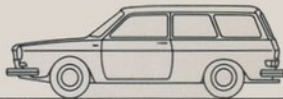
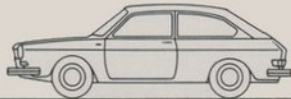
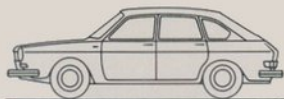


Instruction Manual



Instruction Manual

VW 411 E

VW 411 E Variant

August 1971 Edition

It is to your advantage . . .

to get to know your new car quickly so that you will be able to start off on your first trip with complete confidence.

For this reason you should read the first part of this booklet, which deals with the operation of your VW 411 E carefully.

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

When you have studied this manual, and we strongly recommend you to do so, you will know how to operate your car properly.

You will then be entitled to expect many years of reliable and economical service from your car regardless of weather, road conditions and mileage run.

In this connection we should like to mention the VW Service Record which is the second important publication that you receive with the vehicle.

The Service Record tells you exactly what points you have to watch to maintain the roadworthiness of your car and explains the Volkswagen Diagnosis and Maintenance System.

It also contains the Warranty Voucher for your VW 411 E and the conditions on which this voucher is issued.

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

In your own interests: Have your VW 411 E serviced as laid down in the Service Record right from the start. Proper treatment and complete proof of all maintenance work carried out can be of vital importance if you should have occasion to make a claim under warranty.

The pictures and text in this manual are based on the VW 411 LE with a number of useful optional extras. Where the controls and technical details of the VW 411 E differ considerably, attention is drawn to the difference. The use of the VW automatic transmission is explained separately. The special features of the VW 411 E Variant are summarized and explained at the end of this manual. Special equipment such as is often required due to local regulations in various countries is not taken into account.

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

Volkswagenwerk Aktiengesellschaft

Test wiring and socket

VW technology never stands still. Your new Volkswagen has numerous improvements which will help to maintain its reputation as one of the most reliable and economical automobiles.

But not only the vehicle itself has been improved still further — the Volkswagen Diagnosis and Maintenance System is also continuously being modified to keep it in line with technical developments.

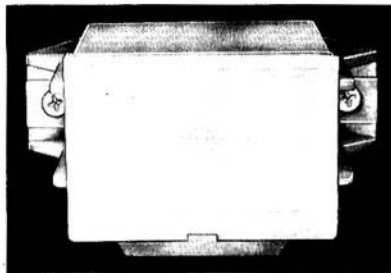
Advanced electronic test instruments which can check many points in the Diagnosis program automatically — without the help of the test mechanic — will be introduced. The results of these checks are printed on the test report simultaneously.

To do this, the vehicle is connected to the electronic system of the diagnosis stand by means of a special socket in the engine compartment.

Your Volkswagen is ready for this new system. The vehicle has a special wiring network which is connected to the multi-point socket in the engine compartment shown here.

This socket is used to connect the vehicle to the Diagnosis Stand. Please ensure that the lid of the socket is always closed.

The Volkswagen Diagnosis and Maintenance System is a good thing. It is the most modern automobile servicing system in use today and every effort is being made to keep it constantly in step with technical developments.



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Concerning your safety

(Well worth reading before or after studying the rest of the manual.)

For years now our engineers have been leading the field in the development of safe automobiles. Your Volkswagen is the product of this experience:

Your vehicle is equipped with all the safety features of design and trim which are necessary and which we consider practical. All for your safety, your protection and, in addition, to reduce the danger to other road users if the worst comes to the worst.

In the description of your Volkswagen, the term "safety" crops up dozens of times (you will see this or have already seen it).

We have, however, not fully exhausted the subject of safety in conjunction with the technical detail of your Volkswagen in this booklet.

As an interested reader you will soon realize, without knowing a great deal about technical matters, that numerous details of your vehicle are designed in such an elaborate way to offer you the highest possible degree of primary and secondary safety.

Here are just a few of these safety features:

- Independent suspension at front and rear. Suspension struts at front, double-joint axle at rear, positive wheel location, uniform roadholding.
- Good weight distribution due to front luggage compartment, no sagging at rear, headlamp settings always right even when vehicle is fully loaded.
- Front disc brakes, no fading, smooth uniform braking of front wheels.
- Drum brakes at rear with brake pressure limiter to stop the wheels locking—vehicle remains dead in line even during emergency stops.
- Dual circuit brake system.
- Radial ply tires—maximum adhesion on dry and wet roads, good in winter conditions.
- Halogen dual headlights—first-class lights on low and high beams.
- Emergency warning lights.
- Safety cell passenger compartment, front and rear ends designed to absorb impact energy.
- Padded instrument panel and padding of all hard surfaces and edges inside body.
- Large, soft control knobs for driver and passenger, clearly marked with symbols.
- Anchorages for three-point safety belts at front and rear.
- Safety steering column; padded steering wheel hub.
- Firmly fixed individual front seats, backrest and seats fully adjustable. Backrests locked to prevent them tilting forward.
- Large outside driving mirror, hinged to yield on impact. Anti-dazzle inside mirror falls out on impact.
- Recessed door inner controls, inner locking knobs on all doors, child-proof locks on rear doors.
- Rounded door outer handles with built-in impact-proof press buttons.
- Rotary latch, anti-burst door locks.

You will agree that your Volkswagen has a lot of built-in safety.

It is now up to you drive safely. Bear the following points in mind:

- drive carefully and defensively
- watch the traffic well ahead
- judge your speed and braking distances properly particularly when tire adhesion is reduced due to rain or snow and ice
- keep your vehicle in good mechanical condition by having regular maintenance checks carried out by specialists
- make use of the "Volkswagen Diagnosis and Maintenance System". This system has been developed specially to cater for the higher safety requirements of modern road traffic.

For everyday use there also a few safety measures which no responsible driver should forget:

Before getting behind the wheel —

- check that the tires are in good condition and correctly inflated
- ensure that all windows are clean and unobstructed, particularly in the winter
- check that the headlamps, tail lamps and turn signals are clean
- check that all the lights are working. The headlamps, turn signals and brake lights work only when the ignition is switched on.

Before moving off —

- adjust the driving seat so that you are comfortable and can reach all the controls without effort
- set inside and outside mirrors properly
- put your safety belt on and ask all your passengers to do the same
- check that the dual circuit brake warning light is working (if fitted). Ignition must be switched on to do this.
- check windshield wipers (ignition on) and windshield washer
- check that all doors are properly shut.

Before getting into traffic stream —

- check the brakes—after having a good look in the mirror
- make sure that the handbrake is right off.

When on the move —

- keep a safe distance behind preceding vehicle
- give signals in good time when turning or changing lanes
- don't drive at top speed when it is dark
- switch the low beams on in good time at dusk so that you can be seen by other road users. This also applies in the daytime when it is foggy or snowing
- use fog lamps and rear fog lamps according to regulations
- remember that you have emergency warning lights to use if your car breaks down on a busy road. Always try to get the vehicle off the road as quick as possible when this happens. Place warning triangle on road.
- don't continue driving when you feel tired
- always allow for the carelessness of other road users.

When leaving the vehicle —

- protect it again misuse and theft by removing ignition key and locking the steering. Close the windows, lock the doors, and take steps to stop car rolling away especially when parking on gradients.

Keys



Two pairs of keys are supplied with the VW 411 E. The symmetrically shaped one is for the front doors, the steering lock/starter switch and the rear door of the Variant model and the other one is for the glove box.

The door and ignition key is a double-sided key. One valuable advantage of this type of key is that you cannot try to put it into the lock the wrong way round.

Once you can remember that the key for the glove box has one plain side you can always find the right key even in the dark.

It can often prove useful to have the spare key on you at all times. It can be carried in the holder for the vehicle documents or in your wallet.

In any case, always note the numbers of the keys so that if they do get lost you can obtain a replacement from your VW dealer by quoting the number.

Doors

Large, wide-opening doors make it very easy to get into the VW 411 E. They are strong doors with inner and outer panels pressed out of one piece of metal complete with window frames.

Extremely flat release levers recessed into the door trim panels improve internal safety.

The rotary latches, anti-burst locks and the well-shaped outer handles with the built-in press buttons are all safety-designed.

The positive door check straps hold the doors open firmly even when vehicle is on a steep hill or when it is windy.

In small garages or when close-parked you can get out on either side because both front doors can be locked from outside.

To lock and unlock door —

just turn the key one quarter turn to left or right. The key returns automatically to original position.

To open door —

depress trigger in door handle.

To lock and unlock door from inside —

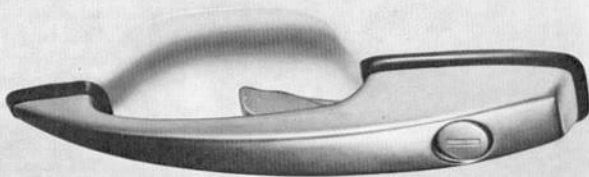
press locking knob in or pull it out.

To lock door from outside without key —

press locking knob in and then depress the trigger in the outer handle and hold it in as you close the door.

If the door closes on its own after the locking lever has been depressed it will not lock because the locking knob springs out automatically.

This prevents you from being locked out if the door should slam to while the key is still inside the vehicle.

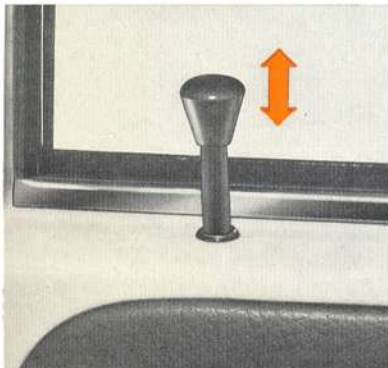


The locking knobs on the rear doors are fitted so far forward that they can also be reached easily from the driving seat. The VW 411 E naturally has child-proof locks to prevent the rear doors from being opened accidentally when vehicle is moving. Moving the small catch in the door end face puts the inner lock controls out of action and when the door is closed the catch is concealed.

To open door —
pull safety knob up and operate trigger in outer handle.

To lock and unlock door from inside —
press safety knob down or pull it up.

To lock door from outside —
press safety knob down and then slam the door.



To put child-proof catch out of action —
move catch in door end face upwards.

To open door when child-proof catch is in action —
pull safety knob up—door can only be opened from outside.



Think about this as well:

The locking knobs provide almost 100 % protection against accidental door opening when vehicle is moving. But, when locked in this way the doors cannot be opened from outside without using force. This is desirable in some cases but one day you may require assistance from outside and are not able, for some reason or other, to release the locking knob. In order to ensure that the doors can be opened from outside in an emergency do not press the knobs down when the vehicle is moving.

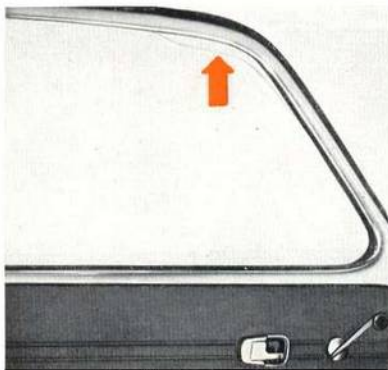
Adults can normally be trusted not to play about with the door locks and children should be in the back of the car when on the move in any case because the safety problem is solved there by the child-proof catches. However, you must decide for yourself.

Windows

The windshield and rear window are large and extend well up into roof panel so that together with the large side windows, interrupted only by thin but strong frames and door pillars, very good all round vision is obtained.

The window winding cranks with soft plastic knobs are designed to promote internal safety.

The windows in the standard front doors have a cut-out in the upper edge to give draft free ventilation.



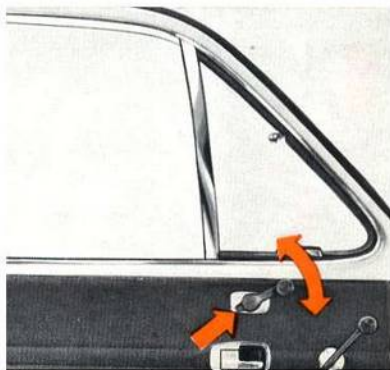
Front door with vent wing *)

Opening the vent wing —

Release catch by pressing in, turn crank handle counterclockwise.

Closing the vent wing —

Turn crank handle clockwise until catch engages.



*) Optional extra

Fastener for hinged window*)

To open the hinged window pull on the knob and push at the center of the hinged catch.



*) Optional extra for 2-door Sedan

Seats

The three-point mounted individual front seats are adjustable not only fore-and-aft but also in height. The rake of the backrests is also adjustable and on the VW 411 LE the backrests go right down to a reclining position.

Contoured padding on seat cushions and backrests combined with modern flat spring cores gives good lateral support when cornering, nonfloating but shock absorbing springing and plenty of headroom.

To move seat fore-and-aft —

lift rear lever, move seat to position desired and engage lever.

To adjust height of seat —

lift front lever, move seat to required position by moving body weight, release the lever and let it engage in the next position.

To adjust backrest rake —

take weight off backrest and turn large knob.



Front backrests with head restraints *) are available.

The hinged backrests on the two-door models are locked when the vehicle is moving.

At the rear is a three-seater bench with a deep cushion and high backrest, also padded to give maximum comfort.

For the VW 411 E, a hinged center arm rest is available as an optional extra.

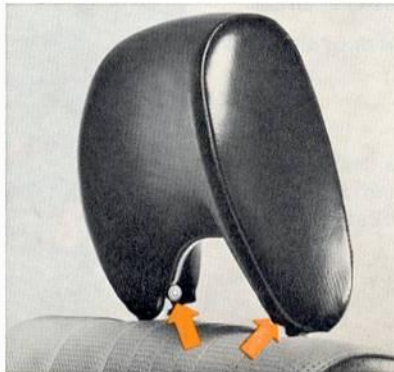
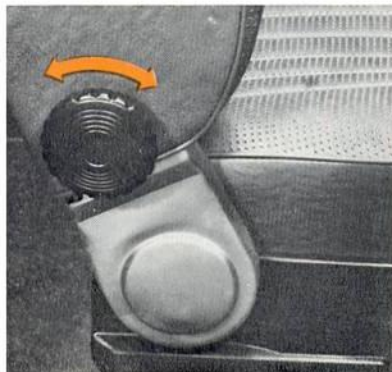
Moving front seats to reclining position)**

Push seat forward and lower backrest with adjusting knob (Take head restraints off first, if fitted)

To adjust head restraint*)** — press knobs on the mounting tubes and adjust restraint to the position required

To remove head restraint — press knobs and pull restraint out.

To release backrest lock**)** — lift knob on outside of backrest.



*) Optional extra
**) L Models only

***) adjustable and detachable on L Models only.

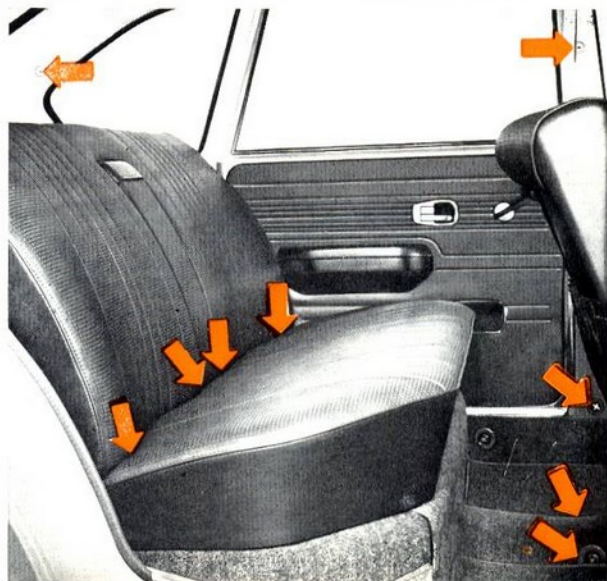
****) Two-door Sedan and Variant

Safety belts

Safety belt anchorages are provided

The front seats can be fitted with shoulder, lap or combined shoulder/lap belts and the two outside seats on the rear bench can be provided with shoulder or lap belts.

Belts can be obtained from any VW Dealer.



Instrument panel, hand and foot controls

The instrument panel is practical, attractive in appearance and shape and naturally meets all demands for maximum internal safety:

The two large round instruments are very easy to read.

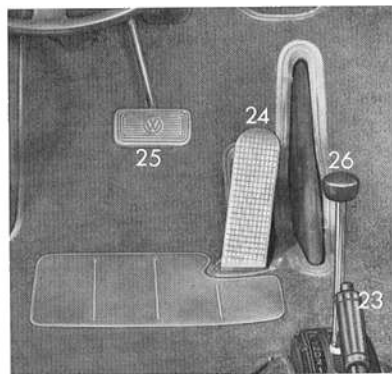
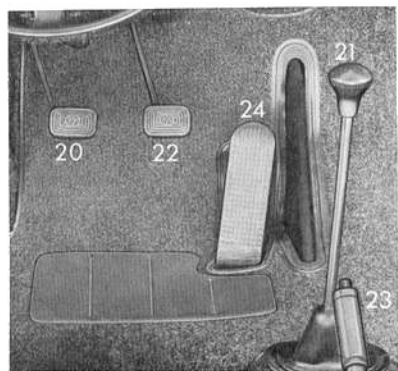
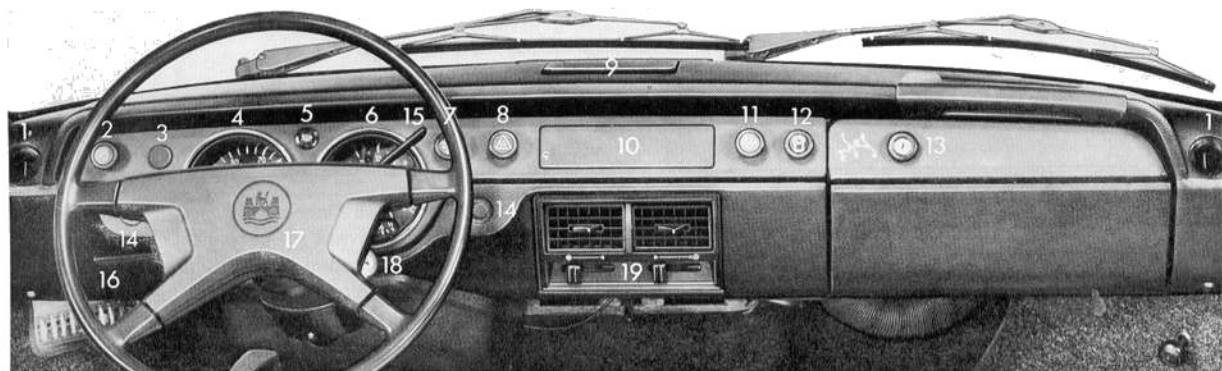
Instruments and warning lights are well within drivers field of view. The switches have extremely flat soft plastic knobs and are all easy to reach and operate. Warning lights and knobs cannot be confused because they are clearly marked with internationally known symbols.

On both sides of the instrument dials provision has been made for the installation of additional accessory switches.

The upper surface of the instrument panel and the lower part which inclines forward for safety reasons are covered with matt black padding. The upper padded edge is designed as an anti-dazzle surface to prevent the instruments from reflecting in the windshield at night and the edge also absorbs impact energy.

A flexible grab handle is flush mounted in the padded edge.

The matt black steering wheel with the large padded energy absorbing hub is also designed for safety and ease of operation.



- 1 — Round vent — warm air for side window
- 2 — Lighting switch, page 21
- 3 — For service installation of accessory switches
- 4 — Speedometer with mileage recorder (trip recorder*), page 23
- 5 — Dual circuit brake warning light*), page 43
- 6 — Instrument with warning lamps, fuel gauge and clock**), page 20
- 7 — Temperature regulating switch for heater, page 28
- 8 — Emergency warning light switch, page 20
- 9 — Ashtray, page 36
- 10 — Cover plate for radio aperture, page 18
- 11 — Heated rear window*), page 24
- 12 — Cigarette lighter**), page 24
- 13 — Glove box lid with lock, page 24
- 14 — For service installation of accessory switches
- 15 — Lever for wipers and washer system, page 21
- 16 — Turn signal/dimmer switch, headlamp flasher, page 22
- 17 — Horn
- 18 — Steering lock/starter switch, page 23
- 19 — Fresh air control box, page 34
- 20 — Clutch pedal, pages 51, 60
- 21 — Gearshift lever, page 51
- 22 — Brake pedal (manual transmission), page 42
- 23 — Hand brake lever, page 42
- 24 — Accelerator pedal
- 25 — Brake pedal (automatic transmission), page 52
- 26 — Selector lever (automatic transmission), page 52

*) Optional extra
**) L Models only

On your vehicle the emergency warning light switch (item 8) is on the left of the speedometer.

**Instrument with warning lamps,
fuel gauge and clock *)**

Warning lamps

- | | |
|--------------------|----------------------------|
| a — flashing green | — turn signals (page 22) |
| b — red | — oil pressure (page 50) |
| c — blue | — high beams (page 22) |
| d — green | — parking lights (page 21) |
| e — red | — generator (page 50) |

Warning lamps b and e should not be on
when vehicle is moving.

Fuel gauge —

when the needle is at R there are about
1½ gallons of fuel left.

To set the clock —

press knob in and turn hands.

Clock and fuel gauge are electrically operated.

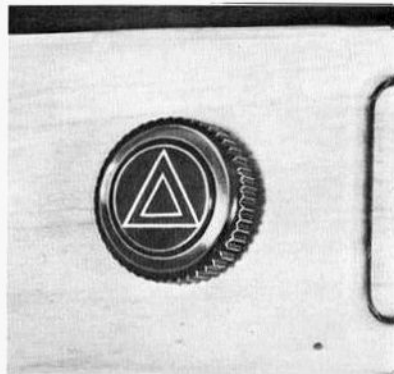
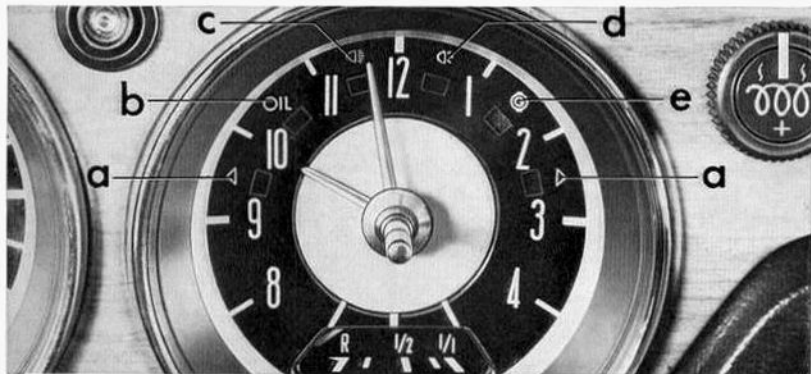
Emergency warning light system

Pull knob out to switch on—All four turn
signals then flash at the same time.

This system must only be used to warn other
road users that something is wrong such
as when vehicle has broken down on a
motorway.

The system remains on even when ignition is
switched off. Regulations governing the use of
this type of warning light system vary
from country to country.

On your vehicle the emergency
warning light switch is on the
left of the speedometer.



Lighting switch

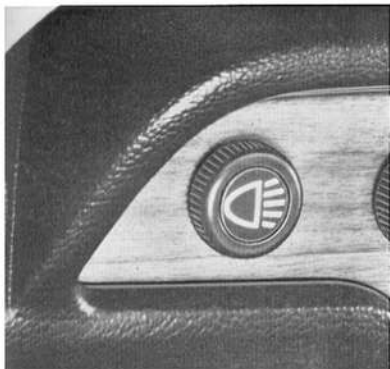
Parking lights—pull knob to first stop.

A green warning lamp lights up in the right hand instrument dial.

Headlights—pull knob to second stop.

In both positions the tail lights, license plate light and instrument lights are on as well.

The brightness of the **instrument lights** is controlled by turning the switch.



Please note:

To prevent the battery from being run down unnecessarily if you park the vehicle and forget to switch the headlamps off and to ensure that the full battery capacity is always available for starting, the headlamps are now wired through the steering/ignition lock:

The headlamps only work when the ignition is switched on.

The headlamps go out when starting the engine.

The parking and other lights operated by the lighting switch are not affected

Lever for wipers and washer system

Wipers slow

Lift lever to first stop (1)

Wipers fast

Lift lever to second stop (2)

Wipers off

Press lever right down.
The blades park automatically when switched off.

If you lift the lever briefly to the pressure point of the first stop (1) the blades wipe to and fro at least once.

To operate washer system

Pull lever towards steering wheel. Water is sprayed on to screen as long as lever is held in this position.

If your vehicle is equipped with a wiper delay switch and an automatic wash-wipe device, the lever has two further functions:

Delay switch on

Push lever down from off position. The wipers go to and fro once about every 10 seconds.

Automatic wash-wipe device

With switch in central position only: Pull lever towards steering wheel. Water sprays on to the screen. When you release the lever, the wipers go to and fro two or three times.



Turn signal switch

With ignition on:

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

The turn signals cancel automatically when steering wheel returns to straight ahead position.

With ignition off:

- Lever up—right parking light*)
- Lever down—left parking light*)

To signal slight changes in direction such as when lane changing, the lever should be moved until a slight resistance is felt (warning lamp must flash). When you release the lever it returns automatically to the central position.

To raise and lower headlight beams

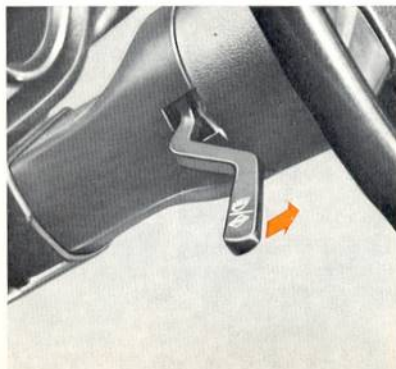
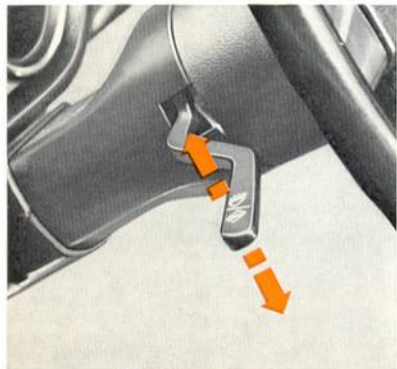
(Lighting switch out to second stop.)

Lift turn signal switch towards steering wheel. When high beams are on, the blue warning lamp in right-hand instrument dial comes on.

Headlight flasher

Lift turn signal switch towards wheel. The flasher only works when lights are off or the parking lights are on.

(Lighting switch at first stop.)



*) L Models only

Steering/ignition lock

1 – Ignition off/steering locked

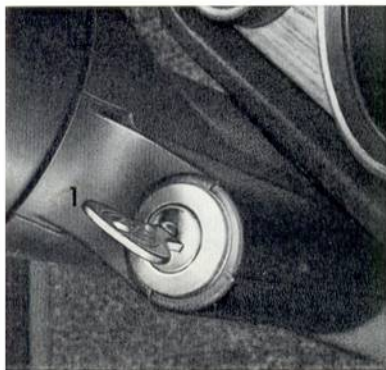
The steering is not locked until key has been withdrawn and wheel turned to engage locking pin.

2 – Ignition on/steering free

3 – Start

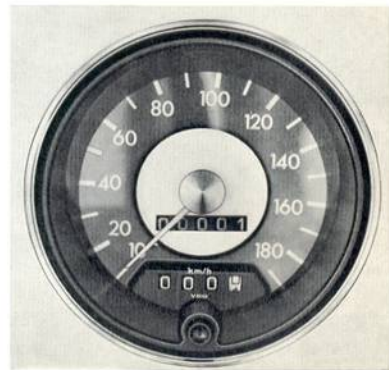
If the key is difficult to turn or cannot be turned at all after being inserted into pin, turn wheel to and fro slightly to free the locking pin.

Caution: Remove key only when vehicle is stationary.



To reset trip recorder *) —

press knob, recorder returns to zero.



*) Optional extra

Pull switch for heated rear window *)

The heated rear window places a fairly heavy load on the battery and for this reason it is wired so that it can only be switched on when the ignition is on.

The green warning lamp in the switch knob helps to remind you to switch the heater element off as soon as the window is clear

To switch on cigarette lighter **) —

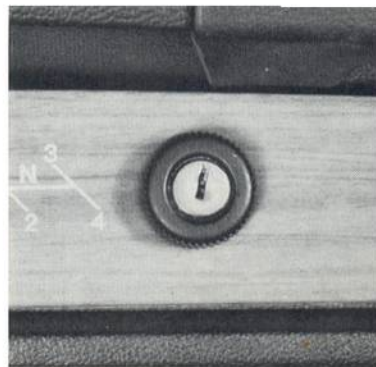
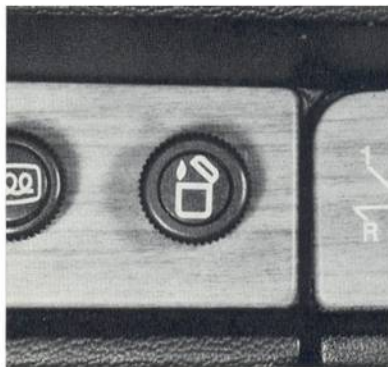
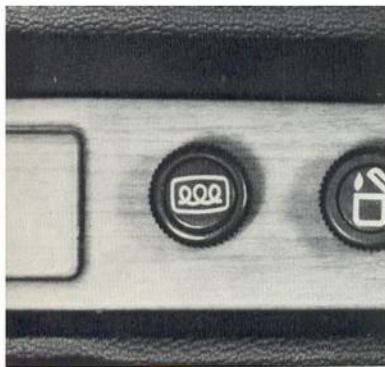
Press in knob and release. When core glows, lighter springs back automatically. Pull out and use immediately.

Glove box lid with lock

To unlock: Turn key to left

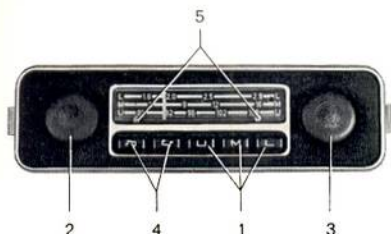
To open: Turn knob to left

To close: Press lid closed (lock engages)



VW Automobile Radios

are also available as optional extras. The models are called "Emden", "Wolfsburg", "Hannover" and "Ingolstadt" (mono). If you have selected one of these sets for your car, note the following:



Emden

1 - 3 wave band press buttons:

U = VHF (87.6—108 Mc/s)
 M = Medium wave (515—1620 kc/s)
 L = Long wave (150—290 kc/s)

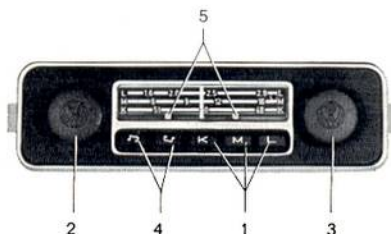
2 - Rotary knob on left: "Off—on" and volume

3 - Rotary knob on right: Tuning

4 - Tone control press buttons: left = bass
 right = treble

5 - Two station markers

At the back of set: Socket for tape recorder and connection for automatic aerial.



Wolfsburg

1 - 3 wave band press buttons:

K = Short wave (5.9—6.35 Mc/s)
 M = Medium wave (515—1620 kc/s)
 L = Long wave (150—290 kc/s)

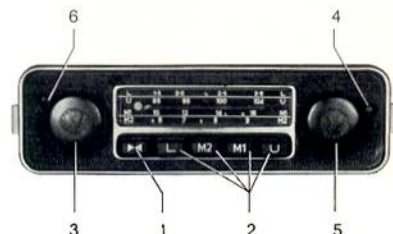
2 - Rotary knob on left: "Off—on" and volume

3 - Rotary knob on right: Tuning

4 - Tone control press buttons: left = bass
 right = treble

5 - Two station markers

At the back of set: Socket for tape recorder and connection for automatic aerial.



Hannover

1 - 4 wave band press buttons:

U = VHF (87.6—104 Mc/s)
 2 x M = Medium wave (515—1620 kc/s)
 M₁ = 515—920 kc/s M₂ = 900—1620 kc/s
 L = Long wave (150—270 kc/s)

2 - One press button ∞: Automatic station seeker

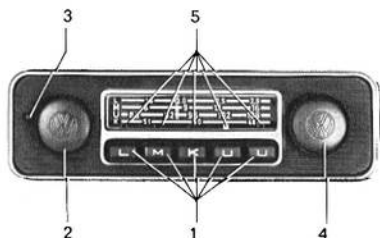
3 - Rotary knob on left: "On—off" and volume

4 - Slide under left knob: Tone control
 down = bass up = treble

5 - Rotary knob on right: Tuning

6 - Switch under right knob: Sensitivity switch for station seeker

At the back of set: Sockets for tape recorder and station seeker remote control and connection for automatic aerial.



Ingolstadt (mono)

1 – 5 waveband press buttons:

2 x U	= VHF	(87.6 — 108 Mc/s)
K	= Short wave	(5.9 — 6.35 Mc/s)
M	= Medium wave	(515 — 1620 kc/s)
L	= Long wave	(150 — 290 kc/s)

- 2 – Rotary knob on left: "On—off" and volume
- 3 – Switch under left knob: Tone control
down = bass
up = treble
- 4 – Rotary knob on right: Tuning
- 5 – Five markers on lower edge of scale:
Shows the wavelength of the station button depressed.

At the back of set: Socket for tape recorder and connection for automatic aerial.

Function of knob for automatic station seeker:

Pressing the left button starts the **automatic station seeker** which then tunes in to the nearest station on the selected waveband. If started again the station seeker automatically finds the next nearest station.

Station retention: When a waveband is changed, the set remains tuned to the last station which was tuned by hand.

Function of station buttons: Tune in exactly to the station required with the right hand knob. Pull the press button of the appropriate waveband out and then press it in again. This fixes this station to this button so that it can be selected again by just pressing the button. This can be done with any station desired.

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

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

The telescopic aerial requires a certain amount of care otherwise it will get stiff and is then liable to bend when being pushed down. From time to time, after washing the vehicle, the aerial should be wiped dry with a clean cloth and coated lightly with chrome grease (VW Part No. 030 096 067).

Heating

The heating system of the VW 411 E should satisfy even the most exacting demands. There are no heating or defrosting problems in this vehicle.

One important feature is that the heating can even be used when the engine is not running.

If your car is provided with a heater preselector switch *) — set it and your car will be warm before you drive off.

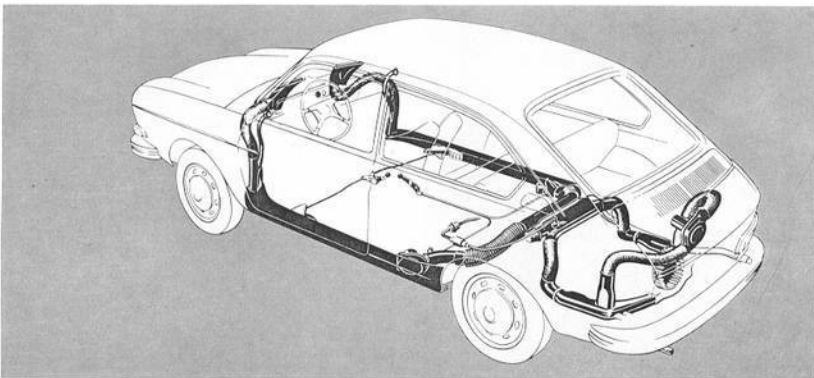
The VW 411 E has a combined engine/gasoline/fresh air heating system. The fresh air is preheated in heat exchangers and then passes on to a gasoline/electrical heater.

This thermostatically-controlled heater rapidly heats up the fresh air to the temperature required and keeps it at this temperature. The amount of heat produced by the heater varies according to the temperature of the engine and the engine load. The heater temporarily cuts out when the engine alone is capable of

supplying sufficient heat, for example whilst driving fast on motorways.

The heater only works alone when the vehicle is stationary and the engine is not running.

The heater is supplied with gasoline from the normal fuel tank. The fuel consumption varies, according to heat output, from .35 to approximately 1 pint per hour.



*) Optional extra

Heating controls—standard equipment

- 0 = heating off
- 1 = heating on
- 1-2 = regulation of heat

When driving—ignition on

To switch heating on —

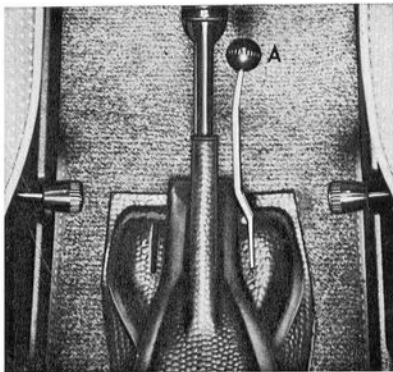
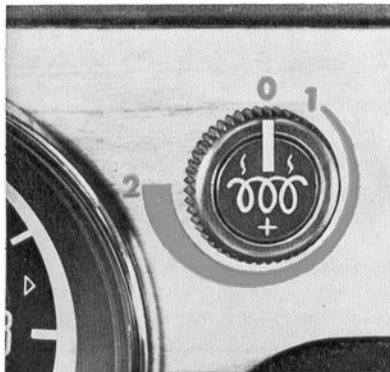
Pull lever -A- fully to the rear. Turn knob of temperature regulating switch, located on the right hand side of the right instrument, to the right to position -1-. The green warning lamp in the knob lights up indicating that the heating is on.

By turning knob to the right you can now adjust the heat output to suit individual requirements from minimum -1- to maximum -2-.

To switch heating off —

Turn knob of temperature regulating switch fully to the left until mark is at -0-. The warning light goes out indicating that the heating is off.

Push lever - A - fully forwards.



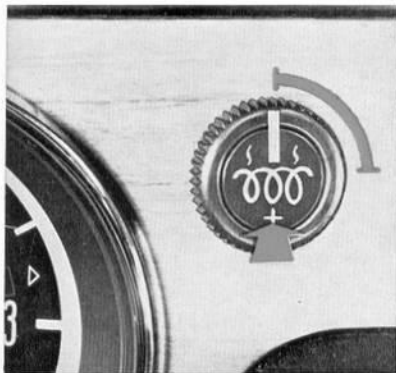
Heating with vehicle stationary — ignition off
Maximum operating time: 10 minutes

To switch heating on —

Pull lever -A- fully to the rear.

Press knob of temperature regulating switch in and turn it to the right. The warning lamp lights up indicating that the heater is on. The knob springs back to normal position when released.

Adjust heat output to suit individual requirements by turning knob between - 1 - minimum and - 2 - maximum.



To switch heating off —

The clockwork mechanism built into the temperature regulating switch automatically switches off the heater after approximately 10 minutes and the warning light goes out. You can, however, switch off the heater at any time by turning the knob of the temperature regulating switch anticlockwise, to position 0. The clockwork will continue to run on until the spring runs down.

Please note:

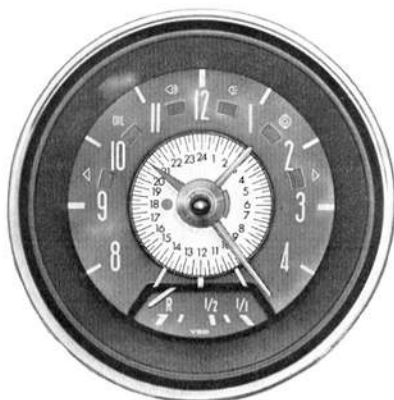
- 1 — After the heater has been switched off, the hot air fan and the combustion air blower continue to run on for a short period to cool the heater down quickly. This so-called **run-on** is normal and should not worry you.
- 2 — **When filling the tank always make sure that the heater is switched off** (the warning light is out). However, you need not wait until the "run-on" is finished.
- 3 — The heater uses about the same amount of electricity as the vehicle lighting with the headlights on high beam. To prevent excessive strain on the battery, we recommend that the heater is not operated several times successively when the car is stationary. This applies particularly when the temperature is low and the full battery capacity is required to start the engine.
- 4 — If the heating is not used for a long time, deposits from the fuel can settle in the heater and cause trouble when the heater is used again. This can be avoided by switching the heater on for a few minutes at least once every two months, even during the warm periods of the year.

Heater preselector switch *)

The preselector mechanism built into the clock enables you to preset the time at which the heater switches itself on automatically.

The preselector scale covers a range of 24 hours, the smallest division being 15 minutes.

Heater operating time is approximately 15 minutes.



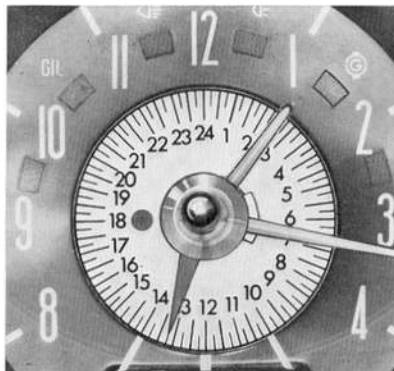
*) Optional extra

Setting heater switch-on time with vehicle stationary—Ignition off

Turn knob in center of clock dial to the left until the pointer is at the time desired on the 24 hour scale.

The color in the round aperture is then "red" and shows that the heater is ready for action. Pull lever -A- fully to the rear. Switch the temperature regulating switch on by turning knob to the right and select the amount of heat required (see page 28).

At the preselected time the heater switches itself on automatically, operates for approximately 15 minutes and switches itself off automatically. When the heater is working the warning lamp is on.



Note:

If you do not use the time preselector switch, the mechanism should be put out of action. Turn knob in clock to the right until "green" is showing in the left hand aperture.

The heating can now be switched on with the rotary switch as described under "When driving" and "Heating with vehicle stationary". Please note the instructions given on page 29.



Day/Night Indicator

A second aperture is located on the right of the setting knob.

In this aperture a white area shows up during daytime and a black area at night. The areas are arranged in such a way that at a specific time during dawn or dusk (i. e. at 6 a.m., picture left, or 6 p.m., picture right) half of each color shows up.

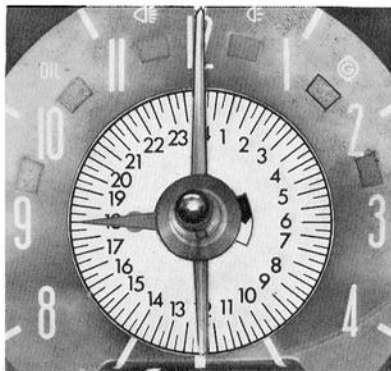
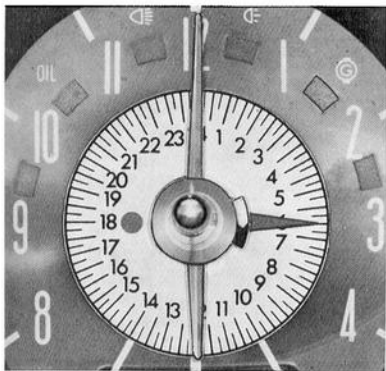
The color of the arrow point indicates the approach of either day or night.

When the clock is reset by more than 12 hours or the battery has been removed or disconnected, ensure, when resetting the clock, that the correct color shows up in the aperture.

If the black area is visible between 6 a.m. and 6 p.m., all you need to do is to put the clock forward by 12 hours by pressing in and

turning the knob in the center of the clock until the corresponding white area shows up again.

If the day/night indicator shows a color which does not correspond to the time of day the heater would switch itself on 12 hours later than desired.

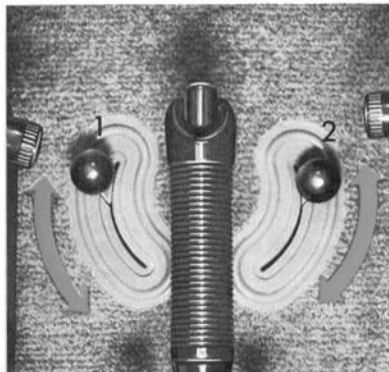


Heat distribution

The warm air is distributed with two levers:

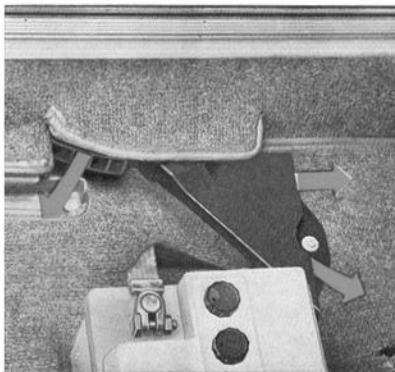
1 = left side of body

2 = right side of body



Levers forward:

Outlets in foot well open

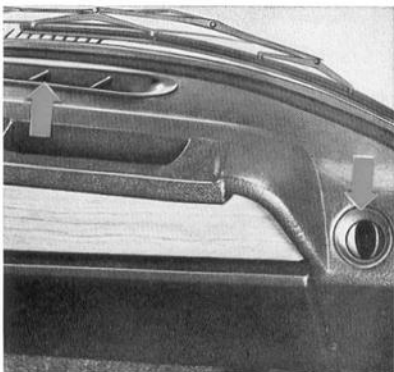


Levers to rear:

Vents in instrument panel: combination vents for windshield, round vents for side windows (defrosting).

Levers in intermediate position:

Air to footwell and window defrosting according to lever position.



Ventilation

The ventilation system of the VW 411 E makes it possible to obtain adequate and draft free ventilation of the body. A two-speed electric fan increases the flow of air when driving slowly or standing still.

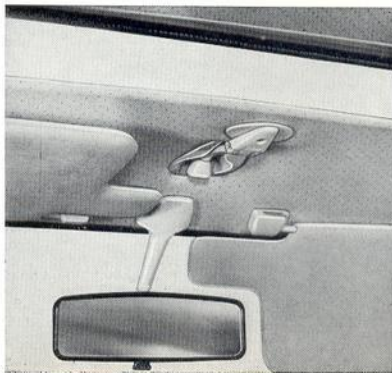
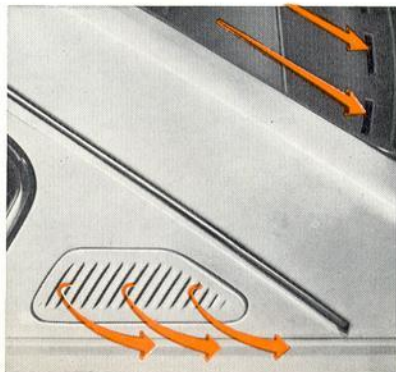
Even when all windows are closed the body is ventilated properly because the used air can escape out of the slots behind the rear side windows. The VW 411 E is available with a steel sliding roof which opens up a large section of the roof.

The outside slots are connected to openings below the rear window. The air passing out of the body flows over the rear window and helps to keep it clear.

Steel sliding roof*)

To open — turn crank anti-clockwise
For safety reasons the crank handle should always be in the recess. When closing the roof, turn the crank as far as it will go first and then turn it back until it can be folded into the recess.

If your car has a sliding roof with an automatic wind deflector*), the operation is still the same. When the roof is opened the wind deflector comes up automatically and when roof is closed it goes down.



*) Optional extra

Ventilating body

Both grilles in instrument panel closed—lever -A- fully to right

Both grilles in instrument panel open—lever -A- to left

Air flow up or down—swing grille in desired direction

Air flow to right or left—lever in grille turned in desired direction.

Ventilating windshield

Combination vents for windshield closed—lever -B- to left

Combination vents for windshield open—lever -B- to right

Moving lever to position I switches the fan on:
Lever position I —slow, small amount of air
Lever position II — fast, large amount of air

To clear misted-up windows quickly, it is advisable to run the fan fast for a short time. In position I it can be left on continuously when vehicle is moving, if necessary.

Defrosting windshield

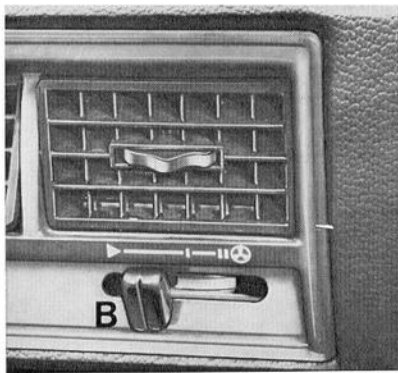
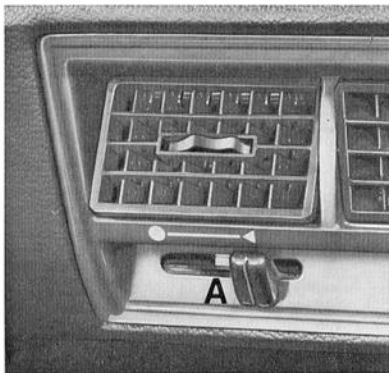
The quickest way to defrost the windshield and the front side windows is to direct all the warm air through the combination vents in the instrument panel and the round vents:

- Switch heating on (page 28)
- Levers 1 and 2 to the rear (page 32)
- Lever A fully to right
- Lever B fully to left
- Round vents open

When the ice has thawed, switch the fresh air ventilation on as well to dry the glass quickly.

- Lever B fully to right (fan speed II).

As soon as the windshield and side windows are clear, open the footwell vents (levers 1 and 2 — page 32) so that the body warms up as quickly and uniformly as possible.



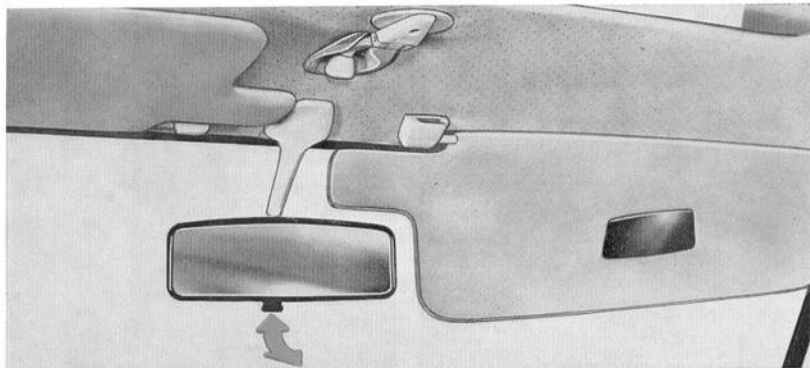
Interior trim

When maximum internal safety is required, even the smallest details must not be forgotten.

Sun visors

Both the large sun visors are well padded. They can also be swung to the side after lifting them out of the mounting near the inside mirror.

There is a make-up mirror in the back of the sun visor on the passenger's side. *)



Rear view mirrors

A good view to the rear is becoming even more important in present-day traffic.

The VW 411 E has large mirrors which can be set accurately. The arm of the outside mirror is hinged and swings sideways on impact.

The inside mirror springs out of its mounting on impact. It can be remounted by pressing it home firmly. Its housing and arm are covered with plastic.

The inside mirror has a small lever on the back:
Normal position—lever forward
Anti-dazzle—lever to rear

*) L Models only

The interior light is smooth and flush-mounted and has a built-in switch. It is switched on by pressing on the lens.

Center position – light comes on when door is opened

Pressed on right – light is on all the time

Pressed on left – light is off all the time.

The ashtrays are also flush mounted for safety reasons.

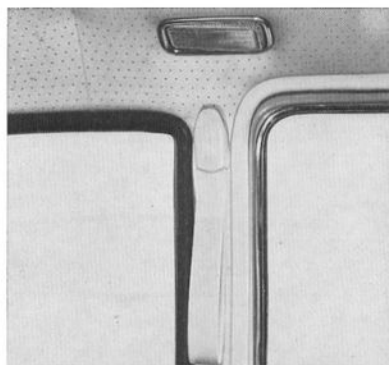
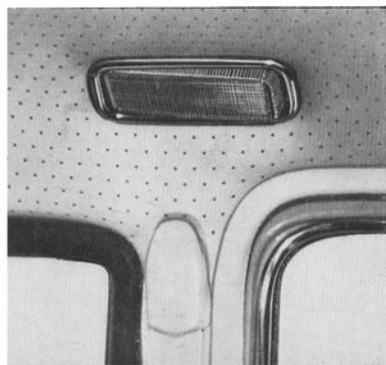
They can be taken out easily for emptying.

The ashtray in the top of the Instrument panel has a magnetic lid.

To empty front ashtray—open lid, lift ashtray out by opened lid. Press ashtray in again until the two springs engage.

To empty rear ashtray—open it, press spring down and take ashtray out. To insert again, press spring down.

The assist loops are of strong plastic material and **the coat hooks** are covered with soft plastic.



Engine compartment lid, tank filler neck

Engine compartment lid

The engine compartment cannot be opened when vehicle doors are locked. The lock release lever is in the lock pillar of the left-hand door or the lock pillar of the left rear door on the four-door sedan. The lid is spring-loaded so that it stays in the open position.

To open – pull lever – the lid springs open slightly.

To close – press lid down until the lock clicks.



Tank filler flap

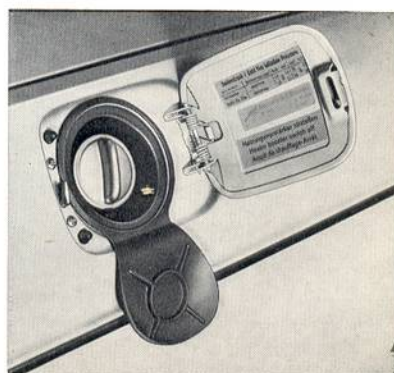
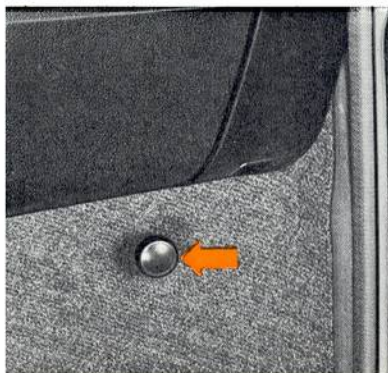
The tank filler neck is located in the right front fender under a locked flap which can only be opened from inside the vehicle.

The release knob is on the right underneath the instrument panel.

To open flap – pull knob – flaps springs up

To close flap – press it down until catch engages.

Once again we have thought of everything – there is even a rubber apron to prevent the filler nozzle from damaging the paint.



Luggage compartments

Front luggage compartment—rear luggage shelf

The roadholding of the VW 411 E is excellent—this is guaranteed by the running gear which has been designed in accordance with the most modern developments.

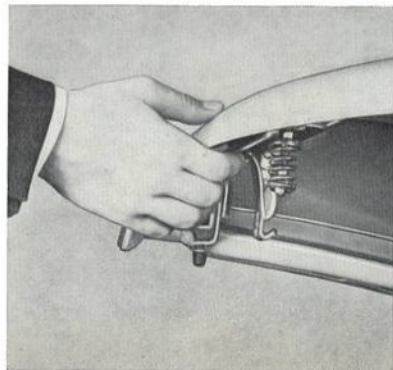
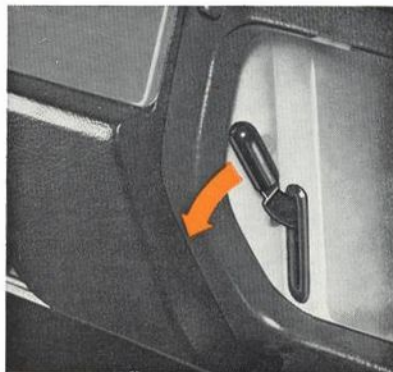
The good ride characteristics are aided by the uniformly balanced weight distribution on front and rear axles, regardless of whether the vehicle is occupied by the driver alone or by five persons.

The release lever for the front hood is in the glove box. The hood is held open by spring pressure.

To open hood—press lever down, hood springs open a small amount. Lift hood

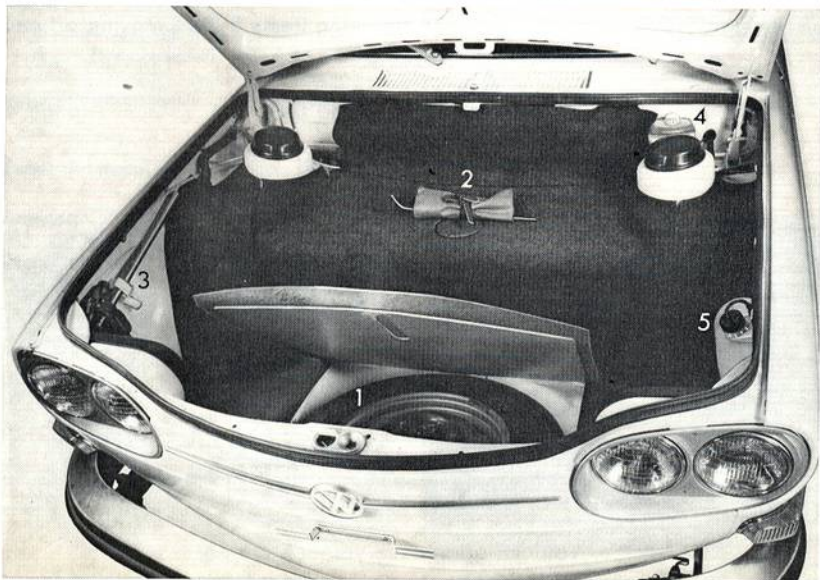
slightly and release the safety hook by pressing button near the locking pin.

To close hood—just press hood down until lock clicks.



The position of the front luggage compartment over the front axle means that the axle loading can be arranged even more favourably by suitable stowage of luggage.

Always put the heavy pieces of luggage in the large front luggage compartment first before you start to use the shelf at the rear.



The large front luggage compartment is accessible from the front and both sides. In it you will find:

- 1 — The spare wheel. It lies flat in a recess in the luggage pan and is covered by a strong, leatherette trimmed board
- 2 — The roll containing the tools
- 3 — The jack (lever type)*
- 4 — The reservoir for the brake fluid
- 5 — The water container for the windshield washer

* If your car is equipped with a screw type jack, it is stowed under the rear seat.

Driving

Points to check

Traffic safety and vehicle roadworthiness belong together.

By checking the following items before moving off on a long trip:

the amount of fuel in the tank	page 41
the lights and turn signals	page 41
the brakes	page 42
the windshield washer and at regular intervals	page 44
the oil level in the engine	page 46
the brake fluid level	page 43
the tire pressures	page 47

You can often save yourself a lot of trouble

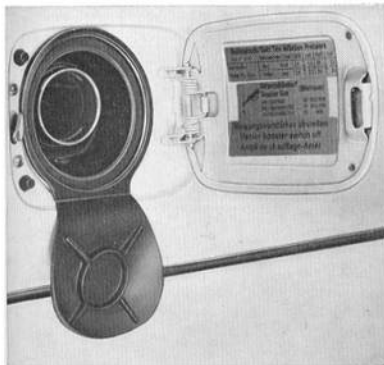
Fuel — reserve — refueling

The 80 bhp engine of the VW 411 E will run satisfactorily on all super fuels which fulfil the octane requirement of the engine (98 R. O. N.).

The **tank** holds 50 liters (11 gallons) of fuel. Of this amount, 6 liters (1.3 gallons) is reserve.

To fill tank—open flap over neck, fold rubber apron out. Turn cap to left, and take it off. After filling tank—turn cap to right until it clicks, fold apron together and close the flap.

Switch the heater off when filling the tank.



Lighting and turn signals

The VW 411 E is equipped with large effective lights for your safety and that of other road users.

Twin headlights with halogen bulbs give an optimum spread of light and superior length of beam.

The **turn signals** are wrapped well round into the fenders so that they can be seen clearly from the side as well.

Two **back-up lights** are part of the standard equipment and the L models have separate parking lights.



When checking the lights, remember that the brake lights, back-up lights and turn signals only operate when the ignition is switched on.

The brake lights only work when the brake pedal is depressed and the back-up lights when reverse gear is engaged or the selector lever on the Automatic is at "R".

If a turn signal is defective, the warning lamp flashes much quicker than usual.

You can easily replace a defective bulb or fuse yourself if necessary.

The proper bulb to be fitted is listed on page 75.

How to replace the bulbs is described on page 72 and instructions on replacing fuses are given on page 76.

Brakes

The VW 411 has disc brakes at the front and drums at the rear and the hydraulic system is a dual circuit system. There is also a brake force limiting valve in the system which ensures that the actual braking force is distributed to the front and rear axles in the best way and that the vehicle does not deviate from course. A brake servo which increases the pedal force and the pressure in the system is available as an optional extra.

Immediately after moving-off, while still moving fairly slowly, have a good look in the rear view mirror and apply the brakes once or twice to make sure that they are working properly. The handbrake should be checked at the same time. It should start to become effective at the 3rd notch.

Please note the following points about braking:

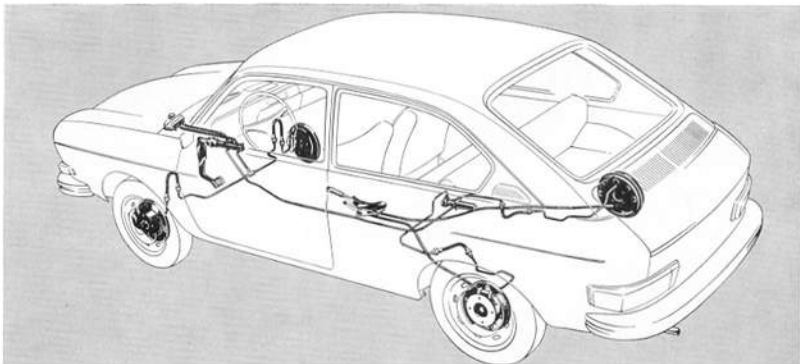
The braking distance increases very rapidly as the speed increases. At 60 mph for example it is four times longer than at 30 mph, so always try to apply the brakes in good time and do not use too much force because locked wheels increase the braking distance.

Water reduces the coefficient of friction of the brake linings. The brake discs of the front brakes in particular get wet easily when it rains hard or when the car is washed. The discs dry quickly due to the friction of the pads it is true but the full braking force is retarded slightly.

To this is added the loss of tire adhesion on wet roads, so always remain at a safe distance behind the vehicle in front when roads are wet or slippery. Safety first is the motto.

Brake lining wear depends to a large extent on the operating conditions and style of driving. On vehicles which are used mainly in town traffic and stop/start conditions or are driven hard it may be necessary to have the thickness of the brake linings checked in a VW workshop in between the normal visits to the workshop.

The front and rear brakes are each able to work alone. If the hydraulic pressure in one of the circuits fails—you will notice this immediately due to the sudden increase in pedal travel—take the vehicle to a VW workshop at once. You can still stop the vehicle with the other brake circuit but the braking distance becomes somewhat longer.



If your VW 411 E has a **dual circuit brake warning lamp*)**, fitted between the two large instruments, right in front of you, the failure of one brake circuit when braking will be indicated by the lighting up of the red warning lamp.

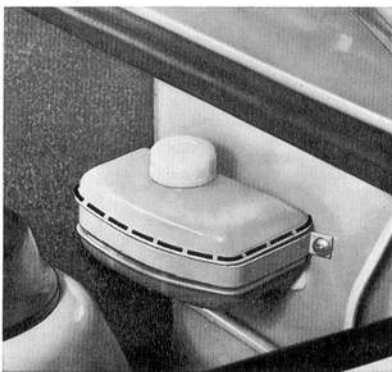
To check the warning lamp, switch the ignition on. If the lamp does not light up or does not go out when the engine is running there is a defect in the electrical system. Take the vehicle to the nearest VW Dealer.



*) Optional extra

The **brake fluid reservoir** in the VW 411 E with manual transmission has three compartments. One for each brake circuit and one for the hydraulic operation of the clutch. As the Automatic has a converter instead of a clutch the reservoir on this vehicle only has two compartments.

On vehicles with a brake servo *) the reservoir also has two compartments. The connection for the hydraulic clutch operation is higher up. All reservoirs have a single filler hole. The material is translucent so that the brake fluid level can be seen easily. The fluid level should only be up to the upper ridge round the reservoir so that reservoir is not filled right to the top.



A slight drop in the fluid level when vehicle is in operation is normal and is caused by the automatic adjustment of the front pads. If the level drops considerably however, it is a sign of leakage somewhere in the system and you should take the vehicle to a VW workshop immediately and have it checked. Brake fluid is hygroscopic and as too high a water content in the fluid becomes detrimental to the entire brake system after a period of time, the brake fluid must be renewed every two years.

The brake servo *) is operated by vacuum taken from the engine intake manifold. This means that assistance is only effective when the engine is running. When the vehicle is being towed and the engine is not running, the brake pedal must be depressed with more pressure than when servo is working. The actual braking effect is not altered.

The pneumatic windshield washer system*)

The system works with compressed air from the spare wheel. The spare wheel is pumped up to 3 kg/cm^2 (42 psi) which is the highest pressure for which the water container is designed and the air pressure is applied to the container by means of a connecting hose. You can fill the water container three or four times without having to go to a filling station for air.

A special valve in the connection in the container cuts off the flow of air to the container when the pressure in the spare wheel has fallen to about 2 kg/cm^2 (28 psi). This means that the spare wheel always has sufficient pressure in it in case it has to be fitted.

It is advisable to add our window cleaning solution (see page 64) to the water because water alone does not usually clean the windshield quickly and properly.

Filling water container

Unscrew cap and fill container to the brim with water. The container holds about $1\frac{1}{2}$ liters ($2\frac{1}{2}$ pints).

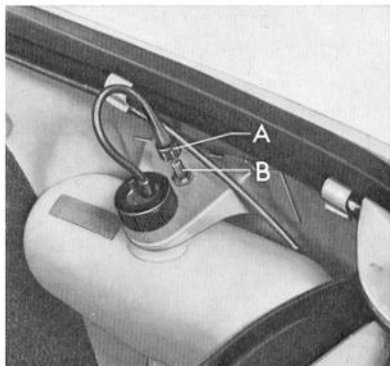
Screw cap back on.

Press washer operating knob and check that a strong squirt of water comes out of each jet.

If nothing happens or only a weak squirt appears, the pressure in the spare wheel has probably dropped to about 2 kg/cm^2 (28 psi). Take vehicle to a filling station and pump spare wheel up as follows:

Detach connecting hose A and pump wheel up to 3 kg/cm^2 (42 psi) with valve B.

Screw hose A into valve B again.



*) For Variant see page 95

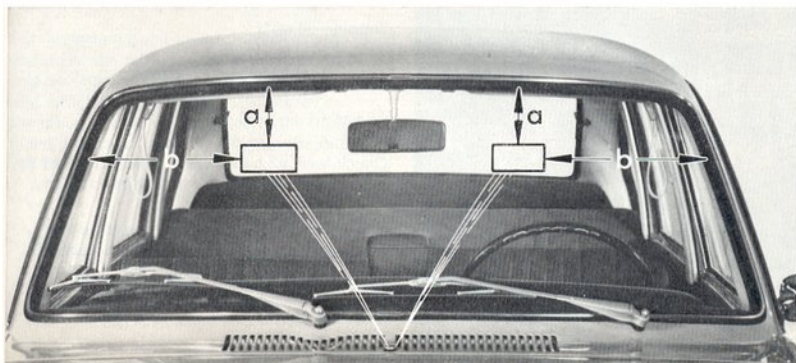
Make it a general principle to always operate the washer before switching the wipers on because if the blades are moved dry they can easily scratch the glass.

Checking windshield washer jets

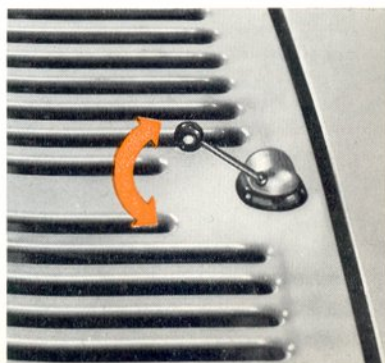
The picture shows where the water should strike the windshield when the vehicle is standing still. This ensures that the glass is cleaned properly at high speeds.

a = 150–200 mm (6–8 in.);

b = 380–480 mm (15–19 in.).



The jets can be adjusted with a needle.



Engine oil level

The **engine oil level** should always be between the two marks on the dipstick and must never be below the lower mark. The vehicle must be on a level surface when checking the oil level.

Do not check the oil immediately after stopping the engine as the oil in circulation takes a few minutes to drain down into the crankcase. If the level is down to the lower mark it is not necessary to add enough oil to bring level right up to upper mark. Add sufficient oil to ensure that vehicle will run to next oil

change without level falling below lower mark.

When engine is operating in arduous conditions such as sustained high speed driving on motorways in the summer or when climbing high passes, the oil level should be up to the upper mark.

Checking oil level*)

Pull dipstick out and wipe it with a clean cloth.

Push dipstick in fully, pull it out again and check level.

The difference in oil quantity between upper and lower marks is 1.0 liter (1.75 pints).

Topping oil up*)

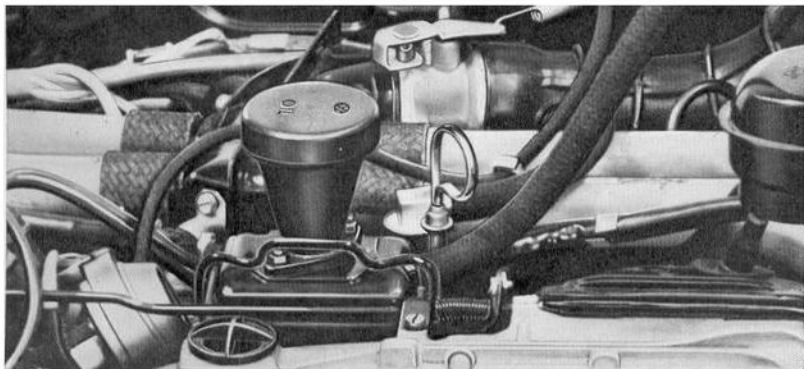
Unscrew cap from oil filler tube.

Add oil.

Check level with dipstick—level should not be over upper mark. Screw cap back on tightly.

Notes on the use of different makes of oil and viscosity grades are given on page 85.

*) See page 94 for Variant.



The tires*) of a modern fast automobile are a vital part of the complete design. On the VW 411 E the tubeless radial ply tires with the designation 155 SR 15 are chosen to exactly meet vehicle requirements. They have a great deal of influence on the excellent roadholding and safe driving characteristics of the vehicle.

Normal tires of the cross ply type detract from the roadholding and ride comfort and should not be used. It is also advisable to avoid using radial ply tires of different makes and different tread patterns. A combination of radial ply and normal tires is also definitely to be avoided.

One important point to watch when changing wheels is that tubeless radial ply tires must only be fitted on the standard safety type rims with hump (size 4½ J x 15). As an exception, a tube can be fitted in the tubeless radial ply tire. In cases of doubt, ask your VW Dealer.

Tire pressures*)

Tire pressures which are too high or too low will tend to shorten the life of the tire, quite apart from the fact that both have a very detrimental effect on the roadholding of the vehicle.

The pressures should never be below the following:

With 1—2 occupants
Fully loaded

front
1.4 kg/cm² (20 psi)
1.6 kg/cm² (23 psi)

rear
1.8 kg/cm² (26 psi)
2.2 kg/cm² (31 psi)

For long distance high-speed motoring, always use the highest pressures. The pressures are for cold tires so they must be checked before starting a trip.

In the interests of safety, the tire pressures should always be checked before starting on a long trip and normally at least once a week.

The spare wheel*) should always be inflated to 2.0 to 3.0 kg/cm² (28 to 42 psi) if the windshield washer is checked regularly. It thus always has the minimum pressure for use on the rear axle when vehicle is fully loaded. The pressure of the spare wheel is checked at valve B in the connecting line to the windshield washer container. See page 44.

Wheel balancing

For smooth running at high speeds and long tire life, it is essential that the wheels are balanced statically and dynamically.

As the tires can get out of balance after being in use for some time the wheels should be rebalanced every 10 000 km (6000 miles). The wheels should also be balanced again when a tire has been repaired. This also applies to balanced wheels when a tire has lost all its pressure due to a faulty valve.

*) Variant see page 96.

Tire wear

Due to their construction, radial ply tires have a long service life. Exactly how long, depends of course, even with these modern tires on maintenance of the correct inflation pressures and on the style of driving. High speed cornering, full throttle acceleration and hard braking all tend to increase the rate of tire wear.

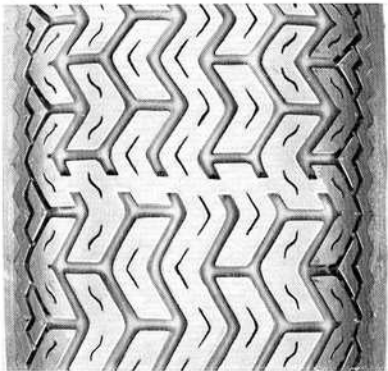
The seasons of the year and climatic conditions also have a certain influence on wear. The tire tread tends to wear quicker in the summer than in the cold season: rubber is less resistant to friction when it is warm than when it is cold.



If you wish to do something to make your tires last a long time, remember the following points:

- 1 – Check tires occasionally for damage and remove foreign bodies.
- 2 – Keep gasoline and oil off the tires.
- 3 – Replace missing dust caps as soon as possible.

Tires should be replaced when the tread depth is only 1 mm all round and on full tread width because this is the absolute limit for safe usage.



The original tires on your vehicle have built-in wear indicators.

These are moulded into the base of the tread grooves and appear as bars across the tire when the tread has worn down to 1.6 mm deep. There are from 4 to 6 of these bars according to make of tire.

When the wear indicator bars appear in two or more adjacent grooves so that there is no tread on tire surface at these points, the tire is worn almost down to the safe limit.

The tire should be replaced as soon as possible.

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.

Winter tires,
see "Driving in Winter" page 58.

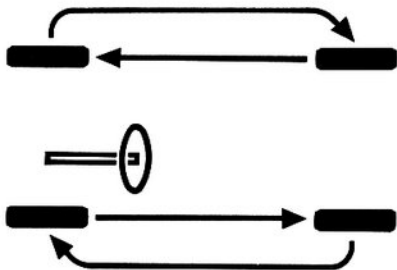
For safety reasons, the tires on all wheels should be replaced at the same time or at least they should be replaced in pairs on the axles. For the same reasons use only tires of the same make and type of tread pattern.

New tires should be run in at a medium speed for about 100 km because they do not give maximum adhesion at first

If you notice that your tires are wearing unevenly consult VW Dealer. Bear in mind, however, that uneven tire wear is not always due to some vehicle condition such as incorrect wheel alignment, etc. It is often caused by a particular style of driving such as fast cornering, for example.

If the tire pressures are neglected for a long time this can also cause uneven wear.

To avoid having to replace the tires prematurely in such cases, it is advisable to change the tires round as shown here, that is without altering the direction of rotation. The tires must then be inflated to the correct pressures and the wheel bolts tightened to 15 mkg diagonally.



Starting the engine

On the fuel injection engine of the VW 411 E, the electronic control unit automatically provides the correct fuel/air mixture for starting via temperature sensors in crankcase and cylinder head.

The engine will always start immediately if you operate the ignition key and accelerator pedal as follows:

Depress accelerator pedal fully and keep it down, while operating the starter, until engine fires.

This procedure is used when engine is cold or hot and under all weather conditions.

When it is cold, depress the clutch pedal so that the starter only has to turn the engine.

When it is very cold, do not switch heaters, lights and other current consumers on until engine is running. To ensure that the full battery capacity is available when starting the engine, the headlights, wipers, fan and heated rear window are switched off automatically when the starter is operated.

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

If the engine does not start first time or if it stalls at any time, the ignition will have to be switched off first because the non-repeat lock in the ignition switch prevents the starter from being operated a second time straightaway and being damaged if the engine happens to be running.

Do not try to warm the engine up by running it at idling speed with the vehicle stationary. Drive off straight away but do not race the engine while it is still cold.

The warning lamps which light up when the ignition is switched on, should go out when engine has been started:

The red light for the generator thus shows that the generator is working. If the lamp lights up when you are driving, the generator has stopped charging. You can drive on in this case but try to get the vehicle into a workshop as soon as possible because the battery will soon run down.

The other red light shows that the oil pressure is in order. If this lamp comes on when driving, stop at once, switch the engine off and check the oil level. Add oil if necessary. Should the cause of the trouble be elsewhere, you are advised to get expert assistance.

There are some remarks on starting the engine on page 53 for Automatic drivers.

**Be careful when starting the engine in a confined space.
Danger of poisoning.**

Driving tips

Remember that new tires do not give maximum adhesion and should be run-in at medium speed for about 100 km.

New brake linings also require running-in so try to avoid emergency stops in the first 200 km. The permissible speed ranges for the various gears are as follows.

1st gear 0– 40 km/h (0–25 mph)

2nd gear 15– 70 km/h (10–44 mph)

3rd gear 25–110 km/h (15–68 mph)

4th gear 45–155 km/h (28–96 mph)

If you have to do a bit of rapid overtaking anytime you can accelerate up to

78 km/h (48 mph) in 2nd gear
and 120 km/h (75 mph) in 3rd gear
for a brief period.

Economic driving

If you drive smoothly and in a controlled style you will be rewarded by a saving in fuel and general expenses. Very fast, sporty driving with full throttle acceleration and violent changes between accelerating and braking will mean more frequent visits to a gas station not to mention increased tire and brake lining wear.

You can drive very economically between:
15 km/h (10 mph) and 45 km/h (28 mph)
in 2nd gear
30 km/h (18 mph) and 80 km/h (50 mph)
in 3rd gear
45 km/h (28 mph) and 120 km/h (75 mph)
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.

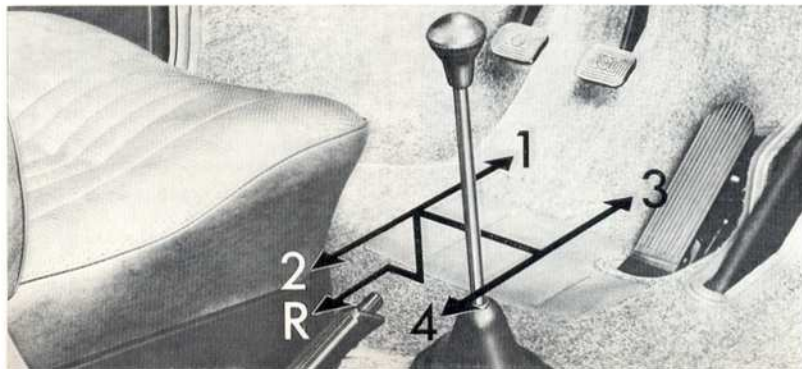
A good driver slips the clutch as little as possible when moving off and changing gear.

He always depresses the clutch pedal fully when changing gear, he also changes down into the appropriate gear when driving in a long line of vehicles and when cornering instead of slipping the clutch and he never uses the clutch pedal as a footrest.

Similar remarks also apply to the gear lever. Do not make a habit of resting your hand on the lever like some drivers do, particularly in town traffic. The pressure of your hand is transmitted to the shift forks in the transmission and can cause premature wear. After changing gear — hand off gear lever.

All the remarks about gearshifting and use of the clutch are not the least interesting to the driver of the Automatic.

The transmission does all his thinking for him. Details of driving a vehicle with the automatic transmission are given on the next pages.



Automatic

When driving a vehicle with an automatic transmission, there are only a few points which you should know in order to be able to make full use of this type of transmission.

Just remember the following three basic rules:

- 1 – There is a “torque converter” between engine and transmission which also acts as a moving-off clutch.

For this reason you must apply the foot-brake or the handbrake when selecting a driving range with the vehicle stationary. This is necessary because the torque converter always transmits a certain amount of power even at idling speed. As a result, the vehicle tends to “creep”

when a gear is selected. The tendency is stronger the higher the engine speed is.

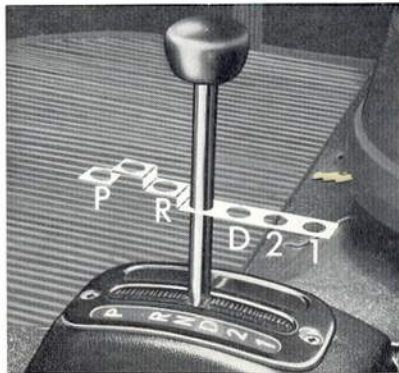
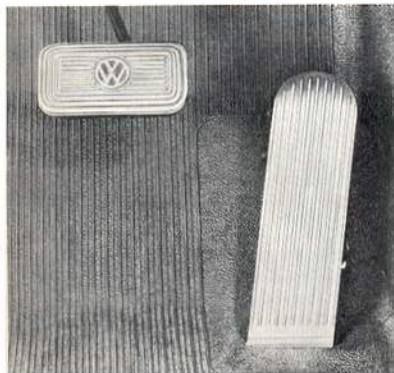
- 2 – When selecting a driving range while the vehicle is stationary, do not depress the accelerator. The engine must be running at idling speed as otherwise a lot of extra strain is placed on the automatic clutches.

If you accidentally knock the selector lever into neutral -N- while driving, lift your foot off the accelerator and let engine speed drop before selecting a driving range again.

- 3 – Your car does not have a clutch pedal. The brake pedal has been made wider so

that you can depress it with the left foot when necessary.

Remember not to try to “de clutch” through force of habit when selecting a driving range because you may then apply the brakes.



The selector lever

At the base of the selector lever there is a small plate showing the various driving ranges. The plate is illuminated so that it can be seen in the dark.

P = Parking

R = Reverse

N = Neutral

D }
2 } = Forward driving ranges
1 }

The driving ranges

The automatic transmission has three forward ranges and one reverse.

In position D all three gears are shifted automatically from standing still to top speed according to the traffic situation.

The vehicle moves off in first gear as the accelerator pedal is depressed and the transmission shifts up dependent on engine load (accelerator pedal position) and the speed into second or third gear.

As speed decreases the transmission shifts down again.

Lever position D is therefore the "normal position"

In position 2 the 3rd gear remains out of use. This position should always be selected when the braking effect of the engine in position D is not sufficient, such as when driving down long, fairly steep gradients.

Position 2 can be selected even when vehicle is pulling with accelerator depressed.

However as the 2nd gear shifts as soon as selected it should not be selected unless the vehicle speed is below 100 km/h (62 mph) and this speed should not be exceeded in driving range 2.

Position 1 is only used on rare occasions. In this position the 2nd and 3rd gears are out of use. This position can also be selected while moving with throttle open but the speed limit in this case is 60 km/h (37 mph).

Reverse should only be selected when the vehicle is standing still just as with the normal manual transmission and without depressing accelerator pedal. The lever must be lifted slightly to select reverse.

As the climbing ability in reverse is less than in the forward range it is advisable to climb very steep ramps in forward gear only.

Accelerator pedal and "kick-down"

When you depress the accelerator pedal fully it goes past the pressure point to the "kick-down" position.

This "kick-down" arrangement gives you the possibility of influencing the operation of the automatic transmission by the position of the accelerator pedal.

As soon as you let the accelerator pedal back from the "kick-down" position, the transmission shifts into the next higher gear. If you keep the pedal in the "kick-down" position when accelerating, the transmission will not change up until the engine has reached maximum speed which is about 60 km/h (37 mph) in 1st gear and about

95 km/h (59 mph) in 2nd gear. This gives you maximum acceleration by revving engine right up (Forced throttle shift).

When you wish to overtake quickly you floor the pedal to "kick-down" position so that the transmission shifts down immediately to 2nd gear at speeds below 90 km/h (56 mph) and into 1st gear at speeds below 55 km/h (34 mph).

Starting the engine

The engine can only be started with selector lever in neutral -N- or in the park position -P-.

When a driving range is engaged, an inhibitor switch prevents the starter from working. Otherwise starting is as described on page 50.

Moving off

Before you select a driving range prior to moving off and also when moving the lever from "P" to "N", which means going briefly into reverse, you must apply the foot- or hand-brake. You know already why this happens.

The usual driving range is position D so moving off takes place as follows:

Apply handbrake or footbrake,

Move selector lever to position D,

Release brakes and accelerate.

Stopping

To stop temporarily, at traffic lights for instance, all you have to do is apply the brakes. You need not move the selector lever into neutral. To move off again, just depress accelerator pedal and the vehicle starts off in first gear automatically.

Parking

When parking the vehicle, apply the hand-brake and then move the selector lever to -P-. To do this, the lever must be lifted a second time and pushed past the reverse position where it engages automatically in -P-. The transmission is then locked mechanically which is the reason why the parking lock must only be engaged when vehicle is stationary.

Maneuvering

All that you have to remember here is that the reverse and forward ranges must only be selected when vehicle is stationary and the engine running at idling speed.

Hill climbing

There is no need to "shift" the automatic transmission when driving in mountainous country. If a smooth fast speed can be maintained there is no need to move the selector

lever by hand—it can be left at "D". On very curvy stretches however it is advisable to select position "2".

This prevents unnecessary upshifting into 3rd gear when throttle is released briefly and enables engine braking to be used when going downhill thus reducing strain on brakes. On very steep downhill stretches select position "1" so that maximum engine braking effort is available.

Note

If you move the lever from "D" to "2" (not at speeds above 100 km/h [62 mph]) the engine braking is effective immediately.

If lever is moved to position "1" (not at speeds above 60 km/h [37 mph]) and throttle not opened, the transmission will stay in "2" until speed has dropped to about 30 km/h (18 mph). Footbrake may have to be used. The downshift into "1" then takes place and full engine braking is effective.

1st gear will be engaged earlier if accelerator pedal is depressed. At full throttle it will shift at 60 km/h. When lever is at "1" the transmission will not shift into "2" automatically.

Towing

If your own vehicle has to be towed on its wheels because of some defect please note that the speed must not exceed 50 km/h (30 mph) and the distance it is towed must not be over 50 km (30 miles) as the transmission is then not properly lubricated because the transmission oil pump does not work when the engine is not running.

The best way to get round this problem is either suspend the vehicle at the rear or remove the drive shafts.

Tow or push starting is not possible with your car. If the engine fails to start anytime, consult your VW Dealer.

Trailer towing (see page 61).

There are two good things about VW all over the world.

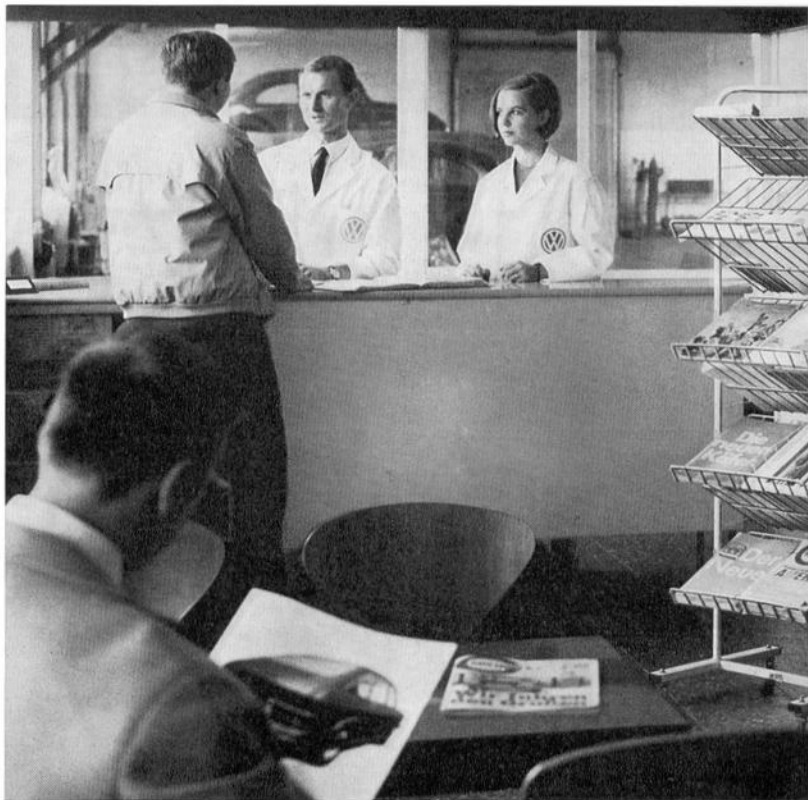
The Volkswagen. And the Volkswagen Service.

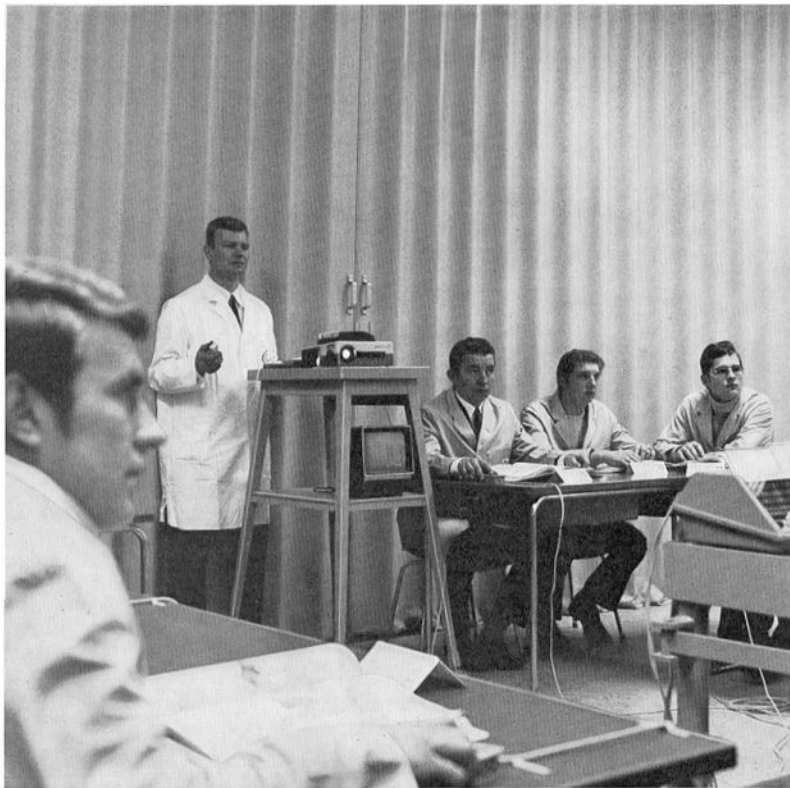
You will find VW specialists everywhere.

Not just within a radius of a few thousand miles but in 140 different countries. In more than 9000 authorised VW concerns.

You can rest assured that you will find VW Service everywhere — as reasonably priced and reliable as at home. We know, because we supply all VW concerns with everything they require. From the smallest replacement part to the largest special tool.

We don't just wish you pleasant motoring — we do something to keep it that way.





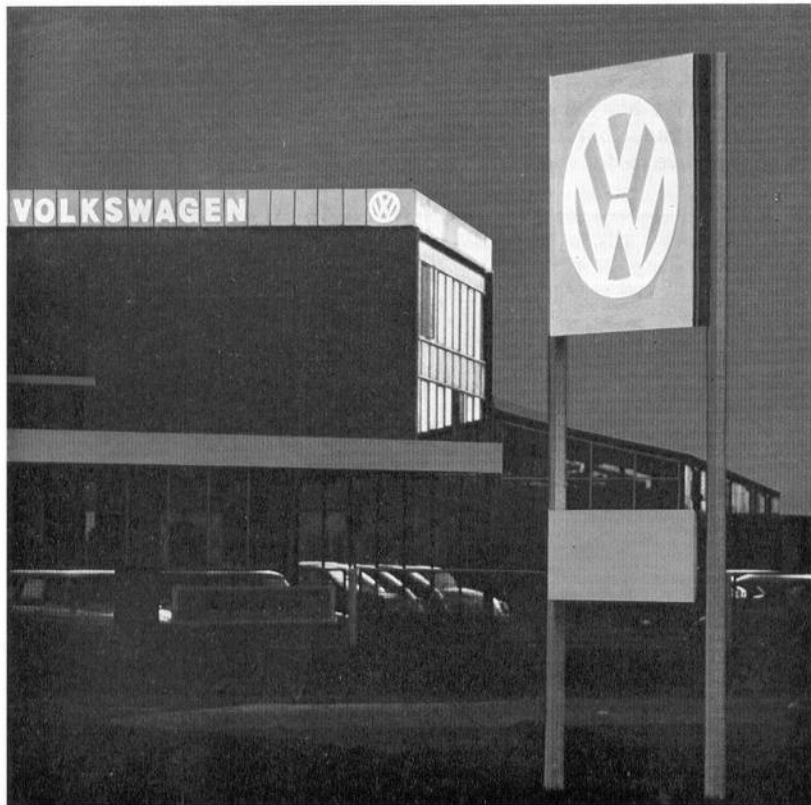
**They go to "school" with VW.
So that you feel as safe with your VW
all over the world as you do at home.**

Every year 50 000 specialists are trained in VW service schools. Mechanics, foremen, service advisers from every corner of the world. In small groups of 8-10 they get to know the most modern procedures.

Their knowledge is extended and kept right up to date by continuous training at their place of work.

Result of this training: precision in servicing—and less time spent on the work.

For it is not sufficient for a VW workshop simply to produce quality. It does so at reasonable prices.



**So that you know where to take
your car for servicing:**

**Every VW workshop displays
the VW sign.**

Many other workshop would like to have you as a customer but they are not good enough for your VW. Workshops not authorized by VW cannot offer you the sort of service which you get at a VW shop.

The Volkswagen Diagnosis and Maintenance system, for example.

Trained mechanics with special tools. Rationalized procedures developed by the VW factory. In short — the economic way of keeping your VW in tiptop, roadworthy condition. Year after year.

Driving in winter

The VW 411 E is a good cold weather vehicle

You can leave the vehicle out in the bitter cold without fear—the air-cooled engine will always start readily. The combined heating system quickly supplies heat for the body, even before you move off, if you wish.

All you have to do is to switch the heater on a few minutes before driving away.

If your car is fitted with a preselector switch all you have to do is to set it and your car will be warm the next morning.

The VW 411 E will always be ready for the road, regardless of snow and ice if a few simple measures are taken to winterize the vehicle in advance.

Winter tires*) are not absolutely essential on the VW 411 E because the radial ply tires are very good on winter roads. Provided that the conditions are not too severe, the radial ply tires can be used in place of M + S tires. Better still are radial ply M + S and M + S studded tires.

The radial ply winter tires suitable for the VW 411 E are designated 155 R 15 M + S or 155 R 15 M + SE (with studs).

These tires must be fitted on all four wheels.

The correct pressures for radial ply winter tires are:

	front	rear
1—2 persons	1.6 (23 psi)	2.0 (28 psi)
fully loaded	1.8 (26 psi)	2.4 (34 psi)

If you decide to buy winter tires we advise you to get the radial ply M + S studded type. This type of tire is much safer on hard snow or ice. New studded tires should be run for 300 km at moderate speeds in order to give the studs time to settle. Winter tires are no longer fully effective when the tread has worn down to a depth of 4 mm (.16 in.).

Snow chains. Only thin chains which do not stand clear of the tire tread and inner wall more than 15 mm (.6 in.) including tensioner, should be used.

The chains offered under the genuine VW accessories programme are of this type.

Contrary to winter tires, snow chains are usually only fitted on the driving wheels. If, in exceptional cases, it is necessary to fit chains on the front wheels as well, the steering should not be locked hard over as otherwise the chains may rub in the wheel housings. This applies particularly when chains are fitted on winter tires.

When driving over long stretches of road which are free of snow, the chains should be removed. They serve no useful purpose here

but merely damage the tires and wear out quickly.

Handbrake. Brake linings which have become wet due to splashing or condensation can freeze on to the drums in the winter when the handbrake is left on. To avoid this trouble when parking the vehicle, engage 1st or reverse gear instead and do not apply handbrake if there is a danger of frost.

On the automatic transmission: place selector lever in -P-.

When parking on steep hills, turn the front wheels in towards the kerb as well.

SAE 30 engine oil will tend to thicken at temperatures around freezing point and may cause starting difficulties.

As soon as winter temperatures are expected, change over in good time to a thinner grade of oil.

Details of the various oils to be used in the winter are given on page 86.

The various viscosity grades are described on page 85.

*) Variant: see page 95

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

For the automatic transmission there are no special winter instructions.

The battery drops in capacity as the temperature drops. This is due to its chemical and physical properties. This means that a really cold battery which may in any case not be fully charged, has only a fraction of the capacity it has at a normal temperature.

If the vehicle is driven mainly in the town, using lights, heater and other electrical equipment a great deal, or if the vehicle is not driven much in the winter, it is advisable to have the battery checked from time to time and charged or quick-charged as necessary.

This will not only mean quicker, reliable starting but will help to prolong battery life. Instructions on care of the battery and quick charging are given on page 80.

The spark plugs should not have excessively large gaps particularly in the winter. The gap is 0.7 mm (.028 in.).

The windshield washer can be frostproofed and kept usable by adding a large dose of the window cleaning agent listed on page 64 to the water.

Methylated spirits can also be used as an anti-freeze. A mixture of 1 part spirits to 3 parts of water will offer protection against frost down to about -12°C ($+10^{\circ}\text{F}$).

Methylated spirit naturally has not got the special cleaning properties of the window cleaning agent.

Door locks can freeze up if water gets into the lock when washing the vehicle, for instance, so do not aim the water jet directly at the locks. It is a good idea to cover the keyholes up beforehand.

A frozen door lock can be thawed out easily even when it is very cold, with the aid of our lock defreezing agent. This solution has a preservative effect so that the lock cylinder is not damaged even if the solution is used often. It does not damage paint work either.

Door lock defreezer
plastic bottle (100 cc) 000 096 106

Door lock defreezer spray
(16 cc—pocket size) 000 096 107

Refill for 000 096 107
(300 cc) 000 096 108

Frozen windows can be cleared with our defroster spray. After the spray has worked for a short period, the ice can be wiped off.

Defroster spray 000 096 109
(300 cc)

Ice on the inside of the windows can be prevented by rubbing the glass with a defroster cloth.

Defroster cloth 000 096 110

The air intake slots in front of the windshield and under the rear window should be cleared of snow so that the fresh air ventilation and engine cooling are not affected.

It is a good idea to carry a shovel or a short-handled spade in the car in the winter so that you clear away the 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.

Trailer towing

General hints

Towing a trailer places a considerable strain on the body, transmission, clutch and brakes of the towing vehicle.

In order to avoid damage to your Volkswagen, please note the following instructions and driving rules which are also written with road safety in mind:

- 1 – Do not exceed the maximum trailer weight specified for the vehicle.
- 2 – The towing bar must be fitted in accordance with the instructions from the Volkswagen factory. Towing bars fitted at the factory or as VW accessories by VW workshops fulfil these conditions otherwise the towing bar must be fitted in accordance with the instructions supplied with it.
Check whether local regulations require the fitting of a towing bar to be recorded in the vehicle documents.

The operation of the trailer turn signals must be indicated by a special warning lamp on the instrument panel. When the VW trailer turn signal/warning light relay is used, this warning lamp only works when the trailer is equipped with 21 watt turn signal bulbs.

In the 7 pin trailer socket there is a spare pin (terminal 54 g) for an additional power supply (for caravan lighting for example).

Please remember that the battery capacity is limited when using such lighting.

- 3 – The pressure of the trailer draw bar on the ball of the towing bar must be between 25 and 40 kg (55–90 lbs). The permissible rear axle load must not be exceeded.
- 4 – A second outside driving mirror is essential in most cases. If the trailer is wider than the vehicle, both outside mirrors should be on extending telescopic arms so that a good view to the rear is always obtained.
- 5 – Always drive at a moderate speed. In lots of countries there are speed restrictions for vehicles towing trailers.
- 6 – Ensure that the tires have good treads and that the inflation pressures are correct. Keep tires inflated to the pressures for maximum load. It is essential that the trailer tires have the same pressures.
When the towing vehicle is fitted with studded tires, trailer with brakes should also be equipped with studded tires.
- 7 – Use the clutch carefully when towing. Do not accelerate more than necessary when moving off and never slip the clutch longer than necessary.

- 8 – Use brakes in good time and as gently as possible. Practise braking properly with a trailer with over-run brakes: Apply brakes gently at first then brake rapidly. In this way you can avoid the jerking which is caused by locked trailer wheels.
- 9 – Change down in good time when going uphill and downhill.
- 10 – Trailer towing always puts the fuel consumption up. This is due to the extra weight and the higher rolling and air resistance.
- 11 – If driven properly your VW will climb any normal road gradient when towing a trailer. But do not demand the impossible. The hill climbing figures given are for the vehicle with two occupants—but without trailer and it is obvious that these figures must be reduced considerably according to trailer weight.
- 12 – Furthermore, the engine output decreases as the height increases as a result of the drop in atmospheric pressure. When high mountain passes have to be climbed do not tow a trailer of the maximum permissible weight.

Trailer towing with the automatic transmission

For trailer towing the automatic transmission has certain advantages which become apparent when moving off, when climbing and when driving in long columns of vehicles.

There is no friction clutch which may heat up excessively and wear prematurely due to improper use. The vehicle moves off very smoothly, without any jerks. There is also no jerking when driving and when changing the drive range and this is beneficial to the engine, the transmission and the tires on the driving wheels.

The additional work which the driver of a vehicle manual transmission has to cope with due to the more frequent gear changes necessary when towing a trailer, is all taken care of by the automatic transmission. And the changes are always properly timed.

All you have to do is read the remarks on page 51 about driving a car with automatic transmission.

We should just like to give you a few tips on trailer towing on gradients which will help to increase road safety and avoid damage to the automatic transmission:

- 1 – It is normal to move off in drive range D when towing a trailer, if the road and traffic conditions permit higher speeds. On steep gradients and under traffic conditions which only permit low speeds it is better to select drive range 2 or 1. This prevents unnecessary upshifts and downshifts during temporary deceleration and acceleration.
- 2 – It is quite **correct** to select drive range 1 on long downhill stretches in order to make full use of the engine braking power and thus relieve the brakes. On slight downhill gradients the engine braking power may be adequate even in drive range 2.
- 3 – It is **wrong** to hold vehicle and trailer on a slope a long time by accelerating the engine with a drive range selected instead of applying the hand or foot brakes. Prolonged slipping of the torque converter would cause the fluid to heat up excessively and this can damage the seals in the transmission.

Care of car

Even the finest paint requires regular and proper care if it is to retain its gloss over the years. This is easy to understand if you just stop to think of the influences to which the paint is exposed:

hot sunlight, cold rain, industrial fumes and fall-out, soot, dust and dirt. In the winter, all the external parts of the vehicle are subjected to even more severe climatic

conditions and aggressive salt solutions. We recommend, therefore, that at this time of the year the vehicle is waxed at shorter intervals than at other times.

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

Washing

Wash the vehicle frequently from top to bottom with clear water but do not wash it in the direct sunshine. Rinse the sponge often to avoid scratching the paintwork. If water alone is not adequate, add a shampoo to the water and apply it with a sponge or soft brush. Then rinse vehicle well and dry with a leather.

Tin of shampoo (300 cc)	000 096 112
Sponge	000 096 151
Leather	000 096 155
Auto cloth	000 096 150
Brush	000 096 157
Washing gloves	000 096 153
Washing gloves, nylon	000 096 160

Waxing

Wax as often as possible. This will prevent dirt from sticking to the paint and industrial grime from penetrating into paint. After washing the vehicle, apply wax and polish it until paint shines or just put wash/wax solution in the second lot of water regularly. Rinse vehicle with this solution and dry with leather.

Tin of wax (250 cc)	000 096 011
Tin of wax (1000 cc)	000 096 112
Tin of wash/wax solution (150 cc)	000 096 121
Tin of wash/wax solution (250 cc)	000 096 122

Polishing

The paint should only be polished if it has lost its shine and the gloss cannot be brought back with wax. After treatment with polish, the vehicle must be waxed.

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

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

Removing industrial grime

Treat the paint surfaces with industrial grime remover as soon as possible. The solution is allowed to work for a few minutes and then rinsed off very thoroughly. Pay particular attention to all seams and joints.

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

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

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

Touching up paint damage

Small marks in the paint such as scratches or stone damage should be repaired with genuine VW touch-up brushes or spray cans before the marks start to rust. A sticker in the front luggage compartment in the jack recess gives to the color designation and number of the original finish.

Care of chromed parts

Wash the chromed parts first and rub them until completely dry. Then clean with chrome polish from the tube. This polish contains a preservative so that it cleans and protects the chromed parts.

Liquid chrome protector should be used to prevent corrosion of parts for a long period. Apply it with a spray gun where possible. The protective film can be removed effortlessly with protective film remover.

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

For applying liquid chrome protector we recommend the use of spray gun 000 096 064.

Removing insects

Dried on insects can be cleaned off paint with insect remover. Wash paint surfaces afterwards. Clean dirty windshields with insect sponge.

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

Parking under trees

Vehicles which have been parked under trees in the summer are often found to be covered with sticky spots. These spots can be removed with a shampoo solution easily if treatment is not delayed too long. The paint should be waxed again afterwards.

Cleaning cloth upholstery

Clean with a vacuum cleaner or a medium hard brush. Spots or very dirty patches can be removed with plastic and cloth liquid cleaner. Moisten a clean, plain cloth with the cleaner and rub spot with a circular motion, working inwards.

Plastic and cloth liquid cleaner (500 cc)	000 096 072
Plastic liquid cleaner (500 cc)	000 096 073

Cleaning leatherette

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

If very dirty, clean air-permeable leatherette with liquid plastic and cloth cleaner by applying with a plain absorbent cloth.

After cleaning, rub area dry with a soft cloth.

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

Plastic cleaning paste (200 grams)	000 096 071
Plastic and cloth liquid cleaner (500 cc)	000 096 072
Plastic liquid cleaner (500 cc)	000 096 073

Windshield wiper blades

Blades which are clogged with insects or oil deposits should be removed and cleaned with a hard brush and a detergent solution. New blades should be installed once or twice a year according to condition.

Door, hood and window weatherstrips

The weatherstrips will remain flexible and last longer if they are rubbed lightly with talcum powder or glycerine from time to time. This will also stop the weatherstrips on doors and hoods from freezing on in the winter.

Airing the body

If the vehicle is left in a closed garage for a long time, the garage and car doors must be opened occasionally to prevent the formation of mould and damp stains.

Cleaning windows

Windows can normally be cleaned with a sponge and lukewarm water and then dried with a leather.

Do not use this leather for the paintwork because traces of paint cleaner and polish will cause streaks to appear on the windshield.

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

Remove silicon, grease and oil with "A'Silic" powder.

Sprinkle powder on screen and then rub it off. Add silicon remover to washer water to keep screen clean.

Sachet of window cleaner (35 cc)	000 096 101
Bottle of window cleaner (200 cc)	000 096 105
Insect sponge	000 096 083
Anti-mist cloth	000 096 165
Squeegee	000 096 152
Powder "A'Silic" (125 cc)	000 096 075
Silicon remover (120 cc bottle)	000 095 093

Do-it-yourself tips

Wherever you see the familiar VW sign at the roadside you can be sure of expert advice and quick efficient assistance.

If a repair becomes necessary at any time, take your car to a VW Dealer. It will be in good hands there.

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

Wheel changing

Preparation: Take spare wheel out of luggage compartment after detaching the water container air pressure hose from the tire valve. You also require the jack, wrench, bar and possibly the puller.

Please note: The special valve in the connection on the water container prevents the pressure in the container from escaping when the pressure hose is detached from the valve in the spare wheel.

The washer system thus remains in action for the time being.

However, when the air in the container has been used up, the washer system cannot be used again until the flat tire on the spare wheel has been repaired and the hose has been reconnected.



Changing a wheel

Apply handbrake firmly. According to equipment. Pull wheel cap off with puller or lever it off with the thin end of the bar.

Place puller into the holes in the cap, push the bar through the puller and lever against the wheel rim.



Or place thin end of bar between cap and wheel and lever cap off. Hold cap in each case so that it does not fall on to ground. Loosen all bolts about one turn with the socket wrench and bar.

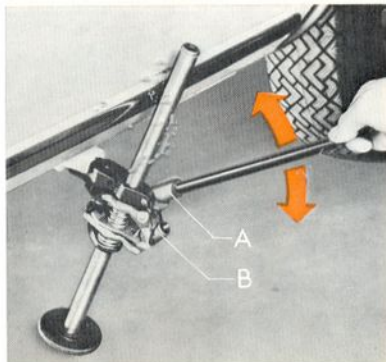


Your VW 411 E may have a lever type jack in front luggage compartment, or a screw type jack under the rear seat.

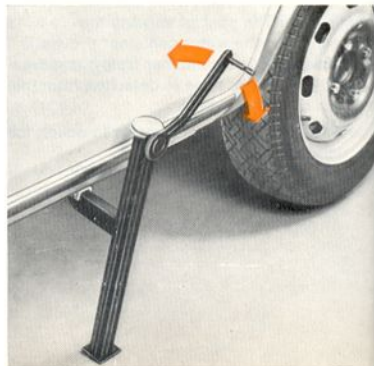
Insert lever type jack into square tube under the body and push leg down until it touches the ground.

Place bar in upper link -A- on jack to lift vehicle.

Place bar in lower link -B- to lower vehicle.



Insert jack into square tube under the body:
Turn to right to lift vehicle.
Turn to left to lower vehicle.



Place **spare wheel** in position and raise or lower vehicle slightly until one of the holes in the wheel is in line with one of the threaded holes.

Remove bolts and take wheel off.

Insert one wheel bolt first. Move wheel about slightly until the other three bolts can be inserted.

Tighten bolts with wrench without bar first and while tightening move the wheel to and fro so that it is centered on the hub by the

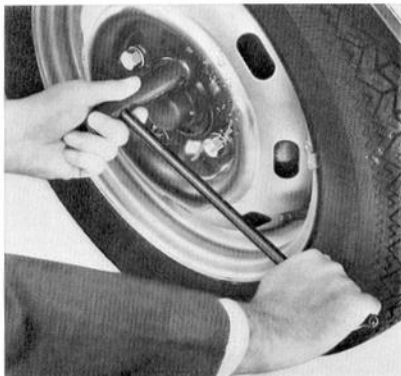
Place bar in wrench so that maximum leverage is obtained—as shown and tighten bolts uniformly and diagonally.

Fit wheel cap by giving it a smart blow on the edge with the hand.

Have the torque of the wheel bolts checked as soon as possible after changing a wheel. The tightening torque is 15 mkg (108 lb. ft.).

Do not forget to rectify the pressure in the wheel which has been fitted, in accordance with the list of pressures on page 47 or 95 and have the damaged tire repaired as soon as you can.

One more point: when a tire has been repaired, the wheel must be balanced again.

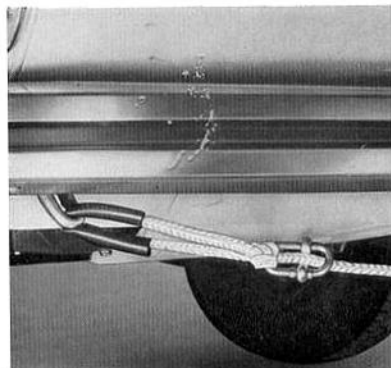
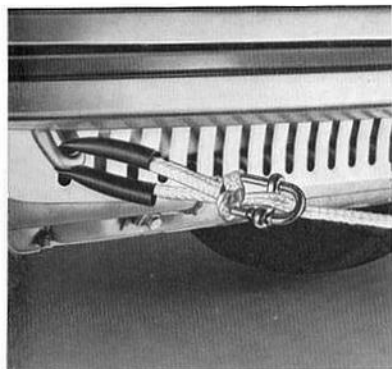


Towing

Your vehicle is equipped with towing eyes at front and rear. The towrope should be slightly elastic in order to reduce the snatching between towing and towed vehicle. Plastic towropes are good in this respect. The driver of the towing vehicle must engage the clutch very smoothly when moving off or changing gears. The driver of the vehicle being towed must keep the towrope taut.

Avoid using excessive towing effort and do not jerk. During towing operations on other than hard roads there is always the danger that the attachment parts on the body will be overloaded and damaged. Instructions for towing and being towed with a vehicle with automatic transmission are given on page 54.

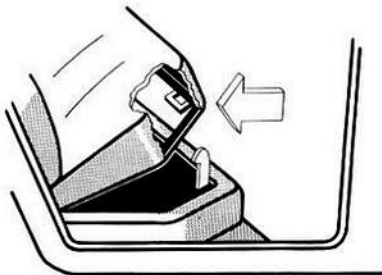
As the brake servo *) does not work when the engine is not running, the assistance it normally gives is not available when vehicle is being towed. The brake pedal must be depressed harder than usual.



*) Optional extra

Removing and installing rear seat

By pressing firmly against the frame of the seat (see sketch) you can unhook the left and right sides one after the other and then lift the seat out. When installing the seat, press it well under the backrest on each side so that you can engage the hooks properly.



**In a VW concern you get
Genuine Volkswagen Spare Parts,
Genuine Volkswagen Exchange Parts,
Genuine Volkswagen Accessories.
All with a guarantee.**

Genuine Volkswagen spare parts are the proper parts for your VW.

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What is the difference? The price. Genuine Volkswagen exchange parts are cheaper. Often 50% or more. Because we take the old parts in part payment and rework them.

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You will get the same guarantee on all these as on every part of a new VW: up to 10 000 km or 6 months.

VW values quality. Do you?



Aiming the headlights

The adjustment of the headlights is also essential to traffic and vehicle safety. The headlights are set correctly in the factory. The alignment is checked regularly at the specified intervals with special instruments by your VW workshop.

If you should find one day that the headlight setting requires adjustment and a proper instrument is not available, the headlights can also be set as follows:

1 — Headlight bulb

Position empty vehicle on level ground 5 m (16 ft. 5 in.) away from a smooth light-colored wall. Ensure that the tires are inflated to the specified pressures and load rear seat in center with one person or 70 kg (154 lbs.).

Outer headlight = Low beam (asymmetric)
Inner headlight = High beam

Each beam and each headlight is set separately. The headlights have adjusting screws on the back of the reflectors for vertical and lateral aim.

A = Vertical adjustment

B = Lateral adjustment

The screws are accessible after lifting hood and taking the protective caps off. No tools are required to adjust the beams.

1. Preparation of wall

- Make a mark on the wall in line with the longitudinal centerline of the vehicle. The vertical line -V- is then drawn at this point.
- Measure height of headlight center -d- from ground (-d- is the same for low and high beam headlights). Make the horizontal line A-B on the wall at this height.
- Mark line H-H 5 cm (2 in.) below line A-B.
- Mark spacing of high beam headlights -a- and low beam headlights -a'- on each side of line -V- and draw lines C-D and C'-D'.

Distance between headlight centers

$$a' = 1270 \text{ mm (50 in.)} \quad \frac{a'}{2} = 635 \text{ mm (25 in.)}$$

$$a = 948 \text{ mm (37.3 in.)} \quad \frac{a}{2} = 474 \text{ mm (18.65 in.)}$$

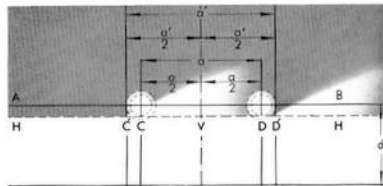
2. Setting the inner headlights:

- Cover one headlight and adjust the other one by turning knurled screw until the bright spot is centered on the cross formed by the horizontal line A-B and the vertical line C or D.

- Adjust other headlight in the same way.

3. Setting the outer headlights:

- Cover one headlight and adjust other one to correct height first. The horizontal light/dark border on the left side should be set on line H-H.
- Then adjust laterally so that the angle on the line between the horizontal part of beam and the part rising at 15° is on the appropriate vertical line C' or D'.
- Adjust other headlight in the same way.



2 - Sealed Beam unit

On Volkswagen with Sealed Beam headlights aim beams as follows:

Check tire pressures, correct if necessary and park vehicle on level surface squarely facing a wall or screen 25 feet (7.5 m) in front of the headlights.

The driver's seat must be loaded with one person or a weight of 154 lbs. (70 kg).

Outer headlight = Low beam/High beam

Inner headlight = High beam

Each beam and each headlight is set

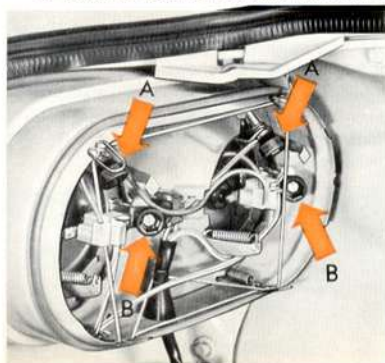
separately. The headlights have adjusting screws on the back of the reflectors for vertical and lateral aim.

A = Vertical adjustment

B = Lateral adjustment

The screws are accessible after lifting hood and taking the protective caps off.

No tools are required to adjust the beams.



Preparation of wall

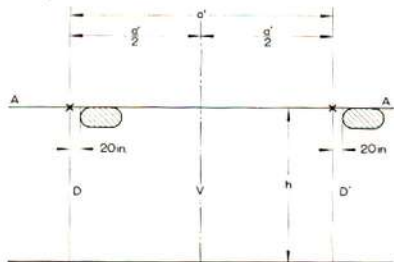
- Make a mark on the wall in line with the longitudinal centerline of the vehicle. The vertical line —V— is then drawn at this point.
- Measure height of headlight center —h— from ground (—h— is the same for low and high beam headlights). Make the horizontal line A—A on the wall at this height. Distance between headlight centers

$$a = 37.3 \text{ in. (948 mm)} \quad \frac{a}{2} = 18.65 \text{ in. (474 mm)}$$

$$a' = 50 \text{ in. (1270 mm)} \quad \frac{a'}{2} = 25 \text{ in. (635 mm)}$$

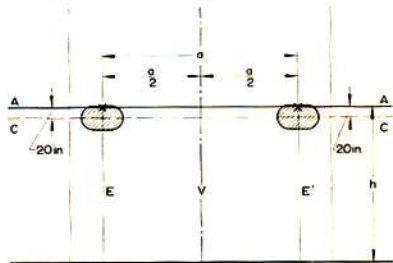
Setting the outer headlights:

- Cover one headlight and adjust other one to correct height first. The top edge of the high intensity zone should be on horizontal line A—A.
- Then adjust laterally so that the left edge of high intensity zone is 2.0 inches to the right of the lines D or D'.



Setting the inner headlights:

- Cover one headlight and adjust the other one by turning knurled screw until the bright spot is centered on the cross formed by the horizontal line C—C (2.2 inches below line A—A) and the vertical lines E or E'.
- Adjust other headlight in the same way.



Replacing bulbs

Before starting to replace a bulb, move the appropriate switch to the off position. Never touch the new bulb with bare fingers. The finger marks left on the glass evaporate due to the heat when bulb is switched on, settle on the reflector and spoil the mirror finish. The headlights do not need aiming again when a bulb has been replaced but it is advisable to have the setting checked. A list of the bulbs used in the VW 411 E is given on page 75.

We recommend that a small box of spare bulbs, which can be obtained at any VW Dealers, is carried on the vehicle.

1 — Headlight bulbs

Open front hood—remove knurled screw and take plastic cap off headlights.

There are two ridges on the bottom edge of the cap to facilitate removal.

When fitting the plastic cap, ensure that rubber seal is located properly and do not overtighten the knurled screw.

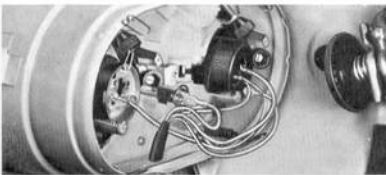
High beams (inner headlights)

Pull both cables off—pull rubber sleeve off—the halogen bulb H 1 is held in reflector with a wire clip.

Unhook wire clip and take bulb out.

When inserting new bulb, watch the recess in the reflector—do not interchange cables:

The ground cable (brown) belongs on the tab on the side of the reflector.

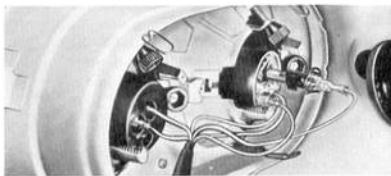


Low beams (outer headlights)

The low beam headlights have the same halogen bulbs (Type H 1) as the high beam headlights.

Pull 3 cables to outer headlight off—pull rubber sleeve off—unhook wire clip and take halogen bulb out.

When inserting new bulb, watch the recess in the reflector—do not interchange cables: Ground cable (brown) on tab on side of reflector. Parking light cable (gray) on lower connector.

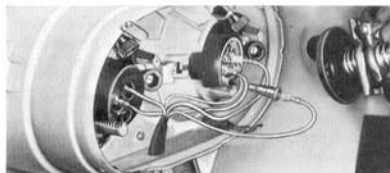


Parking light bulb

The parking light bulb is located in the outer headlight and is held in the reflector in a special holder.

Pull off 3 cables to outer headlight—take rubber sleeve off—pull bulb holder out of reflector—press bulb lightly into holder, turn and take out—put new bulb in holder and press holder into reflector—fit rubber sleeve—do not interchange cables:

Ground cable (brown) on tab on side of reflector—Parking light (gray) lower tab.



2 — Sealed Beam unit

The sealed beam units in the center are for high beam and have one filament, the outer units are for low beam and high beam and have two filaments.

Should it be necessary to replace either one of them, proceed as follows:

Open front hood — remove knurled screw and take plastic cap off headlights. There are two ridges on the bottom edge of the cap to facilitate removal.

Pull connector off defective lamp. Remove two Phillips screws and take trim plate off.



Loosen the three Phillips screws and take out retaining ring and lamp insert. Note that the Sealed-Beam insert for the high beam (inner) has two cable connecting tabs and the insert for low beam has three tabs. The housings have lugs which engage the setting ring so that the Sealed-Beam inserts are installed correctly.

When putting the plastic caps back, make sure that the rubber seal is located correctly.

Do not overtighten the knurled screw.



Front turn signal bulb

(with sealed beam equipment: front turn signal / parking light and side marker bulb)

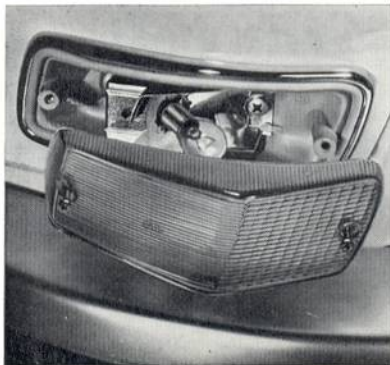
Remove two Phillips screws.

Take lens off.

Press bulb into holder lightly, turn and take out.

Install new bulb.

Do not overtighten screws.



Rear lights—The lenses of the three compartment rear lights are in two parts. Turn signal (orange)—Reflector. Brake-, tail-, back-up lights (red, red, white).

Each lens is secured with two Phillips screws.

Rear turn signal bulb

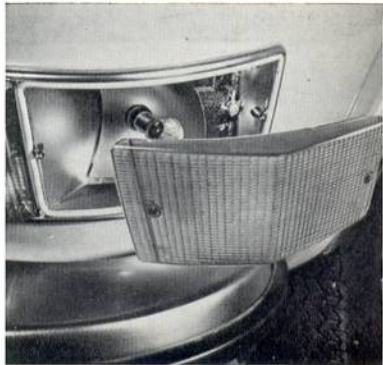
(with sealed beam equipment: rear turn signal or side marker bulb)

Unscrew two Phillip screws until lens can be taken off.

Press bulb lightly into holder, turn and take out.

Install new bulb.

Do not overtighten the screws.



Bulbs for brake-, tail-, back-up lights

Unscrew two Phillips screws until lens can be taken off.

Bulb positions:

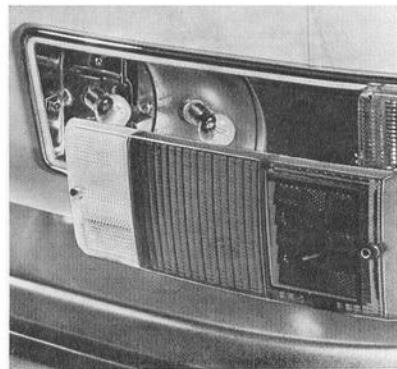
Outer — brake and tail light

Inner — back-up light

Press bulb lightly into holder, turn and take out.

When installing the twin-filament bulb for brake and tail lights, the pin nearest to bulb glass must be to the right on top.

Do not overtighten screws.

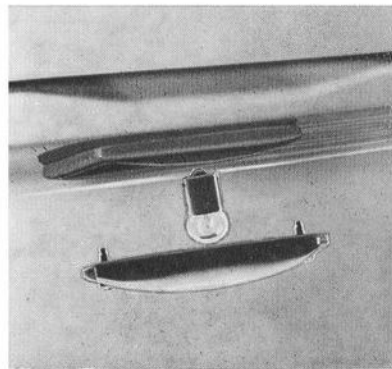
**License plate light bulb*)**

Unscrew two Phillips screws until lens can be taken off.

Press bulb lightly into holder, turn and take out.

Install new bulb.

Do not overtighten screws.

**Side parking light bulb**

Remove Phillips screw.

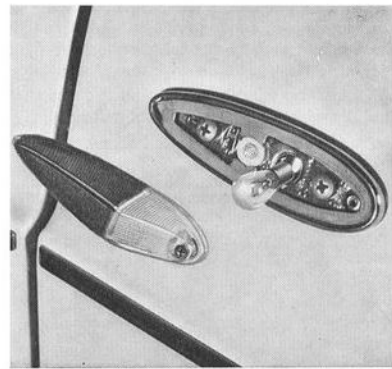
Take lens off.

Press bulb in lightly, turn and take out.

install new bulb.

Insert lens into housing at the rear first.

Do not overtighten screw.



*) Variant: See page 95

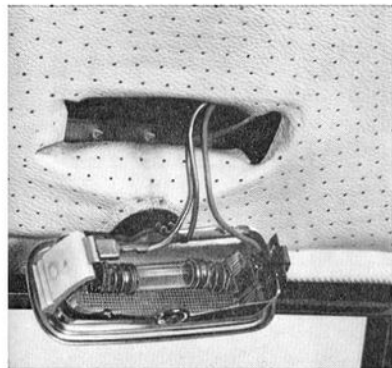
Interior light bulb

Lever interior light out carefully with a screwdriver.

Take bulb out.

install new bulb.

Insert housing at rear first, then press it in until retaining spring engages.



Bulb chart

Bulb for	Qty	DIN designation	VW Part No	If your car is equipped with sealed beam headlights the deviations from the above chart are as follows:		
Headlight	4	YA 12 V	55 W N 17 761 2	Sealed beam (high beam)	4001 (US)	ZAP 118 001
Parking light	2	HL 12 V	4 W N 17 717 2	Sealed beam (high/low beam)	4002	ZAP 118 002
Front turn signal	2	RL 12 V	21 W N 17 732 2	Parking light, turn signal and side marker, front	1034	ZVP 118 034
Rear turn signal	2	RL 12 V	21 W N 17 732 2	Side marker, rear	67	ZVP 118 067
Side parking light	2	HL 12 V	4 W N 17 717 2	Stop/tail light	1034	ZVP 118 034
Brake/tail light	2	SL 12 V 21/ 5 W	N 17 738 2	Back-up light	1073	ZVP 118 073
Back-up light	2	RL 12 V	21 W N 17 732 2	License plate light	89	ZVP 118 089
License plate light 1/2')		G 12 V	10 W N 17 719 2			
Interior light	1	K 12 V	10 W N 17 723 2			
Instrument lighting:						
Speedometer	2	W 12 V	1.2 W N 17 751 2			
Clock	2					
Selector lever indicator light**))	2					
Warning lamps:						
High beam	1	W 12 V	1.2 W N 17 751 2			
Parking light	1					
Turn signal	2					
Oil pressure	1					
Generator	1					
Heating	1					
Emergency warning light	1					
Dual circuit brakes	1					
Heated rear window	1					

* Variant, see page 95

** Automatic transmission only

Fuses

Each electrical circuit is fitted with a fuse to prevent damage to the cables due to overloading if a short circuit or defect occurs in the electrical equipment.

A fuse which has blown can be recognized by the burnt out wire.

A fuse usually only blows when there is a defect in the wiring or in an electrical component. A fuse very rarely blows because of a slight temporary overload.

This means that is invariably not much good to just replace a blown fuse with a new one. If you should do this and the new fuse goes again in a very short time, the vehicle must be taken to a VW Dealer, the electrical system checked to find the cause and the faulty part repaired.

On no account should fuses be patched up with aluminium foil (silver paper) or wire as this can cause serious damage elsewhere in the electrical system.

It is advisable to always carry a few spare 8 and 16 ampere fuses on the vehicle.

The fuse box, which has a transparent cover and contains 12 fuses, is located under the dashboard on the left side panel.

Replacing fuse in connector

Press two halves together lightly and twist until connector can be opened.

Take fuse out.

Install new fuse.

Press halves together lightly and twist until they engage.

*) L models only

Replacing fuses in fuse box

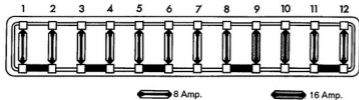
Take transparent cover off by pressing it up at the bottom.

Take blown fuse out.

Install new fuse—do not bend retaining springs.

The fuse must fit tightly.

Insert cover at top and press it down.



The individual circuits connected to the 12 fuses are as follows.

- 1 — Temperature regulating switch (warning lamp), left tail light, selector lever console light (Automatic)
- 2 — Left/right parking lights, right tail light, license plate light
- 3 — Right low beam
- 4 — Left low beam
- 5 — Right high beam
- 6 — High beam warning lamp, left high beam
- 7 — Side parking lights*)
- 8 — Interior light, emergency flasher
- 9 — Cigarette lighter, heating (switch current), fuel pump
- 10 — Temperature regulating switch (heating/switch current fresh air fan, wipers, rear window defogger (switch current)
- 11 — Buck-up lights (Automatic), warning lamps for generator, oil pressure, fuel gauge, turn signals
- 12 — Horn, brake warning light, stop lights

In addition to the fuses in the fuse box, there are three fuses in the engine compartment in connectors under the relay group:

- A*) Main fuse for gasoline heater (16 amp)
- B*) Overheating switch fuse for heater (8 amp)
- C*) Main fuse for heated rear window (8 amp)

On vehicles with manual transmission there is a further 8 ampere fuse in a connector in the engine compartment near the distributor. This fuse is for the back-up lights (see illustration).

Replacement of fuses in the connectors is described on page 76.

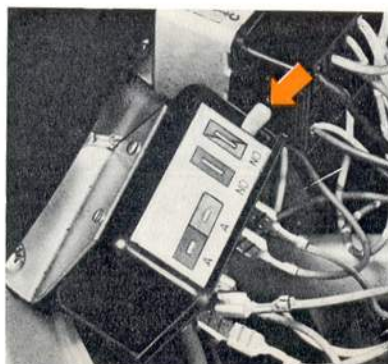
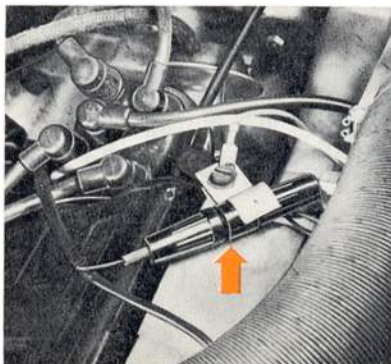
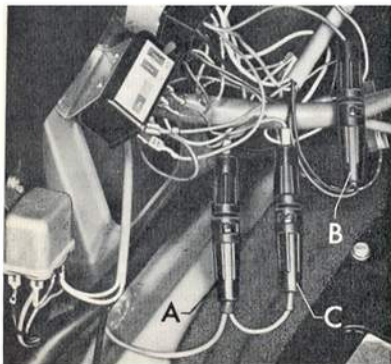
Safety switch*)

If the heater does not work sometime or stops of its own accord, the safety switch (left of engine compartment) may have operated.

After 3 minutes, pull the red lever of the safety switch to the rear (arrow) and release it.

If the heater does not start to work or if the safety switch responds again after a certain period of time, there is a defect in the heater which can only be repaired by a VW Dealer.

*) In the Variant, the same fuses are on the left side under the rear seat.



The battery on the VW 411 E is located under the lefthand front seat.

This is the best sprung place on the vehicle so the battery is subjected to the minimum amount of bumping and this has a beneficial effect on its service life.

A battery gives its best performance at the temperature which the vehicle occupants find most comfortable. At about 20° C, the battery capacity is at its maximum, which is useful when plenty of power is required to start the engine in the winter.

As the starting ability of the engine, the operation of the heater and the functioning of the entire electrical system depends to a great extent on the condition of the battery, it is essential to check the battery regularly and give it certain amount of attention.

Checking battery

Slide lefthand front seat back fully. Swing backrest forward on two-door models or move backrest as far forward as possible on four-door models.

Pull locking lever at front under seat (on door side, behind seat trim) outwards.

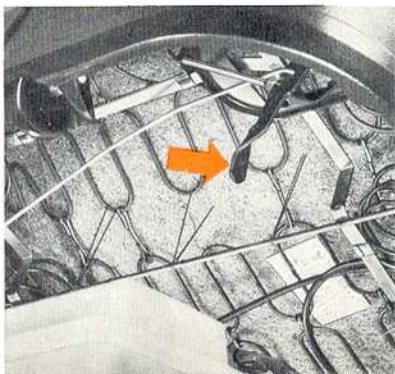
Swing seat out of height adjusting support and tip it to the rear.

Checking acid level

Screw plugs out and check that acid is up to the mark.

If the level is down, add **distilled water** only.

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



How often the battery has to be checked depends, as with many other points of vehicle maintenance, on the operating conditions and the time of year. The acid level drops when the battery is charged due to the dissociation of the water used to dilute the acid and to a lesser extent, to evaporation.

How often it will require topping-up depends, as stated above, on operating conditions and the time of the year. If a vehicle is often used for long runs in the daytime when next to no current is being used, the battery will need topping up with distilled water much more often than in the case of a vehicle operating under different conditions. As a general rule, the battery acid level must be checked more often in summer than in winter.

VW drivers in hot countries who do a lot of driving are advised to check the battery at least once a week.

If you do not intend to use your vehicle for a prolonged period, it is best to take the battery to a VW 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.

Removing battery

Tip lefthand front seat back (see battery checking)

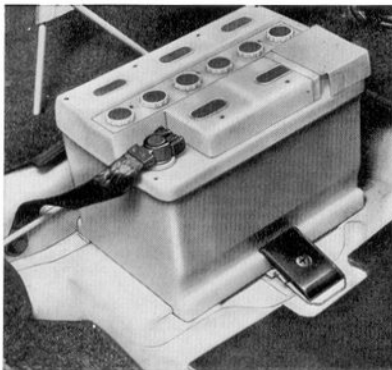
Lift cover over positive terminal (do not take cover off)

Loosen both connections. To avoid short circuits, take ground cable (—) off first but connect positive cable (+) first.

Remove screw in hold-down bracket.

Move battery slightly to the rear and lift it out.

The terminals and posts must be kept clean and coated with terminal grease after battery has been installed. Ensure that the ground cable is cleaned until metal is bright and that it is attached firmly to the body.



Some more points:

Never short the battery terminals as this causes the battery to heat up very quickly and it may burst. Furthermore, the sparks can ignite the gas generated during the charging process.

When reinstalling the battery, make sure that the cables do not become interchanged. To avoid confusion always remember that the + terminal is thicker than the — terminal.

Never drive the vehicle with the battery disconnected.

On the other hand, both terminals must be taken off before quick charging the battery in the vehicle.

Failure to do this can lead damage to the electronic components in the electrical system.

Starting trouble

Volkswagens are reliable. You can keep your car reliable if you have it checked and maintained with the Volkswagen Diagnosis and Maintenance System.

Apart from this, many VW drivers will be pleased to see that this instruction manual contains a trouble diagnosis chart so that if the engine does stop or fails to start some day, it can be checked and often got running again.

The operations are described as done by a skilled mechanic. The source of trouble is located by checking systematically: There should be fuel, there should be a spark — the trouble is soon found. It is really quite easy once you know how it is done.

Condition	Possible cause	What to do
A — Starter will not turn engine or turns it too slowly	1 — Battery run down 2 — Battery cables oxidized or loose, Battery flat	1 — Have battery charged or replaced. Try to start vehicle with manual transmission by pushing (ignition on, clutch out, 2nd gear engaged. When vehicle is rolling, let clutch in quickly). Vehicles with automatic transmission cannot be push started 2 — Clean battery terminals or tighten them. Important To avoid short circuits, take ground cable (–) off first and connect positive cable (+) first. Have battery charged or replaced. Try to start by towing vehicle (ignition on, clutch out, 2nd gear engaged. Let clutch in slowly at about 20 mph). Vehicles with automatic transmission cannot be tow started.

Condition	Possible cause	What to do
	<p>3 — Starter switch, cables or starter defective</p>	<p>3 — Manual transmission: Push or tow vehicle (see point A 1 and 2) to start engine and see VW Dealer.</p> <p>Automatic transmission: See VW Dealer</p>
<p>B — Engine will not start even though starter is turning it over quickly Read instructions in section on "Starting engine" to ensure that correct procedure is being used. Check that there is fuel in the tank. Do not operate starter longer than 5 seconds at a time. Then switch ignition off and wait about 10 seconds before trying again. If engine does not start after 4 or 5 attempts, locate trouble with aid of table.</p>	<p>1 — Defect in Ignition system</p> <p>2 — Plugs wet or dirty</p> <p>3 — No current at coil</p>	<p>1 — Check ignition. Wipe wet cables dry. Pull connector off a plug, and screw connector off cable. Grip cable with piece of dry cloth and hold end about 8 mm from a metal part. Have someone turn engine over (gearshift lever in neutral). A strong spark should jump from end of cable to metal part.</p> <p>2 — If a spark appears, take plugs out. Dry plugs out, clean electrodes with a chip of wood and check gaps. Install new plugs if necessary. If engine still does not start, look for defect in fuel system.</p> <p>3 — If there is no spark when checking as at point 1, pull the thin black cable (terminal 15) off the tab on the</p>

Condition

Possible cause

What to do

4 — Coil defective, breaker contacts in distributor faulty

coil, switch ignition on and touch cable end briefly to a bare metal part. There should be a spark. If there is no spark, there is a break in the circuit. See VW Dealer.

4 — Manual transmission: If there is a spark, switch ignition off and engage 4th gear. Take off distributor cap and rotor. Push vehicle until points are fully open. The breaker gap should be 0.4 mm (.016 in.). Push vehicle again until points are closed. Push a piece of thick paper to and fro between the points. Switch ignition on again and open and close points several times with a non-metallic object. A strong spark should appear between the points. If there is no spark, see your VW Dealer.

Automatic transmission: Switch ignition off, take distributor cap and rotor off, clean points with piece of thick paper. Have someone turn engine over with starter. Every time the points open there should be a strong spark.

Condition	Possible cause	What to do
	<p>5 — Distributor cap and rotor damp or damaged</p> <p>6 — Defect in fuel system: Mixture too rich due to incorrect starting procedure</p> <p>7 — Fuel pump fuse blown.</p>	<p>5 — If engine does not start even though there is a spark at the breaker points, wipe cap and rotor with a clean cloth and check for damage, cracks and burning. The carbon brush in the cap must spring up again when pressed in and must not be broken.</p> <p>6 — Switch electric fuel pump off by taking the fuse out (see list of fuses). Start engine with full throttle and let it run until it stops of own accord. Install fuse again and start in normal way.</p> <p>7 — Install new fuse. If new fuse blows again, see VW Dealer.</p>

Proper lubrication

Use only good brands of gasoline engine HD oil for the engine of your Volkswagen.

HD (Heavy Duty) is the internationally used designation for engine oils with certain characteristics. In some countries, however, the suitability of engine oils for certain operating conditions is classified according to the API system (American Petroleum Institute). With this system, HD oils suitable for the Volkswagen engines are designated "MS" or "SD".

The viscosity of the oil is usually shown by the SAE grades (Society of Automotive Engineers).

The viscosity must be matched to the temperature involved and is thus dependent on the climate and on seasonal outside temperatures.

The following table is valid for Volkswagen engines only.

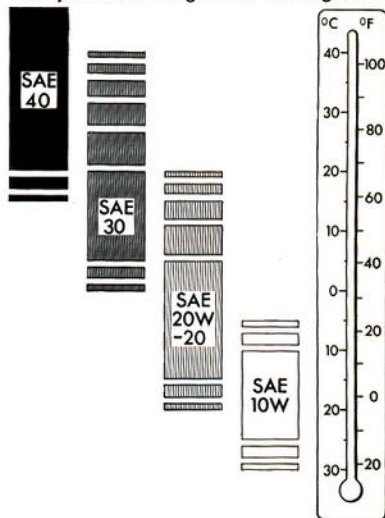
It can be seen that the Volkswagen engine normally requires only two different viscosity grades which are selected as follows:

Tropical areas	in hot season		SEA 40
	in cool season		SAE 30
Areas with a temperature climate	in summer		SAE 30
	in winter	where temperature is not normally below -15°C (5°F)	SAE 20 W-20
		where temperature is normally down to -25°C (-13°F)	SAE 10 W *)

When the temperature is continually below -25°C (-13°F) (arctic areas) it is advisable to use SAE 5 W*).

*) Do not drive at high speeds for long periods when using SAE 10 W oil if the outside temperature is above -10°C (14°F) or if using SAE 5 W when the temperature is above -20°C (-4°F).

Temperature ranges for SAE grades



As the operating ranges of neighbouring SAE grades overlap, as shown by shaded parts of sketch above **brief** variations in temperature can be disregarded. For the same reason it is also quite in order to mix oils of different viscosities when oil has to be added and the viscosity of the oil in the engine is no longer correct for the actual temperature.

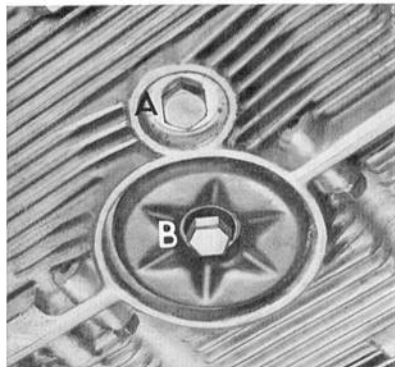
Engine oil changes

The engine oil should be changed at 1000 km (600 miles), 5000 km (3000 miles) and then every 5000 km. The full flow oil filter should be replaced at 1000 km, 10 000 km (6000 miles) and then every 10 000 km.

The oil change quantities are:

with filter change	3.5 liters (6.125 pints)
without filter change	3.0 liters (5.25 pints)

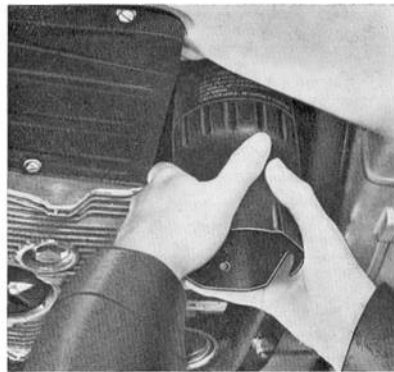
Engine oil changes at the specified intervals are necessary even if the very best brand of HD oil is used because dirty oil in the engine means increased wear and reduces service life.



The old oil is drained, when warm, by removing the drain plug -A-. The engine does not need to be flushed but the strainer should be taken out by removing the center nut -B- and cleaned at every oil change. New gaskets and washers should be fitted every time.

The center nut for the oil strainer should be tightened with a torque wrench. The correct torque is 1.0–1.3 mkg (7–9 lb. ft.).

A special wrench is required to screw the oil filter off and on.



Due to the detergent properties of the HD oil, the fresh oil will look very dark after the engine has been running for a short time only. This need not worry you and under normal operating conditions there is no reason whatever to change the oil at shorter intervals than every 5000 km (3000 miles).

We only recommend more frequent oil changes—every 2500 km (1500 miles)—in the winter if you drive mainly short distances and in city traffic. If you only drive a few hundred miles a month under these conditions it is advisable to have the oil changed every 6 to 8 weeks.

In areas with arctic climates where the average temperature is about -25°C , the oil should be changed every 1250 km (750 miles)

Lubricant additives

No additives of any kind should be mixed with the fuel or the lubricating oils.

Transmission oil

Transmission and final drive are combined in one housing and lubricated with the same SAE 90 hypoid oil (to MIL-L 2105-B specifications — additive basis: Sulphur-Phosphor).

The thinner SAE 80 hypoid oil (to MIL-L 2105-B specifications — additive basis: Sulphur-Phosphor) should only be used in areas with arctic climates.

Manual transmission oil changes

Your VW workshop will change the transmission oil at 1000 km (600 miles) only. Just in case you have to carry out an oil change because of a considerable and constant change in temperature we have included the following instructions:

Then put in 2 liters (3.5 pints) of good quality hypoid oil (to MIL-L 2105-B specifications — additive basis: Sulphur-Phosphor).

The oil level should be up to the bottom of the oil filler hole — B —.

The oil sometimes runs into the transmission housing very slowly.

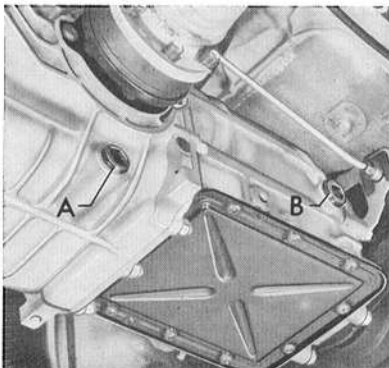
If one attempts to put the oil in too quickly it may overflow and give the impression that the housing is already full although actually only about 1.0–1.5 liters (2–3 pints) have been put in.

It is essential to the service life and silent running of the rear axle that the correct amount of oil is used in the transmission.

ATF (Automatic transmission fluid)

The torque converter and the transmission are both operated with and lubricated by the same automatic transmission fluid.

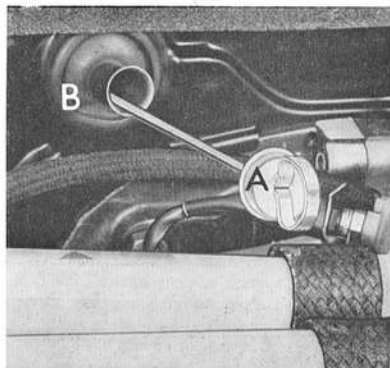
ATF is a special oil for automatic transmissions and can generally be used all the year.



All ATF fluids which carry the Dexron test mark, for example, Dexron® No. B 10100 can be used for VW vehicles with automatic transmissions.

Suitable products are supplied by all well-known mineral oil firms.

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



As the transmission can only work properly if the amount of fluid in it is correct, the fluid level must be checked very carefully. Wipe the dipstick with a lint-free cloth before checking the level which should be between the two marks on the dipstick and not above or below in any circumstances. Before inserting the dipstick, always ensure that the ring-shaped handle of the dipstick is vertical as otherwise trouble will be experienced with the transmission. If too much fluid is put in, it must be drained off.

Please note that the difference between the lower and upper marks is only 0.4 liter (.7 pint).

To put the fluid in, use a clean funnel with a plastic extension hose about 50 cm (20 in.) long.

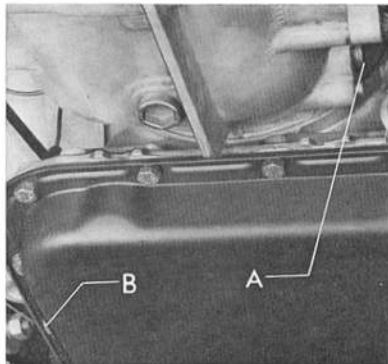
Every 50 000 km (30 000 miles) the ATF must be changed. If the vehicle is operating under arduous conditions (trailer towing, stop and go operation and city traffic, continuous mountain driving, extremely high temperatures) it is advisable to change the ATF every 30 000 km (18 000 miles).

After taking out the drain plug — B — and draining the fluid, the oil pan and strainer must be removed and cleaned.

Although the system holds 6.0 liters of ATF (10.5 pints), the quantity for changes is only 3 to 4 liters (5.25—7.0 pints). The remainder stays in the torque converter and oil passages.

Use a new gasket when installing the oil pan. A torque wrench is required when tightening the oil pan screws and the torque is 1 mkg (7 lb. ft.).

The new gasket settles after being installed so it is necessary to tighten the screws again two or three times at intervals of about 5 minutes, using the same torque.



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

Put 2.5 liters (4.4 pints) of ATF in first (use only factory approved ATF). Then start the engine and with vehicle stationary, move selector lever to all positions in turn to fill the system, then check the level on the dipstick with selector lever at — N —.

The ATF should be up to the tip of the dipstick at this stage, otherwise fluid should be added. Take vehicle on a short run to warm up the transmission and then add ATF to correct the level. (see "Every 10 000 km").

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

The transmission oil in the final drive is not changed.

Air cleaner

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

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

Remove and clean air cleaner

Pull crankcase breather hose off air cleaner—loosen clip and pull hose between air cleaner and intake air distributor off upper part of cleaner—loosen clip on hose (connecting cleaner lower part and air duct) with Phillips screwdriver. Also loosen clip on intake air preheating and pull hose off. Pull both hoses for load- and temperature-sensitive intake air preheating off the connections on the upper part of air cleaner. Loosen wing screw in cleaner and pull out — lift air cleaner out in horizontal position.



Loosen two clips and take top part of cleaner off.

The top part must not be laid down with the filter element upwards.

Clean lower part of cleaner carefully.

Fill it to mark with fresh engine oil (approx. 0.45 liter [.8 pints]).

SAE 30 oil should be used normally all the year.

Use SAE 10 only in countries with an arctic climate.

The top part does not need cleaning normally, but 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 air cleaner, ensure that the "4 L" mark on the upper part and the arrow on the lower part are aligned.

Before tightening the wing screw ensure that the hoses are located correctly.

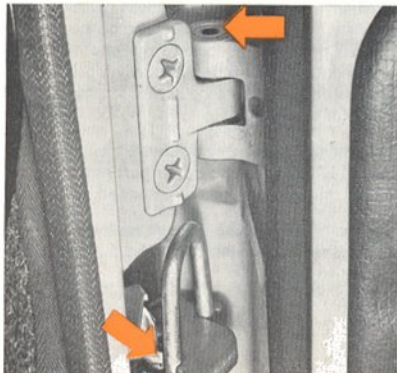
Hinges, check straps, locks

At the top of the 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 out.

Fill with SAE 30 engine oil as necessary and press plug in again.

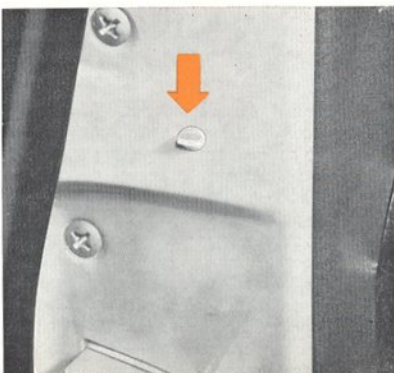
The bearings of the two rollers for the door check straps (front doors only on 4 door Sedan) should also be lubricated with SAE 30 engine oil.

Catch oil drops with a cloth and wipe hinges carefully.



The **door lock** should be given a few drops of oil through a hole in the end of the door which is normally sealed with a plug.

The **hood locks** should be greased lightly if stiff in operation.



The **lock cylinders** are treated with graphite powder. The key can be dipped into the graphite and then turned to and fro in the lock a few times.

The friction surfaces of the **latches and striker plates** should be greased lightly when necessary.

VW 411 E Variant

This vehicle is basically the same in its design as the standard VW 411 E Sedan.

Details relating to the operation and care of the Variant are given on the following pages.

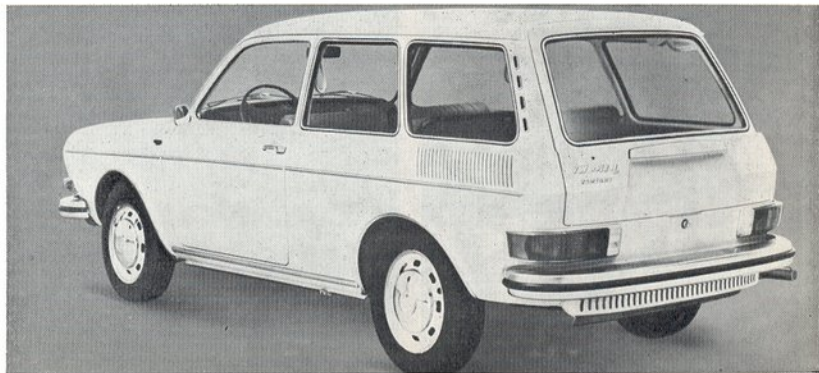
Rear flap

The symmetrically shaped key for the front doors and the starter/ignition switch is also used for the lock of the rear flap.

To lock and unlock rear flap — turn the key one quarter turn to left or right.

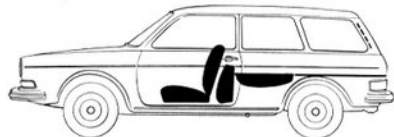
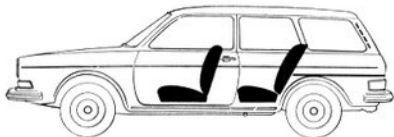
To open flap — press button, lock disengages, grasp flap in recess and lift it up until it is held in the fully open position by torsion springs. Do not let the flap fly up on its own as this may strain the hinges.

To close flap — swing it down firmly so that the lock engages. Ensure that the flap engages the second catch properly.



The front and rear seat backrests are locked to prevent them from tilting forward when the brakes are applied hard.

The load surface can be increased to 2.2 m² (24 sq. ft.) by tipping the rear seat cushion and backrest forward.



Increasing load surface

Tip rear seat forward—raise seat to vertical position.



To fold rear backrest-down—pull release handle on the rear of the backrest upward to disengage the catch. Pull backrest forward and fold it down.

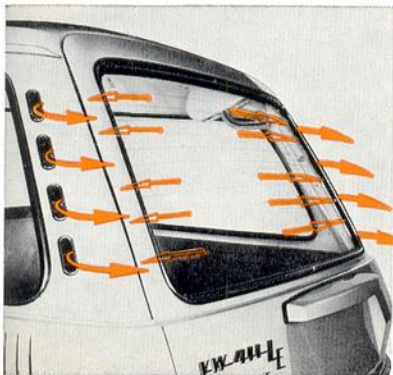


Body ventilation

The fresh air ventilation of the Variant is the same as on the Sedan.

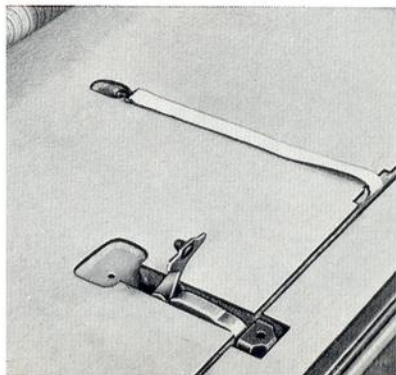
The outside slots at the rear vehicle are connected to inside openings in the rear roof pillars. The air passing out of the body flows over the rear window and helps to keep it clear.

The Variant can also be fitted with an electrically heated rear window as an optional extra.



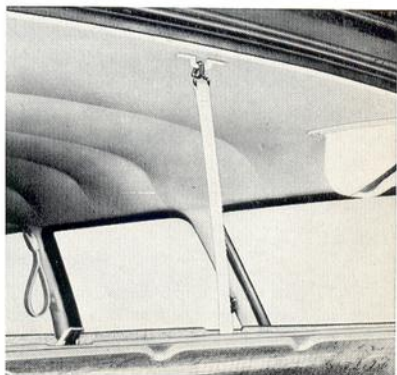
Engine compartment lid

The engine compartment lid forms part of the rear load surface and is covered with a mat.



To open engine compartment lid — open rear flap — roll mat forward — release catches — raise lid and insert hook of lid strap into eye below the edge of the roof.

After closing lid, insert the hook of the strap in the recess provided in the lid insulation.



Engine oil level

To check oil level—unscrew oil filler cap with attached dipstick and wipe the dipstick with a clean cloth. Insert dipstick again and screw on filler cap lightly.

Unscrew filler cap, take out dipstick and check oil level.

Difference in the amount of oil between lower and upper marks: 1 liter (1.75 pints).

Screw on filler cap and tighten it.

To top up engine oil—unscrew filler cap, put oil in, check oil level with dipstick. The oil level should not be above the upper mark. Screw on filler cap and tighten it. Please note instructions given on page 46.

Air cleaner

To remove air cleaner

Pull crankcase ventilation hose off air cleaner—pull hose connecting upper of air cleaner. Pull hose for intake air preheating off. Pull both hoses for load- and temperature-sensitive intake air preheating off connections in top part of air cleaner.

and intake air distributor off air cleaner. Remove wing bolt from air cleaner—lift air cleaner out in horizontal position.

To clean and install air cleaner

Release both clips and take upper part off lower part.



Clean lower part and fill it with fresh engine oil.

Insert upper part into lower part of air cleaner—ensure that the mark "4 V" on the upper part and the arrow on the lower part are aligned—tighten both clips.

When installing air cleaner make sure that the bellows between the lower part and the air duct, and the hoses are properly connected.

Please note the details on care and maintenance of air cleaner on page 89.



Replacing license plate light bulbs

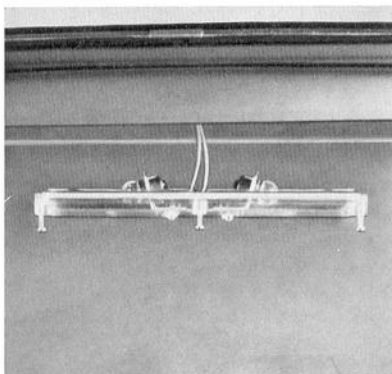
Loosen three screws and remove glass insert.

Press bulb lightly into bulb holder, turn and take out.

Insert new bulb.

Do not tighten screws excessively.

The license plate is properly illuminated only if both G 12 V/5 W bulbs are intact.



Aiming headlights

The adjustment of the headlights is basically the same as on the Sedan. See page 70.

The headlight adjustment of the Variant differs, however, in the following points:

When adjusting the headlights in front of a wall the **driver's seat** must be loaded with one person or 70 kg (154 lbs.).

The distance between line A-B and H-H is 10 cm (3.9 in.) at a distance of 5 m/16.5 ft.

The pneumatic windshield washer

The spare wheel should be pumped up to 4 kg/cm² (56 psi). As on the Sedan, the air pressure is routed to the water container with a connecting hose.

The valve in the hose stops the flow of air to the container automatically when the pressure in the spare has dropped to about 2.8 kg/cm² (40 psi).

This ensures that there is always sufficient pressure in the spare wheel if it has to be used.

(See instructions on pages 44 und 65.)

Tires

Tubeless radial ply tires with the following designation 165 SR 15 on safety rims, 4½ J x 15 (with hump).

The inflation pressures

should never be lower than:

	front	rear
with half payload	1.3 kg/cm ² (18 psi)	2.1 kg/cm ² (30 psi)
with full payload	1.3 kg/cm ² (18 psi)	2.5 kg/cm ² (35 psi)

Winter tires

designations:

- 165 R 15 M + S or
- 165 R 15 M + SE (with studs)

Inflation pressures

front	rear
1.5 kg cm ² (21 psi)	2.7 kg cm ² (38 psi)

Snow chains

Thin chains which do not stand clear of the tire tread and inner wall more than 15 mm, including tensioner, can be used on the rear wheels only.

Identification plate, chassis and engine numbers

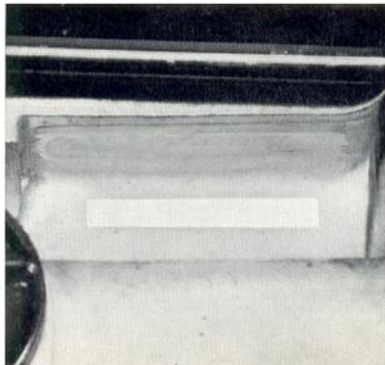
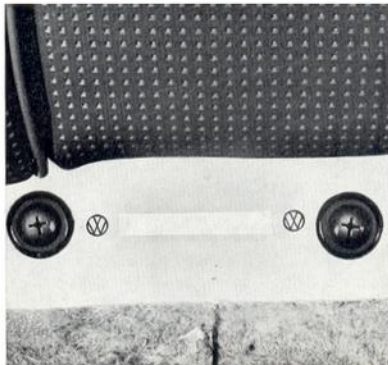
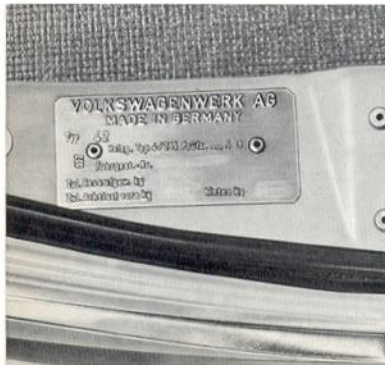
The data in the vehicle documents is liable to be checked by vehicle licensing authorities and sometimes by customs officials when crossing borders, to see whether it corresponds with the numbers on the vehicle.

The chassis and engine numbers in particular are often compared with the actual numbers. It is, therefore, handy to know where these numbers are to be found.

The **identification plate** is under the front hood near the lock.

The **chassis number** is under the rear seat between the inner anchor points for the safety belts.

The **engine number** is on the top of the right hand half of crankcase below the breather.

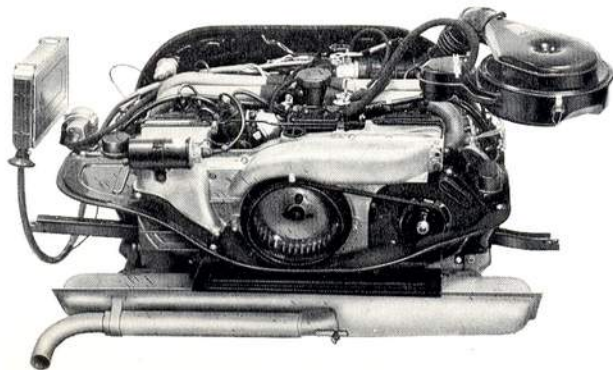


Technical data

Engine

Four cylinder, four stroke, horizontally opposed engine attached to transmission and hypoid final drive to form a single unit at rear.—Thermostat controlled air cooling by fan on crankshaft—Pressure feed oil system with gear-type pump, cooler, full flow filter and strainer.—Electrical fuel pump—Oil bath air cleaner—Electronically controlled fuel injection.

Bore	90 mm (3.543 in.)
Stroke	66 mm (2.598 in.)
Capacity, effective	1679 cc
Compression ratio	8.2 : 1



Maximum output DIN	80 bhp at 4900 rpm
SAE	85 bhp at 5000 rpm
Maximum torque DIN	13.6 mkg (98.4 lb. ft.) at 2700 rpm
SAE	13.75 mkg (99.4 lb. ft.) at 3500 rpm

Mean piston speed
at maximum output speed

10.8 m/sec (2124 ft/min)

Fuel consumption*)	
with manual transmission	10.4 liters per 100 km 27.2 miles per gallon.
with automatic transmission.....	10.5 liters per 100 km 26.9 miles per gallon

Fuel rating	98 octane (RES. F 1)
Oil consumption	0.5—1.0 liters per 1000 km 1.4—2.8 pints per 1000 miles

Valve clearance with engine cold
Intake and exhaust

0.15 mm (.006 in.)

Distributor	centrifugal and vacuum spark advance
Firing order	1—4—3—2
Ignition timing	27° before TDC at 3500 rpm**)
Dwell angle	47 ± 3°
Spark plugs	Beru 175/14/3, Bosch W 175 T 2
Plug gap	0.7 mm (.028 in.)

*) measured consumption plus 10 % with half load at a steady 110 kph on level road without wind.

**) red mark on fan.
Set only with stroboscope lamp and vacuum hoses off.
Black mark on fan at 5° before TDC is only for provisional setting.
Must be accurately set to 27° before TDC afterwards.

Rear axle—Independent suspension with trailing wishbones—Rear wheel drive via drive shafts with two homokinetic sliding joints each—Progressive acting coil springs—Telescopic shock absorbers—Stabilizer (Sedan).

Manual transmission—Hydraulic operated single-disc dry clutch—Four-speed gearbox and bevel gear differential in one housing, forward gears baulk synchronized and silent running.

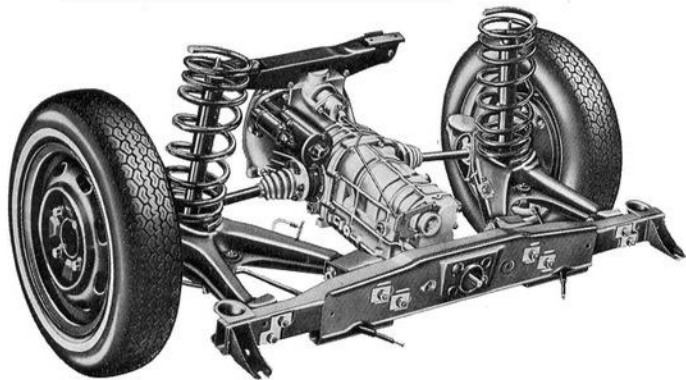
Gear ratios: 1st gear 3.81 : 1, 2nd gear 2.11 : 1, 3rd gear 1.40 : 1, 4th gear 1.00 : 1, reverse 4.30 : 1.

Final drive ratio: 3.91 : 1.

Automatic—Automatic transmission and final drive combined—Separate oil supply for transmission and final drive—Hydrodynamic torque converter and planetary gearbox with three forward speeds and reverse.

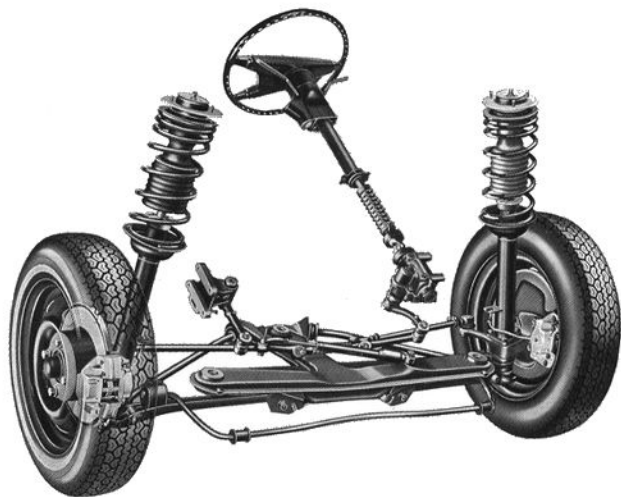
Planetary gear ratios: 1st gear 2.65 : 1, 2nd gear 1.59 : 1, 3rd gear 1.0 : 1, reverse 1.8 : 1.

Final drive ratio: 3.91 : 1.



Front axle—Independent suspension with suspension struts which house shock absorbers and locate springs, attached to axle carrier by track control arms and radius rods.—Progressive acting coil springs—Telescopic shock absorbers—Stabilizer.

Steering—Recirculation ball steering gear with three-part maintenance free tie-rod—Hydraulic steering damper—Safety steering column.



Chassis

Wheelbase	2500 mm (98.4 in.)
Track, front	1376 mm (54.7 in.)
Toe-in, unladen	1—3 mm, wheels not pressed,
Camber, unladen	1° 10' + 25' — 30'
Track, rear	1350 mm (53.1 in.)
Rear wheel toe-in, unladen	+ 5' ± 5' per wheel
Rear wheel camber, unladen	— 1° ± 30'
Turning circle	Sedan: 11.4 m (37.4 ft.) Variant: 11.8 m (38.6 ft.)
Wheels	perforated disc wheels with drop center rims
Rim size	4½ J x 15 (Safety type with hump)
Tires	Tubeless radial ply
Tire size	front rear
	Sedan: 155 SR 15 155 SR 15
	Variant: 165 SR 15 165 SR 15
Tire pressures	Sedan: page 47 Variant: page 95

Brakes Footbrakes: Hydraulic dual circuit brake system. Brake servo as optional extra — Self-adjusting disc brakes with fixed calipers at front — Drums at rear with floating brake shoes, with adjusting screws. — Brake force limiting valve in rear circuit (Sedan) — Handbrake acting mechanically on rear wheels — Handbrake cable securing and adjusting screws, with automatic equalizing.

Electrical system

Voltage	12 volts
Battery	45 Ah
Automatic transmission	0.8 hp
Starter: Manual transmission	0.7 hp
AC generator with regulator	max. 55 ampere

Body

All steel unitary body/chassis—Fenders bolted on—Passenger compartment designed as safety cell—Front and rear ends designed to absorb impact energy.

Dimensions and weights

	VW 411 E Sedan/Variant	VW 411 LE Sedan/Variant	
Length	4525 mm (178.2 in.)	4553 mm (179.1 in.)	
Width	1635 mm (64.4 in.)	1650 mm (64.9 in.)	
Height, unladen	1485 mm (58.5 in.)	1485 mm (58.5 in.)	
Ground clearance	135 mm (5.3 in.)	135 mm (5.3 in.)	
	Two-door Sedan	Four-door Sedan	Variant
Unladen weight	1080 kg (2380 lbs.)	1100 kg (2425 lbs.)	1120 kg (2468 lbs.)
Permissible load	450 kg (992 lbs.)	430 kg (948 lbs.)	545 kg (1200 lbs.)
Permissible total weight	1530 kg (3372 lbs.)	1530 kg (3372 lbs.)	1665 kg (3670 lbs.)
Permissible front axle load	680 kg (1499 lbs.)	680 kg (1499 lbs.)	680 kg (1499 lbs.)
Permissible rear axle load	870 kg (1918 lbs.)	870 kg (1918 lbs.)	1010 kg (2226 lbs.)

Roof load and trailer weights¹⁾

Roof load ²⁾	75 kg (165 lbs.)
Trailer with brakes	900 kg (1984 lbs.)
Trailer without brakes	500 kg (1102 lbs.)

¹⁾ Subject to local regulations which may differ.

²⁾ Use only racks supported in rain channel.

The roof racks in the Genuine VW Accessories program fulfil this condition.
Distribute load evenly.

Capacities

Fuel tank	50 liters (11 gallons) 6 liters (1.5 gallons) as reserve
Engine oil—initial amount	3.5 liters (6.125 pints)
Engine oil—change amount	3.5 liters (6.125 pints) with filter change 3.0 liters (5.25 pints) without filter change
Oil bath air cleaner	0.45 liter (.8 pint) engine oil
Manual transmission and final drive	
initial amount	2.5 liters (4.375 pints) hypoid oil *)
oil change	2.0 liters (3.5 pints) hypoid oil *)

Automatic transmission, converter and transmission

initial amount	approx. 6 liters ATF (10.5 pints)	} to factory specifications
oil change	approx. 3 liters ATF (5.25 pints)	

*) to MIL-L 2105-B specifications (Additive basis — Sulphur-phosphor)

Automatic transmission, final drive	approx. 1 liter hypoid oil *) (1.75 pints)
Windshield washer container ..	approx. 1.5 liters of water (2.5 pints)

Performance

	Sedan	Variant
Manual transmission:		
Maximum and cruising speed	155 km/h (96 mph)	
Acceleration time from 0—100 km/h (0—62 mph)	15 seconds	
Hill climbing ability on good roads	with two occupants	with half load
1st gear	47.0 %	41.5 %
2nd gear	24.5 %	21.5 %
3rd gear	15.0 %	13.0 %
4th gear	9.0 %	7.5 %
Automatic transmission:		
Maximum and cruising speed	152 km/h (94 mph)	
Acceleration time from 0—100 km/h (0—62 mph)	16.5 seconds	
Hill climbing ability on good roads	with two occupants	with half load
Forward range	44 %	36 %
Reverse	28 %	24 %

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Vehicle data quiz

- What sort of fuel does your vehicle require? → Super (Premium) minimum Octane rating 98
- What sort of engine oil? → **HD oil for gasoline engines ***
SAE grade (viscosity) according to time of year.
Further details on page 85
- *) In some countries HD oil is known as "MS" or "SD" oil
- What is the difference in quantity between the minimum and maximum marks on the dipstick? → **1.0 liter**
At 1000, 5000 and then every **5000 km** (600, 3000 and every 3000 miles)
The element in the full flow filter is replaced at 1000, 10000 and then every 10000 km. The amount of oil required is 3.5 liters with filter change and 3.0 liters without
- How often should the engine oil be changed? → **SAE 90** Hypoid oil to MIL-L 2105 B specifications (additive basis: Sulphur-phosphor) or **SAE 80** in areas where average temperature is low
- What sort of oil is used in gearbox and final drive → Only at 1000 km (600 miles)
- When is the gearbox and final drive oil changed? → The level should be up to the upper ridge round the reservoir.
- How much brake fluid should there be in the reservoir? → Yes — but only for the screenwasher. It will work satisfactorily when it is freezing if sufficient anti-freeze is put in the water.
- Do you require anti-freeze for your vehicle in the winter? → Container capacity: approx.: 1.5 liters
- Which spark plugs should be used? → Bosch W 175 T2 or Beru 175/14/3 **). Fit new plugs every 20000 km
- Are the wheel bolts tightened properly? → The torque should be 15 mkg
**) Or plugs with similar values from other manufacturers according to makers specifications.

What are the correct tire pressures?

	Sedan	
	front	rear
With 1-2 occupants	1.4 kg/cm ²	1.8 kg/cm ²
Fully loaded	1.6 kg/cm ²	2.2 kg/cm ²

	Variant			
Half load	1.3 kg/cm ²	(18 psi)	2.1 kg/cm ²	(30 psi)
Full load	1.3 kg/cm ²	(18 psi)	2.5 kg/cm ²	(35 psi)

M + S and M + S Studded tires: 0.2 kg/cm² more in each case.

These pressures are for **cold** tires. The pressures must not be reduced if tires are checked when hot and pressure is higher than specified.

Where are the fuses to be found?

Under transparent cover on left under instrument panel. See page 78 for additional fuses.

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