Index

4-cylinder

5-cylinder

Coupe

CAUTION

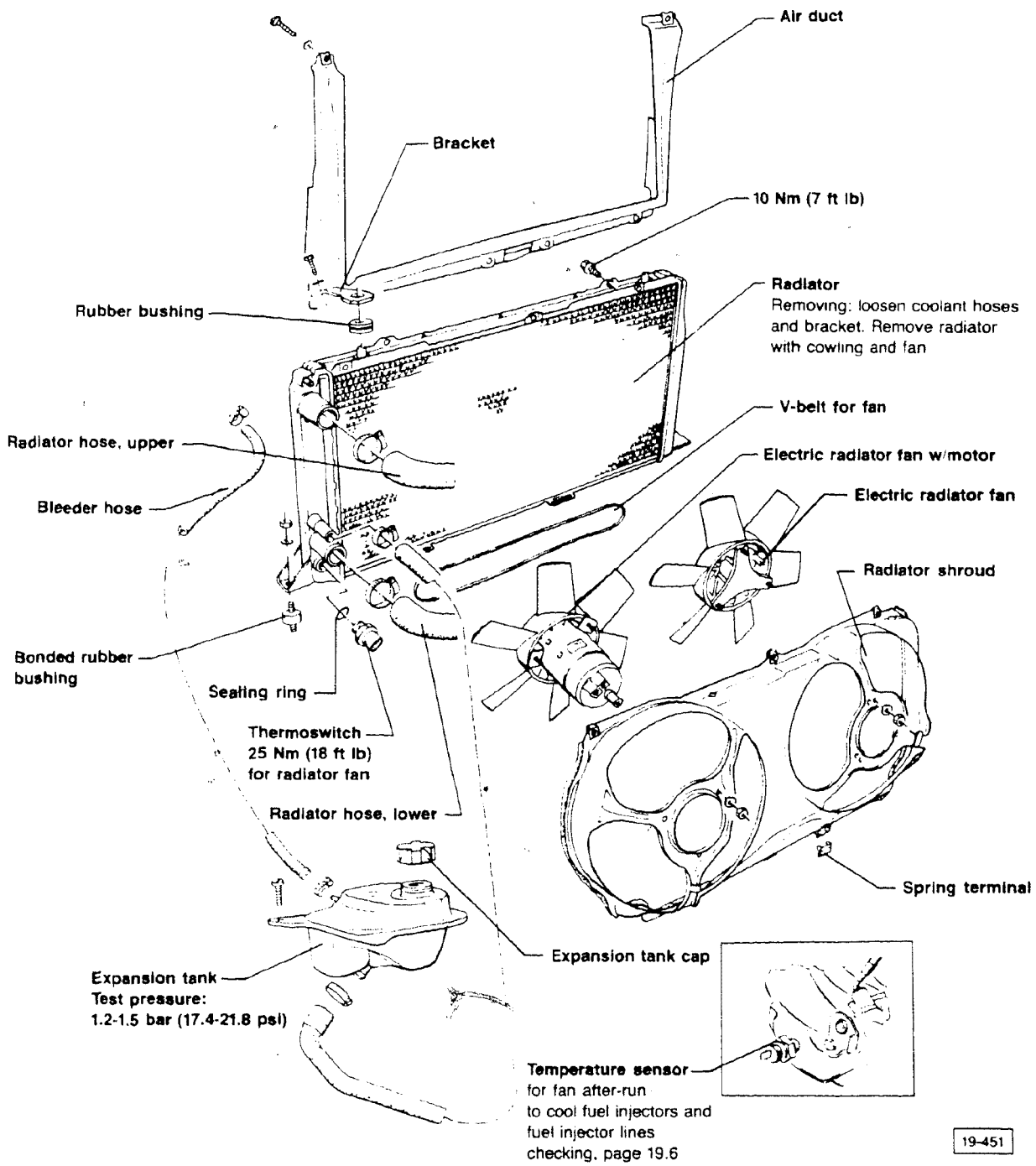
Always replace gaskets and seals.
Always secure hoses with hose clamps.

CAUTION

Coolant/antifreeze **must not** be reused when replacing engine, cylinder head, cylinder head gasket, radiator and heater core.

Note

Perform cooling system checking with Snap-On* **SVT 362** and **US 4467**



CAUTION

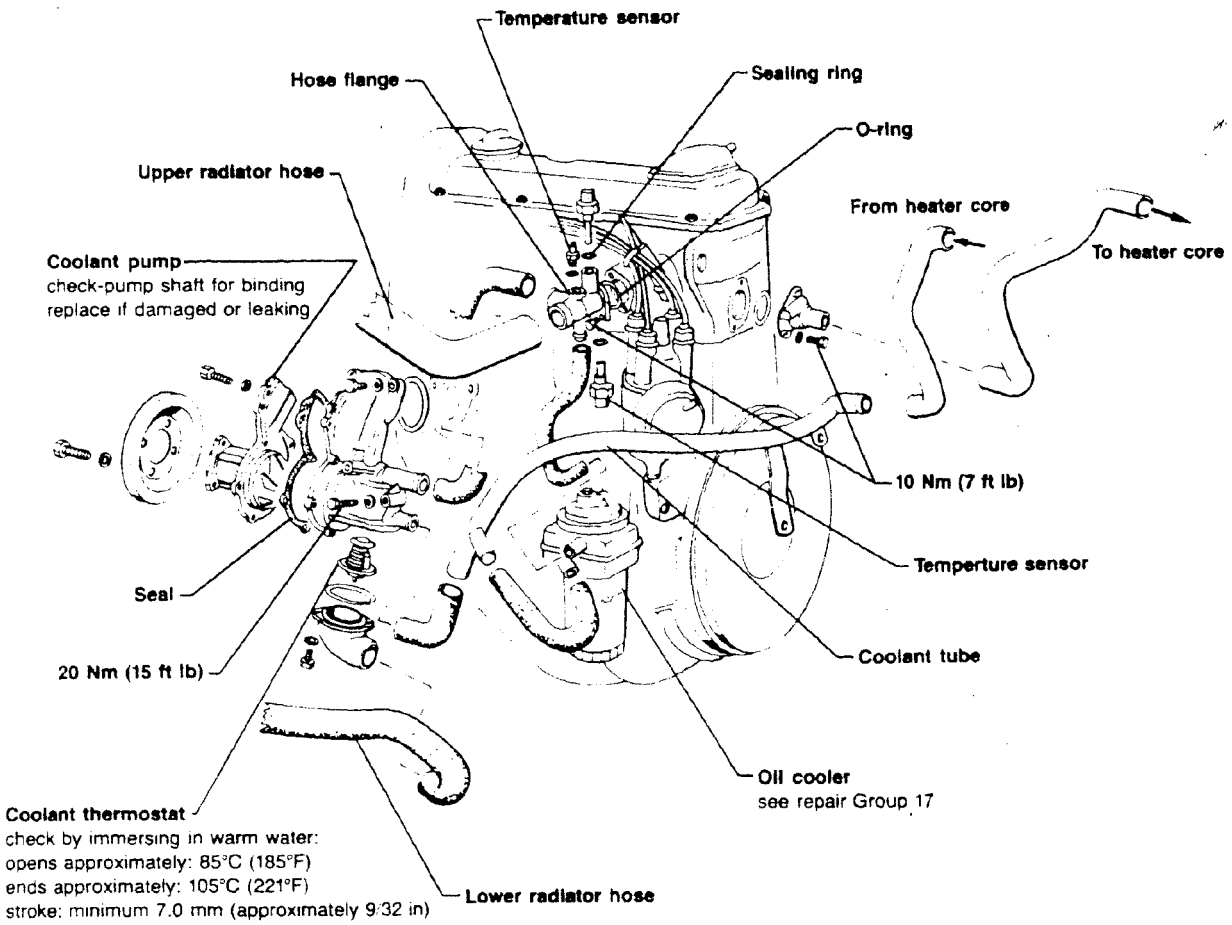
Always replace gaskets and seals. Always secure hoses with hose clamps.

CAUTION

If engine is internally damaged and as a result large quantities of metal shavings are found in the engine oil, oil passages must be cleaned and the oil filter, oil cooler replaced.

Note

Components shown can be removed/installed with engine in vehicle.



19-435

CAUTION

Coolant antifreeze **must not** be reused when replacing engine, cylinder head, cylinder head gasket, radiator and heater core.

CAUTION

Part numbers are for reference only. Always check with your Parts Department for latest information.

Cooling system, draining/refilling

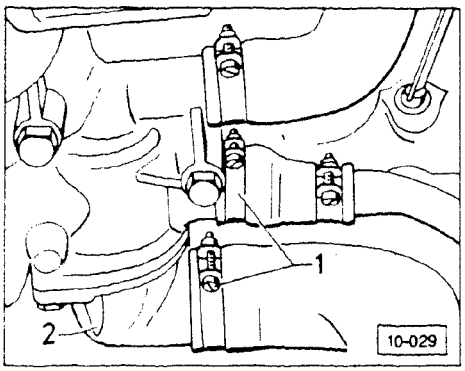
The cooling systems of **all** Audi vehicles are filled at the factory with a mixture of water and an antifreeze solution (G 11) with corrosion inhibitors. This coolant mixture should be used year-round.

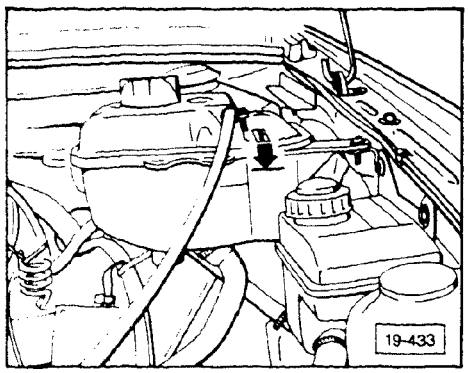
Phosphate-free antifreeze prevents frost and corrosion damage, the formation of chalk and in addition, it raises the boiling point of water. Due to the higher boiling point the coolant is an aid to operational efficiency, when the engine is operating under full load, particularly in tropical climates.

When replacing coolant/antifreeze solution in all Audi models, all model years, use phosphate-free coolant/antifreeze ZVW237 102.

Recommended mixtures

Protection	Anti-freeze	Water
–25°C (–13°F)	2.8L (3.0 qts)	4.2L (4.5 qts)
–35°C (–31°F)	3.5L (3.7 qts)	3.5L (3.7 qts)





Draining

- set heater control to **warm**
- remove expansion tank cap
- drain coolant either at coolant hoses **1**, or thermostat flange **2**

Refilling

- reinstall and secure all hoses
- fill expansion tank with coolant to **maximum** mark
- reinstall expansion tank cap
- run engine until electric fan comes on
- check coolant level, and top up as necessary

Note

When the engine is at normal operating temperature, coolant level in expansion tank should be slightly above the **maximum** mark. When engine is cold, the coolant level should be between **minimum** and **maximum** marks.

WARNING

Never touch the radiator fan blades.
They will rotate spontaneously when the time relay turns the fan on. Heat in engine compartment may cause repeat of this cycle more than once after the ignition is turned off.

Radiator cooling fan timed run-on

Vehicles are now equipped with a radiator cooling fan timed run-on system to cool fuel lines and injectors after the engine is turned off to improve hot start characteristics.

How the system works

When the underhood temperature is higher than 110°C (230°F) after the ignition is turned off, the thermo switch will trigger the time relay to switch on the radiator cooling fan.

When the temperature falls below 103°C (217°F) the relay will turn off the radiator cooling fan. This cycle will repeat once or more for maximum of 10-12 minutes.

Components

Thermo switch

Mounted on bracket on cylinder head (injector side) between cylinders one and two.

Time relay

After thermo switch is grounded, operate radiator fan at first speed for 10-12 minutes after ignition is turned off.

Radiator fan thermoswitch, switching values

Switch	Cut in/out temperatures	
	in	out
three cavity B+		
first speed	92-97°C (198-207°F)	84-91°C (175-196°F)
second speed	99-105°C (210-221°F)	91-98°C (196-208°F)

Troubleshooting

Time relay

Located on auxiliary relay carrier, under left side of instrument panel.

- switch ignition on and off
- connect thermo switch wire to ground. Make sure fan runs on first speed

Note

Because the time relay is only operational for 10-12 minutes after the ignition is turned off, testing must be done within this time period.

Thermo switch

ON = Grounded when engine compartment temperature is over 110°C (230°F)

OFF = **NOT** grounded when engine compartment temperature is below 103°C (217°F)

Electrical wiring

For electrical troubleshooting see applicable wiring diagram.

Antifreeze hydrometer, checking

Calibration of hydrometer must be checked frequently to ensure accuracy.

- mix a 50/50 mixture of antifreeze and water together in a small container
- hydrometer should read −35°C (−30°F)
  - if not, put a mark (paint dot) to indicate where −35°C (°30°F) should be.

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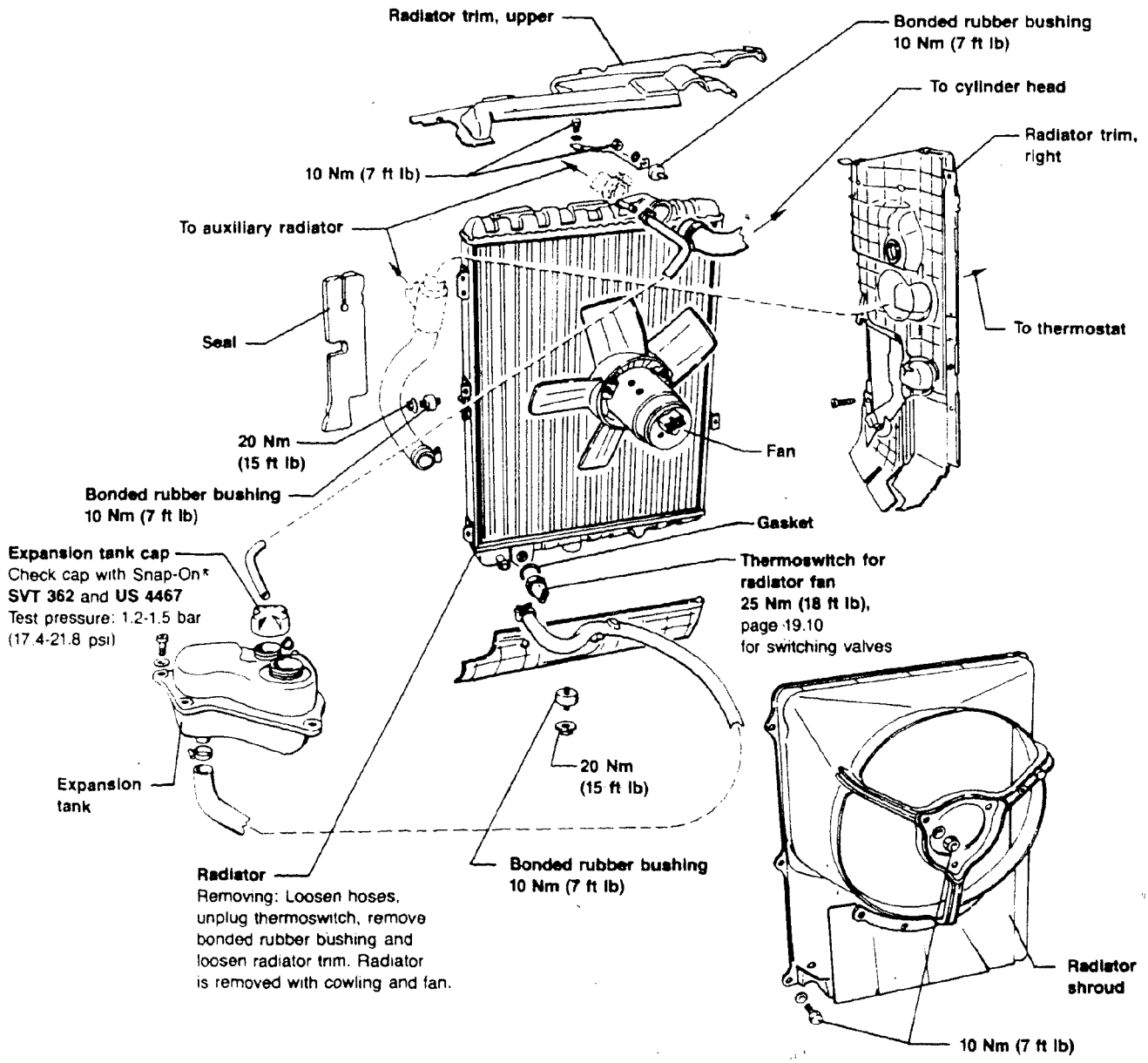
CAUTION

Always replace gaskets and seals. Always secure hoses with hose clamps.

CAUTION

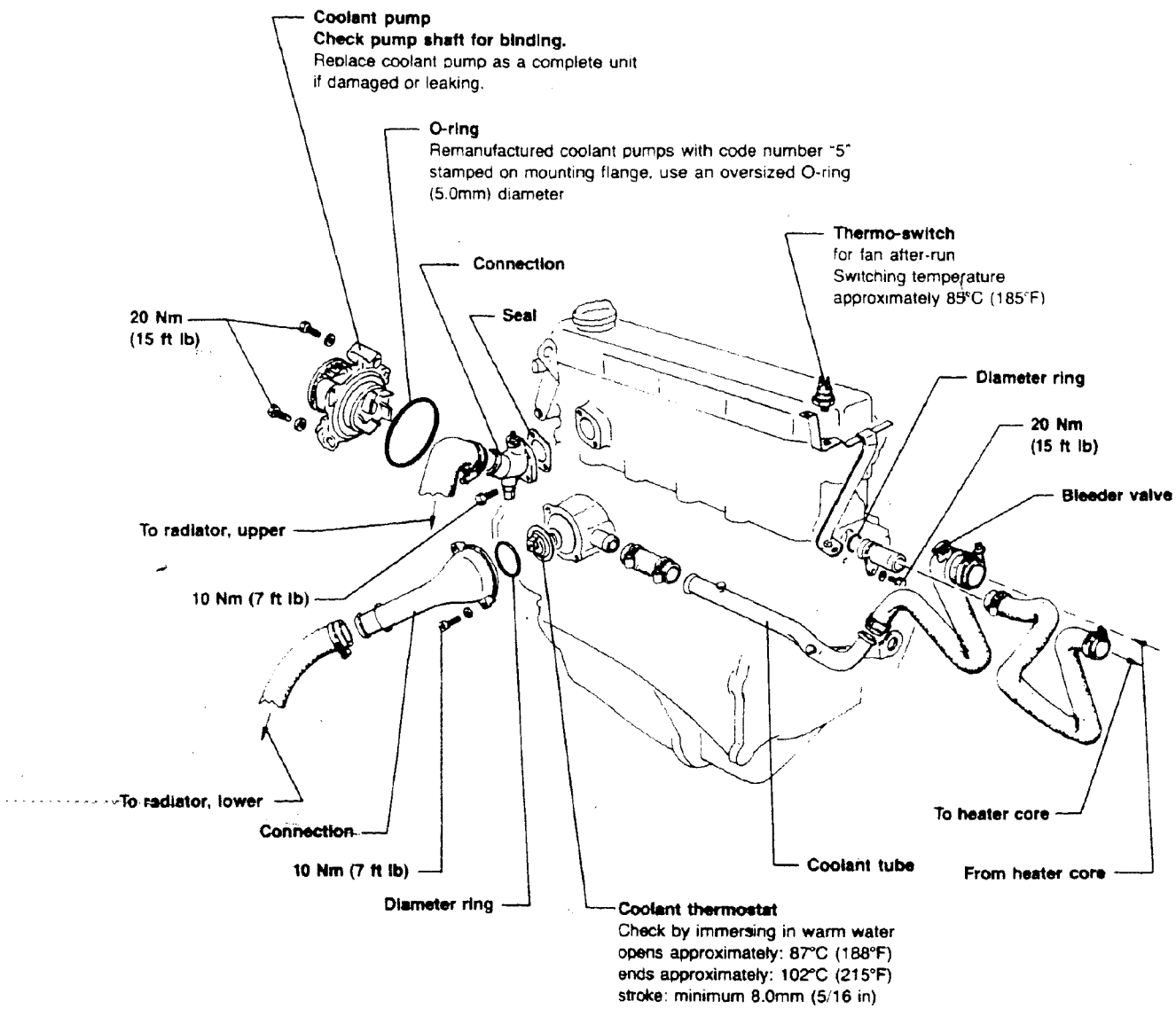
Coolant/antifreeze **must not** be reused when replacing engine, cylinder head, cylinder head gasket, radiator and heater core.



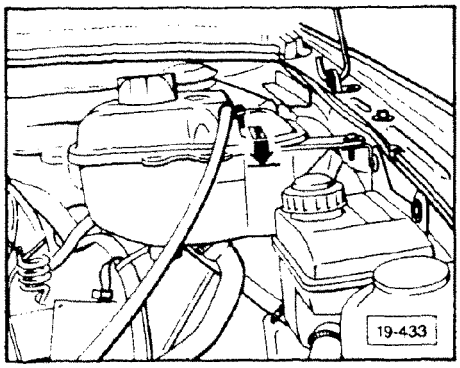
19-448

CAUTION

Always replace gaskets and seals.
Always secure hoses with hose clamps.



19-449



Coolant level, checking

When the engine is at operating temperature, coolant level in expansion tank should be slightly above the **maximum** mark (**arrow**). When engine is cold, the coolant level should be between **minimum** and **maximum** marks.

Switch	Cut in/out temperatures	
	in	out
two cavity	92-97°C (198-207°F)	84-91°C (175-196°F)
three cavity with B+		
first speed	92-97°C (198-207°F)	84-91°C (175-196°F)
second speed	99-105°C (210-221°F)	91-98°C (196-208°F)

Radiator fan thermoswitch, switching values

Antifreeze hydrometer, checking

Calibration of hydrometer must be checked frequently to ensure accuracy.

— mix a 50/50 mixture of antifreeze and water together in a small container
— hydrometer should read −35°C (−30°F)
  • if not, put a mark (paint dot) to indicate where −35°C (−30°F) should be.

CAUTION

Coolant/antifreeze **must not** be reused when replacing engine, cylinder head, cylinder head gasket, radiator and heater core.

CAUTION

Part numbers are for reference only. Always check with your Parts Deaprtment for latest parts information.

Cooling system, draining/refilling

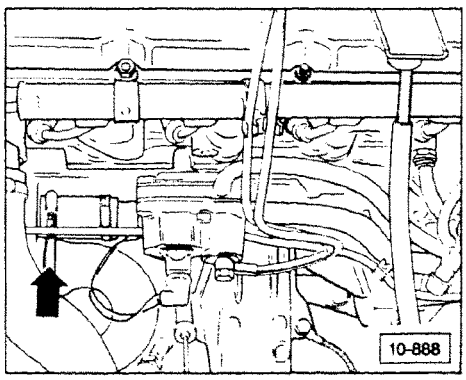
The cooling systems of **all** Audi vehicles are filled at the factory with a mixture of water and an antifreeze solution (G 11) with corrosion inhibitors. This coolant mixture should be used year-round.

Phosphate-free antifreeze prevents frost and corrosion damage, the formation of chalk and in addition, it raises the boiling point of water. Due to the higher boiling point the coolant is an aid to operational efficiency, when the engine is operating under full load, particularly in tropical climates.

When replacing coolant/antifreeze solution in all Audi models, all model years, use phosphate-free coolant/antifreeze ZVW237 102.

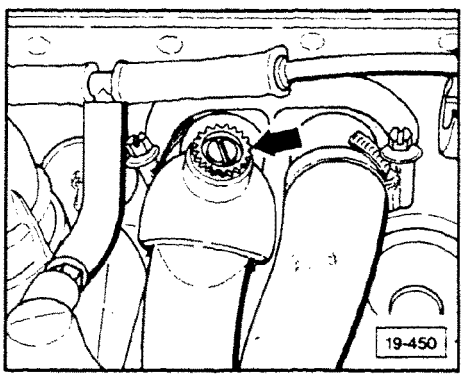
Protection	Anti-freeze	Water
–25°C (–13°F)	3.2L (3.4 qts.)	4.8L (5.1 qts.)
–35°C (–31°F)	4.0L (4.2 qts.)	4.0L (4.2 qts.)

Recommended mixtures



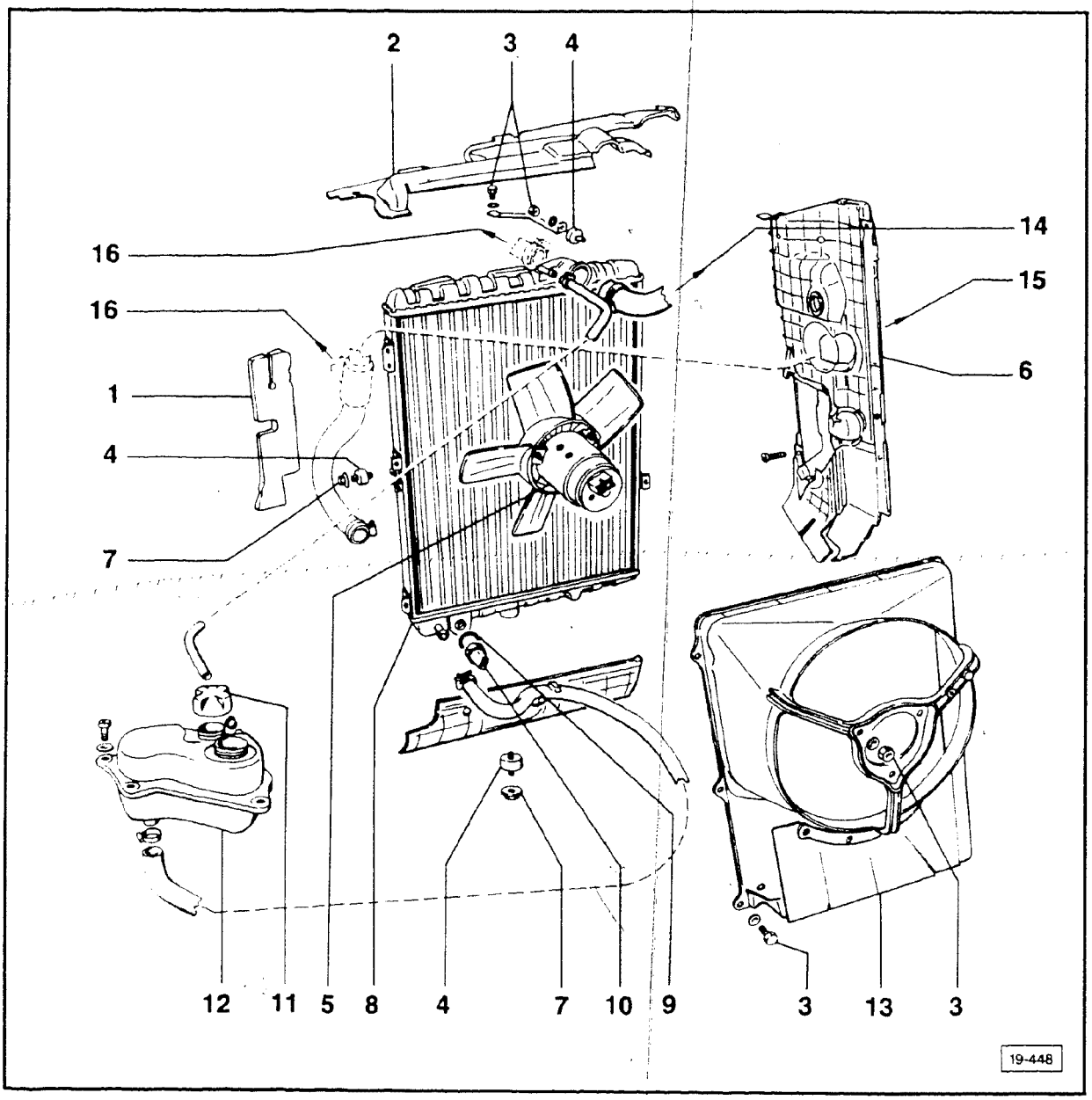
Draining

- remove expansion tank cap
- disconnect coolant hose for heater at engine block
- loosen hose to coolant tube (**arrow**)



Refilling

- reinstall and secure all hoses
- open bleeder screw (**arrow**)
- fill with coolant to **maximum** mark on expansion tank
- close bleeder screw when coolant starts to come out
- reinstall expansion tank cap
- run engine until radiator fan comes on



Note

Check cooling system for leakage using **VAG 1274** and **VAG 1274/1A**
Draining filling coolant, see page 19.15
Coolant mixture ratio, page 19.15
Replace gaskets and seals
All hose connections must be secured using screw type clamps

1 — **Seal**

2 — **Radiator cowl,** upper section

3 — **10 Nm (7 ft lb)**

4 — **Bushing** (rubber bonded type) **10 Nm (7 ft lb)**

5 — **Radiator cooling fan**

6 — **Radiator cowl,** right side

7 — **20 Nm (15 ft lb)**

8 — **Radiator** Removing, page 19.16

9 — **Seal**

10 — **Thermoswitch**
25 Nm (18 ft lb)
Checking, page 19.16

11 — **Cap**
for coolant expansion tank
Checking:
using tool **VAG 1274** and
VAG 1274/1A check pressure
- must be 1.2 to 1.5 bar
(17.4 to 21.8 psi)

12 — **Coolant expansion tank**

13 — **Fan shroud**

14 — to connection at cylinder head

15 — to connection at thermostat

16 — to auxiliary radiator

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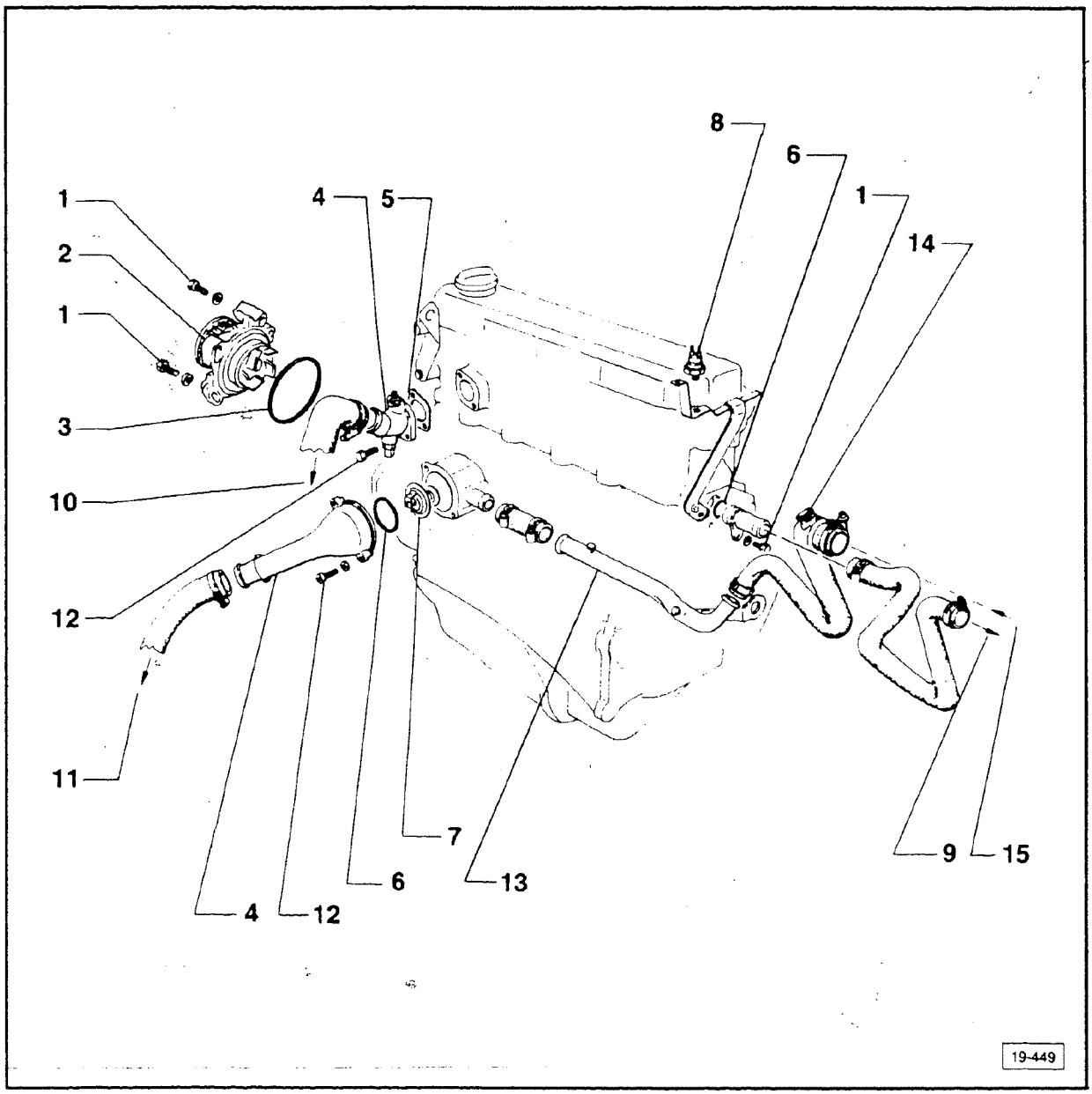


Note

Replace gaskets and seals
All components shown in illustration can be removed and installed with engine installed
All hose connections are secured with screw type clamps

1 — **20 Nm (15 ft lb)**

2 — **Water pump**
Check pump shaft for binding, replace if damaged or leaking

3 — **O-ring**
Replace if damaged or leaking using oversize seal (0.5 mm, part number **069 121 043**)

4 — **Hose flange**

5 — **Gasket**

6 — **O-ring**

7 — **Thermostat**
Checking: heat in water bath
Starts to open ≈ 87°C (189°F)
Full open ≈ 102°C (216°F)
Opening distance: 8.0 mm minimum (0.3 in.)

8 — **Thermoswitch**
For fan after-run
Switching temperature: approximately 85°C (185°F)

9 — to heater core

10 — to upper radiator

11 — to lower radiator

12 — **10 Nm (7 ft lb)**

13 — **Coolant tube** (metal)

14 — **Vent valve**

15 — from heater core

J-15

Coolant, draining/filling

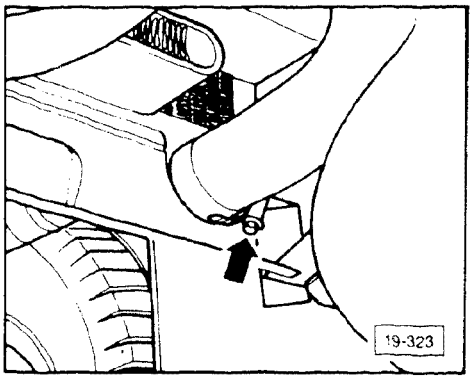
Note

The cooling system of all Audi vehicles is filled at the factory with a mixture of water and antifreeze solution (**G11**) containing corrosion inhibitors designed for year round use.

Phosphate-free antifreeze prevents frost, corrosion damage, the formation of chalk and in addition raises the boiling point of the mixture. Due to the higher boiling point operational efficiency is improved under full load, particularly in tropical climates.

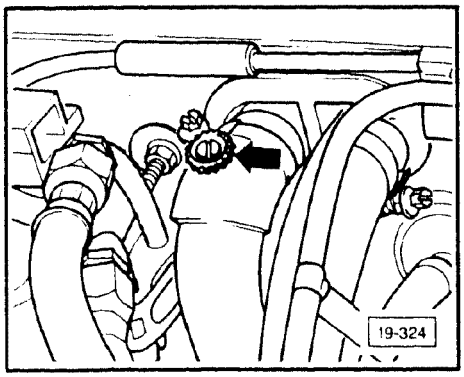
Use phosphate-free coolant/antifreeze part number **ZVW237 102** whenever replacing or topping up. This applies to **ALL** Audi models for **ALL** model years.

Recommended mixture ratios:	
Outside temperature (down to)	**Antifreeze Water** (G11)
– 13°F (– 25°C)	**3** parts to **2** parts
– 31°F (– 35°C)	**1** part to **1** part



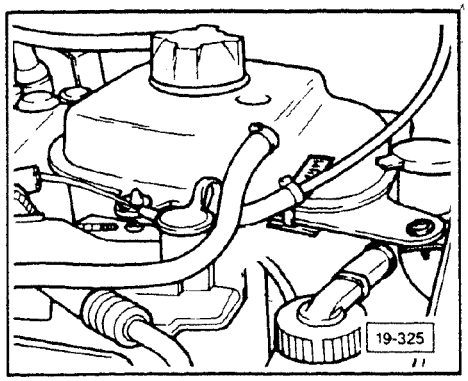
Coolant, draining

- remove cap on expansion tank
- drain coolant
- loosen coolant hose to heater on rear of engine block
- loosen lower radiator hose



Cooling system, filling

- open vent valve screw (**arrow**)
- fill coolant up to "**max**" mark on expansion tank
- observe vent valve; close when coolant starts to come out



- put cap on expansion tank
- run engine until electric fan comes on
- check coolant level and top up if necessary

Note

When the engine is at normal operating temperature, coolant level in the expansion tank should be slightly above the **maximum** mark. When the engine is cold, the coolant level should be between the **minimum** and the **maximum** marks.

Radiator, removing

- loosen hoses, harness connector to thermoswitch, rubber bonded bushing and A/C condenser
- loosen right radiator cowl from radiator and remove radiator complete with fan shroud and fan

Note

Vehicles with ABS, the fan motor also has to be loosened and pushed forward.

Radiator fan thermoswitch, switching values

Switch	Cut In/Out temperatures In	Out
1st speed	92 to 97°C 198 to 207°F	84 to 91°C 175 to 196°F
2nd speed	99 to 105°F 210 to 221°F	91 to 98°C 196 to 208°F