

## Charge air pressure system with turbocharger

### **WARNING!**

*Observe the following for all installations, especially in engine compartment due to lack of room:*

- ◆ *Route lines of all types (e.g. for fuel, hydraulic, EVAP canister system, coolant and refrigerant, brake fluid, vacuum) and electrical wiring so that the original path is followed.*
- ◆ *Watch for sufficient clearance to all moving or hot components.*

### **Turbocharger with attachments, removing and installing**

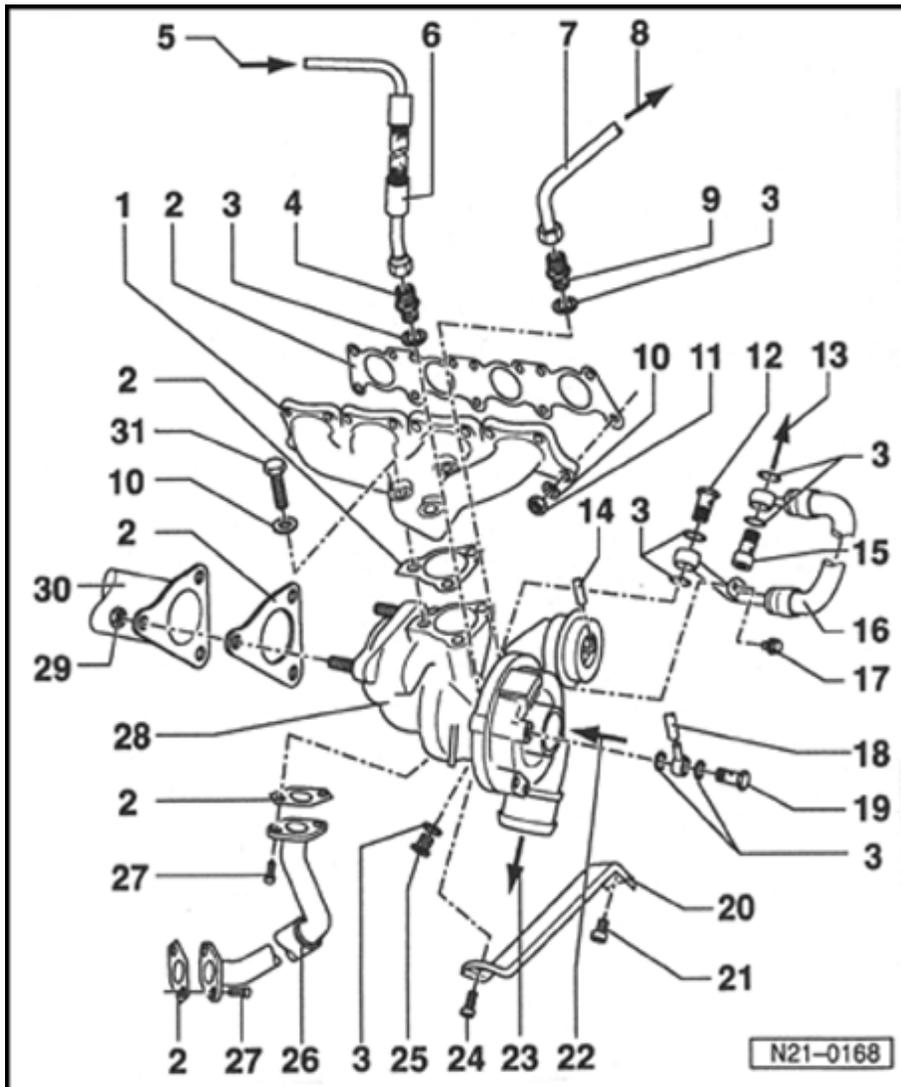
Observe rules for cleanliness ⇒ [Page 21-13](#) .

#### **Notes:**

- ◆ *All hose connections are secured with clamps.*
- ◆ *Charge air pressure system must be properly*

*sealed.*

- ◆ *Always replace self-locking nuts.*
- ◆ *Charge air pressure hoses and their connections must be free of grease before re-installation.*



**1 - Exhaust manifold**

**2 - Gasket**

◆ Always replace

◆ Note installed position

**3 - Seal**

◆ Always replace

**4 - Connecting piece, 30 Nm**

**5 - From oil filter bracket**

**6 - Oil supply line**

◆ Tighten to 25 Nm

**7 - Coolant return line**

◆ Tighten to 30 Nm

**8 - To upper coolant line**

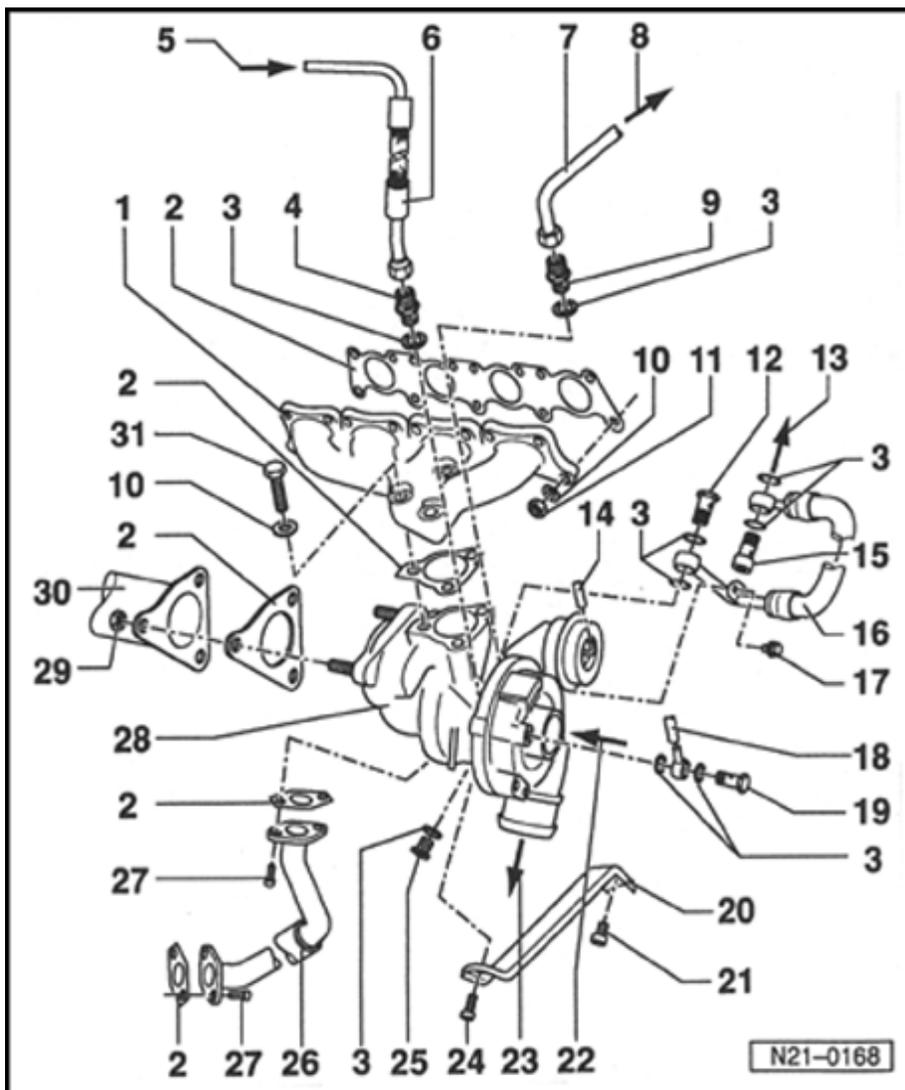
**9 - Connecting piece, 35 Nm**

**10 - Washer**

**11 - 30 Nm**

◆ Always replace

◆ Coat threads with G 052 112 A3



12 - Banjo fitting, 35 Nm

13 - to engine block

14 - Hose

◆ To wastegate bypass regulator valve -N75-  
⇒ [Page 21-12](#) , item no. 24

15 - Banjo fitting, 35 Nm

16 - Coolant supply line

17 - 10 Nm

18 - Hose

◆ To wastegate bypass regulator valve -N75-  
⇒ [Page 21-12](#) , item no. 24

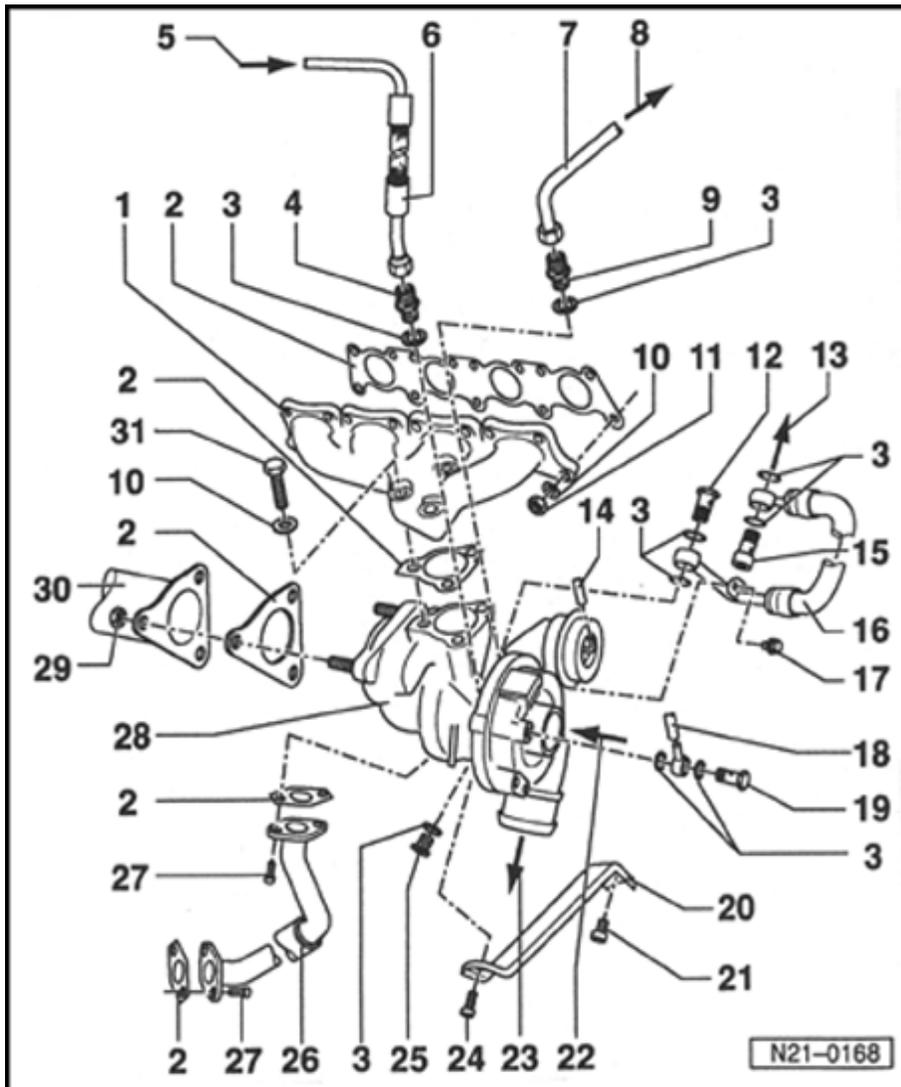
19 - Banjo fitting, 15 Nm

20 - Bracket

◆ Between turbocharger and cylinder block

21 - 25 Nm

22 - From air filter



23 - To charge air pressure cooler

24 - 10 Nm

25 - Locking screw, 15 Nm

26 - Oil return line

◆ To oil pan

27 - 10 Nm

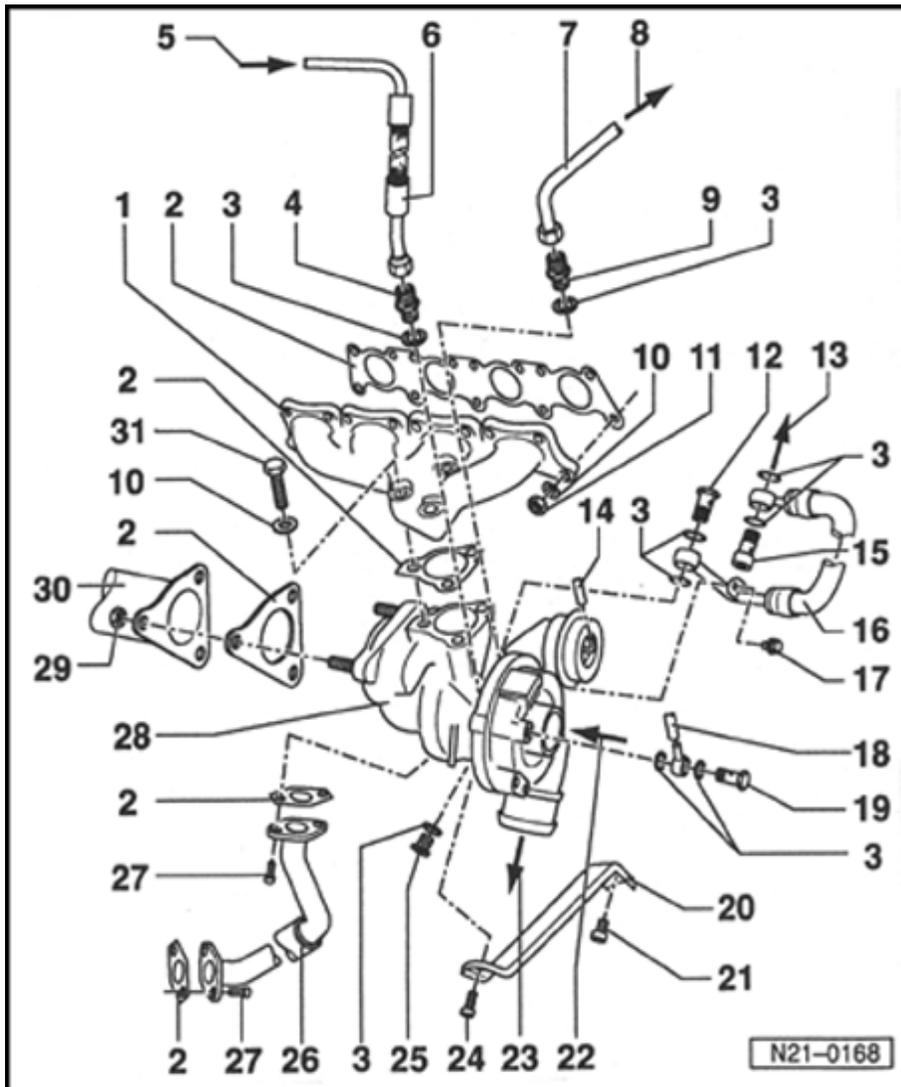
28 - Turbocharger

◆ Checking charge air pressure regulation ⇒ [Page 21-15](#)

◆ The charge air pressure regulation valve and vacuum diaphragm for charge air pressure regulation are part of the exhaust turbocharger and cannot be replaced individually.

◆ Before connecting oil supply line, fill turbocharger with oil at filler tube

◆ After installing turbocharger, let engine idle for approx. 1 minute without increasing engine speed. This ensures adequate oil supply to the turbocharger.



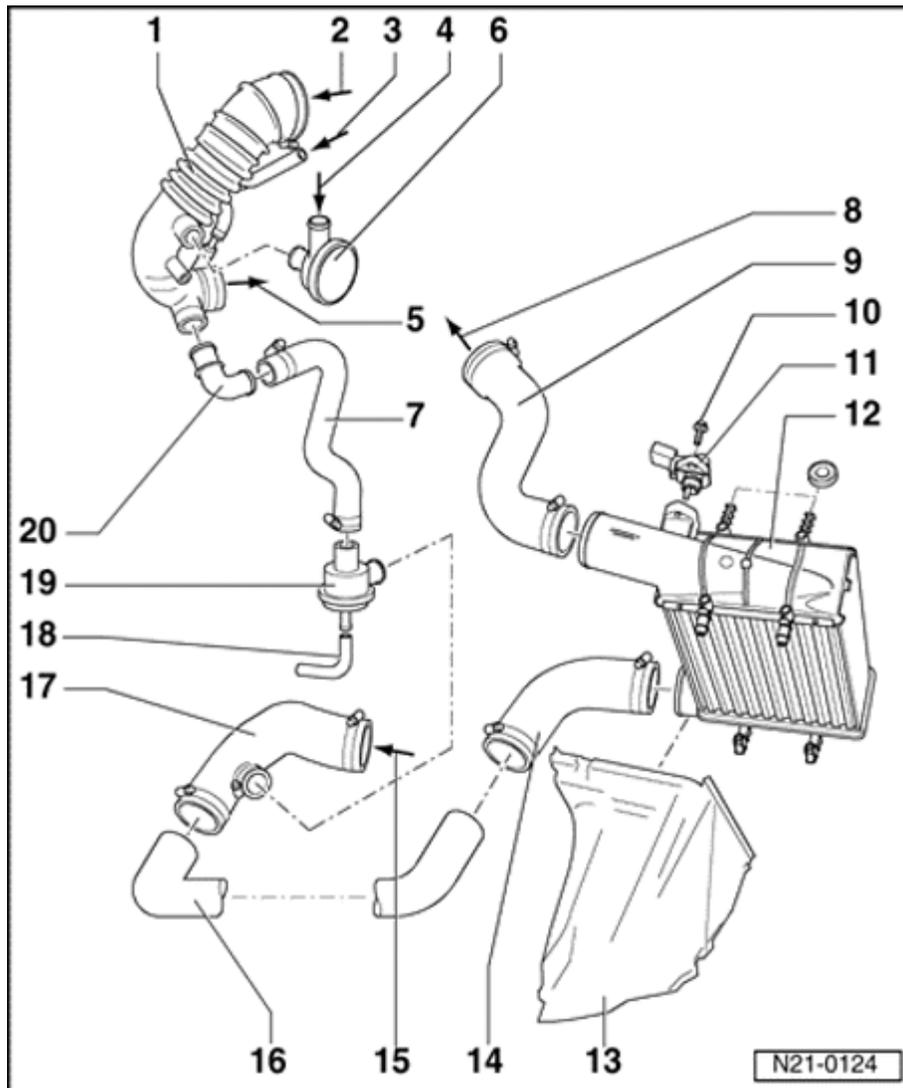
### 29 - 30 Nm

- ◆ Always replace
- ◆ Coat threads with G 052 112 A3

### 30 - Catalytic converter

### 31 - 35 Nm

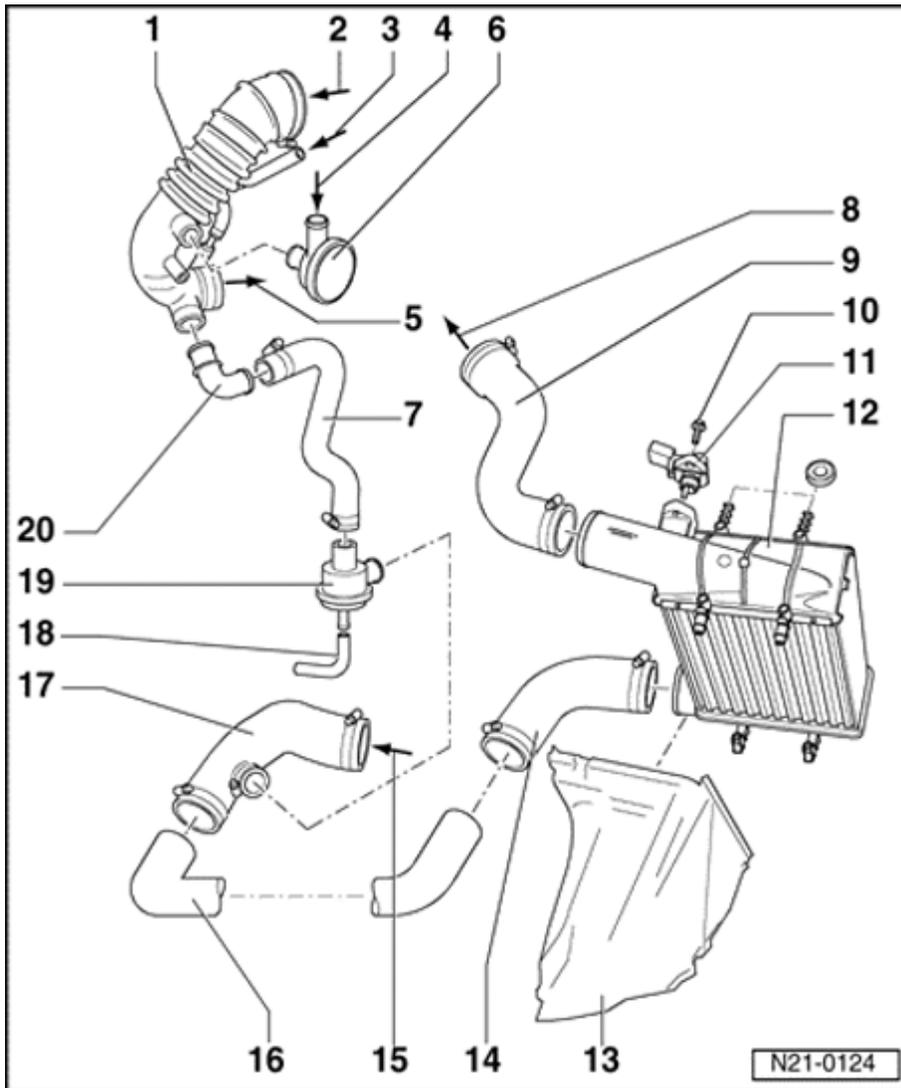
- ◆ Always replace
- ◆ Coat threads and bolt head contact surface with G 052 112 A3



## Charge air pressure cooler components, removing and installing

### Notes:

- ◆ All hose connections are secured with clamps.
  - ◆ Charge air pressure system must be properly sealed.
  - ◆ Note assembly markings at hoses and components during installation.
- 1 - Intake hose**
- 2 - From air filter**
- 3 - From EVAP canister**
- 4 - From crankcase ventilation**
- 5 - To turbocharger**
- 6 - Pressure regulation valve**
- ◆ For crankcase ventilation



**7 - Connection hose**

- ◆ Note assembly markings

**8 - To throttle valve control module**

**9 - Connection hose**

- ◆ Charge air pressure pressure cooler/throttle valve control module
- ◆ Note assembly markings

**10 - 10 Nm**

**11 - Charge air pressure sensor -G31-**

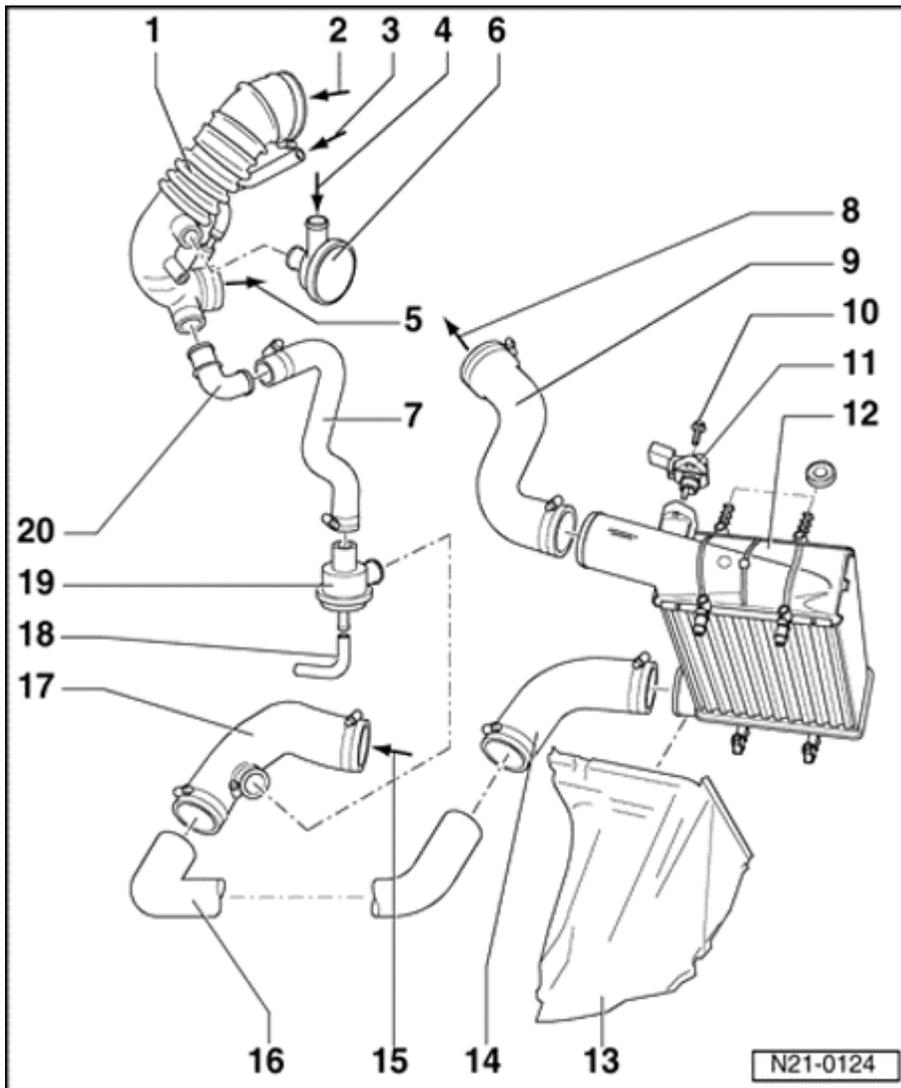
- ◆ Replace O-ring when damaged
- ◆ Checking ⇒ [Page 21-23](#)

**12 - Charge air pressure cooler**

**13 - Air duct**

**14 - Connection hose**

- ◆ Transverse line/charge air pressure cooler
- ◆ Note assembly markings



15 - From turbocharger

16 - Transverse line

17 - Connection hose

◆ Exhaust turbocharger/transverse line

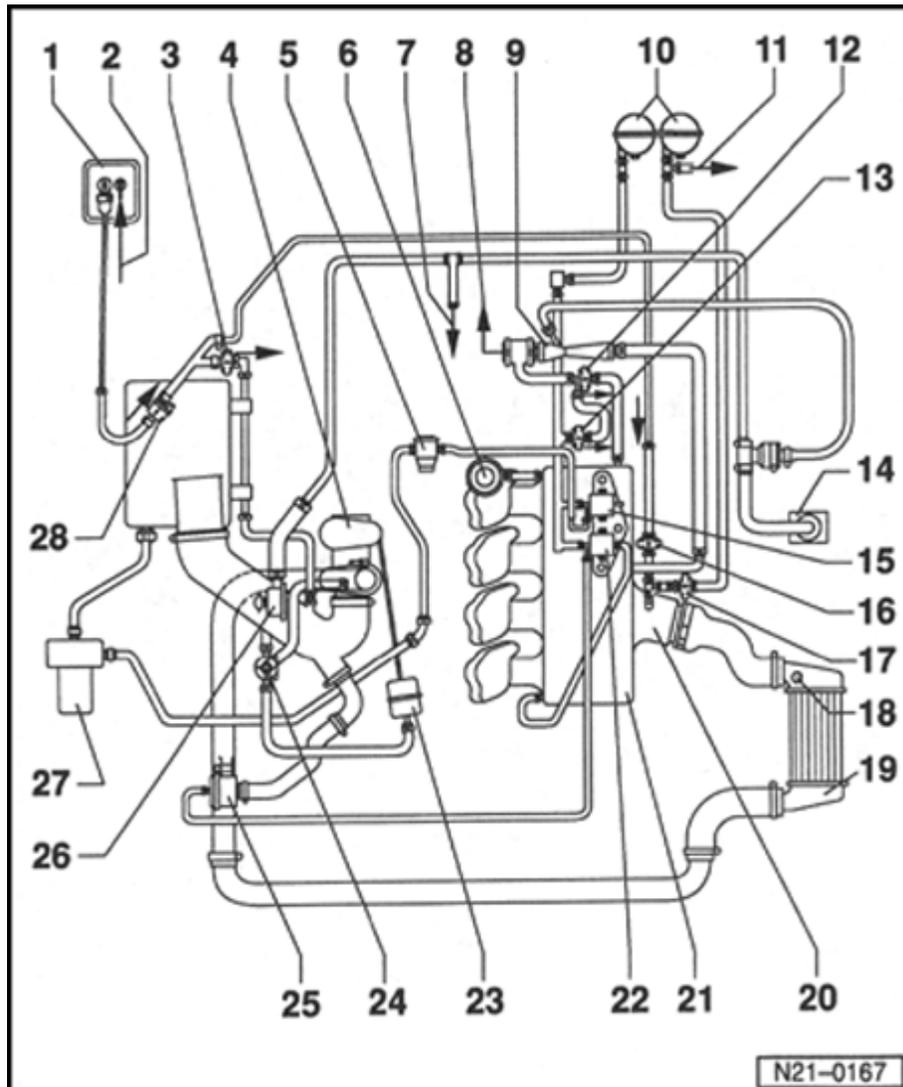
◆ Note assembly markings

18 - Vacuum line

19 - Deceleration shut-off valve

◆ Checking ⇒ [Page 21-22](#)

20 - Elbow



## Turbocharging system, overview

### 1 - EVAP canister

### 2 - Vent line

- ◆ From change-over valve at fuel tank ⇒ [Page 20-3](#) , item no. 7

### 3 - Check-valve

- ◆ For EVAP canister system

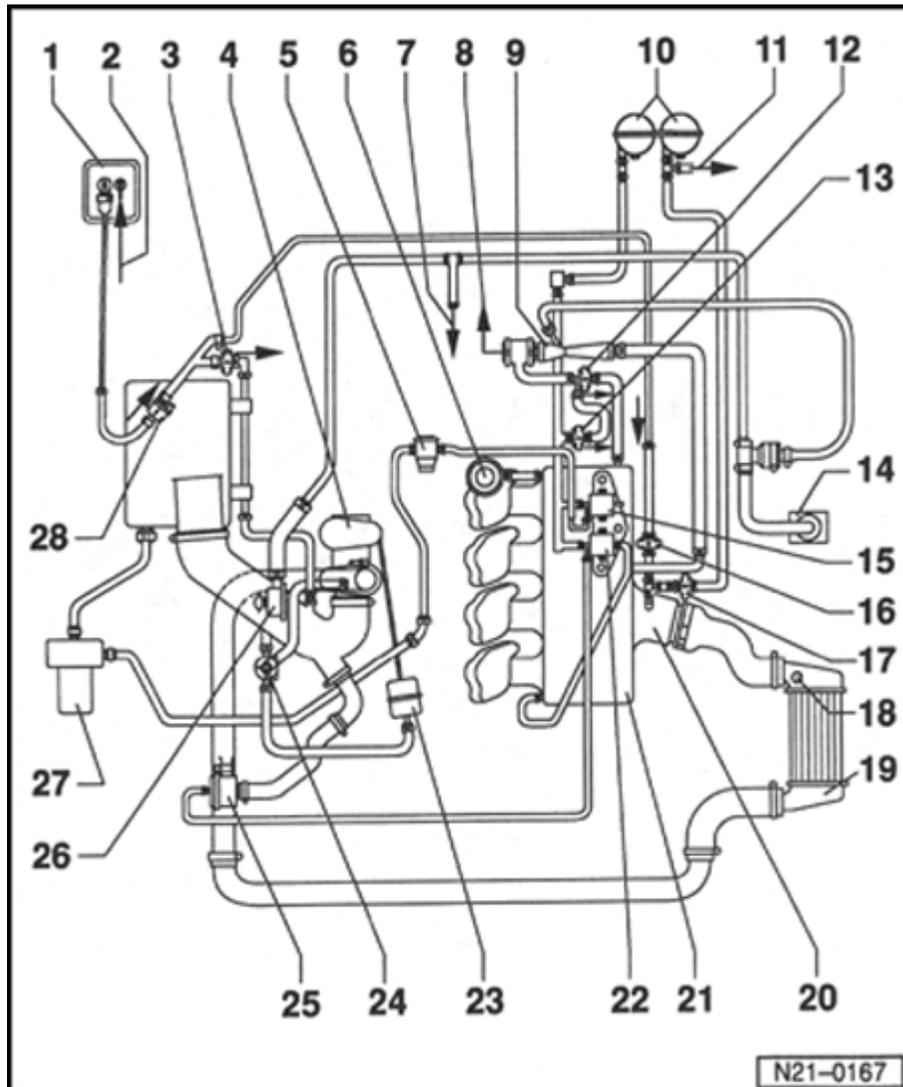
### 4 - Turbocharger

- ◆ The charge air pressure regulation valve and vacuum diaphragm for charge air pressure regulation are part of the exhaust turbocharger and cannot be replaced individually.

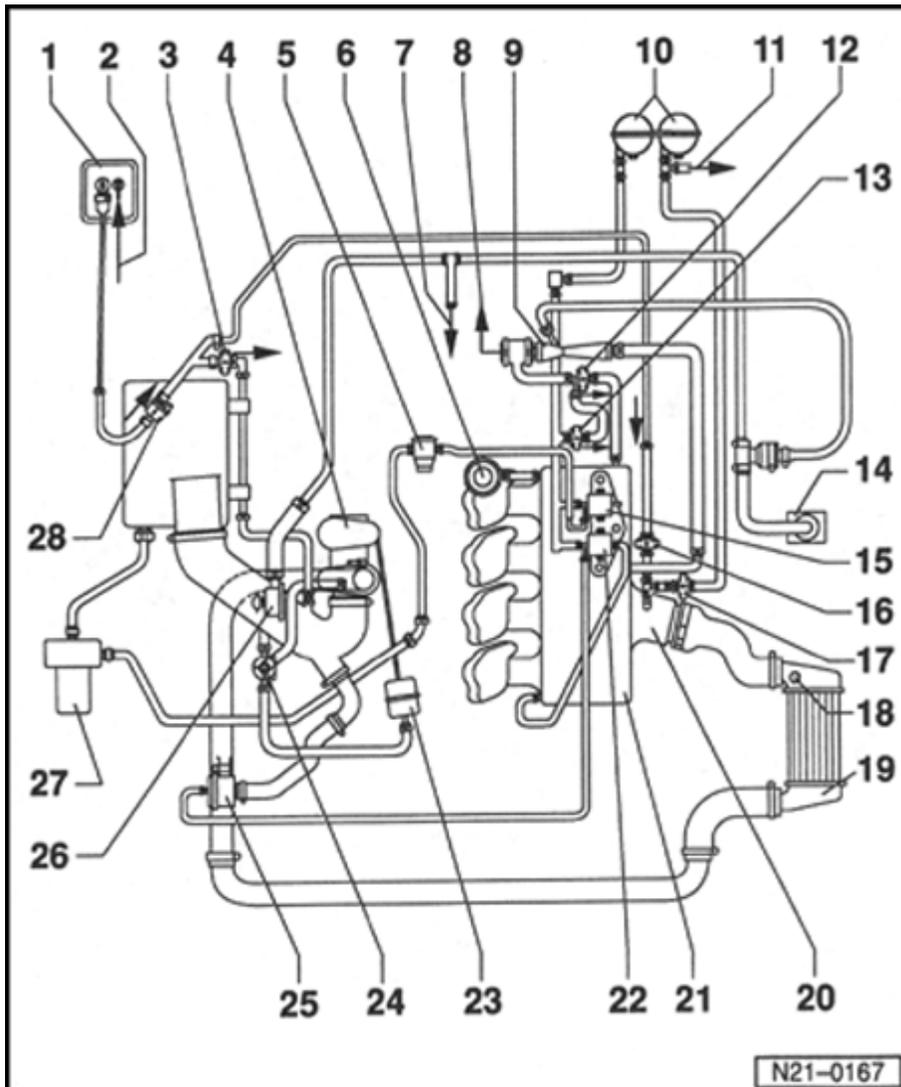
### 5 - Combination valve

- ◆ For Secondary Air Injection (AIR) system
- ◆ Checking ⇒ [Page 26-17](#)

### 6 - Fuel pressure regulator



- 7 - To cylinder head cover**
  - ◆ Crankcase breather valve
- 8 - To brake booster**
- 9 - Vacuum booster**
- 10 - Vacuum reservoir**
  - ◆ To separate chambers
- 11 - To diagnostic pump**
- 12 - Check-valve**
  - ◆ Bypass to vacuum booster
- 13 - Check-valve**
  - ◆ For engine vacuum control
- 14 - Crankcase ventilation**
- 15 - Secondary Air Injection (AIR) solenoid valve -N112-**
  - ◆ Checking ⇒ [Page 26-21](#)



#### 16 - Check-valve

- ◆ For EVAP canister system

#### 17 - Check-valve

- ◆ For diagnostic pump

#### 18 - Charge air pressure sensor -G31-

- ◆ Checking ⇒ [Page 21-23](#)

#### 19 - Charge air pressure cooler

#### 20 - Throttle valve control module

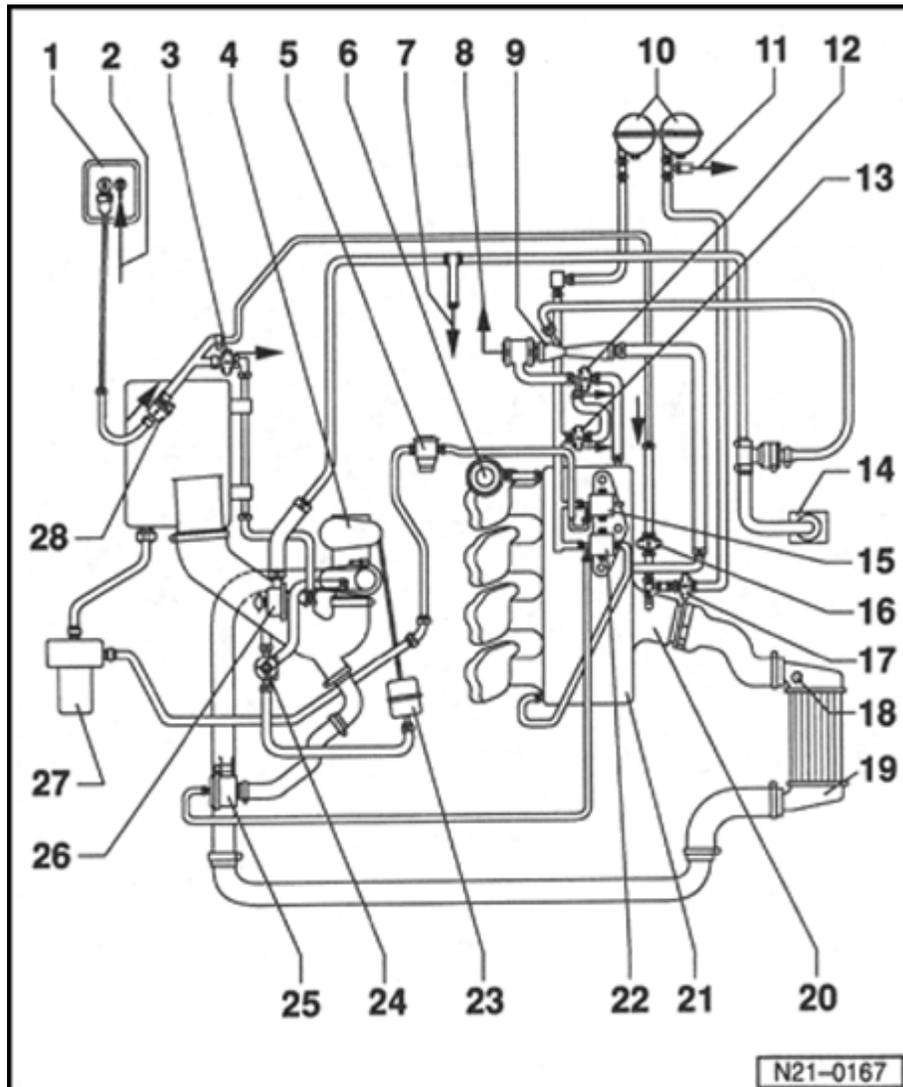
#### 21 - Intake manifold

#### 22 - Recirculating valve for turbocharger - N249-

- ◆ Checking ⇒ [Page 21-27](#)

#### 23 - Pressure unit

- ◆ For charge air pressure regulation valve
- ◆ Part of turbocharger, cannot be replaced



#### 24 - Wastegate bypass regulator valve -N75-

- ◆ Valve is activated (pulsed) by the Engine Control Module (ECM)
- ◆ Closed when no voltage present, limited by charge air pressure
- ◆ Checking activation:

⇒ [Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Engine Code\(s\): ATW, AUG, AWM, Repair Group 01; Output Diagnostic Test Mode \(DTM\); Performing output Diagnostic Test Mode \(DTM\)](#)

#### 25 - Deceleration shut-off valve

#### 26 - Pressure regulation valve

- ◆ For crankcase ventilation

#### 27 - Secondary Air Injection (AIR) pump motor -V101-

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

#### 28 - Evaporative Emission (EVAP) canister purge regulator valve -N80-

- ◆ Checking:

⇒ [Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Engine Code\(s\): ATW, AUG,](#)

*AWM, Repair Group 01; Output Diagnostic Test Mode (DTM); Performing output Diagnostic Test Mode (DTM)*



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## Rules of cleanliness

When working on turbocharger, carefully observe the following 5 rules:

- ◆ Thoroughly clean all connections and the surrounding area before disconnecting.
- ◆ Place parts that have been removed on a clean surface and cover. Use lint-free cloths only!
- ◆ Carefully cover over opened components or seal, if repairs are not carried out immediately.
- ◆ Only install clean components: Only unpack replacement parts immediately prior to installation. Do not use parts that have been stored loose (in tool boxes etc.)
- ◆ When the system is open: Do not work with compressed air if it can be avoided. Do not move vehicle unless absolutely necessary.



## Safety precautions

If special testing equipment is required during road test, note the following:

- ◆ Test equipment must always be secured to the rear seat and operated from there by a second person.

If test and measuring equipment is operated from the passenger seat, the person seated there could be injured in the event of an accident involving deployment of the passenger-side airbag.