Instruction Manual

Instruction Manual

VW 1600 L – Karmann Ghia Coupé

August 1968

VOLKSWAGENWERK AG · WOLFSBURG

Contents

All pictures and text in this instruction manual are based on the VW 1600 L Karmann Ghia Coupé with a number of useful optional extras. Driving the VW Automatic is described in a special section. Special equipment such as is often required due to local regulations in various countries is not taken into account.

We trust you will appreciate that we must reserve the right to alter, without notice, any of the equipment and specifications illustrated or described in this manual.

Volkswagenwerk Aktiengesellschaft

It is to your advantage

to get to know your new car quickly so that you will be able to start off on your first trip with complete confidence. For this reason you should read the first part of this booklet, which deals with the operation of your Volkswagen, very carefully.

The second part tells you everything about winter driving and care of the car and also contains some useful do-it-yourself tips. There is also some information on the proper sort of fuel and oil to use, how to carry out oil changes and lubricate the car und a collection of interesting technical data.

When you have studied this manual, and we strongly recommend you to do so, you will know how to operate your car properly. You will then be entitled to expect many years of reliable and economical service from your car regardless of weather, road conditions and mileage run. In this connection we should like to mention the VW Service Record which is the second important publication that you receive with the vehicle.

The Service Record tells you exactly what points you have to watch to maintain the road-worthiness of your car and explains the lubrication and maintenance program which we have prepared for it. It also contains the Warranty Voucher for your car and the conditions on which this voucher is issued.

Always have the Service Record with you when you take the vehicle to a VW workshop — it helps to establish proper contact with the workshop staff.

In your own interests: Have your Volkswagen serviced as laid down in the Service Record right from the start. Proper treatment and complete proof of all maintenance work carried out can be of vital importance if you should have occasion to make a claim under warranty.

Get in and make yourself comfortable

When driving, you must be comfortable.

That is why the Volkswagen has separate front seats which are built so that you can alter seat position and backrest rake to suit your requirements. This is quite simple — just lift the lever at the front right-hand side of the seat and slide the seat forward or backward. After adjusting, make sure that the seat is securely locked in position.

The backrest rake can be set to various angles by turning the large knob on the other side of the seat. Try it out until you find the angle which suits you best.

When the doors are closed, cable-operated safety catches prevent the backrests from tilting forward.

Only one key is required to open the door and the rear hood and to start the engine.

The other key is for the glove compartment lid.

It is a good idea to note the numbers of the keys on a slip of paper which is then put with the vehicle documents. If you should lose the keys, you can always obtain replacements from your VW Dealer.

Before closing the door from inside,

it is advisable to open a window slightly. The door will then be easier to close because the air can escape from inside the body.

1 - Vent wing fastener

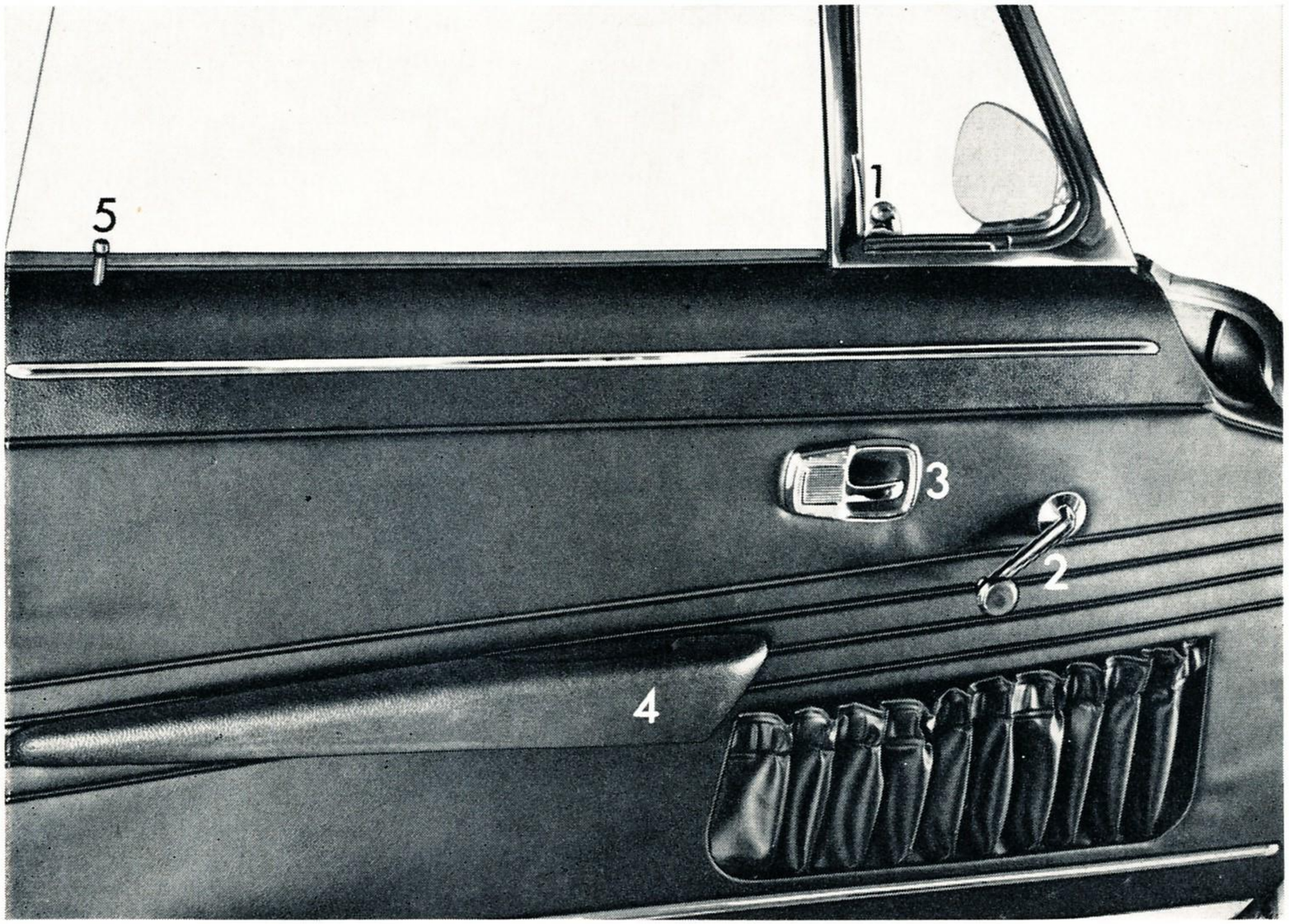
2 - Window crank

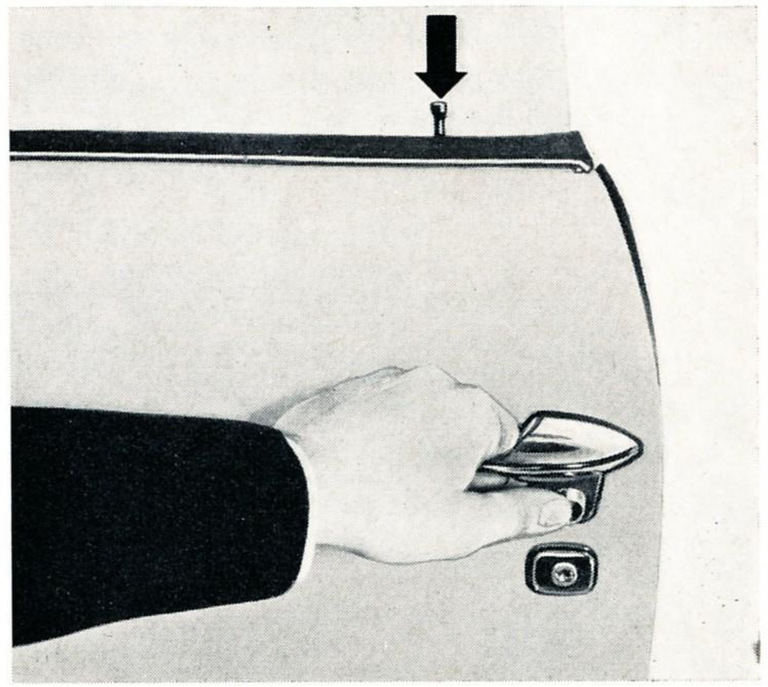
3 - Lock release lever

4 - Armrest and door closing grip

5 - Safety knob for lock

The doors cannot be opened from inside with the release lever until the safety knobs have been lifted.
When leaving the vehicle, just press the safety knob down and depress the button under the outer handle as you close the door. The vehicle is then locked.





If the door closes on its own after the safety knob has been depressed, it will not lock itself because the safety knob springs up automatically. This is an additional safety measure to prevent you from being locked out if the door should slam to while the key is still inside the vehicle.

In front of you – the instrument panel

Even if it is not your first Volkswagen, just have a quick look at the dash and try out the various knobs and levers with the ignition switched on:

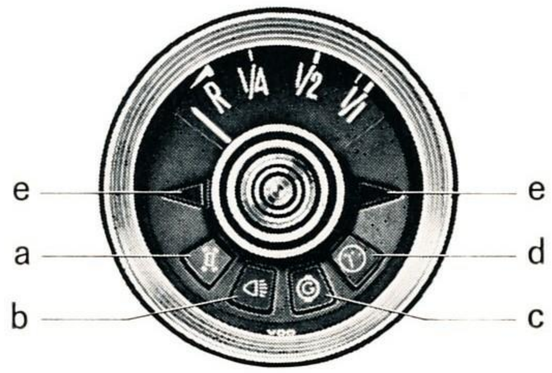
1 - Clock

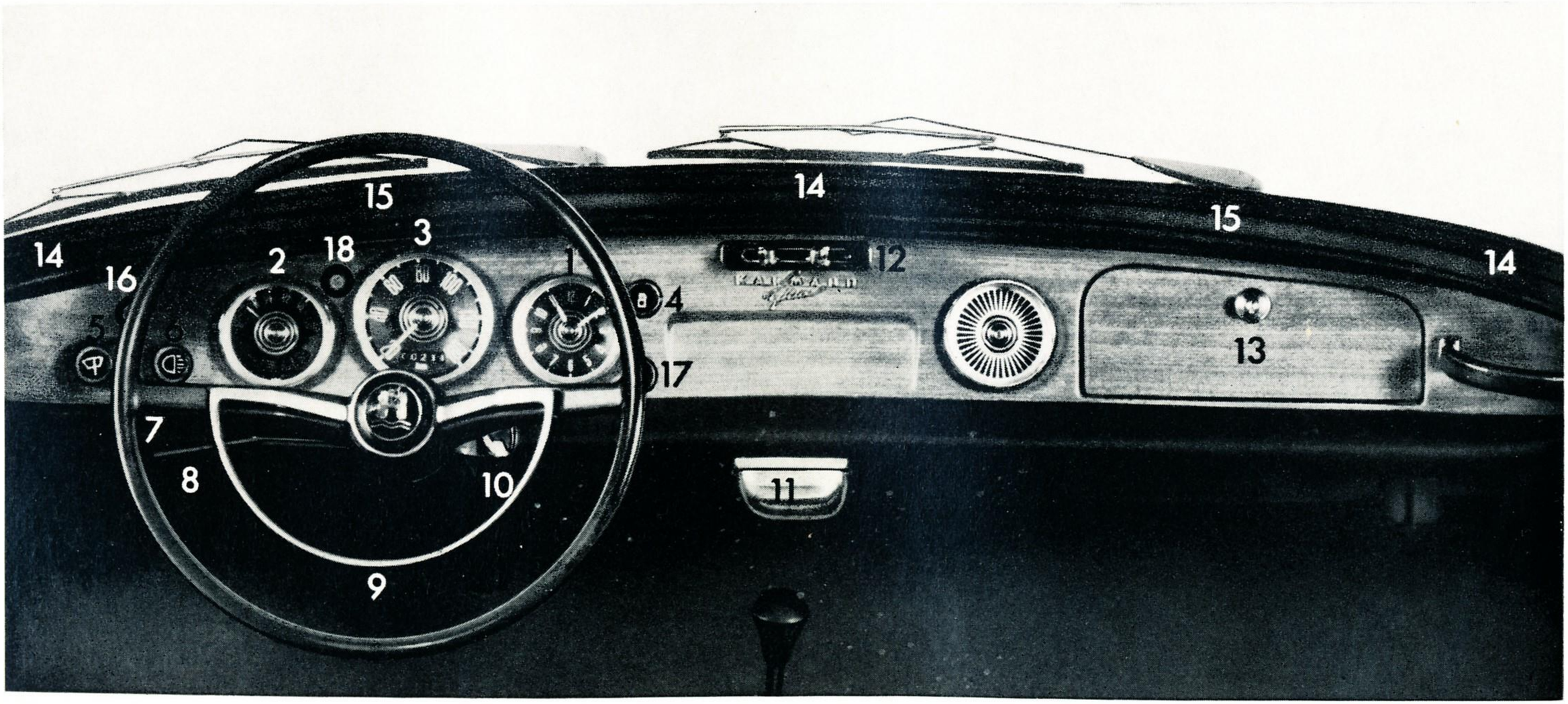
The clock is electrically operated. The hands can be moved by pressing in and turning the knob in the dial center.

2 - Fuel gauge

The following warning lamps are in the fuel gauge dial:

a — dark green — parking lamps
b — blue — headlamp high beam
c — red — generator
d — red — oil pressure
e — light green arrows — turn signals





When the needle is on the vertical mark "R" there are about 5 liters (1 gallon) of fuel left in the tank — time to refuel at the next opportunity.

3 - Speedometer

4 - Cigarette lighter
To switch the lighter on, press it in and then release it. When the element is hot, it springs back slightly and is ready for use.

5 - Windshield wipers and windshield washer system
The two-speed wipers are switched on by turning the switch. They park automatically when switched off. When the knob in the center of the wiper switch is pressed, the washer sprays water on to the windshield.

6 - Lighting switch
Pull the knob out to the first stop to switch on the parking, license plate, tail and instrument lights. When the knob is pulled out to the next stop, the headlamps are switched on as well. A blue warning light in the fuel gauge dial shows when the headlamp high beams are switched on.

The instrument lighting is switched on and controlled in brightness by turning the main lighting switch.

7 - Fog lamps
The fog lamps are switched on with a separate switch underneath the instrument panel on the left. The fog lamps only work together with the headlamp low beams.

8 - Turn signal switch
With ignition on:
Lever up — right turn signals
Lever down — left turn signals

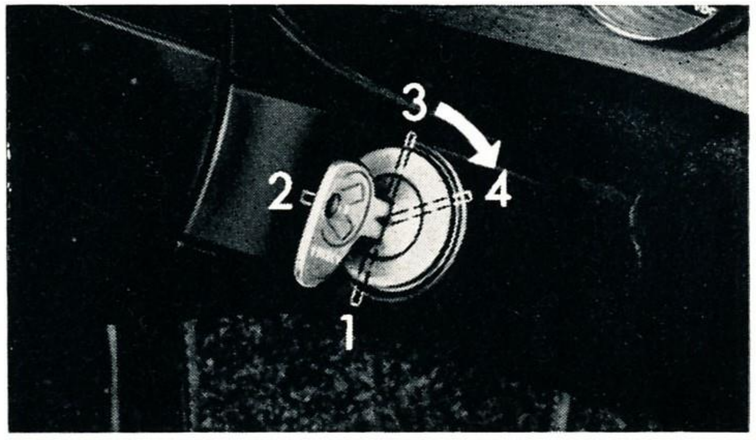
The turn signals are cancelled automatically after taking a corner as soon as the steering wheel is returned to the straight ahead position.

With ignition off:
Lever up — right parking lamp
Lever down — left parking lamp

Lifting the turn signal lever switches the headlamp beams up and down. When the lights are not on or only the parking lights are on, the button serves as a headlamp flasher (not with Sealed Beams).

9 - Horn ring

10 - Steering-ignition lock
1 — Ignition off — steering locked
2 — Ignition off — steering free
2 — Ignition on
4 — Starting



Important
Remove key from lock only when vehicle is stationary.

11 - Ashtray
To remove ashtray, press leaf spring down and pull ashtray out.

12 - Fresh air ventilation
The two levers control the flow of air through the vents at lower edge of windshields separately on each side of vehicle. As the levers are pressed outwards the flow of air increases.

13 - Glove compartment
The knob is lockable. Press the knob to open the glove compartment lid.

14 - Defroster vents

15 - Fresh air vents

16 - Dual circuit brake warning light
see page 19.

17 - Hazard warning light system
To switch on, pull knob out. (A warning lamp in the knob comes on).
When the system is switched on, all four turn signals flash at the same time. The system is used to warn other road users of a drangerous situation when moving or that the vehicle is stationary. Regulations governing the use of this type of warning system vary from country to country.
The hazard warning light system remains in operation when ignition is switched off.

Above the windshield

18 - Heated rear window *

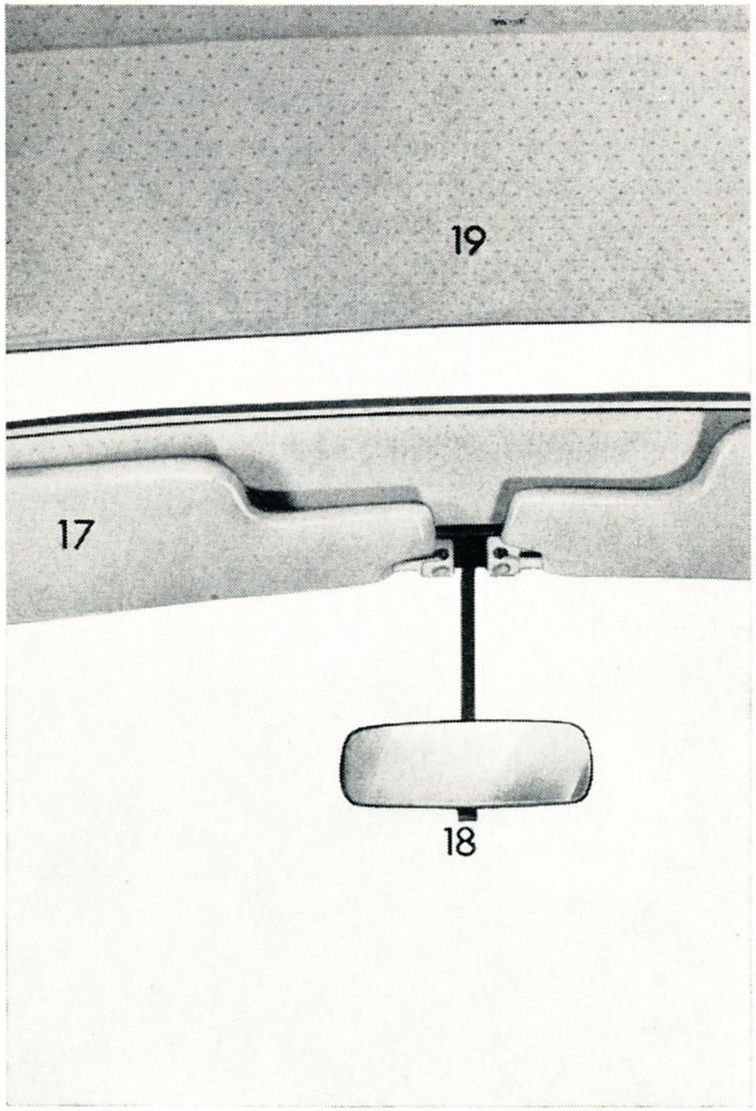
This switch is for the heatable rear window but it only works when the ignition is switched on. A green warning lamp in the instrument panel (item No. 18) shows when the window is switched on.

As soon as the rear window is clear, switch the heater element off to reduce the load on the battery.

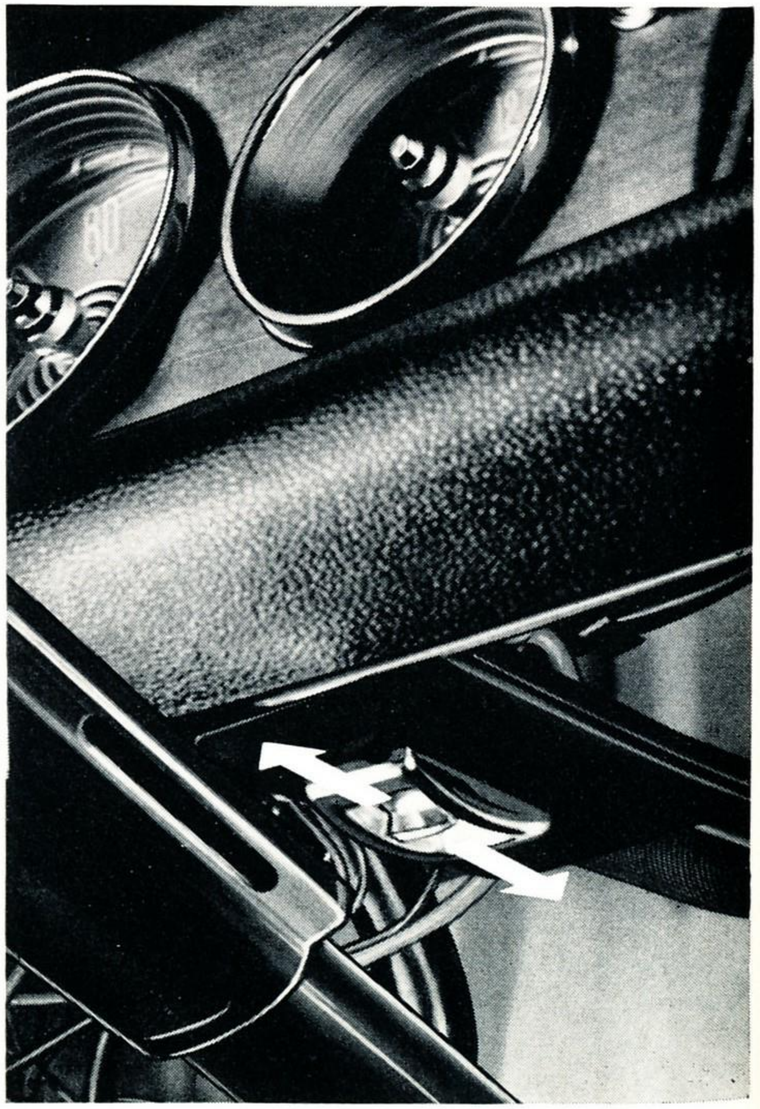
17 - Sun visors
You can pull the visors out of the center mounting near the mirror and swing them towards the door windows to prevent dazzle from the side.

* Optional extra

18 - Rear view mirror
Anti-dazzle interior mirror
Button forward — anti-dazzle position
Button to rear — normal position



19 - The sliding roof
The sliding roof is electrically operated and is controlled with a switch under the instrument panel to the right of the steering column. To open roof, slide switch to the rear, to close it move switch to front. The roof stops moving when the switch is released.



VW Automobile Radios

are also available as optional extras. The three models are called "Braunschweig", "Emden" and "Wolfsburg". If you select one of these sets for your car, note the following points:

"Braunschweig" model

5 tuning press buttons as follows:
2 x U = VHF (87.6 — 108 Mc/s)
2 x M = Medium wave (515 — 1620 Kc/s)
1 x L = Long wave (150 — 290 Kc/s)
1 rotary tuning knob: on right
1 rotary/push-pull knob for On/Off, volume and tone control (Knob out — bass, knob in — treble) on left.

"Emden" model

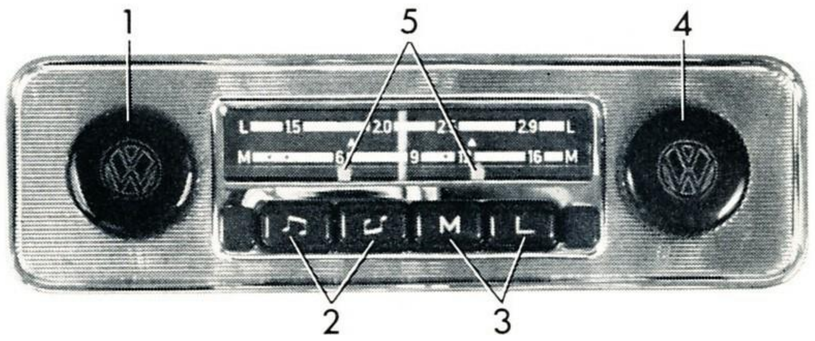
3 wave band press buttons:
U = VHF (87.6 — 108 Mc/s)
M = Medium wave (515 — 1620 Kc/s)
L = Long wave (150 — 290 Kc/s)
1 tone control press button: treble-bass
1 tuning knob: on right
1 On/off and volume control knob: on left
2 station markers

"Wolfsburg" model

2 wave band press buttons:
M = Medium wave (515 — 1620 Kc/s)
L = Long wave (150 — 290 Kc/s)
2 tone control press buttons: treble-bass
1 tuning knob: on right
1 On/off and volume control knob: on left
2 station markers

How to use tuning press buttons
Select station.

Pull appropriate wave band button out and the press it in again. This fixes the station so that you can select it at any time by pressing the button even though you have moved tuning knob to another station.



1 — "On-off", volume knob
2 — Tone control buttons
3 — Wave band buttons
4 — Tuning knob
5 — Station marker

In built-up areas and hilly districts the VHF reception is often of poor quality.

If local regulations require it, do not forget to obtain a radio license before using your car radio.

The telescopie aerial requires a certain amount of care otherwise it will get stiff and is then liable to bend when being pushed down.

From time to time, after washing the vehicle, the aerial should be wiped dry with a clean cloth and coated lightly with special aerial grease (obtainable in car accessory shops).

Use only a 2 ampere fuse in the connecting cable (VW Part No. 111 035 307).

In the footwell and between front seats

1 - **Clutch pedal**

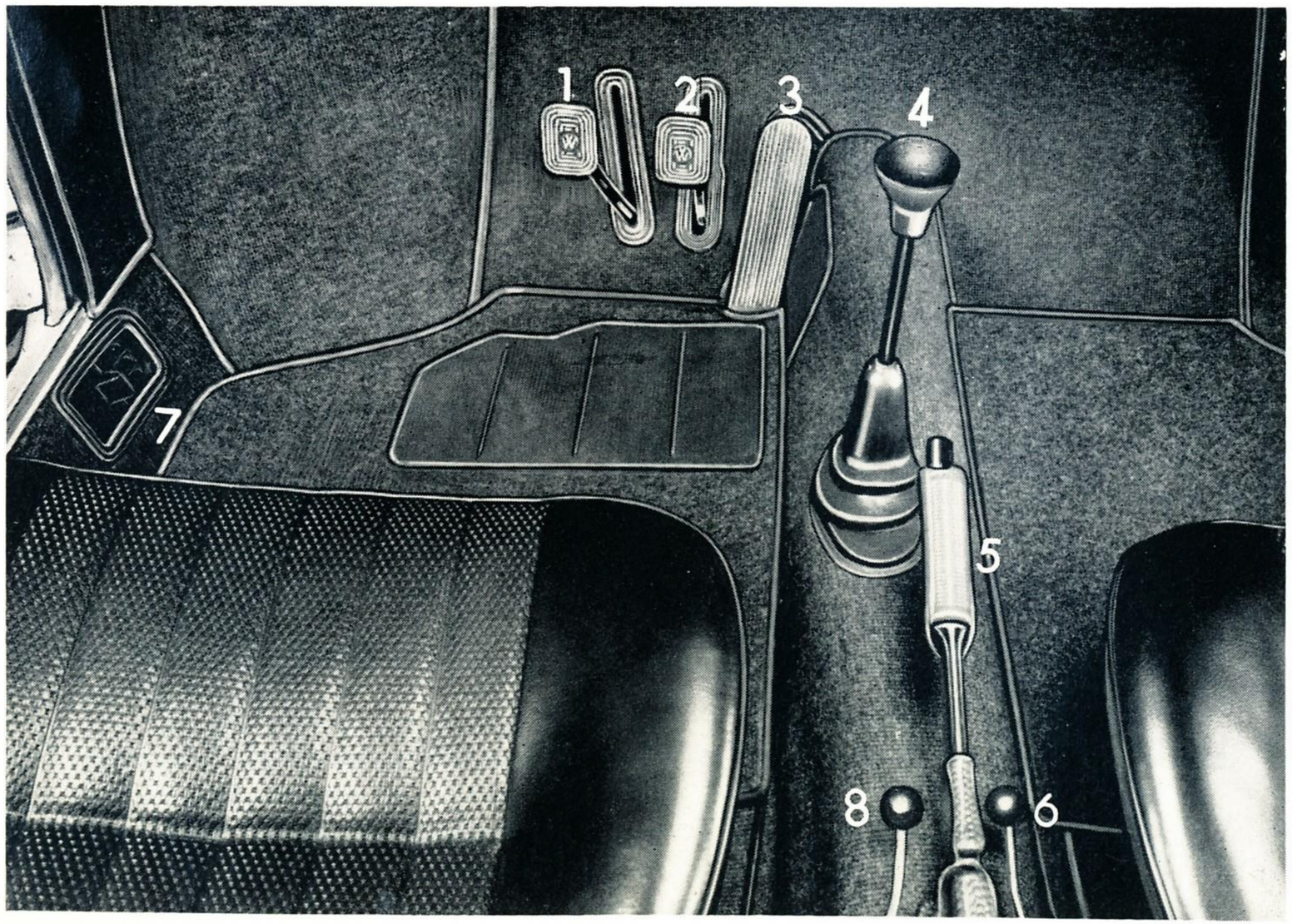
2 - **Brake pedal**

3 - **Accelerator pedal**

4 - **Gearshift lever**

5 - Handbrake

To release the handbrake, pull the lever up slightly and press the locking knob.



6 - Heating control levers

Lever up — heating on
Lever down — heating out

The heating will be more effective if you open one of the vent wings slightly when the heating is on because the fan can then force the warm air into the body interior more easily.

7 - Heater control slides in front footwell

The flow of warm air into the front footwell can be controlled separately on each side by means of slides over the outlets.

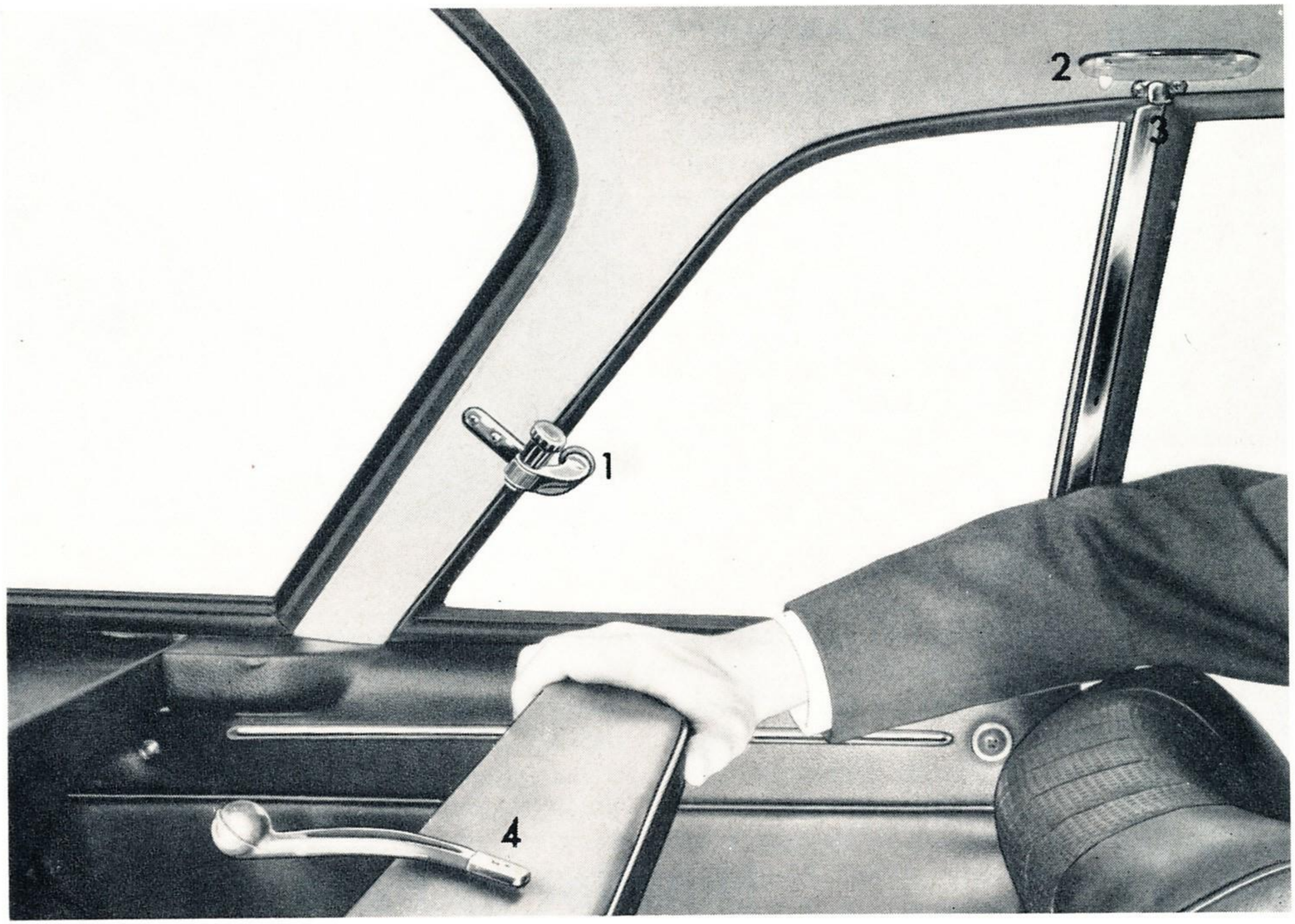
8 - Control lever for heating in rear footwell

This lever controls the flow of warm air into the rear footwell when the heating is on.

Lever up — flaps open
Lever down — flaps closed

At low temperatures it is advisable to leave the rear outlets closed when first moving off. This increases the flow of air to the windshield and also helps to prevent steaming up when the air humidity is high. As soon as the windshield is clear, the rear footwell outlets should be opened so that the interior of the body heats up as quickly and uniformly as possible.

Behind you



1 - Hinged window

2 - Interior lighting

The light has a built-in switch which has three positions:

Knob down — light comes on when a door is opened

Knob up — light on

Knob in center — light off

3 - Assist straps and coat hooks

4 - Emergency seat

The bench behind the front seats is for children or can serve as an emergency seat. The backrest is held in the normal position by a rubber loop.

If you fold the backrest forward, you gain quite a lot of extra space for luggage.

Safety belts

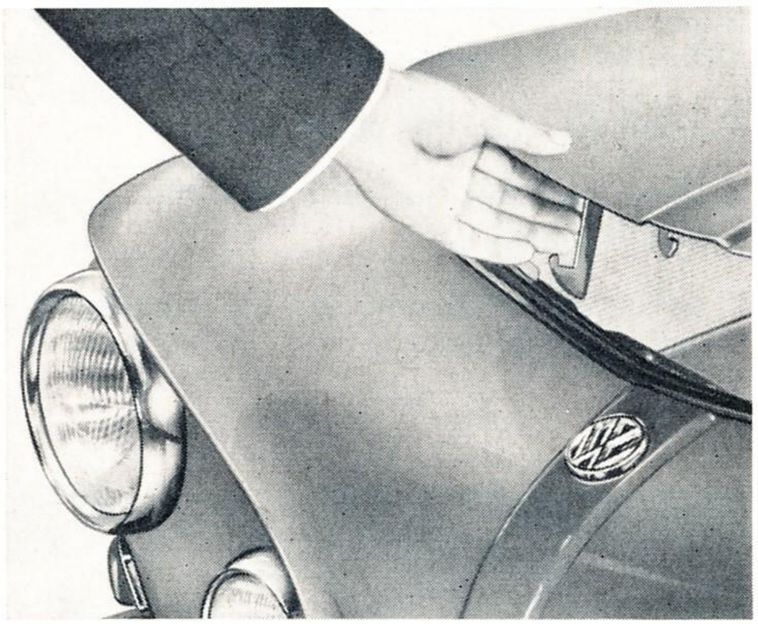
can be obtained from every VW Dealer. Shoulder belts for the driver and front seat passanger are fixed to mounting points on the lock pillar and on the side of the tunnel in the rear footwell.

For combined lap/shoulder belts there is an additional mounting point on the side members.

Now let us have a look . . .

. . . in the front luggage compartment

Whether you are taking a lot of luggage with you or not, please load the front luggage compartment first, using the heaviest pieces of luggage if possible. A good distribution of load means good roadholding so take advantage of the possibilities offered by the Volkswagen with its two luggage compartments.



The lever for the front lock hood is in the glove box: To unlock hood, pull lever back. The hood springs up slightly first under spring pressure and can be opened fully when the safety hook near the lock has been pressed back. To close the hood, press it down firmly until you hear a click. Never try to close the hood by pressing at the side, always press it in the center near the lock.

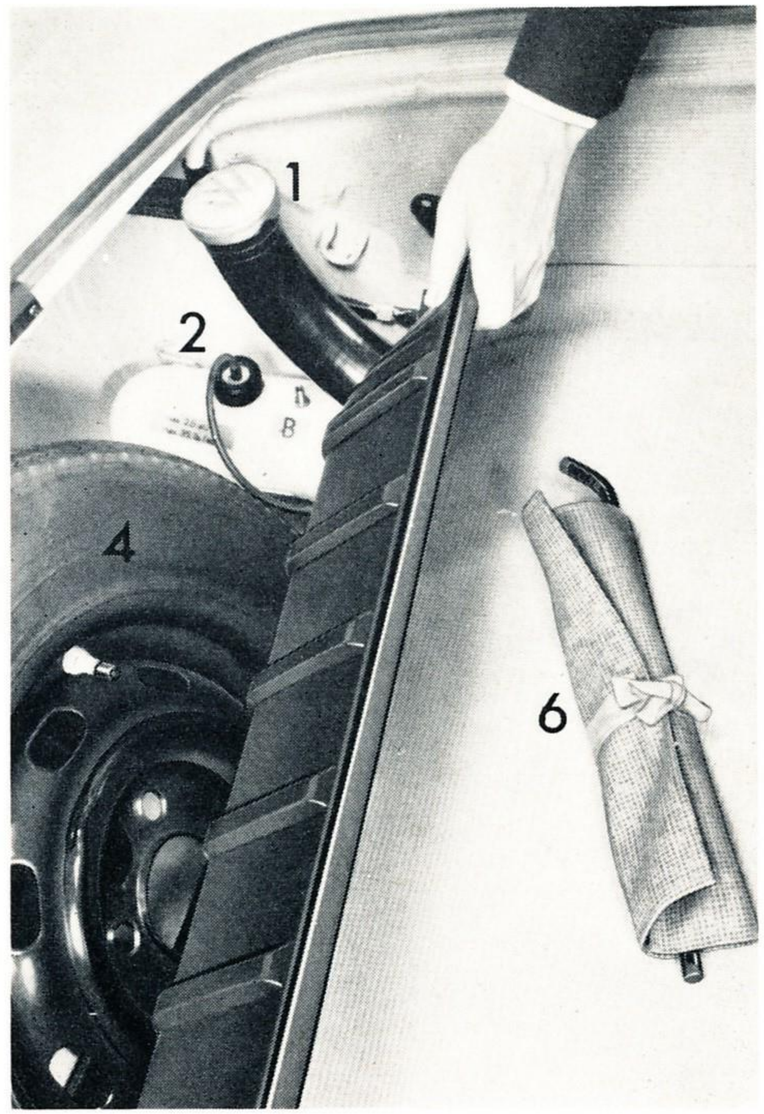
1 - Fuel tank filler

The tank holds 40 liters (8.8 gallons). The choice of fuel is left entirely to you. The Volkswagen will run satisfactorily on all normal commercial fuels which fulfil the octane requirements of the engine (90 octane).

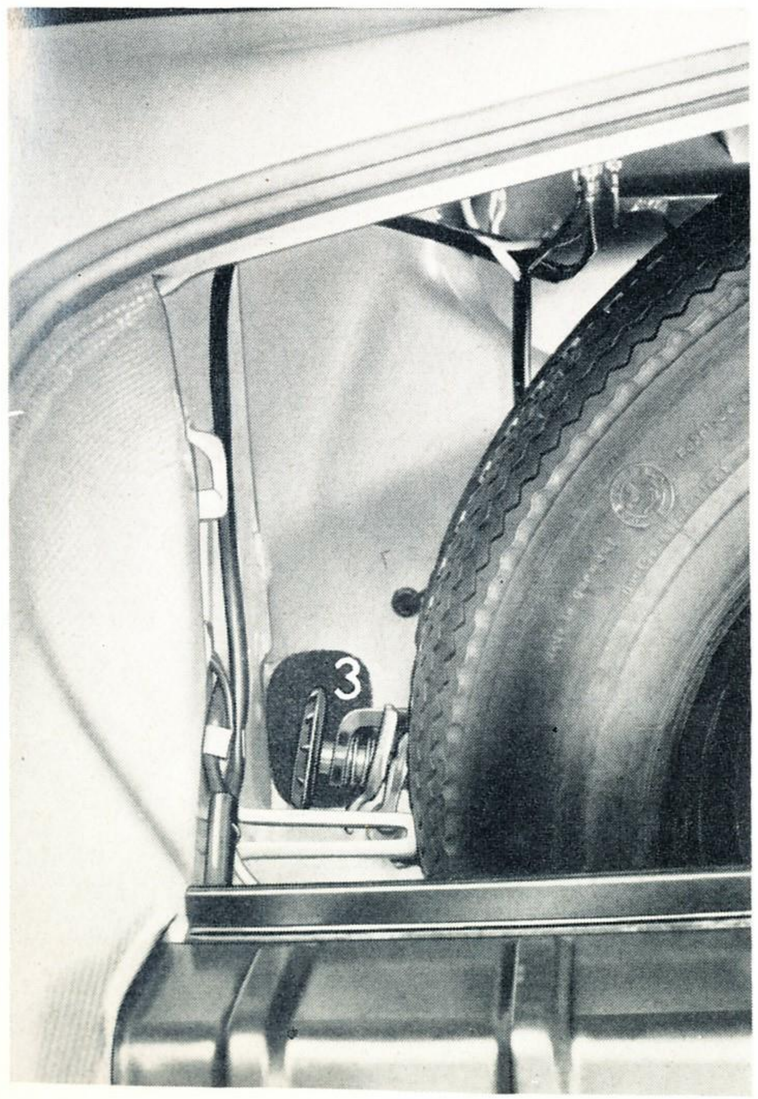
If regular fuels with adequate anti-knock qualities are not available, premium fuels should be used or mixed with the regular fuel.

2 - Container for windshield washer

The container can be filled with water until it overflows. There is always room for sufficient air to operate the washer. The correct air pressure is 2.5 kg/cm² (35 psi). It is advisable to add a cleaning solution to the water as clear water alone is usually not adequate to ensure that the windshield is cleaned quickly and properly. If enough of this cleaning agent is put in, it also acts



as an anti-freeze solution in the winter. The Order No. of the VW cleaning agent is given in the "Car Care" section. Methylated spirits can also be used as an anti-freeze agent. In this case a mixture of 1 parts meths to 3 parts water will protect the water from freezing down to about — 12° C (10° F).



3 - Jack

How you operate the jack is described together with wheel changing on page 31.

4 - Spare wheel

Have the air pressure in the spare wheel checked from time to time. Inflate it to the highest pressure you will normally require. It is then easier to lower the pressure when fitting the wheel than to inflate to the pressure required.

5 - Brake fluid reservoir

The fluid should always be level with the joint round the container. If the level drops below the joint after the vehicle has been in use for some time, have your VW Dealer check the brake system.

Brake fluid is hygroscopic. Too high a water content in the brake fluid becomes detrimental to the entire brake system after a period of time so the brake fluid should be renewed about every two years. Afterwards the system must be bled.

6 - Tools

In the tool bag you will find

1 wheel cap remover

1 pair of combination pliers

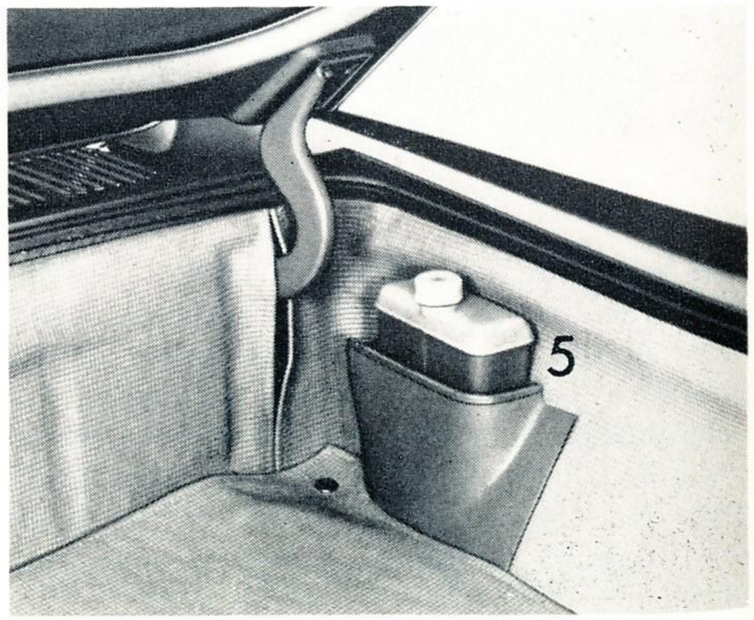
1 screwdriver with reversible blade for slotted and Phillips screws

1 8 × 13 mm open-end wrench

1 small bar for the spark plugs

1 large bar for the jack and the double-ended socket

1 double-ended socket for the wheel bolts and spark plugs



. . . and under the rear hood

which is opened by pressing the knob above the license plate. The catch which holds the hood in the slightly opened position can be released by pressing the hood down lightly.

The luggage compartment light goes out when the hood is closed. To lock the rear luggage compartment, you use the same key as for the doors and the ignition switch.

To get to the engine, detach the floor covering and roll it forward. The lid can be taken out after turning the two catches to the left.

Give your Volkswagen that individual touch – fit approved Volkswagen accessories

Approved Volkswagen accessories are not just any old accessories. They have either been designed specially for the Volkswagen or selected from the vast range of accessories available and tested for use on the Volkswagen in the Volkswagen factory. The trademark "Approved Accessories" is your guarantee for material quality, good workmannship and reliability.

Approved VW accessories are supplied by your VW Dealer who will also fit them for you if necessary but you can fit lots of the accessories yourself.

VOLKSWAGEN
Erprobtes Zubehör

Approved Accessories
Accessoires Agréés
Accessori Approvati
Accesorios Aprobados
Utprovade Tillbehör
Acessórios Aprovados
Beproefde Accessoires

Before moving off, check . . .

the fuel, the brakes, the lights and, at regular intervals, the oil level in the engine and the tire inflation pressures.

The fuel in the tank, when full, is sufficient for 400 — 450 kms (250 — 280 miles).

The brakes should be applied once or twice just after moving off to see that they are working properly.

1 — Please remember that all brakes are subject to a certain amount of wear. It may be necessary to have the brakes adjusted in a VW workshop in between the normal maintenance services. This applies particularly to vehicles which are driven hard or frequently used in city traffic and for short distances only.
The front pads of the disc brakes adjust automatically so only a gradual drop in the fluid level in the reservoir shows that the pads are wearing.

2 — Your Volkswagen is fitted with a dual circuit brake system which means that the hydraulic system is divided into a front wheel circuit and a rear wheel circuit which can each operate independently. If one circuit fails — you will notice this due to the sudden increase in pedal free travel — take the vehicle to a VW workshop at once. You can still stop the vehicle with the other brake circuit but the braking distance becomes somewhat longer.

Dual circuit brake warning light *

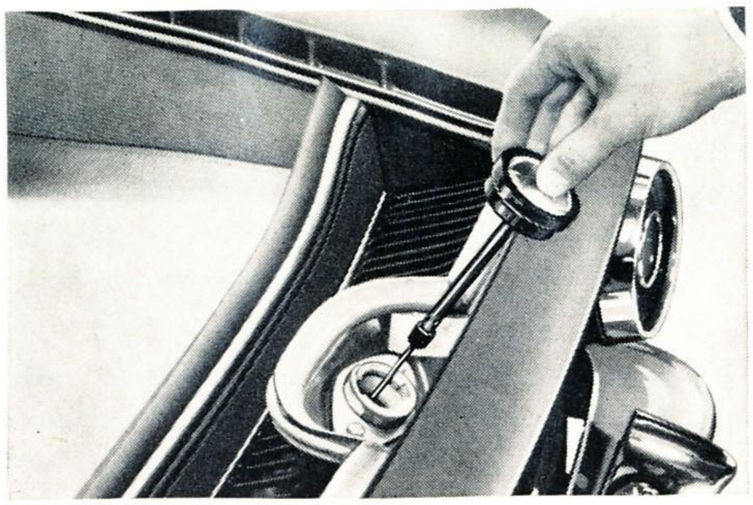
This warning light is fitted to check the operation of the dual circuit brake system. Should the light come on when the brakes are applied, take the vehicle to a VW workshop immediately because it may be that the hydraulic pressure in one of the two brake circuits has failed.

From time to time, check the warning light by pressing the bulb housing with the ignition switched on. If lamp does not light up, the bulb should be replaced.

The lights include headlamps, fog lamps, tail lights, license plate light, turn signals, back up lights and brake lights. The turn signals and brake lights must be checked with the ignition on.

If a turn signal is defective, the warning lamps in the fuel gauge dial flash much quicker than usual or go out. The brake lights only work, of course, when the brake pedal is depressed and the back up lights when reverse gear is engaged or Automatic selector lever at „R".

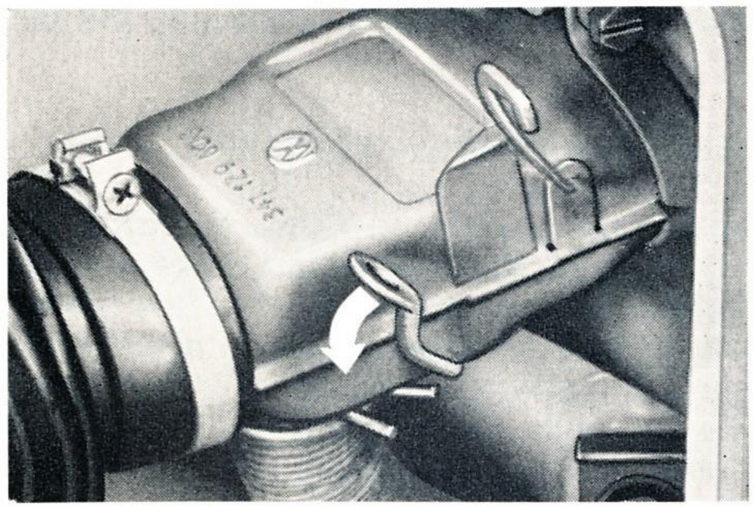
* Optional extra



The oil level should be between the two marks on the dipstick and must never be below the lower mark. Wipe the dipstick clean before checking.

The vehicle must be on a level surface when the oil level is checked otherwise the dipstick reading will be inaccurate. Do not check the oil immediately after stopping the vehicle. Wait at least 5 minutes to give the oil in the engine time to drain down into the bottom of the crankcase.

When topping up, always use a good brand of gasoline engine HD oil. It is an advantage to use the same brand whenever possible but sometimes mixing HD oils from different manufacturers cannot be avoided. You need not fear that this will damage the engine in any way. Details of the various oil viscosity grades are given on page 42.



Three more important points:

1 - The carburetors of your Volkswagen should draw in preheated air at temperatures below + 10° C (50° F). This helps to keep down fuel consumption in cold weather and prevents the carburetor icing which sometimes occurs when air humidity is high.

The weighted flap in the air cleaner intake pipe must be free to move in the winter and the cool seasons. If the average temperature is above + 10° C, the flap must be fixed open by jamming the lever under the ridge on the intake pipe.

2 - If the vehicle is used mainly in very dusty conditions, the oil bath air cleaner must be checked frequently, even daily if necessary.

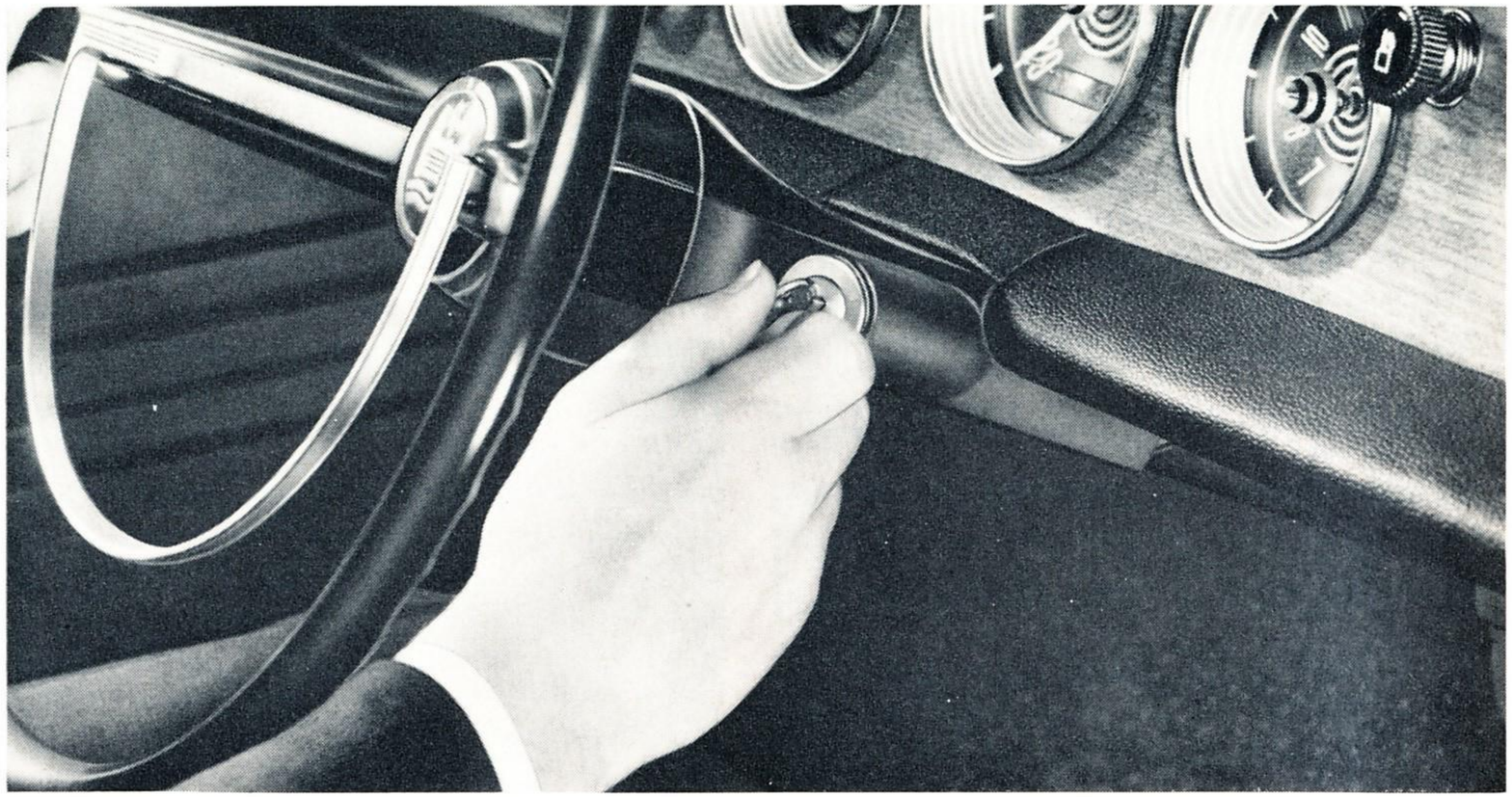
How this is done is desribed on page 46.

3 - Never drive the vehicle with the battery disconnected because this can damage the electronic components in the electrical system.

Correct tire pressures are essential in the interests of vehicle safety.

Pressures which are too low or too high will reduce the service life of the tires and have a detrimental effect on vehicle road-holding. Even though the tubeless tires on your vehicle retain their inflation pressures for a long time the pressures should always be checked before starting a long trip and normally at least about once a week. All the various pressures you will need are given in the list on page 50 and on a small plate fixed to the lid of the glove compartment.

Starting the engine



Before turning the ignition key, make sure that the gear shift lever is in neutral.

At temperatures above freezing point or when the engine is still warm, depress the accelerator pedal slowly while operating the starter. When the engine is very warm, depress pedal fully but do not "pump" it.

At temperatures below freezing point or when engine is cold, depress the accelerator pedal fully once and then release it so that the automatic choke can work. Then switch ignition on and start **immediately.** Declutch so that the starter only has to turn the engine.

As soon as the engine starts, release the ignition key so that the starter is switched off.

Do not try to warm the engine up by letting it idle with the vehicle stationary — drive off straight away. Do not race the engine while it is still cold.

If the engine does not start the first time or stalls when declutching, the ignition will have to be switched off and then on again because there is a non-repeat lock in the switch which prevents the starter from being operated when the engine is running and thus being damaged.

The warning lights in the fuel gauge dial which come on when the ignition is switched on, go out when the engine starts.

The red warning light for the generator shows that the generator is working. If this light comes on when you are driving, the generator has stopped charging.

In this case, you can drive on but try to get the vehicle into a workshop as soon as possible because the battery will soon run down.

If the red warning light for the oil pressure comes on while driving, however, stop at once because the flow of lubricating oil in the engine may have ceased. Check the oil level first. Should the cause of the trouble be elsewhere, you are advised to get expert assistance.

Be careful when running the engine in confined spaces. Ensure that there is ample ventilation so that the poisonous exhaust gases can escape.

. . . it runs . . . and runs . . . and runs . . .

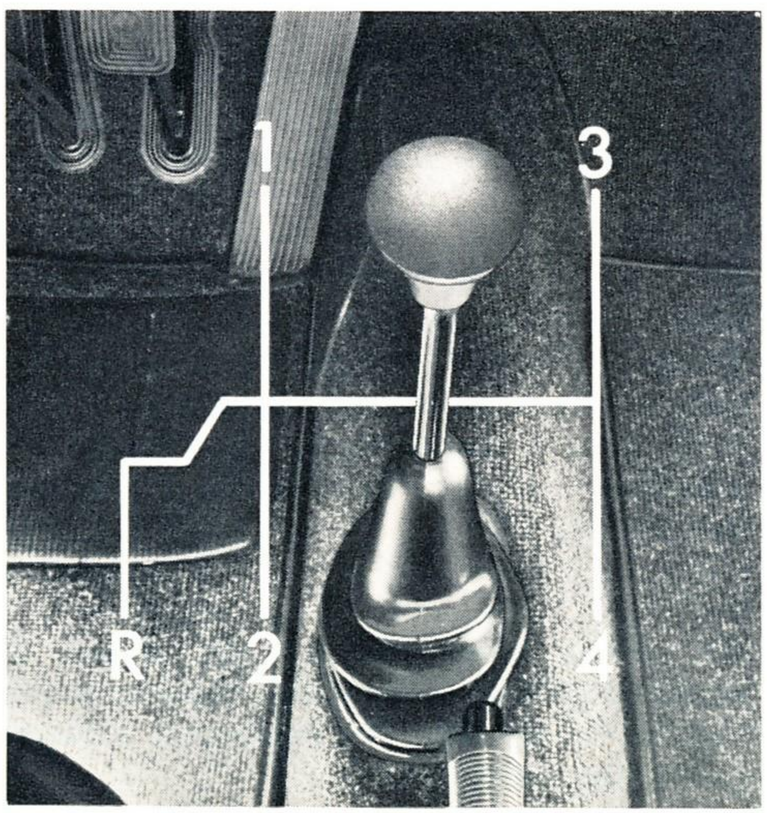
You can drive your Volkswagen at full speed from the first day. There are, however, certain permissible speed ranges for the various gears:

	1st Gear	2nd Gear	3rd Gear	4th Gear
kph	0—30	10—60	30—90	45—145
mph	0—18	6—37	18—56	28— 90

When a particular traffic situation makes it essential to move rapidly, you can accelerate up to 70 kph (43 mph) in 2nd gear and up to 100 kph (62 mph) in 3rd gear for brief periods only. Bear in mind, however, that full throttle acceleration puts fuel consumption up considerably. It is more economical to drive smoothly and keep the top speed fairly constant. Very fast, racy-sporty driving, alternating between full throttle and hard braking will mean more frequent visits to a filling station not to mention increased tire and brake lining wear.

You can drive very economically between:

10 and 35 kph in 2nd gear (6 and 22 mph)
30 and 60 kph in 3rd gear (18 and 37 mph)
45 and 110 kph in 4th gear (28 and 68 mph)



Just a few words about the clutch while we are on the subject of driving. The clutch is a very hard worked part of the vehicle.

A good driver slips the clutch as little as possible when moving off and changing gear. He always depresses the clutch fully when changing gear, he changes down into the appropriate gear in queues and city traffic instead of slipping the clutch and never uses the clutch pedal as a "rest" for his left foot.

Shift into reverse gear only when the vehicle is standing still. Reverse gear is fitted with a lock so that it cannot be engaged unintentionally. To engage reverse, press the lever down, move it over to the left and pull it back to the stop.

Volkswagen automobiles have first class brakes which can stop the vehicles in the shortest possible distance. But do not forget that the braking distance increases very rapidly as the speed increases. At 100 kph for example it is four times longer than at 50 kph. Apply the brakes in good time whenever possible but do not use too much force, locked wheels increase the braking distance.

Water reduces the tire adhesion and the coefficient of friction of the brake linings but we cannot do anything about this. You can, however, take care when driving, remain at a safe distance behind the preceding vehicle particularly when roads are wet and slippery. Safety first is the motto.

That just about covers the operation of the car and how to drive it properly. The following pages deal with tips for winter driving, cleaning, breakdowns and all there is worth knowing about the lubrication and maintenance of the vehicle.

VW Automatic *

When driving the VW Automatic, there are only a few points you should note in order to enjoy all the benefits of the automatic transmission and make full use of them. First of all there are three basic rules to get used to:

1 — With your Karmann Ghia Coupé Automatic there is a torque converter between the engine and the automatic transmission and this also functions as a clutch for moving off. Because of this you should apply the footbrake or handbrake when you select a driving range while the vehicle is stationary. This is necessary because transmission of power is not completely interrupted even when the engine is just idling. In consequence the vehicle tends to move slowly i. e. to "creep". This tendency is increased the higher the engine speed.

2 — When selecting a driving range while the vehicle is stationary do not depress the accelerator. During the selection operation the engine must be running at idling speed as otherwise the load on the automatic clutches in the transmission is very great. If the selector lever is accidentally knocked into the neutral position N while you are driving, lift your foot off the accelerator and wait until the engine speed has dropped to idling before you select a driving range again.

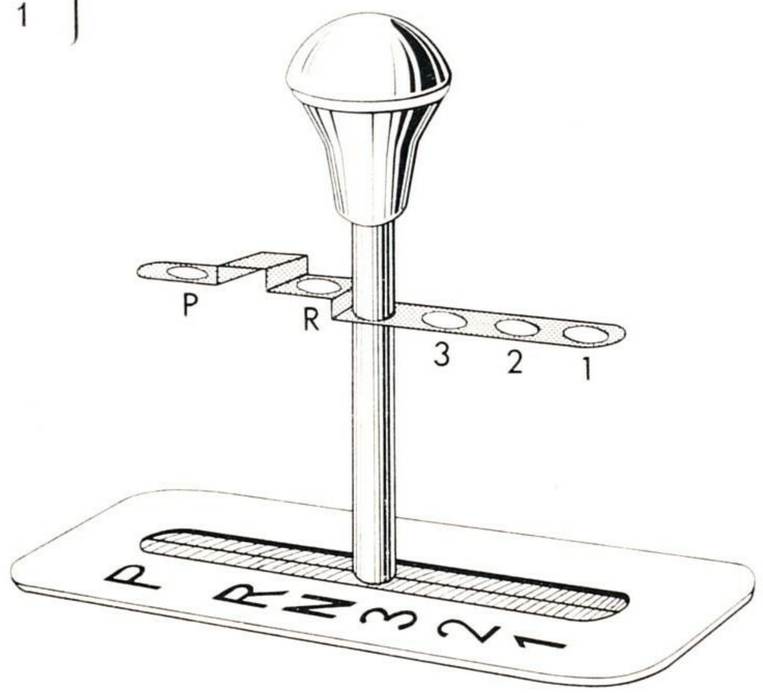
3 — When you select a driving range while you are driving you should get rid of your former habit of thinking you have to declutch lest you accidentally push down the brake pedal.

Remember, your VW Karmann Ghia Coupé Automatic has no clutch pedal. Instead, the brake pedal is much broader than it used to be so that you can brake with the left foot when necessary, such as when parking in a confined space.

The selector lever

At the base of the selector lever you will see the symbols indicating the various positions on a metal plate.

P = Parking lock
R = Reserve
N = Neutral
3
2 } Forward driving ranges
1



* Optional extra

The driving ranges

Your Karmann Ghia Coupé Automatic has 3 forward drive ranges and one reverse. The figures 3, 2 and 1 indicate how many gears are automatically engaged and used in each position of the selector lever.

In position 3 all three gears are engaged automatically according to driving conditions to cover the range from standstill to maximum speed.

On acceleration the vehicle always moves off in first gear and, according to the load on the engine (accelerator position: part throttle or full throttle), automatically changes to second or third gear. When the driving speed is reduced, the gears in the transmission are automatically changed down.

Selector position 3 is therefore the "normal position"

In position 2 the third gear remains out of use. Position 2 should be selected when the braking effect of the engine in Position 3 is not sufficient, such as when driving down long gradients. Position 2 can be selected without any worry while you are driving along, even with the accelerator depressed.

However, since 2nd gear is immediately engaged on selection, your speed must not be more than 100 kph or 60 mph at the time, nor should this speed be exceeded in this driving range.

Position 1 is used on rare occasions only. In this position second and third gears are out of use. Position 1 can also be selected while driving. In this case the maximum speed is about 60 kph or 40 mph.

First gear is used when driving down steep hills since the full braking power of the engine is made available.

The reverse driving range should be engaged, just as with a normal transmission, only when the vehicle is stationary and without depressing the accelerator. To select reverse you must lift the lever slightly. Because the climbing ability in reverse is a little less than in forward drive it is advisable to climb particularly steep garage ramps in forward drive only.

Accelerator and "Kick down"

When the accelerator pedal is fully depressed you will distinctly feel the full throttle position. By pressing harder the accelerator can be pushed beyond the full throttle position to the "kick down" point. The "kick down" is equivalent to changing down to a lower gear.

Using the "kick down" you change the operation of the automatic transmission with the accelerator: at speeds below 80 kph (50 mph) the next lower gear is automatically engaged thus giving the vehicle maximum acceleration. As soon as the maximum speed for the gear in use has been reached or when the accelerator is released out of the "kick down" position the next higher gear is automatically engaged again.

Starting the engine is only possible when the selector lever is in neutral N. As long as a driving range or the parking lock is engaged a cut-out switch prevents starting of the engine. Apart from this starting up is as described on page 21.

Moving off

Before selecting a driving range for moving off it is important that the footbrake or handbrake is applied slightly to prevent the vehicle from "creeping".

You will already have read the reasons for this.

It is usual to move off in position 3 as follows:

- Apply handbrake or depress footbrake lightly
- Move selector lever to position 3
- Release brakes and accelerate

Stopping

When stopping temporarily at traffic lights, for example, you do not need to move the selector lever to neutral but only need to apply the brakes. On moving off again you just accelerate — the car starts off automatically in first gear.

Parking

On parking, first of all apply the handbrake and then move the selector lever to position P. To do so it is necessary to move the lever through Reverse and lift it once more to P. It is held automatically in this position. The transmission is then mechanically locked. Because of this the vehicle must be stationary before the parking lock is used.

Maneuvering

When maneuvering the vehicle, the only additional point to remember is that the driving ranges, Reverse and 3 may only be selected when the car is stationary and the engine is idling.

Driving in mountainous districts

When driving on long steep mountain roads with sharp bends you are advised to select range 2 or 1 according to the gradient on uphill slopes also. In this way you prevent the next higher gear from being selected unnecessarily when the accelerator pedal is raised.

Towing

You can tow another vehicle a short distance if it will not start because the battery is flat but your Karmann Ghia Automatic is not suitable for towing trailers or other cars for long distances. The automatic transmission is not designed for prolonged additional loads of this sort.

If your Karmann Ghia Automatic has to be taken in tow on some occasion because a fault has arisen please do not exceed 50 kph (30 mph) under any circumstances. Your car should not be towed for more than 50 km (30 miles) as there would not be sufficent lubrication of the transmission because of absence of oil pressure.

This restriction does not apply if the rear end is lifted or if the drive shafts are removed first.

Tow starting or push starting is not possible with your Karmann Ghia Automatic. If the engine will not start please contact a VW workshop.

When it snows and freezes

You will learn to appreciate the air cooling of the engine and the air heating. You can leave your car out in the bitter cold without fear — the aircooled engine will always start readily and supply warm air for the interior of the body.

Do not, under any circumstances, try to influence the heating of the vehicle by covering up the slots in the rear hood. These slots must always be clear so that air can flow in to the carburetors and to the engine cooling fan.

The brakes may freeze up in the winter if water gets into the drums due to splashing or condensation so leave the car in 1st or reverse gear when parking it and do not apply the handbrake.

When parking on steep hills, turn the front wheels against the kerb as well to stop the vehicle rolling away. If there is no kerbstone, it may be advisable to place a stone or wedge under a wheel.

Tires with badly worn treads are very dangerous particularly in the winter so ensure that they are replaced in good time.

M + S tires with special heavy treads give good roadholding in snow and slush. They can be fitted to all four wheels but never use them on the front wheels only.

Better still are M + S tires with spikes which increase the safety margin even on hard snow and ice. These tires should always be fitted on all four wheels. The maximum speed for a vehicle fitted with M + S and M + S spiked tires is 130 kph (80 mph).

The specific characteristics of winter tires can be improved by raising the tire pressures to 0.2 kg/cm² (3 psi) above the normal operating pressure for the tire concerned. This inflation pressure then covers the recommended pressure increase of 3 psi for fast highway driving. M + S tires with spikes should be run at moderate speeds when new in order to give the spikes time to settle.

In general, winter tires only have real advantages when conditions on the road are really wintry. For safety reasons, it is not advisable to drive a vehicle fitted with any type of winter tire at top speed. You cannot expect a winter tire to have the same degree of adhesion on dry, wet or snow-free roads as a normal tire. Furthermore, under these conditions M + S tires wear rapidly, particularly at high speeds.

Winter tires are no longer fully effective when the tread has worn down to a depth of 4 mm.

When M + S ice tires are fitted, it may be necessary to fit clips on the lower torsion arms of the front axle to prevent the tires from rubbing in the wheel housing on full lock.

Radial ply tires are also good in winter conditions. If conditions are not too severe these tires can be used instead of M + S tires. M + S and M + S spiked tires of the radial ply type have the very best characteristics for winter use. The maximum speed for a vehicle fitted with these tires should be limited to 130 kph (80 mph) for safety reasons. The pressure increase of 0.2 kg/cm² (3 psi) recommended for normal winter tires is also applicable to radial ply winter tires.

Snow chains can be fitted to the rear wheels only. Only thin chains which do not stand clear of the tire tread and inner side wall more than **15 mm** (.5in.) including tensioner, are suitable. When driving over long stretches of road which are free of snow, the chains should be removed. They serve no useful purpose here but merely damage the tires and wear out quickly.

Engine oil of SAE 30 grade will tend to thicken at temperatures around freezing point and may cause difficult starting. As soon as winter temperatures are expected, change over in good time to a thinner grade of engine oil. Details of the various oils to be used are given on page 42.

If you only drive mainly short distances and in city traffic in the winter we recommend that you have the engine oil changed at 2500 km (1500 mile) intervals.

Should you only drive a few hundred miles a month under these conditions, it is advisable to have the oil changed every 6 to 8 weeks. At other times these additional changes are unnecessary and uneconomical.

In countries with arctic climates and temperatures below about — 25° C (— 13° F) the engine oil should be changed every 1250 km (750 miles).

Transmission oil of SAE 90 grade can generally be used all the year round. Only in countries with arctic climates is it necessary to use the thinner SAE 80 transmission oil. When the temperature is below — 13° F for long periods, it is advisable to use ATF in the four speed synchromesh transmission also. This does not apply to the final drive of the Automatic Transmission. The vehicle should only be driven with this oil during the cold period. As soon as the temperature rises to near freezing point, this oil **must** be replaced by SAE 80 or SAE 90.

The battery not only tends to drop in capacity as the temperature drops, it also has to work much harder in the cold weather. Quite apart from the higher current consumption when starting and using the lights more often, there are numerous other electrical items used mainly in the winter, such as heated rear windows. A really cold battery which may in any case not be fully charged has only a fraction of the capacity that a battery at normal temperature has and this is fatal when trying to start a cold engine. Particularly if the car is only driven short distances and in city traffic, the battery should be charged from an external source from time to time.

Further details are given on page 39.

The spark plugs should not have excessively large gaps especially in the winter. The gap is normally 0.7 mm (.028 in.) but when the weather is very cold the gap can be temporarily reduced to 0.5 mm (.020 in.) to facilitate starting.

The chassis is exposed to very arduous conditions particularly in the winter. The steadily increasing use of chemicals to de-ice the roads produces solutions which attack even the most durable paintwork after a time. The underside of the Volkswagen is sprayed with a wax-based compound to protect it from these influences. It is advisable to examine the protective film at the beginning of the winter and have it repaired by respraying so that the full protective effect is retained. Do not apply oily anti-corrosion compounds to the wax-coated surface.

Door locks can freeze up in winter if water gets into the lock when washing the vehicle so do not aim the water jet directly at the locks. It is a good idea to cover the keyholes up beforehand. A frozen door look can be thawed out easily by using a lock de-freezing agent such as offered in the VW car care materials. This solution has a preservative effect so that the lock cylinder is not damaged even if the solution is used often. It does not damage paintwork either.

Door lock de-freezer, plastic bottle (100 cc)	000 096 106
Door lock de-freezer spray (16 cc-pocket size)	000 096 107
Refill for 000 096 107	000 096 109

Frozen windows can be sprayed with de-froster spray. After the spray has worked for a short period, the ice can be wiped off.

Defroster spray (300 cc)	000 096 109

It is a good idea to carry a shovel or a short-handled spade in the car to clear away snow if you get stuck. A small hand brush for sweeping snow off the vehicle and a plastic scraper for the windshield are also useful.

Care of car

The paintwork of your car has a high gloss, good impact resistance, excellent weathering properties and a long service life. But even the finest paint requires regular and proper care if it is to retain its gloss over the years.

This is easy to understand if you stop to think that the paint is continuously exposed to the influence of sunlight, rain, industrial fumes, soot, dust and dirt.

In the winter, all parts of the vehicle are subjected to even more severe climatic conditions and aggressive salt solutions. It is advisable to clean and wax the vehicle more often at this time of the year.

Every VW Dealership has stocks of car cleaning materials for the Volkswagen. These materials have been tested by us and found to give the best results. The order numbers of these materials are given here.

Washing

In the first two months:
Wash vehicle frequently with clear water. Do not wash in direct sunshine.
Rinse sponge often to avoid scratching the paintwork.

Later on:
Wash vehicle whenever dirty. If water alone is not adequate, add a shampoo to the water and apply with a sponge or soft brush.

Then rinse vehicle well and dry with a leather.

Tin of shampoo (150 cc)	000 096 111
Tin of shampoo (250 cc)	000 096 112
Sponge	000 096 151
Leather	000 096 155
Brush	000 096 157
Washing gloves	000 096 153

Waxing

Wax for first time after 8 — 10 weeks, and then rewax whenever water no longer rolls off paint.

Wax paint after washing and rub until paint shines again or just put wash/wax solution in second lot of water regularly.

Wash with this solution and dry with leather.

Tin of wax (250 cc)	000 096 011
Tin of wax (1000 cc)	000 096 012
Tin of wash/wax solution (150 cc)	000 096 121
Tin of wash/wax solution (250 cc)	000 096 122

Polishing

Should only be done if paint has lost shine and gloss cannot be brought back with wax. After treatment with polish the vehicle must be waxed.

If paint is cleaned with polishing wax it need not be waxed afterwards.

Tin of paint polish (250 cc)	000 096 001
Tin of paint polish (1000 cc)	000 096 002
Tube of polishing wax (210 grams)	000 096 021
Bag of polishing cotton (200 grams)	000 096 161
Bag of polishing cotton (500 grams)	000 096 162

Patching up paint damage

Small marks in the paint such as scratches or stone damage can be repaired with genuine VW touch-up brushes or spray cans before the marks rust. A sticker in the spare wheel compartment gives the color designation and number of the original finish.

Removing industrial grime

Treat paint surfaces with industrial grime remover as soon as possible. The solution must be rinsed off very thoroughly!

Pay particular attention to seams and joints.

Bottle of industrial grime remover (500 cc)	000 096 091

Removing tar spots

Treat paint surfaces with tar remover as soon as possible. After treatment rinse traces of remover off with soap powder solution (water and shampoo).

Tin of tar remover (150 cc)	000 096 051
Tin of tar remover (250 cc)	000 096 052

Removing insects

Dried on insects can be cleaned off paint with insect remover.

Wash surfaces afterwards.

Clean dirty windshields with insect sponge.

Tube of insect remover (80 grams)	000 096 081
Insect sponge	000 096 083

Care of chromed parts

Before applying chrome cleaner, the parts must be washed and dried. Then clean with chrome polish from tube.

This polish contains a preservative:

It cleans and protects the chromed parts.

Liquid chrome protector should be used to prevent corrosion of parts for a long period.

Apply with spray gun where possible. Protective film remover is used to remove the film.

Tube of chrome polish (80 grams)	000 096 061
Tin of chrome protective film (500 cc)	000 096 163
Tube of chrome grease	000 096 067
Tin of chrome protective film remover (500 cc)	000 096 167

Cleaning leatherette

If not very dirty, clean with soft cloth or brush.

If very dirty, clean air-permeable leatherette with liquid plastic and cloth cleaner. Apply with absorbent plain cloth. After cleaning, rub area dry with a soft cloth.

Non-permeable plastic material can be cleaned with plastic cleaning paste.

Plastic cleaning paste (200 grams)	000 096 071
Plastic and cloth liquid cleaner (500 cc)	000 096 072

Cleaning cloth upholstery

Clean with vacuum cleaner or a medium hard brush.

Spots or marks can be removed with liquid plastic and cloth cleaner: apply by moistening a clean, plain cloth with cleaner and rubbing spot with a circular movement and working inwards.

Plastic and cloth liquid cleaner (500 cc)	000 096 072

It is advisable to use spray gun 000 096 064 to apply liquid cleaners and polishes.

Windshield wiper blades

Blades which are clogged with oil or insects should be cleaned with a hard brush and detergent. According to condition, the blades should be replaced once or twice a year.

Cleaning windows

Windows can normally be cleaned with a sponge and warm water and dried with a leather. Do not use this leather for the paintwork because traces of paint cleaner and polish will cause streaks to appear on the windshield.

Insects can be removed with the insect sponge and other dirt, oil deposits etc. with glass cleaner.

Bottle of window cleaner (200 cc)	000 096 105
Sachet of window cleaner (35 cc)	000 096 101
Insect sponge	000 096 083
Anti-mist cloth	000 096 165

Door and window weatherstrips

To keep weatherstrips flexible and intact coat them occasionally with talcum powder.

Airing the body

If the vehicle is left in a closed garage for long periods, the garage and car interior should be aired from time to time to prevent the information of mould and damp stains inside the vehicle.

The tires

In addition to checking pressures regularly and driving carefully, the following points should be remembered in connection with tires:

1 — Check tires for damage occasionally and remove foreign bodies.

2 — Keep oil and gasoline away from the tires.

3 — Try not to expose tires to strong sunshine for long periods.

4 — Replace missing valve dust caps as soon as possible.

Tires should be replaced when the tread depth is only 1 mm all round and on full tread width because this is the absolute limit for safe usage. We advise you however not to let the tires wear down to this extent as tires with treads in this condition cannot grip the road surface properly when driving at high speeds on wet roads. If you notice that the tires are wearing unevenly, get advice from your VW workshop.

For smooth running at high speeds and long tire life it is essential that the wheels are balanced statically and dynamically. As the wheels can get out of balance after being in use for some time due to natural tire wear, the wheels should be balanced again every 10 000 km (6000 miles). Furthermore, a wheel should always be balanced again when a tire has been repaired. This also applies to balanced wheels when a tire has lost pressure due to a faulty valve.

Many vehicle owners prefer to use radial ply tires because they appreciate the positive characteristics of these tires such as longer service life, increased skid resistance, better cornering properties, short braking distances and lower roll resistance. These owners are prepared to accept the fact that these tires tend to roll somewhat harder due to their construction and this in turn causes an certain amount of drumming inside the body.

Tubeless radial ply tires can only be used on the Volkswagen together with the standard safety type wheel rims (hump type). This must be noted when changing wheels. If in doubt, consult VW dealer. In the interests of vehicle safety it is essential to ensure that the tire pressures are correct and uniform on each axle when radial ply tires are fitted. Note the pressures recommended for radial ply tires in the list on page 50 of this manual and have the pressures checked regularly. All our other instructions on looking after tires also apply, without exception, to radial ply tires.

Just in the case

you have to deal with a small defect or a breakdown yourself one of these days we have included some information on the next few pages which should help you.

All other repairs should always be carried out by one of our service stations. The service organization of the VW factory offers you a wide-spread network of authorized workshops staffed by skilled mechanics and equipped with all the specials tools and appliances required. Whenever you see the familiar VW sign on the roadside you can be sure of expert advice and quick efficient assistance.

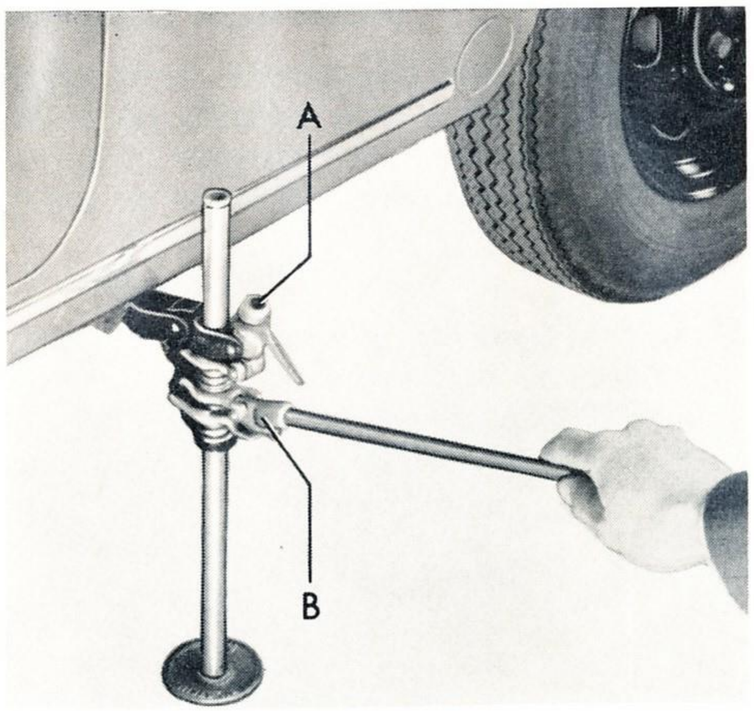
Wheel changing

Apply the hand brake.

Take off wheel cap with remover and jack bar by hooking the remover into the holes in the edge of the cap and levering against the wheel rim with the jack bar.

Loosen all wheel bolts about one turn with socket wrench and bar.

Insert jack into square hole under the body and push the jack tube down until it touches the ground.



Place bar in upper link of jack (A) and raise vehicle by moving the bar up and down.

Unscrew wheel bolts and take wheel off. Place spare wheel in position and raise or lower vehicle as necessary until one of the holes in the wheel is in line with one of the threaded holes.

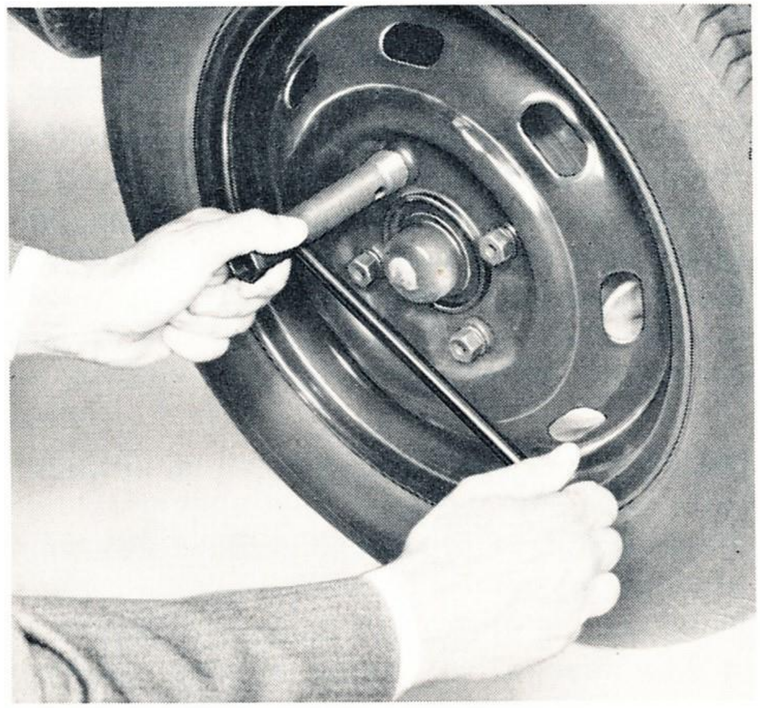
Insert one bolt and tighten it until the wheel can be moved about.

Raise vehicle again slightly and move wheel until the other bolts can be inserted. Tighten bolts using wrench without bar first and while tightening, move wheel to and fro so that it is centered by the rounded shape of the bolt heads.

Place bar in lower link (B) and lower the vehicle by moving bar up and down.

Place bar in wrench so that maximum leverage is obtained, as shown in illustration, and tighten bolts evenly and diagonally.

Install trim rings (if fitted) in rim and fit wheel caps by giving them a smart blow with the hand.



Have the wheel bolts checked with a torque wrench as soon as possible after changing a wheel on the road. The correct torque is 15 mkg (108 lb. ft.).

Do not forget to adjust the pressure of the tire which has been fitted in accordance with list on page 50 and have the damaged tire repaired as soon as you can.

Cleaning fuel pump filter

Remove plug and take filter out.

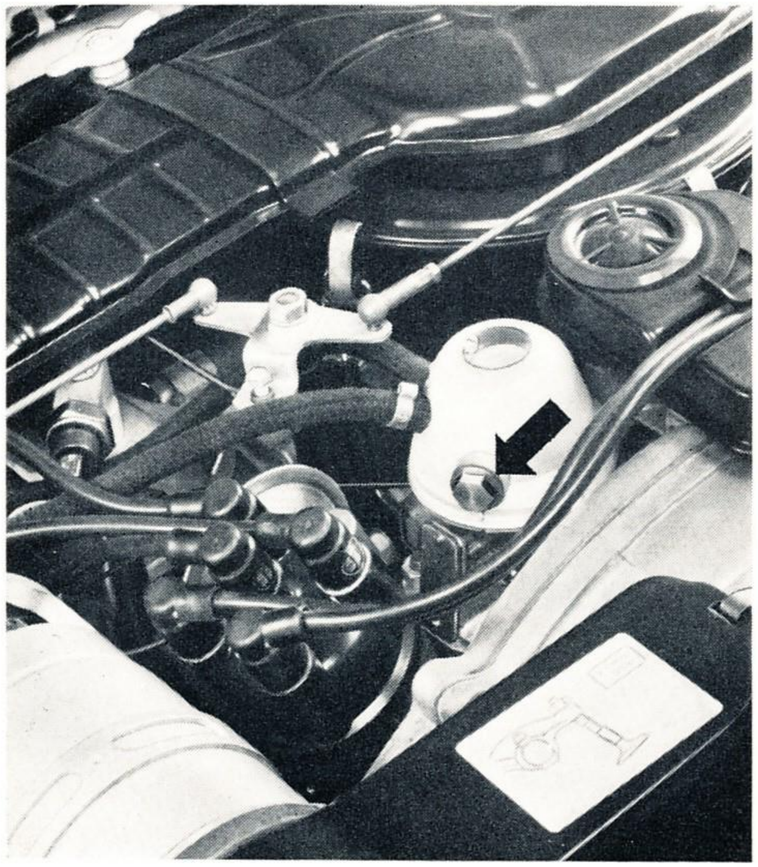
Put plug back in quickly to stop fuel leaking out.

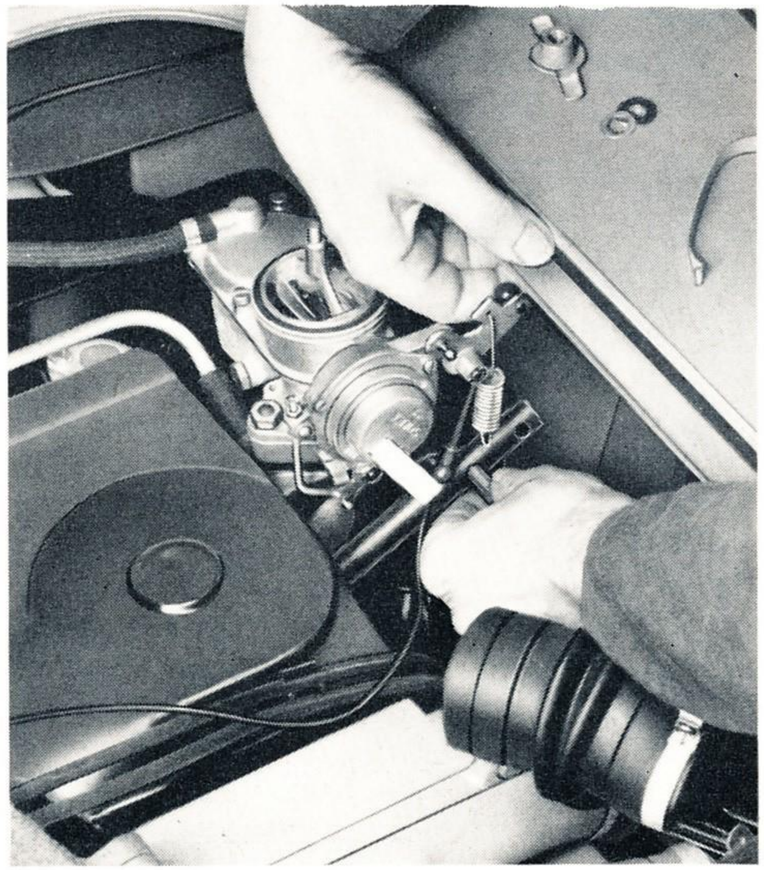
Wash filter in clean benzine and blow it out.

When installing the filter, ensure that the washer for the plug is located properly.

Removing and installing spark plugs

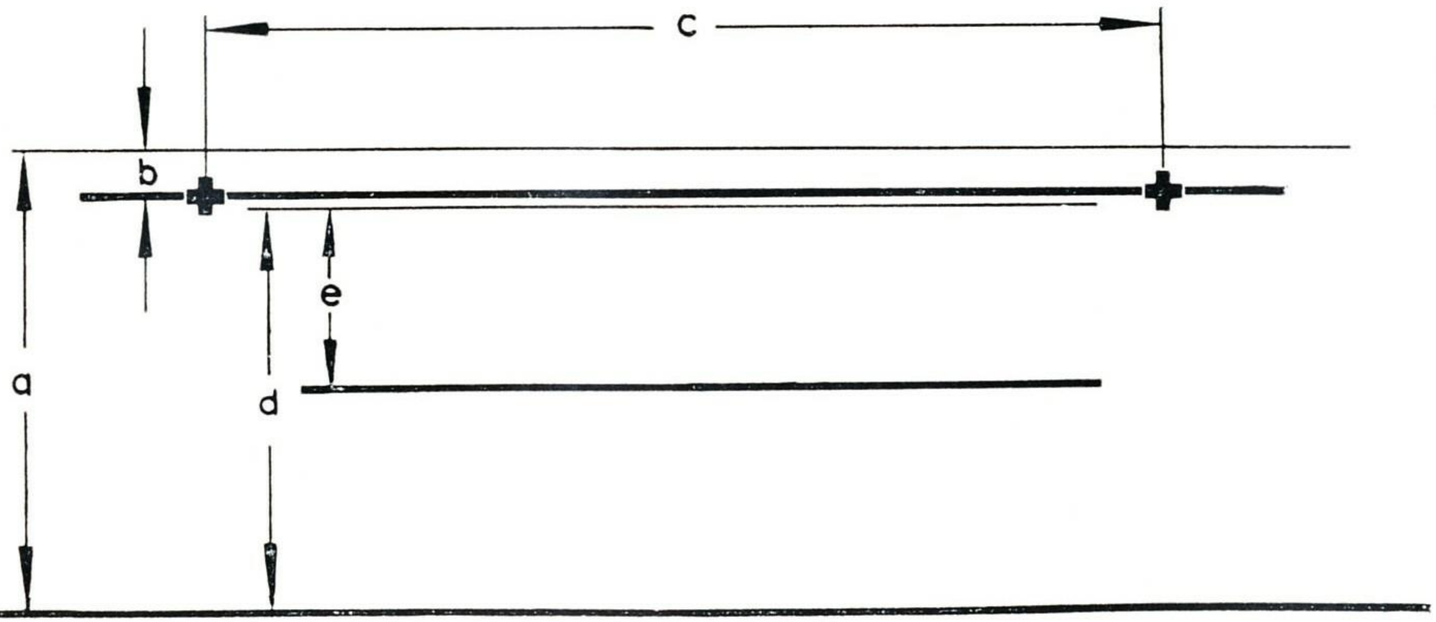
Remove air cleaner and unhook return springs from carburetor pull rods.
Pull connector off and screw plug out with socket wrench and bar.
Dirty plugs should be cleaned with a sand blaster but in an emergency the carbon can be removed with a chip of wood. Please do not use a wire brush. The plugs should also be clean and dry on the outside as well, in order to avoid shorting and tracking.
The gap can be set by bending the ground electrode. The gaps should normally be 0.7 mm (.028 in.) but when it is very cold they can be reduced temporarily to 0.5 mm (.020 in.) to facilitate starting.
Take care not to crossthread the plugs when inserting them and tighten them firmly but do not overtighten.
New plugs should be fitted every 20000 km (12000 miles).



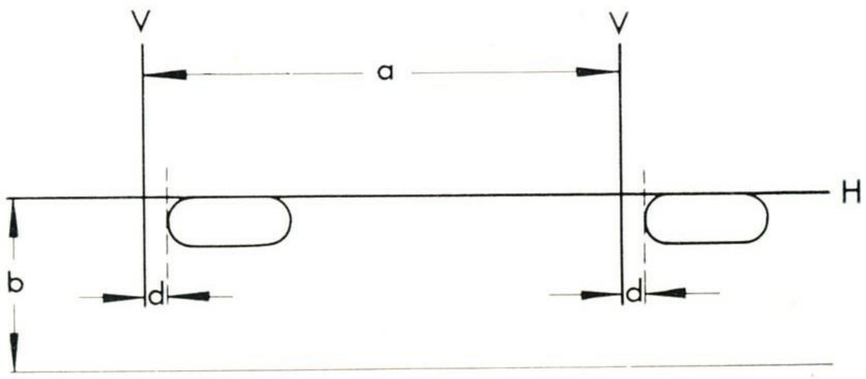


Headlight adjustment

When adjusting the headlights, ensure that the tires are inflated to the correct pressures. If a headlight aiming device is not available, proceed as follows:



Sketch 1
a - Height of headlight center from floor
b - 50 mm (2 in.) — adjusting line for the headlights
c - 1258 mm (49.5 in.) — distance between headlights
d - height of fog lamp center from floor
e - 270 mm (10.6 in.) — adjusting line for fog lamps



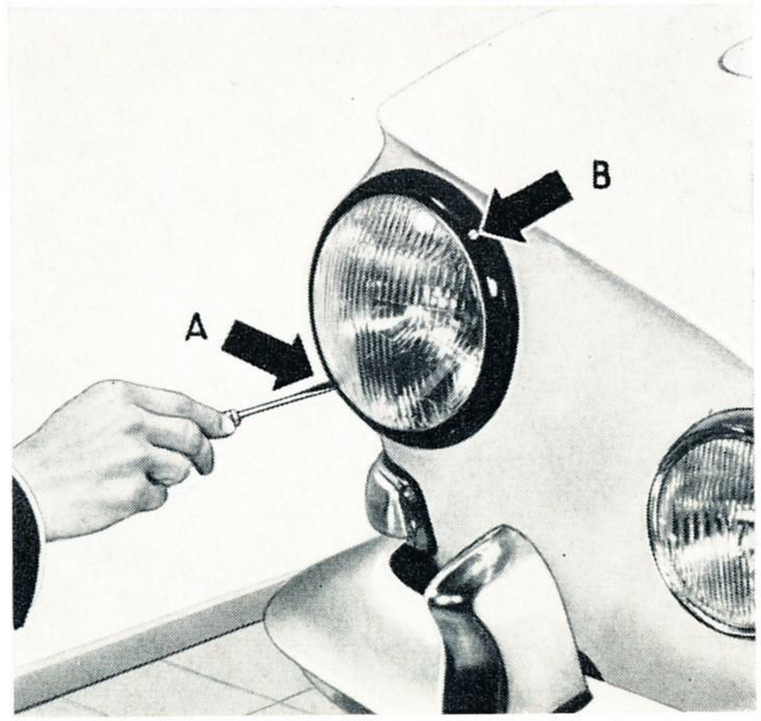
Sketch 2 (for Sealed-Beams)
a - Distance between headlights (49.5 in.)
b - Height of headlight center from floor
d - 2 in.

1 - Headlights with separate reflector and bulb

Position the vehicle on a level surface 5 m. (16 ft. 5 ins.) away from a vertical wall. The rear seat must be loaded with one person or a weight of 70 kg. (154 lbs.).
Draw two crosses with setting lines on the wall to the measurements in sketch 1. The longitudinal center line of the vehicle must be aligned exactly with the center between the two crosses and at right angles to the wall.

Remove securing screw in the center below the headlight and take off trim ring.

A - Lateral aim B - Vertical aim



Aim the headlights individually by turning the two slotted screws with the beams dimmed. Cover up the second headlight.

The headlights are correctly aimed when the light-dark border line is horizontal on the adjusting line to the left of the cross and the angle on light-dark border line is exactly on the center of the cross.

Fog lamp adjustment

Aim the fog lamps by means of the adjusting screws from inside the spare wheel well so that the center of the light beam is exactly on the adjusting line shown in sketch 1.

2 - Sealed-Beam headlights

Position the vehicle on a level surface 7.6 m. (25 ft.) away from a vertical wall. The drivers seat must be loaded with one person or a weight of 70 kg. (154 lbs.).

Draw three setting lines on the wall to the measurements in sketch 2. The longitudinal center line of the vehicle must be aligned with the center between the two vertical lines and at right angles to the wall.

Loosen the screw in the center below the headlight and take the trim ring off.

Aim the headlights individually by turning the two aiming screws with low beams switched on. Cover up the second headlight. The headlights are correctly aimed when the top edge of the high intensity zone is on the horizontal line H and the left edge is 2 in. to the right of the vertical line V.

Bulb replacement

Headlight bulb

Remove Phillips screw in the center below the headlight and take off trim ring.
Remove securing screw for lens and reflector unit and take off lens and reflector unit.
Pull the connector off the bulb base.
Turn the cap to the left and remove.
Replace the bulb.
The lug in the lamp holder must engage in the notch provided in the reflector. Never touch the glass portion of the bulb with the bare hand.
Insert the cap so that the contact strip is located on the base of the parking light bulb. Check headlight adjustment.

Sealed-Beam units

Loosen screw in the center below the headlight and take the trim ring off.

Remove three screws in Sealed-Beam retaining ring and take ring off.

Take Sealed-Beam unit out of support ring and pull cable connector off.

When installing new Sealed-Beam units, ensure that the three glass lugs engage properly in the support ring.

Check headlight settings.

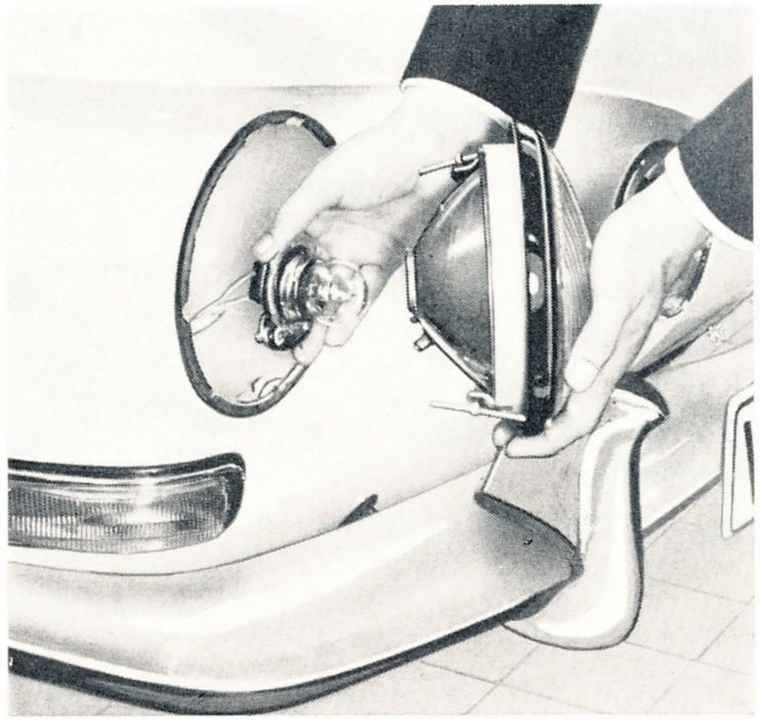
Fog lamp

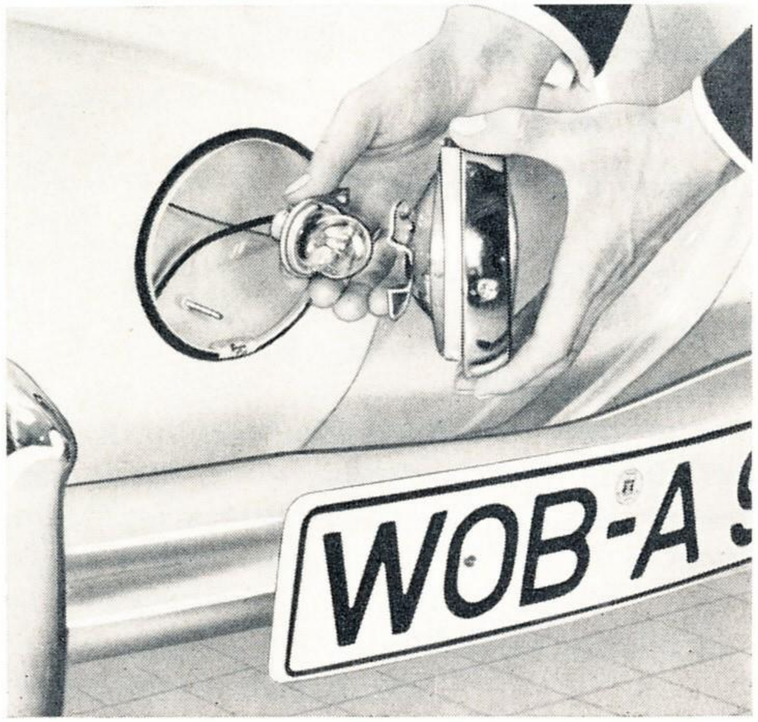
Loosen the Phillips screw in the center below the ring and remove lens and reflector unit.

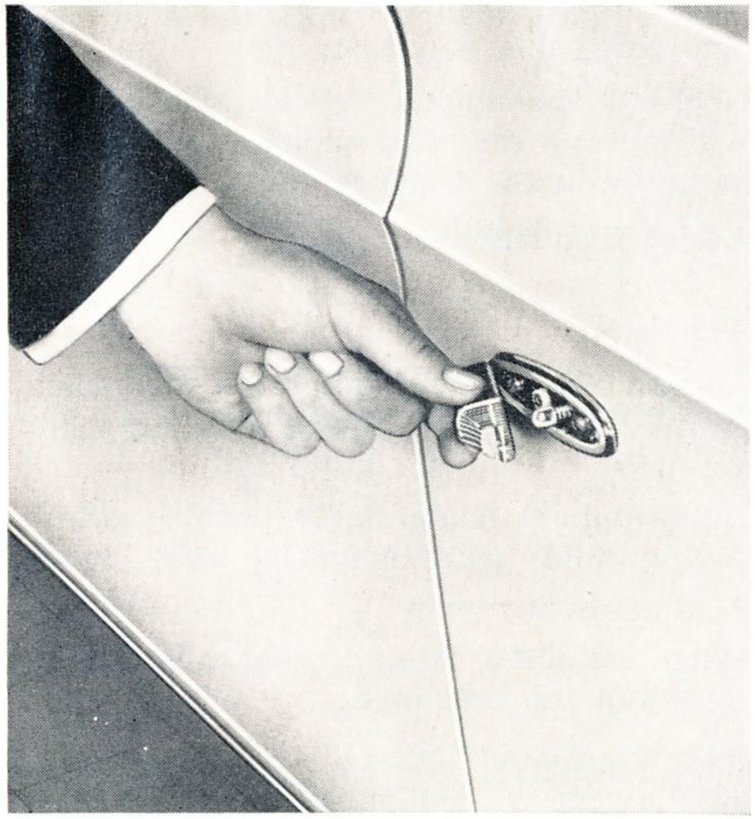
Remove bulb holder after pushing off the spring clip and unhooking the spring.

Replace bulb.

When installing, do not forget to engage the spring in the bulb holder.







Parking lamp bulb

Remove Phillips screw.

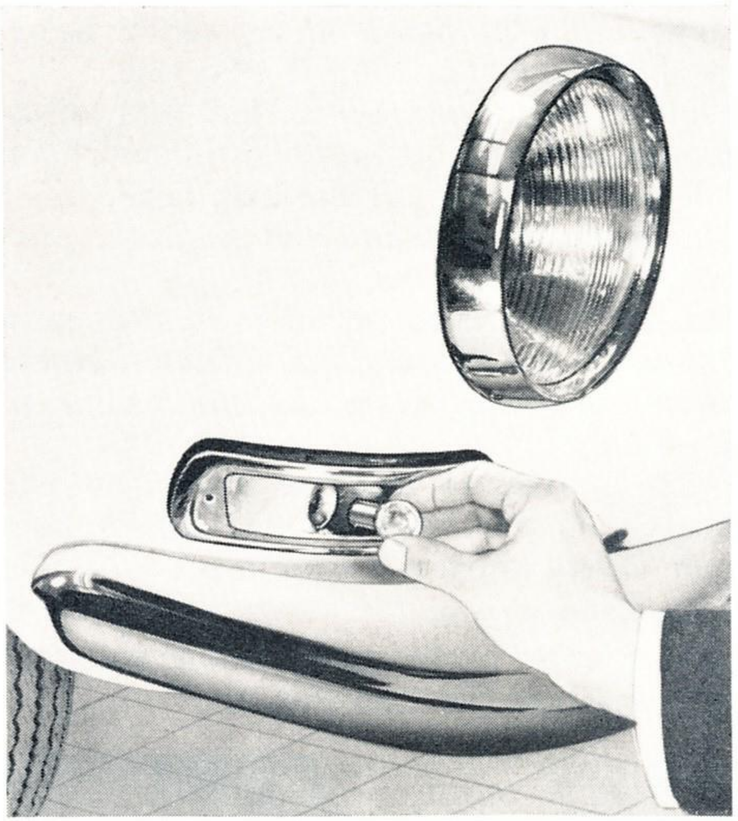
Take lens off.

Press bulb into holder lightly, turn and take out.

Install new bulb.

Insert the lens into the housing at the rear first.

Do not overtighten screw.



Front turn signal bulb

Remove two Phillips screws.

Take lens off.

Press bulb into holder lightly, turn and take out.

Install new bulb.

Ensure that gasket is located properly when installing.

Do not overtighten screws.

Stop, tail or turn signal bulb

Unscrew two Phillips screws so far that the lens can be taken off.

Bulb positions:

Top — turn signal light
Center — tail light
Bottom — stop light

Press bulb into holder lightly, turn and take out.

Install new bulb.

When fitting the lens, ensure that gasket is located properly. Tighten screws evenly but do not overtighten.

License plate light bulb

Open rear hood.

Remove screws on each side of lens and take off lens with bulb holder.

Pull bulb holder out of lens.

Press bulb into holder lightly, turn and take out.

Install new bulb.

When installing, ensure that the gasket fits properly.

Back-up light * bulb

Loosen two Phillips screws until frame and lens can be taken off.

Take bulb holder out of lamp housing.

Press bulb in lightly, turn it and take it out. Install new bulb.

When installing lens, ensure that the gasket fits properly.

* Optional extra

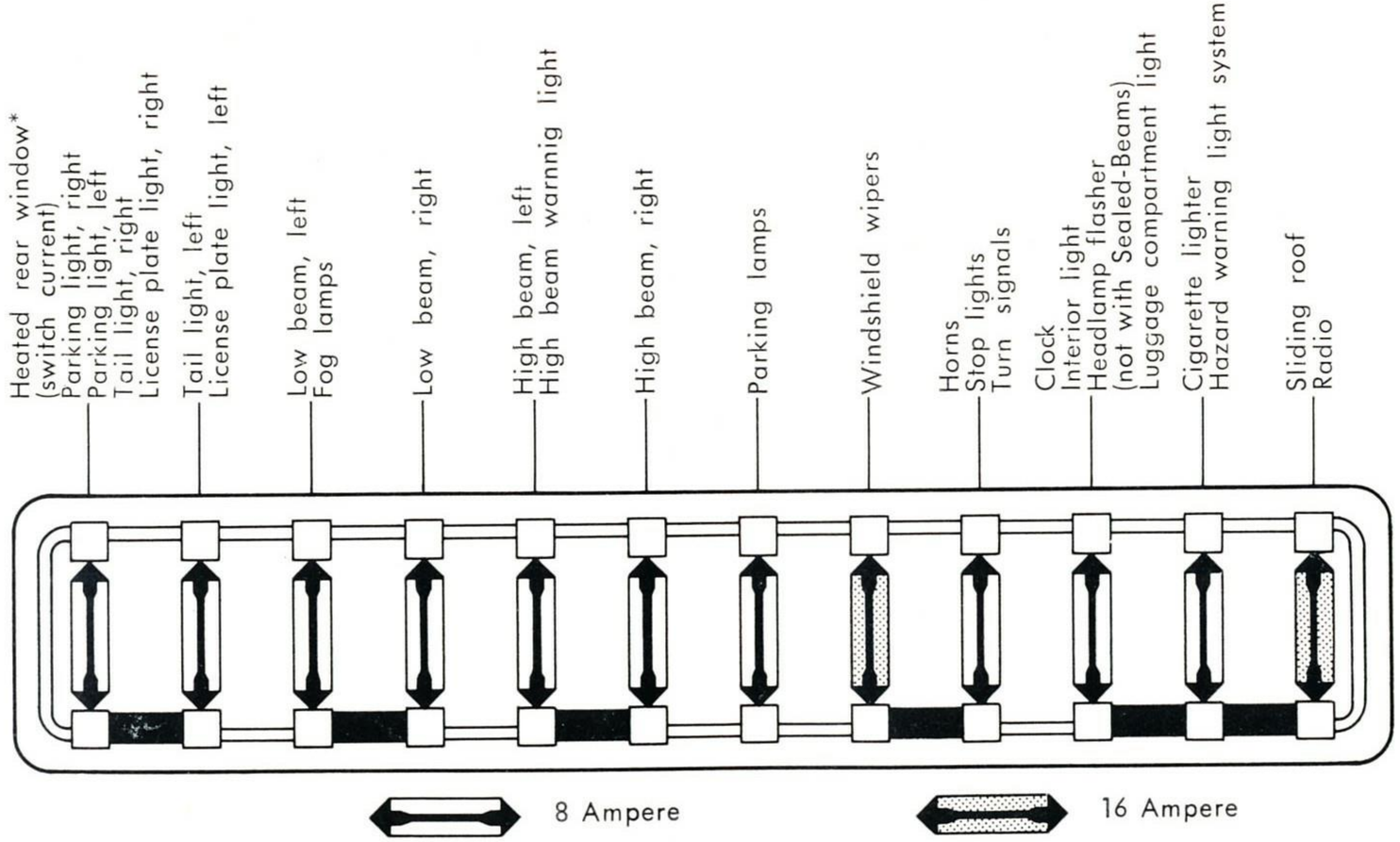
Replacing fuses

The fuse box is located under the instrument panel on the left.

When a fuse blows it is not sufficient to merely replace it which a new fuse. The cause of the short circuit or overload must be established. On no account should fuses be patched up with tin foil or wire as this can cause serious damage elsewhere in the electrical system. It is advisable to always carry a few spare 8 and 16 ampere fuses on the vehicle.

An 8 ampere fuse in a holder on the coil is for the back-up lights. *

On the left under the rear seat is an 8 ampere fuse for the main current supply to the heated rear window. *



Bulb chart

Bulb for V = Volt, W = Watts	German designation	Part No.
Headlamps	A 12 V 45/40 W	N 17 705 3
Fog lamp	D 12 V 35 W	N 17 709 2
Parking light, front and side, license plate light	HL 12 V 4 W	N 17 717 2
Turn signal, front and rear, brake light	RL 12 V 21 W	N 17 732 2
Tail light	G 12 V 5 W	N 17 718 2
Back-up lights *	12 V 25 W	N 17 733 2
Speedo, clock, fuel gauge, warning lamps	J 12 V 2 W	N 17 722 2
Other warning lamps	W 12 V 1.2 W	N 17 751 2
Interior light, luggage compartment lamp	K 12 V 10 W	N 17 723 2

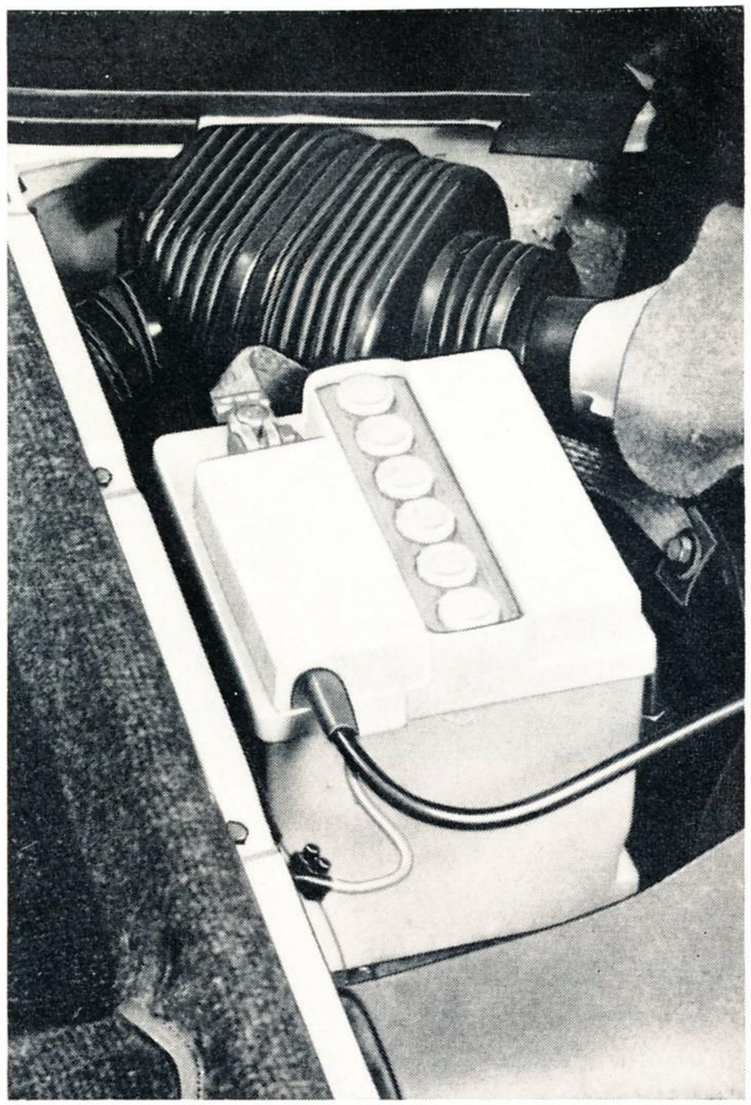
* Optional extra

Checking battery

The ability of the engine to start readily depends to a great extent on the condition of the battery. For this reason the battery should be checked regulary and given a certain amount of attention.

Important

When working on the battery take care not to short-circuit the battery terminals as this causes the battery to heat up very quickly and it may burst. Furthermore, the sparks can ignite the gas generated during the charging process.



When the rear seat is lifted, the battery cell plugs can be screwed out. The acid level should be in accordance with the mark. If the level is low, top up with distilled water only.

The acid level drops when the battery is charged due to the dissociation of the water used to dilute the acid and, to a lesser extent, to evaporation. How often the battery has to be topped up depends mainly on operating conditions and indirectly on the time of year. When a vehicle is often driven long distances in the daytime with hardly any current being used, the battery will have to be topped up with distilled water much more often than in the case of a vehicle which is operating under different conditions. As a general rule, the battery acid level must be checked more often in the summer than in the winter. VW drivers in hot countries who do a lot of driving are advised to check the battery at least every week.

Do not put in more water than is necessary because if the level is too high the acid will overflow when the battery is being charged and cause damage.

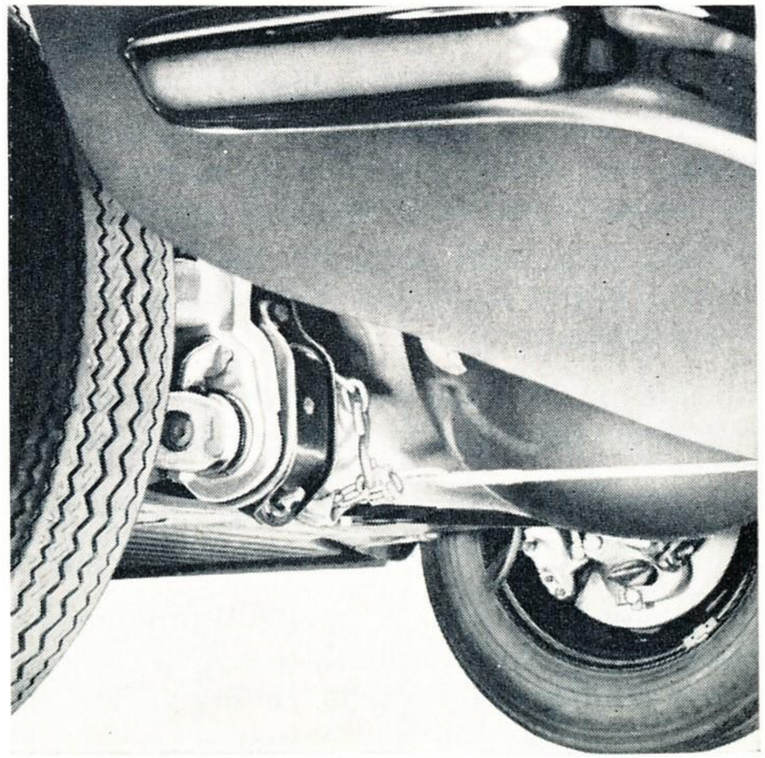
The terminals and connections should be kept clean and greased with battery terminal grease. Ensure that the ground connection to the body is free of corrosion and tight.

If you lay your vehicle up for a prolonged period, it is advisable to take the battery to a workshop. A battery which is not in constant use will discharge itself in time and this can cause permanent damage to the plates if the battery is not checked about every four weeks and charged as necessary.

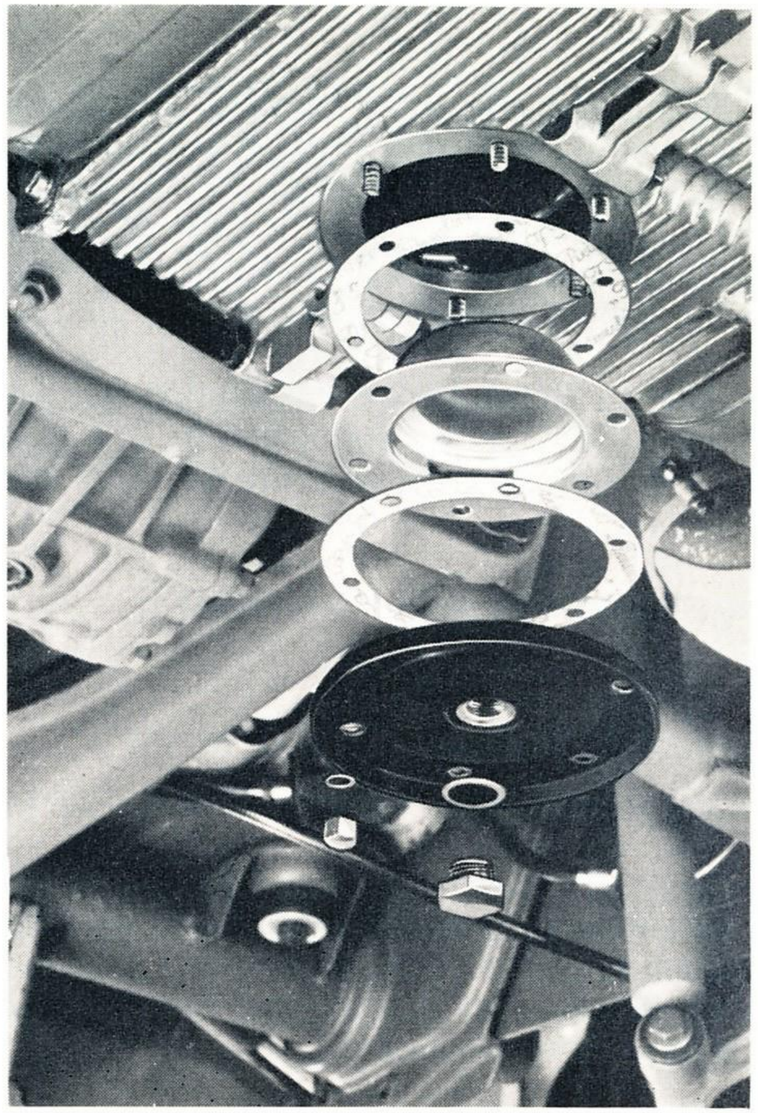
Towing

Just in case you wish to attach a towrope to your vehicle one day, please note that the bumpers are not suitable for this purpose.

At the front, the rope should be attached to the lower tube of the front axle.



Proper lubrication



Engine

Regular oil changes are necessary even if the very best brand of HD oil is used because dirty oil in the engine means increased wear and reduces service life.

The oil is drained, when warm, by removing the plug in the oil strainer cover plate. Flushing is not necessary but the strainer must be removed and cleaned at every change. The gaskets and the copper washers under the cap nuts must always be renewed. The engine is then filled with 2.5 liters of HD oil (4.4 pints).

Due to the detergent properties of the HD oil, the fresh oil will look very dark after the vehicle has been running for only a short time. This need not worry you and under normal operating conditions there is no reason whatever to change the oil at shorter intervals than every 5000 km (3000 miles). We only recommend more frequent oil changes — every 2500 km/1500 miles — in the winter if you drive mainly short distances and in city traffic. If you only drive a few hundred miles a month under these conditions it is advisable to have the oil changed every 6 to 8 weeks. In countries with arctic climates where average temperatures are about — 25° C (— 13° F) the oil should be changed every 1250 km (750 miles).

Some more information about oil

When changing and topping up the oil, try to always use the same brand of HD oil for gasoline engines. The quality of modern oils produced by reputable firms is so good that the choice of brand is left entirely to you. The VW engine makes no demands in respect of oil which cannot be fulfilled by every well known and popular brand. It is best to select "your" oil at the first 1000 km (600 miles) oil change and stick to this brand on all occasions. Should you have any doubts at all, your VW Dealer will be pleased to advise you.

The classification of oil into various viscosity grades is shown by the designation SAE 30, SAE 20 W/20 and so on. The viscosity of a lubricant indicates its resistance to flow at a given temperature. The VW engine only requires two different viscosity grades which are used, according to season of year, as follows:

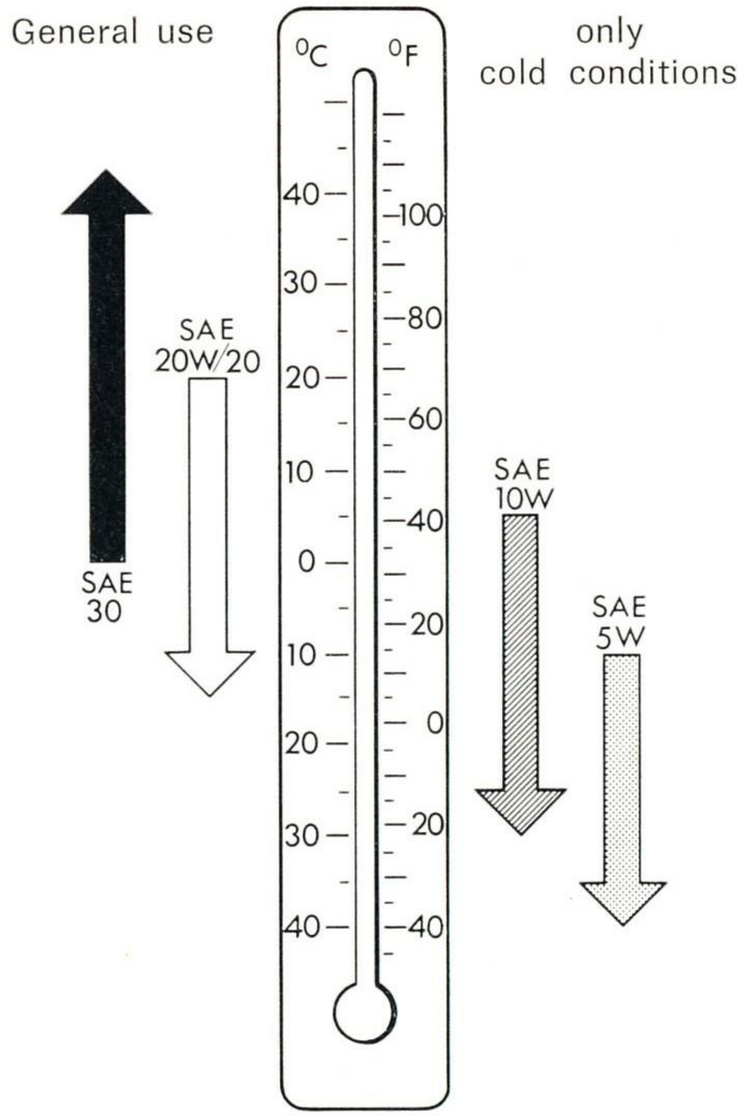
SAE 30	In warm seasons and all the year in countries with hot climates
SAE 20 W/20	In the winter
or	
SAE 10 W *)	In areas where the average temperature is below — 15° C (5° F)
SAE 5 W *)	In countries with arctic climates and temperatures below — 25° C (— 13° F)

All SAE grades cover a temperature range of about 35° C and the ranges of two neighbouring grades overlap by at least 20° C. Brief variations in temperature between seasons can therefore be disregarded. For the same reason it is also quite in order to mix oils of different viscosities when oil has to be added between oil changes and the viscosity of the oil in the engine no longer corresponds to the actual temperature.

In some countries, oils are classified according to the API system (American Petroleum Institute). Under this system HD oils suitable for the VW engine are designated "For Service MS".

No **additives** of any sort should be mixed with HD oil.

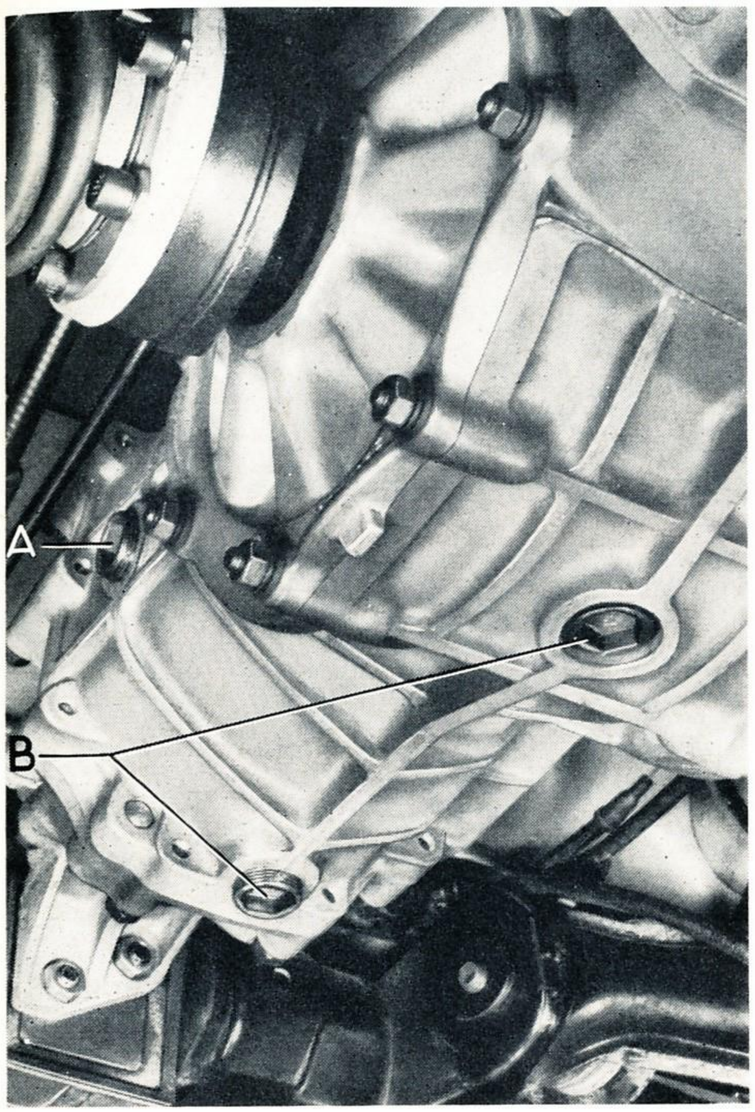
Temperature ranges of SAE grades



* Avoid driving at high speeds for long periods if using SAE 10 W oil and the outside temperature is above 0° C (32° F) or if using SAE 5 W oil when the temperature is above –15° C (5° F).

Manual transmission

Transmission and differential are combined in one housing and both lubricated with the same hypoid oil. The oil should be up to the edge of the filler hole (A).



At oil changes every 50 000 km (30 000 miles) the old oil should be drained when warm. The two magnetic oil drain plugs (B) must be cleaned carefully and 2.5 liters (4.4 Imp pints) of good quality oil put in. In countries with arctic climates, the thinner SAE 80 oil should be used all the year.

The oil sometimes runs into the transmission housing very slowly. If one attempts to put the oil in too quickly it may overflow and give the impression that the housing is already full although actually only about 1 — 1.5 liters have been put in. It is essential to the service life and silent running of the rear axle that the correct amount of oil is used in the transmission.

Additives should also not be used with hypoid oil.

Automatic transmission

The torque converter and the transmission are both lubricated by the same automatic transmission fluid (ATF).

Every 10 000 km (6000 miles) the fluid level must be checked. This ist done with the dipstick (C) located at the front edge of the engine compartment and attached to the cap of the ATF filler neck (D). To get an accurate reading, the dipstick should only be withdrawn when the engine is idling, the selector lever is at N (handbrake applied) and the transmission oil is warm.

As the transmission can only work properly if the amount of oil in it is correct, the oil level must be checked very carefully. Wipe the dipstick with a lint-free cloth before checking level which should be between the two marks on the dipstick and not above or below in any circumstances. If too much oil is put in it must be drained off. Please note that the difference between the lower and upper marks is only 0.4 liter (.7 pint). To put oil in, use a clean funnel with an extension hose about 50 cm long.

Before inserting the dipstick, always ensure that the ring-shaped handle of the dipstick enters vertically as otherwise trouble will be experienced with the transmission.

Every 30 000 km (18000 miles) the ATF must be changed. After taking out the drain plug (E) and draining the oil, the oil pan and strainer must be removed and cleaned. Although the system holds 6.5 liters of ATF, the quantity for oil changes is only 3 to 4 liters. The remainder stays in the torque converter.

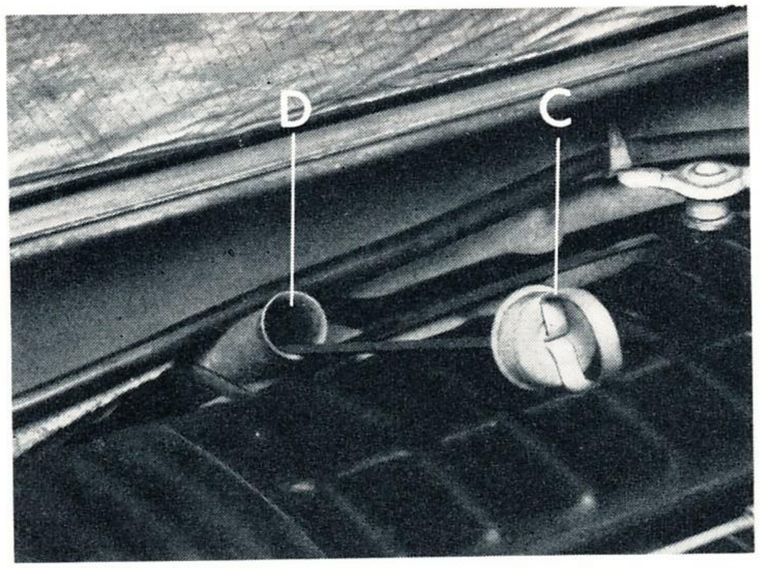
Use a new gasket if possible when installing the oil pan and tighten the securing screws uniformly. It is advisable to use a torque wrench for these screws and torque to 1 mkg (7 lb. ft.).

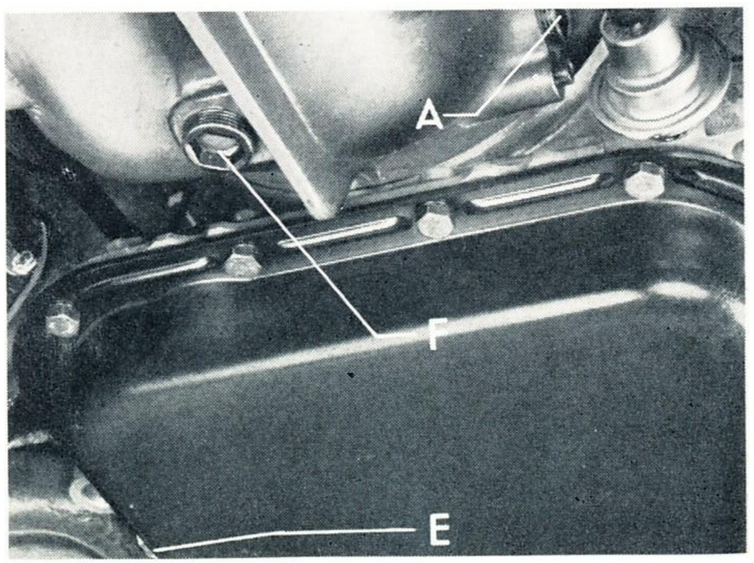
Important. When installing oil pan and putting in the ATF, ensure that everything is kept scrupulously clean.

The engine must not be started or the vehicle towed when there is no ATF in the transmission.

Put 2.5 liters of ATF in first. (Use only factory approved ATF). Now start engine and, with vehicle stationary, move selector lever to all positions in turn, then check the level on the dipstick with selector lever at N. The ATF should be up to the tip of the dipstick at this stage. Take vehicle on a short run to warm up the transmission and then add ATF to correct the level (see "Every 10 000 km . . .").

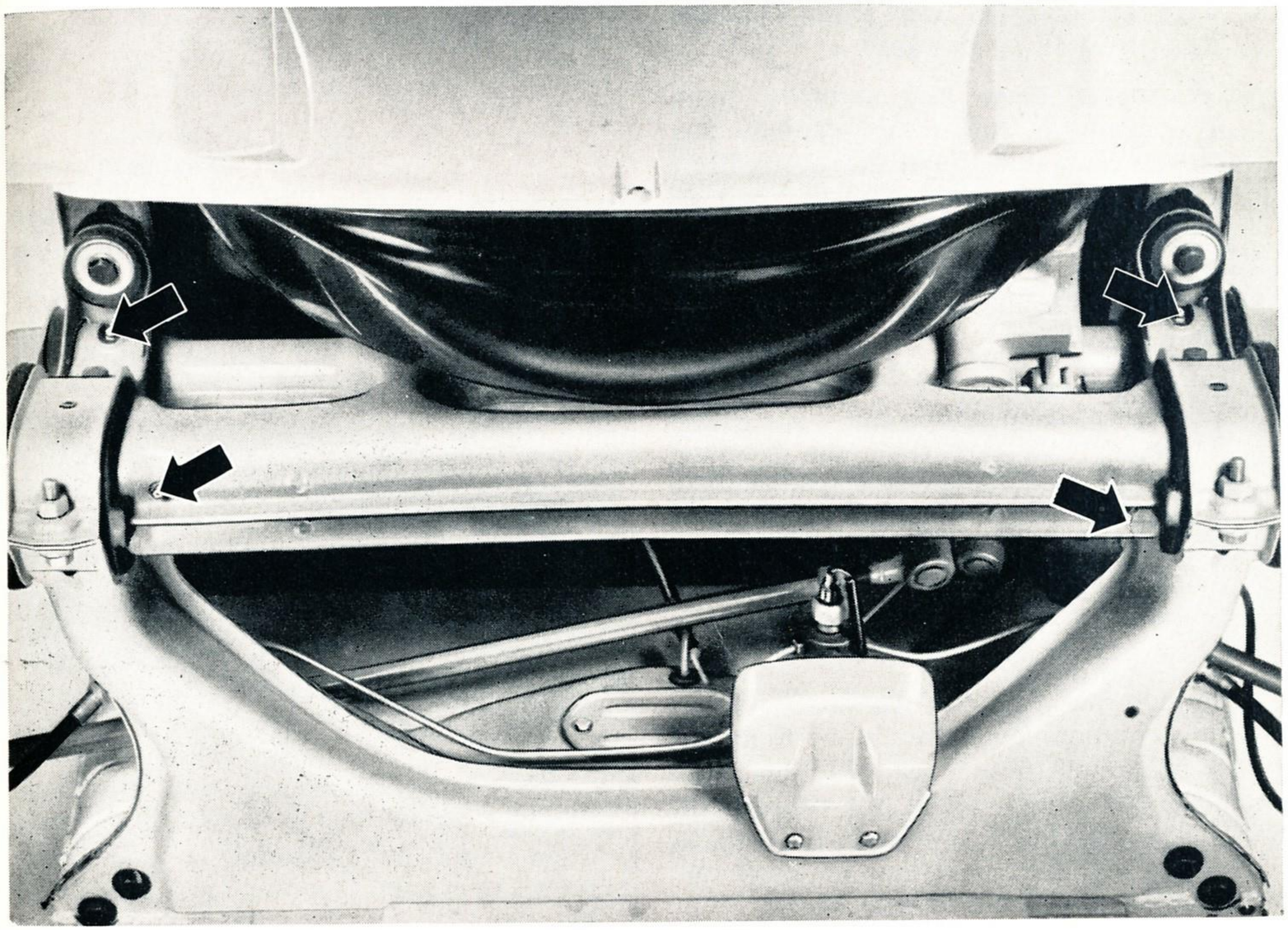
The transmission oil in the differential is checked and changed as with the manual transmission (filler hole - A, drain hole - F) but the amount of SAE 90 hypoid oil required is only 1 liter (1.75 pints).





Front axle

The front axle can only be lubricated properly when the axle is free of load, that is with the front end lifted.
There are four nipples on the axle tubes which must be lubricated with a lithium-based multi-purpose grease. The nipples and the grease gun nozzle should be cleaned carefully. Place gun on nipples and inject grease until fresh grease starts to come out at the torsion arm sealing rings.



Grease and oil must not be left on tires and brake hoses for long periods. Even small traces should be wiped off immediately.
If the vehicle is driven less than 10000 km (6000 miles) per year, the front axle must be lubricated once a year.

Air cleaner

A dirty cleaner element not only reduces the engine output, it can also cause premature engine wear. If local conditions are such that the vehicle is often driven on very dusty roads, the cleaner must be checked frequently, even daily if necessary.

All the dust present in the air drawn in by the engine is retained by the filter element in the upper part of the air cleaner and washed out when the vehicle is in motion by the oil in the lower part. In time, this causes a layer of sludge to form at the bottom of the lower part. When there is only 4 — 5 mm of oil above the sludge layer, the lower part must be cleaned and filled with fresh oil. The cleaner must be removed to do this:

Pull crankcase breather hose off air cleaner intake pipe.

Release clip on intake pipe and pull bellow off pipe.

Take off connecting rod between bell crank and right-hand carburetor.

Remove center wing nut securing air cleaner. Unscrew right and left wing nuts so far that the air cleaner can be lifted off. These nuts cannot be taken out of the cleaner.

Release the five clips and take top part of cleaner off. The top part must not be put down with the filter element upwards.

Clean lower part of cleaner carefully. The drain hole in the outer casing of the lower part must be clear.

Fill lower part up to oil level mark with fresh engine oil (approx. 0.4 liter/.7 Imp pints) SAE 30 grade oil should be used all the year. In countries with arctic climates use SAE 10 W oil all the year.

The top part does not normally need cleaning. Only if the filter element has become so dirty due to delayed cleaning of the bottom part or oil shortage that the air inlet holes on the underside are partly blocked, should the encrusted dirt be removed, preferably by scraping with a chip of wood.

When assembling the cleaner note that the embossed marks on upper and lower parts are in line. When installing the cleaner, ensure that the seals between carburetors and cleaner are located properly and that the bellow seals properly on the cleaner intake pipe. Furthermore, it is essential to tighten the two outer nuts securing the cleaner first and then the center one.

Check that the weighted warm air flap in the intake pipe moves freely. At temperatures above + 10° C (50° F) this flap should be fixed in position but at temperatures below + 10° C it should be free to move and regulate the flow of warm air according to the speed of the engine.

Doors and hoods

Above the door hinge pin is a small oil chamber which is sealed with a plastic plug. At least once every three months, the amount of oil in the chamber should be checked after lifting the plug out with a screwdriver. The chamber should be filled with SAE 30 engine oil. Press plug in and wipe off excess oil with a cloth.

The door and hood locks and the hood hinges should be lubricated at the same intervals. The door lock should be given a few drops of engine oil through a hole in the end of the door. The hood hinges are also oiled and the hood locks greased lightly. Surplus oil on the hood hinges should be wiped off also.

The lock cylinder is treated with graphite as necessary. The key can be dipped into the graphite and then turned in the lock a few times. The friction surfaces of the latches and striker plates should be greased lightly.

Technical data

Engine

Four cylinder, four stroke, horizontally opposed, flat design, in rear
Thermostatically controlled air cooling by fan on crankshaft
Pressure oil feed with gear-type pump
Oil cooler
Mechanical fuel pump
2 downdraft carburetors with accelerator pumps and automatic chokes
Oil bath air cleaner with intake air pre-heating

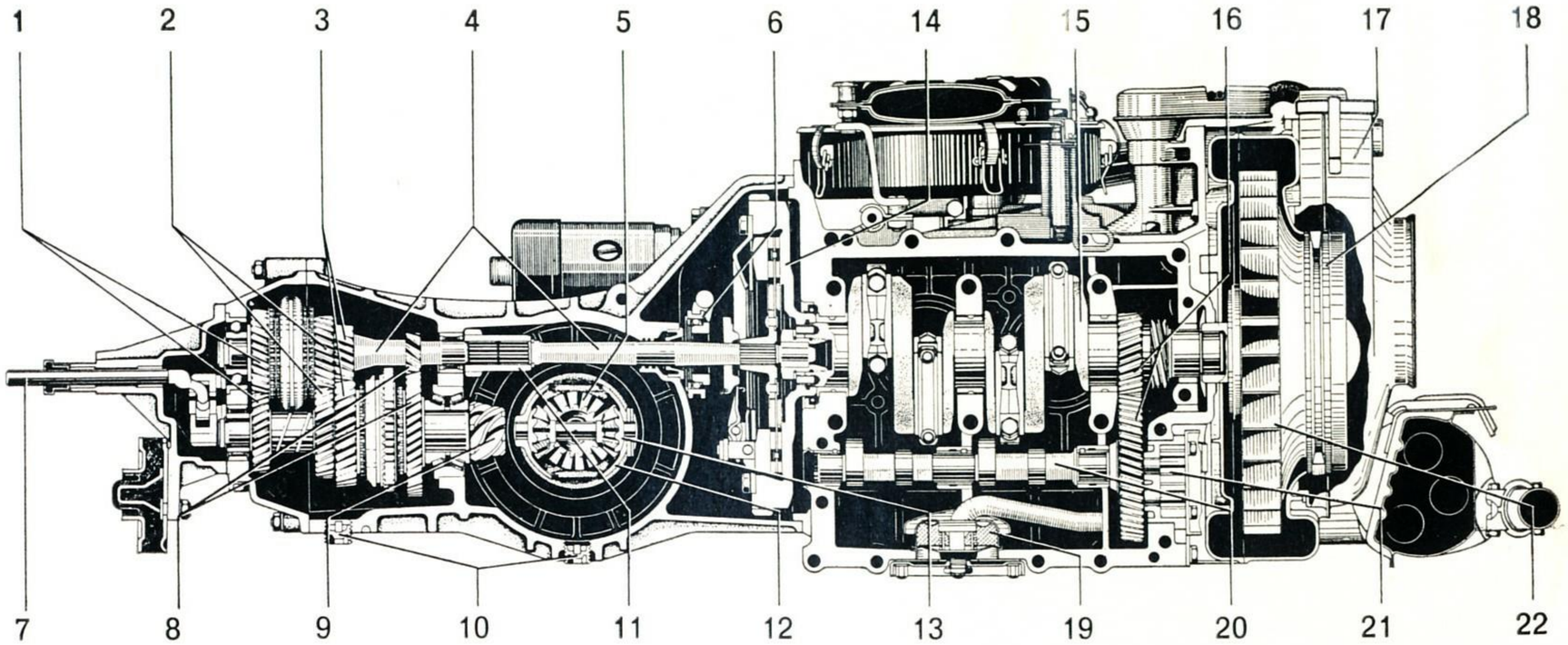
Bore	85.5 mm (3.36 in.)
Stroke	69 mm (2.72 in.)
Capacity	1584 cc (96.6 cu. in.)
Compression ratio	7.7:1
Maximum output DIN	54 bhp at 4000 rpm
SAE	65 bhp at 4600 rpm
Maximum torque DIN	11.2 mkg at 2200 rpm
SAE	87 ft. lbs. at 2800 rpm
Mean piston speed	9.2 m/s at 4000 rpm 1811 ft./min.
Fuel consumption [1])	approx. 8.9 liters per 100 km 32 miles per gallon
Fuel rating	90 Octane (Res. F 1)
Oil consumption	0.5 — 1.4 liters per 1000 km 1.4 — 4.0 pints per 1000 miles
Valve clearance with engine cold	Inlet and exhaust 0.10 mm (.004 in.)

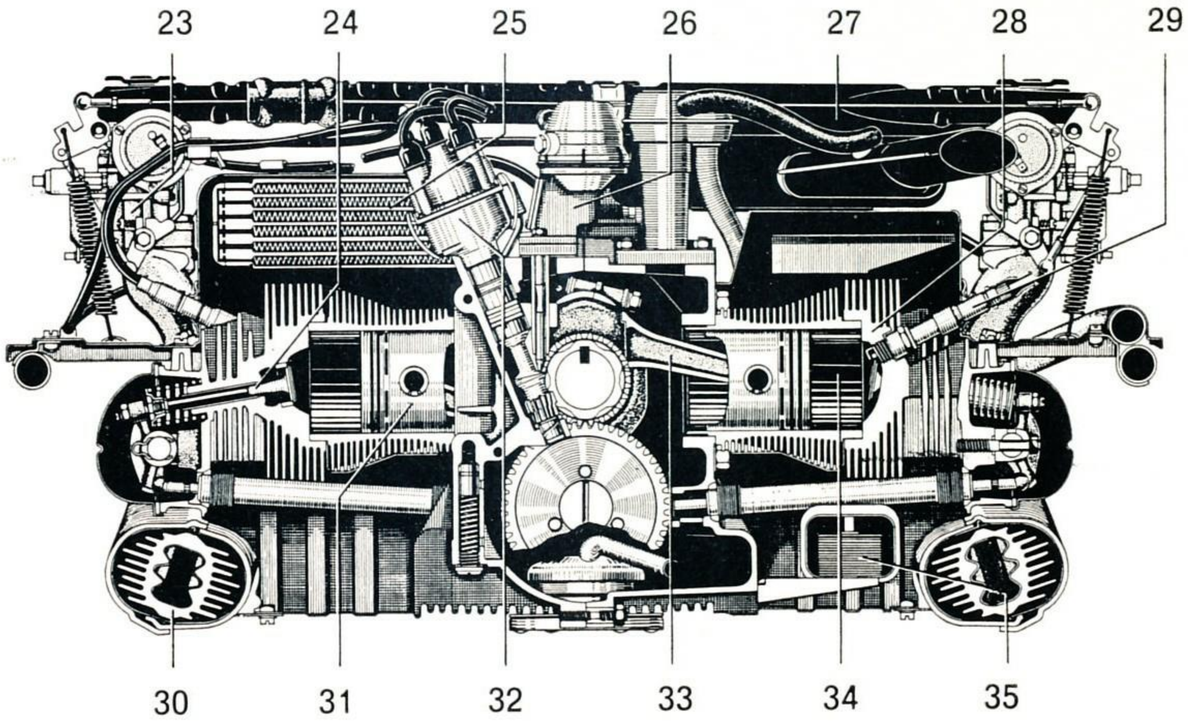
[1]) Measured consumption plus 10%, with half load at a steady ¾ of maximum speed on level road with no wind.

Power transmission

Single plate, dry clutch
Clutch pedal free play: 10 — 20 mm (.4 — .8 in.)
Baulk synchronized four-speed gearbox with bevel gear differential in one housing independent suspension.
Gear ratios: 1st gear 3.80:1, 2nd gear 2.06:1, 3rd gear 1.26:1, 4th gear 0.89:1,
Reverse gear 3.88:1
Differential ratio: 4.125:1

1 — 4th gear train
2 — 3rd gear train
3 — 2nd gear train
4 — Main drive shaft
5 — Differential pinion
6 — Clutch release bearing
7 — Transmission shift lever
8 — 1st gear train
9 — Drive pinion
10 — Oil drain plugs
11 — Reverse gear
12 — Differential housing
13 — Differential pinion
14 — Flywheel
15 — Crankshaft
16 — Camshaft drive gears
17 — Fan housing
18 — Crankshaft pulley
19 — Oil strainer
20 — Camshaft
21 — Oil pump
22 — Fan
23 — Carburetor
24 — Valve
25 — Oil cooler
26 — Fuel pump
27 — Oil bath air cleaner
28 — Cylinder head
29 — Spark plug
30 — Heat exchanger
31 — Piston
32 — Ignition distributor
33 — Connecting rod
34 — Cylinder
35 — Thermostat





Chassis

Platform frame with tunnel-shaped center member
Front axle bolted to forked frame head, sub-frame at rear to carry engine-transmission unit
Independent suspension: twin, cranked, trailing arms at front, trailing and diagonal arms at rear. Wheels driven by short drive shafts, each with two constant velocity joints.
Torsion bar springing, double-acting telescopic shock absorbers, stabilizer at front, equalizer spring at rear
Roller steering with maintenance-free tie-rods and hydraulic steering damper
Footbrakes: Hydraulic dual circuit system with discs at front
Handbrake: Mechanical, effective on rear wheels.

Wheelbase	2400 mm (94.5 ins)
Turning circle diameter	11.1 m (37 ft)
Track at front	1310 mm (51.6 ins)
Toe-in	4 to 6 mm (0.16 — 0.24 in.) unladen
Camber	1^0 20' ± 20' unladen
Track at rear	1346 mm (53.0 in.)
Wheels	4½ J × 15 Perforated wheel discs with drop center rims

Tires	Normal (tubeless) 6.00—15 L 4 PR		or Radial ply * (tubeless) 165 SR 15	
Tire pressures	front kg/cm² (psi)	rear kg/cm² (psi)	front kg/cm² (psi)	rear kg/cm² (psi)
With 1 or 2 occupants	1.2 (17)	1.7 (24)	1.3 (18)	1.9 (27)
Fully loaded	1.3 (18)	1.9 (27)	1.3 (18)	1.9 (27)

For long high-speed motorway trips, the pressures for normal tires should be increased by 0.2 kg/cm² (3 psi) at front and rear. All pressures given are for cold tires.

Electrical system

Voltage	12 Volts
Battery	36 Ah
Starter	0.7 hp
Generator	max. 30 amperes, early cut in
Distributor	with vacuum spark advance
Firing order	1 — 4 — 3 — 2
Basic ignition timing	7.5^0 before TDC

* Optional extra

	Contact breaker gap	0.4 mm (.016 in.)
	Spark plugs	Bosch W 145 T 1, Beru 145/14,, or plugs with similar values from other manufacturers
	Plug thread	14 mm
	Plug gap	0.7 mm (.028 in.)
Dimensions and Weights	Length	4280 mm (168.5 in.)
	Width	1620 mm (63.8 in.)
	Height	1335 mm (52.6 in.)
	Ground clearance	138 mm (5.4 in.)
	Unladen weight	910 kg (2006 lbs.)
	Maximum load	400 kg (882 lbs.)
	Permissible total weight	1310 kg (2888 lbs.)
	Permissible rear axle load	790 kg (1741 lbs.)
	Permissible front axle load	550 kg (1212 lbs.)
	Permissible trailer and roof weights [1]	
	Trailer with brakes	650 kg (1433 lbs.)
	Trailer without brakes	485 kg (1069 lbs.)
	Caravans or trailers for boats or gliders — with brakes	800 kg (1763 lbs.)
	Roof load [2]	75 kg (165 lbs.)
Capacities	Fuel tank	40 liters (8.8 galls)
	Engine	2.5 liters (4.4 pints)
	Rear axle and transmission	2.5 liters (3.0 liters when dry 5.25 pints)
	Oil bath air cleaner	approx. 0.4 liter (.7 pints)
	Windshield washer	approx. 1 liter (1.75 pints) operating pressure 2.5 kg/cm² (35 psi)
Performance	Maximum and cruising speed	145 kph (90 mph)
	Acceleration time from 0—80 kph (0—50 mph)	11.5 seconds
	Climbing ability	1st gear 46%
		2nd gear 24%
		3rd gear 13.5%
		4th gear 8.5%

[1] Subject to local regulations which may differ.
[2] Use only roof racks supported in rain channel and distribute load uniformly.

Technical Data for the Karmann Ghia Coupé Automatic insofar as it differs from the detail for the Karmann Ghia Coupé with manual transmission

Engine

Fuel consumption * . . . . . approx 9.7 liters per 100 km (29.6 miles per gallon)
Ignition timing . . . . . 0° (TDC)

Power transmission

Automatic transmission combined with rear axle drive, separate lubrication of transmission and axle drive.
The transmission consists of a hydrodynamic torque converter and planetary gearing with three forward gears and one reverse.
Planetary gear ratios:
1st gear 2.65 : 1 2nd gear 1.59 : 1 3nd gear 1.0 : 1 Reverse gear 1.8 : 1
Final drive ratio 3.67 : 1

Trailer Weights

The Karmann Ghia Coupé Automatic is unsuitable for trailer towing.

Capacities

Torque converter and planetary gears . . . . . approx 6 liters ATF
(10.5 pints)
(Refill with 3 liter, 5.2 pints)
(Type of ATF according to factory instructions)
Final drive . . . . . approx 1 liter (1.8 pints)
Hypoid oil SAE 90

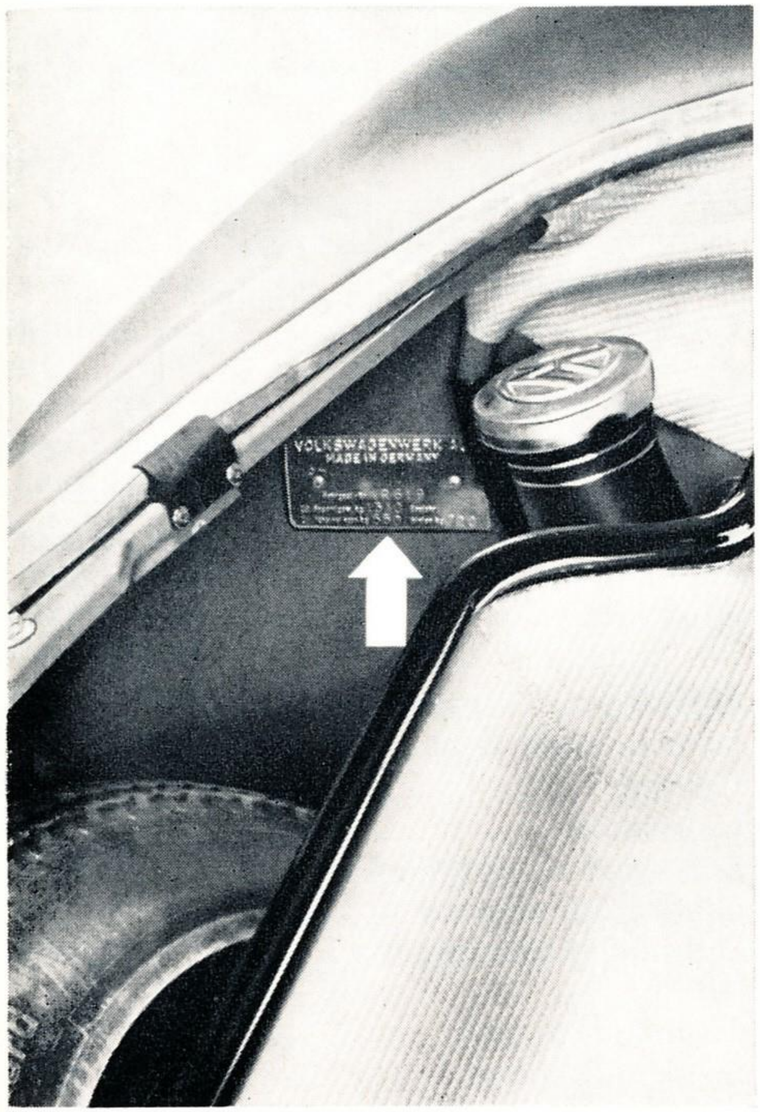
Perfomance

Maximum speed . . . . . 140 kph (87 mph)
Acceleration 0—80 kph (0—50 mph) . . . . . approx 13.5 seconds
Hill climbing ability
Forward 40%
Reverse 26%

*) Measured consumption plus 10%, with half load at a steady ¾ of maximum speed on level road with no wind.

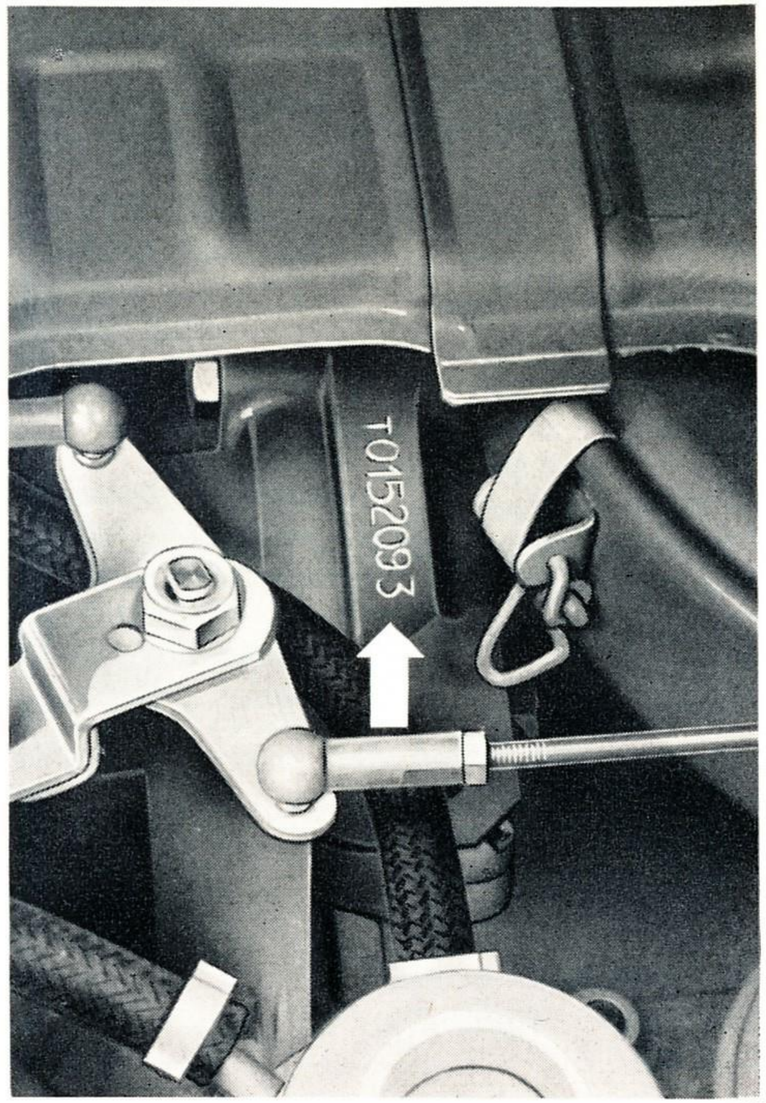
In the vehicle documents are, amongst other things, the model designation, the chassis number and the engine number.

The identification plate is under the front hood near the tank filler neck.



The chassis number is on the frame tunnel under the rear seat.

The engine number is between the oil cooler and air cleaner near the crankcase joint.



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Genuine VW Parts are the proper replacement parts for the Volkswagen. They guarantee accuracy, quality and reliability. Every part of the Volkswagen is available as a Genuine VW Part and all are naturally of the same high quality as the original parts on the vehicle when it leaves the factory. Genuine VW Parts are covered by the same Warranty conditions as brand new vehicles. The genuine parts are expertly installed in every VW workshop.

VW Exchange Parts are also replacement parts for your Volkswagen just like the Genuine VW Parts. They are covered by the same Warranty conditions as Genuine VW Parts and are available in every VW workshop. But there is one difference: The price.

VW Exchange Parts are cheaper than Genuine VW Parts but exactly the same in quality. The exchange parts are not new parts, but parts which have been reconditioned in the Volkswagen factory. That is why you have to hand in the old repairable part to get an exchange part.

Please consult your VW workshop on all questions concerning repairs. They will be pleased to advise you and your vehicle will be in good hands.

158.810.20 - Printed in Germanay - 8. 68


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