2 Emission control systems - component replacement

Crankcase emission control

1 The components of this system require no routine attention, other than to check that the hoses are clear and undamaged at regular intervals.

Evaporative emission control

Charcoal canister - replacement

2 The canister may be located in the engine compartment, on a bracket attached to the left-hand suspension tower, or under the air intake ducting **(see illustration)** .

2.2 Charcoal canister location (arrow) - six-cylinder model

3 Move any surrounding pipes and hoses to one side to improve access to the canister.

4 Disconnect the hoses from the canister. If the hose is secured by a plastic locking clamp, squeeze the ends of the clamp to release it from the connection on the canister. Note the hose locations to ensure correct installation.

5 Unscrew the securing screws, and withdraw the canister/bracket assembly from the engine compartment **(see illustration)** .

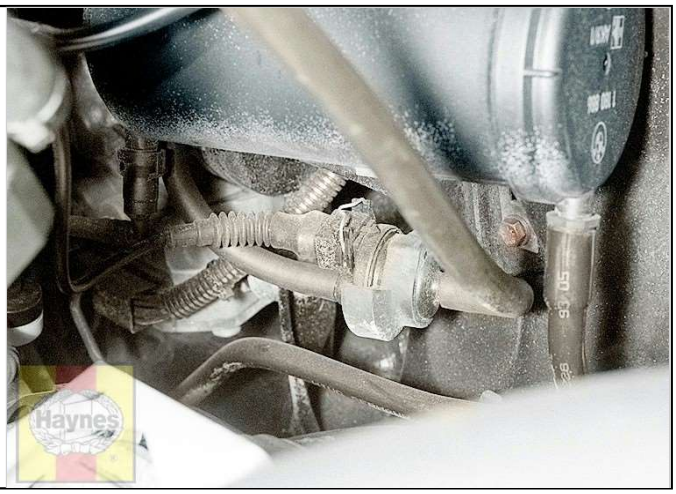
2.5 Removing the charcoal canister - four-cylinder model

6 Installation is a reversal of removal, but ensure that the hoses are correctly reconnected as noted before removal, and make sure that the hose securing clamps are correctly engaged.

Purge valve (solenoid valve) - replacement

7 The valve is located on a bracket, next to the charcoal canister, or under the air intake ducting **(see illustration)** .

2.7 Purge valve location - four-cylinder engine



8 Disconnect the battery negative cable. **Caution:** *If the radio in your vehicle is equipped with an anti-theft system, make sure you have the correct activation code before disconnecting the battery.*

9 If necessary, to improve access, loosen the clamps and remove the air ducting. Note the locations of any breather hoses connected to the ducting.

10 Disconnect the hoses from the valve, noting their locations to ensure correct installation.

11 Disconnect the electrical connector from the valve.

12 Pull the valve from its rubber mounting.

13 Installation is a reversal of removal, but make sure that all hoses are correctly reconnected as noted before removal.

Exhaust emission control

Catalytic converter - replacement

14 The catalytic converter is integral with the front section of the exhaust system. Refer to Part A or B of Chapter 4 (as applicable) for details of removal and installation.

Oxygen sensor - replacement

Note:
Ensure that the exhaust system is cold before attempting to remove the oxygen sensor.

15 On pre-OBD-II models, the oxygen sensor is screwed into the front section of the exhaust system under the vehicle **(see illustration)** . On OBD-II-equipped models, there is a second oxygen sensor, behind the converter **(see illustration)** .

2.15a Typical oxygen sensor location (arrow) in the front section of the exhaust system (six-cylinder model shown)

2.15b On OBD-II models, there are two oxygen sensors (arrows), one ahead of and one behind the converter

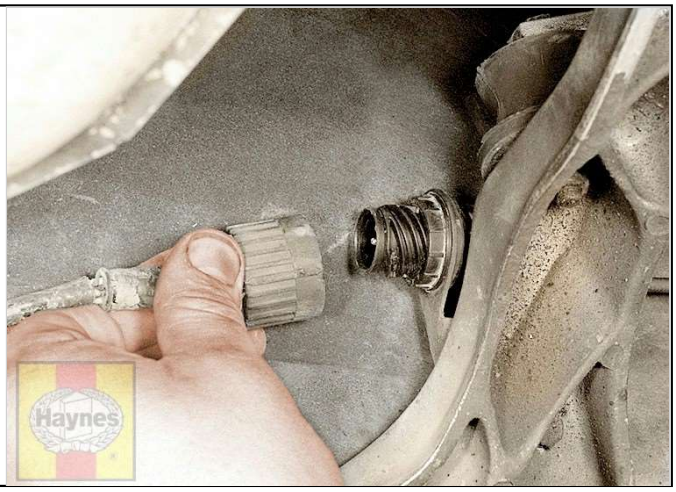
16 Disconnect the battery negative cable. **Caution:** *If the radio in your vehicle is equipped with an anti-theft*

system, make sure you have the correct activation code before disconnecting the battery.

17 Apply the parking brake, then jack up the front of the vehicle and support securely on axle stands.

18 Trace the wiring back from the sensor to the electrical connector under the vehicle, and disconnect the connector **(see illustration)** .

2.18 Disconnecting the oxygen sensor electrical connector - six-cylinder model



19 Unscrew the sensor and remove it from the exhaust pipe.

20 Installation is a reverse of the removal procedure. Tighten the sensor to the specified torque. Check that the wiring is correctly routed, and in no danger of contacting the exhaust system.

Secondary air injection

One-way check valve

21 The one-way check valve is located in the air hose connecting the intake manifold to the electric solenoid. Using a flashlight and a mirror to locate the valve, trace the line from the underside of the intake manifold to the solenoid. Disconnect the lines from both ends of the check valve and remove the valve.

22 Installation is the reverse of removal. Make sure that the tube connections are snug.

Solenoid valve

23 Unplug the solenoid valve electrical connector **(see illustration)** .

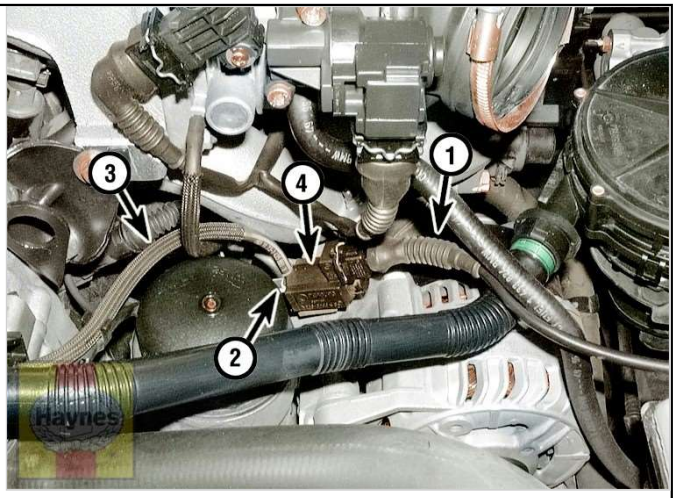
2.23 Typical electric solenoid valve in a secondary air injection system (Z3 four-cylinder model shown, other systems similar)

1 Electrical lead

2 Intake manifold-to-solenoid line

3 Solenoid-to-check valve line

4 Electric solenoid valve



24 Disconnect the inlet line (from the one-way check valve) and outlet line (to the secondary air check valve) from the solenoid valve and remove the valve.

25 Installation is the reverse of removal. Make sure that the tube connections are snug.

Secondary air pump

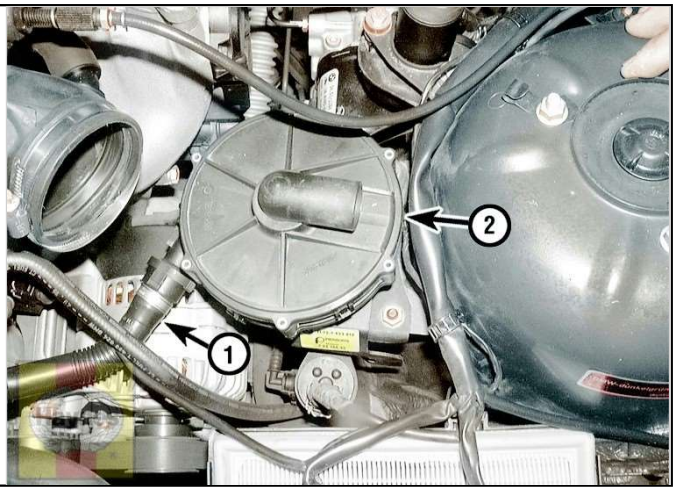
26 Unplug the air pump electrical connector.

27 Disconnect the air pump-to-secondary air check valve hose **(see illustration)** and remove the pump.

2.27 Typical secondary air pump (Z3 four-cylinder model shown, other systems similar)

1 Pump-to-check valve hose

2 Secondary air pump

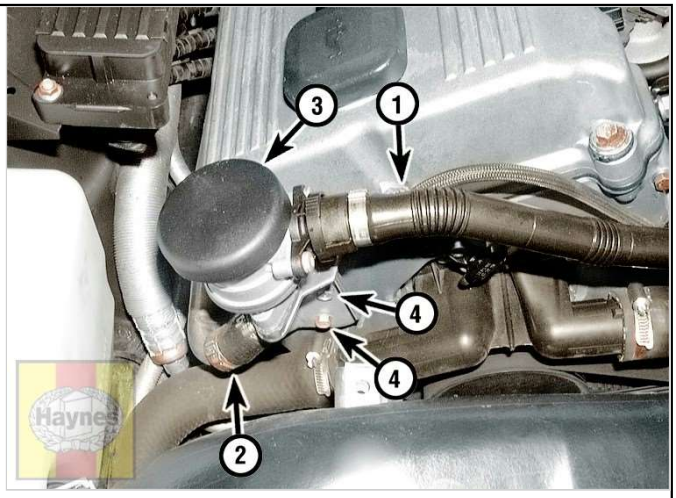


28 Installation is the reverse of removal. Make sure that the hose connections are snug.

Secondary air check valve

29 Disconnect the hoses from the check valve **(see illustration)** .

2.29 Typical secondary air check-valve (Z3 four-cylinder model shown, other systems similar)



1 Pump-to-check valve hose

2 Check valve-to-exhaust manifold hose and line

3 Secondary air check valve

4 Check valve mounting bracket bolts (it's not necessary to remove the bracket unless you're reconditioning or replacing the cylinder head; the check valve can be detached from the bracket by removing two nuts - not visible in this photo)

30 Remove the check valve mounting nuts, remove the pump from its mounting bracket and discard the old gasket.

31 Installation is the reverse of removal. Be sure to use a new gasket and make sure that the hose connections are snug.