

Volkswagen New Beetle
2.0 Liter 4-cyl General, Engine (Engine Code AEG)
19 Engine-Cooling system (Page GR-19)

- [**Cooling system components, removing and installing**](#)
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Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-1)

Notes:

- ◆ *When the engine is warm the cooling system is under pressure. If necessary, release pressure before starting repairs.*
 - ◆ *Hoses are secured with spring clips. During repairs, only use spring clips.*
 - ◆ *VAG 1921 pliers are recommended to install spring clips.*
 - ◆ *When installing coolant hoses; route stress - free, so they do not come into contact with other components. Observe markings on coolant connections and hoses.*
- Check cooling system for leakage using VAG 1274 cooling system tester and 1274/9 adaptor.

Cooling system components (body side) ⇒ [Page 19-2](#) .

Cooling system components (engine side) ⇒ [Page 19-5](#) .

Coolant hoses, connection diagram ⇒ [Page 19-9](#) .

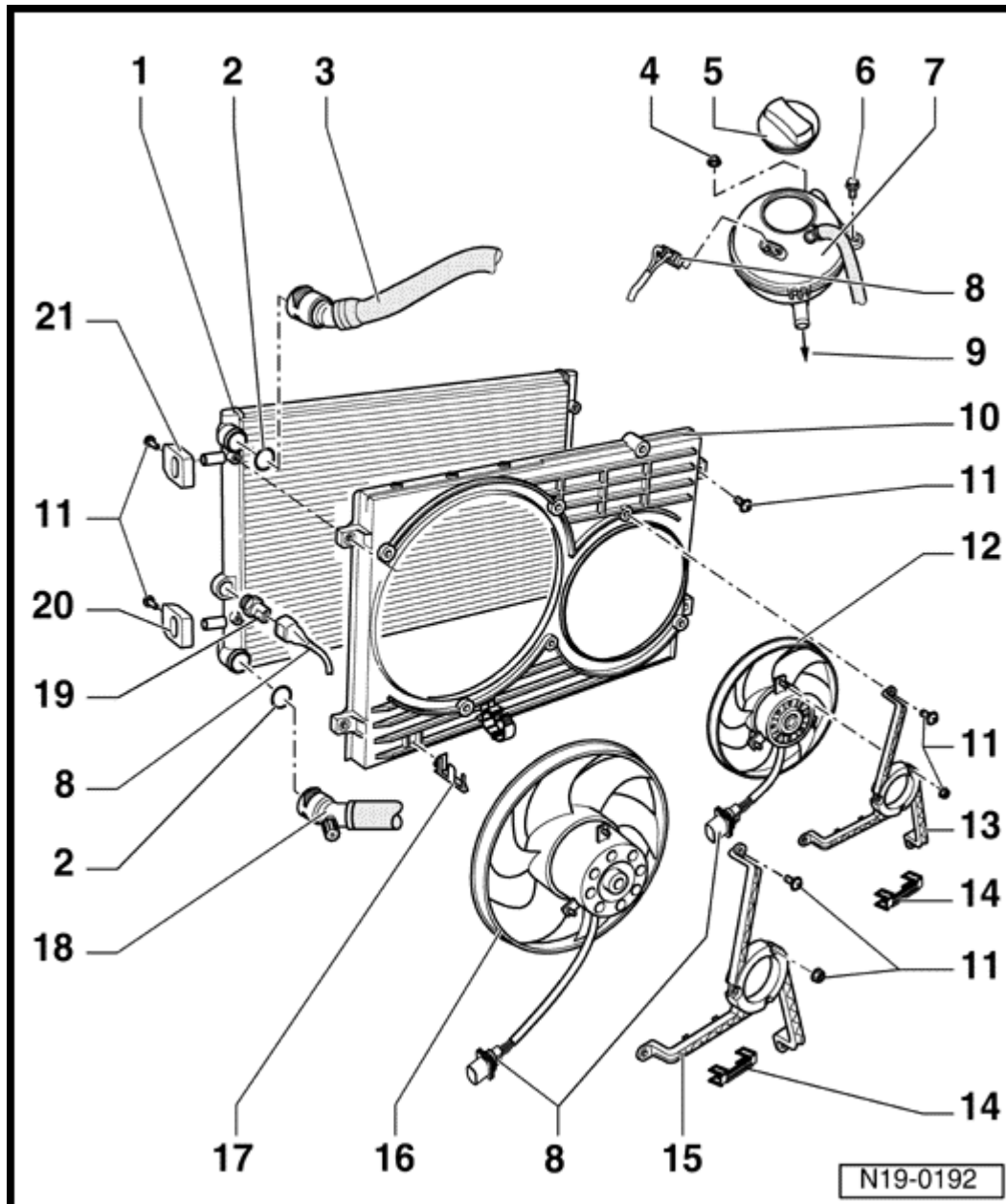
Engine coolant, draining and filling ⇒ [Page 19-10](#) .

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

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-2)



Cooling system components (body side), removing and installing

1 - Radiator

♦ Removing and installing ⇒ [Page 19-14](#)

- If replaced, also replace entire engine coolant

2 - O - ring

- Replace

3 - Coolant hose, upper

♦ Attached to radiator with retaining clip

♦ Coolant hoses, connection diagram ⇒ [Page 19-9](#)

4 - 4 Nm (35 in. lb)

5 - Cap

- Check using: VAG 1274 cooling system tester and VAG 1274/9 adaptor

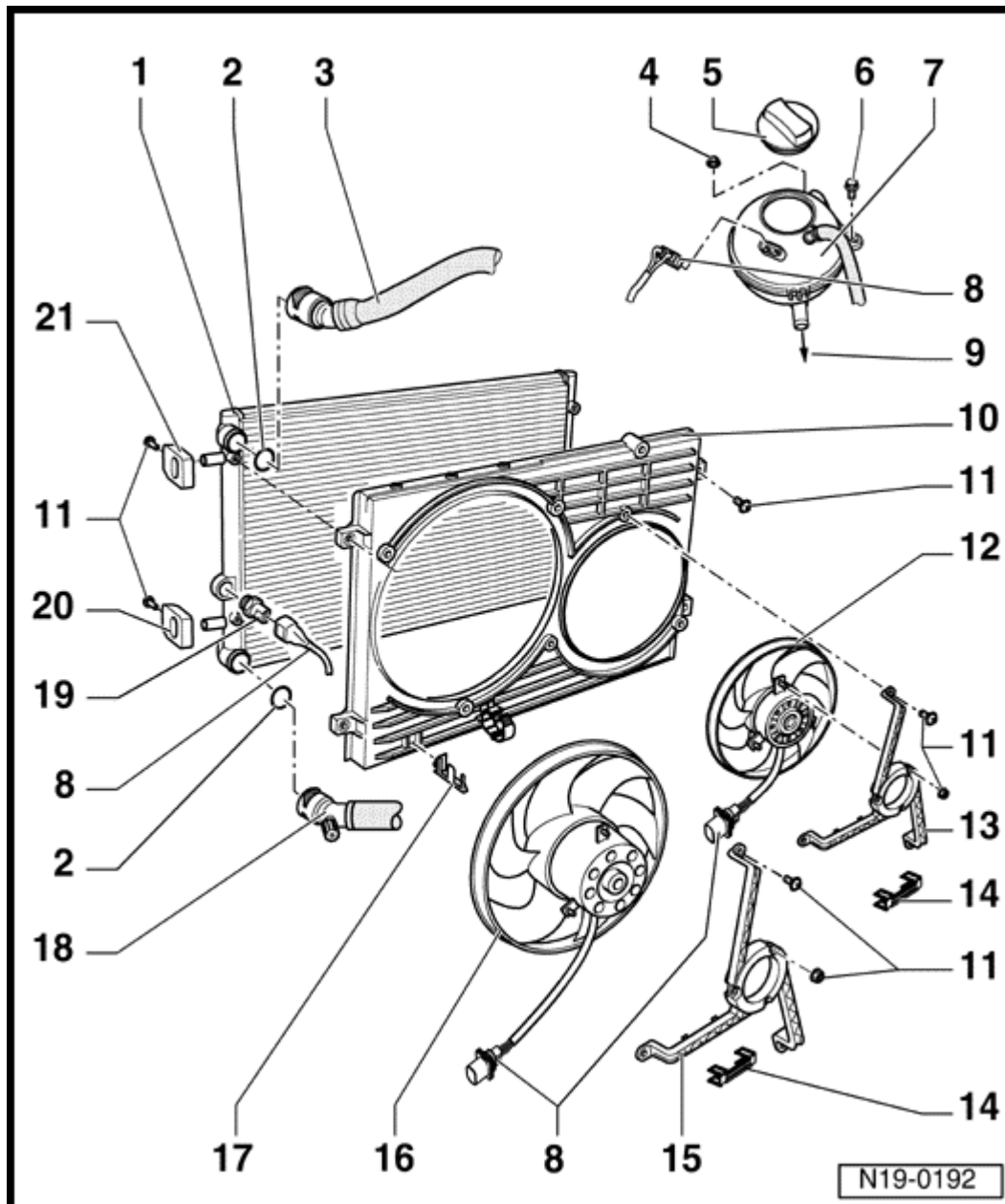
- ◆ Test pressure: 1.4 to 1.6 bar

6 - 2 Nm (18 in. lb)

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2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-3)



7 - Expansion tank

- Carry out leak test of cooling system with VAG 1274 cooling system tester and VAG1274/8 adaptor

8 - Connector

9 - to coolant hose

- ♦ Coolant hoses, connection diagram ⇒ [Page 19-9](#)

10 - Air ducting

11 - 10 Nm (7 ft lb)

12 - Additional fan

- ♦ optional equipment

13 - Fan ring

- ◆ for auxiliary fan

14 - Retaining clip

- Ensure it is seated securely

15 - Fan ring

16 - Radiator fan

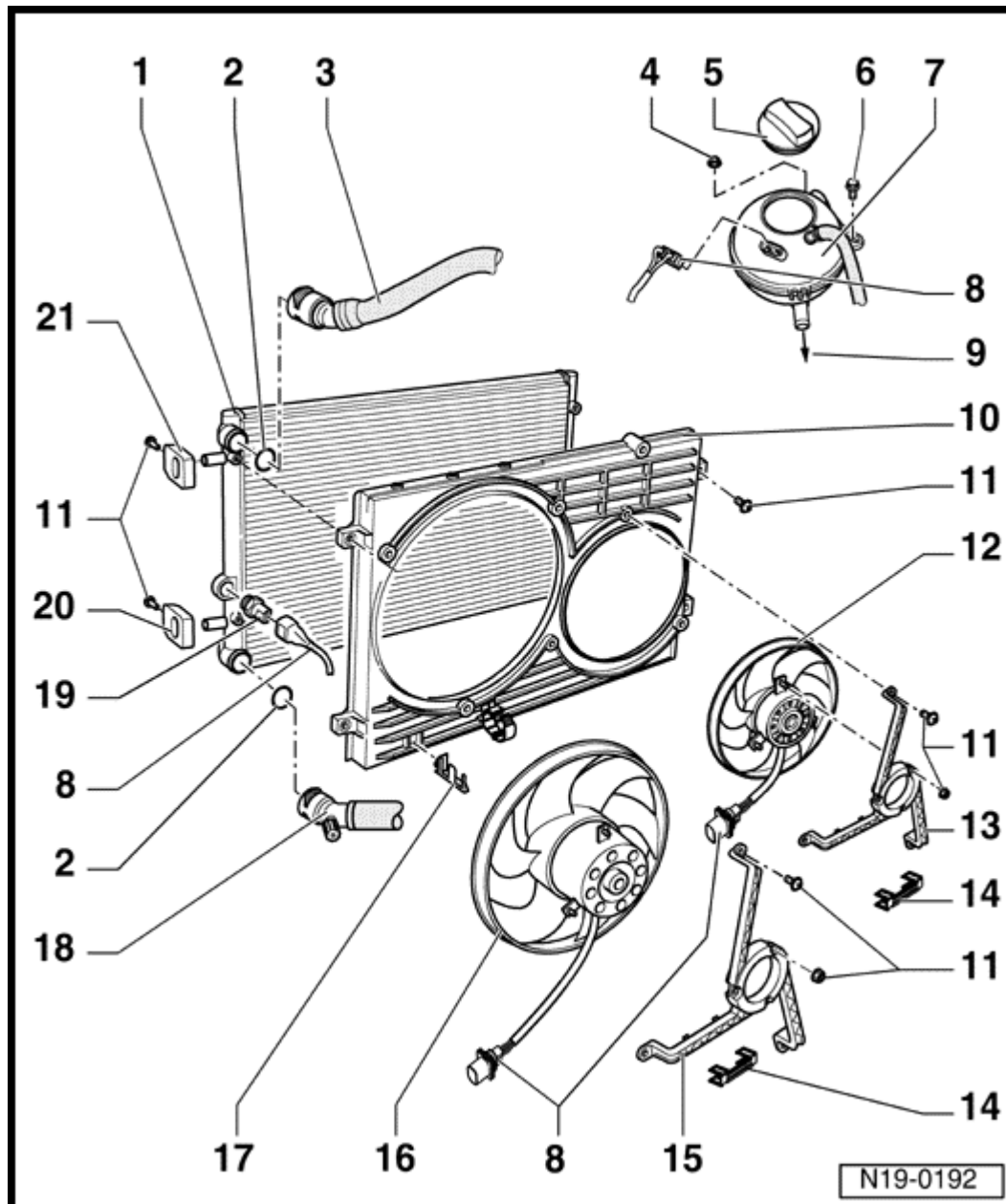
17 - Bracket

- ◆ for radiator fan connector

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2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-4)



18 - Coolant hose, lower

- ◆ Attached to radiator with retaining clip
- ◆ Coolant hoses, connection diagram ⇒ [Page 19-9](#) .

19 - Thermo switch F18

- ◆ 35 Nm (26 ft lb)
- ◆ for electric fan
- ◆ Switching temperatures: **Stage 1** ON: 92 to 97 ° C OFF: 84 to 91 ° C **Stage 2** ON: 99 to 105 ° C OFF: 91 to 98 ° C

20 - Bracket

- ◆ for radiator, lower

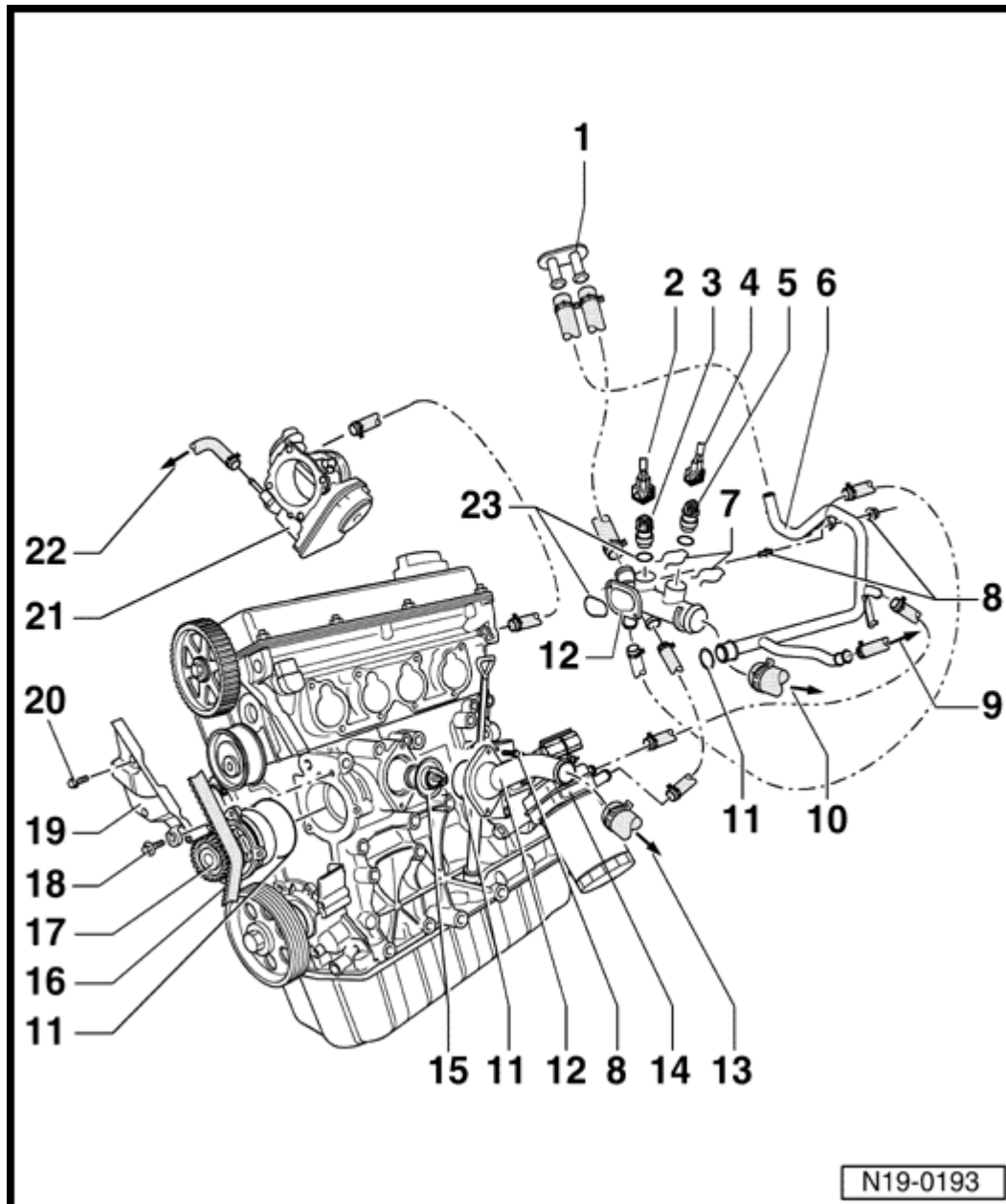
21 - Bracket

- ◆ for radiator, upper
- Note installation position

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-5)



Cooling system components (engine side), removing and installing

1 - Heat exchanger

- ◆ for occupant heating system

2 - 4 - pin harness connector

- ◆ Wiring cavities 1 and 3 for G62
- ◆ Terminals 1 and 3: gold plated

3 - Engine Coolant Temperature sensor G62

- ◆ for Engine Control Module
- ◆ with Engine Coolant Temperature gauge sensor G2

- If necessary, release cooling system pressure before removing

◆ Checking:

⇒ Repair Group 01

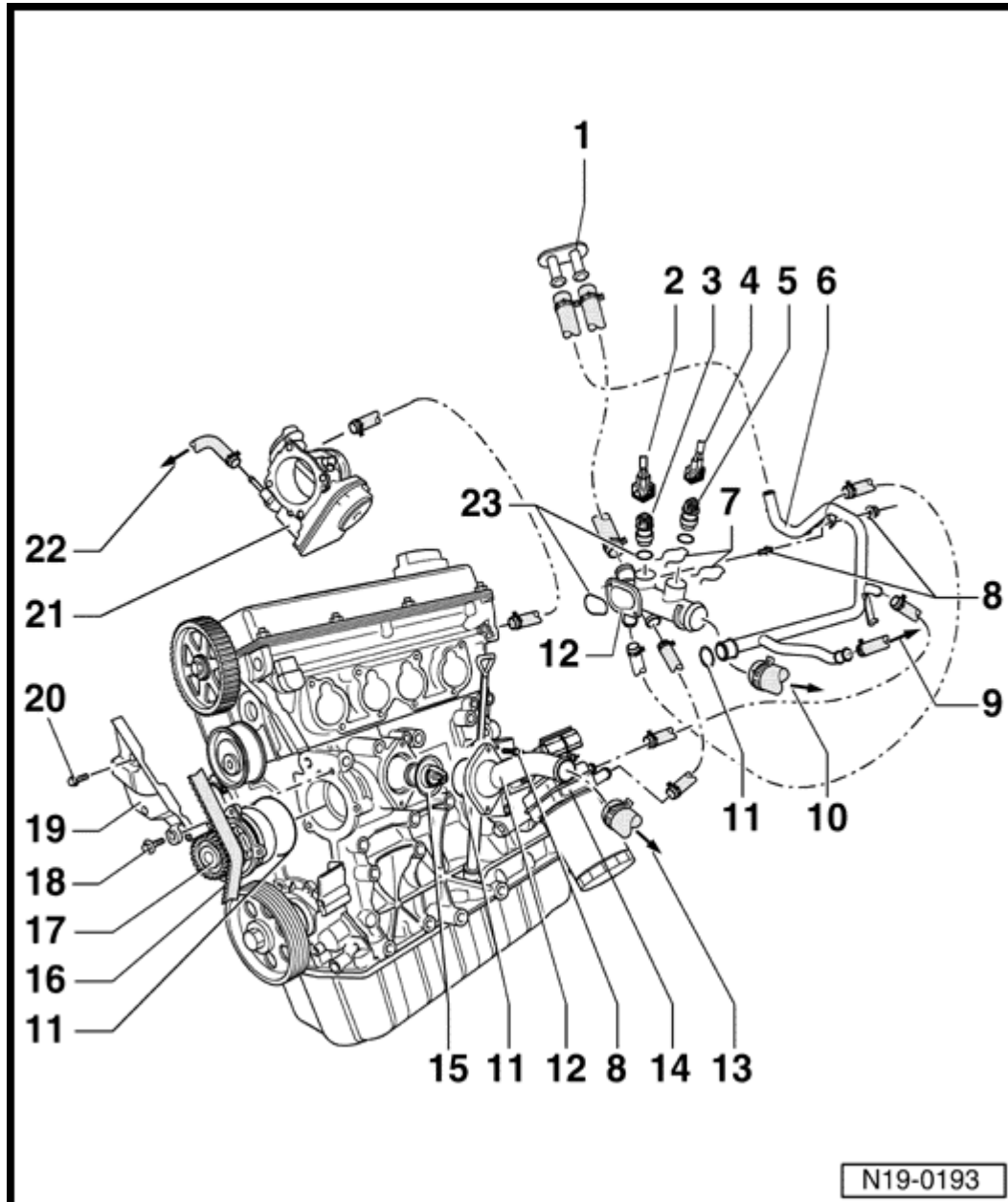
4 - 2 - pin harness connector

◆ for vehicles with A/C only

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-6)



5 - A/C cut - out Thermal switch F163

- ♦ Vehicles with A/C only. otherwise a blind plug

6 - Coolant pipe

- ♦ Coolant hoses, connection diagram ⇒ [Page 19-9](#) .

7 - Retaining clip

- Ensure it is securely seated

8 - 10 Nm (7 ft lb)

9 - to expansion tank

- ♦ Coolant hoses, connection diagram ⇒ [Page 19-9](#) .

10 - to top of radiator

- ♦ Coolant hoses, connection diagram ⇒ [Page 19-9](#) .

11 - O - ring

- Replace

12 - Connection

13 - to bottom of radiator

- ♦ Coolant hoses, connection diagram ⇒ [Page 19-9](#) .

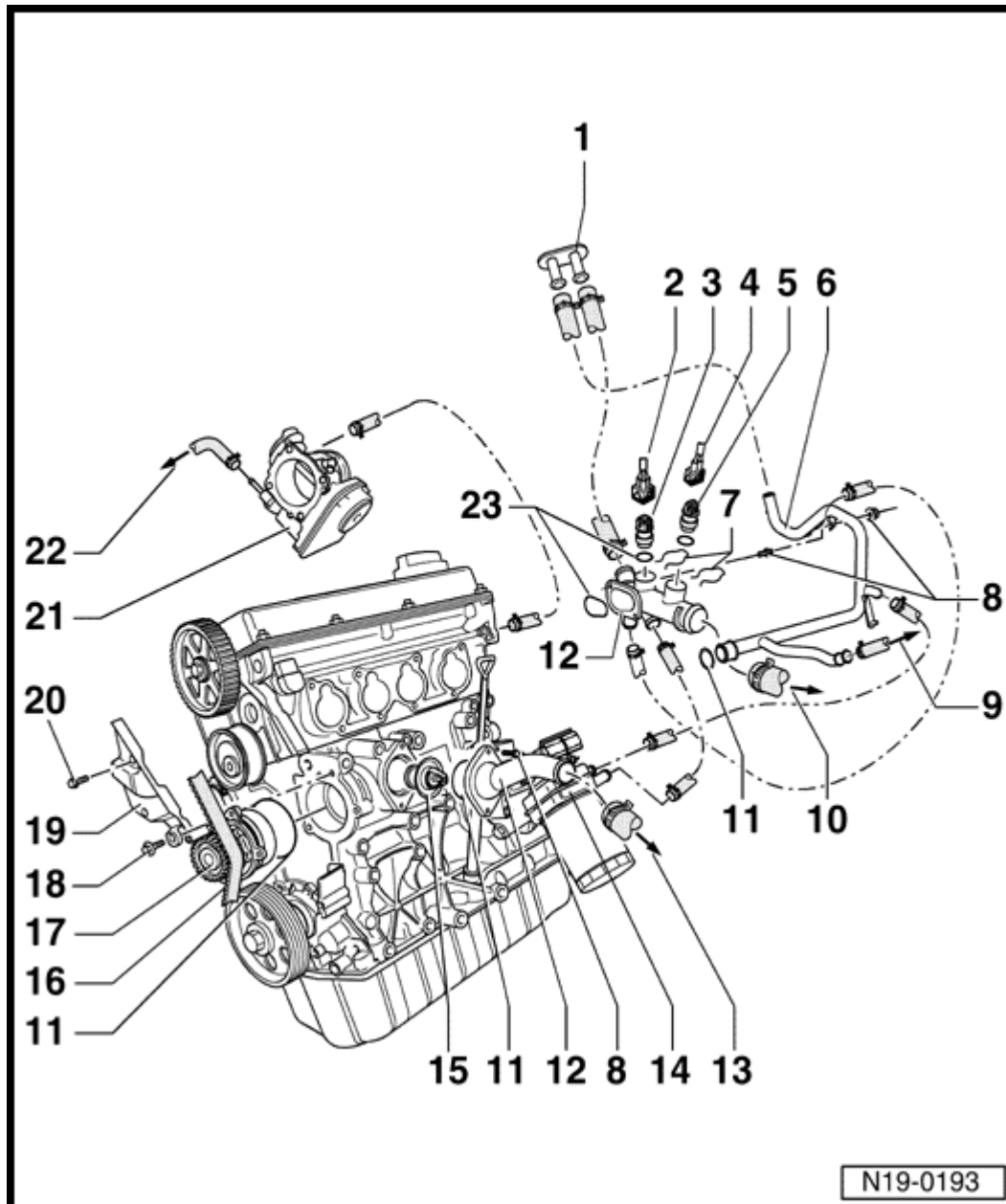
14 - Oil cooler

- ♦ Removing and installing: ⇒ [Page 17-5](#) (item 17)

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-7)



15 - Engine Coolant thermostat

- ◆ Checking: heat - up thermostat in water
- ◆ Opening starts @ approx. 86 ° C
- ◆ Opening lift: 7 mm minimum
- ◆ Removing and installing ⇒ [Page 19-20](#)

16 - Toothed belt

- Mark engine direction of rotation before removing
- Check for wear
- Do not kink
- ◆ Removing, installing and tensioning ⇒ [Page 13-11](#)

17 - Coolant pump

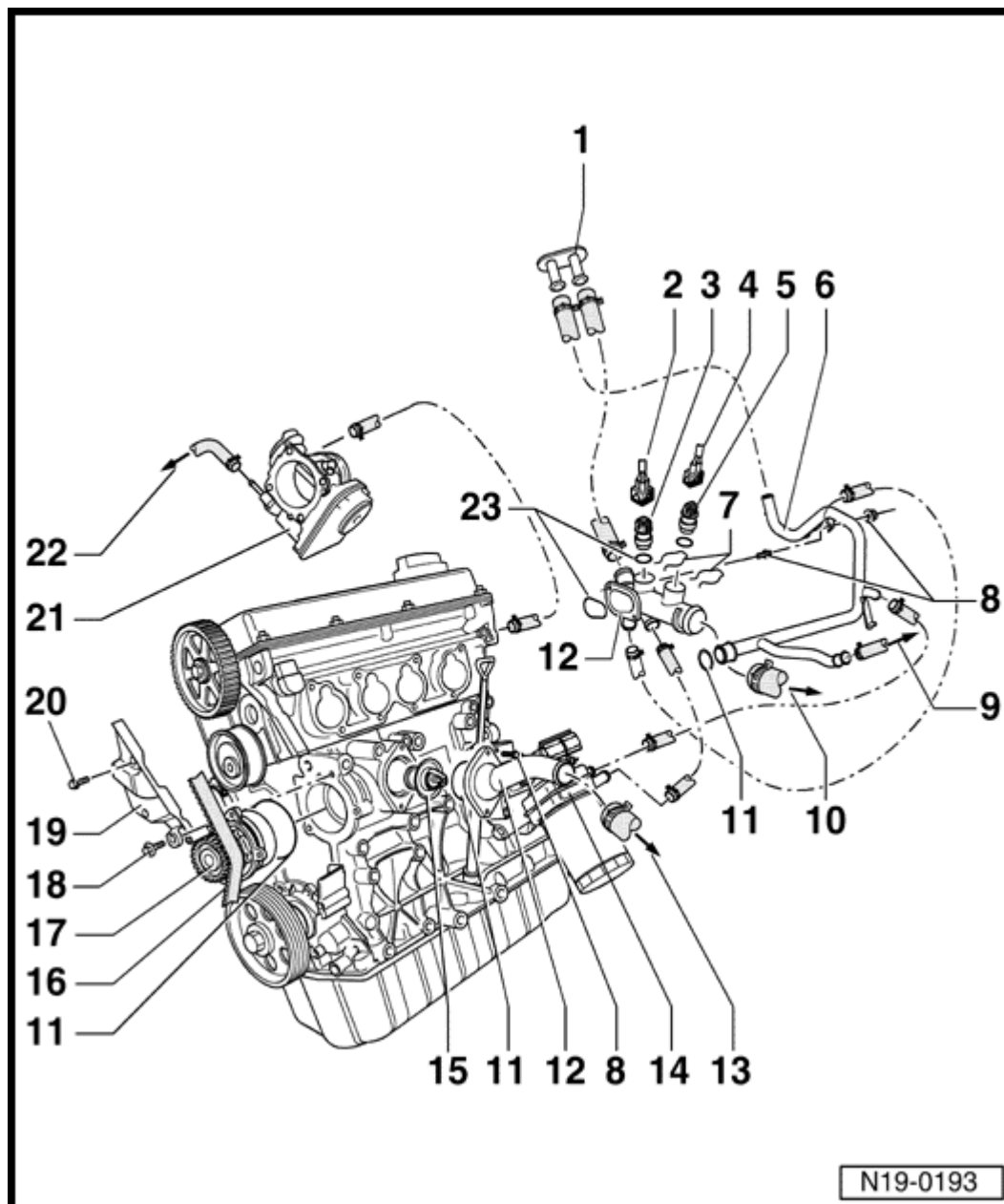
- Check arm for ease of movement
- If damaged and leaking replace complete assembly
 - ♦ Removing and installing ⇒ [Page 19-17](#)

18 - 15 Nm (11 ft lb)

19 - Toothed belt guard, rear

20 - 20 Nm (15 ft lb)

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2.0 Liter 4-cyl General, Engine (Engine Code AEG)
Cooling system components, removing and installing (Page 19-8)



21 - Throttle Control Module

- ♦ Heated by engine coolant

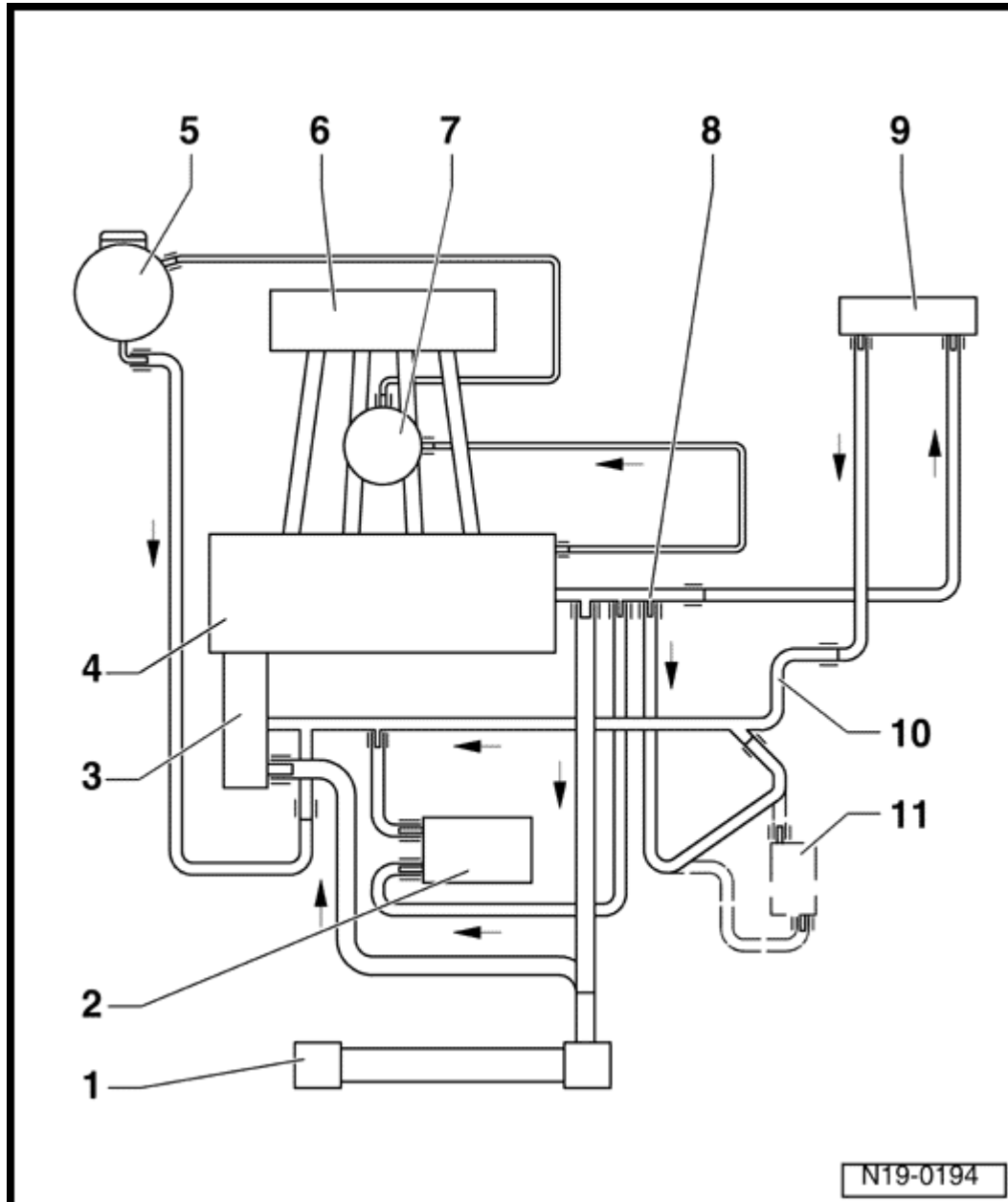
22 - to expansion tank, upper

- ♦ Coolant hoses, connection diagram ⇒ [Page 19-9](#) .

23 - O - ring

- Replace if damaged

Volkswagen New Beetle
2.0 Liter 4-cyl General, Engine (Engine Code AEG)
Cooling system components, removing and installing (Page 19-9)



Coolant hose connection diagram

- 1 - Radiator**
- 2 - Oil cooler**
- 3 - Coolant pump/coolant thermostat**
- 4 - Cylinder head/engine block**
- 5 - Expansion tank**
- 6 - Intake manifold**
- 7 - Throttle Control Module**
- 8 - Connection**
- 9 - Heat exchanger**

10 - Coolant pipe

11 - Transmission cooler

- ◆ vehicles with automatic transmission

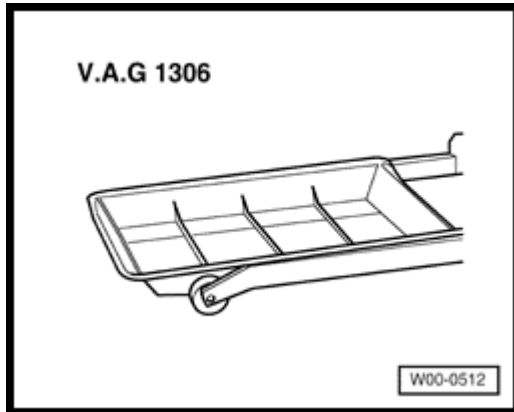
Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-10)

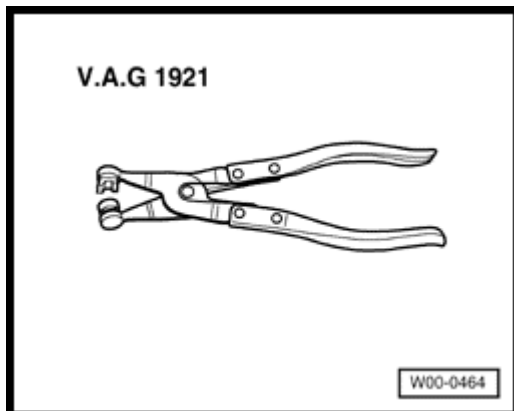
Cooling system, draining and filling

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



▲

- ◆ VAG 1306 Drip tray



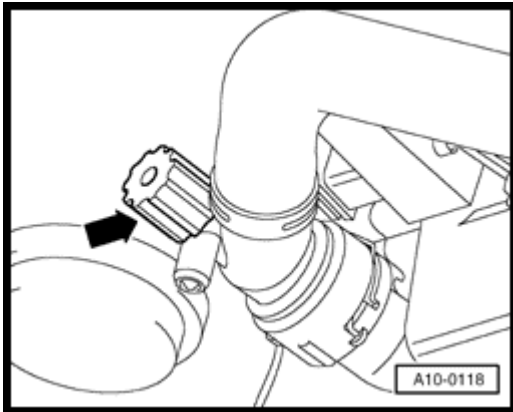
▲

- ◆ VAG 1921 Spring clip pliers
- ◆ Anti - freeze tester

Volkswagen New Beetle
2.0 Liter 4-cyl General, Engine (Engine Code AEG)
Cooling system components, removing and installing (Page 19-11)

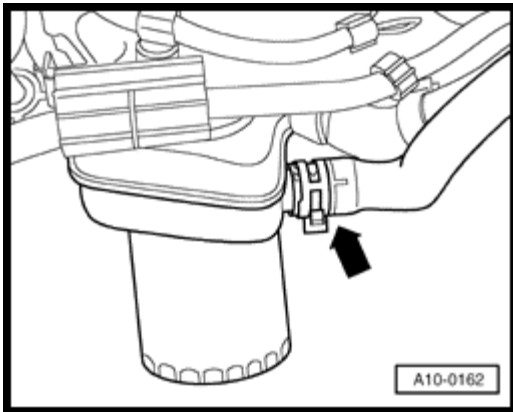
Cooling system, draining

- Open cap on coolant expansion tank.
 - Remove center insulation tray
- ⇒ General body repairs; Repair group 50



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- Unscrew radiator drain plug to drain engine coolant - arrow -



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- To drain coolant from engine also remove coolant hose from oil cooler - arrow - .

Note:

Observe proper disposal regulations!

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-12)

Cooling system, filling

Notes:

- ◆ *Only use G 12 coolant additive. Identification: red color*
- ◆ *On no account must G 12 be mixed with any other coolant additives!*
- ◆ *If the fluid in expansion tank is brown; G 12 has been mixed with another coolant. Drain the system and replace with fresh engine coolant.*
- ◆ *G 12 prevents frost and corrosion damage, scaling and also raises the boiling point of the engine coolant. For this reason, the system must be filled year round with frost and corrosion protection additives.*
- ◆ *In some countries, particularly those with tropical climates, the higher boiling point of the coolant will improve engine reliability when it is heavily loaded.*
- ◆ *Protects against freezing to approx. - 25 ° C (approx. - 35 ° C in arctic climates).*
- ◆ *Do NOT reduce the coolant concentration by adding water even in warmer seasons in warm countries. The anti - freeze ratio must be 40 % minimum.*
- ◆ *If for climatic reasons, greater frost protection is required, the G 12 concentration can be increased but only up to 60 % maximum (freeze protection to approx. - 40 ° C), otherwise, freeze protection as well as cooling effectiveness will be reduced.*
- ◆ *If the radiator, heat exchanger, cylinder head or cylinder head gasket is replaced, you must replace the entire engine coolant with new coolant.*

Volkswagen New Beetle

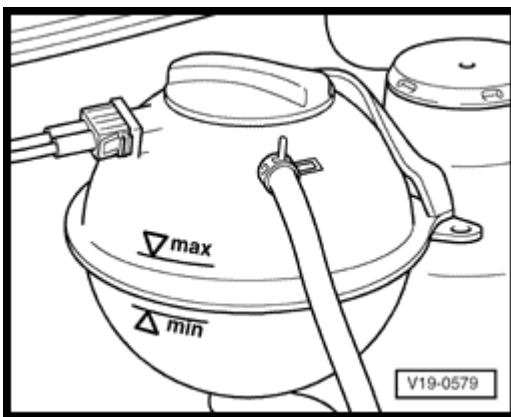
2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-13)

Recommended mixture ratios:

Freezing protection to:	Antifreeze amount (%):	G 12 ¹⁾	Water ¹⁾
-25 °C	40 %	2.0 ltr.	3.0 ltr.
-35 °C	50 %	2.5 ltr.	2.5 ltr.

- 1) Coolant quantity can vary depending upon vehicle equipment.
- Screw in engine coolant drain plug.

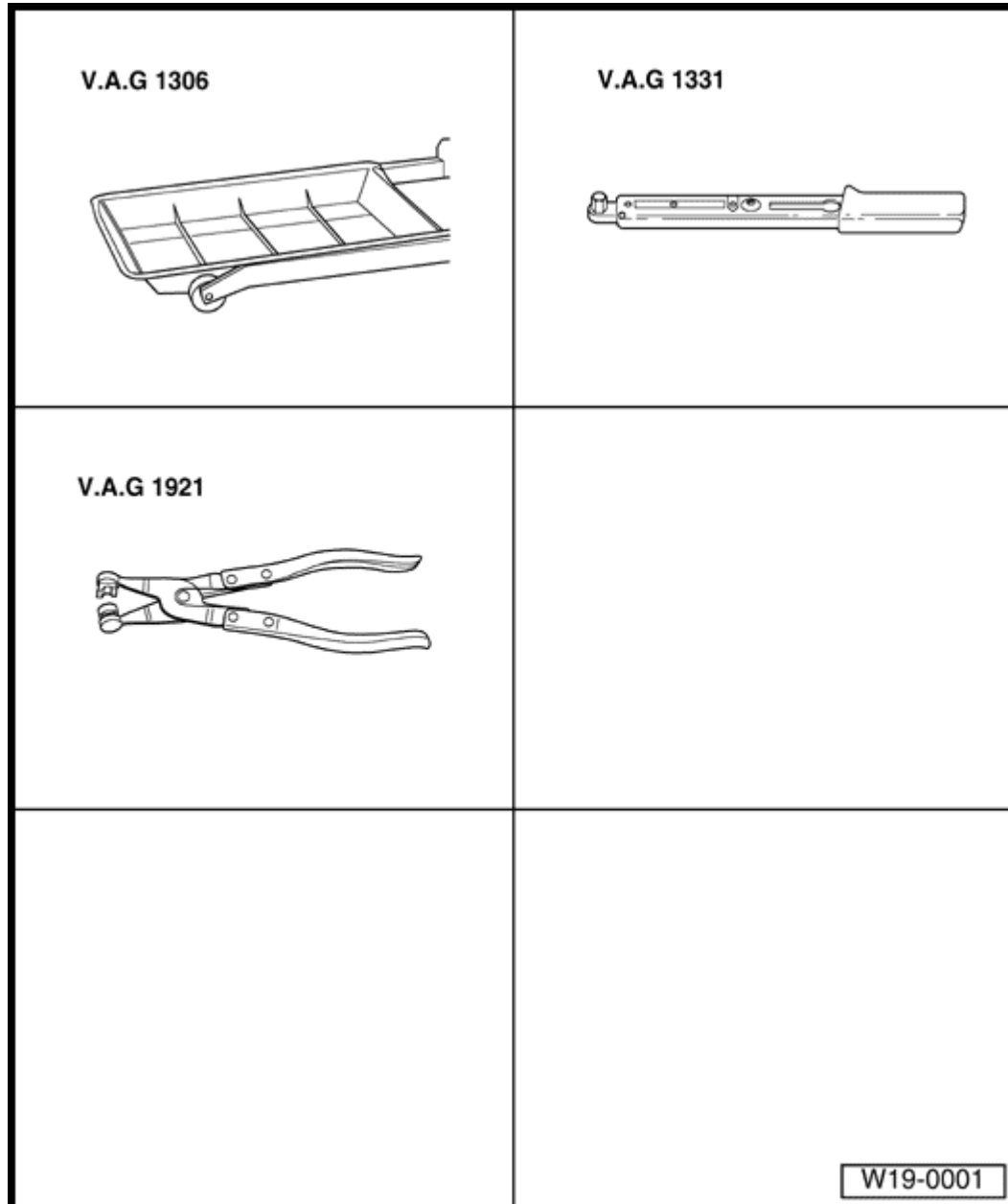


- Fill expansion tank with coolant up to Max. mark.
- Install expansion tank cap.
- Run engine until radiator fan comes on at least once.
- Check coolant level and top - up if necessary.
 - When engine is at normal operating temperature, coolant level must be on Max. mark, when engine is cold; between Min. and Max. marks.

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-14)



Radiator, removing and installing

Special tools, workshop equipment, test and measuring appliances and auxiliary items required

- ◆ VAG 1306 Drip tray
- ◆ VAG 1331 Torque wrench 5 to 50 Nm (3.7 to 37 ft lb)
- ◆ VAG 1921 Spring clip pliers
- ◆ Anti - freeze tester

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-15)

Radiator, removing

- Drain coolant ⇒ [Page 19-10](#) .
- Remove front section
⇒ General body repairs; Repair group 50
- Disconnect coolant hoses from radiator.
- Disconnect thermo - switch harness connectors.
- Remove ribbed belt tensioning element.
⇒ General body repairs; Repair group 50
- Remove radiator mounting bolts and take out radiator.

Vehicles with A/C:

- *Observe additional information and removal work* ⇒ [Page 19-16](#) .

Radiator, installing

Notes:

Installation is carried out in the reverse order of the removal procedure. When installing, note the following:

- Fill with coolant ⇒ [Page 19-10](#)

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2.0 Liter 4-cyl General, Engine (Engine Code AEG)
Cooling system components, removing and installing (Page 19-16)

Vehicles with A/C, additional removal information

WARNING!

Do NOT open the A/C refrigerant circuit!

Note:

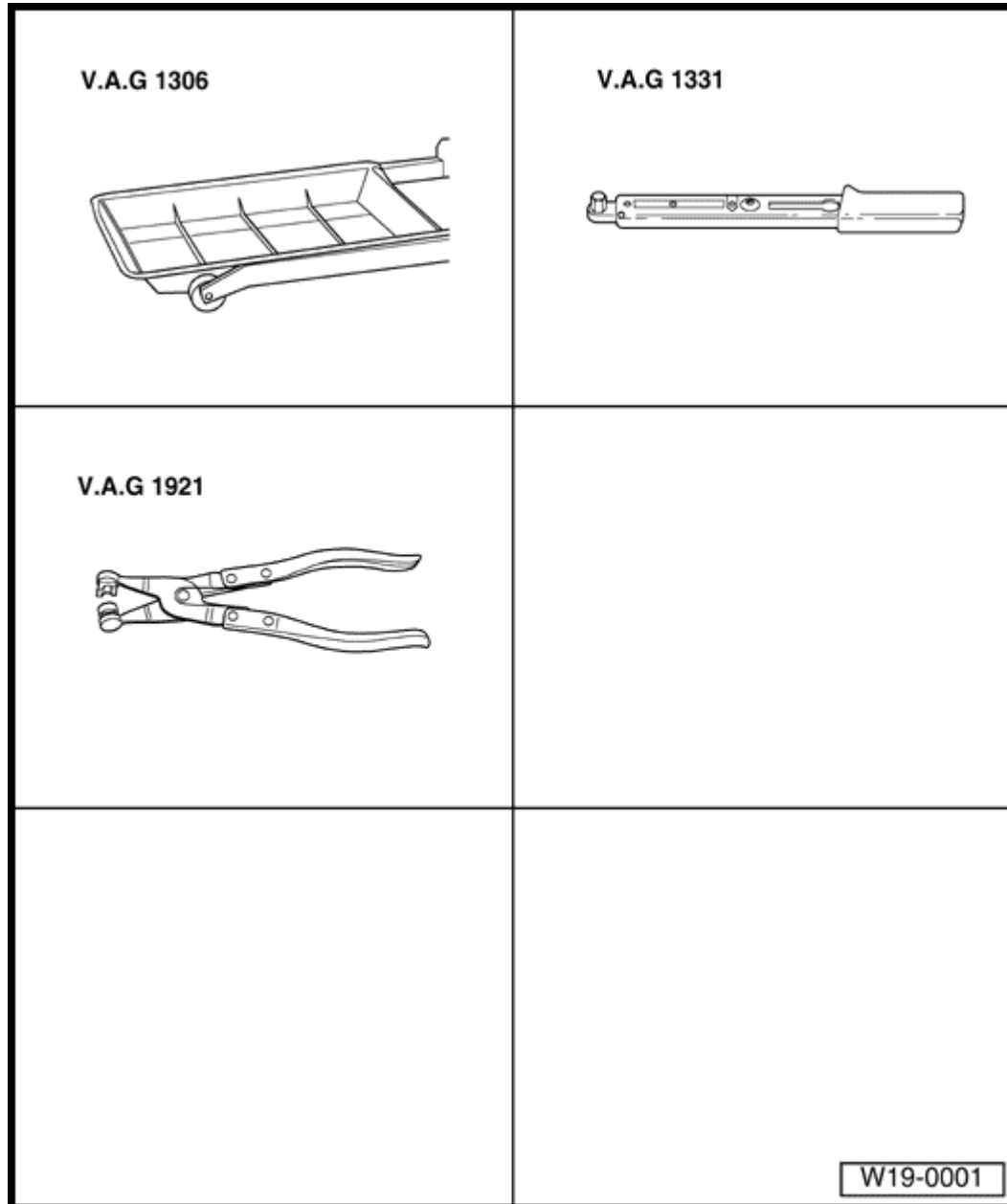
To prevent damage to the A/C condenser and refrigerant lines/hoses, ensure that the lines and hoses are not stretched, kinked or bent.

- Remove retaining clamp(s) from refrigerant lines.
- Before removing upper radiator support, fasten to the body.
- To remove radiator, fasten A/C condenser to the body.

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-17)



Coolant pump, removing and installing

Special tools, workshop equipment, test and measuring appliances and auxiliary items required

- ◆ VAG 1306 Drip tray
- ◆ VAG 1331 Torque wrench 5 to 50 Nm (3.7 to 37 ft lb)
- ◆ VAG 1921 Spring clip pliers
- ◆ Anti - freeze tester

Volkswagen New Beetle

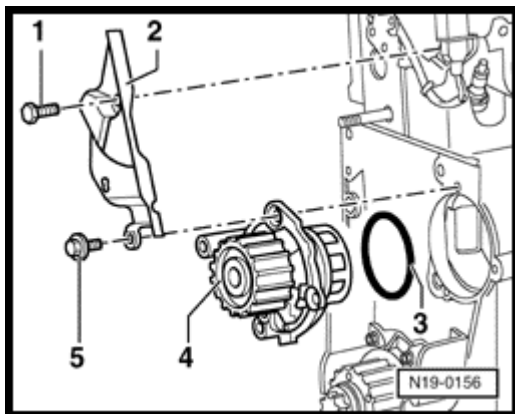
2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-18)

Removing

Notes:

- ◆ Always replace seals and gaskets.
 - ◆ It is not necessary to remove the lower part of the toothed belt guard.
 - ◆ The toothed belt should be left in position on the crankshaft sprocket.
 - ◆ Cover toothed belt with a cloth to protect it from coolant before removing coolant pump.
- Drain coolant ⇒ [Page 19-10](#)
 - Remove ribbed belt ⇒ [Page 13-8](#) .
 - Remove tensioning element for ribbed belt.
 - Remove upper belt guard and center ⇒ [Page 13-11](#)
 - Take toothed belt off coolant pump toothed belt sprocket ⇒ [Page 13-11](#) .



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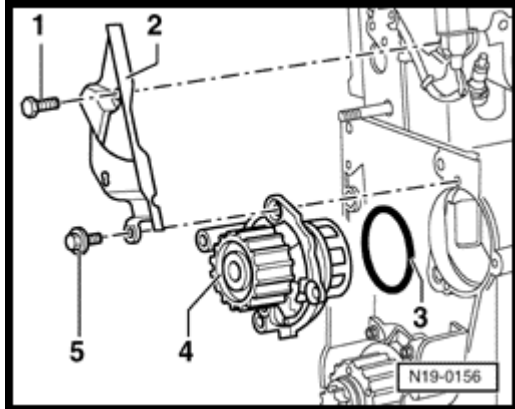
- Remove mounting bolt - 1 - from toothed belt guard - 2 - .
- Unscrew coolant pump mounting bolts - 5 - and remove coolant pump - 4 - .

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-19)

Installing



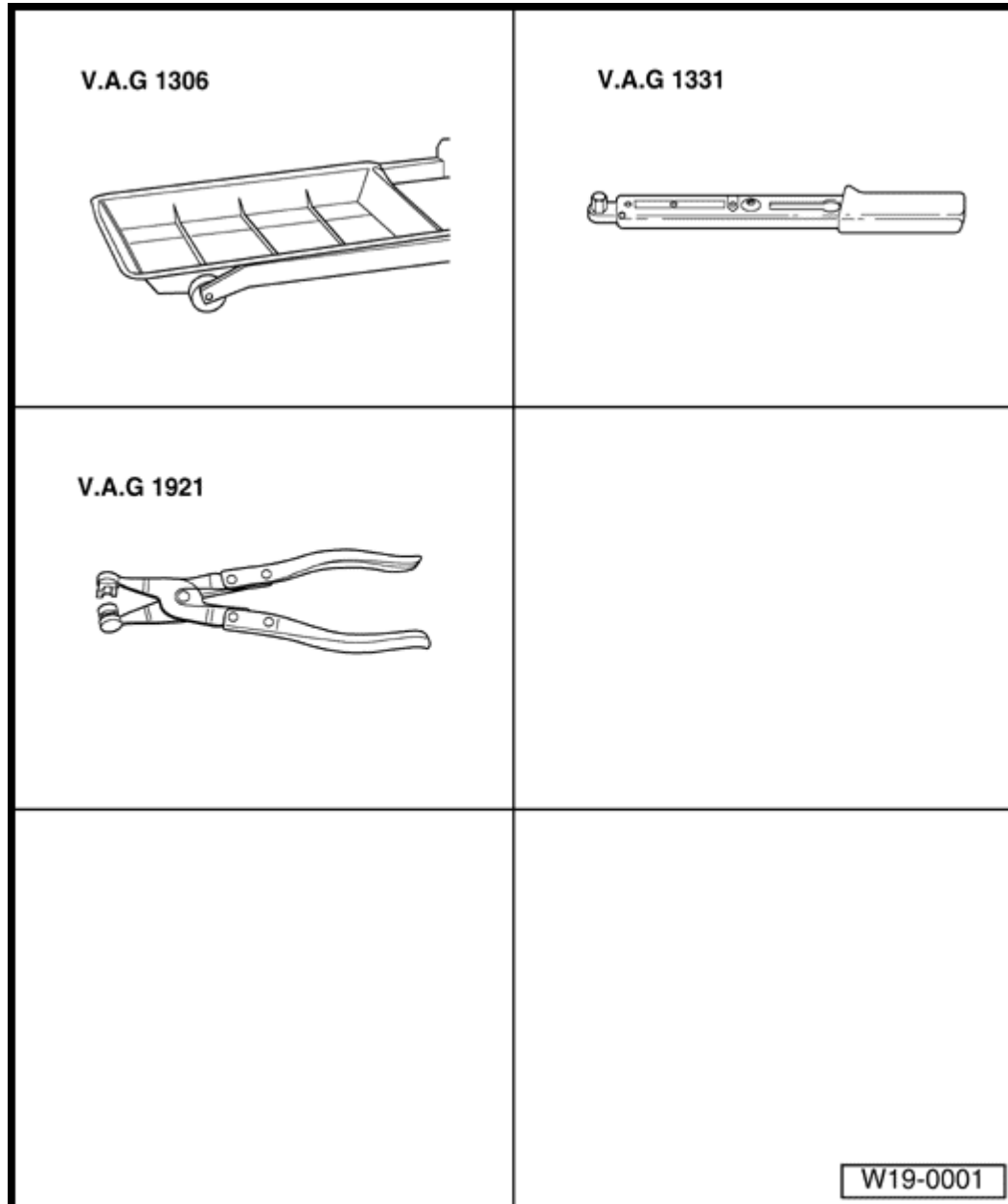
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- Moisten new O - ring - 3 - with coolant.
- Install coolant pump - 4 - .
 - Installation position: plug in housing faces downwards.
- Insert coolant pump - 4 - into engine block and tighten mounting bolts - 5 - .
 - Tightening torque: 15 Nm (11 ft lb)
- Tighten mounting bolt - 1 - for toothed belt guard (rear) - 2 - to cylinder head.
 - Tightening torque: 20 Nm (15 ft lb)
- Remove upper and center belt guards ⇒ [Page 13-11](#)
- Install toothed belt and adjust timing ⇒ [Page 13-11](#) .
- Install ribbed belt tensioner.
 - Tightening torque: 25 Nm (18 ft lb)
- Install ribbed belt ⇒ [Page 13-8](#) .
- Fill with engine coolant ⇒ [Page 19-10](#)

Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-20)



Thermostat, removing and installing

Special tools, workshop equipment, test and measuring appliances and auxiliary items required

- ◆ VAG 1921 Spring clip pliers
- ◆ VAG 1331 Torque wrench 5 to 50 Nm (3.7 to 37 ft lb)
- ◆ VAG 1306 Drip tray

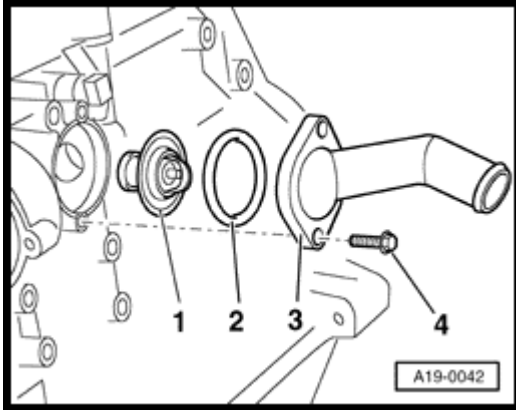
Volkswagen New Beetle

2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Cooling system components, removing and installing (Page 19-21)

Thermostat, removing

- Drain coolant ⇒ [Page 19-10](#)



A

- Disconnect coolant hose from connecting flange - 3 - .
- Unfasten mounting bolts - 4 - for connecting flange - 3 - and remove connecting flange - 3 - with thermostat - 1 - .

Thermostat, installing

Installation is carried out in the reverse order of removal, when installing, note the following:

- Moisten new O - ring - 2 - with engine coolant.
- Install connecting flange - 3 - with thermostat - 1 - into engine block.

Note:

The brace on the thermostat must be almost vertical.

- Tighten mounting bolt - 4 - .
 - Tightening torque: 15 Nm (11 ft lb)
- Fill with engine coolant ⇒ [Page 19-10](#)