



Cooling system components, removing and installing

Note:

- ◆ *When the engine is warm the cooling system is under pressure. If necessary release pressure before starting repair work.*
- ◆ *Hoses are secured with spring-type clips. In cases of repair only use spring-type clips.*
- ◆ *VAS 5024 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 VAG 1274 and adapters VAG 1274/8 and VAG 1274/9.*

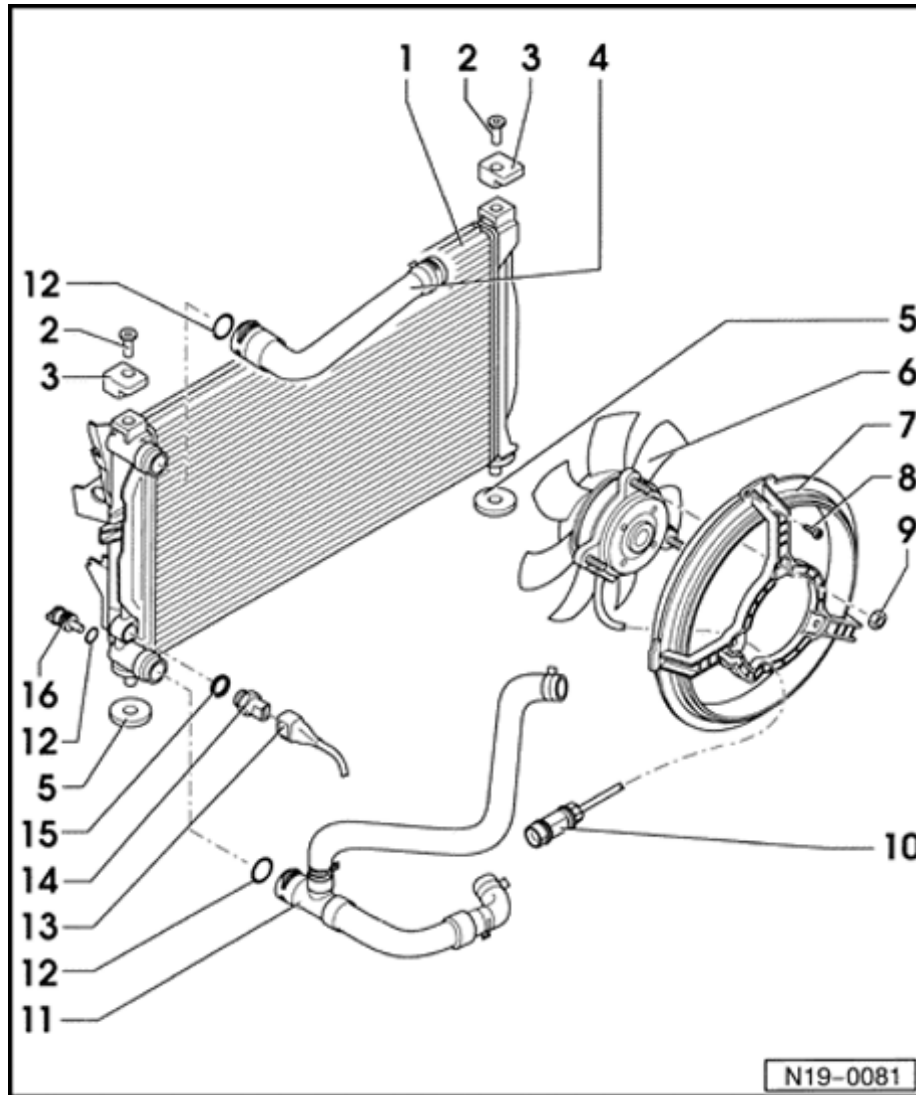
Cooling system components, body side ⇒ [Page 19-2](#) .

Cooling system components, engine side ⇒ ⇒
[Page 19-6](#) .

Coolant hose connection diagram ⇒ [Page 19-17](#) .

Draining and filling with coolant ⇒ [Page 19-18](#) .

Coolant mixture ratios ⇒ [Page 19-18](#) .



Cooling system components, body side

1 - Radiator

- ◆ Removing and installing ⇒ [Page 19-23](#)
- ◆ After replacing radiator, replace engine coolant
- ◆ With ATF cooler on vehicles with automatic transmission

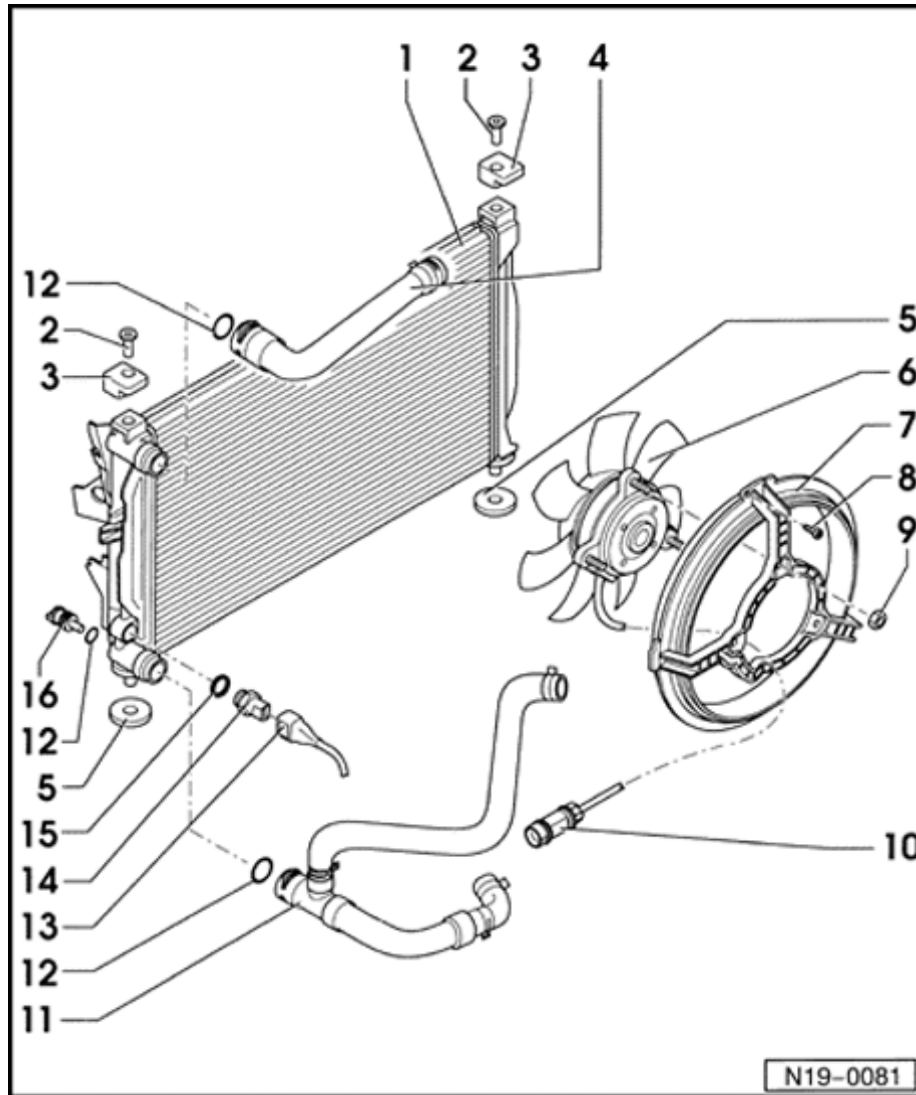
⇒ *Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37*

- ◆ Cleaning ATF cooler:

⇒ *Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37*

2 - Securing clip

3 - Securing rubber



4 - Upper coolant hose

- ◆ Secured to radiator with retaining clip
- ◆ Ensure securely seated
- ◆ Coolant hose connection diagram ⇒ [Page 19-17](#)

5 - Rubber washer

6 - Radiator fan -V7-

- ◆ Electric fan as optional extra

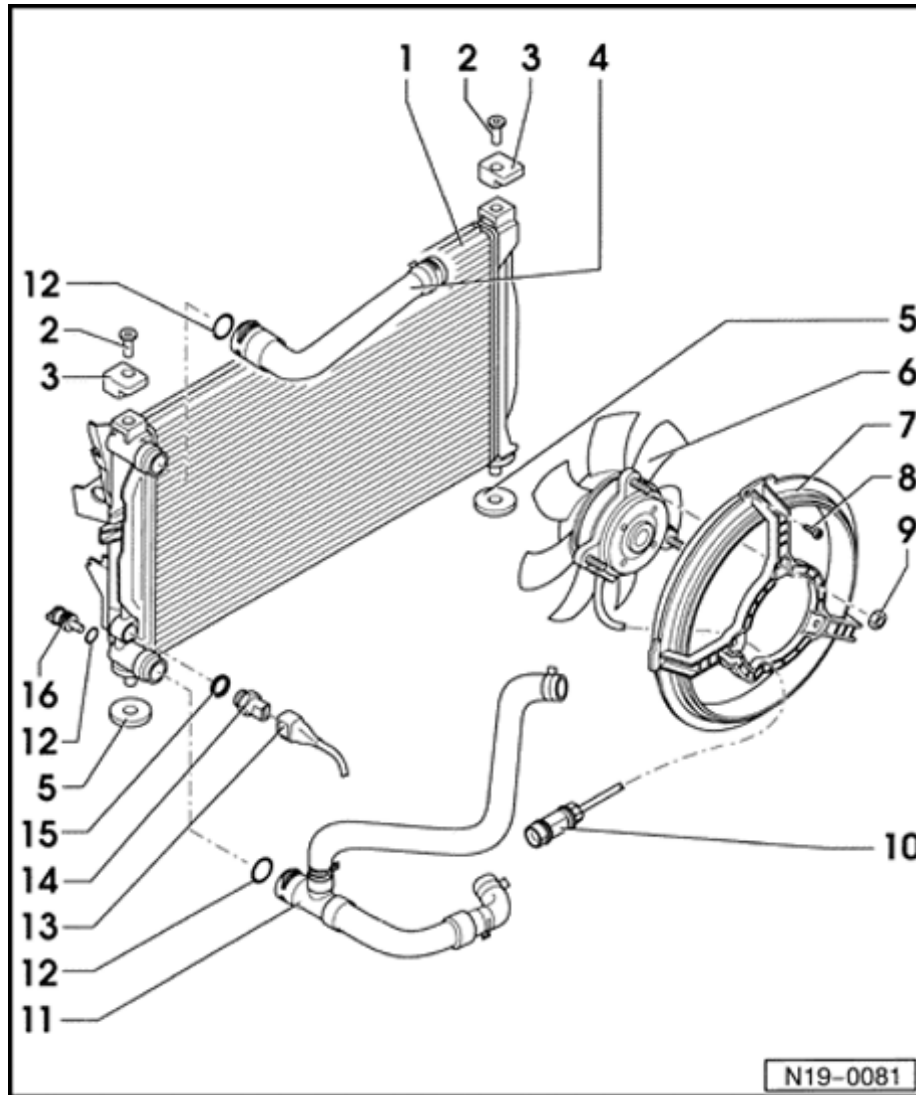
7 - Fan ring

- ◆ Clipped into air ducting and secured with securing bolt (item 8)

8 - Locking bolt

9 - 10 Nm

10 - 2-pin connector



11 - Lower coolant hose

- ◆ Secured to radiator with retaining clip
- ◆ Ensure securely seated
- ◆ Coolant hose connection diagram ⇒ [Page 19-17](#)

12 - O-ring

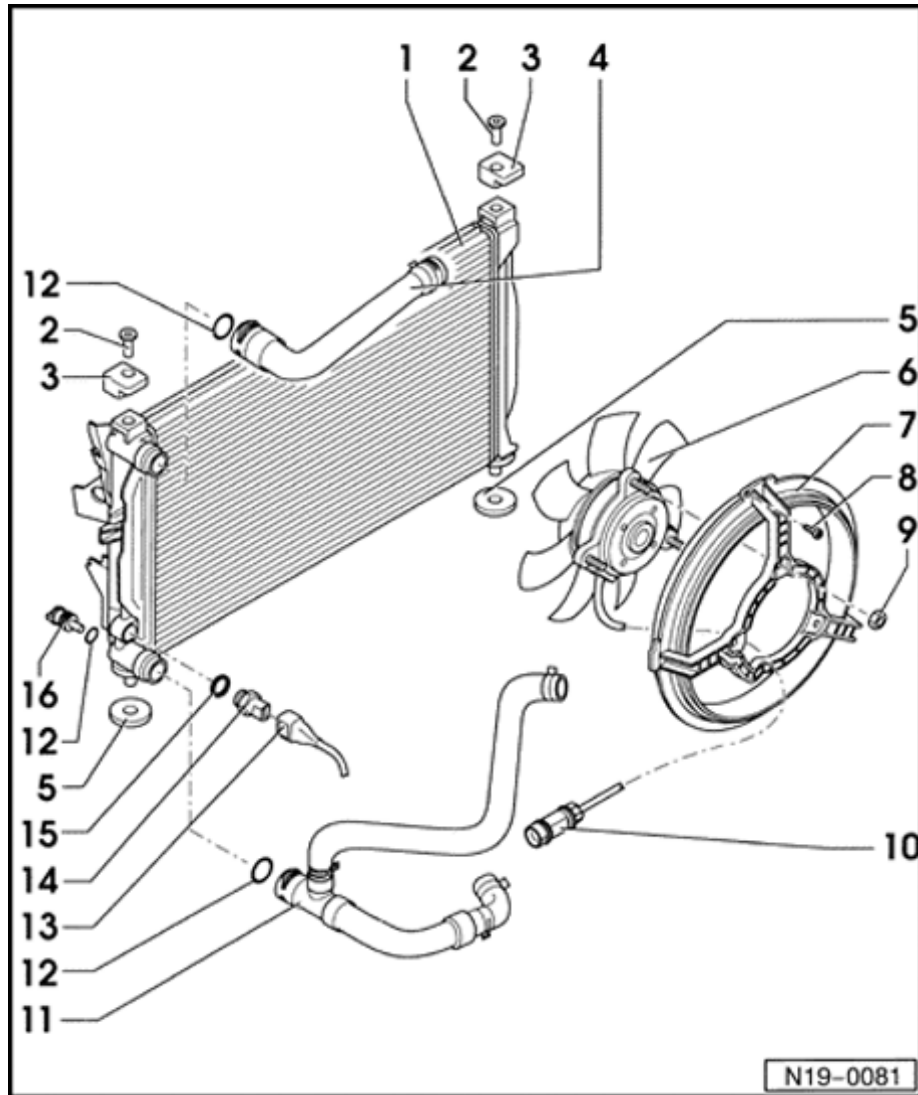
- ◆ Replace if damaged

13 - Connector

- ◆ Black, 3-pin
- ◆ For radiator fan thermo switch

14 - Radiator fan thermo switch -F18-, 35 Nm

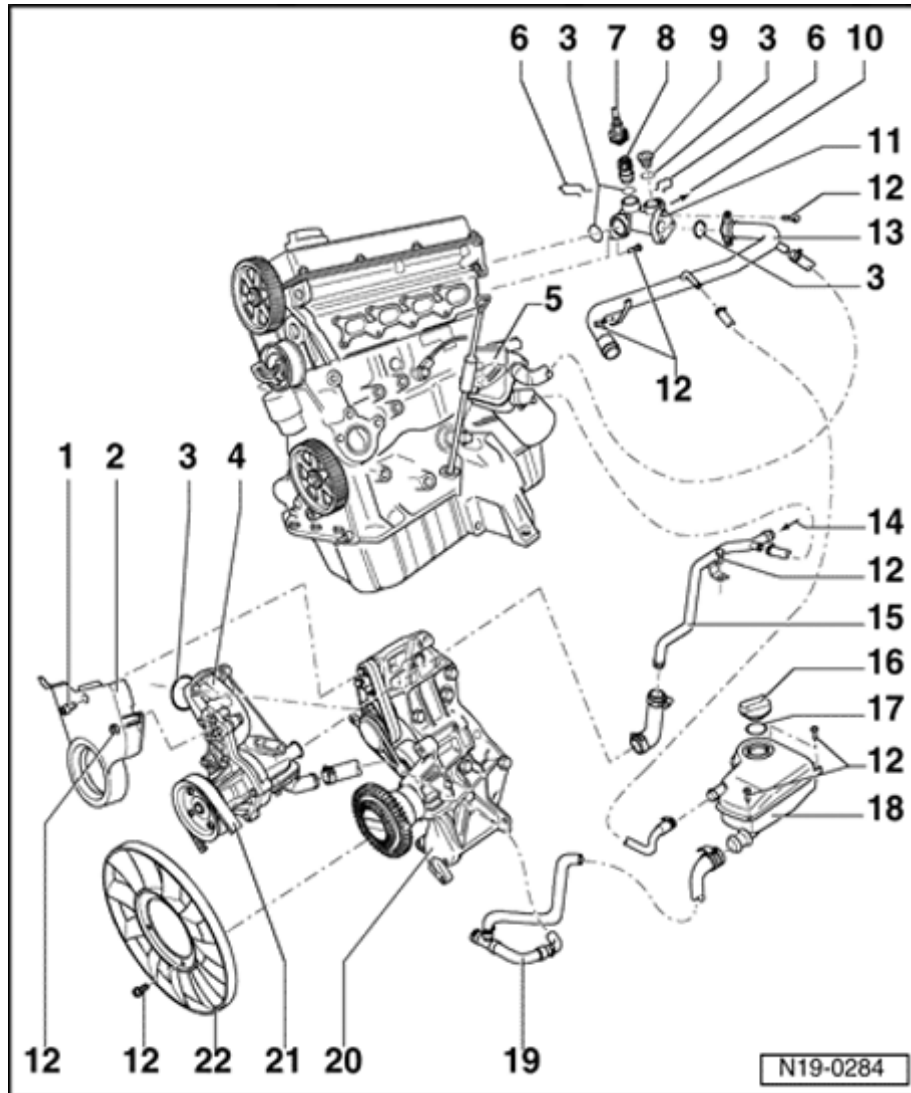
- ◆ For electric fan
- ◆ Switching temperatures:
 - Stage 1 on: 92 to 97 ° C
 - Stage 1 off: 84 to 91 ° C
 - Stage 2 on: 99 to 105 ° C
 - Stage 2 off: 91 to 98 ° C



15 - Seal

◆ Always replace

16 - Drain screw, 10 Nm



Cooling system components, engine side

1 - 20 Nm

2 - Toothed belt guard - lower part

3 - O-ring

◆ Always replace

4 - Coolant pump

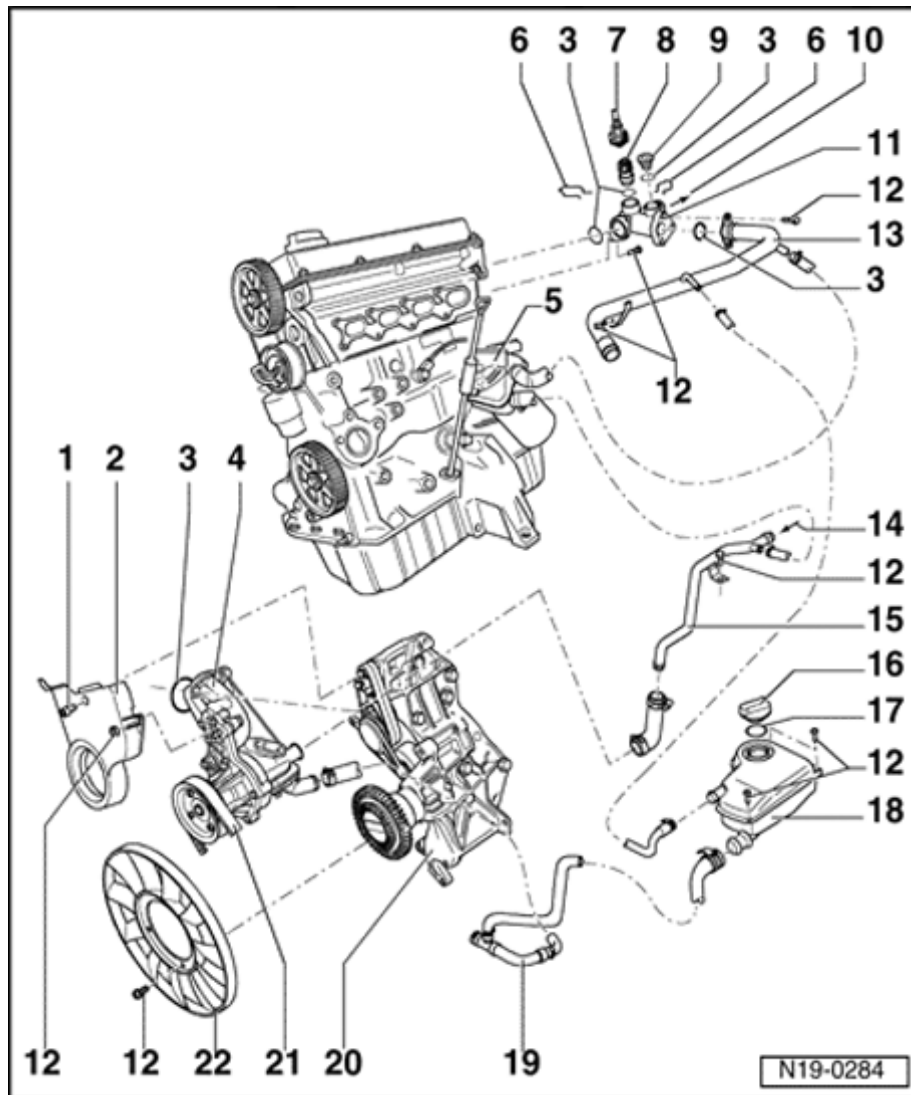
◆ Check for ease of movement

◆ Removing and installing coolant pump and compact bracket ⇒ [Page 19-11](#)

◆ Disassembling and assembling ⇒ [Page 19-15](#)

5 - Oil cooler

◆ Removing and installing ⇒ [Page 17-4](#) , item 13



6 - Retaining clip

- ◆ Ensure seated securely

7 - Connector

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

8 - Engine Coolant Temperature sensor -G62-

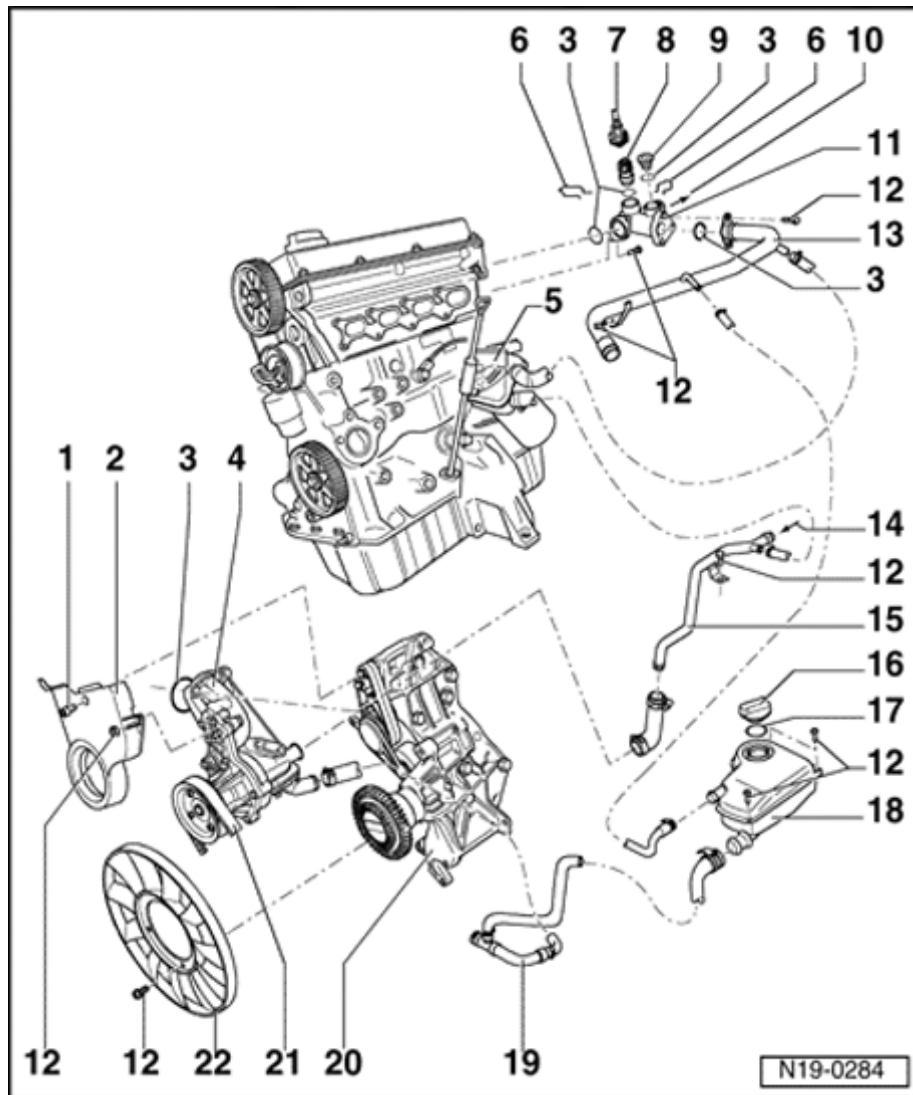
- ◆ With Engine Coolant Temperature gauge sensor -G2-
- ◆ For engine control module
- ◆ If necessary, release pressure in cooling system before removing
- ◆ Checking:

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 01*

9 - Plug

10 - To heat exchanger

- ◆ Coolant hose connection diagram ⇒ [Page 19-17](#)



11 - Connection

12 - 10 Nm

13 - Upper coolant pipe

◆ Secured to intake manifold

◆ Coolant hose connection diagram ⇒ [Page 19-17](#)

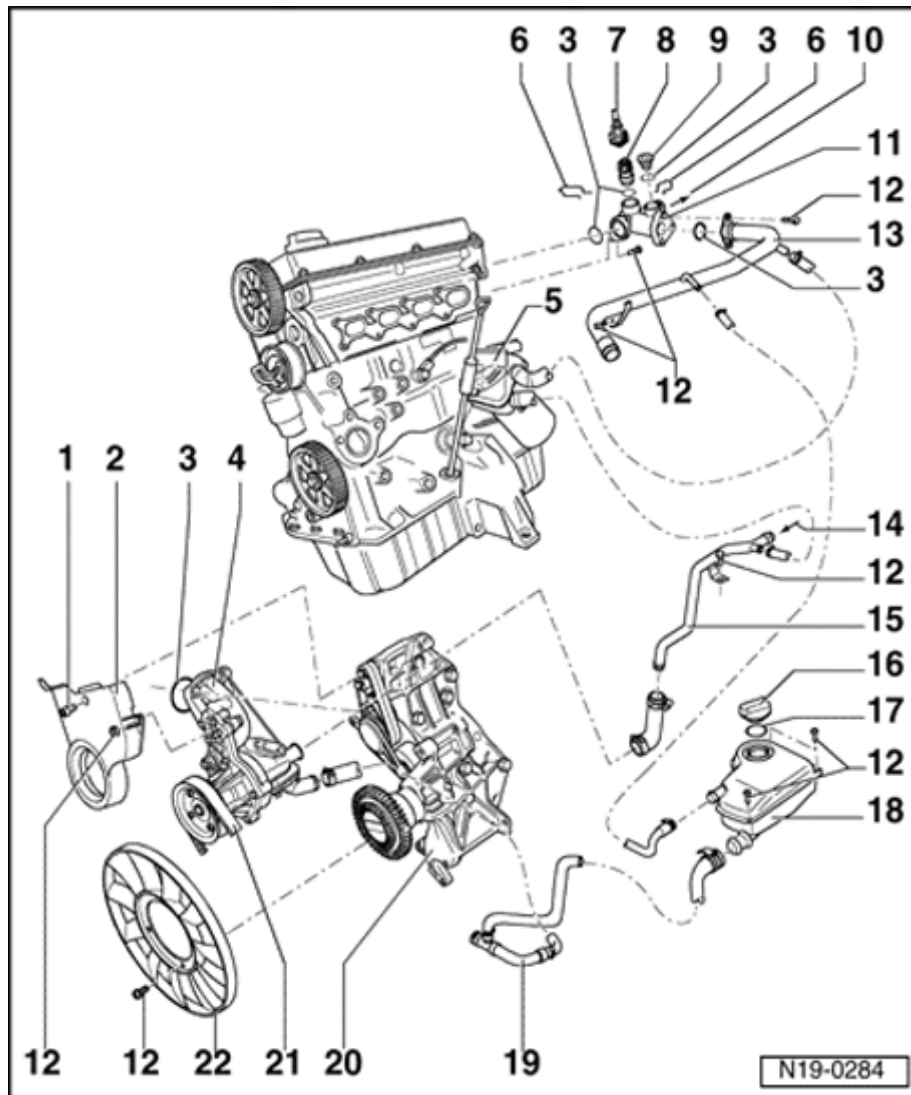
14 - From heat exchanger

◆ Coolant hose connection diagram ⇒ [Page 19-17](#)

15 - Lower coolant line

◆ Secured to oil filter bracket

◆ Coolant hose connection diagram ⇒ [Page 19-17](#)



16 - Cap

- ◆ Check with cooling system tester VAG 1274 and adapter VAG 1274/9
- ◆ Test pressure: 1.4 to 1.6 bar

17 - O-ring

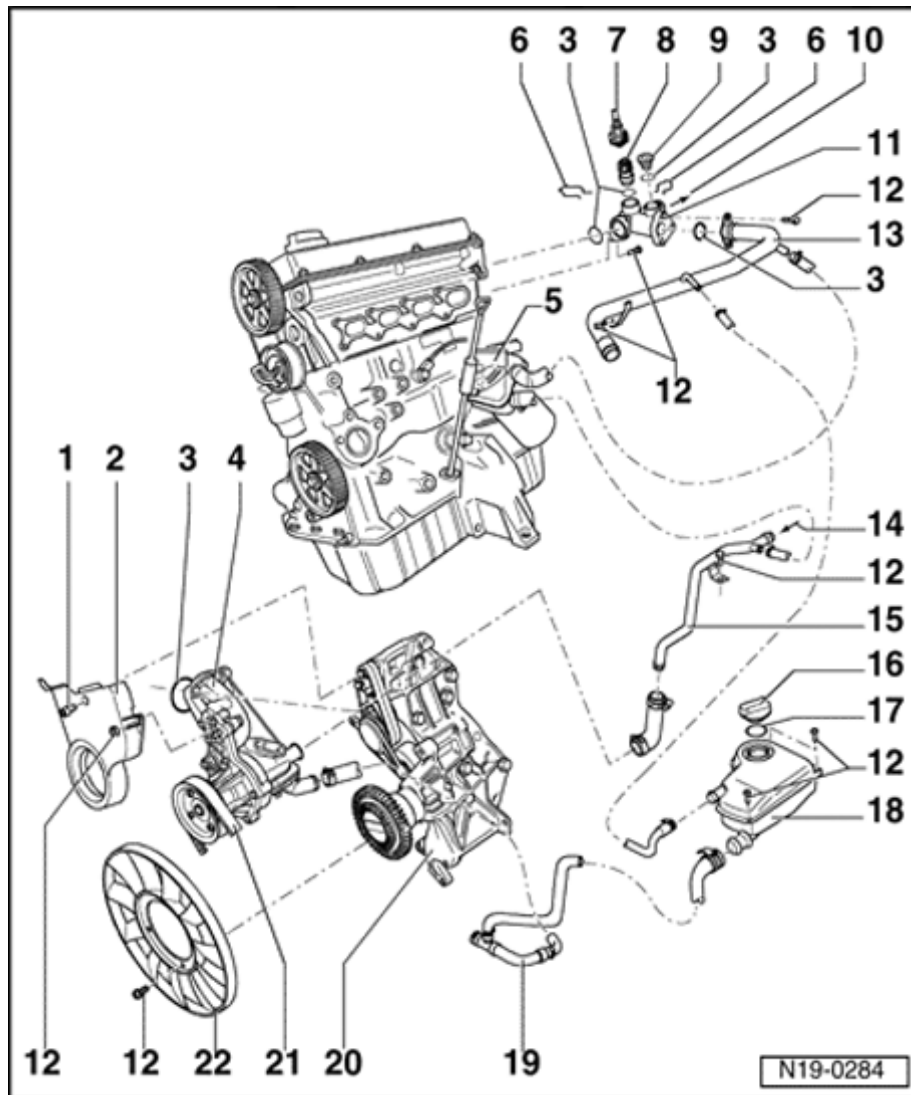
- ◆ Replace if damaged

18 - Expansion tank

- ◆ Leak test cooling system with cooling system tester VAG 1274 and adapter VAG1274/8

19 - Lower coolant hose

- ◆ From bottom of radiator
- ◆ Coolant hose connection diagram ⇒ [Page 19-17](#)
- ◆ Secured to radiator with retaining clip
- ◆ Make sure securely seated



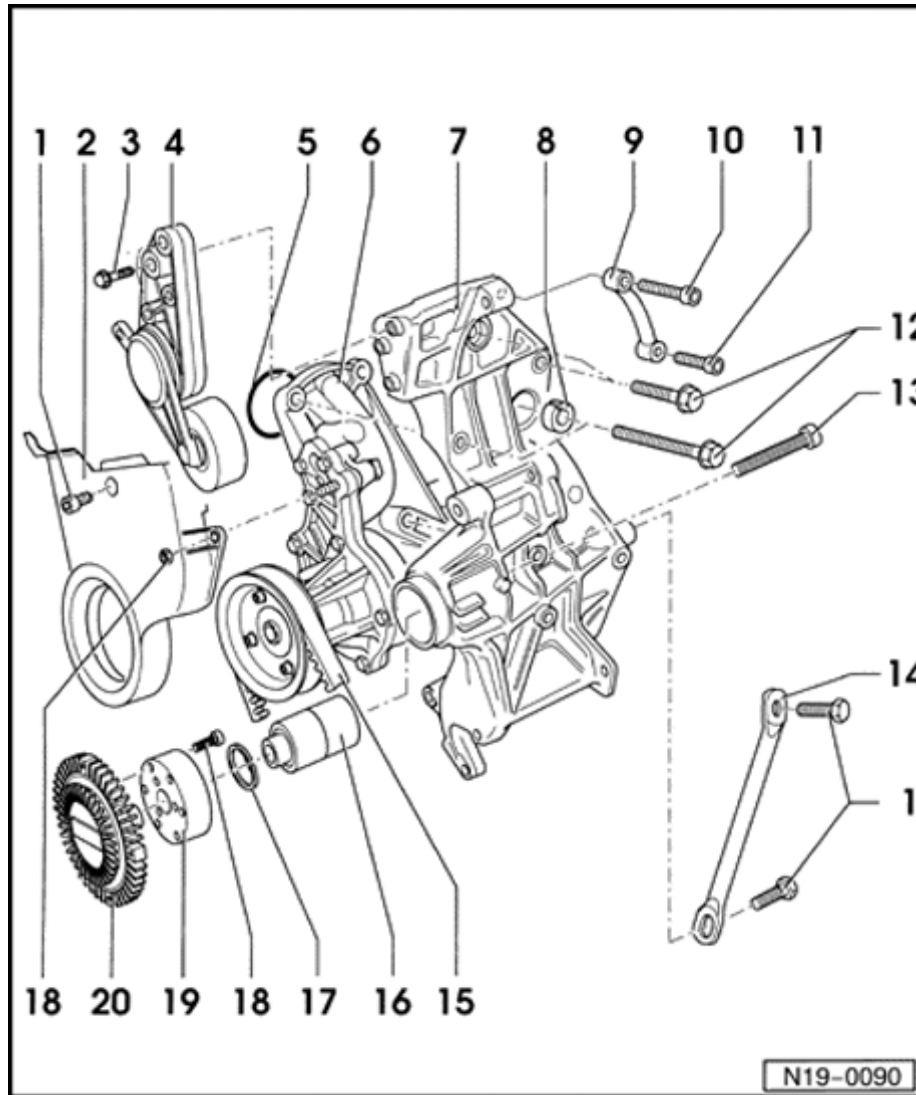
20 - Compact bracket

- ◆ For tensioning viscous fan coupling, Generator and power steering pump
- ◆ Removing and installing ⇒ [Page 19-11](#)

21 - V-belt

- ◆ Removing and installing ⇒ [Page 19-32](#)
- ◆ Removing and installing coolant pump and compact bracket ⇒ [Page 19-11](#)

22 - Radiator fan



Coolant pump and compact bracket, removing and installing

1 - 20 Nm

2 - Toothed belt guard - lower part

3 - 25 Nm

4 - Ribbed belt tensioner

◆ Removing and installing ribbed belts ⇒ [Page 13-14](#)

5 - O-ring

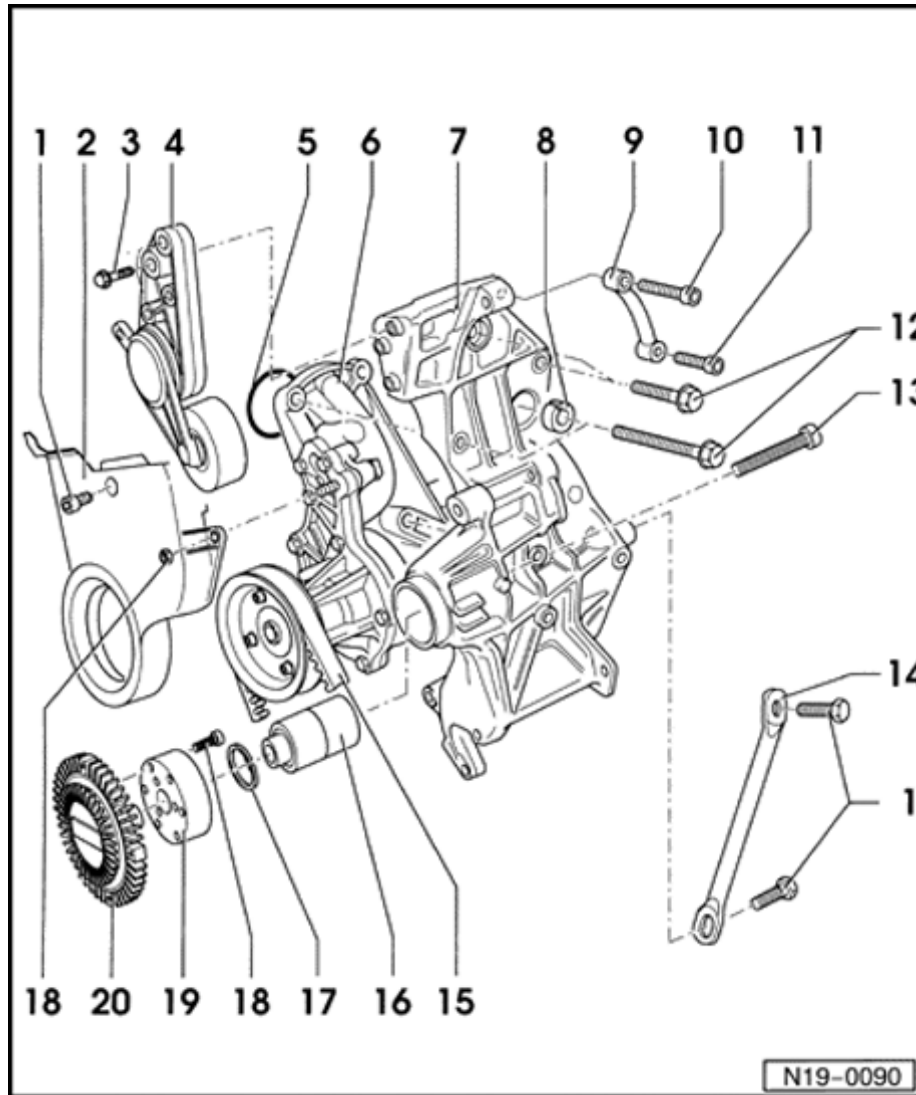
◆ Always replace

6 - Coolant pump

◆ Check for ease of movement

◆ Disassembling and assembling ⇒ [Page 19-15](#)

◆ Bolted to cylinder block together with compact bracket



7 - Compact bracket

- ◆ For tensioning, viscous fan coupling, Generator and power steering pump

8 - Bushing

9 - Support

- ◆ Between compact bracket and cylinder block

10 - 30 Nm

11 - 25 Nm

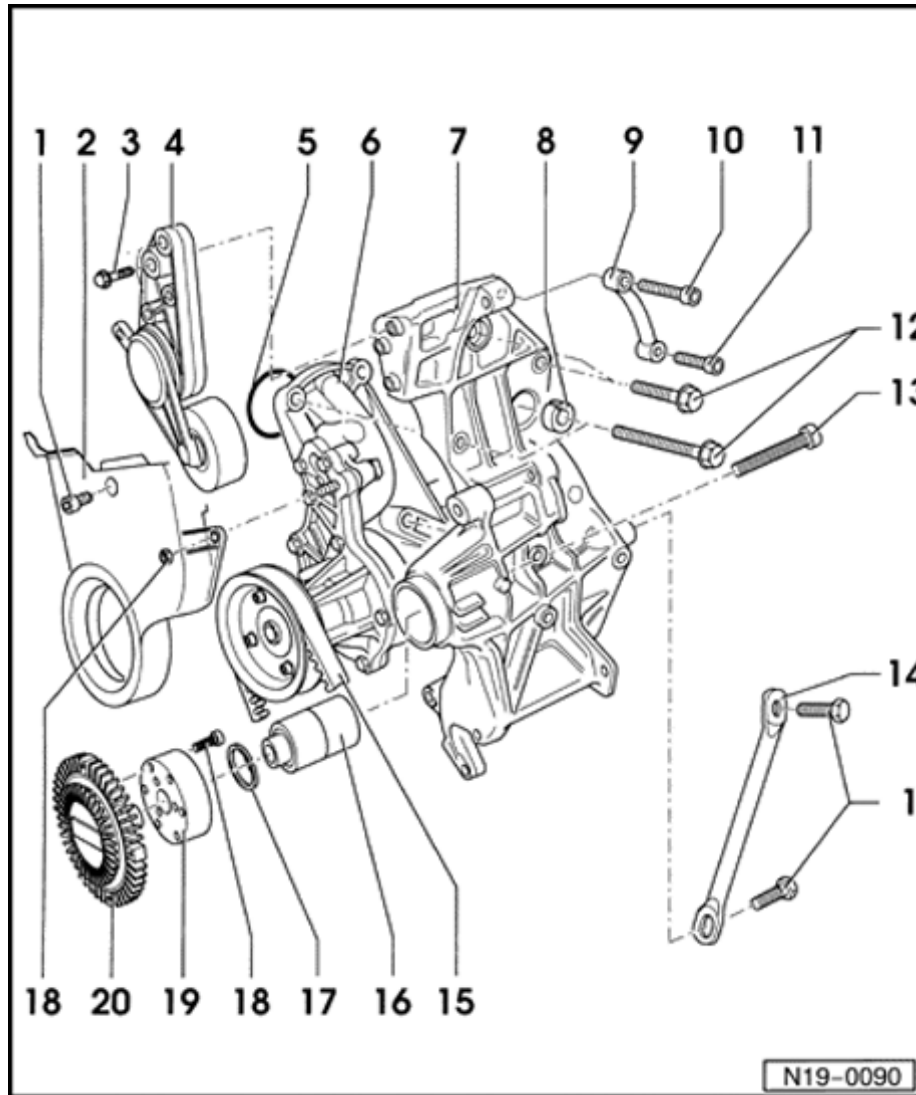
12 - 30 Nm

- ◆ Note tightening sequence ⇒ Fig. ⇒ [1](#)

13 - 45 Nm

- ◆ For viscous fan coupling

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14 - Support

- ◆ Between intake manifold and compact bracket

15 - V-belt

- ◆ Removing and installing ⇒ [Page 19-32](#)

16 - Bushing

- ◆ For viscous fan coupling
- ◆ Removing and installing ⇒ [Page 19-29](#)

17 - Circlip

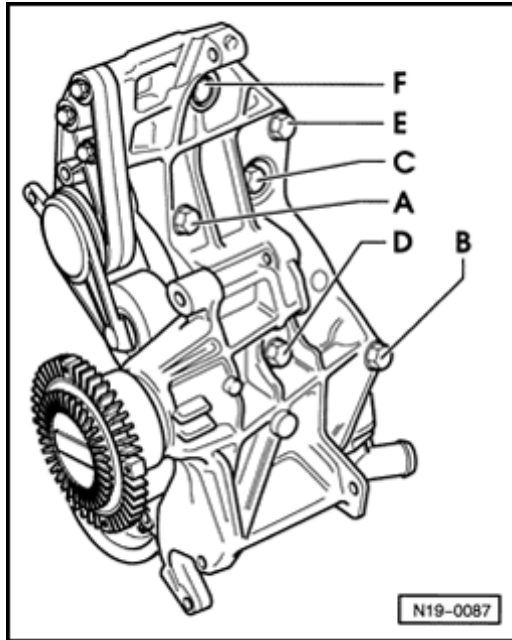
18 - 30 Nm

19 - Belt pulley

- ◆ For viscous fan coupling
- ◆ Removing and installing ⇒ [Page 19-27](#)

20 - Viscous fan coupling

- ◆ Removing and installing ⇒ [Page 19-27](#)



A

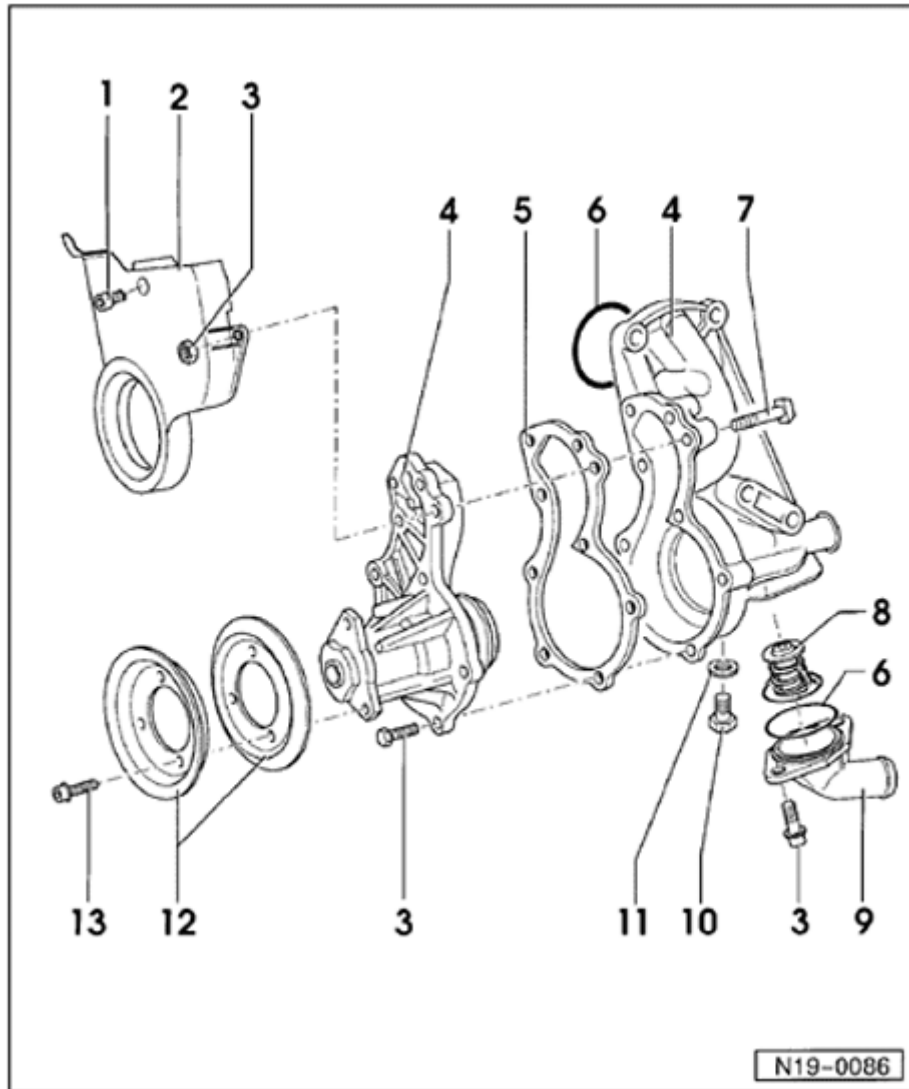
Fig. 1 Tightening sequence for compact bracket to cylinder block

Special tools and equipment

- ◆ VAG 1331 Torque wrench (5 to 50 Nm)

Work sequence

- Fit compact bracket with coolant pump to cylinder block.
- Tighten compact bracket to 30 Nm in tightening sequence as follows:
 - 1 - Tighten bolt -A-
 - 2 - Tighten bolt -B-
 - 3 - Tighten bolt -C-
 - 4 - Tighten bolt -D-
 - 5 - Tighten bolt -E-
 - 6 - Tighten bolt -F-



Coolant pump, disassembling and assembling

1 - 20 Nm

2 - Toothed belt guard - lower part

3 - 10 Nm

4 - Coolant pump

- ◆ Check for ease of movement

5 - Gasket

- ◆ Always replace

6 - O-ring

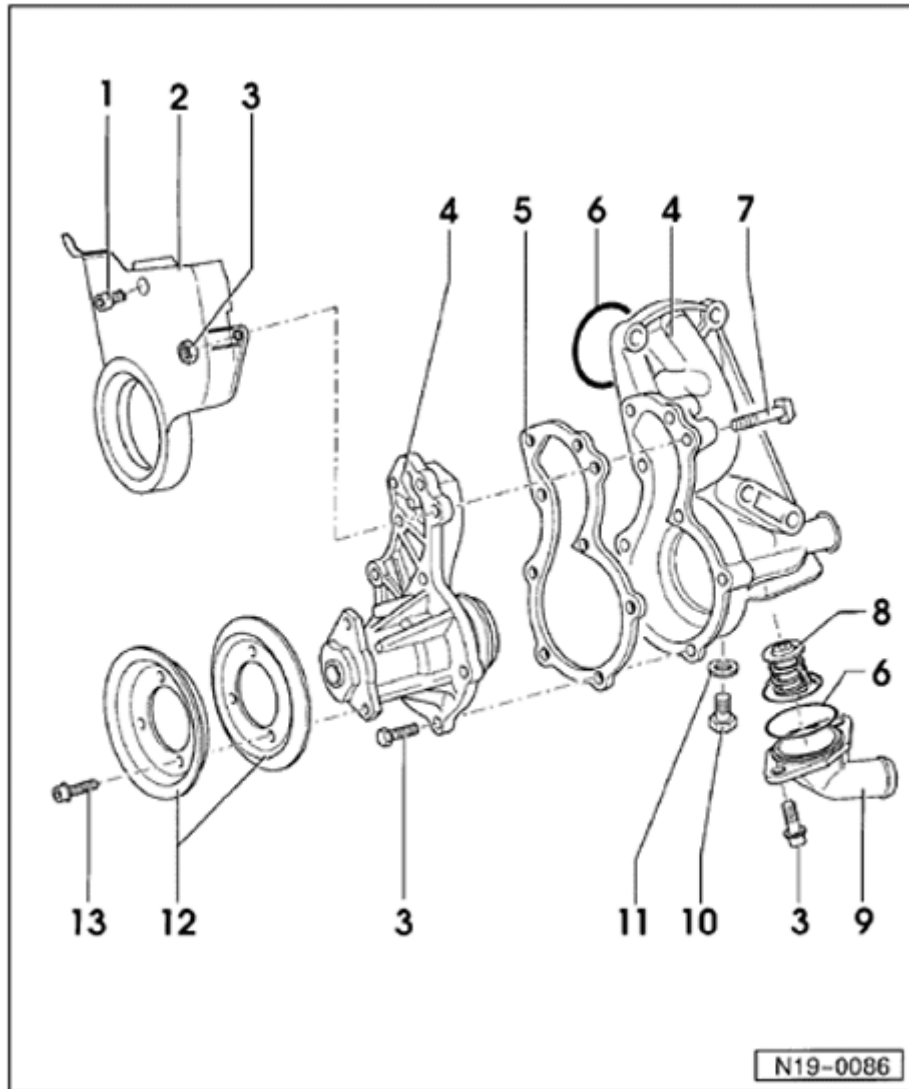
- ◆ Always replace

7 - Hammer head bolt

- ◆ Insert before installing

8 - Coolant thermostat

- ◆ Checking: heat-up thermostat in water
- ◆ Opening begins: approx. 85 ° C
- ◆ Ends: approx. 105 ° C
- ◆ Opening lift: min. 7 mm



9 - Connection

10 - Drain plug, 30 Nm

11 - Seal

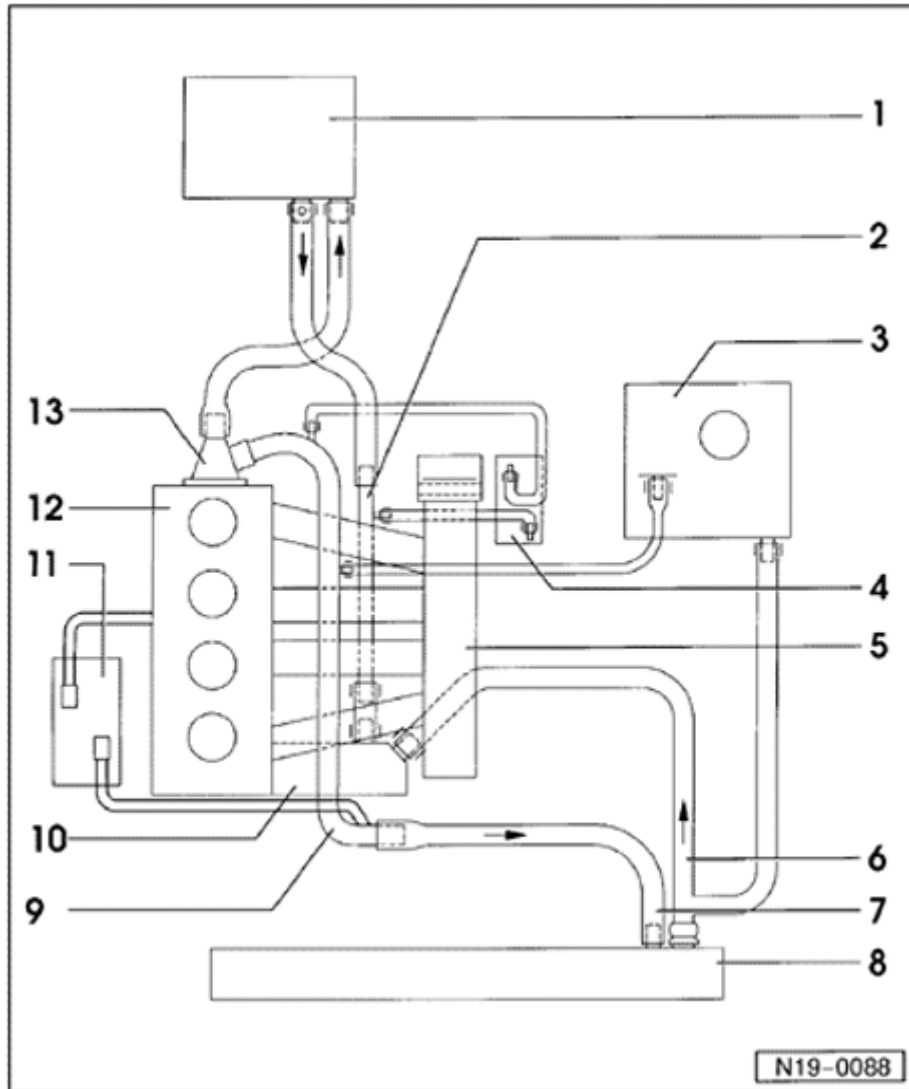
◆ Always replace

12 - Belt pulley

◆ Before removing mark installation position of both parts

13 - 25 Nm

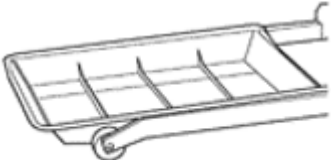



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Coolant hose connection diagram

- 1 - Heater unit heat exchanger
- 2 - Lower coolant line
- 3 - Expansion tank
- 4 - Oil cooler
- 5 - Intake manifold
- 6 - Lower coolant hose
- 7 - Upper coolant hose
- 8 - Cooler
- 9 - Upper coolant pipe
- 10 - Coolant pump/coolant thermostat
- 11 - Turbocharger
- 12 - Cylinder head/cylinder block
- 13 - Connection



<p>V.A.G 1306</p> 	<p>V.A.G 1274/8</p> 
<p>V.A.G 1274/10</p> 	<p>V.A.G 1331</p> 
<p>W19-0015</p>	

Cooling system, draining and filling

Special tools and equipment

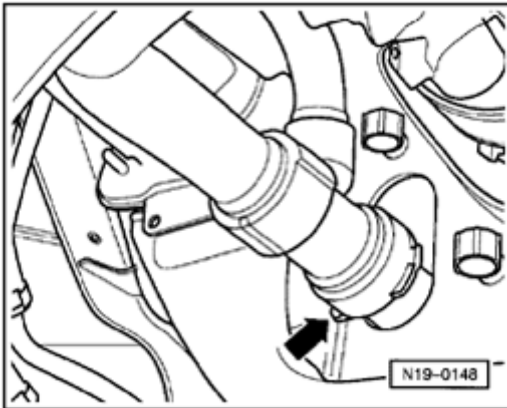
- ◆ VAG 1306 Drip tray
- ◆ VAG1274/8 Adapter
- ◆ VAG1274/10 Adapter
- ◆ VAG 1331 Torque wrench (5 to 50 Nm)
- ◆ Refractometer



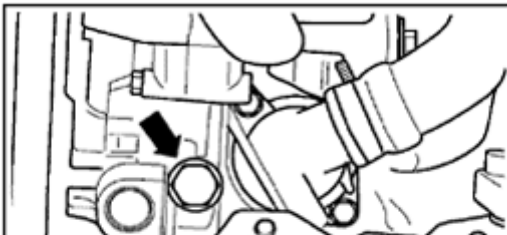
Draining

- Open cap on coolant expansion tank.
- Remove insulation tray:

⇒ [Repair Manual, Body Exterior, Repair Group 50](#)

**A**

- Pull off bottom coolant hose retaining clip (arrow) and remove coolant hose from radiator.

**A**

- Unscrew coolant pump drain plug (arrow).

Note:

Observe disposal regulations for coolant!

Filling

Note:

- ◆ *Only use coolant additive G 12. 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 another 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 a radiator, heat exchanger, cylinder head or cylinder head gasket is replaced, do not reuse old coolant.*



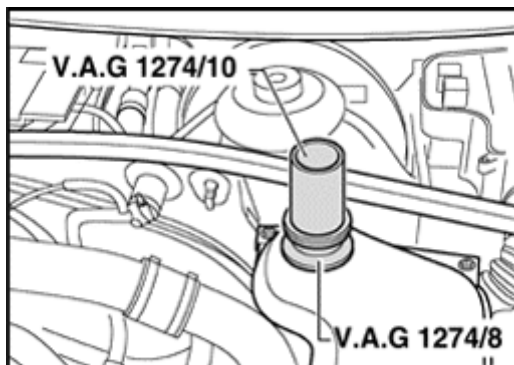
Recommended mixture ratios:

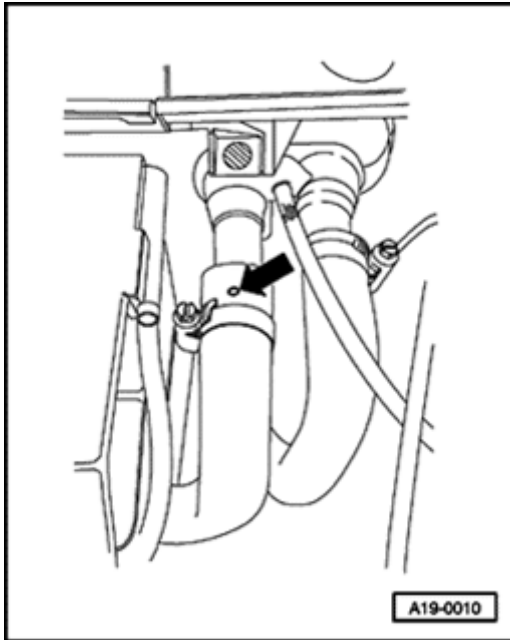
Frost protection to	Anti-freeze amount	G 12 ¹⁾	Water ¹⁾
-25 ° C	40 %	3.0 l	4.0 l
-35 ° C	50 %	3.5 l	3.5 l

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

Work sequence

- Install lower coolant hose and secure.
- Replace O-ring and install coolant pump drain plug. Tightening torque: 30 Nm
- Screw adapter VAG 1274/8 onto expansion tank and extend with VAG 1274/10.





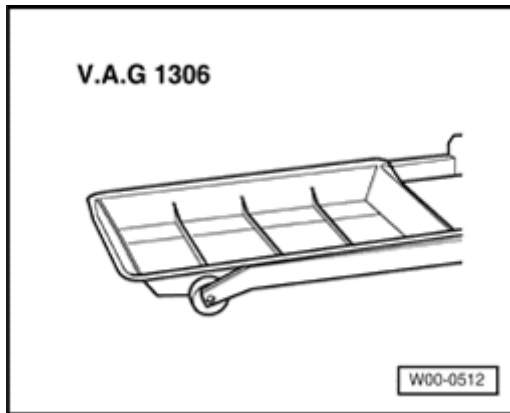
A

- Loosen coolant hose on heat exchanger and pull back hose sufficiently so that bleeder hole (arrow) is no longer sealed by the connection.
- Top up coolant until it flows out at bleeder hole in coolant hose.
- Push coolant hose on connection and tighten.
- Install expansion tank cap.
- Set heater controls to maximum heat position.
- Start engine and maintain an engine speed of about 2000 rpm for approx. 3 minutes.
- Allow engine to run at idling speed until lower hose on radiator becomes hot.
- Check coolant level and top-up if necessary.
 - When engine is at normal operating temperature, coolant level must be on the Max. mark.
 - When engine is cold, coolant level must be between Min. and Max. marks.



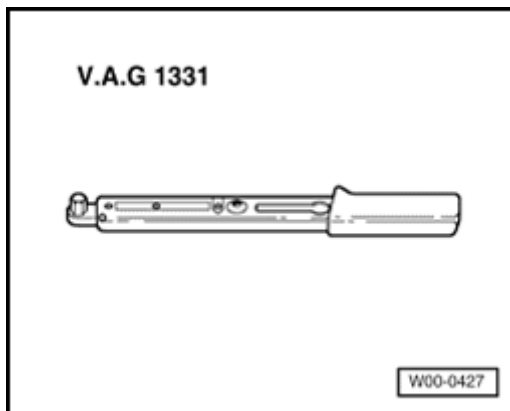
Radiator, removing and installing

Special tools and equipment



A

- ◆ Drip tray VAG 1306



A

- ◆ VAG 1331 Torque wrench (5 to 50 Nm)

Removing

- Drain coolant ⇒ [Page 19-18](#) .
- Remove front bumper.

⇒ [Repair Manual, Body Exterior, Repair Group 63](#)

- Pull coolant hoses off radiator.
- Disconnect connectors from thermo-switch.



Vehicles with automatic transmission

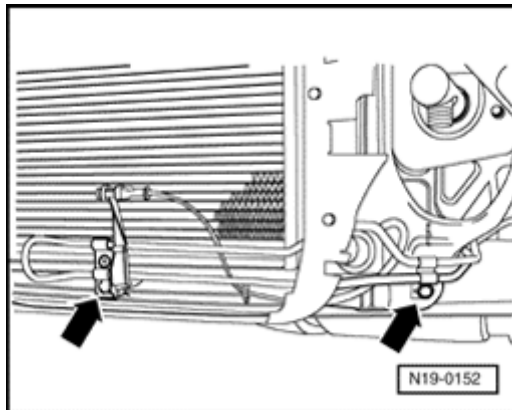
- Remove ATF lines/hoses from radiator.

⇒ *Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37*

Continued for all vehicles

A

- Unbolt power steering hydraulic oil cooling line (arrows) and ensure it is free. Do not open hydraulic oil circuit.
- Remove upper radiator securing clips and take radiator out forward.



Vehicles with air conditioner

- Observe additional information and removal instructions ⇒ [Page 19-25](#) .

Installing

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

Vehicles with automatic transmission

- Check ATF level.

⇒ *Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37*



Continued for all vehicles

- Fill with coolant ⇒ [Page 19-18](#) .

For electrical connections and routing:

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

- Install front bumper.

⇒ [Repair Manual, Body Exterior, Repair Group 63](#)

- Check headlight alignment and adjust if necessary.

⇒ [Repair Manual, Maintenance](#)

Additional information and removal work on vehicles with air conditioner

WARNING!

The air conditioner refrigerant circuit must not be opened.

Note:

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

- Remove retaining clamp(s) from refrigerant lines.



- Remove condenser from radiator and pull forward as far as possible.
- Secure condenser to body so that refrigerant lines/hoses are not stressed.
- Pull radiator out between condenser and lock carrier.



Viscous fan coupling, removing and installing

Special tools and equipment

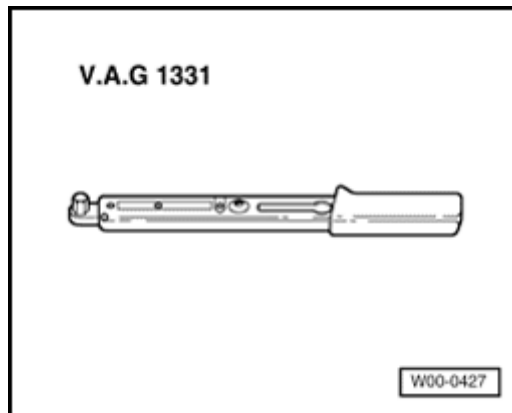
- ◆ VAG 1331 Torque wrench (5 to 50 Nm)
- ◆ Punch, 5 mm diameter

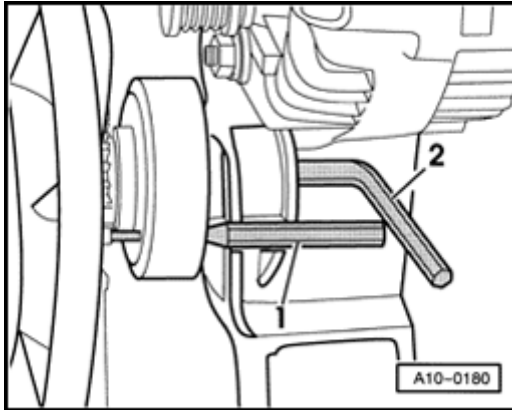
Removing

- Bring lock carrier into service position,

⇒ [Repair Manual, Body Exterior, Repair Group 50](#)

- Remove ribbed belt ⇒ [Page 13-14](#) .
- Remove fan from viscous fan coupling.



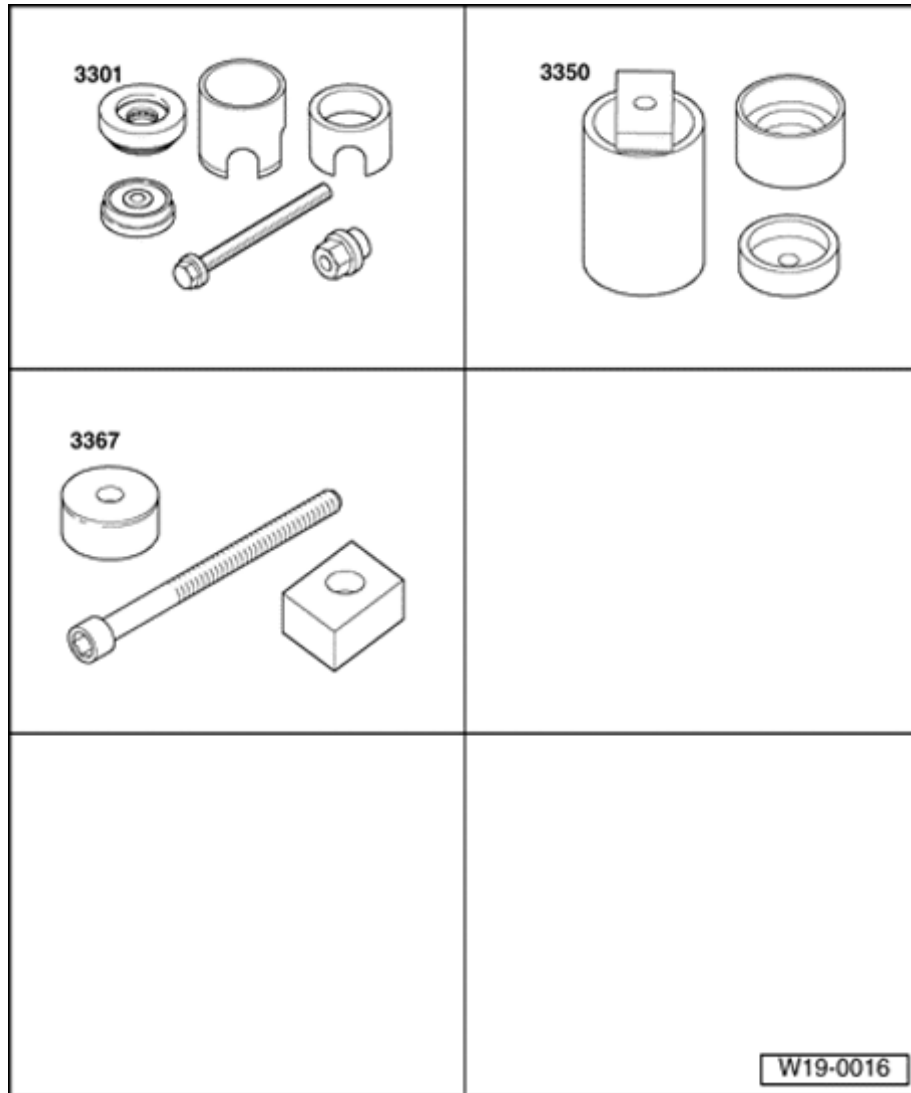
**A**

- Secure viscous fan coupling belt pulley with a punch (< 5 mm diameter) -1-.
- Remove viscous fan coupling securing bolt (with 8 mm hex key -2-) and remove viscous fan coupling with belt pulley.
- Remove belt pulley from viscous fan coupling.

Installing

Installation is the reverse of removal. Note the following:

- Tighten fan pulley to viscous fan coupling. Tightening torque: 30 Nm.
- Bolt viscous fan to compact bracket. Tightening torque: 45 Nm.
- Bolt fan to viscous fan coupling. Tightening torque: 10 Nm.
- Install ribbed belt ⇒ [Page 13-14](#) .



Viscous fan coupling bushing, removing and installing

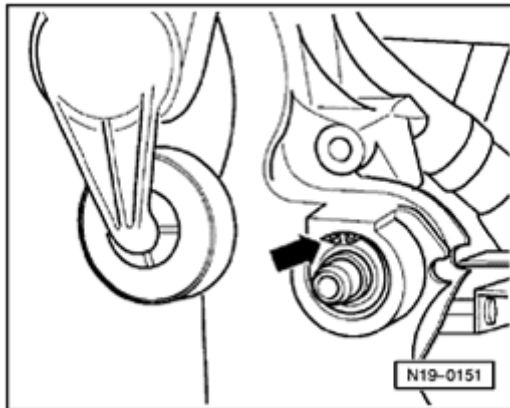
Special tools and equipment

- ◆ Hex nut from assembly device 3301
- ◆ Extractor tube from assembly device 3350
- ◆ Press tool for viscous fan coupling bushing 3367

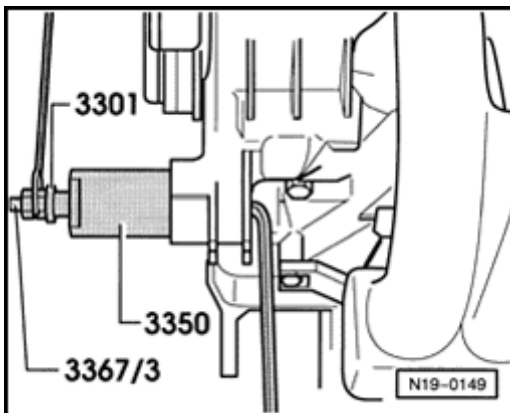


Removing

- Remove viscous fan coupling (with belt pulley)
⇒ [Page 19-27](#) .

**A**

- Remove bushing circlip (arrow).

**A**

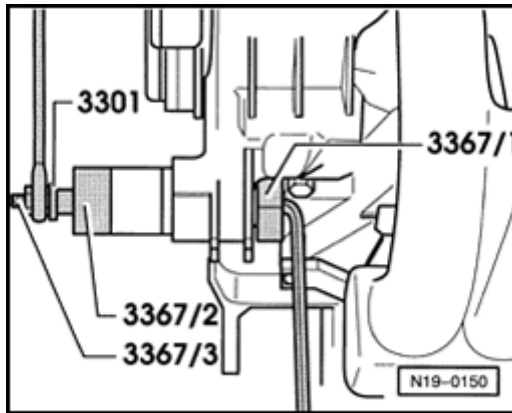
- Press bushing out of compact bracket with aid of socket head bolt 3367/3, extractor tube from assembly device 3350 and hex nut from assembly device 3301.



Installing

A

- Press bushing into compact bracket onto stop with aid of compensating pieces 3367/1, press piece 3367/2, hex socket head bolt 3367/3 and hex nut from assembly device 3301.
- Secure bushing with circlip after installation.
- Install viscous fan coupling ⇒ [Page 19-27](#) .





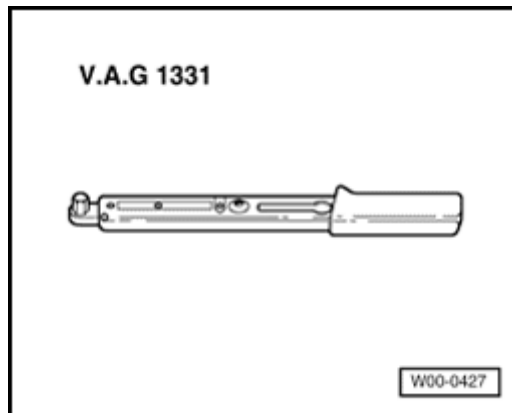
Engine coolant pump V-belt, removing and installing

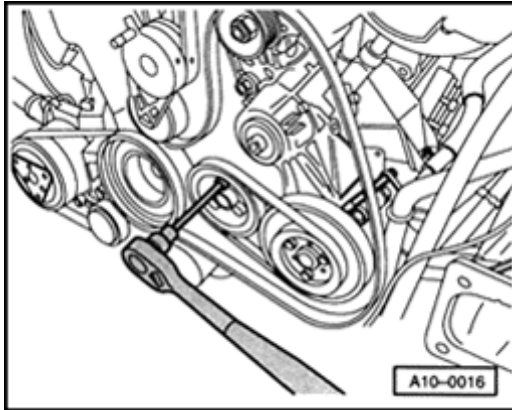
Special tools and equipment

- ◆ Punch
- ◆ VAG 1331 Torque wrench (5 to 50 Nm)

Removing

- Remove viscous fan coupling (with belt pulley) ⇒ [Page 19-27](#) .
- Mark installation position of 2-part coolant pump pulley.



**A**

- Secure power steering pump belt pulley with a drift.
- Unscrew coolant pump 2-part coolant pump pulley and remove V-belt.

Installing

- Install 2-part pulley on coolant pump and fit V-belt between coolant pump and power steering pump.
- Tighten belt pulley evenly until V-belt has moved outward to its running surface. If necessary turn power steering pump pulley or coolant pump slightly.
- Secure power steering pump pulley with drift.
- Tighten coolant pump pulley to 25 Nm.

Note:

It is not necessary to adjust V-belt tension.

- Install viscous fan coupling ⇒ [Page 19-27](#) .