

## Cooling system, components

### Note:

- ◆ Always replace gaskets and seals.
- ◆ Draining and filling system with coolant ⇒ [page 19-6](#).
- ◆ Testing cooling system for leaks ⇒ [page 19-11](#).

### 1 - Thermostat

- ◆ Replacing ⇒ [page 19-4](#)
- ◆ Opening and closing temperatures ⇒ [page 19-4](#)

### 2 - Seal

- ◆ Always replace

### 3 - Thermostat housing

4 - 10 Nm (7 ft lb)

### 5 - Gasket

- ◆ Always replace

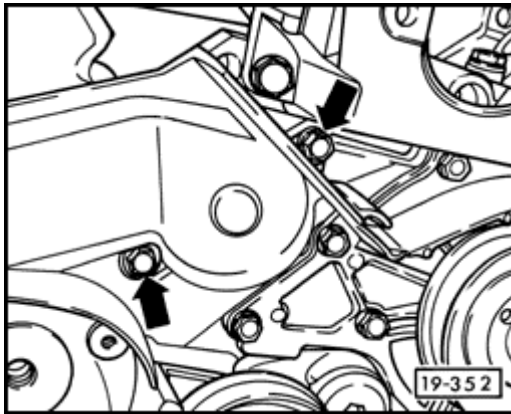
### 6 - Coolant pump

- ◆ To remove and install, remove ribbed drive belt ( ⇒ [page 13-9](#) ) and toothed belt ( ⇒ [page 13-11](#) )

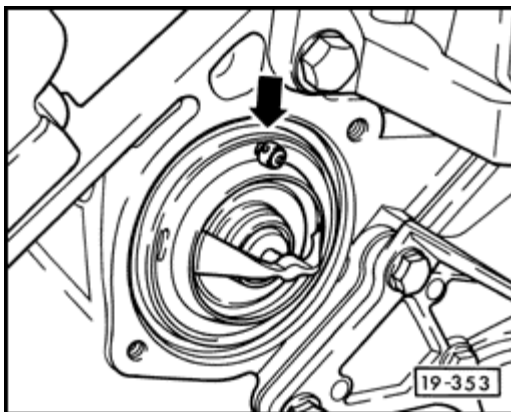
7 - 10 Nm (7 ft lb)

## Thermostat, replacing

- Remove ribbed belt ⇒ [page 13-9](#) .
- Adjusting tension of toothed belt ⇒ [page 13-13](#) .



- A** - Unbolt thermostat housing and pull out from below toothed belt.



- A** Installation position of thermostat. The vent valve must be installed facing up (arrow).
  - ◆ Starts to open at approx. 87 ° C (189 ° F)
  - ◆ End of opening approx. 102 ° C (216 ° F)
  - ◆ Stroke: 8.0 mm (5/16 in.)

### Coolant fan control thermal switch, checking

The coolant fan control thermal switch -F54- is located in the lower left part of the radiator.

Terminal assignment		Switching temperature	
3-pin connector			
	On	Off	
1 =	1st stage	92° - 97° C (198° - 207° F)	approx. 84° C (183° F)
2 =	2nd stage	99° - 105° C (210° - 221° F)	approx. 91° C (196° F)
3 =	Battery positive voltage (B+)		

## Cooling system, draining and filling

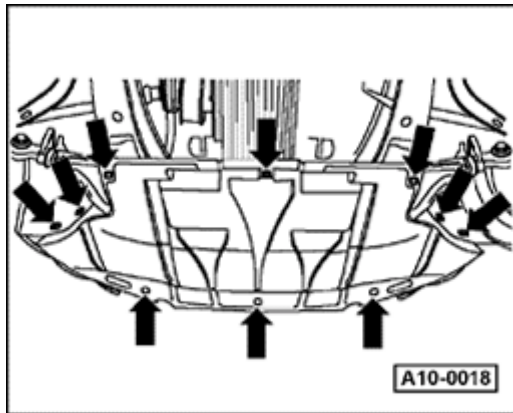
### Note:

- ◆ *The cooling system is filled year round with a mixture of water and anti-freeze and anti-corrosion agent G 011 A8C.*
- ◆ *G 011 A8C and coolant additives marked with "conforming to TLVW 774 C" prevents freezing, corrosion damage and scale formation, and raises the coolant boiling point. For these reasons the cooling system must always be filled year-round with G 011 A8C anti-freeze and anti-corrosion agent.*
- ◆ *Due to its high boiling point, coolant is an aid to operational efficiency when the engine is operating at full load, particularly in tropical climates.*
- ◆ *Coolant must be drained and replaced if either the radiator, heater core, cylinder head or cylinder head gasket have been replaced.*
- ◆ *Capacity: approx. 8.5 liters (9 qt.)*

### Draining

### **WARNING!**

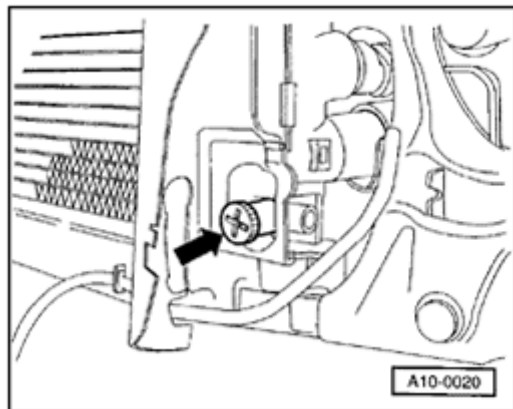
***The cooling system is pressurized when the engine is warm. Wear gloves and other appropriate protection, and slowly and carefully release system pressure, if necessary, before performing repairs.***



- Open the cap on the coolant expansion tank.

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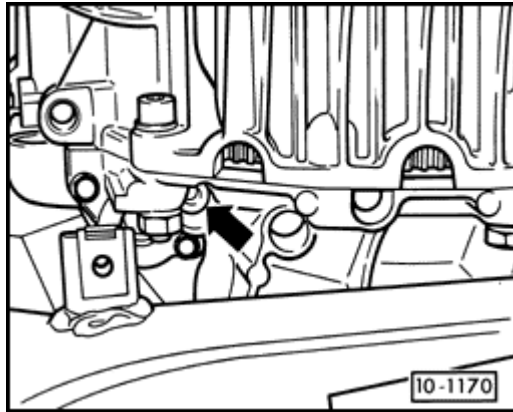
- Remove noise insulation panel below engine.



- Drain coolant at radiator.

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- Remove locking plate for connection flange of coolant hose at bottom of radiator, pull off connection flange.



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- Using special tool 3247, drain coolant from engine drain plug (arrow) and at drain plug on bottom left of radiator.

### Filling

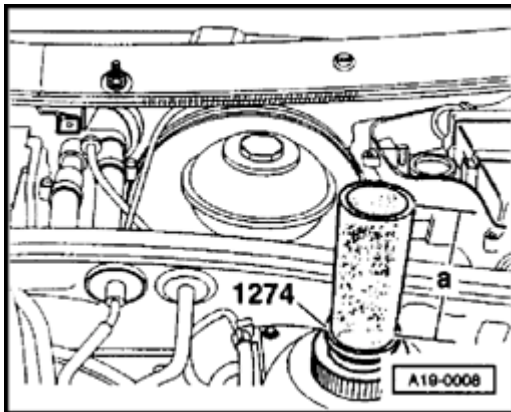
Recommended mixing ratios:

Anti-freeze protection down to:	Anti-freeze concentration <sup>1)</sup>	G 11 <sup>2)</sup>	Water <sup>2)</sup>
-25 ° C (-13 ° F)	40%	2.5 liter (2.6 qt.)	3.5 liter (3.7 qt.)
-35 ° C (-31 ° F)	50%	3.0 liter (3.2 qt.)	3.0 liter (3.2 qt.)

1) Do not exceed an antifreeze concentration of 60%; antifreeze protection and cooling efficiency are reduced if the concentration is higher.

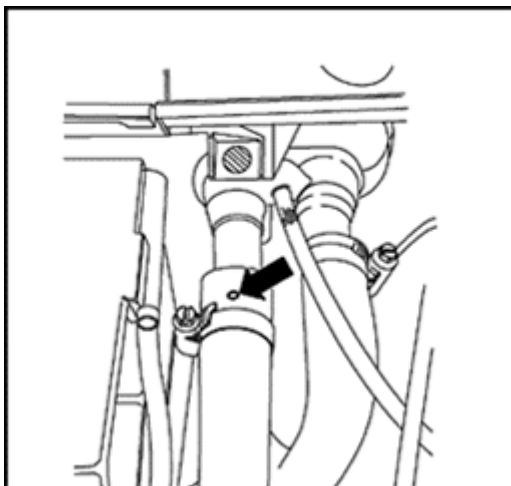
2) The quantity of coolant may differ depending on specific equipment installed in the vehicle.

- Close drain plug at engine block and at bottom left of radiator.
- Push on connection flange of coolant hose at bottom of radiator, and install locking element for connection flange.



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- Unscrew cap on expansion tank, screw on adapter VAG 1274/1, and extend with 42mm diameter and 100 mm long auxiliary hose.



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- Open hose clamp, pull back coolant hose sufficiently so that vent hole is no longer concealed by connection.
- Open bleed screw at coolant pipe below expansion tank.
- Pour coolant into system until it flows out at bleeder hole, then tighten screw to 15 Nm (11 ft lb).
- Pour in more coolant until it flows out at vent hole, then push on coolant hose and tighten.
- Close cap on expansion tank and set heater controls to hot position.
- Start engine and run at about 2000 RPM for about 3 minutes.



- Continue running engine at idle until radiator becomes hot at the bottom connection.

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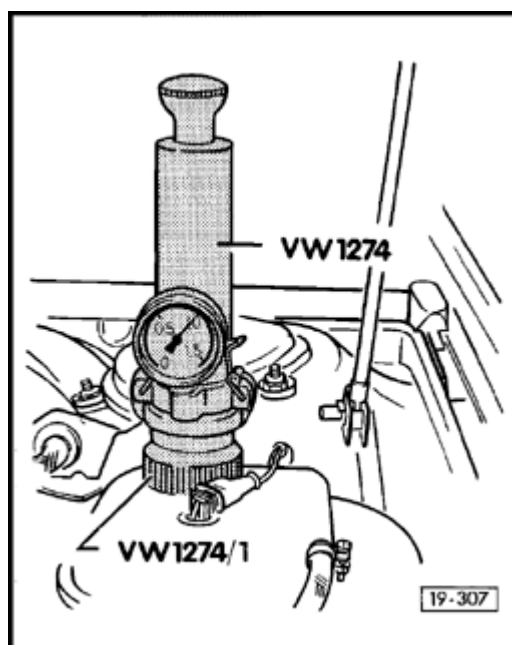
- Check coolant level in expansion tank and top up if necessary.
- Stop engine (switch ignition off).

## Cooling system leaks, checking

### **WARNING!**

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- Engine must be at operating temperature



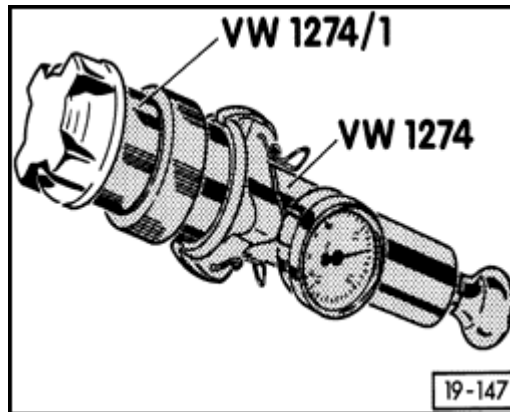
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- Connect cooling system tester VW 1274 to expansion tank using adapter VW 1274/1.
- Operate hand pump on tester to create a pressure of approx. 1 bar (15 psi).

If the pressure drops:

- Locate and repair leak in the cooling system.

### Expansion tank cap, pressure testing



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- Screw cap onto cooling system tester VW 1274 with adapter VW 1274/1.
- Operate hand pump to build pressure.
- Pressure relief valve must open at 1.2-1.5 bar (17-22 psi).