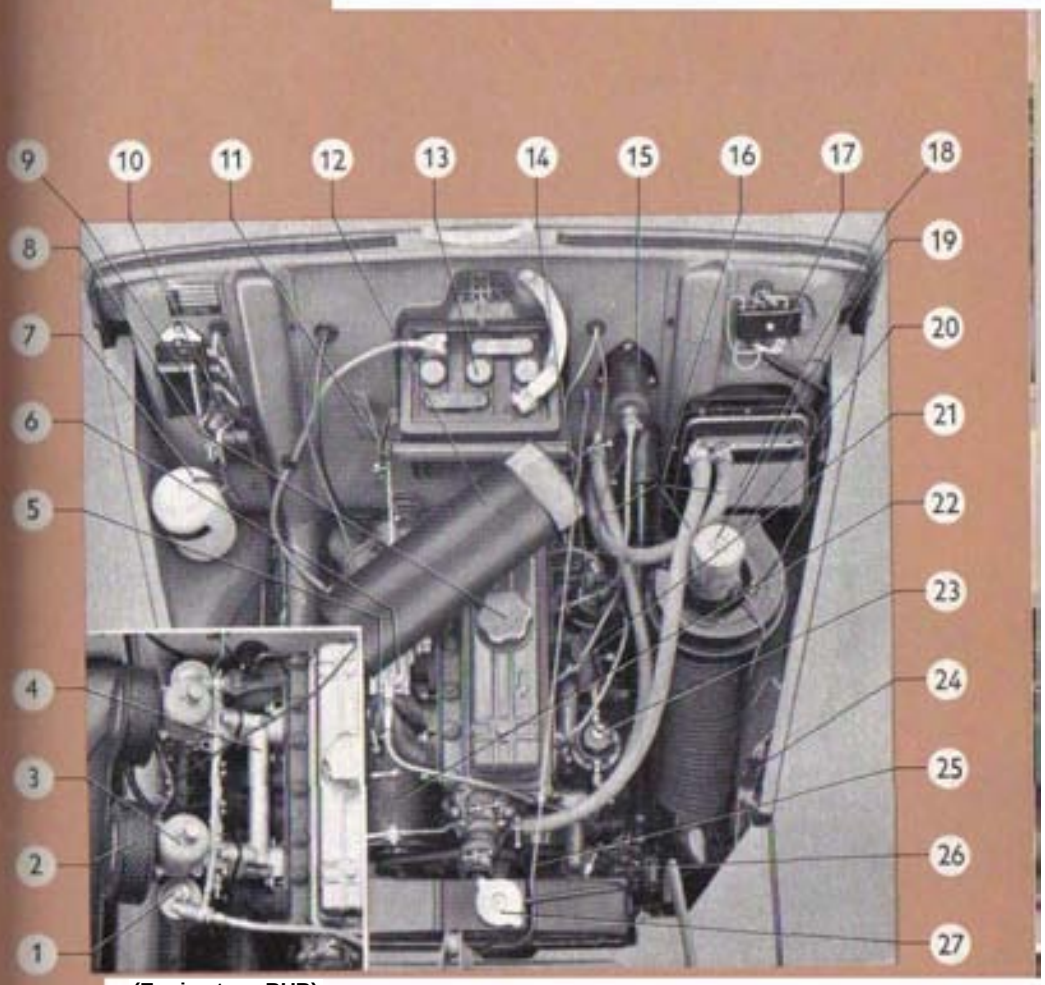
The fuel system is fed from the tank to the carburetor by i Fuel pump which ii driven by a cam on the engine camshaft. There Is a filter in the fuel pump which traps water and other impurities in the fuel.

Lubricating system

The engine lubrication is taken care of by a gear pump which sucks up oil from the oil pan on the bottom of the engine and forces it through the oil filter out to the lubricating points in the engine. Under the oil filter there is a relief valve which prevent] the oil pressure from reaching excessively high values.

Cooling system

The engine is water-cooled and the cooling system is of the pressure type. Water is circulated *by* means of a pump fitted on the fan shaft. A thermostat with an opening temperature of about 76" C (169' F) prevent! the cooling water from passing through the radiator before the engine has reached its normal **working** temperature.



(Engine type BUB)

1. Float chamber
2. Air cleaner
3. Front carburetor
4. Equalizing tube
5. Oil cleaner
6. Carburetor
7. Container for windshield washer B. Oil filling tap 9. Charging control
10. Windshield washer motor
11. Throttle control
12. Air cleaner
13. Battery U. Distributor
15. Coil
16. Hoses for heating lyite
17. Fusebox
18. Heater
19. Fan motor
20. Fan for heater
21. Oil dipstick
22. Generator
23. Fuel filterwith fuel pump
24. Junction block for electrical leads
25. Chain for radiator blind
26. Steering gear
27. Filling cap for radiator

Electrical system

. The electrical system is of the six-volt type and is fitted with a voltage control generator. The starter motor is controlled from the instrument panel by means of the ignition key. This key also forms the main switch for the rest of the electrical system. The cables to the headlights, parking lights and internal lighting, however, are not taken over the ignition switch but can be switched on and off without the ignition key being in position.

Lighting

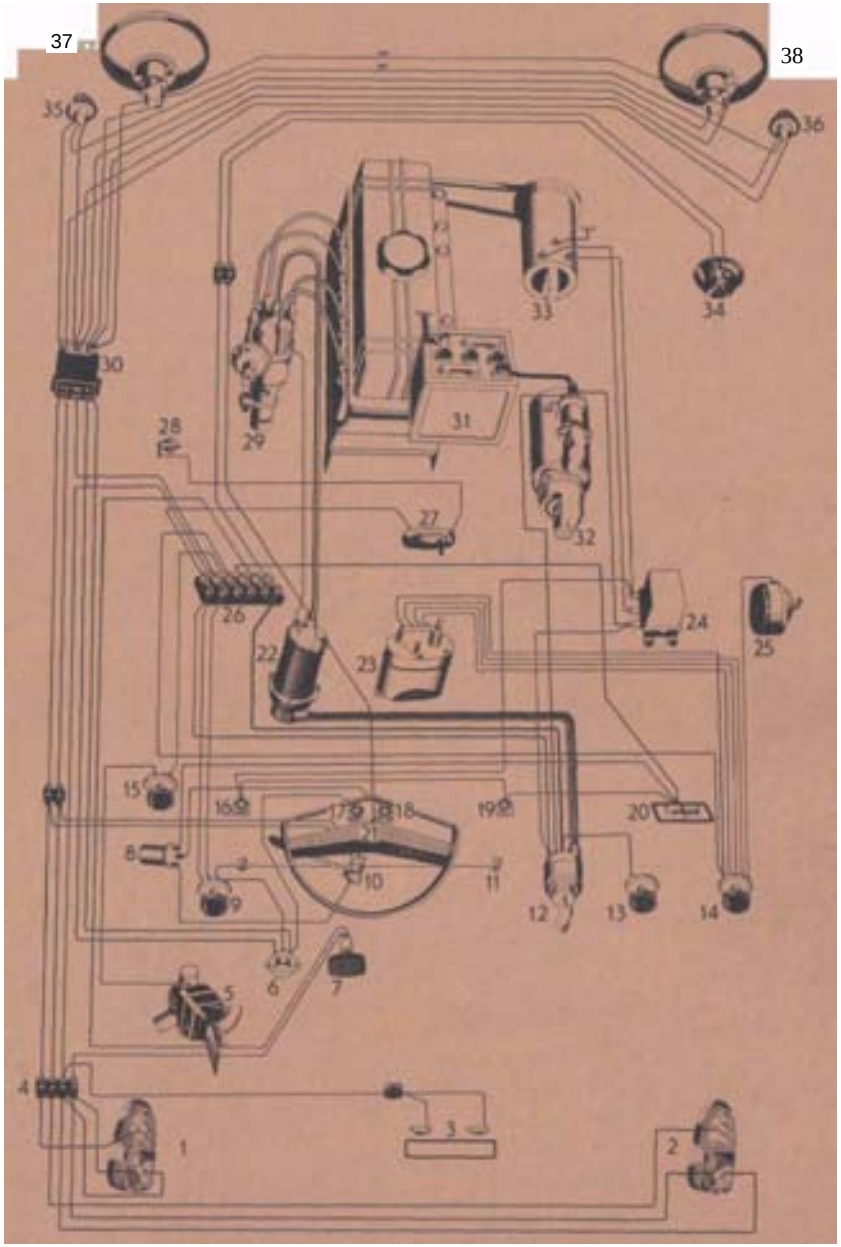
The lighting on the vehicle consists of two headlights (full and dipped) together with two combined flasher and parking lights. At the rear the lighting consists of two tail lights including flashers as well as combined lamps for the tail lights and the brake warning lights. Internal lighting consists of a roof light above the rear view mirror.

See pages 42—44 concerning replacement of bulbs.

Fuses

The electrical system is protected by means of fuses fitted in a fusebox to the left on the bulkhead under the hood. When replacing a fuse, be sure that you use a fuse of the right rating. If one of the fuses should blow repeatedly do not fit a more powerful fuse. Instead, take the vehicle to a workshop for a check of the electrical system.

1. Left-hand tail light
2. Right-hand tail light
3. Number plate lighting
4. Connector
5. Ventilator fan
6. Lighting switch
7. Brake pedal
8. Flasher impulse unit
9. Lighting control
10. Direction indicator switch
11. Instrument lighting
12. Ignition switch
13. Cigarette lighter
14. Controls for windshield wipers and windshield washer
15. Control for fan
16. Charging control lamp
17. Full headlight warning lamp
18. Direction indicator warning lamp
19. Oil pressure warning lamp
20. Fuel gauge
21. Horn ring
22. Ignition coil
23. Windshield wiper motor
24. Charging relay
25. Windshield washer motor
26. Fusebox
27. Roof lamp
28. Switch in front door
29. Distributor (order of firing 1-3-4-2)
30. Plug
31. Battery
32. Starter motor
33. Generator
34. Horn
35. Flasher and parking light, left
36. Flasher and parking light, right
37. Headlight, left
38. Headlight, right



Wiring diagram

Description

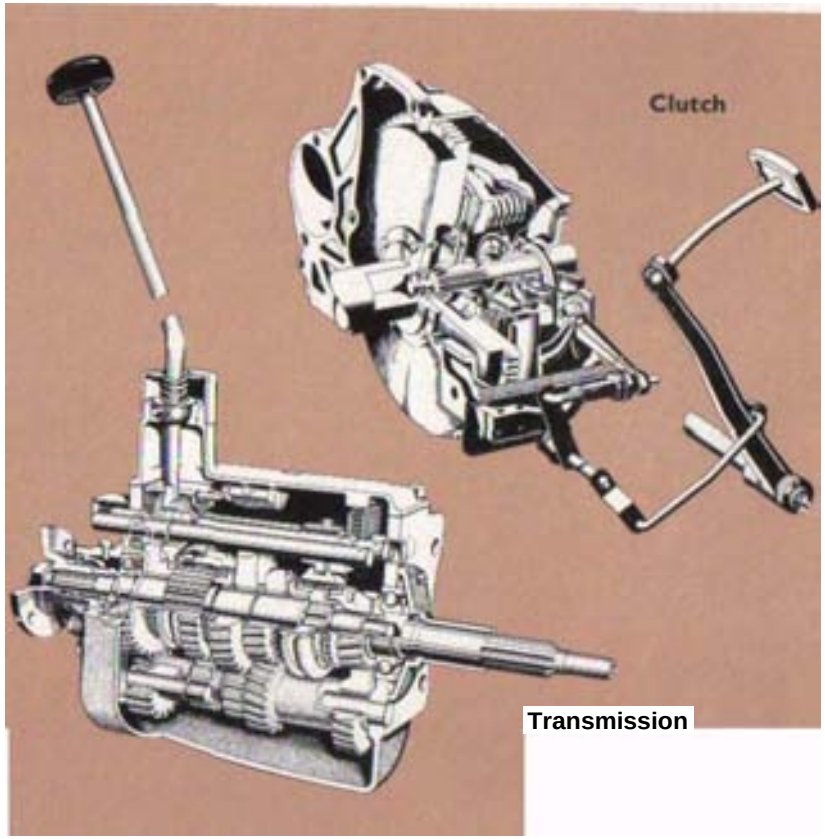
Power transmission

Clutch

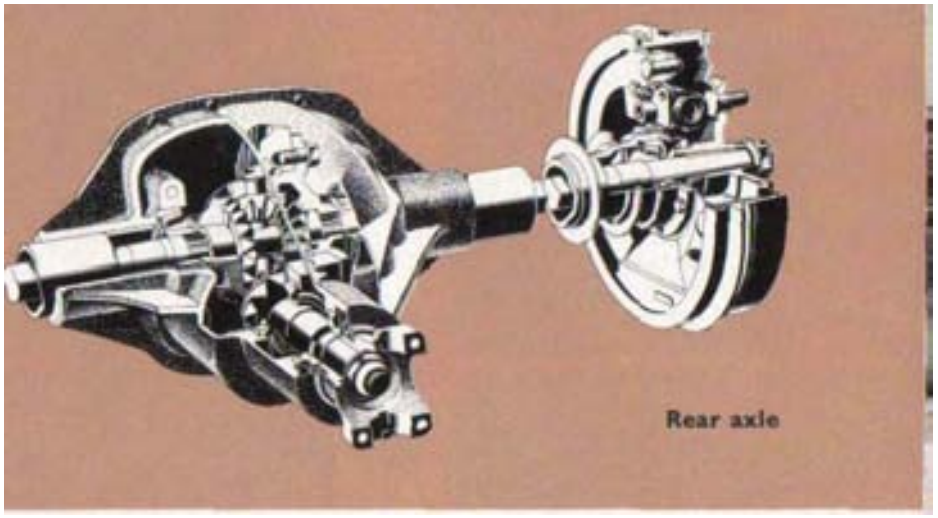
The function of the clutch Is to transmit the power from the engine to the transmission. The clutch Is of the (Ingle dry plate type. The pressure ptate is operated by means of three release leven operated by means of the clutch pedal.

Transmission

The transmission li uied to regulate the speed ratio between the engine and the rear axle so that the engine always operates in its most favorable speed range. The transmission is synchronised on all the forward gears, this means that gear-shifting can be carried out without double declutching. Since the transmission is fitted with bevel gears and the gear lever is rubber insulated, excellent sound insulation is obtained. See page 56 for data.



Transmission



Propeller shaft

The propeller shaft, which is the connecting link between the transmission and the rear axle, is divided in two sections. The forward section Is |ournaled at its rear end in a bearing housing supported by two rubber-bushed bolts,

Rear axle

The driving power of the engine is transmitted Irom the propeller shaft to the rear wheels through the rear axle. The rear axle is of the hypoid type, i.e. the Input drive shaft is below the horizontal level of the axle shafts,

Brakes

The vehicle is fitted with two independent brake systems, a footbrake system and a handbrake system,

The footbrake system is hydraulic and Influences all four wheels. The hydraulic system consists of a fluid-filled master cylinder which, when the brake pedal is depressed, transmits the brake pressure through the brake fluid in the lines to the cylinders at the wheels. The plungers and these cylinders are then pressed upwards and these apply the brakes. The handbrake system is of the mechanical type and only influences tbe rear wheels. Movement of the handbrake lever is transmitted through a system of pullrods and levers to the leven on the rear wheel brakes, whereby the rear wheel brakes are applied.

Wheels and tires

The vehicle has pressed steel wheels with lug* for th* attachment of the hub caps. All wheels are carefully balanced and the tire* are of the tubeleM type. Tyre size: 5.90—15.

Body

Hood (1

The hood Is fitted with a locking device which is operated from the driving seat by means of a lever under the instrument panel. The hood II unlocked and can be lifted up after this lever has been pulled backwards,

The hood ii retained In let tipped up position by means of \ spring clamp which engages the hood hinge. As a further safety measure, this can b« locked in this position by means of a screwdriver, see illustration.

Doors and locks(2

The car is provided with locks for both the doors. The doors are locked from inside by moving the handle downwards (position 3). In order to prevent you from being locked out of the car, the door handle lifts again automatically when the door is closed.

Jf you happen to lose the keys, you car go to your nearest Volvo dealer who will supply you with new keys.

In order to prevent the locks from freezing during the winter, these should be regularly "lubricated" with some antl-freeze agent. Several pre-parations of this type are available commercially.

Remember to apply it **in good time** , and to apply this "lubricant'[1] regularly to the locks during the winter.

Position 1 Open

Position *1* Closed

Position *3* Locked

^^^ **If** the lock has frozen up in extremely |cold weather be careful that you do not break the key. A good plan is to warm up the key and then insert it quickly into the lock whereby the ice there melts.

Adjusting the front seats

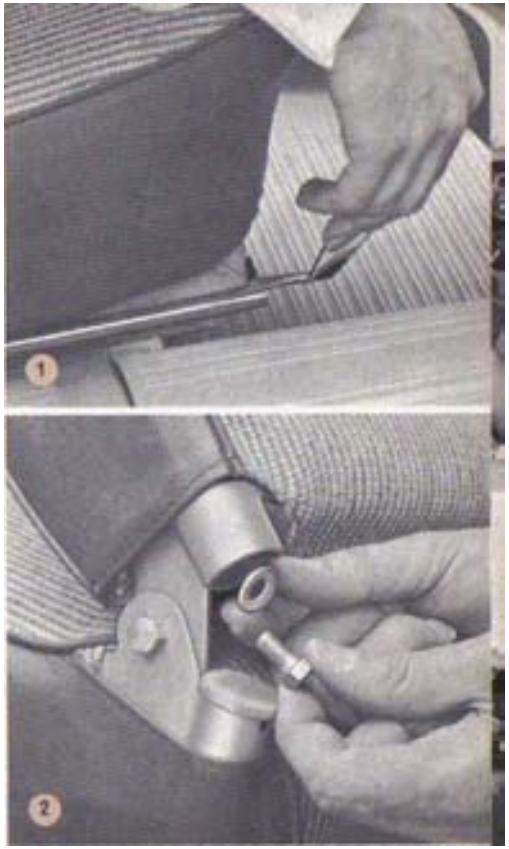
^k The front seats can be adjusted both forwards and backwards by moving the small handle *an* the Inner adjuster rail to one side. Sit in the seat with your leet on the floor and move the **seat** to the most comfortable position. After adjusting make sure ihat the catch on the handle engages properly with the hole in the adjuster rail.

The angle of the front seat backrests can be adjusted by removing or adding further shimi under the backrest setting screws,.

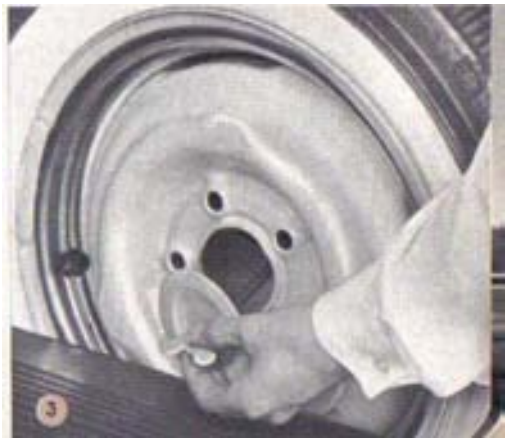
Luggage compartment

The luggage compartment is locked with the same key as used (or the door. The compartment is opened by turn-Ing the handle anti-clockwise. The lid ' Is lifted up **as** far as it will go and then lowered slightly. The lid is then held in this position by a catch built Into the left-hand hinge. When the lid ij to be closed again, it should first be lifted up so that the catch is re leased and then lowered,

^- The spare wheel is attached by a bolt ^P with washer and a wing nut. When the wheel is to be used, unscrew the wing nut after which the bolt should be lifted upwards and moved out wards as shown in fig. 3.



Always be careful to tighten the spare wheel securely and to pack in the toolbag and jack properly as otherwise irritating rattles can arise.



Description

Bedding equipment

There is > special bedding set (or the Volvo PV 544 which can be ordered from *four* Volvo dealer (part number 79772).

The bedding let consist! of two support bars ind four plvoc studs with leather strap for locking. The pivot studs are Intended to replace , permanently the pi/ot boles with which the front seat backrests are equipped as standard. The old pivot . \ bolts are removed and the new ones with leather straps fitted ai shown in fig. 1.

Arranging sleeping places

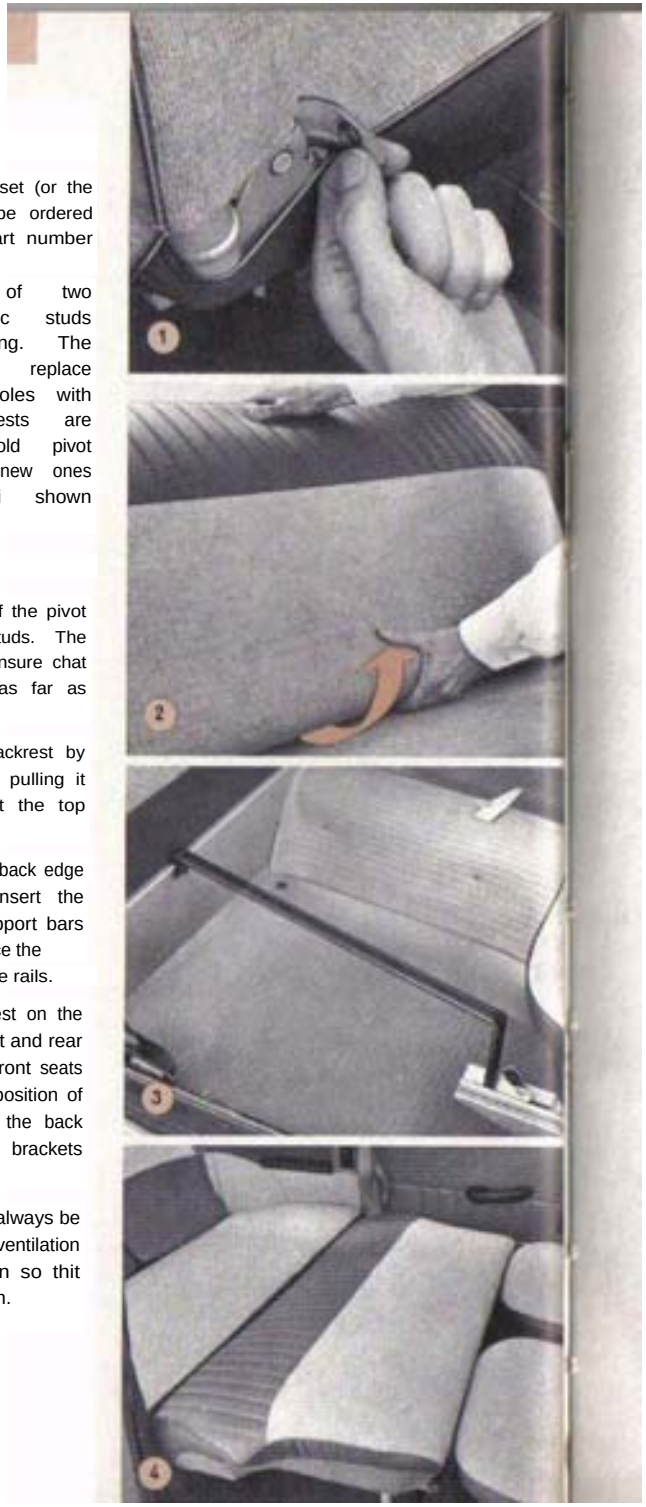
1. Undo the leather straps of the pivot studs and remove the studs. The backrests can be taken off. Insure chat the seau are slid forward as far as possible.

2. Remove the rear seat backrest by grasping the lower part and pulling it outwards until the catch at the top releases.

3. Lift the seat cushion at the back edge and move it backwards. Insert the countersunk parts of the support bars under the seat cushion and place the bent ends in the front seat slide rails.

4. Place the rear seat backrest on the support bars between the front and rear teats- The backrests of the front seats should then be placed In the position of the rear seat backrest with the back sides facing forwards and the brackets upwards.

When overnighting in the car. always be sure to have one of the ventilation windows lully or partly open so thit there is * good supply of oxygen.



Safety belts

Extra equipment on this vehicle includes safety belts for both the front seats. Utilize this simple but effective safety device. The practical design of the belt type used makes it so simple to engage and disengage the belts so that you get used to fitting the belts as an automatic procedure before starting the engine.

The length of the belt can be adjusted on that part of the belt which Is attached to the floor. Make sure that the belt has che right length for you.

When the belt catch is taken from the button on which it is hung on the door pillar, press in the handle in the middle. The belt then passes round the waist and over the chest and should be locked in the fitting between the front seats,

To disengage the belt press the handle in and lift it straight up. The belt should then be hung up on the button on the door pillar.

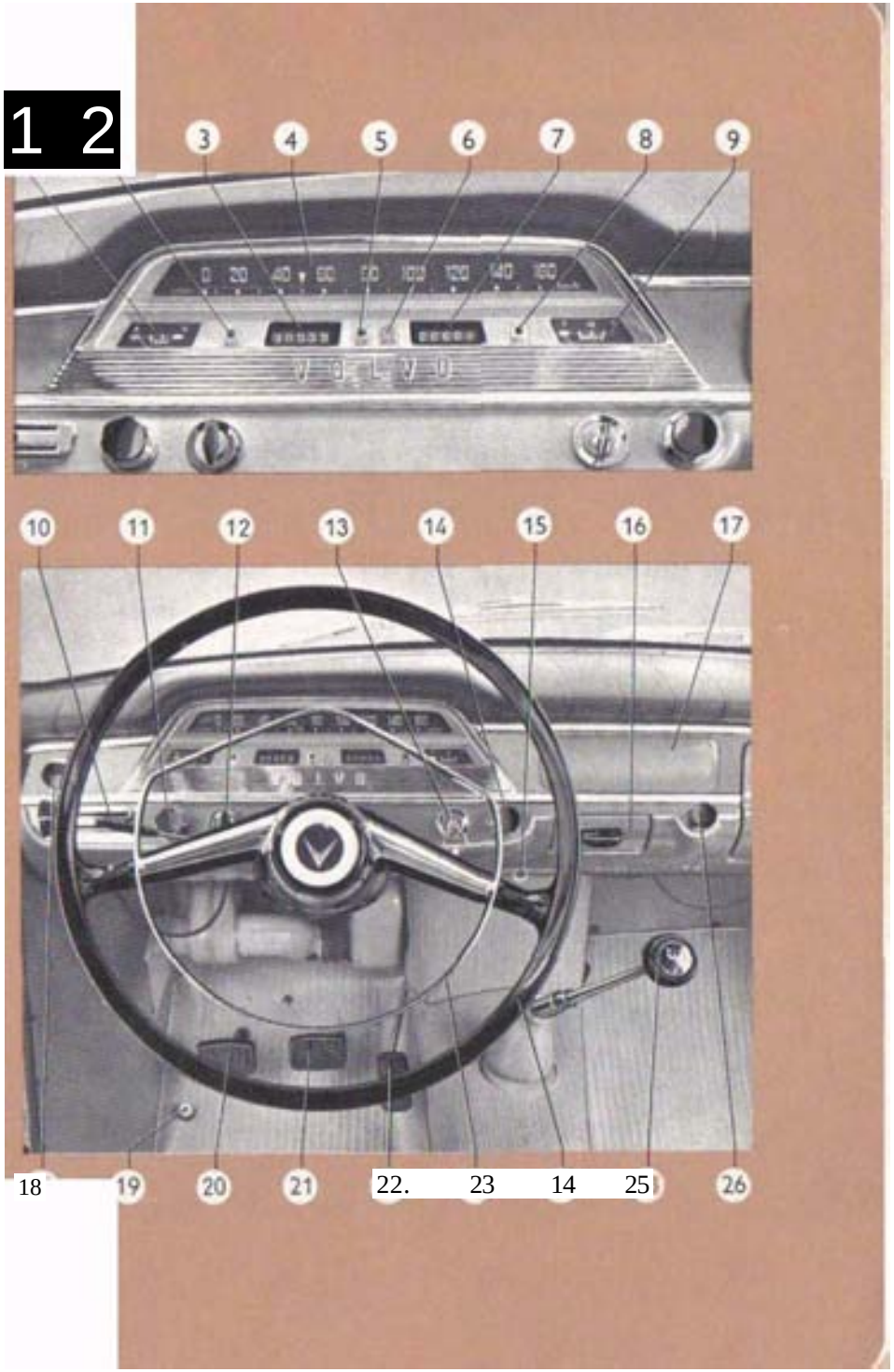
Make a habit of always hanging up the belt when It Is not being used. If it is allowed to lie on the floor it will soon become dirty and frayed and will hinder getting in and out of the vehicle. Check now and then that the bolts that hold the belt are properly tightened. If the belt has become dirty it is best cleaned with water and a synthetic washing compound. Gasoline and similar must not be used since this can cause stains.

Instruments and **operating controls**

Before you start the engine, sit behind the wheel and carefully check through all the instrument! and controls you need for driving. The location of these is shown in the illustration. The Instrument! and operating controls are described in more detail below with reference to the numbers under the illustration.

Immediately after starting and now and then while driving you should have a quick look at the instruments and check that they are showing normal reading! according to the values shown below.

1. Temperature gauge
2. Charging control lamp
3. Trip meter
4. Speedometer
5. Indicator lamp for full headlights
6. Indicator lamp for direction indicators
7. Mileometer
8. Oil pressure warning lamp
9. Fuel gauge
10. Direction Indicator . control
11. Lighting switch
12. Choke control
13. Ignition switch with starter U. Windshield wiper control
15. Radiator blind control
16. Ashtray
17. Radio panel 16. Heater controls
19. Foot dipper switch
20. Clutch pedal
21. Brake pedal
22. Accelerator pedal
23. Horn ring
2i. Steering wheel
25. Gearshift lever
26. Cigarette lighter (extra)



1 Temperature gauge

The temperature gauge shows the temperature of the cooling system and thus indicates the working temperature of the engine. The indicator on this gauge should remain within the green markings. If it should show an excessively high temperature for a longer time without the radiator blind being pulled up. this cm depend upon the fact that the channels in the cooling system are blocked and circulation is thus being hindered. In such cases the cooling system should be cleaned (see page 40).

Charging control lamp

Thii lamp lights up when the battery Is discharging, this being normal at idling speed. If you accelerate a little, this lamp should go out. Should the lamp light up while you are driving, this generally means that there is some fault in the electrical system or that the fan belt is not sufficiently tensioned and is slipping on the pulley thereby causing poor charging.

Trip meter

This trip meter, which is graduated in tenths of a mile, can be used to measure even short distances. This meter can be reset to zero *by* means of a control under the instrument panel to the left of the steering column.

Speedometer

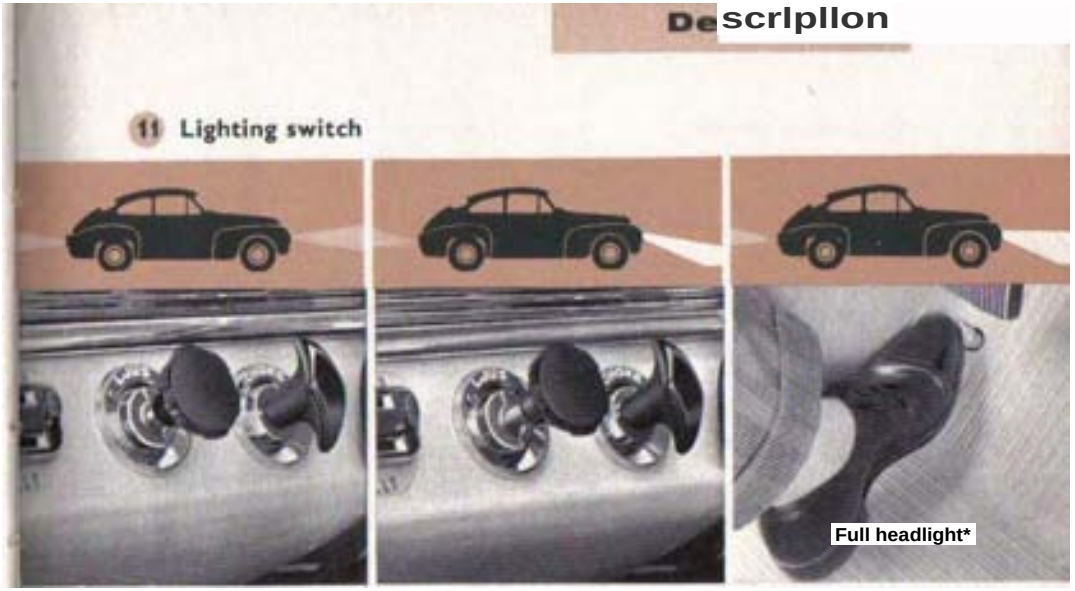
The speedometer has a horizontal field, the right hand point showing the speed at which you are travelling. Since the length of the red strip is proportional to the speed, this is in itself a safety factor — the more r*d you can see, the more dangerous your speed. >

Mileometer

The miteometer shows the total distance covered in miles. At a reading of 99 999 miles the mechanism returns to zero and starts to go round again.

Oil pressure warning lamp

When you switch on the ignition this lamp should light up and then go ojt again when the engine has been started. Should the lamp remain on while you are driving, the engine should be stopped immediately and the cause for this determined. In most cases it means that the oil I evil is too low.



Dimmed headlights

Parking lights

Headlights

1 The headlights are controlled by meins of a push pull switch on the instrument panel and by *a* foot dimmer switch (21) to the left on the floor. The headlights are switched from full on to dipped and vice versa by depressing the dimmer switch with your foot-**Instrument lighting**

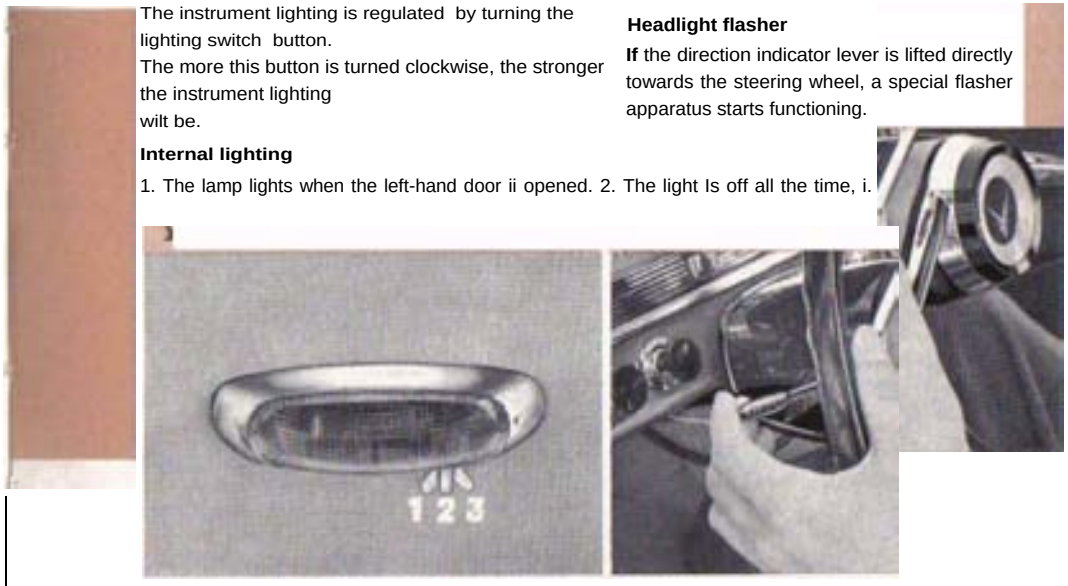
The instrument lighting is regulated by turning the lighting switch button.
The more this button is turned clockwise, the stronger the instrument lighting
wilt be.

Internal lighting

1. The lamp lights when the left-hand door ii opened. 2. The light Is off all the time, i.

Headlight flasher

If the direction indicator lever is lifted directly towards the steering wheel, a special flasher apparatus starts functioning.



The light is on all the time.

13 Ignition switch

1. "Radio" position
In this position, the complete electrical system of the vehicle with the exception of the engine ignition system is switched on.

2. Neutral position

3. The driving position

4. The starting position
To start the engine, turn the key to this position whereby the starter motor will cut in.

12 Choke control

To use the choke pull the choke control out in its vertical position and then give it a quarter turn to the right or to the left. Turn it back to the vertical position before pushing it in again.

14 Control for windshield wiper and washer

The windshield wipers are driven electrically and are started by pulling out the knob. When the knob is pushed in again, the windshield wipers return automatically to their original position.
The windshield washers are started by pulling the knob out a further nooch. The windshield washers will then function until the knob is pushed in again. The fluid container for the windshield washers is under the hood and has a capacity of 1 quart.
Never let the windshield wipers work on a dry and dusty surface since this can scratch the wiper blades.

15 Radiator blind control

When the engine is cold, the radiator blind should be pulled up all the way when starting to insure that the engine rapidly attains its normal operating temperature. When air temperatures are very low, it is recommended that the car is driven with the radiator blind partially up in order to maintain a higher temperature inside. **Keep an eye on the temperature gauge** so that the engine does not start running too warm.
Do not use the radiator blind during the first 2 500 km (1500 miles).

18 Heater and ventilation system

Switch for fresh air fan

Pushed right in — closed
Interm. pos. — full output
Fully out — half output

Sliding control for flow of air

Defroster pos. — all air to windshield
Floor pos. — windshield and floor
Closed — air stream shut off

Sliding control for air temp.

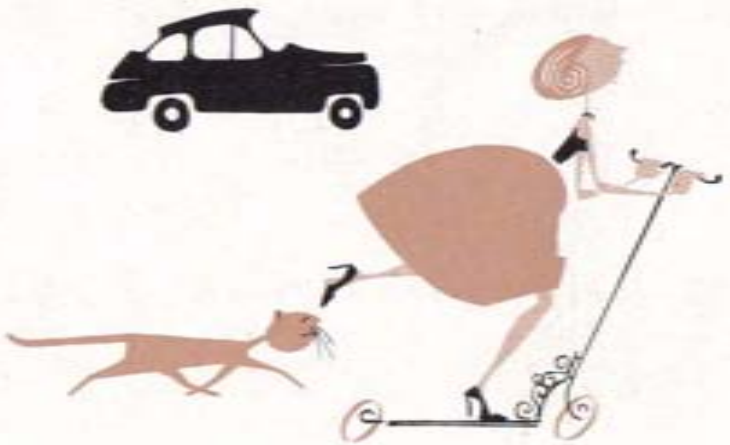
This control is used to regulate the temperature of the incoming air.

The heater and ventilation system is regulated by means of the three controls shown above.
The air intake is located to the left immediately behind the radiator grille. The fresh air fan sucks air in here and then forces it through a heater and into a distribution valve from where the air is distributed with the help of the airflow control to the floor and the windshield. Since the air intake is at the front of the car, the air taken in is free from exhaust gases.
The heater unit is connected to the engine cooling system and is controlled by a thermostat which maintains a constant temperature. When the temperature setting is changed it takes a couple of minutes before the heater element has stabilized to the new temperature.

Ventilator windows
The ventilator windows in the doors permit draft-free ventilation of the vehicle. When the windows are closed and the handle moved downwards, these are automatically locked by means of a pin. This pin must first be pushed in before the window can be opened.

Misty windows
When air temperatures are low and the vehicle is full of passengers, the windows can easily become misty. The best way to get rid of this or to avoid it is to have the ventilator windows open or partly open at the same time as the fan heater controls are set at their full output position. Have all the air passing through to the windshield to begin with, i.e. the control in the defroster position, since it is most important to have clear vision through the windshield first.

Driving



The driving of your PV 544 should not cause you any difficulties whatsoever. You will soon find that everything has been arranged so that you can drive in comfort without sacrificing safety. Keep your eye on the road the whole time. The instruments themselves look after the function of the vehicle and the warning lights will immediately inform you if any fault should occur.
Stop the vehicle immediately if something should go wrong. It may be just a minor point, but if it is not remedied in time it can cost you time and money.

9 driving tips = 9 lives for your vehicle

1. Use your brakes sensibly.
2. Suit speed to prevailing road conditions.
3. Follow the running-in instructions carefully.
4. Do not use the clutch pedal as a foot rest.
5. Do not let the engine labor.
6. Use the transmission to maintain engine speed at a favourable level.
7. Think of your tires (and kerb edges).
8. Never drive when oil pressure is low.
9. Never subject the engine to heavy loading until the normal working temperature has been attained.

Running in

When the vehicle is new you should naturally not drive your Volvo too hard. The first period is very important since all the vital parts in the vehicle become bedded in. Do not use full engine output for more than short periods during the first 500 km (300 miles).

Keep an eye on the cooling water temperature

Since the bearing parts in a new engine have not the contact they gradually wear into, heavy loading can easily cause high engine temperatures. Always keep an eye on the temperature gauge during the running-in period.
Do not use the radiator blind during the first 2 500 km (1 500 miles).

Warranty inspections

After 1 000 km (600 miles) running the vehicle should be taken to a Volvo workshop for the first cost-free warranty inspection. The control and adjusting procedure then carried out also includes an oil change in the engine. It is very important to insure that this oil change is carried out since during the first period the engine oil usually contains a lot of impurities.

After 2 500 km (1 500 miles) running the vehicle should be taken back to the workshop for the last warranty inspection. This inspection includes the servicing procedure shown in the warranty booklet.

After 5 000 km (3 000 miles) running, the vehicle 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 engine oil is changed, the oil filter element should also be replaced. The transmission and rear axle should be carefully rinsed out with flushing oil.
From this mileage onwards, oil changes should be carried out at the intervals shown in the maintenance scheme on page 32 and in the lubricating chart at the end of this instruction book.

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

Starting the engine

1. Make sure that the gearshift lever is in the neutral position.

2. If the engine is cold pull out the choke. If the engine is warm, do not use the choke *bur.* depress the accelerator pedal instead.

3. Depress the clutch pedal fully.

4. Turn the ignition key . to the starting position. Release the key is soon 11 . the engine starts.

After the engine ha? started regulate the idling speed by meam of the choke. **Never use the choke more thin a minute or so and when the engine il thoroughly warmed up, never use the** choke **at all.**

Warming up the engine

Experience has shown that engines in vehicles used with frequent stopping and starting are subject to abnormally rapid wear. The reason for this is that *the* engine does not maintain its normal working temperature. The result of this is that corrosive acids formed by the combustion residues have an opportunity to act on the cylinders for a considerably long time. When the engine is cold, it should thus be taken up to it! normal working temperature as quickly as possible.

Stalling (B1«A)

When the humidity of the air is high and air temperatures are between —5' C and 10' C (23' F and 50° F), ice can form in the carburetor idling system. The result of this can be that the engine stalls when the accelerator pedal is released. This tendency to stall usually occurs about 10 minutes after a cold engine has been suited and can be counteracted by pulling out the choke knob about 'V so that the rapid idling device comes into function.

After starting a cold engine do not rice it immediately but run it at moderate speed and do not subject it to heavy loading until engine temperature has reached its normal level.

Gear position! on the 3-speed transmission (M **30)**

Gear positions on the 4-ipeed transmission

Gear-shifting

(M 30) (M 40)

If the engine is to function in the best possible way it is important to insure that the point at which gear-shifting is carried out ii suited to the speed in such a way that the engine speed in maintained within certain limits, neither too high nor too low. If the engine speed is excessively low. there is poor pulling power and unfavorable loading on the engine and the power tram-mission. If the engine speed is too high, on the other hand, this means that fuel consumption goes up, engine pulling power decreases and acceleration will be no better.

As a rule the most economical running is obtained if gear-shifting is carried out roughly in the middle of the speed ranges shown. If more rapid acceleration is desired, however, the range for each speed shown can be taken to its upper limiting value,

Never let the engine labor in high speed but change down in good cirtie. If you require greater pulling power, however, and the engfne is running easily with light acceleration, this naturally does not prevent you going down rather lower than shown in the table (even for a longer period of time).

H*com mended speeds, m.p.h. for the various gear ratios

Vehicle type	First	2nd speed	3rd speed	4th
Special I Special de Luxe j	0-20	10-45	20-	-
Sport de Luxe	0-25	10-45	20-65	25-

Starting in a garage

If you start your vehicle in a garage, always open the garage doors before you start the engine. The exhaust gases from the engine contain the poisonous gas carbon monoxide which is particularly dangerous since it is both invisible and odorless. Air containing only 0.2 % carbon monoxide can be fatal if breathed in for half-an-hour.

Braking

You should attempt to use the brakes as little as possible. Use the engine as a brake instead by releasing the accelerator pedal in good time. Violent braking is only justified in dangerous situations and even in such situations the wheels must not be locked. Remember that the best braking effect is obtained if the wheels continue to rotate slowly.

Steady acceleration and gentle braking are characeristic for a good driver and also result in the most economic running. Apply brakes **before** going into a curve and use your transmission on downhill gradients so that you save unnecessary wear on both the brakes and the tires.

Binding brakes

When air humidity is high it can happen that moisture comes in into the brake linings and this can cause the brakes to bind when applied. The best way to eliminate this is to carry out a long, gentle braking whereby the moisture will evaporate through the heat developed.

Towing

If the vehicle is to be towed, the tow-line should not be attached directly to the bumpers but should be taken round the bumper supports. While the vehicle is being towed, the tow-line should be kept evenly stretched since violent jerks can damage the bumpers.

Servicing

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 are the two cost-free service inspections after 1 000 km (600 miles) and 2500 km (1 500 miles). After these inspections the servicing of the vehicle should follow the routine in the **service book** which is based on a rubber stamp system with all-round lubrication after every 1 250 km (750 miles) and service inspections after every 5 000 km (3 000 miles) running. The simplest (and in the long run most profitable) way to give the vehicle the servicing it requires is to have all the servicing done by a Volvo workshop. You will then have all the work shown in the service book carried out in accordance with fixed prices and the workshop stamp in the service book will show how the vehicle is being serviced — this is also extremely important as far as second-hand value is concerned.

If you prefer to carry out these simpler servicing procedures yourself or if you are sometimes obliged to have these done by a workshop outside the Volvo organization, this chapter contains some advice about when and how these servicing procedures should be carried out.

For the sake of convenience, the servicing procedures have been summarised in a maintenance scheme on the following page.

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 with color in the scheme.

Operation	Carried out every: 1250 km 750 miles	5000 km 3000 miles	10 000 km 6000 miles	20 000 km 12 000 miles	See note below
Lubrication					
1 Lubricate chassis	●	●	●	●	
2 Lubricate body			●		
3 Check oil level in engine					When tanking
4 Change oil in engine		●			Spring and fall
5 Check oil level in transmission	●				
6 Change oil in transmission		● [1]		●	
7 Check oil level in rear axle	●				
8 Change oil in rear axle		● [1]		●	
9 Check oil level in steering box		●			
10 Check brake fluid level		●			
Engine					
11 Clean oil filler cap			●		
12 Replace oil filter element		● [1]	●		
13 Clean fuel filter		●			
14 Clean air filter (B 16 A)		●			
15 Change air cleaners (B 16 B)				●	
16 Check valve clearances		●			
17 Carry out compression test				●	
18 Check fan belt tension			●		
19 Check cooling water level					When tanking
20 Clean cooling system					Spring and fall
21 Check spark plugs		●			

[1] Only after the first 5000 miles (5000 km).

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

a) lighting, including brake warning lights
b) direction indicator flashers
c) horn

Operation	Carried out every: 1250 km 750 miles	5000 km 3000 miles	10 000 km 6000 miles	20 000 km 12 000 miles	See note below
22 Change spark plugs				●	
23 Check distributor contact breakers		●			
24 Check ignition timing setting		●			
25 Clean and check carburetor		●		●	
Electrical system					
26 Check electrolyte level in battery					When tanking
27 Check state of charge of battery		●			
28 Check headlight alignment			●		
Power transmission					
29 Check clutch pedal for play		●			
Brakes					
30 Check brakes		●			
31 Overhaul brakes				●	
Front end					
32 Check front wheel alignment			●		
33 Check king pins, steering rods, etc.				●	
Wheels and tires					
34 Check tire air pressure					When tanking
35 Tighten wheel nuts			●		
Body					
36 Wash body					See page 48
37 Polish body					See page 48
38 Clean					See page 49

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.

All metallic surfaces, no matter how finely ground they are, consist of extremely small uneven points. If two ground surfaces are pressed together and rubbed, the uneven surfaces will engage in each other and result in friction and wear. If these two surfaces are separated by a thin coating of oil, however, the friction disappears and with it the wear. This is exactly what happens when bearings, pistons and gears in the vehicle are lubricated. The oil or grease actually prevents the metallic surfaces from coming in contact with one another.

This means that from a purely theoretical viewpoint the metallic surfaces in a motor vehicle are never subject to wear and it should be sufficient to lubricate them once. Unfortunately this is not so in practice. The uneven surfaces are worn down more and more and the minute particles released contaminate the oil which becomes also partially carbonized. It is thus impossible to avoid wear completely but wear can be decreased and prevented to a very large extent by **regular and careful** lubrication.

Chassis lubrication

Make a habit of insuring that the vehicle is given all-round lubrication according to the instructions in the lubricating chart at the end of this book after a certain number of miles. You should preferably follow the recommendations in the service book concerning all-round lubrication after every 1 250 km (750 miles) since this mileage is based on research carried out by the Volvo factory. Use only top-quality lubricants of well-known manufacture.

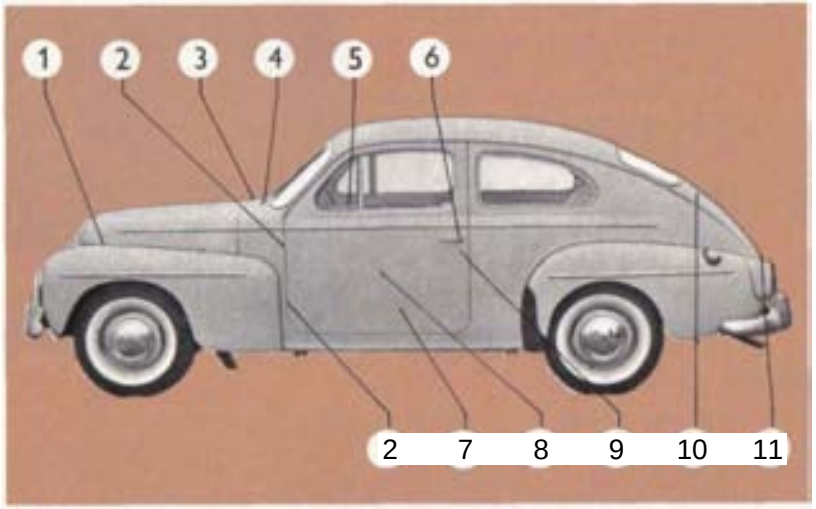
When all-round lubrication is ordered at a service station, the servicing procedures detailed for 1 250 km (750 miles) intervals in the lubricating chart are followed. Apart from this the oil level in the engine is checked as well as the cooling water level and the electrolyte level in the battery.

Before lubrication is carried out, all the lubricating points must be carefully cleaned to prevent dust and other impurities from getting into the bearings.

Body lubrication

In order to avoid squeaking from doors and locks, the body should be lubricated after every 10 000 km (6 000 miles) running.

During the winter the locks should also be lubricated with some antifreeze preparation which prevents the locks from freezing up.



No.	Lubricating point	Lubricant
	1. Hood hinges	Light engine oil
	2. Door hinges	
	3. Hood lock	
	4. Windshield wiper arm attachment	
	5. Ventilation window lock	
	6. Door lock plungers	Paraffin
	7. Front seat sliderails	
	8. Locking mechanism, etc. (accessible after the door upholstery panels have been removed). Lubrication need only be carried out about every 20 000 km (12 500) miles or once a year	Light engine oil
9	Keyholes	Pulverised graphite
10	Luggage compartment hinges	Light engine oil
11	Luggage compartment lock	

3 Check the oil level in the engine

The oil level in the engine should be checked each time the fuel tank is filled. Carry out the check with the engine switched off by using the oil dipper stick which is on the left-hand side of the engine.

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 the oil level should not be above the upper mark since oil consumption will then be abnormally high.

If necessary top up with new oil **of the same type already in the engine** through the oil filler hole.

4 Change oil in engine

The intervals between oil changes depends to a great extent on the driving conditions. During the summer or when the vehicle is being mainly used for long-distance running it is sufficient to change the oil after every 5 000 km (3 000 miles). During the winter and when the vehicle is being used under unfavorable driving conditions with continuous stopping and starting, the oil should be changed after every 2 500 km (1 500 miles).

Oil grade		Viscosities			Oil capacity	
Normal running conditions	Unfavorable conditions	Under 20° F	20°–90° F	Above 90° F	When changing oil	Inclusive oil filter
For Service MS*)	For Service MS	SAE 10 W	SAE 20	SAE 30	4¼ Imp. pints 5 U.S. pints	6½ Imp. pints 7¾ U.S. pints

Normal running conditions refer to driving at normal engine speed where the engine is not subjected to heavy loading for long periods of time.

Unfavorable conditions cover "**stop and go**" driving where the engine does not have the chance to reach normal operating temperature, this causing troublesome sludge formation. Such unfavorable conditions also include driving for long periods at high speeds or other cases where the engine is subjected to a high degree of loading resulting in high working temperatures.

*) For type B 16 B engine only oil quality "For Service MS" should be used.

5 Transmission

6 The oil in the transmission should be checked after every 1 250 km (750 miles). The oil level should be up to the filler hole. If necessary top up with new oil. The oil in the transmission should be changed after every 20 000 km (12 500 miles). (In the case of a new or reconditioned transmission the oil should also be changed after the first 5 000 km = 3 000 miles). The old oil should be drained off immediately after the vehicle has been run. Every other time the transmission oil is changed, it should be flushed out with flushing oil before new oil is added.

Oil grade	Viscosity	Oil capacity
Gear oil (not hypoid oil)	SAE 80*) (Above 90° F – SAE 90)	1½ Imp. pints 1¾ U.S. pints

7 Rear axle

8 The oil level in the rear axle should be checked after every 1 250 km (750 miles). The oil level should be up to the filler hole. If necessary top up with new oil.

The oil in the rear axle should be changed after every 20 000 km (12 500 miles) (In the case of a new or reconditioned rear axle, the oil should also be changed after the first 5 000 km = 3 000 miles). The old oil should be drained off immediately after the vehicle has been run. At every other oil change, the rear axle should be flushed out with flushing oil before the new oil is added.

Oil grade	Viscosity	Oil capacity
Hypoid oil	SAE 80*) (Above 90° F – SAE 90)	2½ Imp. pints 3¼ U.S. pints

9 Steering box

The oil level in the steering box should be checked after every 5 000 km (3 000 miles). The oil level should be up to the filler plug. If necessary top up with new oil **of the same grade and viscosity as that already used.**

The oil in the steering box does not usually need to be changed except when the unit is being reconditioned. If it is necessary to change the oil at all, suck up the old oil with a spray gun inserted through the filler hole.

Oil grade	Viscosity	Oil capacity
Hypoid oil	SAE 80*) (Above 90° F – SAE 90)	¾ Imp. pint ¾ U.S. pint

*) Where SAE 80 oil is not available in temperatures above 20° F, use SAE 90.

10 Brake fluid

The level of the brake fluid in the hydraulic brake system master cylinder must be checked after every 5 000 km (3 000 miles). The master cylinder is located under the steering shaft and is accessible after the hood has been lifted up. The master cylinder should be almost full of brake fluid (about 10 mm = 3/8" under the edge of the filler hole).

Engine

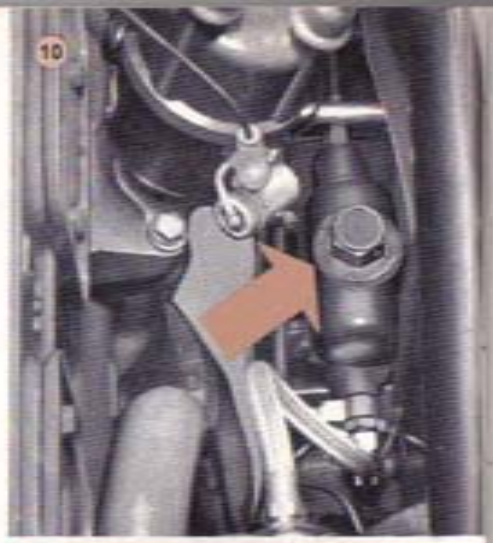
11 Clean the oil filler cap

The oil filler cap is fitted with a filter for the evacuation of water vapor and gas that leaks past the piston rings. If this filter becomes blocked by dust from the air passing in, there will be excessive pressure in the crankcase and this can lead to oil leakage. This filter must therefore be cleaned after about every 10 000 km (6 000 miles). Loosen the three screws round the cap and then take off the upper parts. Take out the filter and then wash the whole unit in clean gasoline.

12 Change the oil filter element

The engine is fitted with a full-flow oil filter, i.e. all the oil passes through the oil filter on its way from the pump to the various lubricating points The impurities in the oil are thus trapped in the filter which gradually becomes blocked. This means that the element must be replaced at regular intervals, for example after every 10 000 km (6 000 miles). This should preferably be done by a Volvo workshop.

10



Brake fluid

The brake fluid used in the hydraulic brake system must come up to the standards laid down in SAE 70 R 1 (H.D. grade).
From the point of view of traffic safety it is extremely important to ensure that poor quality brake fluid is not used in the hydraulic brake system. A top-quality brake fluid must satisfy strict conditions concerning resistance to cold and heat and must have no detrimental effect on the rubber components in the brake system.

11

13 Clean the fuel filter

The fuel filter should be cleaned after every 5 000 km (3 000 miles). Loosen the nut and move the retainer to one side. Remove the glass bowl and the strainer and clean them. After refitting, pump fuel up with the hand primer.

14 Clean the air filter (B 16 A)

The air filter should be regularly cleaned, for example after every 5 000 km (3 000 miles). Loosen the nut in the end and remove the filter unit. Clean it in gasoline, allow it to dry and then oil it in with engine oil, which should be allowed to run off before the unit is reassembled.

15 Change the air cleaners (B 16 B)

The air cleaners of the SU carburetors should be replaced with new ones after every 20 000 km (12 500 miles). The old ones should be discarded since the cleaner and element is made as a unit. When driving on dusty roads it is a good idea to remove the air cleaners and blow them clean with compressed air now and then.

16 Valves

Have the valve clearance checked in a Volvo workshop after every 5 000 km (3 000 miles). Excessively small valve clearance can easily cause burnt valves and valve seats. See page 55.

18 Fan belt

The fan belt tension should be checked after every 10 000 km (6 000 miles). Insufficient belt tension causes poor cooling and poor generator output.

13

14

15

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 at the top of the radiator. In order to avoid deposits in the cooling system, only clean water should be used (not water containing chalk or iron), together with some rust-preventive additive. Do not use rust-preventive agents based on mineral oil since these can damage the rubber hoses in the cooling system. Be careful when you unscrew the radiator cap. There are two positions on the cap when loosening it, one to decrease pressure in the system and the second to remove the cap itself.

Never add cold water to a hot engine. "The sudden change in temperature can cause cracks in the engine.

Clean the cooling system

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

Cleaning can be conveniently carried out in connection with filling or draining of anti-freeze in the fall and spring, (see page 52).

21 Check the spark plugs

The spark plugs should be checked in a Volvo workshop after every 5000 km - (3 000 miles). The plugs should be cleaned by using a brush or a sand-blaster and should then be blown well clean with compressed air. The electrode gap can be checked by using a wire gauge with a diameter of 0.7— 0.8 mm (0.028-0.032"). After the spark plugs have been cleaned and adjusted they should be thoroughly tested.

Replace the spark plugs

When the electrodes have been burnt down about 50 %, all the spark plugs should be replaced. This corresponds to a driving stretch of about 20 000 km (12 500 miles). This replacement should preferably be carried out at a Volvo workshop where the spark plugs are tightened with a torque wrench to about 3.5 kgm (25 lb.ft.). When fitting new spark plugs, be sure that you fit the right type (see page 55). Consult a Volvo workshop if you consider fitting another type of plug.

ff3 Ignition system

1 24 The distributor contact breaker gap and the engine ignition timing setting should be checked in a Volvo workshop after every 5000 km (3000 miles). All adjusting work should be done by the workshop which has the necessary equipment for this purpose. 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.

25 Carburetor

The carburetor float chamber should be removed and cleaned after every 5000 km (3000 miles). After every 20000 km (12500 miles), the vehicle should be taken to a Volvo workshop for the carburetor to be thoroughly cleaned and checked.

Acceleration pump (B 16 A)

The carburetor is fitted with an acceleration pump and the length of the pump stroke is determined by a cam washer which can be ad justed for short or long strokes by lifting the washer and turning it half a turn. The best acceleration performance is obtained when the arm is towards the lower cam. This will, however, also result in increased fuel consumption.

Gasoline

The fuel used should be gasoline with an octane value of at least 83* for B 16 A and 93* for B 16 B. If gasoline with too low an octane value is used, knocking or glow ignition can result.

*) Research Method

Electrical system

Q Check the battery electrolyte level

The electrolyte level should be checked whin the fuel tank **ii** being filled. The electrolyte level should be 5 — 10 mm (^{B}/ii—*/$"} over the top of the cell plates. Top up with distilled water if necessary. Never add too much distilled water since this can cause the acfd to splash over and result in corrosion on the part; of the engine around the battery. **Never check the electrolyte level by lighting a** match. The gases formed in the eel Is are very explosive.

^ Check the state of charge of the battery

The state of charge of the battery should be checked after every 5000 km (3000 miles). This check is carried out with the help of a hydrometer, this showing the specific gravity of the electrolyte which varies with the state of charge, see page 56. During the winter the state of charge must be checked more often since a fully charged battery is more resistant to frost damage than a half charged one.

^) Check headlight alignment

The alignment of the headlights should be checked in a Volvo workshop after every 10 000 km *(6* 000 miles). Remember that the lection of the road lit up by the headlights can vary depending on the loading in the verhicle. When the headlights are adjusted in a workshop, the beams are therefore directed rather low so thai when the vehicle is loaded, the alignment does not exceed the maximum value permitted in accordance with traffic regulations.

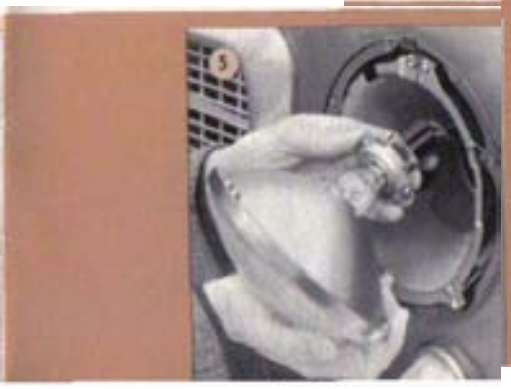
Replacement of bulbs

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 dipped lights. The guide pins on the socket for 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 butbs have a "Top" mark on the socket and this should be turned upwards.

When fitting butbs do not touch the glass with your fingers. The reason for this ti that grease, oil or any other impurities can be car bom led onto the bulb and this can cause damage to the reflector.

Replacing the roof light bulb

When replacing the roof light bulb the lamp shade Is pulled straight out. 42



Replace the headlight bulbi

1 • . Loosen the screw on the underside of the rim with a screwdriver.

Z[1] . Pull out the bottom part of the rim slightly and then lift upwards so that the retainer catch releases its grip.

3 Loosen the three screws retaining the insert. It is not necessary to remove these screws complete, The insert can now be removed by turning it in an anticlockwise direction.

* Loosen the small springs retaining the above holder and remove it.

Take out the bulb holder and loosen the bulb by pressing it inwards and turning it in a clockwise direction at the same time. When fitting a new bulb, remember that there are different widths on the socket pins. When refitting the bulb holder in the insert make sure that the small retainer engages in its notch.

On vehicles **fitted with Sealed Beam headlights, follow the instructions under pictures 1—1 and then replace the complete** unit.

Replacing the bulbs in the front parking and flasher lights

Loosen the rim with a screwdriver. Be careful not to damage the rim.

Remove the glass lens in the same way.

The bulb is now accessible for replacement. Remember that the pins on the socket have different position.

Replacing the bulbs for the rear blinkers and parking lights/stop lights

Unscrew the screws with an x-headed screwdriver and remove the glass with metal rim.

The bulbs are now accessible for replacement. The upper bulb is for the traffic indicators and the lower bulb for the parking light and stop light.

Replacing number plate lighting bulbs

Unscrew the screws with an x-headed screw-driver and remove the glass with rim.

When fitting the new bulb check that the spring clamps grip it properly.

Power transmission

29 Check the clutch pedal play

The clutch pedal play should be checked and adjusted if necessary after every 5 000 km (3 000 miles). In order to prevent the clutch from slipping, there must be a certain play on the clutch pedal, i.e. it should be possible to depress the pedal slightly before the clutch starts to disengage.
This play, in the form of pedal free play, should be 10—15 mm (about 1/2"). Check and adjustment can be carried out conveniently in a Volvo workshop.

Brakes

30 Check the brakes

After every 5 000 km (3 000 miles) the vehicle should be taken to a Volvo workshop for a check on the function of the brakes.
As the brake linings are worn, the brake shoes must be adjusted so that satisfactory braking effect is obtained without excessively large movements on the brake pedal and handbrake lever. There must be a certain free play on the brake pedal (7—12 mm = about 1/2") so that the brake shoes are not prevented from returning to their rest positions.

31 Overhaul the brakes

After every 20 000 km (12 500 miles) the brake shoes should be examined at a Volvo workshop for wear. If the vehicle is used for hard driving, this should be done more often. If the brake linings are worn down to the rivets, this can cause serious damage to the brake drums.

Front end

32 Check the front wheel alignment

Correct front wheel alignment is of vital importance for the steering of the vehicle. Faulty adjustment can also mean heavy wear on the tires.
Have the front wheel alignment checked in a Volvo workshop at regular intervals, for example after every 10 000 km (6 000 miles). If the vehicle has been involved in a collision or heavy impact and it is suspected that the front end may have been influenced, take the vehicle to a workshop for a check on the front wheel alignment as soon as possible. The front wheel alignment angles are shown on page 57.

33 Check the king pins, tie-rod, etc.

After every 20 000 km (12 500 miles) the vehicle should be taken to a Volvo workshop for a check of the front end concerning excessive play in the king pins, ball joints, steering gear, etc. At the same time the front wheel bearings are disassembled, cleaned and repacked with grease.

Servicing

Wheels and tires

9 Check the air pressure

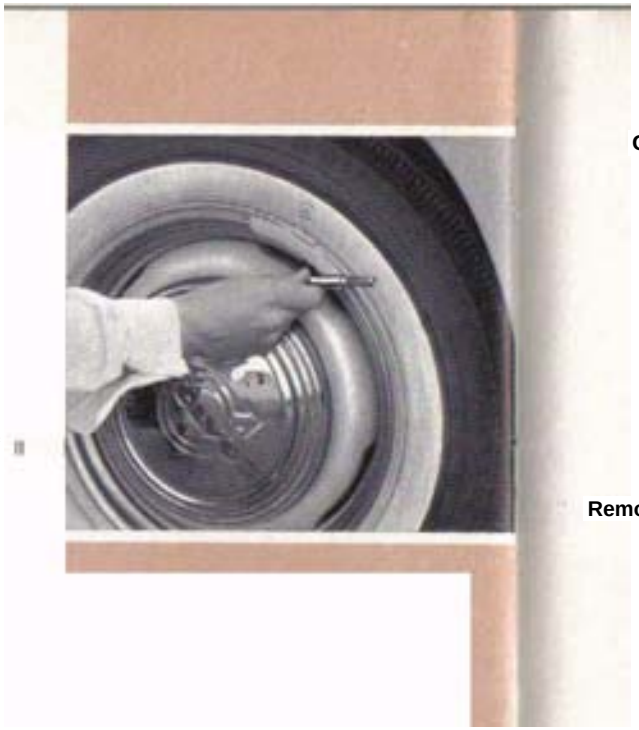
Make a habit of checking the air pressure in the tires regularly. The best way to do this is to check [he pressures every time you fill the fuel tank. See page 57 for the correct air pressures. Do not forget the spare wheel when you check the air pressure. Even if this wheel is not used, the air pressure cm go down and you wi find that the tire is flat just when you need it. Do not leave the spare wheel unused for any length of time but interchange it with one of the other tires at regular intervals, The tires with which the car is equipped 2S standard are, according to the manufacturers, suitable for speeds up to 160 km.p.h. (100 m.p.h.). For prolonged driving at high speeds (140-160 km.p.h. = 90-100 m.p.h.) the manufacturers recommend that the pressure should be increased by 0.4 kg/cm^a(6lb,'sq.in.)

If the car is trimmed in such a way that it can be driven at speeds exceeding 160 km.p.h. (100 m.p.h.]. special high-speed tires must be f tied.

Tighten the wheel nuts, balance the wheels

After every 10000 km (6000 milej} the wheel nuts should be tightened to atorqueof10-Ukgm(7I-100lb.ft.) The wheels should also be balanced at the same time if this proves necessary.

If inspection of the tires shows chat there are particularly worn spots and unusual wear on the tread, take the vehicle to a Volvo workihop for th« wheels to be balanced.



Excessively low air pressure is one of the most usual reasons for abnormal tire wear. If pressure is too low, the outer edges of the tread take the whole loading and are therefore worn down very quickly. Insufficiently inflated tires

Excessively high air pressure means that the tire is worn along the centre of the tread. It also means that the tire cannot stand up to impact which results in severe tire damage.

Changing a wheet

Before the vehicle is jacked up, the handbrake should be applied and one of the gears should be engaged to make sure that the vehicle stands still. Liy a couple of stones or chockj in front of and behind the wheels that are to remain on the ground. Do not rely entirely on the jack, for safety's sake, a block or something similar should be used as an extra support under the vehicle.

Removing

1 Lever off the hub cap with the help of the spade-shaped lever.

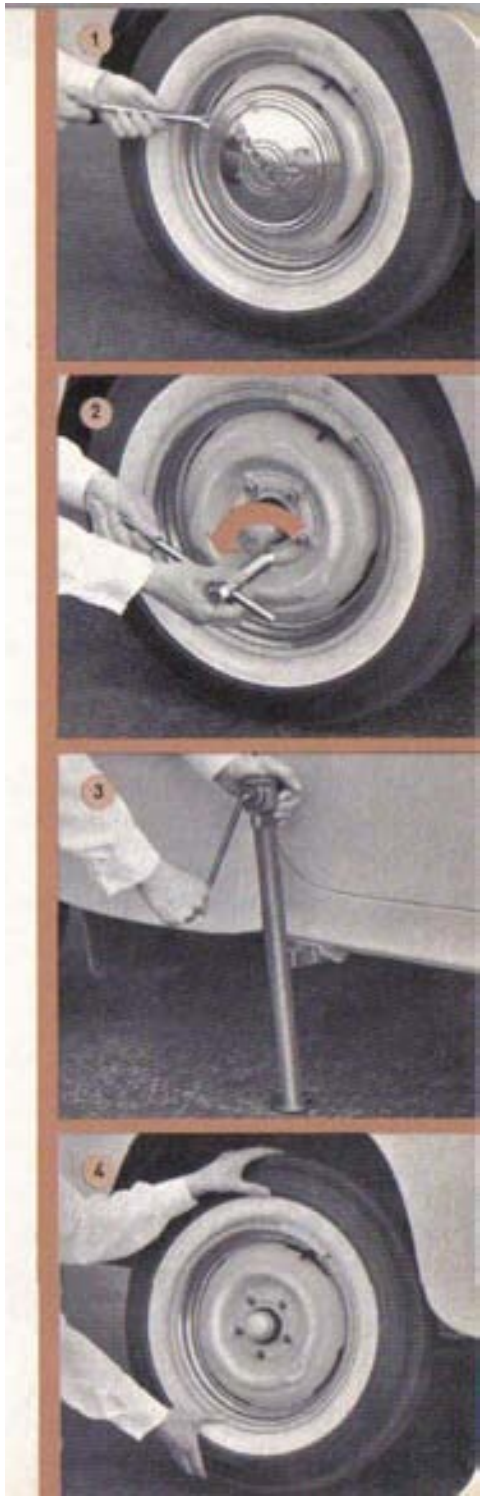
Loosen the wheel nuts to a certain extent with the help of the socket and tommy bar. All the wheels have nuts with right-hand threads which are loosened by turning In an anticlockwise direction.

Insert the lifting claw of the jack in the appropriate jack attachment of the wheel to be changed. Lift up the side of the car far enough for the wheels to turn freely.

Unscrew the wheel nuts completely and lift off the wheel. Be careful when lifting off the wheel so that the threads of the studs are not damaged.

Fitting

Fit the new wheel and tighten the nuts until the wheel Is in good contact with the hub flange. Then lower the vehicle and tighten the nuts finally. Tighten the nuts alternately. Fit the hub cap by striking it smartly with the hand opposite th« last of the lugs to engage.



Body

Washing

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

While the vehicle is being washed it should stand where it is not in direct sunshine since sunshine can cause drying patches. First rinse off the underside of the body with a jet of water and use a soft brush if necessary. Then rinse down the entire body with a fairly **light** jet until the dirt has loosened up. Do not be stingy with the water. Then wash off the dirt with a sponge using **plenty** of water.

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

Spots of tar, etc. can be removed by using kerosene. If the vehicle has white side-wall tires, these can be cleaned by scrubbing them with washing agents, scouring powder or, in the worse cases, a fine sandpaper. Whenever washing agents are used, the tires must be carefully rinsed off afterwards with clean water. After washing, clean the vehicle carefully with a soft, **clean** chamois leather.

Polishing (waxing)

The vehicle does not need polishing until the surface finish begins to appear a little matt and normal washing is not sufficient to make it shine again. Polishing will also remove any deposits on the surface finish. 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.

The vehicle should be carefully washed and dried before being polished. If polishing is carried out on a dirty or dusty surface, the surface finish can easily be scratched. Do not polish in direct sunshine since this can result in a smeary surface.

Polishing a couple of times a year is generally sufficient to give the surface finish the maintenance it needs. If you want to wax the vehicle, be very careful to insure that the surface is absolutely clean before a layer of wax is applied. Be very careful when using solvents since these can damage the surface finish in many cases. **Waxing may not be carried out before at least one year has passed after the vehicle has been delivered.**

i

Use a good quality polish intended for synthetic finish. Never polish j or wash the vehicle in direct sunshine since the result can be a smeary 1

washin S

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 near the sea. After washing you can apply wax or anti-rust preparations.

Teaching up, gravel damage on the finish etc.

At the same time as the underside of the body is rinsed off, the underbody protection should be examined. Should touching up be necessary, make sure that this is done before it has a chance to rust.

The synthetic finish on your vehicle requires the use of workshop equipment and specialized knowledge. For this reason you should always go to a Volvo workshop for the repair of minor damage. Damage caused by gravel as well as scratches in the surface can, however, be touched up by the owner and Volvo dealers supply the original paint in 100 g (4 oz.) tins for this purpose. Do not use cellulose paint for touching up since the difference in color may become apparent after some time.

Always touch up minor damage as soon as possible since otherwise rusting may occur.

38 Cleaning

Cleaning the upholstery

The upholstery in the vehicle should be cleaned with a vacuum cleaner at least once a month. If you have no vacuum cleaner, a stiff brush should be used instead.

If there are any stains on the upholstery these can be removed in accordance with the instructions on the following page. Do not use gasoline or carbon tetrachloride on the parts of the upholstery consisting of plastic material.

These parts should be cleaned with tepid soap solution or household cleaning agents in severe cases.

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

Clean the floor mats

The floor mats should be taken out at least twice a year and cleaned. Particularly during the winter when there can be snow and ice on the mats, they should be taken out and dried.

If the mats are stained they can be cleaned with methylated spirits which is then rinsed off with water.

Battery acid

If any battery acid is spilt on the upholstery, the stain must be removed immediately otherwise a hole can be corroded in the upholstery. Use ammonia, but if you have no ammonia available you can rinse the stain with water. Rinse the stain as soon as possible with ammonia which should then be rinsed off with water.

Mood

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

Lipstick

Chewing gum

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

Vomit
Urine

Servicing before long-distance driving

with carbon tetrachloride. <

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

Dab the stain with cold water before it has 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.

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

If you're thinking of travelling abroad with your vehicle or taking a long trip on the whole, you should have your vehicle overhauled in a Volvo workshop. You will enjoy your journey better if you know that your vehicle is in perfect trim. You drive in a more relaxed way if you're certain ever/thing is functioning perfectly- You thus avoid irritating incidents expensive and time-taking stoppages. Even if something unforeseen should happen, your journey does not need to be spoiled. Wherever you go you know you have Volvo workshops within reach and these workshops can take care of your vehicle very quickly. Do not forget your regular servicing during your trip abroad. All Volvo workshops abroad are equipped to give your vehicle the service it needs.

If you prefer to look over your vehicle yourself before taking a long journey, the following tips are worth noting:

Give the vehicle thorough all-round lubrication.

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 the fuel consumption is normal, you can save both time and money by doing a thorough overhaul.

5 Examine the state of charge of the battery and clean tern

6 Check brakes, front wheel alignment and steering gear.

7 Check the tool kit and check the spare wheel.

8 Check the lighting and adjust your headlights for right-hand traffic if necessary.

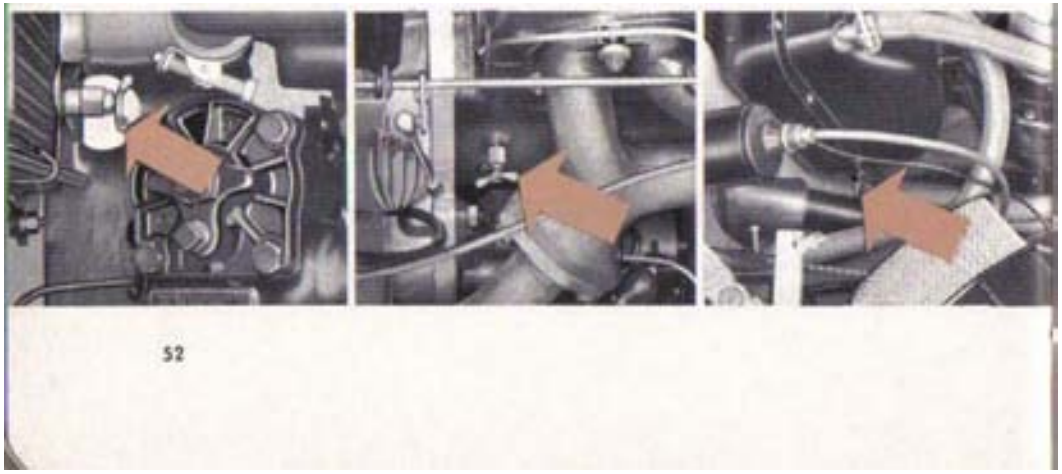
Procedure in cold weather

When cold weather is in the offing, It Is time to chink of the winter servicing of your vehicle. The first heavy night frosts can come as an unpleasant surprise unless preventive precautions have been taken. Most people know that there should be anti-freeze in the radiator but have you thought that the water in the windshield washer can also freeze and that moisture can freeze in the locks?

AntWreezt

Some suitable type of ami-freeze should be added to the cooling system in good time before cold weather. The most usual anti-freeze agents are ethylene glycol and methylated spirit. Methylated spirit, however, has the disadvantage that it evaporates at normal engine temperatures. Ethylene glycol is made more permanent and is therefore preferable for use as anti-freeze. Pure . ethylene glycol has a corrosive effect on the cooling system in the engine and that is why the anti-freeie preparation available on the market has corro-sion-preventative additives. For certain chemical reasons the quantity of these additives is only sufficient to last for one winter season. Under unfavorable conditions, they can even be used up more quickly, for example if tliere is sludge, rust or flushing agents left in the cooling system. The cooling system should be thoroughly flushed out before anti-freeze is added. Drain off the entire cooling system including the heater, flush out with water, steam at a pressure of about 1 kg/cm* (14 p.s.i.) or soda solution.

Drain cocks for cooling system



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Mixing table for ethylene glycol'water

Coolini iritcm Ciplcit)'		NaiAiurr amount of tthylepc ElycoHor Iron protection down to:				
		(14°F)	-IS'C (S°F)	(~5° *ft*	-30° C (-	)
Imp. pinu U.S. pint*	15 lt	3V, «V.	*VI.* *<l.*	5V. 6V.	7 *VI,*	

Engine lubricating system

During the winter engine oil with a viscosity of SAE 10W should be used for ihe engine lubricating system. This lighter oil reaches the lubricating points ir the engine more easily at low temperatures and also facilitates cold starting. If you drive mainly short distances during the winter, the engine oil should be changed more often than usual, for example after every *2* 500 km (1500 miJes).

If the vehicle has been stand ing outdoors dunng the night in very cold weather, you should not start driving is soon as the engine has been started. Let the engine run for a minute or so at rapid idling speed first.

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 the starter motor are used more and since the capacity of the battery is also considerably tower with low air temperatures, the state of charge must be checked more often. If the battery voltage is excessively low there is risk of frost damage to the battery.

Brake system

During the winter the brakes are subjected to splash and condensation water to a greater extent than during the summer and the result of this can be that the handbrake cable may freeze up if the handbrake is left on. When you park the car, do not apply the handbrake but engage first gear or reverse.

Windshield washer, anti-freeze for door locks

In the same way as anti-freeze is added to the cooling system during the winter to prevent frost damage, anti-freeze should also be added to the windshield washer water container. Your Volvo dealer can supply you with i suitable anti-freeze for this purpose

A frozen door lock is one of the most irritating things that can happen to a car-owner. Many valuable minutes early m the morning can go to waste warming up keys and melting ice in locks. Remember chis in **good** time and lubricate the lock with some anti-freeie preparation.

Specifications

Dimensions and weights

Length	4450 mm (175")
Width	1590 mm (62⅝")
Height	1560 mm (61⅜")
Wheelbase	2600 mm (102⅜")
Trackwidth, front	1295 mm (51")
rear	1315 mm (51¾")
Ground clearance	200 mm (7⅞")
Turning circle	10.8 m (36 ft.)
Kerb weight, PV 544—11141	1050 kg (2310 lb)
PV 544—11142	1060 kg (2332 lb)
PV 544—11244	1070 kg (2354 lb)

Engine

Type designation	B 16 A	B 16 B
Max. output, (DIN)	60 h.p.	76 h.p.
(SAE)	66 h.p.	85 h.p.
Max. torque, (DIN)	11.3 kgm (82 lb.ft.)	11.5 kgm (83 lb.ft.)
(SAE)	11.8 kgm (86.5 lb.ft.)	12 kgm (87 lb.ft.)
Number of cylinders	4	4
Bore	79.37 mm (3.125")	79.37 mm (3.125")
Stroke	80 mm (3.15")	80 mm (3.15")
Displacement	1.58 liters (97 cu.in.)	1.58 liters (97 cu.in.)
Compression ratio	7.4:1	8.2:1
Valves	Overhead	Overhead
Valve clearance, inlet	0.40 mm (0.016")	0.50 mm (0.020")
exhaust	0.45 mm (0.018")	0.50 mm (0.020")
Idling speed	400—600 r.p.m.	500—700 r.p.m.

Fuel system

Carburetor, type	Down-draft	Horizontal (twin)
designation	Zenith, 34 VN	SU H4

Lubricating system

Oil pressure, warm engine	2.5—3.5 kg/cm² (36—50 lb/sq.in.) at approx. 50 km.p.h. (30 m.p.h.) in top gear

Cooling system

Type	Pressure (approx. 0.25 kg/cm² = 4 lb/sq.in.)
Thermostat:	
starts to open at	75—78° C (167—172° F)
fully open at	90° C (194° F)

Ignition system

Firing order	1-3-4-2	
Ignition setting:		
87 octane Research	2—4° B.T.D.C.	—
93 octane Research	2—4° B.T.D.C.	4° B.T.D.C.
97 octane Research	2—4° B.T.D.C.*)	4—6° B.T.D.C.*)
Spark plugs:		
normal driving	Bosch W 175 T3**)	Bosch W 175-225 T3**)
hard driving	Bosch W 225 T3**)	Bosch W 240 T3**)
spark plug gap	0.7—0.8 mm (0.028—0.032")	
Distributor:		
direction of rotation	Clockwise	
contact braker gap	0.4—0.5 mm (0.016—0.020")	

*) Delivery setting. **) Or corresponding types.

Electrical system

Voltage	6 volts.	
Battery, type	Tudor 3 Df 6 SAAJ GH 13-6	or corresp. types.
Battery, capacity	85 Ah	
Battery electrolyte, specific weight	1.275—1.285	
Battery electrolyte, specific weight when recharging necessary	1.230	
Generator output	300 watts	
Starter motor output	0.6 h.p.	
Fuses, rating/number	8/4 25/2	

Lamp bulbs (6 volts)

	Watts	Socket	Number
Headlights	45/40	Ba 20 d	2
Direction indicators/parking lights, front	20/5	Ba 15 d spec.	2
Direction indicators, rear	20	Ba 15 d	2
Stop lights/parking lights, rear	20/5	Ba 15 d spec.	2
Number plate lighting	5	S 8	2
Internal lighting	10	S 8	1
Instrument lighting	2	Ba 9 s	2
Indicator lamps, direction indicators	2	Ba 9 s	1
headlights	2	Ba 9 s	1
charging	2	Ba 9 s	1
oil pressure	2	Ba 9 s	1

Power transmission

Clutch

Clutch pedal free play	20—25 mm (about 1")

Transmission

	M 30	M 40
Type designation		
Reduction ratios: 1st speed	3.13:1	3.13:1
2nd speed	1.55:1	1.99:1
3rd speed	1:1	1.36:1
4th speed	—	1:1
Reverse	3.25:1	3.25:1

Rear axle

Type	Crown wheel and pinion (Hypoid)
Reduction ratio	4.56:1

Brakes

Brake pedal free play	10 mm (about 3/8")

Front wheel alignment

Toe-in	0—3 mm (0.18")
Camber	—1/4° to +1/2°
Caster	—3/4° to +1/4°
King pin inclination	5°

Wheels and tires

Tire size	5.90—15
Tire pressure (cold tires and normal load):	
front	1.4 kg/cm² (20 lb/sq.in.)
rear	1.6 kg/cm² (23 lb/sq.in.)

Capacities

Fuel tank	approx 35 liters (7 3/4 Imp. galls = 9 1/4 US galls.)
Cooling system	approx. 8.5 liters (15 Imp. pint = 2 US galls)
Oil capacity, engine when changing oil	approx 2.75 liters (4 7/8 Imp. pints = 6 US pints)
including oil cleaner	approx 3.5 liters (6 1/4 Imp. pints = 7 1/2 US pints)
Oil capacity, transmission	approx. 0.75 liter (1 1/8 Imp. pints = 1 1/2 US pints)
Oil capacity, rear axle	approx. 1.3 liters (2 1/4 Imp. pints = 2 3/4 US pints)
Oil capacity, steering gear	approx. 0.25 liter (3/8 Imp. pint = 1/2 US pint)

Tool equipment

Jack
Socket wrench for wheel nuts and spark plugs
Tommy bar for wrench
Pliers
Adjustable wrench
Phillips screwdriver
Screwdriver
Toolbag

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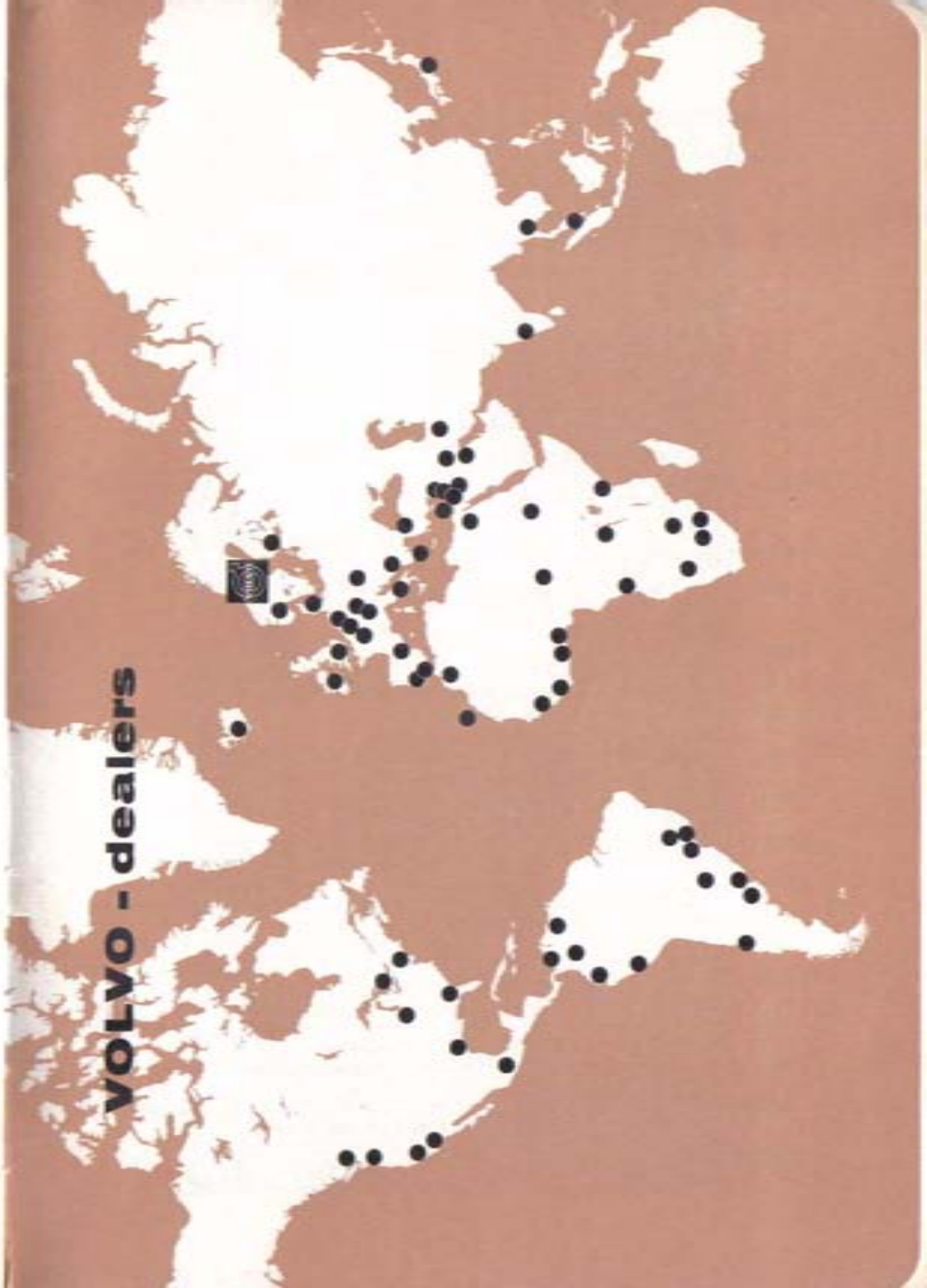


Lubricating chart

Symbols

!•- Chassis lubricant

^k **Brake fluid**
~ HD type

^^ **Light engine oil**

fl **Engine oil**
Grade (B16A): For Service MM or MS
(B16B): For Service MS Viscosity:
below 0° C (32° F) SAE 10 W
0°-30° C (32°-90° F) SAE 20
over 30° C (90° F) SAE 30

n **Transmission oil**
• Viscosity: SAE 80 all the year round*)

Q **Rear axle oil**
Grade: Hypoid oil
Viscosity: SAE 80
all the year round*) ,

^ **Lubricant see notes**

Oil capacities

Engine …… 2.75 liters
4^{7}/s Imp.pints
6 US pints
Engine, incl. oil cleaner .. 3.5 liters
6*/4 Imp. pints
7% US pints
Transmission ..... 0.75 liter
1*/4 Imp. pints
$1V_2$ US pints
Rear axle ..... 1.3 liters
2^{x}/4 Imp. pints $2^{3}/_{4}$
US pints

Notes for lubricating chart

Note 1 The front wheel bearings should be disassembled after every 20000 km (12500 miles). The bearings should be cleaned and then carefully packed with heat-resistant grease. **Note** 2 Check that the oil level is up to the filler plug. Use SAE 80 hypoid oil (above 30° C (90° F) - SAE 90).

Note 3 Check the brake fluid level. If necessary top up with new brake fluid. **Note 4** Lubricate the wick under the rotor with a few drops of light engine oil. Also add a few drops of oil to the lubricator. **Note** 5 Check every 1250 km (750 miles) that the oil level is up to the filler plug. The oil should be changed after every 20000 km (12500 miles).

Note 6 The rear wheel bearings should be disassembled after every 40 000 km (25 000 miles) or at least every other year. See note 1.

Note 7 Fill the lubricator with light engine oil. The lubricator is opened by turning the outer casing. Use a normal oil can (not a pressure can).

Note 8 At every engine oil change light engine oil (SAE 20) should be filled into the carburetor damping cylinders. Unscrew the nuts at the top of the carburetors and remove the plunger. Fill up with oil so that the spindle but not the part above it is full. Also lubricate the carburetor jets sparingly after the choke control has been pulled out fully.

Note 9 Lubricate sparingly with heat-resistant grease.

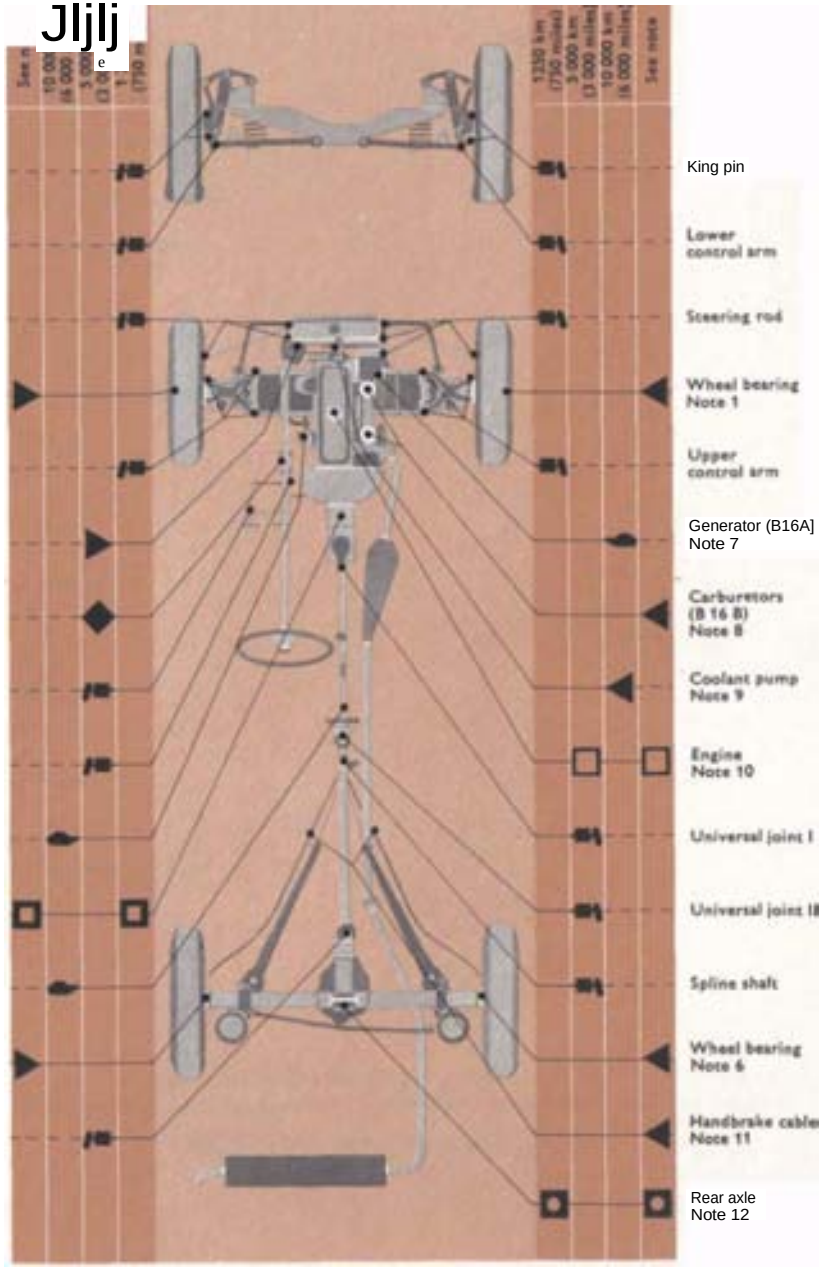
Note 10 Check the oil level when you fill the fuel tank (at least every 14th day). Change the oil after every 5 000 km (3 000 miles) as well as in the spring and in the fall when the viscosity is changed (see page 36). **Note 11** Have the handbrake cable lubricated with graphite grease twice a year at a Volvo workshop.

Note 12 Every 1250 km (750 miles) check that the oil is up to the filler plug. The __ oil should be changed after every 20000 km (12 500 miles).

«) See page 37 62

Lubricate after every:

Lubricate after every:



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