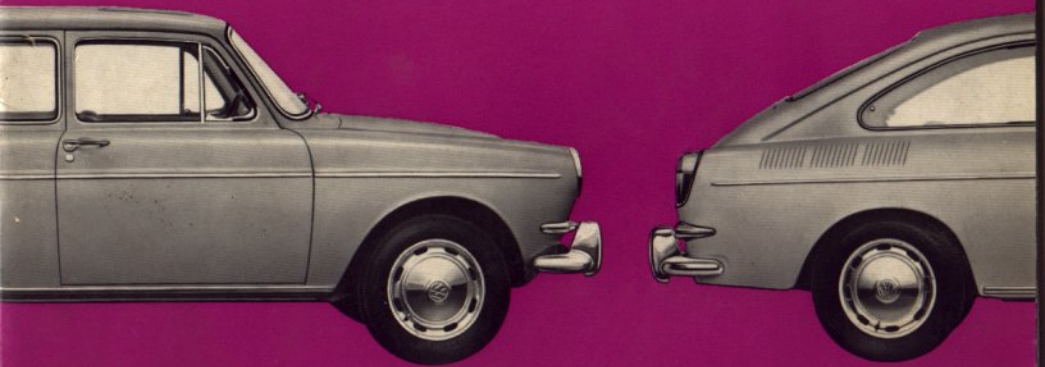
VOLKSWAGEN 1600

Instruction Manual



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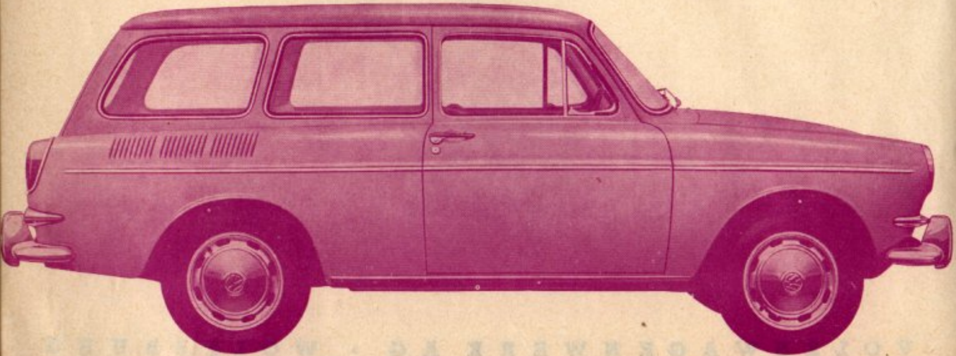
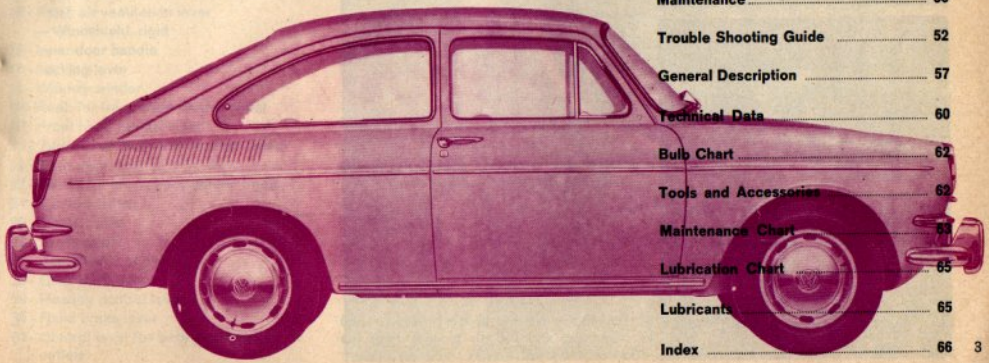
Instruction manual

January 1966

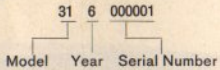
VOLKSWAGENWERK AG · WOLFSBURG





The Service Booklet. There is a pocket for the service booklet in the sun visor on the driver's side. The mileage visible at the end of the coupon will remind you when the next lubrication and maintenance service is due.

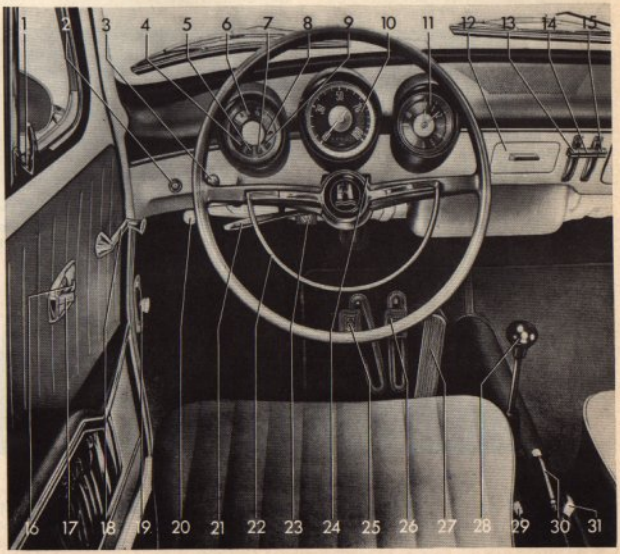
The identification plate is found under the front hood beside the hood lock. The 9 digit number after the words "Fahrgest. Nr." is the chassis number. It describes the model number, model year and serial number of the vehicle as shown in this sample:



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

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

1 - Vent wing handle
2 - Switch for windshield wipers and washer
3 - Switch for lights and instrument lighting
4 - Warning light – Green – Parking lights
5 - Warning light – Blue – Headlight high beam
6 - Fuel gauge
7 - Warning light – Red – Generator
8 - Warning light – Green – Turn signals
9 - Warning light – Green – Oil pressure
10 - Speedometer
11 - Clock
12 - Ash tray
13 - Fresh air ventilation lever – Windshield, left
14 - Fresh air ventilation – Foot level
15 - Fresh air ventilation lever – Windshield, right
16 - Inner door handle
17 - Locking lever
18 - Window winder
19 - Knob for front lower heater outlet
20 - Front hood release knob
21 - Turn signal lever with dimmer switch
22 - Horn ring
23 - Switch for emergency blinker lights
24 - Ignition switch
25 - Clutch pedal
26 - Brake pedal
27 - Accelerator pedal
28 - Gear shift lever
29 - Heating control lever
30 - Hand brake lever
31 - Control lever for back seat heater outlets



Operating Instructions

Before driving off acquaint yourself with the Volkswagen 1600. There are two different keys, one for the doors and one for the ignition switch. Be sure the key numbers are recorded in the front of your Service Booklet so you can get a replacement if the key is lost.

Both doors can be locked and unlocked from the inside and the outside.

Unlocking – outside
A quarter turn of the key and the door can be opened by pressing the button beneath the door handle.

Unlocking – inside
A pull on the inside door handle and the door will open regardless of whether it has been locked or not.

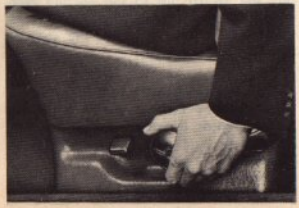
Locking – outside
While the key can be used to lock the door, it is more convenient to push in the lever above the inner door handle and to depress the button below the outer door handle as you close the door. If the door closes unintentionally after the inner lever has been depressed, it will not lock and thus the danger of being locked out is reduced.

Locking – inside
For greater security inside the car, push the door locking levers in so the doors cannot be opened from the outside without the key.

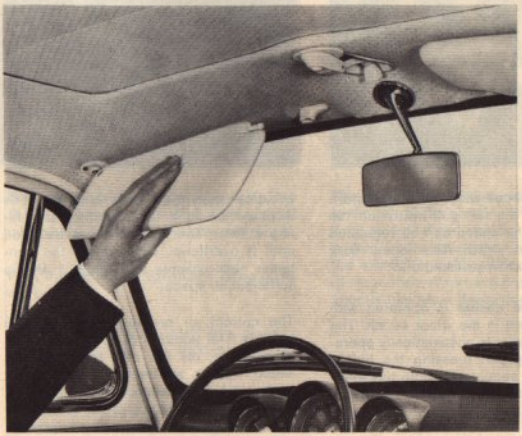
The front seats. The seats can be adjusted individually while driving, by merely pulling up the lever under each seat.

The rake of the front seat backs can be adjusted to eight different positions by turning the adjusting knob.

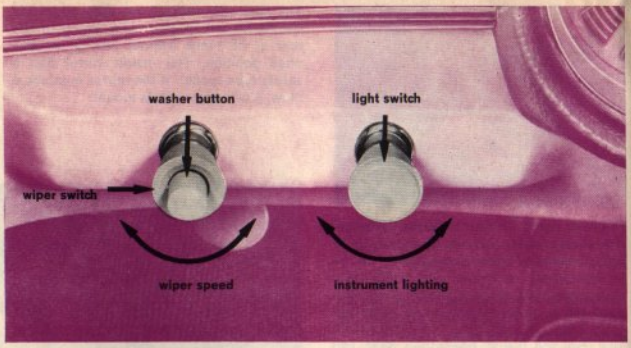
When the doors are closed, a special locking device secures the seat backs and prevents them from tilting forward.
To remove a front seat, press down the leaf spring on the inner runner. This spring prevents the seat from sliding out to the front unintentionally.



The rear view mirrors are adjustable and should be set to give clear vision to the rear at all times without having to alter ones position. The inside mirror has a safety type mount. If the mirror is struck a blow, it will come off its mount.



The padded sun visors can be swivelled toward the door windows to offer protection against the sun from the side.



The variable speed windshield wipers are controlled by the left pull switch on the dash board. The speed can be regulated by turning the switch. The wipers park automatically when switched off.

The windshield washer is operated with the button fitted in the wiper switch. The windshield washer is pneumatically operated so that by just pressing the button once, you can spray water onto the windshield until the wipers have cleaned the glass properly.

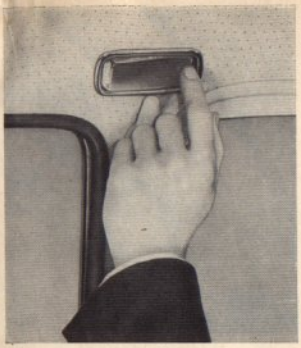
The water container is located in front of the spare wheel under the front hood and holds about 1 quart (1 Liter). Do not forget to fill the container from time to time. As the air pressure in the container escapes when the cap is removed, it is advisable to refill the container at a filling station. The container can be filled until it overflows. The pipe in the container neck ensures that there is always sufficient air space.

The correct air pressure is 36 psi (2.5 kg/cm^2). The addition of 25 % alcohol to the water or the use of a suitable windshield washer antifreeze in winter will protect it from freezing down to a temperature of approximately 10° F (– 12° C).

The lights are switched on with the right hand pull switch on the dash board.

When the parking lights are switched on by pulling the switch out to the first stop, a green warning lamp in the fuel gauge dial lights up. To switch the headlights on, pull the switch out to the second stop. The dimmer switch is located in the lever of the turn signal switch on the steering column.

The instrument lighting can be varied in brightness by turning the knob of the lighting switch. It can also be switched off completely by turning the switch to the left as far as it will go.

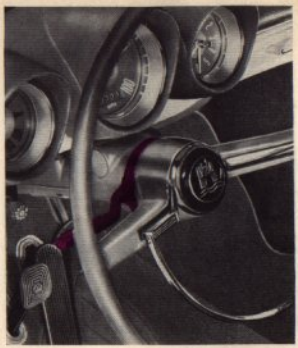


The interior light is located above the left door. It is operated by pressing on the light as follows:

Light pressed in on right
Interior light switched on

Light pressed in on left
Interior light switched off.

Light in central position
Interior light comes on when a door is opened



Turn signal lever. You can operate the turn signal lever with your fingers without taking your hands off the steering wheel.

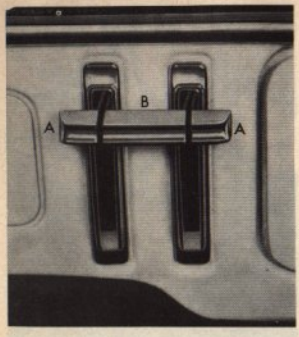
With the ignition switch on, the turn signals are operated:

Lever downwards — left turn signal
Lever upwards — right turn signal

Two warning lights in the fuel gauge flash while the turn signals are in operation. The signals are self-cancelling.

When the headlights are switched on the button in the lever serves as dimmer switch. A blue high beam warning light is located in the fuel gauge.

The emergency blinker switch is located to the left of the steering wheel under the dash board. If the vehicle is disabled or parked under emergency conditions, pull the switch to make all four turn signals blink at once. A warning light in the switch knob blinks when the system is turned on.



Fresh air ventilation. The fresh air ventilation can be regulated by the three levers on the dash board when the vehicle is in motion. The two outer levers – A – operate the ventilation for each side of the car individually through a vent in each lower corner of the windshield. The center lever – B – regulates the ventilation outlet under the dash board. The amount of fresh air entering will increase the further the levers are pushed down. When all three levers are in the upper position, the ventilation system is closed.

Further ventilation is provided by the vent wings in the doors and the flexible glass quarter windows.

Even in cool weather a vent wing or window should be opened slightly. The windows will then remain clear.

The sliding roof is operated by the crank in the recess between the sun visors.

After pulling down the handle, the roof can be opened or closed as required. It will stay in any position.

When closing, crank the sliding roof fully forward to the stop, then turn the handle back a little and fold it into the recess.

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

The ash tray in the dash board can be removed by depressing the spring.

When removing the rear ash trays, lift them out of the bottom of the housing first. When inserting, engage them in the spring and then press into the housing.

The luggage compartments are theft-proof when the car is locked. The knob for releasing the front hood is located under the dash board on the left. The hood is released when the knob is pulled and is opened by pressing up the catch beside the lock.

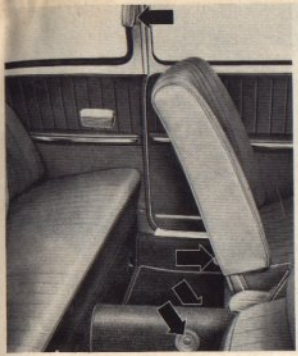
When closing the hood, ensure that the lock engages firmly. Never attempt to close the hood by pressing at the side, always press it near the lock.

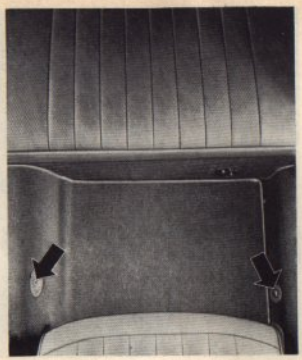
The rear hood is opened by pulling the lever in the left-hand door pillar.

The automatic light in the rear luggage compartment operates only when the lights are on and goes out automatically when the hood is closed.

The engine compartment is accessible from the rear luggage compartment. Release the buttons and roll back the lining. Turn the handles on the engine compartment lid to the left, raise the lid and secure it by hooking the left handle into a bracket on the upper edge of the luggage compartment. If you want the luggage compartment light to illuminate the engine, remove the engine compartment lid.

Turn the handles to the right to lock the engine compartment lid and secure them by pressing them flat.





Safety Belts. The belts for the driver and the front passenger are attached to the mounting points in the floor. Mounting points in the door pillars allow the installation of combination lap/shoulder belts.

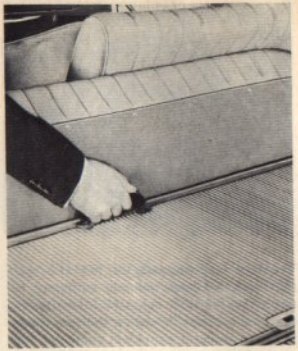
There are mountings for rear seat belts to the left and right of the rear seat back rest and under the back rest above the frame tunnel.

Squareback Sedan

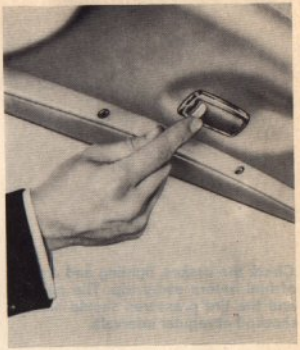
The rear door is opened by the button under the license plate. Lift the door by the recess under the knob. It is held in the fully open position by spring tension.

When closing it you merely have to slam it lightly until it engages in the lock. It is locked by the same key which you use for the two doors.

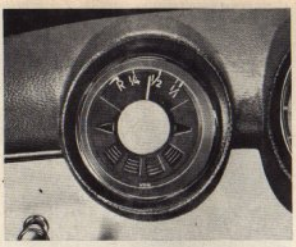
The loading surface can be increased by more than half its size by tipping the rear seat forward. To do this, raise the seat cushion and tip the backrest forward with the handle.



When the seat has been tipped forward, the seat cushion and backrest are held by two retaining pins. In the normal position a retaining device automatically prevents the backrest from tilting forward.



The load compartment lighting. An additional interior light for the load compartment is located on the roof member above the rear door.



Check the brakes, lighting and amount of fuel before every trip. The oil level and the tire pressures should also be checked at regular intervals.

The fuel tank capacity of 10.6 U.S. gall. (40 liters, 8.8 Imp. gall.) is sufficient for approximately 280 miles (450 km). When the ignition is switched on the fuel gauge in the instrument panel will show you how much fuel you actually have. When the needle registers "R" (reserve) it is time to fill up at the next opportunity. The remaining 1.3 U.S. gall. (5 liters, 1.1 Imp. gall.) in the tank will last for about 30–35 miles (55 km).

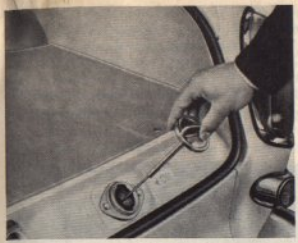
The fuel tank filler is under the front hood. Your VW 1600 uses regular grade gasolines commonly sold in the United States and Canada. If regular fuels with adequate anti-knock properties are not available, premium fuels should be used or mixed with regular fuel. Fuels of the required octane rating may not be available in all countries. When traveling abroad, please consult your VW dealer.

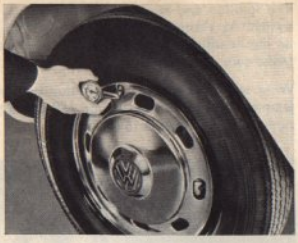
Checking the brakes before starting out on a trip is always a good idea. Just depress the brake pedal a few times to make sure that the brakes are working efficiently.

The stop and turn signal lights are an essential part of the lighting system. The ignition must be switched on if you wish to check them.

If a turn signal bulb is defective, the other bulb and the warning lights in the fuel gauge will flash considerably faster.

The stop lights only operate when the foot brake is applied.





The oil level should only be checked when the engine is not running. It must always be between the two marks on the dipstick and must never fall below the lower mark. Wipe the dipstick with a clean rag before checking the oil level.

If possible always use the same brand of oil. Use oil labeled "for Service MS".

Tires. Correct tire pressures are essential for ensuring the excellent road-holding properties of your car. The tire pressure should be occasionally checked.

Fastback Sedan:

1 to 2 occupants	front 16 psi. (1.1 kg/cm²)
	rear 24 psi. (1.7 kg/cm²)
3 to 5 occupants	front 17 psi. (1.2 kg/cm²)
	rear 26 psi. (1.8 kg/cm²)

Squareback Sedan:

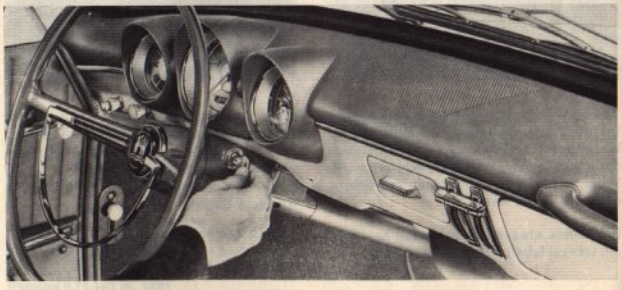
with half payload	front 17 psi. (1.2 kg/cm²)
	rear 26 psi. (1.8 kg/cm²)
with full payload	front 17 psi. (1.2 kg/cm²)
	rear 37 psi. (2.6 kg/cm²)

For long, high speed motorway trips, the tire pressures should be increased by 3 psi. (0.2 kg/cm²) at front and rear.

Starting the engine

The ignition and starter are switched on, one after the other, by means of the 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.

When switching on the ignition, the red generator warning light and the green oil pressure warning light in the fuel gauge will come on. Operate the starting motor immediately by turning the key further to the right.



At temperatures above freezing point or when the engine is still warm, depress the accelerator pedal slowly while operating the starter. Depress the accelerator pedal fully only when the engine is very warm.

At temperatures below freezing point and when the engine is cold, depress the accelerator pedal fully and then release it slowly before switching on the ignition. This enables the automatic chokes to close the choke valves. When the weather is severely cold, the engine may turn over slowly during starting. In this case, depress the clutch while cranking; if it turns over faster, hold the clutch down until the engine starts. When starting without depressing the clutch, be sure the handbrake is on and the gearshift in neutral.

As soon as the engine starts, release the ignition key so that the starter is switched off. You can move off at once. The automatic chokes regulate the mixture and idling speed to suit the operating temperature. Do not race the engine when it is still cold.

Practical Driving

Breaking-in instructions are not necessary for your Volkswagen 1600. 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 general driving rules.

Gear shifting

Glance occasionally at the speedometer especially during the initial period.

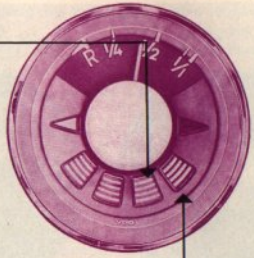
Shift the gears within the permissible speed ranges only:

1st gear	2nd gear	3rd gear	Top gear
0–15 mph (0–25 kph)	10–35 mph (15–55 kph)	20–55 mph (30–90 kph)	30 mph (45 kph) and up
			
You can drive very economically between:	**10 and 20 mph (15 and 35 kph)**	**20 and 35 mph (30 and 55 kph)**	**30 and 60 mph (45 and 100 kph)**

Do not race or lug the engine in the individual gears. This practice can have an adverse effect on the life of the engine.

Shift to reverse gear only when the car is stationary. A locking device prevents unintentional shifting. Depress the gear lever slightly and then move it to the left and to the rear to engage reverse.

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 again 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.



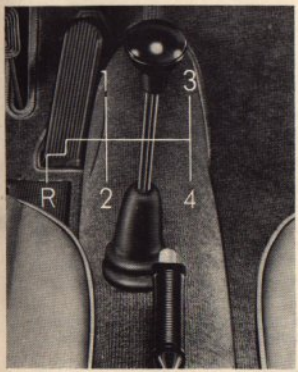
The generator warning light goes out when the speed is increased. If it comes on while you are driving, the generator is no longer charging. In this case you can proceed but, if possible, only as far as the nearest Volkswagen Dealer as otherwise the battery will soon run down. (See page 36 "Checking the V-belt".)

The warning light for the oil pressure goes out when the engine is started. If this warning light comes on while driving you must stop at once as the chances are that the oil circulation has been interrupted. Check the oil level. If the oil level is correct, get in contact with the nearest Authorized Volkswagen Dealer.

If either the generator or oil pressure warning light goes on when the engine is idling, it does not indicate trouble. They should both be out when the vehicle is being driven, however.

Caution

Be careful when starting the engine in the garage. Provide ample ventilation so that the exhaust fumes, which contain carbon-monoxide gas, can escape.



Shifting to a lower gear

Shift down to a lower gear when on steep inclines and also when accelerating from low speeds. All four gears of the transmission of your car are synchronized so do not hesitate to shift gears.

Certain speed ranges have to be adhered to when shifting to a lower gear. Shifting down to a lower gear at excessive speeds puts an unnecessary strain on the transmission. On the other hand very low speeds in the individual gears are harmful to the engine. Shift down from 4th to 3rd gear approximately between 55 and 30 mph (90 and 45 kph) and from 3rd to 2nd gear between 35 and 20 mph (55 and 30 kph). The 1st gear is only used for moving off, driving at walking pace or on very steep inclines.

Do not downshift when coming to a normal, complete stop; brake slowly and when the car is moving slowly enough, shift into neutral and release the clutch pedal.

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

Brakes

The brake responds to even the slightest foot pressure. Apply the brakes carefully and avoid locking the wheels. Locked wheels will not shorten the braking distance but may cause you to lose control of the vehicle and will shorten tire life.

When driving downhill, make use of the braking effect of the engine and shift to that gear which you would use in driving uphill. The ignition must never be switched off when going downhill.

Violent braking can only be justified in an emergency. Nevertheless, it is advisable to check the full braking effect at certain intervals so that you will be familiar with the behavior of the car and the actual braking distance.

Economical operation is one of the outstanding features of your car. However, getting a few extra miles from each gallon depends on your driving habits:

Make use of the lower speed ranges of the individual gears. For instance on level roads at a speed of 30 mph (45 kph) and up use the 4th gear in preference to the 3rd gear.

Accelerate gradually. Under normal driving conditions shift to 2nd gear at 10 mph (15 kph), to 3rd gear between 20 and 25 mph (30 and 40 kph) and to 4th gear between 30 and 40 mph (45 and 55 kph).

Do not pump the accelerator pedal unnecessarily. Even the small quantity of fuel additionally discharged each time the accelerator pedal is depressed results in a noticeable increase in the fuel consumption.

Do not continue to accelerate on inclines when your speed drops – shift in good time to a lower gear. There are, however, no hard and fast rules for this: If, for instance, the speed drops on an incline in 4th gear from 70 mph (110 kph) to 55 mph (90 kph) and lower, it is best to shift to the 3rd gear between 50 and 45 mph (80 and 70 kph). If you are driving at a speed of between 30 and 40 mph (45 and 60 kph) in 4th gear on a level road shift to 3rd gear right at the beginning of the incline.

Reduce your speed before corners and when stopping. Do not coast in neutral downhill.

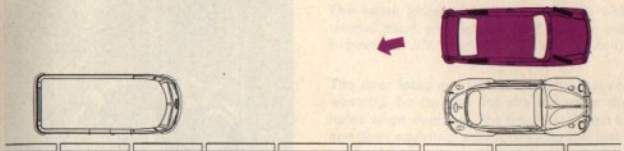
High speeds always result in increased fuel consumption. When accelerating, depress the accelerator pedal slowly and only to such an extent as is necessary to reach the desired speed. On long trips this method will prove most economical.

The most advantageous engine operating conditions result from brisk driving and correct gear shifting.

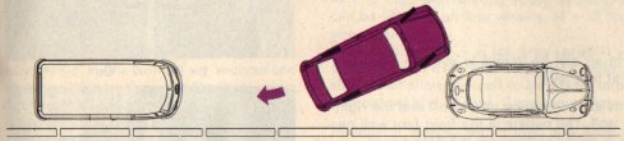
Parking

Parking in limited spaces can be made quite simple:

Stop your car even with the car in front of the space. Turn the steering wheel sparply to the right and back up slowly into the gap:



When the front bumper of your car is even 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:

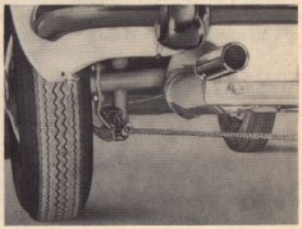


Now turn the steering wheel to the right again and pull up a little bit, until both ends of the car are as close to the curb as possible:

When parking on a steep slope, turn the front wheels toward the curb, set the handbrake and engage first or reverse gear.

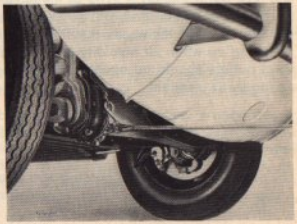
Remove the key to protect the vehicle against theft.

Towing

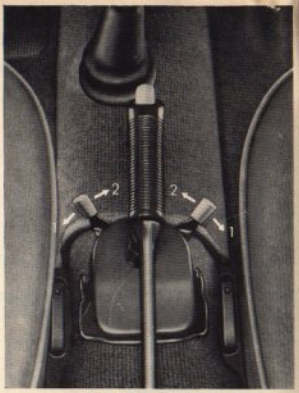


Just in case you wish to attach a towrope to your vehicle one day, please note that the bumpers are not suitable for this purpose. At the rear we recommend that the rope is attached to a lower shock absorber bracket. This point is not very easy to reach but it will at least ensure that your desire to help does not result in damage to your vehicle.

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



Cold Weather Hints



1 - Off 2 - On

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

The warm air heating

can be fully regulated. The distribution of warm air can be varied to suit the wishes of the occupants by means of controllable outlets at foot level.

The left-hand lever between the front seats turns all the heating on and off and the right-hand lever controls the heating in the rear foot well. The outlets in the front foot well can be controlled separately on each side by means of knobs underneath the dash board.

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

If you open a vent wing or a quarter window when the heating is on, the heater output will increase noticeably because the engine fan can then force the warm air into the interior more easily.

Do not try to change the cooling and heating of your car in winter by covering the air intake slots in the rear fenders. These slots, must always remain open to ensure the flow of fresh air to the carburetors and fan.

The SAE 30 engine oil will thicken at temperatures below freezing point and result in difficult starting. Change to the thinner SAE 10 W engine oil at oil changes when temperatures under freezing point are expected.

If you drive mainly short distances and in city traffic in the winter we recommend that you have the oil changed every 1,500 miles (2,500 km). If you only cover a few hundred miles a month under these conditions it is advisable to have the oil changed every 6 to 8 weeks. In the warmer seasons, additional oil changes are unnecessary and uneconomical.

In territories where exceptionally low temperatures prevail (below – 13° F/ – 25°C), SAE 5 W oil should be used instead of SAE 10 W. The oil should be changed every 750 miles (1,250 km).

The SAE 90 transmission oil can generally be used all the year round. It need only be replaced by the thinner SAE 80 grade in countries with arctic climates.

The battery requires special care in winter because of the increased consumption of current when starting the engine and using the lights at night. Furthermore, its efficiency decreases at low temperatures. If the car is mostly used over short distances or in city traffic, it is advisable to have the battery recharged occasionally. The connections between battery and starting motor must be kept perfectly clean.

The spark plugs should not have an excessively large gap especially in winter. The normal spark plug is .028" (0,7 mm). In extremely cold weather the gap can be reduced to between .016" and .020" (0,4 and 0,5 mm) to facilitate starting.

The door locks can freeze in winter, especially if water gets into the lock cylinders when washing the car. Do not aim the water directly at the locks, but instead, cover the key holes when washing. The frozen lock can be opened by warming the key before insertion and then squirting anti-freeze into the lock cylinder. Do not spill anti-freeze on the paint.

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

M + S tires with special heavy treads give good road holding in snow and slush. They can be fitted to all four wheels. M + S tires should however, never be fitted to the front wheels only.
Better still are M + S ice tires (spiked) which increase the safety margin even on hard snow and ice. Even with these tires, which should always be fitted to all four wheels, you should not allow yourself to be misled into driving faster than under the same conditions with normal M + S tires. Check your State Laws before installing spiked tires.

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

Clips must be fitted to the lower torsion arms when M + S or spiked tires are used in order to prevent the tires from rubbing on the wheel housings on full lock. See your Authorized Volkswagen Dealer.

Snow chains, in conjunction with normal and winter tires, can only be used on the rear wheels. Only thin chains which do not stand clear of the tread and walls more than .6" (15 mm), including tensioner, are suitable. When driving over long stretches of road which are free of snow the chains should be removed. They serve no useful purpose here and merely damage the tires and wear out quickly.

Care of the Tires

Apart from the tire pressures, your driving habits also affect the tire wear considerably. Rapid acceleration, violent braking and cornering result in excessive tire wear.

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

The tires should be checked occasionally for foreign matter and damage. The tire tread should never be allowed to wear down to a thickness of less than 2/32" which is the absolute minimum required for safe usage. If the tires show signs of uneven wear after a considerable mileage consult your local VW dealer.

For smooth running at high speeds and long tire life, it is suggested having the wheels balanced statically and dynamically. Wheels can become unbalanced due to normal tire wear.

When mounting a tire on a wheel, the red mark should be positioned at the valve.

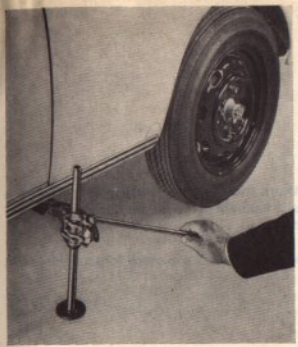
Changing wheels

The spare wheel, jack and tools are found under the front hood which is opened by means of the knob under the dash board. The jack is secured by a clip near the spare wheel.

Set the hand brake.

Take off the hub cap with the removal tool and loosen all four wheel bolts about one turn with the wrench and operating bar.

Insert the jack in the square tube below the sill panel.



Push down the jack base plate until it makes contact with the ground.

Insert handle into upper link on jack. Raise vehicle until wheel is clear of ground by pumping the handle up and down.

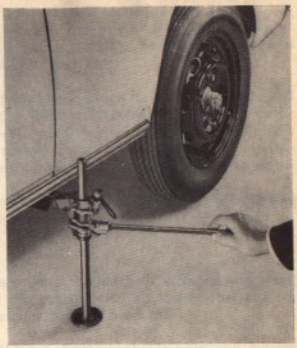
Remove wheel bolts and take off the wheel.

To put new wheel on raise the car until the four holes in the wheel are roughly lined up with the threaded holes for the wheel bolts.

Insert one wheel bolt and tighten it so far that the wheel can be swung round this point by hand until the remaining holes are in line with the threaded holes.

Insert the other wheel bolts.

Tighten the wheel bolts until the wheel, centered by the spherical shape of the bolt heads, contacts the wheel hub all round.



Insert the jack handle into the lower link on the jack. Lower the vehicle by pumping handle up and down.

Tighten all bolts evenly.

Place trim ring in wheel and install hub cap with a sharp blow of the hand.

Care of the Car

It is our object to provide your car with paintwork that not only looks good and has a sparkling luster, but is most durable. A chemical treatment protects the body against rust and anchors the synthetic resin enamel to the metal.

But even the best paint work requires occasional care since exposure to sunshine, rain, dust and dirt creates a weathering effect.

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, longhandled brush for the chassis, and plenty of water.

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

Spray the exterior finish of body and wheels evenly with water until dirt is soaked off. Do not allow a powerful jet of water to hit the painted surface. Using plenty of clear water, remove dirt with a sponge. Clean the sponge at short intervals to avoid scratching the paint work.

There are many auto soaps and detergents available which greatly facilitate this job. Do not buy just any product, let your Authorized Volkswagen Dealer advise you. It is of utmost importance to rinse the body thoroughly with water to ensure that no traces of the detergent remain on the body. After washing, dry off with a clean chamois to prevent water spots from forming.

Preservation (waxing) should be carried out for the first time after approximately 8 to 10 weeks and afterward, if possible, at regular intervals of 6 to 8 weeks. Waxing restores to the finish certain substances it has lost by exposure to the weather. At the same time a protective waterrepellent coating is applied to the body.

The "Genuine VW Preservative" (L 190) was specially produced for the Volkswagen and is obtainable from every Authorized Volkswagen Dealer. After washing and drying the car thoroughly, apply the preservative thinly with a soft cloth. Let it dry approximately 20 minutes and then rub it down with polishing cotton or a soft polishing cloth until iridescent colors can no longer be seen when you look across the polished surface at an angle.

Do not forget to wax the car after each detergent washing as the intensive cleansing properties of the chemical detergent will partially dissolve the protective film of wax.

Polishing. You should polish your car only if its appearance has been affected as a result of insufficient care, or if the application of the preservative no longer restores the original luster. Avoid the use of abrasives or harmful chemical products.

A special polish for the synthetic-resin enamel finish is also available from your Authorized Volkswagen Dealer under the designation "Genuine VW Polishing Fluid" (L 170). Prior to applying the polish, the car should be washed and dried carefully. Apply the polish with a soft clean cloth or polishing cotton – use a straight horizontal or vertical motion rather than a circular motion. After rubbing for some time you will notice 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.

To prevent the polishing fluid from drying prematurely, do not apply it on too large an area of the body at a time. A subsequent application of the preservative and your efforts will be rewarded with a long-lasting shine.

Newer wash, wax or polish the car in sunlight.

Tar spots. Tar splashes have a tendency to corrode the finish within a short time and should be removed as soon as possible with Genuine VW Preservative.

On the road you usually have nothing at your disposal but fuel. Kerosene or turpentine may also be used. After this, the treated spots should be washed with a mild, luke warm detergent solution, and rinsed, in order to remove traces of the cleansing agent.

Insects are caught, especially in hot weather, on the front of the car and on the windshield. Insects should not be allowed to remain on the paint finish for long and should be removed with water and a sponge. Once baked on they can only be removed with luke warm detergent solution.

Parking under trees. Vehicles which are parked under trees in summer are often found to be covered with spots. These spots can be removed easily with luke warm detergent solution if the treatment is not delayed too long. It is advisable to apply a coat of preservative afterward.

Crome parts should be treated with "Genuine VW Chrome Cleaner Chromlin" when dry. Apply Chromlin thinly and allow to dry for 10 minutes before polishing with a dry cloth.

Cloth upholstery. If a vacuum cleaner is not available, the upholstery should be cleaned thoroughly with a brush or whisk broom. Stains can generally be removed with luke warm soap suds. Grease and oil stains are removed with cleaning paste or cleaning fluid. Do not pour the cleaning fluid directly on the upholstery as otherwise rings will form. Moisten a clean, uncolored cloth with the fluid and rub with a circular motion, starting outside the spot and working inwards.

Leatherette can best be cleaned with a soft cloth or soft brush. If very dirty, a dry foam cleaner can be used.

If the seating surfaces and the front sides of the backrests are also made of leatherette, these surfaces may only be cleaned with a dry foam cleaner. They are made of a special leatherette which is permeable to air and liquid cleaners would immediately penetrate into the textile backing.

Grease and paint spots should be wiped off before they dry on. Soaked-in spots can be removed by rubbing carefully with a cloth moistened with benzine or alcohol. Spots caused by shoe polish can be removed with turpentine. Use these agents carefully and sparingly as otherwise they tend to dissolve the dust-repellent finish of the leatherette. Solvents such as trichlorethylene or paint thinner should not be used for cleaning. After cleaning, the leatherette should be dried thoroughly with a soft cloth. So-called preservatives are not suitable for leatherette because they do not soak into the material and merely collect dust and soil clothing.

The windows can be cleaned best with a clean sponge and warm water. A glass cleaning solution should only be added to the water in exceptional cases as these solutions tend to affect the paint preservative. Always use a special clean leather to dry the windows. This leather must not be used for the paintwork in any circumstances as most paint cleaners and polishes contain ingredients which will cause unpleasant streaks to appear on the windshield when it rains, even if only the smallest trace is present. These streaks can only be removed with a good windshield cleaner and a lot of care. Do not forget the windshield wiper blades.

Door and window weatherstrips. It is important to keep the rubber parts undamaged and supple to ensure perfect sealing. To retain the flexibility of the rubber, these parts should be coated occasionally with talcum powder or silicone spray.

Airing the interior. If the car is left in your garage for a long period, it must be aired regularly. Permit air to circulate freely by opening the doors and lowering the windows to prevent the formation of mold and damp stains.

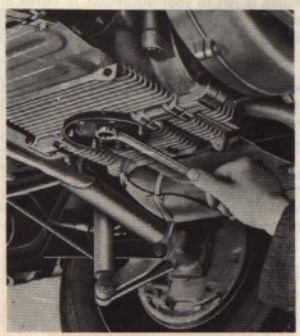
To lubricate correctly means to lubricate carefully and at the prescribed intervals. Therefore, do not omit to have the lubrication service carried out at proper time. A lubrication chart can be found on page 65 indicating the correct mileages at which to lubricate.

Lubrication Service

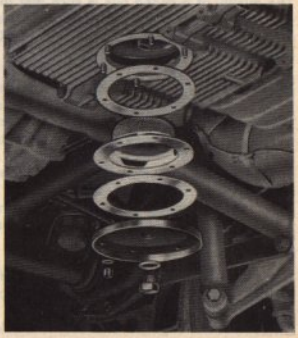
Regular oil changes are necessary even if the very best brand of oil is used. Dirty oil in your engine simply means increased wear and a shorter service life.

The oil is drained, when warm, by removing the plug in the oil strainer bottom plate. Flushing of the engine is unnecessary. However, the oil strainer must be removed and cleaned at every oil change. The two gaskets and the washers for the cap nuts must be renewed each time. The engine is refilled with 5.3 U.S. pints of oil (2,5 liters; 4.4 Imp. pints) labeled "for Service MS".

Draining the engine oil.



Removing the oil strainer.



It is uneconomical under normal operating conditions to change the oil at shorter intervals than every 3,000 miles (5,000 km). We recommend oil changes at more frequent periods, only in the winter if you drive mainly short distances and in city traffic or only cover a few hundred miles per month under these conditions.

Types of lubricant

Oils labeled "for Service MS" are prescribed for the engine. These oils are oils with proved oxidation stability, bearing corrosion preventive properties and detergent-dispersant characteristics which tend to hold foreign contaminants in suspension which would normally deposit on engine parts. These foreign contaminants will drain out with the oil.

The detergent properties of these oils will make the fresh oil darker after a short period of operation. This is quite natural and there is no reason to change the oil earlier than called for in the Lubrication Chart.

Some more information on oils

The quality of branded oils is such that the choise is left to your discretion. In cases of doubt, your Authorized Volkswagen Dealer will be glad to assist you. We recommend that you select "your" oil after the first 300 miles (500 km) and stick to it at all future oil changes.

The viscosity grades of the different oils are shown by the designations SAE 30, SAE 10 W and so on. The viscosity of a lubricant is an indication of its resistance to flow at a given temperature. The lubricant chart on page 65 shows you which viscosity grade of oil to select to suit the existing temperature.

Temporary deviations in the temperatures for the various viscosity grades are of no importance. It is permissible to mix oils of different viscosity grades when it is necessary to add oil between the oil changes and the outside temperature no longer corresponds to the viscosity grade of the oil in the engine. It is, however, essential that the same brand of oil be used.

Some countries do not use the API classification (API = American Petroleum Institute). "For Service MS" oils are known in these countries as „HD oils".

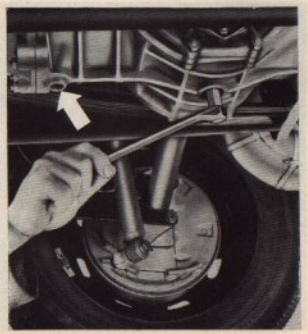
 No additives of any kind should be mixed with "for Service MS" oils.

Transmission

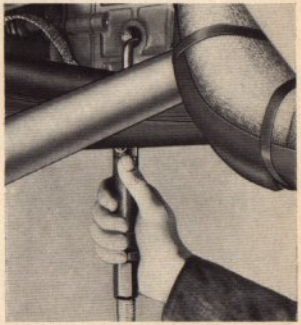
The transmission and differential gears are combined in the transmission case and both lubricated with hypoid oil. The oil should be up to the edge of the filler hole. At oil changes — at 300 miles (500 km), and then again at 30,000 miles (50,000 km) — the old oil is drained by removing both magnetic drain plugs while the oil is at operating temperature. The magnetic oil drain plugs should be cleaned thoroughly and the transmission then filled with 5.3 U.S. pints (2.5 liters; 4.4 Imp. pints) of branded hypoid oil.

Additives should not be used with hypoid oils.

Draining the transmission oil



Filling with transmission oil.



Chassis

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

The front axle has four grease fittings which must be lubricated every 6,000 miles (10,000 km).

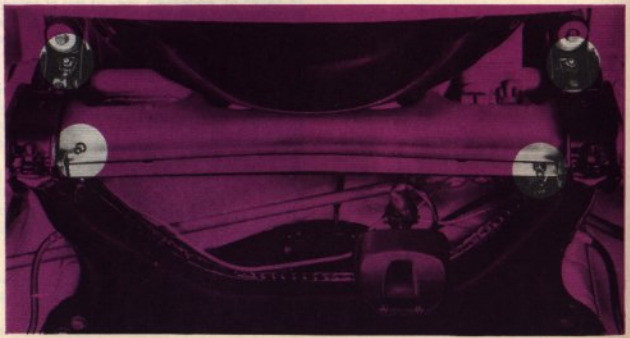
Prior to lubrication, the grease fittings should be cleaned thoroughly with a cloth to prevent dirt from being forced into the bearings.

The dust seals of the maintenance-free ball joints should be checked for damage at every maintenance service. Damaged seals should be replaced as soon as possible.

Oil and grease should be kept off the tires and brake hoses. Even small quantities should be wiped off immediately.

If you drive less than 6,000 miles (10,000 km) in the year, the front axle should be lubricated once a year.

Annually at the beginning of the cold season the cables for the accelerator, clutch and heating as well as the clutch cable adjusting nut should be checked and, if necessary, cleaned and lubricated.



The front wheel bearings

are packed with an anti-corrosion grease at the factory. The caps on the front wheel hubs must be free from grease.

Every 30,000 miles (50,000 km) the bearings should be carefully cleaned and packed with the grease prescribed under "Lubricants".

The brake discs must be removed for this purpose. Finally the front wheel bearings must be adjusted. In order to avoid damage to the bearings, this operation should be carried out by an Authorized Volkswagen Dealer only.

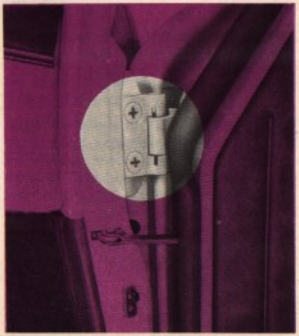
Doors and hoods

The door hinges should be lightly oiled at every lubrication service.

Lubricate the door lock cylinders with graphite. It is sufficient to dip the key into the graphite and to move it back and forth several times in the lock.

The door lock striker plates should be very lightly lubricated.

The hood hinges should be oiled, the hood locks lightly greased.



Maintenance Service

The Volkswagen Organisation has an extensive network of Authorized Volkswagen Dealers staffed with well-trained and experienced personnel, and equipped with all the special tools required for servicing your car. If ever you should need service when touring and away from home, look for the well-known VW Sign. Here you will receive prompt and expert assistance.

If you cannot get to an Authorized Volkswagen Dealer and must make adjustments yourself we have listed here the most important tasks usually done during the maintenance services. However, it is important that repair jobs beyond your capacity be performed by the nearest Authorized Volkswagen Dealer. Your car is then in capable hands. This saves time, inconvenience, and money.

Checking the V-belt

The belt should be checked at regular intervals for tension and wear. When pressed with the thumb it should yield approximately .6" (1.5 cm) and should not show signs of excessive wear.

The intake housing cover is removed when adjusting or replacing the belt. Loosen the nut on the generator pulley with a 21 and 27 mm wrench and remove the rear half of the generator pulley. The belt tension is adjusted by removing or inserting the spacer washers between the two pulley halves. Removing spacer washers increases the tension and inserting washers reduces it. After adjustment check tension as described above.

Checking air cleaner

The oil bath air cleaner should be checked every 6,000 miles (10,000 km).

The dust present in the air drawn in by the engine is retained by the filter in the upper part of the air cleaner and washed out when the vehicle is in motion by the oil in the lower part of the cleaner. In time, this causes a layer of sludge to form at the bottom of the lower part. If the cleaner check reveals that there is only .2" (4–5 mm) of oil above the sludge layer, the lower part should be carefully cleaned and filled with fresh oil. The top part does not need cleaning. However, if the filter insert has become so dirty due to delayed cleaning of the lower part or oil shortage that the air inlet holes on the underside are partly blocked, the encrusted dirt should be removed, preferably with a chip of wood.

A dirty filter insert not only reduces the engine output, it can also cause premature wear in the engine. If the local conditions are such that the vehicle is frequently driven over very dusty roads, it is advisable to clean the air cleaner more often.

The warm air control flap should be checked each time for free movement. This flap regulates the flow of pre-heated air to the carburetor according to the speed of the engine.

Servicing air cleaner

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

Disconnect cable from automatic choke on right-hand carburetor and from the pilot jet solenoid.

Pull crankcase breather hose off air cleaner intake.

Loosen securing clip on air cleaner intake and pull bellows off intake tube.

Remove center wing nut securing the cleaner.

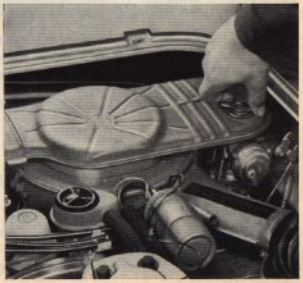
Loosen right and left wing nuts until the cleaner can be taken out.

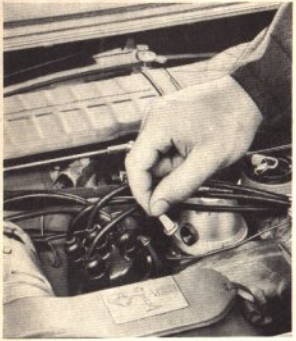
Remove cleaner and take upper part off after loosening the five clips. Do not lay the upper part down with the filter element upward.

Clean lower part of cleaner thoroughly. The water drain hole must always be clear.

Fill lower part up to the mark with fresh SAE 30 engine oil.

Align the marks on the upper and lower parts when assembling the cleaner. On installation, ensure that the rubber seals between cleaner and carburetors are located properly and that the bellows on the cleaner intake seals correctly. It is important to tighten the two outer wing nuts securing the filter first and then the center one.





Cleaning the fuel pump filter

The fuel pump filter prevents foreign matter and water from entering the carburetor. It should be cleaned at the prescribed intervals.

Pull suction hose off fuel pump and seal it.

Remove the hexagon plug and take filter out.

Wash filter carefully in solvent.

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

Ignition timing

Particular attention should be paid to correct ignition timing. In many cases poor performance, high fuel consumption and even damage to the engine can be the result of incorrect ignition setting. The ignition should not be advanced arbitrarily.

Before setting the ignition timing, the breaker contact point gap must be checked. With the breaker arm fully lifted by the cam the clearance should be .016" (0.4 mm). The initial spark advance must be set at 7.5° before top dead center.

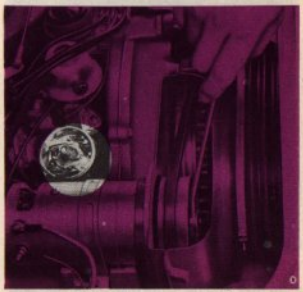
Adjust ignition timing only with the engine cold or slightly warm.

Cleaning contact points

A certain amount of material movement takes place between the contact breaker points in the course of time. This creates a small build-up and a crater on the contact surfaces of the points but does not normally affect the ignition system. It is important, however, to ensure that the points are always clean and free of oil and grease. The best way to clean the points is to pull a piece of cardboard between them while pressing them lightly together. Badly burned points should be replaced.

Lubricating ignition distributor

The breaker arm fiber block in the ignition distributor should always be lubricated with lithium grease. Every 6,000 miles (10,000 km) check whether cleaning and lubrication is required. Use only a small amount of grease. Do not allow grease to come in contact with the breaker points because it will affect the ignition.



Adjusting contact points

Remove distributor cap and rotor.

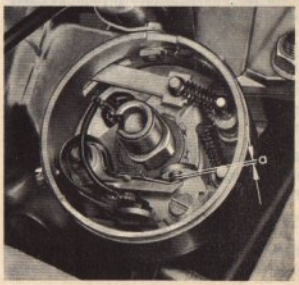
Remove air intake housing cover and turn the engine by means of the generator until the contact arm rests on the highest point of the cam lobe.

Loosen the breaker point locking screw.

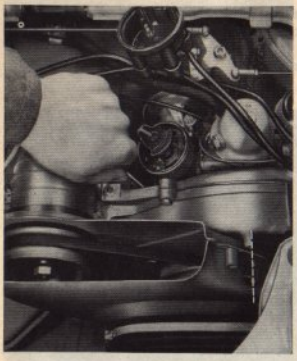
Insert a screwdriver between the two lugs on the contact plate and the slot in the point carrier and adjust the gap to "a" = .016" (0.4 mm).

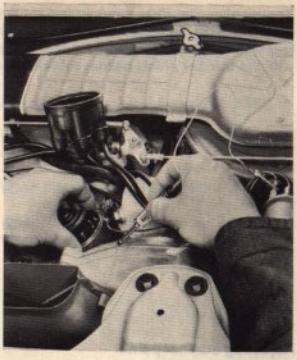
Tighten locking screw and install rotor.

After the contact points have been adjusted, the ignition timing must be reset.



Setting the ignition timing





Turn the engine clockwise until the **left-hand** mark on the crankshaft pulley lines up with the adjusting surface on the fan housing and the distributor rotor arm is in line with the number 1 cylinder mark on rim of distributor.

Loosen clamp screw on distributor retainer.

Connect a 6 Volt test lamp to terminal labeled no. 1 of the ignition coil and to ground.

Switch on ignition.

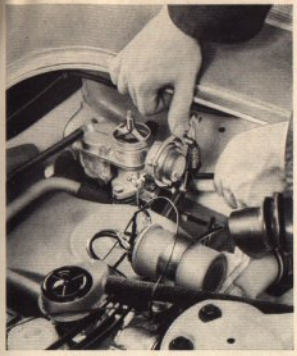
Rotate the distributor clockwise until the contact points are closed and then slowly counter-clockwise until the contact points just start to open and the test lamp comes on.

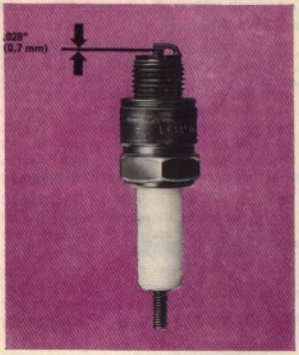
Tighten the clamping screw of distributor retainer.

Install distributor cap.

The ignition is correctly set if on turning the engine slowly clockwise, the test lamp comes on when the **left-hand** mark on the crankshaft pulley is in line with the adjusting surface on the fan housing. Beforehand, the engine should be turned back counter-clockwise approximately a quarter of a revolution to take up the play in the distributor drive.

Checking the spark plugs





Checking compression

The appearance of the electrodes and insulator gives valuable information on the adjustment and condition of the engine:

medium grey – correct carburetor adjustment and proper performance of spark plug
black – mixture too rich
light grey – mixture too lean
oiled up – failure of spark plug or piston ring blow-by

The spark plugs have an average service life of approximately 12,000 miles (20,000 km) and should, therefore, be replaced in time. To prevent any breakdowns in the ignition system, the spark plugs should be checked every 6,000 miles (10,000 km). The air cleaner must be taken off to remove the spark plugs. It is also advisable to unhook the return springs from the carburetor pull rods. Deposits can easily be removed with a brush and a chip of wood. The insulator should be clean and dry on the outside in order to avoid short circuiting and tracking. If necessary, adjust the spark plug gap which should be .028" (0.7 mm).

Do not omit the gasket when screwing in the spark plug. Do not overtighten the spark plugs. The compression is checked by inserting a suitable gauge into the spark plug holes when the engine is warm. All the plugs should be removed and the air cleaner taken off. The accelerator pedal is then depressed fully and the engine turned over with the starter until the gauge reading shows no further change. The pressure should be at least 100 psi. (7 kg/cm²). It is important that only an accurate instrument is used and a good seal obtained between instrument and spark plug seat.

Adjusting the valves

The valves must only be adjusted when the engine is cold or slightly warm. The valve clearance for the intake and the exhaust valves is .004" (0.10 mm).

When adjusting, both valves must be closed, i. e. the piston of the cylinder concerned must be at T.D.C. of the compression stroke. The arrangement of the cylinders can be seen by the numbers 1 to 4 on the engine cover plates. Valve adjustment is carried out in the following sequence: cylinders 1, 2, 3, 4.

Remove intake housing cover.

Remove distributor cap.

Turn the engine by the generator until the rotor arm points to the No. 1 cylinder mark on the rim of the distributor.

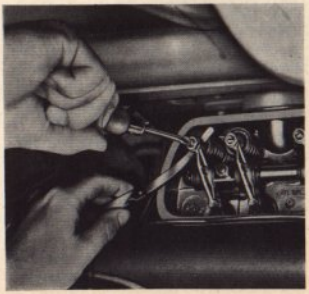
Remove cylinder head cover.

Loosen the adjusting screw lock nuts for the valves of No. 1 cylinder.

Adjust valve clearance with a feeler gauge.

Hold the adjusting screws and tighten the lock nuts.

To adjust the valves for cylinders No. 2, 3 and 4, the engine is turned further **counter-clockwise** until the rotor arm is 90° offset each time.



Carburetor adjustment

The carburetors are checked at the factory and set exactly on the engine. Alteration of the setting by fitting jets or choke tubes of other than the specified sizes is detrimental and should not be done. Checking and adjusting the carburetor requires special test equipment in addition to knowledge and experience. For this reason, it is advisable to leave work of this nature to an Authorized Volkswagen Dealer.

Special test appliances are also required for the idling adjustment. However, if you are compelled to correct the setting yourself, proceed as detailed here. The adjustment should then always be checked accurately by an Authorized Volkswagen Dealer at the first opportunity.

Run engine till warm.

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

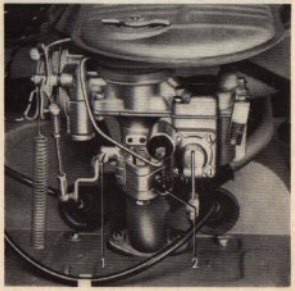
Turn idling adjusting screws (1) on both carburetors out so far that both throttle valves are fully closed, then turn screws in again until they just touch the throttle valve levers and finally give them both one half turn inward.

Turn the volume control screw (2) of one carburetor clockwise until the engine speed begins to drop. Then give screw one quarter of a turn in counter-clockwise direction.

Adjust the volume control screw of the other carburetor in the same manner.

Regulate the idling speed to 800-900 rpm by adjusting the idling adjustment screws uniformly on both carburetors.

Install the connecting rod between right carburetor and three-arm bell crank free of tension. If necessary, the length of the rod must be adjusted after loosening the two locknuts.



Checking clutch pedal free-play

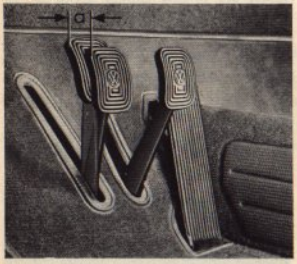
Easy gear shifting and complete transmitting of engine power to gears and wheels can only be guaranteed if the clutch is adjusted as specified.

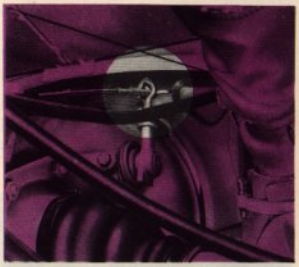
Measured at the clutch pedal, this free-play should be between .4" and .8"/10 and 20 mm (a). The clearance is adjusted with the wing nut on the cable end.

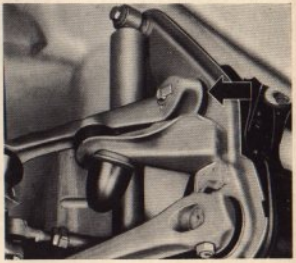
After adjusting by turning wing nut left or right to the nearest notch, depress clutch pedal several times and recheck pedal free-play.
Lubricate bearing point between operating lever and adjusting nut with universal grease.

Checking upper torsion arm play

The upper torsion arms of the front axle are connected by the stabilizer and normally have hardly any noticeable axial play in their bearings. As result of wear this play can increase and should, therefore, be checked every 6,000 miles (10,000 km).







To check the play, rock one wheel and observe the torsion arms. If play is noticed at the upper torsion arms, they must be readjusted. This operation should be left to an Authorized Volkswagen Dealer, as the camber and the toe-in of the front wheels have to be corrected afterward. These operations require special experience and measuring devices.

The front wheel camber and toe-in

can only be checked properly by an Authorized Volkswagen Dealer. When the vehicle is unloaded, the camber should be 1° 20' ± 10' and toe-in .080" to .24" (2 to 6 mm). Excessive deviations from these values have a detrimental influence on the riding characteristics of the vehicle and on the service life of the tires.

The steering

The steering must not have an excessive amount of play in the straight ahead position and the wheels must self-center after cornering.

To check the steering move the steering wheel back and forth until resistance is felt.

The adjustment is correct if the back and forth movement does not exceed 1" (25 mm), measured at steering wheel rim.

Adjustments to the steering require special experience as well as special tools, and these operations should be carried out by an Authorized Volkswagen Dealer only.

Checking and adjusting brakes

The front axle is fitted with disc brakes and the rear axle with drum brakes. Every 6,000 miles (10,000 km) the thickness of the friction pads and the brake linings should be checked. The thickness must not be less than .08" (2 mm) for the disc brakes and .1" (2,5 mm) for the drum brakes. The linings on the rear brakes can be checked through holes in the back plates. All the brake lines and connections should be checked for leakage, external damage and corrosion. Damaged brake lines must be replaced immediately.

The drum brakes must be adjusted as the linings wear and the pedal travel becomes excessive. The disc brake lining wear is taken up automatically every time the brake pedal is depressed.

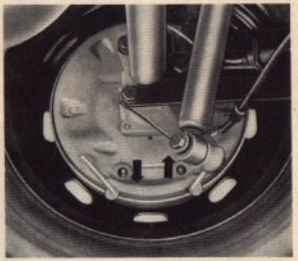
Adjusting the drum brakes

The brake shoes are adjusted separately through holes in the back plates. The hand brake must be fully released when adjusting the shoes.

Before and after adjusting the brakes, depress the brake pedal hard once to center the shoes in the drums.

Lift vehicle.

Turn the adjusting nut in direction of arrow by levering it with a screwdriver until the brake lining lightly contacts the drum.



Repeat the process on the other adjusting nut. Note that the two adjusting nuts turn in opposite directions.

Back the nuts off 3 to 4 teeth until the wheel turns freely and reseal the holes in the back plate carefully.

Adjust the brakes on the other wheel in the same way.

Bleeding the brakes

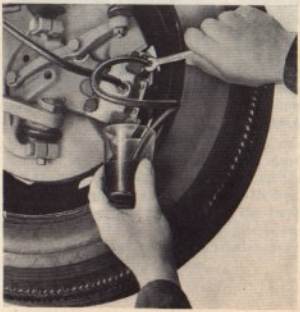
If air gets into the hydraulic brake system the pedal will go down a long way and feel spongy. Before bleeding the brakes, check the level of the brake fluid in the reservoir near the spare wheel. The reservoir should be at least three quarters full. Only use Genuine VW brake fluid or Lockheed fluid when topping up. Be careful not to spill the brake fluid as it will mar the paintwork.

When bleeding the brakes, always begin with the wheel farthest away from the master cylinder. The sequence for cars with left-hand drive is as follows: Right and left rear wheels, then the right front and finally the left front wheel.

Remove rubber cap of the bleeder valve and attach bleeder hose.

Submerge the free end of the hose in a glass container partially filled with brake fluid. Depress and release the brake pedal quickly and repeatedly until a certain resistance indicates that pressure has been built up in the system.
Hold the pedal in lowest position.

Open bleeder valve ½ to 1 turn until brake fluid ceases to flow from bleeder hose and then close valve again with the pedal still held down.
Repeat this procedure on the same wheel until bubbles cease to appear at the end of the bleeder hose when the valve is opened. Tighten bleeder valve, take bleeder hose off and install dust cap.
Repeat the above operations on the other wheels. Make sure that the brake fluid level in the reservoir is sufficient to ensure that air is not drawn in. After bleeding the complete system, check the brake fluid level and top up if necessary.



Adjusting hand brake

The hand brake is adjusted at the hand brake lever. The adjusting nuts are accessible through slots in the sides of the rubber boot. Always adjust the foot brake before the hand brake.

Lift both rear wheels.

Unlock both nuts and tighten them uniformly until the rear wheels will just turn with the hand brake off.

Apply hand brake. At not later than the fourth notch it should be impossible to turn the wheels by hand. The compensating lever under the adjusting nuts should be horizontal when the hand brake is on.

Lock the adjusting nuts again carefully.

Checking the battery

Easy starting of the engine depends upon the condition of the battery. It should, therefore, be checked and maintained regularly. The battery cover can be removed by raising the rear seat and opening the battery snap fastener.

The electrolyte level must always be slightly above the plates. The electrolyte level has to be adjusted in accordance with the electrolyte level mark. Depending on the type of battery, either the lower edge of the insert or the bar above the plates must just be covered. Losses by evaporation can be replenished by adding distilled water. Do not add acid unless some of the electrolyte has been spilled. If the electrolyte level is too high it can boil over and cause damage. For this reason exercise care when topping up.

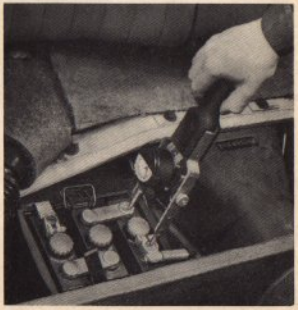
The battery should be checked with a cell tester. This is a voltmeter in parallel with a heavy resistance. The voltage of each cell should not fall below 1.6 Volts while the reading is being taken (10–15 seconds). Otherwise the cell is discharged or defective. The normal voltage is 2 Volts.

The battery poles should be cleaned with a clean cloth, or in the event of heavy corrosion, with a stiff brush. The battery poles and cable terminals should be coated with grease. Make sure that battery ground strap is tightly bolted down.

The state of charge of the battery can be checked with a hydrometer. The specific gravity of the electrolyte will increase with the charging of the battery. The gravity can be read from a scale.

Battery fully charged	1.28 = 32° Bé
Battery semi-charged	1.20 = 24° Bé
Battery discharged	1.12 = 16° Bé

When storing your vehicle 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.



Headlight adjustment

It is best to check the headlight alignment with a regulation screen or aiming device. If none is available, proceed as follows:

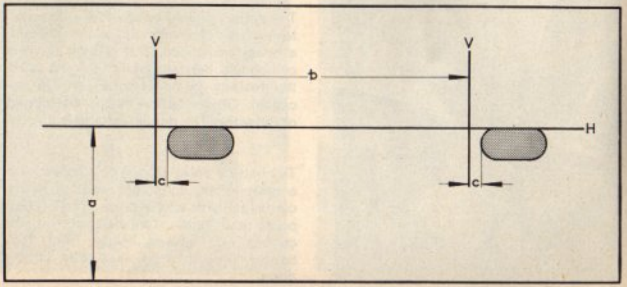
Adjust tires to correct pressures and park vehicle on level surface squarely facing a wall or screen 25 feet in front of the headlights. The driver's seat must be loaded with one person or a weight of 154 lbs. (70 kg).

Measure height (a) of center of headlights from ground and draw a horizontal line (H) on screen at this height the full width of the vehicle.

Opposite the center of each headlight, draw vertical lines (V) intersecting the horizontal. These lines should be 49.6" inches apart. Drawing a vertical line for the center of the vehicle might help aligning vehicle with screen.

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

a - Height of headlamp center from floor
b - Distance between headlamps (49.6")
c - 2"



A - Lateral aim B - Vertical aim

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

The headlights are correctly aimed when the top edge of the high intensity zone is on the horizontal line H and the left edge is 2° to the right of the vertical line V.

Check with your State Bureau of Motor Vehicles for variations from these dimensions.

Replacing Sealed Beam Unit.

A double filament, type 2, seven inch sealed beam unit of domestic manufacture is used in your Volkswagen. Should it become necessary to replace the unit, loosen screw in the center below the headlight and take the trim ring off.

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

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

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

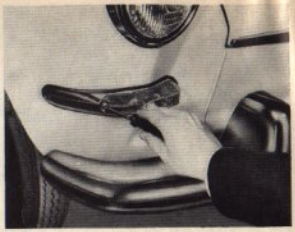
Check headlight settings.

Front turn signal and parking light bulb replacement

Remove two Phillips screws.

Remove lens and replace the bulb.

When installing make sure that the seal is correctly seated.



Replacing the rear turn signal or stop light and tail light bulbs

Remove two Phillips screws.
Take off lens.
Replace bulb.

Position of bulbs:
Upper – Turn signal bulb
Center – Tail light bulb
Lower – Stop light bulb

When installing the lens, make sure that the seal is correctly seated. Do not overtighten the screws.

Licence plate light bulb replacement

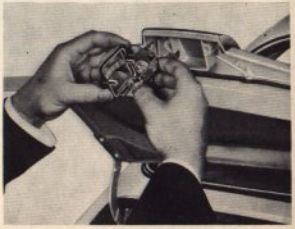
Open rear luggage compartment lid.

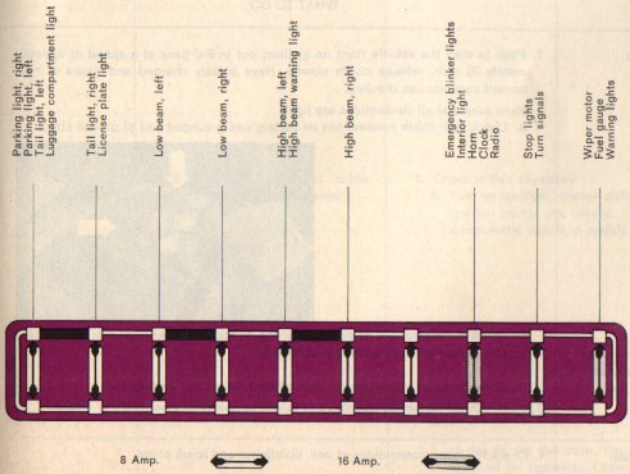
Remove both Phillips screws and take off lens with bulb holder.

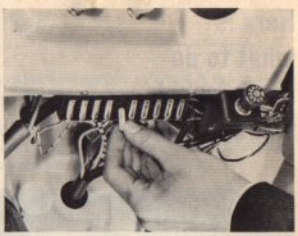
Pull bulb holder off lens.

Replace bulb.

When installing make sure that the cable grommet is correctly seated.







Replacing fuses

The fuse box is located to the left under the dashboard. 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. Under no circumstances use fuses which have been patched with tin foil or wire as they would be liable to cause severe damage elsewhere in the electrical system. We suggest that you always carry a few 8 and 16 Amp. fuses.

Adjusting doors

There should be no noticeable play between the lock and the striker plate. It should be possible to open the doors easily without any signs of jamming. To adjust the door, loosen the three striker plate screws in the lock pillar and move the striker plate. Adjust the striker plate so that door and pillar are a flush fit. The striker plate is correctly adjusted if the housing on the door has the same clearance at top and bottom when sliding into the striker plate.

Here is what to do when trouble troubles you

Your Volkswagen should repay you with trouble free driving if it receives regular preventive maintenance.
Should you ever encounter difficulty in starting your engine or have trouble on the road, there are a few simple repairs which you can make to get your VW going again. Locate the PROBLEM and PROBABLE CAUSE of your trouble in the Guide on the following four pages and follow the directions on WHAT TO DO.
If the trouble is serious or you are uncertain as to its origin, be sure to see an Authorized VW Dealer as soon as possible.

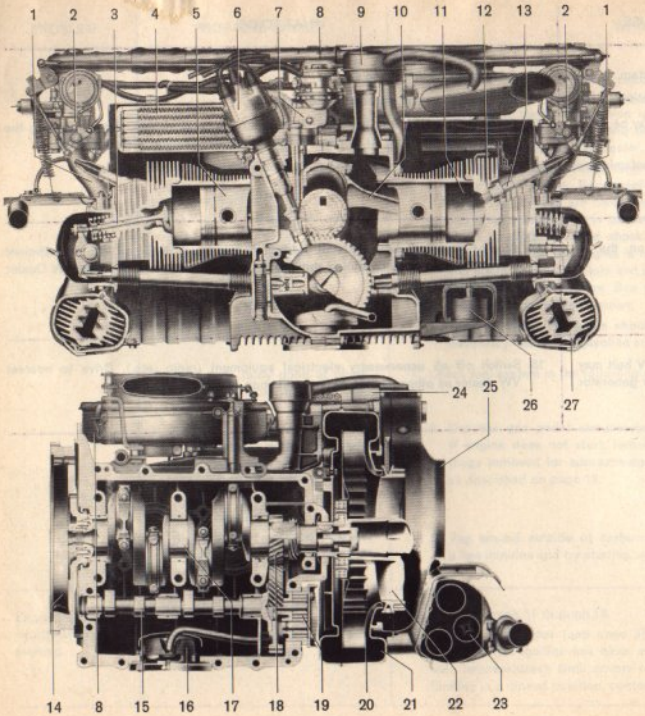
PROBLEM	PROBABLE CAUSE	WHAT TO DO
VW will not start: engine will not turn over or turns over too slowly.	1. Run down or dead battery	1. Push to start the vehicle (turn on ignition, put in 3rd gear at a speed of approximately 20 mph, release clutch slowly). Have battery charged and cause of high current consumption checked.
	2. Loose connection A. At battery	2. Make sure that all connections are tight. A. Check both cable connections on battery and grounded end of ground strap.
	B. At starter C. At connector block on steering column under dash board. D. At light switch or fuse box.	B. Check connections at solenoid, mounted on starter, under right rear of vehicle. C. Check push-on connectors for tightness. D. Check push-on connectors at back of light switch and on fuse box.
	3. Starter defective	3. Have vehicle started by pushing and take it to nearest Authorized VW Dealer.
VW will not start: engine turns over.	4. Loose connection in ignition system	4. Check for loose connections at coil, distributor and spark plugs.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
	5. Loose connection in primary circuit to coil.	5. Turn on ignition. Remove thin black cable from ignition coil, hold it by insulation and strike it against blower housing or other ground, **being careful of gasoline and its fumes.** If no spark, electricity does not reach coil from battery. Check push-on connectors on steering column under dash board for tightness, and connectors at fuse box. If still no spark see the nearest Authorized VW Dealer.
	6. If spark at black coil cable, trouble is in ignition system.	6. Check in this sequence: A. Turn on ignition, remove distributor cap, engage 4th gear and push vehicle until ignition points are closed. Open and close ignition points several times with a non-metal object. A visible and audible spark will appear between the points.

If this is not the case, the cables on ignition coil and distributor should be checked for tightness. Clean and adjust distributor points (page 38 and 39). If even then no spark is visible, see your nearest Authorized VW Dealer.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
		B. If spark appears at points, remove high tension wire from center of distributor cap and hold it against a metal part of the engine at a distance of approximately 1/4". Switch on ignition and turn over engine or open ignition points as described under A. A strong blue spark must appear. If this is not the case, see your Authorized VW Dealer. C. If a spark appears at high tension cable, the distributor cap should be cleaned inside and outside. Reconnect high tension cable. Remove all spark plugs (page 41). If plugs are clean and dry, reconnect ignition cables to spark plugs and bring spark plugs in connection with metal (ground). **Hold cable with dry piece of cloth to avoid shock.** A spark should appear between spark plug electrodes when the engine is turned over. If not, clean and dry ignition cables and spark plug connectors and check that ignition cables are tight in distributor cap and plug connectors. See your Authorized VW Dealer if the above steps did not ensure proper ignition. D. Dirty or wet spark plugs should be cleaned and dried. Install new plugs if necessary. Unburned gasoline on plug electrodes points to excessive fuel supply.
	7. If spark is fairly good at plugs, trouble is most likely in fuel system. A. Caused by improper starting procedure. If the gas pedal is depressed too often, the accelerator pump of the carburetor injects too much gasoline. B. Carburetor may be flooded, float or needle valve may be sticking.	7. Check fuel system in the following sequence: A. Depress gas pedal completely and operate starter for a prolonged period. If engine does not start, remove and dry spark plugs, turn over engine with plugs removed for approximately 30 seconds. Reinstall plugs and start engine as described on page 18. B. Tap around outside of carburetors with wooden or plastic tool handle. Wait a few minutes and try starting again as described at 7 A.
Engine stalls shortly after starting	8. Poor fuel supply 9. Automatic choke does not open, excessive fuel supply.	8. See paragraph 11 through 13. 9. Remove air cleaner (see page 37). Check whether choke valves are in vertical position after ignition has been switched on for 2–5 minutes (depending on outside temperatures). Both covers for choke units must be hot. If choke valves are binding in a closed position, contact your nearest Authorized VW Dealer.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
Engine stalls while vehicle is driven.	10. Defect in ignition system 11. Fuel supply is exhausted 12. Fuel filter in pump may be clogged 13. Gasoline may be contaminated by water, dust or dirt.	10. See paragraph 4 through 6. 11. Check whether any gasoline is left in tank. 12. Disconnect intake fuel line from fuel pump and plug up line. After removing the screw plug, the fuel filter can be taken out for cleaning (see page 38). 13. See your VW dealer for cleaning of all components of the fuel system.
Green warning light comes on while you are driving.	14. If green light goes on, the oil pressure is too low.	14. Stop at once and check oil level. Add oil as necessary. If the oil level is sufficient and green light goes on during driving, contact the nearest Authorized VW Dealer before driving on.
Red warning light comes on while you are driving.	15. If red light goes on, V belt may be torn or slipping or generator does not charge.	15. Switch off all unnecessary electrical equipment (radio, etc.). Drive to nearest VW dealer as otherwise the battery will soon run down.



1 - Intake manifold
2 - Carburetor
3 - Valve
4 - Oil cooler
5 - Piston
6 - Ignition distributor
7 - Fuel pump
8 - Oil bath air cleaner
9 - Crankcase breather
10 - Connecting rod
11 - Cylinder
12 - Cylinder head
13 - Spark plug
14 - Flywheel
15 - Camshaft
16 - Oil strainer
17 - Crankshaft
18 - Camshaft drive gears
19 - Oil pump
20 - Fan
21 - Fan housing
22 - Crankshaft pulley
23 - Muffler
24 - Ignition coil
25 - Cooling air intake housing
26 - Thermostat
27 - Heat exchanger

General Description

Engine

The engine, located in the rear of the car, is attached by four bolts to the recessed flange of the rubber mounted transmission case. The crankcase is made of a light alloy. 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 heads and are operated by the camshaft via cam followers, push rods and rocker arms. The short crankshaft runs in four bearings and has induction hardened journals. The camshaft is driven from it by means of helical gears. The connecting rods are provided with lead-bronze bearings. The pistons are of light alloy with steel inserts.

Two down-draft carburetors with automatic chokes and accelerator pumps supply the fuel-air mixture.

The oil pump of the pressure lubrication system is driven by the camshaft. The oil is drawn through the strainer in the crankcase and forced via an oil cooler to the lubrication points. When the oil is thick, an oil pressure relief valve enables the oil to flow directly to the lubrication points by bypassing the oil cooler.

The engine is cooled by a fan mounted on the crankshaft. The fan sucks in air through an opening in the cooling air intake housing and forces it through the fins of the cylinders. The flow of cooling air is regulated by a thermostat ensuring a constant operating temperature.

The engine is equipped with battery ignition. The spark advance is controlled automatically by vacuum. The generator is driven by a V belt. The generator pulley can be adjusted to alter the V belt tension.

Chassis

The frame with its central tunnel is of pressed steel. It is forked at the front and supports the rubber-mounted front axle. The engine-transmission unit is rubber-mounted at three locations in a special sub-frame. The sub-frame with the engine and transmission unit is also rubber mounted at five locations to frame and body. A rubber mounting supports the engine at the rear on the body.

The gear shift rod, fuel line, and the guide tubes for the hand brake, clutch, accelerator and fresh air heating cables pass through the tunnel.

The front axle beam is of pressed steel and is provided with bearing tubes for the torsion arms. The front wheels are individually suspended by two adjustable crossed torsion bars in the lower axle tube. A torsion bar extending between the two upper torsion arms serves as a stabilizer.

The roller type steering gear acts on the front wheels via divided tie rods. A steering damper ensures steering steadiness.

The rear axle is of the swinging half axle design. The rear wheels are independently sprung and have adjustable torsion bars. The Squareback Sedan is provided with an auxiliary spring which is positioned diagonally above the rear axle.

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-plate clutch. The transmission case houses the transmission with four forward speeds, one reverse, and the differential.

All the forward gears are synchronized. The gears are helically cut to provide silent operation.

The drive pinion and the ring gear are cut spirally. The two swinging rear axle shafts are pivoted in the differential.

Brakes

The hydraulic foot brake system is fitted with disc brakes at the front and drums at the rear. The hand brake operates on the rear wheels via cables.

Body

The two-door body is made of pressed steel and electrically welded. It is bolted to the frame. Quarter windows and vent wings in the doors ensure draft-free ventilation. Both front seats can easily be adjusted while driving. The luggage compartments under the front and rear hoods are secured against theft when the car is locked. Both these locks are operated by cables. The fuel tank and spare wheel are located in the front luggage compartment. The engine compartment is accessible through the rear luggage compartment.

The Squareback Sedan has two fixed and two hinged quarter windows. The load compartment is accessible through the rear door which is held open by torsion bars. By tipping the rear seat forward the load surface can be increased by more than half its size.

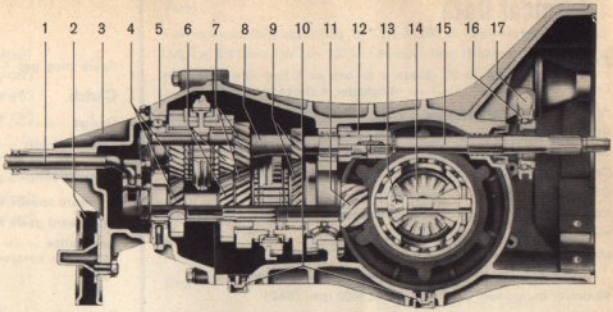
Heating system

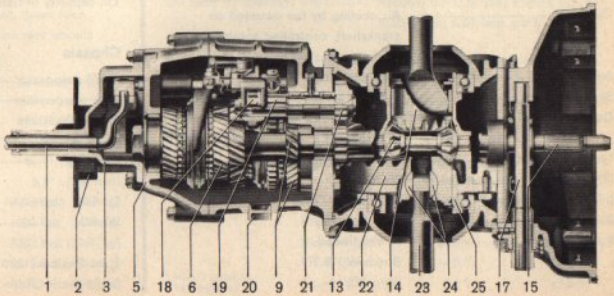
The fresh air drawn in by the fan is heated in heat exchangers. It is emitted through three defroster vents on the windshield and two controllable outlets each in front and rear foot wells. The heating is regulated by two levers situated beside the driver's seat on the frame tunnel and a knob on each side under the instrument panel.

Ventilation

The air for the ventilation is drawn in through two openings in front of the windshield. Depending on the position of the three regulating levers on the instrument panel, the fresh air enters either through vents on the windshield or through outlets above foot level.

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





Technical Data

Engine

Design	4 cylinder, 4 stroke in rear of car
Arrangement of cylinders	Two pairs, horizontally opposed
Bore	3.36" (85.5 mm)
Stroke	2.72" (69 mm)
Capacity	96.6 cu. ins. (1584 cc.)
Compression ratio	7.7 : 1
Valves	Overhead
Valve clearance with engine cold	Intake .004" (0.10 mm) Exhaust .004" (0.10 mm)
Maximum horsepower	65 at 4600 rpm. (SAE)
Lubrication	Force feed by gear pump. Oil cooler
Oil capacity	5.3 U.S. pints (4.4 Imp. pints; 2.5 liters)
Fuel delivery	Mechanical fuel pump
Carburetors	Two down draft Solex 32 PDSIT
Cooling	Air cooling by fan mounted on crankshaft, controlled automatically by thermostat
Battery	6 Volt, 88 Amp.
Starting motor	6 Volt, 0.6 bhp.
Generator	6 Volt, 200 Watt at 2800 rpm. with regulator
Ignition distributor	Vacuum spark advance
Firing order	1 – 4 – 3 – 2
Initial spark advance	7.5° before TDC
Breaker point gap	.016" (0.4 mm)
Spark plugs	14 mm thread Bosch W 175 T 1 Beru 175/14 Champion L 87 y or plugs with similar values from other manufacturers
Spark plug gap	.028" (0.7 mm)

Clutch

Design	Single plate, dry
Pedal free-play	.4" – .8" (10 – 20 mm)

Transmission

4 forward speeds, 1 reverse

All forward gears synchronized and silent.

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

Rear axle

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

Ratio	4.125 : 1
Oil capacity of transmission	6.3 U.S. pints (5.3 Imp. pints; 3.0 liters)

Chassis

Front suspension	2 torsion bars, stabilizer
Rear suspension	2 torsion bars
Shock absorbers	Double-acting telescopic shock absorbers at front and rear
Steering	Roller type with divided tie rod, hydraulic steering damper
Turning circle	Approximately 36.5 ft. (11.1 m)
Wheels	Disc wheels with drop center rims 4½ J × 15
Tires Fastback and Squareback Sedan	6.00 – 15 L 4 PR tubeless

Inflation pressures

Fastback Sedan:

1 to 2 occupants	Front	16 psi. (1.1 kg/cm²)
	Rear	24 psi. (1.7 kg/cm²)
3 to 5 occupants	Front	17 psi. (1.2 kg/cm²)
	Rear	26 psi. (1.8 kg/cm²)

Squareback Sedan:

with half payload	Front	17 psi. (1.2 kg/cm²)
	Rear	26 psi. (1.8 kg/cm²)
with full payload	Front	17 psi. (1.2 kg/cm²)
	Rear	37 psi. (2.6 kg/cm²)

For long, high speed motorway trips, the tire pressures should be increased by 3 psi. (0.2 kg/cm²) at front and rear.

Wheelbase	94.5" (2400 mm)
Track	Front 51.6" (1310 mm)
	Rear 53.0" (1346 mm)
Toe-in (unladen)	0.16"–0.24" (4 to 6 mm)
Camber (unladen)	1° 20' ± 10'
Foot brake	Hydraulic, disc front, drum rear
Hand brake	Mechanical, acting on rear wheels

Dimensions and weights

	Fastback Sedan:	Squareback Sedan:
Length	166.3" (4225 mm)	166.3" (4225 mm)
Width	63.2" (1605 mm)	63.2" (1605 mm)
Height	58.1" (1475 mm)	57.7" (1465 mm)
Ground clearance	5.9" (149 mm)	5.8" (144 mm)
Unladen weight	2028 lbs. (920 kg)	2095 lbs. (950 kg)
Max. load	882 lbs. (400 kg)	992 lbs. (450 kg)
Permissible total weight	2910 lbs. (1320 kg)	3087 lbs. (1400 kg)
Permissible front axle load	1212 lbs. (550 kg)	1212 lbs. (550 kg)
Permissible rear axle load	1741 lbs. (790 kg)	2072 lbs. (940 kg)

Fuel

Fuel consumption according to DIN 70 030 is approximately 28 mpg. U.S. i.e. 8.3 liters fuel per 100 km; 34 mpg. Imp. (Measured consumption plus 10 % with half load and at a steady ¾ of top speed 63 mph. (101 kph.)

Fuel rating	90 octane (Res. F 1)
Oil consumption	1.7 – 4.8 U.S. pints per 1000 miles 0.5 – 1.4 liters per 1000 km 1.4 – 4.0 Imp. pints per 1000 miles

Refill requirements

Fuel tank	10.6 U.S. galls. (8.8 Imp. galls; 40 liters)
Engine	5.3 U.S. pints of engine oil (2.5 liters; 4.4 Imp. pints)
Rear axle and transmission	5.3 U.S. pints of hypoid oil (2.5 liters; 4.4 Imp. pints)
Brakes	0.53 U. S. pint of brake fluid (0.25 liters; 0.44 Imp. pint)
Oil bath air cleaner	Approx. 0.8 U.S. pint engine oil (0.38 liters; 0.67 Imp. pint)
Container for windshield washer	Approximately 1 quart of water (1 liter) Air pressure: 36 psi (2.5 kg/cm²)

Performance

Maximum and crusing speed ... 84 mph. (135 kph.)

Climbing ability ...

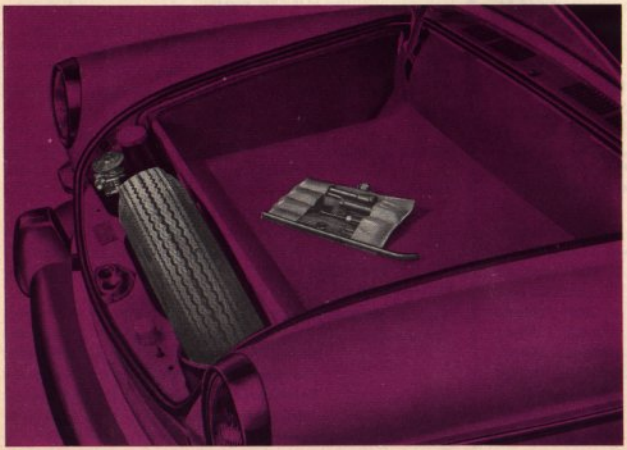
	Fastback Sedan[1]	Squareback Sedan[2]
First gear	46.0 %	41.5 %
Second gear	24.0 %	21.5 %
Third gear	14.0 %	12.5 %
Fourth gear	8.0 %	7.5 %

[1] with 2 persons
[2] half payload

Bulb chart

V = Volt, W = Watt

Bulb for	Designation according to German Standard DIN 72 601	U.S. Replacement bulbs	VW Part No.
Headlights (Sealed Beam)	–	# 6006, type 2	111 941 161 A
Parking light and front turn signal	S 6 V 5/18 W	1154	N 17 717 1
Turn signal rear, stoplight	R 6 V 18 W	1129	N 17 731 1
Tail light	G 6 V 5 W	# 81	N 17 718 1
License plate light	G 6 V 10 W	# 81	N 17 719 1
Speedometer, clock, fuel gauge, warning lights	J 6 V 1.2 W	–	N 17 722 1
Interior and luggage compartment lights	K 6 V 10 W	–	N 17 723 1



Tools and accessories

1 Tool roll

1 Hub cap removal tool

1 Combination pliers

1 Screwdriver with reversible blade for Phillips and slotted screws

1 Open end wrench 8 × 13 mm

1 Wrench for wheel bolts with handle (the handle is also used to operate the jack)

1 Spark plug socket wrench with handle

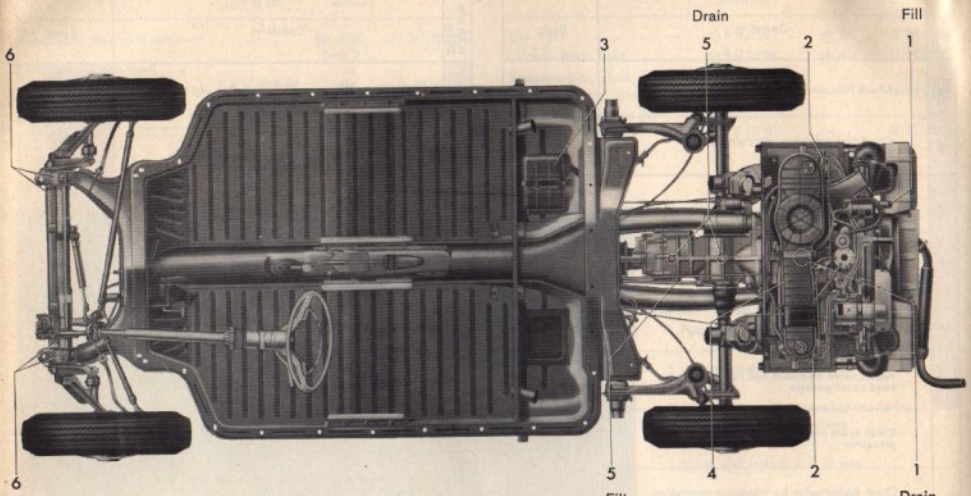
1 Spare wheel

1 Jack

Maintenance Chart

at 300 miles 500 km	Operation	Every
✓	Check rear axle shaft nuts for tightness	
✓	Check tire pressures and tightness of wheel bolts	
✓	Check V-belt	6,000 miles 10,000 km
✓	Clean fuel pump filter	
✓	Check breaker points and replace if necessary, lubricate distributor, check breaker gap and ignition timing	
✓	Adjust valve clearance and fit new cylinder head cover gaskets	
	Clean spark plugs and check compression pressures	
	Check rubber valve for crankcase ventilation, check exhaust system for damage	
✓	Check water drain flaps and cooling air bellows	
✓	Adjust clutch pedal free-play	

at 300 miles 500 km	Operation	Every
✓	Check dust seals on steering joints and tie rod ends and tightness of tie rods	6,000 miles 10,000 km
	Check and adjust axial play of upper torsion arms, camber and front wheel toe-in	
	Steering gear: Check and adjust play between roller and worm	
	Check tire wear, damage and inflation pressures	
✓	Check hydraulic brake system for leaks and damage, check brake fluid level and adjust foot and hand brakes	
	Check thickness of brake linings	
✓	Check operation of electrical system and adjust headlight alignment	
✓	Road test vehicle; check foot and hand brake efficiency. Check and adjust idling and heating	
	Clean front wheel bearings, fill with grease and adjust	30,000 miles 50,000 km


Drain
Fill
6
3
5
2
1
6
5
4
2
1
Fill
Check oil level
Drain

Lubrication Chart

at 300 miles 500 km	No.	Lubrication Points	Every
✓	1	Engine, Change oil, clean oil strainer, Check for leaks	3,000 miles 5,000 km
	2	Carburetor controls	
	3	Check battery, clean and grease terminals	
		Door and hood locks and door hinges	
	4	Check air cleaner, clean lower part if necessary	6,000 miles 10,000 km
	5	Rear axle Check oil level Check for leaks	
	6	Front end: Lubricate	
✓	5	Rear axle: Change oil, clean magnetic oil drain plugs Check for leaks	30,000 miles 50,000 km

Lubricants

Lubricant	Lubrication Points	Specifications		
		Temperature °F	°C	Viscosity Grade
Engine oil	Engine Carburetor linkage Oil bath air cleaner Door hinges	above 32	0	SAE 30
		below 32	0	SAE 10 W
		below —15	—25	SAE 5 W
Hypoid oil	Transmission	SAE 90 all the year*		
Universal grease	Door and hood locks	cold-resistant water-repellent high pressure grease		
Lithium grease	Front end Front wheel bearings breaker arm fiber block in distributor	Multi-purpose grease		

* SAE 80 all the year in countries with arctic climates

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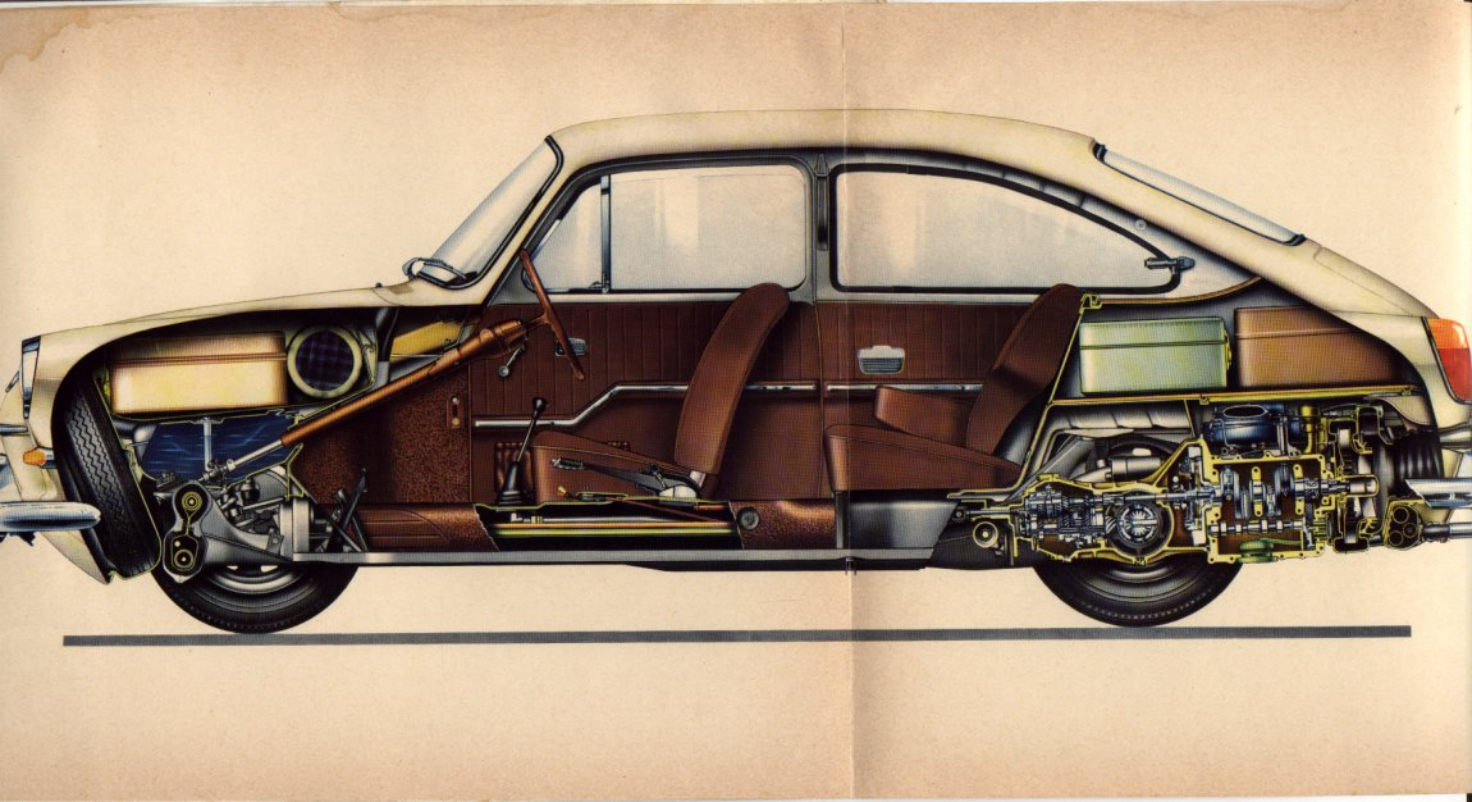

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