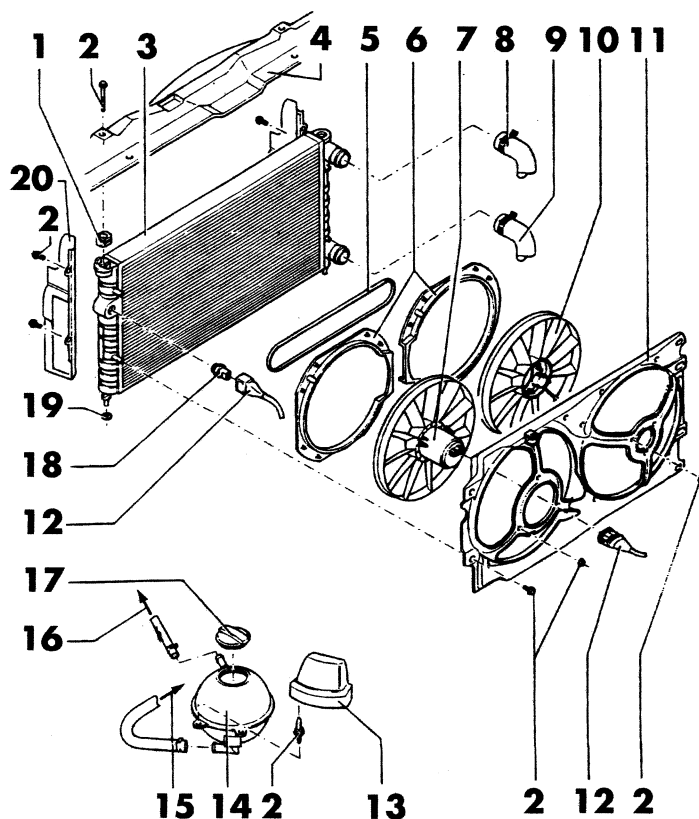


COOLING SYSTEM: EXPLODED VIEW

In case of repair, the steel strip clamps may be replaced with bolt clamps.
For fitting the steel strip clamps, the tool **U-10095** is recommended.
Replace gaskets and O-rings.

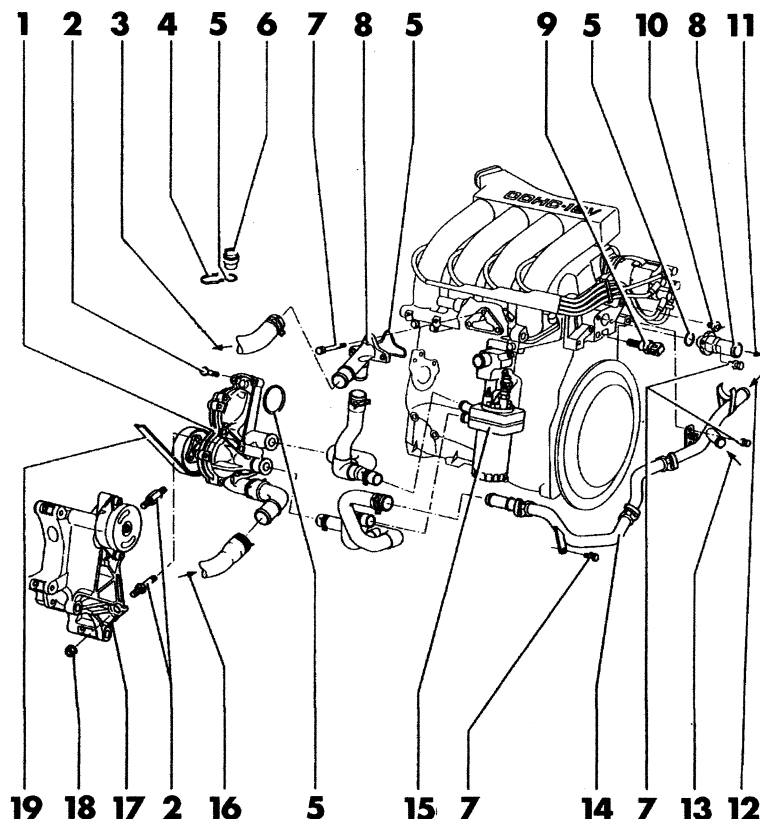


19BD17

- | | |
|---|--|
| <p>1. Fixing block.</p> <p>2. 10 Nm.</p> <p>3. Radiator.</p> <p>4. Lock holder crossmember.</p> <p>5. V belt.</p> <p>6. Fan ring.</p> <p>7. Fan.</p> <p>8. Upper hose.</p> <p>9. Lower hose.</p> <p>10. Additional fan.</p> | <p>11. Fan baffle.</p> <p>12. Connector.</p> <p>13. Cover.</p> <p>14. Expansion tank.</p> <p>15. To the cooling liquid pipe.</p> <p>16. To the radiator upper hose.</p> <p>17. Expansion tank cap.</p> <p>18. Fan control thermoswitch. 35 Nm.</p> <p>19. Rubber gasket.</p> <p>20. Fan.</p> |
|---|--|
- Removal and replacement.
- According to model.
- Note the mounting position.
- To the cooling liquid distributor.
- o the cooling liquid pump.
- According to model.
- Check watertightness with the equipment **VAG 1274** and the adaptor **VAG 1274/3**.
- Check the valve using the equipment **VAG 1274** and the adaptor **VAG 1274/4**.
- Check.

COOLING SYSTEM: EXPLODED VIEW

In case of repair, the steel strip clamps may be replaced with bolt clamps.
For fitting the steel strip clamps, the tool **U-10095** is recommended.
Replace gaskets and O-rings.

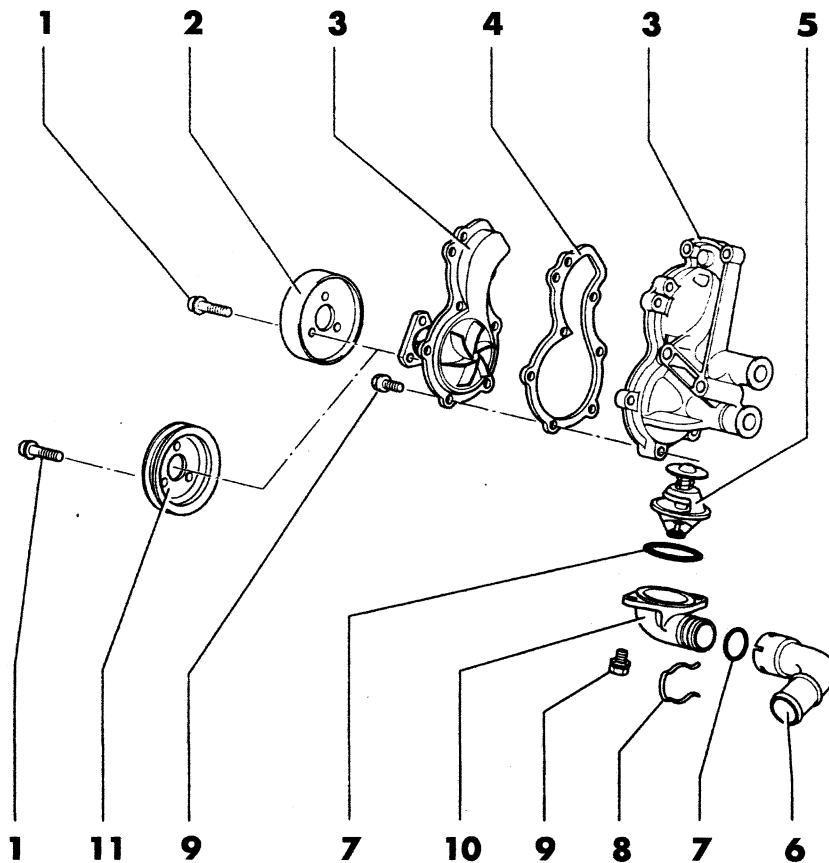


19AD12

- | | |
|--|--|
| <p>1. Cooling liquid pump.
Check that the operation is smooth.
Cannot be repaired.</p> <p>2. 20 Nm + 90°.
Replace.</p> <p>3. To the radiator upper hose.</p> <p>4. Fixing clamp.</p> <p>5. O-ring.
Replace.</p> <p>6. Thermo-switch for controlling third speed of electric fan.
Models with air conditioning only.
The thermal switch is located in the coolant distributor (pos. 8).</p> | <p>7. 10 Nm.</p> <p>8. Cooling liquid distributor.</p> <p>9. Cooling liquid temperature transmitter. 10 Nm.</p> <p>10. Transmitter for coolant liquid temperature gauge. 10 Nm.</p> <p>11. To the heater.</p> <p>12. To the heater.</p> <p>13. To the expansion tank.</p> <p>14. Cooling liquid pipe.</p> <p>15. Oil cooler.</p> <p>16. To the radiator lower hose.</p> <p>17. Support.</p> <p>18. 30 Nm.</p> <p>19. Trapezoid and Poly-V belt.</p> |
|--|--|

COOLING SYSTEM PUMP: EXPLODED VIEW

In case of repair, the steel strip clamps may be replaced with bolt clamps.
For fitting the steel strip clamps, the tool **U-10095** is recommended.
Replace gaskets and O-rings.



19BD11

- | | |
|---|--|
| 1. 20 Nm. | 6. Cooling liquid hose. |
| 2. Cooling liquid pump pulley.
Version with Poly-V belt. | 7. O-ring.
Replace. |
| 3. Cooling liquid pump.
Check that the operation is smooth.
Cannot be repaired. | 8. Fixing clamp. |
| 4. Gasket.
Replace. | 9. 10 Nm. |
| 5. Thermostat.
Check. | 10. Thermostat cover. |
| | 11. Cooling liquid pump pulley.
Models with trapezoidal belt. |

Engine 19

Cooling: 2.0 l 16 V engine

COOLING LIQUID

Draining and refilling

The cooling system is supplied with a mixture of water and the anti-freeze and rustproof product **G11** or **G12**.

This product, along with the anti-freeze additives with the indication:

- “according to **TL-VW 774 B**” in the case of the **G11**.
- “according to **TL-VW 774 D**” in the case of the **G12**.

Note

Bear in mind the indications in the section “operations to be performed depending on the type of vehicle-equipped anti-freeze additive” (see table of contents).

The above additives prevent deterioration due to freezing, rust or lime sediments, as well as raising the boiling temperature of the coolant.

Because of that, the cooling system must at all moments be filled with the specified mixture of anti-freezing and anti-rust compound.

In particular, in tropical climate countries, the anti-freezing compound, because of the high boiling point it gives to the mixture, helps to guarantee a reliable operation when the engine is under high loads.

Recommended mixture ratio

Cover	Anti-freeze additive	Water
- 25 °C	40 %	60 %
- 35 °C	50 %	50 %

The refilling amount for the cooling system is 5.5 l approximately, but may vary according to the car equipment.

The antifreezing ratio must not exceed 60 %, higher ratios result in a decrease in the cooling power and anti-freeze protection.

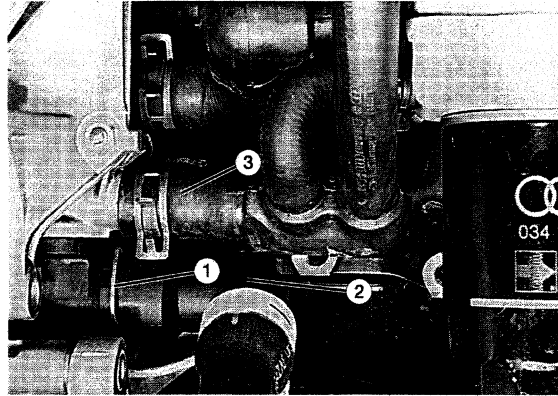
The cooling liquid must be change whenever the cylinder head, cylinder head gasket, radiator or the complete engine are replaced.

Note

The cooling system is under pressure when the engine is hot. Before attempting any repair to the system, let the pressure to come down.

Draining

Remove the expansion tank cap.



19B020

Drain the coolant liquid by removing the safety clip “1”, removing the hose “2” and the flexible tube “3”; use the **U-10095** tool to remove the clips. (Raise the vehicle and separate the lower engine unit if necessary.)

Refilling

Slowly fill the cooling system with coolant liquid up to the “MAX” mark on the expansion reservoir.

Run the engine for 2 minutes at about 1500 rpm, while adding coolant liquid until the level reaches the overflow hole in the expansion reservoir.

Mount the cap and start up the engine, keeping it running until the radiator fan is started.

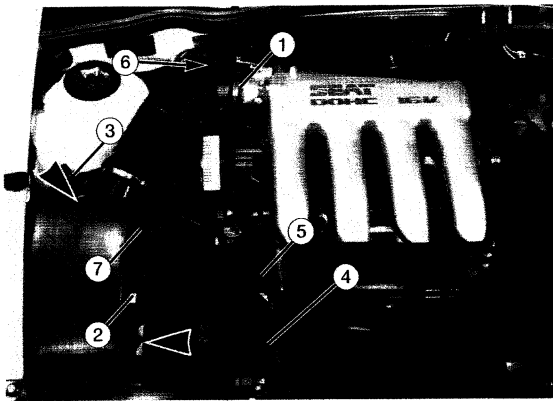
Check the coolant liquid level and top up if necessary once the pressure has dropped.

With the engine at the working temperature, the liquid level must be slightly above the mark “MAX”.

When the engine is cold, the liquid level must be between the marks “MIN” and “MAX”.

COOLING LIQUID PUMP Removal and refitting

Removal

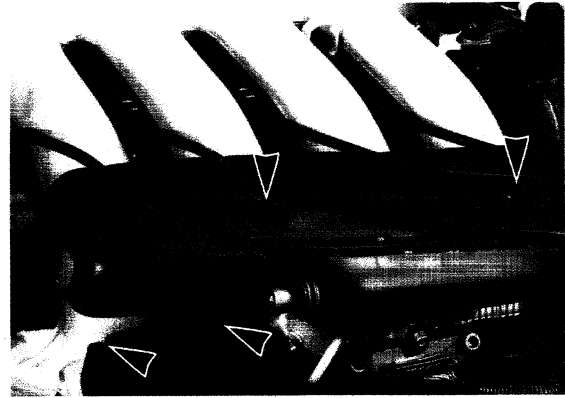


10B113

Remove the following items from the air filter/inlet tube assembly:

1. Junction clip between inlet tube and inlet manifold.
2. Suction take-off from its fixing to the inlet air thermo-regulator.
3. Inlet air temperature transmitter connector.
4. Sump gasses ventilation tube from its fixing to the pressure regulating valve.
5. Idling stabilizer valve tube from its fixing to the valve.
6. Hot air tube from its fixing to the exhaust manifold heat shield.
7. Tube for inlet air silencer from its fixture to the air filter set.

Remove the O-rings which connect the air filter assembly to the bodywork and remove the filter.



19B032

Remove the spark plug cable cover fixing bolts and partially remove the cover until the pressure regulating valve bolts can be removed. Move the valve to one side without disconnecting the sump gasses outlet tube.



10B005

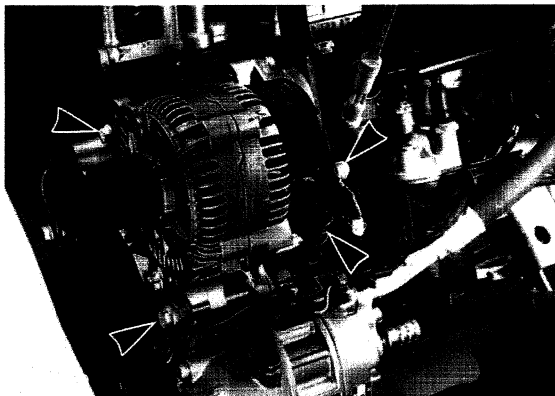
Separate belt Poly-V using the corresponding tool:

- Models with tensioning roller **U-40010.**
- Models without tensioning roller **U-40050.**

Mark the direction of rotation on the belt, before removing it; the mark must be taken into account when refitting.

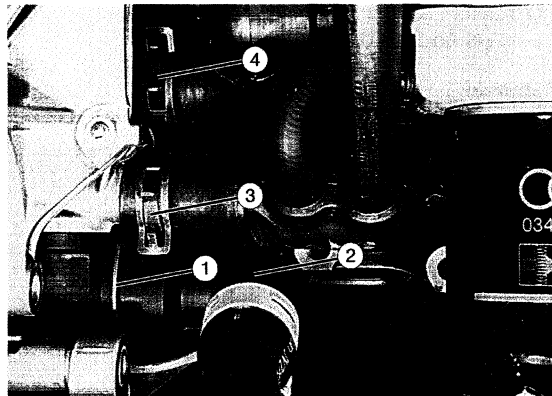
Engine 19

Cooling: 2.0 I 16 V engine



10B006

Remove the bolts fixing the alternator to the support.
Partially detach the alternator; to do this, disconnecting the electrical cables is not required.

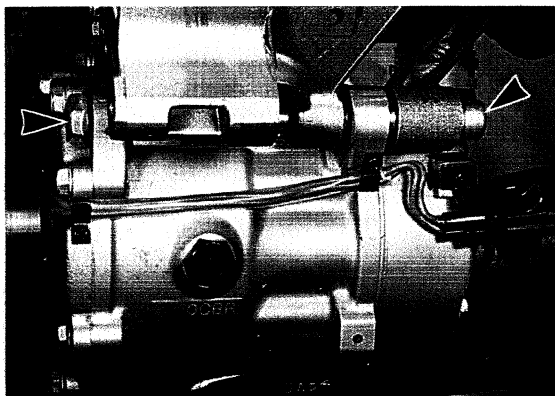


19B024

Remove the expansion tank cap.

Raise the vehicle and drain the coolant liquid by removing the safety clip "1" and the hose "2", then remove the flexible tubes "3" and "4", using the **U-10095** tool to remove the clips.

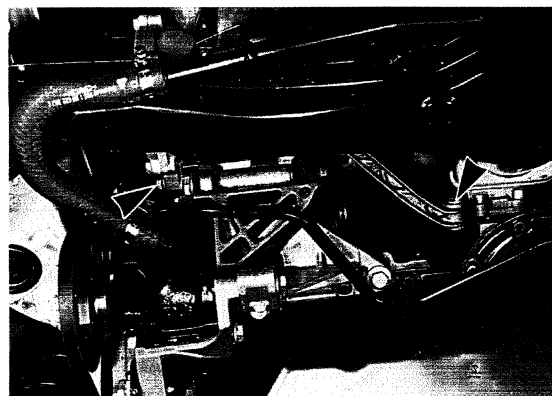
Separate lower protector from the propulsion engine set if necessary.



19B023

(Versions fitted with air conditioning.)

Remove the bolts which hold the air conditioning compressor to the brackets.



19B025

(Versions fitted with air conditioning.)

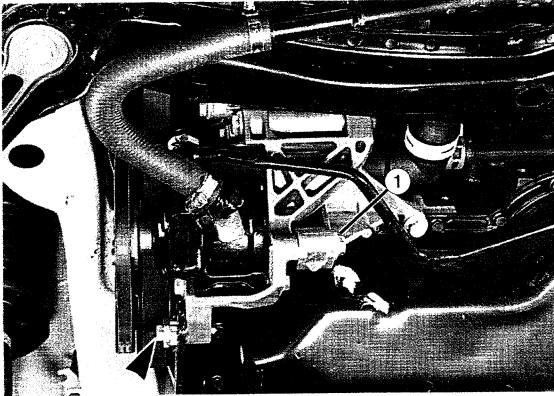
Remove the bolts fixing the air conditioning compressor to the support and partially detach the compressor without stressing the pipes.

Note

Opening the air conditioning system is not required.

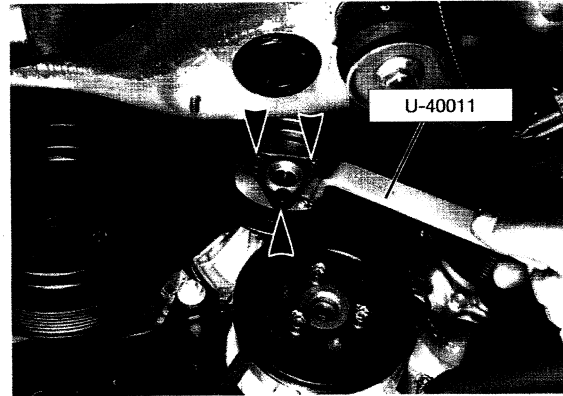
Engine 19

Cooling: 2.0 I 16 V engine



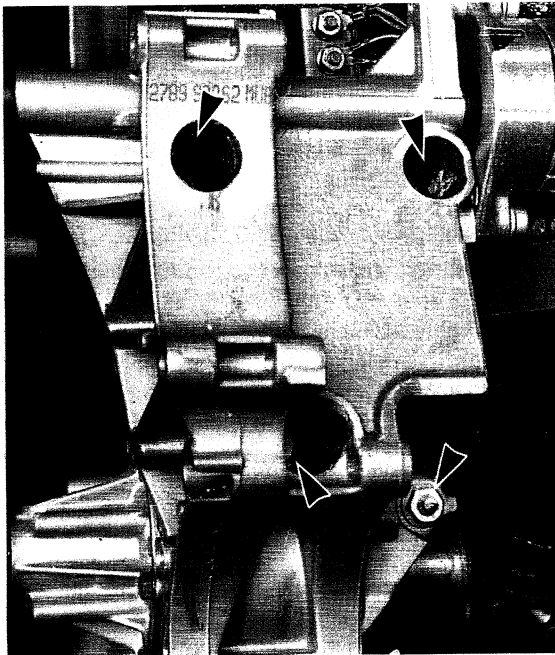
48B016

Raise the vehicle and remove the power steering drive belt. To do this, the fixing bolt "1" and the tensioning nut bolt must be loosened.



19B028

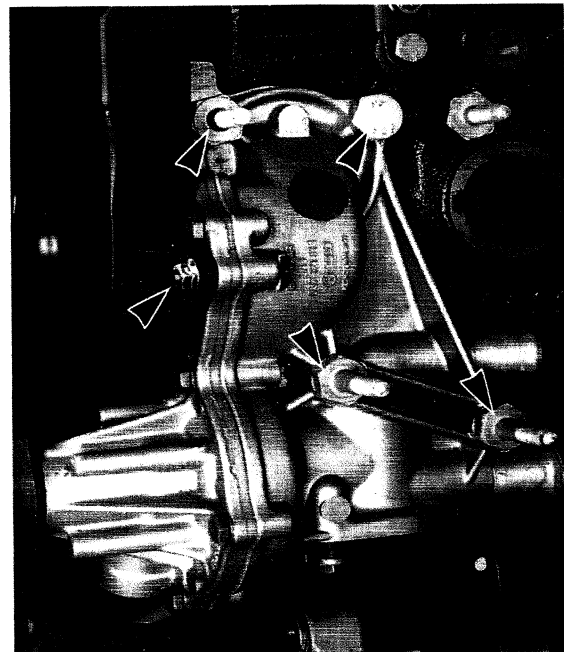
Only when the pump is to be replaced, remove the pulley mounted on the engine using the **U-40011** tool.



19B001

Remove the support fixing bolts and nuts and remove the support.

(A bolt on the underside of the bracket must be removed; this is not shown in the photograph.)

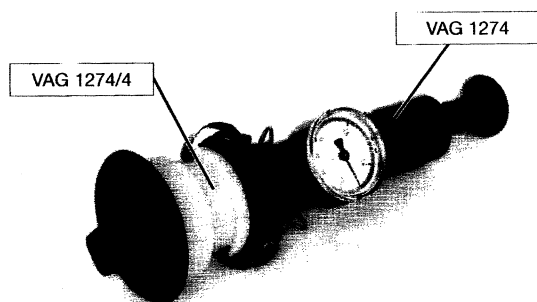


19B002

Remove the threaded studs for fixing the pump to the cylinder block and the hammer head bolt fixing the pump to the guard.

Remove the cooling liquid pump.

EXPANSION TANK CAP
Checking



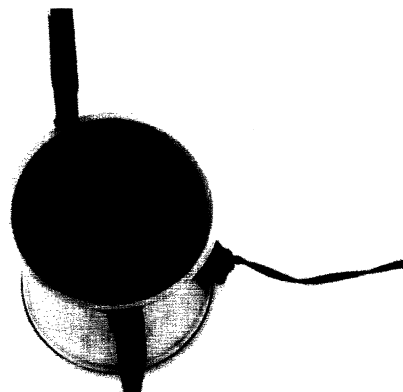
19A006

Place the cap on the equipment **VAG 1274** using the adaptor **VAG 1274/4** and operate the equipment manual pump until the pressure reaches **1.4 ÷ 1.6 bar**.

When the pressure reaches the above value, the cap safety valve must open.

Otherwise, replace the cap.

THERMOSTAT
Checking



19A007

Heat the thermostat by dipping it into a container with hot cooling liquid and control the water temperature with a thermometer.

The valve must start opening when the temperature is about **85 °C**.

Continue heating the liquid and check that the valve is fully open (minimum stroke **7 mm**) when the liquid temperature is about **105 °C**.

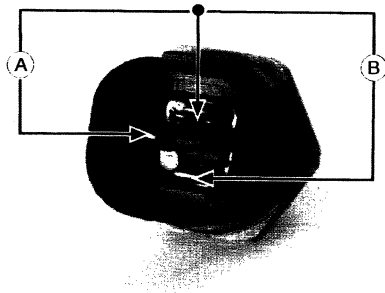
The thermostat is located at the bottom of the cooling liquid pump.

FAN CONTROL THERMOSWITCH Checking

Dip the thermoswitch heat sensitive area in a container with cooling liquid.

Heat the cooling liquid and, using a thermometer, check the cut-in/cut-off temperatures for the electrical fan 1st and 2nd speeds.

This checking may be carried out using the digital tester **VAG 1526** (continuity checking model) and the auxiliary cables **VAG 1594 A**.



19D006

Connect the tester to the contacts marked "A" on the drawing (1st speed) and check that when the temperature reaches $92 \div 97^\circ\text{C}$, the circuit closes and when the temperature comes down below $91 \div 84^\circ\text{C}$, the circuit opens again.

Then connect the tester to the contacts marked "B" on the drawing (2nd speed) and check that when the temperature reaches $99 \div 105^\circ\text{C}$, the circuit closes and when the temperature comes down below $98 \div 91^\circ\text{C}$, the circuit opens again.

Otherwise, replace the thermoswitch.

ELECTRIC FAN 3rd SPEED THERMAL CONTROL SWITCH Checking

(Models with air conditioning only)

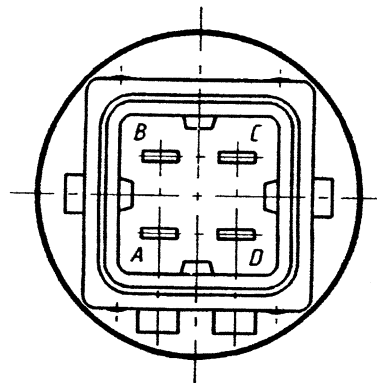
The thermal switch controlling the third speed of the electric fan is located in the cylinder head coolant distributor tube.

Remove the thermal switch from the vehicle.

Dip the thermoswitch heat sensitive area in a container with cooling liquid.

Heat the cooling liquid and, using a thermometer, check the cut-in/cut-off temperatures for the electrical fan 3rd speed.

This checking may be carried out using the digital tester **VAG 1526** (continuity checking model) and the auxiliary cables **VAG 1594 A**.



19AD11

Connect a multi-meter between contacts "A" and "C" and check that when a temperature of $110 \div 115^\circ\text{C}$ is reached the circuit closes (switches on) and when the temperature drops below $105 \div 110^\circ\text{C}$ the circuit re-opens (switches off).

Otherwise, replace the thermoswitch.

ELECTRICAL FAN-RADIATOR ASSEMBLY
Removal and refitting

Removal (versions without air conditioning)

To remove the electrical fan-radiator assembly, the following is required:

- Disconnect the battery negative lead.
- Remove the cooling liquid tank cap.
- Partially remove the cover from the spark plug cable and the sump gases pressure regulating valve (it is not necessary to remove the gases vent tube).
- Disconnect the hoses from the radiator. (Raise the vehicle and separate the lower guard from the motor-propulsion assembly if necessary.)
- Remove the bolts fixing the fan baffle to the radiator and remove the baffle together with the fan.
- Loosen the two radiator fixing bolts on the lock holding crossmember.
- Remove the radiator from the vehicle.

Refitting

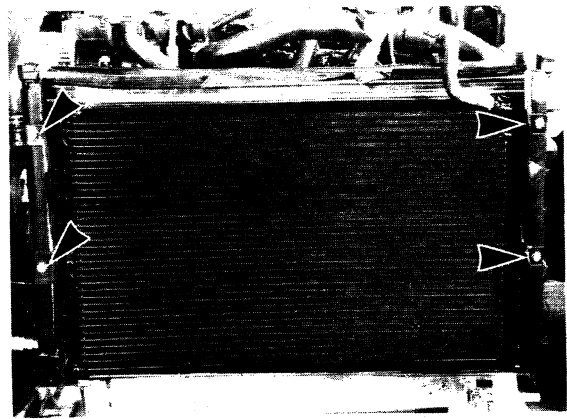
To reassemble, reverse the above operations taking the following into account:

Refill the cooling system with cooling liquid. Bear in mind the indications in the section **"operations to be performed depending on the type of vehicle-equipped anti-freeze additive"**.

Removal (versions with air conditioning)

To remove the electrical fan-radiator assembly, the following is required:

- Disconnect the battery negative lead.
- Remove the cooling liquid tank cap.
- Disconnect the hoses from the radiator. (Raise the vehicle and separate the lower guard from the motor-propulsion assembly if necessary.)
- Remove the front panel as described in the Repair Group 51.



10B116

Remove electrical connections from the electrical fan-radiator assembly.

Detach the radiator from the condenser and remove the electrical fan-radiator assembly from the vehicle.

After removing the radiator, fix the condenser without stressing or bending the air conditioning system pipes.

Refitting

To reassemble, reverse the above operations taking the following into account:

Refill the cooling system with cooling liquid. Bear in mind the indications in the section **"operations to be performed depending on the type of vehicle-equipped anti-freeze additive"**.

Check and, if necessary, adjust the headlamp alignment.

ELECTRICAL FAN-RADIATOR ASSEMBLY
Removal and refitting

Removal (versions without air conditioning)

To remove the electrical fan-radiator assembly, the following is required:

- Disconnect the battery negative lead.
- Remove the cooling liquid tank cap.
- Partially remove the cover from the spark plug cable and the sump gases pressure regulating valve (it is not necessary to remove the gases vent tube).
- Disconnect the hoses from the radiator. (Raise the vehicle and separate the lower guard from the motor-propulsion assembly if necessary.)
- Remove the bolts fixing the fan baffle to the radiator and remove the baffle together with the fan.
- Loosen the two radiator fixing bolts on the lock holding crossmember.
- Remove the radiator from the vehicle.

Refitting

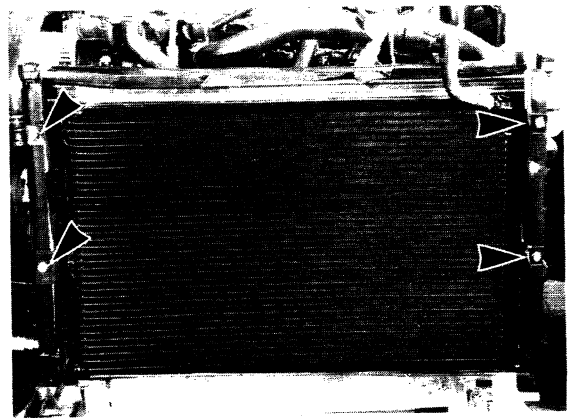
To reassemble, reverse the above operations taking the following into account:

Refill the cooling system with cooling liquid. Bear in mind the indications in the section **"operations to be performed depending on the type of vehicle-equipped anti-freeze additive"**.

Removal (versions with air conditioning)

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Refill the cooling system with cooling liquid. Bear in mind the indications in the section **"operations to be performed depending on the type of vehicle-equipped anti-freeze additive"**.

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