



VOLKSWAGEN

Emission Control System Maintenance Requirements and Warranty

1973 Models

Contents

In the Interest of Clean Air	1
How Emission Control Works	2
Crankcase Ventilation System	2
Emission Afterburning	6
Exhaust Recirculation	7
Fuel Evaporation Control	10
How to Maintain the Emission Control System	12
Maintenance Schedule	13
Emission Control System Warranty	17

© 1972 Volkswagenwerk Aktiengesellschaft

All rights reserved.

May not be reproduced or translated in whole or in part without the written consent of Volkswagenwerk AG.

Specifications subject to alteration without notice.

Printed in Germany.

In the Interest of Clean Air

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 — as the word implies — controls or reduces those parts of the emission that can be harmful to our environment. Your Volkswagen is equipped with such a system.

In this brochure, we explain how the Volkswagen emission control system works, and what you can do to keep it in working order.

Volkswagen warrants the emission control system in your vehicle under the terms and conditions set forth on pages 17 to 20 of this brochure. To keep the warranty in force, you, as the owner of the vehicle, have certain responsibilities. It is important that you maintain your Volkswagen according to the manufacturer's specifications, and that you keep a record of all maintenance work performed. Authorized Volkswagen dealers will help you meet your obligations under the terms of our warranty. They have Volkswagen trained mechanics and special tools to provide 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 be discharged into the engine crankcase or exhaust system. Additional hydrocarbons may enter the atmosphere through evaporation of fuel from the carburetor and fuel tank. These hydrocarbons released into the air contribute to undesirable pollution.

In addition, carbon monoxide (CO) and oxides of nitrogen (NO_x) contribute to harmful engine emissions. They, too, are formed during the combustion and discharged into the exhaust system.

To reduce these pollutants all Volkswagens are equipped with a special emission control system. Your Volkswagen may have all or part of the following major components:

Crankcase Ventilation System

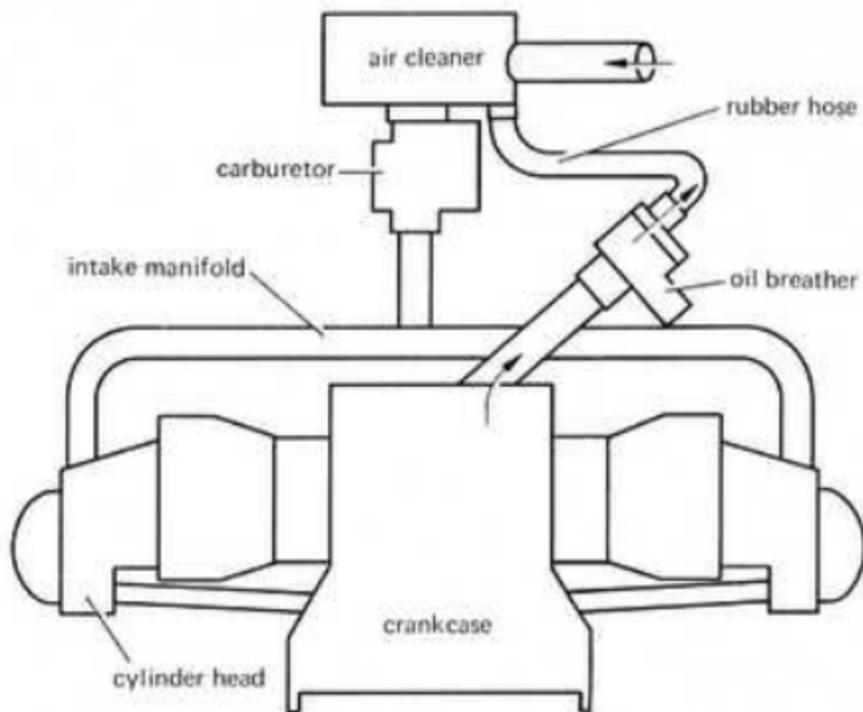
Through the Crankcase Ventilation System harmful emissions from the engine crankcase are not permitted to reach the outside air. These emissions are recirculated to the intake air system and then burned in the combustion chamber.

There are two ways of recirculating the emissions, depending on the engine in your Volkswagen.

Engines with Carburetor

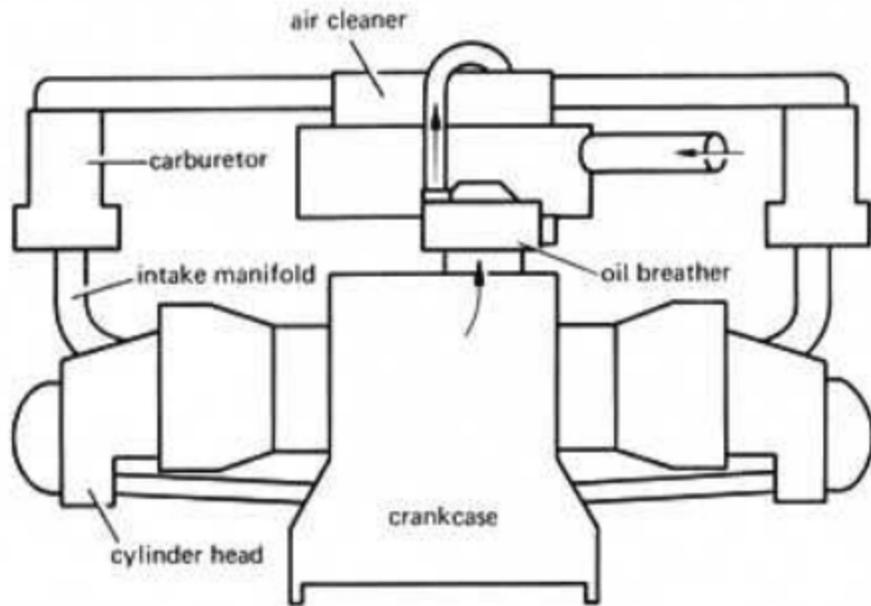
The Crankcase Ventilation System for a VW Beetle or Super Beetle is shown in the illustration.

Harmful pollutants in the engine crankcase are recirculated from the oil breather through a rubber hose to the air cleaner. These pollutants mix with the air/fuel mixture in the carburetor and are later burned in the engine.



The Crankcase Ventilation System for the VW Station Wagon, Campmobile or Kombi is shown in the illustration.

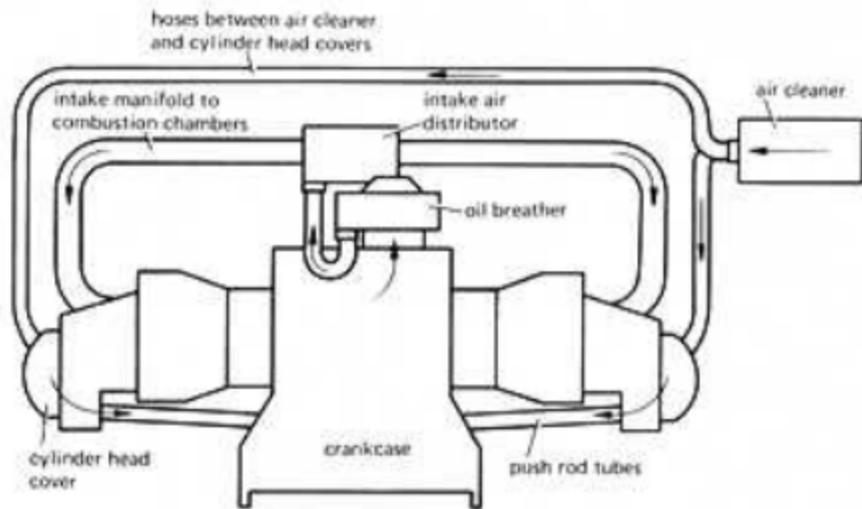
Harmful pollutants in the engine crankcase are re-circulated from the oil breather through a rubber hose to the air cleaner. From here the pollutants mix with the air/fuel mixture in the carburetors and are later burned in the engine.



Engine with fuel injection

If your Volkswagen is a VW Type 3, VW Square-back, VW 411 Four-Door or VW 411 Wagon, the engine is equipped with electronic fuel injection. The recirculation of emissions is accomplished by mixing the pollutants in the crankcase with fresh air.

As shown in the illustration, fresh air coming from the air cleaner passes through the cylinder head covers and push rod tubes into the engine crankcase. Here the fresh air is mixed with the crankcase pollutants and recirculated via the oil breather and the intake air distributor to the combustion chamber, where they are burned. A regulator valve between the oil breather and the intake air distributor controls the flow of the recirculated fresh air/emission mixture to the engine.



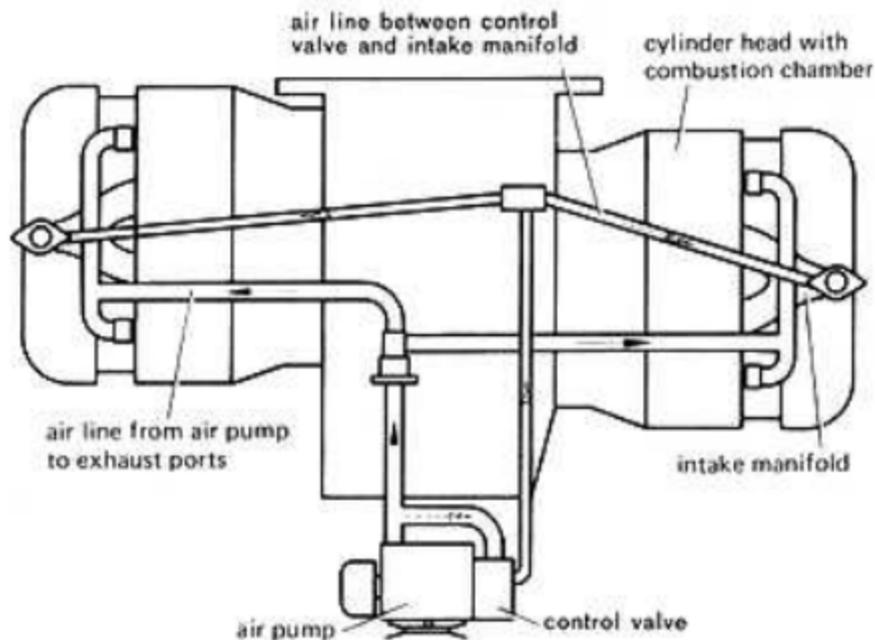
Emission Afterburning

Air pump

If your Volkswagen is a **Station Wagon, Campmobile or Kombi**, a special air pump delivers fresh air to the engine exhaust ports. The additional air is used to "afterburn" the harmful emissions as they leave the combustion chambers. Through this method cleaner exhaust reaches the outside air.

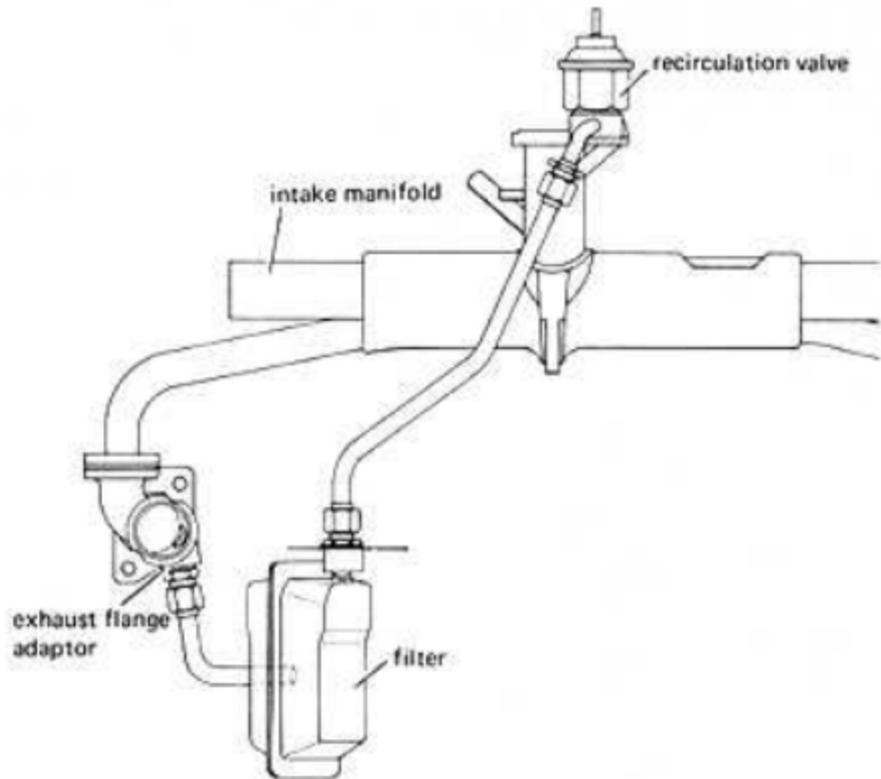
When taking the foot off the accelerator while shifting into another gear, the air pump also supplies fresh air to the intake manifold. The additional air contributes to a more complete combustion of the air/fuel mixture.

A valve controls the necessary supply of fresh air to the exhaust ports and the intake manifold.

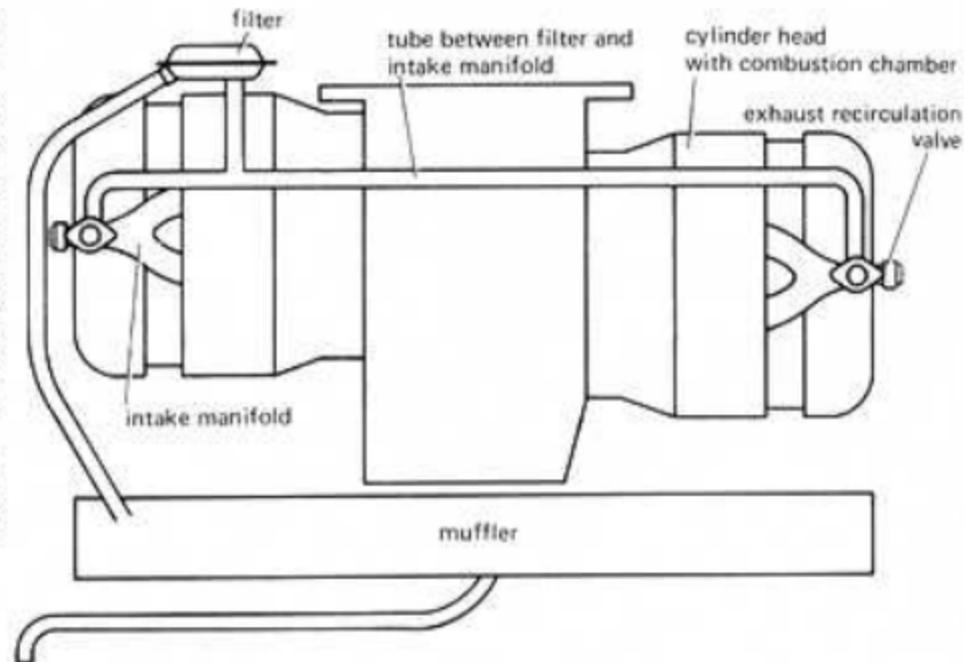


Exhaust Recirculation

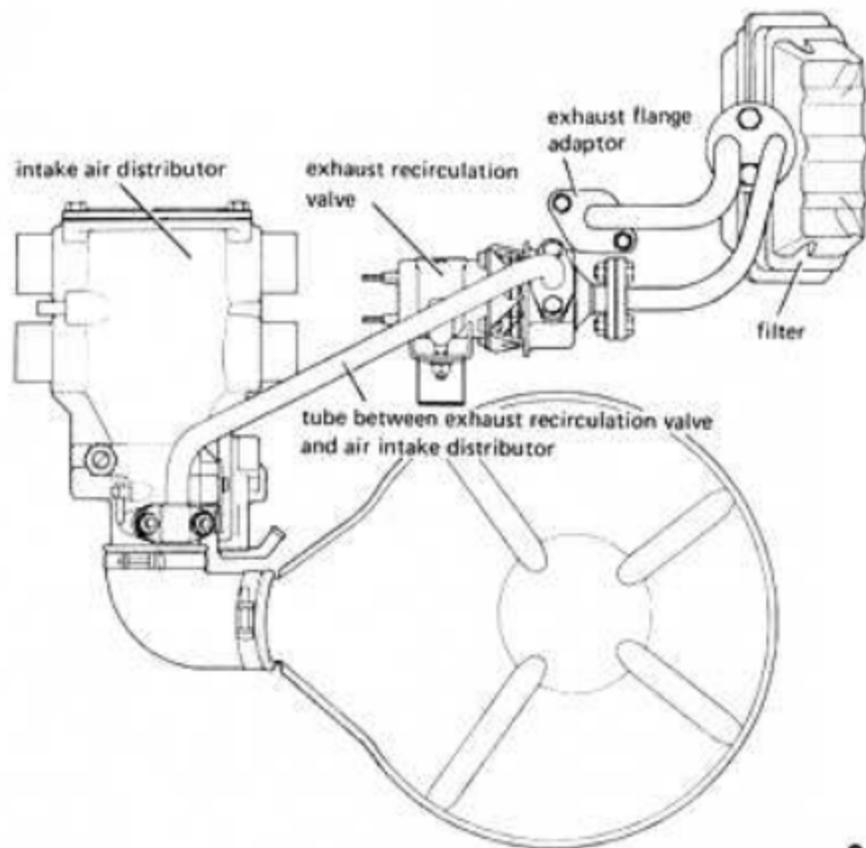
If your Volkswagen is an **Automatic Stick Shift**, some of the exhaust gas from the engine is diverted before it enters the muffler. This gas is cleaned before it is routed back into the intake manifold. A vacuum-operated exhaust recirculation valve controls the flow to the intake manifold depending on engine demand. The exhaust gas recirculated into the combustion chamber of the engine helps lower the formation of oxides of nitrogen (NOx) during the combustion process. See illustration.



If your Volkswagen is a **Station Wagon, Campmobile** or **Kombi**, the engine is also equipped with an exhaust recirculation system. Some of the exhaust gas from the engine is diverted before it enters the muffler. This gas is cleaned and then routed back into both intake manifolds. An exhaust recirculation valve in each intake manifold controls the flow of the exhaust gas to the intake manifold according to engine demand. In the **Manual Transmission**, the valve opens and closes depending on vacuum in the engine. In the **Automatic Transmission**, the valve opens and closes depending on throttle position and temperature conditions. This recirculated gas helps lower the formation of oxides of nitrogen (NO_x) during combustion.



If your **Volkswagen Type 3** or **Squareback** is equipped with an **Automatic Transmission**, part of the engine exhaust is recirculated via a filter and an exhaust recirculation valve. This valve is operated electromagnetically. The exhaust gas enters the intake manifold to mix with the air/fuel mixture. Recirculated exhaust gas helps lower the formation of harmful oxides of nitrogen (NO_x) during combustion.



Fuel Evaporation Control

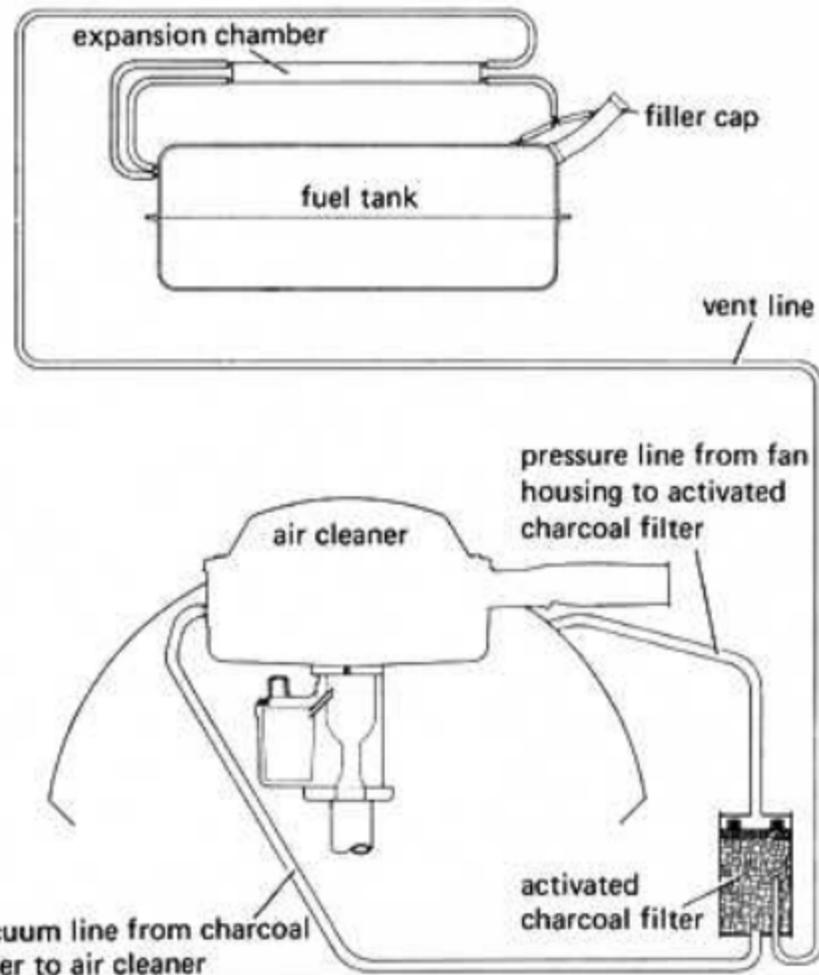
The VW fuel evaporation system prevents gasoline vapors from escaping to the atmosphere from the fuel system. This is accomplished through the following controls:

Fuel tank venting

An expansion chamber for the tank and vent lines are parts of the fuel tank vent system. These components prevent fuel from escaping to the outside at extreme high outside temperatures, and when the car is driven on 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 that we described above. The illustration shows 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 diverted from the cooling fan of the engine cleans the filter and routes these hydrocarbons back to the engine where they are burned during normal combustion.

Carburetor venting

If your Volkswagen is a Beetle, Super Beetle, Station Wagon, Campmobile or Kombi, the float chamber of the carburetor has an internal ventilation. Thus, hydrocarbon-rich vapors that form at high outside temperatures cannot reach the outside atmosphere. They are mixed with the intake air and burned in the engine.

How to Maintain the Emission Control System

For best overall performance of your Volkswagen follow the maintenance recommendations in your Owner's Manual. Your authorized Volkswagen dealer is best qualified and equipped to perform these services.

Many of the maintenance steps have a direct influence on your emission control system. We have grouped these steps together to help you remember at what mileage they must be performed to keep the emission control system working efficiently. Regular maintenance of the emission control system is also necessary to keep your emission control system warranty valid.

More frequent maintenance may be needed if you use your car under severe operating conditions, such as continued short-distance driving or if the car is used in dusty areas. Have your Volkswagen inspected and serviced whenever you suspect a malfunction.

Required Maintenance for the Emission Control System

The following maintenance steps must be performed at the specified mileage intervals to keep the emission control system warranty in effect.

A. At 600 miles

- 1 – Engine: Change oil
- 2 – Oil strainer: Clean (Types 1 and 3 only)
- 3 – V-belt: Check, adjust or replace if necessary (Type 1)
- 4 – Oil filter: Replace (Types 2 and 4 only)
- 5 – Engine: Adjust valves
- 6 – Engine: Adjust idle
- 7 – Fuel cap, tank and connections: Check visually.

B. Every 3,000 miles

- 8 – Engine: Change oil
- 9 – Oil strainer: Clean (Types 1 and 3 only)

C. Every 6,000 miles

- 10 – V-belt: Check, adjust, or replace if necessary (Type 1)

- 11 – V-belt for air pump: Check tension and condition, adjust or replace if necessary (Type 2 only)
- 12 – Ignition distributor: Check and adjust dwell angle and timing
- 13 – Compression: Check
- 14 – Cooling system: Check air intake housing bellows and water drain flaps (Types 3 and 4 only)
- 15 – Engine: Change oil
- 16 – Oil strainer: Clean (Types 1 and 3 only)
- 17 – Oil filter: Replace (Types 2 and 4 only)
- 18 – Engine: Adjust valves
- 19 – Engine: Adjust idle
- 20 – Throttle positioner: Check for proper functioning (Type 1 where applicable)

Additional Services Required

D. Every 12,000 miles

- 1 – Fuel injection: Replace fuel filter (Types 3 and 4 only)
- 2 – Ignition distributor: Replace breaker points, adjust dwell angle and timing
- 3 – Ignition system: Visually check distributor cap and rotor.
- 4 – Spark plugs: Replace
- 5 – Activated charcoal filter: Check visually
- 6 – Timing vacuum hose: Check visually (Automatic Stick Shift and Type 2 only)

E. Every 18,000 miles

- 1 – Air cleaner: Clean and refill lower part with oil (where applicable)
- 2 – Air cleaner: Replace filter element (where applicable) or at least every 2 years

If you take your car to your authorized Volkswagen dealer, he will perform the maintenance service recommended and certify its completion. Retain all receipts of service obtained at other than authorized Volkswagen dealers to verify that these services were performed at the mileage intervals specified.

- 3 – Air pump, air cleaner: Replace element (Type only) or at least every 2 years
- 4 – Oil strainer: Clean (Types 2 and 4 only)

F. Every 24,000 miles

- 1 – Automatic Stick Shift and Type 2
Exhaust recirculation valve: Check, replace if necessary
- 2 – Automatic Stick Shift, Type 2 and Type 3 Automatic Filter element for exhaust recirculation: Replace (at least every 2 years)
- 3 – Fuel cap, tank and connections: Check visually
- 4 – Ignition wires, distributor cap and rotor: Check, replace if necessary
- 5 – Air injection hoses: Check visually (Type 2 only)

G. Every 48,000 miles

Activated charcoal filter: Replace

Explanation of Required Emission Control Maintenance Services

A. At 600 miles

During the first 600 miles, all working parts adjust to each other to a certain degree. Therefore components that are essential for the proper functioning of the emission control system, such as valve adjustment, engine idling, V-belt tension, are checked and adjusted if necessary. Fuel cap, tank and connections are visually checked at this time. Also, the engine oil is changed, and where applicable the oil strainer is cleaned and the oil filter replaced.

B. Every 3,000 miles

To provide good lubrication and to keep the engine internally clean, the oil should be changed and the oil strainer cleaned.

C. Every 6,000 miles

Complete burning of the fuel/air mixture in the combustion chamber is very important to keep harmful emissions at their lowest level. It also keeps your

Volkswagen running most economically.

To keep it that way, the adjustment of the ignition system, fuel system and valves should be checked and, if necessary, corrected. In addition, the compression of each cylinder should be checked. On the VW Type 1, the tension and condition of the fan belt must be checked to assure proper cooling. If your Volkswagen is a Type 3 or Type 4, the air intake housing bellows and water drain flaps should be checked. On the VW Type 2, the tension and condition of the V-belt for the air pump should be checked. The flow-through oil filter on the VW Type 2 and VW Type 4 engines should be replaced.

D. Every 12,000 miles

Spark plugs must fire properly to ensure good engine performance and emission control. The firing of the spark plugs to ignite the air/fuel mixture in the combustion chambers at the precise moment

depends on the ignition breaker points. Both spark plugs and breaker points lose their efficiency through normal wear and should, therefore, be replaced at this time.

The fuel filter in the VW Type 3 and VW Type 4 fuel injection system should be replaced.

Distributor cap and rotor, and the activated charcoal filter should be visually checked.

If your Volkswagen is an Automatic Stick Shift or a Type 2, the timing vacuum hose should also be checked visually.

E. Every 18,000 miles

If your Volkswagen is equipped with an oil bath filter, the lower section of the air cleaner should be cleaned and the oil changed every 18,000 miles. If the air cleaner in your Volkswagen has a paper filter element, the paper element should be replaced every 18,000 miles or at least every 2 years. If you operate your Volkswagen in dusty areas, it may be

necessary to clean the air cleaner more frequently. If your Volkswagen is a Type 2 Station Wagon, Campmobile or Kombi, the filter element for the air pump should be replaced every 18,000 miles or at least every 2 years. If your Volkswagen is a Type 2 or Type 4, the oil strainer should be cleaned every 18,000 miles.

F. Every 24,000 miles

In the VW Automatic Stick Shift and VW Type 2, the exhaust recirculating valve should be checked and, if necessary, replaced.

If your Volkswagen is an Automatic Stick Shift, a Type 2, or a Type 3 with Automatic Transmission, the filter element for the exhaust recirculation should be replaced at 24,000 miles or at least every 2 years.

Fuel cap, tank and connections should be visually checked.

Thermal and high-voltage stresses cause a heavy burden on the ignition wires, the distributor cap and rotor. These items should be checked every 24,000 miles, and replaced if necessary.

If your Volkswagen is a Type 2, the air injection hoses should be checked visually.

Any deficiencies found should be corrected.

Important

Only use replacement parts, fuels and oils that meet the manufacturer's specifications.

No express warranties as to Volkswagen vehicles sold in the United States are made either by Volkswagen of America, Inc. ("VWoA") or by the manufacturer, the distributor or the selling dealer, except the following warranty and the warranty for new Volkswagen vehicles by Volkswagen of America, Inc. set forth in the Owner's Manual:

Warranty for New Volkswagen Vehicles Emission Control System

This warranty is issued by Volkswagen of America, Inc. ("VWoA"), the authorized United States importer of Volkswagen vehicles:

1. VWoA warrants that every 1973 model Volkswagen vehicle imported by VWoA and sold as a new vehicle to a retail customer by an authorized United States Volkswagen dealer (a) was designed, built and equipped so as to conform at the time of sale with applicable regulations of the United States Environmental Protection Agency, and (b) is free from defects in material and workmanship at the time of sale which cause such vehicle to fail to conform with such regulations for 5 years after the date of delivery of the vehicle to the original retail customer

or until the vehicle has been driven 50,000 miles, whichever comes first. This warranty is limited, however, to the following: If the vehicle is brought during this period to the workshop of any authorized Volkswagen dealer in the continental United States or Hawaii, the dealer will make such repairs as may be required under such regulations.

2. In order to keep this warranty in effect, the owner must have the vehicle maintained and serviced as prescribed in the maintenance schedule for the Volkswagen emission control system.

3. This warranty does not cover: (i) maintenance services such as fuel system cleaning, (ii) the replacement of service items such as spark plugs, ignition points, wiring, hoses, belts and filters, (iii) damage or defects due to misuse, alteration, negligence, accident or failure to have the vehicle maintained in accordance with the maintenance schedule for the Volkswagen emission control system, (iv) damage or defects due to the repair of the vehicle by someone other than an authorized Volkswagen dealer or the installation of parts other than genuine Volkswagen parts, (v) damage or defects due to the use of the vehicle in competitive events, including rallies and races, (vi) any vehicle on which the odometer mileage has been altered and the vehicle's actual mileage cannot be readily determined, (vii) and loss of time, inconvenience, loss of use of the vehicle or other consequential damage.

4. If the vehicle is brought to an authorized Volkswagen dealer outside the continental United States or Hawaii, this warranty will not be applicable and defective parts will be repaired or replaced free of charge with new or factory reconditioned parts only within the terms and limitations of the warranty for new Volkswagen vehicles in effect in the country where such authorized Volkswagen workshop is located.

5. This warranty and the warranty for new Volkswagen vehicles set forth in the Owner's Manual are in lieu of all other express warranties of VWoA, the manufacturer, the distributor and the selling dealer. Neither VWoA nor the manufacturer assumes, or authorizes any person to assume, on its behalf, any other obligation or liability.

Let us explain the warranty . . .

The Emission Control System Warranty of 5 years or 50,000 miles, whichever comes first, is in addition to your New Vehicle Warranty as outlined in the Volkswagen Owner's Manual. Both the Emission Control System Warranty and the New Vehicle Warranty begin on the date of original retail delivery and extend to all subsequent owners within the specified warranty periods.

To keep the Emission Control System Warranty in effect, you, as the owner of the vehicle, have the responsibility to provide regular maintenance service for the vehicle in accordance with the manufacturer's emission control maintenance schedule, as outlined on page 13, and to keep a record of all maintenance service performed on your vehicle.

Your best assurance is having these services performed by authorized Volkswagen dealers. They have VW-trained mechanics and special tools to

provide fast and efficient VW quality service. Provided that maintenance or oil change services were performed in accordance with VW specifications, dated bills from other than authorized VW dealers will be accepted as proof that these services were performed when required.

The efficiency of the Emission Control System greatly depends on the overall condition of the car. Not all repairs, adjustments or replacements result from defects in material or workmanship. There are other circumstances beyond the control of the manufacturer that might make a workshop visit necessary. These depend mainly on where you drive and how you drive. They include climatic and atmospheric conditions as well as individual driving habits and vehicle usage.

The following are examples of items that are not covered by this warranty:

Maintenance

A number of components require regular cleaning, adjusting or replacing at recommended intervals to assure efficient engine operation and effective emission control. They include spark plugs, ignition points, air and fuel filters, drive belts, etc. Cleaning of the fuel system may become necessary if contaminated by water, foreign matter, dirt or residue.

Adjustments of ignition timing, valves or carburetion, which are not performed in accordance with the manufacturer's specifications, may not only increase harmful emissions from your Volkswagen, but may also cause loss in performance or may make extensive repairs necessary.

Wear and Tear

Contaminated oil, lack of lubrication or a restriction of the engine cooling system may result in damage to pistons, bearings or other moving parts. Always use high-quality oils of the grade recommended by the manufacturer. It is important to observe the

minimum fuel octane rating required for your engine. Your car may require more frequent maintenance when operated in dusty areas or under extreme climatic conditions than a car operated under normal conditions.

Corrosion and Deterioration

The use of corrosive chemicals for cleaning such engine parts as the carburetor will cause damage that may require replacement of the entire part. The operation of your VW in areas of atmospheric contamination or extreme climatic conditions may contribute to deterioration of certain components that would not normally occur.

Installation of Accessories or Alterations

Installation of parts and accessories or alterations not meeting manufacturer's specifications may render your Emission Control System ineffective and may void this warranty.