



## Secondary Air Injection (AIR) System

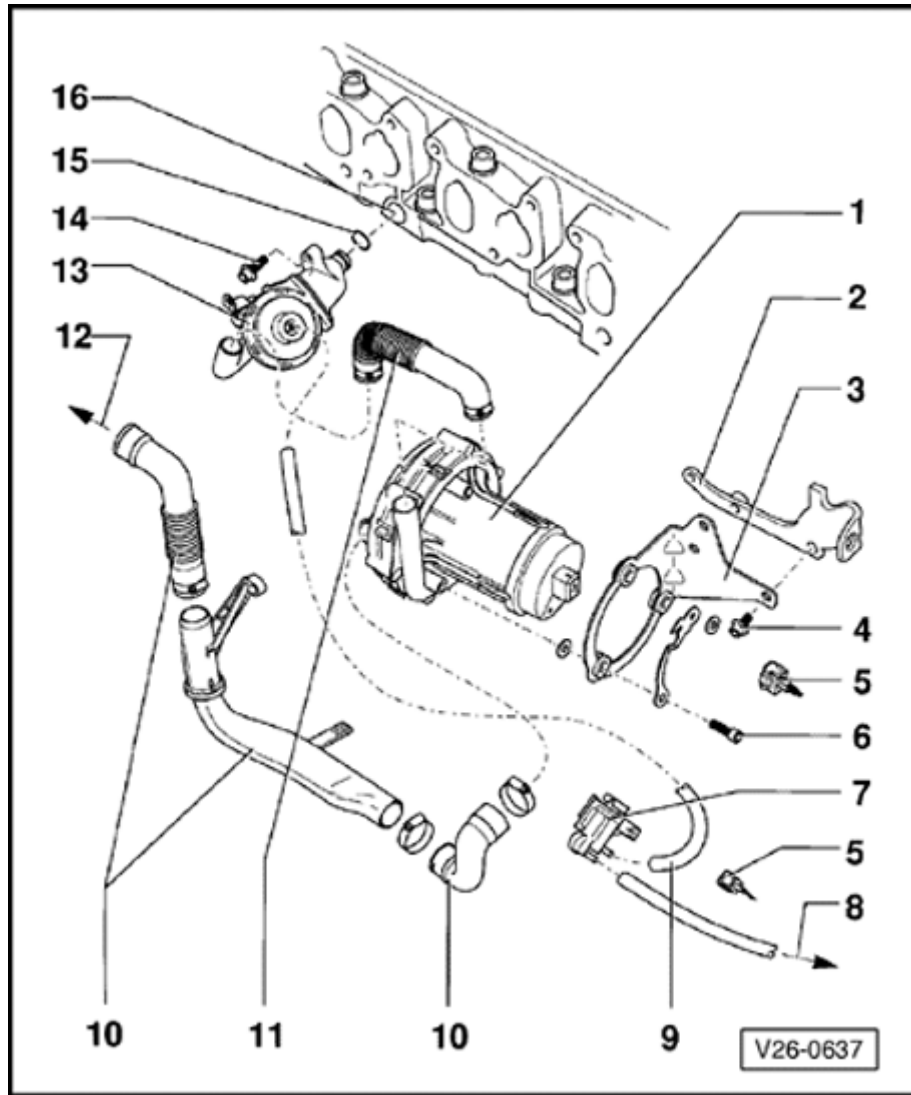
### Function

The Secondary Air Injection (AIR) System injects air behind the exhaust valves for 65 seconds during cold start-at engine coolant temperature of 15 ° C to 35 ° C (58 ° F to 95 ° F). The additional air provided by the Secondary Air Injection (AIR) Pump enriches the exhaust gas with oxygen and initiates after-burning. This after-burning shortens the amount of time required to get the Three Way Catalytic Converter (TWC) up to full operating temperature.

The AIR system is activated by the Motronic Engine Control Module -J220- operating the Secondary Air Injection (AIR) Relay -J299-, which in turn actuates the Secondary Air Injection (AIR) Solenoid Valve (-N112-, change-over valve), and the vacuum-operated Secondary Air Injection (AIR) Inlet Valve.

In addition, the Secondary Air Injection (AIR) System operates briefly each time the engine is started and remains at idle, up to max. 85 ° C (185 ° F) engine temperature. After a 20 second delay, the system is activated for 5 seconds and checked by the On Board Diagnostic (OBD)

program.



## Secondary Air Injection (AIR) System components, removing and installing

### Note:

- ◆ Components with asterisk (\*) are checked by the On Board Diagnostic (OBD) program, and malfunctions stored in Diagnostic Trouble Code (DTC) Memory:

⇒ [Repair Manual, 2.8 Liter VR6 2V Fuel Injection & Ignition, Engine Code\(s\): AAA m.y. 1993-1995, Repair Group 01](#)

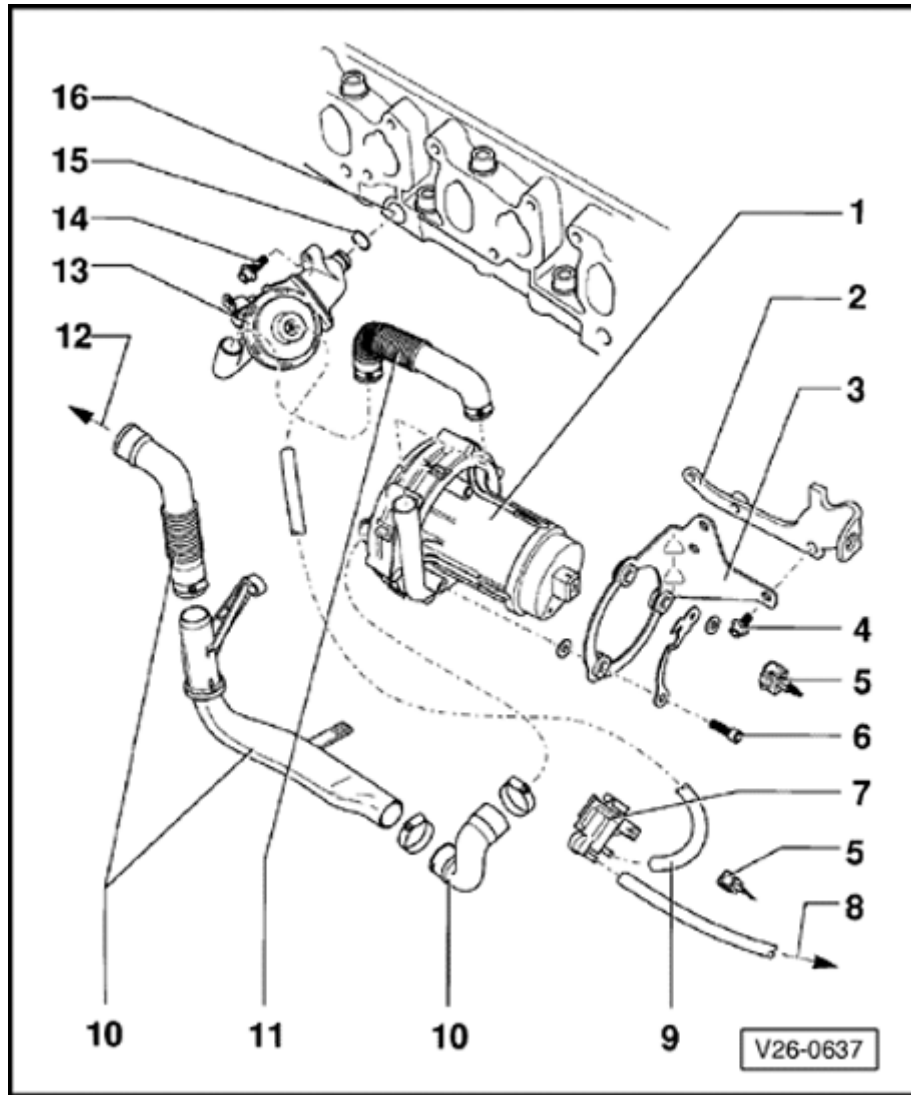
- ◆ Components with double asterisk (\*\*) are checked by On Board Diagnostic (OBD) program operating in Output Diagnostic Test Mode (DTM):

⇒ [Repair Manual, 2.8 Liter VR6 2V Fuel Injection & Ignition, Engine Code\(s\): AAA m.y. 1993-1995, Repair Group 01](#)

- ◆ Secondary Air Injection (AIR) Pump Relay (J299)\* ⇒ [Page 26-19](#), Fig. ⇒ [1](#)

### 1 - Secondary Air Injection (AIR) Pump Motor -V101-\*/\*\*

- ◆ Checking ⇒ [Page 26-20](#)
- ◆ Removing and installing ⇒ [Page 26-24](#)

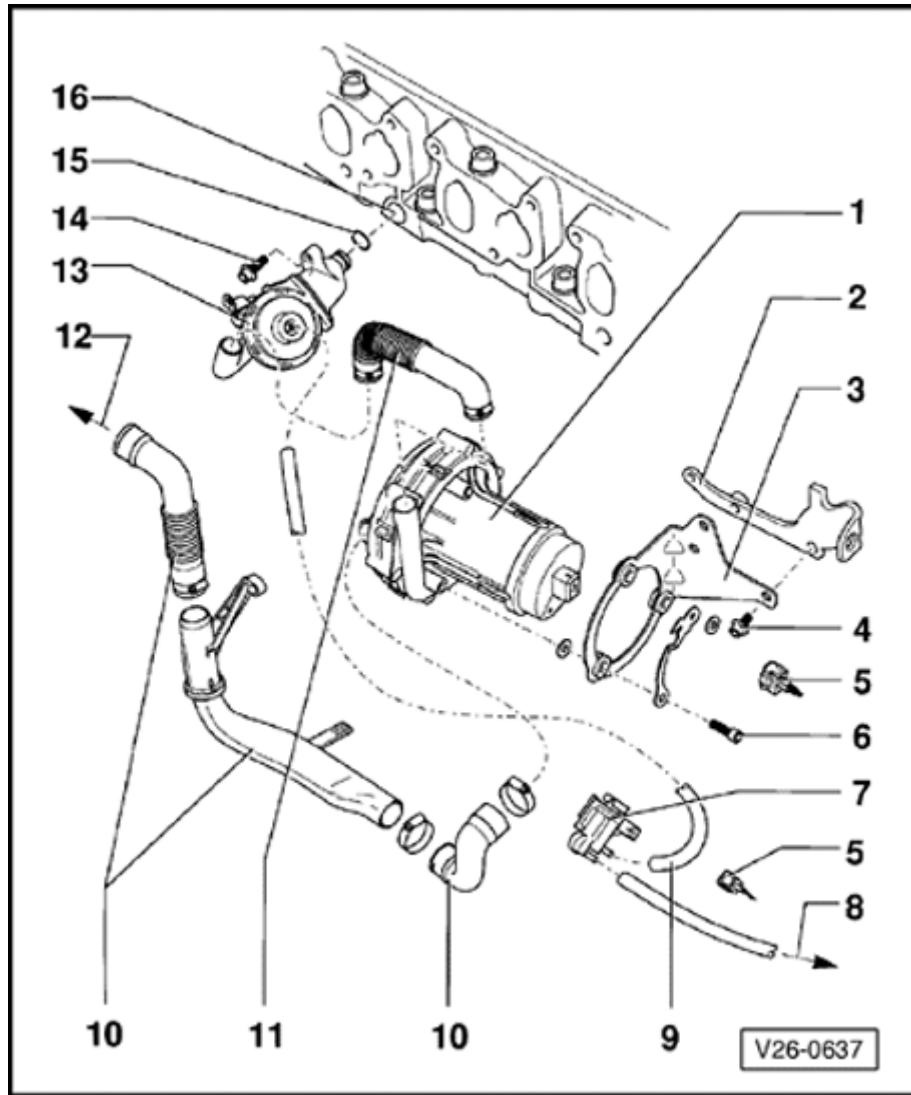


## 2 - Lifting eye

- ◆ On left of cylinder head

## 3 - Bracket

- ◆ For Secondary Air Injection (AIR) Pump Motor - V101 - - 1 - and Secondary Air Injection (AIR) Solenoid Valve -N112- - 7 -



**4 - 25 Nm (18 ft lb)**

**5 - Connector**

- ◆ 2-pin

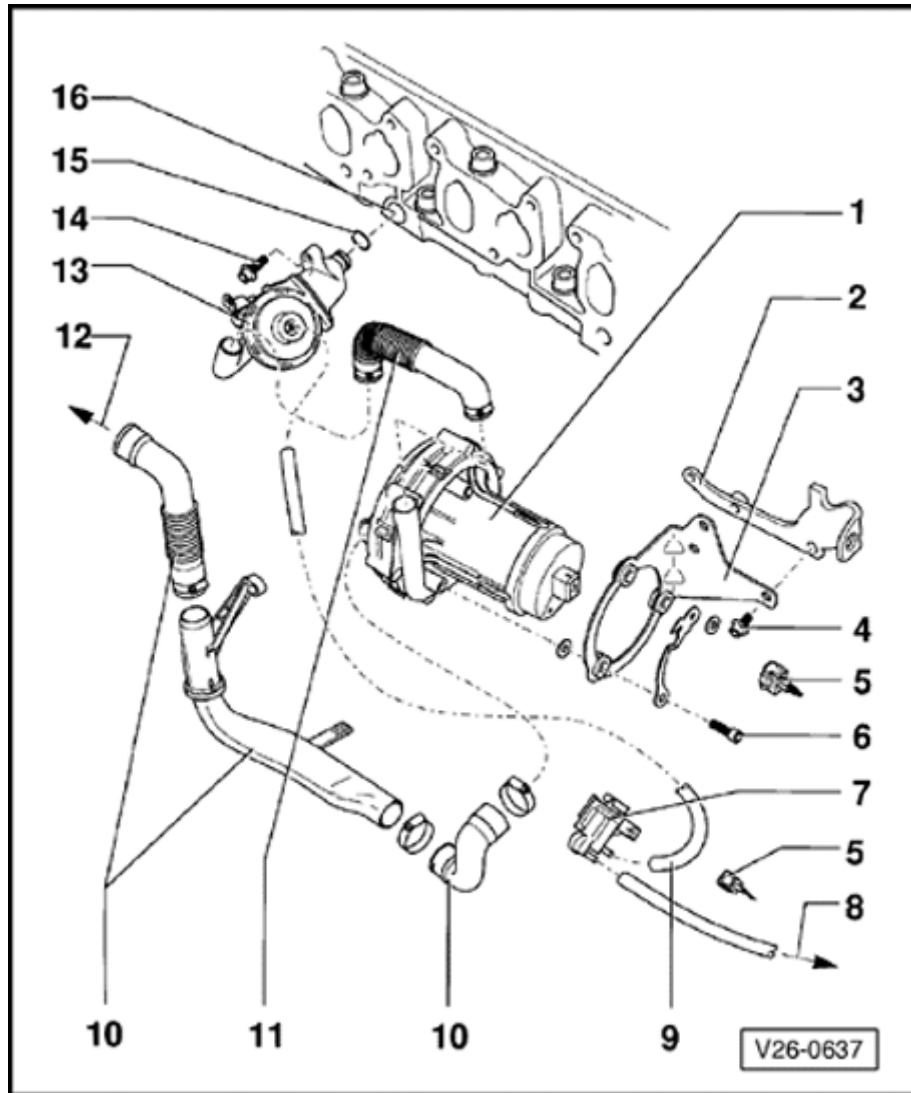
**6 - 10 Nm (7 ft lb)**

**7 - Secondary Air Injection (AIR) Solenoid Valve - N112-\*/\*\***

- ◆ Mounted to bracket - 3 -
- ◆ Checking ⇒ [Page 26-22](#)
- ◆ Removing and installing ⇒ [Page 26-24](#) , Secondary Air Injection (AIR) Inlet Valve and Pump Motor, removing and installing

**8 - Vacuum hose**

- ◆ To upper intake manifold or collective vacuum connection ⇒ [Page 26-9](#) , item -5-



### 9 - Vacuum hose

- ◆ From Secondary Air Injection (AIR) Solenoid Valve - 7 - to Secondary Air Injection (AIR) Inlet Valve - 13 -

### 10 - Intake hose

### 11 - Pressure hose

- ◆ Make sure hose is seated tightly

### 12 - To Air Cleaner (ACL)

### 13 - Secondary Air Injection (AIR) Inlet Valve

- ◆ Checking ⇒ [Page 26-19](#)
- ◆ Removing and installing ⇒ [Page 26-24](#)

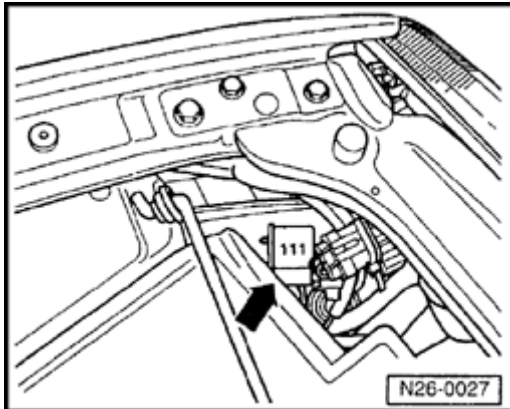
### 14 - 15 Nm (11 ft lb)

### 15 - O-ring

- ◆ Always replace

### 16 - Air port

- ◆ In cylinder head



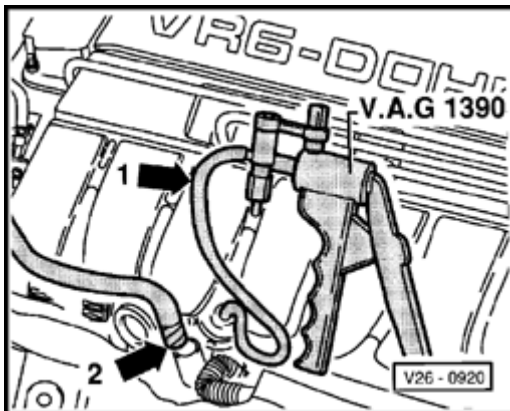
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**Fig. 1 Secondary Air Injection (AIR) Pump Relay -J299-**

- ◆ With fuse -arrow-
- ◆ On the left longitudinal member between battery and headlight -arrow-

### Secondary Air Injection (AIR) Inlet Valve, checking

- Disconnect pressure hose from AIR Inlet Valve.
- Disconnect vacuum hose from AIR Solenoid Valve -N112-.



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- Connect VAG 1390 hand vacuum pump to disconnected vacuum hose -1- and AIR Inlet Valve.

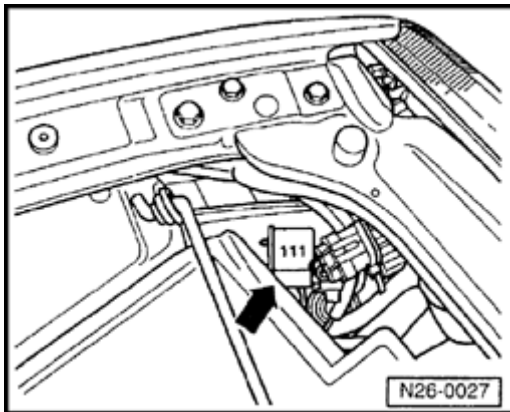
### **CAUTION!**

***Do not use compressed air during this check.***

- Connect auxiliary hose to connection -2-, in place of pressure hose, and blow into it.
- ◆ AIR Inlet Valve must be closed
- Operate hand vacuum pump.
- ◆ AIR Inlet Valve must open



## Secondary Air Injection (AIR) Pump Motor, checking



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- ◆ Fuse on Secondary Air Injection (AIR) Pump Relay -J299- -arrow- OK.
- ◆ Engine oil temperature 15-85 ° C (58-185 ° F)
- Disconnect pressure hose from AIR Inlet Valve, and route upwards.
- Start engine and run at idle.
- ◆ After approx. 20 seconds the AIR Pump Motor (V101) should run for approx. 5 seconds, and secondary air must exit from pressure hose

If the AIR Pump Motor -V101- does NOT run:

- Stop engine.
- Disconnect 2-pin connector from AIR Pump Motor -V101-.
- Connect VAG 1527B voltage tester to the open connector using cables from VAG 1594 adapter kit.
- Start engine and run at idle.
- ◆ After approx. 20 seconds, LED must light for approx. 5 seconds.





If LED lights (voltage supply OK):

- Replace Secondary Air Injection (AIR) Pump Motor -V101-.

If LED does NOT light:

- Reconnect 2-pin connector.
- Check activation of Secondary Air Injection (AIR) Pump Motor -V101-:

⇒ [Repair Manual, 2.8 Liter VR6 2V Fuel Injection & Ignition, Engine Code\(s\): AAA m.y. 1993-1995, Repair Group 01, Output Diagnostic Test Mode and Electrical testing with VAG 1598/18 test box](#)

If Secondary Air Injection (AIR) Pump Motor - V101- does NOT run during the electrical check:

- Check for malfunction of Secondary Air Injection (AIR) Pump Relay -J299-:

⇒ *Electrical Wiring Diagrams, Troubleshooting &*

*Component Locationsbinder*

- Check Diagnostic Trouble Code (DTC)  
Memory:

⇒ [Repair Manual, 2.8 Liter VR6 2V Fuel Injection & Ignition, Engine Code\(s\): AAA m.y. 1993-1995, Repair Group 01](#)



## Secondary Air Injection (AIR) Solenoid Valve -N112-, checking

- ◆ Engine oil temperature 15-85 ° C (58-185 ° F)
- Disconnect vacuum hose from AIR Inlet Valve, and route upwards.
- Start engine and run at idle.
- ◆ After approx. 20 seconds the AIR Pump Motor (V101) should run for approx. 5 seconds, and intake manifold pressure must be perceptible at vacuum hose

If no intake manifold vacuum is perceptible:

- Stop engine.
- Disconnect 2-pin connector from AIR Solenoid Valve -N112-.
- Connect VAG 1527B voltage tester to the open connector using cables from VAG 1594 adapter kit.

- Start engine and run at idle.

◆ After approx. 20 seconds, LED must light for approx. 5 seconds.

If LED lights (voltage supply OK):



- Replace Secondary Air Injection (AIR) Solenoid Valve -N112-.

If LED does NOT light:

- Reconnect 2-pin connector.
- Check activation of Secondary Air Injection (AIR) Solenoid Valve (N112):

⇒ [Repair Manual, 2.8 Liter VR6 2V Fuel Injection & Ignition, Engine Code\(s\): AAA m.y. 1993-1995, Repair Group 01, Electrical testing with VAG 1598/18 test box](#)

If AIR Solenoid Valve -N112- cannot be felt to switch during the electrical check:

- Check for malfunction of Secondary Air Injection (AIR) Pump Relay -J299-:

⇒ [Electrical Wiring Diagrams, Troubleshooting & Component Locationsbinder](#)

- Check Diagnostic Trouble Code (DTC) Memory:

⇒ [Repair Manual, 2.8 Liter VR6 2V Fuel Injection & Ignition, Engine Code\(s\): AAA m.y. 1993-1995, Repair Group 01](#)



## Secondary Air Injection (AIR) Inlet Valve and Pump Motor, removing and installing

### Removing

#### **CAUTION!**

***Obtain radio code before disconnecting battery.***

- ◆ Ignition switched OFF
- Disconnect battery Ground (GND) strap.
- Remove cover above radiator.
- Remove Air Cleaner (ACL).
- Remove headlights:

⇒ [Repair Manual, Electrical Equipment, Repair Group 94.](#)

- Loosen lock carrier (radiator support) with attachments and pull forward slightly:

⇒ *Repair Manual, Body Exterior, Interior Golf, GTI, Jetta, Repair Group 50.*





## Vehicles with air conditioner

### **CAUTION!**

♦ **DO NOT open A/C refrigerant circuit and make sure lines and hoses are not kinked or damaged.**

- Remove clamps from A/C refrigerant lines.

### Continued for all vehicles

- Release poly-ribbed belt tension, remove tensioning roller ⇒ [Page 13-21](#) .
- Remove Generator (GEN).
- Remove Intake Air hose from AIR Pump Motor - V101-, and remove pressure hose between AIR Inlet Valve and AIR Pump Motor -V101-.
- Disconnect vacuum hose from AIR Inlet Valve.
- Disconnect dipstick tube from lower intake manifold.

- Disconnect AIR Inlet Valve from cylinder head.
- Disconnect 2-pin connectors from AIR Pump Motor (V101) and AIR Solenoid Valve -N112-.
- Disconnect AIR Pump Motor -V101- from lifting eye.

### **Installing**

- Install in reverse order of removal.