

# **VANAGON**



**1982 Volkswagen Owner's Manual**

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\* Diesel-Information



### **NOTE TO OWNERS**

In Canada, this manual is also available in French. To obtain a copy, contact your dealer or write to:

Volkswagen Canada Inc.  
Customer Assistance / Assistance à la Clientèle  
1940 Eglinton Ave. East  
Scarborough, Ontario M1L 2M2

### **NOTE AUX PROPRIETAIRES**

Au Canada on peut se procurer un exemplaire de ce Manuel en français auprès du concessionnaire ou de:

- Your car may have all or some of the equipment described in this manual. Therefore you may find explanations of equipment not installed in your car.
- Check with your authorized Volkswagen dealer on available options or accessories.
- Text, illustrations and specifications in this manual are based on information available and validated at the time of printing.
- It has always been Volkswagen's policy to continuously improve its products. Volkswagen, therefore, reserves the right to make changes in design and specifications, and to make additions or improvements in its product, without incurring any obligation to install them on products previously manufactured.



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# BEFORE DRIVING

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## Your new Volkswagen

is the result of many years of technical research and endurance testing. It is a sophisticated product of engineering, a car designed for maximum efficiency and driving pleasure, a car designed with your safety in mind.

## Your Owner's Manual

contains a host of useful information. Read it before you drive your new car. Acquaint yourself with your car's features and know how to operate it more safely. The more you know about your Volkswagen, the more you will enjoy driving it.

FOR YOUR OWN PROTECTION and longer service life of your car, we ask you to heed our instructions and cautions. Ignoring them could result in extensive mechanical failure or physical injury.

## Your Warranty and Maintenance booklet

explains how you can keep your Volkswagen in top driving condition by having it serviced regularly. Always have the warranty & Maintenance booklet with you when you take your car to an authorized dealer for service. Your Service Adviser will record each service.

The **Warranty & Maintenance** booklet also contains detailed information about the warranties covering your VW. These warranties are: "**Warranty for new Volkswagen vehicles**", "**Warranty for new Volkswagen vehicle Emission Control System**", "**Emissions Performance Warranty**" and "**California Emission Control System Warranty**" (California, USA only).

The **Owner's Manual** and the **Warranty & Maintenance** record should be left in the vehicle when sold, to make all operating, safety and maintenance service information available to the next owner. If you bought this car a **used car**, be sure to send in a NOTICE OF USED CAR PURCHASE post card. This card can be found in the **Warranty & Maintenance** booklet or obtained from your VW dealer.



## Operating your car outside the U.S.A. or Canada

Government regulations in the United States and Canada require that automobiles meet specific emission regulations and safety standards. Therefore cars built for the U.S. and Canada differ from vehicles sold in other countries.

If you plan to take your car outside the continental limits of the United States or Canada, there is the possibility that

- **unleaded fuels for cars with catalytic converter may not be available**
- **fuel may have a considerably lower octane rating. Improper fuel may cause engine damage;**
- **service may be inadequate due to lack of proper service facilities, tools or testing equipment;**
- **replacement parts may not be readily available.**

**Volkswagen cannot be responsible for the mechanical damage that could result because of inadequate fuel, service or parts availability.**

Certain Volkswagen models are available for delivery in Europe under our tourist delivery and return shipment program.

For details consult an authorized dealer or write to:

### U.S.A.

Volkswagen of America, Inc.  
Tourist Delivery  
818 Sylvan Avenue  
Englewood Cliffs, N.J. 07632

### Canada

Volkswagen Canada Inc.  
Tourist Delivery  
1940 Eglinton Avenue East  
Scarborough, Ontario M1L 2M2

If you bought your car abroad and want to bring it back home, be sure to find out about current import and customs regulations first.



## Speed ranges

See page 88 for **Diesel Engine**

You can drive your Volkswagen at full speed from the first day. There is no break-in schedule.

There are, however, certain speed ranges for the various gears:

**The maximum speeds as shown in the tables are for normal operating conditions after the engine has warmed up.**

### Manual Transmission

1st gear	up to 15 mph or 24 km/h
2nd gear	between 10 and 32 mph or 16 and 51 km/h
3rd gear	between 15 and 52 mph or 24 and 84 km/h
4th gear	between 30 mph and top speed or 48 km/h and top speed*

If you have a traffic situation where it is necessary to accelerate in 2nd and 3rd gear above the recommended speed ranges, you may do so for a brief period only. A governor is installed on the engine to prevent damage from excessive engine rpm (revolutions per minute).

### Automatic Transmission

Driving ranges	
D	up to top speed*
2	55 mph or 88 km/h
1	25 mph or 40 km/h

Make it a habit to accelerate gradually instead of using full throttle. During gradual acceleration the transmission shifts earlier into the next higher gear, thus saving fuel.

\* Always observe all local and national speed limits!



## OPERATE YOUR CAR SAFELY

A lot has gone into the manufacture of your Volkswagen, including advanced engineering techniques, rigid quality control and demanding inspections. These engineering and safety features will be enhanced by **you, the safe driver,**

- who knows the car and all controls
- who maintains the car properly
- who uses driving skills wisely.

### **Before going on a trip . . .**

- 1 – Be sure tires are inflated correctly. Check for damage and tire wear.
- 2 – See that wheel bolts or nuts are properly lightened and not loose or missing.

### **Turn the engine off before you attempt any checks or repairs on the car.**

- 3 – Check engine oil level, add if necessary. Make it a habit to have engine oil checked with every second fuel filling.
- 4 – Check coolant (Diesel Engine) level to assure sufficient engine cooling.
- 5 – Be sure you have a well charged battery. Each cell should be filled to correct level with distilled water.
- 6 – Check brake fluid level. If too low, have brake system checked.
- 7 – Replenish windshield washer fluid.
- 8 – Replace worn or cracked wiper blades.

- 9 – See that all windows are clear and unobstructed.

- 10 – Check whether all light lenses are clean.

- 11 – Be sure all lights are working and headlights are aimed correctly.

- 12 – Check under car for leaks.

- 13 – Be sure all luggage is stored securely.

You'll find helpful hints on how to perform most of these checks in this manual. If in doubt, have these checks performed by your dealer or any other qualified mechanic.



## In the driver's seat . . .

- 1 – Depress center of steering wheel to check whether horn is working.
- 2 – Position seat for easy reach of controls.
- 3 – Adjust inside and outside rear view mirrors.
- 4 – Use safety belts.
- 5 – Check operation of foot and parking brakes.
- 6 – Check all warning and indicator lights when starting the engine.
- 7 – DO NOT leave car idling unattended.
- 8 – Lock doors from inside, especially with children in the car.

## On the highway . . .

- 1 – Always drive defensively. Expect the unexpected.
- 2 – Use signals to indicate turn and lane changes.
- 3 – Turn on headlights at dusk.
- 4 – Always keep a safe distance from the car in front of you, depending on traffic, road and weather conditions.
- 5 – Reduce speed at night and during inclement weather.
- 6 – Observe speed limits and obey highway signs.
- 7 – **Never let car roll by its own weight with transmission in Neutral. Such coasting may lead to sudden loss of control and damage to transmission and engine, when a gear has to be engaged.**
- 8 – When tired, get off the highway, stop and take a rest. Turn the engine off. DO NOT sit in the car with engine idling. See warning on Engine Exhaust.
- 9 – When stopped or parked, always set parking brake.
- 10 – When stalled or stopped for repairs, move the car well off the road. Turn on emergency flasher and use road flares or other warning devices to alert other motorists.
- 11 – **Make it a habit to have the engine oil checked with every fuel filling.**
- 12 – Check the coolant level (Diesel engine) and the ATF (automatic transmission fluid) regularly, even between the recommended maintenance intervals.



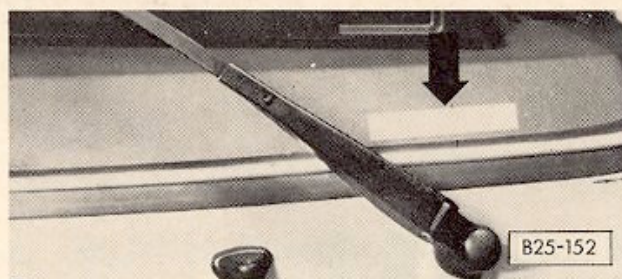
## Vehicle Identification

1	2	3	4	5	6	7	8	9	10
MFD. BY		INCOMPLETE VEHICLE MANUFACTURED		WEST GERMANY					
GVWR		GAWR		FRONT		REAR			
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND BUMPER STANDARDS IN EFFECT									
TYPE MULTIPURPOSE PASSENGER VEHICLE									
		11		12		B25-242			

### Safety Compliance Sticker

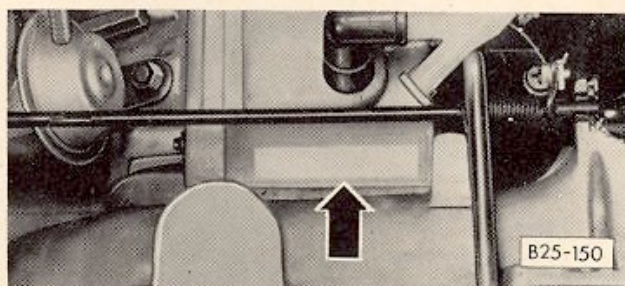
This sticker is your assurance that your new Volkswagen complies with all applicable Federal Motor Vehicle Safety Standards which were in effect at the time the vehicle was manufactured. You can find this sticker on the left doorjamb.

- 1 – National Safety Mark (Canada models only)
- 2 – Campmobile only
- 3 – Manufacturer's name
- 4 – Unit (lb/kg)
- 5 – **Gross Vehicle Weight Rating**
- 6 – Unit (lb/kg)
- 7 – **Gross Axle Weight Rating front**
- 8 – **Gross Axle Weight Rating rear**
- 9 – Date of production (complete vehicle)
- 10+11 – Date of production (incomplete vehicle, Campmobile only)
- 12 – Vehicle identification number



### The Vehicle Identification Number

is located on the instrument panel on the driver's side so that it is visible from the outside through the windshield.



### The Engine Number

See page 99 for **Diesel Engine**.

is located on the right side of the engine compartment, directly in front of the fan housing.

1	FAHRG. NR. CHASSIS NO.	
2	TYP / TYPE	
3	MOTORKB. / GETR. KB. ENG. CODE/TRANS. CODE	
4	LACKNR. / INNENAUSST. PAINT NO. / INTERIOR	
5	M - AUSST. / OPTIONS	

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### Vehicle Identification Label

is located on the left side under the dashboard. The label contains the following information:

- 1 – Vehicle Identification Number
- 2 – Vehicle Code
- 3 – Engine and Transmission Code
- 4 – Paint and Interior Code
- 5 – Option Codes

A duplicate of the label is in your Warranty and Maintenance brochure.



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# OPERATING CONTROLS

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## Key

The same key is used for the ignition/steering lock, the doors and the rear luggage compartment lid.

An additional key is provided for vehicles equipped with a lockable glove compartment.

The ignition/steering lock key number is stamped on a tag.

For your protection against car theft:

Record the key number and keep it in a safe place, such as your wallet. **NOT IN THE CAR!**

If you should lose a key, provide your authorized VW dealer with the key number to obtain a duplicate key.

### Warning

**Always remove the ignition key especially if children are left unattended in the car.**

**DO NOT remove key from steering lock while you are driving or as the car is rolling to a stop. The steering column is locked when you remove the key, and you will not be able to steer the car.**

### Do not invite car theft

by leaving your car unattended with the key in the ignition lock. Take the key with you and lock the doors.

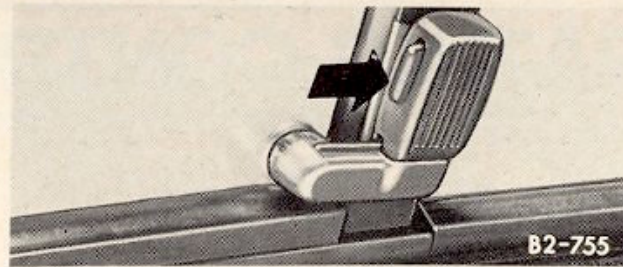
The **buzzer** will sound when you open the driver's door with the key in the ignition lock. This is your reminder to remove the key and lock the doors.



## Windows

**Do not put decals or other signs on the windows of your car that may interfere with the driver's vision.**

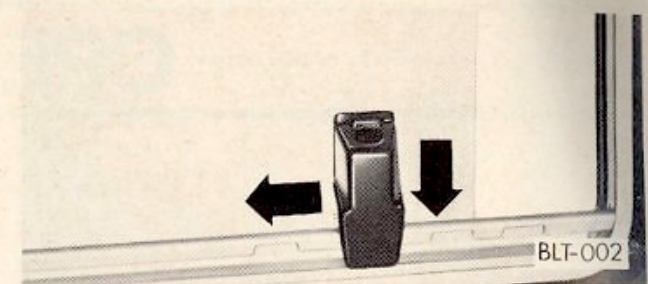
You can lower and raise the windows in the front doors by using the window winders.



### Cars with vent windows

To open – Press button in fastener and swing fastener forward.

To close – Press vent windows against seal at the front, then swing fastener to the rear.



### Cars with sliding windows

The passenger compartment is equipped with sliding windows. When closed, windows are locked. To open, press locking knob down and slide window open.



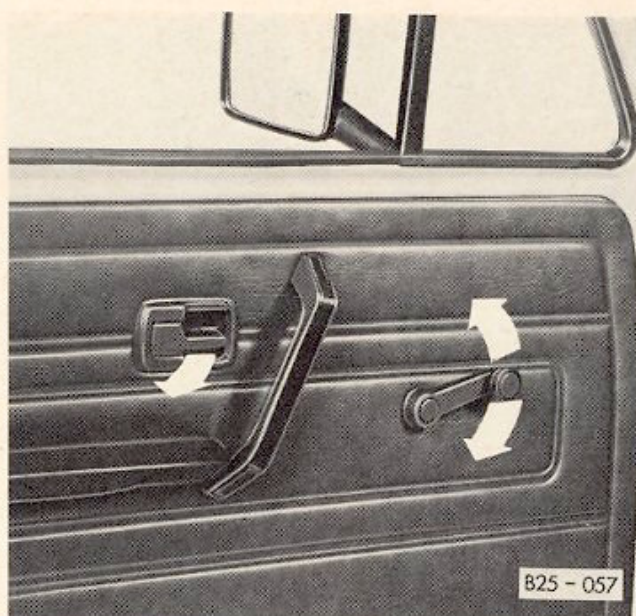


## Doors

### Front doors

#### To lock, unlock and open doors from the outside

- Lock and unlock the doors with ignition key.
- Open the doors by squeezing the trigger in the outer door handle.
- The **passenger's door** can be locked without a key. First depress the locking knob, then close the door.
- The **driver's door** can only be **locked** from the outside with the key. This precaution was taken to prevent locking the

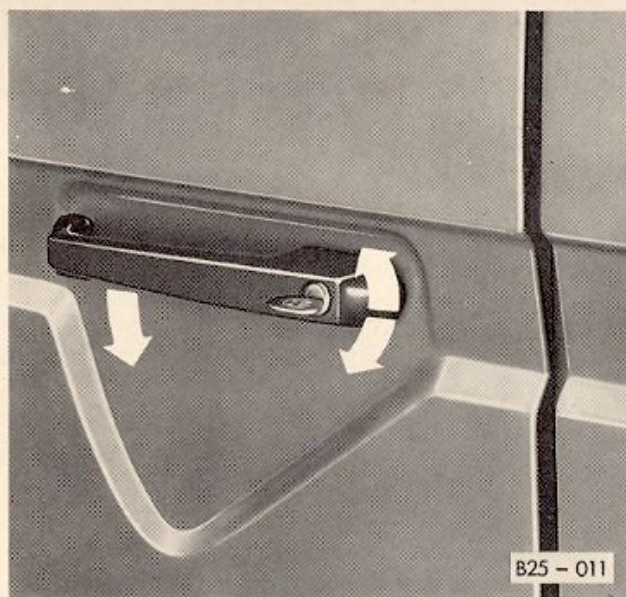


driver's door while the key is still inside the car.

#### To lock, unlock and open doors from the inside

- To **lock** doors depress the locking knob. **This will prevent opening the doors from inside and outside.**
- To prevent inadvertent opening of a door from the inside, e. g. with small children in the car, drive with locked doors.
- To **unlock** doors raise the locking knob.
- To **open** doors pull the inside door handle after raising the locking knob.





## Sliding door

Always drive with a fully latched sliding door.

### To open from the outside

Unlock the door with the key. Then press the handle down and slide the door to the rear. The door is held in the fully open position by a catch.

### To close and lock from the outside

Press the handle down to release the catch. Slide the door forward until it is closed.

You can only lock and unlock the sliding door from the outside with the key.

### To open from the inside

Move the small sliding knob up and pull the handle back.

### To close and lock from the inside

Pull the handle forward to release the catch, close the door and move the small sliding knob down.

In the VANAGON Kombi and VANAGON Delivery Van

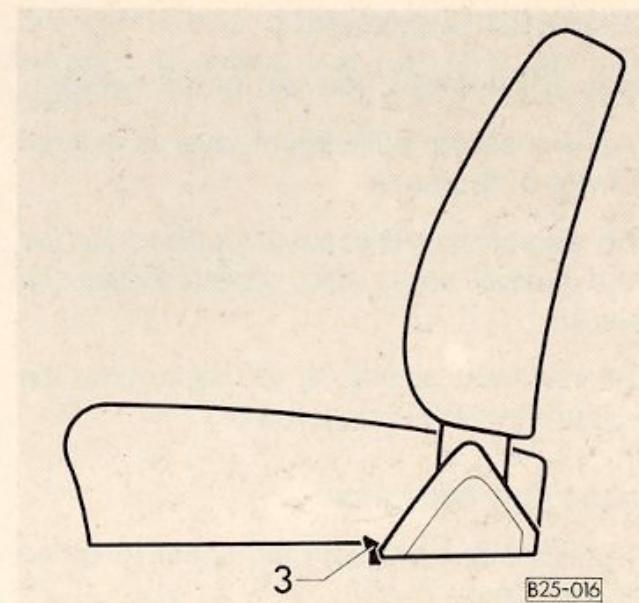
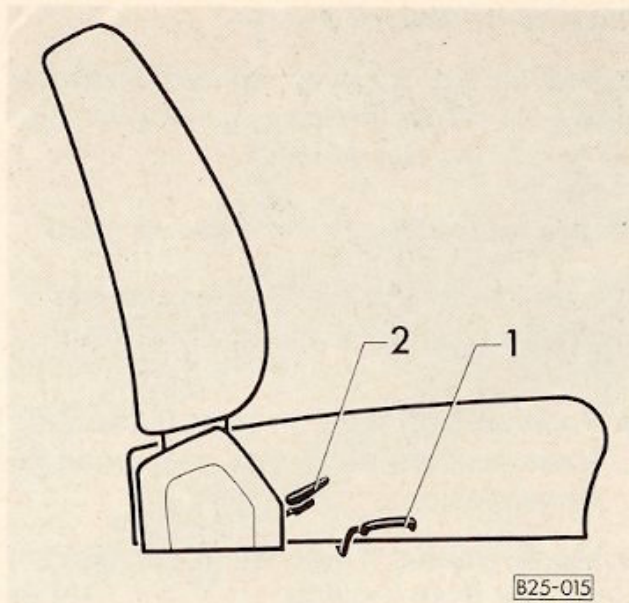
### Cargo area

Make sure the cargo compartment floor area is loaded correctly, to permit unobstructed operation of the sliding door. Do not transport people in the cargo area.



# Seats

Do not adjust the driver's seat while driving. Your seat may suddenly move forward or backward, which could result in loss of control.



## Seats in driver cab

### Cars with bucket seats

#### Seat adjustment (forward or backward)

The bucket seats can be adjusted individually.

- Pull up lower lever (1) at outboard side of seat.
- Slide seat to desired position.
- Let lever go and move seat slightly back and forth to make sure the seat is securely locked.

#### Seatback adjustment

The backrest is secured and cannot tilt forward accidentally.

- To adjust, take body weight off the backrest and push down lever (2) at hinge cover on outboard side of seat.
- Exert slight body pressure in the direction desired and let lever go to lock backrest in position.

#### Removing bucket seats

- Stand outside vehicle, pull up lever (1) and slide seat all the way forward.
- Lift stop hook (3) up against spring-loading, hold there and slide seat past stop.
- Release stop hook and slide seat forward out of guide rails.

When reinstalling seat, reverse the above procedure. The stop hook (3) need not be lifted as the seat can just be pushed past the stop.



## Cars with two-seater

### Seat adjustment (forward or backward)

The two seater adjustment lever is located in front of the seat.

The adjustment procedure outlined for the front bucket seats also applies to the two seater.

The backrest adjusts at the same time the adjustment lever is operated.

### Removing two seater

First remove bolts from the upper hinge on the backrest.

Then proceed as outlined for removal of the bucket seats.

## Cars with swivel seats

The forward or backward adjustment procedure outlined for the front bucket seats also applies to the swivel seats.

### Before turning the driver's swivel seat:

**Do not operate the locking lever of the swivel seat while the car is in motion.**

- Position shift lever in park (automatic transmission) or in first gear (manual transmission).
- block wheels if necessary to prevent vehicle from moving.
- release parking brake.

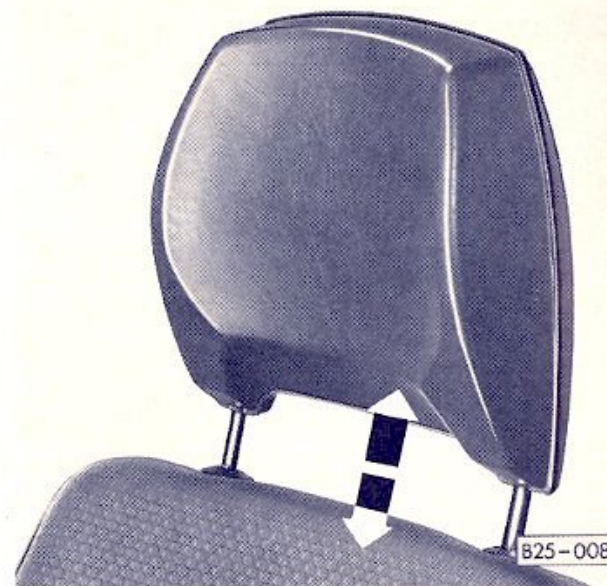
### Warning:

Swivel seats must be in forward facing position while driving.

To swivel the seat, move seat slightly forward or open the door a crack. Then push down the locking lever in front of the seat. The **passenger** seat can be turned 180° to the **left** (half circle).

The **driver's** seat can be turned 90° to the right (quarter circle).

The seats will lock automatically at every turn.



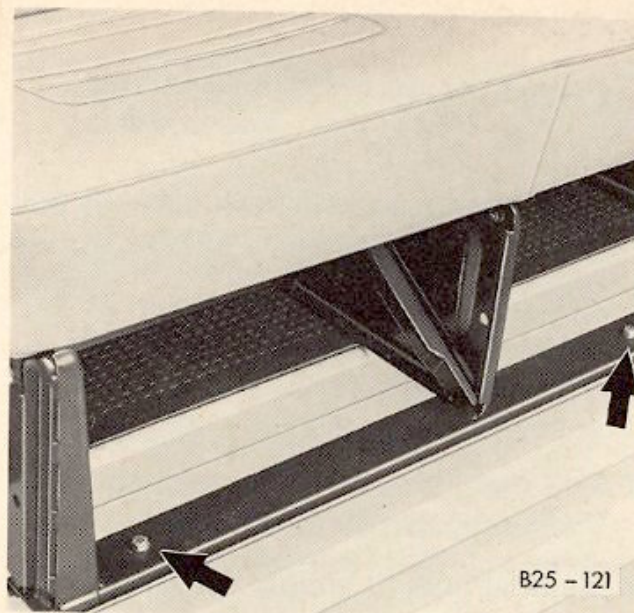
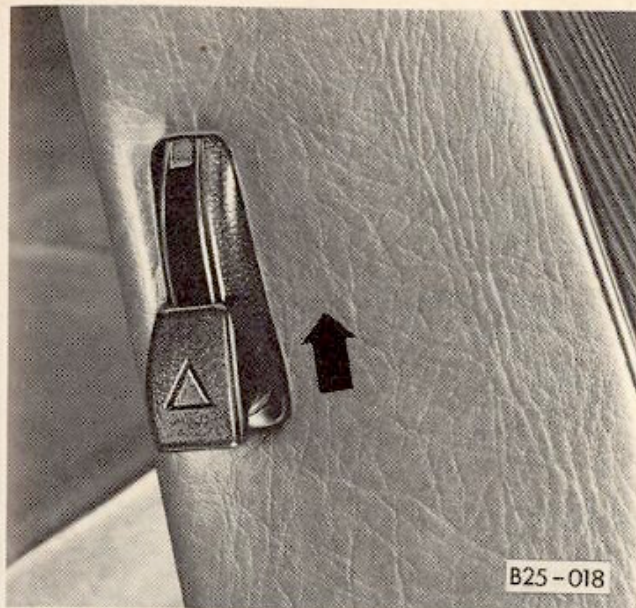
## Head restraints

Head restraints are designed to help reduce injuries. For maximum protection never drive the vehicle without head restraints.

### To adjust height . . .

- Grasp head restraint with both hands and pull up or push down.





**CAUTION:** Never drive the vehicle unless the seat benches are securely bolted down.

## Passenger compartment

In the 9-seater version (U.S. model only), the backrest of the first seat in the middle row can be tilted forward and out of the way for easy access to the rear bench. To disengage the lock of the backrest, pull up the lever on the side of the backrest.

**For your passenger's protection, the backrest lock must be engaged at all times while the car is in motion.**

### Removing center seat bench

Remove the four bolts from under front and rear of seat bench, and take bench out of attachment rails.

To install the center seat bench, reverse the above procedure.

#### Note:

Keep the attachment rails clean.

### Removing rear seat bench

The rear seat bench is secured with one bolt on each sidewall underneath the seat covering. Remove both bolts and take out the seat. **The backrest portion of the bench should not be removed.**

To install the rear seat, reverse the above procedure.



# Safety belts

## Lap/shoulder belts

### Belt warning system

An audio-visual warning system is interconnected with the driver's safety belt.

Every time the ignition is turned on, the FASTEN SEAT BELTS warning light will come on for about 6 seconds as a reminder to buckle up. If the driver does not fasten the safety belt, the buzzer will also come on for the duration of this six second period. With the driver's door closed, the buzzer will go off as soon as the driver has buckled up.

### Inertia reel retractor

The one-piece lap/shoulder belt with inertia reel locking mechanism will adjust automatically to your size and movements as long as the pull on the belt is slow.

Rapid deceleration during hard braking or a collision locks the belt. The belt will also lock when you drive up or down a steep hill or in a sharp curve.

To release a locked belt, lean back to take the body pressure off the belt.

- To **fasten**, grasp belt tongue and pull belt in continuous slow motion across your chest and lap.
- Insert belt tongue into buckle on inboard side of seat. Push down until it is securely locked with an audible click.
- Pull shoulder section to make sure belt fits snugly across the hips.
- **Belts should fit snugly across lap and chest. Make sure any slack is wound on the retractor.**
- Do not wear shoulder part of belt under your arm or otherwise out of position. This would increase the possibility of serious injury in case of an accident.
- To **unfasten** belt, push in release marked PRESS on buckle. Belt will spring out of buckle.
- To **store** lap/shoulder belt, allow belt to wind up on retractor as you guide belt tongue to its stowed position on doorpost.

## Lap belts

Seats in the passenger compartment are equipped with adjustable lap belts.

- To **fasten** the belt, pull the longer section across your lap and insert the tongue in the inboard buckle. Push in until you hear a click to indicate the belt is locked securely.
- **Belt should not be worn loose or twisted.**
- To **unfasten** the belt, push in the release marked PRESS on the buckle.
- To **lengthen** or **shorten** the lap belt, hold the belt tongue at a right angle to the belt and pull the respective belt section in the desired direction. Take up any slack of the loose belt end by moving the slide on the belt.

**The belts should always be kept on top of the seat for ready use. Do not permit them to get caught under the seat.**



## Notes

- For your and your passenger's protection, use safety belts at all times while the car is in motion.
- Do not strap in more than one person with each belt.
- Belts should not be worn twisted.
- For maximum effectiveness the lap belt should be worn low across the pelvic crests.
- Do not wear belts over rigid or breakable objects in or on your clothing, such as eye glasses, pens, keys, etc. as these may cause injury.
- Several layers of heavy clothing may interfere with proper positioning of belts.
- Belts must not rub against sharp objects.
- Keep belt buckles free of any obstruction that may prevent secure locking.
- Make sure the belt of the unoccupied passenger seat is fully wound up on its retractor so that the belt tongue is in its stowed position. This reduces the possibility of its be-

coming a striking object in case of a sudden stop.

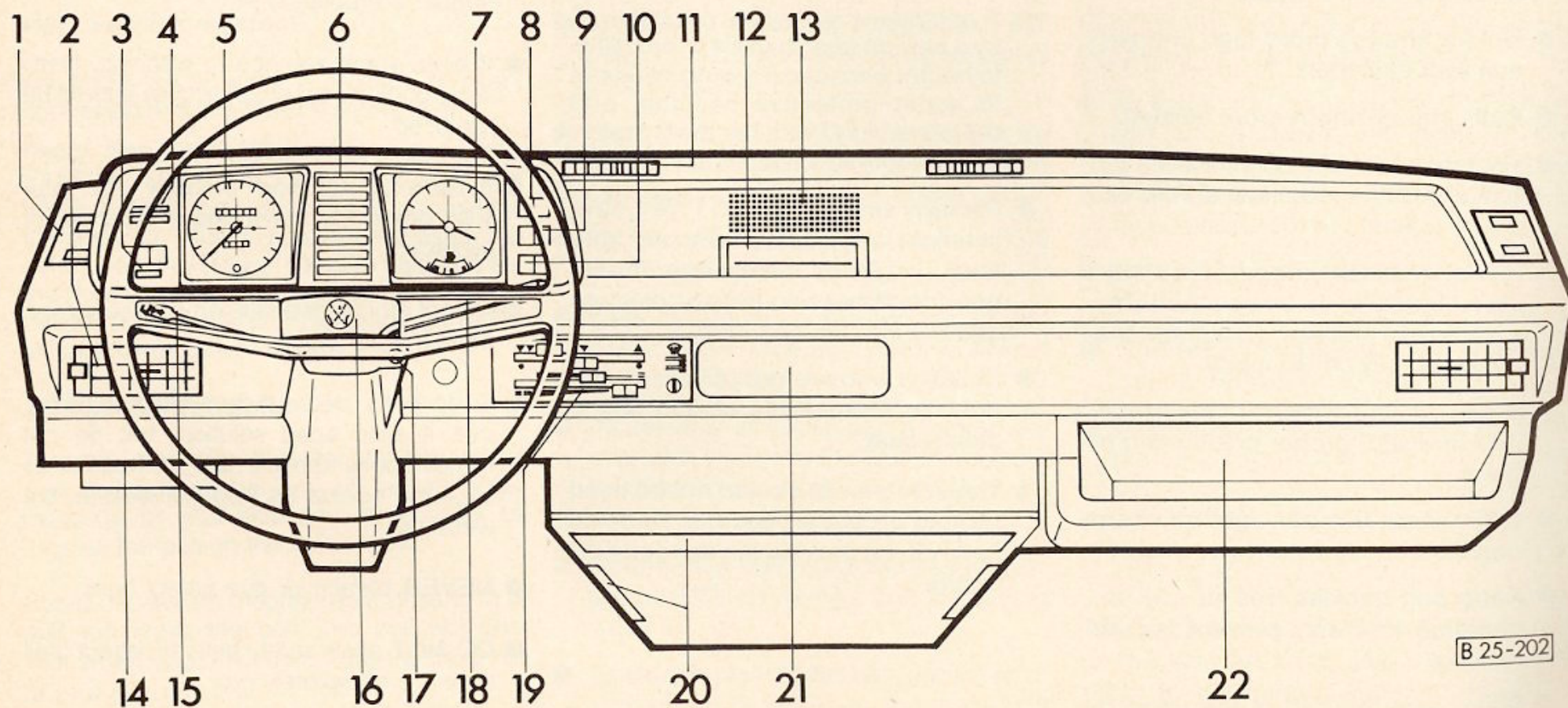
- A shoulder belt should not be worn by a person less than 4'11" or 1.50 m in height because it would not be in its most protective position, and therefore may increase the possibility of injury in a collision.
- Persons smaller than 4'11" or 1.50 m in height, and children who are able to sit upright by themselves, should use one of the rear seating positions and the lap belt provided.
- Children who are not able to sit upright by themselves should use a child's seat.
- The safety belts should not be used to hold a child's seat; the diagonal belt will not provide the needed protection.

## Belt care

- Belts that have been subjected to excessive stretch forces in an accident should be replaced.
- If belts show damage to webbing, bindings, buckles or retractor, they should be replaced.
- If belts do not work properly, see your VW dealer to have them repaired or replaced.
- Do not modify or disassemble the safety belts in your car.
- Keep belts clean. If they need cleaning, use a mild soap solution, but do not remove belts from car. DO NOT use other cleaning agents as they will weaken the webbing.
- **NEVER** bleach or dye safety belts.
- **DO NOT** allow safety belts to retract until they are completely dry.



## Instrument panel



B 25-202



## Instrument panel

	Page		Page
1 – Side window nozzles, left and right, for heating/defrosting .....	41	12 – Ashtray .....	28
2 – Fresh air vents, left and right .....	40	13 – Loudspeaker grille .....	
3 – Headlight switch and thumbwheel for instrument illumination .....	24	14 – Fuses and relays .....	46
4 – Brake warning light .....	24	15 – Turn signal/headlight dimmer switch lever .....	26
5 – Speedometer with trip odometer .....	21	16 – Horn .....	
6 – Warning/indicator lights .....	22	17 – Ignition/steering lock .....	20
7 – Clock with fuel gauge .....	21	18 – Windshield wiper/washer lever .....	27
8 – Rear window defogger switch .....	25	19 – Heater and fresh air ventilation controls .....	40
9 – Emergency flasher switch (HAZARD) .....	25	20 – Footwell air outlets for heating and fresh air ventilation .....	40
10 – For additional switch .....	25	21 – Radio (optional) .....	
11 – Windshield air outlets for heating/defrosting and fresh air ventilation .....	40	22 – Glove compartment .....	



## Ignition/steering lock

The steering is equipped with an anti-theft ignition lock.

### Important reminders before starting

Never start or let the engine run in an enclosed, unventilated area. Exhaust fumes from the engine contain carbon monoxide, which is a colorless and odorless gas. Carbon monoxide can be fatal if inhaled.

- **Manual Transmission:**

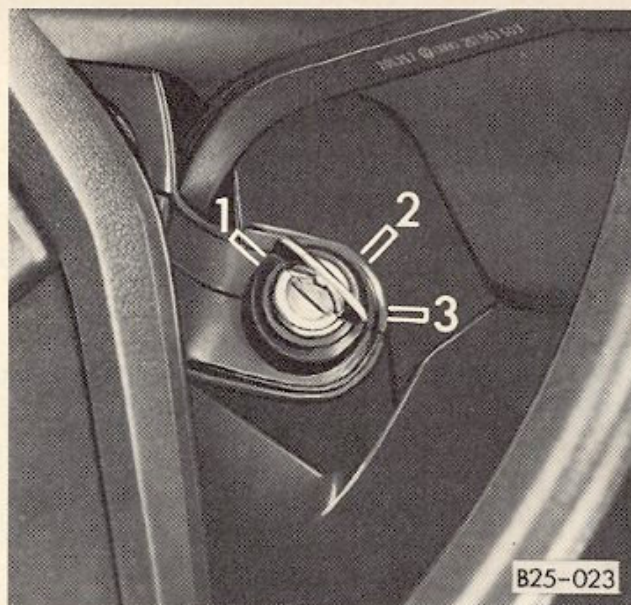
Move gearshift lever to Neutral.

- **Automatic Transmission:**

Move lever to Neutral or Park.

For your protection, fasten safety belts.

**NEVER LEAVE ENGINE IDLING UN-ATTENDED.** If warning lights should come on to indicate improper operation, they would go unheeded. This could result in severe damage to the car.



### Switch positions

See page 89 for **Diesel Engine**.

- 1 – Ignition off/steering locked.  
Insert the key. If it is difficult to turn the key, gently move the steering wheel until the key turns freely.
- 2 – Ignition on/steering free (for towing).
- 3 – Starter engages.

Key returns to Pos. 2 as soon as it is released.

Do not operate starter continuously for more than 10 seconds. If engine fails to start, turn key back to Pos. 1 and restart. Also see “**Starting procedures**”.

With key in Pos. 2, the lights for **oil pressure**, **alternator**, **exhaust gas recirculation (EGR - where applicable)**, **oxygen sensor (OXS-where applicable)** will light up. They should go out after the engine is started. With key in Pos. 3, the brake warning light will come on. It should go out after the engine is started and the parking brake is fully released (see also page 24).

### Buzzer

If you leave the key in the ignition/steering lock, the buzzer will sound when the driver's door is opened. This is your reminder to remove the key.

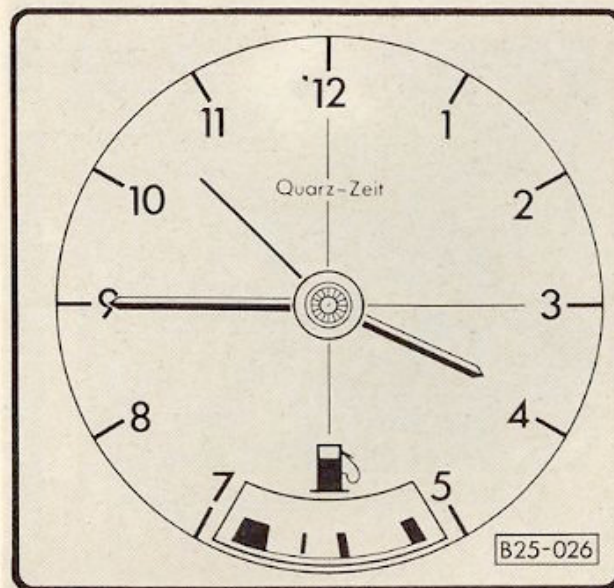
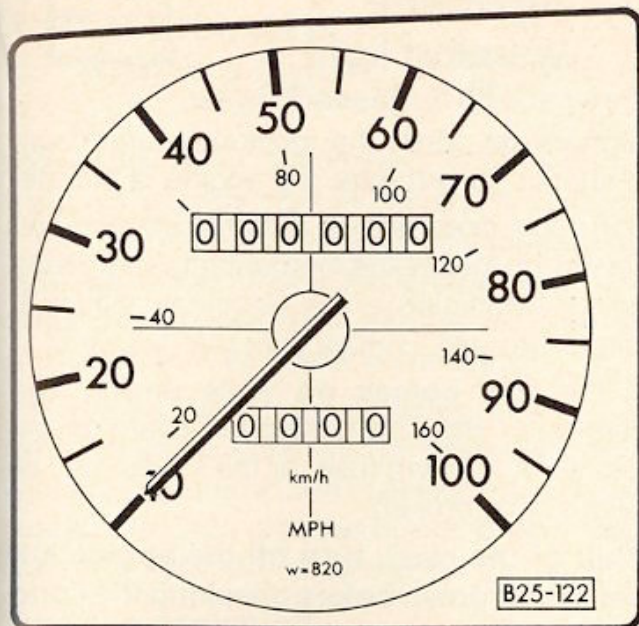
### Remove key and lock steering wheel

- Turn key back to Pos. 1 and pull out. Turn steering wheel until it locks.

Only remove key after car has come to a standstill and parking brake is engaged. **NEVER remove key while driving or as car is rolling to a stop.** Since steering wheel locks, you could lose control of the car.

**Never let car roll by its own weight with transmission in Neutral.** Such coasting may lead to sudden loss of control and damage to transmission and engine, when a gear has to be engaged.





## Instruments

### Speedometer dial

The **speedometer** indicates road speed. The **odometer** indicates the distance driven.

U.S. models: Miles

Canada models: Kilometers

To record a distance, reset the **trip odometer** to zero by pressing the button. The last digit in red indicates 1/10 of a mile or kilometer.

### Clock (optional)

To set the electric clock, depress the knob in the dial center and turn.

### Fuel gauge



The needle in the fuel gauge will indicate the fuel level in the tank shortly after the engine is running.

When the needle reaches the red area at the bottom there is a reserve of about 2.6 U.S. gal. or 10 liters of fuel left in the tank...time to refuel.

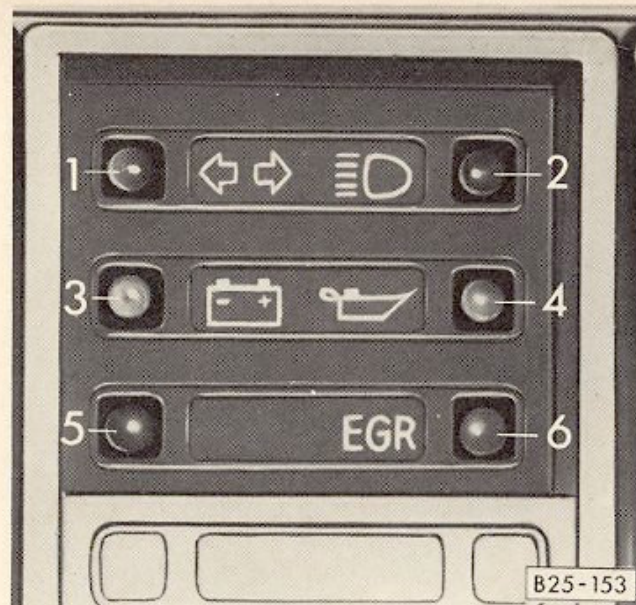


## Warning/indicator lights

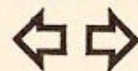
### CAUTIONS:

Whenever stalled or stopped for repair, move the car well off the road. Turn on the emergency flasher and mark the car with road flares or other warning devices.

Before working on any part in the engine compartment, turn the engine off and wait until it has cooled down sufficiently. Hot components can burn skin on contact.



### 1 – Turn signals



For details see "Turn signals"

### 2 – High beam



For details see "Headlight dimmer"

### 3 – Alternator warning light



See page 89 for **Diesel Engine**.

**Comes on** when the ignition is turned on. It should **go out** after the engine is started. If the light **does not go out** after starting and revving-up the engine momentarily, there may be a malfunction in the electrical system. If this is the case, contact your VW dealer.

If the light **comes on** while driving, the alternator may have stopped charging because of a blown fuse, or the V-belt may be slipping or broken.

**Pull off the road, turn off the engine and let it cool down before checking the condition of the V-belt.**

In case of a blown fuse, replace it (see "Fuses and relays")

If the V-belt is not slipping or broken, there may be a malfunction in the electrical system. Have your dealer locate and correct the cause promptly.

**If the V-belt is slipping or broken, have it adjusted or replaced immediately. Do not continue to operate the vehicle as severe damage will occur.**

(see "Troubleshooting" items 16 and 17)



#### 4 – Oil pressure warning light



**lights up** when the ignition is turned on. It should **go out** after the engine is started. If the oil pressure warning light **does not light up** when turning the ignition on or if it **does not go out** after starting the engine, contact your VW dealer immediately.

STOP AT ONCE if the oil pressure warning light comes on while driving. (Brake warning light also comes on due to design of electrical system. In case of brake failure, **only brake warning** light will come on).

Turn the engine off!

##### Note:

The oil pressure warning light is not an indicator for low engine oil level. To check the oil level, always use dipstick (see page 62).

Check the engine oil level to make sure you have enough oil. If in doubt about the cause do not drive on but contact nearest VW Dealer.

An occasional flickering of the oil pressure warning light when the engine is idling after a long high-speed trip is no cause for concern if the light goes out upon acceleration.

#### 5 – For additional light 6 – Service reminder light

(not connected in Canada models)

The following lights will come on when the ignition is turned on and should go out after the engine is started.

If the lights come on and stay on, read your odometer. The time has come to take your car to your VW dealer for the scheduled emission control maintenance service.

#### Exhaust gas recirculation light      EGR

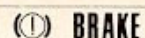
comes on every 15,000 miles or 24,000 km.

#### Oxygen sensor light      OXS

(California models only)  
comes on every 30,000 miles or 48,000 km.



## 1 – Brake warning light



BRAKE

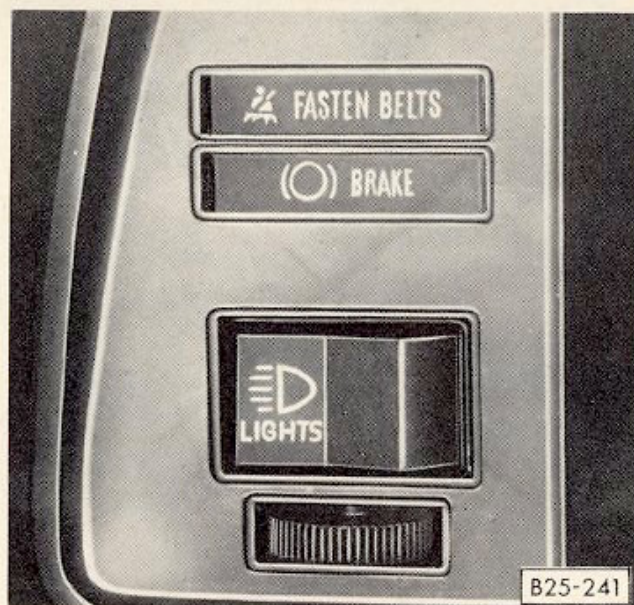
**comes on** while the engine is started. It should **go out** after the engine is started and the parking brake is fully released. This is your assurance that the brake warning light functions properly.

If the brake warning light **does not** light up when starting the engine or setting the hand-brake, there may be a malfunction in the electrical system. In this case, contact your VW dealer.

Your Volkswagen is equipped with a power assisted dual circuit brake system. Both circuits, one for the front brakes and one for the rear brakes, can function independently.

If the brake warning light lights up when you apply the brakes while driving, one of the two brake circuits may have failed. First make sure the parking brake is fully released.

For detailed information see **"Brakes"** on page 34.



## 1 – Safety belt FASTEN BELTS

For details see "Safety belts" on page 16.

## 2 – Headlight switch



Depress the rocker switch to the first stop to turn on the parking, side marker, license plate, tail and instrument lights.

Depress the switch to the second stop to turn on the headlights (ignition on).

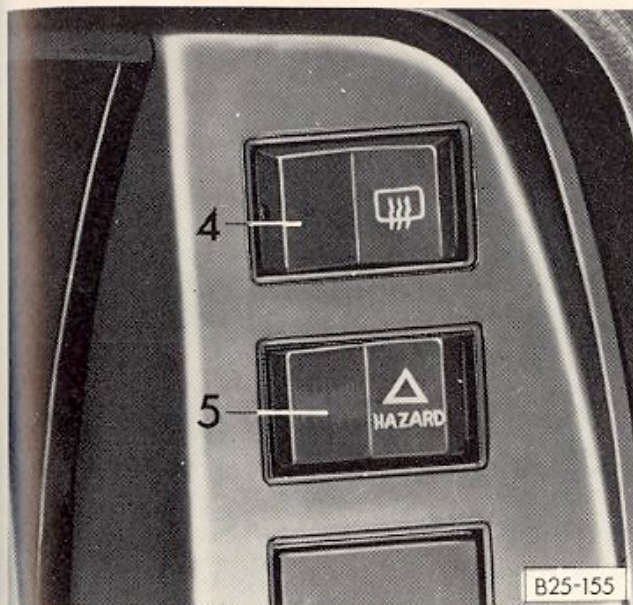
When the high beams are on, the indicator light will light up (see "Turn signal/headlight dimmer switch lever").

To conserve battery power, the headlights will go out automatically when the ignition is turned off or when the engine is started.

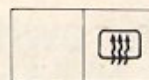
## 3 – Instrument illumination

Turn the thumb wheel below the rocker switch to adjust the brightness of the instrument lights.





## 4 – Rear window defogger



The rear window defogger – together with the flow-through ventilation – will help to keep the inside of the rear window clear of condensation and frost in the winter.

### To turn on rear window defogger:

- Turn on ignition first.
- Depress **right side (symbol)** of rocker switch. The control light in the switch will light up to remind you that the defogger is switched on.

After the rear window has been cleared, switch off the rear window defogger to avoid an unnecessary drain on the battery.

### To turn off rear window defogger:

- Depress **left side (blank)** of rocker switch.

## 5 – Emergency flasher switch



The emergency flasher works independently of the ignition switch position.

If your car is disabled or parked under emergency conditions, make all four turn signals flash simultaneously.

### To turn on emergency flasher:

- Depress **right side (HAZARD)** of rocker switch. The warning light in the switch flashes, too.

### To turn off emergency flasher:

- Depress **left side (blank)** of rocker switch.

When the headlight switch is operated, the emergency flasher switch glows with reduced brightness for easy recognition in the dark. When the emergency flasher is not in operation, the brightness of the light can be adjusted together with the instrument panel lights (see instrument illumination).

**Move the car well off the road when stalled or stopped for repairs.**

**Do not park or operate the car in areas where the hot exhaust system may come in contact with dry grass, brush, fuel spill or other flammable material.**



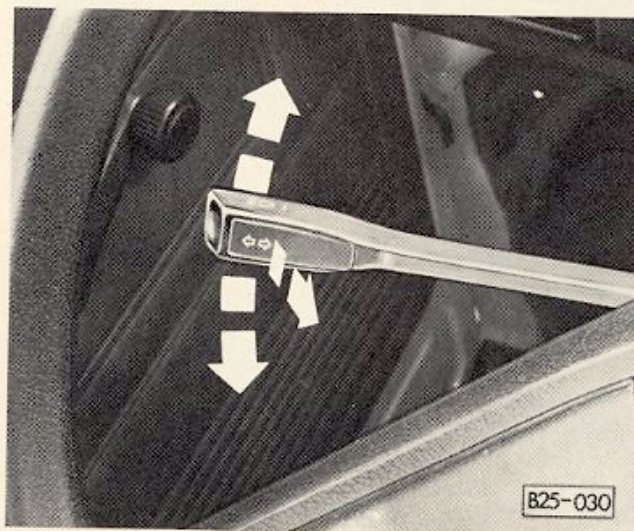
## Turn signal/headlight dimmer switch lever- and wiper/washer lever

There are two levers just behind the steering wheel:

**The lever on the left side** is for the turn signal/headlight dimmer switch.

**The lever on the right side** is for the windshield wiper/washer and (optional) rear window wiper/washer.

Both levers work only with ignition on.



### Turn signals ⇄

Lever up	– right turn signal
Lever down	– left turn signal

The turn signal indicator light flashes when you operate the lever.

The turn signals are cancelled automatically when you have completed a turn (like driving around a corner), and the steering wheel returns to the straight-ahead position.

If a turn signal fails, the indicator light flashes about twice as fast. The fuse or a light bulb may have to be replaced.

### Lane changer

To indicate your intention when changing lanes on expressways, move the lever up or down just to the point of resistance. The lever will return to the OFF position when released.

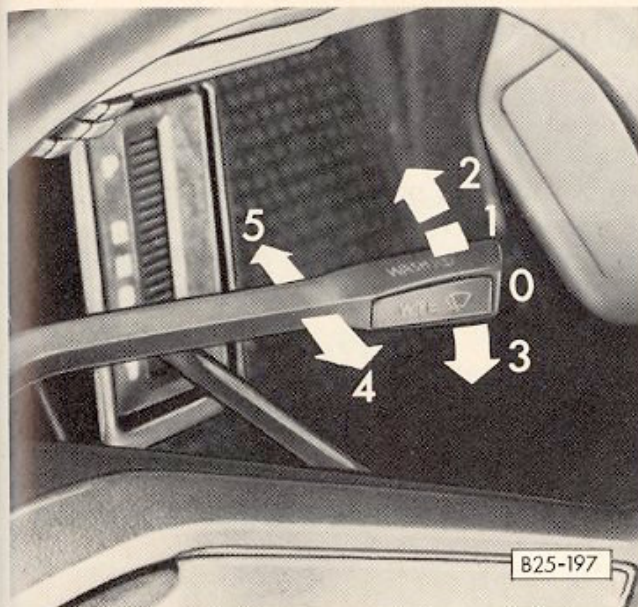
### Headlight dimmer

To switch to either high or low beam, pull the lever toward the steering wheel past the point of resistance. When high beams are on, the indicator light will light up.

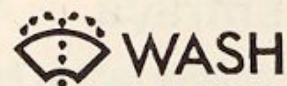
### Headlight flasher

You can signal with your headlights (in lieu of horn) during daylight, by repeatedly pulling and releasing the lever up to the point of resistance.





## Windshield washer



To spray washer fluid on the windshield, pull the lever toward the steering wheel (position 4). You can operate the washer from any selected wiping position.

Avoid running the wiper blades over a dry windshield to prevent scratching the glass. Spray on washer fluid first.

## Windshield wipers WIPE

The windshield wipers can be operated at the following speeds:

Lever position 1 – low speed

Lever position 2 – high speed

Lever position 3 – intermittent wiping  
(Where applicable)

The wipers sweep the windshield approximately every 6 seconds.

Lifting the lever slightly without engaging the first stop allows the wipers to operate for as long as the lever is held in this position. The wipers will stop when the lever is released.

### Note:

**Check wiper blades periodically. Worn or dirty blades impair vision, making driving hazardous. Loosen blades frozen to glass before operating wipers.**

## Rear window wiper and washer

(where applicable)

Push lever to position 5 and release – wiper operates two or three times.

Push lever to position 5 and hold there – wiper **and** washer operate.

Release lever – washer operation stops instantly and wiper stops after two or three sweeps.



## Sliding roof

(optional equipment)

**To open** pull crank handle out of recess and turn counter-clockwise.

**To close** turn crank handle clockwise.

The sliding roof is locked in any position.

**For safety reasons, always fold the crank-handle back into its recess.**

## Ashtrays

To **remove** ashtray from **dashboard**, grasp the open lid and lower handle firmly at one side and pull out sideways.

To replace, move ashtray lid to closed position and press into housing.

To **remove passenger compartment** ashtray, open tray, press down and pull out.

To **replace**, first insert upper edge, and then slide ashtray all the way into housing.

## Cigarette lighter

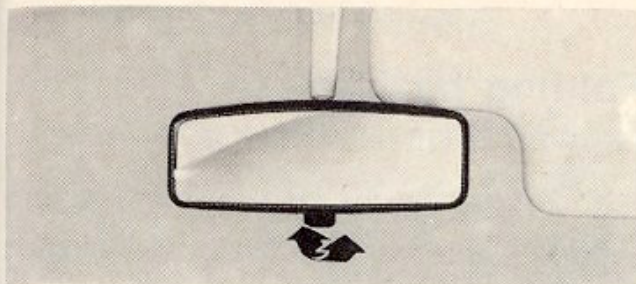
(where applicable)

Push the knob in. When ready for use, the lighter will snap back.

With the cigarette lighter removed, the socket may be used for small electrical appliances, such as shaver or hand vacuum cleaner. The maximum rating of such equipment should not exceed 100 W/12 Volt.

**Do not damage the socket by trying to insert plugs of the wrong design.**





## Rear view mirrors

Adjust the outside and inside mirrors before driving off. It is important for safe driving that you have good vision to the rear.

## Inside day-night mirror

You can adjust the day-night mirror from clear daylight visibility to non-glare visibility at night by moving the lever at the bottom of the mirror up or down.

## Outside mirror

The outside mirror is hinged and folds flat against the car when struck from either direction.

## Interior lights

### Switch positions

#### Front interior light:

Up	—ON—	with front doors open
Center	—OFF	
Down	—ON—	with front doors closed

#### Rear interior light:

Up/front	—ON—	with sliding door open
Center	—OFF	
Down/rear	—ON—	with sliding door closed

## Glove compartment

To open	— Squeeze the two lock latches together
To close	— Press door upward until lock engages
To lock or unlock (where applicable)	— Turn key to right or left

**Keep glove compartment closed while driving to prevent injury during a collision.**

## Sun visors

To protect the driver from side glare, the sun visors can be moved toward the door windows.

## Coat hooks/Assist handles

For your convenience, there are several coat hooks on the door posts. Hang clothes in such a way that they do not impair the driver's vision.

For easier entrance and exit of passengers, we have provided 5 assist handles:

1 on the dashboard for the front passenger seat, and  
4 in the rear passenger compartment.



## Luggage compartment

The rear luggage compartment is easily accessible through the lid at the rear of the vehicle. You lock and unlock it with the key.

**To open the lid**, depress the lock and raise the lid until it is held in the fully open position. Do not let the lid fly open on its own.

To close the lid, swing it down firmly. Always make sure it is properly closed and locked.

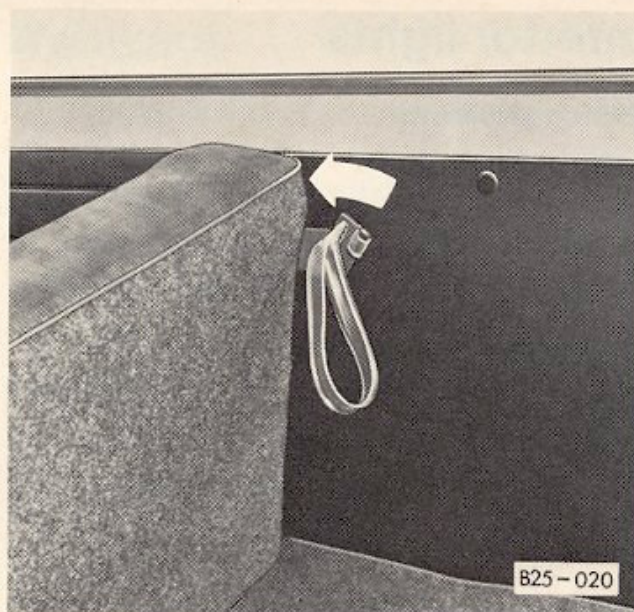
**Keep the rear lid closed while driving to prevent exhaust gas from being drawn into the car.**

**See CAUTIONS on page 33**

**To prevent serious injuries, do not allow any passengers to kneel or sit on the rear load surface while the vehicle is in motion.**

### Note

Before taking your car to an automatic Car Wash, lock the rear lid with the key, as otherwise the bristles of the washing brushes may operate the lock cylinder.



**Keep the luggage compartment locked at all times to prevent unauthorized individuals from operating the lock cylinder to gain access to the car.**

With lock slot in the horizontal position, the luggage compartment can be opened without key by pressing the lock cylinder.

## Folding backrest for rear seat bench

You can expand the luggage compartment load surface by folding the backrest of the rear seat bench down.

If your car is equipped with head restraints, remove them before folding the backrest down.

**To release**, unlock the backrest and pull strap in driving direction. Fold backrest down until it rests on seat cushion.

The backrest will be locked automatically when returned to its upright position. Make sure the lap belts remain on top of the seat cushion, ready for use.

**When transporting luggage and other cargo, secure it in place to prevent such articles from shifting during a sudden stop.**

**Be careful when loading or removing large objects. Sharp edged articles may damage the defogger wires in the rear window.**



# Starting procedure

See page 91 for Diesel Engine.

**Never start or let the engine run in an enclosed, unventilated area. Exhaust fumes from the engine contain carbon monoxide, which is a colorless and odorless gas. Carbon monoxide can be fatal if inhaled.**

## Fasten safety belts!

**Automatic Transmission.** Start with selector lever in Neutral or Park.

**Manual Transmission.** Start with gearshift lever in Neutral, clutch pedal depressed.

## Starting at all temperatures

It is not necessary to depress the accelerator pedal when starting. This holds true for a cold engine and an engine at operating temperature no matter what the outside temperature is. The fuel injection system, with which your Volkswagen is equipped, automatically supplies the required amount of fuel for starting.

**Operate the starter for 10 to 15 seconds only.**

As soon as the engine starts, release the ignition key.

If the engine does not start the first time or stalls, turn the ignition key all the way to the left and restart.

The red warning lights for oil pressure, alternator, EGR and OXS (California models only) and the brake warning light will light up when the ignition is turned on. They should go out after you have started the engine. The brake warning light should go out after releasing the parking brake (see **"Warning/indicator Lights"** for details). It is not necessary to warm up the engine by letting it idle with the car stationary... drive off immediately and maintain moderate speed until the engine is warm.

## Winter starting of Manual Transmission

On the Manual Transmission, also depress the clutch pedal when starting so that the starter only has to crank the engine.

## Cars with catalytic converter (USA models only)

If your Volkswagen is equipped with a catalytic converter as part of the emission control system, the following is important to know:

After the engine is warmed up (not during or shortly after engine start-up) a malfunction in the ignition system, caused by a faulty spark plug, for instance, could reduce the effectiveness of the converter.

To keep the catalytic converter operating properly, we advise you to slow down immediately if you should notice a sudden interruption in the pull of the engine under normal acceleration. This interruption could be for brief moments or of longer duration. Drive slowly (with half or less throttle) to the nearest VW dealer or other qualified workshop to have your ignition system checked and if necessary corrected.

## NEVER LEAVE ENGINE IDLING UN-ATTENDED.

If warning lights should come on to indicate improper operation, they would go unheeded. This could result in severe damage to the car.

Do not park or operate the car in areas where the hot exhaust system may come in contact with dry grass, brush, fuel spill or other flammable material.



## Fuel supply

See page 92 for Diesel Engine.

### UNLEADED FUEL ONLY

**for cars with a catalytic converter** (U.S. models). Such vehicles are so identified by a sticker on the steering column and another sticker next to the fuel filler cap.

#### **Cars with catalytic converter**

Cars with catalytic converter need unleaded fuel. The catalytic converter is an efficient "clean-up" device built into the exhaust system of the car. The catalytic converter burns the undesirable pollutants in the exhaust gas before it is released to the atmosphere.

Deposits from leaded gasolines destroy the catalytic converter and thus defeat its purpose to control harmful exhaust emissions.

Cars with a catalytic converter, requiring unleaded fuel, have a **smaller fuel tank opening, and gas station pumps have smaller nozzles**. This will prevent accidental pumping of leaded fuel into cars with a catalytic converter.

**Unleaded fuels may not be available outside the continental U.S. and Canada. Therefore, we recommend you do not take your car to areas or countries where unleaded fuel may not be available.**

32

**REGULAR** low-lead or unleaded fuel, of 91 RON octane rating, for cars without special marking.

Min. octane rating is listed on a plate, visible after taking off the filler cap.

#### **Regular fuel and octane rating**

Octane rating indicates a gasoline's ability to resist detonation. Therefore, buying the correct octane gas is important to prevent engine "knock".

Regular fuels have an octane rating ranging from 91 to 95 **RON** (Research Octane Number) or 87 to 91 **CLC** (U. S. Cost of Living Council Octane rating). The 91 RON octane rating which you will find on a plate, visible after taking off the filler cap of your car is based on the research method. The CLC octane rating usually displayed on U. S. gasoline pumps is calculated as follows: research octane number plus motor octane number, divided by 2.

That is 
$$\frac{\text{RON} + \text{MON}}{2}$$

The CLC octane rating is usually 4 points less than the RON rating:  
91 RON equals 87 CLC  
95 RON equals 91 CLC

**Do not use any fuel with octane ratings lower than 91 RON or 87 CLC.**

**Fuel filler neck** is located above the right front wheel.

**Fuel tank capacity** is listed under "Technical Data/Capacities."

#### **Gasohol**

A mixture of unleaded gasoline and ethanol (ethyl alcohol) known as 'Gasohol' is available in gas stations in some areas. Volkswagen vehicles are designed and certified to use gasoline as specified under '**fuel supply**'. You may decide to use gasohol in your Volkswagen, provided it contains not more than 10% ethanol and the octane requirements for your car are met.

However, we strongly recommend to switch back to gasoline without ethanol, if you experience the following adverse effects on your vehicle because of the use of gasohol.

- Deterioration of drivability and performance
- substantially reduced fuel economy
- Generation of vapor lock and hot start problems, especially at high altitude or at high temperatures
- Engine malfunction or stalling.

The continued use of gasohol under these conditions may adversely affect the fuel and emission control systems of your vehicle.



## **Engine exhaust is dangerous if inhaled.**

### **Therefore:**

- Never start or let the engine run in a closed garage. Open the door.
- Exhaust fumes from the engine contain carbon monoxide, which is a colorless and odorless gas. Carbon monoxide can be fatal if inhaled.
- Keep the rear lid closed while driving to prevent exhaust gas from being drawn into the car.
- If you smell gas fumes in the car, drive with the windows open, but keep the rear lid closed. Have the cause immediately located and corrected.
- Because of inherent hazards, we do not recommend transporting larger objects than those fitting safely into the luggage compartment.
- Never carry fuel in portable containers in your car. Such containers, full or partially empty, may leak, cause an explosion, or result in fire in case of a collision.

## **How you drive is what you get in fuel mileage**

Fuel economy will vary depending on where, when and how you drive, optional equipment installed in your car, and the condition of your car.

- Keep a light foot on the accelerator.
- Drive smoothly, avoid abrupt changes in speed as much as possible.
- Avoid jack rabbit starts and sudden stops.
- Do not drive longer than necessary in the lower gears. Shifting up early helps to save fuel.
- Avoid unnecessary idling. Turn the engine off.
- "Warm up" idling wastes gas. Start the car just before you are ready to drive. Accelerate slowly and smoothly.
- Any additional weight carried in the car reduces fuel economy. Always keep cargo to a minimum and remove all unnecessary items.
- Organize your trips to take in several errands.

## **How to improve fuel mileage**

A well tuned and properly maintained car will help you get maximum fuel economy.

- Have your car tuned to specifications.
- Fuel injection should be adjusted to specifications.
- Spark plugs should be clean, properly gapped and firing efficiently (not applicable to Diesel Engine).
- Air cleaner should be dirtfree to allow proper engine "breathing".
- Battery should be fully charged.
- Wheels should be aligned.
- Tires should be inflated at correct pressures.
- The published EPA mileage estimates may vary, depending on speed, weather and trip length. Your actual highway mileage will probably be less.



# Brakes

## Functioning of brake system

Your VW is equipped with a power assisted hydraulic dual circuit brake system with disc brakes at the front and self adjusting drum brakes at the rear. Both circuits function independently.

One brake circuit operates the front wheels and the other the rear wheels.

In the unlikely event of hydraulic failure of one circuit, **push the brake pedal down firmly and hold it in that position.** A mechanical linkage activates the second circuit, and you will be able to bring the car to a safe stop.

### Note:

**Failure of one brake circuit will impair the braking capability resulting in an increased stopping distance.**

If one brake circuit has failed, the other will still operate. However, you will notice an increased pedal travel when you step on the brake. Should you encounter such experience, bring your vehicle safely to a full stop.

**Avoid driving the car and have it towed to the nearest VW dealer or qualified**

34 **workshop.**

## Brake pedal

**Do not "ride the brakes" by resting your foot on the pedal when not intending to brake. Overheating and premature wear of the brakes is the result.**

**Make sure that the movement of the brake pedal is not obstructed by a floor mat, or any other object.**

## Brake operation and brake warning light

Make it a habit to check the operation of your brakes before driving. The brake warning light will light up if the parking brake is pulled or one of the brake circuits should fail. See "Brake warning light", for more details.

Keep in mind that the braking distance increases very rapidly as the speed increases. At 60 mph or at 100 km/h, for example, it is not twice but four times longer than at 30 mph or at 50 km/h. Tire traction is also less effective when the roads are wet and slippery. Therefore, always maintain safe distance.

## Brake booster

The brake booster assists braking only

when the engine is running. When the car is moving while the engine is not running, more force on the brake pedal is required to bring the car to a stop.

## Moisture or road salt on brakes affects braking

Driving through water may reduce tire traction. Moisture on brakes from road water, car wash, or coating of road salt may affect braking efficiency. Cautiously apply brakes for a test. Brakes will dry and salt coating will be cleaned off after a few cautious brake applications.

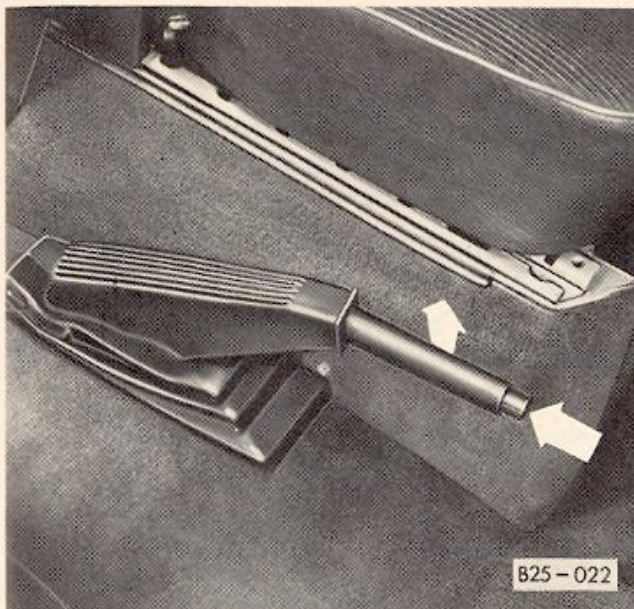
## Brake wear

VW automobiles have excellent brakes, but they are still subject to wear, depending on how the brakes are used. Have the brake system inspected at the intervals recommended in your Maintenance Schedule.

## New brake pads or linings

Brake pads or linings may not have the highest possible braking efficiency when new. Therefore allow for longer braking distance during the initial 100 to 150 miles or 150 to 250 kilometers.





## Parking brake lever

Use the parking brake after the vehicle has come to a full stop.

To **set** the parking brake, press in the release button at the end of the lever as you pull up the lever. The parking brake is engaged as soon as you release the button on the raised lever.

With the ignition on, the brake warning light will light up.

To **release** the parking brake, pull the lever slightly up, depress the release button (arrow), and then push the lever all the way down. **When the parking brake is fully**

released, the brake warning light will go out.

### Notes:

- Release the parking brake fully. A partially engaged brake will overheat the rear brakes, reduce their effectiveness and cause excessive wear.
- Always set the parking brake when parking your car. Move the selector lever to "P" (Automatic transmission) or move the gearshift lever to "1" or "R" (Manual transmission). On hills also turn the wheels toward the curb.

## Accelerator pedal

For good fuel economy we recommend smooth and even acceleration. Very fast, racy driving, alternating between full throttle and hard braking, raises the fuel consumption considerably. Also, tires and brake linings wear faster.

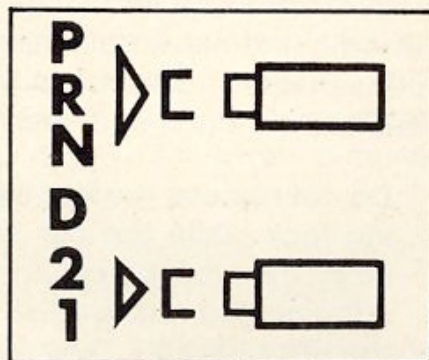
Do not remove the key from the steering lock while the car is rolling to a stop. The steering column is locked as soon as you remove the key and turn the wheel slightly. Take out the key only after the car is parked.



## Automatic Transmission

The selector lever has 6 positions:

Park  
Reverse  
Neutral  
Drive  
Low  
Low



Start in Neutral or Park.

The selector lever has a push button in the handle. **The push button must be depressed when moving the selector lever to the following positions:**

From P to R	} depress push button in handle
R to P	
N to R	
2 to 1	

The selector lever can be moved freely between the other positions without pressing the button.

The selector lever console is illuminated when the parking lights or headlights are switched on.

## Driving the Automatic Transmission

There are few points you should know if you want to take full advantage of your Automatic Transmission.

**Remember the following basic rules:**

- Apply the parking brake or foot brake before selecting a driving position. When the selector lever is in a driving position, the car may creep even at idling speed. Therefore, do not release the parking brake or foot brake until you are ready to move.
- Do not accelerate while selecting a driving position. At this time the engine must run at idling speed so that no undue stress will be placed on the automatic clutches in the transmission.
- If the selector lever is accidentally moved into Neutral (N) while driving, take your foot off the accelerator pedal and wait until the engine speed has dropped to idling before selecting a driving position. Never shift into Reverse (R) or Park (P) when the car is in motion.

Please observe all local and national speed limits!

## The driving positions

The Automatic Transmission has 3 forward driving ranges and one reverse. In the driving ranges D and 2, the Automatic Transmission changes gears automatically while driving.

**Position D** is the driving range for normal city and highway driving. It ranges from zero to top speed, and all three gears shift automatically, depending on the speed.

**Positions 2 and 1** are to be used when driving on long, steep and winding mountain roads, or for slow driving, and also when you want to make use of the engine's braking effect.

**Position 2** should only be used up to 55 mph or 88 km/h. In "2", only the first and second gears will engage automatically. Therefore, only shift down into driving range "2" when the car speed is below 50 mph or 80 km/h. It is not necessary to let up on the accelerator.



**Position 1** is needed on rare occasions, such as steep mountain driving. The first gear engages immediately upon selecting "1". In "1", the transmission will stay in first gear and not shift into second or third. Therefore, **do not select "1" when driving more than 25 mph or 40 km/h.**

**Reserve** position should be selected only when the car has come to a full stop and the engine is running at idle speed.

### Starting the engine

The selector lever must be in Neutral or Park. As long as one of the driving ranges is engaged a safety switch prevents the engine from being started.

### Emergency starting

Your Volkswagen with Automatic Transmission cannot be started by pushing or towing. If engine does not start because of discharged battery, the car can be started with jumper cables. Refer to

"Emergency starting with jumper cables". Should the engine fail to start consult your nearest Authorized Volkswagen Dealer.

### Selecting a driving position while driving (D-2-1)

While driving within the maximum speed ranges, simply release the accelerator pedal and move the selector lever from the position you are in to the position you want. Then step on the accelerator again.

### Moving off

With the parking brake or foot brake set, shift into the position you wish to use, usually position D. To move off, release the brake and accelerate.

Do not release the brake before you are prepared to move, because power is transmitted to the wheels as soon as a driving range is engaged.

### Stopping

When stopping temporarily, at traffic lights for example, it is not necessary to move the selector lever to Neutral. Simply apply one of the brakes. To start off again, release the brake and accelerate.

### Neutral

Shift to this position for standing with brakes applied.

**Never use Neutral for coasting downhill. You may lose control over the vehicle because of reduced braking and cause serious damage to the transmission, when a driving range has to be selected.**

### Parking

When parking your car, apply the parking brake first; then move the selector lever to position P. To do this, depress the push button in the handle and push the lever forward to the Park position. The transmission is then mechanically locked.

**Shift out** of the Park position before releasing the parking brake.

When the car is parked on a steep hill, shifting out of Park may be a little harder. This is due to the weight the car exerted on the transmission.

The Park position may only be engaged when the car is stationary.

**Do not remove the key from the Ignition / steering lock until you have parked the car, because removal of the key locks the steering.**



## Maneuvering

When alternating between forward and reverse drive – for instance, while maneuvering the car into a tight parking space – only shift into Reverse or Drive when

- the car has come to a full stop,
- and the engine is running at idling speed.

### Stuck in snow, mud or sand

When alternating between **Drive** and **Reverse** in an effort to free the vehicle, depress the accelerator pedal slightly while the transmission is in gear, and release the accelerator pedal while shifting. Do not race the engine and avoid spinning the wheels. **Do not repeat "rocking" back and forth with wheels spinning at high engine speed and heavy throttle, as serious damage may be caused to the automatic transmission and other critical parts.**

If you cannot free the vehicle after a few "rocking" attempts, call for help or a tow truck.

## Accelerator "kickdown"

When depressing the accelerator pedal you will find resistance at the full throttle position. By applying greater pressure the pedal can be pushed beyond this point to the kickdown position. The transmission will now shift automatically into the next lower gear to give you maximum acceleration, and only shift up again after the engine has reached maximum speed in that particular gear.

Please observe the following when applying the accelerator kickdown:

- With the selector lever in D, you can apply the kickdown to make the transmission shift down into second gear when driving below 50 mph or 80 km/h and down to first gear when driving below 25 mph or 40 km/h.
- With the selector lever in "2", you can apply the kickdown to make the transmission shift down into first gear when driving below 25 mph or 40 km/h.
- As soon as you release the pedal from the kickdown position the next higher gear is automatically engaged.

**Be careful when using the kickdown on icy roads. Rapid acceleration may cause skidding.**



# Controls for Manual Transmission

## Speed ranges

You can drive your Volkswagen at full speed from the first day. There is no break-in schedule.

There are, however, certain recommended speed ranges for the various gears:

1st gear 0–15 mph or 0–24 km/h

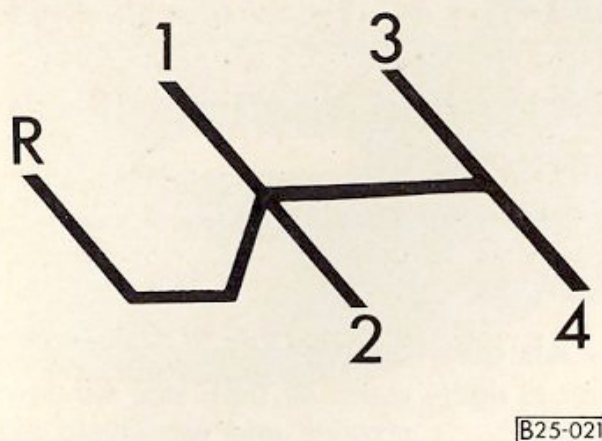
2nd gear 10–32 mph or 16–51 km/h

3rd gear 15–52 mph or 24–83 km/h

4th gear from 30 mph or 48 km/h up.

If you have a traffic situation where it is necessary to accelerate in 2nd and 3rd gear above the recommended speed ranges, you may do so for a brief period only. A governor is installed on the engine to prevent damage from excessive engine speed (revolutions per minute).

**Always observe all local and national speed limits!**



## Starting

**Start engine with gearshift lever in Neutral, clutch pedal depressed.**

## Reverse

**Only shift into Reverse when the car is not moving.**

**To engage Reverse**, move lever to left, press down, move further to left and push forward. Especially after some driving, depress the clutch pedal fully and rest the shift lever in **Neutral** for a few seconds before shifting into **Reverse**.

Back-up lights go on when you engage Reverse gear (with ignition on).

## Gearshift lever

The Manual Transmission is fully synchronized. The four forward gears and a reverse gear are arranged as illustrated.

**Resting your hand on the shift lever knob while driving will cause premature wear in the transmission.**

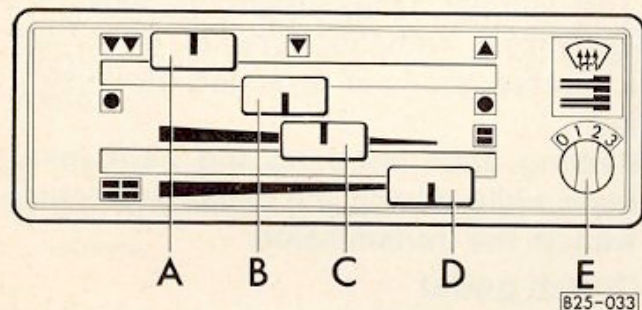
## Clutch pedal

Always depress the clutch pedal fully when changing gears. Do not hold the car on a steep hill with the clutch pedal partially depressed. This may cause premature wear or damage.

**Break-in period for Diesel engine** see page 88.



# CLIMATE CONTROLS



If your car is equipped with an auxiliary heater, refer to page 42-43.

## Heater and ventilation controls

See page 93 for Diesel Engine.

### Heating

#### A – Air distribution lever

Lever at right – warm air from side window nozzles and windshield air outlets.

Lever in center – warm air from footwell air outlets and side window nozzles.

Lever at left – warm air from footwell air outlets in driver cabin and passenger compartment and from side window nozzles.

#### B – Temperature control lever

To **increase** heat – slide lever to **right**.  
To **decrease** heat – slide lever to **left**.

For quick defrosting of the windshield, slide both levers to the extreme right.

Maximum heat output can only be obtained when the engine has reached operating temperature.

## Fresh air ventilation

#### C – Air distribution lever

Fresh air flow through the windshield and footwell air outlets can be regulated with this lever.

To **increase** air – slide lever to **left**.

To **decrease** air flow – slide lever to **right**.

On cars equipped with a three-lever climate control only, fresh air flow is also directed to the passenger compartment through the air outlets in the roof.

#### D – Air distribution lever for roof air outlets in passenger compartment (where applicable)

To **increase** air flow – slide lever to **left**.

To **decrease** air flow – slide lever to **right**.

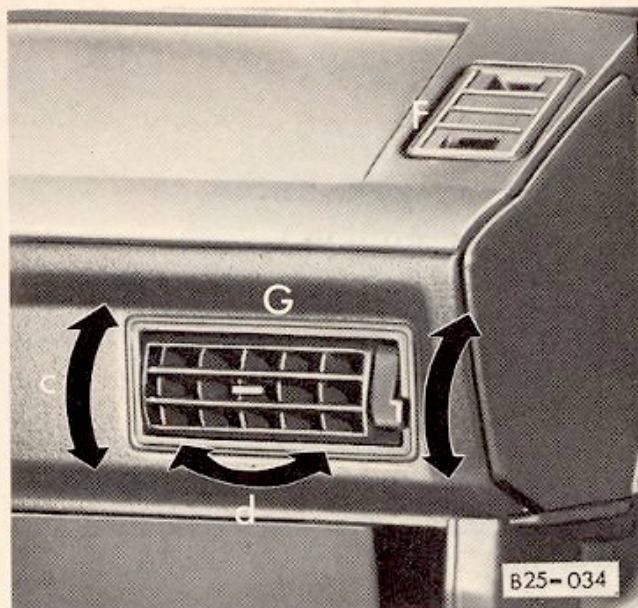
#### E – Fan control switch (where applicable)

Regulate the volume of air flow with this switch.

0 – OFF	2 – medium speed
1 – slow speed	3 – high speed

When driving in slow traffic or standing, turn on the fan to increase fresh air ventilation.





**F – Side window nozzles** – left and right

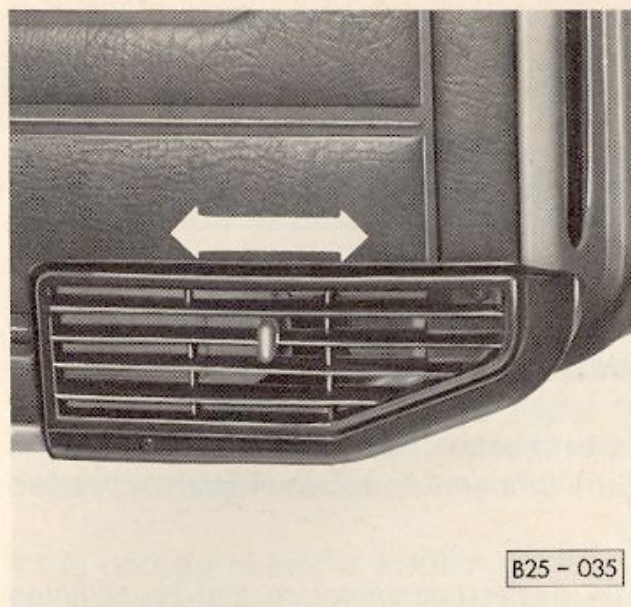
Warm air outlets for heating and defrosting.

**G – Fresh air vents** – left and right

Open and close vents with the small side lever.

Lever down – vent open  
Lever up – vent closed

Air flow direction to the sides or up and down can be adjusted with the lever in the center of the vent.



**Air circulation**

Used air flow – through can be regulated with levers in the vents located in the inside panel of the front doors.

Lever to front– air circulation on.  
Lever to rear – air circulation off.



## VW Auxiliary Heater

(optional equipment on U.S. models)

See page 94 for **Diesel Engine**.

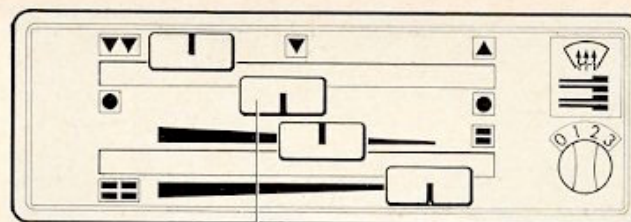
In the auxiliary heating system the engine heat exchangers are combined with a gasoline-operated heater booster, which draws its fuel from the vehicle's fuel tank.

The fresh air is preheated in the engine heat exchangers and then passed on to the heater booster. The thermostatically controlled booster increases the temperature of the preheated fresh air to the desired level.

The heat produced by the heater booster varies according to the temperature in the engine heat exchangers. The heater booster shuts itself off automatically when the engine supplies sufficient heat by itself. When the engine is not running, the heater booster alone heats the car.

Fuel consumption varies according to operating conditions and heat output (approx. 2 US pt or 1 Liter per hour).

**The Auxiliary Heater must be turned off when filling the fuel tank.**



### With ignition on

**To turn heater on** – Slide lever B to the right. Turn temperature switch (TEMP) to position 1.

The desired temperature can be selected by turning the switch further to the right from low (1) to high (2).

A light in the temperature switch will glow when the headlights are on for easy recognition in the dark.

**To turn heater off** – Turn TEMP switch to position 0.

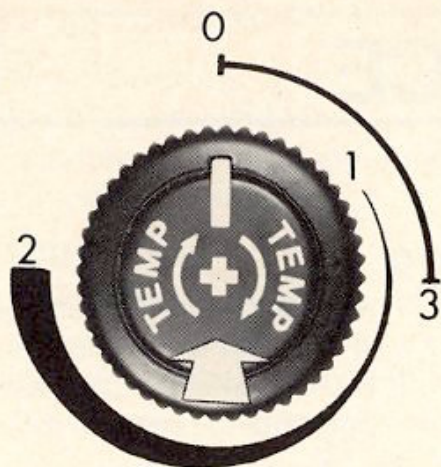
The heater fan will continue to shut off automatically as soon as the heater has cooled off.

### With ignition off

A timer in the switch gives you the possibility to preheat the vehicle interior for approximately 10 minutes before starting the engine.

To prevent excessive battery drain, we recommend that the heater not be operated several times successively when the engine is not running. This applies particularly when the temperature is low and the full battery capacity is required to start the engine.





B25-207

To set the timer, depress the TEMP switch and turn right to the first stop (range 0–3).

Release switch. Then select the desired temperature by turning the switch further to the right (range 1–2).

As soon as the timing cycle is completed, the heater will shut itself off. **If you start the engine before the timing cycle is completed, turn the booster heater off before starting the engine.**

If the booster heater is turned off before the timing cycle is completed, the timer will tick until the timing cycle runs out.

**Never start the gasoline heater or let the engine or the heater run in an enclosed, unventilated area. Exhaust fumes from the engine or the gasoline heater contain carbon monoxide, which is colorless and odorless. Carbon monoxide, however is a very harmful gas, and may be fatal if inhaled.**

## Maintenance

During the winter and when driving over very poor roads, mud or snow may tend to accumulate in the exhaust and combustion air intake pipes. Have these pipes checked for blockage from time to time so that the heater can continue to work



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# DO-IT-YOURSELF SERVICE

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## Cleaning your VW

The paint on your VW is very durable, and so is the upholstery. But a car can get a lot of abuse, from industrial fumes and corrosive road salt to abandoned lollipops and muddy dog feet.

A well-cared-for VW can look like new 10 years later. It all depends on the amount of care the owner is willing to give the car.

Your VW dealer has a number of car-care product and can advise you which ones to use for cleaning the interior and exterior of your car.

- **Always read directions on the container before using any product.**
- **Most chemical cleaners are concentrates which require dilution.**
- **Observe of caution labels.**

Following are a few hints on how to keep your VW looking young and beautiful.

## Washing your VW

The longer the dirt is left on the paint, the greater the risk of damaging the glossy finish, either by scratching if the dirt is rubbed into the paint, or simply by the chemical effect dirt particles have on the paint surface.

### CAUTIONS:

- **Don't wash or dry your car with the engine running.**
  - **Don't clean the undersides of chassis, fenders, wheel covers, etc., without protecting your hands and arms. You may cut yourself on sharp-edged metal parts.**
  - **Don't wash your car in direct sunlight.**
- Wash your car often, use plenty of water, a car-wash and wax solution and a soft sponge or hose brush. Begin by spraying water over the dry car to remove all loose dirt before applying the car-wash and wax solution.

Use plenty of water to rinse the car off. Wipe the car dry with a chamois to avoid water spots.

## Waxing

Waxing is not really needed when you have washed your car with a car-wash and wax solution. If you do not use a car wash liquid with wax, apply wax to preserve the natural shine of the car.

To obtain a long lasting wax finish, apply hard wax eight to ten weeks after buying the car. Wax again when water remains on the surface in large patches instead of forming beads and rolling off.

## Polishing

Use a polish later in the car's life when the paint appears dull and loses its shine. Do not polish the new car. Always apply wax after polishing if the polish you are using does not contain a wax.

Any wax polish combination polishes your car, removes paint oxidation and also waxes your car.



## Cleaning windows

Clean all windows regularly to remove road film and car-wash wax buildup.

Clean windows with a sponge and warm water. Dry with a chamois.

## Weatherstrips

To seal properly, weatherstrips around windows and doors must be pliable. To retain flexibility of the rubber, spray with with silicone, or coat with talcum powder.

## Windshield wiper blades

Remove the wiper blades periodically and scrub with a hard bristle brush and alcohol or a strong detergent solution.

## Metal trim

Bright or black anodized trim will come clean when you wash the vehicle. To protect the trim, use car wax.

## Care of plastics

Plastic parts, such as decorative stripes, panels, bumpers, etc., will come clean during normal car washing. Should additional cleaning or spot removal be necessary, use a soft brush or cloth soaked with a mild detergent solution. Then rinse thoroughly and immediately with clear water.

**Do not use anything** which could mar the finish of the plastic surface, such as wax or polish, harsh detergents or chemical cleaning solvents.

## Touch-up paint

Your dealer has touch-up paint for minor scratches and stone chips. Scratches should be touched up soon after they occur.

The paint code for your car is on the vehicle identification labels (see page 8).

## Care of chassis

The underside of the car picks up dirt and salt and should be sprayed with a powerful jet of water. This is easier to do after the car has been driven in rain.

## Cleaning wheel covers

Use a wet sponge or cloth.

**Never use steel wool or a wire brush.**

## Removing spots

**Do not use gasoline, kerosene, naphtha, nail polish remover or other volatile cleaning fluids. They may be toxic, flammable or hazardous in other ways. Only use spot removing fluids in well ventilated areas. Keep them out of reach of children.**

## Tar

Do not allow tar to remain on the paint finish. Remove it as soon as possible with a cloth soaked with a special paint cleaner. If you do not have a tar remover, you may

substitute with turpentine. After applying a cleaning fluid, always wash with a lukewarm soap/water solution and apply a new wax coat.

## Insects

Remove as soon as possible with a lukewarm soap/water solution or apply insect remover.

## Tree sap

Remove with a lukewarm soap/water solution. Do not allow tree sap to harden on the paint surface.

## Cloth upholstery and carpet

Clean with a vacuum cleaner or a hard bristle brush. Dirt spots can usually be removed with a lukewarm soap/water solution.

Use spot remover for grease and oil spots. Do not pour the liquid on the cloth material. Dampen a clean cloth and rub carefully, starting at the edge and working inward.

## Leatherette and interior trim

Use all-purpose cleaner or a dry foam cleaner. Grease or paint spots can be removed by wiping with a cloth soaked with all-purpose cleaner. Leatherette parts of the headliner and side trim panels can be cleaned with a soft cloth or brush and all-purpose cleaner.



## Fuses and relays

A failure in the electrical system may be caused by a burned fuse or a defective relay. The fuse panel with plug-in arrangement for relays is located under the dashboard on the left hand side of the steering column.

### Replacing a fuse

Before replacing a fuse, turn off all lights and accessories and remove the ignition key to avoid damaging the electrical system.

When replacing a fuse, do not hold fuse by its metal parts. In case of a repeated short circuit, the new fuse will burn out again, causing possible injury.

- Take cover off.
- Turn all fuses between contact springs until metal fuse strips face upward. In a blown fuse the metal strip is separated.  
To replace a fuse, simply depress a contact on either side of the fuse.
- Carefully install new fuse with metal strip facing upward. The fuse must fit tightly between the contact springs – do not bend the springs.

46 ● Reinstall cover.

If a fuse blows repeatedly, do not keep on replacing it. The cause of the short circuit or overload must be found.

On no account should fuses be patched up with tin foil or wire as this may cause serious damage elsewhere in the electrical circuit. It is advisable to always carry a few spare fuses in your car.

**Fuse arrangement** according to the numbers on fuse panel cover      Amp.

1	Tail light left, parking light left, sidemarker light left	8
2	Tail light right, parking light right, license plate light, side-marker light right	8
3	Low beam left	8
4	Low beam right	8
5	High beam left, incldg. indicator lights	8
6	High beam right	8
7	Accessories, Radiator fan (Diesel engine)	16
8	Interior lights, cigarette lighter, stop lights	8
9	Emergency flasher system (HAZARD)	16
10	Windshield wiper/washer pump, rear window defogger	16
11	Turn signals	8
12	Horn, back-up lights	8

**Additional fuses** – in separate fuse holders located at right side of fuse panel

– Blower fan	16
Rear window wiper	16



The fuses for the **auxiliary heater** are arranged as follows:

#### **Temperature control**

16 Amp fuse No. 10 in fuse panel.

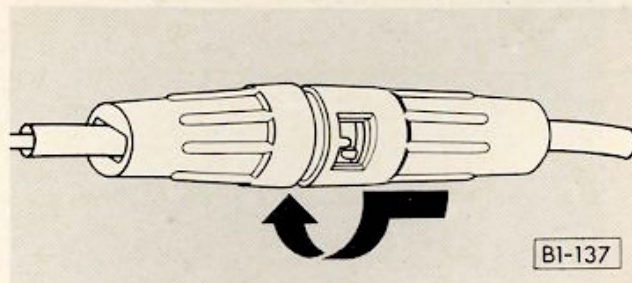
#### **Heater booster** (overheating switch)

8 Amp fuse located at right side of fuse panel underneath dashboard.

#### **Blower fan**

16 Amp fuse located in an in-line fuse holder at right side of fuse panel underneath dashboard.

Plug connector for **electric fuel pump** is located in engine compartment on left side.



To replace a fuse in an in-line fuse holder, pull the holder out of the clip, where necessary. To open the holder, grasp both ends of the holder, press lightly together and twist counterclockwise. Install fuse. To close the holder, put both ends together again, press lightly and twist clockwise.

## **Plug-in relays**

To preclude any possibility of damage, we recommend you have a defective relay checked and exchanged by your authorized dealer.



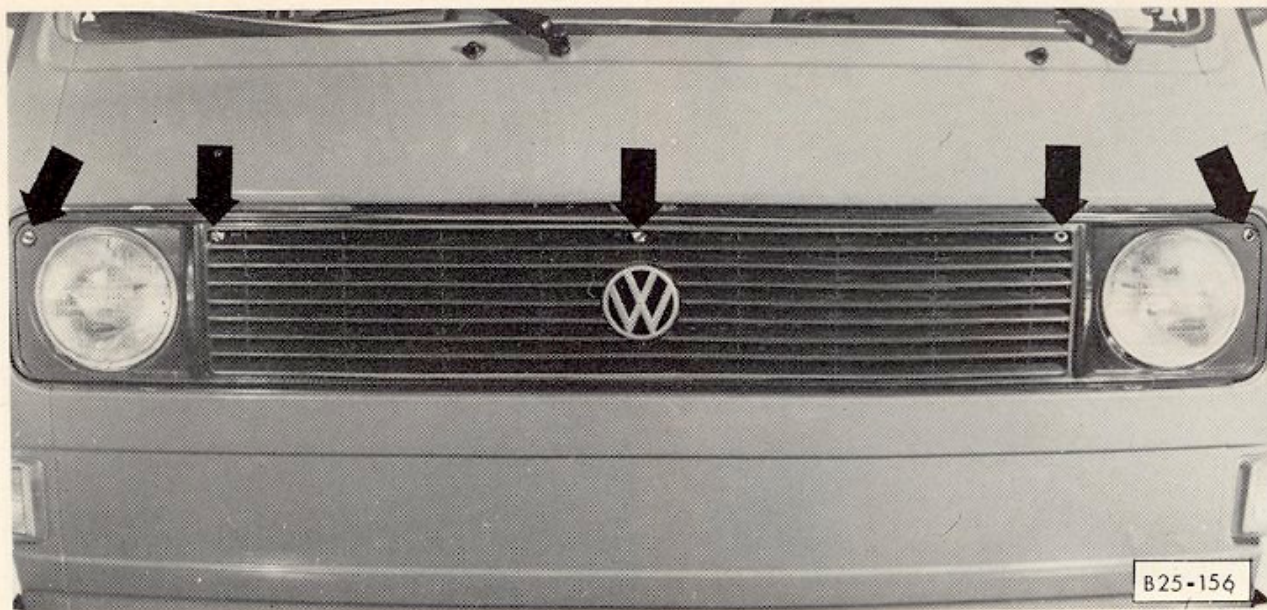
## Bulb chart

\* Always verify part number with your VW dealer

Bulb for	Trade No.	U.S. VW Part No.*	Canada VW Part No.*
Sealed beam headlights .....	H 6014 or 6014	N 191 411 or ZVP 118 114	N 19 141 1 or N 17 614 2
Front turn signal/parking lights .....	1034	ZVP 118 034	N 17 738 2
Front and rear side marker lights .....	1816	ZAP 118 816	N 17 717 2
Rear turn signal .....	1073	ZVP 118 073	N 17 732 2
Stop/tail lights .....	1034	ZVP 118 034	N 17 738 2
Back-up lights .....	1073	ZVP 118 073	N 17 731 2
License plate light .....	89	ZVP 118 089	N 17 719 2
Interior lights .....	211	ZVP 118 211	N 17 723 2

All dashboard lights, such as illumination of instruments, operating controls, indicator and warning lights, should be repaired if necessary by your VW dealer.





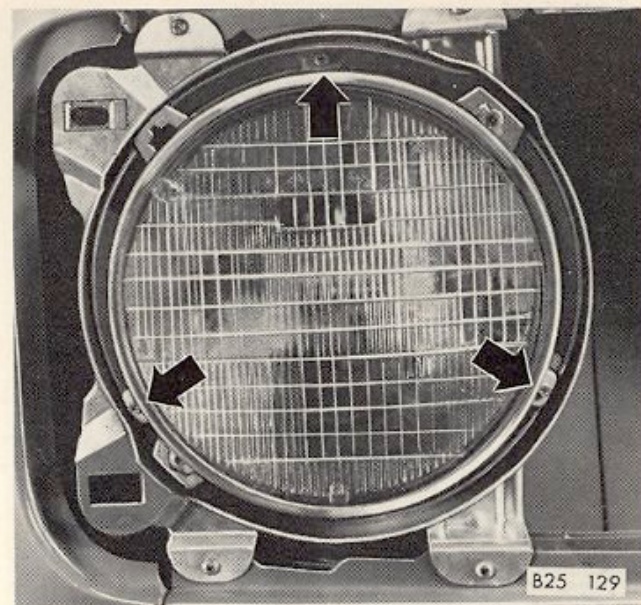
## Replacing bulbs

### Headlights

Your Volkswagen is equipped with double filament seven inch sealed beam units.

Should it become necessary to replace a headlight, the air intake grille must be removed first.

- With a screwdriver loosen the five quick-release screws along upper edge of grille.
- Pull the grille slightly toward you.
- Then lift the grille out of its retainer.



- Remove the three short screws in the sealed beam retaining ring and take the ring off.
- Do not alter the position of the long headlight adjustment screws.
- Take the sealed beam unit out of the support ring and pull the cable connector off.

**When installing a new sealed beam unit, be sure the three lugs on the headlight engage properly in the support ring.**

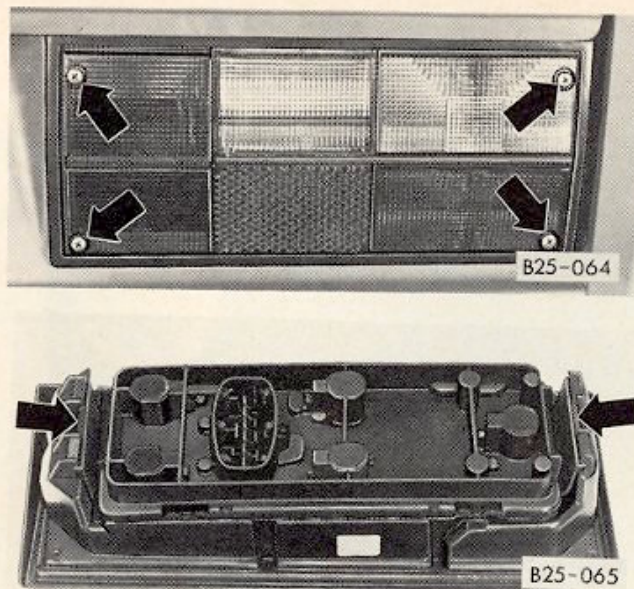
If no other headlight part as described here was removed or its position changed, it should not be necessary to aim the headlights. If in doubt have the adjustment checked by your dealer.





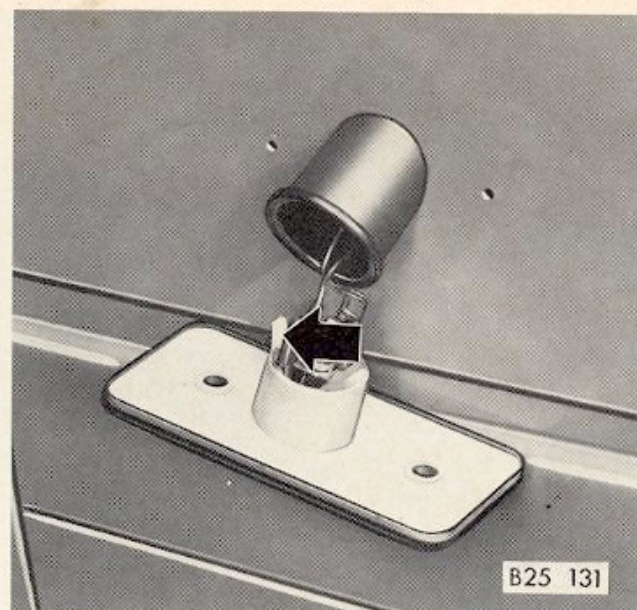
### Front turn signal / parking light bulb / front side marker light bulb

- Remove the two Phillips screws and take off the lens cover.
- Pull out bulb holder and push down the rubber boot.
- Press spring clip inward and take out bulb holder.
- Give bulb a left turn and remove.
- Replace bulb and reverse the above procedure to install bulb holder and lens cover.



### Rear turn signal, stop/tail/back-up light bulb

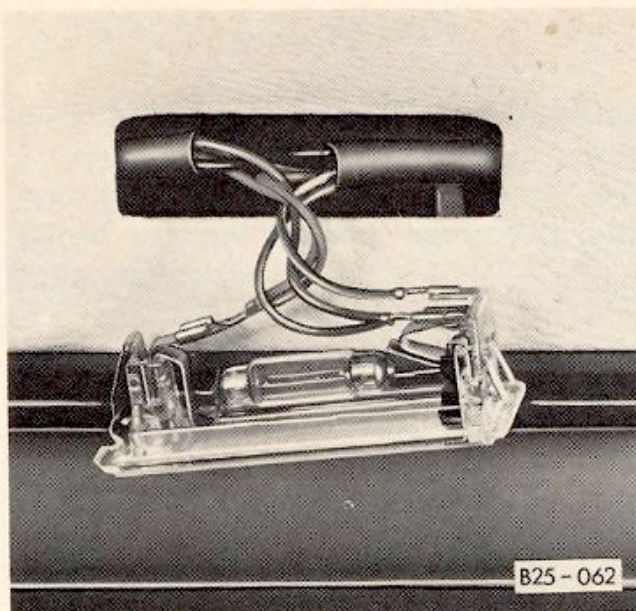
- Remove the four Phillips screws and take off lens cover with bulb housing.
- Squeeze the two side springs inward (arrow) and lift out the bulb housing.
- Press defective bulb into bulb holder, turn left and take out bulb.
- Replace bulb and reverse the above procedure to install bulb housing with lens cover.



### Rear side marker light bulb

- Remove the two Phillips screws and take off lens cover.
- Pull out bulb holder and push down the rubber boot.
- Press spring clip outward and take out bulb holder.
- Give bulb a right turn and remove.
- Replace bulb and reverse the above procedure to install bulb holder and lens cover.





## Interior light

- To remove lamp, press against spring clip on left side and lift out the housing.
- Take out bulb from between the two spring contacts and install new bulb.
- Install lamp by inserting switch side of housing into cut-out first.
- Then press in the other side until spring clip engages.

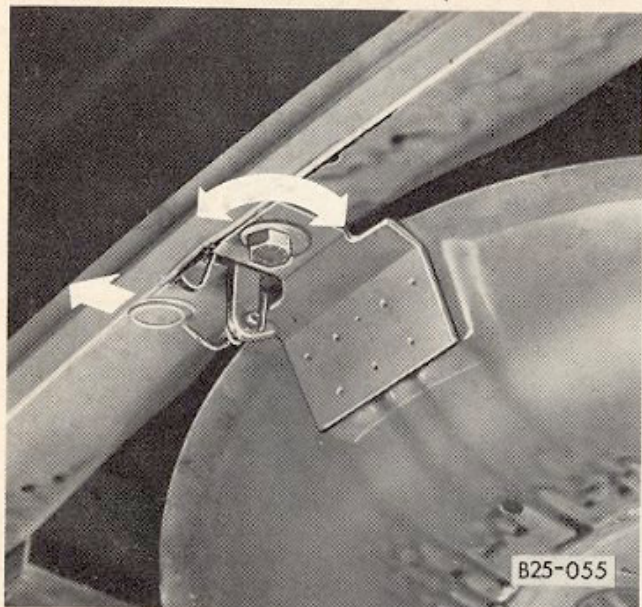
## License plate light bulb

There is one bulb housing on each side of the license plate. Only if both bulbs are operative is the license plate properly illuminated.

- Take the bulb housing off by pulling it down.
- Remove the two Phillips screws and take off lens cover.
- Press bulb into housing, turn left and take out.
- Replace bulb and reverse above procedure to install bulb housing and lens cover.

Make sure the spring clip on each side of the housing is securely engaged in the cut-outs provided at upper edge of cross panel.





## Spare wheel

The spare wheel is located underneath the floor panel of the driver cab, where it rests on a tiltable metal plate.

- To take out the spare wheel, remove the bolt (curved arrow) from the holding bracket with lug wrench and breaker bar.

**Caution: Keep hands and arms away from underbody of vehicle.**

- Stand in front of the vehicle and pull the catch hook (arrow) forward to let the metal plate drop.

52 ● Pull out the spare wheel.



- When re-installing the spare wheel, slide spare wheel onto metal plate.
- Give the plate a hard upward push and make sure the catch hook is securely engaged.
- Replace bolt and tighten firmly.

**Caution: Never drive the vehicle without a firmly tightened bolt on the holding bracket. Should the catch hook disengage accidentally, you could lose control of the car.**

Check the inflation pressure periodically to keep the tire ready for use.

## Jack and tools

**Use the jack only for changing a wheel. Never jack up heavier cars or other loads with it. The car jack must never be used as a support to work underneath the car. If the jack is accidentally dislodged, you could be seriously injured. When working under the car, always use safety stands specifically designed for this purpose.**

The jack and the tools necessary to change a wheel are in a bag stored under the driver's seat.



# Changing a wheel

If you have a flat tire, move a safe distance off the road, turn on the emergency flasher and mark the position of your car with flares or other warning devices to alert other motorists.

Before you change a wheel, be sure the ground is level and firm. If necessary, use a board.

Set the parking brake and block the wheel opposite the defective wheel on the other side of the car.

Never jack the car up by the bumper or body.

## Step 1

- Take out the bag with jack and tools from under the driver's seat.

## Step 2

- With the wheels still firmly resting on the ground, remove the hub cap/wheel cover of the defective wheel.



## Wheels with wheel cover

- The wheel cover can be pulled off by hand.



## Wheels with hub cap

- Insert the puller in the holes at the rim of the hub cap. Put the breaker bar through the puller, brace one end of the bar on the wheel rim and tug lightly on the other end.

When you place the hub cap face down, you can use it as a tray for lug bolts (front wheels) or lug nuts (rear wheels).



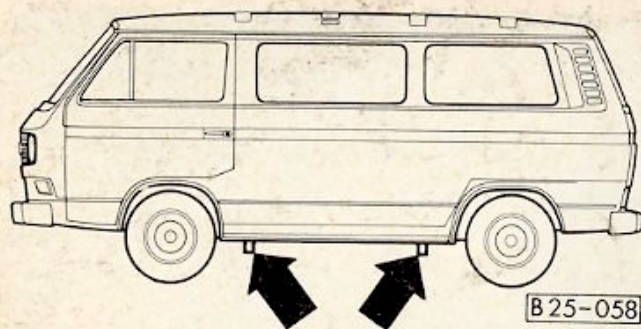
To loosen – turn counterclockwise

To tighten – turn clockwise

## Step 3

- Loosen wheel nuts or bolts counterclockwise about one turn with the lug wrench. Insert the breaker bar to make full use of its leverage. **Do not yet remove the nuts or bolts.**





#### **Step 4**

There are two jack ports on each side under the car body for front and rear wheel changing.

Jacking at any other place may damage the car or may result in injuries.

Provide a **firm base for the jack on the ground**. If necessary, use a board.

- Securely insert the jack into the jack port closest to the wheel to be changed.
- Before inserting jack, clear jack port.
- Place jack as straight as possible, as shown.

#### **Step 5**

**Never jack the car up by the bumper or body.**

**Do not raise the car until you are sure the jack is securely engaged.**

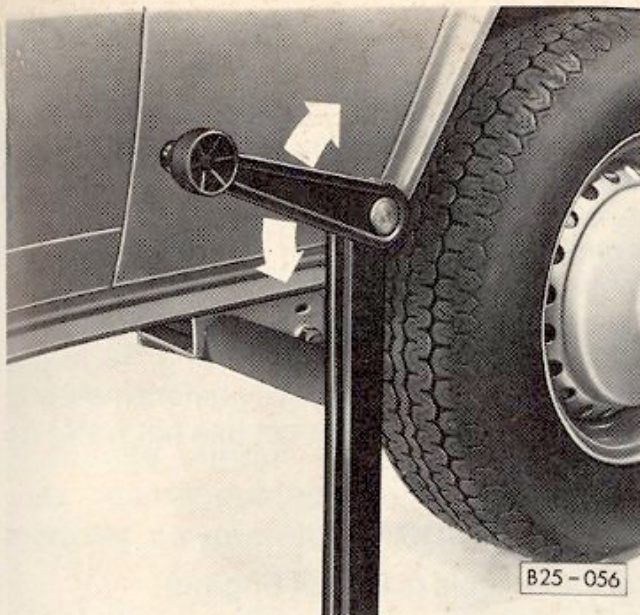
Passengers should not remain in the car when the car is jacked up.

- **To raise** the car, turn the handle clockwise.  
Only raise the car as much as is needed to change a wheel.

#### **Step 6**

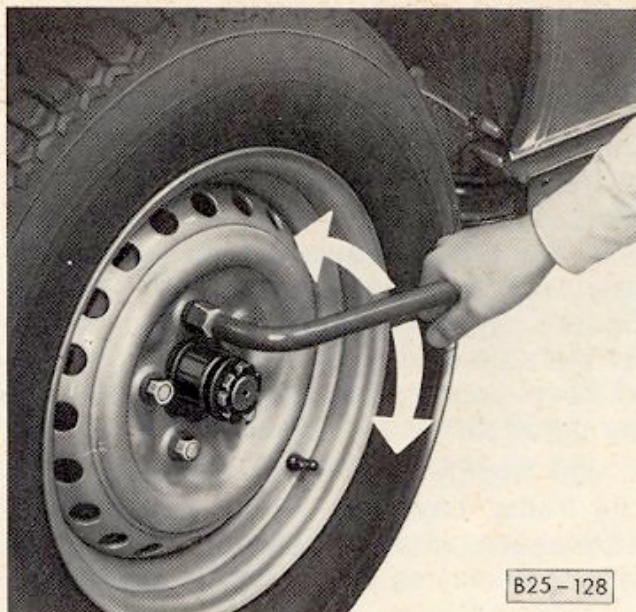
- Fully unscrew wheel nuts or bolts and place them into the hub cap. Take the tap nut or bolt off last. Place the spare wheel against the wheel hub and slightly rotate the wheel until a bolt hole in the wheel is in line with a threaded stud in the wheel hub. Reinstall nuts or bolts and tighten them cross-wise by hand before jacking the car down.





### Step 7

- To lower the vehicle, turn the handle counterclockwise.



### Step 8

- Then go crosswise from one nut or bolt to another tightening them firmly with the lug wrench and breaker bar.
- **Correct tightness of the wheel nuts is important.**

Correctly tightened nuts or bolts should have a torque of 108 ft lb / 15 mkg. This torque can be obtained with the socket wrench and breaker bar by any person of average strength. If in doubt about the correct tightness of the wheel nuts, have it checked with a torque wrench by your dealer or at service station.

### Step 9

- To install the hub cap, place it around the lower part of the wheel center. With a firm blow of your hand on the upper part, the hub cap will snap into place. Make sure it is firmly seated.

### Step 10

- Fully lower the car and remove jack.
- Adjust the air pressure of the tire you have just put on. For correct tire inflation pressures, see the sticker on the left doorjamb.
- Store the jack and tools under the driver's seat.
- Store damaged tire in spare wheel metal plate under front of vehicle.
- Engage lock for metal plate and firmly secure plate with bolt.
- Have flat tire repaired promptly.



## Winter operation

See page 100 for **Diesel Engine**.

### Engine oil

will tend to thicken at low outside temperatures which may cause starting difficulties.

**Refer to the viscosity chart under "Lubricants"** to be sure the viscosity of the engine oil in your car still corresponds to the outside temperature recommendation.

When using multigrade oils, there is generally less need for a seasonal oil change. Engine oil is necessary to lubricate all moving parts in the engine and also for engine cooling.

If you drive mostly short distances in city traffic, or outside temperatures range below + 10°F (- 12° C) for 30 days or more, have your engine oil changed more frequently.

#### **WARNING:**

- **Make it a habit to check the engine oil level with every fuel filling. Lack of oil may lead to serious engine damage.**
- **Always use the dip stick to check the oil level. The oil pressure warning light is not an oil level indicator.**

See "Engine oil checking and changing" 56 for more details.

### Battery

During the winter months, the battery is subjected to greater use than in the summer. More power is consumed when starting at very low temperatures. Lights, wipers and rear window defogger are used more often. Battery capacity also tends to decrease as temperatures drop. Therefore, it is important to keep your battery in the best possible condition.

If you mainly drive short distances or in city traffic, have the battery checked and, if necessary, charged between regular maintenance services. See "**Battery charging**".

**Do not expose battery to open flame or electric spark as hydrogen gas generated by the battery is explosive. Do not let battery acid come in contact with skin, eyes, fabric or painted surface.**

#### **Windshield wipers**

Always loosen frozen wiper blades from windshield. They may tear otherwise.

#### **Windshield washer**

Always use a windshield washer solvent with anti-freeze to prevent the fluid from freezing. Follow instructions on the can.

**Do not use engine coolant anti-freeze or any other solution that can damage the car paint.**

### Door locks

Door locks can freeze. When washing your car in the winter, do not aim the water jet directly at the locks. Put tape over the keyholes to prevent water from seeping in. Water in the locks should be removed with compressed air. Squirt lock de-icer into the lock cylinders to prevent freezing. To free a frozen lock, warm up the key before inserting it, or warm the lock. Do not use hot water as it will freeze later.

### Spark plugs

(not applicable to **Diesel Engine**)

Make sure the spark plugs are not worn or have a gap larger than 0.028 in or 0.7 mm. For further details on spark plugs see page 61.

### Emergency equipment

It is good planning to carry emergency equipment in your car. Some of the things you should have are: window scraper, snow brush, container or bag of sand or salt, flares, small shovel, first aid kit, etc.

**Winter tires** see page 59

**Snow chains** see page 59



## Tires

Your VW is equipped with tubeless radial tires of either designation:

185 R 14 C 6 PR\*  
or 185 SR 14 Reinforced

\* The "C" type tire also bears the label "Load range C."

From the imprint on the tire sidewall, you can determine which type tire is mounted on your vehicle.

The letter "C" stands for "**commercial**", the European rating similar to the domestic "LT", meaning a tire for light trucks. The words "Load Range C" stand for load range C in a **commercial** tire.

The word "Reinforced" refers to a **strengthened passenger car** tire in the European system of tire rating.

The original equipment tires on your vehicle conform to all applicable Federal Motor Vehicle Safety Standards.

## Tire pressures

For good car handling and long tire service life, it is important to maintain recommended tire pressures. Tires inflated above or below specifications can cause increased wear, high gas consumption and affect road-holding of the car.

VW-recommended **cold tire inflation pressures** are listed on a sticker on the left doorjamb.

Note pressure difference between front and rear wheels.

**Always use tire pressure gauge when checking inflation pressures. Do not exceed the maximum tire inflation pressure listed on the tire sidewall. Cold tire inflation pressure means:** when a car has not been driven for at least 3 hours or less than 1 mile.

Always include the spare when checking tire pressure.

## Wheel balancing

A wheel should always be balanced after a tire repair. Even with regular use a wheel can get out of balance, and should therefore be balanced from time to time. Unbalanced wheels may affect car handling and tire life.

## Tire replacement

In the interest of maximum safety and best all-around car handling, always buy replacement tires that have the same specifications with regard to tire size, design, load carrying capacity, tread pattern, tread depth etc. This also applies to VW-recommended alternate replacement tires.

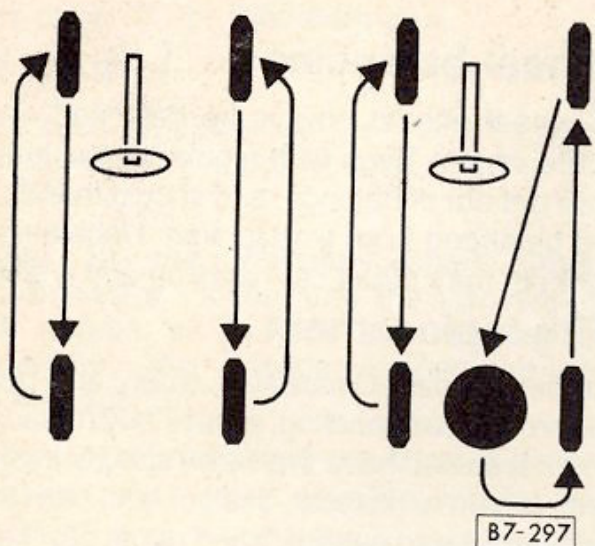
If your tires are worn beyond safe limits, replace all 4 tires at the same time. If this is not possible, replace tires in pairs, either front or rear. Do not combine tires of different design, size or tread pattern. Tire specifications are imprinted on the sidewall of the tires. If in doubt, check with your VW dealer.

Whenever replacing a tubeless tire, always install a **new** valve stem.

New tires do not possess maximum traction. They tend to be slippery. Break new tires in by driving at moderate speed for the first 100 miles or 160 kilometers.

Tire repairs should be left to a specialist only. 57





## Tire Life and Rotation

Tire life depends on various factors, i.e. roads, traffic and weather conditions, driving habits, type of tires and tire care.

Inspect your tires at intervals of at least every 2,000 miles or 3,000 kilometers. If you notice unusual or uneven wear, wheels might need alignment or tires should be balanced. Consult your VW dealer.

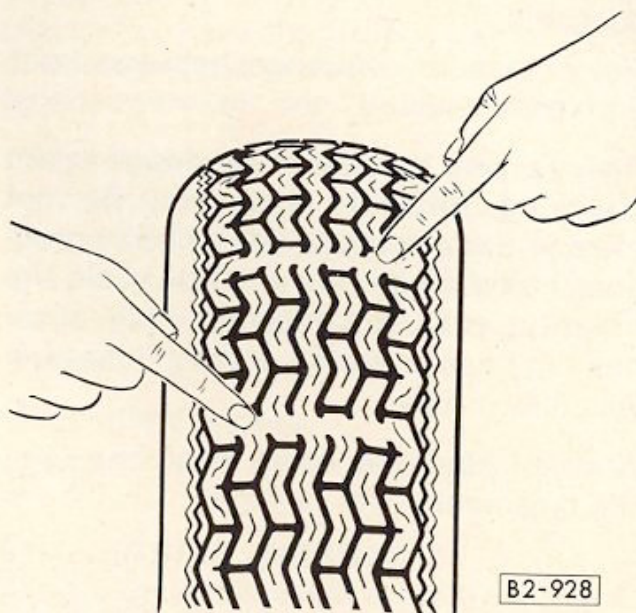
Tire manufacturers recommend rotation every 7,000 miles or 12,000 kilometers to promote longer tire wear. Wheel rotating and balancing, although an expense to you, will help to increase tire

58 life.

The sketch on the left illustrates how tires can be rotated, depending on whether or not you want to include your spare tire.

**Tires must always remain on same side of vehicle.**

After rotation adjust tire pressure and torque wheel nuts diagonally to 123 ft lb / 17 mkg (Please refer to "Changing a wheel" on pages 49–51).



## Tire wear

The original equipment tires on your VW have built-in tread wear indicators. They are molded into the bottom of the tread grooves and will appear as approximately  $\frac{1}{2}$  in (12.5 mm) bands when the tire tread depth becomes  $\frac{1}{16}$  of an in (1.6 mm). When the indicators appear in two or more adjacent grooves, it is time to replace the tires. We recommend, however, that you do not let the tires wear down to this extent. Worn tires cannot grip the road surface properly, and are even less effective on wet roads.

**Do not drive with worn tires or tires showing cuts or bruises as they may lead to sudden deflation.**

If you notice that tires are wearing unevenly, consult your VW Dealer. Uneven wear may not always be due to improper wheel alignment. It can be the result of individual driving habits such as cornering at high speeds.

If the tire pressure is not checked and adjusted regularly, abnormal tire wear can also occur.



## Tire care

- Avoid damaging tires and wheel rims. If you must drive over a curb or other obstacle, drive slowly and at an angle. Frequently check tires for uneven wear and damage.
- Remove imbedded material.
- Replace worn or damaged tires in time.
- Replace missing valve dust caps.
- Keep oil and gasoline from tires.
- Keep tires inflated correctly.

## Winter tires

Winter tires are not absolutely essential on cars with radial ply tires, because radial ply tires are very good on winter roads.

Better are, however, radial ply M+S tires. For a better grip on snow and ice, you may want to use winter tires with studs, but **check with your local Motor Vehicle Bureau for possible restrictions.**

Cold tire inflation pressures in winter tires should be increased by 3psi, front and rear.

Winter tires should have the same load capacity as original equipment tires and should always be mounted on all four wheels. **Winter tires with studs** should be run at moderate speeds when new in order to give the studs time to settle.

Tires with badly worn treads and studs are very dangerous. Make sure they are replaced in time. Winter tires do not fulfill their purpose if the tread depth is less than  $\frac{5}{32}$ " (4 mm).

For safety reasons, it is not advisable to drive a vehicle mounted with winter tires at top speed. You cannot expect winter tires to have the same degree of traction on dry, wet or snowfree roads as a normal tire.

Furthermore, winter tires wear rapidly under these conditions, particularly at high speeds.

## Removing and storing tires

The driving direction should be clearly marked on all tires before removing them for storage. This is to make sure that they are mounted and run in the same directions as before. When remounting, put the tires with the most tread depth at the front. Have the tires/wheels balanced as soon as possible.

Store tires in a cool and dry place.

## Snow chains –

**use for rear wheels only**

**Check with local authorities for possible restrictions.**

Only use chains with fine pitch links protruding no more than  $\frac{1}{2}$  in/15 mm from tire tread and side walls, including tensioner. Wheels must rotate freely in all steering positions with chains mounted to prevent damage to body, axles or brake components. Remove chains when roads are free of snow.



## Exercise extreme caution when working on the engine

The engine compartment of any motor vehicle is a potentially hazardous area. If you are not fully familiar with proper repair procedures, do not attempt the adjustments described on the following pages. This caution applies to the entire vehicle.

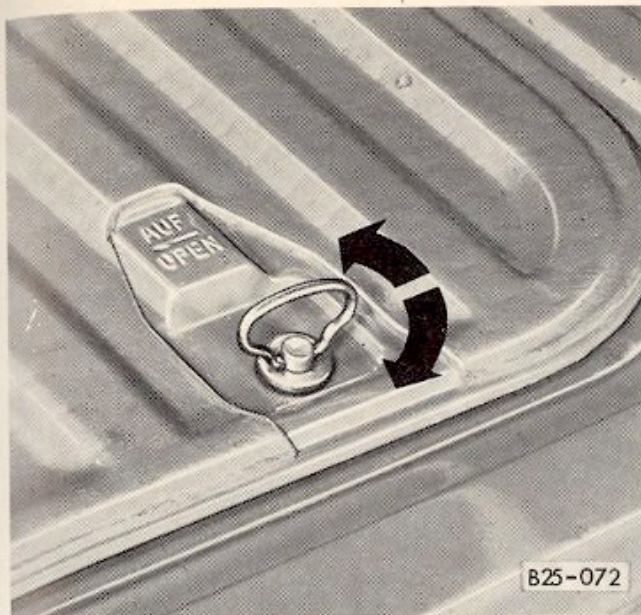
- Before working on any part in the engine compartment, turn the engine off and let it cool down sufficiently. Hot engine compartment components can burn skin on contact.
- Exercise extreme caution to prevent neckties, jewelry or long hair from getting caught in the V-belt, the drive belts or any other moving engine parts.
- If work has to be done with the engine running, always set the parking brake, and make sure the shift lever is in either Neutral or Park.
- Always support your car with safety stands if it is necessary to work underneath the car. The jack

supplied with the car is not adequate for this purpose.

- When working under the car without safety stands but with the wheels on the ground, make sure the car is on level ground, that the wheels are blocked with wedges and that the engine cannot be started. REMOVE THE IGNITION KEY.
- Be alert and cautious around engine at all times while the engine is running.
- Do not smoke or allow an open flame around gasoline or battery.
- Keep a fire extinguisher in close reach.

- Incomplete or improper servicing may cause problems in the operation of the car. If in doubt about any servicing, have it done by your Authorized VW Dealer or any other properly equipped and qualified workshop.
- Improper maintenance during the warranty period may affect your warranty coverage.





## Engine compartment

You have access to the engine compartment lid from inside the luggage compartment.

**To open** the lid, roll the floor covering out of the way and turn both lock handles to the left.

**To close** the lid, reverse the above procedure.

## Cleaning or replacing spark plugs

(not applicable to Diesel Engine).

Turn the engine off and let it cool down.

### Removing spark plugs

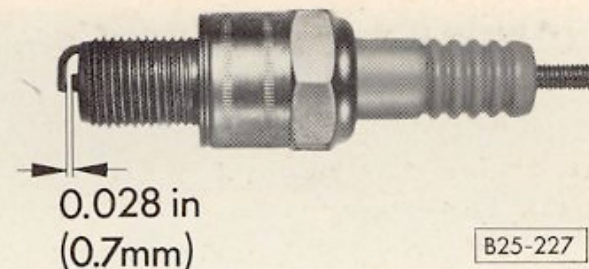
Grasp the spark plug connector and pull it off. Do not pull the ignition wires as they may separate from the connectors.

Unscrew the spark plugs with a suitable spark plug wrench.

### Cleaning spark plugs

Dirty spark plugs should be cleaned with a sand blaster, but if not available, the carbon can be removed with a wood or plastic pick. Do not use a wire brush. The plugs should also be clean and dry on the outside to avoid shorting and arcing. **The gap can be set by bending the outside electrode. The gap should be 0.028 in / 0.7 mm.**

Always heed CAUTIONS on page 60.



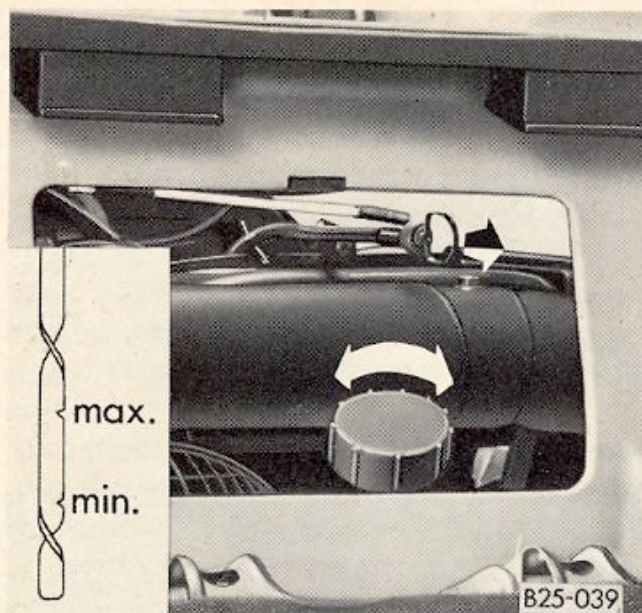
### Installing spark plugs

Insert them by hand and screw them into the cylinder head as far as they will go. Only then use the spark plug wrench to tighten them firmly. Do not overtighten.

Spark plugs should be replaced according to the Maintenance Schedule, or when deposits, oil fouling or wrong heat range cause misfiring.

**Never remove a spark plug wire while the engine is running to check fouling or misfiring. Unburned fuel entering the catalytic converter can cause expensive damage.**





The engine oil dipstick and the oil filler neck are located behind the license plate.

#### CAUTION:

Lack of sufficient engine oil may lead to severe engine damage. The oil pressure warning light is not an oil level indicator.

Always heed CAUTIONS on page 60.

## Engine oil

### Checking the level

See page 97 for **Diesel Engine**.

- To get a true reading, the car should be on level ground. After turning off the engine, wait a few minutes for the oil to return to the crankcase.
- Flip license plate down.
- Pull out dipstick and wipe it clean with a rag.
- Reinsert dipstick; push it in all the way for an accurate reading.
- Pull dipstick out again. The oil level is correct if it is between the "max" and "min" marks on the dipstick.
- If oil level is below "min" mark, or not showing on dipstick, add oil immediately.

**Make it a habit to have the engine oil level checked with every fuel filling. The difference between the "min" and "max" marks on the dipstick is about 0,5 U.S. quart or 0,6 liter.**

**The engine in your car depends on oil to lubricate and cool all of its moving parts. Therefore the engine oil should be checked regularly and kept at the required level.**

The correct oil grade and viscosity recommendation is given under "Lubricants".

### Engine oil consumption

It is normal for your engine to consume oil. The rate of oil consumption depends on the quality and viscosity of oil, the speed at which the engine is operated, the climate, road conditions as well as the amount of dilution and oxidation of the lubricant.

Because of these variables, no standard rate of oil consumption can be established, but drivers should expect an increased oil consumption at high speeds and when the engine is new.

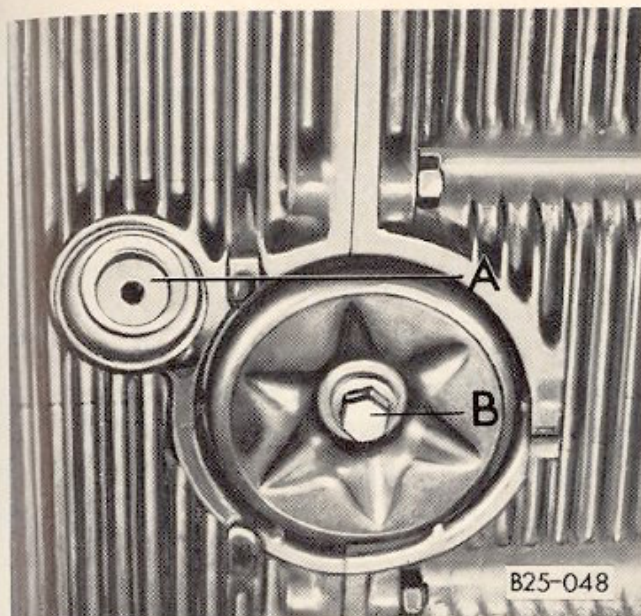
#### Adding engine oil

- Unscrew cap from oil filler neck.
- Pull extension tube out of filler neck as far as it will go.
- Only add the amount of oil needed.
- Check oil level with dipstick. It should be between the "min" and "max" marks.
- Push in the extension tube, replace filler cap and hand tighten securely.

**The oil filter cap must be secure to avoid oil spill causing fire hazard.**

**Always heed CAUTIONS on page 60.**





## Changing the engine oil

See page 99 for **Diesel Engine**.

Change the engine oil at specified mileage intervals, but at least twice a year (see Maintenance Schedule). This is very important as the lubricating properties of oil diminish gradually during normal operation of the car.

We recommend more frequent oil changes if you drive your car only short distances during the winter months.

Always heed **CAUTIONS** on page 60.

- Drain the oil when the engine is still warm. Remove the drain plug — A — first. After the oil is drained, take out the oil strainer by removing the center nut - B - and clean it. The cleaning of the strainer should be done at specified mileage intervals (see Maintenance Schedule). Use new gaskets and washers when reinstalling the strainer to be sure no oil leak will develop later.

### Important

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

**CAUTION:** When removing oil drain plug with your fingers, keep your arm as high as possible. This will prevent hot oil from running down your arm. Wear eye protection.

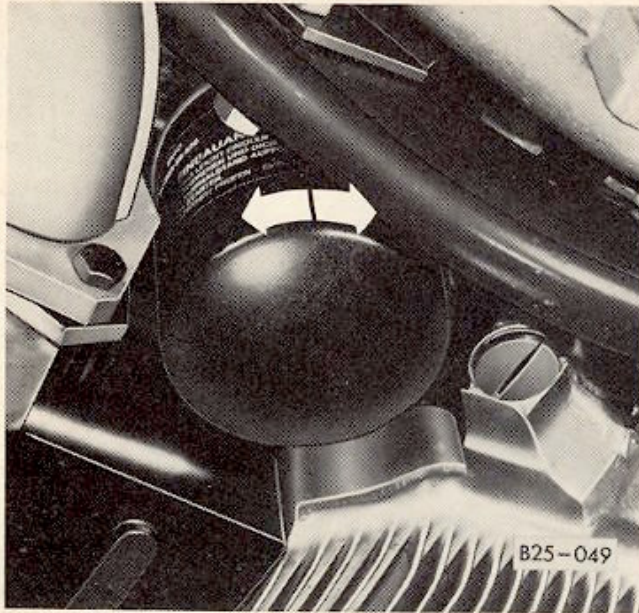
- Fill the engine with oil labeled "For Service API/SE". For the right oil viscosity, see "Lubricants".

Engine oil capacity is listed under "Capacities".

**Be mindful of how you dispose of the engine oil. Do not dump it in streams or down sewage drains. Check your local ordinances.**

Because of detergent additives in the oil the fresh oil will look dark after the engine has been running for a short time. This is to be expected, and there is no reason to change the oil more often than recommended by the manufacturer.





## Changing the oil filter

See page 98 for **Diesel Engine**.

The oil filter should be changed at the intervals listed in your **Maintenance Schedule**

- loosen oil filter element with appropriate wrench and remove
- lightly coat new filter seal with oil
- screw on new filter element until seal just contacts the crankcase
- only hand-tighten according to filter manufacturer's instructions on the carton or on the filter element
- run the engine and check for leaks.



## Manual Transmission Oil

Both transmission and final drive are combined in one housing. The lubricant used is hypoid oil which does not have to be changed.

The transmission is checked for leaks during the maintenance service. Should the need arise to replenish the oil filling, it should only be done with the necessary workshop equipment.

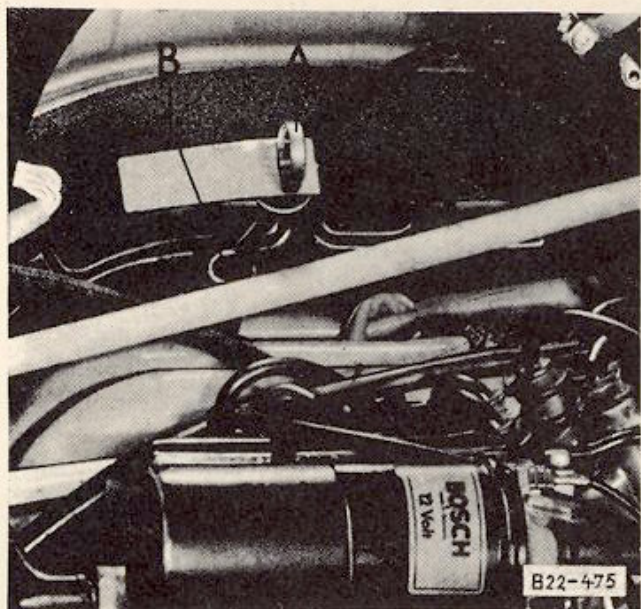
## Automatic Transmission Fluid

The torque converter and the transmission are lubricated with Automatic Transmission Fluid (ATF). The final drive requires hypoid oil SAE 90 only.

**Do not tow the car or run the engine when there is no ATF in the transmission.**

### Checking the ATF level

The ATF has to be checked at frequent intervals, for instance, when the engine oil is being checked, but at least at the specified intervals (see Maintenance



A = dipstick

B = filler neck

Schedule). A correct ATF level is very important for the proper functioning of the transmission.

The reading should be done when the ATF is warm; with the engine idling, the selector lever in Neutral and the parking brake applied.

**Always heed CAUTIONS on page 60.**

The ATF filler neck is in the engine compartment on the left hand side. The dipstick is attached to the plug. Pull it out and wipe it clean first before inserting it to take a reading.

The Automatic transmission may be damaged by even a tiny speck of dirt. Only use lint free rags to wipe the dipstick. Use a clean funnel or spout when adding ATF.

You have enough ATF if the fluid level is between the two marks on the dipstick. It should never be above or below these marks.

If level is too high or too low do not just add or drain ATF. Have your dealer check and correct the cause as soon as possible.

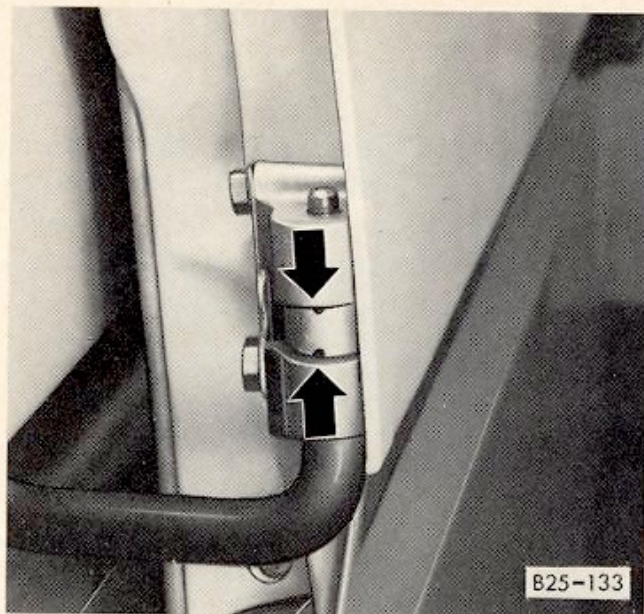
For correct ATF specifications, see "Lubricants."

### Changing the ATF

The complete ATF filling has to be changed at recommended mileage intervals. The ATF filling should be changed more frequently under heavy duty conditions such as continued stop-and-go driving, extended mountain driving, and at extremely high outside temperatures (see Maintenance Schedule).

**The transmission oil in the final drive does not have to be changed.**





## Door hinges and locks

The hinges of the sliding door and the rear lid should be lubricated about every 6 months.

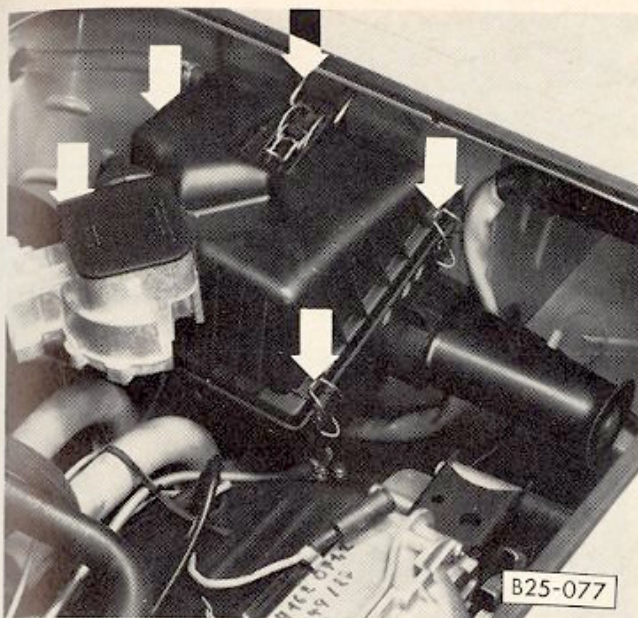
Make it a habit to lubricate the hinges of all other doors regularly and as often as necessary.

Use a few drops of SAE 30 engine oil.

Wipe off excess oil with a cloth.

Lubricate the **door lock cylinders** with graphite. Dip the key into graphite and turn it in the lock a few times.





## Air cleaner

All dust present in the air drawn in by the engine is retained by the filter element in the air cleaner.

A dirty filter element not only reduces the engine output but can also cause premature engine wear.

Normally, it is not required to service the air cleaner more often than recommended in the Maintenance Schedule. If the vehicle is driven on very dusty roads, the air cleaner must be serviced more frequently, even daily.

## To clean or replace the filter element

See page 98 for **Diesel Engine**.

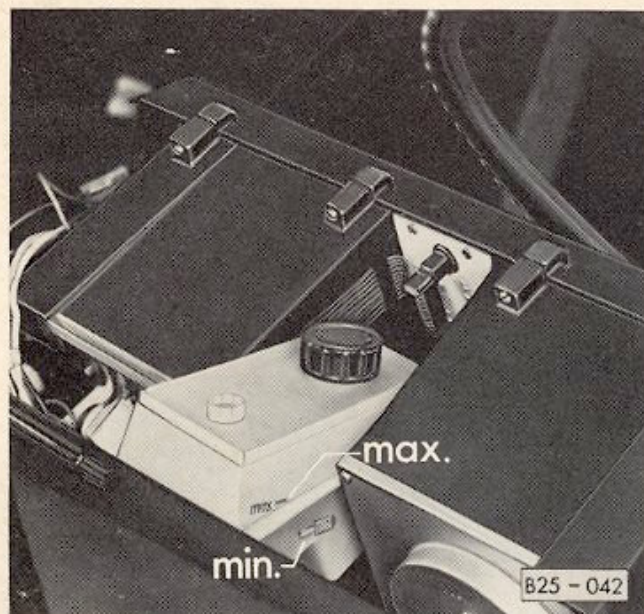
- Unfasten the 5 quick-release clamps (see illustration).
- Lift up top of filter element housing.
- Remove filter element and shake to remove dirt or, if necessary, replace.
- Carefully place filter element into lower part housing and make sure it is seated correctly.
- Press top onto lower housing and secure the two upper clamps.
- Then secure the 4 clamps on sides of housing.

### Note:

The paper filter element must never be cleaned or soaked with gasoline, cleaning fluids or oil.

Always heed **CAUTIONS** on page 60.





## Brake fluid reservoir

The brake fluid reservoir is located under the instrument cluster in the dashboard panel.

To gain access to the reservoir, grasp the two recesses provided on back of the frame cover and pull up.

When replacing the cover, insert the front edge first, then press the cover down firmly. Make sure it is correctly seated.

The fluid level in the brake fluid reservoir should always be between the two marks "MAX" and "MIN". If the brake fluid level falls considerably below the mark "MIN" the complete brake system should be thoroughly checked by your VW dealer and the cause corrected.

**Do not continue to operate the car.**

**Every 2 years, the brake fluid has to be replaced. See Maintenance Schedule.**

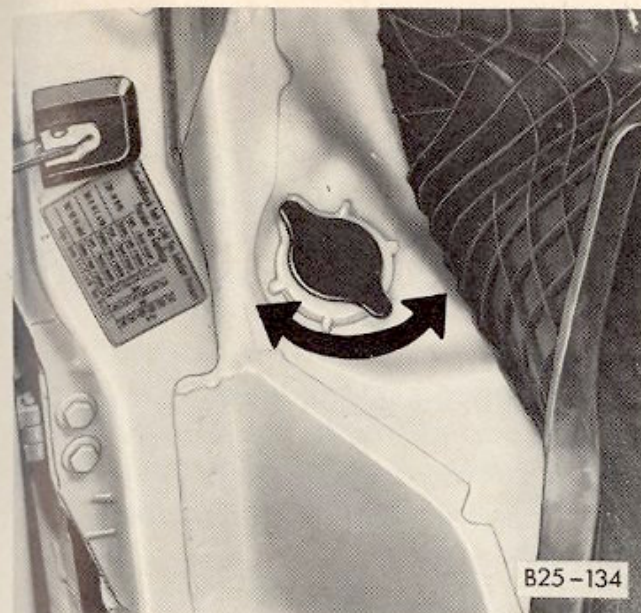
**If brake fluid must be added to the reservoir, use only new and unused DOT 3 or DOT 4 brake fluid that meets SAE specification J 1703 and conforms to Motor Vehicle Safety Standard 116. Using any other brake fluid, or using brake fluid that has absorbed moisture from the open air, or brake fluid that is dirty, may cause premature wear or unreliable braking action. Do not add or mix DOT 5 silicone type brake fluid with the brake fluid in your car as severe component corrosion may result. Such corrosion could lead to brake system failure.**

### **WARNING:**

**Brake fluid is poisonous**

**When adding or replacing brake fluid, make certain to avoid spilling. Brake fluid will damage fabric, paint, plastics and metal. Cover the areas surrounding the reservoir before removing the filler cap.**





## Container for windshield washer fluid

The filler cap is located at the left side of the driver's footwell.

The capacities of the containers are listed under "Capacities".

To fill the container, unsnap cover and unscrew the filler cap. After filling the container, screw the cap on tightly and close cover.

Turn on the ignition and check functioning of the washer/wiper mechanism.

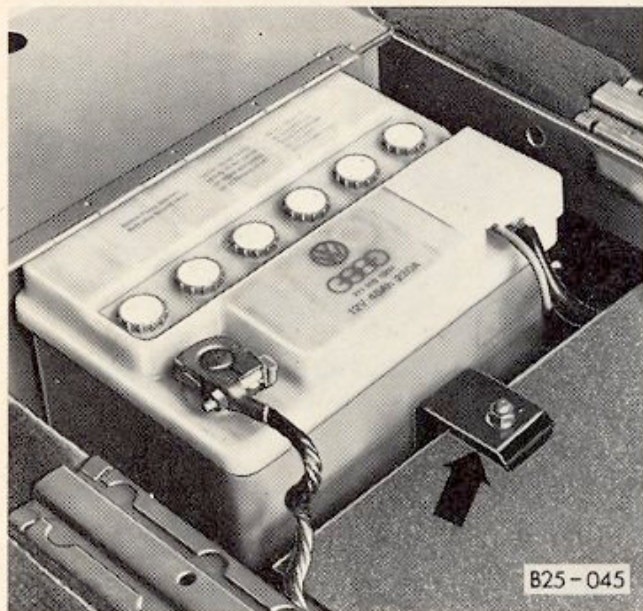
As clear water is usually not adequate for cleaning the windshield, add a cleaning solution to the water. It is a concentrate, so follow the directions on the can for the correct amount to be used.

You can use windshield washer antifreeze and solvent all year round. It helps to keep your windshield clean, and prevents freezing of the washer fluid in the winter.

**Do not use engine coolant, anti-freeze or any other solution. That can damage your car paint.**

**Cars with rear window wiper and washer have an additional container on the right in the luggage compartment.**





## Battery (12 Volt)

See page 99 for **Diesel Engine**.

The battery is located under the **front passenger seat**. To check the battery, move the seat all the way forward. On vehicles equipped with **swivel seats**, turn the seat 180° to the left.

## Electrolyte level

under normal operating conditions and moderate temperatures the battery in your VW is maintenance-free.

At high outside temperatures it is advisable, however, to check the fluid level at regular intervals through the transparent battery housing. The fluid level should always be between the 'min' and 'max' marks in **each** cell.

**If the fluid level is below the 'min' mark, let your VW dealer correct the condition.**

Do not let battery acid come in contact with skin, eyes, fabric, or painted surfaces.

If you get electrolyte in your eyes or on your skin, immediately rinse with cold water for several minutes and call a doctor.

Do not expose the battery to an open flame or electric spark. Hydrogen gas generated by the battery is explosive.

## Cleaning terminals and connections

The terminals and connections should be kept clean and greased with silicone spray or petroleum jelly. Make sure the ground connection to the body is tight and free of corrosion.

**When working on the battery, be sure not to short circuit the terminals. This would cause the battery to heat up very quickly, which could lead to damage.**

**Never drive the car with a disconnected battery as this may damage the electrical system.**

**Note:**

**Before work is done on the electrical system, disconnect the negative ground strap at body and the positive cable. To reconnect battery, reverse the procedure.**



## Charging of Battery

### WARNINGS

- Charge battery in a well ventilated area. Keep away from open flame or electrical spark. Do not smoke. Hydrogen gas generated by the battery is explosive.
- Electrolyte fluid that may spill during charging should be washed off with a solution of warm water and baking soda to neutralize the acid.
- Wear eye protection while connecting and disconnecting battery charger. If you get electrolyte in your eyes or on your skin, immediately rinse with cold water for several minutes and call a doctor.
- Never charge a frozen battery. It may explode because of gas trapped in the ice. Allow a frozen battery to thaw out first.
- Never use a fast charger as a booster to start the engine. This may seriously damage the car's electrical system and the charger.
- Fast charging a battery is dangerous and should only be attempted by a competent mechanic with the proper equipment.

## Slow battery charging

- It is not necessary to remove the battery from under the passenger seat in the driver cabin. It is also not necessary to disconnect the cables.
- Make sure the electrolyte level in each cell is between the "min" and "max" marks. **If the fluid level is below the 'min' mark, let your VW dealer correct the condition.**

Normally, a battery should be charged at no more than 10 percent of its rated capacity. For example, a charging current of 4.5 Amp. would be used on a battery having 45 Ah. Rated capacity of the battery in your car is listed on the battery housing.

Heed all warnings and follow instructions that come with your battery charger.

**Charger cables must be connected POSITIVE (+) to POSITIVE (+) and NEGATIVE (-) to NEGATIVE (-).**

- 1—Charging rate not over 6 Amp.
- 2—Connect charger cables and switch on charger.  
**Do not connect or disconnect charger cables while charger is operating.**
- 3—After charging, turn off charger and disconnect charger cables.

### Note

A replacement battery should always have the same rating as the original equipment battery. Specifications are printed on the battery housing.

### To remove battery from car

- Disconnect negative ground strap.
- Disconnect positive cable.
- Unscrew bolt of holding plate with open end wrench.

### To reinstall battery in car

- Place battery in car and tighten bolt of holding plate.
- Reconnect positive cable.
- Reconnect negative ground strap.



## Emergency starting with jumper cables

### WARNINGS

- Improper use of a booster battery to start a car may cause an explosion.
- Lead-acid batteries generate explosive gases. Keep sparks, flame and lighted cigarettes away from batteries.
- Do not charge a frozen battery, thaw it out first. Gas trapped in the ice may cause an explosion.
- Check electrolyte level in each cell. If it is below the 'min' mark, let your VW dealer correct the condition.
- Make sure the voltage of both batteries is the same.
- The capacity (Ah) of the booster battery should not be lower than that of the discharged battery.
- No attempt should be made to jump start any vehicle with a low electrolyte level in the battery.
- Car with discharged battery: turn off lights and accessories, remove key, move lever to **N** or **P** and set parking brake.
- Car with booster battery should not be running. Disconnect ground cable.

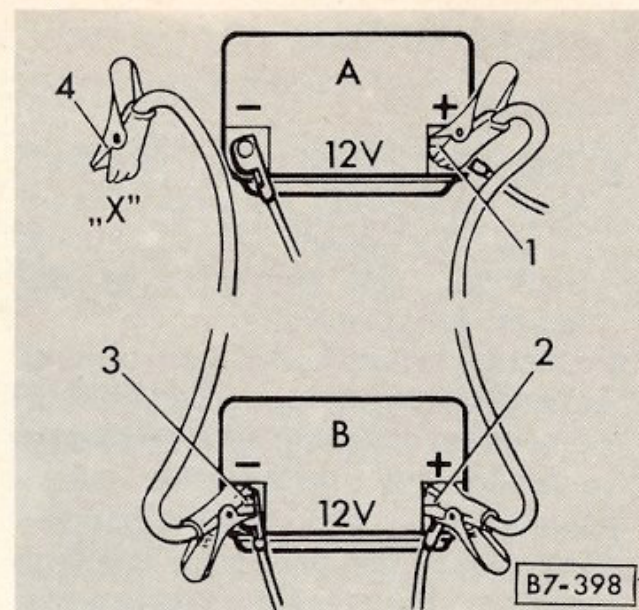
### How to use jumper cables

To avoid serious injury and damage to car, heed all warnings and instructions of the jumper cable manufacturer.

The jumper cables must be sufficiently long for vehicles not to touch.

Improper hook up of jumper cables can ruin the alternator. Always connect POSITIVE (+) to POSITIVE (+), and NEGATIVE (-) to NEGATIVE (-).

1. Connect clamp of plus-cable to positive (+) terminal (1) of discharged battery.
2. Connect clamp on opposite end of cable to positive (+) terminal (2) of booster battery.
3. Connect clamp of minus-cable to negative (-) terminal (3) of booster battery.
4. Connect clamp on opposite end of cable to bolt securing ground strap to body. (4) of car with discharged battery. Connect clamp as far away from battery as possible.
5. Start engine in the usual manner. If engine fails to start, do not continue to crank but contact nearest workshop.
6. With engine running, remove jumper cables from both cars in exact reverse order: Steps 4 through 1.



A – DISCHARGED BATTERY

B – BOOSTER BATTERY

X – To bolt securing ground strap to body

**CAUTION – Cars with Catalytic Converter/Automatic transmission:**

**Do not push or tow this car to start. Damage to the catalytic converter, the transmission and/or other parts of the car may result.**

**Wear eye protection while connecting and disconnecting Jumper cables.**



## Emergency towing by commercial tow truck

Your car can be towed by commercial tow trucks using conventional sling-type gear.

**Never allow passengers to ride in a towed vehicle for any reason.**

**Always tow with rear wheels off the ground**

This restriction does not apply to cars with manual transmission.

If excessive damage or other conditions prevent towing your car with rear wheels off the ground, use wheel dollies.

## Troubleshooting

Your Volkswagen should repay you with trouble free driving if it receives regular maintenance. Should you ever encounter difficulties in starting your engine or have trouble on the road, there are a few repairs which you can make to get your car going again.

- Move disabled car well off the road. Turn on emergency flasher lights. If necessary mark vehicle with road flares or other warning devices.
- If you are not fully familiar with proper repair procedures, do not attempt the checks, adjustments or repairs described on these pages.
- Always support your car with suitable stands if it is necessary to work underneath the vehicle.
- The jack supplied with the car is not adequate for this purpose.

- Be extremely cautious when working on any part of the car to prevent accidental injury. Remove neckties or necklaces; tie long hair back behind your head. Disconnect the battery ground cable after turning off the engine before working on the electrical or fuel system to prevent sparking. Only connect battery if this is necessary for certain test.

**Note:** The adjustment of idling and ignition timing requires special equipment and should only be carried out by an authorized dealer.

See page 103 for **Diesel Engine**.

Locate the condition and probable cause of your trouble in the list on the following pages and follow the directions on what to do. If the trouble is serious or if you are uncertain as to its origin, be sure to see a VW dealer or qualified machanic as soon as possible.

**Always heed CAUTIONS on page 60.**



If you are not fully familiar with proper repair procedures, do not attempt the checks or repairs described on this page. Always heed CAUTIONS on page 60.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
Car will not start: engine will not turn over or turns over too slowly.	1. Run down or dead battery.	1. Charge or replace battery.
	2. Loose connection A. At battery B. At starter C. At ignition switch or fuse box	2. Make sure that all connections are tight. A. Check both cable connections on battery and grounded end of ground strap. B. Check connections at solenoid, mounted on starter, under right rear of vehicle. C. Check push-on connectors behind dashboard.
	3. Starter failure.	3. Ask for assistance.
	4. On vehicles with Automatic Transmission: The selector lever is not in starting position.	4. Shift into Neutral or Park.
Car will not start: engine turns over.	5. Improper starting procedure.	5. Refer to "Starting hints".
	6. No fuel in tank	6. Fill up tank.



If you are not fully familiar with proper repair procedures, do not attempt the checks or repairs described on this page. Always heed CAUTIONS on page 60.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
	<ul style="list-style-type: none"><li>7. Dampness in engine compartment.</li><li>8. Dampness in distributor.</li><li>9. Spark plugs wet, sooty or dirty.</li><li>10. Other failures in ignition or fuel injection system.</li></ul>	<ul style="list-style-type: none"><li>7. Dry ignition coil, ignition wires and distributor components.</li><li>8. Remove distributor cap and rotor and dry them carefully, especially inside of cap, with lint-free cloth.</li><li>9. Install new plugs and check electrode gaps (0.028 in/0.7 mm)</li><li>10. Contact nearest VW dealer.</li></ul>
Engine stalls shortly after starting.	<ul style="list-style-type: none"><li>11. Poor fuel supply.</li></ul>	<ul style="list-style-type: none"><li>11. See paragraphs 13 and 14.</li></ul>



If you are not fully familiar with proper repair procedures, do not attempt the checks or repairs described on this page. Always heed **CAUTIONS** on page 60.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
Engine stalls while vehicle is driven.	12. Failure in ignition system. 13. Fuel supply is exhausted. 14. Fuel filter may be clogged, gasoline may be contaminated by water or dirt.	12. See paragraph 7 through 8. 13. Check whether any gasoline is left in tank. 14. See your VW dealer for cleaning of all components of the fuel system.
Red warning light for oil pressure comes on while you are driving. (Brake warning light also comes on due to design of electrical system. In case of brake failure, <b>only brake warning</b> light will come on).	15. If light goes on, the oil pressure is too low.	15. Stop at once and check oil level. Add oil as necessary. If the oil level is sufficient and light goes on during driving, contact the nearest VW dealer before driving on.
Brake warning light comes on with the engine running and the parking brake released.	One of the two brake circuits may have failed.	See "Brake warning light" for what to do.
Red warning light for alternator comes on while you are driving.	16. A fuse in the fuse box (see page 40) may be blown. 17. The V-belt may be torn or slipping or alternator does not charge.	16. Replace fuse. If it blows again, do not drive on, because the turn signals will not work. Ask for assistance. 17. If belt is not slipping, switch off unnecessary electrical consumers to conserve battery power. Drive to nearest dealer for location and correction of problem. If belt is slipping or broken, <b>do not drive on. V-belt must be replaced to prevent serious damage.</b>



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# EMISSION CONTROL SYSTEM

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## In the Interest of Clean Air

See page 104 for **Diesel Engine**.

Pollution of our environment has become a problem that is of increasing concern to all of us. We urge you to join us in our efforts for cleaner air in controlling the pollutants emitted from the automobile.

Volkswagen has long recognized its responsibilities not only toward its customers but also toward the public in general.

We have developed an emission control system that controls or reduces those parts of the emission that can be harmful to our environment. Your Volkswagen is equipped with such a system.

Volkswagen warrants your new vehicle under the terms and conditions set forth in the Warranty and Maintenance booklet. You, as the owner of the vehicle, have the responsibility to provide regular maintenance service for the vehicle, as specified in the Maintenance Schedule, and to keep a record of all maintenance work performed. Authorized Volkswagen dealers have VW trained mechanics and special tools to offer fast, efficient service.

## How Emission Control Works

When an automobile engine is running, it uses energy generated through the combustion of a mixture of air and fuel. Depending on whether a car is driven fast or slow or whether the engine is cold or hot, some of the fuel (hydrocarbons) may not be burned completely but discharged into the engine crankcase

or exhaust system. Additional hydrocarbons may enter the atmosphere through evaporation of fuel from the fuel tank. Some hydrocarbons released into the air contribute to pollution.

In addition, carbon monoxide (CO) and oxides of nitrogen (NO<sub>x</sub>) are formed during combustion and discharged into the exhaust system.

To reduce these pollutants, all Volkswagen are equipped with a special emission control system.

**Your Volkswagen may have all or part of the following major components:**

## Controlled Combustion

The amount of pollutants emitted from an engine greatly depends on the combustion of the air/fuel mixture. Complete burning of the air/fuel mixture is, therefore, very important.

Your Volkswagen is equipped with a precisely calibrated fuel injection system to assure a finely balanced air/fuel mixture under all operating conditions.

The fuel injection system also monitors the ignition distributor via a vacuum line to assure ignition at exactly the right moment for complete combustion.



## Crankcase Ventilation

Through crankcase ventilation harmful emissions from the engine crankcase are not permitted to reach the outside atmosphere. These emissions are recirculated to the air cleaner. From here the emissions mix with the air/fuel mixture in the intake system and are later burned in the engine.

## Exhaust Gas Recirculation (EGR) (where applicable)

Some of the exhaust gas from the engine is diverted before it enters the muffler. This gas is routed back into the intake manifold. An exhaust gas recirculation valve controls the flow to the intake manifold. The exhaust gas recirculated into the combustion chambers of the engine helps lower the formation of oxides of nitrogen (NOx) during the combustion process.

## Catalytic Converter (where applicable)

The catalytic converter is an efficient "clean up" device built into the exhaust system of your car to further help reduce engine pollutants. Harmful carbon monoxide and hydrocarbons in the exhaust gas are chemically changed into harmless carbon dioxide and water vapors before they pass to the outside through the muffler.

The use of **unleaded fuel**, however, is **critically important** for the life of the converter. Deposits from leaded gasolines and fuel additives containing sulphur, zinc, nickel or barium will ruin the catalyst and make it ineffective as an emission clean-up device. Therefore, **only unleaded gasoline without harmful**

78 **additives must be used.**

## Three-way catalytic converter

To comply with California exhaust emission laws, pollutants in the exhaust gas can be reduced to minimum with the three-way catalytic converter.

However, the catalytic converter can only achieve this reduction of harmful pollutants with the aid of the **Lambda Control System**. This system is designed to maintain close control of the air/fuel mixture ratio under all operating conditions. At an air/fuel mixture ratio of 14.5 to 1 ( $\text{Lambda} = 1.0$ ), hydrocarbons (HC), carbon monoxide (CO) and oxides of nitrogen (NOx), can be controlled efficiently and simultaneously by the three-way catalytic converter. If, at any time, the air/fuel mixture ratio is either below or in excess of  $\text{Lambda} = 1.0$ , pollutants increase.

## Oxygen Sensor (OXS) (where applicable)

The oxygen sensor, installed in the exhaust manifold, makes it possible to maintain the air/fuel mixture ratio at the desired level of  $\text{Lambda} = 1.0$ . The oxygen sensor continuously senses the oxygen content of the exhaust and signals the information to an electronic control unit. The control unit corrects the fuel injector operating time, so that the engine always receives an accurately metered air/fuel mixture. The **Lambda Control System** is monitored by the oxygen sensor (OXS) indicator light in the dashboard. (See page 23 – "OXS light".)



## **Fuel Evaporation Control**

The sealed Volkswagen fuel evaporation system prevents gasoline vapors from escaping to the atmosphere through the following controls:

### **Fuel tank venting**

An expansion chamber for the fuel tank and vent lines are part of the fuel tank vent system. These components prevent fuel from escaping to the outside at extremely high outside temperatures and when the car is driven or parked at an incline or in any other non-level position.

### **Activated charcoal filter**

Vapors from the fuel tank are trapped in a container filled with activated charcoal. The filter is connected to the fuel tank vent system. This is how it works:

Fuel vapors pass through the filter and deposit hydrocarbons on the surface of the charcoal filter element. When the engine is running, fresh air entering the activated charcoal filter through an opening cleans the filter and routes these hydrocarbons back to the engine where they are burned during normal combustion.



## An important word of CAUTION on the Emission Control System in your car

To assure efficient operation of the Emission Control System:

- Have your car maintained properly in accordance with the service recommendations listed in the Warranty & Maintenance booklet. Lack of proper maintenance, especially of the fuel and ignition systems, as well as improper use of the vehicle could lead to damage.
- Do not alter or remove any component of the Emission Control System unless approved by the manufacturer.
- Do not alter or remove any device, such as switches, ignition wires, valves, which are designed to protect your vehicle's emission control system.
- Do not continue to operate your vehicle if you detect engine misfire or other unusual operation conditions.

### Starting

Do not leave car engine idling unattended after starting. If warning lights should come on to indicate improper operation, they would go unheeded. Extended idling also produces heat, which could result in overheating or other damage to the car.

### Parking

As with any vehicle, do not park or operate your car in areas where combustible materials, such as dry grass or leaves, can come into contact with a hot exhaust system.

### Undercoating

Do not apply additional undercoating or rustproofing on or near the exhaust manifold, exhaust pipes or catalytic converter. During driving, the substance used could overheat and cause a fire.

## CARS WITH CATALYTIC CONVERTER

(U.S. models)

Do not turn the ignition off while the car is moving. Immediate damage to the catalytic converter will result if you turn the ignition off while your car is moving, or if you try to push-start the car. Under these conditions unburned fuel can reach the catalytic converter, which will make it ineffective as an anti-pollutant device.

Do not drive if you detect engine misfire or other unusual operating conditions, as this could result in overheating of the catalytic converter or other damage to the vehicle.



# TECHNICAL DATA

## Engine

**Diesel Engine** see page 106.

Four cylinder, four stroke, horizontally opposed in rear. Thermostatically controlled air cooling by fan on crankshaft. Pressure oil feed with gear-type pump. Oil cooler, full flow filter and strainer. Self-adjusting hydraulic valves. Electric fuel pump. Electronically controlled fuel injection. Paper element air cleaner. Activated charcoal filter in the fuel system.

Maximum output SAE net .....	67 hp at 4200 rpm
Maximum torque SAE net .....	101.0 ft lb at 3000 rpm
Displacement .....	120 CID (1970 cm <sup>3</sup> )
Stroke .....	2.80 in (71 mm)
Bore .....	3.70 in (94 mm)
Compression ratio .....	7.3 : 1
Fuel .....	"Regular"
US models .....	<b>UNLEADED FUEL ONLY</b>
Canada models .....	low lead or unleaded fuel

(minimum octane rating is listed on a plate visible after taking off the filler cap.  
See also "Fuel supply".)



<b>Transmissions</b>	<p><b>Automatic Transmission</b> Automatic Transmission combined with final drive. The transmission consists of a hydrodynamic torque converter and planetary gearing with three forward gears and one reverse. Drive shafts with two constant velocity joints per shaft.</p> <p><b>Manual Transmission</b> Single plate dry clutch. Clutch pedal, free play: <math>\frac{3}{8}</math> – 1 in (10–25 mm) Synchronized four-speed transmission and differential in one housing. Drive shafts with two constant velocity joints per shaft.</p>
<b>Body/Chassis</b>	Unitized body, frame plates reinforced with side and cross members, front axle bolted to frame side members, engine/transmission suspended in 4 bonded rubber mountings.
<b>Steering:</b>	Rack and pinion. Safety steering column.
<b>Front wheel suspension:</b>	Independent, upper and lower control arm, stabilizer, coil springs, shock absorbers.
<b>Rear wheel suspension:</b>	Independent, semi-trailing arms with integrated axle support, coil springs, shock absorbers.
<b>Service (foot) brake system:</b>	Hydraulic dual-circuit power-assisted brake system with pressure regulator for rear wheel circuit. Front wheels with disc brakes, rear wheels with self-adjusting drum brakes.
<b>Parking brake system:</b>	Mechanical, effective on rear wheels.
<b>Tires:</b>	<p>Tubeless radial ply — 185 R 14 C 6 PR* or 185 SR 14 Reinforced</p> <p>* The "C" type tire also bears the label "Load range C." See page 57.</p>
<b>Wheels, Tire and Rim size and Tire pressure:</b>	see sticker on left doorjamb.



## Capacities

See page 106 for **Diesel Engine**.

	U.S.	Metric
Fuel tank .....	16 gal	ca. 60 liters
Reserve (of total capacity) .....	2.5 gal	ca. 10 liters
Engine oil with filter change .....	3.7 qt	3.5 liters
Engine oil without filter change .....	3.2 qt	3.0 liters
Manual Transmission and final drive* ....	3.7 qt	3.5 liters
Automatic Transmission:		
Torque converter and planetary gears		
at change .....	3.2 qt	3.0 liters
Final drive* .....	1.5 qt	1.4 liters
Windshield washer container .....	4.3 qt	4.2 liters
Rear window washer container .....	1.1 qt	1.0 liters

\* Does not have to be changed



## Electrical system

See page 106 for **Diesel Engine**

Voltage .....	12 Volt
Battery .....	54 Ah on U.S. models, 63 Ah on Canada models
Starter .....	1.1 hp
Alternator .....	max. 65 Amp. (910 Watt)
V-belt size .....	9.5 x 1165
Ignition distributor .....	with combined vacuum and centrifugal spark advance and speed limiter
Ignition system .....	Breaker point ignition California models: Electronic ignition (breakerless)
Firing order .....	1-4-3-2
Ignition timing .....	for correct specification for your engine, see label in engine compartment
Spark plugs .....	Bosch W 145 M2 or W 8 C 0 Beru 145/14/3 L Champion N-288
Plug thread .....	14 mm
Electrode gap .....	0.028 in (0.7 mm)



## Dimensions

Wheelbase . . . . . 96.8 in (2460 mm)  
 Turning circle diameter . . . . . approx. 35 ft (10.7 m)  
 Track at front (at gross vehicle weight) 64 in (1570 mm)  
 Track at rear (at gross vehicle weight) 64 in (1570 mm)

	Station Wagon	Kombi	Camp- mobile
Length in/mm . . . . .	179.5/4570	179.5/4570	179.5/4570
Width in/mm . . . . .	72.6/1845	72.6/1845	72.6/1845
Height, unladen in/mm . . . . .	76.7/1950	77.1/1960	80.7/2055
Ground clearance in/mm . . . . .	7.4/ 190	7.4/ 190	7.4/ 190

## Weights

Gross vehicle weight lb/kg . . . . .  
 Gross axle weight front lb/kg . . . . .  
 Gross axle weight rear lb/kg . . . . .

see sticker on left doorjamb

### Permissible roof weights

Roof weights lb/kg . . . . .

220/100\*      220/100\*      110/ 50\*

\* Applies only to roof rack mounted to rain gutters or roof luggage rack (Campmobile with Pop-Up Roof). Distribute load evenly.



## Lubricants

### Engine oil-PETROLEUM based and/or SYNTHETIC based

Always use quality oil labeled "**Service SF or SE**" for the engine of your Volkswagen. Engine oils are graded according to their viscosity. The proper grade to be used in your engine depends on existing climatic or seasonal conditions.

Refer to the temperature chart when selecting engine oil. As temperature ranges of the different oil grades overlap, **brief** variations in outside temperatures are no cause for alarm. It is also permissible to mix oil of different viscosities if you find it necessary to add oil.

### Transmission oil

Hypoid oil	Single-grade	Multi-grade	Specifications
Manual Transmission	SAE 80 W	SAE 80 W-90	MIL-L-2105 API/GL 4
Final drive of the Automatic Transmission	SAE 90	SAE 80 W/90	MIL-L-2105 B API/GL 5

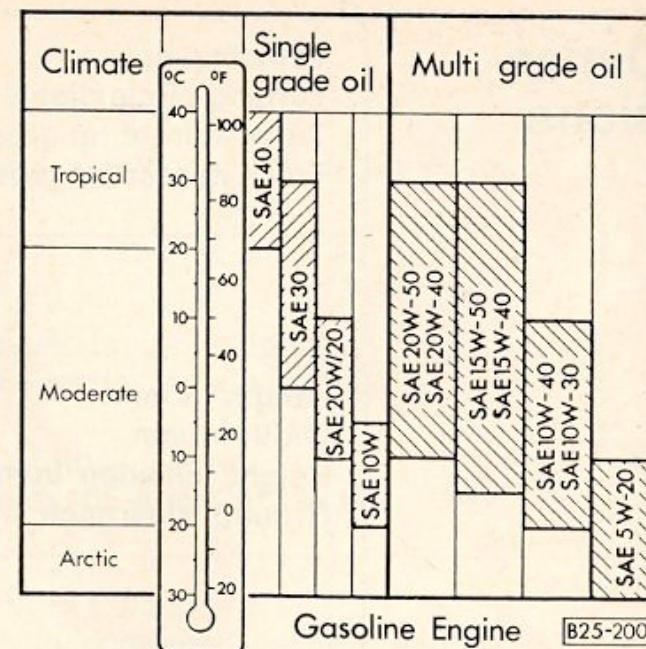
Automatic Transmission and torque converter require ATF all year round. All ATF's labeled Dexron® can be used.

### Lubricant additives

If your Volkswagen is properly maintained, it is uneconomical to mix any type of additive with lubricating oils and transmission fluids.

### Battery

86 **Silicone spray or petroleum jelly** should be used for the battery terminals and posts.



**When using single grade SAE 10W or multi grade SAE 5W-20 engine oil avoid high speed long distance driving if outside temperature rises above the indicated limits.**

See page 97 for **Diesel Engine**.

**Oil change intervals specified in the Warranty and Maintenance booklet accompanying the vehicle must be adhered to, including intervals for oil filter change.**



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# DIESEL ENGINE

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This portion of your Owner's Manual contains information that applies to Volkswagens with **Diesel Engines**.

As this Owner's Manual is based on the gasoline engine equipped car, there are certain data that do not apply to your Vanagon Diesel, such as Catalytic Converter, Exhaust Gas Recirculation, Emission Control System, Fuel Octane Rating, Engine Oil Grades, Spark Plugs.

Please read the following pages before you drive your Vanagon Diesel, especially the explanations on

- **Break-in period**
- **Starting with pre-glow**
- **Diesel Fuel No. 2**
- **Engine oil grade: "For Service API/CC or CD"**
- **Water cooling system**

All other information and operating instructions for your Volkswagen as described in this Owner's Manual apply. For warranty and service information, consult your **Warranty & Maintenance** booklet.



## Break-in period

During the first 900 miles/1500 km, avoid full throttle starts, and abrupt stops. Do not overstrain the engine, shift into the next gear **before reaching the top speeds.**

**The maximum speeds listed apply to normal operating conditions only and after the engine has warmed up.**

Gear	up to 600 miles	up to 1000 km
1	12 mph	20 km/h
2	25 mph	40 km/h
3	40 mph	65 km/h
4	60 mph	95 km/h

During the next 300 miles or 500 km the speed can be **gradually** increased.\*

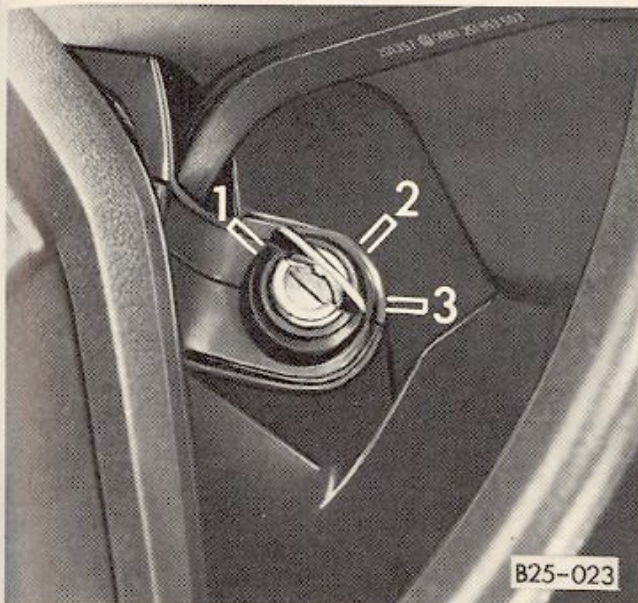
**After the break-in period**, the speed ranges are:

1st gear up to	16 mph or 25 km/h
2nd gear between	5 and 28 mph or 10 and 45 km/h
3rd gear between	16 and 47 mph or 25 and 75 km/h
4th gear between	25 mph or 40 km/h and top speed*

Engine speed in each gear is automatically limited to prevent excessive engine speeds.

\* Always observe all local and national speed limits!



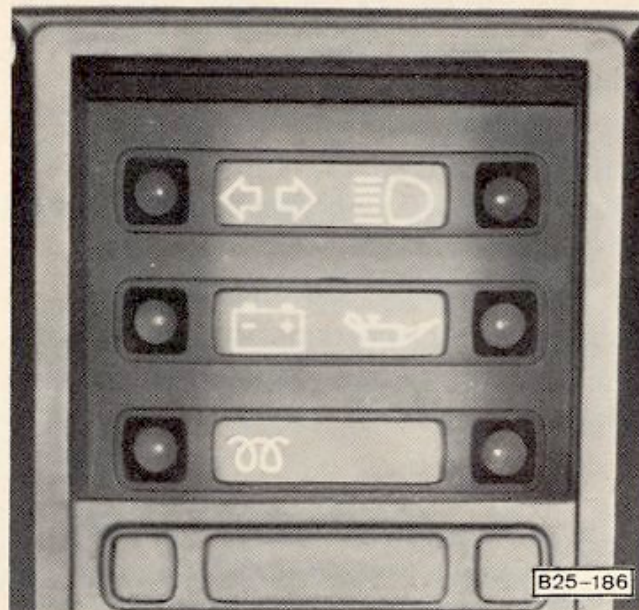


## Steering lock / Pre-glow and starter switch

1. OFF – steering locked.
2. PRE-GLOW switch ON – steering free (for towing) and glow plug operation.
3. START engine – after glow plug light has gone out.

Key returns to Pos. 2 as soon as it is released.

During pre-glowing, other instrument panel lights will also come on. They will go out after the engine has started. See “Warning lights” for details.



## Glow plug light

Turn ignition key to position 2. The glow plug light will light up until the engine is preheated. When the light goes out, start the engine.

The time for pre-glowing varies. It is very brief in the summer. It can take more time in winter.

When the engine is warm, the glow plug light will not come on. You can start the engine immediately.

## Alternator warning light

**lights up** when the ignition is turned on. It should **go out** after the engine is started.

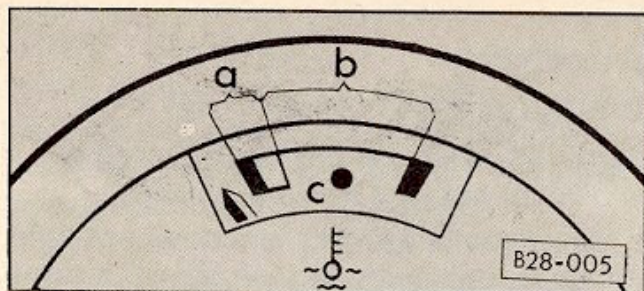
If the alternator warning light **does not light up** when turning the ignition on or if it **does not go out** after starting the engine, there may be a malfunction in the electrical system. If this is the case, contact your VW dealer.

**Stop at once** if the alternator warning light comes on while you are driving.

**Turn the engine off!**

See “Troubleshooting” or contact your VW dealer immediately.





## Water temperature gauge

(only works with the ignition on)

The needle in the water temperature gauge will indicate the temperature of the coolant shortly after the ignition is switched on.

Engine operating temperature will vary with climate, traffic conditions and engine load. Maintain moderate speed until the engine has warmed up.

## Warning light

For a bulb check the red light in the water temperature gauge will flash for about 3 seconds when the ignition is turned on.

If the light flashes while driving, the engine may be overheated. Pull off the road, stop the engine and depress the HAZARD switch.

### Warning

- Let the engine cool down. Hot components can burn skin on contact.

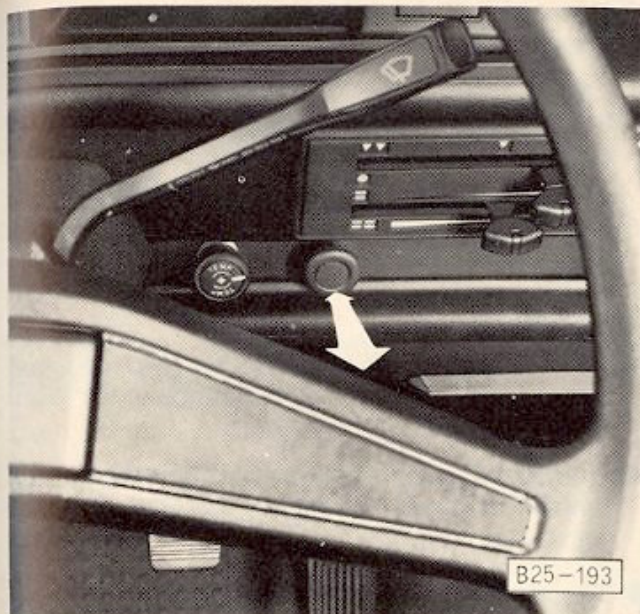
The fan should be operating when the warning light is on (listen for fan, located in front of car behind grille).

Check coolant level and V-belt tension. If both are correct, but warning light continues to flash, contact your nearest dealer to have the cause located and corrected.

For more details see **"Cooling system"**.

Also see "Troubleshooting" on page 103.





Knob for cold start device

## Starting procedures

Fasten safety belts

**Gearshift lever must be in Neutral.**

Always depress clutch pedal when starting.

### Starting cold engine

At outside temperatures above freezing –

**Do not depress accelerator while starting**

At outside temperatures below freezing –  
**Depress accelerator pedal while cranking and release pedal slowly as engine begins to run.**

**Never leave engine idling unattended. If warning lights should come on to indicate improper operation, they would go unheeded. This could result in overheating or other damage to the car.**

- Regardless of outside temperature, pull out the cold start knob located at right of steering column.
- Turn key to PRE-Glow (Pos. 2). Glow plug light should be on.
- As soon as glow plug light goes out start the engine.
- Approximately 2 minutes after starting, fully push in cold start knob.

Do not accelerate engine excessively immediately after starting. Allow oil pressure to build up.

Do not operate starter longer than 30 seconds. If engine does not start, wait about 30 seconds, then pre-glow again and start. If engine fires but runs rough, continue to engage starter a few seconds longer until engine runs smoothly.

### Starting warm engine

- Do not depress accelerator while starting.
- Do not pull out knob for cold start device.
- The glow plug light will not light up – start engine immediately.

### Stopping engine

- Turn key back to OFF position.

Do not stop engine immediately after hard or extended driving. Keep engine running at increased idle for about, two minutes to prevent excessive heat build-up.



## Fuel: Diesel Fuel No. 2

Service stations offering Diesel fuel are generally located at truck routes of major highways. Directories of Diesel fuel stations are usually sold at Diesel fuel stations.

Some U.S. states and Canadian provinces require permits to purchase Diesel fuel. Ask your VW dealer or your State Motor Vehicle Department. Diesel fuel may not be available outside the continental U.S. and Canada; we recommend you do not take your car to countries where Diesel fuel may not be obtainable.

### CAUTION:

**Your Diesel engine has been specifically designed to operate on Diesel fuel only. Therefore, do not use home heating oil or regular gasoline.**

**The properties of these fuels may cause serious damage to the fuel injection system and to the engine. This could lead to additional expense and may also affect your warranty.**

### Winter operation

At temperatures below 7°F or -14°C, Diesel Fuel No. 2 loses its fluidity due to wax separation, which may affect normal starting and engine operation. To counteract this effect, Diesel Fuel No. 2 is winterized by fuel suppliers the cold season.

As cold weather sets in, we suggest you ask your fuel dealer whether Diesel Fuel No. 2 is sufficiently winterized for your area.

If winterized Diesel Fuel No. 2 is not available, ask

for Diesel Fuel No. 1. If Diesel Fuel No. 1 is not available, mix Diesel Fuel No. 2 with up to 25 % Kerosene (or with regular leaded or unleaded gasoline, if Kerosene is not available).

DO NOT USE PREMIUM GASOLINE.

### Mixing table

Diesel Fuel in tank – Add Kerosene (or gasoline):	
Empty	4 gal or 15 liters
One quarter full	3 gal or 11.5 liters
One half full	2 gal or 8.5 liters
Three quarters full	1 gal or 4 liters

Always add the correct amount of Kerosene (or gasoline) to the fuel tank first, and then fill up tank with Diesel Fuel No. 2. If the tank is only partially filled with diesel fuel, determine the amount of Kerosene (or gasoline) to be added by using the 25 %/75 % formula.  
For example:  
1 gallon Kerosene (or gasoline)/3 gallons diesel fuel or 4 liters Kerosene (or gasoline)/12 liters diesel fuel

### CAUTION

**Mixing Diesel Fuel No. 2 with Kerosene (or gasoline) must be done before wax starts to separate. Later mixing may be effective in the fuel tank but not in the rest of the fuel system.**

**Always add the correct amount of Kerosene (or gasoline) to the fuel tank first, and then fill up tank with Diesel Fuel No. 2.**

**Do not add more Kerosene (or gasoline) than 25 % of total fuel in your tank. Refer to mixing table in center column.**

**Do not use “starting assist fluids”, they will cause engine damage.**

**Do not use any fuel additives, such as fuel line anti-freeze offered for gasoline engines.**

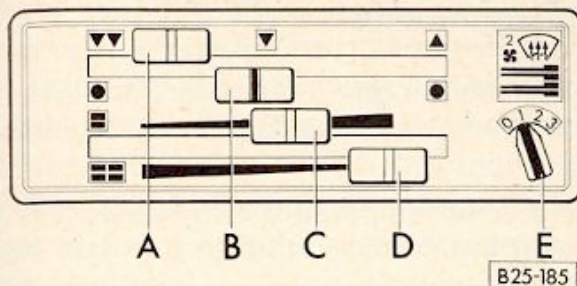
### WARNING

- Any amount of gasoline added to Diesel fuel makes the mixture as flammable as pure gasoline.
- Handle all fuels in well ventilated areas. Do not smoke or have anything in the area that can ignite fuel.
- Never carry additional fuel containers in your vehicle. Such containers, full or empty, may leak, cause an explosion, or result in fire in case of a collision.

It is normal that the engine noise level (dieseling) is louder during the warm-up period in winter. It is also normal that whitish-blue smoke may be emitted from the exhaust after starting and during warm-up. The amount of smoke depends on the outside temperature.

Let your Diesel engine run at slightly increased idle after a cold start-up to shorten the warm-up period.





If your car is equipped with an auxiliary heater, refer to page 94–95.

## Heater and ventilation controls

### A — Air distribution lever

Lever at right — air from side window nozzles and windshield air outlets.

Lever in center or left — air from footwell air outlet in driver cabin and passenger compartment and from side window nozzles.

### B — Temperature control lever

To **increase** heat — slide lever to **right**.

To **decrease** heat — slide lever to **left**.

For quick defrosting of the windshield, slide both levers to the extreme right.

Maximum heat output can only be obtained when the engine has reached operating temperature.

### C — Air distribution lever

Air flow through the windshield and footwell air outlets can be regulated with this lever.

To **increase** air — slide lever to **right**.

To **decrease** air flow — slide lever to **left**.

### D — Air distribution lever for roof air outlets in passenger compartment (where applicable)

To **increase** air flow — slide lever to **left**.

To **decrease** air flow — slide lever to **right**.

### E — Fan control switch

Regulate the volume of air flow with this switch.

0—OFF	2—medium speed
1—slow speed	3—high speed

When driving in slow traffic or standing, turn on the fan to increase fresh air ventilation.

See **CAUTIONS** on page 41.



## Diesel Auxiliary Heater

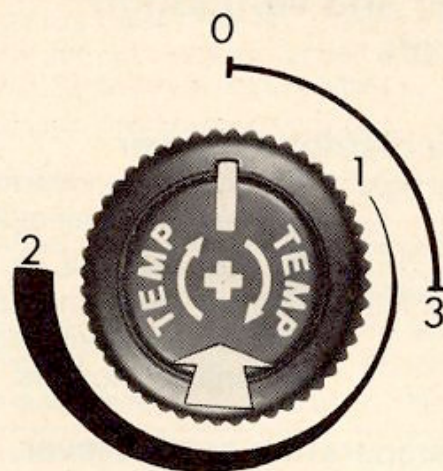
(optional equipment)

Turn the auxiliary heater **on** and **off** with the temperature switch, located on the right of the steering column. Use the same switch to regulate the heat.

Warm air is emitted from the defroster vents for the windshield and from the vents for the passenger compartment.

While driving, the heater can be operated continuously. When the engine is not running, the heater will shut off automatically after 10 minutes to save battery power.

The auxiliary heater is running on Diesel fuel from your fuel tank. Fuel consumption varies according to operating conditions and heat output (approx. 1 US qt or one liter per hour).



B25-207

### Temperature Switch

Switch positions:

0 – Heater **off**

1 – Heater **on** when driving. Temperature switch knob lights up. After approx. 40 seconds of pre-glow time the fans will start to run.

1 to 2 To regulate heat output from low to high.

0 to 3 To set the timer, depress the switch knob and turn (to heat with engine not running).

### With ignition on

**To turn heater on** – Slide lever B to the right. Turn temperature switch (TEMP) to position 1.

The desired temperature can be selected by turning the switch further to the right from low (1) to high (2).

A light in the temperature switch will glow when the headlights are on for easy recognition in the dark.

**To turn heater off** – Turn TEMP switch to position 0.

### With ignition off

A timer in the switch gives you the possibility to preheat the vehicle interior for approximately 10 minutes before starting the engine.

To prevent excessive battery drain, we recommend that the heater not be operated several times successively when the engine is not running. This applies particularly when the temperature is low and the full battery capacity is required to start the engine.

The heater fan will continue to run and shut off automatically as soon as the heater has cooled off.



**Never start the diesel heater or let the engine or the heater run in an enclosed, unventilated area. Exhaust fumes from the engine or the diesel heater contain carbon monoxide, which is colorless and odorless. Carbon monoxide, however, is a very harmful gas, and may be fatal if inhaled.**

## **Troubleshooting**

Should the auxiliary heater stop running while in operation, an overheating switch was triggered. If the heater can not be switched on after repeated turning the switch off and on, see your VW dealer to locate the problem.

## **Fuses**

The auxiliary heater is equipped with two fuses, one 16 amp fuse for the entire heater and one 8 amp fuse for the overheating switch. Both fuses are located in a fuse holder behind the glove compartment. When the fuse for the overheating switch is blown, the fan is working however no heat is delivered.

If the replacement fuse blows again, have the heater checked by your VW dealer as soon as possible.

## **Maintenance**

During the winter and when driving over very poor roads, mud or snow may tend to accumulate in the exhaust and combustion air intake pipes. Have these pipes checked for blockage from time to time so that the heater can continue to work.



## Do-it-yourself Service

A well maintained car will reward you with good performance. Clean fuel and air is important for your **Diesel Engine**. If necessary, have the fuel and air filters serviced between regular maintenance services (see Maintenance Schedule).

### CAUTIONS:

- Do not let Diesel fuel spill on rubber hoses. Such connecting hoses may develop leaks and cause serious engine damage.
- Do not dump Diesel fuel from the old canister on the ground, into open streams or -down sewage drains. Should the discarding of Diesel fuel present a problem, we suggest you have fuel filter changes performed by your VW dealer or at a service station.

Always heed CAUTIONS on page 60.



## Fuel filter

### To drain water from fuel filter

- open vent screw at top of fuel filter.
- loosen drain plug underneath filter and, using a container, drain about half a cup or until drained fuel is pure.
- tighten drain plug and vent screw.

### To remove fuel filter

#### Drain filter first to prevent fuel spill

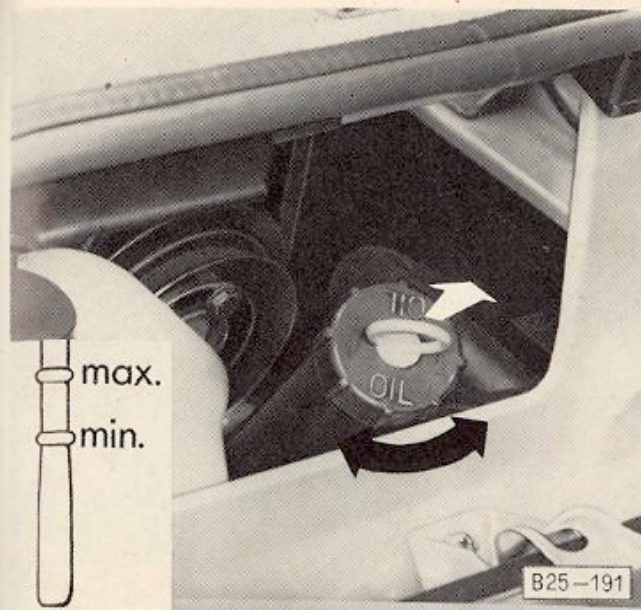
- loosen filter element with appropriate wrench.
- unscrew filter by hand and remove carefully.
- discard filter element.

### To reinstall fuel filter

- apply thin film of Diesel fuel to gasket of new filter canister.
- screw filter element on by hand. Do not use wrench to tighten.
- crank engine until it starts and accelerate a few times till engine runs smoothly.
- check for leaks.

*gwen 1512*





The engine oil dipstick and the oil filter neck are located behind the license plate.

### CAUTION

Lack of sufficient engine oil may lead to severe engine damage. The oil pressure warning light is not an oil level indicator.

*oil & filter 7.5K  
or 3mo.*

## Engine oil

### Checking the level

- To get a true reading, the car should be on level ground. After turning off the engine, wait a few minutes for the oil to return to the crankcase.
- Flip license plate down.
- Pull out dipstick and wipe it clean with a rag.
- Reinsert dipstick; push it in all the way for an accurate reading.
- Pull dipstick out again. The oil level is correct if it is between the "max" and "min" marks on the dipstick.
- If oil level is below "min" mark, or not showing on dipstick, add oil immediately.

The difference between the "min" and "max" marks on the dipstick is about 0.5 U.S. quart or 0.6 liter.

The engine in your car depends on oil to lubricate and cool all of its moving parts. Therefore the engine oil should be checked regularly and kept at the required level. Make it a habit to have the engine oil level checked with every fuel filling.

The correct oil grade and viscosity recommendation is given under "Lubricants".

### Engine oil consumption

It is normal for your engine to consume oil. The rate of oil consumption depends on the quality and viscosity of oil, the speed at which the engine is operated, the climate, road conditions as well as the amount of dilution and oxidation of the lubricant.

Because of these variables, no standard rate of oil consumption can be established, but drivers should expect an increased oil consumption at high speeds and when the engine is new.

### Adding engine oil

- Unscrew cap from oil filler neck.
- Pull extension tube out of filler neck as far as it will go.
- Only add the amount of oil needed.
- Check oil level with dipstick. It should be between the "min" and "max" marks.
- Push in the extension tube, replace filler cap and hand tighten securely.

The oil filler cap must be secure to avoid oil spill causing fire hazard.

Always heed CAUTIONS on page 60.



Climate	°C	°F	Single grade oil	Multi grade oil
Tropical	40	100	SAE 40	
	30	80	SAE 30	
Moderate	20	60	SAE 20W/20	
	10	40	SAE 20W/20	SAE 20W-50 SAE 20W-40
	0	20	SAE 10W	SAE 15W-50 SAE 15W-40
	-10	0		SAE 10W-40 SAE 10W-30
Arctic	-20	-4		

Diesel Engine B25-201

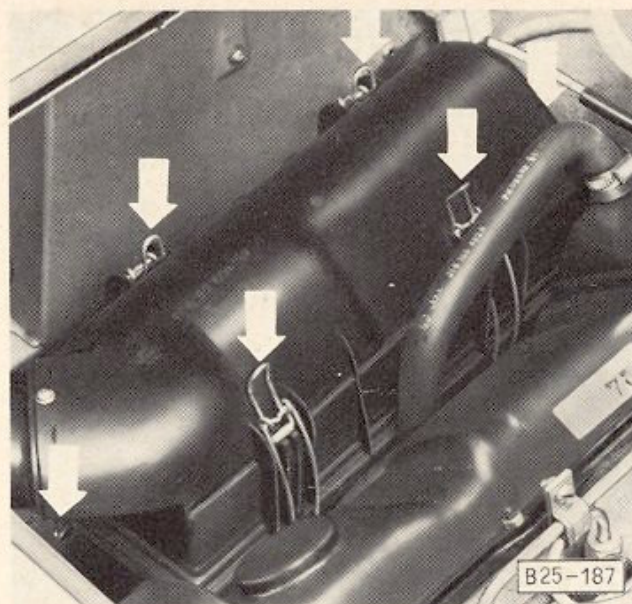
## Lubricants

### Engine oil grade

For your Diesel engine, only use single-grade or multi-grade engine oils labeled "API Service CC or CD".

The terms CC or CD must appear on the oil container singly or in combination with other designations, for example "SE/CC" or "SF/CC".

The viscosity SAE number of the oil should be selected for the lowest anticipated temperature at which engine starting will be required, and not for the temperature at the time of oil change.



B25-187

## Air cleaner

To clean or replace filter element:

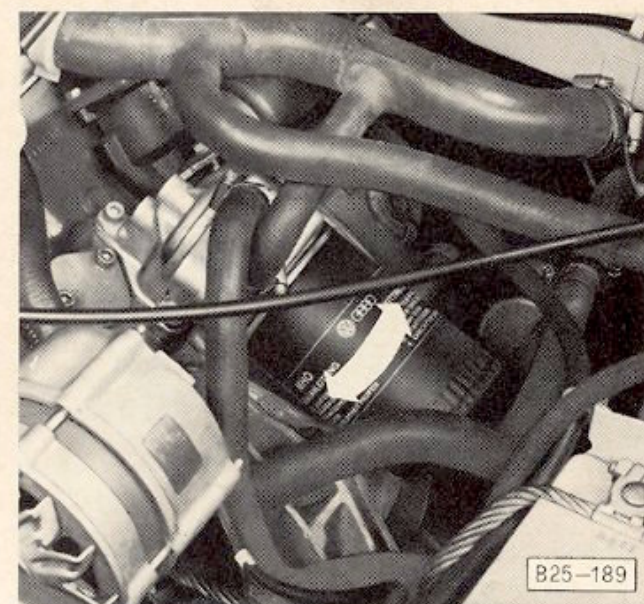
Turn off engine!

- Unfasten clamps and pull top of air cleaner housing toward you.
- Lift out filter element.
- Shake filter element to remove dirt. Replace if necessary.
- Reinstall filter element in top.
- Press top onto lower part of filter housing and fasten clamps.

**The paper filter element must never be cleaned or soaked with gasoline, cleaning fluids or oil.**

Always heed CAUTIONS on page 60.

15K



B25-189

## Changing the oil filter

To replace the oil filter:

- Use oil filter VW Part No. 068 115 561 or equivalent.
- Apply thin film of engine oil to filter gasket (do not use grease).
- Screw on filter by hand until filter gasket contacts flange firmly all around.
- Tighten filter 3/4 turn. Use VW filter cap wrench US 4496 or equivalent, wrench extension and standard torque wrench.
- Check dipstick for correct oil level.
- Run engine at various speeds for 3 to 5 minutes.

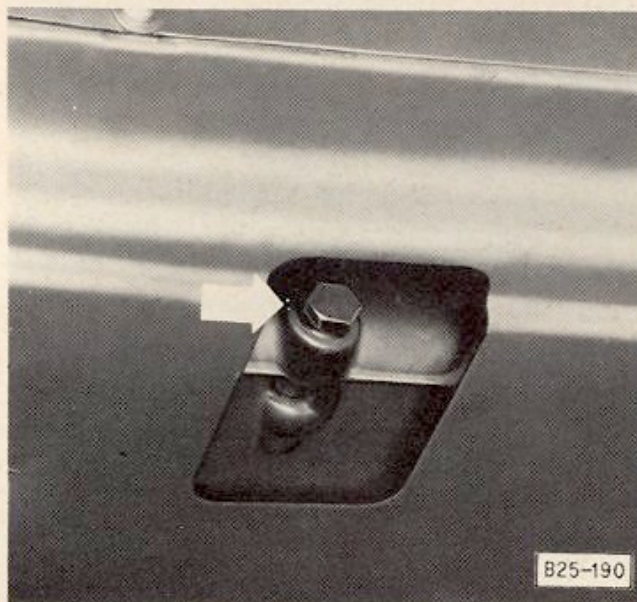
7.6



- Stop engine, use filter cap wrench (center drive socket), extension and torque wrench for final check. Torque must be at least 18 ft lb (2,5 mkg).
- Re-check dipstick for correct oil level, add oil as needed.
- Start engine and check for proper seal at the oil filter gasket.

Follow these instructions carefully. An improperly installed filter may leak and damage your engine.

**Always heed CAUTIONS on page 60.**



## Changing the Engine Oil

See also page 63

Drain the oil when the engine is still warm. Remove drain plug (arrow). After draining oil replace gasket, reinstall plug and tighten securely. Fill in fresh oil.

## V-belt tension checking

Correct V-belt tension is important as the V-belts drive not only the alternator but also the water pump for engine cooling.

**Before checking V-belt tension, turn the engine off and let it cool down.**

The tension of the V-belt for water pump is correct, if the belt yields about 0.2 to 0.4 in/5 to 10 mm when pressing firmly with the thumb in the center between crankshaft and water pump pulley. The tension of the V-belt for the generator is correct, if the belt yields about 0.4 to 0.6 in/10 to 15 mm, when pressing firmly with the thumb in the center between water pump and generator pulley.

**Tensioning and replacing of V-belts/drive belts should be performed by your VW dealer or a qualified workshop.**



# Winter operation

## Coolant

For year round driving, your car is delivered with anti-freeze coolant in the radiator for temperatures down to

–31° F / –35° C.

## Coolant for summer driving

**Because of its anti-corrosion properties anti-freeze must also remain in the cooling system for summer operation.**

Increasing the anti-freeze in the coolant further than shown in the table, is not only uneconomical, it is also detrimental to engine cooling.

See “**Cooling system**” for more details.

For outside temperatures down to	anti-freeze		water	
	US qt	Liters	US qt	Liters
–13° F/–25° C	6.8	6.4	10.0	9.6
–22° F/–30° C	7.6	7.2	9.3	8.8
–31° F/–35° C	8.4	8.0	8.4	8.0
–40° F/–40° C	9.3	8.8	7.6	7.2

## Anti-freeze concentration

At the beginning of the winter season, have the coolant checked for anti-freeze concentration particularly if you have added only clear water before. Use any quality phosphate-free anti-freeze containing ethylene glycol.

The ratio between water and anti-freeze depends on the anticipated outside temperatures. The ratios can be taken from the mixing table below or from the container of the antifreeze manufacturer.

## Warning — hot radiator

**Let the engine cool down.**

The fan switches on automatically when the coolant reaches a certain temperature and continues to run even with engine stopped until the coolant temperature drops.

Be careful when removing the cap from the radiator, when the engine is hot. Protect your hands, arms and face. Open the cap carefully one turn to allow excess pressure to escape before removing the cap.



## Cooling system

### Checking the coolant level

#### CAUTION — hot radiator

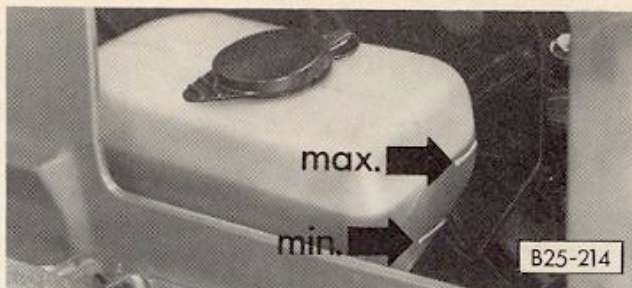
When the engine is hot, the cooling system is under pressure. Let the engine cool down. If you have to remove the cap from a hot radiator, protect your hands, arms and face against scalding. Use a thick rag and carefully turn cap only enough to allow excess pressure to escape. Then slowly remove the cap.

For year round driving, anti-freeze is added at the factory for temperatures down to:  $-31^{\circ}\text{F}/-35^{\circ}\text{C}$ .

**Because of its anti-corrosion properties, anti-freeze should also remain in the cooling system for summer operation.**

Although a properly working cooling system requires only a little amount of care, the coolant level should be checked from time to time, and always before going on a longer trip.

The cooling system capacity is listed under "Capacities".



Refill Tank



Expansion Tank

#### NOTE:

Cold anti-freeze and cold water should only be added to the radiator when the engine is cold.

**Always heed CAUTIONS on page 60.**

### Adding coolant

The refill tank and the expansion tank are in the engine compartment. Tilt License plate lid forward.

Coolant level in refill tank must be between min. and max. marks when engine is not running. When engine is warm, coolant level may be slightly above max. mark.

Top up coolant in refill tank. Only when cooling system was drained or a lot of coolant needs to be added, also fill expansion tank.

To maintain the anti-corrosion properties of the coolant, the anti-freeze concentration should not be reduced, even during the warm season. Always add anti-freeze and water in the ratio specified in the mixing table in chapter "Winter operation".

Use any quality phosphate-free anti-freeze containing ethylene glycol. Such anti-freeze is available at your VW dealer.

**Anti-freeze, other than specified by Volkswagen, may cause corrosion of the cooling system, leading to engine overheating and damage.**

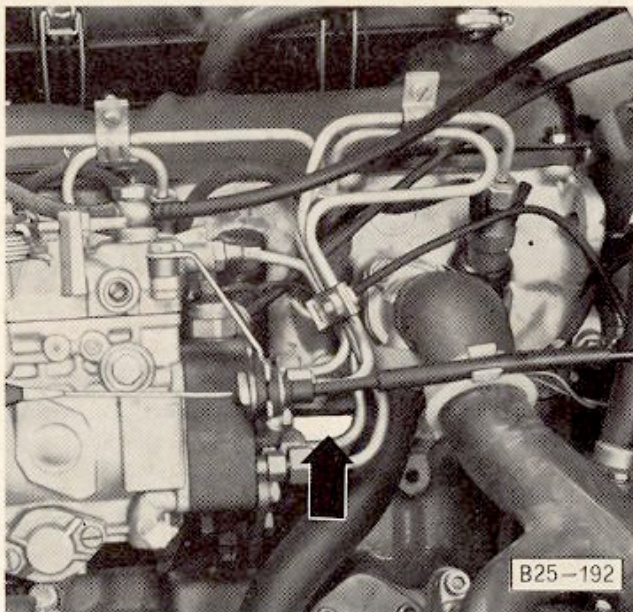
Only for topping-up coolant, a small amount of anti-freeze containing ethylene glycol and phosphates may be used, if recommended anti-freeze is not available.

- After adding coolant, run the engine at idle speed for a few seconds.
- Wait for the radiator fan to switch on and off again.
- Check coolant level. Add more coolant if necessary.



## **Batterie (12 Volt)**

The battery is in the engine compartment on the right.



## **Engine Number**

The engine number is located on the engine case next to the injection pump.



## Troubleshooting

If you are not fully familiar with proper repair procedures, do not attempt the checks or repairs described on this page. Always heed **CAUTIONS** on page 60.

Condition	Probable Cause	What to do
I – Alternator warning light comes on while driving.	<ol style="list-style-type: none"> <li>1. V-belt for water pump may be slipping or broken.</li> <li>2. V-belt for alternator may be slipping or broken, or alternator does not charge.</li> </ol>	<ol style="list-style-type: none"> <li>1. Stop at once and turn off the engine because the water pump has stopped working and no longer provides for engine cooling. Do not continue to drive. Have V-belt adjusted or replaced promptly by your VW dealer or qualified workshop.</li> <li>2. If V-belt runs properly without slipping, turn off all unnecessary electrical equipment and drive to the nearest dealer, as otherwise the battery will soon run down. <b>WARNING</b> Do not touch V-belt when engine is running.</li> </ol>
B – Engine turns over but will not start.  <b>WARNING: Do not use "starting assist fluids". They will cause engine damage. Do not use any fuel additives, such as "dry gas" offered for gasoline engines.</b>	<ol style="list-style-type: none"> <li>1. Improper starting procedure.</li> <li>2. No fuel in tank.</li> <li>3. Glow plugs not working (no voltage at glow plugs because plug relay, starter switch, relay plate on fuse panel or glow plugs are malfunctioning).</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to "Starting".</li> <li>2. Fill up tank.</li> <li>3. Check all electrical and fuel connections in engine compartment for tightness. If cause cannot be corrected, contact nearest VW dealer.</li> </ol>
C – Warm engine hard to start, or car hard to start in winter.	Improper starting.	Refer to "Starting".
G – Engine heats up excessively while driving car, warning light in temperature gauge flashes.	<ol style="list-style-type: none"> <li>1. Stop-and-go or mountain driving in hot weather.</li> <li>2. Insufficient coolant.</li> <li>3. Failure in radiator fan or thermo switch.</li> </ol>	<ol style="list-style-type: none"> <li>1. Slow down. Engine temperature should return to normal. If not, check other probable causes.</li> <li>2. Add if necessary.</li> <li>3. See your dealer.</li> </ol>



## Emission Control

### In the Interest of Clean Air

Pollution of the environment is a problem that is of concern to all of us. We urge you to join us in our efforts for cleaner air and a healthier environment.

Volkswagen has long recognized its responsibilities not only towards its customers but also toward the public in general. Substantial progress has been made in developing emission controls, so that our cars control or reduce those parts of the emission detrimental to our environment, such as unburned fuel (hydro-carbons), carbon monoxide and oxides of nitrogen.

The amount of pollutants discharged into the engine crankcase and exhaust system greatly depends on the combustion of the air/fuel mixture. — To achieve optimum burning of the air/fuel mixture, emissions from your car are controlled through a combination of engine design, specific engine adjustments and control components.

Volkswagen warrants your new vehicle under the terms and conditions set forth in the Warranty and Maintenance booklet. You as the owner of the vehicle, have the responsibility to provide regular maintenance service for the vehicle, as specified in the Maintenance Schedule, and to keep a record of all maintenance work performed. Volkswagen dealers have trained mechanics and special tools to offer fast, efficient service.

### Controlled Combustion

In your Diesel engine, air is compressed in the pre-combustion chambers. At the point of maximum compression, fuels is added by the fuel injection pump. The fuel is atomized into fine particles and mixed with the compressed air. Ignition takes place as a result of the high temperature which has been created through compression (not through spark plugs as in gasoline burning engines). Combustion at optimum compression in the Diesel engine makes it possible to burn the air/fuel mixture almost completely, and thus control emissions from the engine.

To ensure clean burning of the air/fuel mixture, it is important that you provide the maintenance and emission control services explained in the Maintenance Schedule.

### Crankcase Ventilation System

Through Crankcase Ventilation harmful emissions from the engine crankcase are not permitted to reach the outside atmosphere. These emissions are recycled to the air cleaner. From here the emissions mix with intake air and are later burned in the engine. The crankcase ventilation system must be kept clean for good engine performance and durability.



### **To assure efficient operation**

Have your car maintained properly in accordance with the service recommendations listed in the Maintenance Schedule. Lack of proper maintenance, especially of the fuel and injection systems, as well as improper use of the vehicle could lead to damage.

- Do not alter or remove any component of the Emission Control System unless approved by the manufacturer.
- Do not continue to operate your car if you detect engine misfire or other unusual operating conditions.

### **Parking**

As with any vehicle, do not park or operate your car in areas where combustible materials, such as dry grass or leaves, can come into contact with a hot exhaust system.

### **Undercoating**

Do not apply additional undercoating or rustproofing on or near the exhaust manifold, exhaust pipes or heat shields. During driving, the substance used for undercoating could overheat and cause a fire.

### **Air Conditioner**

The cooling system of your Vanagon Diesel is not designed to accommodate the additional load of an air conditioner. The manufacturer therefore advises against the installation of an air conditioner.



## Technical Data

### Engine

Four stroke, four cylinder in line, transversely mounted, crankshaft with five main bearings, spur-belt driven overhead camshaft. ● Water cooling, thermostatically-controlled, with electric fan, thermostatically operated. ● Pressure oil feed with gear-type pump and full flow filter. ● Mechanical fuel injection pump, fuel injectors and pre-combustion chambers. ● Paper element air cleaner.

Maximum output SAE net . . . . .	48 hp at 4200 rpm
Maximum torque SAE net . . . . .	97 Nm at 2000 rpm
Displacement . . . . .	97 CID/1588 cm <sup>3</sup>
Stroke . . . . .	3.40 in/86.4 mm
Bore . . . . .	3.01 in/76.5 mm
Compression ratio . . . . .	23 : 1
Fuel . . . . .	Diesel fuel No. 2

### Electrical system

Battery . . . . .	63 Ah
Starter . . . . .	2.3 hp
V-belts:	
Crankshaft/coolant pump . . . . .	9.5 x 643 LA
Coolant pump/alternator . . . . .	9.5 x 600 LA

### Capacities

	U.S.	Metric
Cooling system . . . . .	16.9 qt	16 liters
Engine oil "API Service CC or CD"		
with filter change . . . . .	4.2 qt	4.0 liters
without filter change . . . . .	3.7 qt	3.5 liters



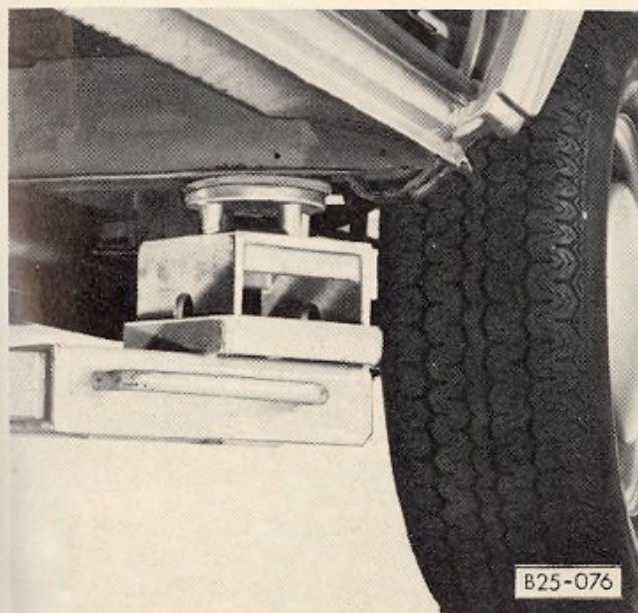
# GAS STATION INFORMATION

## Lifting car

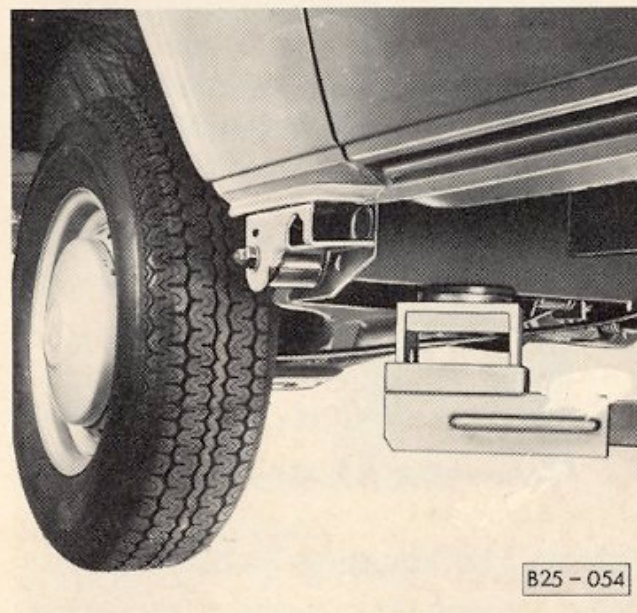
### Lifting car with workshop hoist

Make sure there is sufficient clearance between pads and vehicle before driving car on to hoist.

**The car must be lifted only at the lift points illustrated.**



**Front**  
At the front jacking point



**Rear**  
At rear cross member

### Lifting car with floor jack

The same lifting points as illustrated for the hoist also apply when using a floor jack. To avoid damage to the underbody or chassis frame, it is necessary to insert a rubber pad between the floor jack and the lift points.

**Caution:** Vehicle should never be jacked up from underneath the engine oil pan, the transmission housing, or the front axle. This could lead to serious damage.

### Lifting car with car jack

The car jack must never be used as a support to work underneath the car. If the jack is accidentally dislodged, you could be seriously injured. When working under the car always use safety stands specifically designed for this purpose.

Refer to the "Wheel changing procedure" detailed in this manual.



## Starting

See page 91 for **Diesel Engine**.

**Manual Transmission** — Start in Neutral.

**Autom. Transmission** — Start in Neutral or Park.

## Gasoline Engine

It is not necessary to depress accelerator. Fuel injection system supplies required amount of fuel for starting.

**Emergency starting:** A vehicle with Automatic Transmission cannot be started by pushing or towing. See page 7 for "Emergency starting with jumper cables".

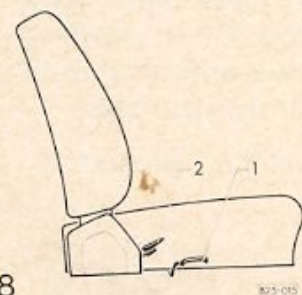
## Driving ranges

See shift pattern on ashtray.

## Driver's seat

To **adjust seat**, pull lever (1) up.

To **adjust backrest**, push lever (2) down.



## Fuel cap

Above right front wheel.

## Fuel recommendation

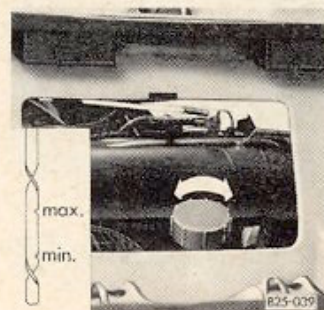
UNLEADED FUEL ONLY for cars so marked.

REGULAR, 91 RON, for cars not specially marked. See page 32.

## Engine oil dipstick

Check oil level 5 min. after engine has stopped. Level should be between upper and lower marks on dipstick.

The difference between the two marks is about 0.5 U.S. quarts or 0.6 liter.



## Vehicle Identification Number (VIN)

Visible through driver's side of windshield.

## Vehicle Identification Label

Located on left side under dashboard.

## Engine oil filler cap

**The oil filler cap must be secure to avoid oil spill causing fire hazard.**

Use quality oil labeled "API Service SF or SE". Oil viscosity chart page 86.

For **Diesel Engine** use labeled for service API CC. Oil viscosity chart on page 98.

## Transmission oil

Manual Transmission — hypoid oil\* SAE 80 W or SAE 80 W-90 (multi-grade), MIL-L-2105 API/GL 4.

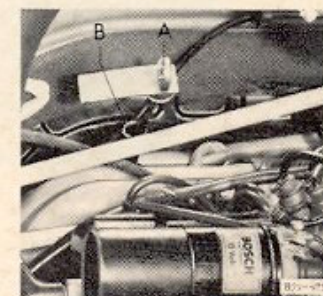
**Automatic Transmission:** final drive — hypoid oil\* SAE 90, MIL-L-2105 B, API/GL 5.

\* Lifetime filling

## ATF (Automatic Transmission)

Check ATF level when ATF is warm, with engine idling, selector lever in Neutral and parking brake applied. Dipstick has cover plug attached. Details on page 65.

Use ATF "Dexron®".



A = dipstick  
B = filler neck



## Brake fluid reservoir

Under instrument cluster. Brake fluid level should be between upper and lower edge of reservoir.

If brake fluid must be added to the reservoir, use only new and unused DOT 3 or DOT 4 brake fluid that meets SAE specification J 1703 and conforms to Motor Vehicle Safety Standard 116. Using any other brake fluid, or using brake fluid that has absorbed moisture from the open air, or brake fluid that is dirty, may cause premature wear or unreliable braking action.

**Do not add or mix DOT 5 silicone type brake fluid with the brake fluid in your car as severe component corrosion may result. Such corrosion could lead to brake system failure.**



## Fuses and relays

— under dashboard, left side of steering column.

## Additional fuses for:

Temperature control, heater booster and air blower motor for auxiliary heater — next to fuse panel.

See pages 46 and 47.

**Plug connector for electric fuel pump** — in engine compartment on left side.

## Tire pressure

See sticker on left doorjamb.

## Battery

Under passenger seat in driver cabin. Check fluid level through transparent battery housing. **If the fluid level is below the 'min' mark, let your VW dealer correct the condition.**

## Towing — Manual Transmission

Place gearshift lever in Neutral.  
Turn ignition on.  
Release parking brake.

## Towing — Automatic Transmission

Always tow car with rear wheels off the ground.  
Place lever in Neutral.  
Turn ignition on.  
Release parking brake.

## Windshield washer container

— under dashboard left hand side.  
Fill with water and cleaning solution.  
Follow mixture instructions on can.  
After filling, screw on cap tightly.

## Spare wheel

Underneath floor panel of driver cabin.

**Jack and tool kit** — under driver's seat.

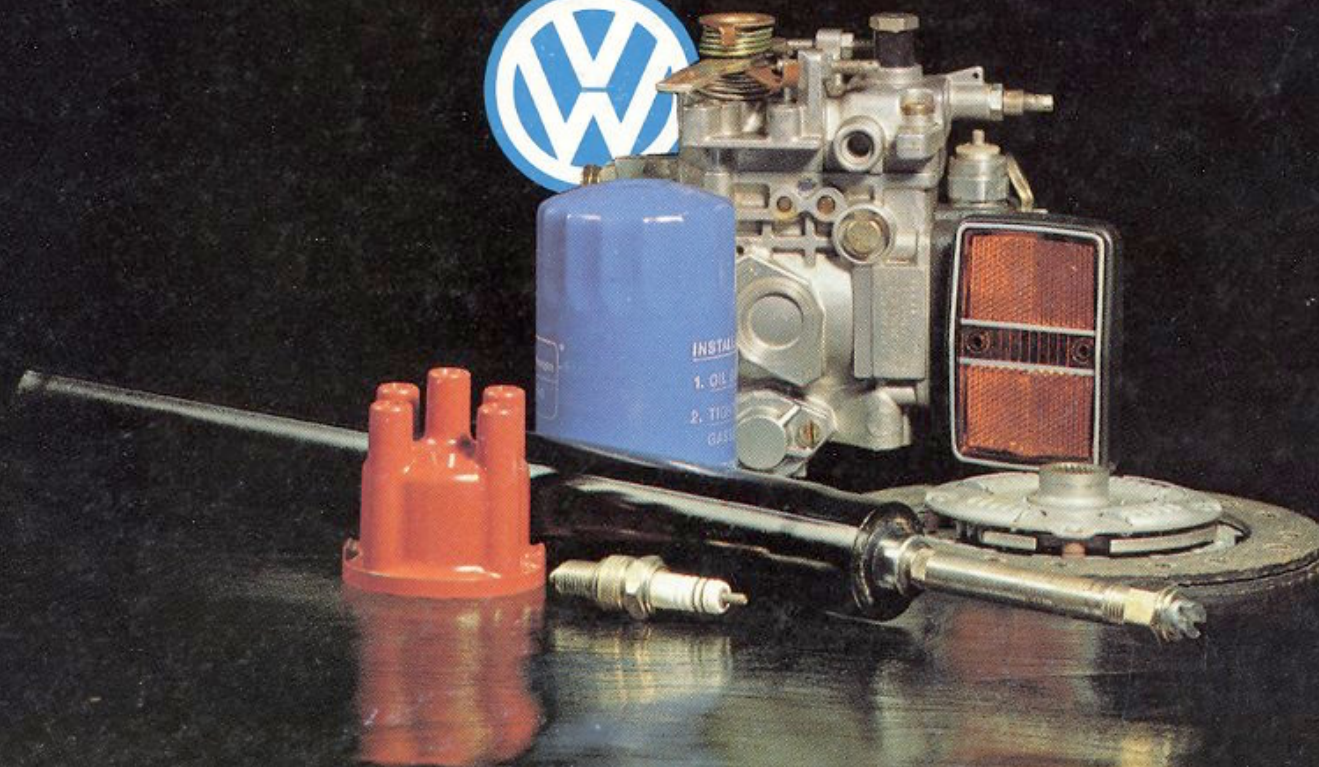


**Jack ports** — two on each side for front and rear wheel changing.

**Do not jack up car by the bumper or body.**



**Genuine VW Parts:  
The people who built  
your VW  
used them.  
And so should you.**





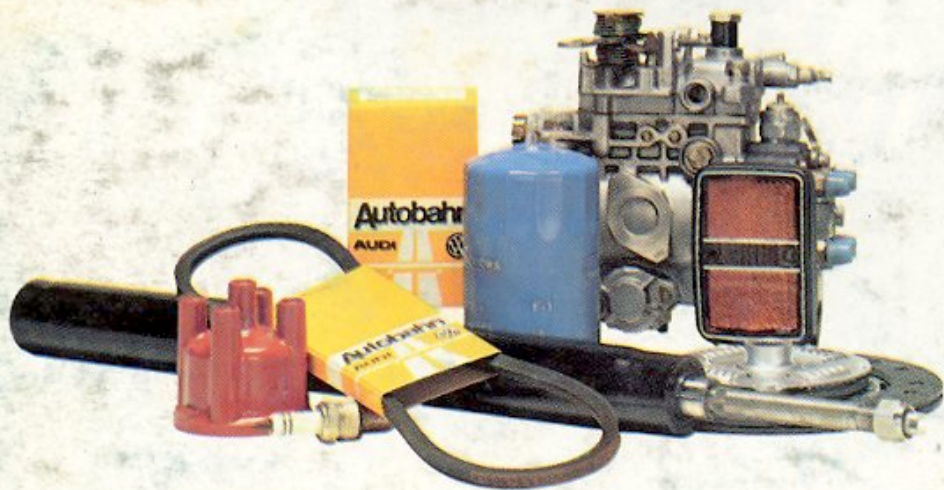
## There are only Genuine VW Parts in your new VW. That's one reason why it runs like a new VW.

No one knows your new VW in quite the same way as the people who built it. And when it comes to replacement parts, we build them to the same standards and specifications as the original equipment. We've made sure that these genuine replacement parts are built with the same enduring quality that you would look for in a new VW.

To be sure you're getting the best in genuine replacement parts for your VW, ask your dealer about the Autobahn line of parts. It's a convenient way of choosing from among the most popular maintenance and replacement parts with the kind of quality that you want to put in your automobile.

Shown on the opposite page are just a few of the genuine replacement parts available at our parts department. We'll be glad to help you select the right ones for your car.

And they are backed by our Limited Parts Warranty. Even after your New Car Warranty has run out and you have a repair performed, our Limited Parts Warranty ensures that we will repair or replace every defective Genuine VW Part, used in the repair, for 6 months or 6,000 miles, whichever comes first.\*









# Autobahn® Accessories. A continuing story.

Why not shop for your accessories in the same place you would for high quality replacement parts.

Your dealer parts department will have them. A wide range of options from wheel covers and roof luggage carriers to floor mats and radios.

Speaking of sound, your dealer can bring you up-to-date with some of the best car audio equipment you could find anywhere. Including our remote CB, featuring microphones with integrated controls.

And don't forget about our car care products. They're especially formulated to help maintain your car's top running condition and good appearance for many years to come.

See our parts department for assistance in selecting from our complete line of Autobahn accessories—they're custom designed for your car.

# Autobahn®



## At a glance . . .

### ENGINE

Horsepower SAE net	67 at 4200 rpm
Diesel engine	48 at 4200 rpm
No of cylinders	4
Displacement	1970 cm <sup>3</sup> (120 CID)
Diesel engine	1588 cm <sup>3</sup> ( 97 CID)
Type	horizontally opposed, rear mount
Diesel engine	in-line, rear mount
Cooling	air cooling by fan on crankshaft
Diesel engine	water-cooled
Fuel/air supply	AFC fuel injection
Diesel engine	mech. fuel injection
Fuel tank capacity	16 USgal/60 liters
Engine oil capacity	
with filter change	3.7 USqt/3.5 liters
w/o filter change	3.2 USqt/3.0 liters
Diesel engine	
with filter change	4.3 USqt/4.0 liters
w/o filter change	3.7 USqt/3.5 liters

### VEHICLE LENGTH

179.5 in/4570 mm

### WIDTH

72.6 in/1845 mm

### HEIGHT\*

— Station Wagon 76.7 in/1950 mm

\* unladen

— Campmobile 80.7 in/2055 mm

### BRAKES

dual circuit power-assisted  
discs front, drums rear

### SUSPENSION

4-wheel independent

### STEERING

rack and pinion

### DRIVE TRAIN

Type	rear wheel drive
Gears (Manual)	4 forward, 1 reverse
Speeds (Automatic)	3 forward, 1 reverse

### ELECTRICAL SYSTEM

Battery	U.S.: 12 Volt/54 Ah Canada: 12 Volt/63 Ah
Diesel engine	12 Volt/63 Ah
Alternator	65 Amp. max.