

Charge air system with turbocharger

Notes:

- ◆ *All hose connections are secured with clips.*
- ◆ *Charge air system must be free of leaks.*
- ◆ *Replace self-locking nuts.*
- ◆ *Charge air pressure hose and all the respective connections must be free of grease etc. before installing.*
- ◆ *Assembly tool VAS 5024 or hose clip pliers V.A.G 1921 are recommended for installing spring-type clips.*

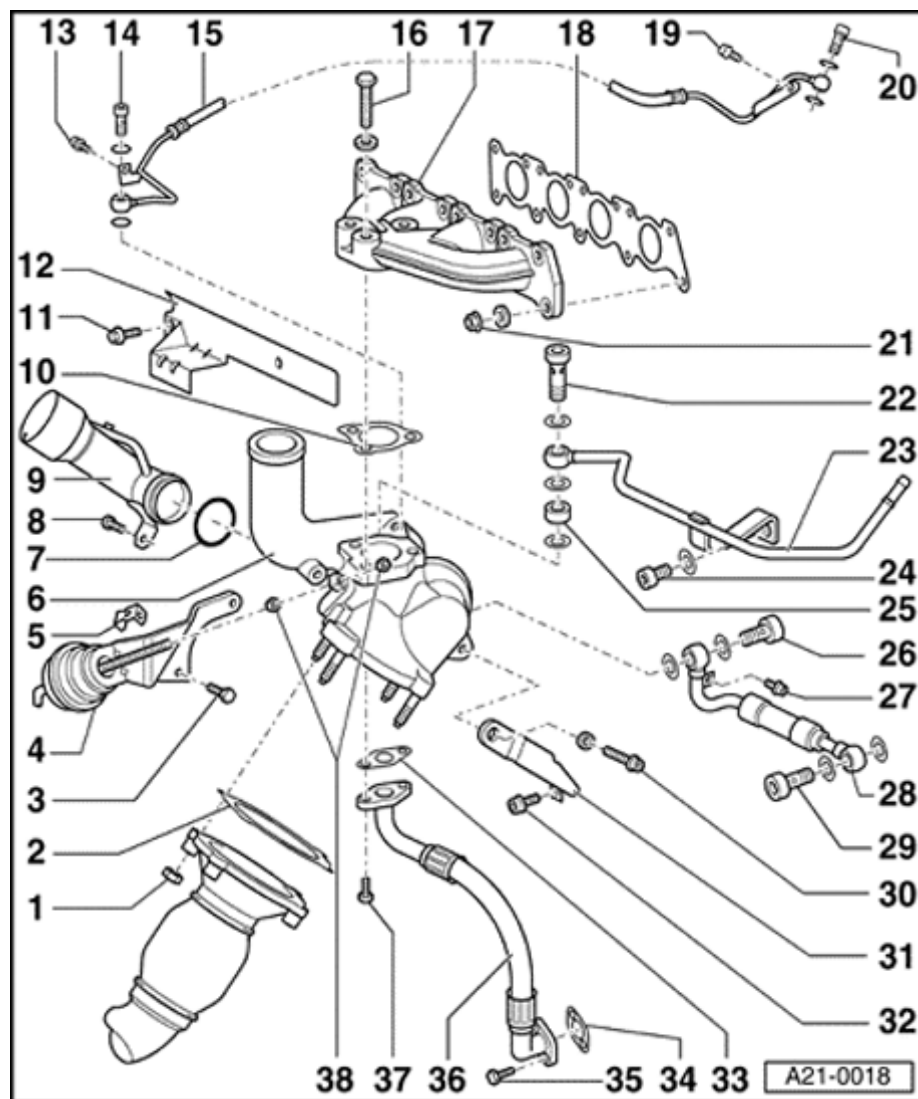
Removing and installing turbocharger with attachments ⇒ [Page 21-2](#) .

Removing and installing parts of charge air cooler ⇒ [Page 21-11](#) .

Observe rules for cleanliness ⇒ [Page 21-20](#) .

Observe safety precautions ⇒ [Page 21-21](#) .

Checking charge air pressure system ⇒ [Page 21-22](#) .



Turbocharger and attachments, removing and installing

Part I

1 - 40 Nm

- ◆ Coat threads with G 052 112 A3

2 - Seal

- ◆ Replace

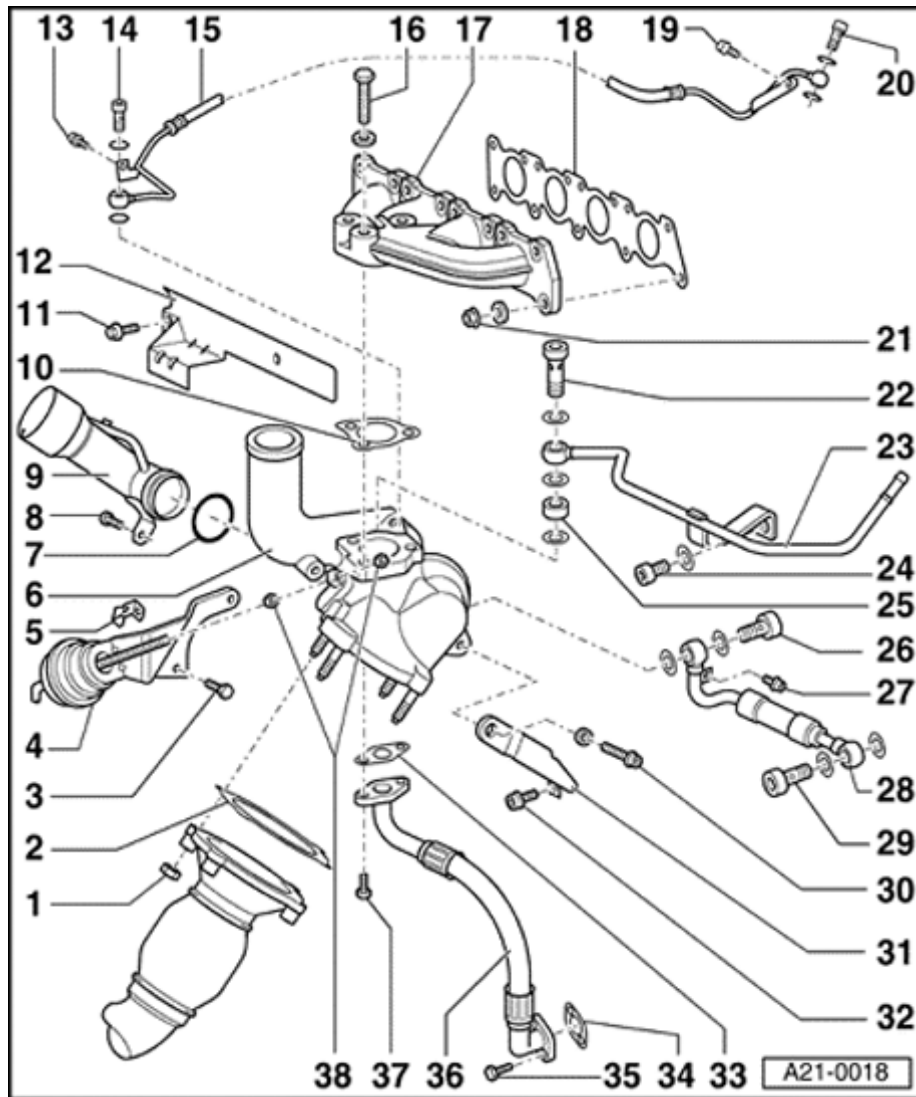
3 - 10 Nm

- ◆ Must not be loosened

4 - Pressure unit

- ◆ For charge air pressure regulating valve
- ◆ Can only be replaced in conjunction with turbocharger
- ◆ Checking charge air pressure control ⇒ [Page 21-22](#)

5 - Circlip



6 - Turbocharger

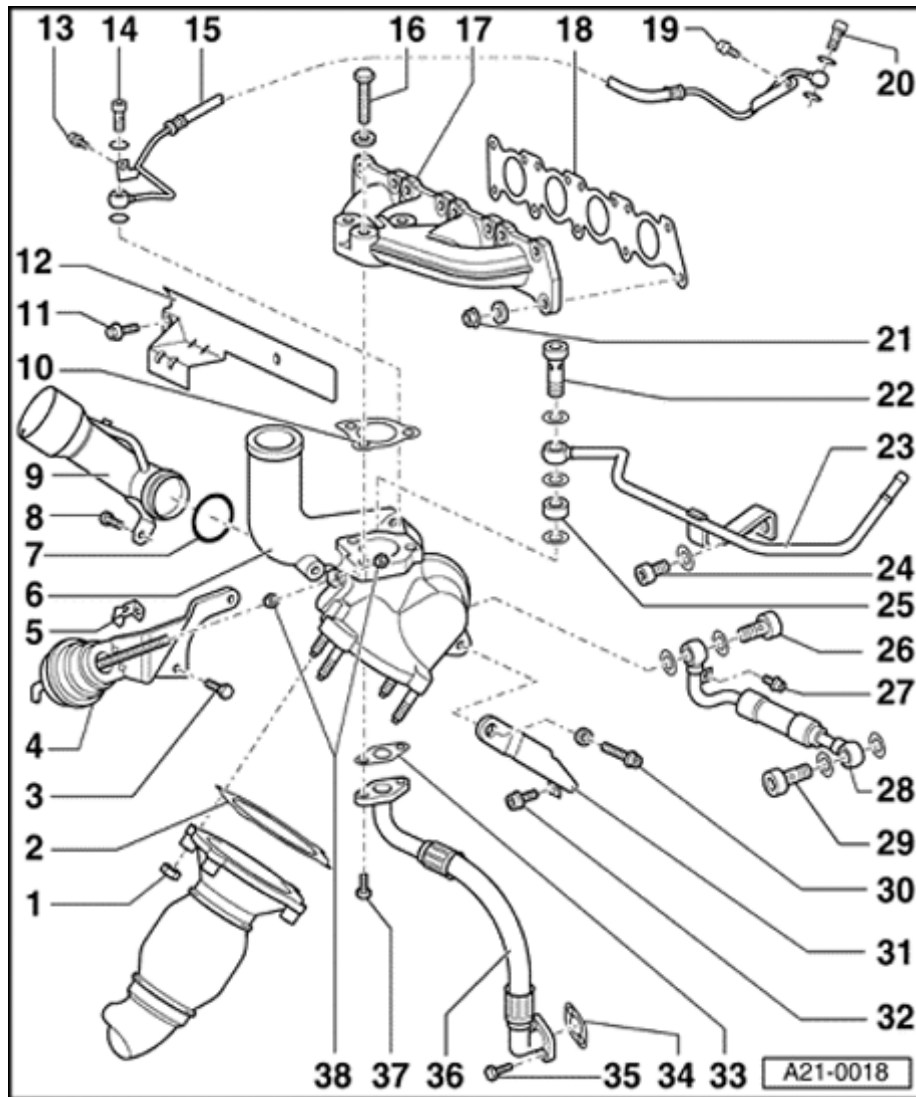
- ◆ Checking charge air pressure control ⇒ [Page 21-22](#)
- ◆ Charge air pressure control valve and charge air pressure control valve vacuum unit are components of the turbocharger and cannot be replaced individually
- ◆ Fill turbocharger with oil via the connection before connecting the oil supply pipe
- ◆ After installing the turbocharger run engine at idling speed for approx. 1 minute and do not rev up, to make sure the oil supply for the turbocharger.

7 - O ring

- ◆ Replace

8 - 10 Nm

9 - Intake pipe



10 - Gasket

- ◆ Replace
- ◆ Note installation position

11 - 20 Nm

12 - Heat shield

13 - 10 Nm

14 - Banjo bolt, 30 Nm

15 - Oil supply pipe

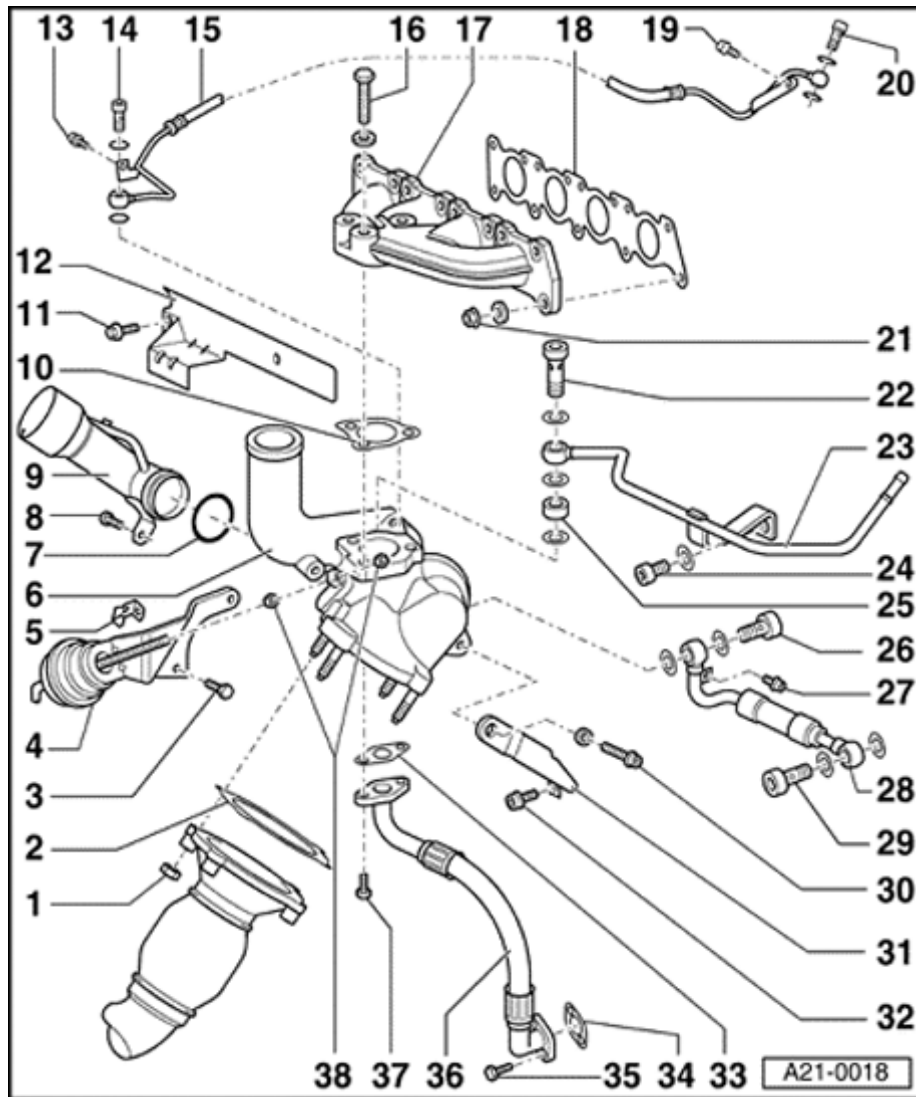
16 - 30 Nm

- ◆ Replace
- ◆ Coat threads and bolt head seating surface with G 052 112 A3

17 - Exhaust manifold

18 - Gasket

- ◆ Replace
- ◆ Note installation position



19 - 20 Nm

20 - Banjo bolt, 30 Nm

21 - 25 Nm

◆ Replace

◆ Coat threads with G 052 112 A3

22 - Banjo bolt, 35 Nm

23 - Coolant return pipe

24 - 25 Nm

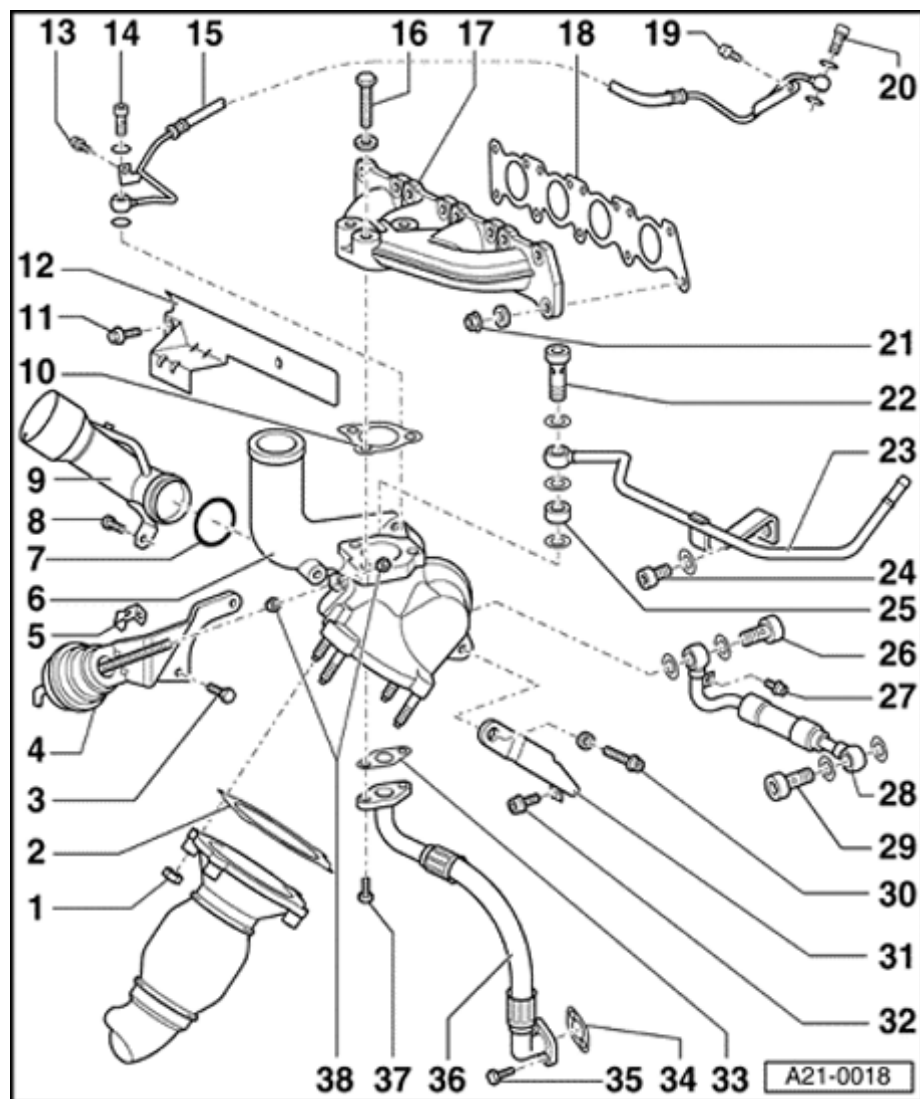
25 - Spacer sleeve

26 - Banjo bolt, 35 Nm

27 - 10 Nm

28 - Coolant supply pipe

29 - Banjo bolt, 35 Nm



30 - 30 Nm

- ◆ Only use genuine bolt from parts catalogue

31 - Retainer

- ◆ Between turbocharger and cylinder block

32 - 25 Nm

33 - Gasket

- ◆ Replace

34 - Gasket

- ◆ Replace

35 - 10 Nm

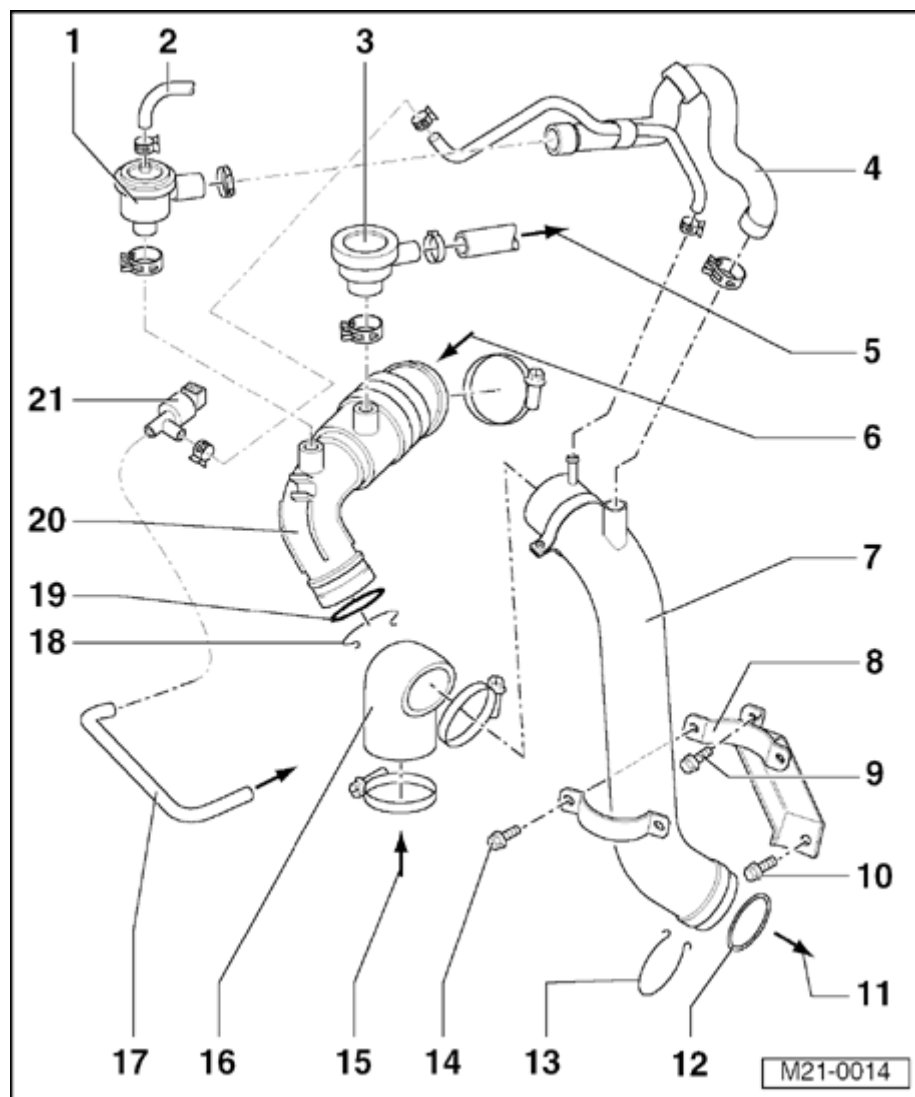
36 - Oil return pipe

- ◆ To oil pan

37 - 10 Nm

38 - 10 Nm

- ◆ Do not alter setting
- ◆ Must not be loosened



Part II

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; DTC memory, DTC memory of Engine Control Module (ECM), checking and erasing

- ◆ Components marked with ** are checked by the Output Diagnostic Test Mode:

⇒ Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01; Output Diagnostic Test Mode; Performing Output Diagnostic Test Mode

- ◆ Observe installed position of heat protection mats

1 - Overrun shut-off valve

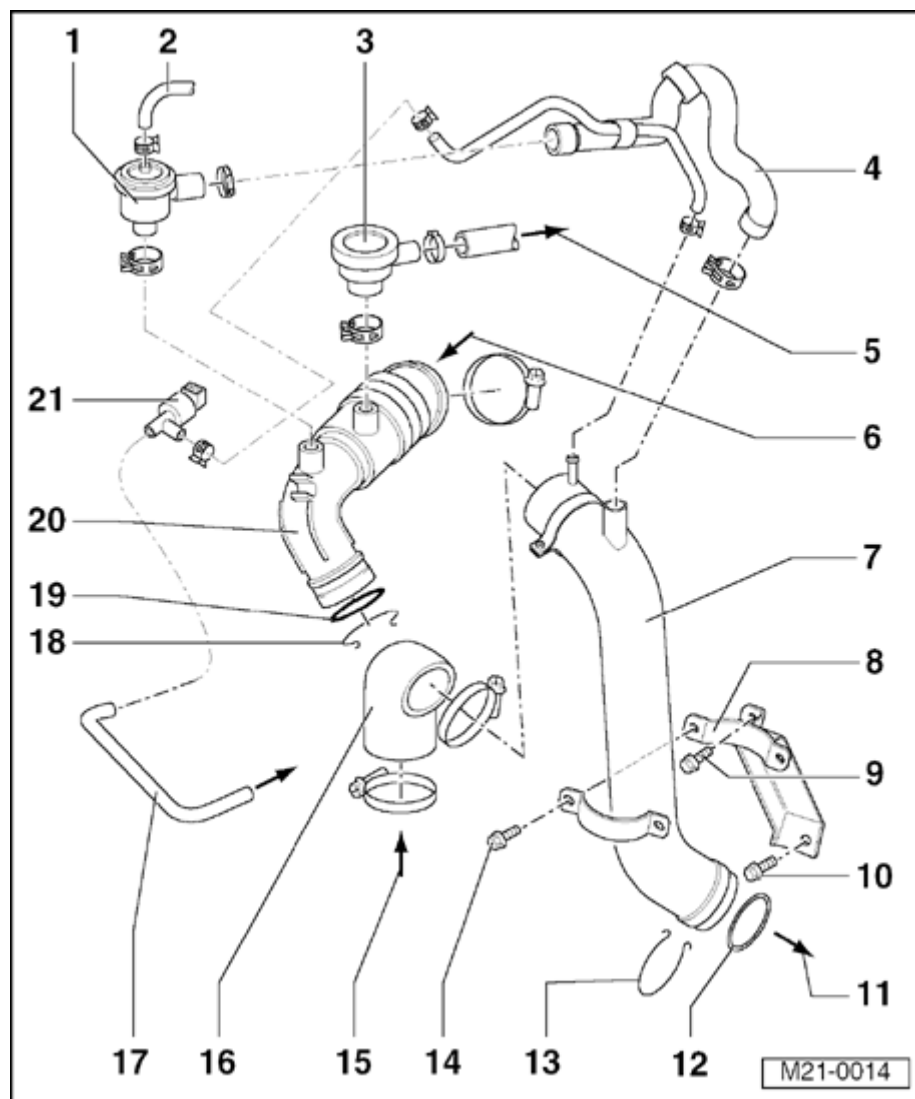
- ◆ Checking ⇒ [Page 21-40](#)

2 - Connecting pipe/hose

- ◆ to Recirculating valve for turbocharger -N249-*/**

3 - Pressure regulation valve

- ◆ for cylinder block housing ventilation



4 - Connecting pipe/hose

- ◆ from deceleration shut-off valve to upper air guide hose

5 - to cylinder block housing ventilation

6 - from air filter

7 - Upper air guide pipe

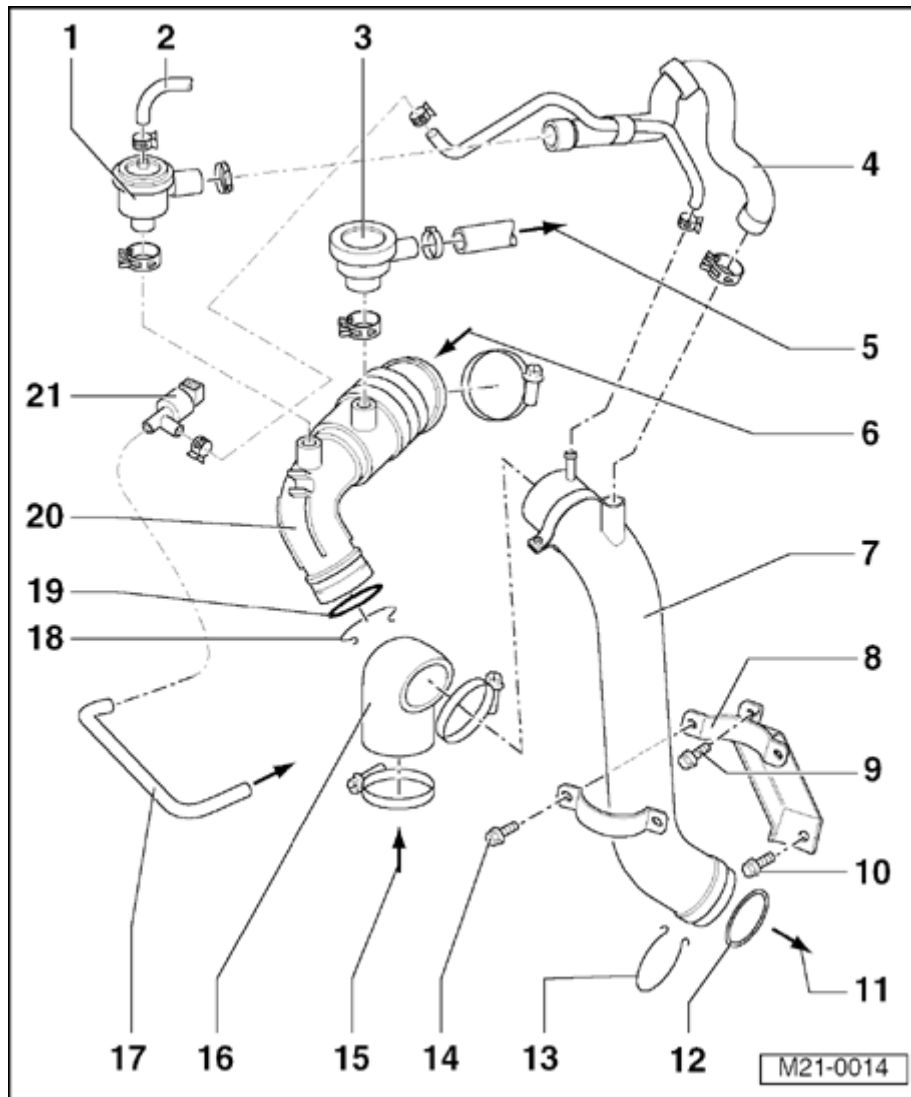
- ◆ Observe installed position of heat protection mat
- ◆ Vehicles with Engine Control Module AWP, AWW with quick release connection (with O-ring and securing brace)
- ◆ Vehicles with engine code AWD with screw clamp

8 - Bracket

9 - 40 Nm

10 - 25 Nm

11 - for connecting hose of connecting piece/charge air cooler at bottom



12 - O ring

- ◆ Replace
- ◆ only vehicles with engine code AWP, AWW

13 - Circlip

- ◆ Check seated securely
- ◆ only vehicles with engine code AWP, AWW

14 - 10 Nm

15 - from exhaust turbocharger/exhaust tube

16 - Connecting pipe/hose

17 - Connecting pipe/hose

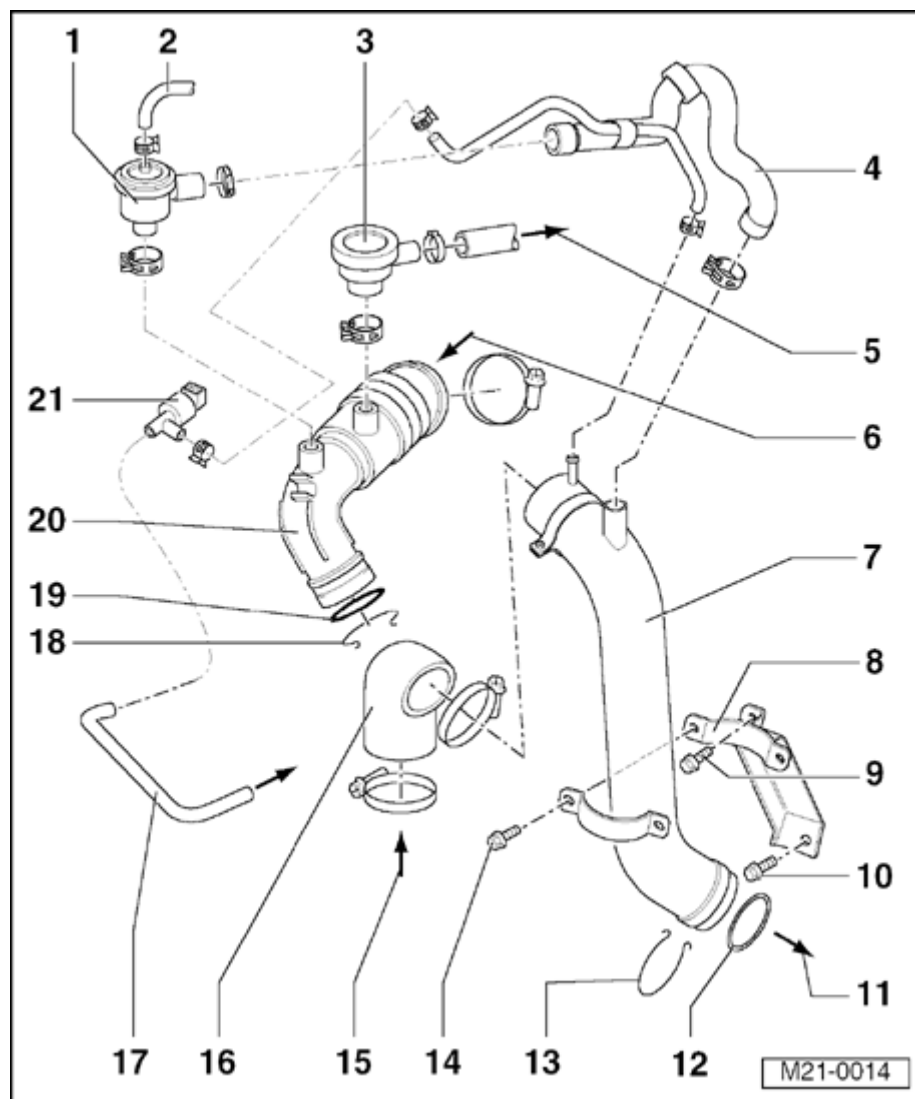
- ◆ to pressure unit for Boost Pressure Regulation Valve

18 - Circlip

- ◆ Check seated securely

19 - O ring

- ◆ Replace



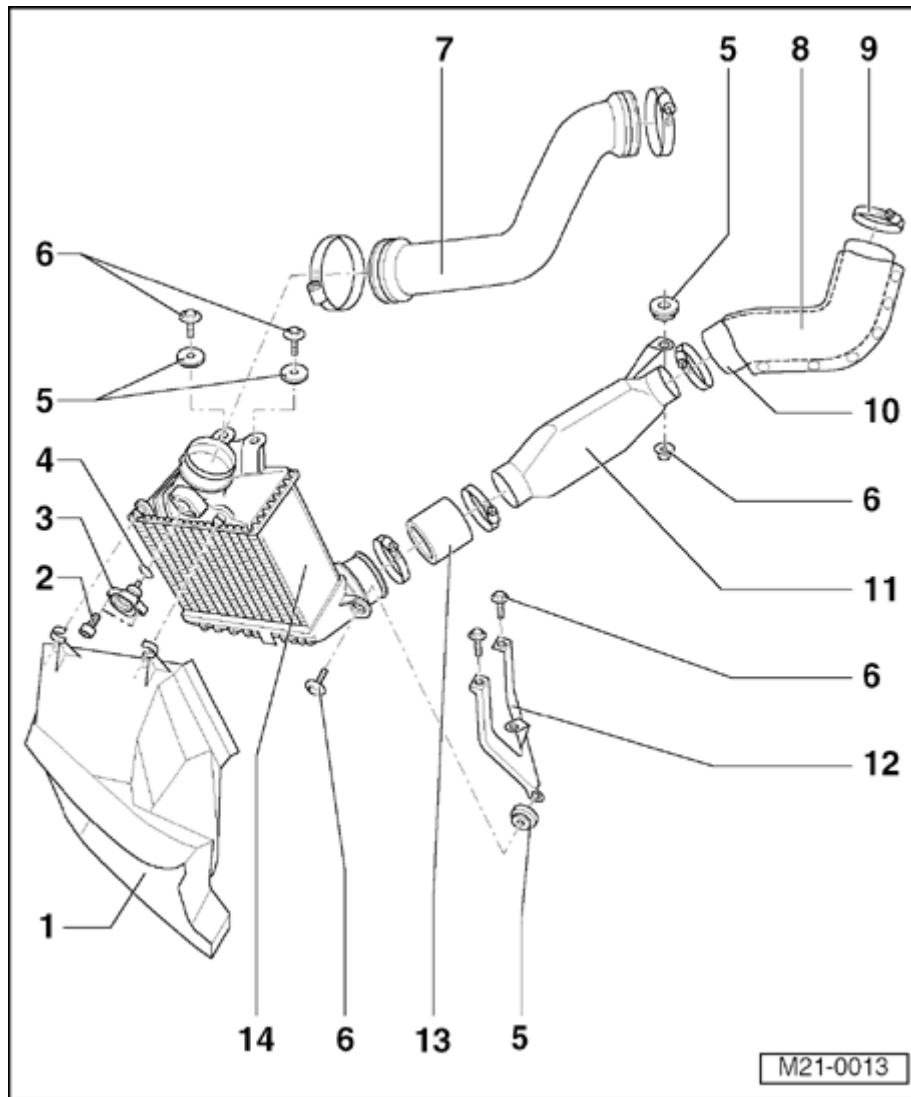
20 - Intake hose

- ◆ to intake connection of exhaust turbocharger

21 - Wastegate bypass regulator valve -N75-*/**

- ◆ The valve will be activated from the engine control module (pulsed)
- ◆ Checking activation:

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01; Output Diagnostic Test Mode; Performing Output Diagnostic Test Mode*



Charge air cooling system components, removing and installing

Notes:

- ◆ All hose connections secured by clips.
- ◆ Charge air system must be free of leaks.
- ◆ When installing observe markings on hoses and components.
- ◆ Observe installed position of heat protection mats

1 - Air ducting

2 - 10 Nm

3 - Charge air pressure sensor (G31)

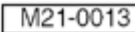
- ◆ Checking ⇒ [Page 21-31](#)

4 - O ring

- ◆ Replace

5 - Rubber grommet

- ◆ With sleeve



7 - Intake hose

- ◆ Between intake manifold and charge air cooler

- ◆ Observe installed position

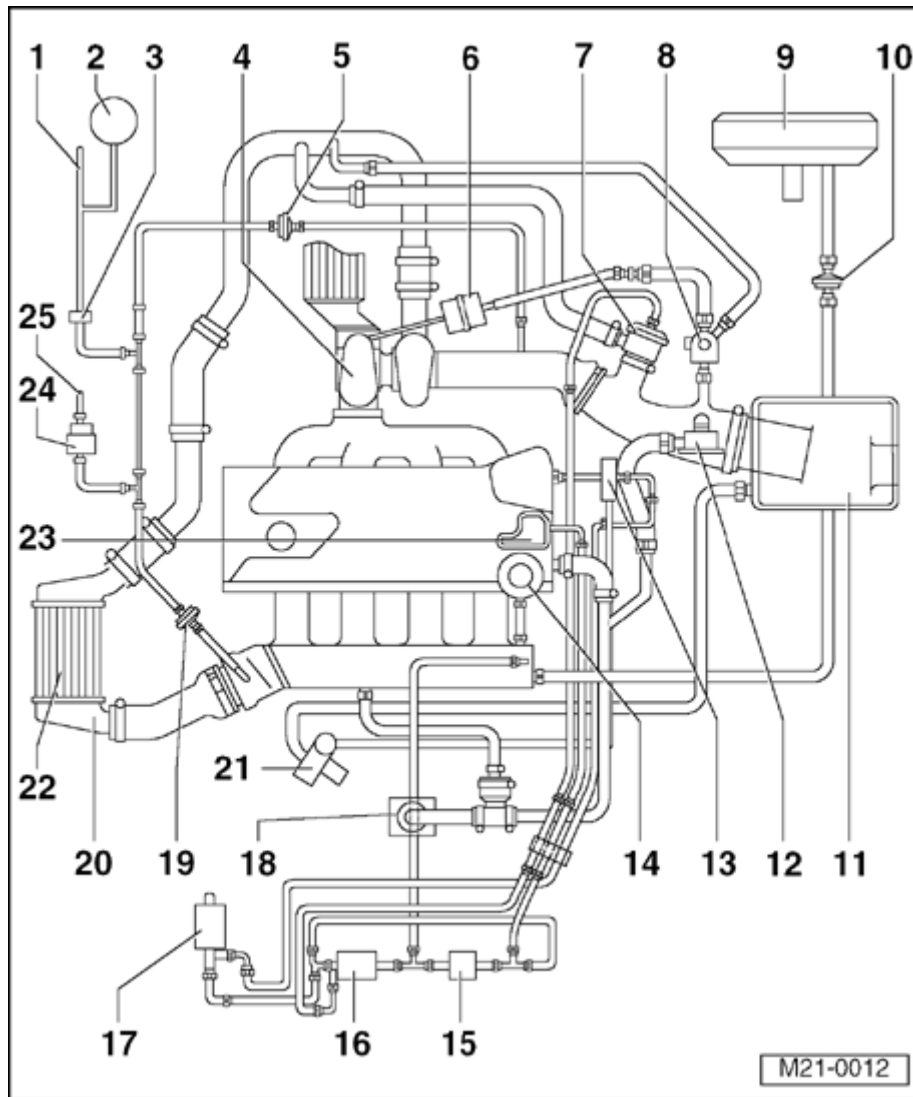
- ◆ only vehicles with engine code AWD

- ◆ Vehicles with engine code AWP, AWW with quick release connection (with O-ring and securing brace)

11 - Air duct

13 - Connecting pipe/hose

14 - Charge air cooler



Turbocharging diagram

Only engine code AWD

Engine code AWP, AWW ⇒ [Page 21-17](#)

1 - Connecting pipe/hose

- ◆ from Leak detection pump (LDP) -V144-

2 - Vacuum reservoir

- ◆ below wheelhousing liner at front right

3 - Non-return valve

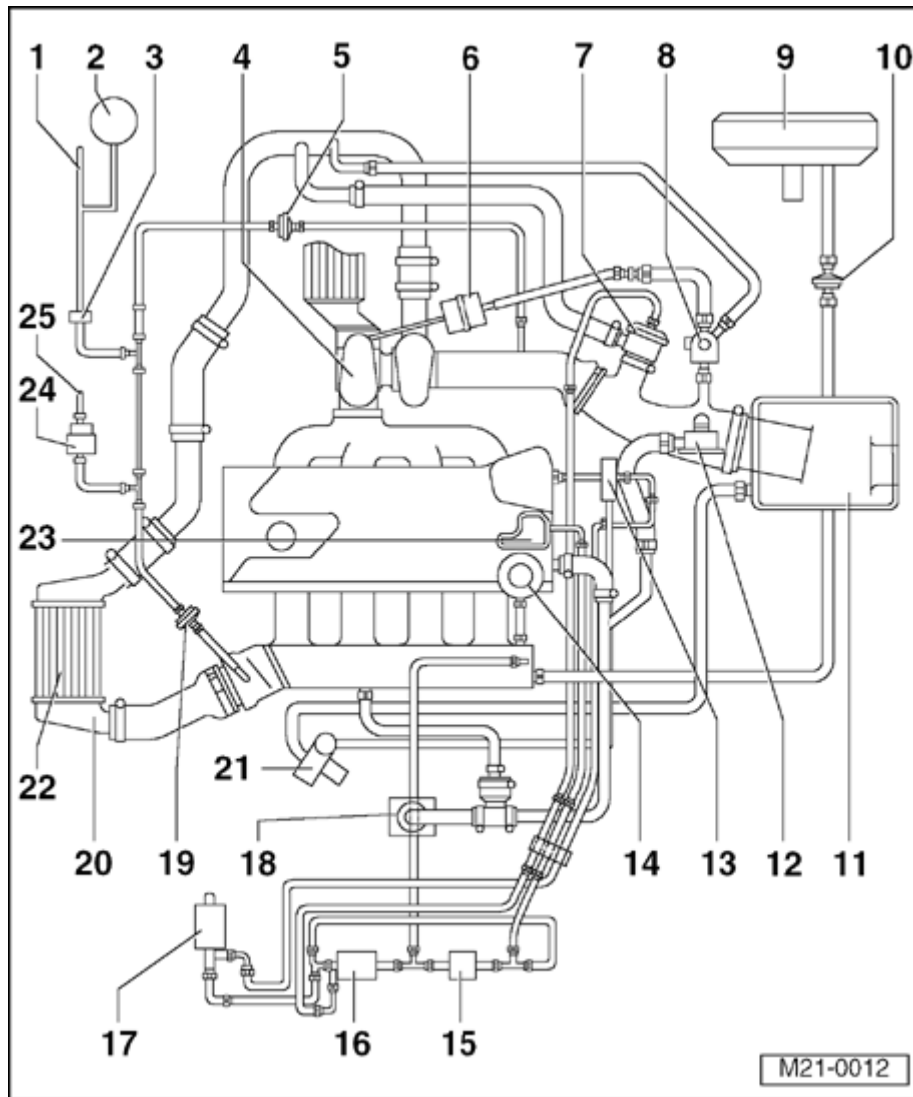
4 - Turbocharger

5 - Non-return valve

6 - Pressure unit

- ◆ For charge air pressure control valve

7 - Overrun shut-off valve



8 - Wastegate bypass regulator valve -N75-

- ◆ The valve will be activated from the engine control module (pulsed)
- ◆ Checking activation:

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01; Output Diagnostic Test Mode; Performing Output Diagnostic Test Mode*

9 - Brake servo

10 - Non-return valve

- ◆ For brake servo

11 - Air cleaner with air mass meter -G70-

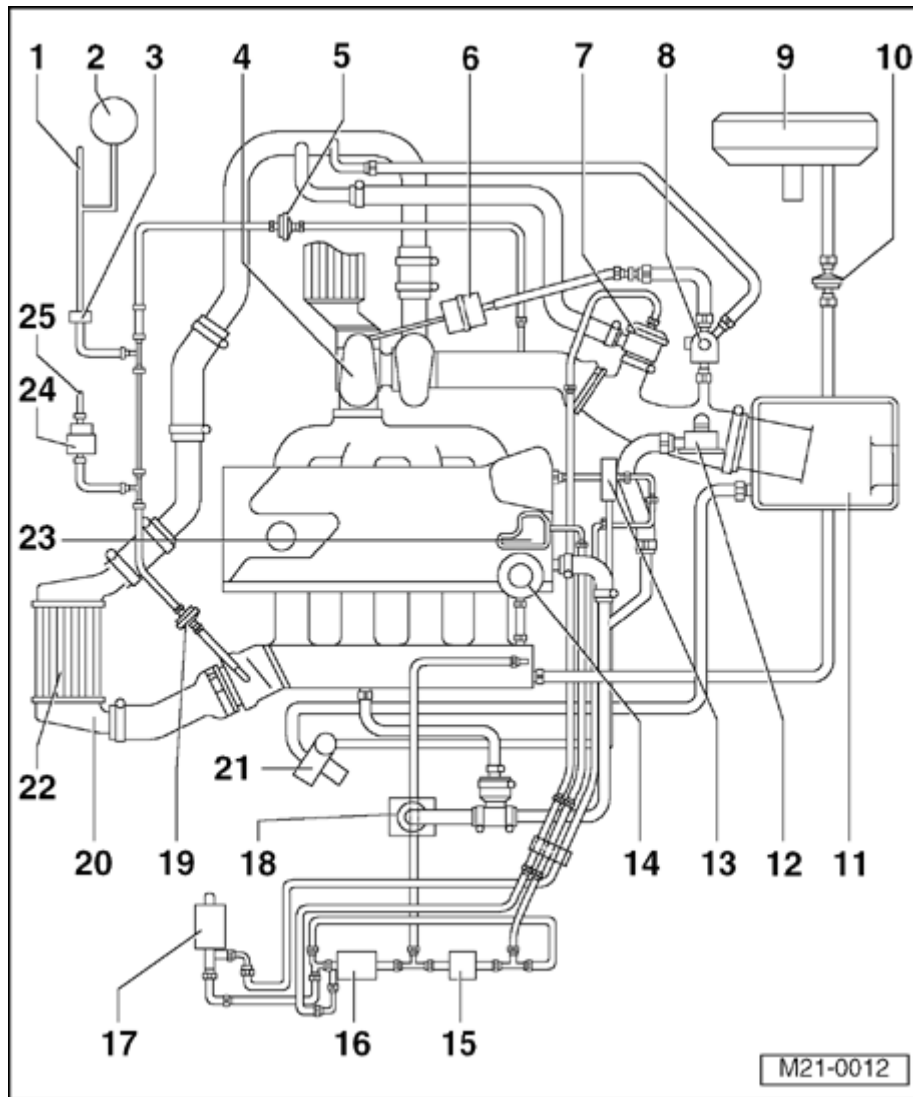
12 - Cylinder block breather pressure regulating valve

13 - Combi-valve

- ◆ For secondary air system
- ◆ Checking ⇒ [Page 26-14](#)

14 - Fuel pressure regulator

15 - Non-return valve



16 - Recirculating valve for turbocharger -N249-

17 - Secondary air intake valve (N112)

♦ Checking ⇒ [Page 26-20](#)

18 - Cylinder block breather

19 - Non-return valve

20 - Charge air pressure sensor (G31)

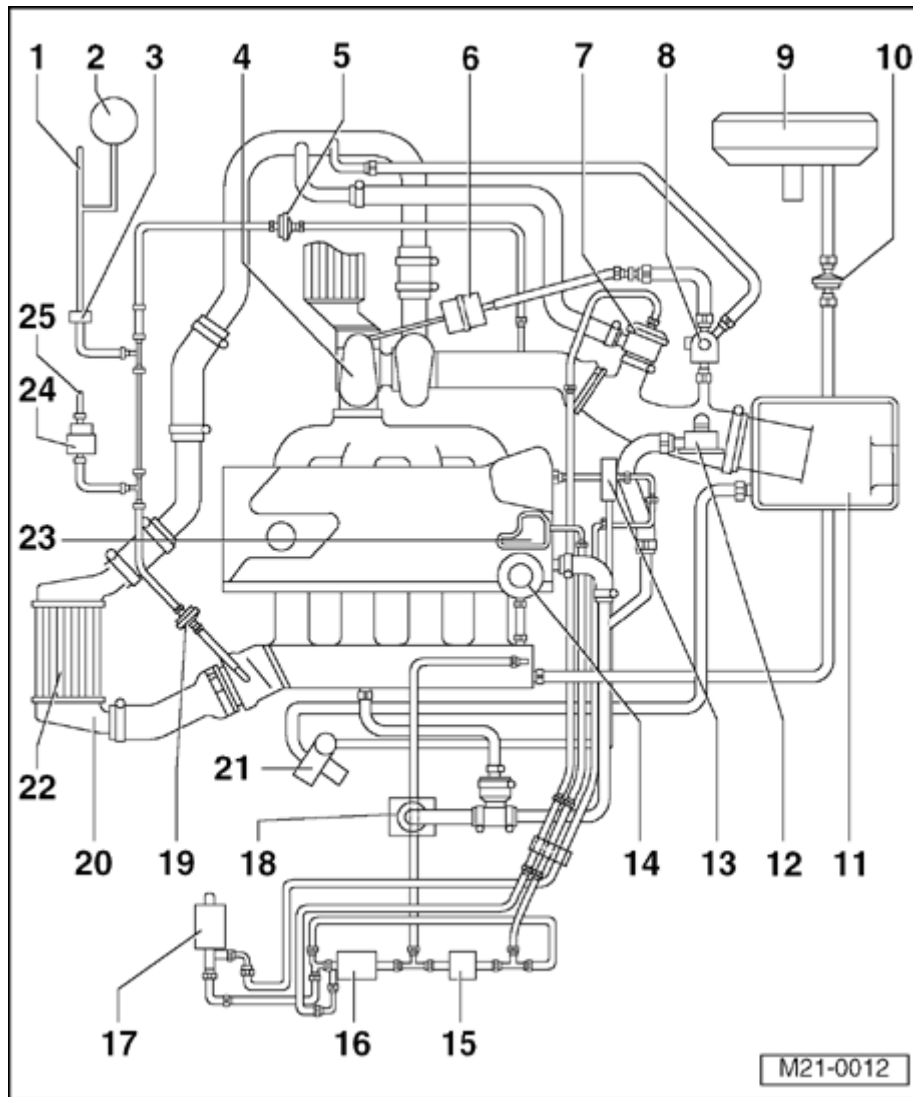
♦ Replace O ring if damaged

21 - Secondary air pump motor (V101)

♦ Checking function ⇒ [Page 26-16](#)

22 - Charge air cooler

23 - Vacuum reservoir



24 - Evaporative Emission (EVAP) canister purge regulator valve (N80)

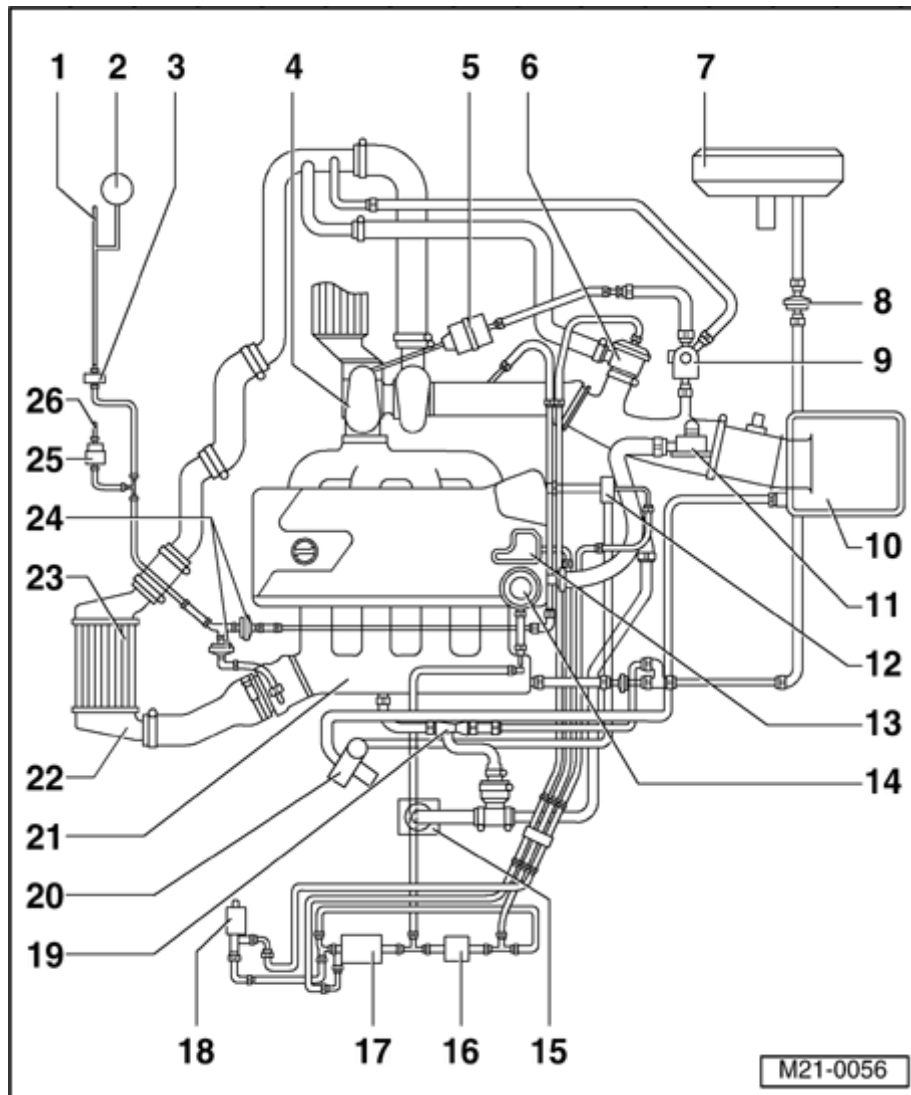
◆ Checking activation:

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01; Output Diagnostic Test Mode; Performing Output Diagnostic Test Mode*

◆ Checking function ⇒ [Page 20-57](#)

25 - Connecting hose

◆ to EVAP canister



Engine code AWP, AWW

1 - Connecting pipe/hose

- ◆ from Leak detection pump (LDP) -V144-

2 - Vacuum reservoir

- ◆ below wheelhousing liner at front right

3 - Non-return valve

4 - Turbocharger

5 - Pressure unit

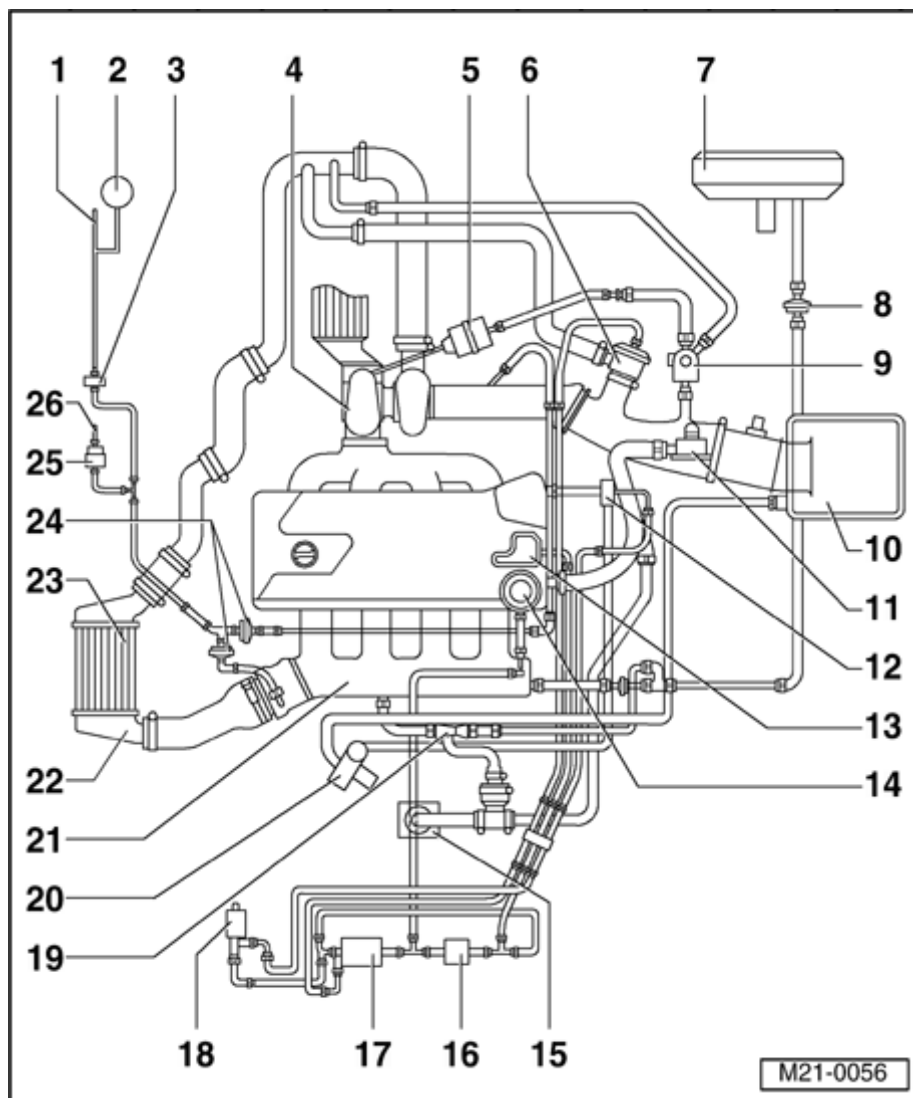
- ◆ For charge air pressure control valve

6 - Overrun shut-off valve

7 - Brake servo

8 - Non-return valve

- ◆ For brake servo



9 - Wastegate bypass regulator valve -N75-

- ◆ The valve will be activated from the engine control module (pulsed)
- ◆ Checking activation:

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01; Output Diagnostic Test Mode; Performing Output Diagnostic Test Mode*

10 - Air cleaner with air mass meter -G70-

11 - Cylinder block breather pressure regulating valve

12 - Combi-valve

- ◆ For secondary air system
- ◆ Checking ⇒ [Page 26-14](#)

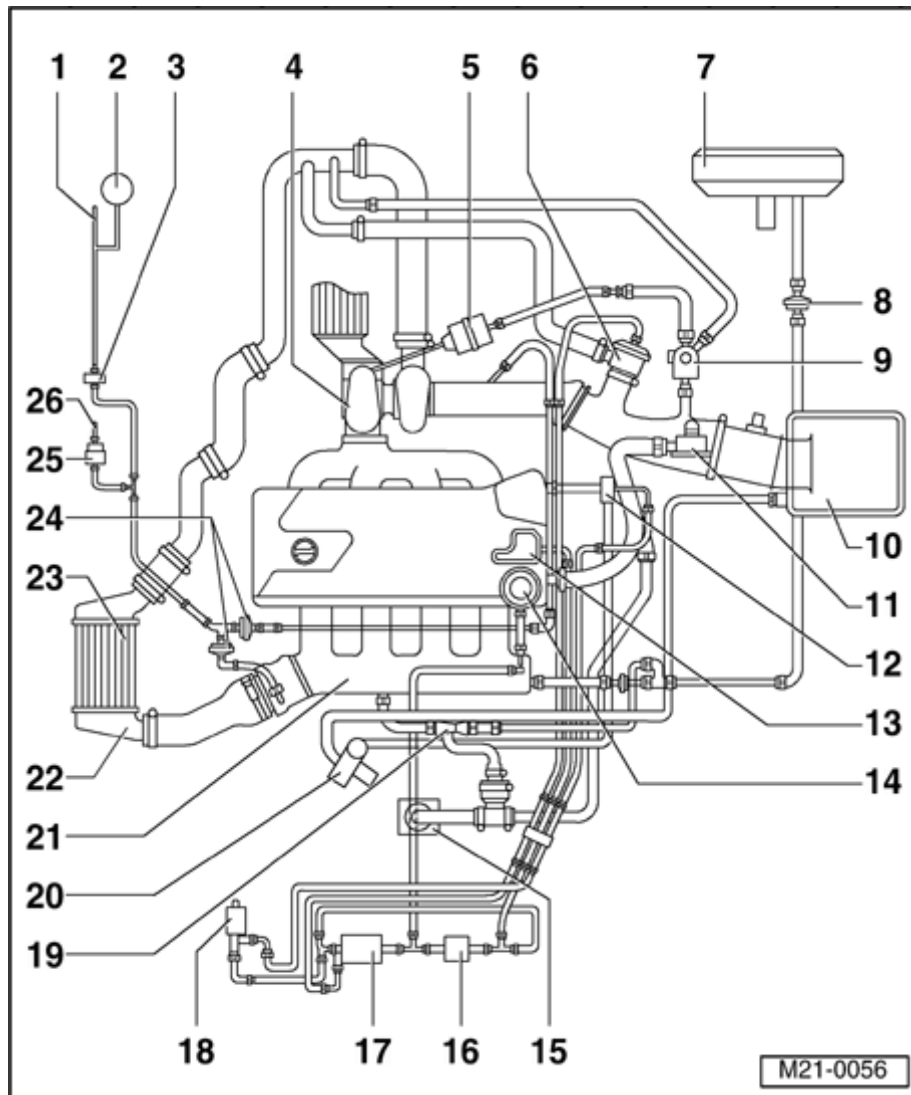
13 - Vacuum reservoir

14 - Fuel pressure regulator

15 - Cylinder block breather

16 - Non-return valve

17 - Recirculating valve for turbocharger -N249-



18 - Secondary air intake valve (N112)

◆ Checking ⇒ [Page 26-20](#)

19 - Vacuum booster

20 - Secondary air pump motor (V101)

◆ Checking function ⇒ [Page 26-16](#)

21 - Intake pipe

22 - Charge air pressure sensor (G31)

23 - Charge air cooler

24 - Non-return valve

25 - Evaporative Emission (EVAP) canister purge regulator valve (N80)

◆ Checking activation:

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01; Output Diagnostic Test Mode; Performing Output Diagnostic Test Mode*

◆ Checking function ⇒ [Page 20-57](#)

26 - Connecting hose

◆ to EVAP canister



Rules for cleanliness

When working on the exhaust gas turbocharger, pay careful attention to the following "5 rules":

- ◆ Thoroughly clean all unions and the adjacent areas before disconnecting.
- ◆ Place parts that have been removed on a clean surface and cover. Do not use fluffy cloths!
- ◆ Carefully cover opened components or seal, if the repair cannot be carried out immediately.
- ◆ Only install clean components: Only unpack replacement parts immediately prior to installation. Do not use parts that have been stored loose (e.g. in tool boxes etc.).
- ◆ When the system is open: Do not work with compressed air if this can be avoided. Do not move vehicle unless absolutely necessary.



Safety precautions

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.***

Observe following if test and measuring instruments are required during a test drive:

- ♦ Test and measuring instruments must be secured to rear seat and operated by a 2nd person from this location.

If test and measuring instruments are operated from front passenger's seat and the vehicle is involved in an accident, there is a possibility that the person sitting in this seat may receive

serious injuries when the airbag is triggered.