

Volkswagen New Beetle

1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical

19 Engine-Cooling system (Page GR-19)

- [Cooling system components, removing and installing](#)
- [Continued coolant circulation pump \(V51\), checking](#)
- [Coolant hose connection diagram](#)
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- [Cooling system components, engine side](#)
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1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical

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

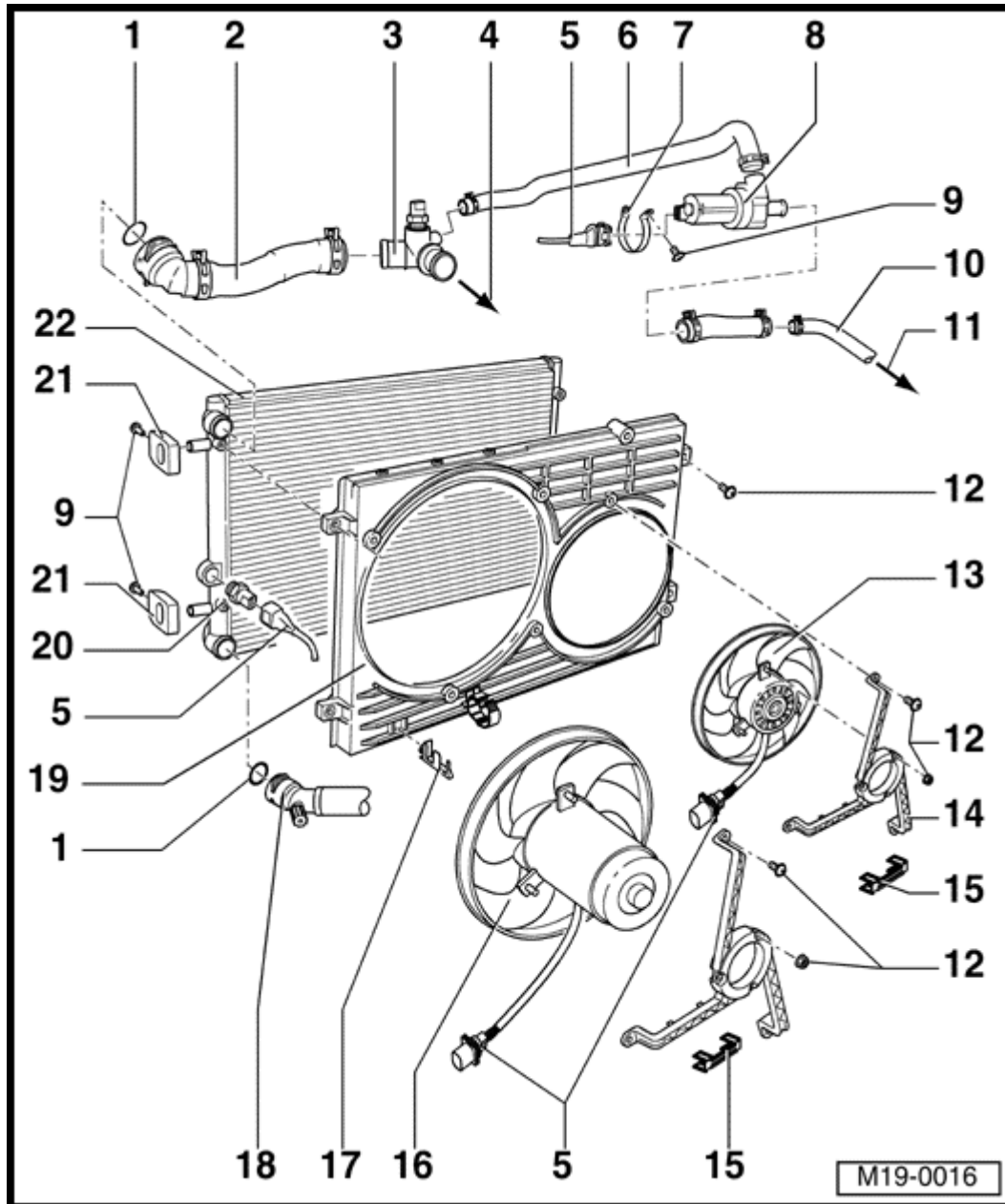
Notes:

- ◆ *When the engine is warm the cooling system is under pressure. If necessary, release pressure before commencing repair work.*
- ◆ *Hoses are secured with spring - type clips. In cases of repair only use spring - type clips.*
- ◆ *V.A.G 1921 pliers are recommended when installing spring - type clips.*
- ◆ *When installing coolant hoses route stress - free, so that they do not come into contact with other components (observe markings on coolant connection and hose).*

Perform cooling system leakage test with cooling system tester V.A.G 1274 and adapters V.A.G 1274/8 and V.A.G 1274/9.

- ◆ Parts of cooling system body side ⇒ [page 19-2.](#)
- ◆ Parts of cooling system engine side ⇒ [page 19-6 .](#)
- ◆ Coolant hose connection diagram ⇒ [page 19-11.](#)
- ◆ Draining and filling with coolant ⇒ [page 19-13 .](#)
- ◆ Coolant mixture ratios ⇒ [Page 19-13 .](#)

Cooling system components, body side



1 - O - ring

- ◆ Replace if damaged

2 - Upper coolant hose

- ◆ Secured to radiator with retaining clip
- ◆ Check securely seated
- ◆ Coolant hose connection diagram ⇒ [page 19-11](#)

3 - Junction piece

4 - Engine coolant temperature (ECT) sensor (G62)

5 - Connector

6 - Upper coolant hose

- ◆ Secured to radiator with retaining clip

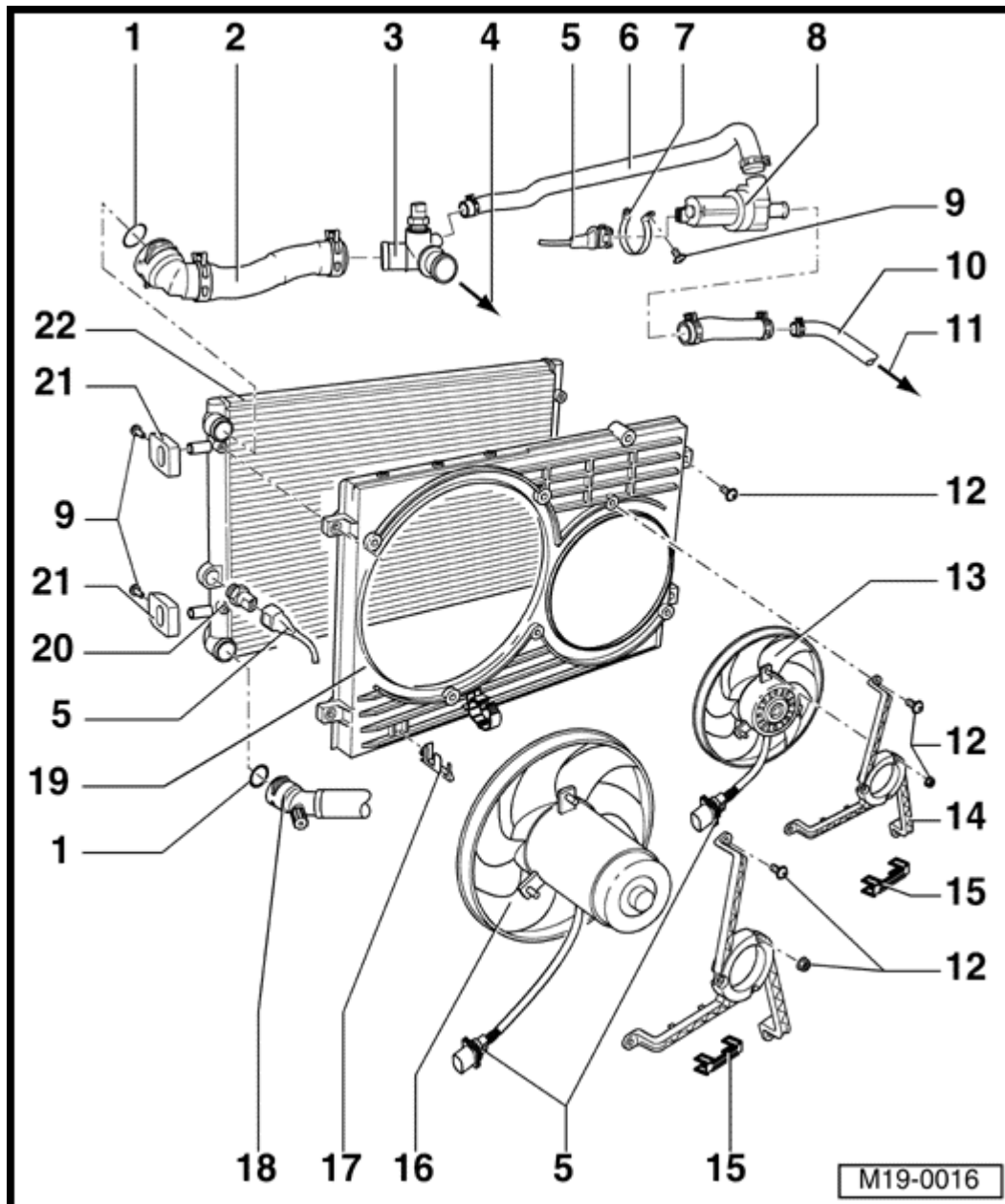
7 - Bracket

- ◆ Secured at intake air boot

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



8 - Continued coolant circulation pump (V51)

- ◆ Continues to run up to 10 minutes after ignition is switched off
- ◆ Checking ⇒ [Page 19-27](#)

9 - 15 Nm

10 - Coolant pipe

- ◆ Secured with retaining clamps at right long member

11 - To turbocharger

- ◆ Coolant hose connection diagram ⇒ [Page 19-11](#)

12 - 10 Nm

13 - Additional fan

- ◆ Only vehicles with optional equipment

14 - Fan ring

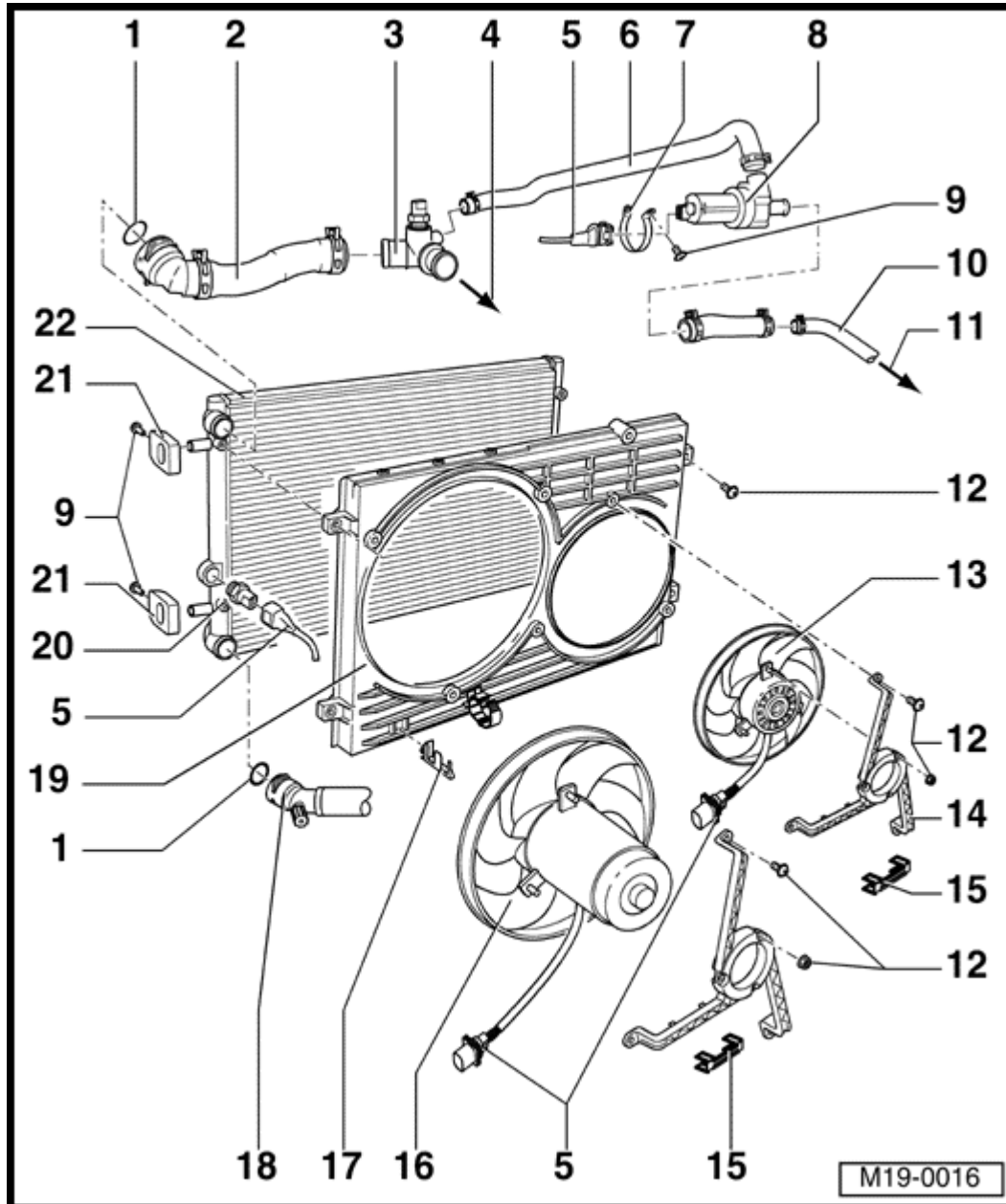
15 - Retaining clip

- ◆ Check seated securely

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



16 - Radiator fan

17 - Bracket

- ◆ For radiator fan connector

18 - Lower coolant hose

- ◆ Secured to radiator with retaining clip
- ◆ Coolant hose connection diagram ⇒ [Page 19-11](#)

19 - Air ducting

20 - Thermo switch (F18), 35 Nm

- ◆ For electric fan

Switching temperatures, stage 1:

- ◆ on: 92-97° C

- ◆ off: 84-91° C

Switching temperatures, stage 2:

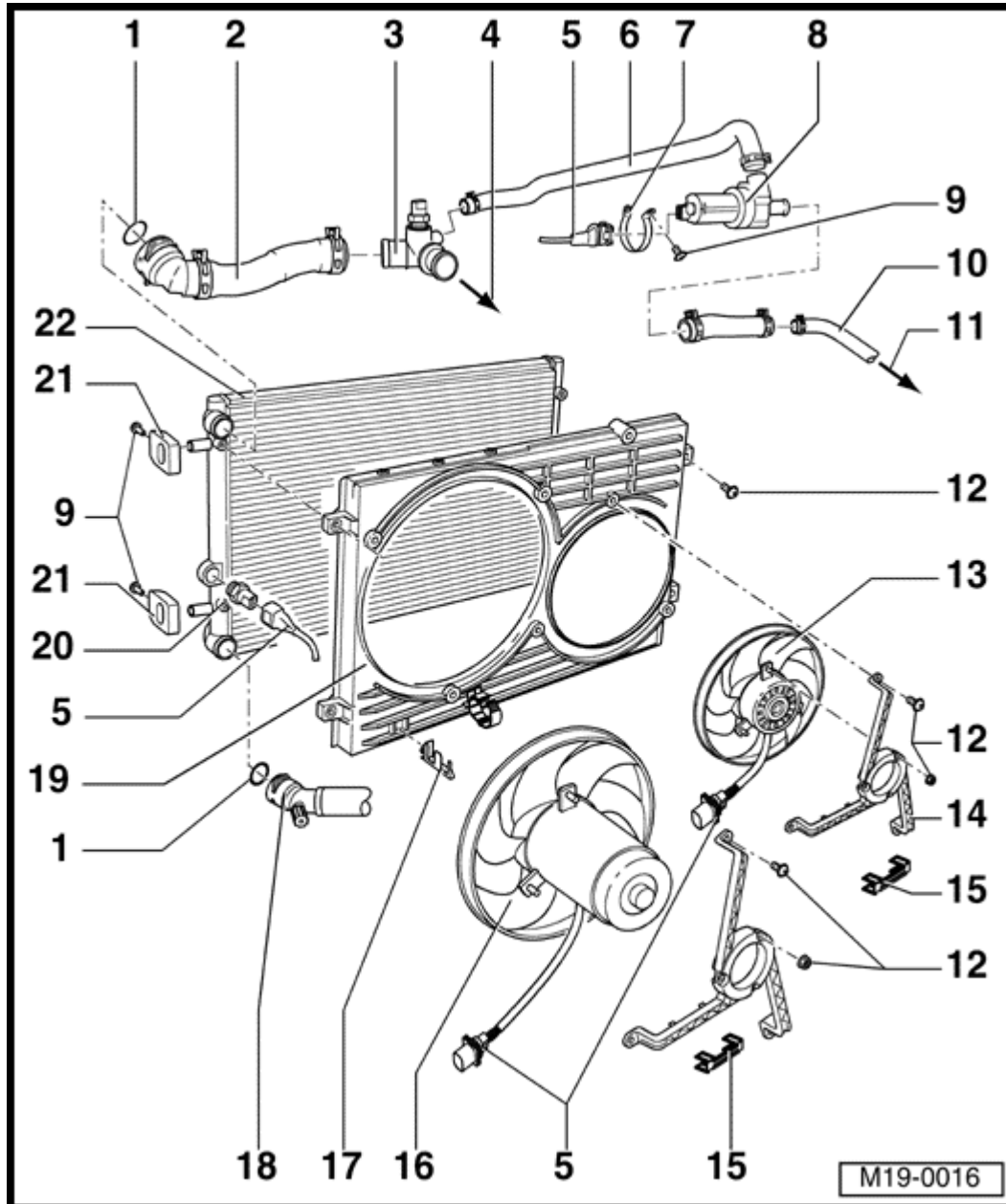
- ◆ on: 99-105° C

- ◆ off: 91-98° C

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1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical

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



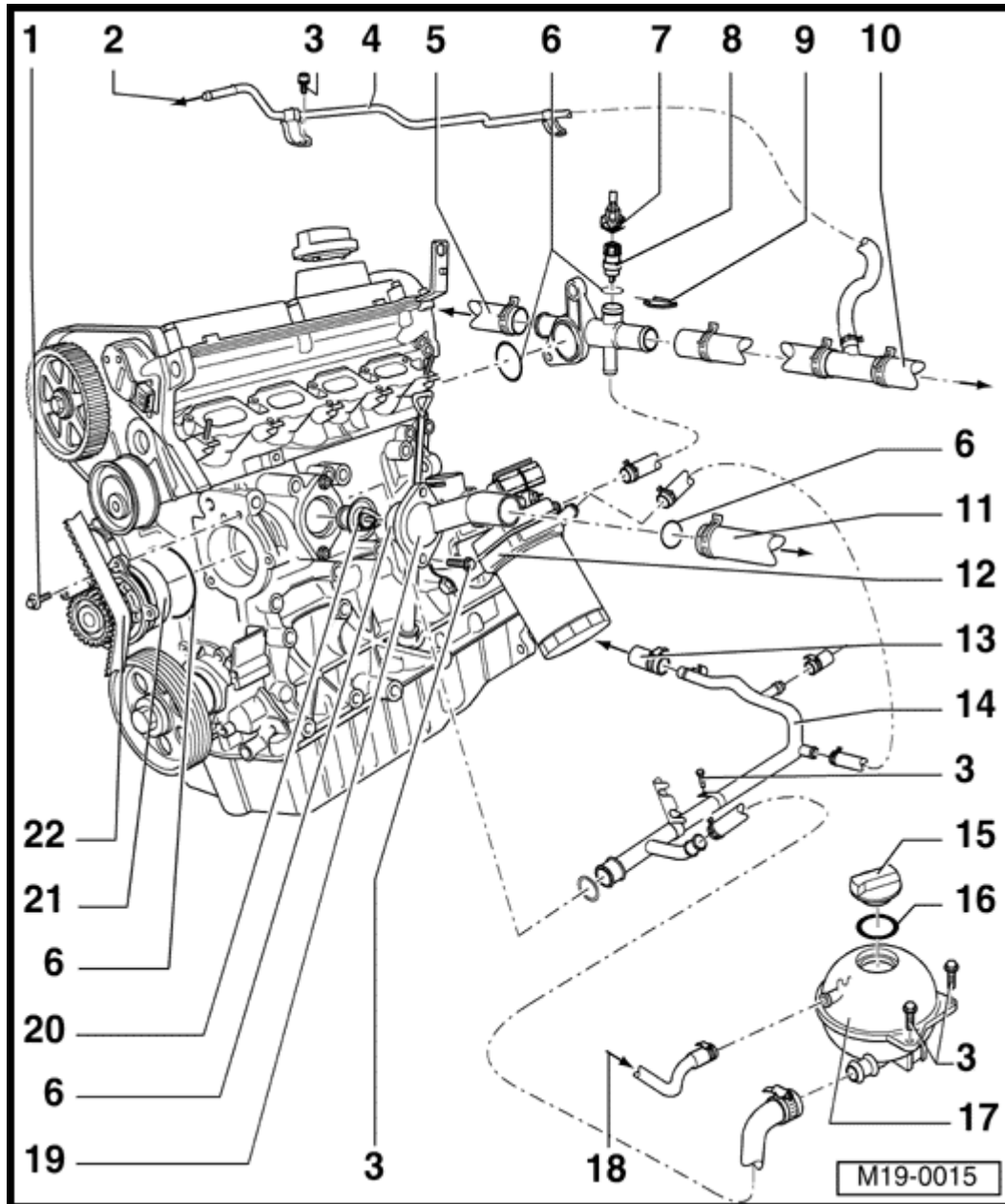
21 - Bracket

- ◆ For radiator
- ◆ Note fitting position

22 - Cooler

- ◆ Removing and installing ⇒ [page 19-18](#)
- ◆ After replacing replace all coolant

Cooling system components, engine side



1 - 15 Nm

2 - To coolant reservoir

- ♦ Coolant hose connection diagram ⇒ [page 19-11](#)

3 - 10 Nm

4 - Upper coolant pipe

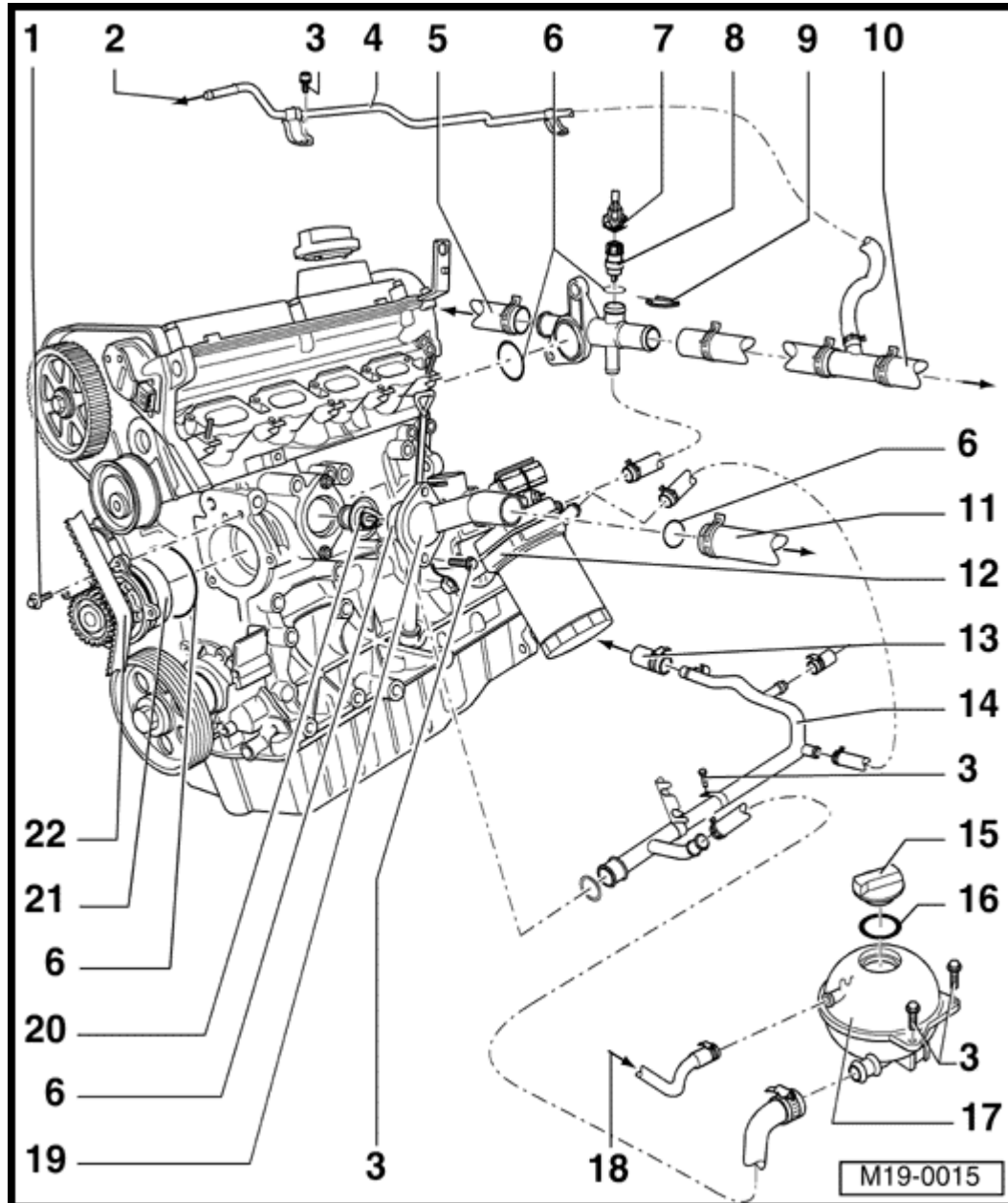
- ♦ Secured to intake manifold
- ♦ Coolant hose connection diagram ⇒ [page 19-11](#)

5 - To heat exchanger

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



6 - O ring

- ◆ Replace if damaged

7 - Connector

- ◆ 4 pin
- ◆ Wiring chamber 1 and wiring chamber 3 for G62
- ◆ Contacts 1 and 3 gold plated

8 - Coolant temperature sender (G62)

- ◆ With coolant temperature gauge sender (G2)
- ◆ For engine control unit

- ◆ If necessary, release pressure in cooling system before removing
- ◆ Checking and erasing DTC memory:

⇒ [Repair Manual, 1.8 Liter 4 - Cyl. 5V Turbo OBDII Fuel Injection & Ignition, Repair Group 01](#)

9 - Retaining clip

- ◆ Check seated securely

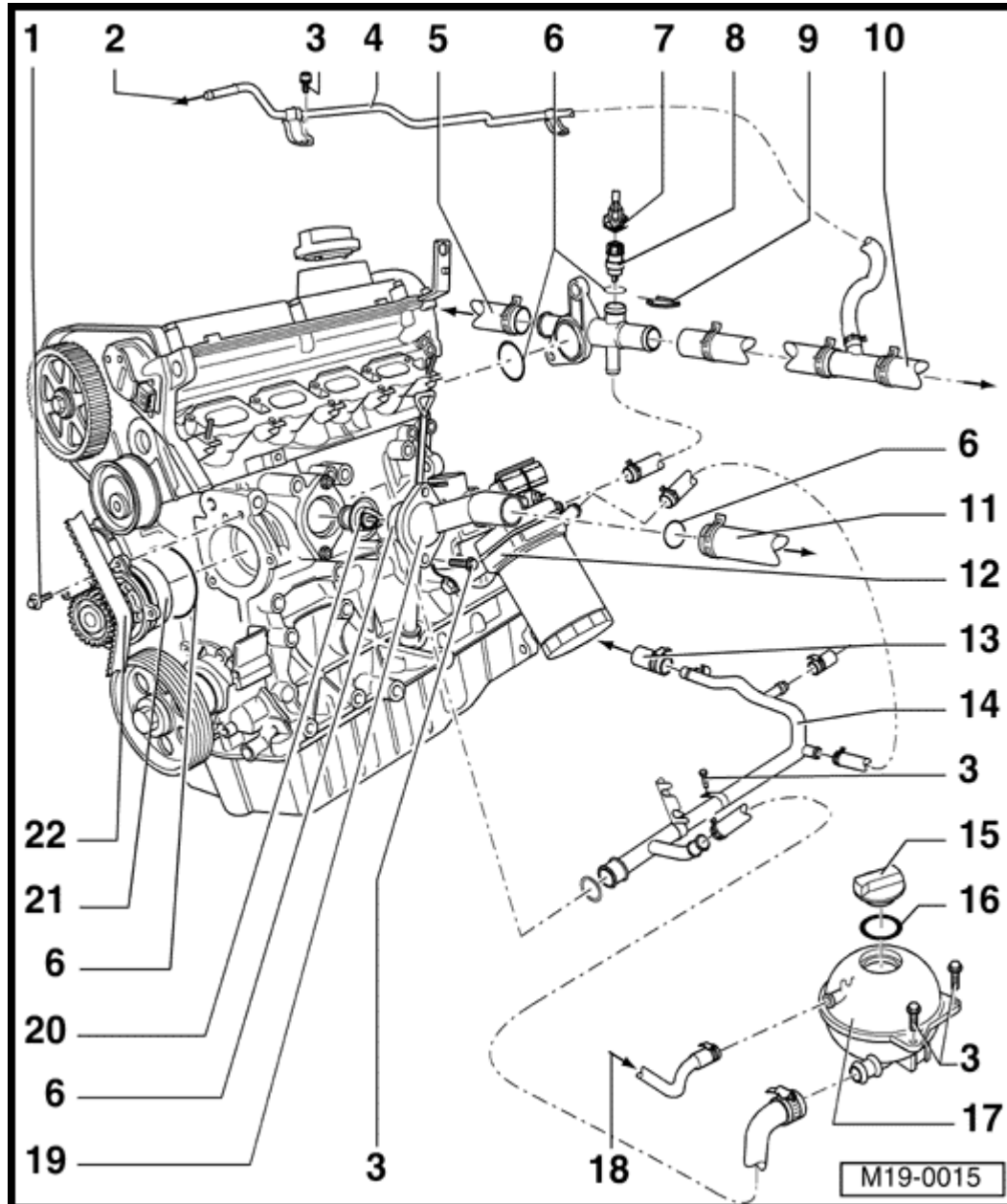
10 - To top of radiator

- ◆ Coolant hose connection diagram ⇒ [page 19-11](#)

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Cooling system components, removing and installing (Page 19-8)



11 - To bottom of radiator

- ◆ From bottom of radiator
- ◆ Coolant hose connection diagram ⇒ [page 19-11](#)

- ◆ Secured to radiator with retaining clip
- ◆ Check securely seated

12 - Oil cooler

- ◆ Removing and installing ⇒ [page 17-8](#)

13 - From heat exchanger

- ◆ Coolant hose connection diagram ⇒ [page 19-11](#)

14 - Coolant pipe

- ◆ Secured to oil filter bracket
- ◆ Coolant hose connection diagram ⇒ [page 19-11](#)

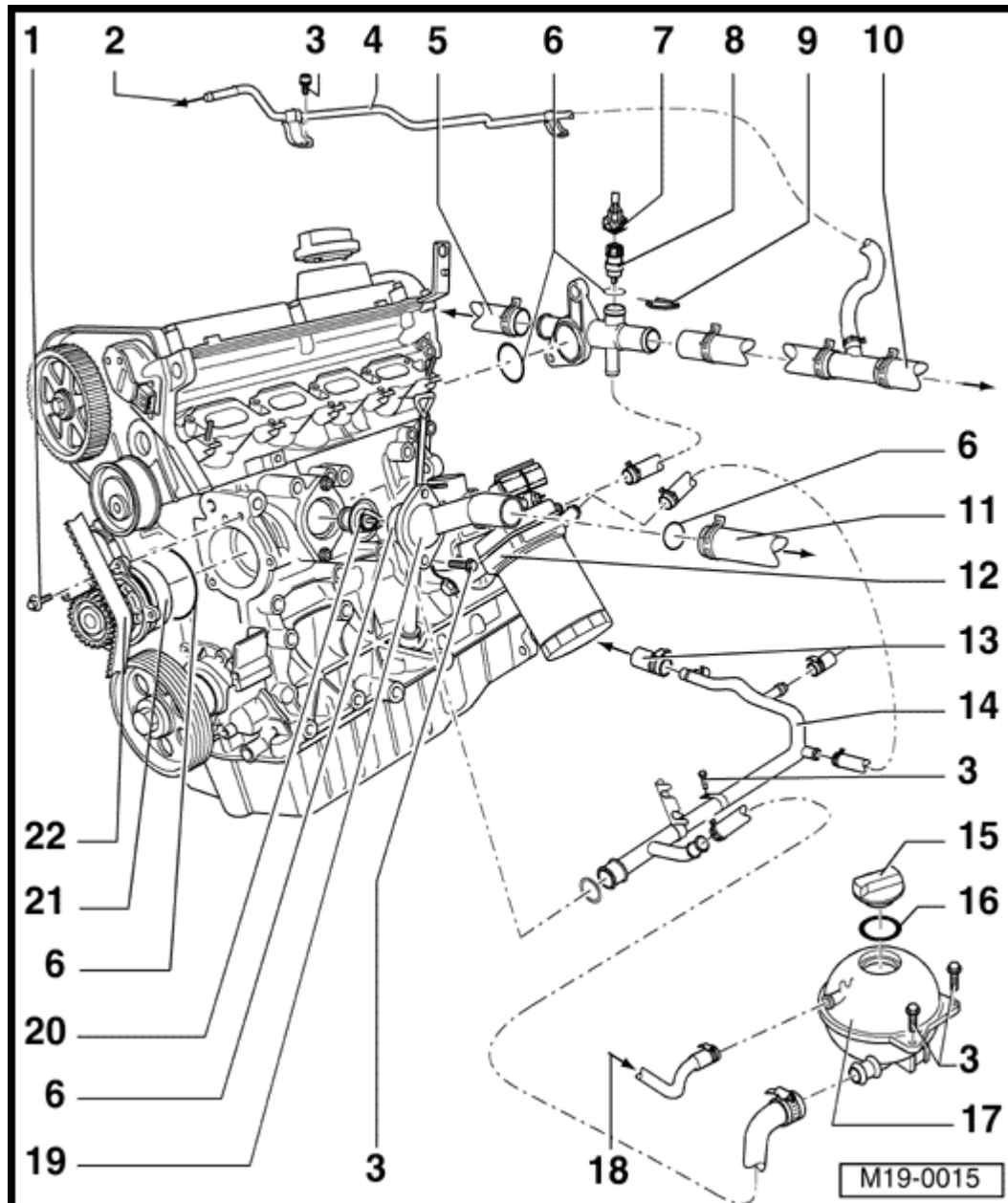
15 - Cap

- ◆ Check with cooling system tester V.A.G 1274 and adapter V.A.G 1274/9
- ◆ Test pressure 1.4-1.6 bar

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1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical

Cooling system components, removing and installing (Page 19-9)



16 - O ring

- ◆ Replace if damaged

17 - Expansion tank

- ◆ Carry out leak test of cooling system with cooling system tester V.A.G 1274 and adapter V.A.G1274/8

18 - To heat exchanger

- ◆ Coolant hose connection diagram ⇒ [page 19-11](#)

19 - Connection

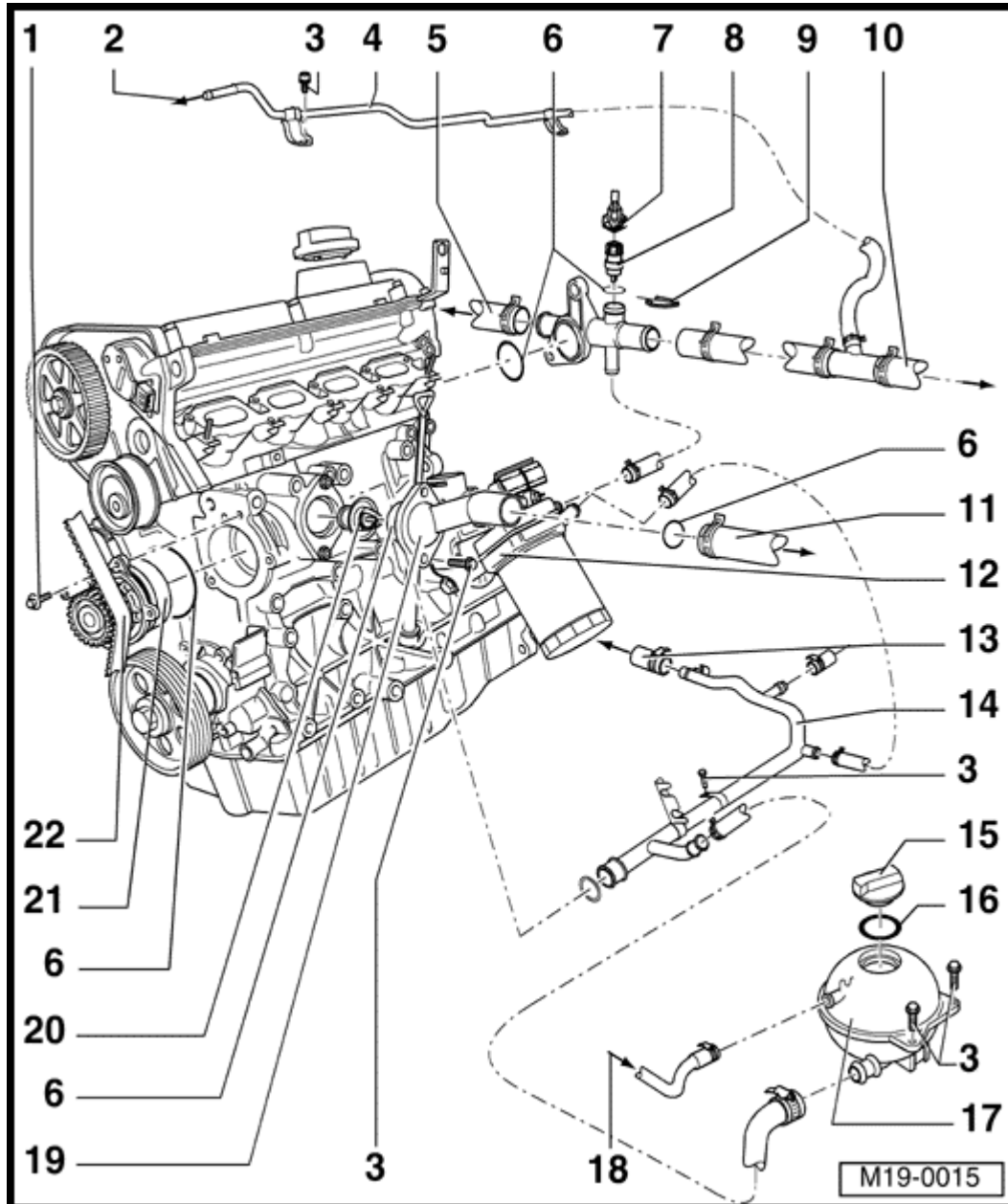
20 - Coolant thermostat

- ◆ Checking: heat - up thermostat in water
- ◆ Opening commences approx. 87° C
- ◆ Ends approx. 102° C
- ◆ Opening lift min. 7 mm

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



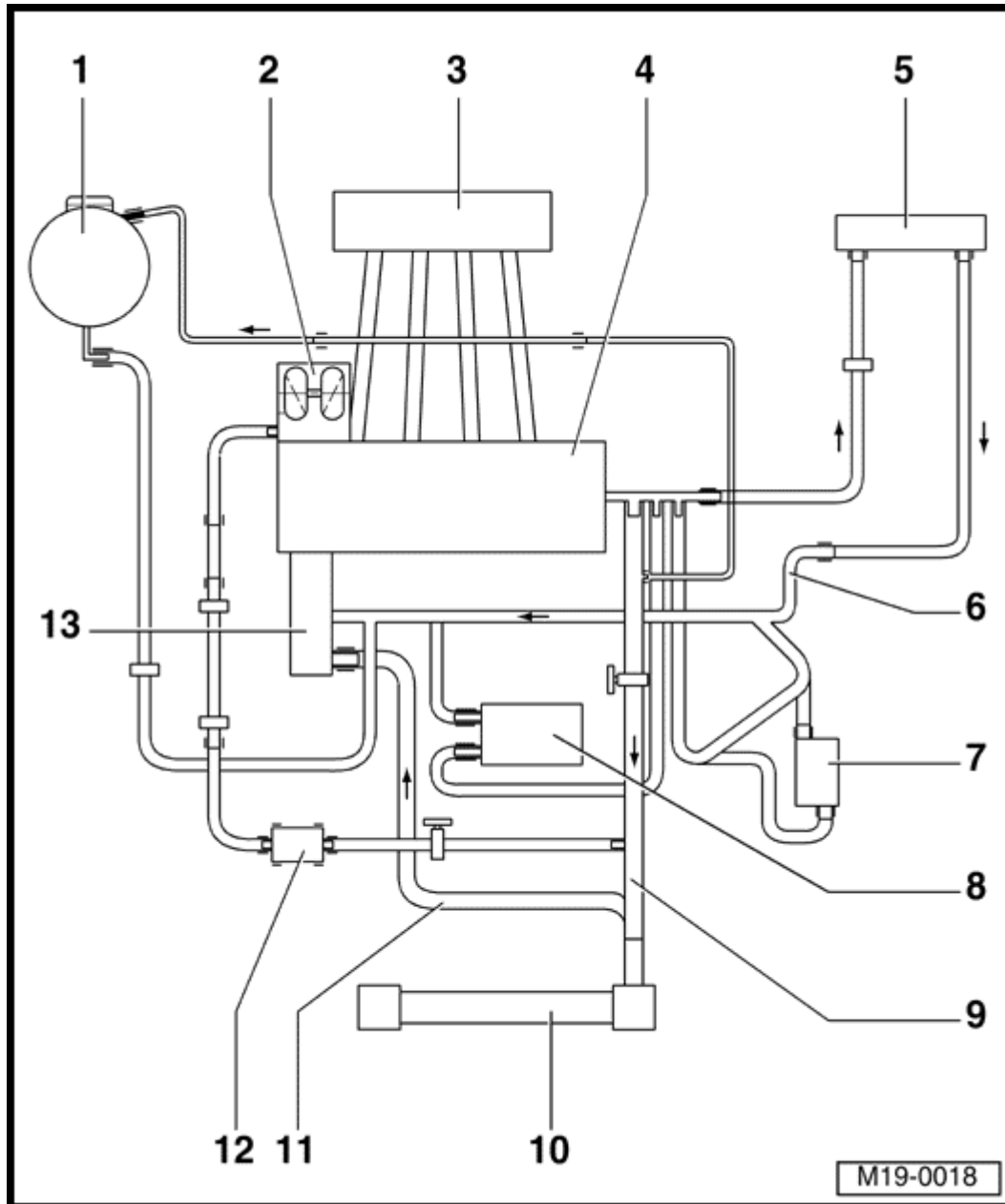
21 - Coolant pump

- ◆ Check for ease of movement
- ◆ If damaged or leaking replace complete
- ◆ Removing and installing ⇒ [Page 19-21](#)

22 - Toothed belt

- ◆ Mark D.O.R. before removing
- ◆ Check for wear
- ◆ Do not kink

Coolant hose connection diagram



- 1 - Expansion tank
- 2 - Turbocharger
- 3 - Intake manifold
- 4 - Cylinder head/cylinder block
- 5 - Heating system heat exchanger
- 6 - Coolant pipe
- 7 - ATF cooler

◆

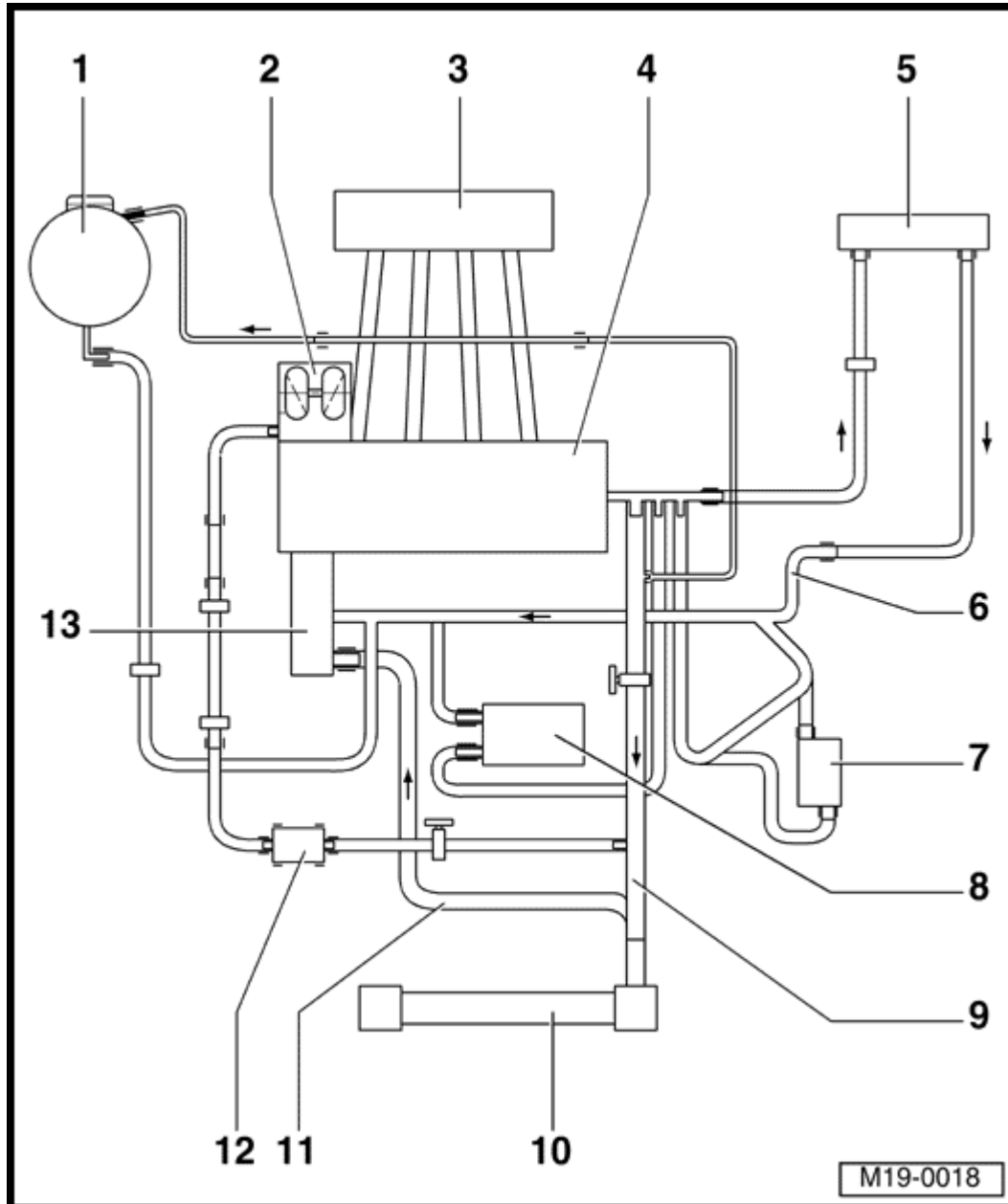
Only on vehicles with automatic gearbox

8 - Oil cooler

9 - Upper coolant hose

10 - Cooler

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



- 11 - Lower coolant hose
- 12 - Continued coolant circulation pump (V51)
- 13 - Coolant pump/coolant thermostat

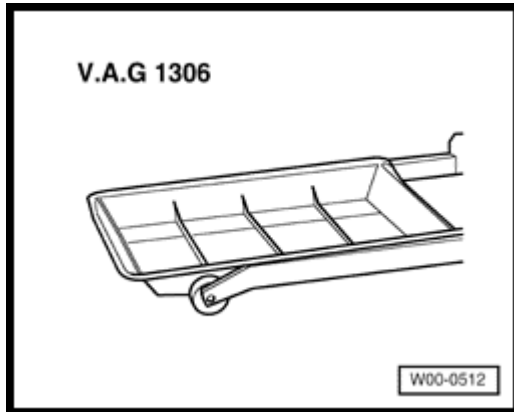
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Cooling system components, removing and installing (Page 19-13)

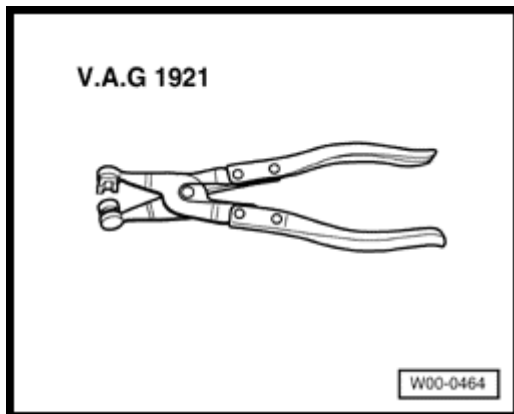
Cooling system, draining and filling

Special tools and equipment



▲

- ◆ V.A.G 1306 Drip tray



▲

- ◆ V.A.G 1921 Hose clip pliers
- ◆ Anti - freeze tester

Draining

WARNING!

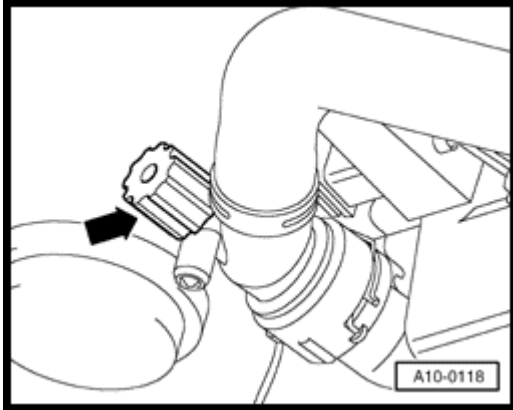
Steam can be released when removing the cap from the expansion tank. Cover cap with a cloth and open carefully.

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1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical

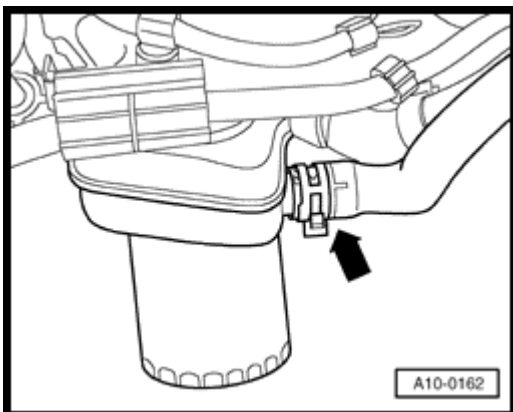
Cooling system components, removing and installing (Page 19-14)

- Open cap on coolant expansion tank.
- Remove center insulation tray:
⇒ [Repair Manual, Body-Exterior, Repair Group 50](#)



A

- To drain coolant from radiator remove drain plug - arrow - .



A

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

Notes:

Observe disposal regulations!

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

Filling

Notes:

- ◆ *Only use coolant additive G 12 in accordance with TL VW 774 D. Identification: colored red.*
- ◆ *On no account must G 12 be mixed with other coolant additives!*
- ◆ *If the fluid in expansion tank is brown, G 12 has been mixed with other coolant. In this case the coolant must be changed.*
- ◆ *G 12 and coolant additives marked "In accordance with TL VW 774 D" prevent frost and corrosion damage, scaling and also raise boiling point of coolant. For this reason the system must be filled all year round with frost and corrosion protection additives.*
- ◆ *Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.*
- ◆ *Protection against frost must be assured to about - 25° C (in arctic climatic countries to about - 35° C).*
- ◆ *The coolant concentration must not be reduced by adding water even in warmer seasons and in warmer countries. The anti - freeze ratio must be at least 40 %.*
- ◆ *If for climatic reasons a greater frost protection is required, the amount of G 12 can be increased, but only up to 60 % (frost protection to about - 40° C), as otherwise frost protection is reduced again and cooling effectiveness is also reduced.*
- ◆ *If radiator, heat exchanger, cylinder head or cylinder head gasket is replaced, do not reuse old coolant.*

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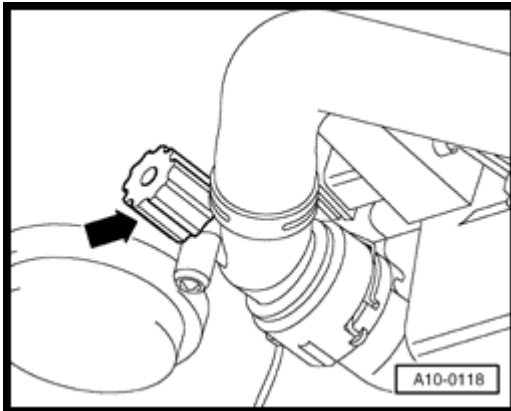
1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical

Cooling system components, removing and installing (Page 19-16)

Recommended mixture ratios:

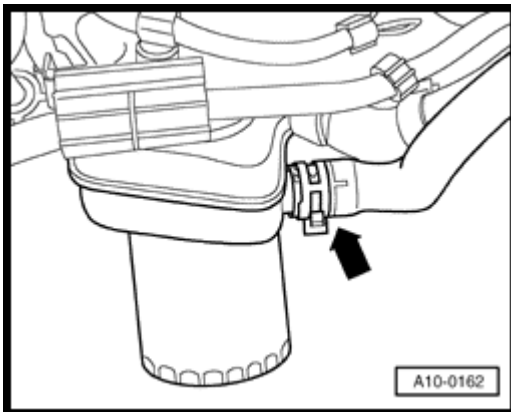
Frost protection to	Anti-freeze amount	G 121)	Water1)
-25 °C	40 %	2.0 ltr.	3.0 ltr.
-35 °C	50 %	2.5 ltr.	2.5 ltr.

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



A

- Screw drain plug into radiator.



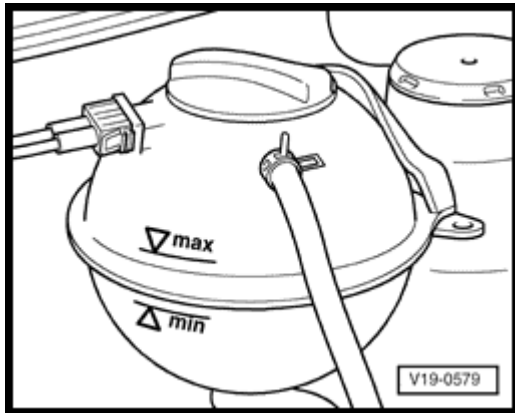
A

- Push coolant hose onto oil cooler connection and tighten.

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



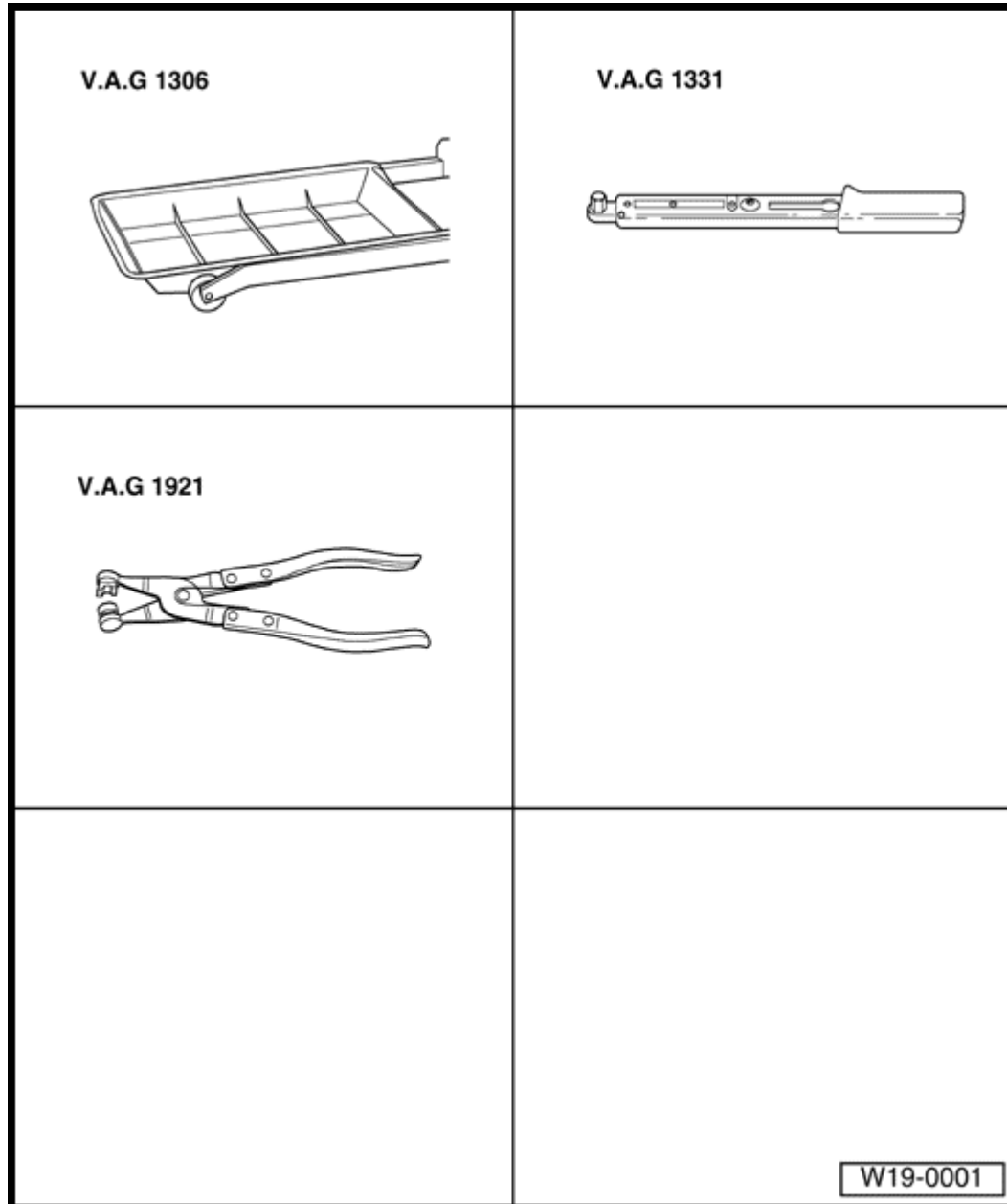
A

- Fill with coolant up to max. mark on expansion tank.
- Fit expansion tank cap.
- Start engine and maintain an engine speed of about 2000 rpm for approx. 3 minutes.
- Run engine until radiator fan cuts - in.
- Check coolant level and top - up if necessary. When the engine is at normal operating temperature, the coolant level must be on the max. mark. When the engine is cold, the coolant level must be between the min. and max. marks.

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



Radiator, removing and installing

Special tools and equipment

- ◆ V.A.G 1306 Drip tray
- ◆ V.A.G 1331 Torque wrench (5-50 Nm)
- ◆ V.A.G 1921 Spring - type clip pliers
- ◆ Anti - freeze tester

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

Removing

- Drain coolant ⇒ [Page 19-13](#) .
- Remove front bumper.
⇒ [Repair Manual, Body-Exterior, Repair Group 50](#)
- Pull coolant hoses off radiator.
- Pull connectors off thermo - switch and radiator fan.
- Remove tensioning element for ribbed belt.
⇒ [Repair Manual, Body-Exterior, Repair Group 50](#)
- Remove radiator securing bolts and take out radiator.

Notes:

Vehicles with air conditioner:

- *Observe additional information and removal work* ⇒ [Page 19-20](#) .

Installing

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

Filling with coolant ⇒ [Page 19-13](#)

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

Additional information and removal work on vehicles with air conditioner

WARNING!

The air conditioner refrigerant circuit must not be opened.

Notes:

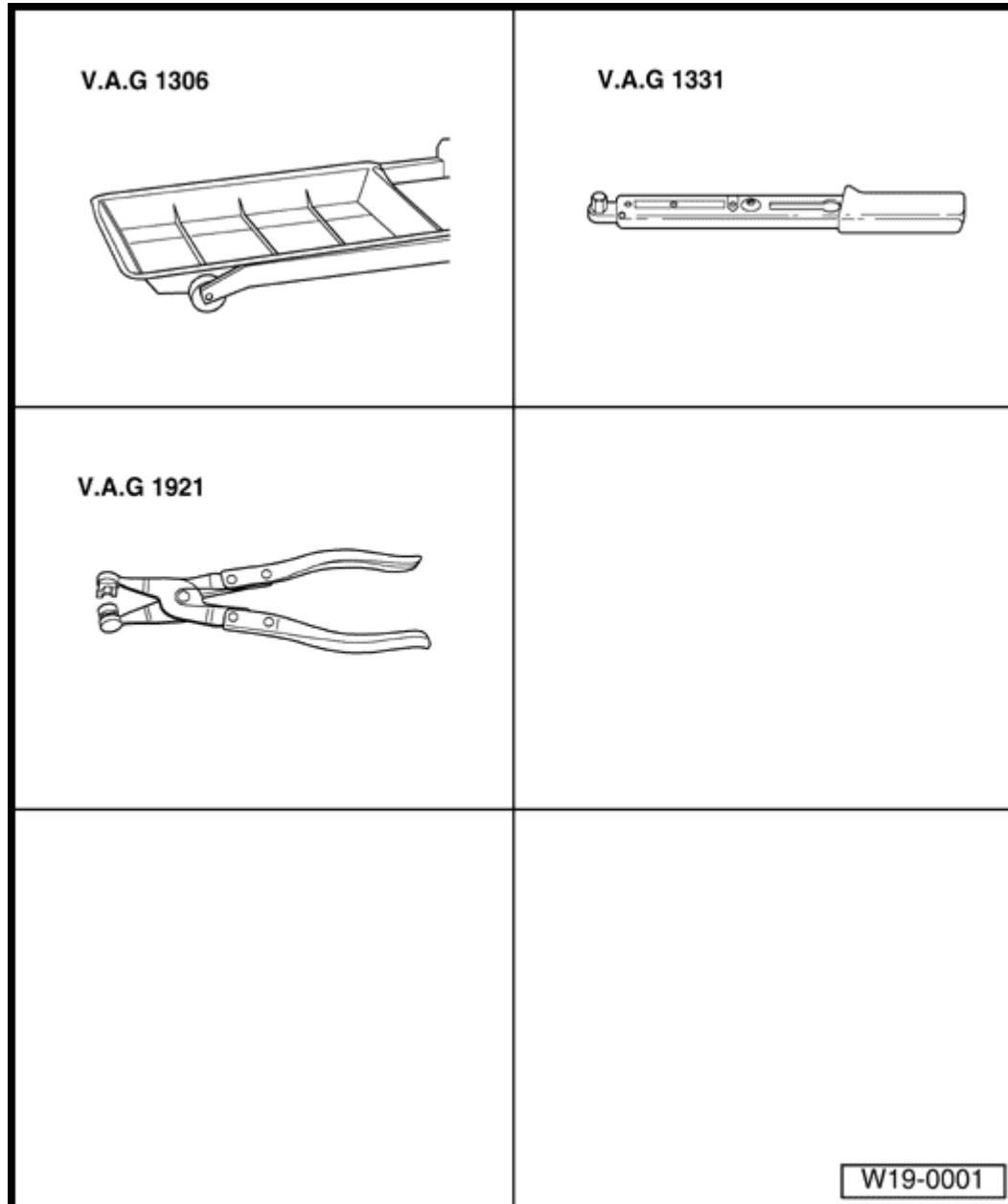
To prevent damage to condenser and also to the refrigerant pipes/hoses, ensure that the pipes and hoses are not stretched, kinked or bent.

- Repair retaining clamps of coolant lines if necessary.
- Secure radiator at chassis before removing lock carrier.
- Remove condenser from radiator and secure to lock carrier.
- Secure condenser at chassis for removal of radiator.

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



Coolant pump, removing and installing

Special tools and equipment

- ◆ V.A.G 1306 Drip tray
- ◆ V.A.G 1331 Torque wrench (5-50 Nm)
- ◆ V.A.G 1921 Spring - type clip pliers
- ◆ Anti - freeze tester

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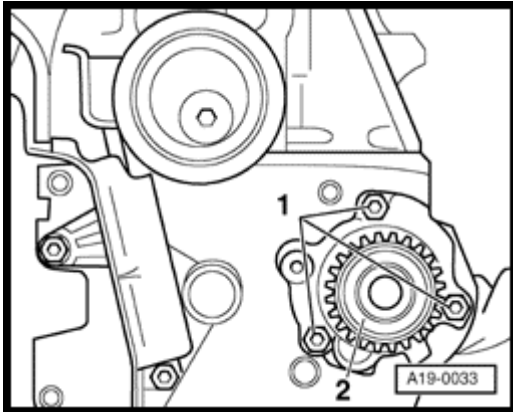
Cooling system components, removing and installing (Page 19-22)

Notes:

- ♦ Always replace seals and gaskets.
- ♦ The lower part of the toothed belt guard need not be removed.
- ♦ 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.

Removing

- Drain coolant ⇒ [Page 19-13](#)
- Remove ribbed belt ⇒ [Page 13-8](#) .
- Remove upper and center toothed belt guard ⇒ [Page 13-11](#) .
- Take toothed belt off coolant pump toothed belt sprocket ⇒ [Page 13-11](#) .



A

- Unscrew coolant pump securing bolts - 1 - and remove coolant pump - 2 - .

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1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical

Cooling system components, removing and installing (Page 19-23)

Installing

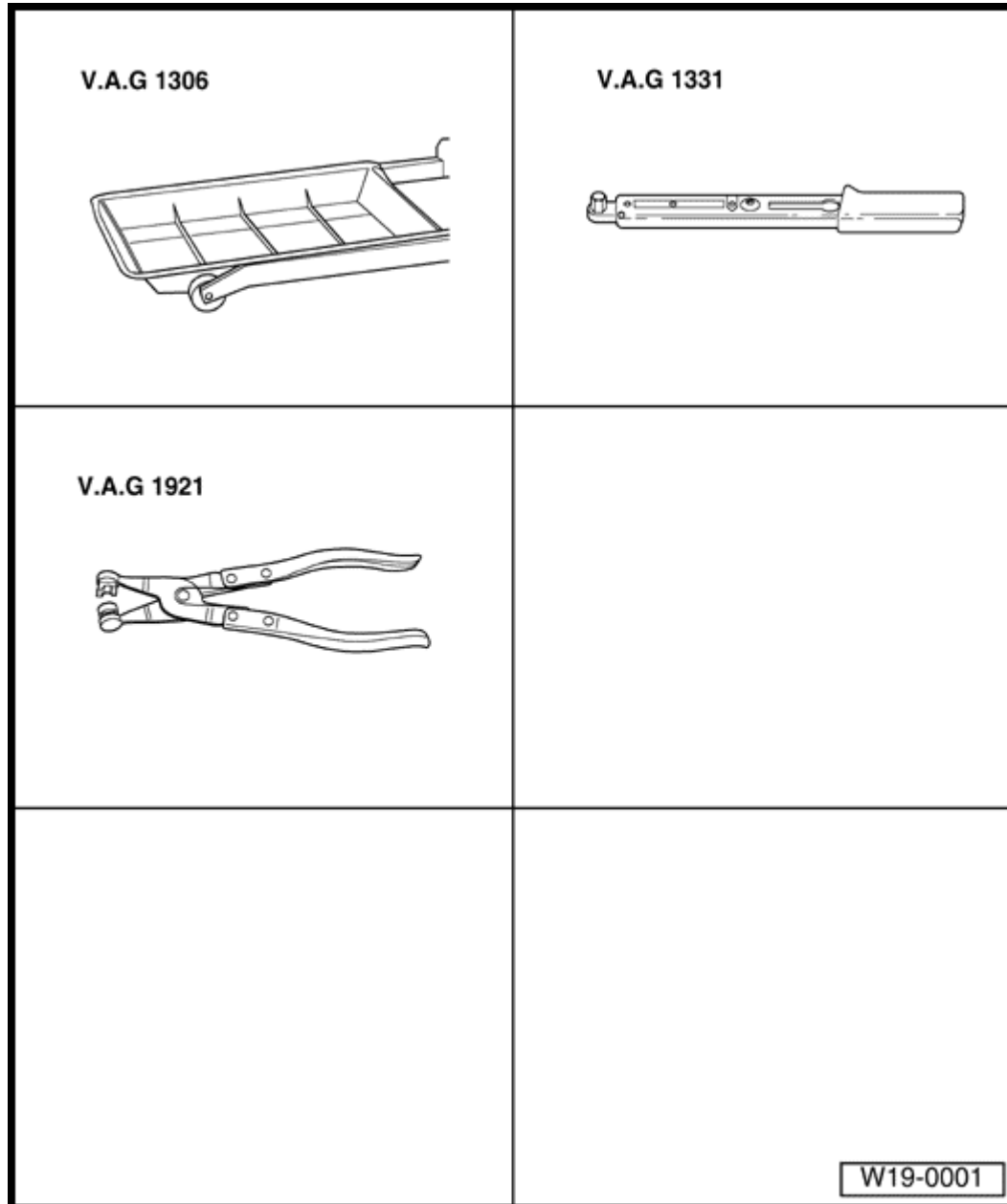
Installation is carried out in the reverse order; when doing this note the following:

- Moisten new O ring with coolant.
- Insert coolant pump into cylinder block and tighten securing bolts.
- Tightening torque: 15 Nm
- Install toothed belt and adjust valve timing ⇒ [Page 13-11](#) .
- Install ribbed belt ⇒ [Page 13-8](#) .
- Filling with coolant ⇒ [Page 19-13](#)

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Cooling system components, removing and installing (Page 19-24)



Thermostat, removing and installing

Special tools and equipment

- ◆ V.A.G 1306 Drip tray
- ◆ V.A.G 1331 Torque wrench (5-50 Nm)
- ◆ V.A.G 1921 Spring - type clip pliers
- ◆ Anti - freeze tester

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Cooling system components, removing and installing (Page 19-25)

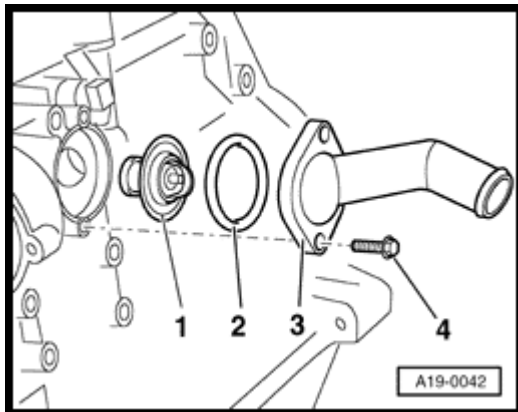
Removing

Notes:

- Always replace seals and gaskets.
- Drain coolant ⇒ [Page 19-13](#) .

Vehicles with air conditioner:

- Observe additional information and removal instructions ⇒ [Page 10-24](#) .



- Pull coolant hose off connecting flange - 3 - .
- Unbolt securing bolts - 4 - of connecting flange - 3 - and remove connecting flange - 3 - with thermostat - 1 - .

Installing

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

- Moisten new O ring - 2 - with coolant.
- Insert thermostat - 1 - into connecting flange - 3 - and turn 1/4 turn (90°)
- Fit connecting flange - 3 - with thermostat - 1 - into engine block.

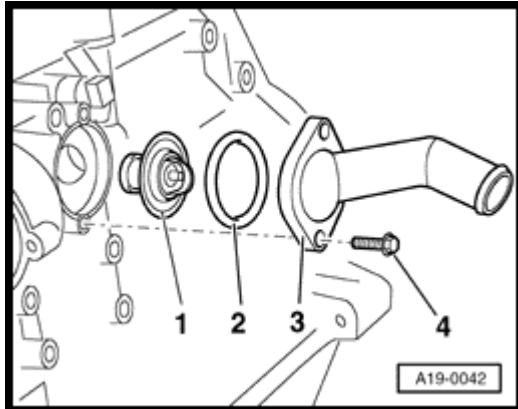
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1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical

Cooling system components, removing and installing (Page 19-26)

Notes:

The brace on the thermostat must be almost vertical.



A

- Tighten securing bolts - 4 - .
- Tightening torque: 15 Nm
- Fill with coolant ⇒ [Page 19-13](#) .

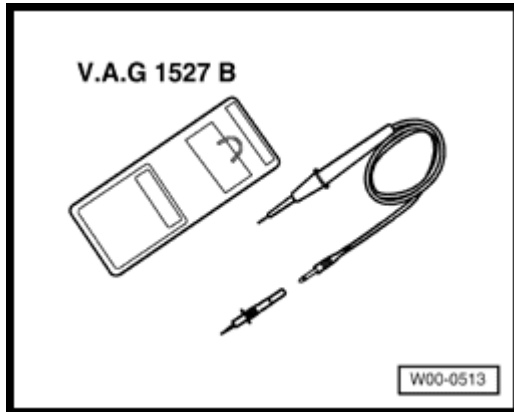
Volkswagen New Beetle

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Cooling system components, removing and installing (Page 19-27)

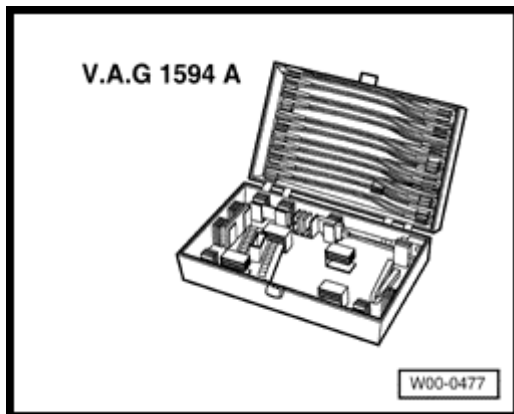
Continued coolant circulation pump (V51), checking

Special tools and equipment



A

- ◆ V.A.G 1527 B Diode test lamp



A

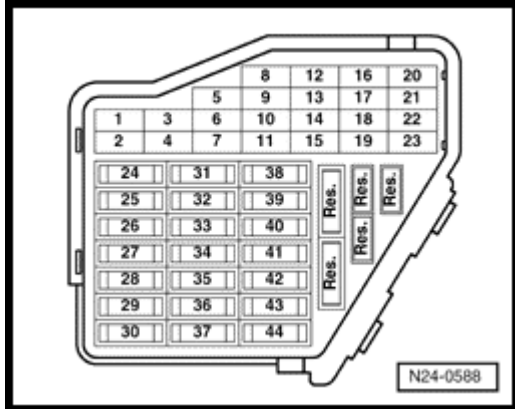
- ◆ V.A.G 1594 A Auxiliary test set
- ◆ Current flow diagram

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Cooling system components, removing and installing (Page 19-28)

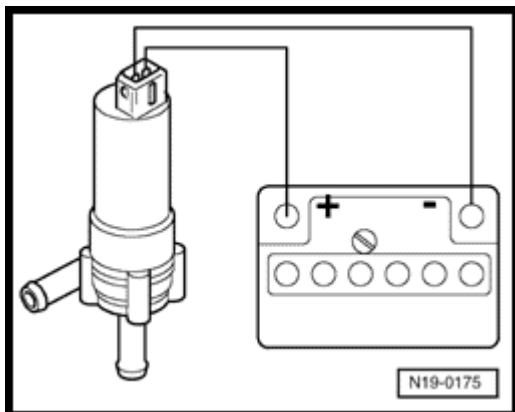
Check conditions



- Fuse No. 16 OK.

Test sequence

- Pull 2 pin connector off continued coolant circulation pump (V51).



- Connect contacts of continued coolant circulation pump (V51) to battery using aux. cables from V.A.G 1594.
- Continued coolant circulation pump must run.

If the continued coolant circulation pump does not run:

- Replace continued coolant circulation pump (V51).

If the continued coolant circulation pump (V51) runs:

- Switch ignition off and on again.

Volkswagen New Beetle

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Cooling system components, removing and installing (Page 19-29)

- Connect diode test lamp V.A.G 1527 B to disconnected connector for continued coolant circulation pump (V51) with auxiliary cable from V.A.G 1594 A
- LED must light up.

Notes:

This check must be performed within 10 minutes of switching ignition off.

LED does not light up:

- Locate and rectify open circuit using wiring diagram:
⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations* binder