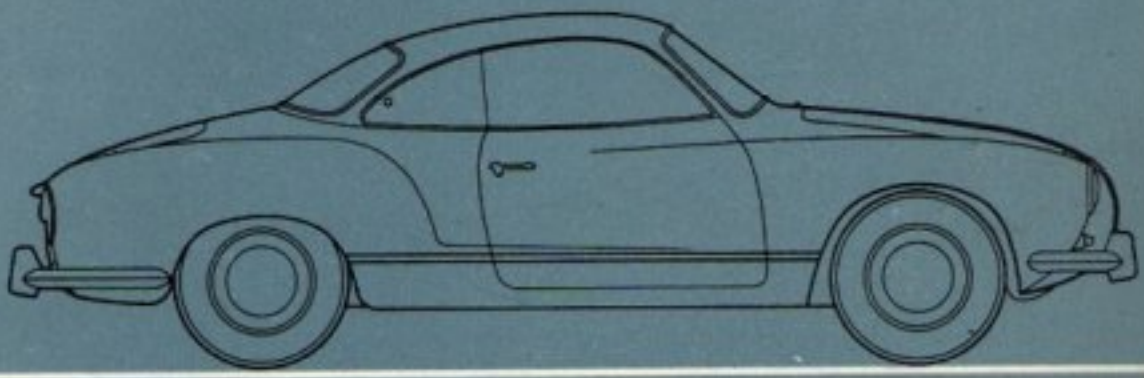
Instruction Manual



KARMANN Ghia

August 1961 Edition

KARMANN Ghia

INSTRUCTION MANUAL

CONTENTS

This manual sets out in full the information necessary for the proper operation, care and general maintenance of your car. In addition, interesting specifications have been included to familiarize you with the construction and mechanical details of this fine piece of mechanism.

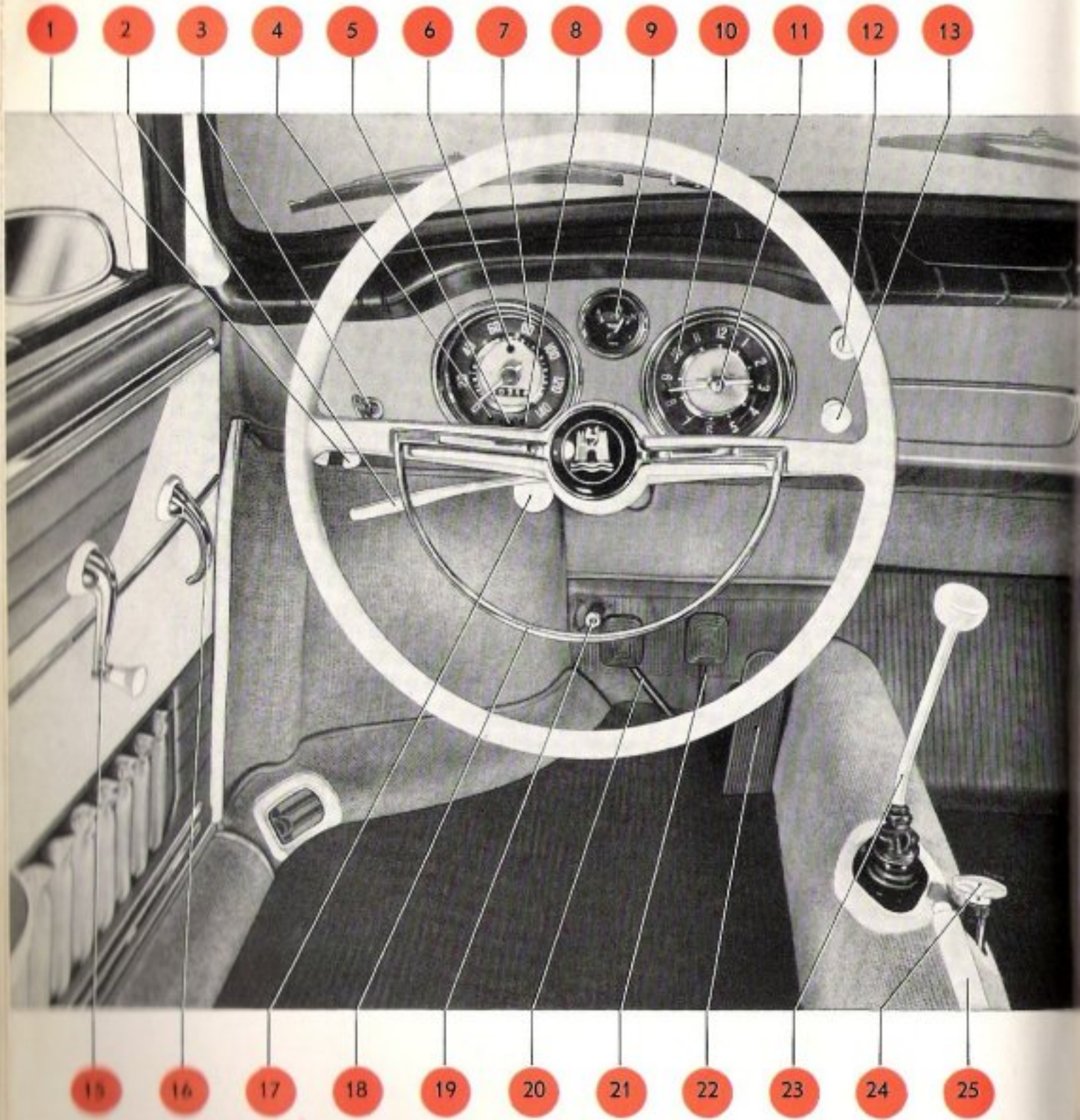
No effort has been spared to produce an efficient and reliable automobile. This Instruction Manual can help you obtain long-time satisfaction in the operation of your car. All information contained in this handbook is based on the actual experience of many years.

In order to maintain maximum efficiency, we particularly stress the importance of following the recommendations set out in this manual. The intimate knowledge obtained by studying this manual will assure you of the utmost service and satisfaction from your car.

Regular attention to proper lubrication and maintenance of your car is important. An extensive network of VW Dealers exists throughout the world, and you will readily recognize such stations by the familiar blue VW SERVICE sign. These Dealers are in constant contact with the Volkswagenwerk through our field engineers, thus providing skillful and speedy execution of any job to be done. You'll enjoy many more miles of trouble-free driving by giving your car just ordinary care.

All experienced car owners know the value of preventive maintenance. The efforts in regard to care and maintenance will be amply rewarded in the long run.

V O L K S W A G E N W E R K A G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CONTROLS AND INSTRUMENTS

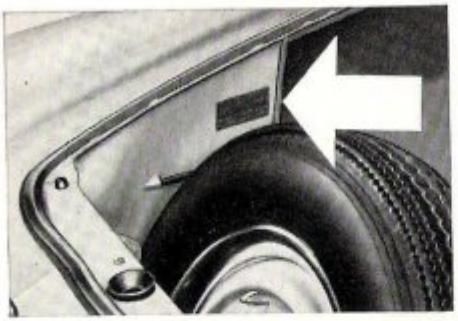
The first thing you must do is become familiar with the controls and instruments of your new car. Sit behind the wheel, make yourself comfortable, and get acquainted with all the various levers, switches, and controls. Some of the features you may already know. Check your present knowledge against this complete list.

Instruments:

Foot controls:

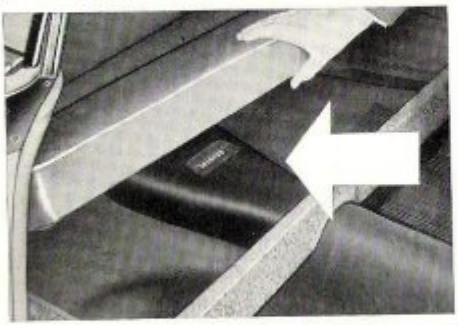
Hand controls:

Among the papers which accompany your car you will find details regarding the model, year of construction, and chassis and engine numbers. The Police or Traffic Department will check if the information given in the documents is identical with that on your car.



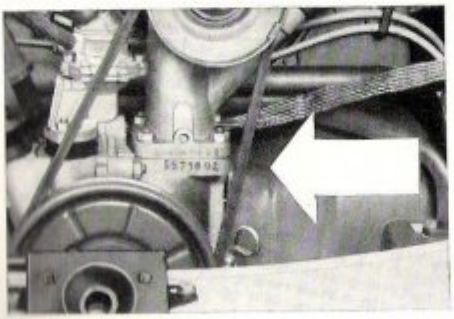
The Identification Plate

is found to the right of the spare wheel underneath the front hood.



The Chassis Number

is stamped on the frame tunnel underneath the emergency seats.



The Engine Number

is on the crankcase flange for the generator support.

The Vehicle Keys

You will receive a key for the door lock and one for the gearshift-ignition lock. On vehicles without the gearshift-ignition lock only one key is required to open the door and operate the starter. It is advisable to make a note of the key numbers and keep it with the vehicle documents. If a key is lost, you can then quote the number when ordering a replacement from your VW Dealer.

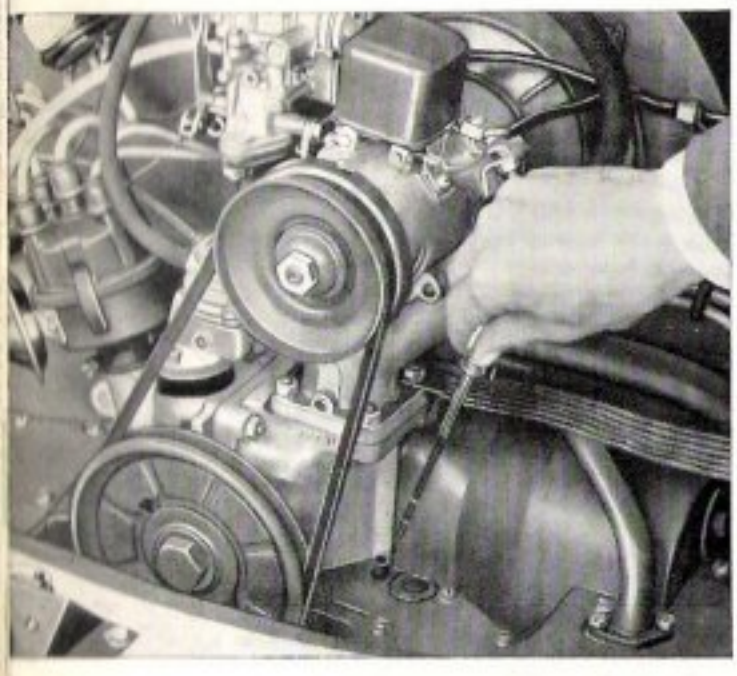
OPERATING INSTRUCTIONS

Before you drive away please check

- **engine oil level**
- **fan belt tension**
- **quantity of fuel in the tank**
- **tire pressures**
- **efficiency of brakes**
- **adjustment of rear view mirrors**

and, if driving at night or in fog

- **the exterior lights**



Engine Oil Level

The oil level should be checked with the engine at rest. The oil level is satisfactory when it is between the two marks on the oil level dipstick, but **it should never be permitted to drop below the lower mark.** To make an accurate check, it is best to wipe the dipstick first with a clean rag. Should it become necessary to add oil please remember the following hints: Most oils marketed at present contain chemical ingredients to improve their lubricating qualities. However, oils of different origin behave differently when used as engine lubricants and should, therefore, not be mixed.

Select an HD oil of a well known and dependable brand right at the beginning, and keep to it.

Further hints as regards engine oil changes are given under the headings "Lubrication" and "Cold Weather Hints" on pages 30 and 33 to 37.

Fan Belt

The V-belt drives the generator and the fan. **Perfect condition and correct tension ensure long belt life and adequate cooling of the engine.** If you find any sign of excessive wear, such as frayed edges, see your VW Dealer. Although the fan belt normally has a long service life, there should always be a spare belt in the car.

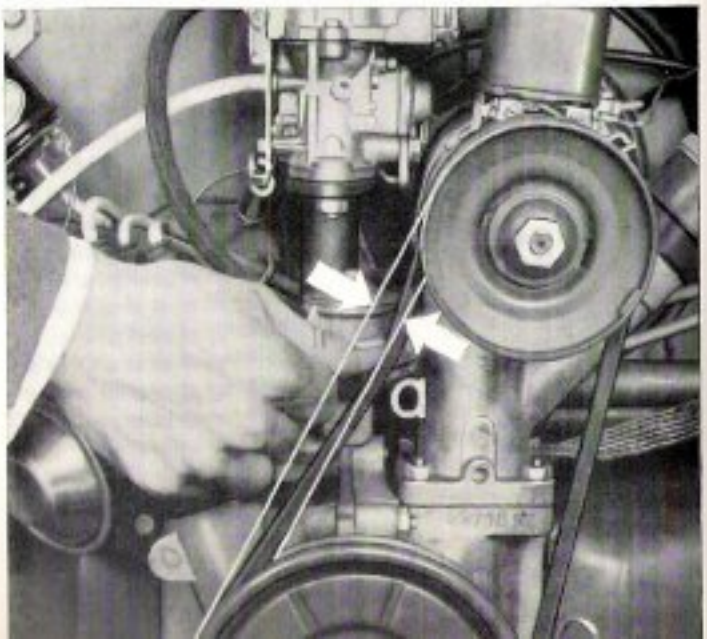
Checking is very simple:

The belt, when firmly pressed inward must yield the amount shown under "a".

a = 1.5 cm. (.6")

The adjustment or replacement of the fan belt is described on page 50.

a = 1,5 cm

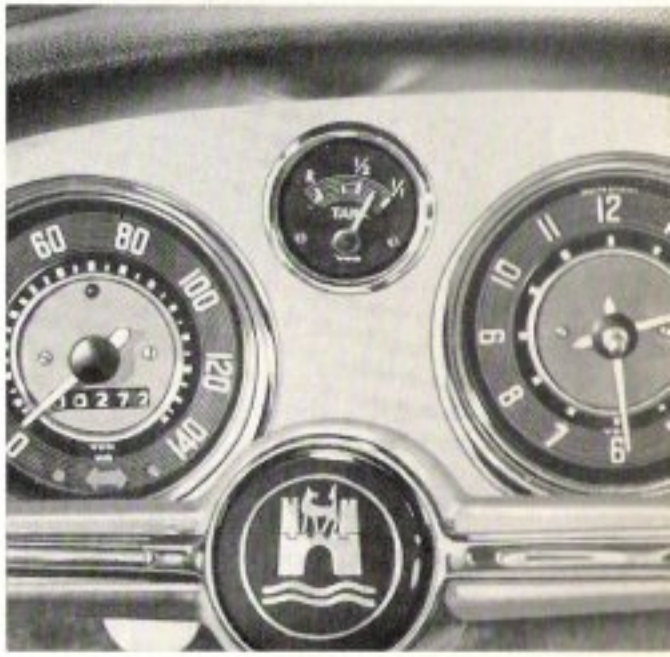


The Fuel Tank

has a capacity of 40 liters (10.6 U.S., 8.8 Imp. gallons) which is sufficient for over 500 kilometers (300 miles). The fuel gauge on the instrument panel shows the actual amount of fuel in the tank. When the needle is on "R" (Reserve) it is time to refuel at the next opportunity. The 5 liters remaining in the tank will last for about 60 kilometers (37 miles).

The choice of fuel type and brand is left entirely to you. The VW engine is so designed that it will run satisfactorily on all normal reputable fuels. All good brands, including gasoline-benzol mixtures, are distinguished by their consistent composition adequate anti-knock properties and freedom from harmful ingredients.

The fuel tank filler is under the front hood which is opened by means of the knob on the left below the instrument panel.



The Tires

deserve and require your special attention. Special mention has been made of the wheels and tires on pages 41 and 42. The riding comfort and the roadholding of your car will greatly depend on their condition.

Maintaining correct tire pressure and driving properly are the most important factors in obtaining maximum tire life. Check at least once a week, using a reliable tire gauge, that the tires are correctly inflated.

Pressures:

High speed driving conditions on long trips:

front ..... 1.2 kg./sq. cm. (17 lbs./sq. in.),

rear ..... 1.6 kg./sq. cm. (23 lbs./sq. in.).

When the car carries 1 or 2 persons:

front ..... 1.1 kg./sq. cm. (16 lbs./sq. in.),

rear ..... 1.4 kg./sq. cm. (20 lbs./sq. in.).

With the car fully loaded:

front ..... 1.2 kg./sq. cm. (17 lbs./sq. in.),

rear ..... 1.6 kg./sq. cm. (23 lbs./sq. in.).

The Brakes

should be checked before the car starts on a trip by depressing the brake pedal, while the car is in motion, to be sure they are in good working order.

"Apply the brakes gently" is a heading on page 14. Here you can read how to apply the brakes in various circumstances.

Good Exterior Lights

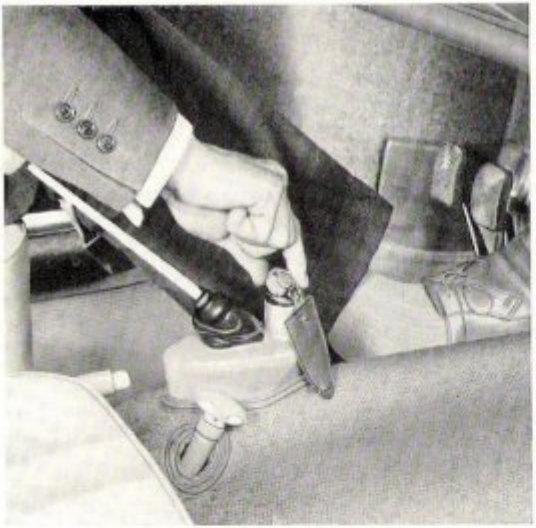
are the first requirement of safe car operation at night. The three positions of the lighting switch are as follows:

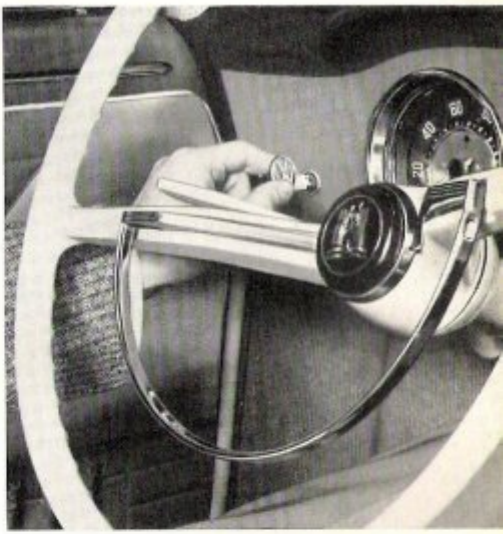
1 - Fully pushed in — Off

2 - Pulled out to first stop — Parking light, tail and license plate lights

3 - Fully pulled out — Headlight high or low beams (depending on position of foot dimmer switch), tail and license plate lights.

When pulling out the lighting switch knob either to the first or second stop, the instrument light is automatically turned on. By turning the knob, a variable degree of instrument lighting is obtained, turning the knob to the extreme left turns out the light entirely. When checking the lighting system, do not forget the two stop lights which should light up when depressing the brake pedal with the ignition turned on.





Starting the Engine

The ignition and starter are switched on, one after the other, by means of the combined starter-ignition switch. As starter operation stresses the battery heavily, other big current users, such as the headlights, windshield wiper and radio, should not be switched on when starting. Make sure, also, that the gear shift lever is in neutral.

First switch on the ignition by turning the key to the right until the red and green warning lights in the speedometer come on. Then operate the starter without delay by turning the key further to the right.

At temperatures above freezing point or when the engine is still warm, depress the accelerator pedal slightly while operating the starter.
Only when the engine is very warm should the accelerator pedal be fully depressed.

At temperatures below freezing point and when the engine is cold, depress the accelerator pedal fully and then release it before switching on the ignition. This enables the automatic choke device to close the choke valve. As the engine and transmission oils tend to become thick when cold, you should also declutch when starting so that the starter motor only has to turn the engine.

As soon as the engine starts, release the ignition key so that the starter is switched off. You can then drive off straight away as the choke valve opens automatically as the engine warms up and regulates the idling speed to suit the engine temperature. Do not race the engine when it is completely cold. If the engine does not start within the first 10 seconds, pause for about the same length of time to rest the battery before repeating the starter operation. The ignition will have to be switched off first and then on again as a non-repeat lock in the switch prevents the starter from being operated repeatedly when the ignition is on and thus being damaged by the engine when it is running. The starting procedure should not be interrupted if the engine is heard to fire a few times without starting.

Caution

Be careful when starting the engine in the garage. Keep the doors and windows open so that the exhaust fumes, which contain the invisible but very dangerous carbon monoxide gas, can escape.

Driving Off

is extremely easy, if you observe the following:

1 - **Press down the clutch pedal as far as possible. Keep it in that position.**

2 - **Shift to the first gear. Release the hand brake.**

3 - **Engage the clutch by allowing the pedal to return slowly, while simultaneously pressing down the accelerator pedal. The car will start to move ahead.**

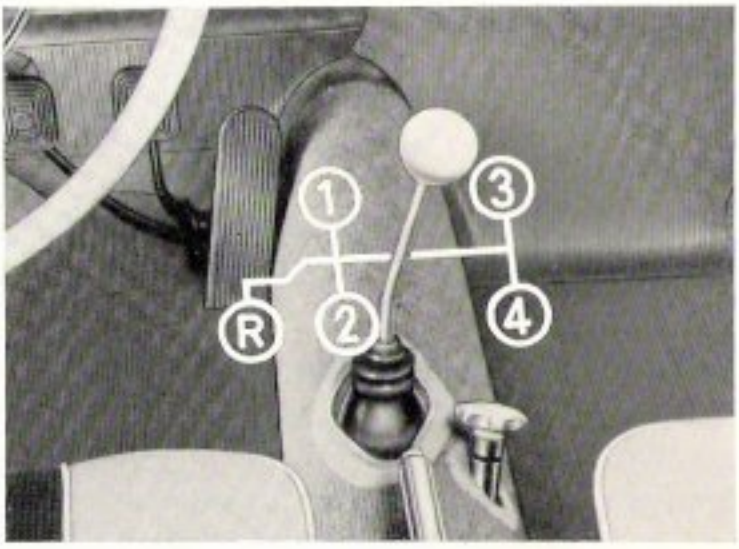
4 - **Gradually increase the pressure on the accelerator pedal and remove your foot from the clutch pedal, as the clutch is now fully engaged.**

Shifting to second gear is equally simple:

1 - **Take your foot off the accelerator pedal, while simultaneously pressing down the clutch pedal.**

2 - **Shift gear lever into second position.**

3 - **Engage the clutch by allowing the pedal to return slowly and again step on the accelerator pedal.**



You now know how to "shift gears", and may at will shift to third and fourth positions. You will have noticed by now that the accelerator and clutch pedals are operated simultaneously, but in opposite directions. It is the coordination of these simultaneous operations that brings skill in shifting gears.

The reverse gear

has a locking device to prevent unintentional shifting. Therefore, first press the gear lever down, move it to the left and pull it back. Never move lever into this position unless the car is at a standstill.

Shifting to a Lower Gear

This is what you should do in close city traffic, or with sharp turns ahead of you, or when driving uphill:

1 - Release accelerator pedal and depress clutch pedal.

2 - Shift to the next lower gear.

3 - Release clutch pedal and press down accelerator pedal simultaneously.

Of course, this takes less time to do than it does to describe. We do not want to bore you with a technical discourse, but it may be of interest to you to know that, when changing down, the synchromesh device assures meshing of the gears without clash, as the lower gear is synchronized so that both gears are turning at the same speed. Under no circumstances should you be afraid to shift to a lower gear, or try to avoid shifting occasionally by merely letting the clutch "slip" in a partly disengaged position.

When shifting gears, it is absolutely necessary to fully depress the clutch pedal. Incomplete declutching makes gear shifting difficult and leads to rapid wear of the synchronizer stop rings.

In order to save transmission and engine from damage shift down from

4th to 3rd between 75 — 40 k. p. h. (45 and 25 m. p. h.)
3rd to 2nd between 50 — 25 k. p. h. (30 and 15 m. p. h.)

The 1st gear is only used for moving off, driving at very slow speeds and climbing very steep hills.

Do not use the clutch pedal as a foot-rest while driving your car.

Apply the brakes gently

The brake responds even to the slightest foot pressure. Increasing pressure will slow the car down progressively. However, avoid blocking the wheels. Blocked wheels will not shorten the braking distance but may cause you to lose control over the movement of the vehicle and will affect the tires adversely.

Here are a few rules on correct braking:

Use your brakes before, not while making a turn.

It is neither good practice nor is it economical to shift to a lower gear far ahead of a turn. Do not hesitate to use the brakes and to shift only shortly before entering the curve so that you may already accelerate again while still negotiating it.

To jam on the brakes suddenly can only be justified when danger is ahead. Nevertheless, it is necessary to check full braking capacity at certain intervals so that you will be familiar with the behaviour of the car and with the actual braking distance should sudden braking become necessary. Before carrying out the test, look into the rear view mirror to make sure that you will not endanger any vehicle that might be following you.

Operate the brakes especially gently when the road is wet or covered with ice as locked wheels will cause the ear to skid.

When driving downhill, make use of the braking capacity of the engine compression by shifting to that gear which you would use in driving uphill.

You will save and preserve the brakes if you use them only to control the speed occasionally, and at the same time you will attain a higher degree of safety. The ignition must never be switched off when descending grades.

Stopping the Car

Take your foot off the accelerator pedal and operate the brakes gently. Shortly before the car comes to a full stop, depress the clutch pedal, place the gearshift lever in neutral position and release clutch pedal again.

If you wish to stop the engine, just turn the ignition key to the left. On vehicles with the gearshift-ignition lock this automatically locks the gearshift lever.

The Front Seats

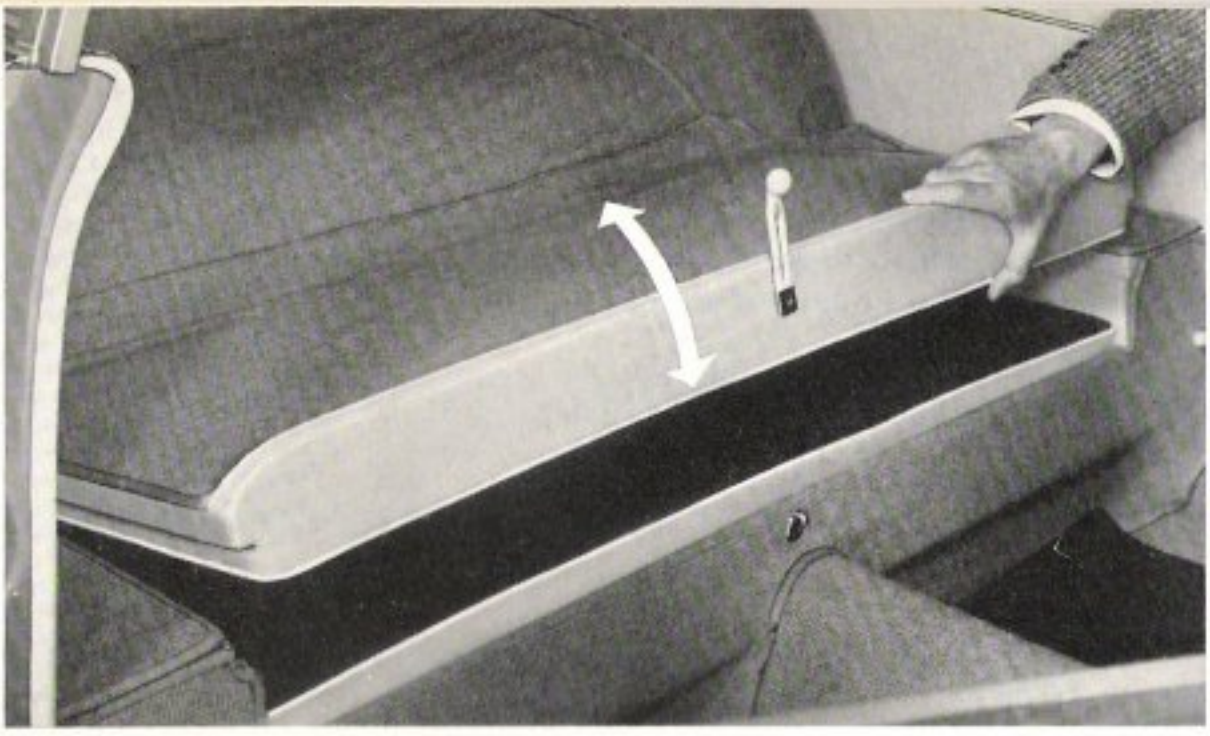
can be adjusted to suit individual requirements. Merely raise the adjusting lever and slide the seat either backward or forward to the most convenient position. The seat rises as it moves forward, permitting short persons to sit higher.

1 - normal 2 - rearward 3 - forward

The rake of the front seat backs can be set at three positions by turning a lever.

Safety Belts

can be obtained from every VW Dealer. The belts are attached to the lock pillar and the frame tunnel.



Emergency Seats

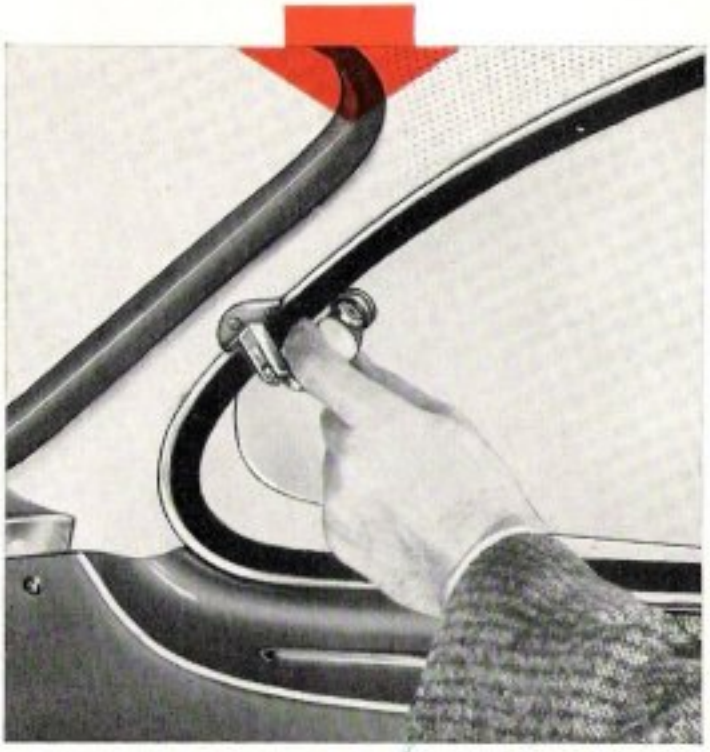
The bench seat behind the front seats is for children or can serve as an emergency seat. The bench seat back is held in the normal position by a rubber strap. When folded down the back adds to the luggage platform area.

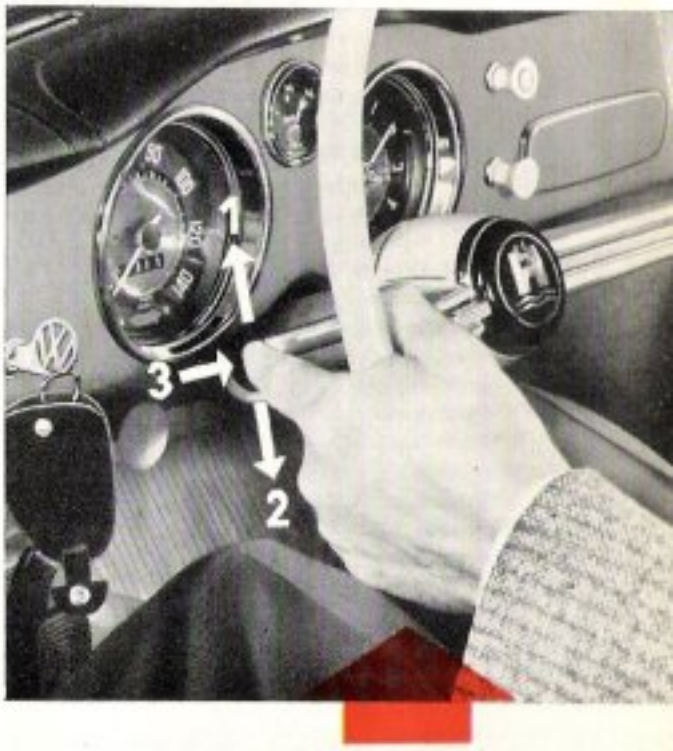
The Fresh Air Ventilation

will prove very efficient during hot weather. Fresh air is guided into the interior through the two defroster vents at the windshield. The air flows of the two ventilators can be controlled separately by the levers below the instrument panel.

1 - off 2 - on

By turning on the heating and the ventilation at the same time, the temperature can be additionally regulated. In addition, either one or both quarter windows can be opened to provide draft-free ventilation. Used up air is sucked out, thus avoiding the rise in humidity caused by condensation which in cold weather mists up the windows.





Flashing Indicator Lever

Flashing indicators and headlamp flasher (not on cars for U.S.A.) are operated by the lever on the left below the steering wheel

1 - upward for right turn,

2 - downward for left turn,

The flashing indicators are self-cancelling.

3 - press the button in the lever to operate the headlamp flasher.

If the button is kept pressed, the headlamp flasher will operate continuously.

The Interior Light

is automatically operated by opening or closing either of the doors. As an added convenience, the light may be operated by the manual three-position switch incorporated in the lamp fitting.

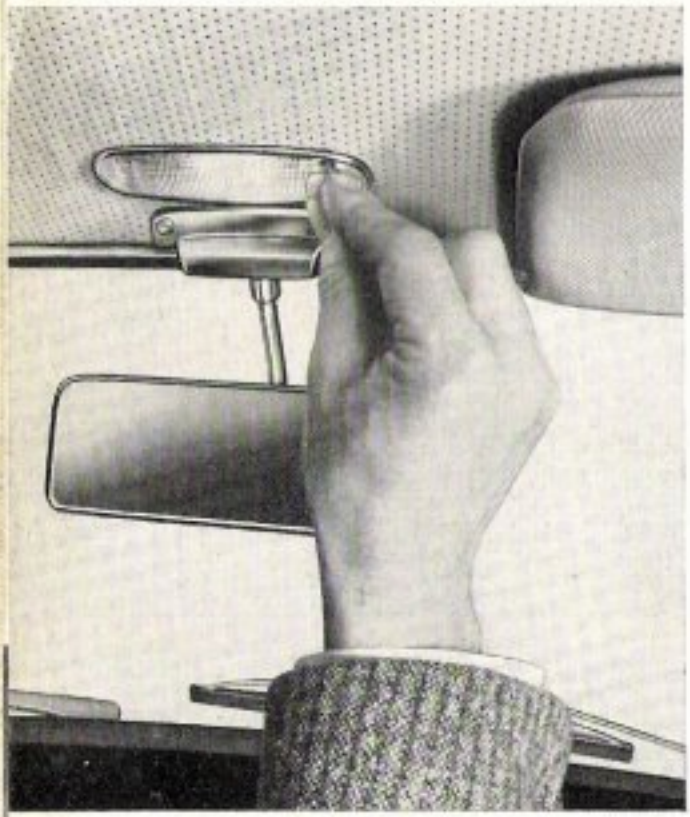
Positions of switch:

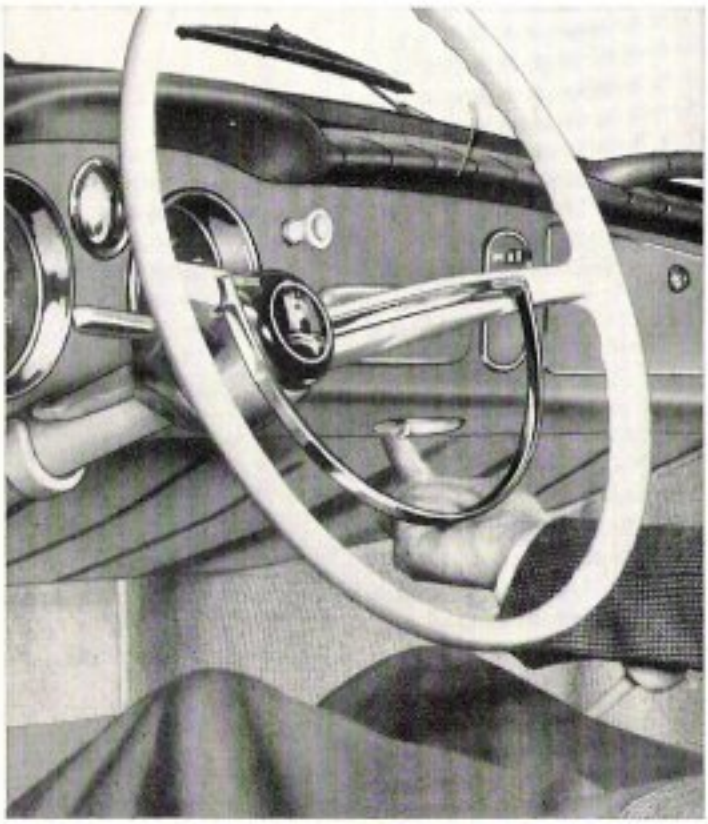
Upper - On

Intermediate - Off

Lower - Door contacts

This allows the light to be turned off with the doors open.





In the Convertible the switch is on the interior light situated below the instrument panel.

Positions of switch:

Forward - Door contacts

Intermediate - Off

Rear - On

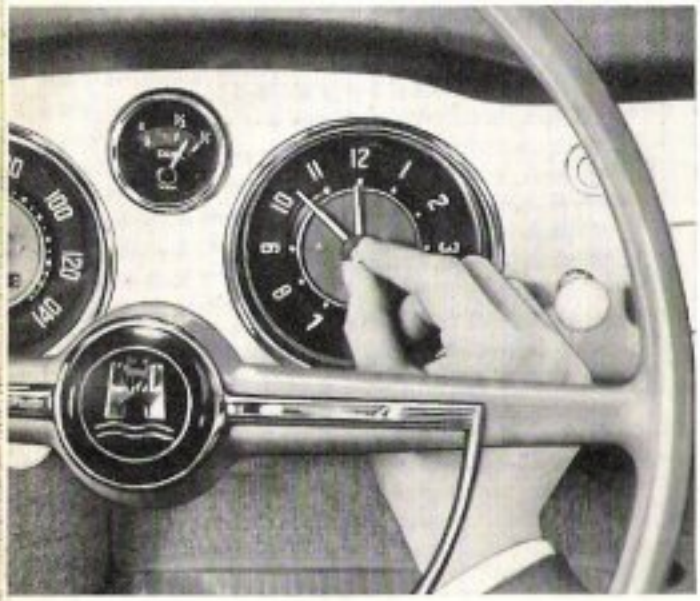
The Windshield Wipers

operate when the upper knob near the clock is pulled out. The wipers return to the parked position automatically when switched off. The windshield washer is controlled by the small button in the center of the wiper switch. The washer is air pressure operated so that by pressing the button you can spray water onto the windshield continuously until it is clean.

Do not forget to refill the container from time to time. It is located under the front hood, behind the spare wheel, and holds about 1 liter. As the air pressure in the container escapes when the cap is removed, it is advisable to refill the container at a filling station. The fluid level is marked on the outside of the container. The

correct air pressure is 2.5 kg./sq. cm. (35 lbs./sq. in.). The addition of 25 % pure spirit to the water in winter will protect it from freezing down to a temperature of —12° C (10° F).

The wiper blades should be removed occasionally and thoroughly cleaned with a hard nylon brush and methylated spirits or a strong detergent solution. Particularly during long dry periods they tend to become clogged with tar splashes and insects. The blades should be renewed once a year.

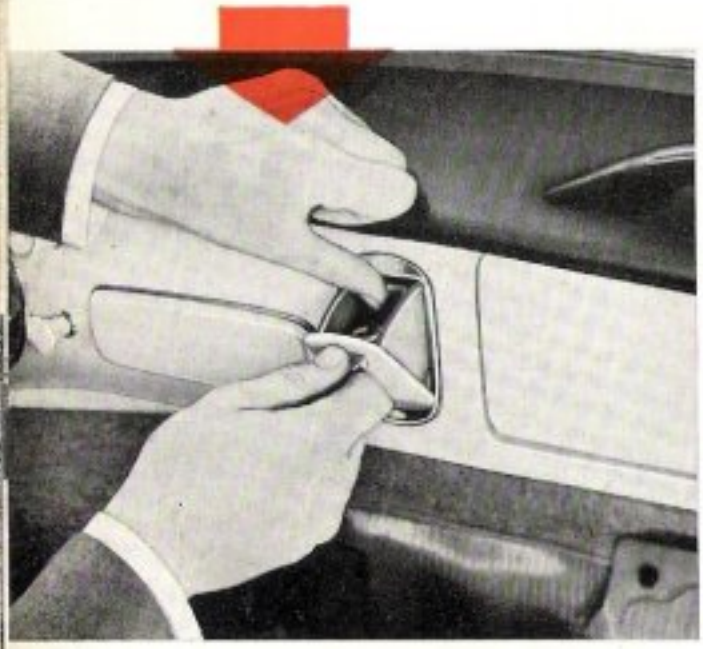


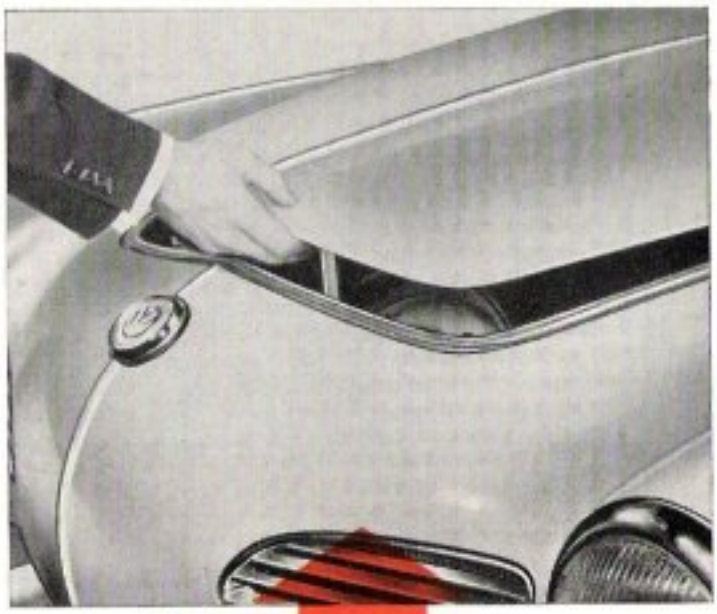
The Clock

is electrically driven. Should it become necessary to reset the clock, push in the knob in the center of the dial and turn to correct the time.

The Ash Tray

in the instrument panel can be completely lifted out of its housing for emptying by lifting the retaining spring slightly.





The Front Hood Lock

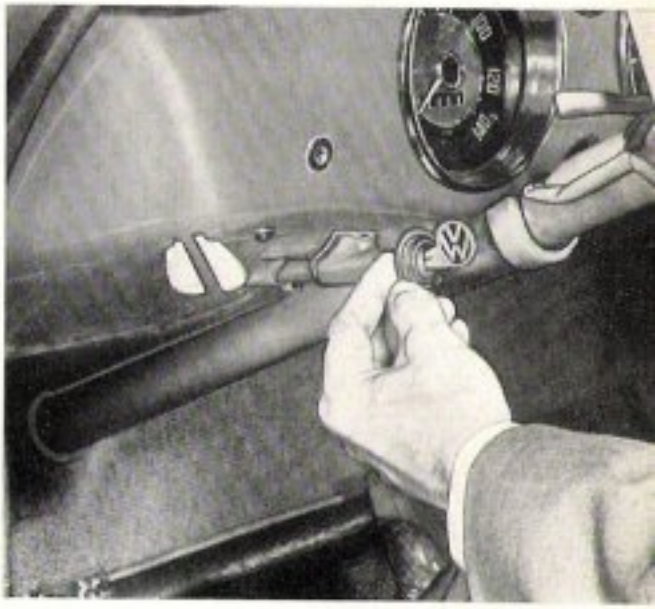
is released by pulling the knob below the instrument panel. Then push back the safety catch to open the hood. The safety catch is to prevent the hood from opening while the car is in motion, if the hood becomes accidentally unlocked.

The control knob for the front hood latch of the Convertible is equipped with a lock as an additional theft precaution. Thus, luggage, fuel and spare wheel are well protected when the top is lowered.

The key — which also locks the door — should be turned anti-clockwise and removed immediately after the control knob has been pulled out.

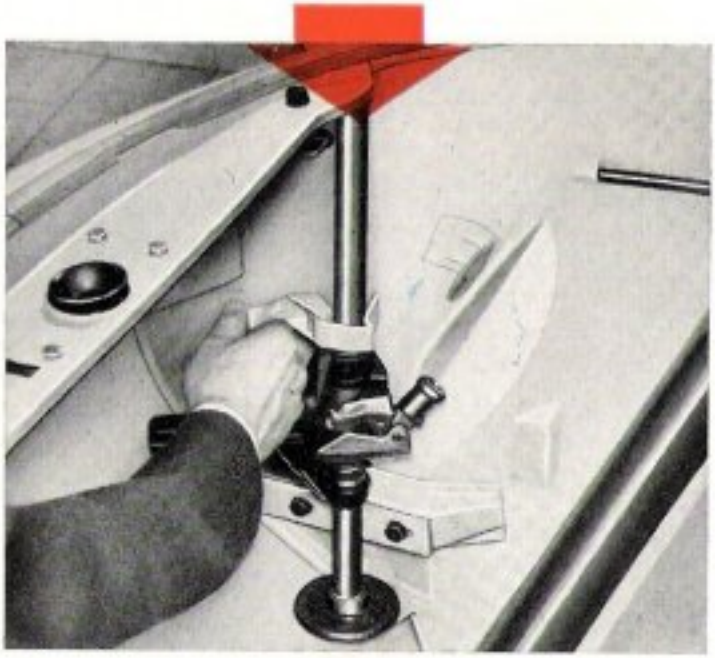
When closing the front hood, the control knob and the hood latch are locked automatically.

A different key is provided for the glove compartment lock.



The Jack

is secured in position in front of the spare wheel by means of a quick release clamping strap. Also accommodated under the front hood are the tools and the spare fan belt.



The Rear Hood Lock

is released by pulling the knob below the emergency seat bench. Balance springs hold the hood in the open position. To lock, lower hood and press down on rear end.

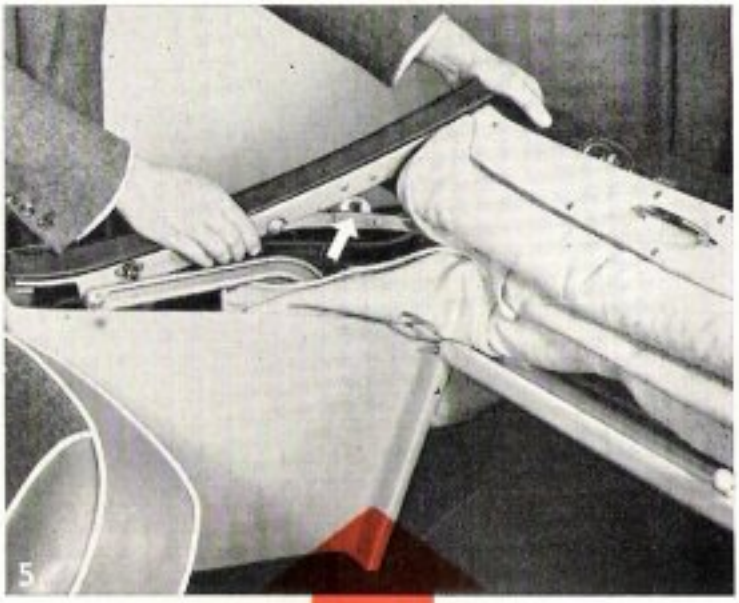
The Convertible Top

can easily be lowered and raised by one person. The service life of the top largely depends on the way the top is lowered and raised. That is why it is of utmost importance to follow the recommendations listed below.

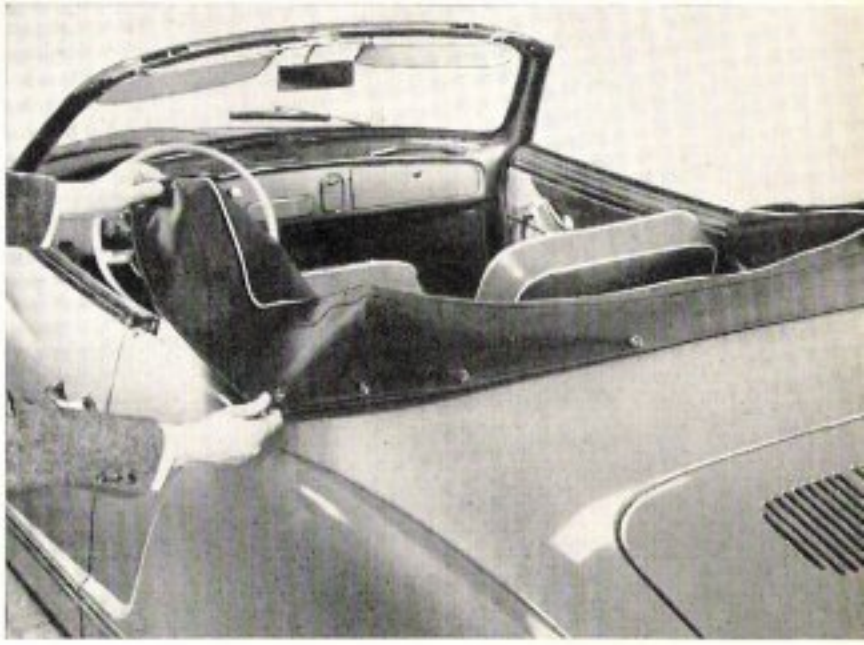
1 - Released
2 - Locked

To Lower the Top

1 - Pull the top lock handle downward.
2 - Unlock the top by turning the handle one complete turn to the right.
3 - Push the header upwards.
4 - Cover the rear window with the flannel cloth.
5 - The top may now be folded back, taking care to fold the rear window and top cover neatly inward between the bows with the back of your hand.



6 - Press top down until the catches engage.



7 - Unsnap the fasteners and remove the boot.

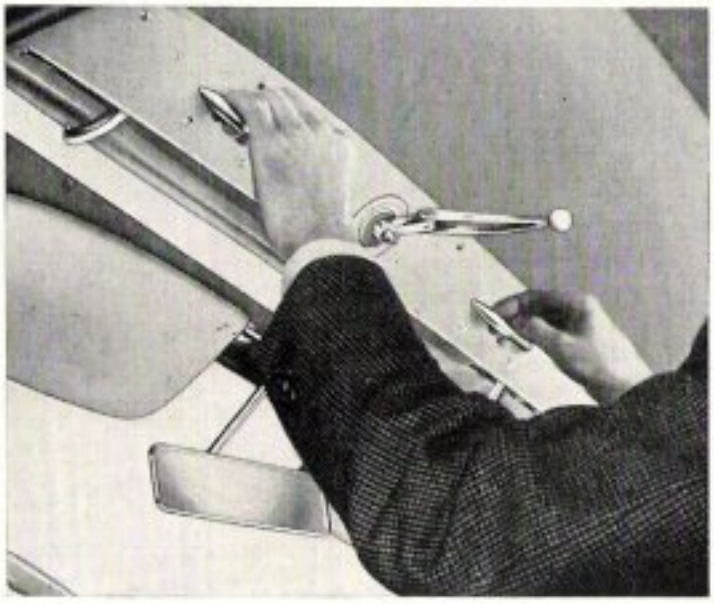
Place the top boot in position and secure it first on the inside and then on the outside by means of the snap fasteners.

To Raise the Top

8 - Remove top boot.

9 - Press the linkage down and disengage the catches on the left and right.

10 - Raise the top.



11 - Pull the top down at both handles until the two locking levers have entered the corresponding openings in the windshield frame.

12 - Lock the top in position by turning the handle a complete turn to the left.

A wet top must always be left to dry in the closed position and must not be lowered.

The section "Care of the Car" gives details of how the top should be properly cleaned.

PRACTICAL DRIVING

Breaking-in Instructions

are not necessary for the Volkswagen. The most modern production and inspection methods have made it possible to dispense with the initial speed restrictions which are normally required. You can drive the vehicle at full speed from the first day.

It is advisable, however, to observe certain fundamental driving rules at all times. You can influence the performance and service life of your vehicle considerably by doing this.

Always keep the vehicle speed within the permissible ranges for the various gears.

1st gear

0—25 kph/0—15 mph

You can drive very economically between:

2nd gear

10—50 kph/6—30 mph

10 and 35 kph/6 and 22 mph

3rd gear

25—75 kph/15—45 mph

25 and 55 kph/15 and 35 mph

Top gear

40—120 kph/25—75 mph

40 and 100 kph/25 and 62 mp

So do not rev the engine too high in neutral nor when driving in the individual gears.

On the other hand, do not labor the engine by driving too slowly in the gears.

Always change down in good time on gradients and keep the engine at the most favorable rpm.

Economical operation

is one of the outstanding features of your car. However, getting a few extra miles from each gallon depends on the manner in which you handle the car and use the gears.

When accelerating,

press the accelerator pedal slowly and only to such an extent as is necessary to reach the desired speed. Depressing the accelerator pedal rapidly does not improve acceleration but results in an increased fuel consumption.

Do not "pump" the accelerator pedal

unless circumstances require it. Even the small quantity of fuel additionally discharged by the accelerator pump each time the accelerator pedal is depressed results in a marked increase in the overall fuel consumption.

Drive your car smoothly and to suit the circumstances,

both when driving in city traffic and on main roads. Adapt the speed of the car to prevailing road and traffic conditions. A good driver accelerates the car gradually, slows down in time, and utilizes the braking power of the engine. Make use of the full acceleration capacity and the excellent brakes of your car only when you really need it.

How to drive at high speed without sacrificing fuel economy

When you have accelerated the car to the desired speed, slowly let the accelerator pedal return to the position which just maintains this speed. This practice is especially economical when driving on highways.

Perhaps you are aware of the fact that air resistance is an obstacle for all vehicles especially at high speeds. Due to the simple and sweeping lines of your car, air resistance is relatively low, but it should be remembered that high road speed always involves a higher fuel consumption.

Watch the Road

closely while driving. You should now be able to operate the various levers, switches and controls automatically. Furthermore, your car will "tell" you on its own accord when it needs attention.

Headlights

Blue Light

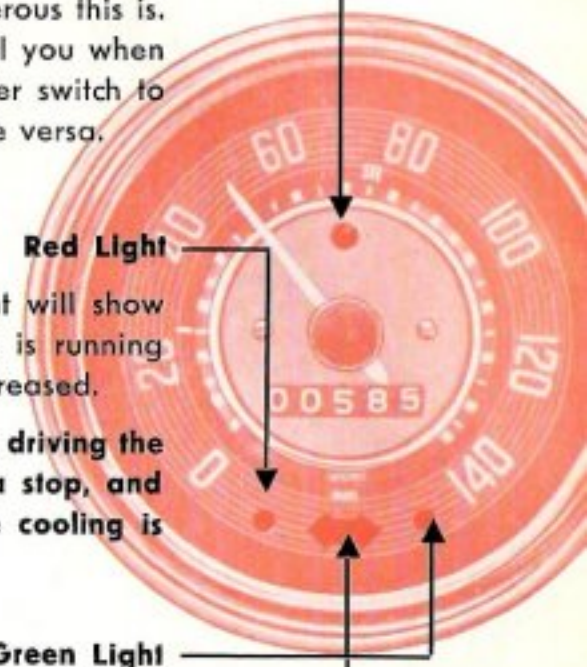
The high beam of your headlights can be blinding to oncoming drivers. You know yourself how unpleasant and dangerous this is. For this reason, be considerate! The blue light will tell you when the high beam is switched on. Just step on the dimmer switch to transfer the headlights from high to low beam and vice versa.

Generator and Cooling

Red Light

are controlled simultaneously by a red light. The light will show when the ignition is turned on and when the engine is running at low speed. The light should go out as speed is increased.

Important. If the red light comes on while you are driving the car, the fan belt may be broken. Bring your car to a stop, and find out what is wrong, for if the belt is broken, the cooling is disrupted and the generator no longer charges.



Oil Pressure

Green Light

The oil pressure of your car is as important as the oil level, which you have already checked. When the ignition is turned on, the Green Oil Pressure Light will go on. The light should go out when the engine is started and the oil pressure increases.

Important. If the green light comes on with the engine running, the chances are that the oil circulation has been interrupted, which means that the lubrication of the engine has ceased. Stop at once and check the level of the oil before you consult a Service Station. An occasional flashing of the lamp with the engine warm and at low speed does not indicate trouble, if the light goes off again as the speed increases.

Flashing Indicators

Green Dual Arrow

The flashing direction indicators lie outside the driver's vision. However, the green light will show when the indicators are switched on. The direction indicator switch can be operated without taking the hand off the steering wheel.

Safety First

Safety for yourself, and safety for others, this is what counts most! Your car "hugs" the road in an excellent way, and does not roll when taking a turn. Your car has an extraordinary capacity for acceleration. Yet, the feeling of security and safety which you will acquire after e few miles should not tempt you to become careless.

Therefore, adjust the speed of your car to the conditions of road, traffic and weather, and always be ready to bring your car to a stop when it is necessary. Be particularly careful when driving on wet or icy roads, for even this car is apt to skid when not driven carefully under such conditions.

Rear View Mirrors

By turning the inner mirror to the vertical position an additional adjustment is obtained to suit individual requirements.

Adjust the outer mirror so that you can see rearward alongside the car without having to turn your head or shoulders. You will then get a clear view of the road behind you.

Passing other Cars

Pass other vehicles with consideration. Always be sure that the road is clear ahead of you, and look out for cars approaching you from the opposite direction. A brief look in your rear view mirror will tell you whether another car is about to pass you from behind. If you have to shift to lower gear, do it before, not during passing. And here is another warning: Never try to pass a car when approaching a curve, where vision is not clear, and never pass a vehicle at the crest of a hill, or at crossroads. You never can tell what lies ahead of you. Be fair and do not accelerate when another car tries to pass you. You will endanger your life and others!

Stopping Your Car Temporarily

When stopped at an obstruction, a traffic light or railroad crossing, do not wait with the clutch pedal pressed down and the gear lever in position. Shift to first gear shortly before moving on again, it will preserve the clutch.

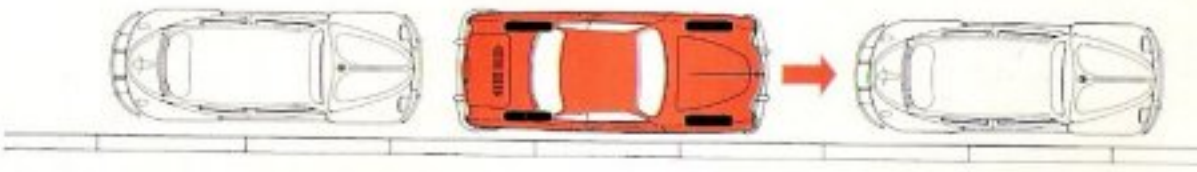
Parking Your Car

in a space between two other cars that are parked at the curb will be easier if yo heed the following advice:

Stop your car level with the car in front of the space. Turn the steering whee sharply to the right and back your car slowly into the gap.

When the front bumper of your car is level with the rear bumper of the car ahead of you, turn the steering wheel fully to the left, and back up further toward the curb.

Now turn the steering wheel again to the right and pull up a little bit, until both ends of the car come as close to the curb as possible.



When parking on a steep slope, set the hand brake to stop the car rolling. As a precautionary measure, it is advisable to engage reverse gear in addition to the hand brake. And do not forget to take the key out of the ignition switch before you leave your car.

If the vehicle has a gearshift-ignition lock you can lock the shift lever in neutral or reverse as a precaution against theft.

Prior to locking the driver's door, secure the door on the other side by pushing the inside door handle forward.

COLD WEATHER HINTS

In Winter

there are two good features of your car that you will appreciate most:

Air Cooling and Heating

You may expose your car to bitter cold without fear: — its air-cooled engine will always be ready to start. You will drive in warm comfort, well protected from the weather, while a current of warm air will keep your windshield and rear view window free from condensation and frost. The increased stress that your car has to stand in winter because of frost and dampness can be easily coped with if you observe the recommendations presented in this section.

Never attempt to influence the cooling and heating of your car in winter by covering the air intake slots below the rear window.

This would be harmful to the engine, as the ingress of fresh air for the carburetor and the heating would be seriously affected. The intake of cooling air is already efficiently controlled by the thermostat.

The Warm Air Heating

of your car can be regulated by a rotary knob situated adjacent to the gear lever

Anti-clockwise — On (1)

Clockwise — Off (2)

To increase the flow of air at the windshield defroster vents the foot level openings in the front of the body can be closed as required by means of slides.

Engine Oil

SAE 20 W/20 oil will remain thin enough at temperatures above 0° C (32° F) and will permit easy starting of the engine. If, however, temperatures below freezing point are anticipated the use of SAE 10 W is recommended.

This grade oil may remain in the engine with safety when the temperature again rises to a higher range. Should it become necessary to add oil in the period between two regular oil changes, SAE 10 W oil may be used below freezing point and SAE 20 oil when the temperature average rises. This means that the grades SAE 10 W and SAE 20 W/20 can be mixed without any disadvantages, but be sure to use always the same brand and type of engine oil.

The engine does not need to be warmed up before moving off, but it is advisable not to race the engine immediately after starting when the temperature is low.

Only if your car is mainly operated over short distances **during cold weather** is it recommended to have the oil changed at more frequent intervals, say every 2500 km. (1500 miles), using the right HD oil. In the warmer season oil changes in addition to those laid down in the Lubrication Chart are unnecessary and uneconomical.

In territories where **exceptionally low temperatures prevail** (below —25° C/ —13° F) it is advisable to use SAE 5 W engine oil, which should be changed every 1250 km (800 miles). At the same time clean the oil strainer.

Transmission Lubricant

The SAE 90 oil need only be replaced by oil of another grade in winter when it is anticipated that the temperature will be below —10° C (14° F) for a prolonged period. When this is the case, the thinner SAE 80 oil should be used temporarily as it facilitates gear shifting when the transmission is cold.

The Chassis

is particularly exposed to moisture in winter. For this reason it is advisable, to adhere strictly to our instructions for lubrication. If, in addition, you spray the bottom of the car with a special chassis oil, as a protection against rusting, you will prolong the life of your car and reduce ice formation on the chassis when the road is wet and the temperature low.

Annually, at the beginning of the cold season, clean and grease the cables for carburetor, clutch, and heating.

The Brakes

of all vehicles are exposed more or less to splashing water which in winter is apt to freeze in the brake drums. Therefore, when parking your car, do not set the hand brake, but shift to first or to reverse gear.

The Door Locks

can freeze up in the winter, especially if water gets into the lock cylinder when washing the vehicle. You should, therefore, not aim the water jet directly at the lock, or better still, cover the key hole up when washing. A frozen lock can be opened by warming the key before insertion and then squirting anti-freeze into the lock cylinder straight away.

Tires

Worn tires are apt to cause trouble in winter. To assure safe operation, replace them in time. To meet the special requirements in winter, so-called M+S tires are available. These special-tread tires are designed to give a better grip on mud and snow. They are either used on the rear wheels only or on all four wheels. However, during the rest of the year it is better to use normal tires.

Chains

You will need chains only when the roads are covered with snow or ice. Without such chains, the rear wheels of your car are apt to spin, and applying the brakes may result in the car skidding. Have the chains fitted to the wheels in good time, if you wish to avoid inconveniences later on.

When driving on long stretches that are free from snow, the chains should be removed to prevent excessive wear of both chains and tires.

The Battery

is under greater strain in winter than in warmer seasons because of the increased consumption of current when starting the engine and using the lights. Besides this, it is a characteristic feature of any battery that its efficiency decreases at lower temperature. If the car is mostly operated over short distances, the battery may call for an additional recharging. Also make sure that the battery ground connections are clean and in proper condition and that the cable connections between battery and starting motor are in order.

Spark Plugs

The normal spark plug gap is 0.7 mm. (.028″). In extremely cold weather reduction of their gaps to 0.4 — 0.5 mm. (0.16″ — .020″) will aid cold starting considerably.

LUBRICATION

Proper Lubrication is of Vital Importance to Your Car

The extra time spent in following these recommendations will be amply rewarded in the long run by your car's efficient performance. It is up to you to maintain the standard of safety offered by your vehicle, and to insure the long life and good service which you have the right to expect from this truly economical car.

To lubricate correctly means to lubricate amply and at prescribed intervals

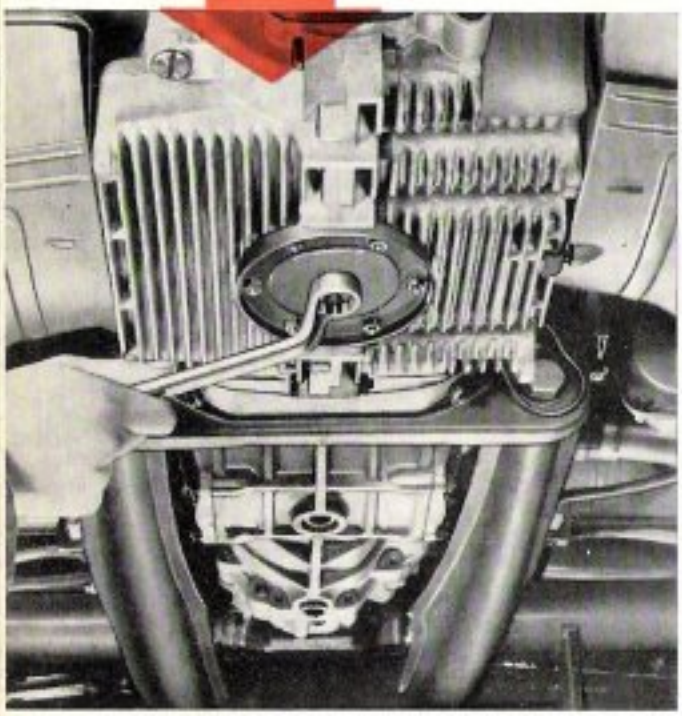
Therefore, do not shy at the work connected with the regular lubrication service. A Lubrication Chart can be found on page 77, indicating the respective mileage at which to lubricate.

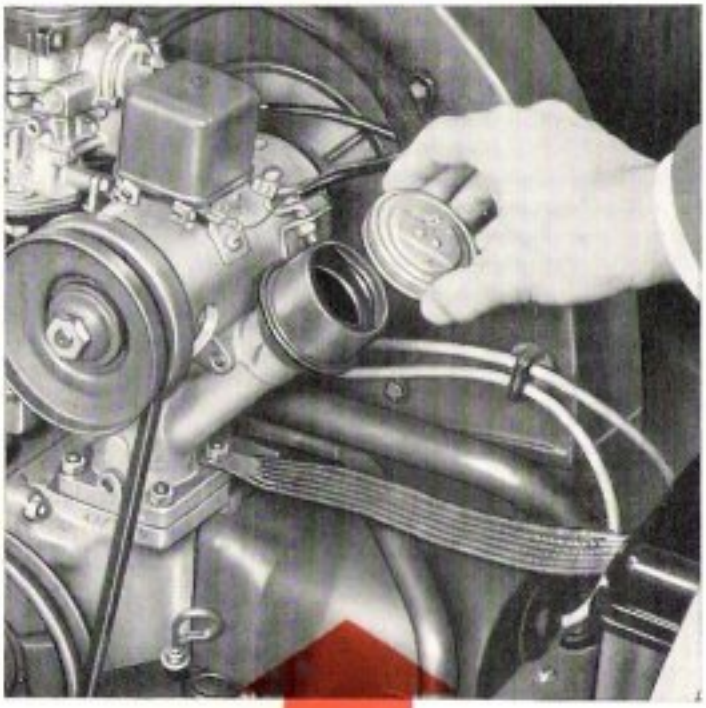
The Service Booklet makes it possible for you to have your car lubricated at a VW Dealer's by skilled hands, with the best available lubricants, at lowest cost and in a minimum of time. You really cannot afford to miss this opportunity.

Engine Oil Change

Regular oil changes are necessary even if the very best branded oils are used. Dirty oil in your engine simply means increased wear and a shorter period of life for your engine. On the other hand, provided that HD oil is used, it is unnecessary and uneconomical to change the oil more frequently than called for in the Lubrication Chart.

The oil is drained by removing the plug in the oil strainer bottom plate. To ensure complete draining, it is important that the operation be performed while the engine is warm. Then screw the plug in again and tighten it.

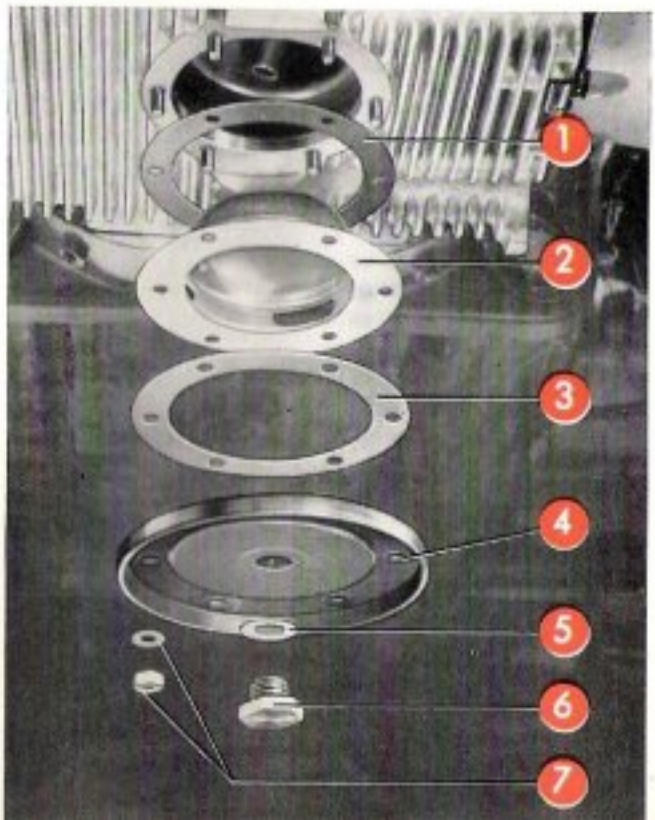




The engine is refilled with **2½ liters of HD oil** (5.3 U.S. pints, 4.4 Imp. pints). Engine flushing is unnecessary.

The Oil Strainer

retains foreign matter and should be taken out and cleaned at every oil change. The two gaskets should be renewed each time the strainer is removed.



1 - Gasket
2 - Oil strainer
3 - Gasket
4 - Bottom plate
5 - Gasket
6 - Drain plug
7 - Nut and lock washer

Types of Lubricant

The advantages of using a **branded HD engine oil** are quite evident.

HD oil is an oil having proved oxidation stability, bearing corrosion preventive properties and detergent-dispersant characteristics which tend to hold in permanent suspension foreign contaminants which would normally deposit on engine parts. These foreign contaminants drain out with the oil at the periodical oil changes. The detergent properties of HD oil will make the fresh oil darker after a short time of operation. This is quite natural and there is no reason whatsoever to change the oil earlier than called for the Lubrication Chart.

Some More Information on Engine Oils

It is left to your discretion to select an oil of a well-known and dependable brand of the proper viscosity to suit your seasonal and driving requirements. In cases of doubt, refer to your Authorized VW Dealer who will be glad to help you with your lubrication problems. It is recommended that you select "your" oil after the first 500 km. (300 miles) and stick to it at all future service oil changes.

Viscosity of the lubricant is an indication of its resistance to flow at a given temperature. The SAE numbers classify lubricants in terms of viscosity, but with no reference to other characteristics or properties.

SAE 30 engine oil is satisfactory in tropical climates where the temperature range will frequently rise above 30° C (86° F).

SAE 20 W/20 engine oil is recommended for use within the mild temperature range from 30° C to 0° C (86° F to 32° F). It may also be used with safety, should temperatures temporarily exceed these limits.

SAE 10 W engine oil is recommended for use if the temperature is anticipated to fall below 0° C (32° F). If may also be used with safety, should temperatures rise above freezing point. A change of oil is, therefore, not necessary until the next regular mileage interval.

SAE 5 W This extremely light engine oil is for use in arctic climates with temperatures below —25° C (—13° F) only.

For further details in connection with the proper oil for winter use see section "Cold Weather Hints" on page 30.
In some countries the API Classification is applied (API = American Petroleum Institute). According to this classification, HD oils suitable for the VW engine are referred to as "For Service MS".

Multigrade Oils

are HD oils which cover several viscosity grades, such as SAE 10 W/30 for example. These oils are also suitable for VW engines.

No additives of any kind should be mixed with an HD oil.

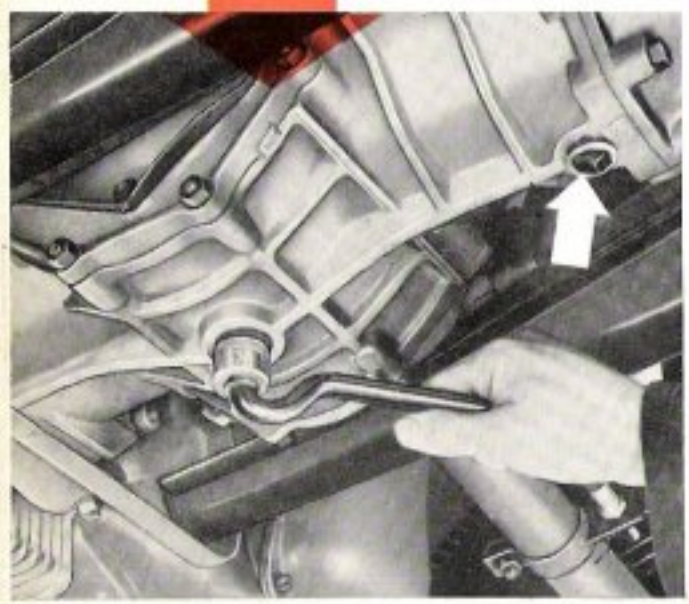
Ignition Distributor

The amount of grease at the breaker arm fiber block should be checked and, if necessary, replenished at the specified intervals.

Every 5000 km. (3000 miles), apply 1 drop of oil to the felt ring in the contact breaker base plate after the rotor is taken off.

Transmission and Differential

The transmission and differential gears are combined in the transmission case and both lubricated with the same hypoid oil. Timely oil changes have a beneficial



affect on the smooth running of the gear trains. The old oil is drained by removing both the magnetic drain plugs while the oil is at operating temperature.

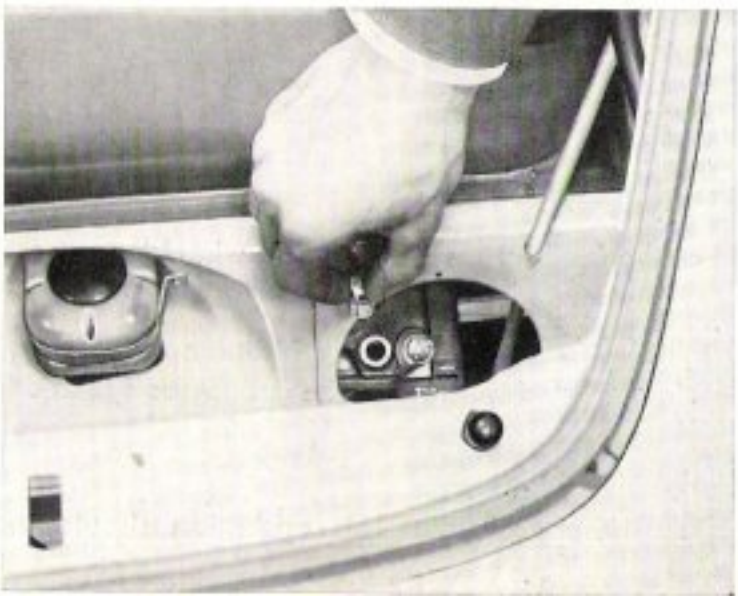
Then refill with **2.5 liters (5.3 U.S. pints, 4.4 Imp. pints) of hypoid oil.**

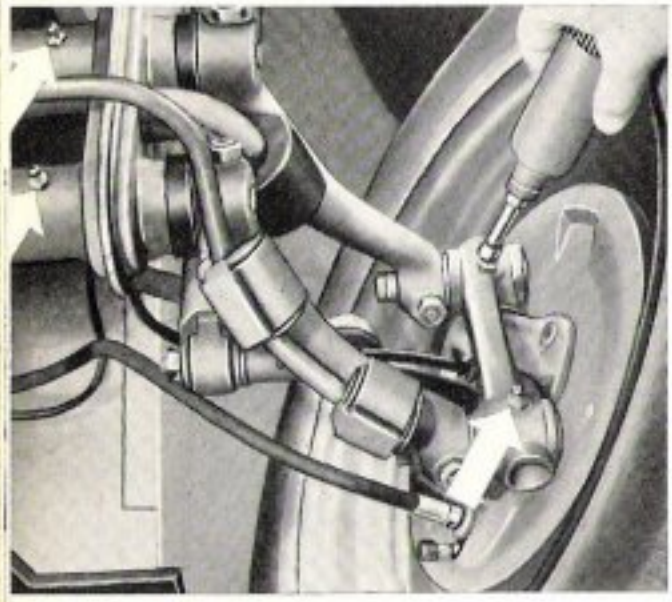
The magnetic drain plugs should be thoroughly cleaned at 500, 2500, 5000 kilometers (300, 1500, 3000 miles) and then at every transmission oil change. As the plugs can only retain a limited amount of deposits, the intervals for cleaning should be strictly adhered to particularly during the gear running-in period. At 2500 and 5000 kilometers the plugs should be removed one at a time and the holes blocked with a wooden plug temporarily. The oil level should then be checked and oil added if necessary. The oil should be up to the edge of the filler hole.

No additives should be used with hypoid oil nor should hypoid oils of various brands be mixed.

Steering Gear

The steering assembly should be lubricated with — SAE 90 — exclusively, and under no circumstances with grease or any other type of oil. It is accessible through an opening behind the spare wheel. The level of the oil in the steering case should be kept somewhat below the filler plug hole.





Chassis

Proper lubrication of the front axle bearing points is best done by raising the front axle so that the weight is taken off the wheels.

Prior to lubrication, the grease fittings should be cleaned thoroughly with a clean piece of cloth, so as to avoid any dirt or foreign matter entering the fittings. The tip of the grease gun should be pressed onto the fitting, whereupon grease should be injected until the excess grease begins to emerge at the edges of the lubrication point.

Grease or oil should not be allowed to come into contact with the tires and brake hoses. Even the slightest trace of lubricant must be wiped off immediately.

If the car is driven mainly over rough roads, it is recommended that you lubricate the king pins at more frequent intervals, say every 1250 km. (800 miles).

Annually, at the beginning of the cold season, the cables for the accelerator, heating and the clutch cable adjusting nut, should be cleaned and greased.

The Front Wheel Bearings

are provided with sufficient grease at the factory. The caps on the wheel hubs must be free from grease.

At intervals of 50 000 km. (30 000 miles) as prescribed in the Maintenance Chart, the front wheel bearings are to be cleaned and repacked with grease as specified in the Lubrication Chart.

Remove the brake drums for this job.

Finally, the front wheel bearings must be adjusted. This operation should, if possible, be carried out by a VW Dealer.

Doors

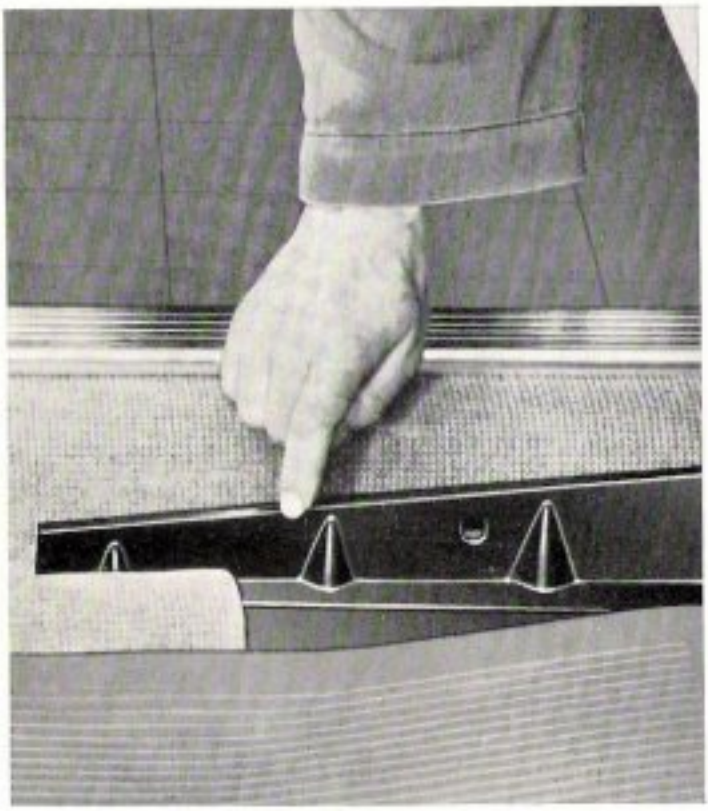
The door hinges require no maintenance.

Door lock cylinders should be treated with graphite only. Blow a small quantity of powdered graphite through the key hole. Dip the key into the graphite, insert key and move it back and forth several times.

The hood hinges should be oiled.

Convertible

If necessary, the joints of the top linkages are to be lubricated with a few drops of oil after dust and dirt have been removed. Care should be taken to avoid oil getting on to the top fabric, as this causes stains and results in disintegration of the rubber ply.



Front Seats

The upper and lower sliding surfaces of the seat runners should be provided with grease. A small amount of grease will suffice to assure easy movement of the seats. Prior to lubrication, wipe off the runners with a rag. To remove, slide the seat fully toward the front.

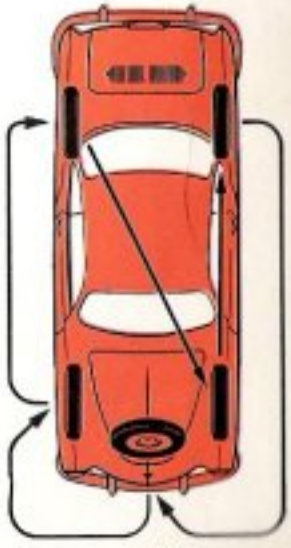
WHEELS AND TIRES

Under-inflation or over-inflation are the most common causes for tire failures. High speed driving and cornering, skidding to a stop and striking curbs or objects on the road wears tires more than many miles of careful driving. A tire should in any case be renewed when the thickness of the tread ribs is 1 mm. (0.04"). Further use will undermine the safety margin of the tire.

Avoid overloading the car and protect the tires from intense sunlight, fuel, or oil.

Normal wear may be kept at a minimum by interchanging wheels and tires including the spare at approximately 5000 km. (3000 miles) intervals. Check tires for damage. Rotate wheels as shown in the illustration.

A drop of oil applied to the wheel mounting bolts facilitates the next wheel change.



To obtain smooth high speed operation and long tire life, it is important to have the wheels balanced statically and dynamically when tires have been repaired. As the wheels can be out of balance after being in service for some time owing to natural tire wear, they should be balanced statically and dynamically every 10 000 km. (6000 miles).

When the tires are being mounted, the red mark on the sidewall should be lined up with the valve to ensure better balancing.

Changing Wheels

It is not pleasant to have to change a tire on the road in the rain. However, it will be easier after you have read these few lines which tell you the correct way. Underneath the front hood, you will find the spare wheel, jack and tool kit.

1 - Set the hand brake securely and block the wheel opposite to the one being removed to prevent the car shifting off the jack.

2 - Grip the square bar of the jack so that the thumb comes to rest on the nose of the upper locking piece. Exert pressure on the nose and slide down the square bar until it is stopped by the base plate.

3 - Insert the jack into the square tube below the body sill in front of the rear wing and push down the jack base plate until it makes contact with the ground.

4 - Remove hub cap by means of the hub cap removal tool.

5 - Loosen wheel bolts by means of the socket wrench before wheel is fully jacked up.

6 - Raise jack until tire clears ground.

7 - Remove wheel bolts and take off the wheel.

8 - To install the spare wheel, operate the jack until the five holes in the wheel are nearly lined up with the holes in the brake drum.

9 - First, insert one wheel bolt only. Tighten it to such a degree as to allow the wheel to be swung around this point by hand until the remaining holes in the wheel and brake drum coincide.

10 - Insert the remaining bolts until the countersunk heads are centered in the corresponding recesses of the wheel.

11 - Tighten all bolts alternately in turn.

12 - Place one end of the jack operating rod into the hole marked "ab" and apply a light pressure on the opposite end of the rod to lower the car to the ground. Keep on exerting pressure on the operating rod to allow the base plate to be pushed up, and remove the jack.

13 - Make sure that all bolts are tight.

14 - Install hub cap firmly and make sure that it is tightly seated.

CARE OF THE CAR

Clean and Smart Appearance

To keep the car looking smart and new should be a matter of pride to the driver or owner of the car. We made it the object of our efforts to use a lasting paint finish of sparkling lustre. A chemical treatment protects the body against rust and corrosion and anchors the paint securely to the metal. The finish is of high-quality synthetic resin and carefully blended to obtain the most beautiful shades.

You will realize the importance of the paint finish if you consider that it is exposed to the elements; it has to resist sunshine, rain, dust, and dirt. That is why periodic care of the body is necessary to retard any disintegrating process.

Washing Your Car

Wash your new car frequently during the first weeks as this is good for the finish. When washing you require a soft sponge for the body, a soft brush for the wheels, a sturdy, long-handled brush for the chassis, and plenty of clear water. For drying the car you need a chamois.

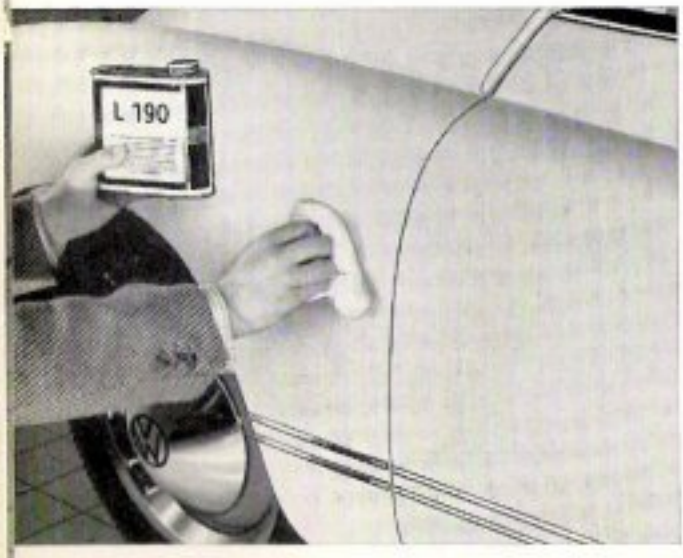
The chassis and lower part of the body should first be flushed with water, to soak off the dirt, and afterwards a brush should be used.

Spray the exterior finish of body and wheels evenly with water until the dirt is soaked off. Do not allow a hard jet of water to hit the painted surface. Using plenty of clear water, dirt should be removed with a sponge. Care should be taken to clean the sponge at short intervals so as to avoid scratches on polished parts. There are some approved auto soaps and detergents which greatly facilitate this job. Avoid the use of any product which has not been recommended by your VW Dealer. It is of utmost importance to rinse the body thoroughly with water after the car-wash has been applied to ensure that no traces of it remain on the body.

After washing, rub down with a clean chamois to prevent water spots.

Preservation (Waxing)

means to restore to the finish certain substances it has lost by exposure to the weather. As these substances are vitally important to the elasticity of the finish, it is necessary to apply a protective water-repellent coat of wax to the body. The intensive cleaning effect of the shampoo removes this protective coating so that it should be renewed accordingly. A preservative specially produced for the finish of your car can be obtained under the designation "L 190" from your VW Dealer.



The body should be waxed after the first eight or ten weeks and then regularly at intervals of from six to eight weeks — in any case after each soap or detergent washing, as already mentioned. Applying the preservative is quite easy: With a soft cloth, spread a thin film on the finish, then rub it down when dry (after about 20 minutes), using polishing cotton or a soft polishing cloth, until iridescent colors can no longer be seen when standing at an angle to the polished area.

Polishing

You should polish your car only if its appearance has been strongly affected by road dust, sunlight and rain as a consequence of insufficient care, and if the application of the preservative no longer restores the original lustre. Avoid the use of abrasives or chemically harmful products, even if their first application seems to give satisfactory results. A special polish for treating the synthetic-resin finish is also obtainable from your VW Dealer under the designation "L 170".

Prior to applying the polish, the car must be washed and dried carefully. Dust or dirt should never be wiped off dry. The polish should be applied with a soft clean cloth or polishing cotton — use a straight horizontal or vertical motion rather than a circular motion. After some time of rubbing you will feel a slight resistance, which indicates that the ingredients of the polish have settled in the finish and that the solvent has evaporated. Now take clean polishing cotton and rub the body down until the high polish is restored. Do not apply the polish on too large an area of the body at a time. A subsequent application of preservative and your efforts will be rewarded with a long-lasting shine.

Never wash, wax or polish the car in sunlight or when the metal is warm.

How to Remove Spots

Washing alone will not always remove splashes of tar, oil traces, "baked on" insects, etc. As a matter of principle, such foreign matter should be removed as soon as possible, for if you neglect to do this, permanent damage may result to the finish.

Tar Spots

An unpleasant sight, to be noticed particularly on light-colored cars, are tiny tar spots which show up on the fenders on hot days when driving on newly tarred roads. Tar splashes have a tendency to corrode the finish within a short time and should be removed as soon as possible. When on the road, you usually have nothing at your disposal but fuel, which may be applied with a soft cloth. Kerosene or turpentine oil may also be used. After this, the treated spots should be washed with a mild, lukewarm soap-solution, and rinsed, in order to remove traces of the cleansing agent. It is, however, better to use the preservative already mentioned, which renders the treatment with soap-solution unnecessary.

Insects

are caught especially during the night, in hot weather, by the fenders, headlights and front hood. Once baked on they are very difficult to remove with water and sponge, and should be treated with lukewarm soap-solution.

Trees in Bloom

Especially lime-trees, in many instances drop tiny quantities of liquids. Cars that have been parked underneath such trees become "freckled" all over. These stains, too, can be readily removed with soap-solution if you do not wait too long.

After-treatment of the cleaned spots with the preservative is strongly recommended.

Care of the Convertible Top

The appearance and life of the top greatly depends on proper care and maintenance.

The top must always be perfectly dry before lowering it. After having driven the car on dusty roads, slightly beat out the top and brush the fabric in line with the lay of the thread by means of a soft brush as the sharp foreign particles harm the top fabric if not removed soon.

Damage due to friction may occur when the lowered top is not tightly held in position by the catches which engage in the slots cut in the side rails. In such cases, the catches should be screwed further into their retainers. To do this, the lock nuts have to be loosened before, and tightened after, the adjustment.

Never use fuel or other volatile cleaners to remove spots as they destroy the rubber ply in the top cover, result in leaks and shorten the life of the top. Try rubbing them carefully with white bread crusts.

The top should be washed only when it is exceptionally dirty, and not more than twice a year. Only use clear water which is free from chemical products or other additives. Prior to washing, beat out the top and then brush it off. Use lukewarm water and a mild soap. Only such soap as castile or olive oil base soaps should be used. Moisten the top with clear water and apply the thick suds. Scrub the top with a soft brush. After scrubbing, flush off the suds with clear water. If necessary, repeat the scrubbing with suds. No traces of the suds should remain after the top has been flushed. Be sure the top is thoroughly dry before lowering.

After washing the top, clean the finish of the car by flushing with clear water and by drying with a clean, soft cloth.

Chromium-Plated Parts

should be lightly coated with a chromium wax such as Chromlin. The use of grease is not recommended, as this will bind dust and dirt.

Textile Upholstery

If no vacuum cleaner is available, the upholstery should be brushed. The brush should not be too soft.

Grease and oil spots on the upholstery should be treated with a spot remover. Do not pour the spot remover on the upholstery as this would injure the color of the fabric. Moisten a clean, undyed cloth with the remover and rub it with a circular movement proceeding from the center of the spot toward the outside. Spots not caused by grease or oil can usually be removed with lukewarm soap water.

Care of Leatherette Upholstery

Cleaning of leatherette upholstery with a soft cloth or soft brush is recommended. Special care should also be taken to remove dust and dirt from the seams. Better results can be obtained using a soft whisk broom and suds of any mild soap (castile or olive oil base) in lukewarm water (rain, boiled or soft water). Use water sparingly, as the upholstery otherwise requires a long time to dry if water trickles through the seam stitches.

For best results, stains, especially those caused by grease or paint, should be removed from upholstery as soon as possible or the may become "set" and hard or impossible to remove. "Set" stains should be removed carefully with a clean cloth dampened in fuel or denatured alcohol. Stains caused by shoe polish can best be removed by turpentine. However, such cleaning agents are liable to affect the dust-repellent finish of the leatherette, if used in excess of the actual requirements. Never use volatile solvents such as lacquer thinners, acetone, etc.

The cleaning should be completed by wiping the surface of the leather dry with a clean cloth, particularly in the seams. No attempt should be made to apply preservatives such as wax polish or varnishes as these will not be absorbed by leatherette, thus merely binding dust and soiling the clothes of the occupants.

Care of Leather Upholstery

The leather upholstery should be serviced in accordance with the instructions given for the leatherette upholstery. After the upholstery has been wiped dry, a suitable cleaner may be used to clean, preserve and freshen the appearance.

Cleaning Glass

Windows can be cleaned by washing with water and wiping dry with a clean, soft linen cloth. In order to facilitate this task on the windshield the arms of the windshield wipers may be tilted forward. To clean unusually dirty windows, use alcohol or household ammonia and lukewarm water.

Door and Window Weather Strips

To assure a perfect door and window seal, it is important to keep the rubber parts undamaged and supple. To retain the original flexibility and to reduce friction, apply a light coating of talcum powder to all rubber parts from time to time.

Airing the Interior

If the car is left in the garage for long periods, attention should be paid to the airing conditions. Permit air to circulate freely through the body by opening the doors and lowering the windows to prevent the formation of mould and damp-stains.

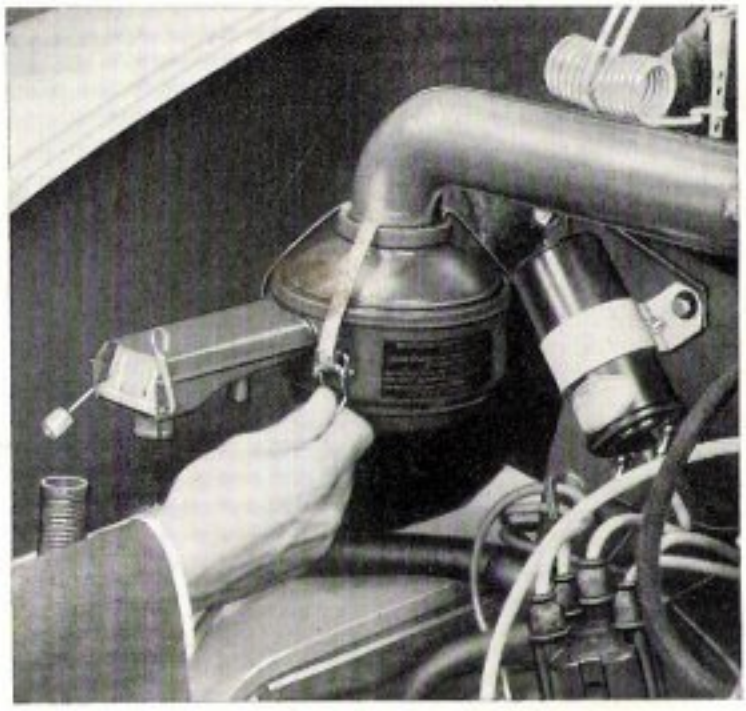
MAINTENANCE

In case you can't get to an Authorized VW Dealer in time, we are including some information which, if needed, will help you to carry out normal maintenance work. However, repair jobs which are beyond your capacity should be entrusted to VW workshops. There your car will be given expert treatment by those familiar with its construction.

This will save you time, inconvenience, and money.

Servicing Air Cleaner

The air cleaner filters particles of dirt and grit from the air used for combustion. Regular servicing at intervals of 5000 km. (3000 miles) is especially important in dusty areas. A dirty air cleaner decreases operating efficiency, and increases fuel consumption.



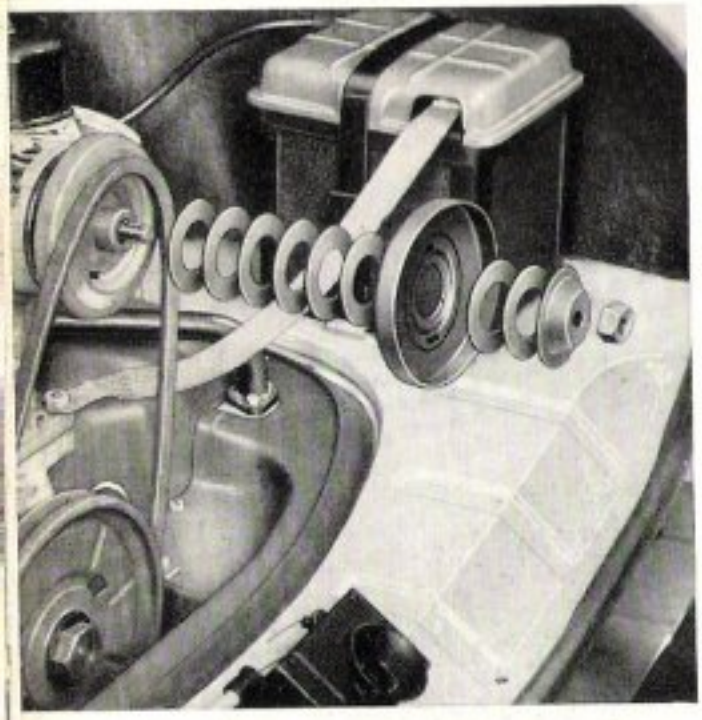
To service the air cleaner, remove it from the intake elbow and take off the upper half. Remove dirty oil from the lower half and refill to indicated level with 0.25 liter (0.53 U.S. pint: 0.44 Imp. pint.) of SAE 20 engine oil. Rinse the filter element in kerosene or any other degreasing fluid and allow the fluid to drain from the filter.

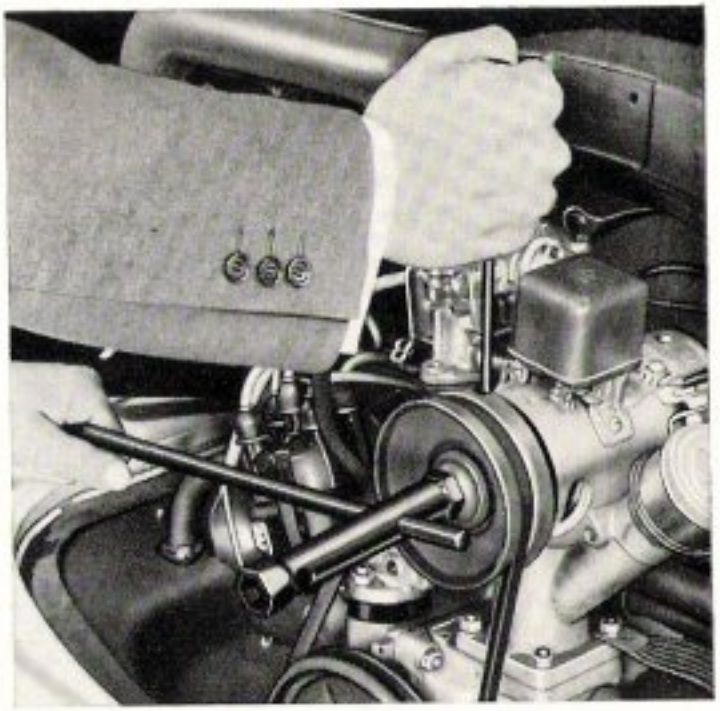
If the car is mainly operating under desert or other extremely dusty conditions, it is up to you to prevent premature wear by servicing the air cleaner more frequently than specified above.

Air cleaner service is overdue if there is no thin oil above the sludge and dirt which has accumulated in the fluid reservoir.

Adjusting or Replacing the Fan Belt

To adjust or replace the fan belt, remove nut and outer half of generator pulley. When loosening or tightening nut, insert a screwdriver in the slot cut into the inner half of the pulley, and support it against upper generator housing bolt. The adjustment of the fan belt tension is effected by means of spacer washers





situated between the two pulley halves. Belt slackness is taken up by removing one or more washers. If the belt is too tight, one or more washers should be added.

The fan belt should not be too slack, nor should it be too tight. Newly installed belts will stretch to some extent and should, therefore, be checked and adjusted after 500 kilometers (300 miles) of initial operation. Further adjustment is not necessary as the tension will not alter any more.

Be sure you are never without a spare belt.

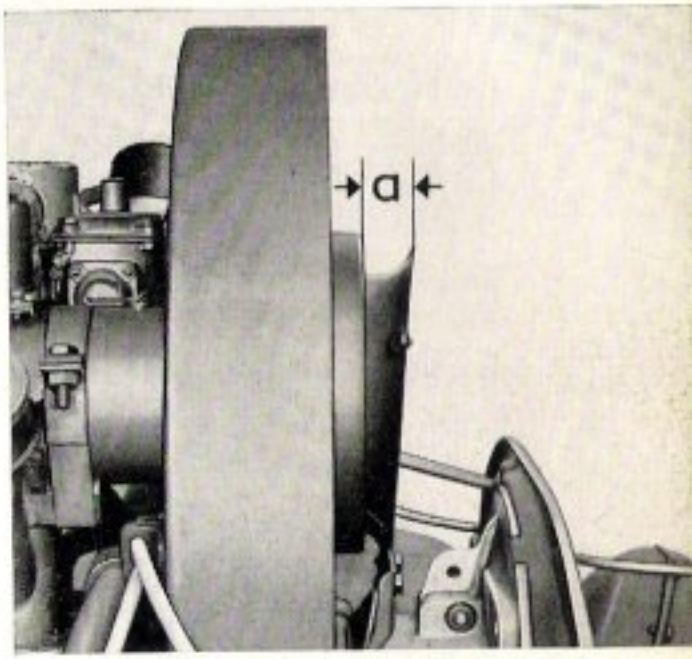
Check automatic air intake control

Incorrect adjustment of the throttle ring is responsible for the engine warming up too slowly or overheating. If the throttle ring opens too far, it may foul the fan resulting in considerable noise.

The automatic air intake control is correctly adjusted if

1 - the throttle ring rests slightly pre-loaded against the air intake flange when the engine is cold.

2 - with the engine warm, the distance from the top edge of the air intake flange to the edge of the throttle ring measures 25—30 mm./1—1.2 in.(a) when the upper end of the thermostat in the right lower heater channel touches the stop of the support.



Checking Adjustment

1 - Warm up the engine until the upper end of the thermostat touches the stop of the support.

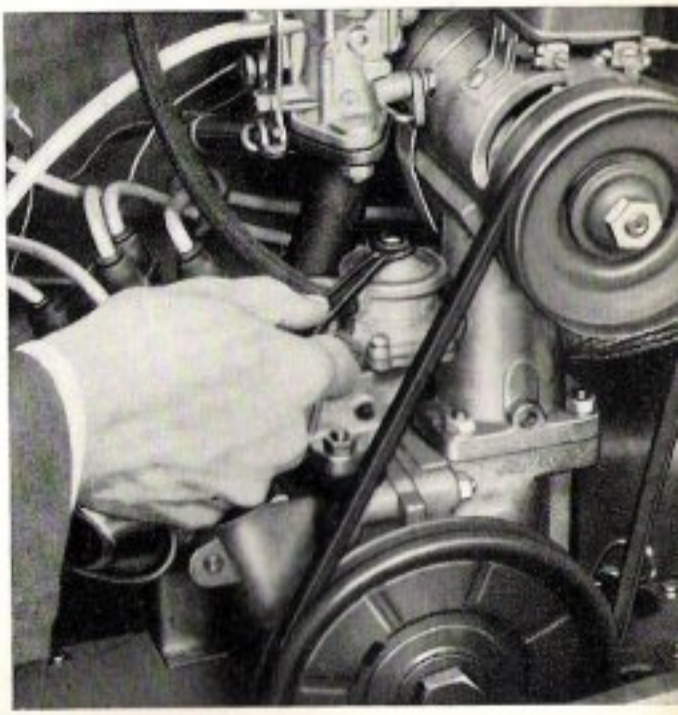
2 - Unhook throttle ring return spring.

3 - Loosen throttle ring operating lever.

4 - Adjust throttle ring so that it opens 25 mm. (1 in.).

5 - Tighten operating lever and insert return spring.

6 - Check the automatic air intake control for proper functioning.



Cleaning the fuel Filter

The fuel pump filter prevents foreign matter and dirt from entering the carburetor.

The filter should be cleaned at the prescribed intervals.

1 - Remove retaining screw by means of an 8 mm. open end wrench and take off cover.

2 - Take out filter and wash out in benzine.

3 - Dry filter thoroughly and install it. The reinforcement ribs should be at the top.

4 - Install cover, and tighten retaining screw making sure the gasket is not omitted.

Carburetor Adjustment

The carburetor is tested at the factory and properly adjusted to the engine. Do not alter this adjustment by exchanging the jets for other than the prescribed sizes. This would be detrimental under normal operating conditions.

Only the idling of the engine may call for a readjustment occasionally.

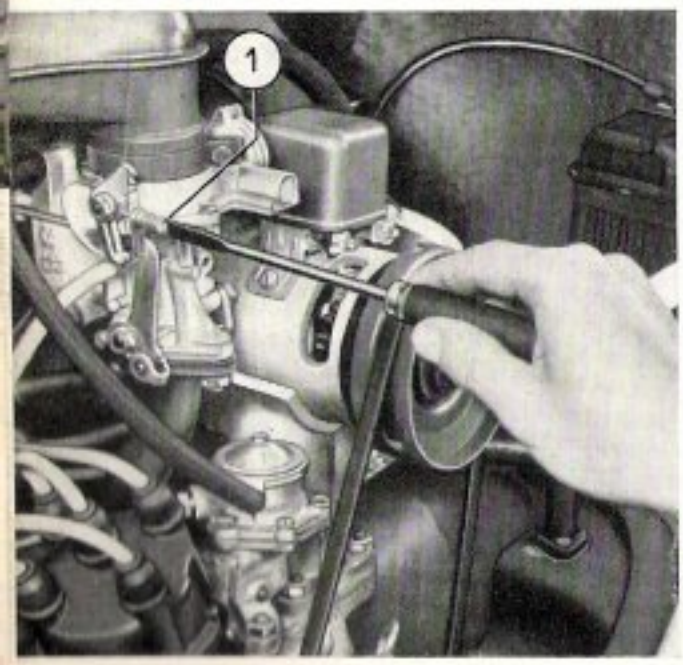
The engine must be warm when adjusting the carburetor.

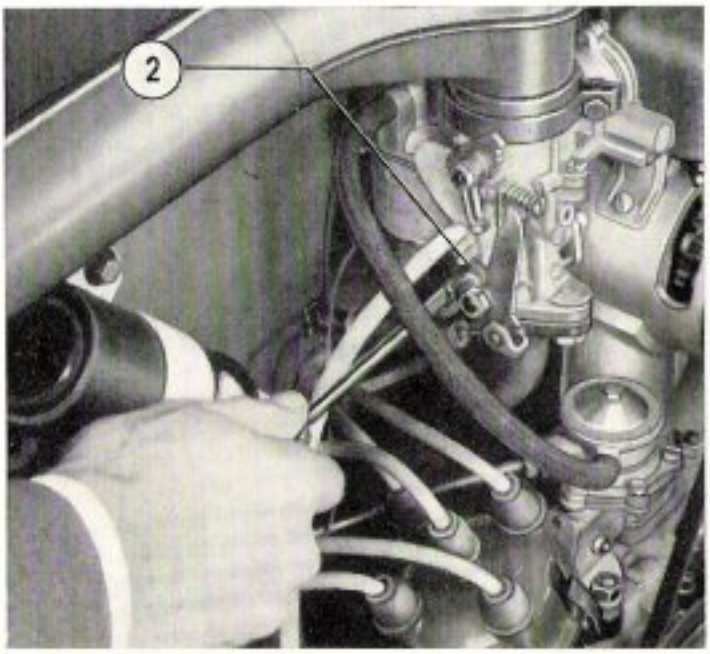
Check that the idling adjusting screw is no longer resting on the fast idle cam of the automatic choke.

1 - Turn the idling adjusting screw (1) in or out until normal idling speed is attained (about 550 RPM).

2 - Gradually turn in the volume control screw (2) until the engine just tends to stall, then back it off by 1/4 to 1/3 turn.

3 - Finally re-adjust the idling speed.





The adjustment is correct if the engine does not stall when the throttle is suddenly opened and closed with the clutch pedal depressed. Poor idling may also be the result of damaged gaskets, intake manifold flanges not sufficiently tightened faulty ignition or leaky valves. Skill and experience are required to check and adjust the carburetor, automatic choke and the accelerator pump. For this reason you should leave this job to an Authorized VW Dealer.

Adjustment of Valve clearance

The following procedure should be carried out only in emergencies where it is impossible for you to reach a VW Dealer.

Remove cylinder head cover.

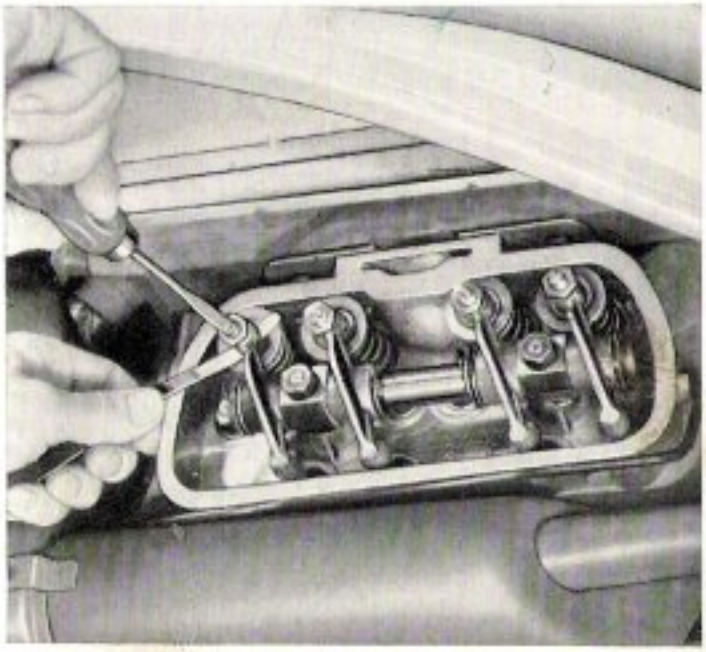
Valve clearance should be 0.20 mm. (0.008") for the intake and exhaust valves with the engine cold.

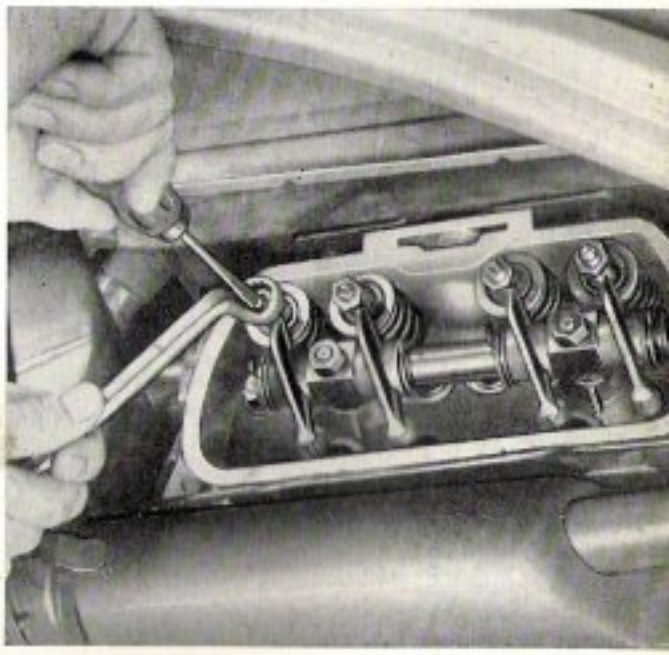
Only adjust valve clearance when the engine is cold.

The arrangement of the cylinders can be seen by the numbers 1 to 4 indented in the cover plates.

Valve adjustment may be made in the following sequence: No. 1 - 2 - 3 - 4 cylinder.

Adjust the valves when the piston of the corresponding cylinder is in top dead center position of the compression stroke. Starting with No. 1 cylinder, crank the engine over slowly to the left by the fan pulley, until both valves are in fully closed position and the timing mark on the pulley is in line with the crankcase joint.

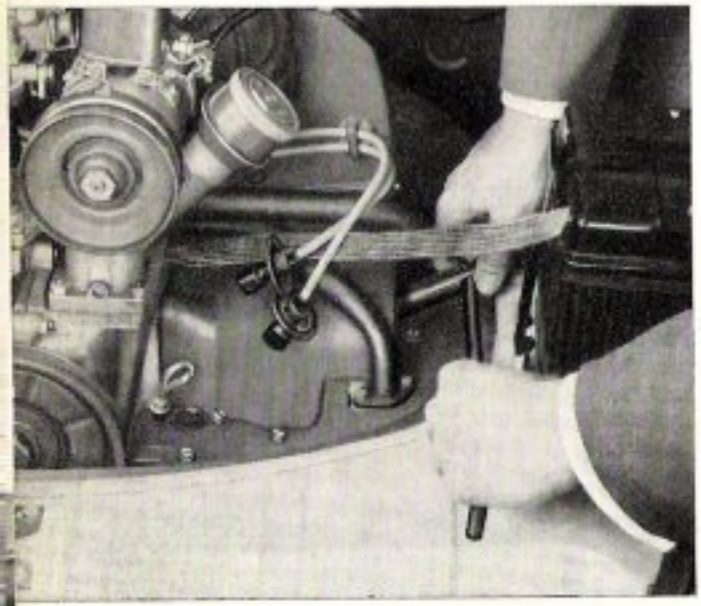


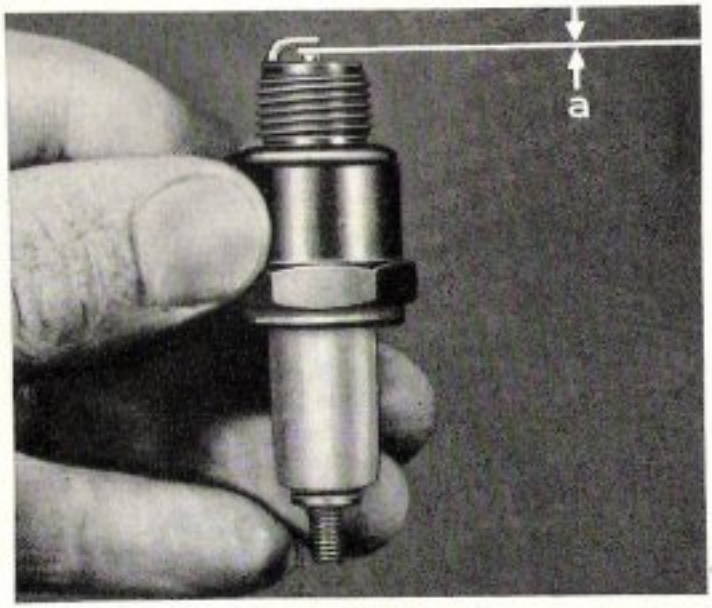


If the clearance requires adjustment, loosen the lock nut of the adjusting screw and turn the adjusting screw as required to obtain the proper clearance. Tighten the lock nut and recheck the clearance. Readjust if necessary. Check and adjust the other valves to the proper clearance in this manner by turning the crankshaft anti-clockwise another 180° for each cylinder.

Checking the Spark Plugs

The spark plugs must be thoroughly maintained for easy starting and economical operation. Remove the plugs and inspect their exterior.





a = 0.7 mm, (.028")

Electrodes and insulator

medium grey — good adjustment of carburetor and correct performance of spark plug,

black — mixture too rich,

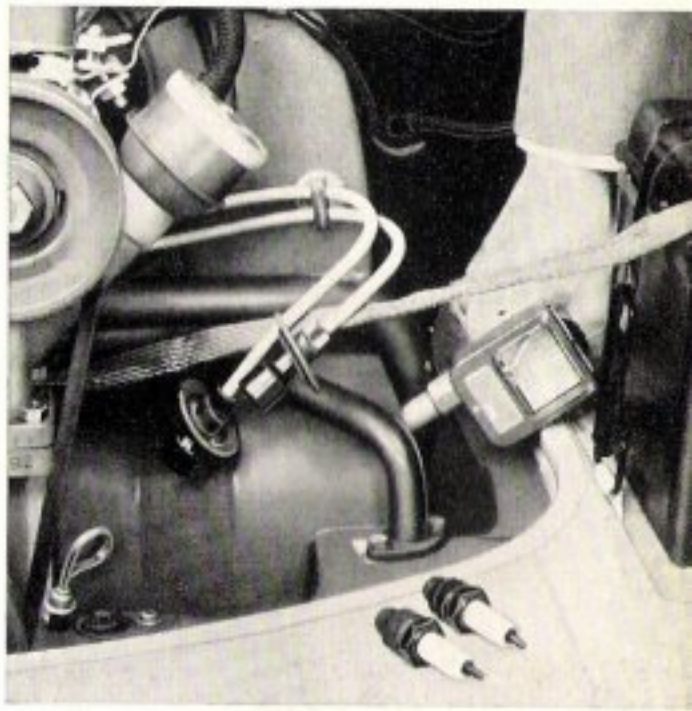
light grey — mixture too lean,

oiled up — failure of spark plug or ring blow-by.

Clean the spark plugs with a brush and a chip of wood and blow them out. Inspect the spark plugs for cracked insulators and burned or pitted electrodes. The insulator should be clean and dry on the outside as well to avoid short circuits.

Check the electrode gap (0.7 mm. = .028") and reset if necessary by bending the outer electrode. Do not forget the plug gasket. Generally speaking, you may count on a service life of the spark plugs up to 15 000 km. (9000 miles).

Check Compression



After warming up the engine, remove all 4 spark plugs. Operate the starting motor with the accelerator pedal fully depressed that is with the throttle in a wide-open position.

The compression is checked by means of an accredited compression gauge inserted into the spark plug hole of each cylinder.

Result: good . . . . 7.0—9.0 kg./sq. cm. (100—128 lbs./sq. in.)

satisfactory . 4.5—7.0 kg./sq. cm. (65—100 lbs./sq. in.)

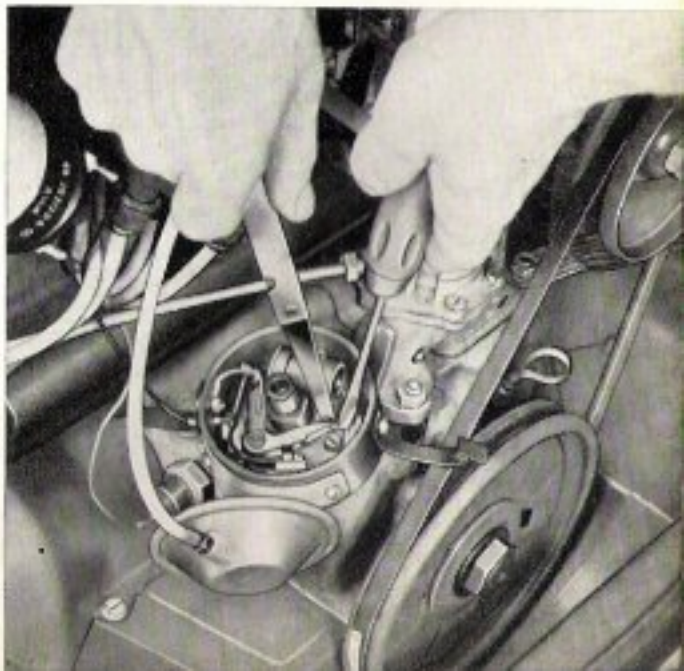
poor . . . . below 4.5 kg./sq. cm. (65 lbs./sq. in.)

Ignition Timing

Particular attention should be attached to the importance of correct ignition timing. The operation of the engine will be seriously affected if the ignition breaker points are not properly timed and correctly spaced. In many cases poor performance, high fuel consumption and even severe damage to the engine can be the result of incorrect ignition setting. The ignition must not be advanced arbitrarily, not even when using premium grade fuels.

Adjust the ignition with the engine cold.

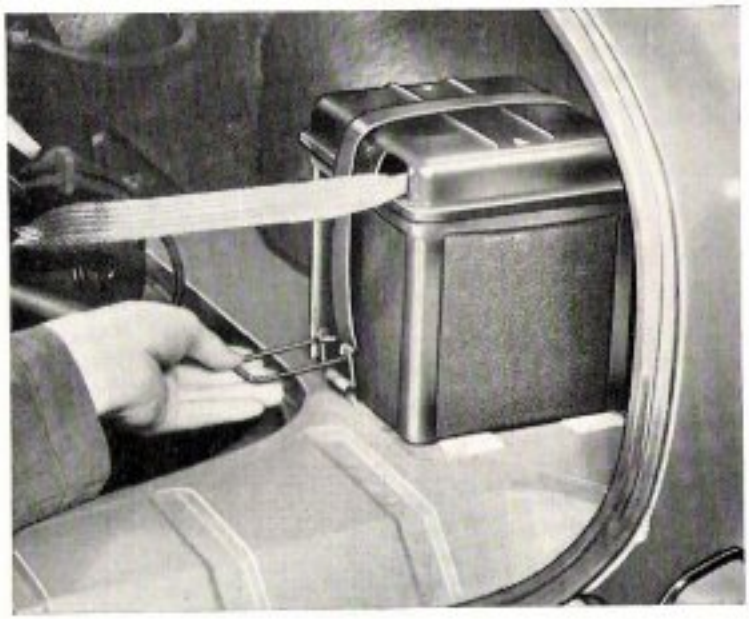
Adjusting Contact Points



Remove distributor cap and rotor. The breaker contact points are adjusted by cranking the engine until the fiber block on the contact arm rests on the highest point of the cam lobe. Then loosen the fixed point locking screw and insert a screwdriver between the two small lugs on the contact plate and the slot in the fixed point arm. Turn the screwdriver to adjust the gap to the correct clearance of 0.4 mm. (0.016").

Battery Maintenance

The battery is located in the engine compartment, where it is easily accessible for servicing. Ready starting of the engine depends upon perfect condition of the battery. Inspect the battery regularly as prescribed. The battery cover can be easily removed after the strap fastener has been opened.



The battery should be checked with a cell tester. This is a voltmeter in parallel with a heavy resistance. The voltage of each cell should not fall below 1.6 volts while taking the reading (10—15 seconds). Otherwise the cell is discharged or defective. Under no-load conditions each charged cell should read 2.0 volts.

Add distilled water to each cell to bring the level to approximately 5 mm. (.2") above the plates. Losses by evaporation may only be replenished by adding distilled water. Never add acid, unless it is known that acid has been spilled from the battery. Check specific gravity afterwards and compensate if necessary. Adjust the acid level accordingly (i. e.) up to the lower edge of the insert or above the level indicator bar.

When laying your vehicle up for a prolonged period, it is advisable to take the battery to a workshop for storage. A battery which is not in constant use will discharge itself in time and this can result in permanent damage to the plates if the battery is not checked about every 4 weeks and charged as necessary.

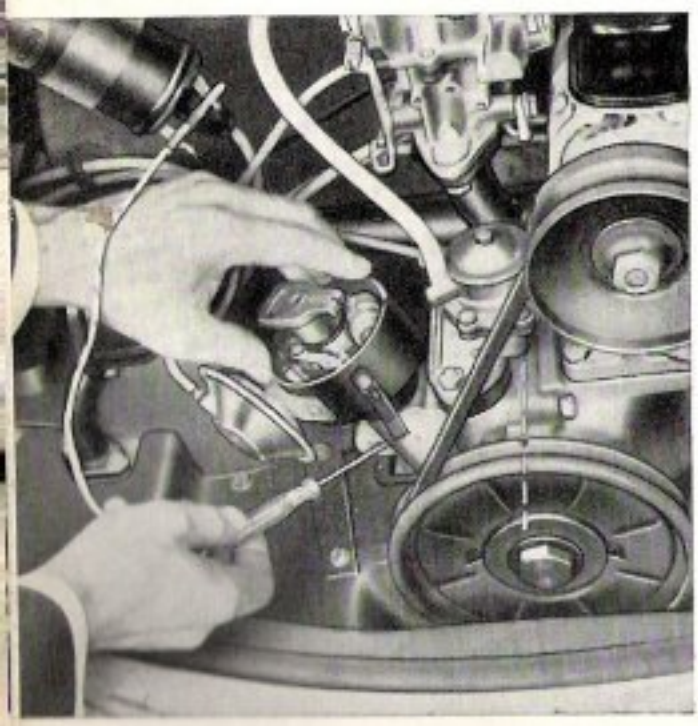
Tighten lock screw and recheck the gap. If the points are burned, rough or pitted, replace them. The distributor cap should be clean and dry to avoid short circuits.

Do not forget to replace the rotor.

After the contact points have been adjusted, it is absolutely necessary to check the ignition timing with the engine cold.

Ignition Timing

Crank the engine clockwise until the right-hand mark on the crankshaft pulley lines up with the vertical crankcase joint and the distributor rotor arm points to the No. 1 cylinder mark on rim of distributor body. Loosen the clamp screw below the distributor and rotate the distributor body clockwise until the contact points are closed. Now switch on the ignition and rotate the distributor slowly anti-clockwise until the contact points just start to open.



This may be seen and heard, for a spark will jump from one point to the other.

To obtain a more accurate adjustment for maximum results, it is advisable to use a test lamp or an ignition timing light.

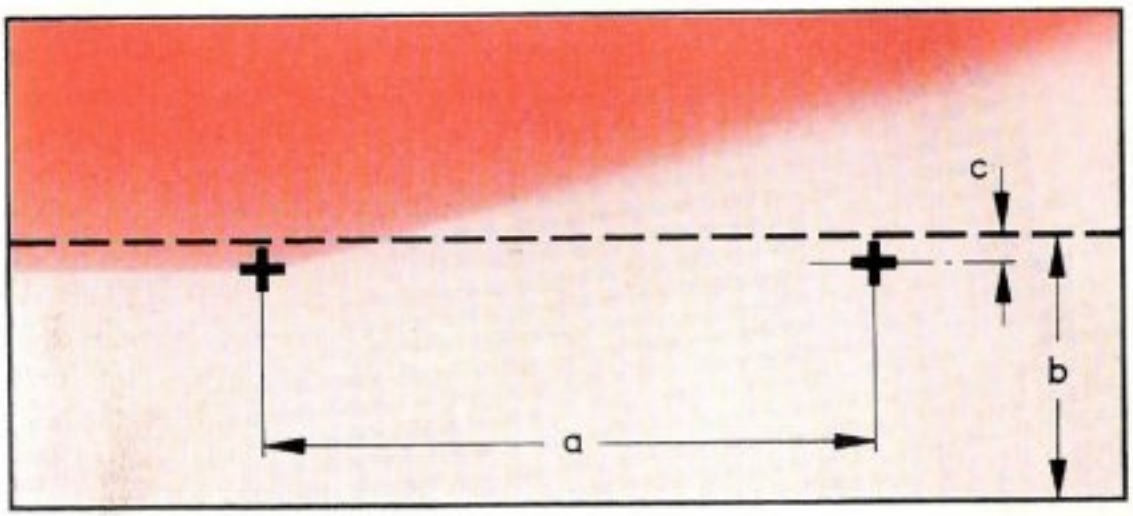
The test lamp should be connected to the coil primary lead terminal and to ground. The lamp will light up as long as the contact points are kept open by one of the four cam lobes of the distributor shaft. After the adjustment is completed, tighten the lock screw, replace the cap on the distributor. Check the ignition timing again.

Aiming the Headlights

If no headlight aiming device is available, proceed as follows:

1 - Position the car on level ground with a dark-colored vertical screen 5 m. (16.5') ahead. The tire pressures must be correct.

2 - Next draw two cross lines on the screen according to the sketch.



Dimensions: a = 1240 mm. (48.8''), b = the height of the headlamp center from the floor, c = 50 mm. (2''), at a distance of 5 m. (16 ft. 5 ins.) from the aiming screen.

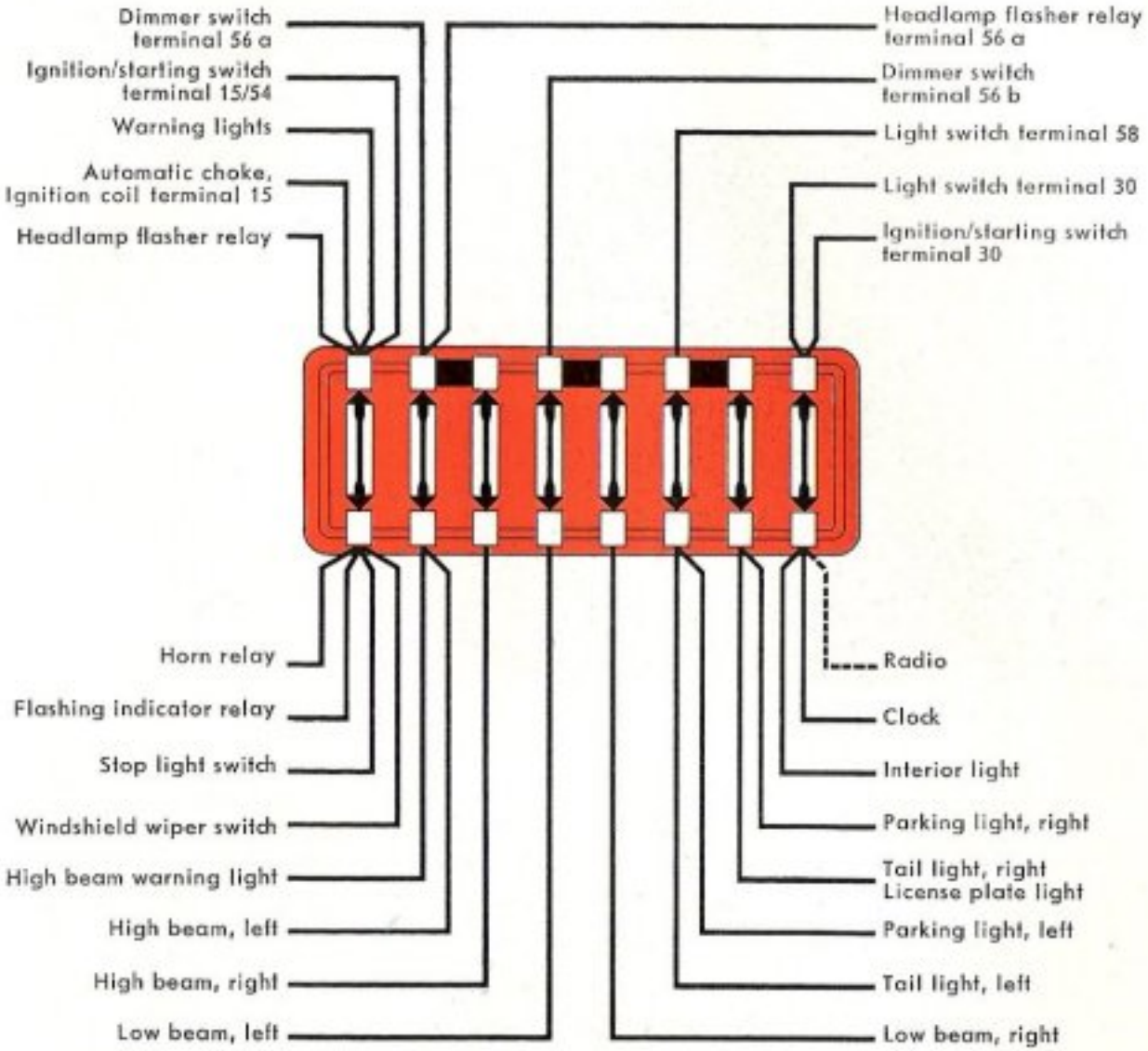
3 - The longitudinal center line of the vehicle must be aligned exactly between the two crosses on the screen.

4 - The rear seat must be loaded with one person or a weight of 70 kg. (154 lbs.).

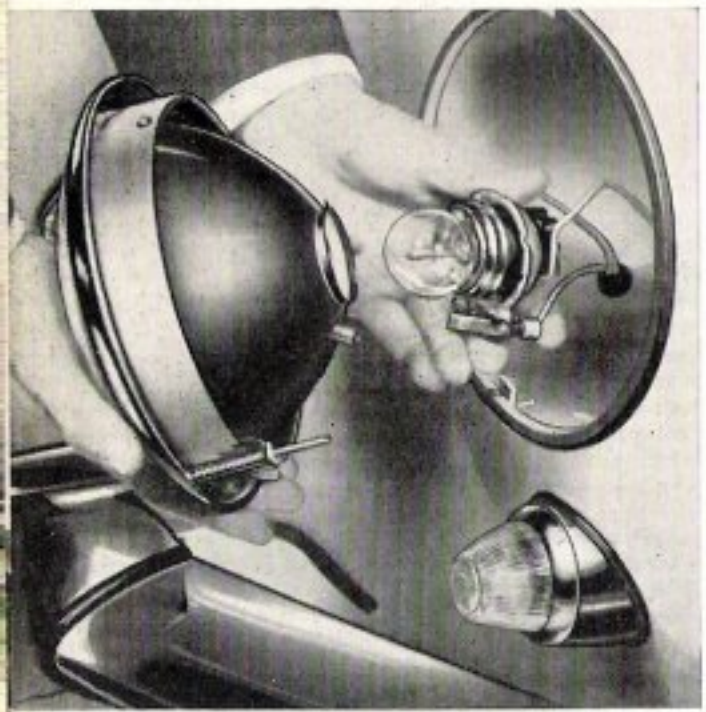
5 - The headlamp beam should be adjusted horizontally and vertically when dimmed.

6 - Each lamp must be adjusted separately with the second lamp covered up.

7 - To adjust the beams, remove the slotted screw in the center of the trim ring below the headlamp and take the ring off. The adjustment is then carried out by means of the adjustment screws in the headlamp rim.



Fuse box under the instrument panel



Vertical Adjustment

The headlamps should be aimed vertically so that the light-dark border line is horizontally on the adjusting line to the left of the cross and slopes upward to the right of the cross.

Horizontal Adjustment

The headlamps should be aimed horizontally so that the angle on light-dark border line is exactly on the center of the cross.

Headlight Bulb Replacement

Remove the slotted screw at the bottom of the trim ring and unhook the ring from the top engagement to remove. Loosen the fixing screw at the bottom of the light unit rim and pull out the light unit. Turn the cap to the left und take the holder out of the reflector. Pull the connector off the bulb base and replace the bulb.

When installing the lamp unit check that:

1 - The lug in the lamp holder engages in the notch provided in the reflector.

2 - The contact strip is located on the base of the parking light bulb.

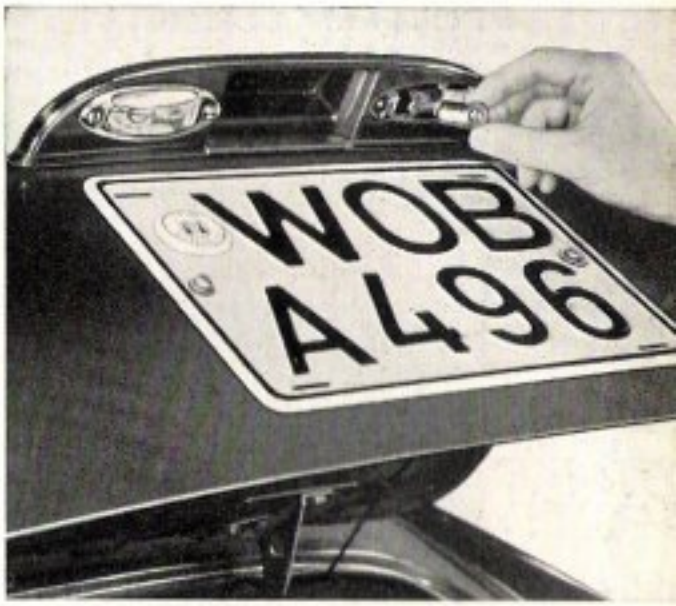
Do not touch the bulb with the bare hand, but use a clean cloth or paper serviette etc., instead.

Front Flashing Indicator Bulb Replacement

Remove the two slotted screws and take off bezel, lens, and rubber seal. Replace the bulb. When tightening the nut, make sure the rubber seal seats properly between bezel and fender.

License Plate Light Bulb Replacement

The license plate light bulbs are accessible after opening the engine comparment hood. Remove the lens and replace the bulb. When installing make sure that the rubber seal is correctly seated.



Tail, Stop and Flashing Indicator Light Bulb Replacement

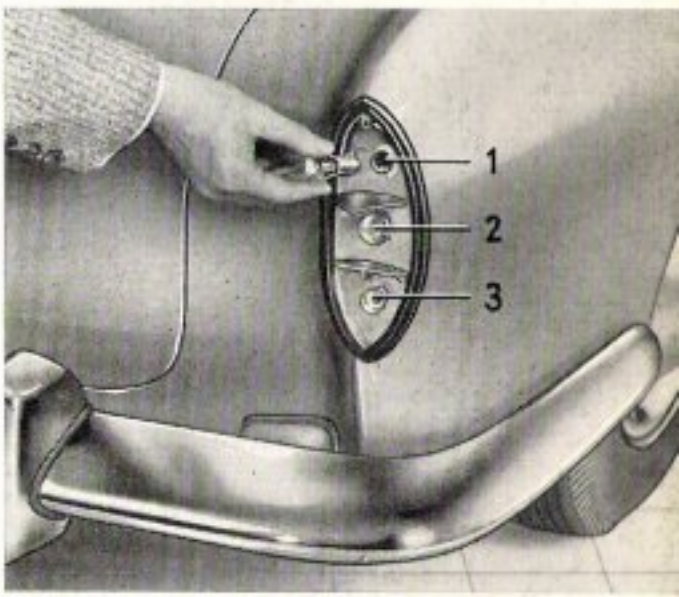
To replace the bulbs of the tail/stop/flashing lights in the rear wings, remove the slotted screws and take off the lenses.

1 - Flashing indicator bulb

2 - Stop light bulb

3 - Tail light bulb

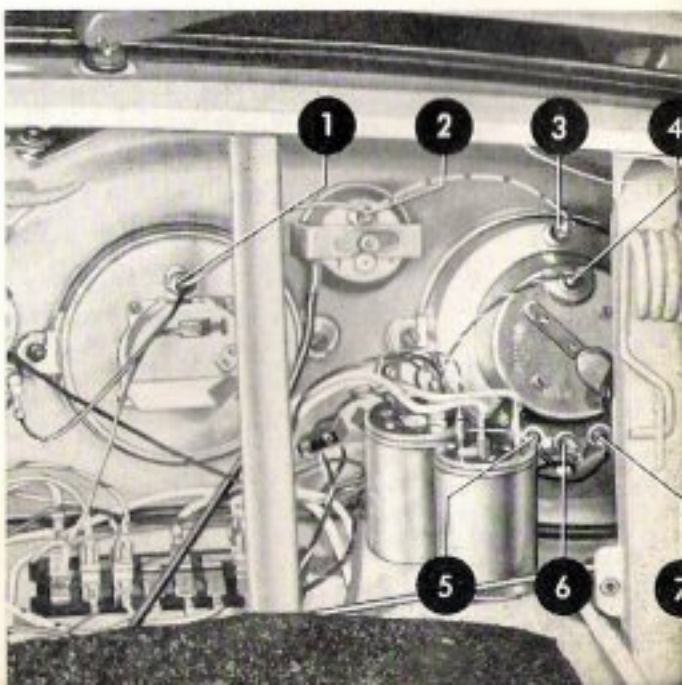
Be sure the bulbs make perfect contact in their sockets and the rubber seal fits properly.



Warning and Instrument Light Bulb Replacement

The warning lights for oil pressure, generator charging, flashing indicators, and headlight high beam, as well as the speedometer, clock and fuel gauge lights, are accessible after lifting the front hood and removing the cover in front of the instrument panel. The bulb sockets can easily be pulled out from their holders.

1 - Clock lighting bulb
2 - Fuel gauge lighting bulb
3 - Speedometer lighting bulb
4 - Headlight high beam warning light
5 - Oil pressure warning light
6 - Flashing indicator light
7 - Generator warning light



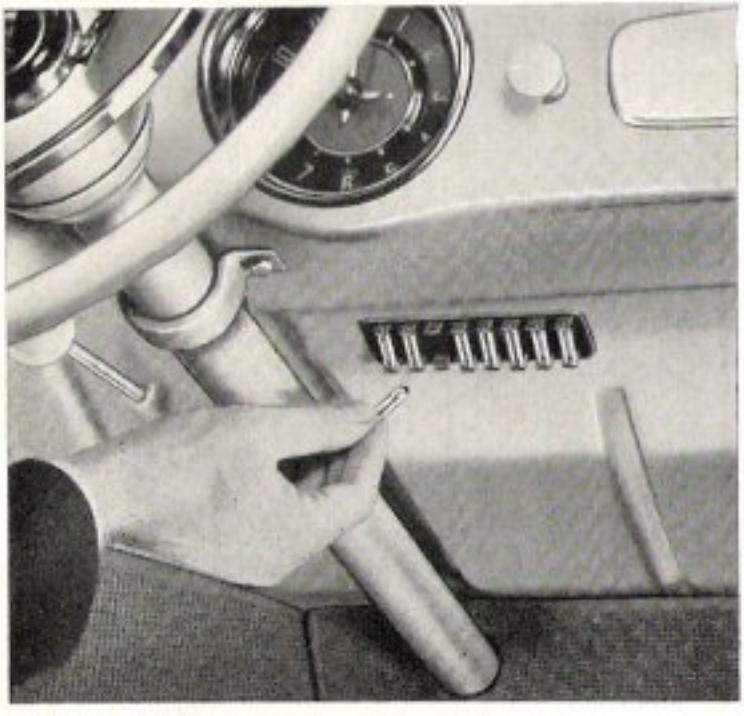
Check condition of the battery posts and the cable terminals. They must be clean and tight to prevent excessive electrical resistance. Use a stiff brush to remove corrosion from both posts and terminals. Coat the clean posts and terminals with light grease to prevent corrosion. Make sure that the battery is properly grounded.

Exchanging Fuses

The fuse box, with transparent cover, is located under the instrument panel near the steering column.

A connector provided with a fuse is in the cable between ignition switch and horn relay.

When a fuse has blown, it is not sufficient merely to replace it by a new one. Inspect the electrical system for evidence of short circuits or other faults that may have caused the fuse to blow. Under no circumstances should you use a fuse



patched up with tin-foil or wire, because this may result in severe damage. We suggest that you carry with you a set of spare fuses (8 amp.).

Checking the Brakes

Excessive brake pedal travel is an indication that the clearance between brake shoes and drum has become too great. The brake shoe linings can be inspected through a hole in the brake drum.

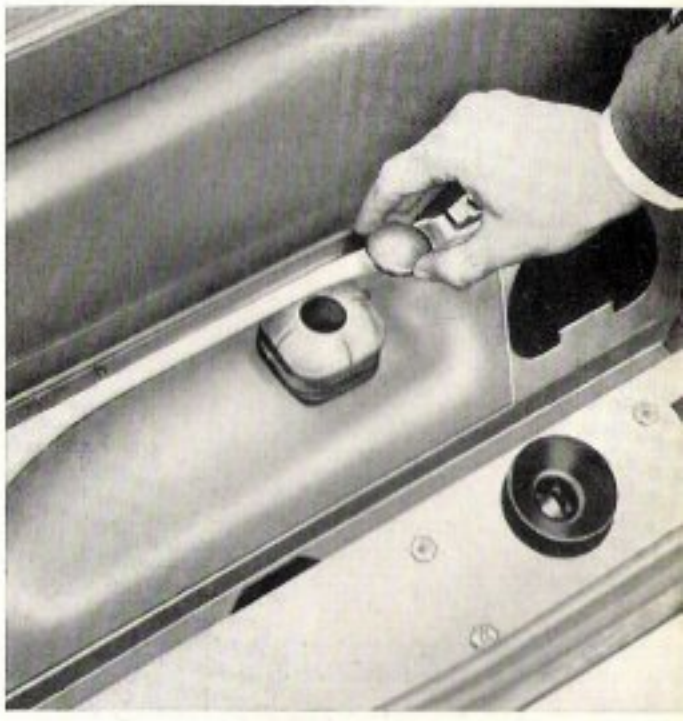
If such a visual inspection, to be carried out every 5000 km. (3000 miles), reveals excessive wear, the linings should be replaced. The thickness of the linings should never be less than 2.5 mm. (0.1").

Brake Adjustment

Brake adjustment should be performed by an Authorized VW Dealer. However, if an emergency arises where the brakes must be adjusted before you can reach the next repair shop, the following procedure is recommended.

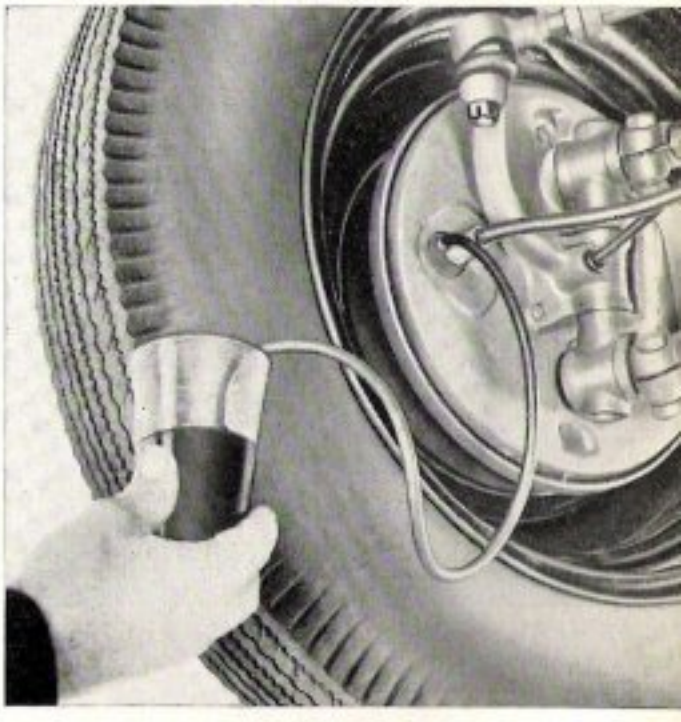
The transparent fluid reservoir is located under the front hood behind the spare wheel. To fill up, use only Genuine VW Brake Fluid. The fluid reservoir should be kept at least 3/4 full at all times.

Handle the brake fluid carefully. It is injurious to the body paintwork.



Bleeding Hydraulic System

The presence of air in the hydraulic brake system will cause "spongy" brake pedal operation.



1 - Remove rubber cap of the bleeder valve of one wheel cylinder and attach one end of the brake bleeder hose to the valve.

2 - Place the opposite end of the bleeder hose in a glass container partly filled with brake fluid so that the end of the hose is submerged.

3 - Turn the bleeder valve to the open position (1—2 turns).

4 - Pump the brake pedal several times, forcing fluid through the lines until bubbles cease to appear in the container. Make sure that enough brake fluid remains in the fluid reservoir during the bleeding operation as otherwise air would be sucked in.

5 - The brake pedal should be kept in the fully depressed condition until the bleeder valve is closed.

6 - Remove the hose. Replace rubber cap.

7 - Repeat the above operations on the other wheels.

When the bleeding is completed, refill the master cylinder reservoir with brake fluid if necessary.

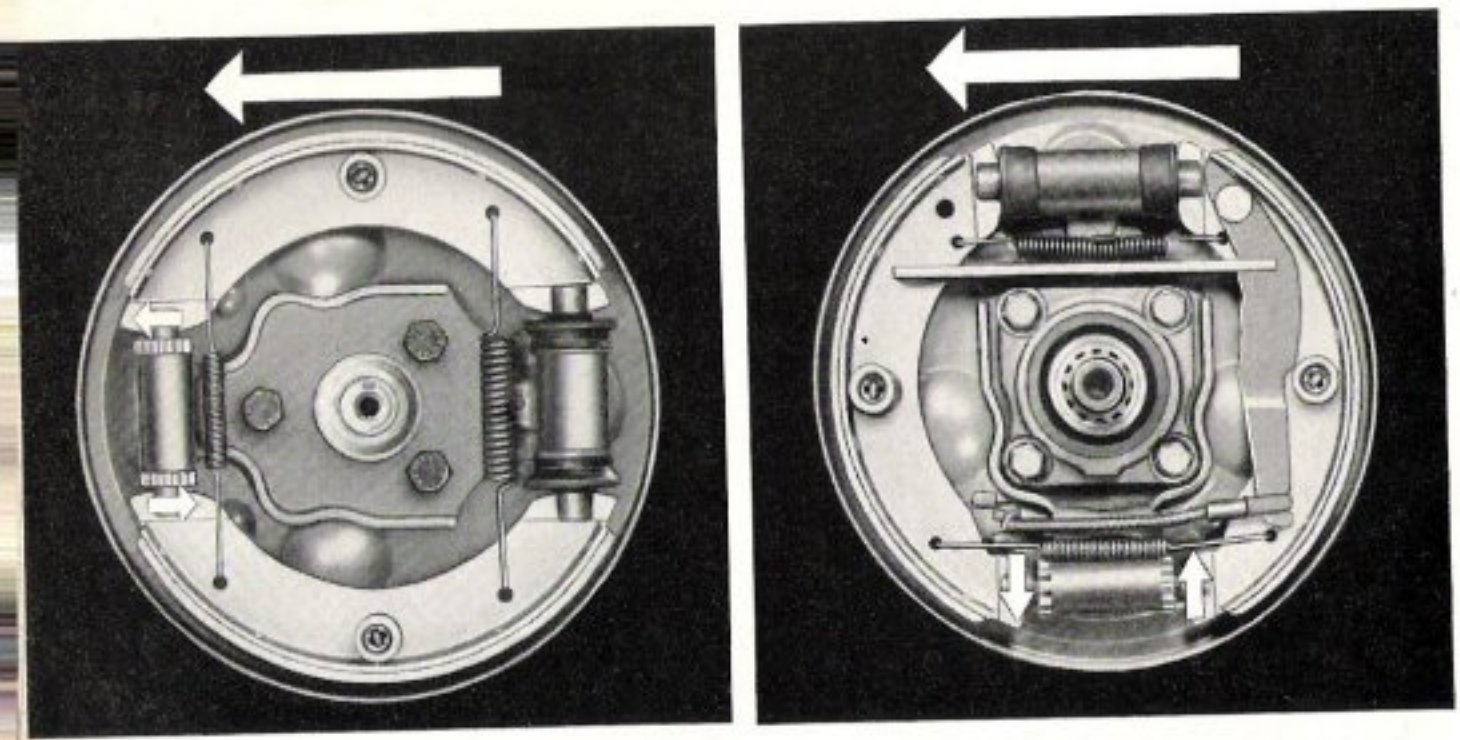
Adjusting Hydraulic Brakes

Excessive brake pedal travel is an indication that the clearance between brake shoes and brake drums has become too great, and consequently, the brakes must be adjusted or relined.

1 - Remove hub caps.

2 - Jack up a wheel and turn it until the hole in the brake drum is in line with one of the adjusting nuts.

3 - Insert a screwdriver through the hole and turn the adjusting nut in the direction indicated by the arrow, using a screwdriver as a lever, until a slight drag is noted when the wheel is turned by hand.



4 - Repeat procedure on the other adjusting nut. Note that the two nuts turn in opposite directions.

5 - Back off the adjusting nuts by 3 to 4 teeth until the wheel can be turned freely.

6 - Repeat the above operations on the other wheels.

7 - Install hub caps and make sure they are tightly seated.

Before and after adjusting the brake shoes it is advisable to depress the brake pedal firmly so that the brake shoes are properly seated in the brake drum.

When adjusting the rear brakes, the hand brake must be released.

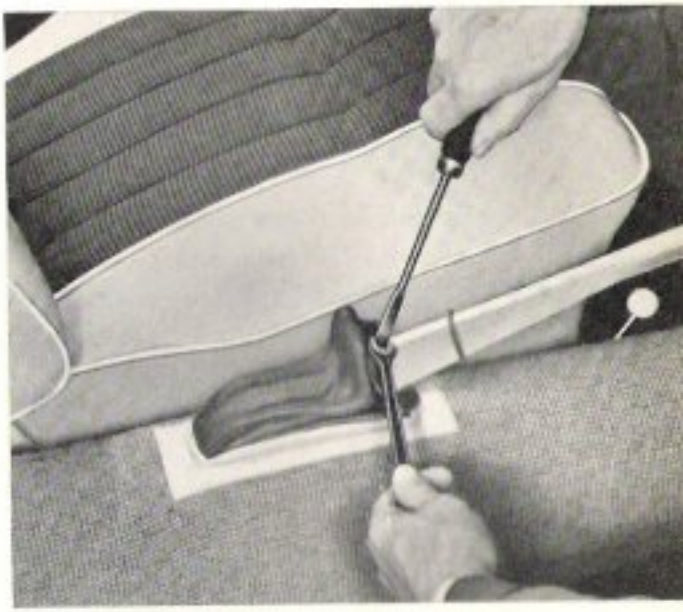
Adjusting Hand Brake

1 - Jack up both rear wheels.

2 - Fold back hand brake lever rubber boot to gain access to the adjusting nuts.

3 - Tighten adjusting nuts on the front ends of the brake cables to a degree which will still allow the rear wheels to turn freely when the hand brake is released.

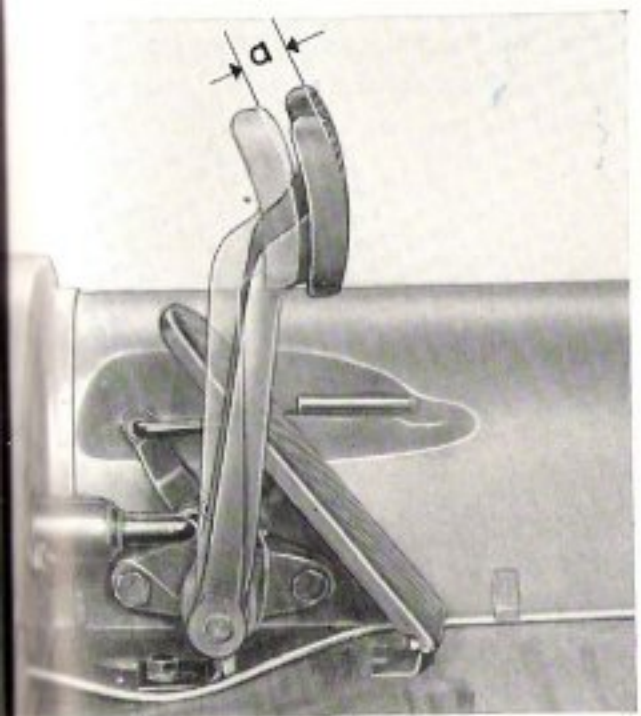
4 - Pull up hand brake lever by two notches and make sure both rear wheels have the same braking effect. At the fourth notch it should be impossible to turn the wheels by hand.



Clutch Pedal Free-play

Easy gear shifting and complete transmission of engine performance to gears and wheels can only be guaranteed if the clutch is adjusted as specified.

Measured at the clutch pedal, this free-play should be 10—20 mm. (0.4—0.8 in.) (a). The clearance may be adjusted at the adjusting nut on the cable end.



1 - Release lock nut on the threaded cable end.

2 - Adjust clutch clearance by turning the adjusting nut. Depress clutch pedal several times and recheck pedal free-play.

3 - When the correct adjustment has been reached, hold adjusting nut in position and tighten lock nut.

4 - Grease clutch cable adjusting nut with Universal Grease.

Steering Gear

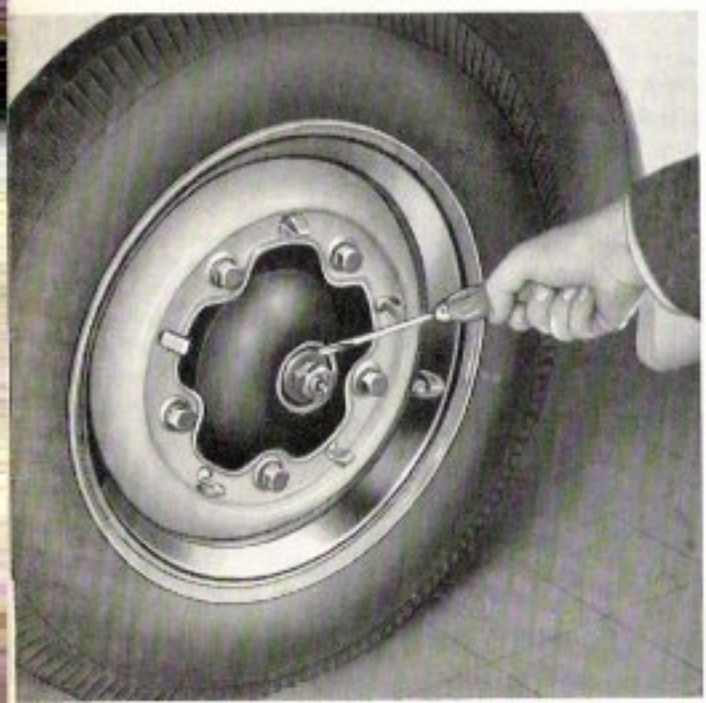
In the center position and up to half a turn of the steering wheel to either side there should be no play in the steering gear. The front wheels must, however, resume the straight ahead position automatically after the vehicle has taken a turn.

To check, move the steering wheel very slightly to and fro and observe the front wheels. The steering adjustment is correct when the wheels react to the smallest steering wheel movement within the given limits.

The adjustment of the steering gear should only be carried out in an Authorized VW Workshop.

Front Wheel Bearings

The front wheel bearings should be adjusted in a VW Workshop only as maladjustment may cause severe damage to the bearings.



If circumstances require the removal of a front brake drum, the front wheel bearings are to be adjusted as outlined below:

Tighten inner nut until the thrust washer can just be moved laterally with a screwdriver and no bearing play can be felt when rocking the brake drum. Incorrect adjustment may ruin the bearings in a short time.

Finally, secure the nuts by bending down the lock plate.

Checking and Adjusting Torsion Arm Link Pins

The torsion arm link pins should be checked and, if necessary, readjusted every 5000 km. (3000 miles).
The front end of the car must be raised so that the weight is taken off the wheels.

Checking

Rock the wheel by hand to check for end play between torsion arm link and torsion arms. If play is present, adjust torsion arm link pins.

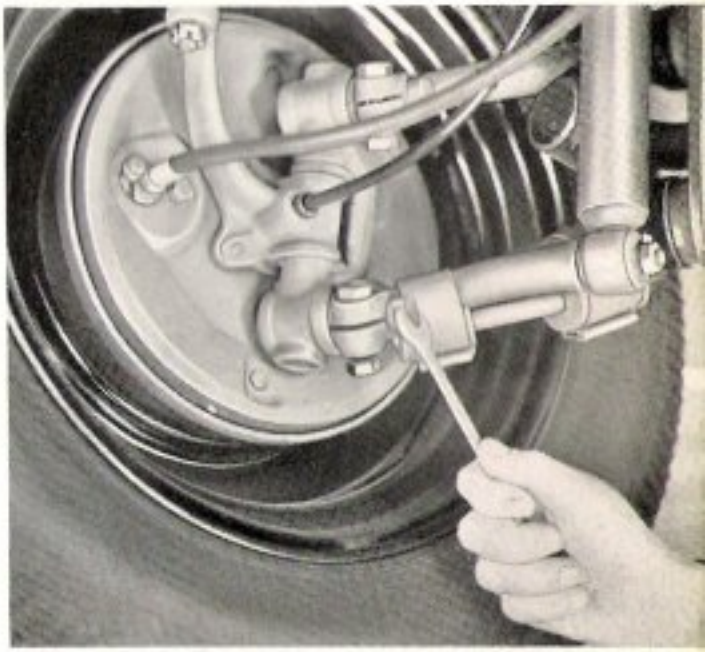
Adjusting

1 - First grease torsion arm link pins thoroughly.

2 - Back off pinch bolts at torsion arm eyes.

3 - Tighten torsion arm link pins fully and then turn back 10° — 12°.

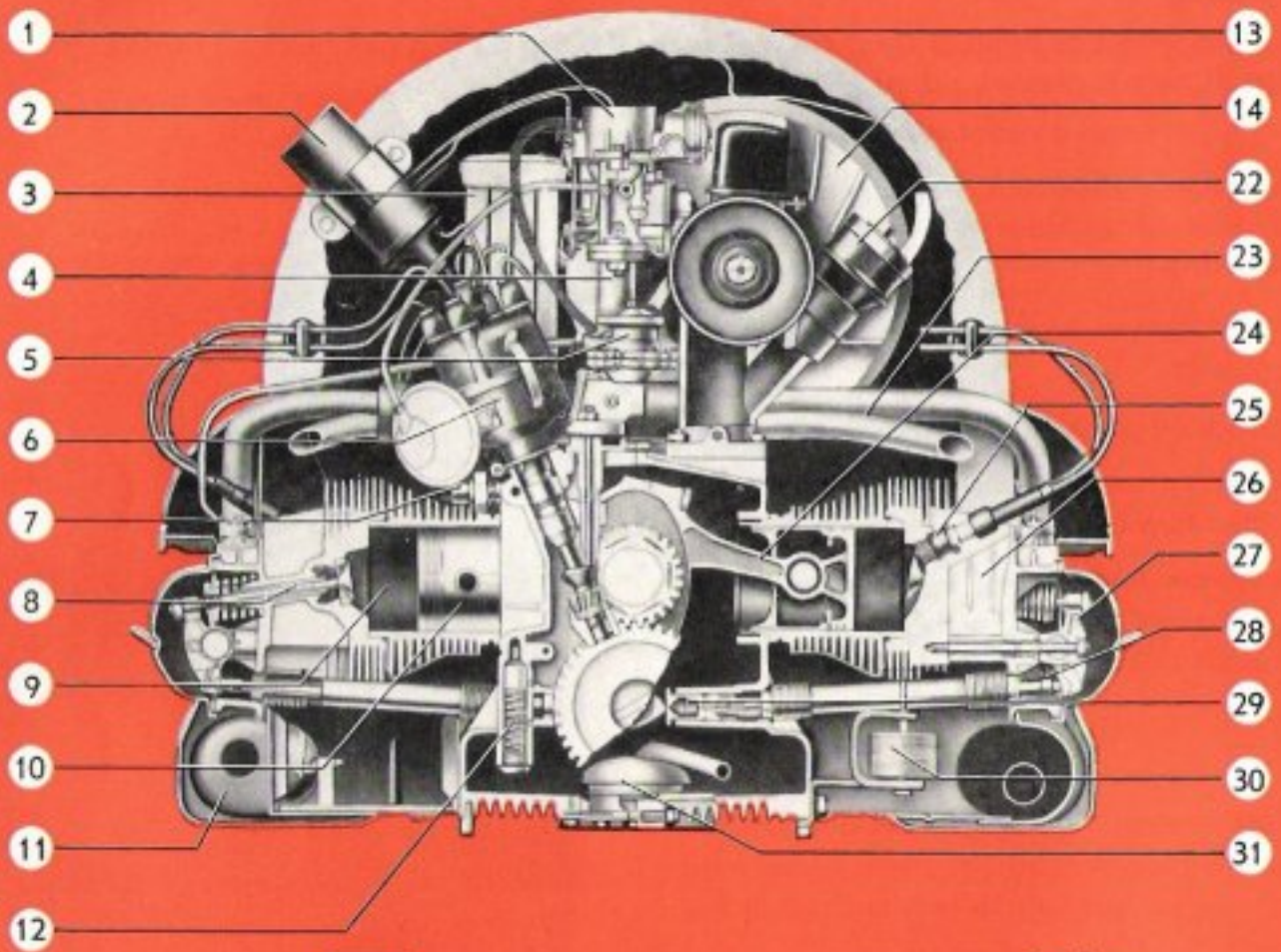
4 - Loosen the pins by tapping lightly on the shaft with a hammer and tighten pinch bolts.

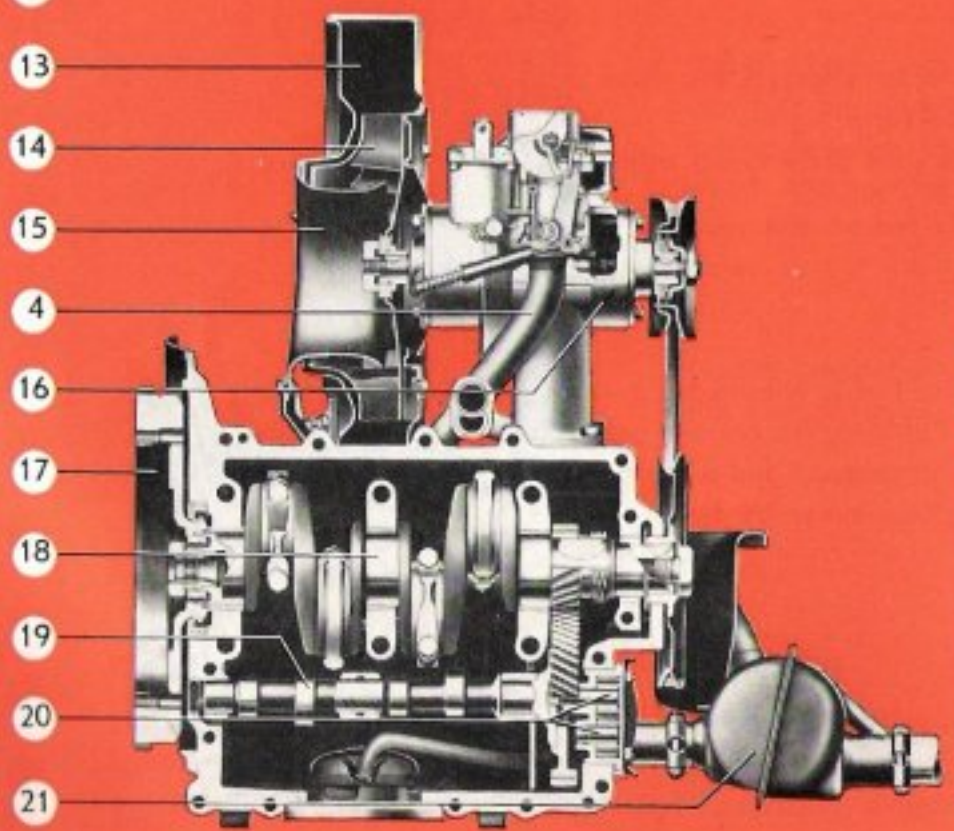


If correct adjustment cannot be effected, the shims are worn and should be replaced by new ones in a VW Workshop.
After the torsion arm link pins have been adjusted, it is absolutely necessary to check the toe-in.

Checking toe-in

With the vehicle empty the toe-in should be 2—4 mm. (0.08"—0.16"). This adjustment of the front wheels can only be carried out satisfactorily in a workshop with the proper gauge for this purpose. If the wheels are not properly toed-in the result will be bad road holding and excessive tire wear.





Engine

1 - Carburetor
2 - Ignition coil
3 - Oil cooler
4 - Intake manifold
5 - Fuel pump
6 - Distributor
7 - Oil pressure switch
8 - Valve
9 - Cylinder
10 - Piston
11 - Heater junction box
12 - Oil pressure relief valve
13 - Fan housing
14 - Fan
15 - Throttle ring
16 - Generator
17 - Flywheel
18 - Crankshaft
19 - Camshaft
20 - Oil pump
21 - Muffler (silencer)
22 - Oil filler and breather
23 - Pre-heating pipe
24 - Connecting rod
25 - Spark plug
26 - Cylinder head
27 - Rocker arm
28 - Push rod
29 - Cam follower
30 - Thermostat
31 - Oil strainer

GENERAL DESCRIPTION

Engine

The engine, located in the rear of the car, is mounted on the recessed flange of the rubber-mounted transmission case. Two pairs of cylinders are horizontally opposed. Each pair has a common cylinder head made of light alloy. The overhead valves are located in the cylinder head and are operated by a camshaft via cam followers, push rods and rocker arms. The short and counter-balanced crankshaft rests in four special light alloy bearings and is heat-treated at its four points of support. It drives the camshaft by means of helical gears. The connecting rods are fitted with lead-bronze bearings. The pistons are made of aluminium alloy.

A down-draft carburetor with automatic choke and accelerator pump supplies the fuel-air mixture to the cylinders. The engine is equipped with battery ignition. The spark advance is controlled automatically by a vacuum mechanism. The oil pump of the pressure lubrication system is driven by the camshaft and sucks the oil from the crankcase through a strainer, and pumps it to the various lubrication points via an oil cooler. In cold weather, when the oil is thicker an oil pressure relief valve makes it possible for the engine to be lubricated directly, that is, by by-passing the oil cooling system.

The air cooling of the engine is effected by means of a fan, which is attached to the extended generator shaft and driven from the crankshaft by a V-belt. The fan sucks in air through an opening in the fan housing, and the air cools the engine by passing through fins. A thermostat regulates the amount of cooling air and ensures well-balanced operating and heating temperatures.

Chassis

The frame of the car is of pressed steel. The steel floor of the frame is formed in two pieces. These two pieces are spot-welded together with the channel-shaped center section of the frame, the forked rear end of which serves to support the transmission and engine unit. The following parts pass through the center of the frame:

Gearshift rod, fuel line and the handbrake, clutch, throttle and heater cables.

The front suspension is an independent parallel arm type, using torsion bar springs. The front axle is bolted to the front end of the frame and consists of two rigidly joined tubes, which carry the torsion bar springs and the upper and lower arms of the front wheel suspension. A stabilizer is attached to both lower torsion arms. Rubber stops prevent the suspension bottoming. The steering gear acts on the front wheels via a divided tie-rod. A steering damper ensures steering steadiness. The rear axle is of the swinging half axle design. The rear wheels are also independently sprung, using one individual torsion bar spring on each side. Double-acting hydraulic shock absorbers in front and rear prevent excessive rebound.

Transmission and Rear Axle

Power from the engine is transmitted to the gears via a dry single-disc clutch. The transmission case incorporates four speeds forward, one reverse, and the differential.

The car is equipped with synchromesh on all forward gears. The gear teeth are helically cut to provide silent operation.

The drive pinion and ring gear teeth are cut spirally. The two swinging rear axle shafts are flexibly supported in the differential housing.

Brakes

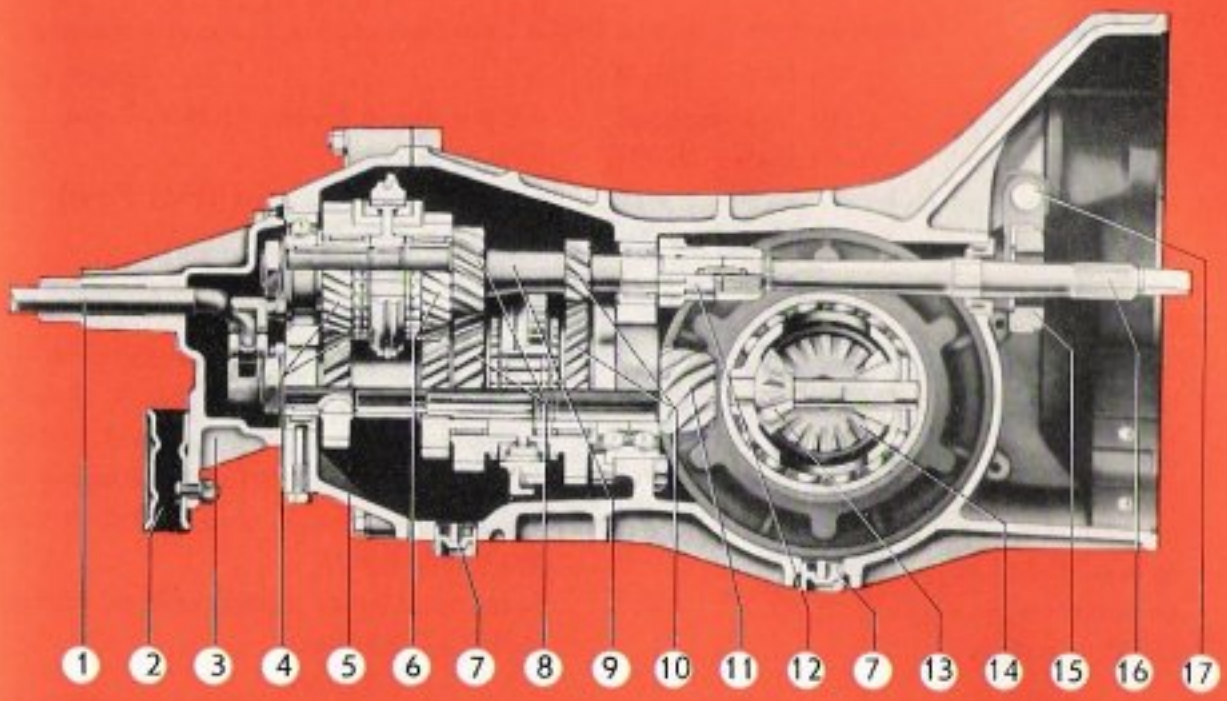
The car is equipped with direct acting hydraulic brakes operating on all wheels. The hand brake acts mechanically on the rear wheels.

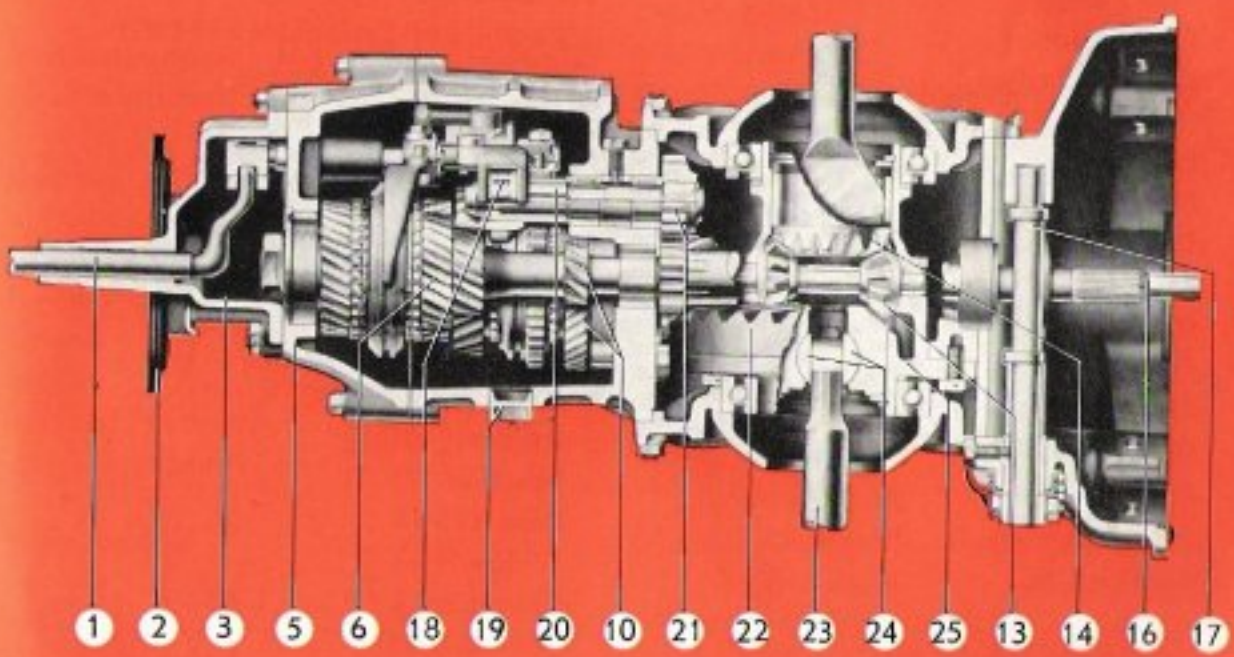
Body

The two-door body, of streamlined shape, is made of pressed steel panels electrically welded together. The fenders are welded to the body. The doors contain window regulator mechanisms. The front seats and the rake of their backrests are adjustable to suit individual requirements. Luggage space is provided behind the rear seats and under the front hood. Fuel tank and spare wheel are accommodated under the front hood. The hood locks are released by pulling knobs from inside the car.

Heating System

Heated air, which is taken from the air flow warmed up by the engine, is emitted through two openings at the foot level, two defroster vents at the windshield and one defroster vent in front of the rear window. The heating system can be controlled from the driver's seat by means of a rotary knob. The two ventilators are individually operated by means of two levers under the instrument panel. The air flows enter the interior through the two defroster vents at the windshield. Thus, fresh air can be mixed with the heated air in the desired proportions. Hinged rear quarter windows provide draught-free ventilation.





Rear Axle and Transmission

1 - Transmission shift lever
2 - Bonded rubber mounting
3 - Gearshift housing
4 - 4th speed
5 - Gear carrier
6 - 3rd speed
7 - Oil drain plug
8 - 2nd speed
9 - Main drive shaft, front
10 - 1st speed
11 - Drive pinion
12 - Reverse gear on main drive shaft
13 - Differential pinion
14 - Differential side gear
15 - Clutch release bearing
16 - Main drive shaft, rear
17 - Clutch operating shaft
18 - Reverse sliding gear
19 - Oil filler plug
20 - Reverse shaft
21 - Reverse drive gear
22 - Ring gear
23 - Rear axle shaft
24 - Fulcrum plate
25 - Differential housing

TECHNICAL DATA

Engine

Design	4 Cylinder, 4 Cycle, O.H.V.-Type, in rear of car
Arrangement of Cylinders	Horizontally opposed (Flat Four)
Bore	77 mm. (3.031")
Stroke	64 mm. (2.520")
Capacity	1192 c. c. (72.74 cu. in.)
Compression Ratio	7.0
Valve Clearance	Intake 0.20 mm. (0.008") — to be adjusted when Engine is cold
	Exhaust 0.20 mm. (0.008") — to be adjusted when Engine is cold
B. h. p. (SAE)	40 at 3900 R.P.M.
Lubrication	Force feed (gear pump) with oil cooler
Oil Capacity	Metric — 2.5 liters
	U.S. — 5.3 pints
	Imp. — 4.4 pints
Fuel Pump	Mechanical Type
Carburetor	Down-Draft Type, Solex 28 PICT
Cooling System	Air cooling by fan, Thermostat-controlled
Battery	6 Volts, 66 Ampere hours
Starting Motor	Electric, 6 Volts, .5 HP.
Generator	Voltage regulated, 6 Volts, 180 Watts at 2500 R. P. M.
Ignition Distributor	Vaccuum spark advance
Firing Order	1—4—3—2
Spark Timing	10° before T. D. C.
Breaker Point Gap	0.4 mm. (.016")
Spark Plugs	Bosch W 175 T 1 — 14 mm. thread
	Beru 175/14 — 14 mm. thread
	Lodge H 14 — 14 mm. thread
	Champion L 10 S or L 85 — 14 mm. thread
	Firestone 147 — 14 mm. thread
	AC 43 L — 14 mm. thread
	Auto-Lite AE 6 or AER 6 — 14 mm. thread
	KLG F 70 — 14 mm. thread
Spark Plug Gap	0.7 mm. (.028")

Clutch

Design	Single disc, dry
Pedal Free-Play	10 to 20 mm. (.4" to .8")

Transmission

4 Forward speeds, synchronised and silent running, and reverse.

Gear Ratios	First	3.80 : 1
	Second	2.06 : 1
	Third	1.32 : 1
	Fourth	0.89 : 1
	Reverse	3.88 : 1

Rear Axle

Power is transmitted through a spiral drive pinion and ring gear, via two swinging axles to the rear wheels.

Ratio	4.375 : 1
Oil Capacity of Transmission and Rear Axle	Metric — 3.0 liters
	U. S. — 6.3 pints
	Imp. — 5.3 pints

Chassis

Front Suspension	Two torsion bars	
	One stabilizer	
Rear Suspension	Two torsion bars	
Shock Absorbers	Double acting hydraulic type, Front and rear	
Steering	Roller steering gear, divided tie rod and hydraulic steering damper	
Turns of Steering Wheel, Lock to Lock	2.6	
Turning Circle	approx. 11.25 m. (37 ft.)	
Wheels	Disc wheels 4 J × 15, Drop-center type	
Tires	5.60—15. tubeless	
Inflation Pressure		
1 to 2 Occupants	Front: 1.1 kg./cm.² 16 lbs./sq. in.	Rear: 1.4 kg./cm.² 20 lbs./sq. in.
Fully loaded	Front: 1.2 kg./cm.² 17 lbs./sq. in.	Rear: 1.6 kg./cm.² 23 lbs./sq. in.
Wheel Base	2400 mm. (94.5 in.)	
Track (Tread)	Front: 1305 mm. (51.4 in.)	
	Rear: 1288 mm. (50.7 in.)	
Toe-in (car unloaded)	2 to 4 mm. (0.08" in. to 0.16" in.)	

Brakes

Foot Brake	Hydraulic, operating on all wheels
Hand Brake	Mechanical, operating on rear wheels

Dimensions and Weights

Length	4140 mm. (163.0 ")
Width	1634 mm. (64.3 ")
Height	1330 mm. (52.4 ")
Road clearance	152 mm. (6.0 in.)
Kerb weight	820 kg. (1808 lbs.)
Maximum carrying capacity	300 kg. (661 lbs.)
Permissible total weight	1120 kg. (2469 lbs.)
Max. Axle Loads	Front 450 kg. (992 lbs.)
	Rear 670 kg. (1477 lbs.)

Fuel Consumption

Fuel Consumption	Metric 7.5 liters per 100 km.
(This figure represents the consumption obtained with car carrying half its permissible load and driven at a steady 3/4 of top speed 90 k.p.h./56 m.p.h. on level road, plus 10%.)	U. S. 31.5 miles per gallon
	Imp. 37.5 miles per gallon
Fuel	Min. Octane Number 76 (Res. F 1)
Oil consumption	About 0.3—1.0 liter per 1000 km.
	1.0-3.4 U.S. pints per 1000 miles
	0.9-2.8 Imp. pints per 1000 miles

Capacities

Fuel tank	40 liters (10.6 U.S.gall.; 8.8 Imp. gall.)
Engine	2.5 liters (5.3 U.S. pints; 4.4 Imp. pints)
Rear axle and transmission	2.5 liters/Refilling quantity (5.3 U.S. pints; 4.4 Imp. pints)
Steering gear case	0.15 liter (0.32 U.S. pint; 0.26 Imp. pint)
Brakes	0.25 liter (0.53 U.S. pint; 0.44 Imp. pint)
Oil bath air cleaner	0.25 liter
Container for windshield washer	approximately 1 liter (1 qt.)

Performance

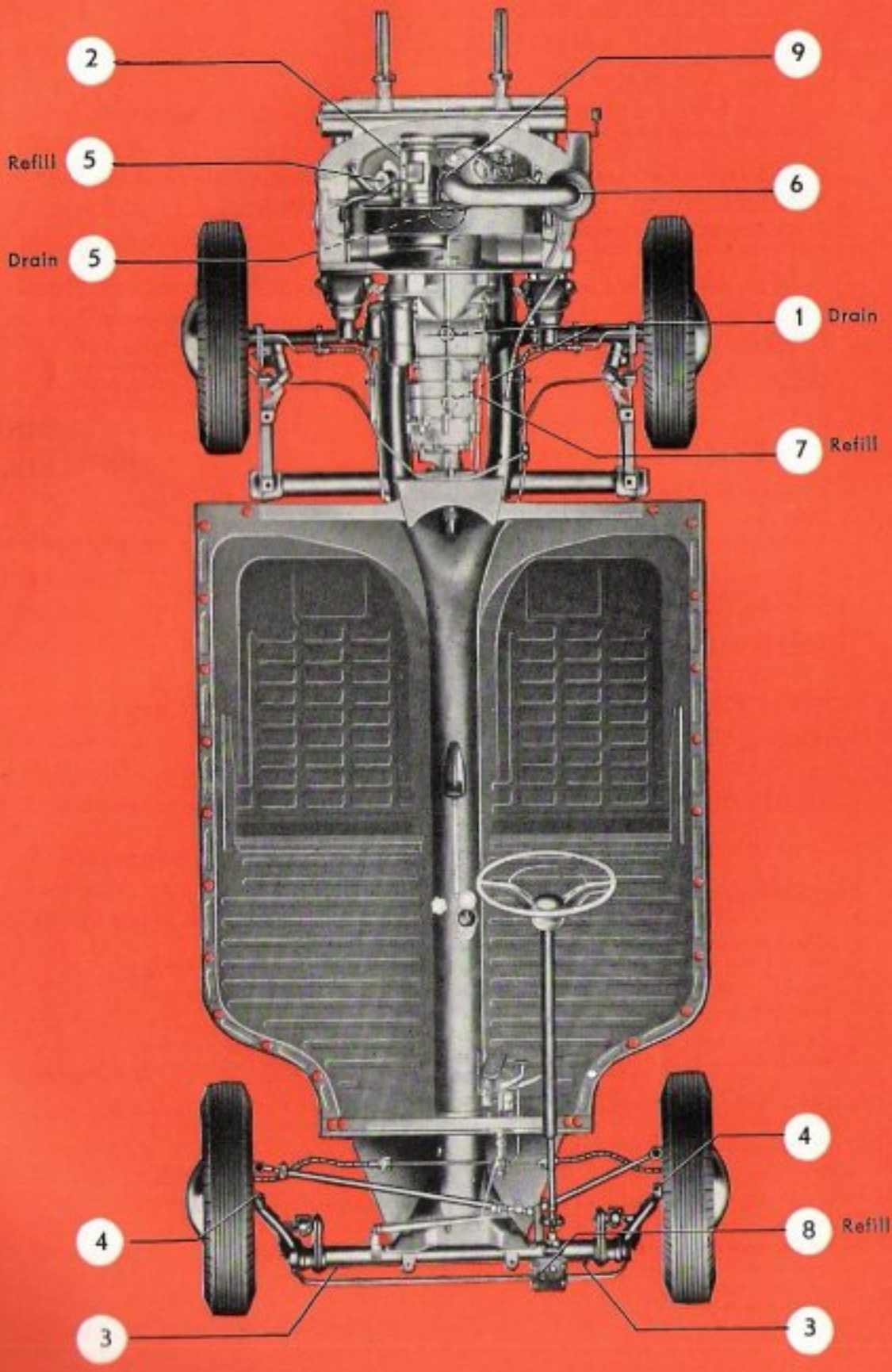
Maximum and cruising speed	120 k. p. h. (75 m. p. h.)
Hill-Climbing Ability	First Speed 39 %
	Second Speed 20.5 %
	Third Speed 12 %
	Fourth Speed 6.5 %

Bulb Chart V = Volts, W = Watts

Light Description	Description of Bulb (according to German Standard DIN 72 601)	Spare Part No.
Headlights	A 6 V 45/40 W	N 17 705 1
Parking Lights	HL 6 V 4 W	N 17 717 1
Flashing Indicator, front	R 6 V 18 W	N 17 731 1
Flashing Indicator, rear	R 6 V 18 W	N 17 731 1
Stop Lights	R 6 V 18 W	N 17 731 1
Tail Lights	G 6 V 5 W	N 17 718 1
License Plate Light	G 6 V 5 W	N 17 718 1
Instrument Light and Warning Lights	J 6 V 1.2 W	N 17 722 1
Interior Light	K 6 V 10 W	N 17 723 1
Interior Light-Convertible	H 65 6 V 5 W	141 947 199

MAINTENANCE CHART

500 km. 300 miles	5000 km. 3000 miles	Operation	Every
		Check adjustment of automatic air intake control	
		Check for tightness: Nuts and bolts on engine, especially on exhaust system, intake manifold, carburetor and fuel pump	
		Check for tightness: Nuts and bolts on chassis, body, rear axle, front axle, and steering	
		Check tire pressures and wheel mounting bolts for tightness	
		Check fan belt	**5000 km. 3000 miles**
		Check throttle ring for proper contact on fan housing	
		Clean fuel pump filter	
		Lubricate felt ring in breaker base plate	
		Clean breaker points, check grease at breaker arm fiber block	
		Check contact breaker points and timing	
		Check valve clearance	
		Check spark plugs and compression pressures	
		Check rear axle and engine for leaks	
		Check intake and exhaust systems for damage	
		Check clutch pedal free-play	
		Check steering adjustment	
		Check torsion arm link pins, front wheel bearing play, tie rod end dust caps, tie rod ends, steering damper mounting and toe-in	
		Rotate wheels. Check for abnormal wear and damage. Correct tire pressures.	
		Check hydraulic brake system lines and connections for leakage and damage. Check brake fluid level and adjustment of hand and foot brakes	
		Check thickness of brake linings through inspection hole	
		Check shock absorbers for proper tightness	
		Check battery voltage and acid level. Clean and grease terminals	
		Check operation of complete electrical system and headlight alignment	
		Check adjustment of doors	
		Road test vehicle, check foot and hand brake efficiency. Check idling adjustment and heating	
		Clean, grease and adjust front wheel bearings	**50 000 km 30 000 miles**


2
9
Refill
5
6
Drain
5
1
Drain
7
Refill
4
4
8
Refill
3
3

LUBRICATION CHART

500 km. 300 miles	2500 km. 1500 miles	5000 km. 3000 miles	No.	Lubrication Points	Lubricant	Every
			1/7	Transmission: Check oil level Clean magnetic oil drain plugs	G	
			2	Engine: Check oil level	M	2500 km. 1500 miles
			3	Torsion arms, tie rod ends with grease fittings	F	
			4	King pins and torsion arm link pins	F	
			5	Engine: Change oil, clean oil strainer	M	5000 km. 3000 miles
			6	Clean air cleaner	M	
			7	Transmission: Check oil level	G	
			8	Steering gear: Check oil level	G	
			9	Carburetor linkage, shafts, fast idle cam	M	
				Door and hood locks	F	
			1/7	Transmission: Change oil, clean magnetic oil drain plugs	G	25 000 km. 15 000 miles

LUBRICANTS

Lubricant	Lubrication Points		Specifications		
Engine oil (Approved HD oil for spark ignition engines)	Engine, oil bath air cleaner, carburetor, felt ring in breaker base plate	M	Temperature °C	°F	
			above 30	86	SAE 30
			from 0	32	SAE 20 W/20
			up to 30	86	SAE 20 W/20
			below 0	32	SAE 10 W
			below —25	—13	SAE 5 W
Hypoid Oil	Transmission	G	above —10	14	SAE 90
			below —10	14	SAE 80
	Steering gear	G	SAE 90		
Universal grease	Torsion arms, king pins and torsion arm link pins, door and hood locks, breaker arm fiber block in distributor	F	Cold resistant water-repellent high pressure grease		
Lithium grease	Front wheel bearings	W	Multi-purpose grease		

INDEX

Tools and Accessories

1 Fan Belt

1 Tool Bag

1 Spare Wheel, complete

1 Jack

1 Hub Cap Removal Tool

1 Combination Pliers

1 Screwdriver 0.8 mm.

1 Screwdriver 0.5 mm.

1 Open End Wrench 8/12 mm.

1 Socket Wrench for Spark Plugs, Wheel Bolts, and Fan Pulley Nut

1 Socket Wrench 14 mm.

1 Bar for Socket Wrench and Jack

1 Service Booklet

158 841 20

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DIENST


SERVICE


SERVICIO


SERVIÇO


SERVIZIO