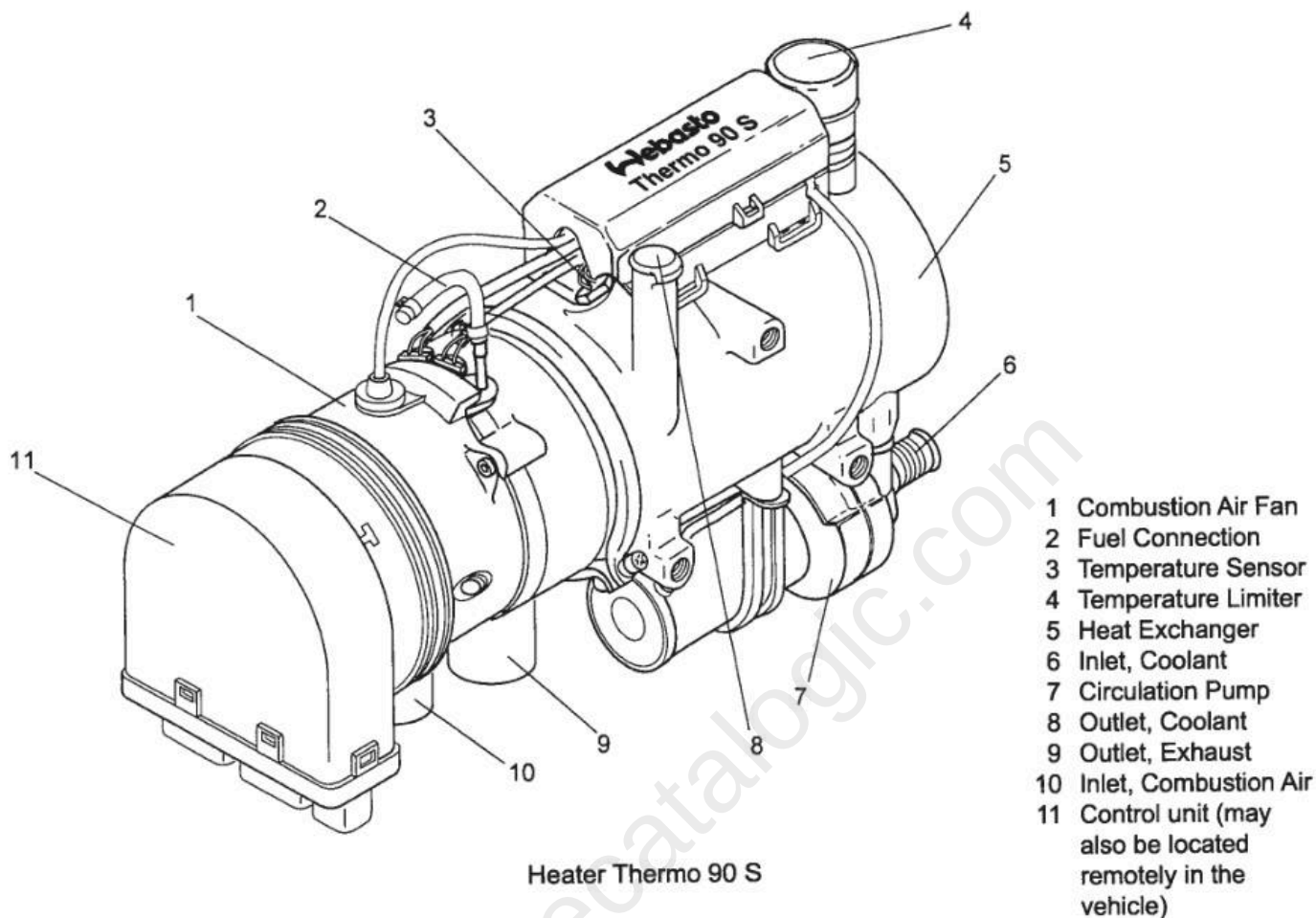


Coolant Heater
Thermo 90
Thermo 90 S

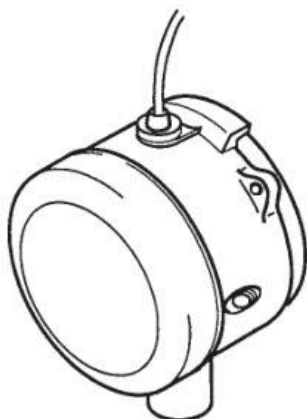
Workshop Manual

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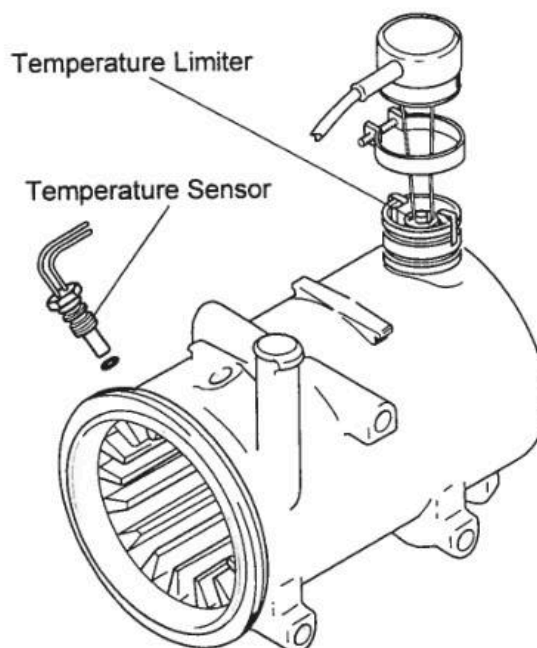
2.1 Combustion Air Fan

The combustion air fan delivers the air required for combustion from the combustion air inlet to the burner insert.



2.2 Heat Exchanger

The heat exchanger transfers the heat provided by combustion to the coolant circuit.



Failure Symptom	Probable Cause	Remedy
8 Flash pulses (F 08) (combustion air fan)	Wiring Combustion air fan defective	Check wiring for damage, open connections or short circuit Replace replace combustion air fan
9 Flash pulses (F 09) (glow pin)	Wiring Glow pin defective	Check wiring for damage, open connections or short circuit Replace glow pin
10 Flash pulses (F 10) (temperature limiter Thermo 90 S only)	Coolant circuit Wiring	Check coolant level Bleed coolant circuit Reset temperature limiter Check wiring for damage, open connections or short circuit
11 Flash pulses (F 11) (coolant circulation pump Thermo 90 S only)	Wiring Coolant circulation pump defective	Check wiring for damage, open connections or short circuit Replace coolant circulation pump

Fig. 5-2 Failure Symptoms after Switch-off upon Failure (Part 2 of 2)

5.4 Storing a Fault Code in Memory

Once the Thermo 90 S completes the after run period (cool down) initiated by a failure event, the current flash code will be downloaded (stored) in memory.

The Thermo 90 S can store up to four error codes. Once the memory is "full", any additional error code will replace the earliest code stored thereby continually updating the error codes stored in memory with the four most recent malfunctions.

5.4.1 Reading and Removing Error Codes Stored in Memory using the PC Diagnostics Kit P.N. 92542C

It is possible to read and remove (reset) stored error codes from the Thermo 90 and Thermo 90 S control unit memory.

This is achieved through the use of a diagnostic interface kit connected between the heater and an IBM compatible computer having the necessary software installed.

The PC Diagnostic Interface Kit comes complete with interface module and cables, software and instructions for use.

Order PC Diagnostics Kit under part number 92542C.

Several interface connection adapters are available for use with various heater models. For this reason, interface connection adapters are not included in the PC Diagnostics Kit.

Order the appropriate interface connector for the heater model(s) you will likely be working with.

For the Thermo 90, order adapter # 83661A
For the Thermo 90 S, order adapter # 92556A

In addition to working with stored fault codes, the PC Diagnostics Kit allows you to do several other functions such as reading values while the heater is in operation or testing individual components. Printing out of fault codes is also available (user supplied printer required).

For further capabilities and instructions for using the PC Diagnostics Kit, see the instruction manual included with the kit.

WEBASTO THERMO 90 S
ELECTRICAL SCHEMATIC
B 8025-3000-0006

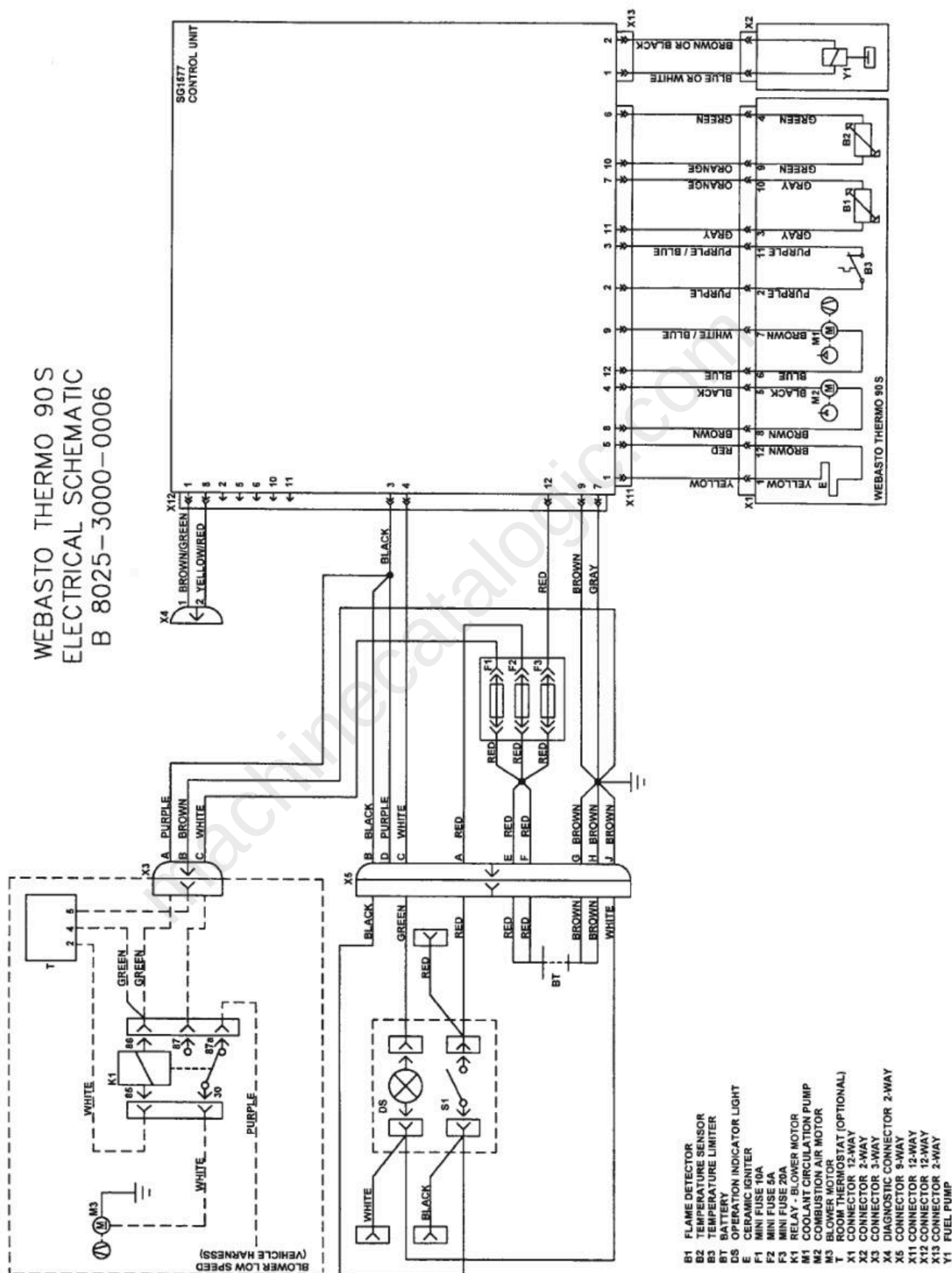


Fig. 7-3 Circuit Diagram – Thermo 90 S, 12 and 24 V Enclosure and Compact Kit with Deutsch Connector

8. Servicing

8.1 General

This section describes the servicing procedures that may be performed with the heater installed.

8.2 Work on the Heater

Prior to performing any work, it is mandatory to disconnect the vehicle battery main lead. As long as the heater is in operation or in run-down, the battery main supply must not be disconnected due to the danger of overheating and resulting in a response of the overheat protection. When performing extensive repairs on the heater, a complete removal is advisable. After work on the heating circuit, a coolant mixture consisting of water and anti-freeze must be replenished in accordance with manufacturer instructions followed by a careful bleeding of the heating circuit.

When performing repairs requiring a relocation of the installation position, the relevant installation instructions and the vehicle-specific installation proposal have to be observed.

8.3 Work on the Vehicle

⚠ CAUTION

In the vicinity of the heater, a temperature of 130 °C (266 °F) must not be exceeded under any circumstances (e.g. during body paint work).

8.4 Heater Test Run

⚠ WARNING

The heater must not be operated, not even with timer, in enclosed areas like garages or workshops not equipped with an exhaust venting facility.

8.5 Annual Maintenance

Before or after each heating season the following maintenance procedures should be performed to maintain the heater's functional reliability:

Heater and Enclosure

- Clean heater exterior and interior of enclosure of any accumulated debris and dust with compressed air or water. Do not force water into electrical connections or into heater.

Electrical System

- Examine electrical connections for corrosion at connections and for security.
- Examine battery condition and clean terminals.
- Load test batteries and replace as necessary.

Combustion Air and Exhaust System

- Check exhaust and combustion air tubes for damage and for foreign matter and contamination. Repair or replace damaged items as necessary.

Fuel System

- Replace fuel filter P.N. 487171 if equipped.
- Examine fuel lines and fuel filter for leakage and damage. Repair or replace damaged items as necessary.

Coolant System

- Examine coolant circuit and circulation pump for leakage and damage.
- Examine hoses for abrasions and cracks.
- Check coolant level and anti-freeze strength. Refer to vehicle manufacturer's recommendations pertaining to coolant system maintenance.

Operational Test

- Operate the Webasto heater for 15 minutes or more.
- Check coolant and fuel connections for leakage. Re-tighten clamps as necessary.
- Check sleeper blower operation by turning on the thermostat. Allow the fan to cycle on and off to ensure proper functioning.

9. Repair

9.1 General

This section describes the repairs that may be performed on the heater Thermo 90 Thermo 90 S when removed. Any further disassembly will void the warranty.

For re-assembly only Webasto-authorized spare parts kits are to be used.

9.1.1 Work on Components after Disassembly

⚠ CAUTION

All gaskets located between disassembled components must always be replaced and discarded.

9.1.1.1 Cleaning

- All disassembled components must be cleaned.

9.1.1.2 Visual Inspection

- Examine all components for damages (cracks, deformation, wear, etc.) and replace as necessary.
- Examine connectors and wiring for corrosion, loose contacts, wrong crimping, etc. and repair as necessary.
- Check terminals for corrosion and contacts for security. Repair as necessary.

9.2.5 Replacement of Combustion Air Fan

9.2.5.1 Removal

1. Remove heater (see 8.7.1.1).
2. Disconnect electrical connections (see 9.2.1.1).
3. Remove screws (2, Fig. 9-4).
4. Pull combustion air fan (1) from burner head (4) and remove together with profiled packing ring (3).

NOTE:

On heater Thermo 90 S with flanged control unit remove control unit as required.

5. Perform procedures on components after disassembly (see 9.1.1).

9.2.5.2 Installation

NOTE:

Locate packing ring (3, Fig. 9-4) properly; do not squeeze.

1. Bring combustion air fan (1) with new profiled packing ring (3) in assembly position and secure with screws (2).
2. Torque tighten screws (2) with $3 \text{ Nm} \pm 10\%$.

NOTE:

On heater Thermo 90 S with flanged control unit install control unit as required.

3. Make electrical connections (see 9.2.1.2).
4. Install heater (see 8.7.1.2).

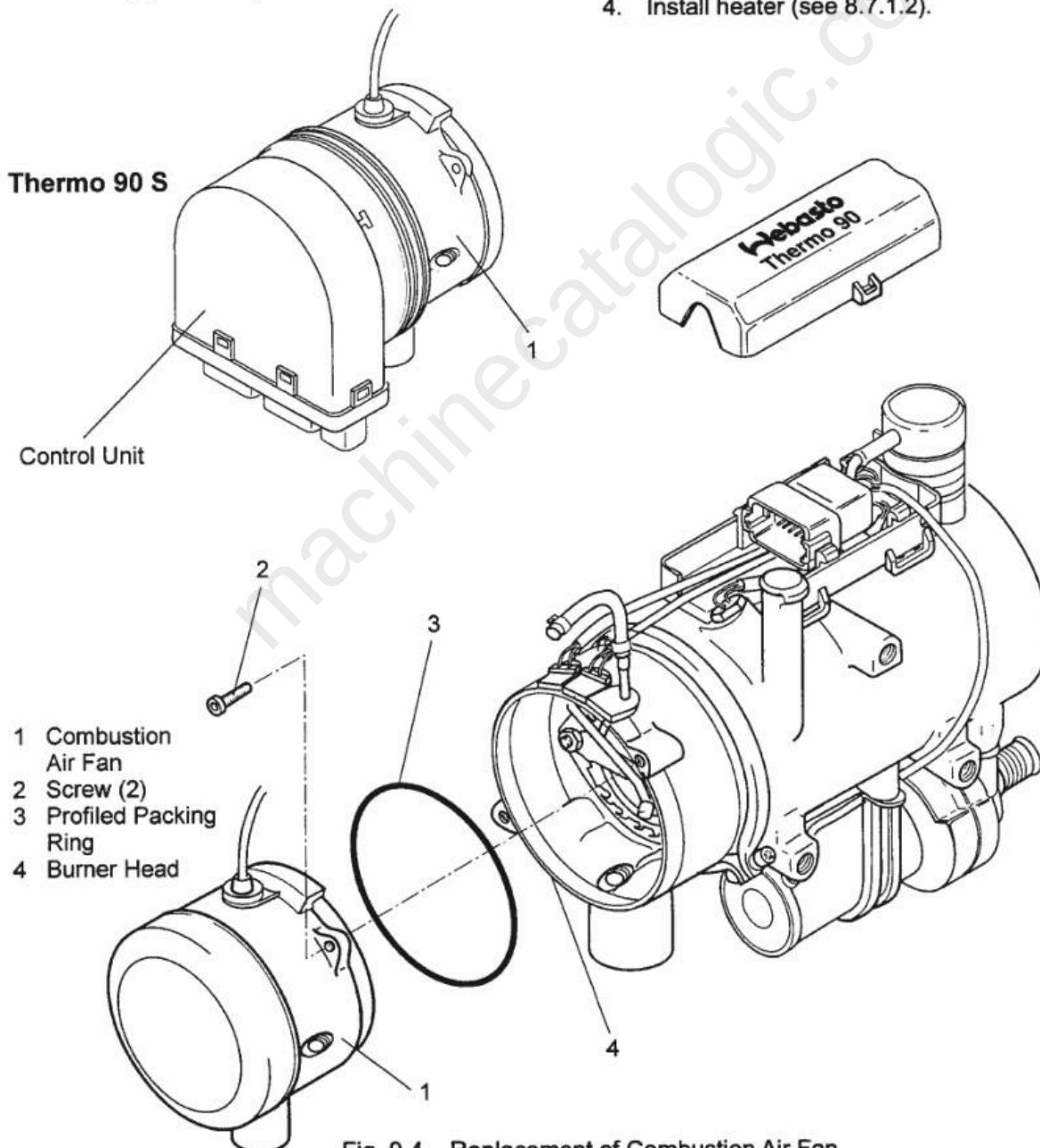


Fig. 9-4 Replacement of Combustion Air Fan

Full Version Available

Webasto Thermo 90 Heater Service Manual

Webasto Thermo 90 heater service manual with troubleshooting, functional tests, circuit diagrams, servicing and repair procedures. Instant PDF download.

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