

Service and Repair Manual

COOLANT HEATER

**DW 80
DIESEL**

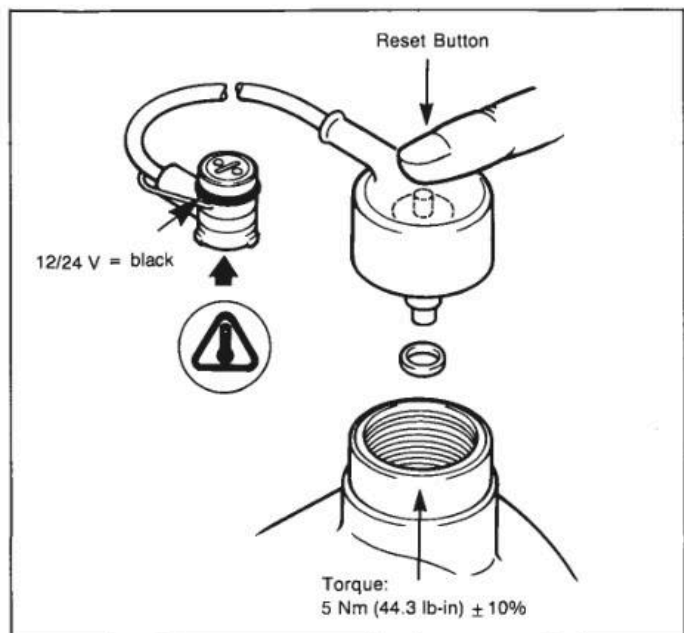
PRICE \$5.50

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4.5 Overheat Thermostat (4)

DESCRIPTION: The overheat thermostat protects the heater against overheating and switches the heater off by cutting power supply to the fuel pump (*fuel supply interrupted*). Thereafter the heater is switched to Fault Lock-out.



After cooling down and elimination of the cause of Fault Lock-out the overheat thermostat can be reset by pressing the reset button.

Switching points of overheat thermostat:

- opens at — $142^{\circ}\text{C} \pm 10^{\circ}\text{C}$ ($287.6^{\circ}\text{F} \pm 18^{\circ}\text{F}$)
- manual reset at — less than $60^{\circ}\text{C} \pm 4,2^{\circ}\text{C}$ ($140^{\circ}\text{F} \pm 8^{\circ}\text{F}$)

CHECKS: The electrical volume has to be checked. At room temperature, the contact is closed. At temperatures over $142^{\circ}\text{C} \pm 10^{\circ}\text{C}$, the contact is open.

ATTENTION: If the overheat thermostat needs to be exchanged, there is a danger of **INJURY FROM LEAKING HOT COOLANT**.

TO AVOID COOLANT SPILL:

- before exchanging the overheat thermostat, reduce pressure in the cooling/heating system by opening the radiator cap;
- coolant hoses should be clamped with clamping claws.

4.6 Flame detector

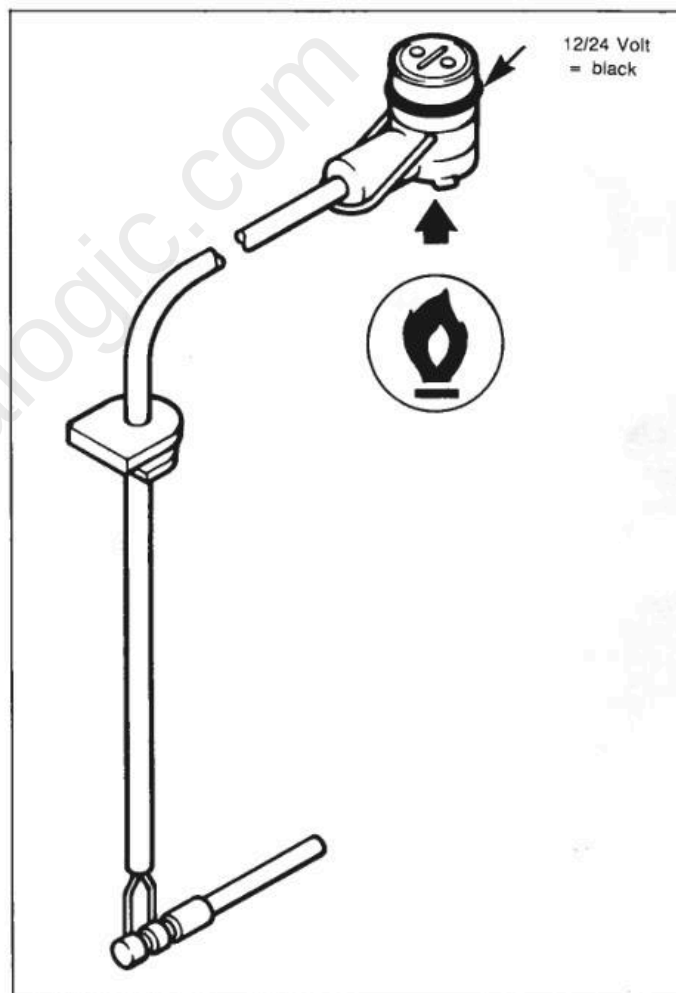
DESCRIPTION: The flame detector is a temperature sensitive resistor which gives an electric impulse to the control unit. The flame detector has the following functions:

- to switch off the ceramic ignition element (see Para. 4.3) when combustion is established,
- to switch off the heater in the event of a flame failure,
- to switch off the heater via the control unit if flame is not established during starting period (safety delay time).

CHECKS: The functions of the flame detector can be tested by the self-diagnostic system or by the Component Tester (see Para. 8.1 and 8.2).

The electrical volume has to be checked with a digital multimeter:

- | | |
|---|--------------------------|
| Resistance at 25°C (77°F) | — $2.6 \dots 3.4 \Omega$ |
| Test current | — less than 5 mA. |

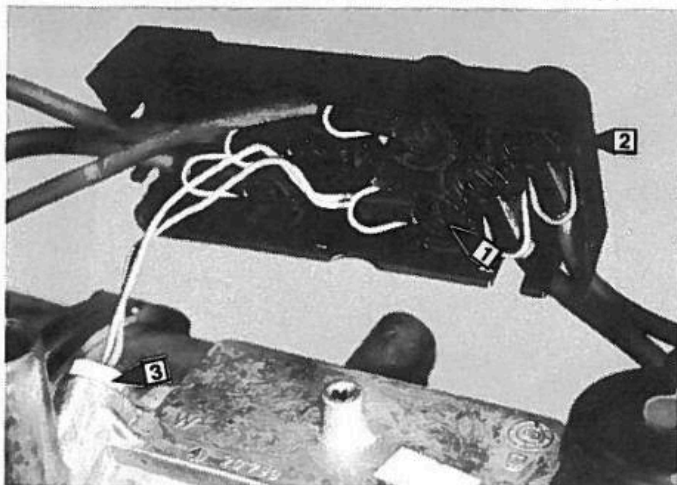


6. TROUBLE SHOOTING

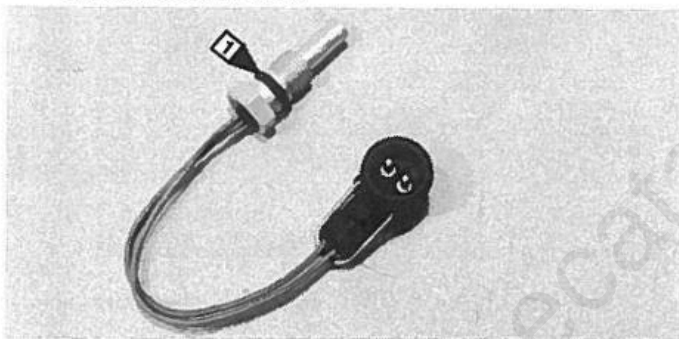
6.1 MANUAL FAULT FINDING

SYMPTOM OF FAULT	CAUSES
6.1.1. Faults in electric system:	
• Heater does not function and indicator light comes on	✦ Check the fuses ✦ Check power supply (battery) ✦ Check voltage on the control unit terminals B3, B4, B8. (see electric diagram Pg. 10)
• Fuse F2 releases	✦ Short circuit in the heater wiring harness
• Fuse F3 releases	✦ Short circuit in the heater wiring harness, coolant circulation pump
• Heater functions, but indicator light does not	✦ Check indicator light connections and light bulb
• Heater functions and indicator light blinks	✦ See Para. 6.2
6.1.2 Faults of coolant circuit	
• Heater switches off (<i>cycling mode</i>) and heat exchanger does not deliver enough heat	✦ Coolant flow volume too small because of: — air in the cooling/heating system — valve/flow control device closed — contamination in the coolant causing flow restriction — coolant circulating pump output insufficient — anti-freeze/water mixture too rich ✦ heat exchanger (water to air) does not deliver enough heat because of: — air in the cooling/heating system — restricted air flow through heat exchanger — anti-freeze/water mixture too rich — heat exchanger too small.
6.1.3. Faults of fuel system	
• No fuel supply to the heater	✦ empty fuel tank ✦ restriction in the fuel line (<i>pinched, broken, plugged up, etc.</i>) ✦ fuel filter plugged up ✦ vent line in the fuel tank plugged up ✦ frozen fuel (<i>water contamination or not winterized</i>) ✦ fuel pump defective.
• Irregular combustion	✦ air bubbles in the fuel ✦ fuel line connections are not tight enough (<i>air leak</i>) ✦ restrictions in the fuel line ✦ contaminated fuel ✦ installation of the fuel system is not correct (<i>see installation instructions</i>) ✦ fuel pump defective ✦ burner/evaporator defective.
6.1.4. Faults of combustion air/exhaust gas system	
• Incorrect CO ₂ level	✦ combustion air intake or exhaust outlet are restricted ✦ combustion air fan defective ✦ fuel pump defective.

1. Disconnect sensor plug connectors (1) from electric block connectors (2) and unscrew temperature sensor (3).



2. Before installing new temperature sensor, make sure the O-ring (1) is properly positioned in the groove. Screw in temperature sensor using torque 1.5 Nm (13.3 lb-in) $\pm 10\%$. After the installation is completed bleed the cooling/heating system (see Para. 7.2)

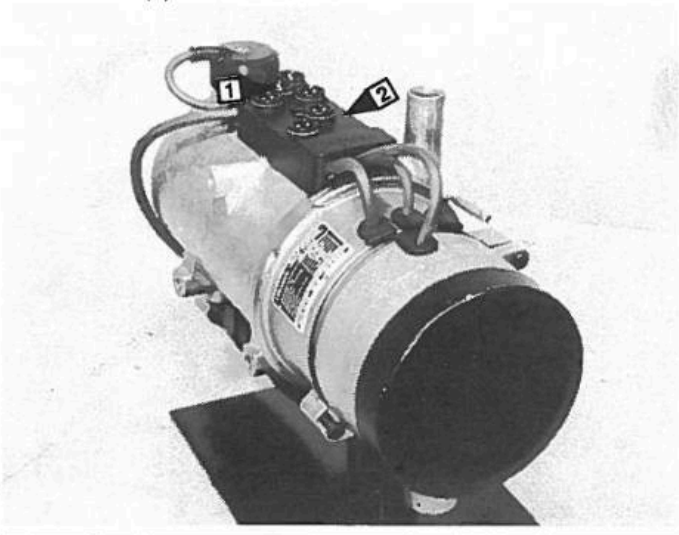


7.3.3. Replacing coolant circulating pump.

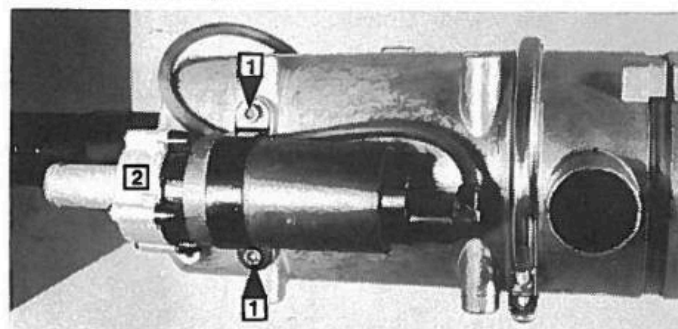
ATTENTION:

- Before exchanging the coolant circulating pump, reduce pressure in the coolant/heating system by opening the radiator cap.
- Coolant hoses should be clamped with clamping claws.

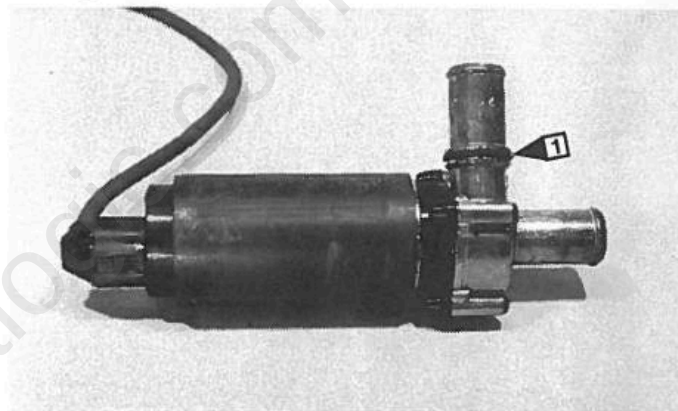
1. Disconnect pump plug connector (1) from electric block connector (2).



2. Unscrew two bolts (1) holding pump to the heater and remove the pump (2).

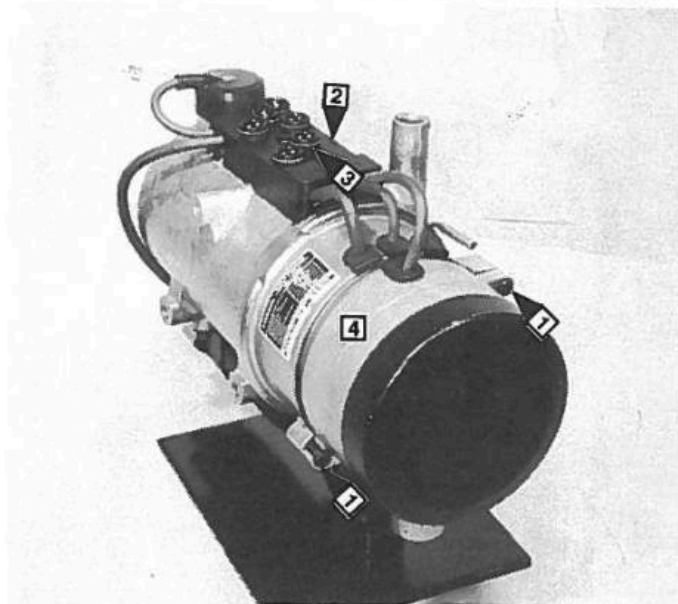


3. A new O-ring (1) has to be used after every removal of the pump. For easier installation of the pump apply vaseline or other suitable grease to the O-ring. After the installation is completed bleed the cooling/heating system (see Para. 7.2)



7.4. Replacing combustion air fan and motor assembly

1. Lift up electric block connector (2) and disconnect plug connector (3). Loosen two bolts (1). Combustion air fan and motor assembly (4) can be easily removed by turning it in left direction and pulling it out.



2. After installing new air fan and motor assembly, CO_2 level and smoke number in full heat operation should be checked.

CO_2 level: 9.5 ... 12 vol. %
Smoke number: Max. 0 - 1 (Bacherach)

— NOTES —

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