



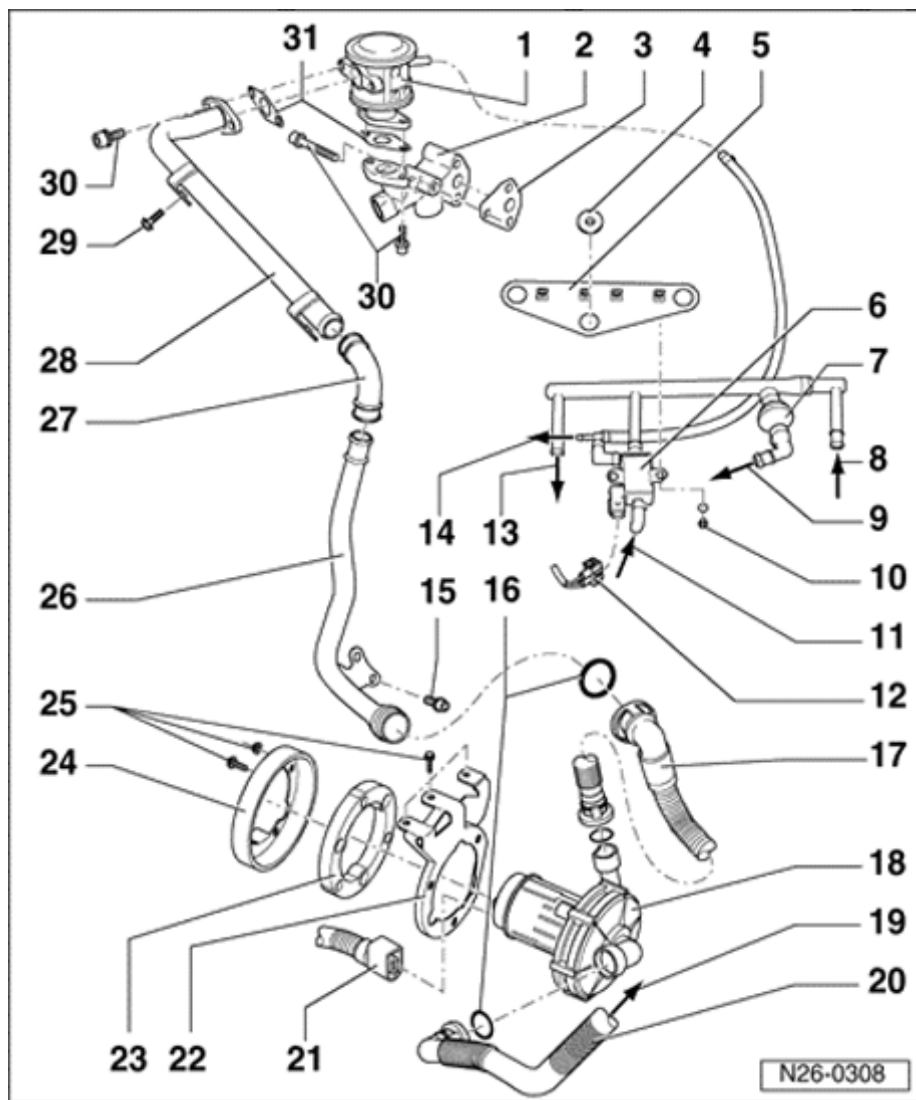
## Secondary air system

### Function

The secondary air system blows air in behind the exhaust valve for 100 seconds during a cold start (+ 5 ° C to + 33 ° C coolant temperature). This produces an oxygen rich exhaust gas, causes afterburning and reduces the heating-up phase of the catalyst.

Activation occurs from the Motronic Engine Control Module -J220- via the Secondary Air Injection (AIR) pump relay -J299- to the Secondary Air Injection (AIR) solenoid valve - N112-, change-over valve and combination valve.

Additionally, after each subsequent engine start (up to max. 96 ° C engine temperature) the secondary air system will switch in for 10 seconds during idling and will be checked by the On Board Diagnostic (OBD). When this occurs, the Oxygen sensor control must be active.



## Secondary air system components, removing and installing

### Note:

- ◆ Components marked with an asterisk (\*) are checked by On Board Diagnostic (OBD)

⇒ Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01

- ◆ Components marked with a double asterisk (\*\*) are checked by the Output Diagnostic Test Mode (DTM)

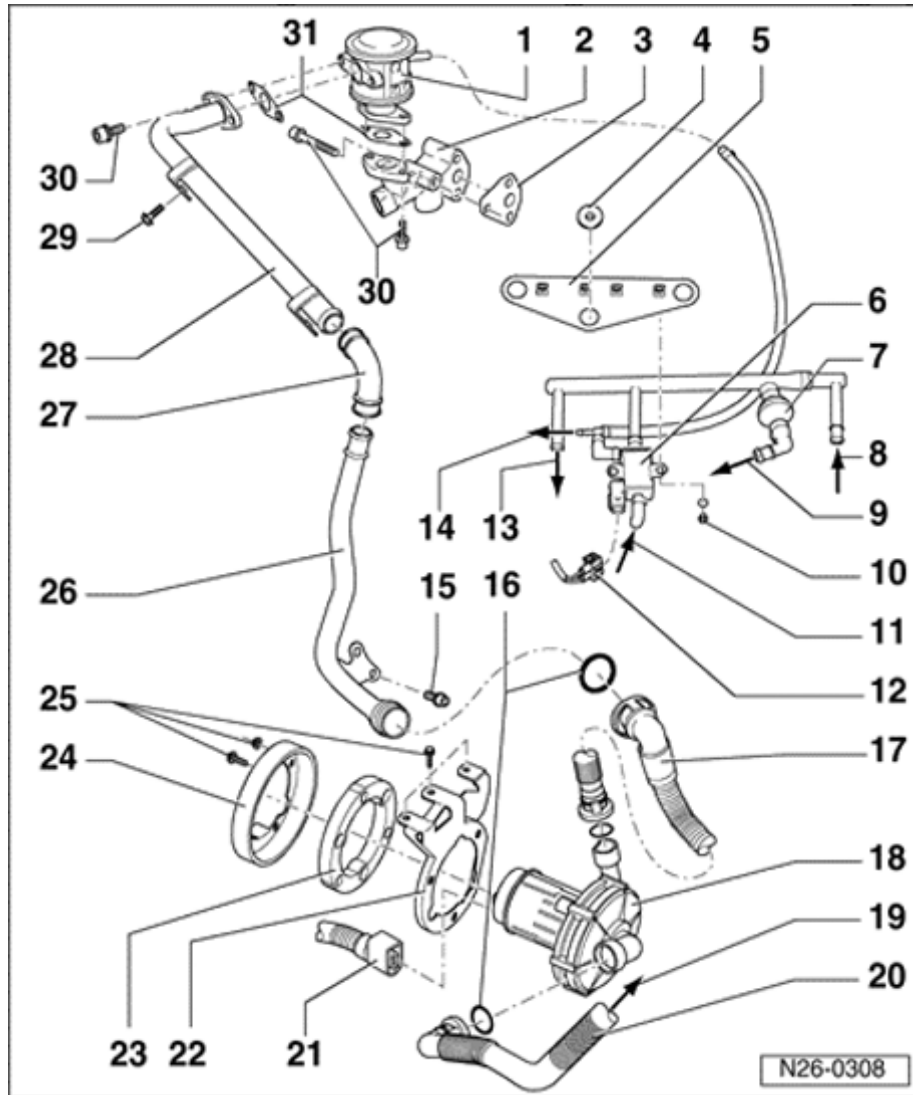
⇒ Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01

### 1 - Combination valve

- ◆ Checking ⇒ Page ⇒ [Page 26-17](#)

### 2 - Bracket

- ◆ Secured to cylinder head



### 3 - Gasket

- ◆ Always replace

### 4 - Rubber mounting

### 5 - Bracket

- ◆ Secured to intake manifold

### 6 - Secondary Air Injection (AIR) solenoid valve - N112-\*/\*\*

- ◆ Resistance: 25 to 35  $\Omega$

### 7 - Check valve

### 8 - From vacuum reservoir

### 9 - To brake servo

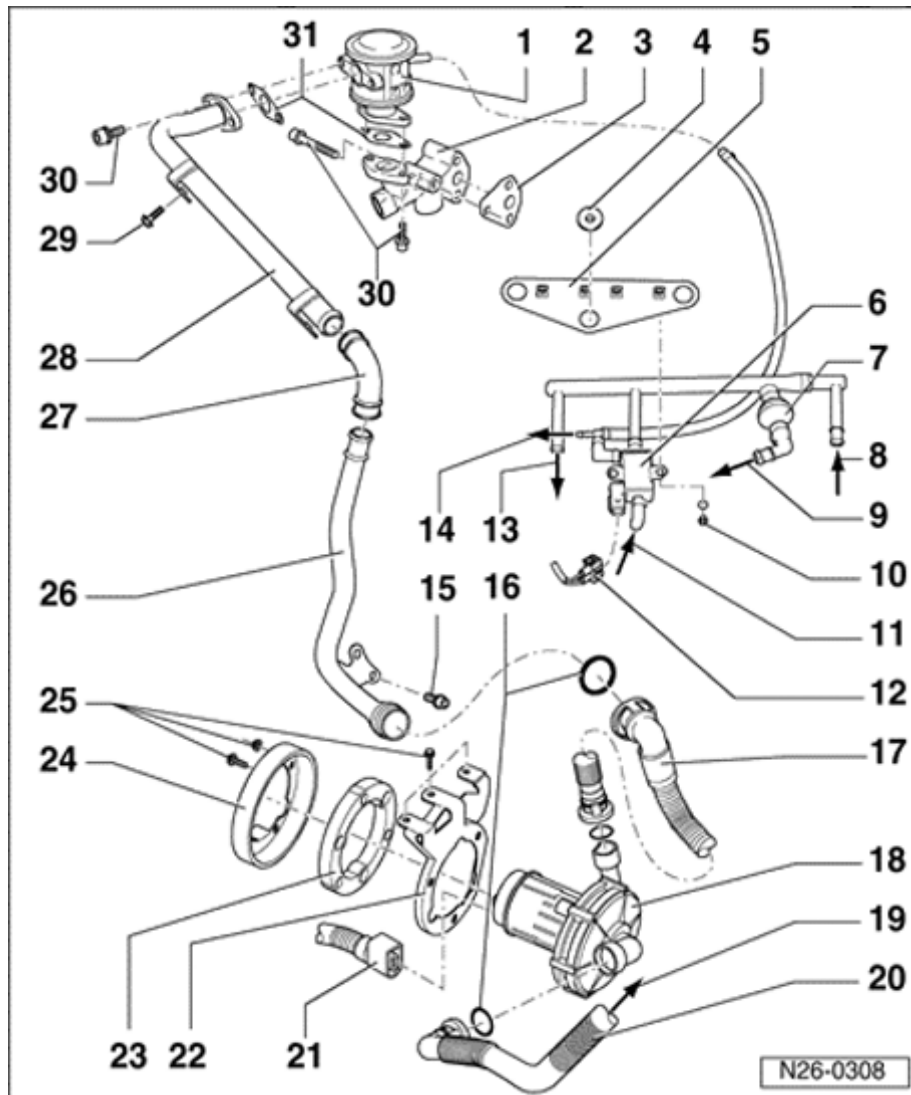
### 10 - 6 Nm

### 11 - Breather connection

### 12 - Connector

- ◆ 2-pin

### 13 - To Recirculating valve for turbocharger -N249-



**14 - To pressure unit on turbocharger**

**15 - 10 Nm**

**16 - O-Ring**

- ◆ Replace if damaged

**17 - Pressure hose**

- ◆ Ensure seated tightly
- ◆ Press together at front to release

**18 - Secondary Air Injection pump motor -V101-\*\***

- ◆ Checking function ⇒ [Page 26-19](#)

**19 - To air cleaner**

**20 - Intake hose**

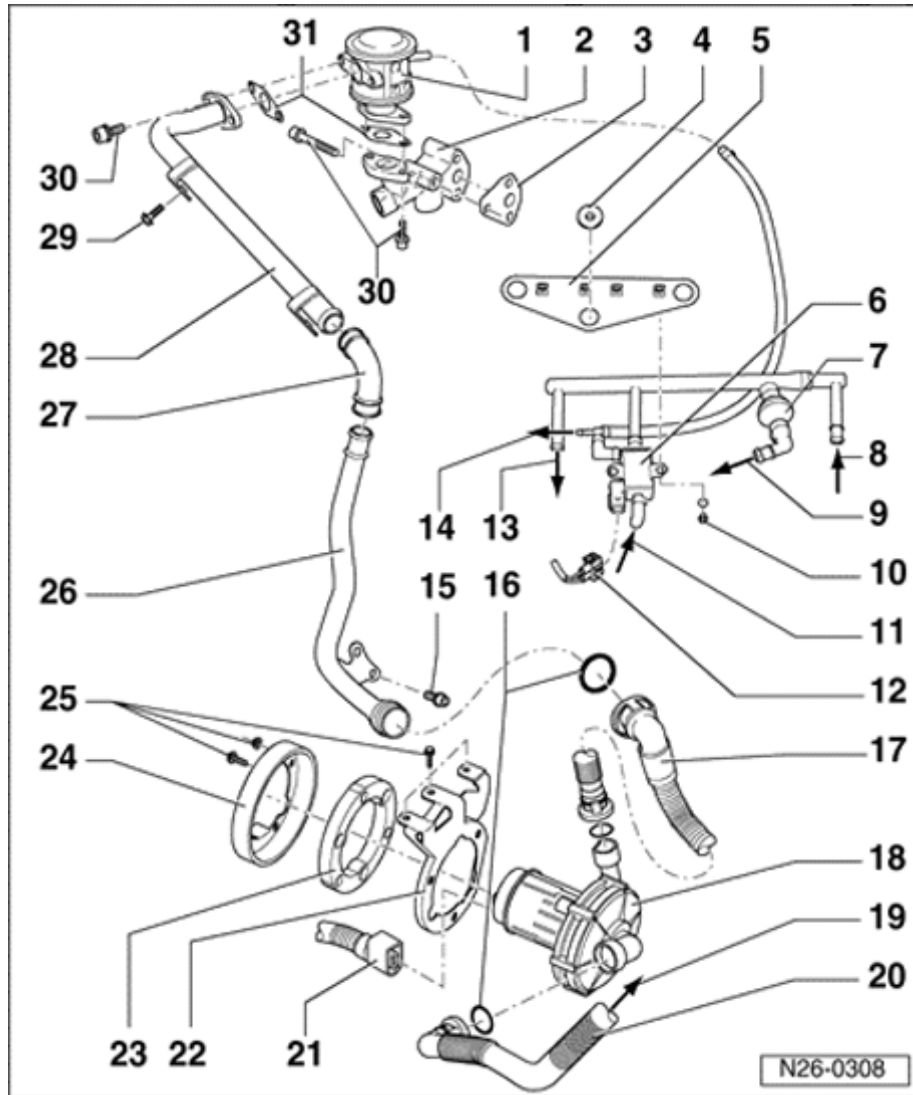
- ◆ For secondary air pump

**21 - Connector**

- ◆ 2-pin
- ◆ For secondary air injection pump motor

**22 - Bracket**

- ◆ For secondary air injection pump motor



23 - Insulation ring

24 - Protective cap

25 - 10 Nm

26 - Connecting pipe

27 - Angle piece

◆ Secure with screw-type or spring-type clips

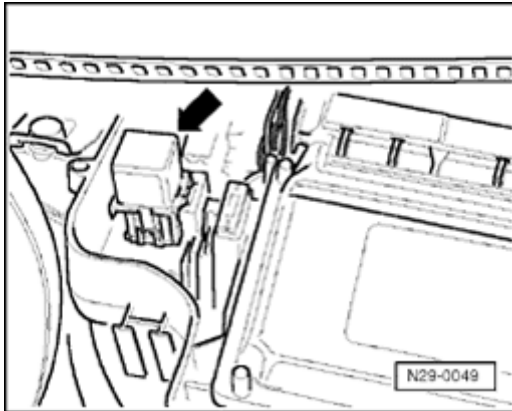
28 - Pressure pipe

29 - 6 Nm

30 - 10 Nm

31 - Gasket

◆ Always replace



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**Fig. 1 Secondary Air Injection pump relay -J299- (arrow)**

- ◆ *If tools are necessary to pull relays or control modules out of the relay plate, first disconnect battery Ground strap.*
- ◆ *Before disconnecting battery Ground strap obtain code for radios with anti-theft coding.*



## Combination valve, checking

### Special tools and equipment

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- ◆ V.A.G 1390 Hand vacuum pump

### Checking conditions

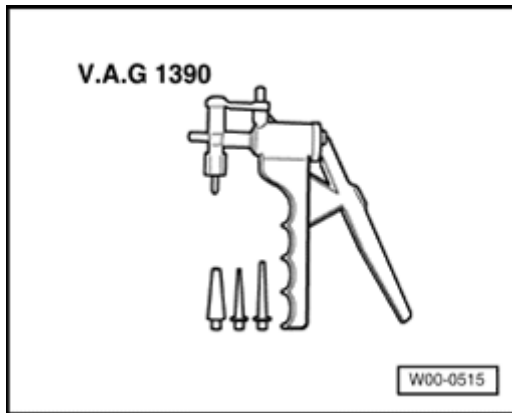
- ◆ No code stored in Diagnostic Trouble Code (DTC) memory.

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01*

- ◆ Perform Output Diagnostic Test Mode (DTM).

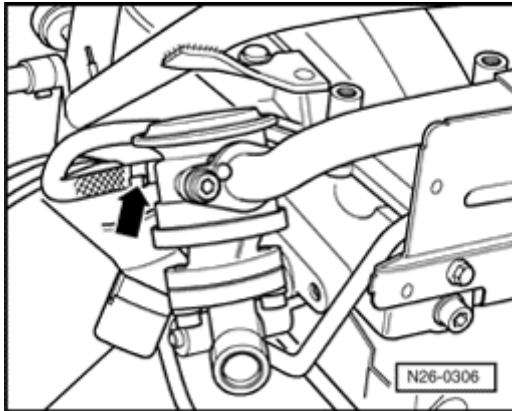
⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01*

- ◆ Vacuum lines and hose connections free of leaks.
- ◆ Vacuum lines not blocked/kinked.





### Checking sequence

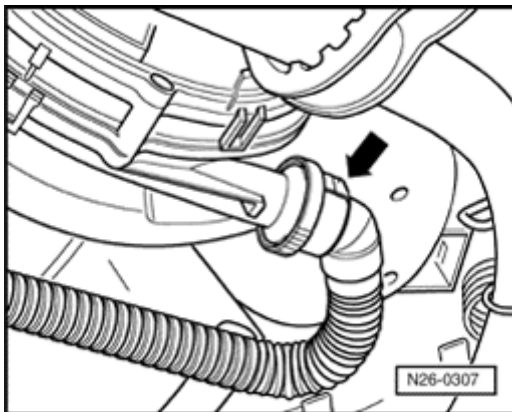


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- Pull vacuum hose off combination valve (arrow) and connect hand vacuum pump V.A.G 1390.

#### **Note:**

*Do not use compressed air during the following check!*



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- Remove pressure hose from secondary air injection pump motor and blow into hose lightly.
  - Combination valve must be closed.
- Operate hand vacuum pump.
  - Combination valve must open.

If the combination valve does not open:

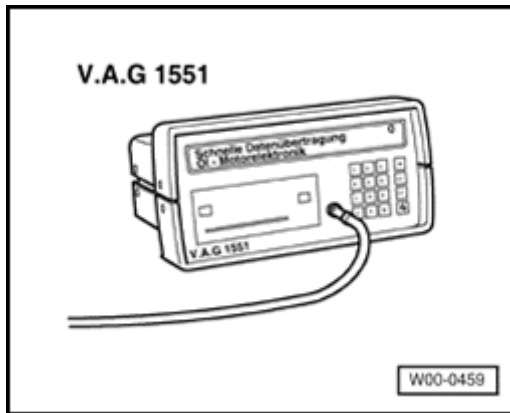
- Replace combination valve





## Secondary Air Injection pump motor

### Special tools and equipment

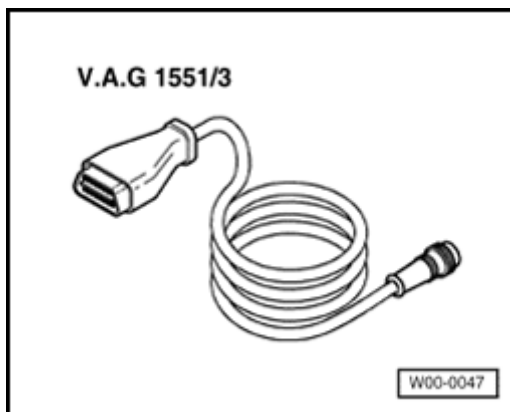


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- ◆ V.A.G 1551 Scan Tool

#### **Note:**

*The vehicle system tester V.A.G 1552 can be used instead of the V.A.G 1551 Scan Tool, however a print-out is not possible.*



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- ◆ V.A.G 1551/3 Cable



### Checking conditions

- ◆ Fuse for secondary air injection pump relay OK.
- ◆ Suction hose for secondary air injection pump is not blocked or kinked

### Checking sequence

- Remove insulation tray.

⇒ [Repair Manual, Body Exterior, Repair Group 50](#)

- Disconnect pressure hose from the secondary air injection pump motor.
- Activate secondary air injection pump relay via Output DTM.

⇒ [Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01](#)

- Secondary air injection pump motor must run at intervals, and air must exit outlet connections.

If the motor runs, but no air exits:

- Replace secondary air injection pump motor.

If the secondary air injection pump motor does not run at intervals:

- Check activation of secondary air injection pump motor.

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01*



## Secondary air inlet valve, checking

### Checking conditions

- Engine oil temperature 5 to 33 °C
- Secondary air injection pump motor OK.

### Checking sequence

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- Disconnect vacuum hose from combination valve (arrow).
- Start engine and run at idling speed. When secondary air injection pump motor starts, vacuum must be felt on vacuum hose.

If no intake manifold vacuum is perceptible:

- Switch engine off.
- Check activation of valve.

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01*

