

# Instruction Manual





# **Instruction Manual**

## **VOLKSWAGEN TRANSPORTER**

**August 1968**

**V O L K S W A G E N W E R K A G . W O L F S B U R G**

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The pictures and text in this manual are based on the Micro Bus L with a number of useful optional extras. Where the controls and technical details of the other Transporter models differ considerably, attention is drawn to the difference. 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.

## **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 and 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.

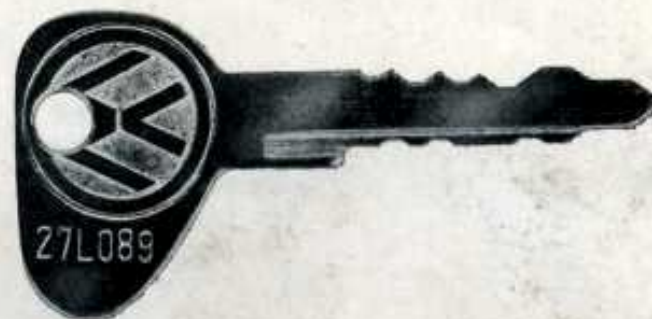
The Service Record tells you exactly what points you have to watch to maintain the road-worthiness of your car and explains the Service System which we have prepared for it. It also contains the Warranty Voucher for your car and the conditions on which this voucher is issued.

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.

## Getting acquainted

### Only one key

is required to open the doors and rear door and start the engine. It is a good idea to note the number of the key. If you should lose the key, you can then obtain a replacement from your VW Dealer by quoting this number.



## All the doors

of your Transporter can be unlocked from outside.

### The cab doors

of the Micro Bus L model are fitted with vent wings.

#### 1 - Vent wing fastener

To open, turn the fastener knob until the locking lug points to the front, then swing the fastener forward.

#### 2 - Window crank

#### 3 - Door closing handle

#### 4 - Lock release lever and locking lever

The doors cannot be opened from inside with the lock release levers as long as the locking levers are pressed in.

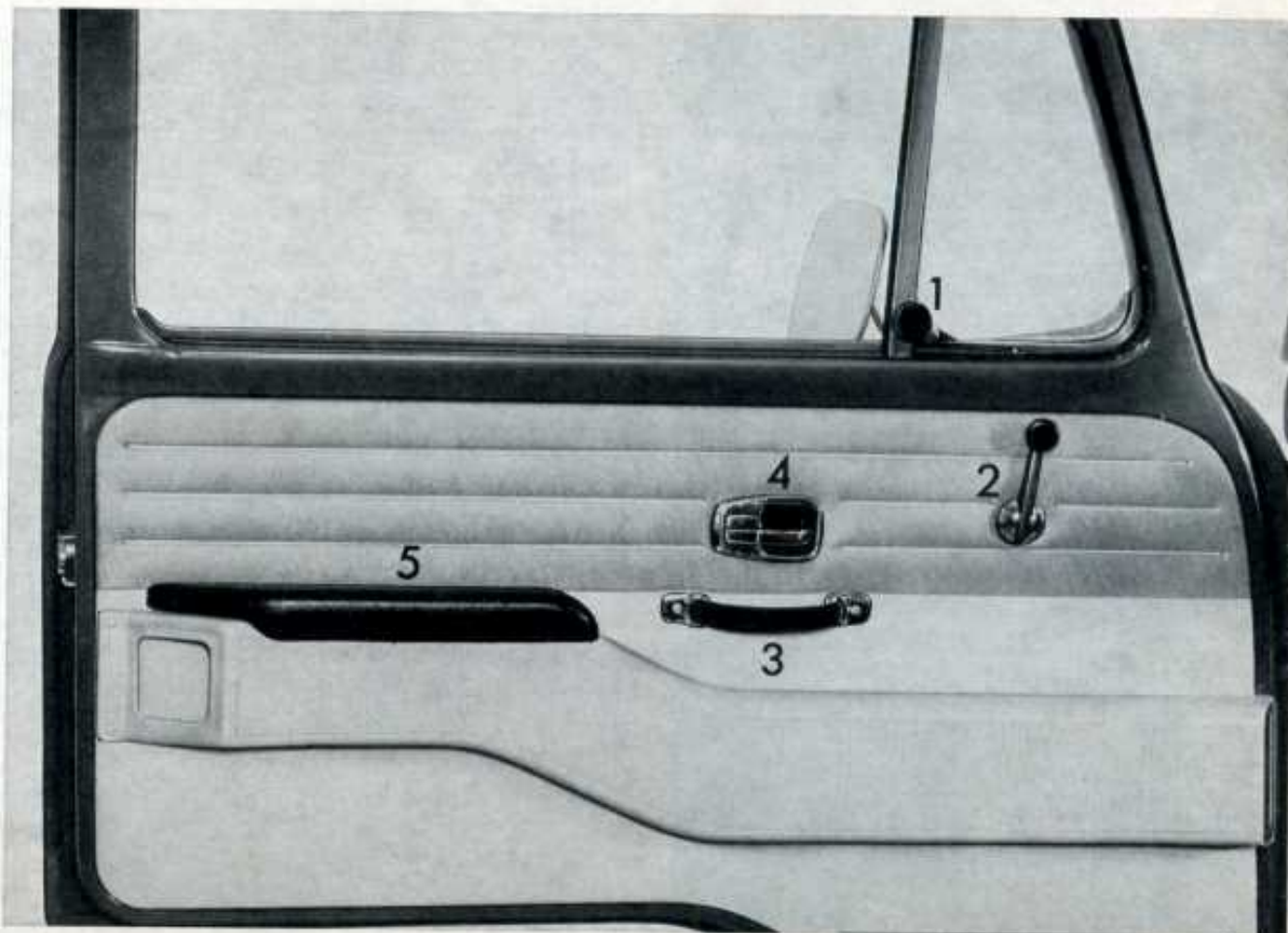
When leaving the vehicle, just press the locking lever in and then depress the catch in the door handle as you close the door. The vehicle is then locked.

If the door closes on its own after the locking lever has been pressed in it will not lock itself because the locking lever springs out 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.

#### 5 - Arm rest on fresh air duct

This is only fitted in the Micro Bus L and Micro Bus models.



The **sliding door** can be opened and slid back after pressing the handle down. When fully open, it is held by a hook.

To close the door, release the retaining hook by pressing the handle down again and push the door forward with a slight impetus until it engages. Then move the handle up firmly so



that the catch at the rear edge of the door is operated and the door is pulled in properly at the rear. Please note that when the vehicle is in motion, the door must always be closed and **locked**.

From inside, the door is operated in the same way: To open it, press the handle forward — A —, to close it, pull the handle firmly to the rear — B —,

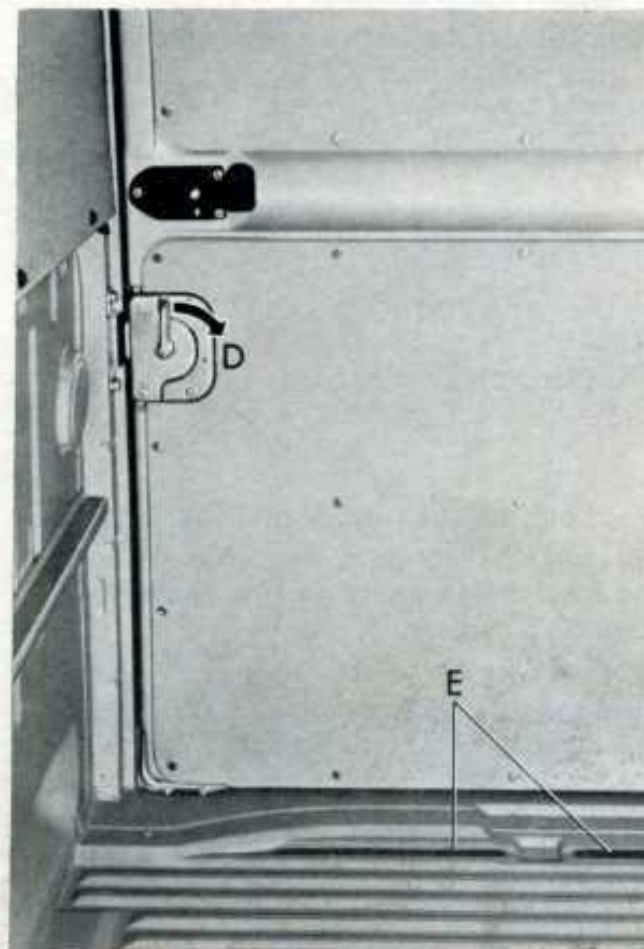
The door can be locked with the key from outside or by turning the small locking lever inside to point downwards — C —. The Delivery Van has a small button which has to be moved to the right instead of the lever.

On Delivery Vans with the full-width cab partition, the sliding door lock lever has to be pulled to the rear to open the door — D —. You can then get out if the sliding door closes unintentionally when you are still in the load compartment.

On the Kombi and the Delivery Van there are red lines — E — on the load compartment floor to mark the limit up to which the cargo can be loaded. To enable the sliding door to be operated properly, do not position the load over these lines.

The **rear door** can be opened by pressing the button at the bottom of the door and then lifting the door until it is held in the fully open position by spring pressure.

To close the door swing it down with a slight impetus. Always check afterwards that the door is properly closed.





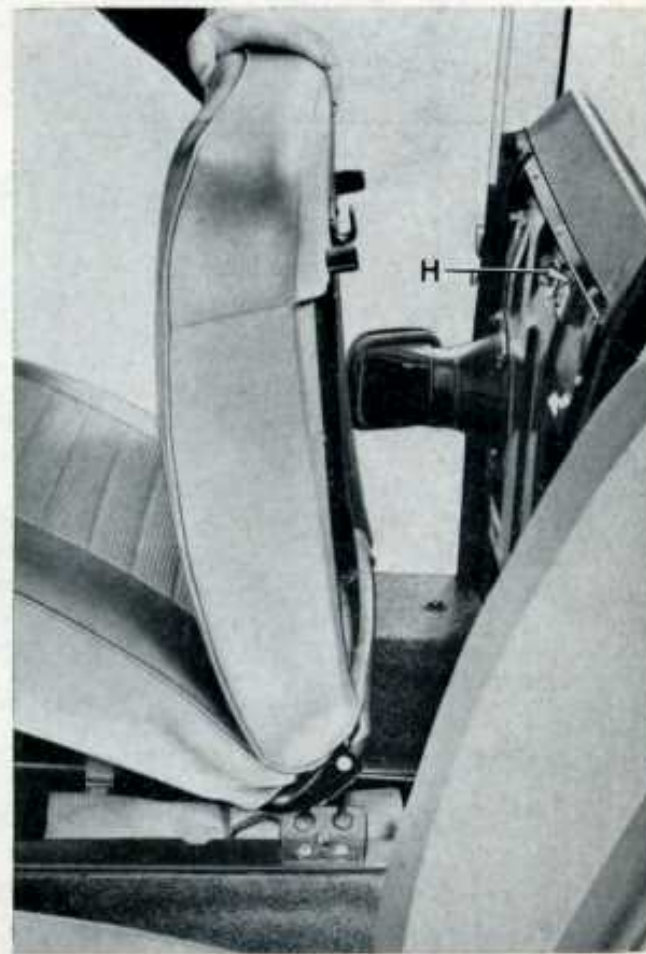
## Get in and make yourself comfortable



When driving, you must be comfortable. That is why the seat position and backrest rake of the driving seat in your Transporter can be altered to suit your requirements. This is quite simple to do: Just lift the lever — F — at the front of the seat and slide the seat forward or backward. Every time the seat is moved make sure that the lever engages properly so that the seat cannot move while you are driving.

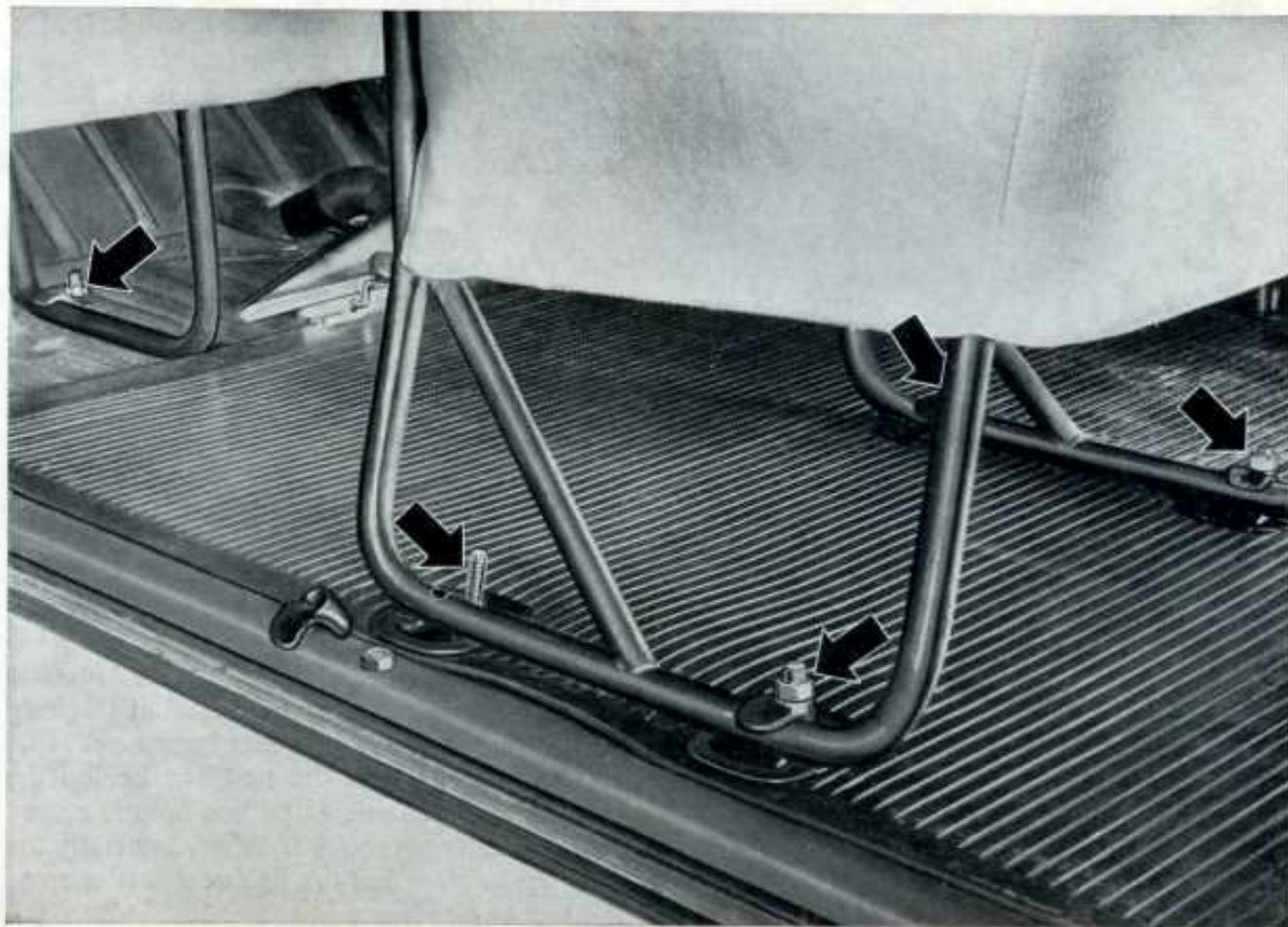
The backrest, which has a safety device to prevent it from tilting forward, can be set to any desired angle by turning the large knob — G —.

The front passenger seat and backrest can be set to two positions as follows: Lift the seat at the front until the backrest hooks out of its retainer — H — on the partition behind the seat. The seat can now be lifted up and moved to the position required. When lowering the seat, make sure that the backrest hooks on to the partition properly.

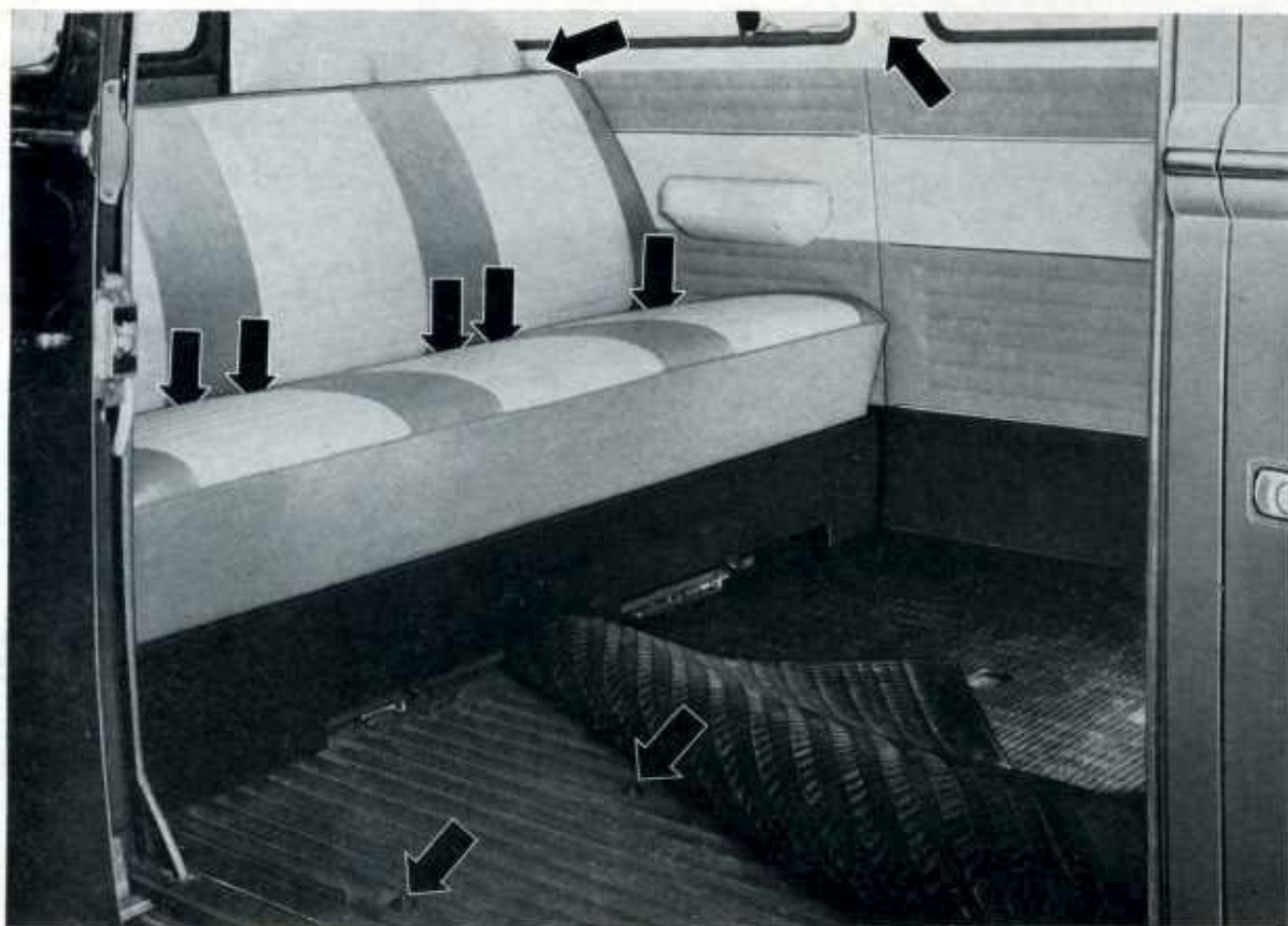


In the passenger compartment, the part of the center bench backrest near the door can be hinged forward to make it easier to get in and out of the rear seat. To release the backrest lock, lift the knob in the side of the backrest.

If you wish to transport large bulky loads you can take the seats out of the passenger compartment. To do this, remove the side trim panels from the center seat and the front trim panel from the rear seat, unscrew the nuts and take off the clips. Take out the seats and the floor plates and remove the bolts by turning them 90°.



**Safety belts** can be obtained from any VW Dealer. All seats can be fitted with lap belts. The seats in the cab and the outer seats in the passenger compartment can be fitted with shoulder or combined lap-shoulder belts. There are eight anchor points in the cab and sixteen in the passenger compartment. The threaded holes are fitted with plugs to keep out dirt.



## In front of you - the instrument panel

Have a good look at the instrument panel and try out the various knobs and levers with the ignition switched on:

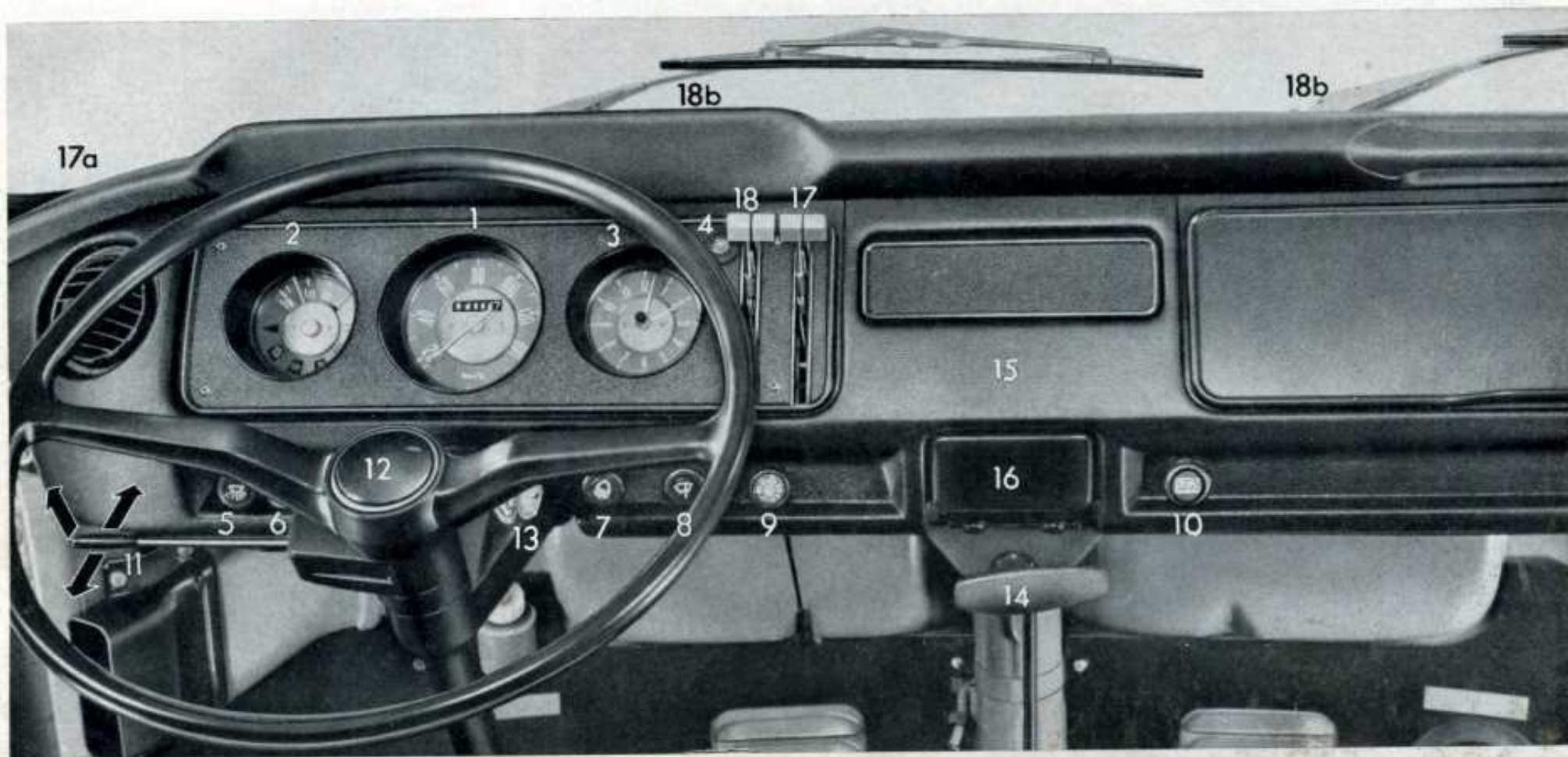
### 1 - Speedometer

### 2 - Fuel gauge

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

In the fuel gauge dial are the following warning lamps:

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





### 3 - Clock

The clock is wound up electrically. The hands can be set by pressing in and turning the knob in the dial center.

All models except the Micro Bus L have a cover plate at this location.

### 4 - Dual circuit brake warning light \*)

See explanation on page 18.

### 5 - Push/pull knob for interior light

When the knob is pulled out, the light in the passenger or load compartment can also be switched on and off with the switch built into the lamp.

### 6 - Push/pull knob for fresh air fan \*)

The two-speed fan is switched on by pulling this switch.

### 7 - Lighting switch

When the knob is pulled out to the first stop, the parking, license plate, tail and instrument lights are switched on and a green warning lamp in the fuel gauge dial lights up. When the knob is pulled out to the next stop, the head-

lamps are switched on as well and the green lamp goes out.

The **instrument lights** are controlled in brightness by turning the lighting switch.

### 8 - Windshield wipers and windshield washer

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

### 9 - 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 dangerous situation when moving or that the vehicle has broken down and 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.

### 10 - Heated rear window switch \*)

This switch is for the heatable rear window but it only works when the ignition is switched on. A green warning lamp in the knob of the switch 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.

### 11 - Turn signal switch

Lever forward — right turn signals

Lever to rear — left turn signals

The turn signals are cancelled automatically after taking a corner.

The headlamp beams are switched up and down by lifting the turn signal lever. When the lights are off or only the parking lights are on, lifting the lever flashes the headlamps.

A blue warning lamp in the fuel gauge dial lights up when the high beams are switched on.

### 12 - Horn

### 13 - Steering — ignition lock

1 — Ignition off — steering locked

2 — Ignition off — steering free

3 — Ignition on

4 — Starting



**Important:** Remove key from lock only when vehicle is stationary.

### 14 - Handbrake

To apply the handbrake, just pull the handle out. To release, turn handle to the right and push it forward.

\*) Optional extra

## 15 - Instrument panel padding \*)

## 16 - Ashtrays

To remove the ashtray, press leaf spring down and pull ashtray out.

The ashtray — 16 a — in the passenger compartment is removed by opening it and lifting it out of the housing at the bottom first. To insert it, hook it into the leaf spring at the top first and then press it into the housing.

## 17 - Fresh air control levers

With the two blue levers in the instrument panel, you can control the fresh air ventilation for each side of the vehicle separately.

Levers up — fresh air intake closed

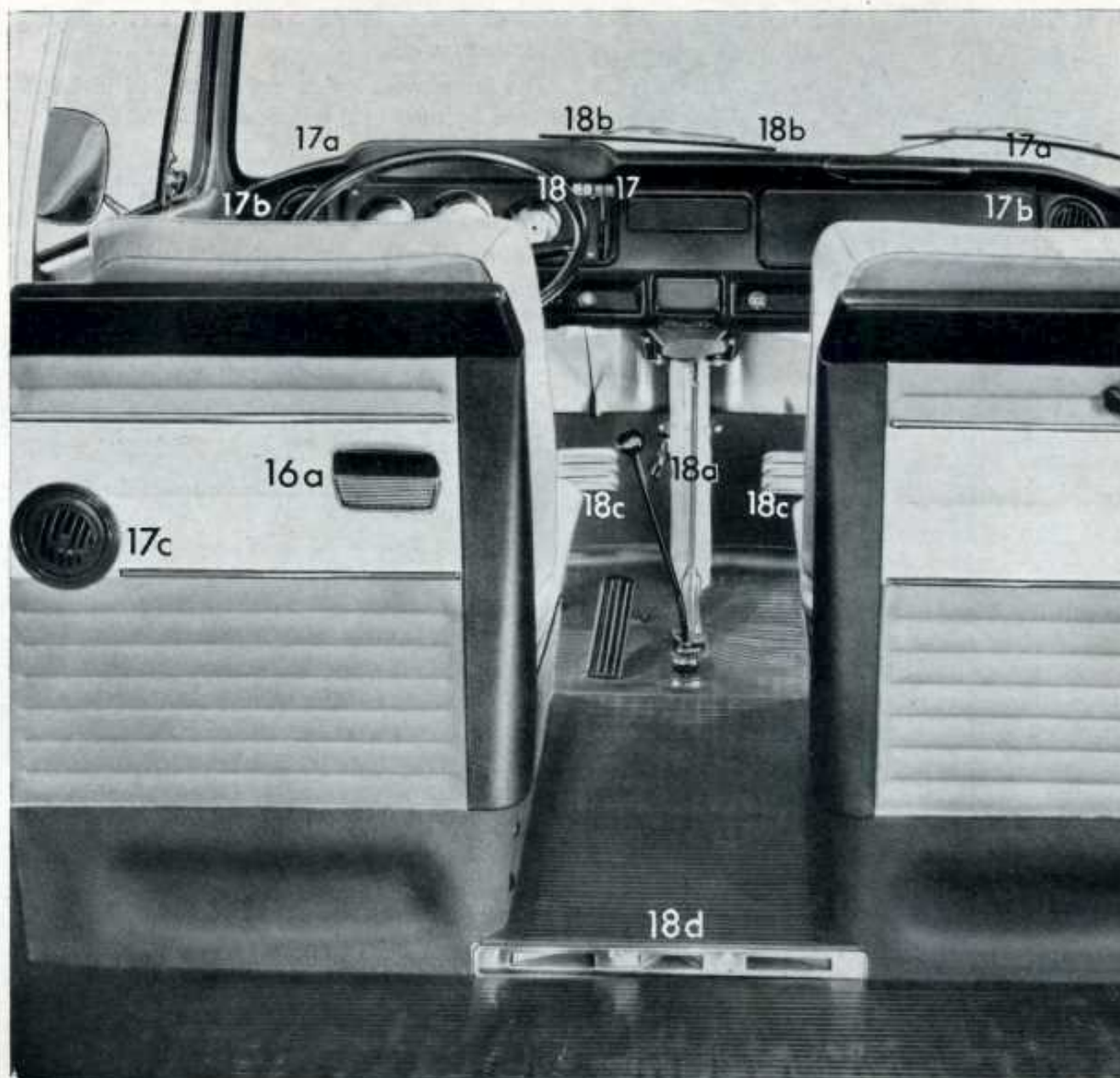
Levers down — fresh air intake open

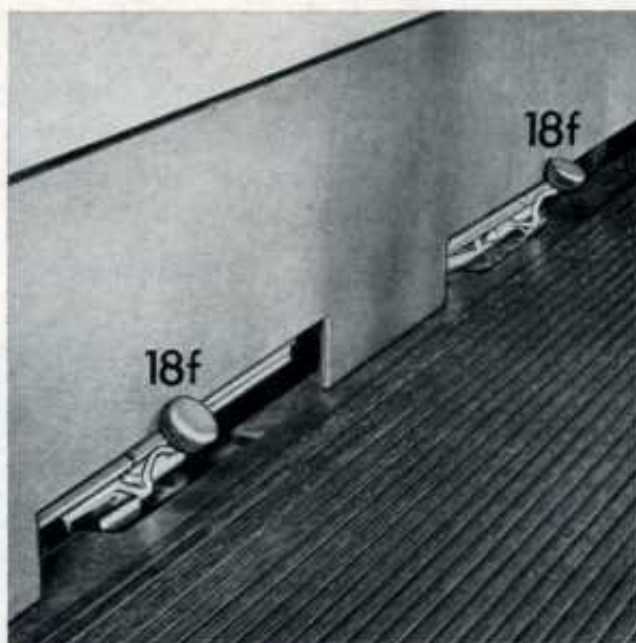
The air enters at two vents — 17 a — at the lower edge of the windshield and through two round vents — 17 b — on each side of the instrument panel. The round vents can be turned to direct the air stream as required and each vent has a flap built in so that the flow of air can be regulated.

The Micro Bus L and Micro Bus models have two further round vents — 17 c — on the back of the front seats.

The fresh air fan \*) is only fully effective when the fresh air vents are open.

\*) Optional extra.





## 18 - Heating control levers

With the two red levers in the instrument panel, the flow of warm air can be controlled separately on each side of the vehicle.

Levers up — heat off

Levers down — heat on

The distribution of warm air inside the body can be regulated as required:

The lever — 18 a — on the front panel controls the distribution of warm air in the cab: If you push the lever down, the warm air comes out

of the defroster vents — 18 b — at the lower edge of the windshield; if the lever is pushed up, the warm air comes out of the vents at footlevel — 18 c. The lever can naturally be set to any intermediate position.

Three further warm air outlets are fitted in the passenger compartment:

The outlet — 18 d — in front of the center seat supplies warm air if the knob — 18 e — under the driving seat is pulled out with the heating on.

Warm air is also supplied to the two outlets under the rear seat — 18 f — when the heating

is on. The levers must be pushed inwards to open the warm air flaps.

At low temperatures it is advisable to leave all the warm air flaps in the passenger compartment closed when first moving off and direct the flow of warm air to the defroster vents with the regulating lever — 18 a. This increases the flow of warm air to the windshield and helps to prevent steaming up when the air humidity is high. As soon as the windshield is clear the other outlets should be opened so that the interior of the body heats up as quickly and uniformly as possible.

## Above you

### 1 - Sun visors

You can pull the visors out of the mountings near the mirror and swing them towards the door windows to prevent dazzle from the side.

### 2 - Cab light

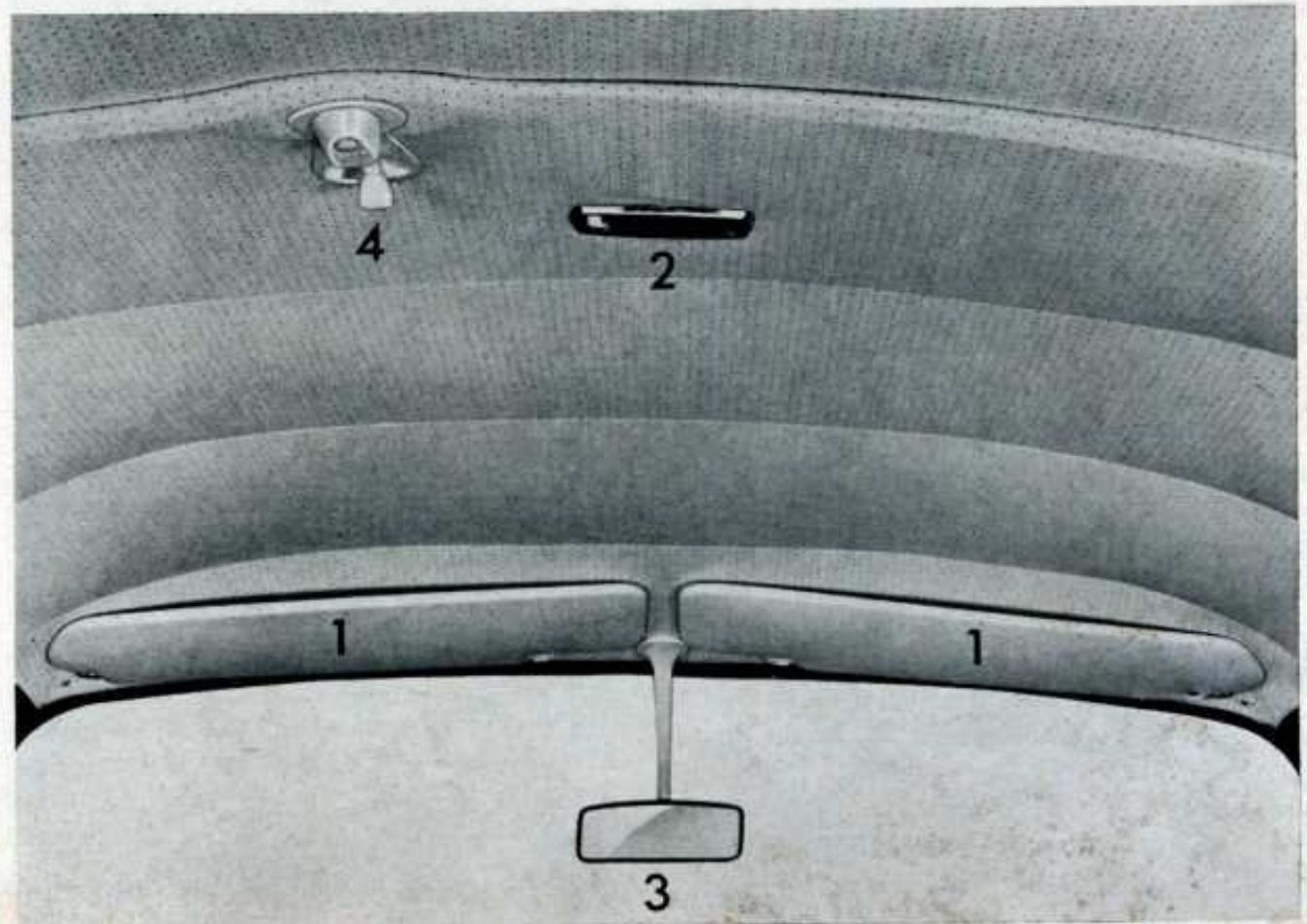
The cab light is switched on with the switch on the lamp itself.

### 3 - Rear view mirrors

Inner and outer mirrors are mounted so that they can be set to give clear vision to the rear at all times.

### 4 - Sliding roof

For safety reasons, the sliding roof crank should always be in the recess. When closing the roof, turn the crank as far as it will go then turn it back slightly until it can be folded into the recess.





## In the footwell

- 1 - Clutch pedal
- 2 - Brake pedal
- 3 - Accelerator pedal
- 4 - Gearshift lever

Reverse gear has a lock to prevent it from being selected accidentally. To engage reverse

gear, press the lever down first then move it to the left and to the rear. When the ignition is switched on, the **back-up lights \***) come on at the same time as the gear engages.

Do not forget that reverse gear must only be engaged when the vehicle is stationary.

\*) Optional extra

## 5 - Brake fluid reservoir

The fluid level should always be between 15 and 20 mm (.6 and .8 in.) below the screw cap. If the level drops considerably below this point after the vehicle has been in use for some time, have your VW Dealer check the brake system.

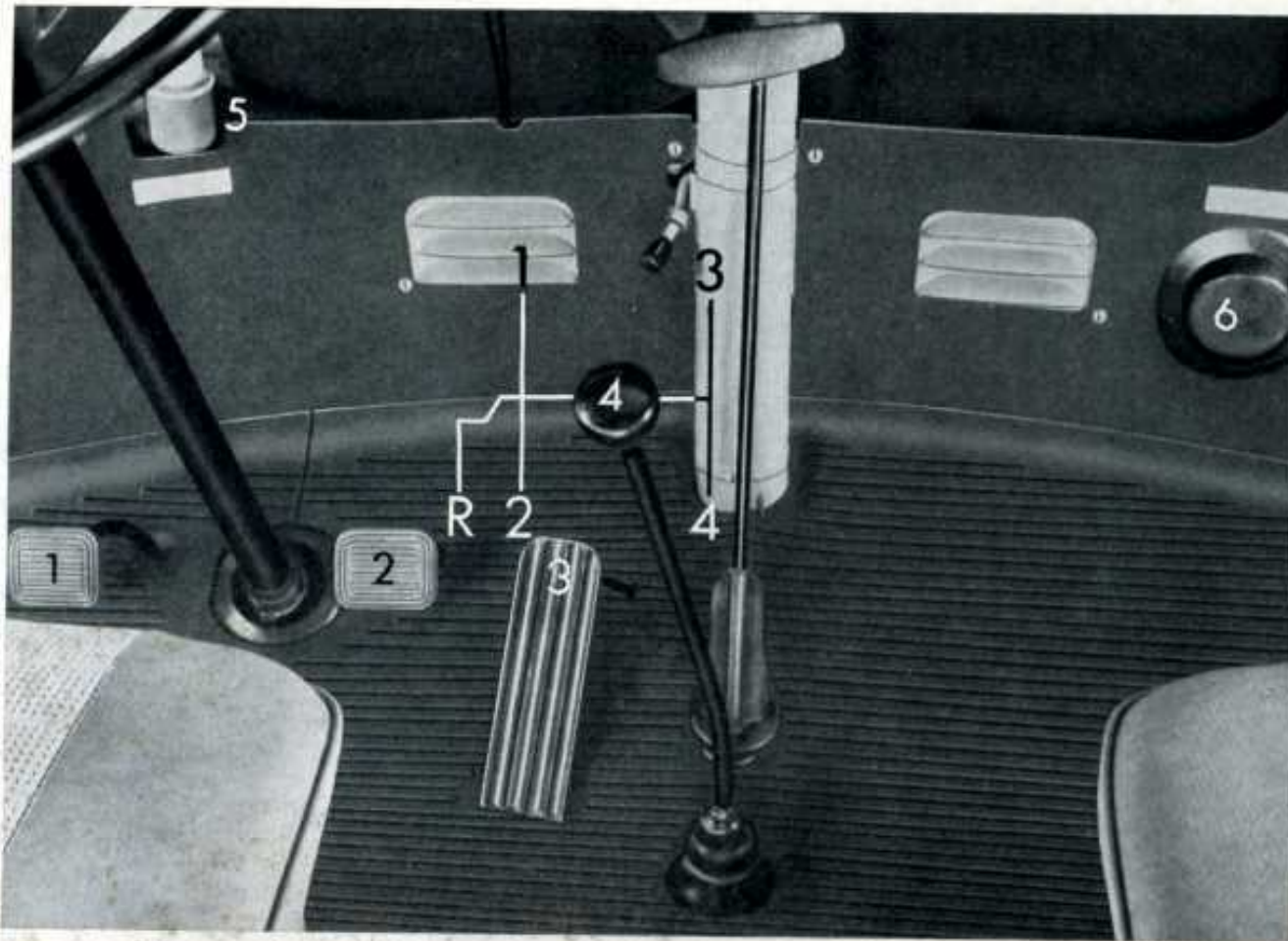
Brake fluid is hygroscopic. Too high a water content in the brake fluid becomes detrimental to the entire brake system after a period of time so the brake fluid should be renewed about every two years. Afterwards the system must be bled.

## 6 - Container for windshield washer

To fill the container, remove the cover first, then screw the cap off. The container can be filled with water until it overflows, there is always room for sufficient air to operate the washer. The maximum air pressure is 42 psi (3 kg/cm<sup>2</sup>).

It is advisable to add a cleaning solution to the water because clear water alone does not usually clean the windshield quickly and properly. If enough of this cleaning agent is put in, it also acts as an anti-freeze solution. The order number is given on page 24.

Methylated spirits can also be used as anti-freeze agent. In this case a mixture of 1 part meths to 3 parts water will protect the water from freezing down about  $-12^{\circ}\text{C}$  ( $10^{\circ}\text{F}$ ).



## These points are also important

### 1 - Spare wheel

Have the air pressure in the spare wheel checked from time to time. It is advisable to inflate it to the highest pressure you are likely to need as it is easier to release some air when the wheel is fitted than to add air.

The spare wheel is located in a recess in the rear load surface.

On the Transporter models with the full width partition in the cab, the spare wheel is stowed under the cab seats.

### 2 - Jack

The jack is secured in position under the front passenger seat. It can only be fixed firmly if the lifting arm on the jack is against the embossed mark (arrow).

The proper way to use the jack is described on page 28.

### 3 - Tools

The tool roll is also located under the front passenger seat.

It contains:

- 1 V belt 9.5 x 900
- 1 wheel cap remover
- 1 pair of combination pliers
- 1 screwdriver with reversible blade for slotted and Phillips screws
- 1 open-ended wrench 8 mm and 13 mm
- 1 double-ended socket for plugs, fan pulley, wheel bolts and jack
- 1 socket 13 mm
- 1 bar for both sockets and jack

Now you know your vehicle fairly well.

For what to do before moving off and when on the move, see pages 17 to 20.



## Before moving off, check . . .

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

The **fuel tank** holds about 13 gallons (60 liters) which is sufficient for approximately 300 miles (500 km).

The filler neck is under a small flap on the right-hand side of the vehicle above the rear wheel housing.

The choice of fuel is left entirely to you. The Volkswagen Transporter will run satisfactorily on all normal fuels which fulfil the octane requirements of the engine (91 octane).

If regular fuels with adequate anti-knock properties are not available, it is quite in order to use premium fuels or a mixture of both types.



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 which causes the pedal free travel to increase gradually in the course of time. 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 frequently in city traffic and for short distances.

2 - Your VW Transporter 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 immediately due to the sudden increase in pedal free travel — take the vehicle to a VW workshop. 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 headlights, rear lights, license plate light, turn signals, back-up lights \*) and brake lights.

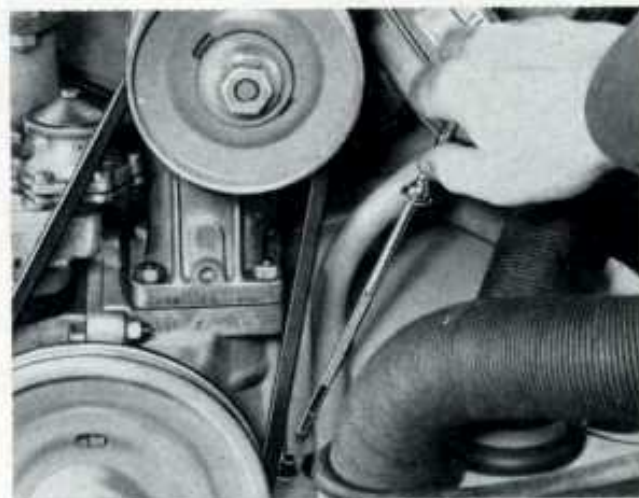
The ignition must be switched on to check the turn signals, back-up lights \*) and brake lights. If a turn signal is defective, the warning lamp

\*) Optional extra.

in the fuel gauge dial flashes much quicker than usual or does not light up at all. The brake lights should work when the brake pedal is depressed. The back-up lights only come on when reverse gear is engaged.

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

The vehicle must be on a level surface when the oil is checked, otherwise the dipstick



reading will be inaccurate. Do not check the oil immediately after stopping the engine because the oil in circulation takes at least five minutes to drain down to the bottom of the crankcase.

To top up, select a good brand of gasoline engine HD oil. It is an advantage to use the

same brand whenever possible but sometimes the mixing of HD oils from different manufactures cannot be avoided. This will not damage the engine. Further details of the viscosity grades are given on page 41.

**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 roadholding. Even though the 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 48 and on a small plate fixed to the tank filler flap.

### Two more important points:

1 - 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 described on page 45.

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

## Starting the engine

Before turning the ignition key, make sure that the gearshift levers 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** and 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, 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 lamps** 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 and cooling** shows thus that the belt is in order and the generator working. If this light comes on when you are driving, stop at once and check the belt which drives the generator. When this belt breaks, the engine cooling ceases to work. The proper way to fit a new belt is described on page 29.

If the generator stops charging for any other reason, 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 ... 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:

	kph	mph
1st gear	0 — 20	0 — 15
2nd gear	10 — 40	10 — 25
3rd gear	20 — 70	15 — 45
4th gear	40 — 105	25 — 65

When a particular traffic situation makes it essential to move rapidly, you can accelerate to 30 mph in 2nd gear and 50 mph in 3rd gear for brief periods. 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 gas station, not to mention increased tire and brake lining wear.

You can drive very economically between:  
10 and 30 kph in 2nd gear (10 and 20 mph)  
20 and 50 kph in 3rd gear (15 and 30 mph)  
40 and 75 kph in 4th gear (25 and 45 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.

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 60 mph for example it is four times longer than at 30 mph. Apply the brakes in good time whenever possible but do not use too much force, locked wheels increase the braking distance.

Water reduces the coefficient of friction of the tires and increases the braking distance but we cannot do anything about this. You can, however, take care when driving, remain at a safe distance behind 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, breakdowns and all there is worth knowing about the lubrication and maintenance of the vehicle.**

## When it snows and freezes

Your car has two features which you will appreciate in the winter: Air cooling and heating. You can leave your car out in the bitter cold without fear — the air-cooled engine will always start readily and supply warm air for the interior of the body.

**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.

Tires of the correct carcass strength must be used even when fitting winter tires. Please pay attention to the ply rating on the tire wall when buying new tires.

The specific characteristics of winter tires can be improved by raising the tire pressures to 0.2 kg/cm<sup>2</sup> (3 psi) above the normal operating pressure for the tire concerned. 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.

**Radial ply tires** are also good in winter conditions. This applies not only to the Micro Bus L models and the Ambulance which are fitted with these tires in production but to all other Transporter models.

If conditions are not too severe these tires can be fitted 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 pressure increase of 0.2 kg/cm<sup>2</sup> (3 psi) recommended for normal winter tires is also applicable to radial ply winter tires.

**Snow chains** can be fitted on the rear wheels only. Only thin chains which do not stand clear of the tire tread and inner side wall more than 15 mm 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 41.

If you only drive mainly short distances and in city traffic in the winter we recommend that you have the engine oil changed at shorter intervals, say every 2500 km (1500 miles). 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 hypoid transmission oil.

When the temperature is below — 13° F for long periods, it is advisable to use ATF (Automatic Transmission Fluid) in the transmission. The vehicle should, however, only be driven with this oil during the cold period. As soon as the temperature rises to near freezing point, the ATF **must** be replaced by SAE 80 or SAE 90 transmission oil.

**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 and heater boosters. 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, therefore, be charged from an external source from time to time. Further details are given on page 36.

**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 lock 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
Refil for 000 096 107 (300 cc)	000 096 108

**Frozen windows** can be sprayed with our defroster 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 but do not wash it in bright 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. Rewax later on whenever water no longer rolls off paint.

Then wax paint after washing and rub until paint shines again or just put wash/wax solu-

tion 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 behind the seats in the drivers cab 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 detergent 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 so that 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 (80 grams) 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 windows

Windows can normally be cleaned with a sponge and warm water and dried with a lea-

ther. 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 window 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

**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 and insects should be removed and cleaned with a hard brush and a detergent solution. The blades should be replaced once or twice a year according to condition.

### Pick-up cover

If you have a Pick-up with cover, please note the following point: When the cover is wet always leave it on the frame until it is dry, to prevent the material from shrinking.

### Door and window weatherstrips

To keep weatherstrips flexible and intact rub them occasionally with talcum powder or glycerine.

**Airing the body.** If the vehicle is left in the garage for long periods, the garage and car doors must be opened from time to time to prevent the formation of mould and damp stains inside the vehicle.

**The driver's seat:** If the driver's seat becomes hard to slide, the runners must be greased lightly at top and bottom after being cleaned with a cloth. The seat can be removed to do this by pushing it forward out of the runners.

**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 commercial vehicle wheels are also 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 every 10 000 km (6 000 miles) particularly on vehicles which are often driven at high speeds for long periods. 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.

**185 R 14 radial ply tires** (with tubes) are fitted in production on the Micro Bus L and the Ambulance. They can naturally be fitted on all Transporter models in order to take advantage of the positive characteristics of these tires such as longer service life, increased skid resistance, better cornering properties, shorter braking distances and lower roll resistance. 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 on page 48 and have the pressures checked regularly. All our other instructions on looking after tires also apply, without exception, to radial ply tires.

# 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.

## How to use tuning press buttons

Select station

Pull appropriate wave band button out and then 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.

## "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

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

## "Wolfsburg" model

2 wave band press buttons:

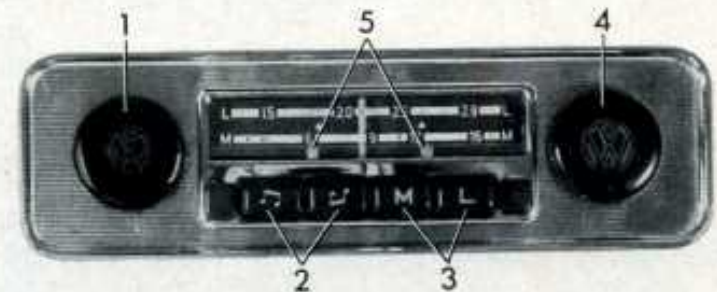
- M = Medium wave (515 — 1620 Kc/s)
- L = Long wave (150 — 290 Kc/s)

2 tone control press buttons: treble-bass

1 Tuning knob: on right

1 On/off and volume control knob: on left

2 station markers



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 telescopic 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 chrome grease (VW Part No. 000 096 067).

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

## Just in 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.

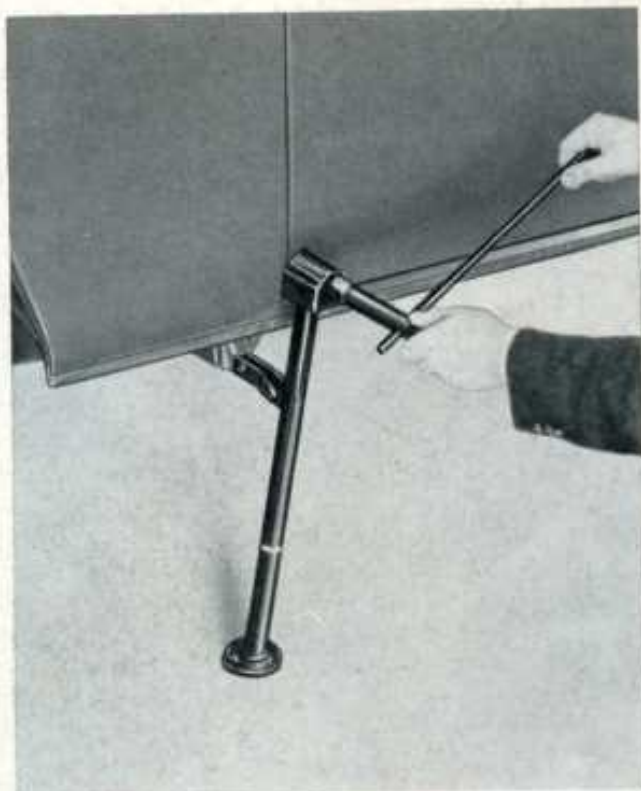
All other repairs should always be carried out by one of our service stations. The service organization of the VW factory offers you a wide-spread network of authorized workshops staffed by skilled mechanics and equipped with all the special tools and appliances required. Whenever you see the familiar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

### Wheel changing

Apply the handbrake and block wheel on opposite side to prevent vehicle from rolling.

Remove wheel cap with puller and jack bar by hooking the puller 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 double-ended socket wrench and bar. Insert jack into square tube under body and turn hexagon at top of jack until base touches ground.

Lift vehicle by turning hexagon with socket and bar. Remove 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 roughly in line with one of the threaded holes.



Insert one bolt and tighten it until the wheel can be moved to align the other holes. Raise vehicle again slightly and move wheel until the other bolts can be inserted.

Tighten bolts first using wrench without bar and while tightening move wheel to and fro so that it is centered on the hub by the rounded shape of the bolt heads.

Lower vehicle.

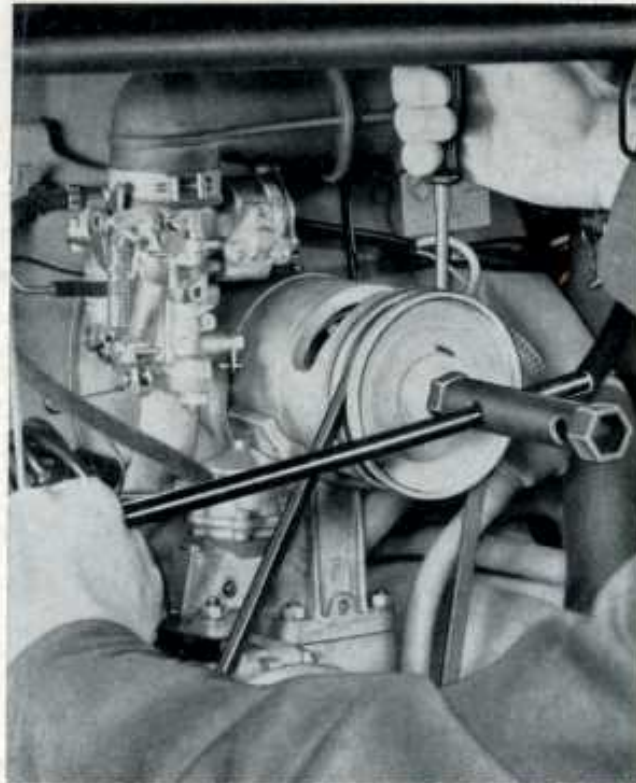
Insert bar in wrench halfway and tighten bolts uniformly and diagonally.



Install wheel cap by giving it a smart blow with the hand and, if necessary, remove trim ring carefully with a screwdriver from wheel with flat tire and insert it in wheel which has been installed.

Please have the wheel bolts checked with a torque wrench as soon as possible after changing a wheel. The torque should be 94 lb. ft. (13 mkg).

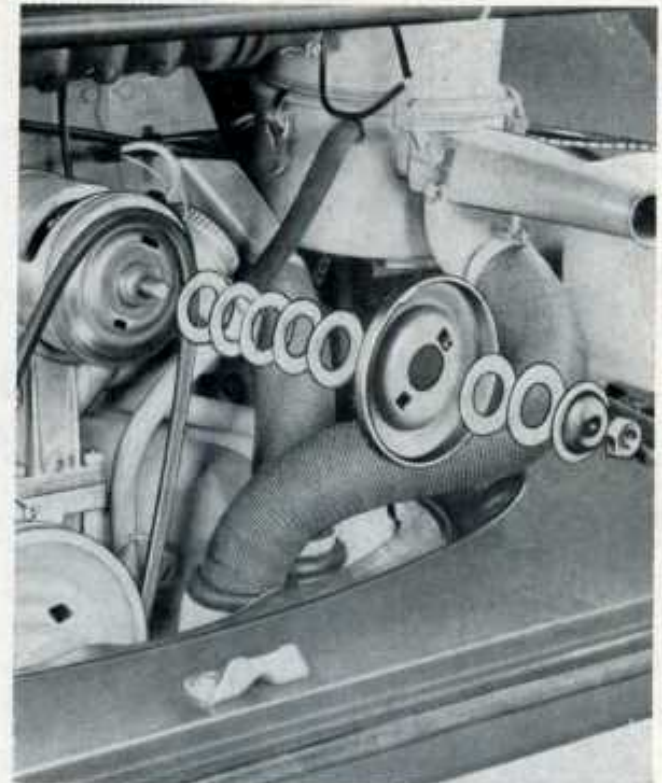
Do not forget to check the tire pressure in the wheel which has been fitted. See list of tire pressures on page 48.



### Adjusting or replacing V belt

The belt tension is correct when the belt can be pressed inwards about 1.5 cm (.6 in.) at the center. The belt must not be too tight or too slack. New belts may stretch slightly at first so they should be checked after about 1000 km (600 miles) and the tension corrected if necessary.

To adjust the belt, remove the rear part of the pulley on the generator. When loosening and tightening the nut, place a screwdriver in the slot in the front half of pulley and support the screwdriver against the upper screw in the generator housing. To fit a new belt, the cover plate for the crankshaft pulley must also be removed after taking out the three screws.



The belt is tensioned by varying the number of washers between the pulley halves. Taking washers out increases the tension, putting them in decreases it.

Even though the belt normally has a long service life, it is advisable to carry a spare on the vehicle.

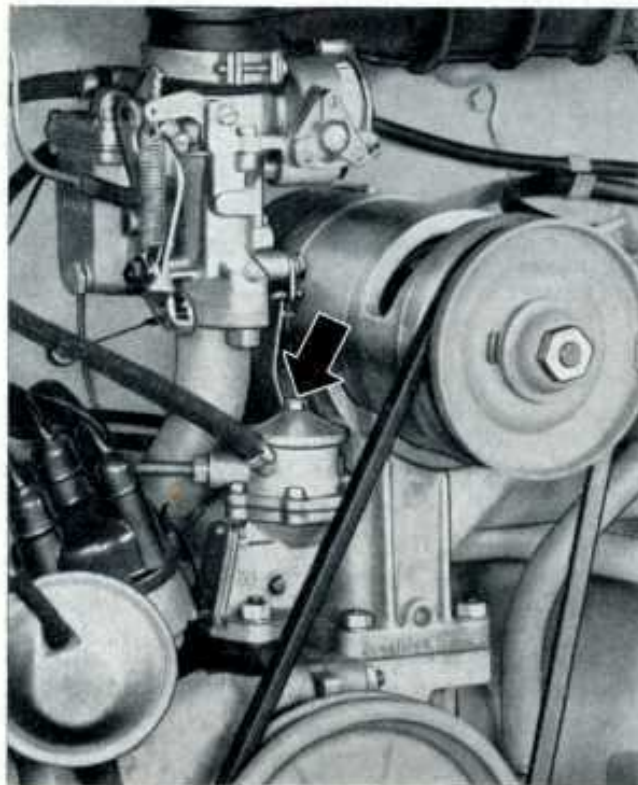
### Cleaning fuel pump filter

Install clip on fuel hose between tank and engine compartment.

Remove screw in cover on pump and take cover off.

Take filter out and clean it in benzine.

When installing filter, do not forget the gasket for the cover.



### Removing and installing spark plugs

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 gap should normally be 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.

Take care not to crossthread the plugs when inserting them and tighten them firmly but do not overtighten.

New plugs should be fitted every 20 000 km (12 000 miles).





## Aiming the headlights

The tire pressures must be correct.

If a headlight aiming device is not available, proceed as follows:

### 1 - Headlight bulb

Position the vehicle on a level surface 5 m (16 ft. 5 in.) away from a vertical wall.

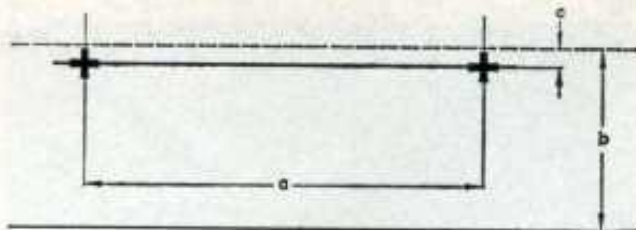
The headlights can be aimed with the vehicle fully loaded or when it is unladen:

- a - One person or 70 kg (154 lbs) on driving seat and vehicle with maximum permissible load. The load must be evenly distributed.
- b - Vehicle unladen. One person or 70 kg in driving seat.

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.

A - Vertical aim

B - Lateral aim



Sketch 1

- a = 1080 mm (42½ in.)
- b = Height of headlamp center from ground.
- c = 50 mm (2 in.) at a distance of 5 m (16 ft. 5 in.) from screen.

Aim the headlights individually by turning the screws — A — and — B — in the headlight rim with low beam switched on. 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 in the light-dark border line is exactly on the cross.

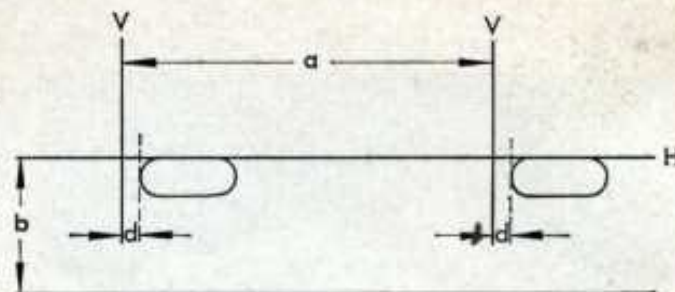
### 2 - Sealed Beam unit

On Volkswagen Transporters with Sealed Beam headlights use sketch 2 and aim beams as follows:

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 middle of the trim ring and take the ring off.



Sketch 2

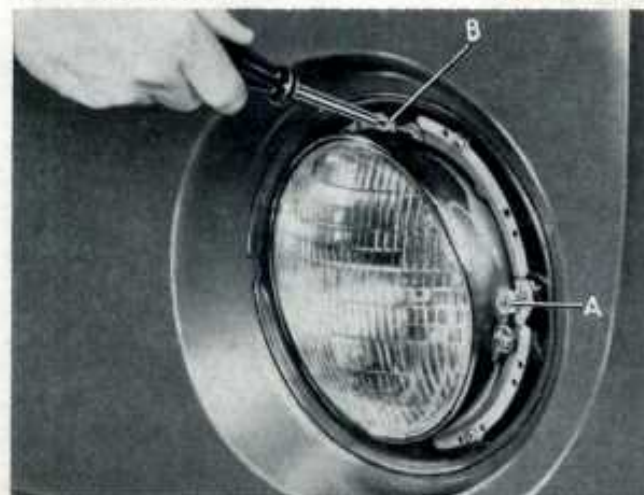
- a = Distance between headlights = 42½ in.
- b = Height of headlight centers from ground at a distance of 25 ft. from screen.
- d = 50 mm (2 in.).

Aim the headlights individually by turning the two aiming screws — A — and — B — with low beams switched on. Cover up the second headlight.

The headlights are correctly aimed when the top edge 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.

A - Lateral aim

B - Vertical aim



## Bulb replacement

### 1 - Headlight

Remove screw in the middle of the headlight rim.

Take headlight unit out.

Pull connector off bulb base.



1 - Headlight bulb

Turn cap to left, pull bulb out of reflector and fit new bulb.

When installing the new bulb, hold it with a clean cloth, a paper serviette or even with the cardboard bulb box but not with the bare fingers. The lug on the bulb flange must engage in the notch provided in the reflector.

Fit the cap so that the contact strip is resting on the base of the parking light bulb.

Check the headlight setting.



2 - Sealed Beam unit

### 2 - Sealed Beam unit

Remove screw in the middle of the trim ring and take the 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.



#### Front turn signal bulb

(with Sealed Beam equipment: front turn signal/  
parking light bulb)

Remove two screws.

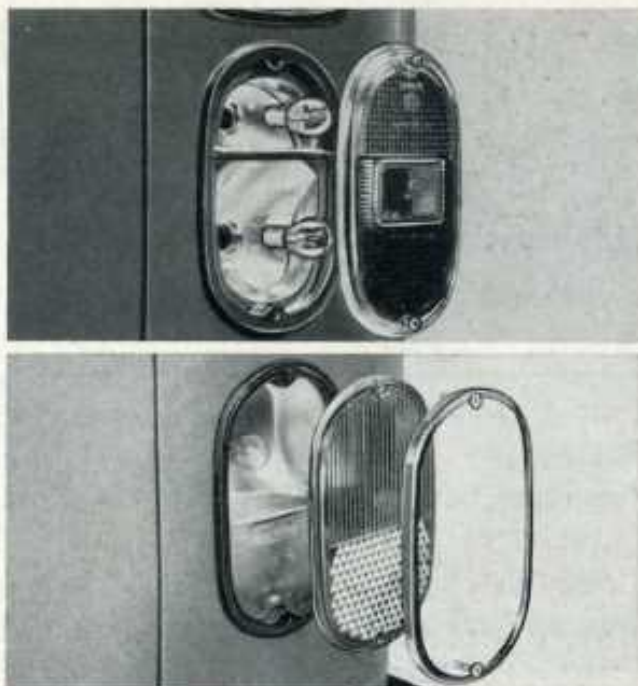
Take lens off.

Press bulb in lightly, turn and take out.

Insert new bulb.

When installing lens, ensure that gasket is  
located properly.

Do not overtighten the securing screws.



#### Rear turn signal or stop/tail light bulbs

(with Sealed Beam equipment: turn signal/  
stop/tail light bulb)

Remove two screws and take lens off.

Bulb positions:

Top — turn signal

Bottom — stop/tail

Press bulb in lightly, turn and take out.

Insert new bulb.

When inserting the double filament bulb, the  
retaining pin nearest to the bulb glass must  
be downwards.

Tighten lens securing screws evenly but do  
not overtighten.



#### License plate light bulb

Remove two screws.

Take lens and bulb holder off.

Press bulb lightly into holder, turn and take  
out.

Insert new bulb.

When installing, ensure that gasket is located  
properly. Do not overtighten the screws.



**Back-up light\*) bulb**

Unscrew the two screws so far that the metal frame with the lens can be taken off.  
 Take bulb holder out of housing.  
 Press bulb into holder lightly, turn and take out.  
 Insert new bulb.  
 When fitting the lens, ensure that gasket is located properly.

\*) Standard on Ambulance, optional extra on other models.

**Bulb chart**

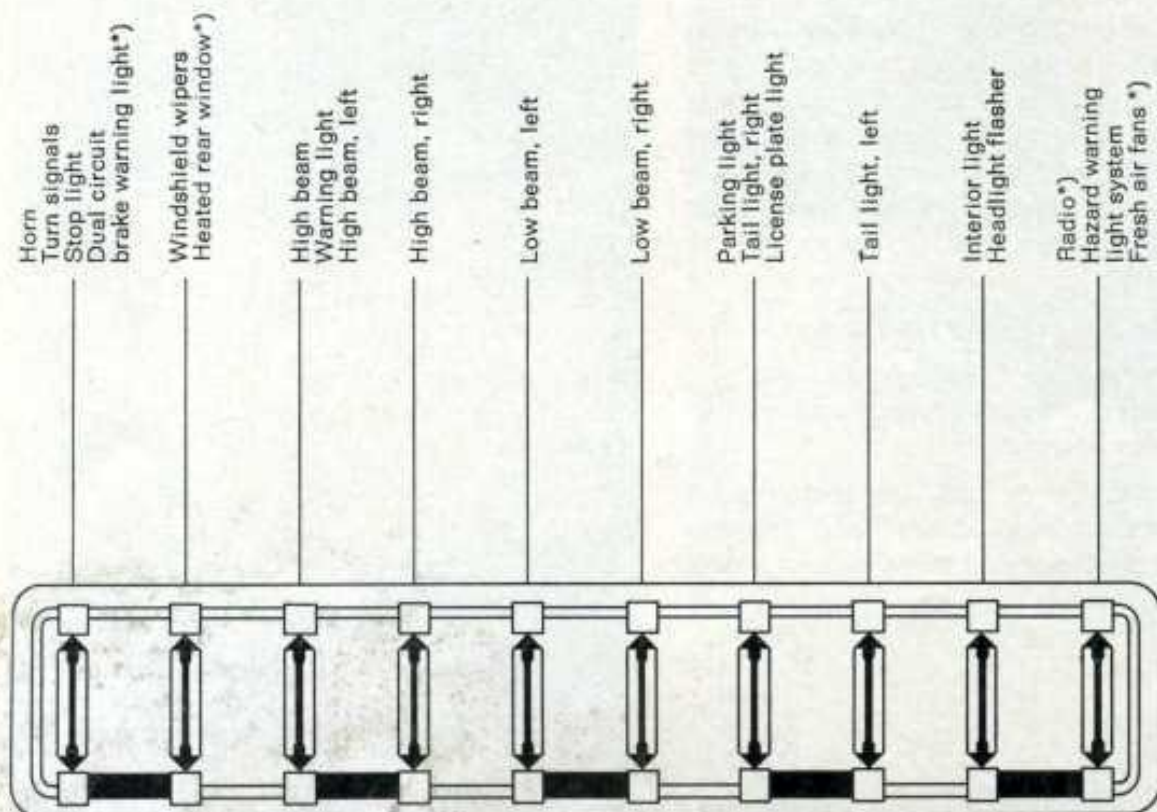
	V = Volts German designation	W = Watts Part No.
Headlight bulb .....	A 12 V 45/40 W	N 17 705 3
Parking light .....	HL 12 V 4 W	N 17 717 2
Turn signal, front and rear .....	RL 12 V 21 W	N 17 732 2
Stop/tail light .....	SL 12 V 21/5 W	N 17 738 2
Licence plate light .....	G 12 V 10 W	N 17 719 2
Warning lights in fuel gauge for hazard warning system, dual circuit brake system*), heated rear window*) and instrument lights .....	W 12 V 1.2 W	N 17 751 2
Interior light .....	K 12 V 10 W	N 17 723 2
*) Optional extra		
<b>Ambulance</b>		
Back-up light **) .....	12 V 25 W	N 17 733 2
Spot light .....	12 V 35 W	211 941 253
Red Cross sign .....	F 12 V 15 W	N 17 716 2
<b>If your car is equipped with Sealed Beam headlights, the deviations from the above chart are as follows:</b>		
Sealed Beam unit .....	6012 (US)	111 941 261 A
Front turn signal/parking light, rear turn signal and stop/tail light .....	SL 12 V 21/5 W	N 17 738 2
**) Optional extra for other models		

## Replacing fuses

The fuse box which has a transparent cover is located under the instrument panel on the left.

When a fuse blows it is not sufficient to merely replace it with 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 ampere fuses on the vehicle.



The back-up lights\*\*) have a separate 8 ampere fuse in a holder in the engine compartment above the generator.



## 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 regularly and given a certain amount of attention.

The battery is fitted in the engine compartment on the right-hand side. It should be taken out for checking and maintenance purposes. To take it out, remove the oil bath air cleaner first. Please note the instructions on page 45.

To check the acid level, remove the plugs. The acid should always be up to the mark. Some batteries have a small plastic cup in the filler hole and others have a bar across the top of the plates. If the level is too low it must be topped up with distilled water.

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.

### 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.



## Towing

A towing attachment is fitted at rear and front so that you can attach a towrope to your VW Transporter easily.

One stipulation is that the towing effort must not be excessive and that towing is done without jerking. When towing a vehicle on anything except hard roads there is always a risk of the frame being overloaded and damaged.

The driver of the towing vehicle must use his clutch very carefully when moving off and changing gear. The driver of the vehicle being towed must keep the towrope taut.

The towrope should be slightly elastic in order to reduce the snatching between towing and towed vehicle. Plastic towropes are good in this respect.



**Authorized VW workshops use a service system which was specially developed for the VW.**



Lots of workshops say they can repair Volkswagens and a lot of them really can.

But what they cannot offer you is — the VW Service System. You can only get this in an authorized VW workshop.

VW mechanics know exactly how to check the vehicles and when they find something wrong it is soon dealt with.

With special tools which every authorized VW workshop has and with special methods which the factory has developed.

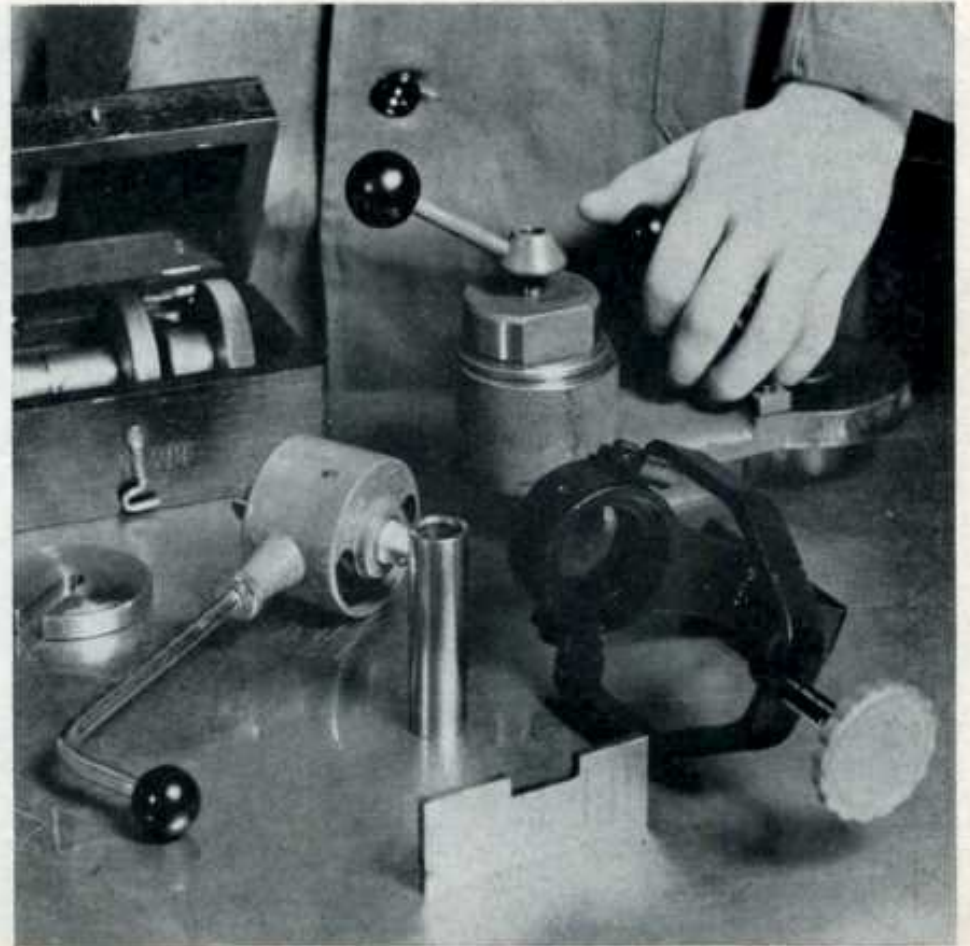


**In an authorized VW workshop you get quality at a reasonable price.**

All over the world 24 000 mechanics are trained in VW Service Schools every year — in small groups of 8—10 men at a time.

Their knowledge is continuously being brought right up to date. On these courses they learn to use all the special tools which only a VW workshop has and which play such an important part in making repairs satisfactory and quick.

Now you know why only an authorized VW workshop gives quality at reasonable prices.



## 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 oil 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 (5.3 US pints/4.4 Imp. 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  $-25^{\circ}\text{C}$  the oil should be changed every 1250 km (750 miles).

## Some more information about oil

Always use a good brand of gasoline engine HD oil for the engine of your Volkswagen. 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 quality which cannot be fulfilled by every well known and popular brand. We advise you to select "your" oil at the first oil change at 1000 km and use the same brand whenever possible, because, from the lubrication point of view this is an advantage. On other hand you need not fear that your engine will be damaged in any way if sometimes you cannot avoid using another brand of oil for an oil change or to top up the level.

The classification of oil into various viscosity grades is shown by the designations 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 $-15^{\circ}\text{C}$ ( $5^{\circ}\text{F}$ )
SAE 5 W*	In countries with arctic climates and temperatures below $-25^{\circ}\text{C}$ ( $-13^{\circ}\text{F}$ )

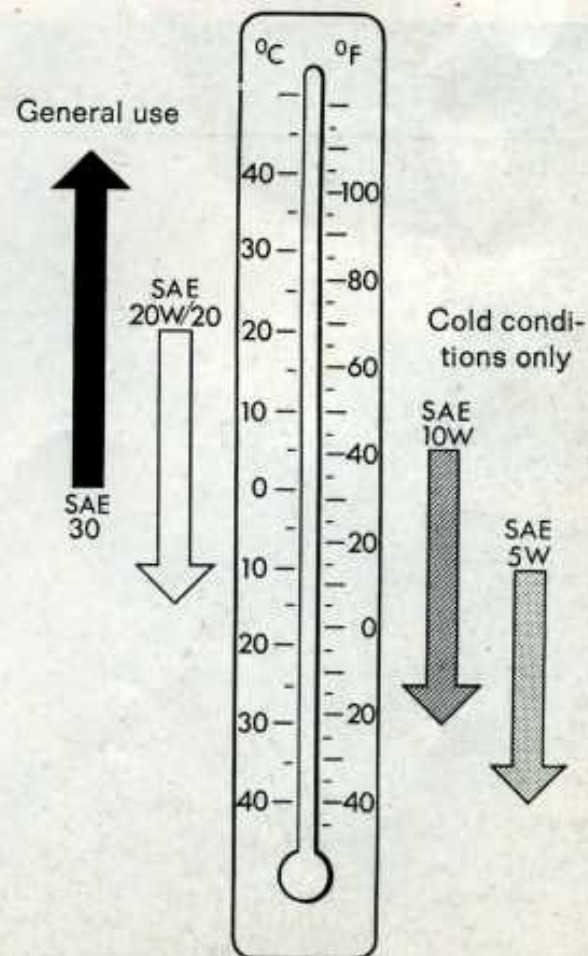
\* Avoid driving at high speeds for long periods if using SAE 10 W oil and the outside temperature is above  $0^{\circ}\text{C}$  or if using SAE 5 W oil when the temperature is above  $-15^{\circ}\text{C}$ .

All SAE grades cover a temperature range of about  $35^{\circ}\text{C}$  and the ranges of two neighbouring grades overlap by at least  $20^{\circ}\text{C}$ . 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

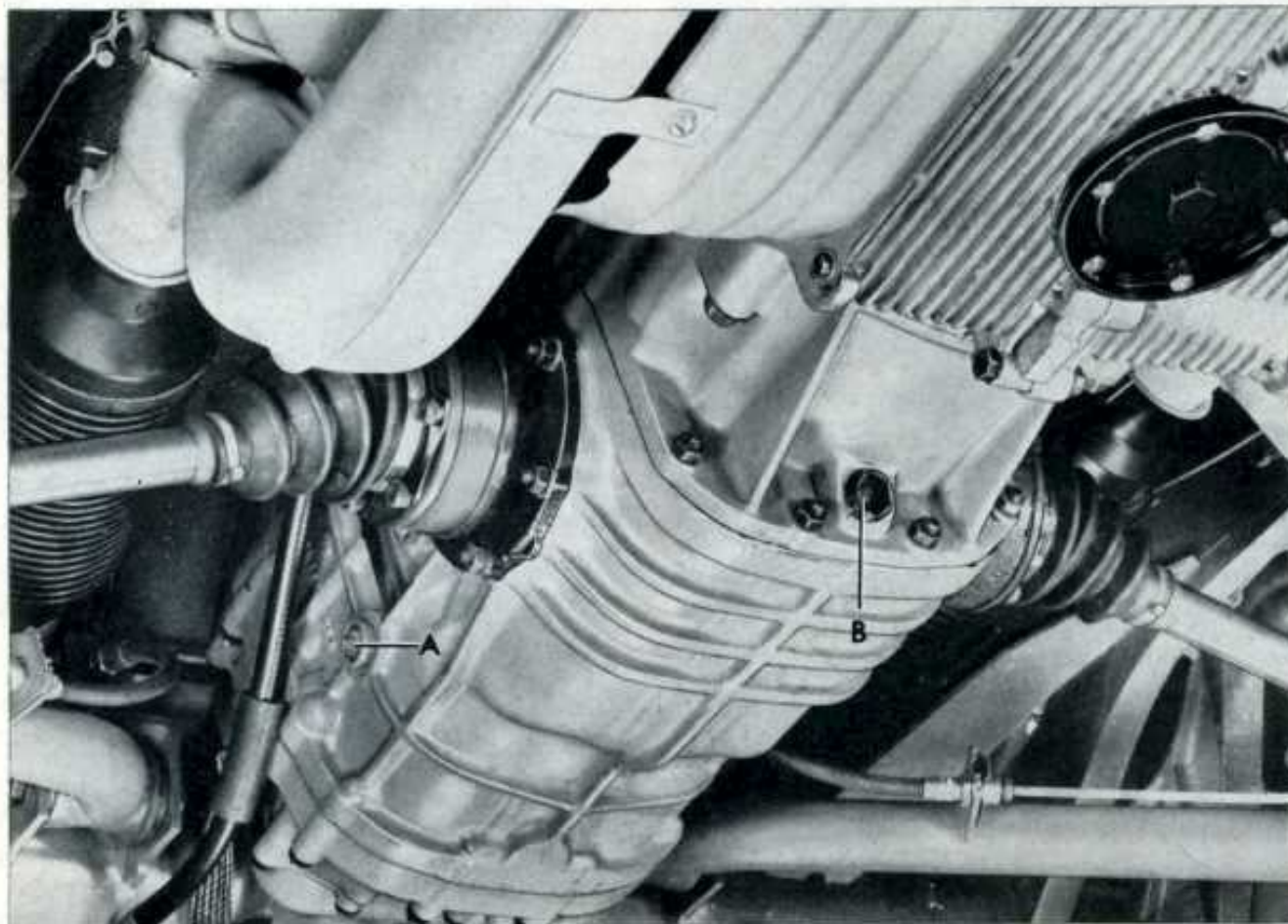


## Transmission

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 magnetic drain plug (B) should be removed

and the old oil drained off while it is still warm. Before the plug is put back it must be cleaned thoroughly. Then put in 3.5 liters of SAE 90 hypoid oil (to factory specifications). Only in countries with arctic climates should the thinner SAE 80 oil be used all the year.



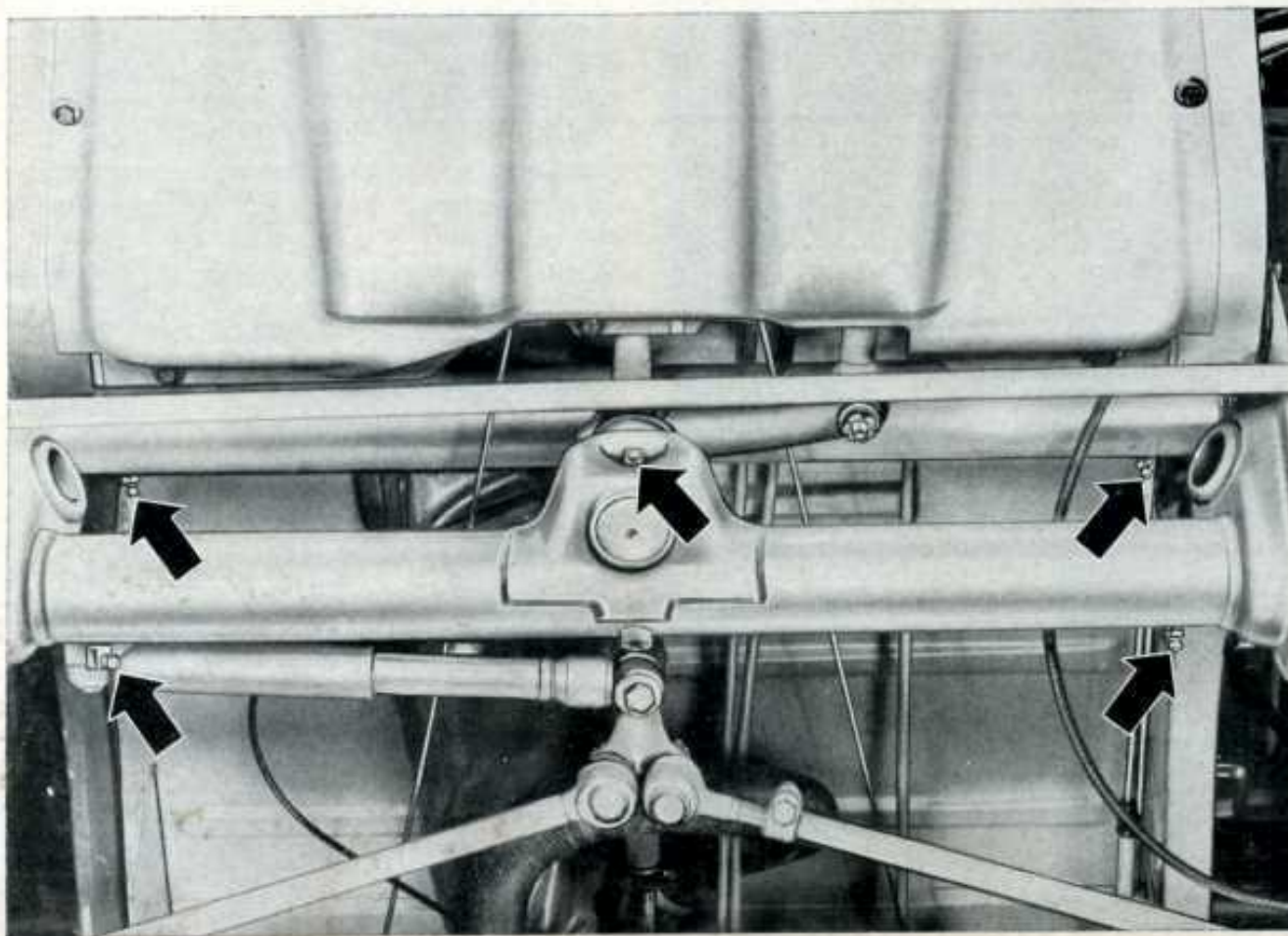
The oil sometimes runs into the transmission housing very slowly. If one attempts to put the oil in too quickly it may overflow and give the impression that the housing is already full although actually only about 1—1.5 liters have been put in. It is essential to the service life and silent running of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

The oil level should be checked every 10 000 km (6000 miles). At the same time the transmission should be checked for leaks.

**Additives should not be put into hypoid oil.**

## Front axle

The front axle can only be lubricated properly when the axle is free of load, that is with the front end lifted.



The four nipples on the axle tubes and the one on the swing lever shaft should be lubricated with a lithium-based multi-purpose grease. The nipples and the nozzle of the grease gun must be cleaned carefully before greasing commences. Place gun on nipples and inject grease until fresh grease starts to come out of the bearings.

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 10 000 km (6000 miles) in a year, have the front axle lubricated once a year.

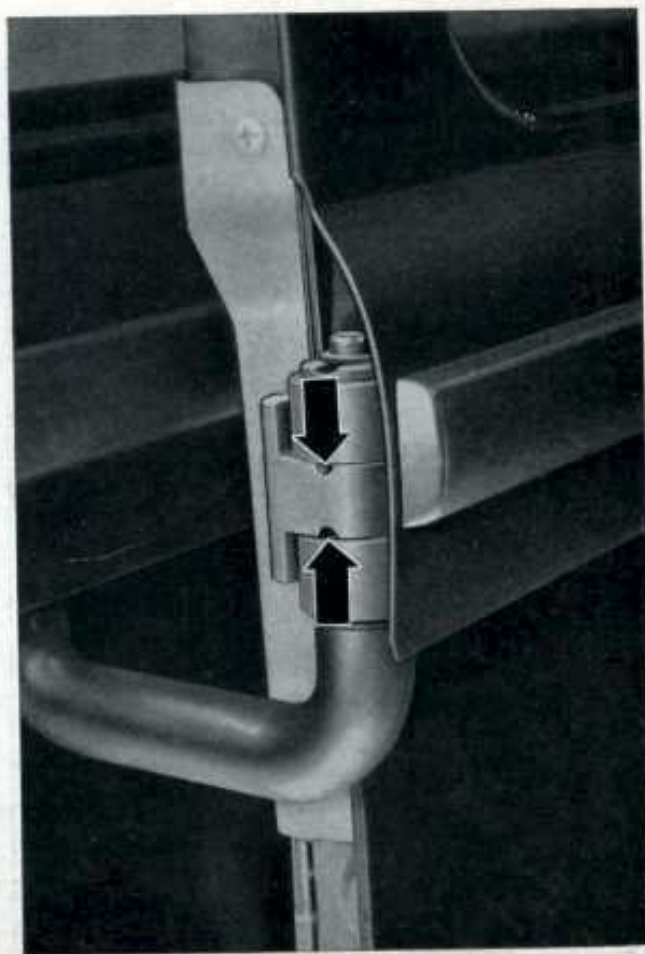
## Doors and hoods

Above the hinge pins in the cab door hinges are small oil chambers which are sealed with plastic plugs. At least every 3 months the oil level should be checked after levering out the plugs with a small screwdriver. The chamber should then be filled with SAE 30 engine oil.



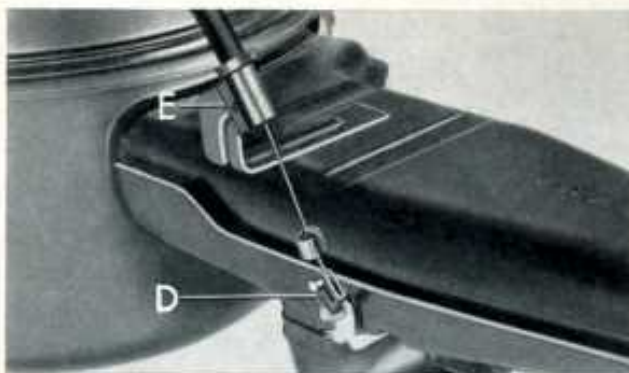
Any oil which overflows should be caught with a cloth, the plug pressed back in again and the hinge wiped carefully.

At the same intervals, the joint of the sliding door hinge — arrow —, the pivot points of the rear flap hinges and the hinges and lock of the



engine compartment lid should be lubricated with a few drops of oil. The door lock striker plates and the support springs of the engine compartment lid should be lubricated with petroleum jelly as and when necessary. Excess lubricant should be wiped off at all these points.

The lock cylinders should be treated with graphite by dipping the key in the graphite powder and turning it to and fro in the lock.



## 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:

Loosen clip — A — on intake elbow and take elbow off.

Pull crankcase ventilation hose — B — off.

Loosen clip — C — on hose for preheated intake air and pull hose off.

Remove retaining clip — D — for warm air control flap cable and unhook cable eye.

Loosen screw — E — on outer cable retainer and pull outer cable out.

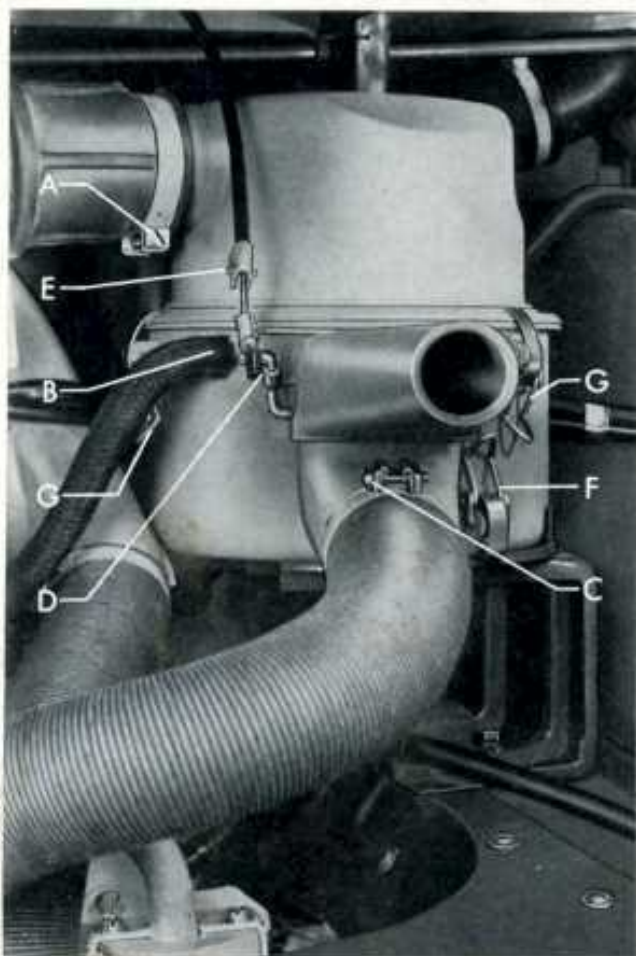
Release clips — F — securing cleaner to bracket and take cleaner off.

Loosen the three upper clips — G —, take cleaner upper part off and put it down with the filter element downwards.

Clean bottom part carefully and fill to the mark with fresh engine oil (approx. 0.45 liter). Use SAE 30 all the year except in countries with arctic climates where SAE 10 W oil should be used.

The top part does not normally need cleaning. 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, the encrusted dirt should be scraped off with a piece of wood.

After assembling the cleaner, secure it to the bracket in the engine compartment with the two clips. Before connecting the cable for the warm air control flap, check that the flap moves freely. Then push the outer cable into retainer as far as it will go and insert screw — E. Then hook cable eye into the flap lever and secure with clip — D. Tighten intake elbow clip carefully.



# Technical Data

## Engine

Four cylinder, four stroke, horizontally opposed in rear  
Air cooling by fan, thermostat controlled  
Pressure oil feed with gear-type pump  
Oil cooler  
Mechanical fuel pump  
Downdraft carburetor with automatic choke and accelerator pump  
Oil bath air cleaner with thermostatically controlled pre-heating connection

Bore .....	85.5 mm (3.36 in.)
Stroke .....	69 mm (2.72 in.)
Capacity .....	1584 cc (96.6 cu. in.)
Compression ratio .....	7.5 : 1
Maximum output DIN .....	47 bhp at 4000 rpm
SAE .....	57 bhp at 4400 rpm
Maximum torque DIN .....	10.6 mkg at 2200 rpm
SAE .....	81.7 ft. lb. at 3000 rpm
Valve clearance with engine cold .....	0.10 mm (.004 in.)
Fuel consumption <sup>1)</sup> .....	approx. 10.4 liters per 100 km 22.6 miles per US gallon 29 miles per Imp. gallon
Fuel rating .....	91 Octane (Res. F 1)
Oil consumption .....	0.5—1.4 per 1000 km 1.7—4.8 US pints per 1000 miles 1.4—4.0 Imp. pints per 1000 miles

<sup>1)</sup> Measured consumption plus 10 %, with half load at a steady  $\frac{3}{4}$  of maximum speed on level road.

## Power transmission

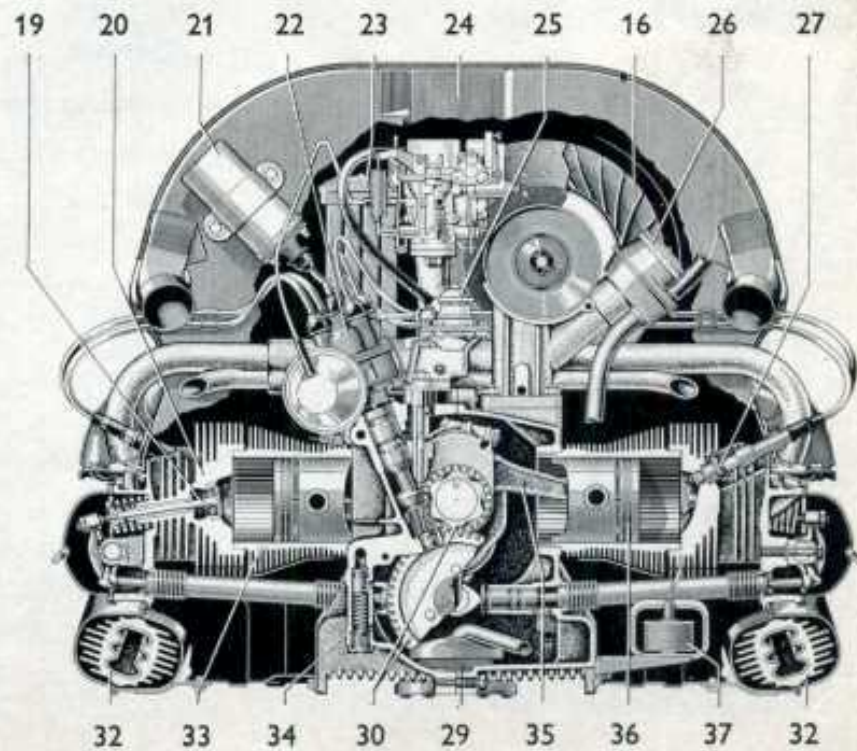
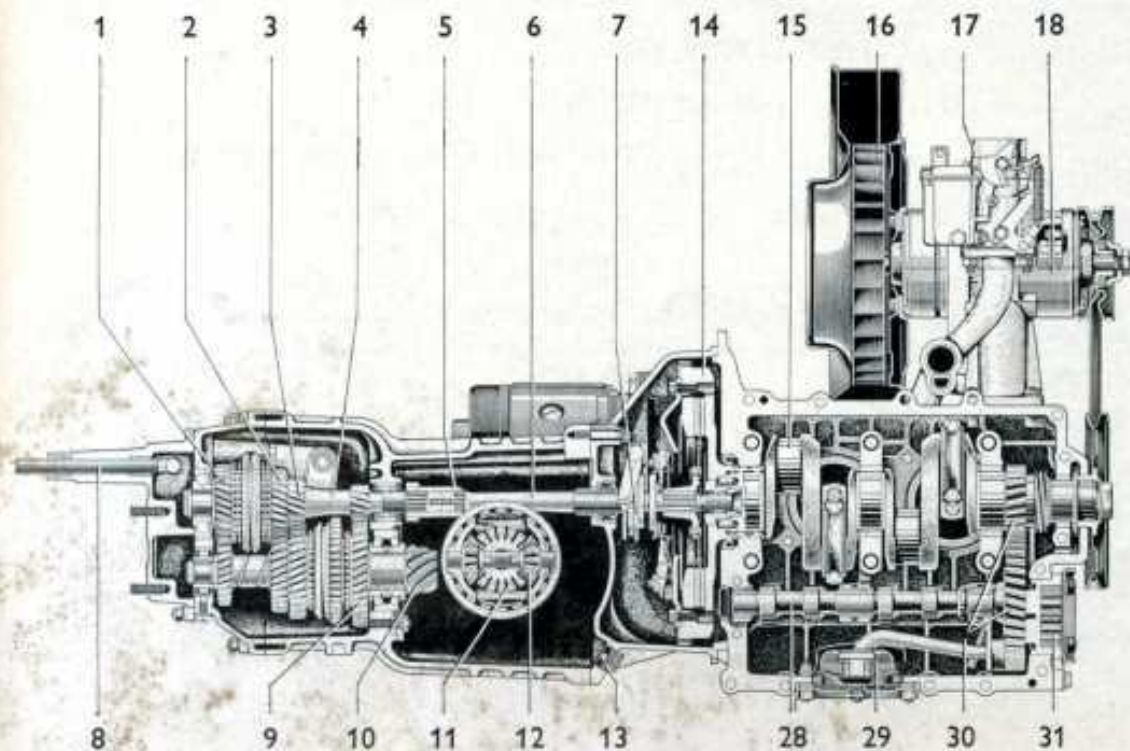
Clutch pedal free play: 10—20— mm (.4—8 in.) • Single plate, dry clutch • Baulk synchronized four-speed gearbox and bevel gear differential in one housing • Double-joint rear axle • Gear ratios: 1st gear 3.80:1, 2nd gear 2.06:1, 3rd gear 1.26:1, 4th gear 0.82:1, reverse gear 3.61:1 • Final drive ratio: 5.375:1 •



- 1 - 4th gear
- 2 - 3rd gear
- 3 - 2nd gear
- 4 - Drive shaft, front
- 5 - Reverse gear
- 6 - Drive shaft, rear
- 7 - Clutch release bearing
- 8 - Transmission shift lever
- 9 - 1st gear
- 10 - Drive pinion
- 11 - Differential side gear
- 12 - Differential pinion
- 13 - Oil drain plug

- 14 - Flywheel
- 15 - Crankshaft
- 16 - Fan
- 17 - Carburetor
- 18 - Generator
- 19 - Valve
- 20 - Cylinder head
- 21 - Ignition coil
- 22 - Distributor
- 23 - Oil cooler
- 24 - Fan housing
- 25 - Fuel pump
- 26 - Oil filler and breather

- 27 - Spark plug
- 28 - Camshaft
- 29 - Oil strainer
- 30 - Camshaft drive gear
- 31 - Oil pump
- 32 - Heat exchanger
- 33 - Cylinder
- 34 - Oil pressure relief valve
- 35 - Connecting rod
- 36 - Piston
- 37 - Thermostat



## Chassis

Unitary body, frame plates reinforced with side and cross members, front axle bolted to frame side members, engine/transmission assembly fitted on three bonded rubber mountings.

Independent suspension: twin, cranked trailing arms with ball joints at front, double-joint axle with three-point trailing links at rear, torsion bar springing. Telescopic shock absorbers, stabilizer at front.

Ross type steering gear with maintenance-free tie-rods and hydraulic steering damper.

Hydraulic dual circuit four-wheel foot brakes, mechanical hand brake effective on rear wheels.

Wheelbase .....	2400 mm (94.5 in.)
Turning circle diameter .....	approx. 12.3 m (40 ft.)
Track at front .....	1385 mm (54.5 in.)
Toe-out .....	0—2 mm (.0—08 in.) with wheels pressed together at rear
Camber .....	0° 40' ± 15'
Track at rear .....	1426 mm (56.1 in.)
Wheels .....	5 JK x 14 (Wheel discs with drop center rims)

	Ambulance	Micro Bus L	Micro Bus	all other Models
Tires .....	185 R 14 with tube		7.00—14 6 PR tubeless	7.00—14 8 PR
Tire pressures:				
front .....	28 psi (2.0 kg/cm <sup>2</sup> )	28 psi	28 psi	
rear: up to 3/4 payload .....	28 psi	28 psi	35 psi (2.5 kg/cm <sup>2</sup> )	
with full load .....	28 psi	35 psi	41 psi (2.9 kg/cm <sup>2</sup> )	
spare wheel .....	28 psi	35 psi	41 psi	

For prolonged high-speed driving, increase the pressures by 3 psi (0.2 kg/cm<sup>2</sup>).

Dimensions and weights	Micro Bus L	Micro Bus	Kombi	Delivery Van	High-roofed Delivery Van	Pick-up	
						without cover	with cover
Length .....	4445 (175.0)	4420 (174.0)	4420 (174.0)	4420 (174.0)	4420 (174.0)	4420 (174.0)	4420 (174.0)
Width .....	1815 (71.5)	1765 (69.5)	1765 (69.5)	1765 (69.5)	1765 (69.5)	1765 (69.5)	1765 (69.5)
Height, unladen .....	1940 (76.4)	1940 (76.4)	1950 (76.8)	1955 (77.0)	2290 (90.2)	1955 (77.0)	2245 (88.4)
Ground clearance .....	185 (7.25)	185 (7.25)	185 (7.25)	185 (7.25)	185 (7.25)	185 (7.25)	185 (7.25)
Unladen weight .....	1260 <sup>1)</sup> (2777)	1235 <sup>1)</sup> (2722)	1265 <sup>2)</sup> (2788)	1175 <sup>3)</sup> (2590)	1250 <sup>3)</sup> (2755)	1175 <sup>3)</sup> (2590)	1210 <sup>3)</sup> (2666)
Payload .....	865 (1906)	890 (1962)	910 (2006)	1000 (2204)	925 (2039)	1000 (2204)	965 (2127)
Gross vehicle weight .....	2125 (4684)	2125 (4684)	2175 (4794)	2175 (4794)	2175 (4794)	2175 (4794)	2175 (4794)
Permissible front axle load .....	975 (2149)	975 (2149)	975 (2149)	975 (2149)	975 (2149)	975 (2149)	975 (2149)
Permissible rear axle load .....	1150 (2534)	1150 (2534)	1200 (2645)	1200 (2645)	1200 (2645)	1200 (2645)	1200 (2645)
Permissible trailer weights <sup>4)</sup> :							
with brakes .....	800 (1760)	800 (1760)	800 (1760)	800 (1760)	800 (1760)	800 (1760)	800 (1760)
without brakes .....	500 (1100)	500 (1100)	500 (1100)	500 (1100)	500 (1100)	500 (1100)	500 (1100)
Permissible load on roof <sup>5)</sup> .....	100 (220)	100 (220)	100 (220)	100 (220)	—	—	—

	Double Cab Pick-up		Pick-up with large platform	Fire Truck	Ambulance	
	without cover	with cover				
Length .....	4420 (174.0)	4420 (174.0)	4470 (176.0)	4420 (174.0)	4420 (174.0)	1) without driver
Width .....	1765 (69.5)	1765 (69.5)	1980 (78.0)	1765 (69.5)	1765 (69.5)	2) with driver and seats
Height, unladen .....	1950 (76.8)	2220 (87.4)	1955 (77.0)	2185 <sup>4)</sup> (86.0)	2175 <sup>4)</sup> (85.6)	3) with driver
Ground clearance .....	185 (7.25)	185 (7.25)	185 (7.25)	185 (7.25)	185 (7.25)	4) Subject to local regulations which may differ
Unladen weight .....	1225 <sup>3)</sup> (2699)	1250 <sup>3)</sup> (2755)	1255 <sup>3)</sup> (2766)	1340 <sup>3)</sup> (2954)	1350 <sup>1)</sup> (2973)	5) Use only roof racks supported in rain channel and distribute load uniformly
Payload .....	950 <sup>7)</sup> (2094)	925 <sup>7)</sup> (2039)	920 (2028)	935 (2124)	—	6) With emergency light
Gross vehicle weight .....	2175 (4794)	2175 (4794)	2175 (4794)	2275 (5015)	1900 (4188)	7) When carrying passengers, reduce load accordingly and distribute it in cab and on platform so that permissible axle load is not exceeded
Permissible front axle load .....	975 (2149)	975 (2149)	975 (2149)	995 (2193)	950 (2094)	
Permissible rear axle load .....	1200 (2645)	1200 (2645)	1200 (2645)	1280 (2821)	1000 (2204)	
Permissible trailer weights <sup>4)</sup> :						
with brakes .....	800 (1760)	800 (1760)	800 (1760)	800 (1760)	800 (1760)	
without brakes .....	500 (1100)	500 (1100)	800 (1760)	500 (1100)	500 (1100)	
Permissible load on roof <sup>5)</sup> .....	75 (165)	75 (165)	—	—	—	

## Capacities

Fuel tank .....	60 liters (16 US gallons; 13 Imp. gallons)
Engine .....	2.5 liters (5.3 US pints; 4.4 Imp. pints)
Gearbox and differential .....	3.5 liters (7.4 US pints; 6.1 Imp. pints)
Brake system .....	0.30 liter (.6 US pint; .5 Imp. pint)
Oil bath air cleaner .....	0.45 liter (1.0 US pint; .8 Imp. pint)
Windshield washer .....	1.5 liter (3 US pints; 2.4 Imp. pints)

## Performance

Maximum and cruising speed .....	105 kph (65 mph)
Pick-up with cover, Pick-up with large platform ..	95 kph (60 mph)
Climbing ability with full load on good roads ..	1st gear 27 %                      3rd gear 7 %
	2nd gear 14 %                      4th gear 4 %

## Electrical system

Voltage .....	12 volts
Battery .....	45 Ah
Starter .....	0.7 hp
DC Generator with regulator .....	max. 38 Ampere, early cut-in
V belt size .....	9.5×900
Ignition distributor .....	with vacuum spark advance
Firing order .....	1 — 4 — 3 — 2
Basic ignition timing .....	TDC (Rotor arm pointing to No. 1 cylinder mark on edge of distributor housing and left mark on crankshaft pulley in line with crankcase joint.)
Contact breaker gap .....	0.4 mm (.016 in.)
Spark plugs .....	Bosch W 145 T 1                      } or plugs with similar values Beru 145/14                              } from other manufacturers.
Plug thread .....	14 mm
Plug gap .....	0.7 mm (.028 in.) or, in very cold conditions 0.5 mm (.020 in.)

## In the vehicle documents ...

are, amongst other things, the model designation and the chassis and engine numbers. Vehicle licensing authorities and customs officials on borders often check that these figures agree with those on the vehicle.

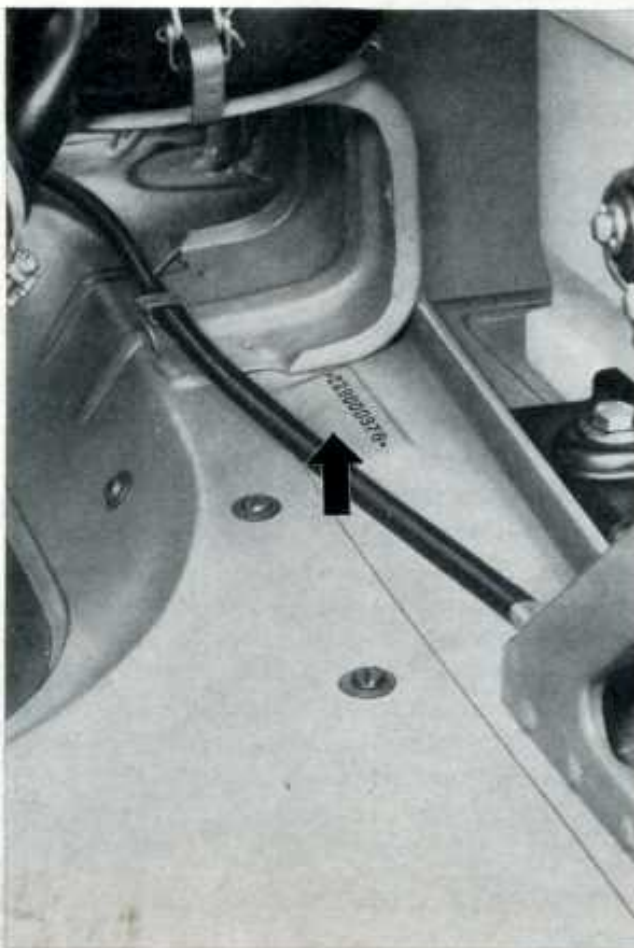
### The Identification Plate

is on the right-hand side of the cab rear panel.



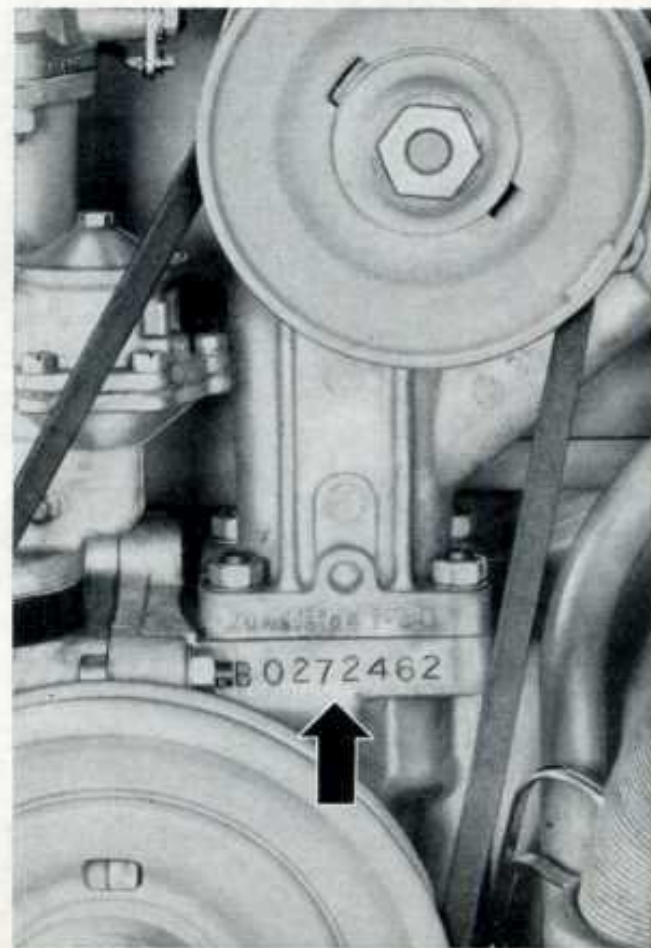
### The Chassis Number

is stamped in the right-hand side of the engine cover plate.



### The Engine Number

is on the generator support flange.



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**In an authorized VW workshop you can get genuine VW replacement parts, VW exchange parts and genuine VW accessories. With a warranty.**



Genuine VW replacement parts are the proper parts for your Volkswagen. And the same applies to exchange parts.

What is the difference? The price. VW exchange parts are up to 50% cheaper because we take the old part back for reconditioning.

All genuine VW accessories have been tested for use on the Volkswagen. And they all carry the same warranty as the parts on a new vehicle: up to 10 000 km running or 6 months.



**You can only get VW service in an authorized  
VW workshop. All over the world.**

Two things are famous about the Volkswagen in the whole world:  
The vehicle itself and the Volkswagen service.

You can get both in your country wherever the VW sign shows  
that an authorized workshop is waiting to help you.

The VW service knows no boundaries.

Is your Volkswagen a globetrotter? All over the world there are  
8288 VW agents — isn't that a comforting thought?



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