



Secondary air system

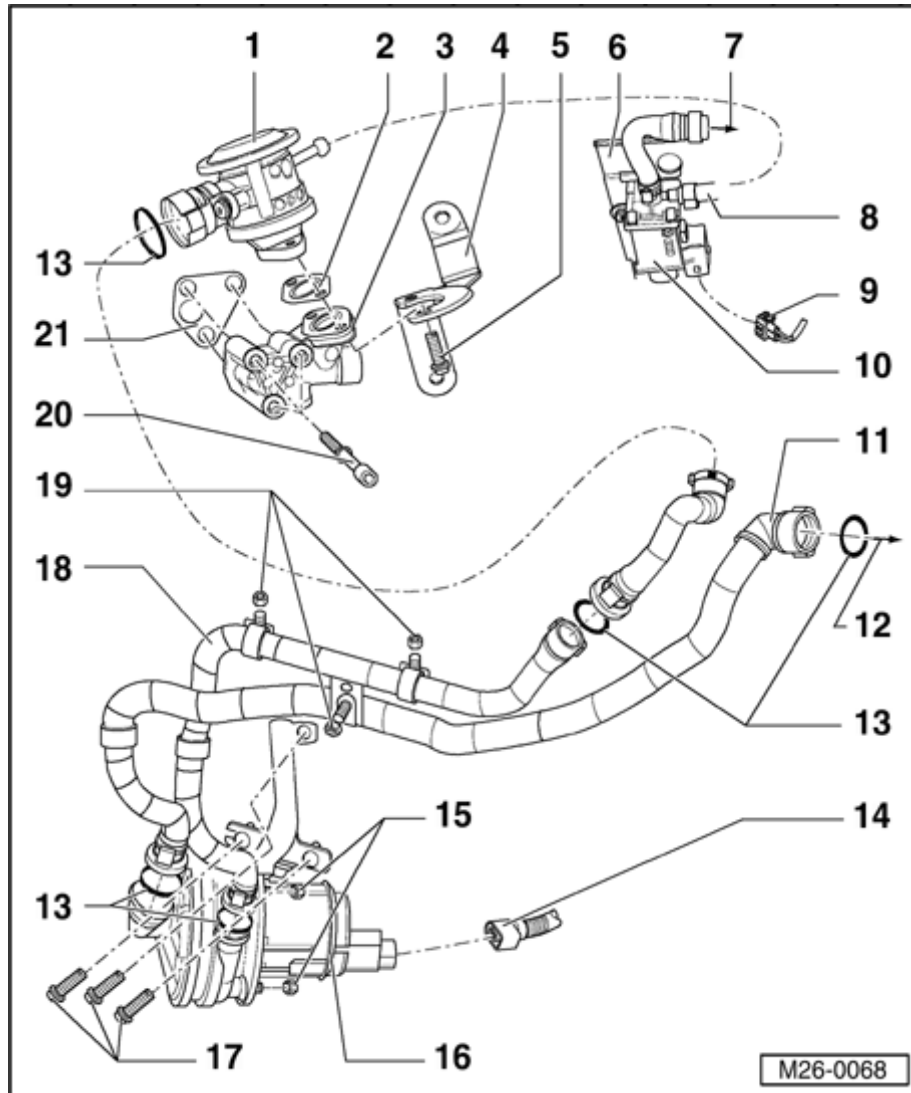
WARNING!

When doing any repair work, especially in the engine compartment, due to the cramped conditions, pay attention to the following:

- ♦ ***Route all sorts of pipes (e.g. for fuel, hydraulics, evaporative emissions system, coolant, refrigerant, brake fluid and vacuum pipes and hoses) and electrical wiring so that the original positions are restored.***
- ♦ ***Make sure sufficient clearance to all moving or hot components.***

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 an after burn and reduces the heating-up phase of the three way catalytic converter. Activation occurs from the Motronic control module (J220) via the secondary air pump relay (J299) to secondary air intake valve (N112, change-over valve) and combi-valve.



Secondary air system components, removing and installing

Notes:

◆ Components marked with an * are checked by the On Board Diagnostic (OBD):

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

◆ Components marked with ** are checked by Output Diagnostic Test Mode (DTM):

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

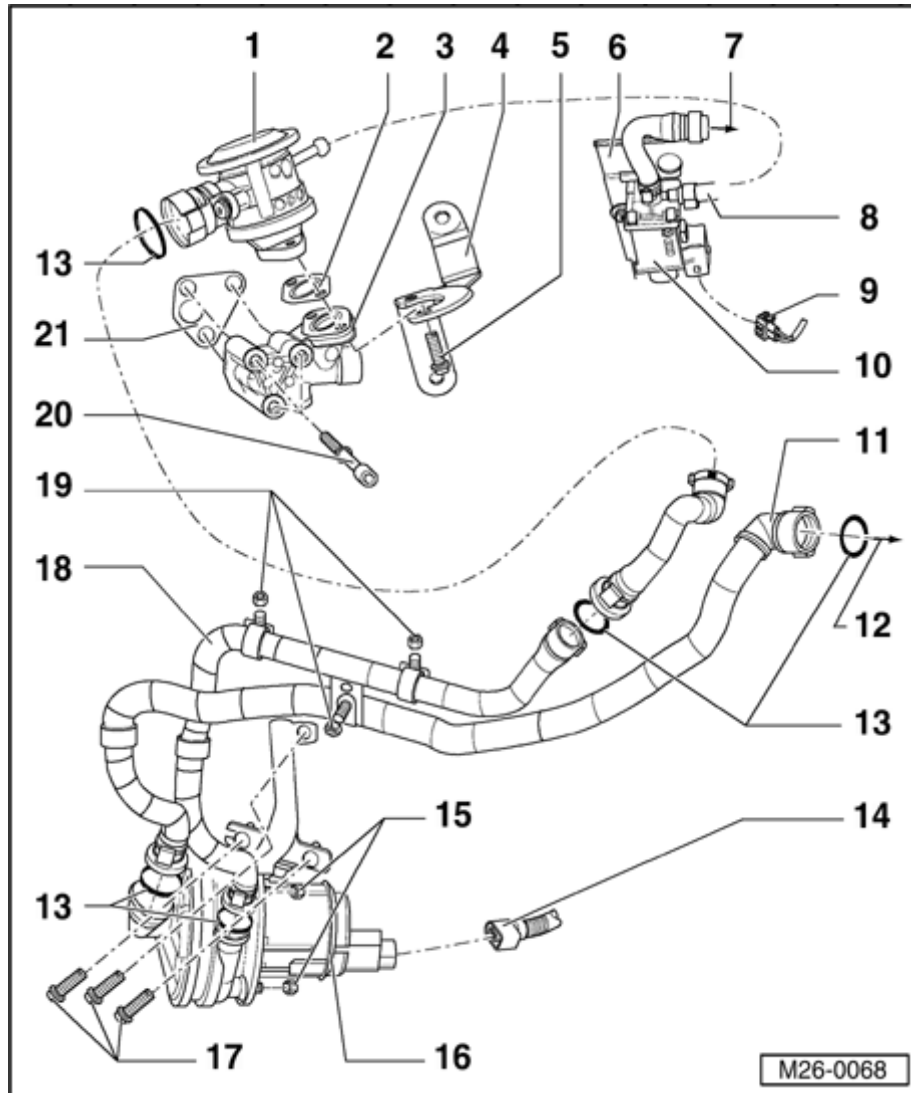
◆ Secondary air pump relay (J299)** ⇒ [Page 26-13](#), ⇒ Fig. ⇒ [1](#)

1 - Combi-valve

◆ Checking ⇒ [Page 26-14](#)

2 - Gasket

◆ Replace



3 - Connection

- ◆ Secured to cylinder head

4 - Bracket

5 - 10 Nm

6 - Bracket

- ◆ Secured to intake manifold

7 - To vacuum reservoir

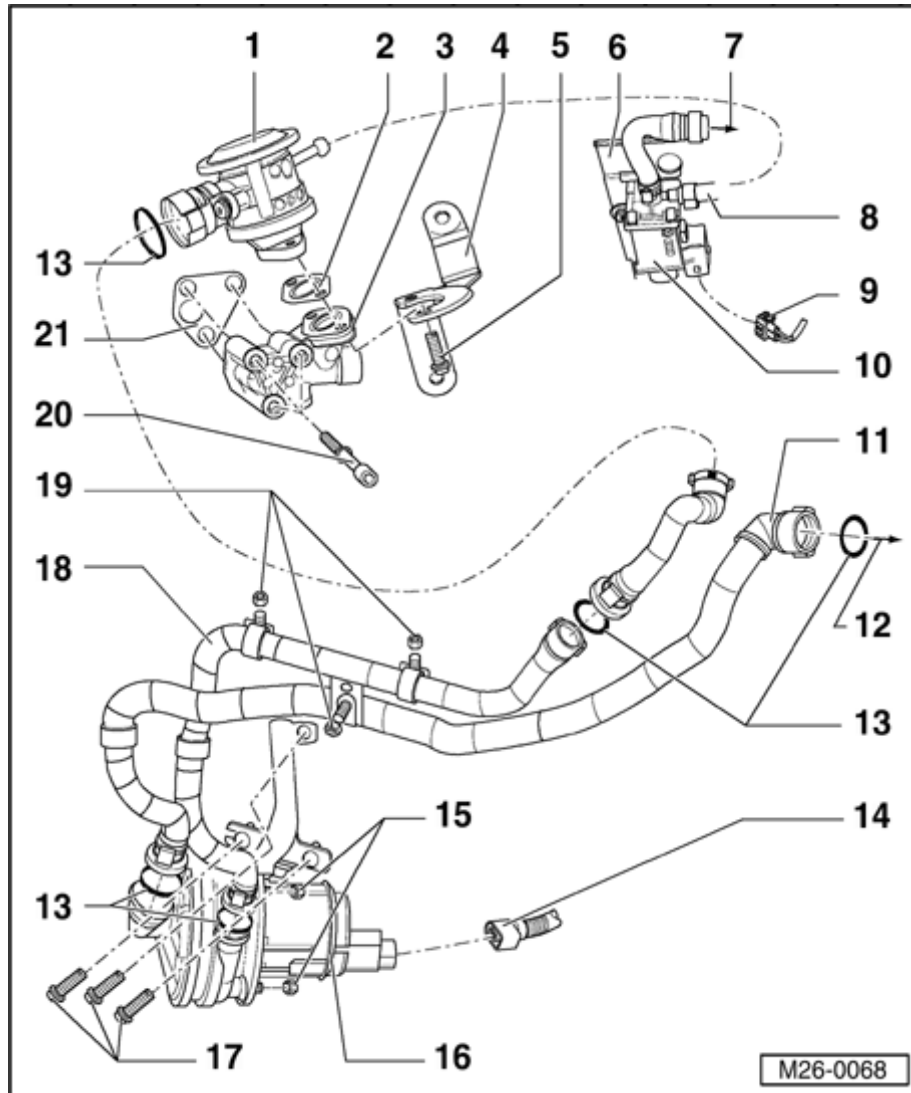
8 - Vacuum hose

9 - Connector

- ◆ 2 pin

10 - Secondary air intake valve (N112)^{*/**}

- ◆ Secured to bracket with 6 Nm
- ◆ Resistance: 21 to 24 Ω
- ◆ Checking \Rightarrow [Page 26-20](#)



11 - Intake hose

- ◆ For secondary air pump
- ◆ Make sure seated tightly
- ◆ Press together at front to release

12 - To air cleaner

13 - O-Ring

- ◆ Replace

14 - Connector

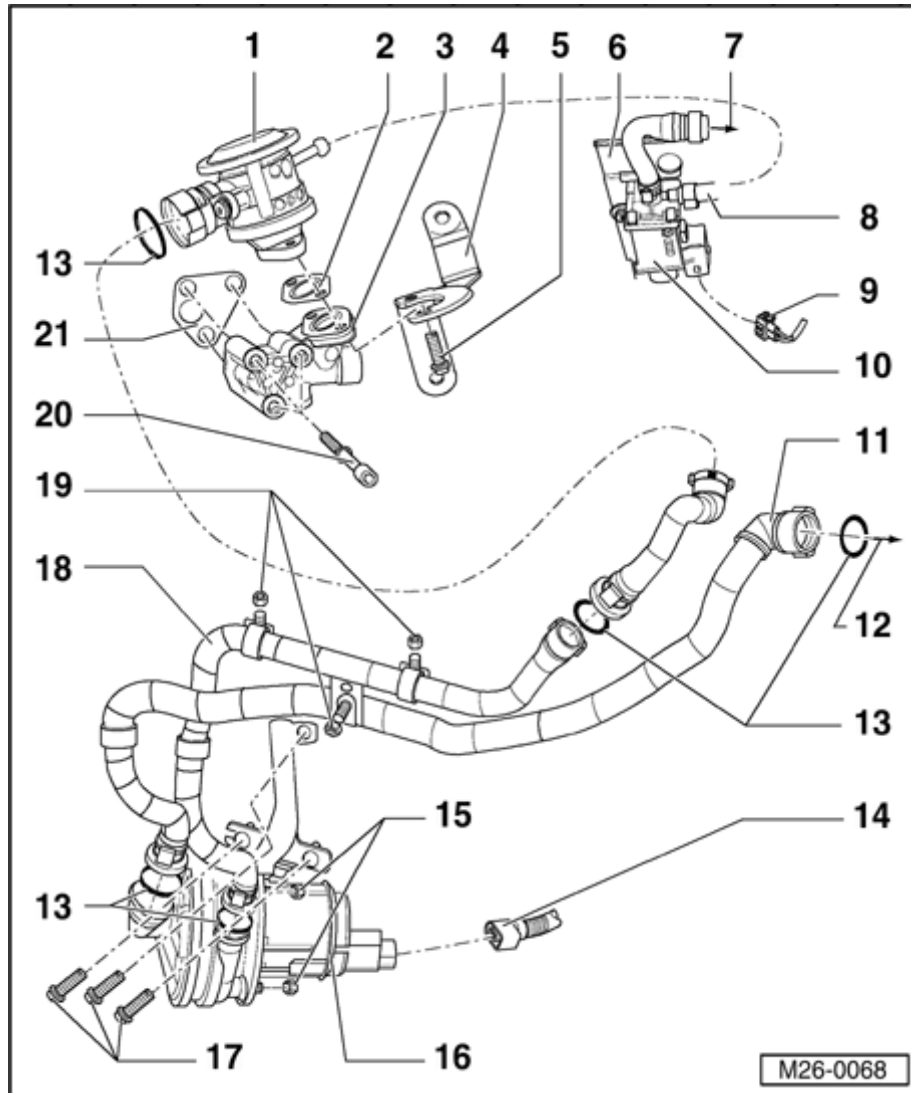
- ◆ 2 pin
- ◆ For secondary air pump motor

15 - 10 Nm

16 - Secondary air pump motor (V101)**

- ◆ Checking function ⇒ [Page 26-16](#)

17 - 10 Nm



18 - Pressure hose

- ◆ Make sure seated tightly
- ◆ Press together at front to release

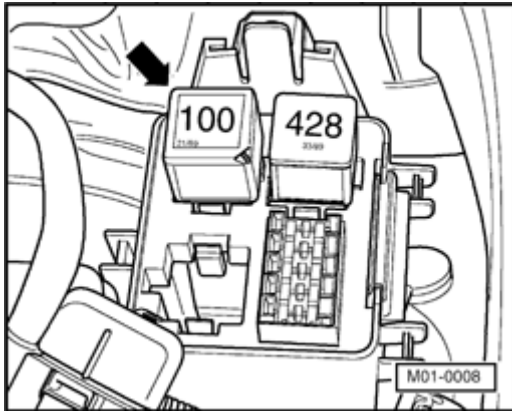
19 - 10 Nm

- ◆ Secured to bracket ⇒ item 6

20 - 10 Nm

21 - Gasket

- ◆ Replace



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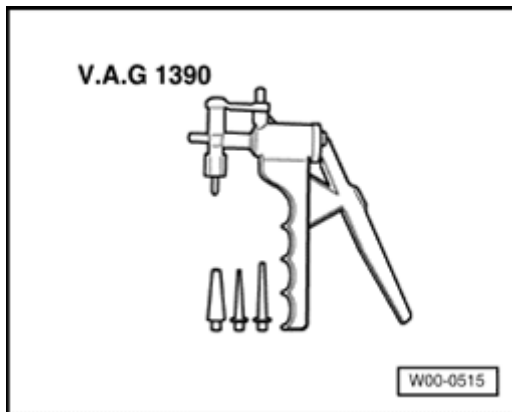
Fig. 1 Secondary air pump relay (J299) -arrow-

- ◆ *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.*



Secondary Air Injection (AIR) solenoid valve -N112-, checking

Special tools, workshop equipment, testers, measuring instruments and auxiliary items required



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- ◆ V.A.G 1390 Hand vacuum pump

Check conditions

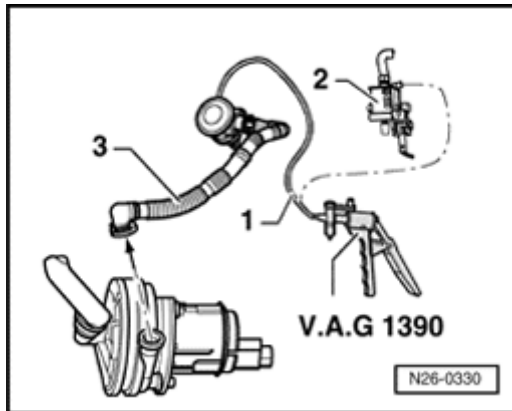
- No DTCs must be stored in DTC memory:

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

- Carry out Output Diagnostic Test Mode (DTM)

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

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



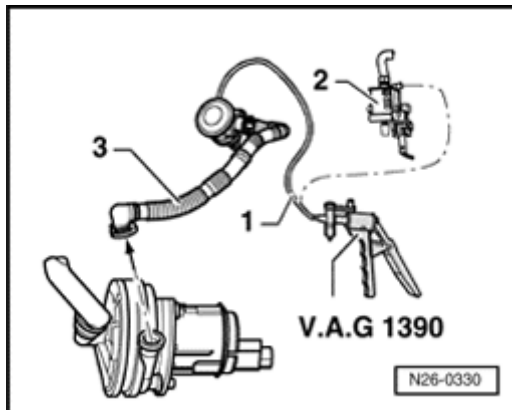
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Test sequence

- Pull vacuum hose -1- off secondary air intake valve -2- (N112).
- Connect hand vacuum pump V.A.G 1390 to vacuum hose -1-.

Note:

Do not use compressed air during the following check!



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- Detach pressure hose -3- from secondary air pump motor and blow in lightly - arrow-. Combi-valve must be closed.

Note:

To release, press together the buttons on the hose coupling.

- Operate hand vacuum pump. Combi-valve must open.

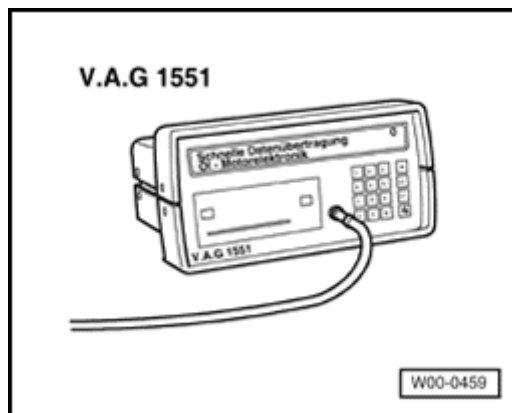
If the combi-valve does not open:

- Replace the combi-valve



Secondary air system pump motor, checking

Special tools, workshop equipment, testers, measuring instruments and auxiliary items required

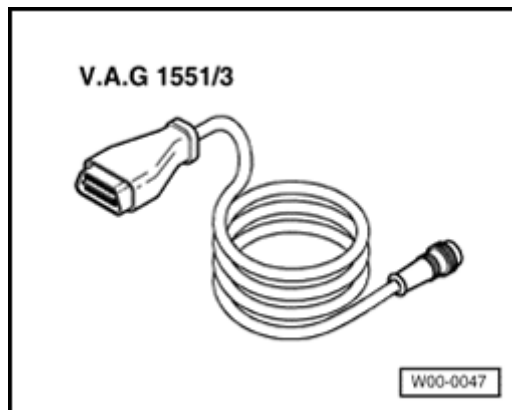


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- ◆ V.A.G 1551 scan tool

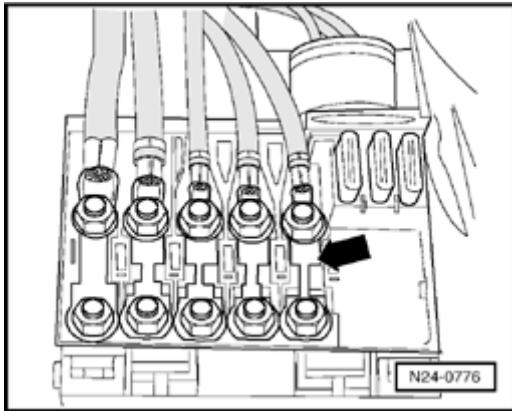
Note:

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



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- ◆ V.A.G 1551/3 Cable



Check conditions

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- Fuse for secondary air pump relay (J299) -arrow- located in the main fuse box on the battery is OK.
- No DTCs must be stored in DTC memory:

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

- The battery voltage must be at least 11.5 V.
- The suction hose for secondary air pump is not blocked or kinked

Test sequence

- Remove engine cover.
- Detach the pressure hose from the secondary air pump motor.

Note:

To release, press together the buttons on the hose coupling.



- Activate the secondary air pump relay via the Output Diagnostic Test Mode (DTM).

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

- The secondary air pump motor must run at intervals, and air must exit the outlet connections.

If the motor runs, but no air exits:

- Proceed with Output Diagnostic Test Mode (DTM) until completed.
- Press keys 0 and 6 for the function "End output" and confirm entry with the Q key.
- Switch off ignition.
- Replace secondary air pump motor.
- Check DTC memory:

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

- Read out readiness code:

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



- If the DTC memory has been erased or the engine control module separated from the permanent positive, the readiness code must be generated again.

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

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

- Check activation of secondary air pump motor:

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

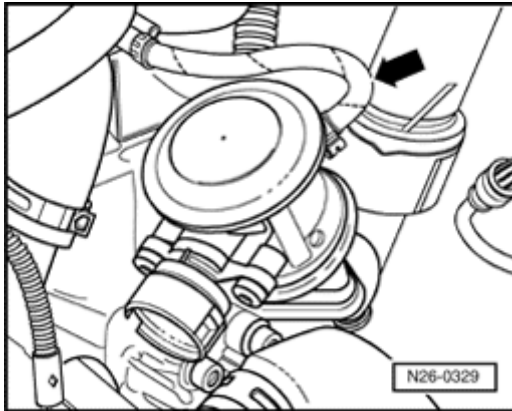


Secondary air intake valve, checking

Check conditions

- Coolant temperature 5 to 33 °C
- Secondary air pump motor OK.
- No DTCs must be stored in DTC memory:

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



Test sequence

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- Pull vacuum hose off combi-valve -arrow-.
- Start engine and run at idling speed. When secondary air pump motor starts, the vacuum must be felt on vacuum hose.

If no intake manifold vacuum is perceptible:

- Switch off engine.
- Check activation of valve:

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