

Maintenance and Instruction Manual



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Customer identification card

This is another feature of Volkswagen Service that adds to your convenience. Just present this Manual whenever you stop for service at your Authorized Volkswagen Dealer. Your Identification Card will quickly furnish the Service Adviser with your name and address and all pertinent vehicle data.

Instruction and Maintenance Manual

VW 1600

1967 Models

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

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It is advisable . . .

to read the first part of this instruction manual, which deals with the operation of your Volkswagen, very carefully. You will then get to know your new car quickly and will be able to start off on your trip with complete confidence.

Everything about winter driving, tips on care of the vehicle and numerous points on carrying out small repairs and adjustments are given in the second half of this manual. This part also contains information on lubrication and maintenance and some interesting technical data.

At the back of the book is the warranty voucher, terms of warranty and a punchcard for the free-of-charge maintenance service. The stamps in the squares show that the lubrication and maintenance services have been carried out regularly by an Authorized Volkswagen Dealer.

Only one key is required to open the doors and start the engine. Be sure the key number is recorded in the front of the manual. If you should lose the key, you can obtain a replacement from your Authorized Volkswagen Dealer.



Sit down and make yourself comfortable...

When driving, you must be comfortable. That is why the Volkswagen has separate front seats which are built so that you can alter seat position and backrest rake to suit your requirements. This is quite simple —

just lift the lever on the side of the seat and slide the seat forward or backward. After adjusting, be sure the seat is securely locked in position.



The backrest rake can also be set to eight different angles by turning the large knob. Try them out until you find the angle which suits you best.

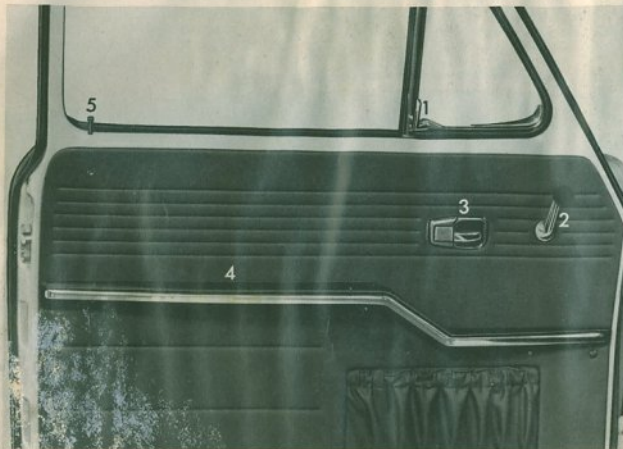
When the doors are closed, cable-operated safety catches prevent the backrests from tilting forward.

To take the seats out, press the spring on the inner runner down and slide seat to the front.

Before closing the door . . .

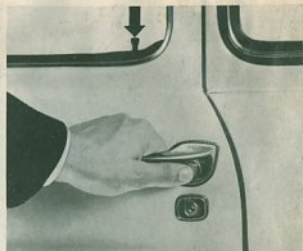
The doors can be closed more easily if a window is opened slightly.

- 1 - Vent wing lock
- 2 - Window crank
- 3 - Inside door handle
- 4 - Armrest and door closing grip
- 5 - Locking knob



The doors cannot be opened until the locking knobs have been lifted.

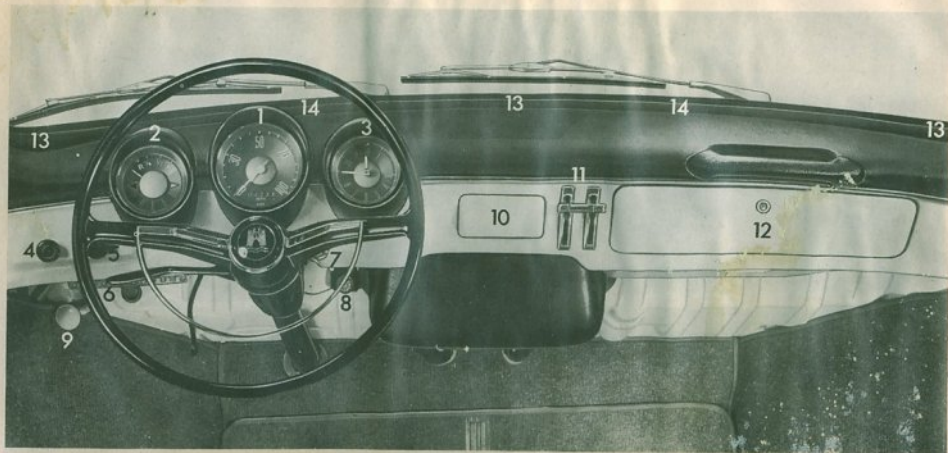
When leaving the vehicle, just press the locking knob down and depress the button in the outer handle as you close the door. The vehicle is then locked.



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

In front of you - the instrument panel

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



1 - Speedometer

2 - Fuel gauge

The following warning lights are in the fuel gauge dial:

green	— parking lights
blue	— headlight high beam
red	— generator
green-yellow	— oil pressure
green-yellow	— turn signals

When the needle is on the "R" mark there is about 1 gallon (4 liters) of fuel left in the tank — time to refuel at the next opportunity.

3 - Clock

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

4 - Windshield wipers and windshield washer system

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

5 - Light switch

Pull the knob out to the first stop to switch on the parking, license plate and tail lights. A green warning light in the dial of the fuel gauge also lights up. When the knob is pulled out to the next stop, the headlights are switched on. The headlight beams are switched up and down with a small button in the turn signal lever. A blue warning light in the fuel gauge dial shows when the headlight high beams are switched on.

The instrument lights are switched on and the brightness controlled by turning the lighting switch.

6 - Turn signal switch

Lever up — right turn signals
Lever down — left turn signals

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

The button in the turn signal lever switches the headlight beams up and down.

7 - Ignition-starter switch

8 - Emergency blinker switch

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.

9 - Knob for front hood

10 - Ashtray

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

11 - Fresh air ventilation

The two outer levers control the flow of air through the vents at lower edge of windshield separately on each side of vehicle. The center lever regulates the flow of air into the front footwell. As the levers are pressed down the flow of air increases.

12 - Glove compartment

Press the knob to open the glove compartment lid.

13 - Defroster vents

14 - Fresh air vents

Two further vents behind the dashboard admit fresh air to the front footwell.

Above the windshield . . .

15 - Sun visors

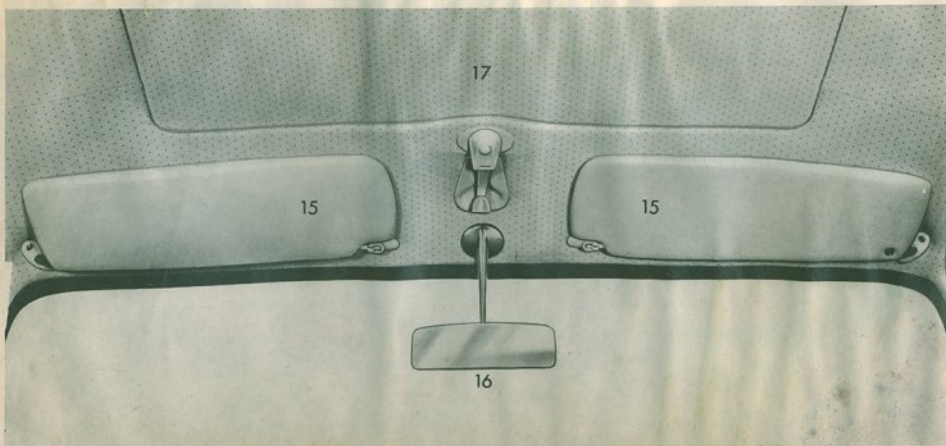
You can pull the visors out of the center mounting and swing them toward the door windows to prevent glare from the sides.

16 - Rear view mirrors

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

17 - Sliding roof

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



In the footwell and between front seats . . .

18 - Clutch pedal

19 - Brake pedal

20 - Accelerator pedal

21 - Gearshift lever

22 - Handbrake

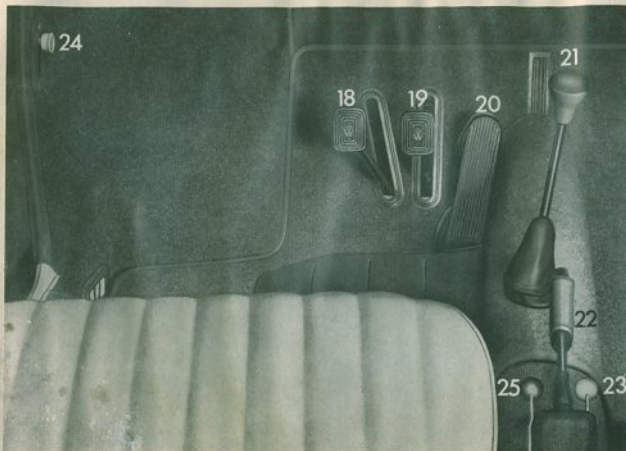
To release the handbrake, pull the lever up slightly first and press the locking knob.

23 - Heating control lever

Lever up — heat on

Lever down — heat off

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



24 - Heater control slides in front footwell

The flow of warm air into the front footwell can be controlled separately on each side.

25 - Control lever for heating in rear footwell

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

Lever up — rear seat heat on

Lever down — rear seat heat off

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

Behind you . . .

26 - Flexible window

27 - Interior lighting

The light has a built-in switch which is operated by pressing on the side of the lens. There are three positions:

Lamp in center position — light comes on when a door is opened

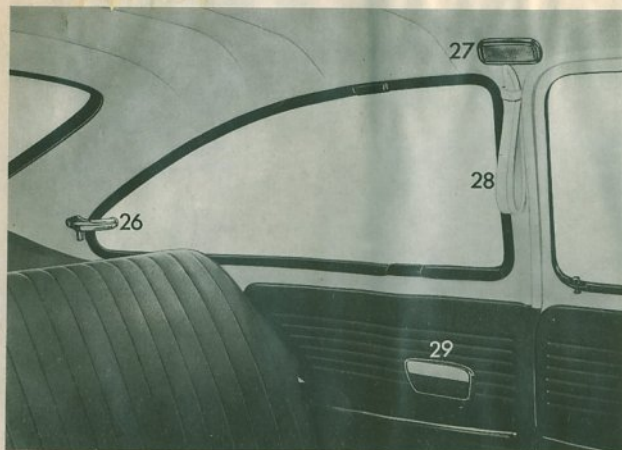
Lamp pressed in on right — light on

Lamp pressed in on left — light off

28 - Assist straps and coat hooks

29 - Ashtrays

They are removed by opening them and lifting them out of housing at the bottom first. To insert, hook the ashtray onto the leaf spring at the top first and then press in at the bottom.



Retractable Lap Belts

The front seats of your Volkswagen are provided with lap-type, retractable safety belts. When not in use, the belts retract into plastic housings which are attached to the side members of the car in line with the lock pillars. When in use, the belts are extended and the buckles engage a chrome-plated stirrup mounted on the center tunnel.

Operation:

After sitting down and making yourself comfortable, pull the belt out of the housing and pass it across your lap to the center of the car. A light push of the center of the buckle against the stirrup will make the buckle engage with a click. If you have pulled out too much of the belt, the automatic retracting mechanism in the housing will take up the slack until the belt contacts your body. It should fit snugly

across the pelvic area. Be sure the belt is not twisted. Do not strap in more than one person with each seat belt.

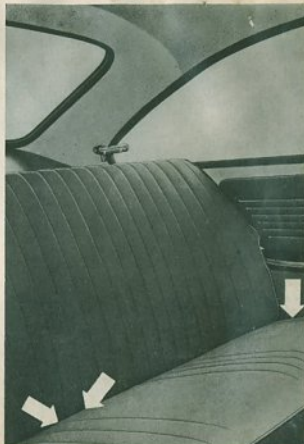
To release the belt, grasp the buckle and pull upward. This opening direction is shown by an arrow. While you can disengage the buckle from the stirrup and just let the buckle go, allowing the retracting mechanism to roll the belt up automati-

cally, we recommend that the belt be allowed to retract slowly into the housing to minimize wear on the mechanism.

To keep belts clean, wash belts with mild detergent without removing from vehicle. Do not bleach or dye the belts or use any other material to clean the belts because some of these agents can weaken the webbing.

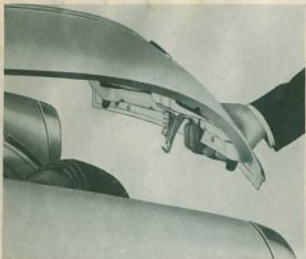
Check belts, buckles, retractors, and stirrups periodically to make sure they function correctly and that the webbing has not been damaged.

There are mounting points for rear seat belts to the left and right and underneath the center of the rear seat cushion.



In the front luggage compartment

Whether you are taking a lot of luggage with you or not, load the front luggage compartment first, using the heaviest pieces of luggage if possible. The correct distribution of load means the best road-holding, so take advantage of the possibilities offered by the Volkswagen with its two luggage compartments.



The knob which opens the front hood is on the left under the dashboard. The hood springs up slightly under spring pressure and can be opened fully when the safety hook near the lock has been pressed upward.

To close the hood press it down firmly until you hear a click. Never try to close the hood by pressing at the side, always press it in the center near the lock.



30 - Fuel tank

The tank holds 10.6 US gallons, 8.8 Imp gallons (40 liters). The choice of fuel is left entirely to you. The Volkswagen will run satisfactorily on all gasolines which fulfill the octane requirements of the engine (90 octane-Regular).

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

31 - Container for windshield washer

The container can be filled with water until it overflows. There is always room for sufficient air to operate the washer. The correct air pressure is 35 psi (2.5 kg/cm²).

It is advisable to add a cleaning solution to the water as clear water alone is usually not adequate to ensure that the windshield is cleaned quickly and properly. If enough of this cleaning agent is put in, it also acts as

a mild anti-freeze solution in the winter. Antifreeze fluids are also commonly available. Follow the directions on the container for the amount to be used.

32 - Jack

Operation of the jack is described together with wheel changing on pages 25 and 26.

33 - Spare wheel

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

34 - Brake fluid reservoir

The container must be at least three quarters full. If this is not so, have your Authorized Volkswagen Dealer check the brake system.

35 - Tools

In the tool roll you will find:

- 1 hub cap remover
- 1 pair of combination pliers
- 1 screwdriver with reversible blade for slotted and Phillips screws
- 1 open-end wrench 8 mm and 13 mm
- 1 spark plug wrench with bar
- 1 wheel bolt wrench
- 1 bar for jack and wheel bolt wrench

... and under the rear hood of the Fastback

Here is another large luggage compartment which is opened with the lever in the lock pillar of the left door. The luggage compartment lamp only lights up when the vehicle lights are on and goes out when the hood is closed.

To get to the engine, roll back the floor covering and lift the lid. The lid can be held up by hooking the left handle into a bracket on the upper edge of the body opening or taken out completely.



The rear compartment of the Squareback Sedan . . .

is accessible through the rear door which is opened by pressing the knob under the license plate. Then grasp the edge of the door underneath the lock and lift the door until it is held in the fully open position by the torsion springs.

Try not to let the door fly up on its own as this may strain the hinges.

To close the door, swing it down firmly. Make sure that it is properly closed.

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

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



Before moving off, check . . .

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

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

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

The lights include headlights, back-up lights, tail lights, license plate light, turn signals and brake lights.

The turn signals, brake lights and back-up lamps must be checked with the ignition on. If a turn signal is defective, the warning lights in the fuel gauge dial flash much faster than usual. The brake lights only work when the brake pedal is depressed and the back-up lights when reverse gear is engaged.

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

The vehicle must be on a level surface when the oil level is checked otherwise the dip-



stick reading will be inaccurate. Do not check the oil immediately after stopping the vehicle. Wait at least 5 minutes to give the oil in the engine time to drain down into the bottom of the crankcase.

Always try to use the same brand of HD engine oil. Further details about the viscosity of the oil to be used are given on page 41.

Tire pressures

	Front	Rear
Fastback Sedan		
with 1 or 2 occupants	16 psi (1.1 kg/cm ²)	24 psi (1.7 kg/cm ²)
fully loaded	17 psi (1.2 kg/cm ²)	26 psi (1.8 kg/cm ²)
Squareback Sedan		
with half load	17 psi (1.2 kg/cm ²)	26 psi (1.8 kg/cm ²)
with full load	17 psi (1.2 kg/cm ²)	37 psi (2.6 kg/cm ²)

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



Two more important points:

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

The weighted flap in the air cleaner intake pipe must be free to move in the winter and the cool seasons. If the average temperature is above 50° F (+ 10° C), the flap must be fixed open by jamming the lever under the ridge on the intake pipe.

2 - If the vehicle is used in very dusty conditions, the oil bath air cleaner must be checked frequently, even daily if necessary. How this is done is described on page 45.

Starting the engine



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

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

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

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

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

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

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

Red warning light for generator

If this light comes on when you are driving, the generator has stopped charging. You can drive on but try to get the vehicle to an Authorized Volkswagen Dealer as soon as possible because the battery will soon run down.

Green warning light for oil pressure

If this warning light comes on when driving, stop at once because the flow of lubrication oil in the engine may be interrupted. Check the oil level first. Should the cause of the trouble be elsewhere, contact your nearest Authorized Volkswagen Dealer.

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

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

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

	1st gear	2nd gear	3rd gear	4th gear
mph	0-15	10-35	20-55	30 and up
kph	0-25	15-55	30-90	45 and up

When a particular traffic situation makes it essential to move rapidly, you can accelerate up to 43 mph (70 kph) in 2nd gear and up to 60 mph (100 kph) in 3rd gear for brief periods only. Bear in mind, however, that

full throttle acceleration raises fuel consumption considerably. It is more economical to drive smoothly and keep the top speed fairly constant. Very fast, racy-sporty driving, alternating between full throttle and hard braking will mean more frequent visits to a gas station and increased tire and brake lining wear.

You can drive very economically between:

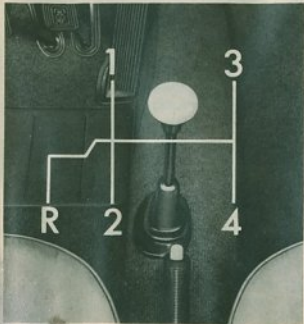
10 and 20 mph (10 and 35 kph) in 2nd gear
20 and 35 mph (30 and 55 kph) in 3rd gear
30 and 60 mph (45 and 100 kph) in 4th gear

Just a few words about the clutch while we are on the subject of driving. The clutch is a very hard-worked part of the vehicle. A good driver slips the clutch as little as possible when taking off and changing gears. He always depresses the clutch fully when shifting, he changes down into the appropriate gear in city traffic instead of slipping the clutch, and never uses the clutch pedal as a "rest" for his left foot.

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

Volkswagen automobiles have excellent brakes which can stop the vehicles in the shortest possible distance. But do not forget that the braking distance increases very rapidly as the speed increases. At 60 mph for example, it is four times longer than at 30 mph. Apply the brakes in time, but do not use too much force — locked wheels increase the braking distance.

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



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

When it snows and freezes . . .

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

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

When parking on steep hills, turn the front wheels against the curb as to prevent the vehicle from rolling.

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

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

Better still are M + S tires with spikes which increase the safety margin even on hard snow and ice. These tires should always be fitted on all four wheels. Check your state laws before using spiked tires.

The specific characteristics of winter tires can be improved by raising the tire pres-

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

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

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

Snow chains can be fitted to regular and winter tires on the rear wheels only. Only thin chains which do not protrude from the tire tread and inner side wall more than $\frac{1}{2}$ inch including tensioner, are suitable. When driving over long stretches of road which are free of snow, the chains should be removed, because they serve no useful purpose and merely damage the tires and wear out quickly.

Engine oil of SAE 30 grade will tend to thicken at temperatures around freezing point and may cause difficult starting. As soon as winter temperatures are expected, change to a thinner grade of engine oil. Details of the various oils to be used are given on page 41.

If you drive mostly short distances and in city traffic, especially in the winter, we recommend that you have the engine oil changed at shorter intervals, say every 1500 miles (2500 km). At other times, these additional changes are unnecessary and uneconomical.

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

Transmission oil of SAE 90 grade can generally be used all year round. Only in countries with arctic climates is it necessary to use the thinner SAE 80 transmission oil.

The battery not only tends to drop in capacity as the temperature drops, it also has to work much harder in the cold weather. Current consumption is higher when starting and the lights are on longer. A really cold battery which may not be fully charged has only a fraction of the capacity that a battery at normal temperature has, and this might not be enough to start a cold engine. If the car is only driven short distances and in city traffic, the battery may have to be charged from an external source from time to time.

The spark plugs should not have excessively large gaps especially in the winter. The gap is normally .028 in. (0.7 mm), but when the weather is very cold, the gap can be temporarily reduced to .016—.020 in. (0.4—0.5 mm) facilitate starting.

Door locks can freeze in winter if water gets into the lock when washing the vehicle so do not aim the water jet directly at the locks. It is a good idea to cover the keyholes beforehand. A frozen lock can be opened by warming the key well before inserting it. An anti-freeze solution or glycerine should then be squirted into the lock cylinder as soon as possible.

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

A clean, smart car looks better

We have provided your vehicle with paintwork which is not only extremely durable and has a very high gloss but which also has a long service life. This has been achieved by special chemical treatment of the body metal and the use of a four layer synthetic resin enamel paint technique.

But even the finest paint requires a certain amount of care. This is easy to appreciate if you consider for a moment the influences to which the paint is exposed. Sunlight, rain, industrial fumes, soot, dirt and dust are constantly attacking the paintwork.

In the winter all parts of the vehicle are subjected to even more severe climatic conditions and the effect of aggressive salt solutions. It is advisable to clean and wax the vehicle more frequently in this period. Every Authorized Volkswagen Dealer stocks car cleaning materials. These materials have been tested by us and found to give the best results. The order numbers of these materials are given on page 23.

Wash the new vehicle frequently with clear water particularly in the first two or three months as this will help to harden the paintwork. Use a soft sponge or hose brush for the body, a long handled brush for the wheels and plenty of water. Spray the body panels and wheels with a fine soft spray first to loosen the dirt, then start at the top and wash downward. Rinse the sponge out frequently to avoid scratching the paint.

Later on, the vehicle should always be washed when it is dirty. The longer the dirt is left on the paint the greater is the risk of it damaging the glossy finish. The dirt particles can have a chemical effect on the paint surface or they can cause scratches if rubbed into the paint. If the dirt cannot be removed with clear water, a suitable shampoo can be added to the water. Afterward, rinse all traces of the shampoo off with clear water and then chamois the vehicle dry to avoid water spots.

Waxing should be carried out for the first time after about 8 to 10 weeks. Waxing is a means of putting back into the paint certain substances which keep it flexible and are lost in the course of time due to weathering and washing particularly when you use a detergent. The wax coating seals the pores of the paint and makes it water-repellent.

The paint should be re-waxed when water remains in large patches on the surface and does not form beads and roll off. Regular waxing will ensure that the paint retains its original high gloss for a long time.

Another way of waxing the paint is to use a wash-and-wax solution. This is easier than waxing in the normal way. Just wash the vehicle first then put the wash-and-wax solution in a bucket of water and apply it to the paintwork. All that remains is to leather off the paint until it is dry. This type of wax will only protect the paint adequately if it is used every time the vehicle is washed and the interval between washes is not more than two or three weeks.

Polishing should only be done when the paint has lost its gloss due to weathering or lack of proper care and the gloss can no longer be restored by waxing in the normal way. After treatment with polish, wax the paint thoroughly to retain the gloss which has been obtained.

Never wash, wax or polish the car in the sunshine.

Before waxing and polishing, the vehicle must be washed and dried thoroughly.

Tar spots tend to penetrate into the paint in a very short time. They should be removed as soon as possible, preferably with a tar remover. Afterward, the area concerned should be washed with a solution of shampoo and water and rinsed well to remove all traces of tar remover.

Insects tend to stick on the front of the vehicle and on the windshield in the summertime. These should also be washed off the paint as soon as possible. When really dried on, the insects can be removed with an insect remover. The paintwork should also be washed, rinsed and leathered off afterward.

Parking under trees. Vehicles which are parked under certain trees in the summer are often found to be covered with sticky spots. These spots can be taken off easily with a shampoo if the treatment is not delayed too long. It is advisable to wax the paint afterward.

Chrome parts should be treated with a chrome cleaner or polish. To give lasting protection in the winter, the chrome parts can be coated with one of the patent chrome protection compounds which form a hard film. The best way to apply these compounds is by spraying. The film can be removed by washing with kerosene, then washing with shampoo and rinsing to remove all traces.

The windows can be cleaned with a sponge and clear water. Always use a special clean leather to dry the windows. This leather must not be used on 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. Do not forget to clean the wiper blades.

The windshield wiper blades should be taken off from time to time and cleaned with a hard brush and alcohol or a strong detergent solution. During long dry periods particularly they tend to get clogged with tar splashes, oil and insects. New blades should be fitted once a year.

Car care materials for the Volkswagen

Since beauty is "skin-deep", your Volkswagen has been given a pretty deep skin. Four layers, as a matter of fact. (Each coat of enamel sprayed on, sanded and baked individually). The items listed below will help you preserve the built-in beauty of your Volkswagen. Compounded especially for use on your VW, they are available at your local Authorized Volkswagen Dealer. Detailed instructions on how to use the various products are imprinted on the individual containers.

Application	Volkswagen Product	Package & Quantity
Car Washing Upholstery Cleaning Whitewall Tire Cleaning	All Purpose Cleaner — ZVW 243 101	Plastic Bottle — 16 oz.
Paint Polishing and Paint Waxing	Combination Car Cleaner and Wax — ZVW 241 109	Can — 16 oz.
Care and Cleaning of Chrome Parts	Chrome Cleaner and Protection — 000 096 067	Tube — 2.8 oz.
Windshield Cleaning	Windshield Washer Anti-Freeze & Solvent — ZVW 241 101	Can — 16 oz.

The cloth upholstery should be cleaned with a vacuum cleaner or a fairly hard brush. Spots can usually be removed with a lukewarm soap solution. Grease and oil spots can be treated with spot remover. Do not pour the liquid on to the material as this will cause marks. Dampen a clean, plain cloth with the cleaner and remove the spot by rubbing with a circular movement and working inwards.

The leatherette parts of the headlining, side trim panels and seats can be cleaned best with a soft cloth or brush. When very dirty use a lukewarm soap solution or a dry foam cleaner. Use only a dry foam cleaner on the leatherette of the seats and backrests because the material used for these parts is air-permeable and liquid cleaners would penetrate into the textile backing.

Grease or paint spots should be wiped off before they dry when possible. Once dry, they can be removed by rubbing carefully with

a cloth moistened with benzine or alcohol. Shoe polish marks can be removed with turpentine but be careful because this will damage the dust repellent surface of the leatherette if allowed to work on it too long. After cleaning, rub the material dry 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 make clothing dirty.

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

Door and window weatherstrips must be undamaged and supple to ensure that they seal properly. To retain the original flexibility of the rubber, coat the weatherstrips with talcum powder or silicone occasionally.

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

- 1 - Check tires for damage occasionally and remove imbedded material.
- 2 - Keep oil and gasoline away from the tires.
- 3 - Try not to expose tires to strong sunshine for long periods.
- 4 - Replace missing valve dust caps as soon as possible.

Tires should be replaced when the tread depth is only $\frac{1}{16}$ in. (1 mm) all round and on full tread width because this is the absolute limit for safe usage. We advise you however not to let the tires wear down to this extent as tires with treads in this condition cannot grip the road surface properly when driving at high speeds on wet roads. If you notice that the tires are wearing unevenly, get advice from your Authorized Volkswagen Dealer.

Just in case

you have to carry out a repair yourself we have included some information on the next few pages which should help you.

All other repairs should always be performed by an Authorized Volkswagen Dealer. The Volkswagen service organization offers you a wide-spread network of authorized dealers staffed by skilled mechanics and equipped with all the special tools and equipment required. Whenever you see the familiar VW sign on the roadside, you can be sure of expert advice and quick, efficient assistance.

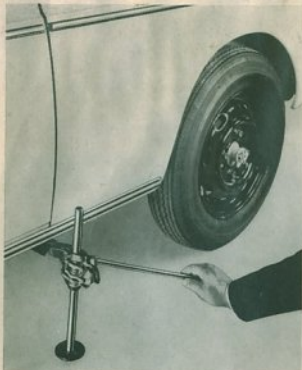
Wheel changing

Apply the hand brake.

Remove hub cap with puller and jack bar by hooking the puller into the holes in the edge of the cap and levering against the wheel rim with the jack bar.

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



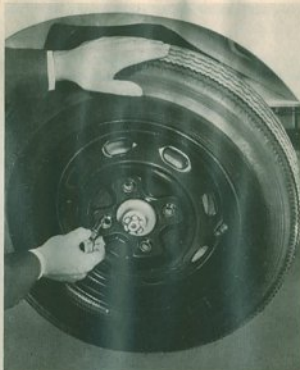


Insert jack into socket and push the jack tube down until it touches the ground.

Place bar in upper link of jack and raise vehicle.

Unscrew wheel bolts and take wheel off.

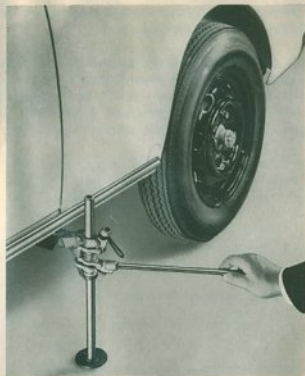
Place spare wheel in position and raise or lower vehicle until the holes in the wheel are roughly in line with the threaded holes.



Insert one bolt and tighten it until the wheel can be swung around to align the other holes.

Insert remaining bolts.

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



Insert bar in lower link of jack and lower the vehicle by pumping handle up and down.

Tighten the wheel bolts diagonally.

Install hub cap with a blow of the hand.



Cleaning fuel pump filter

Pull suction line off pump and seal it.

Remove plug and take filter out.

Wash filter in clean benzine and blow it out.

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

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.

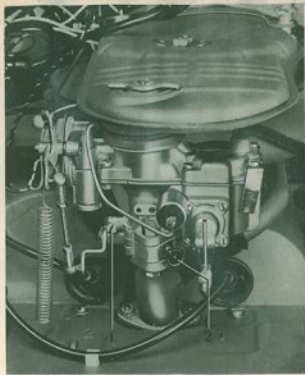
Special test appliances are also required for the idling adjustment. However, if you are compelled to correct the setting yourself, proceed as detailed here. The adjustment should then always be checked accurately by an Authorized Volkswagen Dealer at the first opportunity.

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.

Removing and installing spark plugs

Remove air cleaner and unhook return springs from carburetor pull rods.

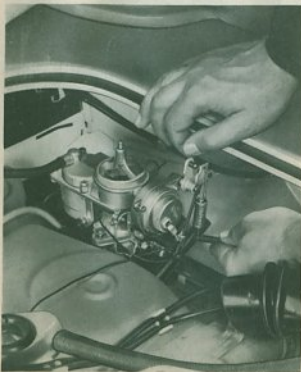
Pull connector off and screw plug out with socket wrench and bar.

Dirty plugs should be cleaned with a sand blaster but in an emergency the carbon can be removed with a chip of wood. Do not use a wire brush. The plugs should also be clean and dry on the outside as well, in order to avoid shorting and tracking.

The gap can be set by bending the ground electrode. The gap should normally be .028 in. (0.7 mm) but when the weather is very cold the gap can temporarily be reduced to .016-.020 in. (0.4-.5 mm) to facilitate starting.

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

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



Ignition timing

Particular attention must 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 must not be advanced arbitrarily.

Before setting the ignition timing, the breaker contact point gap must be checked.

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

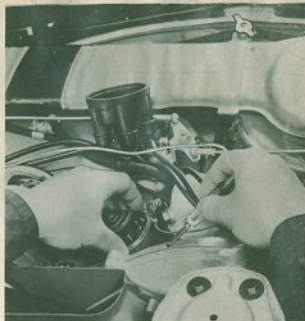
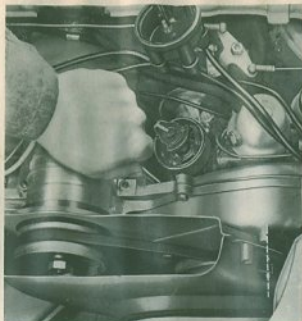
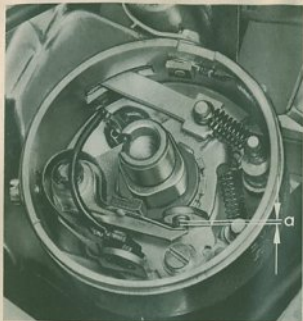
Adjusting contact points

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 in. (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 12 Volt test lamp to terminal labeled No. 1 on 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.

Headlight adjustment

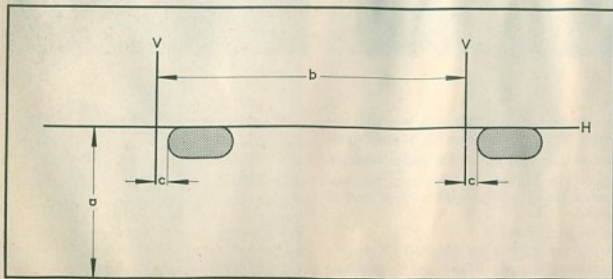
It is best to check the headlight alignment with a regulation screen or aiming device. If none is available, proceed as follows:

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).

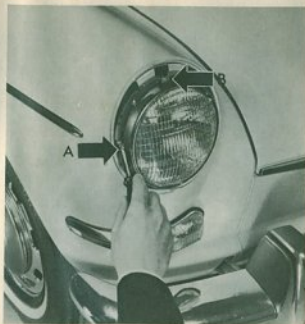
Measure height (a) of center of headlights from ground and draw a horizontal line (H) on screen at this height the full width of the vehicle.

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 in.)
- c - 2 in.



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 in. to the right of the vertical line V.

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



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

Remove two Phillips screws.

Take lens off.

Press bulb into holder lightly, turn and take out.

Install new bulb.

Ensure that gasket is located properly when installing.

Do not overtighten screws.

Bulb replacement

Sealed-Beam

A double filament, type 2, seven inch sealed beam unit 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.



Stop, tail or turn signal bulb

Unscrew two Phillips screws and remove lens.

Bulb positions:

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

Press bulb into holder lightly, turn and take out.

Install new bulb.

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



License plate light bulb

Open rear hood.

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

Pull bulb holder out of lens.

Press bulb into holder lightly, turn and take out.

Install new bulb.

When installing, ensure that the cable grommet fits properly.



Back-up lamp bulb

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

Take reflector out of housing.

Press bulb into reflector lightly, turn and take out.

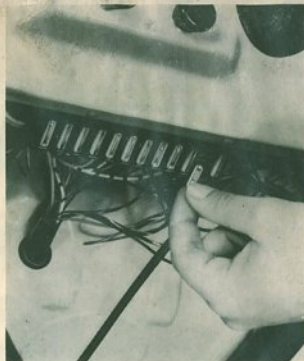
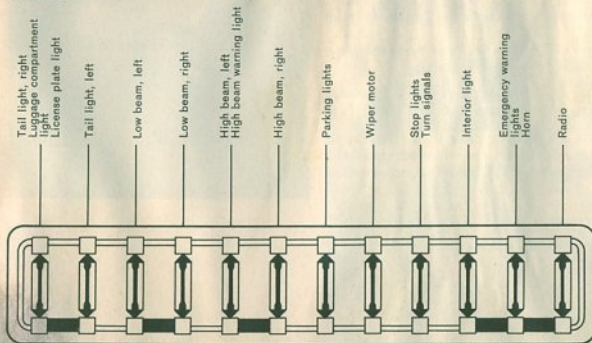
Install new bulb.

Ensure that gasket is located properly when installing.

Bulb chart V = Volt, W = Watts

Bulb for	US replacement bulb	VW Part No.
Headlight	6012	111 941 261 A
Front turn signal, parking light	1034	N 17 738 2
Rear turn signal, stop light	1073	N 17 732 2
Tail light	67	N 17 718 2
License plate light	89	N 17 719 2
Back-up light	1073	N 17 710 2
Speedo, clock, fuel gauge, warning lamps	—	N 17 722 2
Control lamp for emergency warning light system	—	N 17 751 2
Interior and luggage compartment light	—	N 17 723 2

Fuse box



Replacing fuses

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

When a fuse blows it is not sufficient to merely replace it with a new fuse. The cause of the short circuit or overload must be established. On no account should fuses be patched up with tin foil or wire as this can cause serious damage elsewhere in the electrical system.

It is advisable to always carry a few spare 8 Ampere fuses on the vehicle.

Checking battery

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

When the rear seat is lifted, the battery cell plugs can be screwed out. The electrolyte should always be just above the tops of the plates. The electrolyte level should be in accordance with the mark. If the level is low, top-up with distilled water only.

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

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

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

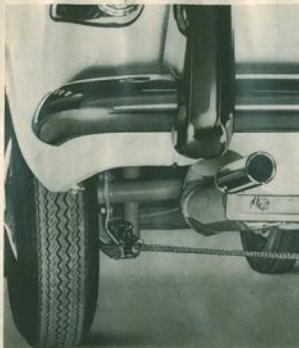
If you store your vehicle for a prolonged period, it is advisable to take the battery to an Authorized Volkswagen Dealer. A battery which is not in constant use will discharge itself in time and this can cause permanent damage to the plates if the battery is not checked about every four weeks and charged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



Towing

Just in case you wish to attach a towrope to your vehicle, please note that the bumpers are not suitable for this purpose. At the rear, the rope should be attached to a lower shock absorber bracket. This point is not very easy to get at but it does 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 tube of the front axle.



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 Volkswagen 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.	<ol style="list-style-type: none">1. Run down or dead battery2. Loose connection<ol style="list-style-type: none">A. At batteryB. At starterC. At connector block on steering column under dash board.D. At light switch or fuse box.3. Starter defective	<ol style="list-style-type: none">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. Make sure that all connections are tight.<ol style="list-style-type: none">A. Check both cable connections on battery and grounded end of ground strap.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. Have vehicle started by pushing and take it to nearest Authorized VW Dealer.
VW will not start: engine turns over.	<ol style="list-style-type: none">4. Loose connection in ignition system5. Loose connection in primary circuit to coil.	<ol style="list-style-type: none">4. Check for loose connections at coil, distributor and spark plugs.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.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
VW will not start: engine turns over.	<p>A. Caused by improper starting procedure. If the gas pedal is depressed too often, the accelerator pump of the carburetor injects too much gasoline.</p> <p>B. Carburetor may be flooded, float or needle valve may be sticking.</p>	<p>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.</p> <p>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.</p>
Engine stalls shortly after starting	<p>8. Poor fuel supply</p> <p>9. Automatic choke does not open, excessive fuel supply.</p>	<p>8. See paragraph 11 through 13.</p> <p>9. Remove air cleaner. Check whether choke valves are in vertical position after ignition has been switched on for 2-5 minutes (depending on outside temperature). Both covers for choke units must be hot. If choke valves are binding in a closed position, contact your nearest Authorized VW Dealer.</p>
Engine stalls while vehicle is driven.	<p>10. Defect in ignition system</p> <p>11. Fuel supply is exhausted</p> <p>12. Fuel filter in pump may be clogged</p> <p>13. Gasoline may be contaminated by water or dirt</p>	<p>10. See paragraph 4 through 6.</p> <p>11. Check whether any gasoline is left in tank.</p> <p>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.</p> <p>13. See your VW dealer for cleaning of all components of the fuel system.</p>
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.

Give your Volkswagen that individual touch. Fit approved Volkswagen accessories.

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

Approved VW accessories are supplied by your Authorized VW Dealer who will also install them for you if necessary. You can fit many of the accessories yourself.

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

Proper lubrication

means regular and careful lubrication. Details of the various intervals at which the lubrication points require your attention are given on pages 54 and 55.

Engine

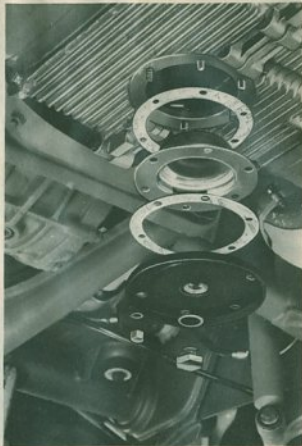
Regular oil changes are necessary even if the very best brand of HD oil is used because dirty oil in the engine means increased wear and reduces service life.

The oil is drained, when warm, by removing the plug in the oil strainer cover plate. Flushing is not necessary but the strainer must be removed and cleaned at every oil change. The gaskets and the copper washers under the cap nuts must always be renewed. The engine is then filled with 5.3 US pints of HD oil (2.5 liters/4.4 Imp pints).

Due to the detergent properties of the HD oil, the fresh oil will look very dark after the vehicle has been running for only a short



time. This need not worry you and under normal operating conditions there is no reason whatever to change the oil at shorter intervals than every 3000 miles (5000 km). We only recommend more frequent oil changes — every 1500 miles (2500 km) — in the winter if you drive mainly short distances



and in city traffic. If you only drive a few hundred miles a month under these conditions it is advisable to have the oil changed every 6 to 8 weeks. In countries with arctic climates where average temperatures are about -13°F (-25°C) the oil should be changed every 750 miles (1250 km).

Some more information about oil

When changing and topping up the oil, try to always use the same brand of HD oil. The quality of modern oils produced by reputable firms is so good that the choice of brand is left entirely to you. The VW engine makes no demands in respect of oil quality which cannot be fulfilled by every well known and popular brand. It is best to select "your" oil at the first 300 miles (500 km) oil change and stick to this brand on all occasions. Should you have any doubts at all, your Authorized VW Dealer will be pleased to advise you.

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

SAE 30 in warm seasons and all the year in countries with hot climates

SAE 20 W/20 In the winter

or

SAE 10 W*) In areas where the average temperature is below 5° F (–15° C)

SAE 5 W*) In countries with arctic climates and temperatures below –13° F (–25° C)

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

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

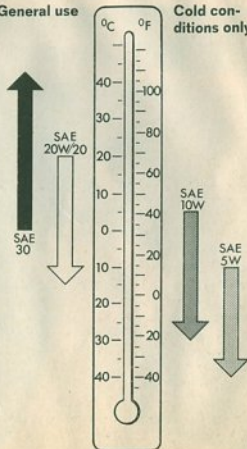
In some countries, oils are classified according to the API system (American Petroleum Institute). Under this system HD oils suitable for the VW engine are designated "For Service MS".

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

Temperature ranges of SAE grades

General use

Cold conditions only



Transmission

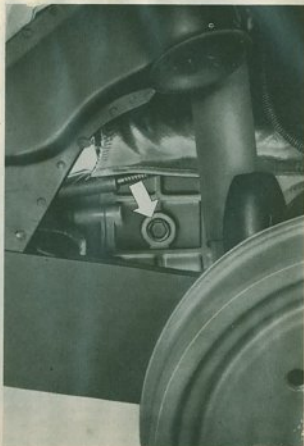
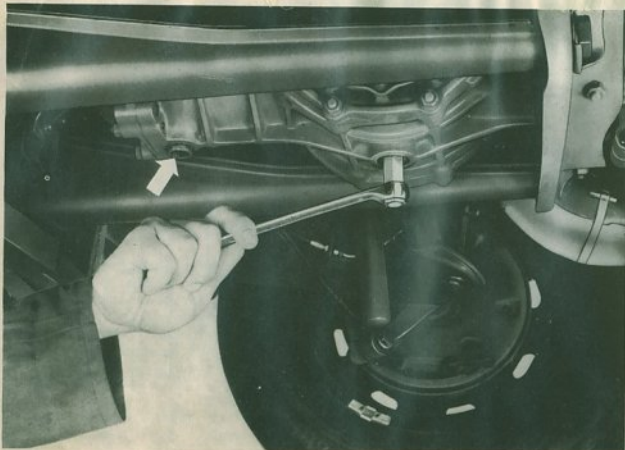
Transmission and differential are combined in one housing and both lubricated with the same hypoid oil. The oil should be up to the edge of the filler hole.

At oil changes, the old oil should be drained when warm. The two magnetic oil drain plugs

must be cleaned carefully and 5.3 US pints (2.5 liters) of good quality SAE 90 hypoid oil put in. In countries with arctic climates, SAE 80 oil should be used all the year.

The oil sometimes runs into the transmission housing very slowly. If one attempts to put the oil in too quickly it may overflow and give the impression that the housing is already full although actually only about 2–3 pints have been put in. It is essential to the service and silent running of the rear axle that the correct amount of oil is used in the transmission.

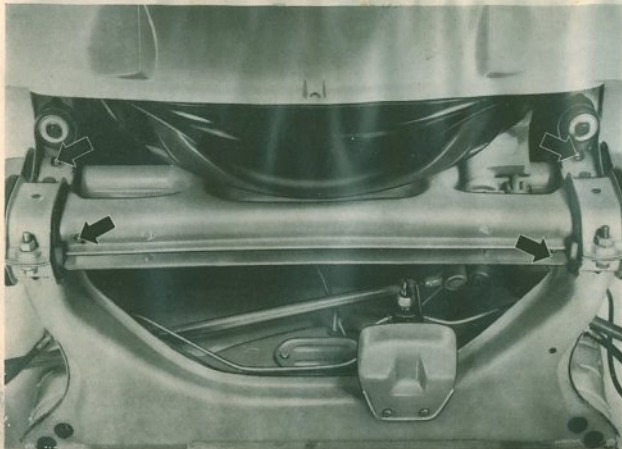
Additives should not be used with hypoid oil.



Front axle

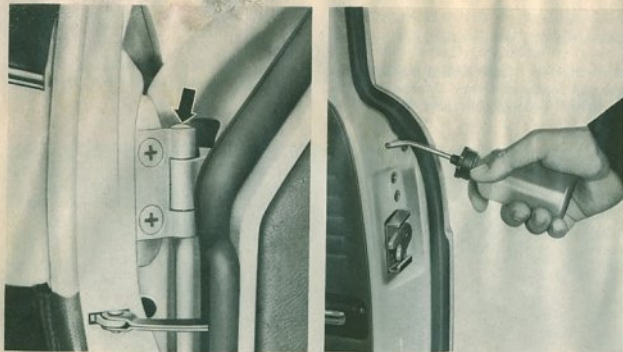
The front axle can only be lubricated properly when the axle is free of load, that is with the front end lifted and the wheels hanging free.

There are four nipples on the axle tubes which must be lubricated with a lithium-based multi-purpose grease. The nipples and the grease gun nozzle should be cleaned carefully before greasing commences. Place gun on nipples and inject grease until fresh grease starts to come out at the torsion arm sealing rings.



Grease and oil must not be left on tires and brake hoses for long periods. Even small traces should be wiped off immediately.

If the vehicle is driven less than 6 000 miles (10 000 km) per year, the front axle must be lubricated once a year.



Doors and hoods

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

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

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

Air cleaner

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

All the dust present in the air drawn in by the engine is retained by the filter element in the upper part of the air cleaner and washed out when the vehicle is in motion by the oil in the lower part. In time, this causes a layer of sludge to form at the bottom of the lower part. When there is only $\frac{3}{16}$ " (4–5 mm) of oil above the sludge layer, the lower part must be cleaned and filled with fresh oil. The cleaner must be removed to do this:

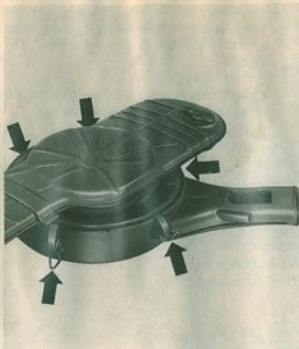
Pull crankcase breather hose off air cleaner intake pipe.

Release clip on intake pipe and pull bellows off pipe.

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

Remove center wing nut securing air cleaner.

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



Release the five clips and take top part of cleaner off.

The top part must not be put down with the filter element upward.

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

Fill cleaner to mark with about .8 pint of fresh engine oil. SAE 30 oil should be used all the year except in countries with arctic climates where SAE 10 W oil should be used.

The top part does not normally need cleaning. If the filter element has become so dirty due to delayed cleaning of the bottom part or oil shortage that the air inlet holes on the underside are partly blocked, the encrusted dirt should be scraped off with a piece of wood.

When assembling the cleaner note that the embossed marks on upper and lower parts are in line.

When installing the cleaner, ensure that the seals between carburetors and cleaner are located properly and that the bellows seals properly on the cleaner intake pipe. Furthermore, it is essential to tighten the two outer nuts securing the cleaner first and then the center one.

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

Technical data

Engine

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

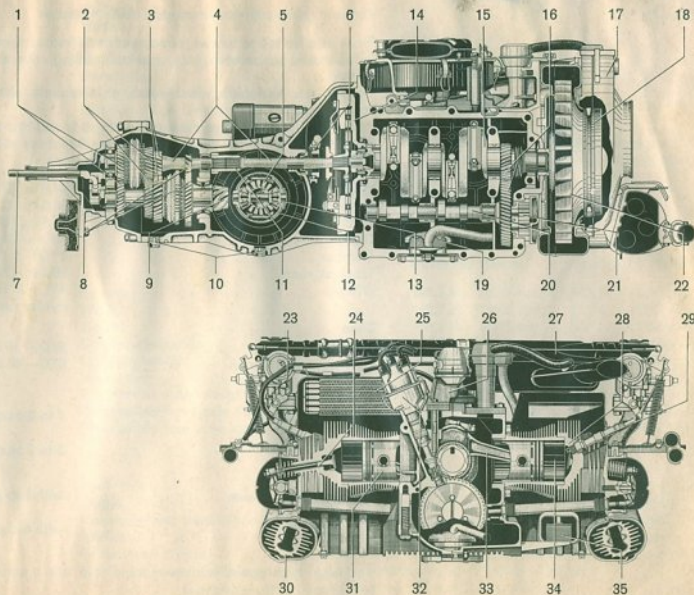
Bore	3.36 in. (85.5 mm)
Stroke	2.72 in. (69 mm)
Capacity	96.6 cu. in. (1584 cc.)
Valve clearance with engine cold	Intake and exhaust .004 in. (0.10 mm)
Compression ratio	7.7 : 1
Maximum output SAE	65 bhp. at 4600 rpm.
Maximum torque SAE	86.8 ft. lbs. at 2800 rpm.
Mean piston speed	1811 ft./min.
Fuel consumption*)	26.4 miles per US gallon 8.9 liters per 100 km 31.5 miles per Imp. gallon
Fuel rating	90 octane (Regular)
Oil consumption	1.7—4.8 US pints per 1000 miles 0.5—1.4 liters per 1000 km 1.4—4.0 Imp. pints per 1000 miles

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

Power transmission

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

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



Chassis

Platform frame with tunnel-shaped center member

Front axle bolted to forked frame head, sub-frame at rear to carry engine-transmission unit
Independent suspension: twin, cranked, trailing arms at front, swing axles on trailing arms at rear

Torsion bar springing, double-acting telescopic shock absorbers, stabilizer at front, equalizer spring at rear

Roller steering with maintenance-free tie-rods and hydraulic steering damper

Footbrakes: Hydraulic, dual circuit system with discs at front

Handbrake: Mechanical, effective on rear wheels.

Wheelbase	94.5 in. (2400 mm)
Turning circle	36.5 ft. (11.1 m)
Track at front	51.6 in. (1310 mm)
Toe-in16 in— .24 in. (4 to 6 mm) unladen
Camber	1° 20' ± 20' unladen
Track at rear	53.0 in. (1346 mm)
Wheels	4½ J x 15 perforated wheel discs with drop center rims

Tires

Fastback Sedan	6.00 — 15 L 4 PR tubeless
Squareback Sedan	6.00 — 15 L 6 PR tubeless

Tire pressures

Fastback Sedan	1 to 2 occupants	Front 16 psi. (1.1 kg/cm ²)
		Rear 24 psi. (1.7 kg/cm ²)
	3 to 5 occupants	Front 17 psi. (1.2 kg/cm ²)
		Rear 26 psi. (1.8 kg/cm ²)
Squareback Sedan	with half payload	Front 17 psi. (1.2 kg/cm ²)
		Rear 26 psi. (1.8 kg/cm ²)
	with full payload	Front 17 psi. (1.2 kg/cm ²)
		Rear 37 psi. (2.6 kg/cm ²)

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

Electrical system

Voltage	12 Volts
Battery	45 Ah
Starter	0.7 hp
Generator	max. 360 watts, early cut in
Distributor	with vacuum spark advance
Firing order	1 - 4 - 3 - 2
Basic ignition timing	7.5° before TDC
Contact breaker gap016 in. (0.4 mm)
Spark plugs	Bosch W 175 T 1, Beru 175/14, Champion L 87y, or plugs with similar values from other manu- facturers
Plug thread	14 mm
Plug gap028 in. (0.7 mm)

Dimensions and weights

	Fastback Sedan	Squareback Sedan
Length	166.3 in. (4225 mm)	166.3 in. (4225 mm)
Width	63.2 in. (1605 mm)	63.2 in. (1605 mm)
Height	58.1 in. (1475 mm)	57.7 in. (1465 mm)
Ground clearance	5.9 in. (149 mm)	5.8 in. (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)	3037 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)

Capacities

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 liter; 0.44 Imp. pint)
Oil bath air cleaner	Approx. 0.8 U.S. pint engine oil (0.38 liter; 0.67 Imp. pint)
Container for windshield washer	Approximately 1 quart (1 liter) of water Air pressure: 36 psi (2.5 kg/cm ²)

Performance

Maximum and cruising speed	84 mph (135 kph)	
Acceleration time from 0—50 mph (0—80 kph) . .	12.5 seconds	
Climbing ability %	Fastback Sedan ¹	Squareback Sedan ²
First gear	46.0	41.5
Second gear	24.0	21.5
Third gear	13.5	12.0
Fourth gear	8.0	7.5
	¹ with 2 occupants	² half payload

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:

31 7 000001
Model Year Serial Number



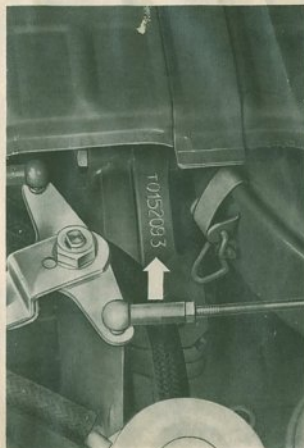
The chassis number

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.



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Lubrication and maintenance

A. The free maintenance service at 300 miles — W 1 — consists of the following:

Oil Change

1. Engine: Change oil, clean oil strainer. Check for leaks.
2. Transmission: Change oil, clean magnetic drain plugs. Check for leaks.
3. Windshield washer: Check fluid.
8. Check dust seals on ball joints and tie rod ends. Check tie rods, tighten if necessary.
9. Check front wheel camber and toe-in.

Maintenance Service

The Mechanic:

1. Check rear axle shaft nuts, tighten if necessary.
2. Check V-belt, adjust if necessary.
3. Clean fuel pump filter.
4. Check contact points, lubricate distributor, adjust ignition timing.
5. Adjust valve clearance.
6. Check water drain flaps and air intake housing bellows.
7. Adjust clutch pedal free-play.

B. An oil change service every 3,000 miles — WS 5 — consists of:

1. Engine: Change oil, clean oil strainer. Check for leaks.
2. Door and hood locks, door hinges: Lubricate.
3. Carburetor linkage: Oil.
4. Battery: Check, add distilled water if necessary. Clean and grease terminals.
5. Windshield washer: Check fluid.

The Service Adviser (Quality Control)

During roadtest:

Check efficiency of braking, steering, heating and ventilation systems. Check overall performance.

After roadtest:

Check cylinder head covers for leaks. Check and adjust idling.

C. A lubrication and maintenance service every 6,000 miles — W 10 — consists of:

Lubrication Service

1. Engine: Change oil, clean oil strainer. Check for leaks.
2. Transmission: Check oil level, add if necessary. Check for leaks.
3. Front end: Lubricate.
4. Door and hood locks, door hinges: Lubricate.
5. Carburetor linkage: oil.
6. Air cleaner: Check, clean lower part if necessary and fill in fresh oil.
7. Battery: Check, add distilled water if necessary. Clean and grease terminals.
8. Windshield washer: Check fluid.

Maintenance Service

The Mechanic:

1. Check V-belt, adjust if necessary.
2. Clean fuel pump filter.

3. Check contact points, replace if necessary: lubricate distributor, adjust ignition timing.
4. Adjust valve clearance.
5. Clean spark plugs, check and adjust plug gap. Check compression.
6. Check weighted control flap for carburetor pre-heating.
7. Replace crankcase breather filter.
8. Check rubber valve for crankcase ventilation, replace if necessary. Check pre-heating pipe valve and exhaust system for damage.
9. Check water drain flaps and air intake housing bellows.
10. Adjust clutch pedal free-play.
11. Check dust seals on ball joints and tie rod ends. Check tie rods, tighten if necessary.
12. Check and adjust end play of upper torsion arms. Check front wheel camber and toe-in.
13. Steering gear: Check and adjust play between roller and worm.

14. Check tires for wear and damage, check tire pressures.
15. Check brake system for damage and leaks, check brake fluid level, add if necessary. Adjust foot and hand brakes.
16. Check thickness of brake linings and pads.
17. Check operation of electrical system and headlight adjustment.

**The Service Adviser
(Quality Control)**

During roadtest:

Check efficiency of braking, steering, heating and ventilation systems. Check overall performance.

After roadtest:

Check cylinder head covers for leaks. Check and adjust idling.

D. In addition, every 30,000 miles, the transmission oil is changed — W 10 — and the front wheel bearings repacked — W 50.



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