

Removal:

1. Open the engine hood and remove the radiator cap (3) (see Fig. 50 — 1/1).

Note: The radiator cap must not be unscrewed unless the cooling water temperature is below 90° C. First turn the cap to notch 1 and allow the overpressure to escape. Then continue to unscrew and remove the cap.

2. Open the outlet valves (4) and (9) (see Fig. 50 — 0/1) and drain off the cooling water; collect the water if additives, such as anti-freeze, anti-corrosive etc., are present.
3. Unfasten the cooling water hose clamps at the top and the bottom of the radiator. The thermostat should be left on the engine drain neck.
4. Unscrew the two flat springs (11) and (11a) for the upper radiator mounting at the left and the right on the radiator and at the front cowl panel (see Fig. 50 — 1/1).

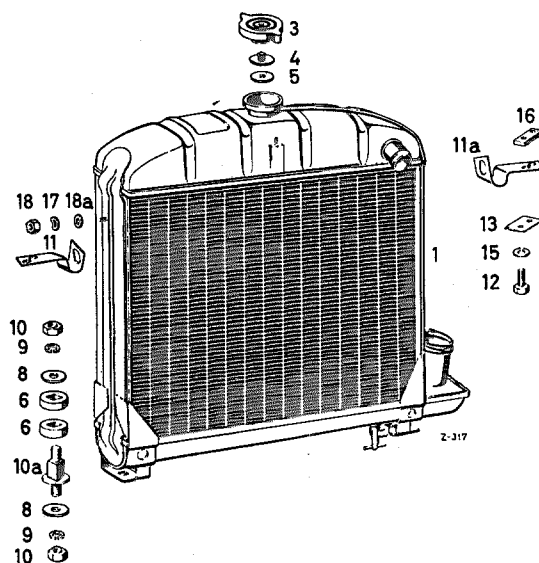


Fig. 50 — 1/1

- | | |
|------------------|------------------------|
| 1 Radiator | 11 Flat spring |
| 3 Radiator cap | 11a Flat spring |
| 4 Plate valve | 12 Hexagon screw |
| 5 Rubber seal | 13 Shim |
| 6 Rubber washer | 15 Lock washer |
| 8 Washer | 16 Threaded back plate |
| 9 Lock washer | 17 Lock washer |
| 10 Hexagon nut | 18 Hexagon nut |
| 10a Fixing screw | 18a Washer |

5. Unscrew the two hexagon nuts (10), together with the lock washer (9) and washer (8), for the lower radiator mounting at the cross tube supports (Fig. 50 — 1/1).
6. Remove the radiator upward. Care must be taken to ensure that the radiator ribs are not damaged by the fan.

Testing:

Radiator:

7. Use hot P 3 lye solution to rinse the radiator for approximately 10 minutes. Use compressed air to blow out the radiator ribs, or clean between them with a water hose.
8. Tightly close the upper and lower pipe socket at the radiator, the overflow pipe and the outlet valve.
9. In place of the standard radiator cap, screw on a radiator cap with an adapter connection for an air blast hose.
10. Connect up an air blast line to the radiator cap, and place the radiator in a water tank, so that it is completely immersed in the water.
11. **Pressure-test the radiator at a pressure of 0.5 atmosphere.** When this is done, the radiator must be entirely leak-proof.

Radiator cap:

12. Check the valves (3) and (4) for freedom of movement. The underpressure valve (4) must not jam, as the resultant partial vacuum can cause the water compartment of the radiator to collapse (Fig. 50 — 1/2). For this reason, it is particularly important to check that the rubber seal (3) has not become swollen; if this happens, the underpressure valve can no longer lift off the rubber seal.
13. If necessary, replace the rubber seal (3). To do this, use a knife or a screw-driver to pry the rubber seal out of the fold in the metal, applying pressure at the edge of the seal.

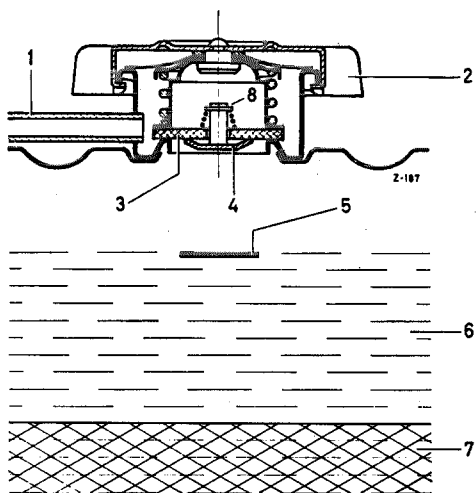


Fig. 50 — 1/2

- 1 Overflow line
- 2 Cap
- 3 Overpressure valve (rubber seal)
- 4 Underpressure valve (valve head)
- 5 Water level marking plate
- 6 Cooling water
- 7 Radiator block
- 8 Locking device

Then pry out the locking device (8) and remove the compression spring and the valve head (4) from the rubber seal (3) (see Fig. 50 — 1/2).

14. Install a new rubber seal. To do this, reverse the order of the removal operation. Again check the valves for freedom of movement.

Note: The overpressure valve (rubber seal) (3) and the underpressure valve (valve head) (4) are also delivered as an assembly as a replacement part under the designation Plate Valve Part No. 000 500 05 40.

The whole plate valve lifts off at an overpressure of 1.0 atm. and opens the overflow line (1). The valve head (4) in the middle of the plate valve is pulled away from the rubber seal (3) at an underpressure of 0.1 atm.; the underpressure is then similarly balanced via the overflow line (1) (see Fig. 50 — 1/2).

Installation:

15. Install the radiator from above; when doing this, insert the cooling water hoses in the upper and lower pipe sockets.

Care must be taken to ensure that the radiator ribs are not damaged by the fan.

16. Fix the upper radiator mounting flat springs (11) and (11 a) at the left and right at the radiator and at the cowl panel. Do not tighten the screws or hexagon nuts yet (see Fig. 50 — 1/1).
17. Slide washer (8) and lock washer (9) on the fixing screw (10 a) and carry out initial tightening of the lower radiator fixing nuts (10) (see Fig. 50 — 1/1).
18. Ensure that a minimum distance of $a = 20 + 2$ mm remains between the top of the fan and the radiator, and $b = 10 + 2$ mm between the bottom of the fan and the radiator. Then tighten the upper and lower radiator fixing screws and nuts (Fig. 50 — 1/4).

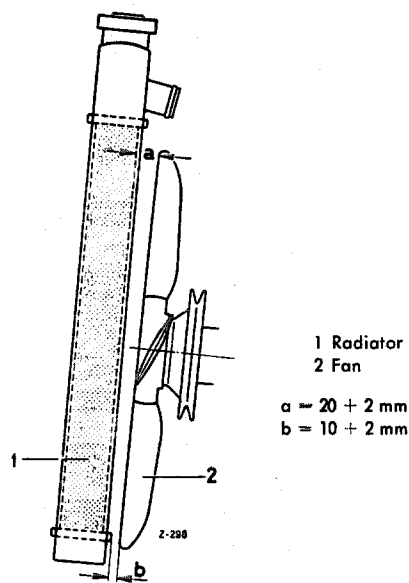


Fig. 50 — 1/4

19. Attach the hose clamps for the water hoses.
20. Push up the heater control levers on the instrument panel; the regulating valves are then completely open (Fig. 50 — 1/5).
21. Fill the cooling water up to the water level marking plate (5) **slowly**, so that the air can escape (see Fig. 50 — 1/2).

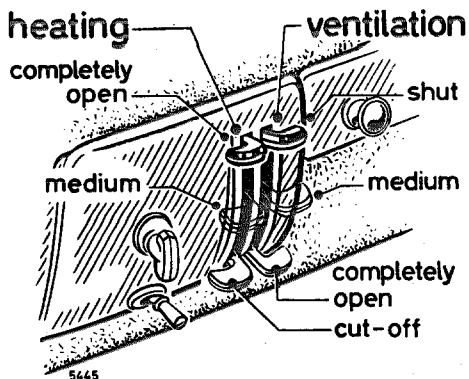


Fig. 50 — 1/5

22. Run the engine for about one minute at a fast idle, leaving the radiator filler neck open.
23. Reduce the idle and slowly top up the cooling system as follows:
 - a) if the cooling water is cold, up to the marking plate which can be seen in the filler neck;
 - b) if the cooling water is warm, up to the top of the radiator filler neck.

When the engine is warm, cold cooling water should be poured into the radiator slowly and with the engine running. Hot water can, however, be used when the engine is cold without special precautions. The capacity of the whole cooling system, including DB heater, is approximately 9.3 liters.

Use clean water, with a minimum lime content, or well filtered river water.

The cooling water **must be treated with additives (anti-corrosion agents) as soon as the vehicle is put into operation.** If this is not done, scale and rust form, and these

gradually decrease the effectiveness of the cooling system. Even distilled or rain water cannot be used without additives. The following can be used as rust and scale inhibitors:

- a) Shell Donax C;
 - b) Phosphatal (Houghton Chemie GmbH.).
- Approximately 25 c. c. of both Shell Donax C and Phosphatal (Houghton Chemie GmbH.) should be mixed with the whole volume of cooling water, i. e. approximately 2.5 c. c. to every liter (1,000 c. c.).

24. Screw on the radiator cap.
When closing the cap, turn it as far as it will go (notch II).

Note: Make sure to screw on the correct radiator cap.

The number 100 which is stamped on, means that the overpressure valve opens at 1 atm. (Fig. 50 — 1/6).

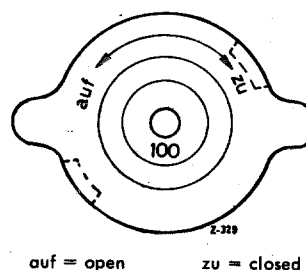


Fig. 50 — 1/6

Particular attention should be paid to this number, as there are in existence radiator caps for our cars which have overpressure valves which operate at different pressures.

25. Check hose unions, radiator and heat exchangers for leakage.