

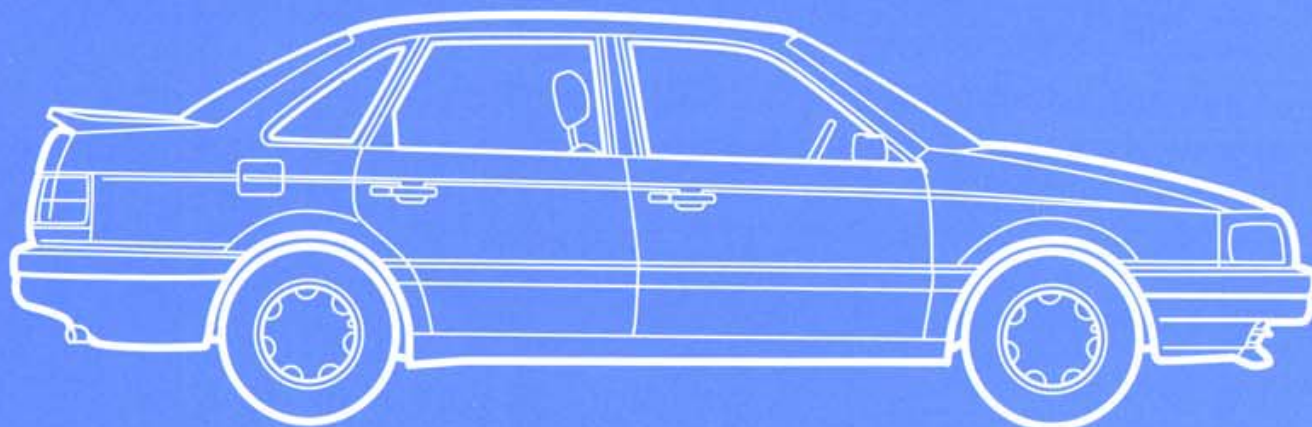


Volkswagen Passat

Official Factory Repair Manual

1990, 1991, 1992, 1993, 1994

4-cylinder (16V, G60, and diesel), 6-cylinder (VR6)
including wagon and Syncro



Bentley Publishers

Contents:

Version 96.01

General, Engine

- 2.0L 16V 4-cylinder (code 9A)
- 2.8L VR6 (code AAA)
- 1.9L Diesel (Canada) (code AAZ)
- 1.8L 4-cylinder G60 (code PG)
- Engine Electrical

Fuel Supply, Turbocharger, Fuel Injection, Exhaust, Ignition

- 2.0L 16V 4-cylinder (CIS-E Motronic)
- 2.8L VR6 (Motronic)
- 1.9L Diesel (Canada)
- 1.8L 4-cylinder G60 Syncro (Canada) (Digifant)

Transmission

- Manual Transmission 02A
- Manual Transmission 02C Syncro (Canada)
- Automatic Transmission 096

Suspension, Brakes, Wheels, Steering

- Suspension-Wheels-Brakes-Steering
- Suspension-Wheels-Brakes-Steering Syncro (Canada)

Body

- Body Exterior
- Body Interior

Heater & Air Conditioning

- Heater-Air Conditioner (R12)
- Air Conditioner (R-134a)

Electrical Equipment

- Radio-Wipers-Lights-Switches-Wiring

Troubleshooting

- Using VAG Diagnostic Testers

Wiring Diagrams

Volkswagen B3 Passat
General-Engine 4 CYL.
19 Engine - Cooling System (Page GR-19)

Cooling system

- [draining and filling](#)
- [general information](#)
- [Body components, layout](#)
- [Engine components, layout](#)

Radiator fan run-on

- [checking](#)

Recommended mixture ratios

- [chart](#)

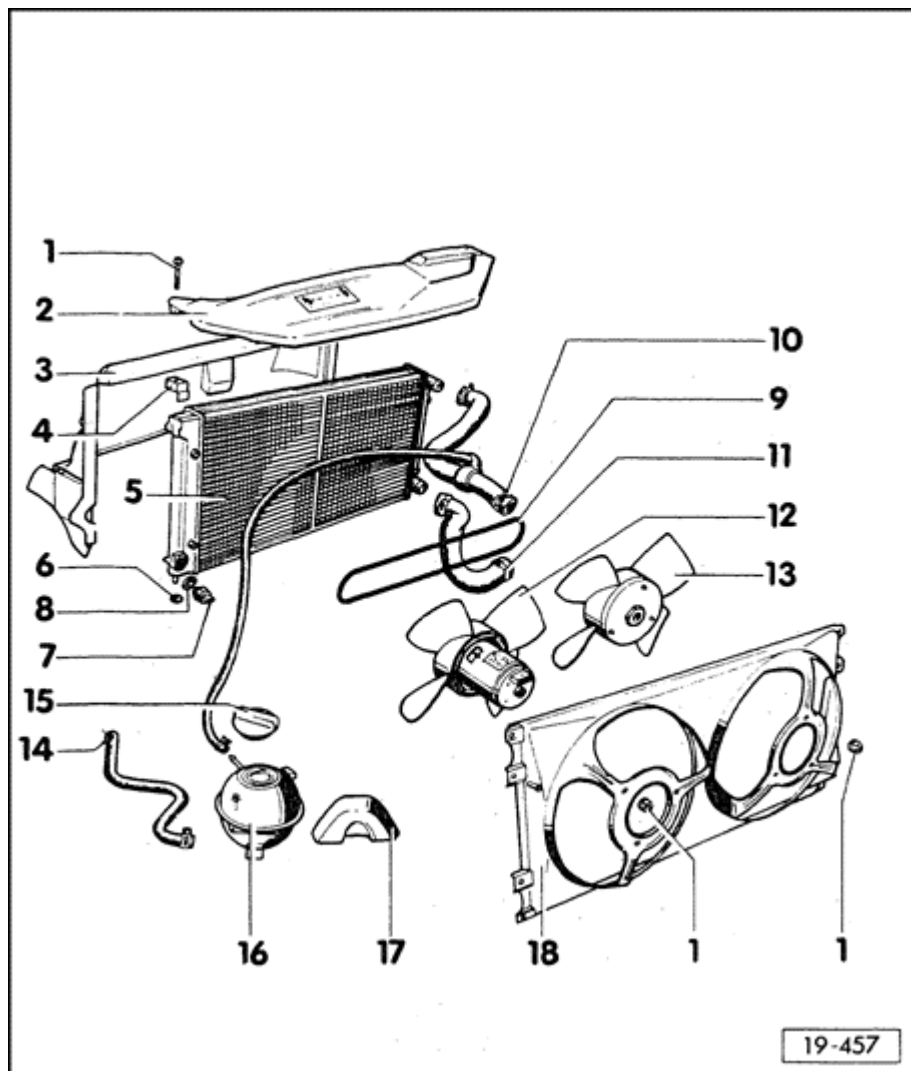
Volkswagen B3 Passat
General-Engine 4 CYL.
Cooling system, general information (Page 19-1)

CAUTION!

When the engine is warm, the cooling system is under pressure. Carefully release the pressure before beginning repairs.

- ◆ When repairing the cooling system hoses, it is recommended that spring type clamps be replaced by screw clamps
- ◆ If installing spring type clamps; use a commercial plier such as Hazet 798-5
- ◆ Draining system and filling with new coolant, ⇒ [page 19-8](#)
- ◆ Coolant mixture ratios, ⇒ [page 19-9](#)
- ◆ Perform cooling system leakage checks using tools VAG 1274 and VAG 1274/3

Volkswagen B3 Passat
General-Engine 4 CYL.
Cooling system, body components, layout (Page 19-2)



1 - 10 Nm (7 ft lb)

2 - Radiator cover

3 - Radiator mounting shroud

4 - Mounting bracket

5 - Radiator

- ♦ if the radiator is replaced, the engine coolant mixture must be completely replaced.

6 - Rubber washer

7 - Thermo-switch (F 18)

- ♦ 35 Nm (26 ft lb)
- ♦ for the radiator fan motor
- ♦ Switching temperatures:
Stage I:

ON: 92 to 97° C

OFF: 84 to 91° C

Stage II:

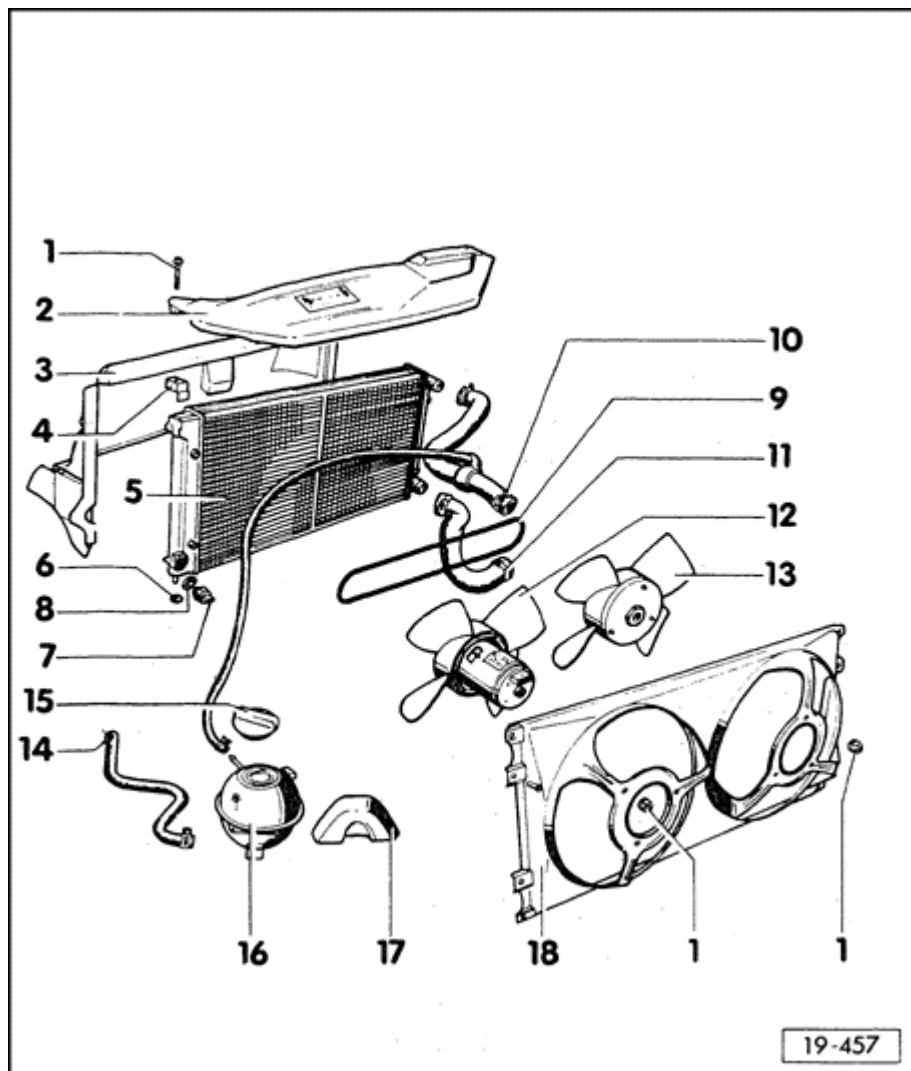
ON: 99 to 105° C

OFF: 91 to 98° C

♦ ⇒ item 15 [page 19-6](#)

♦ vehicles with auto. transmission have an addition transmission oil cooler

Volkswagen B3 Passat
General-Engine 4 CYL.
Cooling system, body components, layout (Page 19-4)



15 - Cap

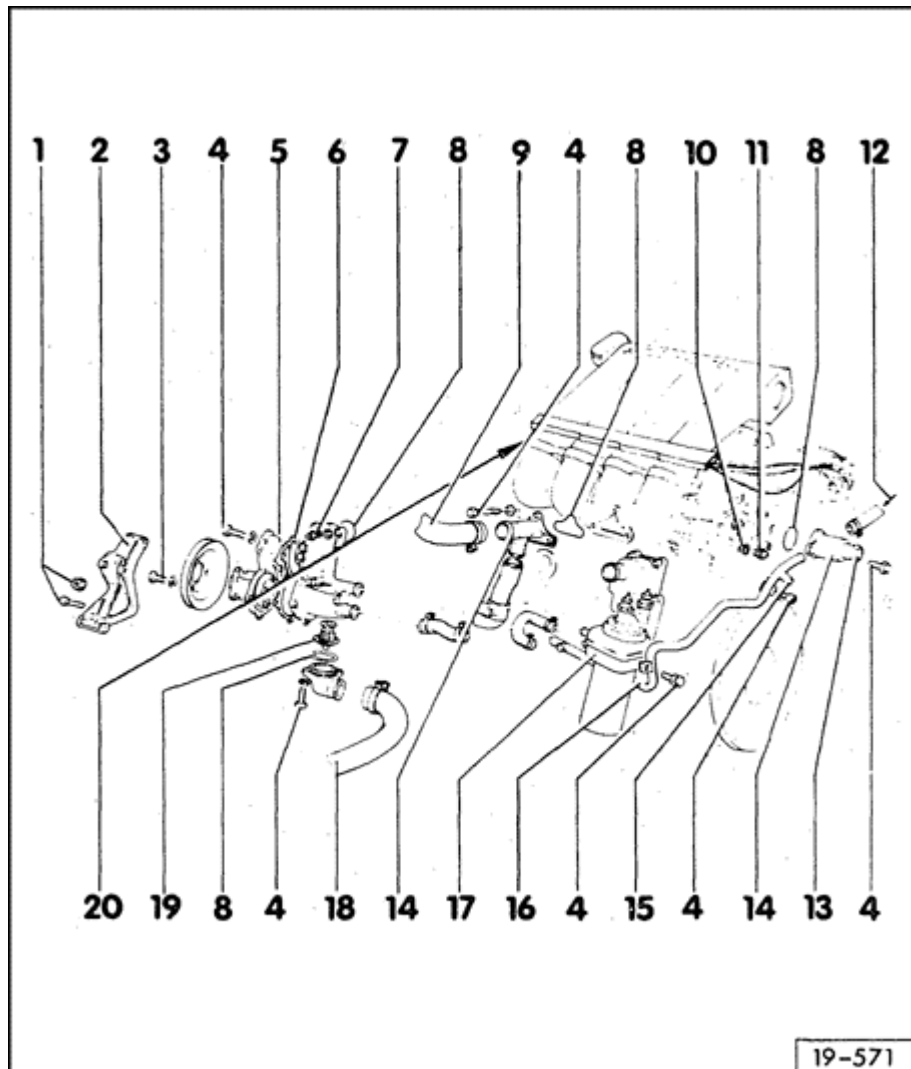
- ♦ for coolant expansion tank
- ♦ check using VAG 1274 and Vag 1274/4: 1.3 to 1.5 bar

16 - Coolant expansion tank

17 - Cover

18 - Fan cowl

Volkswagen B3 Passat
General-Engine 4 CYL.
Cooling system, engine components, layout (Page 19-5)



1 - Hexagon bolt

- ♦ 20 Nm (15 ft lb)
- ♦ if nut has collar: 35 Nm (26 ft lb)

2 - Mounting bracket

3 - 20 Nm (15 ft lb)

4 - 10 Nm (7 ft lb)

5 - Coolant pump

- ♦ check shaft for ease of rotation

6 - Gasket

- ♦ replace

7 - Hexagon bolt/stud

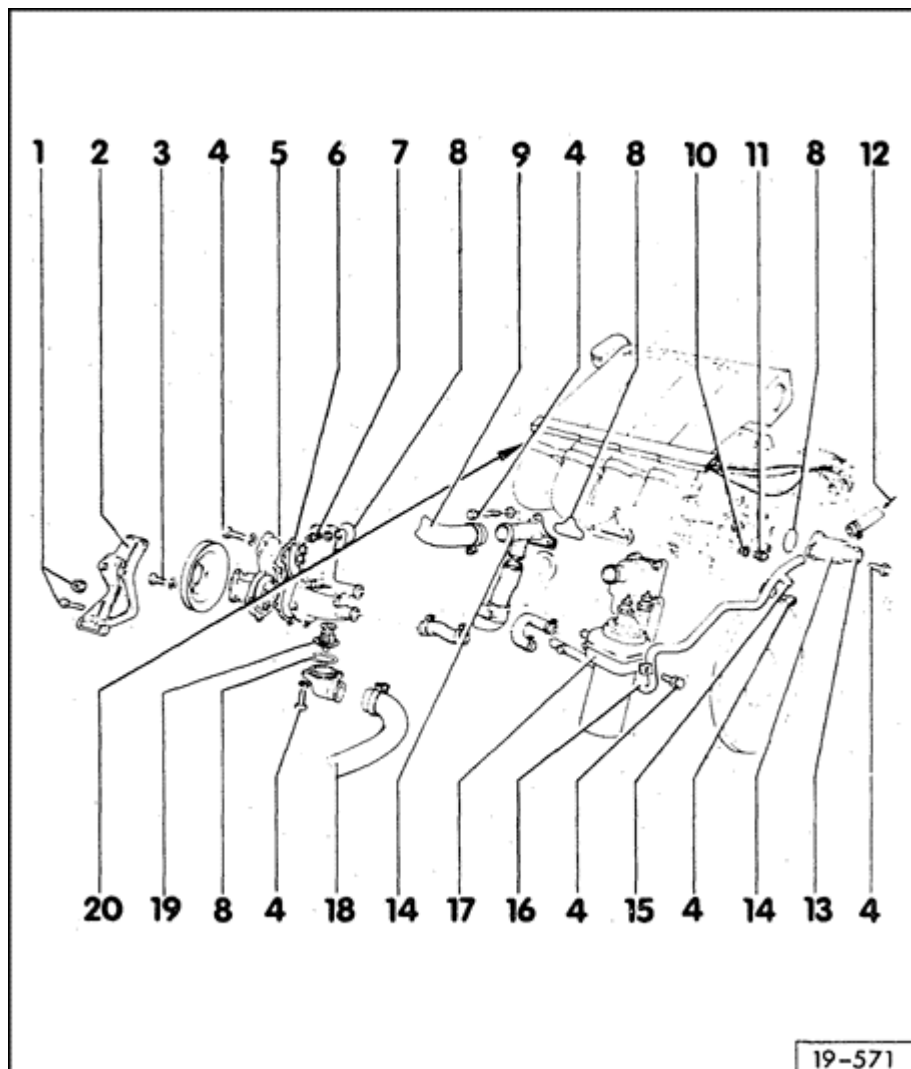
- ♦ 20 Nm (15 ft lb)

8 - O-ring ♦ replace if damaged

9 - to top of coolant radiator

♦ ⇒ item 10 [page 19-3](#)

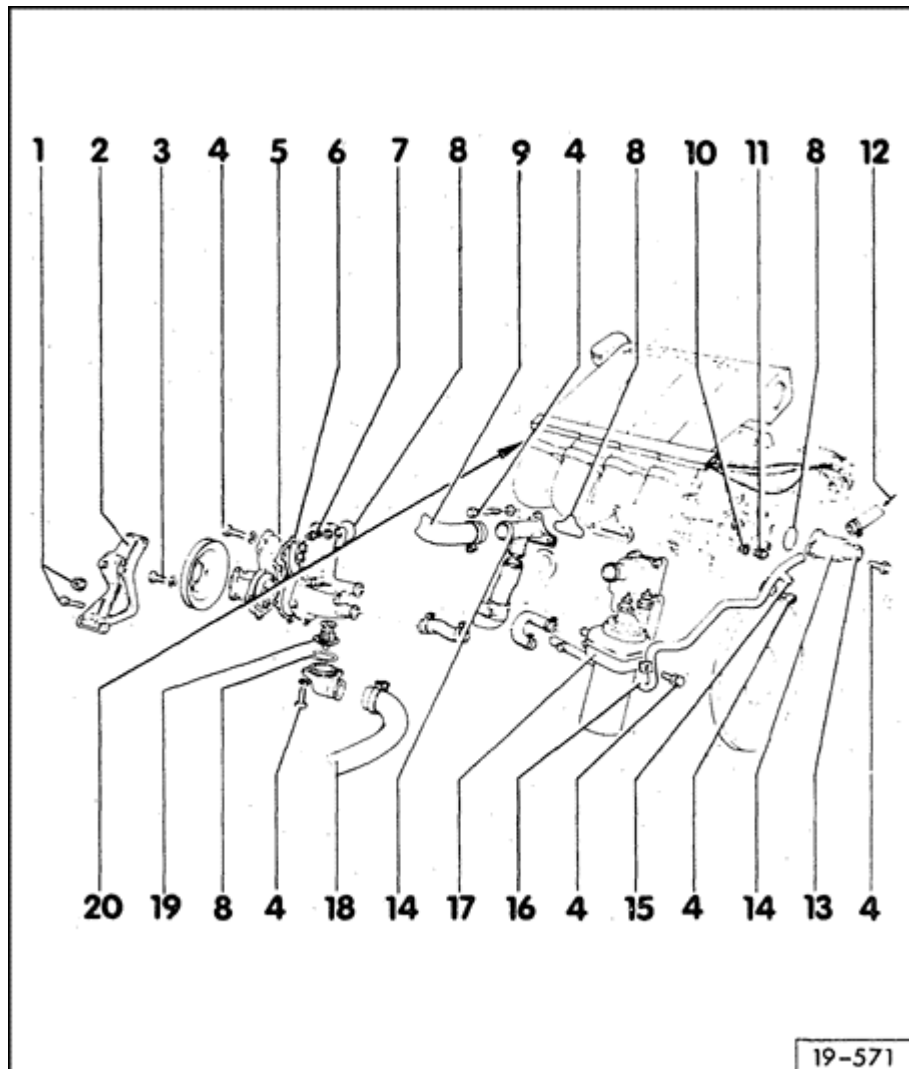
Volkswagen B3 Passat
General-Engine 4 CYL.
Cooling system, engine components, layout (Page 19-6)



- 10 - Sealing ring**
 - ♦ replace
- 11 - Coolant temperature sensor (G 62)**
- 12 - from heater core**
- 13 - to heater core**
- 14 - Hose connector flange**
- 15 - to coolant expansion tank**
 - ♦ ⇒ item 14 [page 19-3](#)
- 16 - Coolant pipe**
- 17 - Oil cooler**
 - ♦ removing and installing ⇒ [Repair Group 17](#)
- 18 - to bottom of coolant radiator**

◆ ⇒ item 11 [page 19-3](#)

Volkswagen B3 Passat
General-Engine 4 CYL.
Cooling system, engine components, layout (Page 19-7)



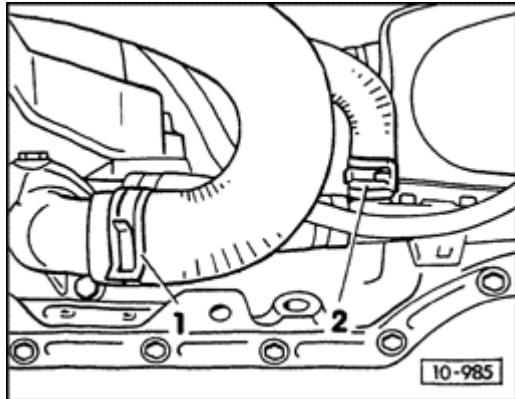
19 - Coolant thermostat

- ♦ to check, submerge in heated water:
 - opening starts: 85° C
 - maximizes at 105° C
 - minimum total stroke = 7mm

20 - Radiator fan run on thermo-switch

- ♦ switching temps:
 - ON: approx. 100° C
 - OFF: approx. 90° C
- ♦ run-on checking, ⇒ [page 19-11](#)

Volkswagen B3 Passat
General-Engine 4 CYL.
Cooling system, draining and filling (Page 19-8)



Draining

- Remove cap from coolant expansion tank
- Drain coolant via hoses 1 and 2 or from the thermostat flange

Filling

Note

The cooling system is filled with a mixture of water and anti-freeze containing G 11 corrosion inhibitors designed for year round usage. G 11 and coolant additives marked as being in accordance with TL: VW 774 B prevent frost and corrosion damage, the formation of chalk and in addition raise the boiling point of the mixture. Due to the higher boiling point, the coolant is an aid to operational efficiency when the engine is operating at high loads, particularly in hot climates.

If the radiator, heater core, cylinder head or cylinder head gasket are replaced, install ALL new coolant. Do NOT re-use old coolant.

Volkswagen B3 Passat
General-Engine 4 CYL.
Recommended mixture ratios, chart (Page 19-9)

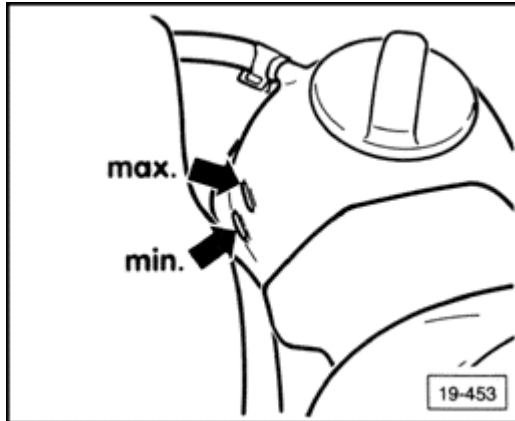
For protection down to -25 ° C (-13 ° F):	
Water	Antifreeze
60 % (3.9 liters)	40 % (2.6 liters)
For protection down to -35 ° C (-31 ° F):	
Water	Antifreeze
50 % (3.25 liters)	50 % (3.25 liters)

Note

The amount of antifreeze must not exceed 60 % or frost protection and cooling effect will decrease.

The stated capacities can vary slightly depending upon vehicle options.

Volkswagen B3 Passat
General-Engine 4 CYL.
Recommended mixture ratios, chart (Page 19-10)



- Fill coolant up to the Max. mark on the coolant expansion tank
- Reinstall the coolant expansion tank cap
- Start the engine and let idle until the radiator coolant fan comes on at least once
- Shut off engine and check coolant level, topping up if necessary
- The coolant level must be on the Max. mark when the engine is hot
- The coolant level must be between the Min. and Max. marks when the engine is cold

Volkswagen B3 Passat
General-Engine 4 CYL.
Radiator fan run-on, checking (Page 19-11)

- Switch on ignition and then switch off again
- Disconnect thermo-switch harness connector and touch to ground
- Radiator fan must run

Note

*For additional troubleshooting use the **VAG 1466** Tester.*