

Cooling system components, removing and installing

WARNING!

- ◆ *When the engine is hot, the cooling system is under pressure. The hot coolant may escape and cause scalding injuries if the system is opened too quickly.*
- ◆ *If necessary, open the cooling system carefully in order to slowly relieve the pressure and avoid scalding.*

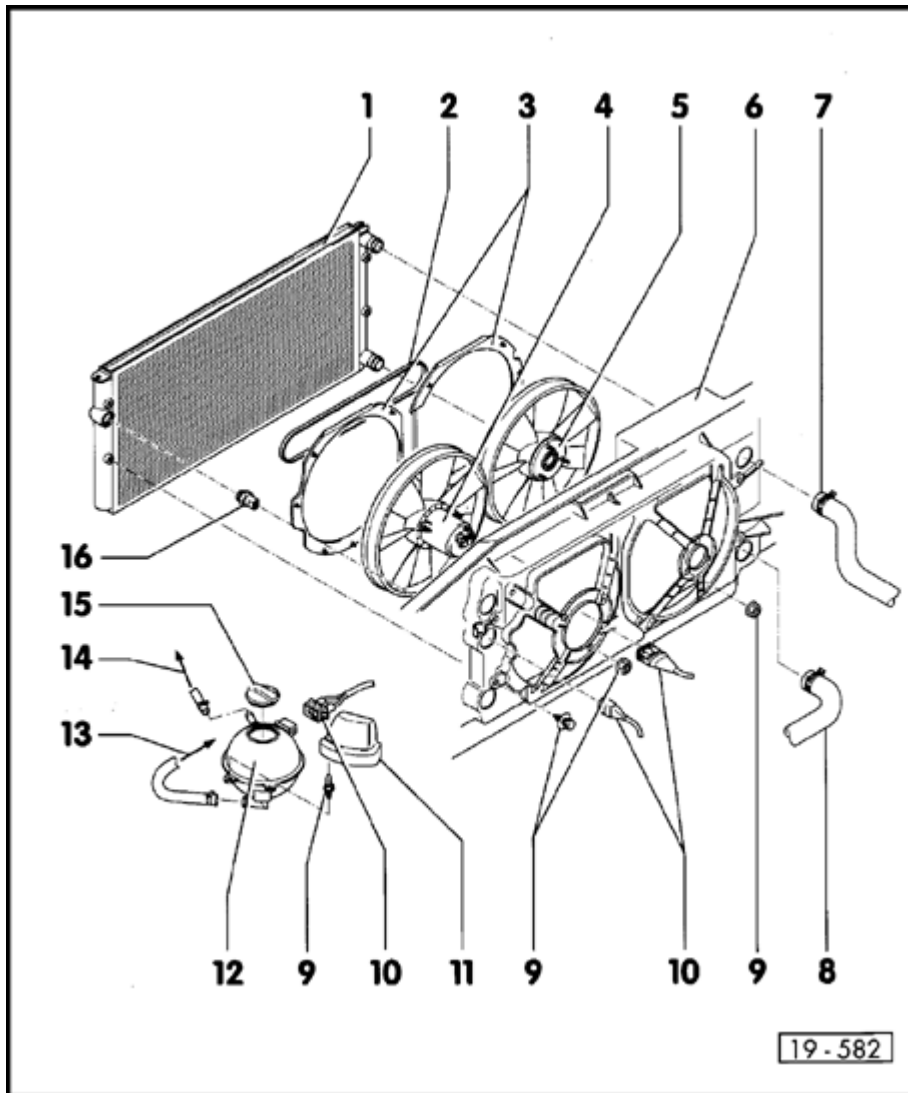
Notes:

- ◆ *Hose connections are secured with spring-type or screw-type clamps.*
- ◆ *Use clamp pliers, Hazet 798-5 or equivalent, to remove and install spring-type clamps.*
- ◆ *During repairs, spring-type clamps may be replaced with screw-type clamps.*

Draining/filling procedures and engine coolant specifications ⇒ [Page 19-10](#)

Coolant mixture ratios ⇒ [Page 19-10](#)

For leak tests of cooling system use VAG 1274 cooling system tester and VAG 1274/3 adapter.



Cooling system components, body side

1 - Radiator

- ◆ Removing and installing ⇒ [Page 19-12](#)
- ◆ After replacing radiator, replace all engine coolant

2 - V-belt

- ◆ Drives auxiliary fan -5-
- ◆ Only with optional equipment

3 - Guide ring

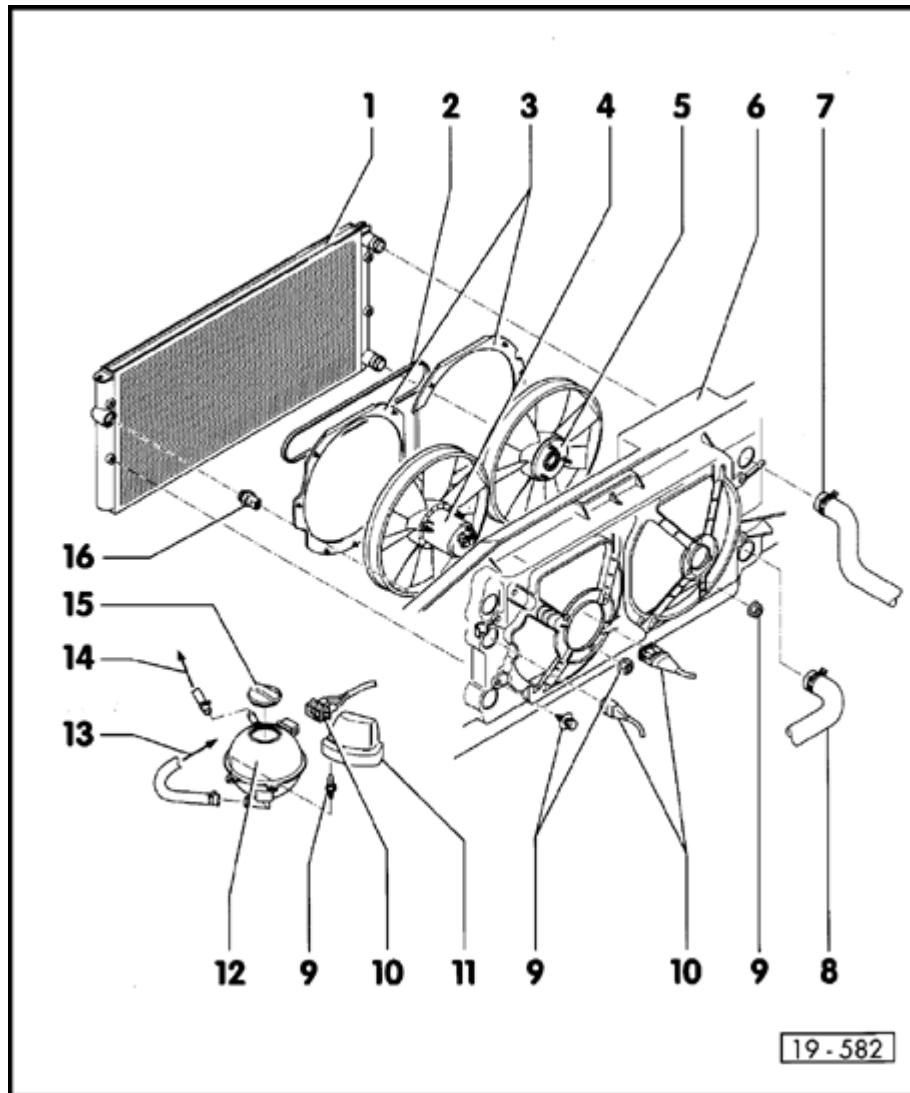
- ◆ Note fitting position
- ◆ Fastened with clips to lock carrier (radiator support) - 6 -

4 - Radiator fan

- ◆ Removing and installing ⇒ [Page 19-12](#)

5 - Auxiliary fan

- ◆ Only with optional equipment
- ◆ Removing and installing ⇒ [Page 19-12](#)



6 - Lock carrier

7 - Upper coolant hose

◆ To flange ⇒ [Page 19-7](#) , Item 18

8 - Lower coolant hose

◆ To flange ⇒ [Page 19-6](#) , Item 12

9 - 10 Nm (7 ft lb.)

10 - Harness connector

11 - Cover

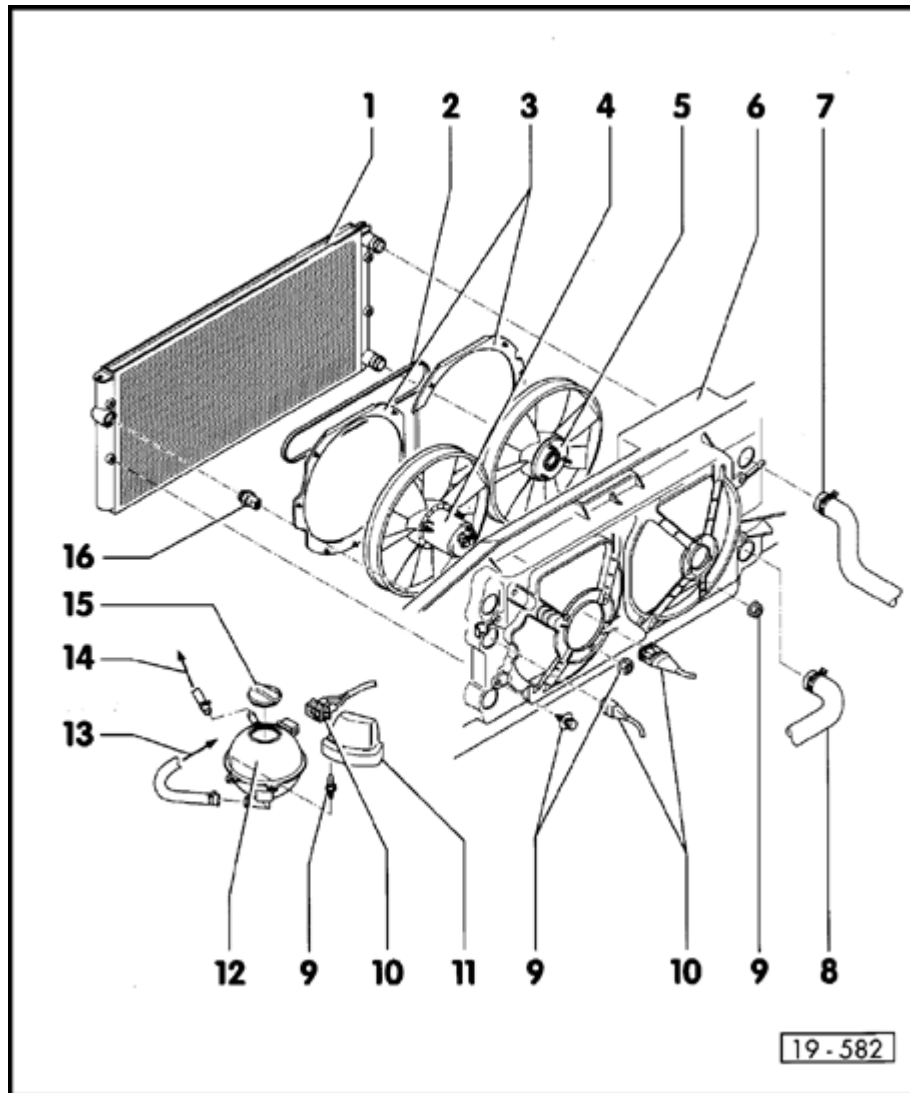
12 - Expansion tank

13 - To coolant pipe

◆ ⇒ [Page 19-6](#) , Item 8

14 - To connection

◆ ⇒ [Page 19-6](#) , Item 11



15 - Cap

- ◆ Check with V.A.G 1274 cooling system tester and 1274/4 adapter
- ◆ Opening pressure 1.3 to 1.5 bar (19 to 23 psi)

16 - Coolant Fan Control (FC) Thermal Switch (F18)

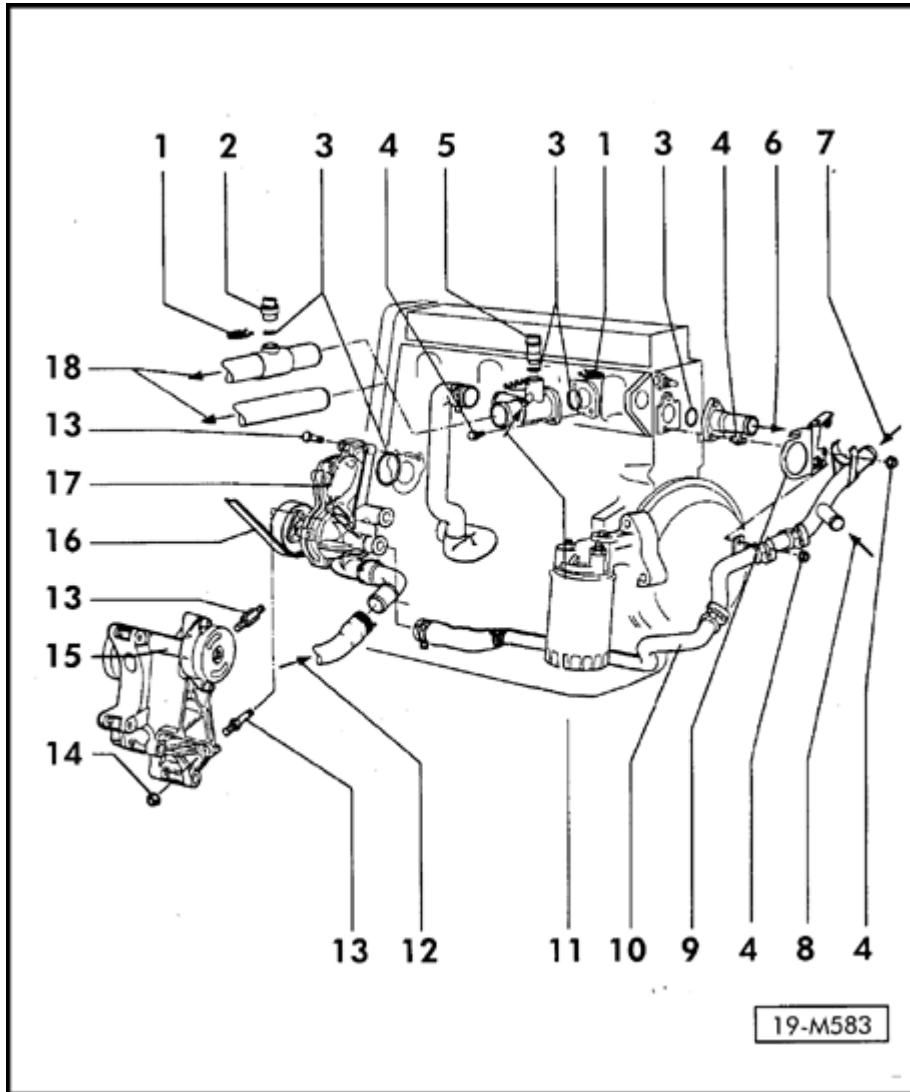
- ◆ Tightening torque 35 Nm (26 ft. lb)
- ◆ Additional with optional equipment only:
Third Speed Coolant Fan Control (FC)
Thermal Switch -F165- ⇒ [Page 19-5](#) , Item 2

Switching temperatures, 1st stage:

- ◆ ON: 92 to 97 °C (197 to 206 °F)
- ◆ OFF: 84 to 91 °C (183 to 195 °F)

Switching temperatures, 2nd stage:

- ◆ ON: 99 to 105 °C (210 to 221 °F)
- ◆ OFF: 91 to 98 °C (195 to 208 °F)

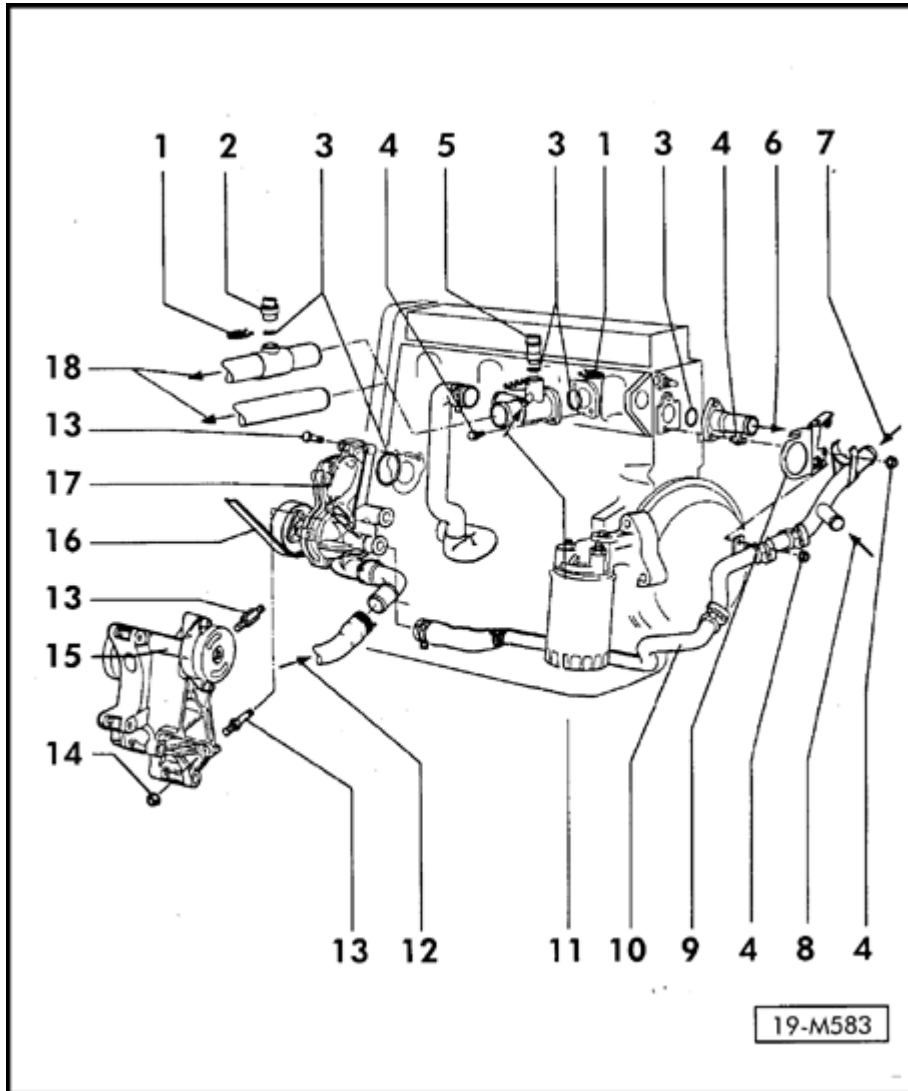


Cooling system components, engine side

- 1 - Retainer**
- 2 - Third Speed Coolant Fan Control (FC) Thermal Switch (F165)**
 - ◆ For electric fan stage 3
 - ◆ Only with optional equipment

Switching temperatures:

 - ◆ ON: 110 to 115 °C (230 to 239 °F)
 - ◆ OFF: 105 to 110 °C (221 to 230 °F)
- 3 - O ring**
 - ◆ Always replace
- 4 - 10 Nm (7 ft lb)**
- 5 - Engine Coolant Temperature (ECT) Sensor -G62-**
- 6 - To heater core**
- 7 - From heater core**



8 - From expansion tank

◆ ⇒ [Page 19-3](#) , Item 13

9 - Bracket

10 - Coolant pipe

11 - From expansion tank

◆ ⇒ [Page 19-3](#) , Item 14

12 - From radiator, lower

◆ ⇒ [Page 19-3](#) , Item 8

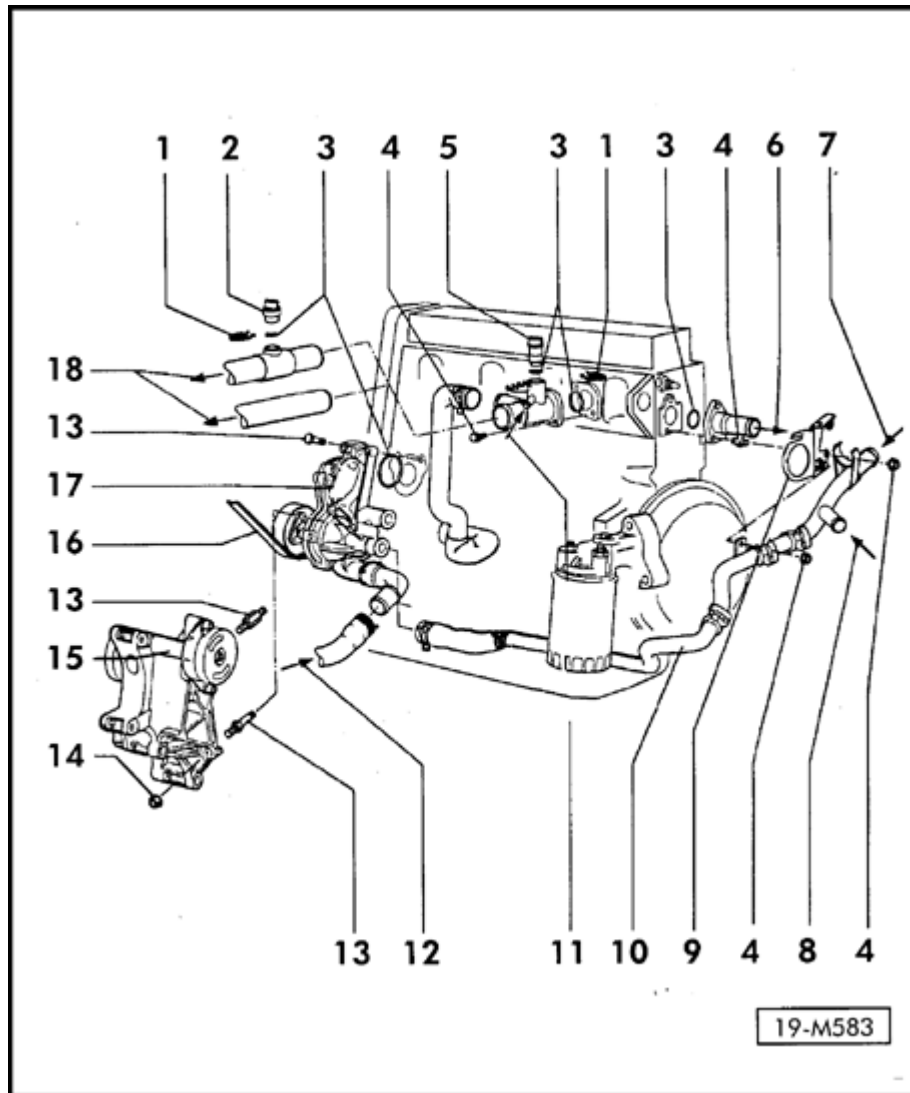
13 - 20 Nm (15 ft lb) plus additional 1/4 turn (90°)

◆ Always replace

14 - 30 Nm

15 - Bracket

◆ For Generator (GEN)



16 - Poly-ribbed belt

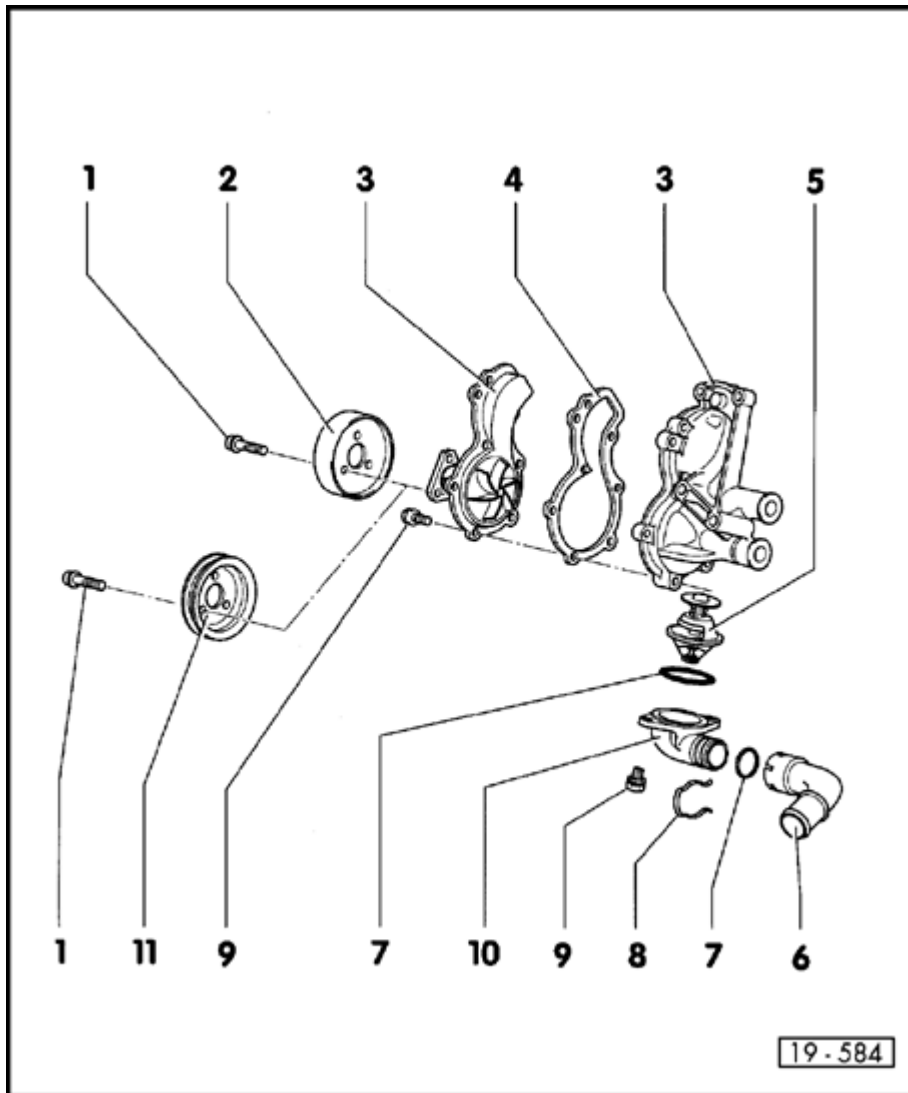
- ◆ Removing, installing and adjusting belt ⇒ [Page 13-11](#)
- ◆ Adjusting V-belt tension ⇒ [Repair Manual, Suspension, Wheels, Brakes, Steering, Repair Group 48](#)

17 - Coolant pump

- ◆ Disassembling/assembling ⇒ [Page 19-8](#)

18 - To upper radiator

- ◆ ⇒ [Page 19-3](#) , Item 7



Coolant pump, disassembling and assembling

1 - 20 Nm (15 ft lb)

2 - Coolant pump pulley

- ◆ For ribbed belt

3 - Coolant pump

- ◆ Check that shaft rotates smoothly

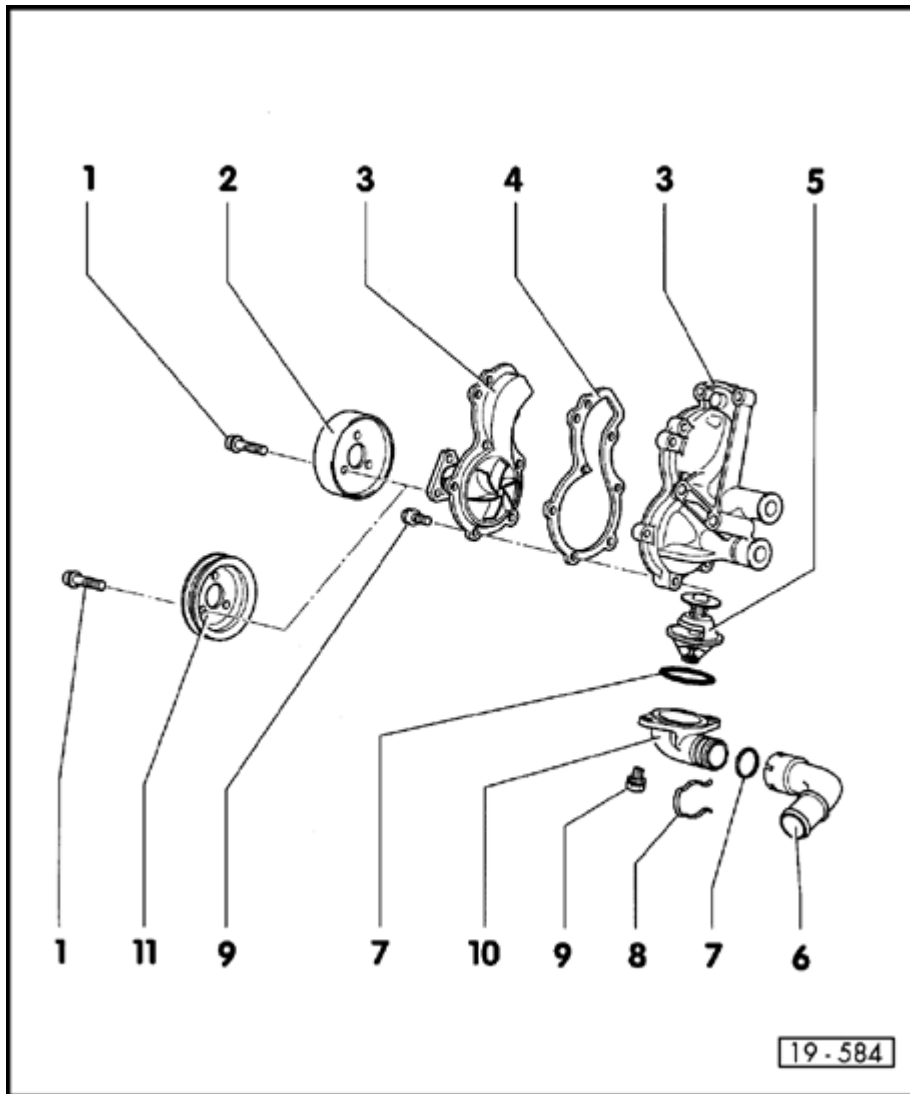
4 - Gasket

- ◆ Always replace

5 - Thermostat

- ◆ To check, heat in water
- ◆ Starts to open at approx. 87° C (188° F)
- ◆ Fully open at approx. 102° C (215° F)
- ◆ Opening stroke: 7 mm (0.28 in.) minimum

6 - Connector Pipe



7 - O ring

- ◆ Always replace

8 - Clip

9 - 10 Nm (7 ft lb)

10 - Flange

11 - Coolant pump pulley

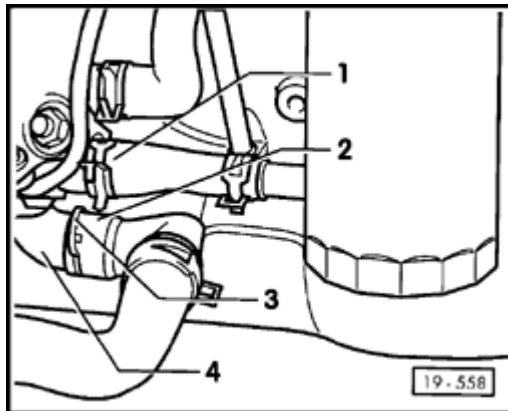
- ◆ For V-belt
- ◆ Removing and installing, use VAG 1590



Cooling system, draining and filling

Draining

- Open coolant expansion tank cap.
- Remove clip -3- and separate connection pipe -2- from thermostat flange -4-
- Remove coolant hose -1- or thermostat flange -4-.



CAUTION!

DO NOT re-use coolant that has been drained from the system. Dispose of properly.

Filling

Notes:

- ◆ *The cooling system of all Volkswagen vehicles is filled at the factory with a mixture of water and anti-freeze solution (G11) containing corrosion inhibitors designed for year round use.*
- ◆ *Phosphate-free antifreeze prevents frost and corrosion damage, and prevents chalk formation in addition to raising the boiling point of the mixture. The higher boiling point improves the operational efficiency under full load, particularly in tropical climates.*
- ◆ *Use phosphate-free coolant-antifreeze Part No. ZVW 237 102 whenever replacing or topping up coolant. This applies to ALL Volkswagen vehicles and ALL model years.*

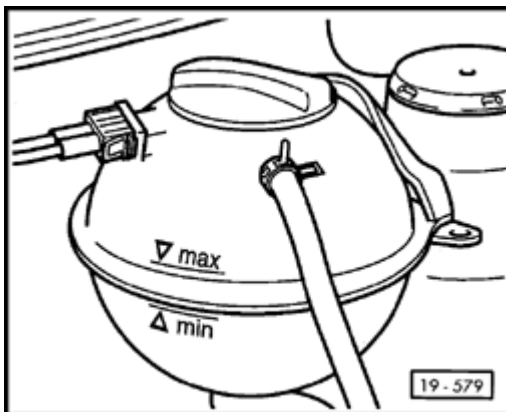


Recommended mixture ratios:

Protection to (temperature)	Anti-freeze amount ¹⁾	G 112)	Water ²⁾
-25 °C (-13 °F)	40 %	2.2 l (2.3 qt.)	3.3 l (3.3 qt.)
-35 °C (-36 °F)	50 %	2.75 l (2.9 qt.)	2.75 l (2.9 qt.)

1) The amount of anti-freeze must not exceed 60 %; frost protection and cooling effect will decrease if amount of anti-freeze is too high.

2) The quantity of coolant can vary depending upon the vehicle equipment.



A

- Fill coolant to MAX mark on expansion tank.
- Close expansion tank (install cap).
- Let engine run until Coolant Fan -V7- comes on.
- Check coolant level and top off if necessary. With engine at operating temperature coolant level must be at MAX mark; with cold engine coolant level must be between MIN and MAX marks.



Radiator and coolant fan, removing and installing

Removing

- Drain coolant ⇒ [Page 19-10](#)

- Remove front bumper:

⇒ [Repair Manual, Body Exterior, Interior Golf, GTI, Jetta, Repair Group 63](#)

⇒ [Repair Manual, Body Exterior, Interior, On Board Diagnostic \(OBD\) Cabrio, Repair Group 63](#)

- Disconnect coolant hoses from radiator.

- Disconnect harness connectors from Coolant Fan Control (FC) Thermal Switch (F18) and Coolant Fan (V7).

- Remove headlights:

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

- Remove both radiator mounting bolts and remove radiator toward the front.

Note:

Vehicles with air conditioner:

- *Observe additional information and removal work ⇒ [Page 19-14](#).*



Installing

Installation is carried out in the reverse order, when doing this note the following:

- Fill with coolant ⇒ [Page 19-10](#)

- Adjust headlights
⇒ [Repair Manual, Electrical Equipment, Repair Group 94](#)



Additional information for vehicles with A/C:

CAUTION!

- ◆ ***DO NOT open A/C refrigerant circuit.***

- ◆ ***To prevent damage to condenser and to refrigerant lines/hoses, DO NOT stretch or kink them.***

- Remove Air Cleaner (ACL).

- Remove both radiator mounting bolts.

- Remove retaining clamps from A/C refrigerant lines.

- Separate condenser from radiator and pull it forward as far as possible.

- Remove radiator between condenser and lock carrier (radiator support).