



# Air heaters D1LE

Technical Description  
Installation Instructions  
Operating Instructions

Eberspächer ®

J. Eberspächer  
GmbH & Co.  
Eberspächerstr. 24  
D-73730 Esslingen  
Telefon (zentral)  
(0711) 9 39-00  
Telefax  
(0711) 9 39-3500

**Engine-independent air heater  
for diesel fuel  
with integrated control unit**

D 1 L E	Cat. No.
Basic heater	12 V 25 2019 05 00 00
with standard equipment	24 V 25 2020 05 00 00

The universal installation kit must be ordered separately as additional equipment, see page 2. See Additional Equipment Catalog for further accessories.



### Specifications (all values ± 10%)

Heating medium	Air
Hot air throughput without counterpressure <sup>1)</sup>	110 kg/h
Heating capacity <sup>1)</sup>	1800 W
Fuel	Diesel fuel (commercially available)
Fuel consumption <sup>1)</sup>	0.21 l/h
Rated voltage	12 V or 24 V
Operating range	
– Minimum voltage	10 V or 20 V respectively
– Maximum voltage	14 V or 28 V respectively
Electric power <sup>1)</sup> consumption	at start: 12 V = 245 W 24 V = 265 W In operation 25 W

Radio interference suppression	3 (KW 0)
Weight	approx. 3.5 kg
Ambient temperature	in operation: – 40° to +70° C not in operation: – 40° C to +85° C

<sup>1)</sup> at rated voltage

Contents	Page
Scope of delivery / Cat. Nos. ....	2, 3
Government regulations .....	4
Safety instructions .....	4
Installation instructions .....	5 – 13
Typical installations / installation location .....	5
Installing the heater .....	6
Principal dimensions .....	6
Permissible installation positions / fastening types .....	6, 7
Running the heating air .....	7
Running the combustion air .....	8
Running the exhaust .....	8
Fuel supply .....	9, 10
Fuel at low temperatures .....	10
Electrics / wiring diagrams .....	11, 12
Function description / operating instructions .....	12, 13

**Scope of delivery**

Quantity / Designation	Cat. No.
1 Basic heater with standard equipment	
12 V	25 2019 05 00 00
24 V	25 2020 05 00 00

The standard equipment includes:

1 Basic heater – 12 V or Basic heater – 24 V (not available alone)	25 2019 01 25 2020 01
1 Fuel metering pump with built-in fuel filter	
1 Switch ON / OFF	
1 Cap	

To be ordered in addition:	
1 Universal installation kit	25 2019 80 00 00

**Control elements, optional**

Quantity / Designation	Order No.
1 Mini-clock – 12 / 24 volt	22 1000 31 31 00
The mini-clock can be combined with the TP 41 / TP 41 i radio remote control. Additionally required: The control unit to adjust the heat flow and the change-over switch 'heating / ventilating' for ventilation mode.	
1 Module clock – 12 / 24 volt with temperature preselection	22 1000 30 38 00
The module clock can be combined with the TP 4 / TP 4i radio remote control.	
1 Mounting parts 'module clock'	25 1482 70 01 00
only required when installing with panel.	
1 Radio remote control TP 4 12 / 24 volt	22 1000 30 63 00 22 1000 30 99 00
TP 4i*	

The radio remote control TP 4 / TP 4i can only be used in combination with the module clock.

1 Radio remote control TP 41 12 / 24 volt	22 1000 31 35 00 22 1000 31 39 00
TP 41i*	

The radio remote control TP 41 / TP 41i can be used on its own or in combination with the mini-clock, order No. 22 1000 31 31 00.

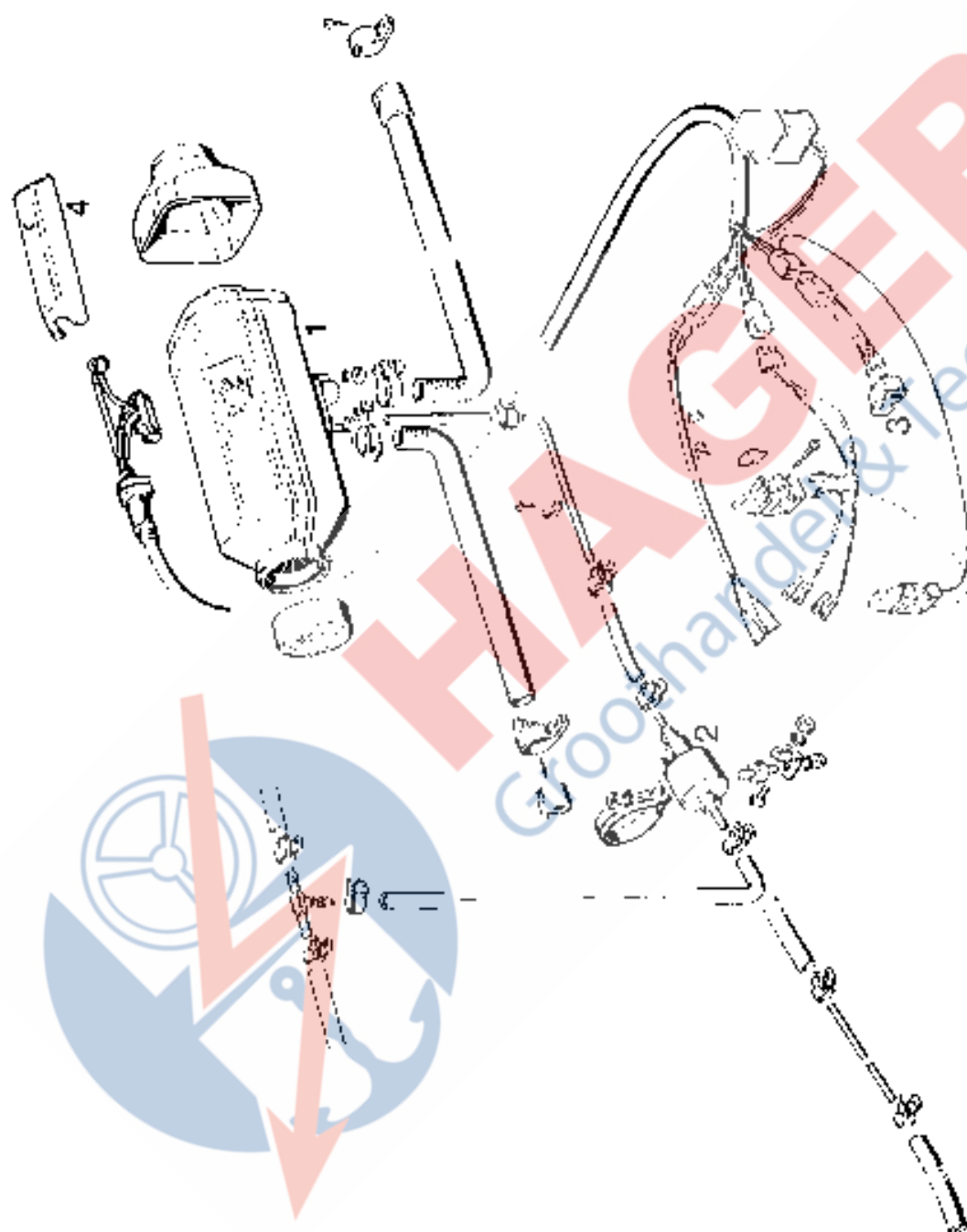
\* Outside Germany, only the i-version radio remote controls may be permissible.

**Please note!**

Control elements must be selected in accordance with the intended use of the heater, distinguishing between air or water heater, simple switching on and off, programme preselection and / or remote control. The control elements are supplied with operating instructions. These are intended for the customer together with the "Technical Description".



Scope of delivery



**Please note:**

This is a schematic drawing of the assembly. The actual assembly may differ from the drawing. The actual assembly should be checked against the actual drawing. The actual assembly should be checked against the actual drawing.

© 2014 HAGER Groothandel & Techniek

## § Government regulations concerning installation

For installation in motor vehicles that are subject to the Regulations Authorising the Use of Vehicles for Road Traffic (StVZO), the air heater has been approved by the (German) Federal Office for Motor Traffic in keeping with the "General Model Approval" (ABG), and the official test symbol is marked on the type plate of the air heater.

D 1 L E S 258

The mounting requirements associated with the General Model Approval (ABG) have been printed in the corresponding sections of these mounting instructions. When the air heater is installed in special vehicles, then the regulations governing such vehicles must be taken into account (e.g. TRS 003 for vehicles used to transport dangerous substances).

The year in which the air heater was operated for the first time must be permanently recorded on the type plate. The works must print 3 years in the corresponding field of the type plate. The valid year is identified by removing those years that are not applicable.

Subsequent installation of the heater must be completed in conformity with these mounting instructions and must be accepted by an officially approved vehicle specialist or inspector (Section 7.4a of Annex VIII relating to StVZO) in conformity with § 19 Section 4 StVZO. The specialist / inspector must issue a corresponding written certificate. The effectiveness of model acceptance (ABG) for the heater depends upon this certificate.

The vehicle owner can choose the kind of certificate to be issued:

- A separate "Acceptance Confirmation" must always be kept in the vehicle. Neutral acceptance confirmations of the motor vehicle specialist are also permissible. The vehicle manufacturer, the vehicle type and the vehicle identification number must all be entered in both cases.
- Entry in the vehicle registration book (by the assessing agency) and in the motor vehicle certificate (by the approving agency).

For vehicles that are not subject to StVZO (e.g. ships), it is necessary to observe the specific rules and mounting instructions applicable to the given vehicle; these can differ regionally.

The heater must be installed in keeping with these mounting instructions or possibly other special installation recommendations by a workshop approved by the manufacturer.

The installation points suggested in these mounting instructions are examples. Alternative installation points are permissible provided they conform with the general installation requirements and, possibly, after consulting the manufacturer. This applies particularly to the electrical wiring (circuit diagram), the fuel supply, conducting the combustion air and exhaust gas and the use of alien operating and controlling elements. This is only permissible with the written approval of the manufacturer.

The sticker "Turn off the heater prior to refuelling", included with the heater, must be applied at an appropriate point on the vehicle (near the fuel tank cap).

Further mounting information (e.g. for boats and ships) can be requested from the manufacturer.

## ⚠ Safety instructions concerning installation

Every combustion process produces exhaust gas that contains toxic substances. Consequently, and on account of the high temperatures, the exhaust gas must be conducted in conformity with the requirements specified in these mounting instructions.

Fuel pipes and exhaust pipes must be safely fastened, to avoid damage from vibrations (recommendation: at intervals of approx. 50 cm).

The hot-air emitter (possibly adjustable) must always be arranged in such a manner that the hot air is not directly blown onto heat-sensitive parts of the vehicle. People and loose objects must not be directly exposed to the blown hot air. To avoid damage and burns, people and loose objects must not be directly exposed to the blowing hot air.

If there is no suction hose, then the suction side of the heater must be covered with a protective grille to prevent injury from the hot-air blower.

The heater may only be started up when the maintenance flap is closed.

The maintenance flap may not be open during operation.

Ensure that the insulation of electrical lines cannot be damaged due to abrasion, kinking, squeezing or by exposure to heat.

As a result of their concept for mobile service, the heaters are not suitable as permanent heating installations (for instance to heat living rooms).

## § Government regulations concerning operation

Subsequent installation of the heater must be completed in conformity with these mounting instructions and must be accepted by an officially approved vehicle specialist or inspector (TÜV, DEKRA) in conformity with § 19 Section 4 StVZO (Regulations Authorising the Use of Vehicles for Road Traffic), who must issue a corresponding written certificate, either by entry in the vehicle papers (vehicle registration book or motor vehicle certificate), or as a separate "Acceptance Confirmation" that must always be kept in the vehicle. The effectiveness of model acceptance for the heater (ABG) depends upon this certificate.

The heater must only be used for the purpose specified by the manufacturer with due consideration of the "Technical Description / Mounting Instructions" and the "Operating Instructions" included with each heater.

It is not permissible to operate the heater where combustible vapours or dusts can be formed, e.g. in the vicinity of fuel, coal, wood and grain stores and similar facilities.

The heater must not be used in closed rooms, e.g. in a garage or car park building. This is because of the danger of poisoning since all combustion processes produce exhaust gases that contain toxic constituents.

The heater must be turned off when refuelling.

With vehicles subject to TRS regulations (transport of dangerous products, e.g. road tankers), the heater must be switched off before entering the hazardous area (refinery, petrol station, etc.).

In conformity with StVZO, the heater must be exchanged for an original replacement heater by the manufacturer or an authorised workshop 10 years after the heater was first used. The vehicle owner / operator of the heater is responsible for ensuring replacement. A plate must then be mounted (not detachable) on the replacement heater indicating the date when the replacement heater was installed, together with the designation "Original Part" (the plate is supplied with the replacement heater).

D.I.Y. repairs (on your own and without using original spare parts) are dangerous and therefore not permitted. The General Model Approval (ABG) for the heater and the General Operating Permit (ABE) for the vehicle will both become invalid.

The manufacturer's guarantee for the entire heating system will become invalid if the above instructions are not observed. The Eberspächer Guarantee Conditions are exclusively applicable.

The observance of the pertinent regulations and safety instructions is a precondition for liability claims. The Eberspächer company cannot be held liable if the "Operating Instructions" have not been observed and if repairs have not been competently completed, even if original spares were used.

## ⚠ Safety instructions concerning operation

As a result of its concept for mobile service, the heaters are not suitable as permanent heating installations (for instance to heat living rooms).

The installation space of the heater must remain free and cannot be used as storage space. Reserve fuel tanks, oil cans, spray cans, gas cartridges, fire extinguishers, cleaning cloths, clothes, paper, etc., must not be stored or transported on or alongside the heater.

The protective grille over the suction side should be occasionally inspected, but particularly before the heating period, and cleaned should this prove to be necessary.

An adjustable hot-air emitter must always be arranged in such a manner that hot air is not directly blown onto heat-sensitive parts of the vehicle. People and loose objects must not be directly exposed to the stream of hot air. To avoid damage and burns, people and loose objects must not be directly exposed to the stream of hot air.

Defective fuses must only be replaced by fuses with the prescribed fuse rating.

Should fuel leak out of the heater's fuel system, then the damage must be immediately rectified by an authorised servicing workshop.

The heater should be tested before the beginning of the heating period. The heater must be turned off, and the fuse removed so that it is inoperable, should intense smoke develop for an extended period, if unusual burner noises can be heard, if there is a distinct smell of fuel or if electric / electronic parts become overheated. Renewed operation of the heater is only permissible after it has been checked by trained specialist Eberspächer personnel.

Damage to the actual heater or the heating installation must only be remedied by an authorised servicing workshop which will only use original spare parts.



## Installation Instructions

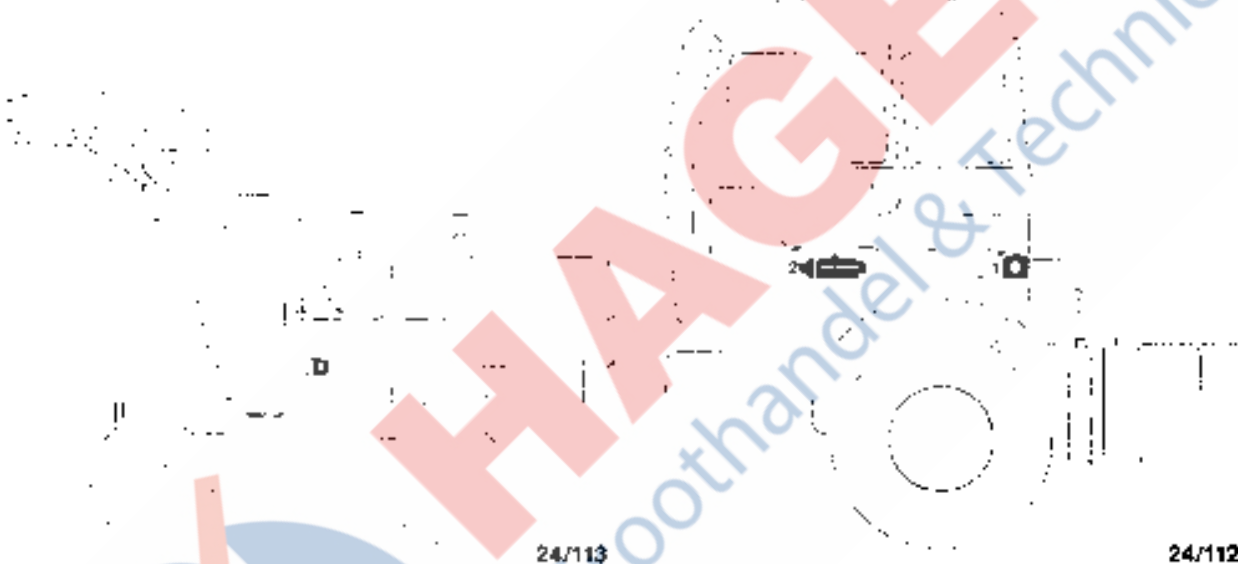
The suggestions put forward in these installation instructions are only examples. Possibilities other than those illustrated (e.g. in the selection of the installation position or means of mounting) are also permissible provided they meet the requirements of the West German road traffic regulations (StVZO), and if necessary after consultation with the manufacturer.

### Typical installations/installation position

#### in the cab of the excavator

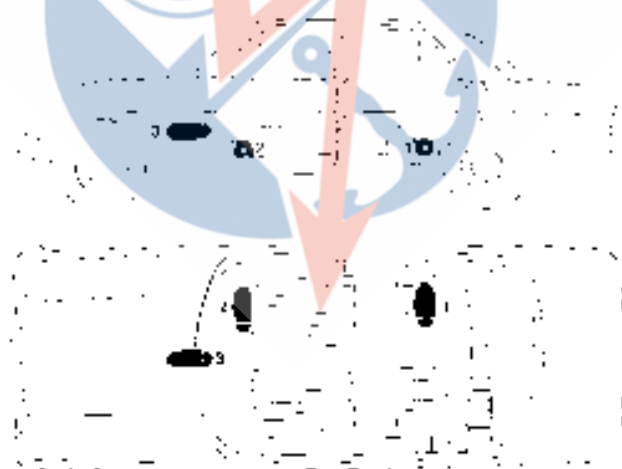
#### In the truck cab

1. on the rear panel of the cab
2. under the driver's seat



#### inside a passenger car

1. under the back seat, inside or under floor
2. in front of the passenger seat
3. on the center console



24/111a

## Installing the heater

The heaters are suitable and approved for installation in vehicle areas used by persons. Installation in the driver or passenger areas or in the dusts is not permitted.

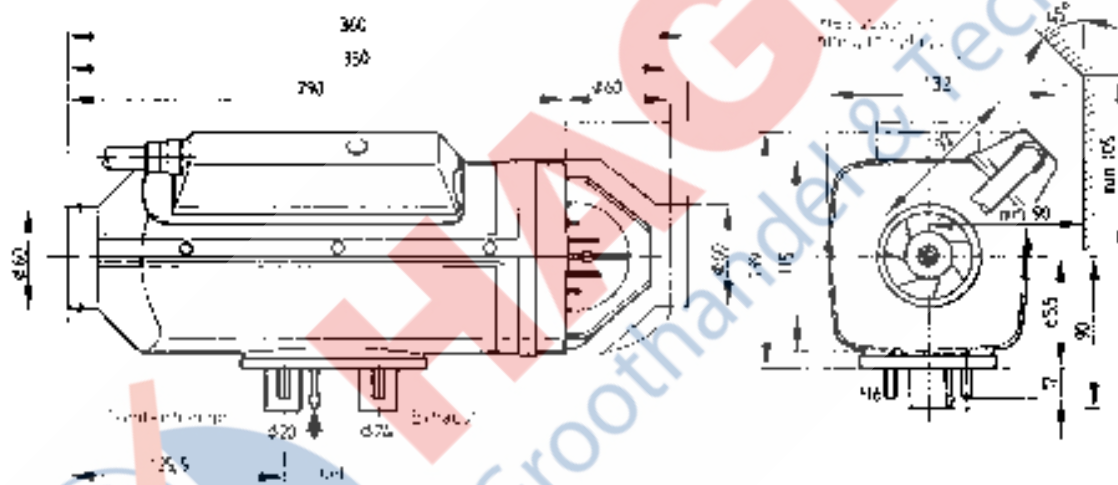
In the case of installation in areas used by persons, the exhaust, combustion air and fuel lines must not have any other connections inside these areas, and must be laid splash water proof and penetrations to the outside.

For this reason the heater may be fixed by its base on an outside panel of the vehicle or on the vehicle floor, using the steel seating on the base.

The leading plate must be clearly visible when the heater is installed. If necessary a second plate (duplicate) with the same information as the original must be affixed to a point on the heater clearly visible after installation or to a cover located in front of the heater. A covering plate is not necessary if the original is visible after removal of a cover without the aid of tools.

\* Vehicles with more than 9 seats.

## Principal Dimensions



## Permissible installation positions

The heater may also be installed in the standard position as shown. See sketch for maximum permissible deviations.

Please consult the manufacturer if further differences are required.

During starting a heater installed in the standard position may deviate, due to the inclination of the vehicle during motion, up to  $\pm 15^\circ$  in both axes from the standard position.

Continuous heating operation after starting is possible at a deviation of up to  $\pm 30^\circ$  from the standard position. With deviation exceeding  $\pm 30^\circ$  reliable heating operation is no longer possible. However, this does not lead to damage of the heater. If the changes in the operating position are only for brief periods.

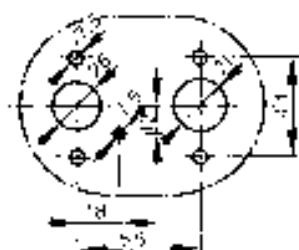
**Important: the plug connection must always point upwards.**





### Fastening to the vehicle wall/floor

Make predrill holes in accordance with the template (see below).



The 100 mm diameter hole for the mounting cutout from the end circle is not included in the template pattern and must be drilled to suit the installation method.

The mating surface for the heater base must be smooth to fit. The penetration and fit must be such that the mating surface is spread out as wide as the mating surface under Car. No. 981201483329.

### Special fit

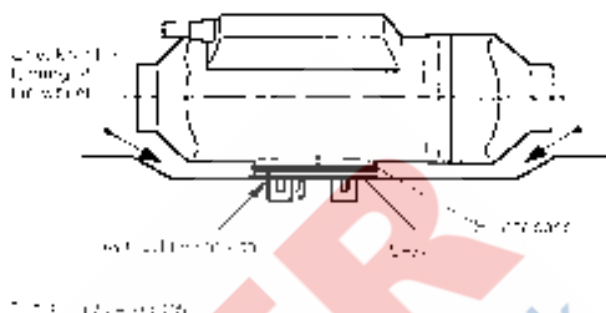
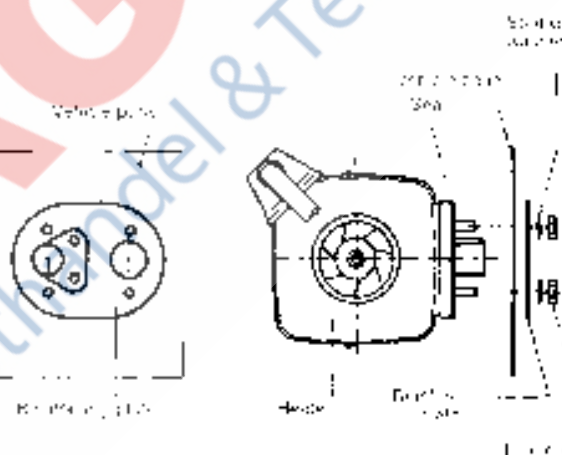
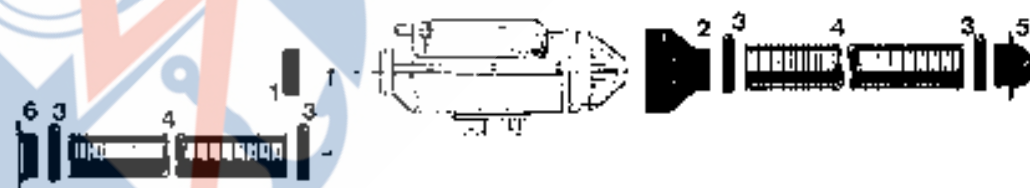


Fig. 12.2.2.2.2.2.2.2

If the mating surface sheet is less than 1 mm thick or has a hole less than 1.5 mm, a metal reinforcement plate, Car. No. 981201483329, must be installed additionally on the outside.



### Running the Heating Air – Parts for running the heating air included in the second order, very for the universal installation kit



1. Fan base
2. Fan engine
3. Fan base (with fan base)

4. Fan base (with fan base)
5. Fan base (with fan base)
6. Fan base (with fan base)

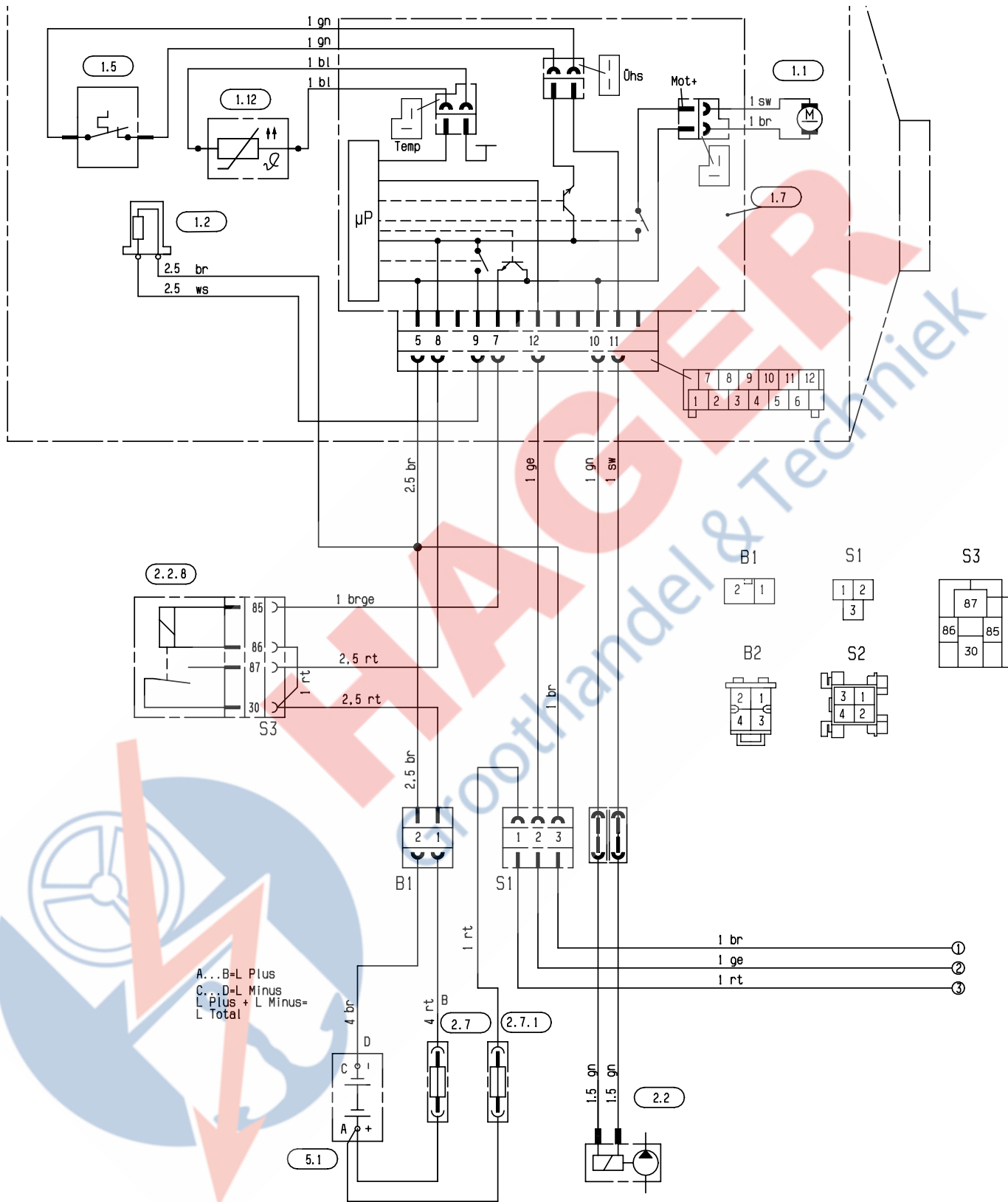
When checking air intake and the average outlet temperature should not significantly exceed 100°C at the outlet point with an intake temperature of 20°C. This will ensure that the safety thermal cut-off switch will not respond under normal operating conditions.

Heating air intake openings shall be arranged in such a manner that exhaust from the vehicle's engine and from

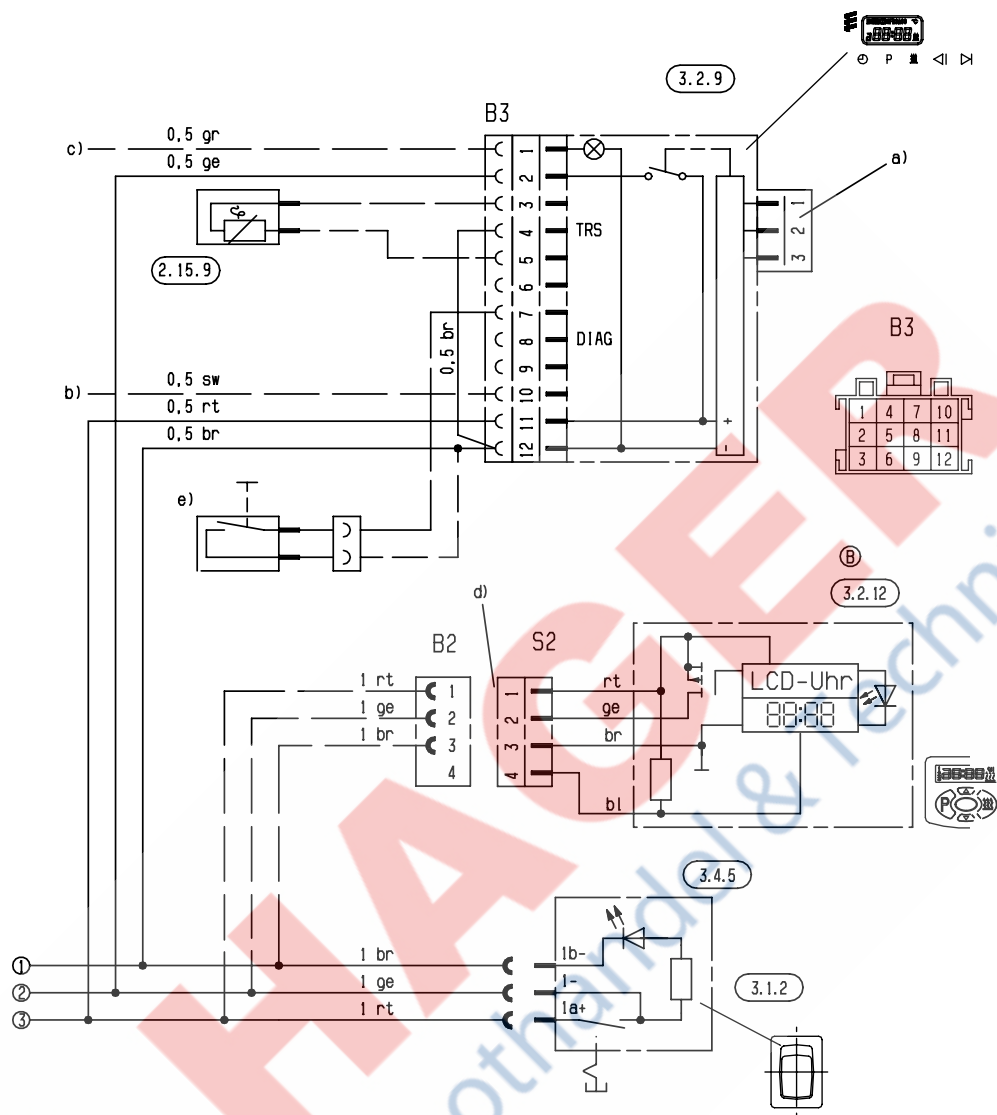
the heater cannot be expected to be sucked in under normal operating conditions, and the heating air cannot be contaminated.

When operating as a recirculating heater, locate the inlet for the heating air in such a way that the outgoing hot air cannot be sucked directly in again.  
Max. permissible heating air intake temperature 40°C.

Wiring diagram







25 2019 00 96 01 B

### Parts List

- 1.1 Burner motor
- 1.2 Heater plugs
- 1.5 Overheating switch
- 1.7 Printed wiring board with controls
- 1.12 Flame sensor
- 2.2 Fuel pump
- 2.7 Main fuse
  - 12 volt = 25 A
  - 24 volt = 15 A
- 2.7.1 5 A fuse (control element)
- 2.15.9 Sensor, outside temperature
- 3.1.2 Heater switch (continuous operation)
- 3.2.9 Module clock
- 3.2.12 Minitimer
- 3.4.5 On indicator light
- 5.1 Battery

- a) Radio module connection
- b) on terminal 15
- c) Lighting terminal 58
- d) optional
- e) External ON / OFF key (optional)

### Cable colours

- sw = black
- ws = white
- rt = red
- ge = yellow
- gn = green
- vi = violet
- br = brown
- gr = grey
- bl = blew
- li = purple

Connector and socket housings are shown from the circuit entry side.

Length A – B + Length C – D:  
 < 5 m 4 mm<sup>2</sup> diameter  
 5 m < 8 m 6 mm<sup>2</sup> diameter





## Fuel supply

Observe the instructions below for the correct installation, as they can lead to malfunctions.

### 1. For cars with diesel engines.

Fuel tapped from the fuel supply line to the engine.

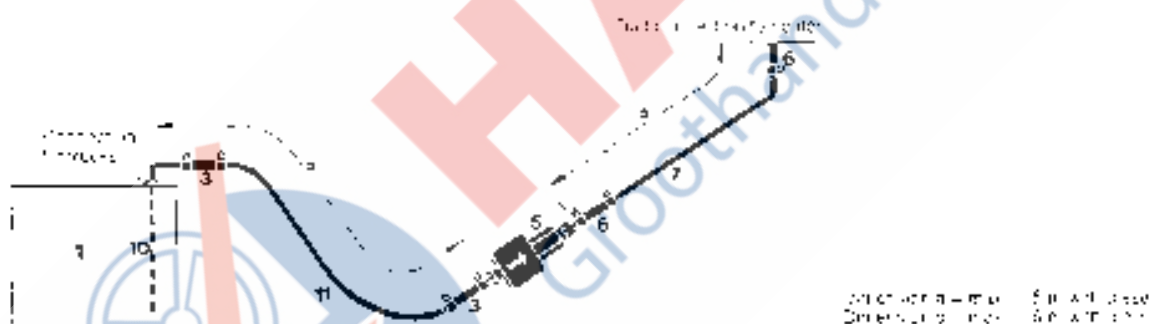
Precaution: The fuel line from the fuel tank to the engine must be leak free, so that there is no break in the fuel column when the engine is not running.



### 2. For trucks with diesel engines.

The following general rules apply:

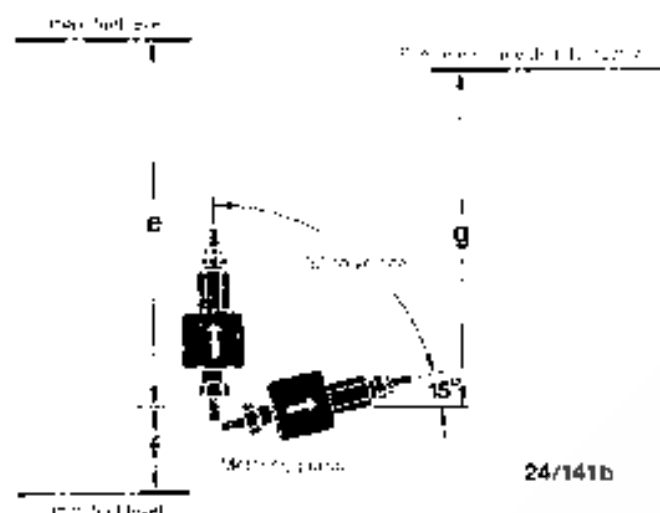
2.1 Tapping fuel – where possible – using a separate user pipe fitted directly into the fuel tank in the case of trucks.



2.2 If it is not possible to fit a separate user pipe in the case of trucks with diesel engines, the fuel supply line can be supplied (as shown under 1):

- 1 Fuel tank (vehicle tank or separate tank)
- 2 Fuel branch
- 3 Fuel hose, internal dia. 5 mm  
Cat. No. 06075030
- 4 Fuel pipe (if necessary when contaminated fuel is used)  
Cat. No. 251226890037
- 5 Fuel metering pump (to be vertically upwards)
- 6 Fuel hose, internal dia. 3,5 mm  
Cat. No. 06075000
- 7 Fuel pipe, plastic, internal dia. 1,5 mm  
Cat. No. 09031118  
or internal dia. 2 mm  
Cat. No. 09031117
- 8 Fuel pipe, internal dia. 2 mm  
Cat. No. 251226595000  
external dia. 6 mm
- 10 Fuel pipe, internal dia. 2 mm  
Cat. No. 09031125

### 3. Permissible suction and pressure heads for installation per 1. and 2.; permissible positioning of metering pump



Supply pressure from tank to metering pump

e = max. 9000 mm suction head;

tank at zero pressure

f = max. 1000 mm with diesel oil

Check whether tank vent takes work properly

Inlet from tank when underpressure occurs during operation (valve 0.03 bar in tank cap)

f = max. 400 mm with diesel oil

Pressure head metering pump to heater

g = max. 2000 mm

Fuel line metering pump to heater should not have a slope f or g if possible.

### 2. Important

Protect fuel lines, filter and metering pump from overheating; do not install near silencers and exhaust pipes

Permissible ambient temperature in operation from +40°C to +50°C, not in operation from -40°C to +65°C

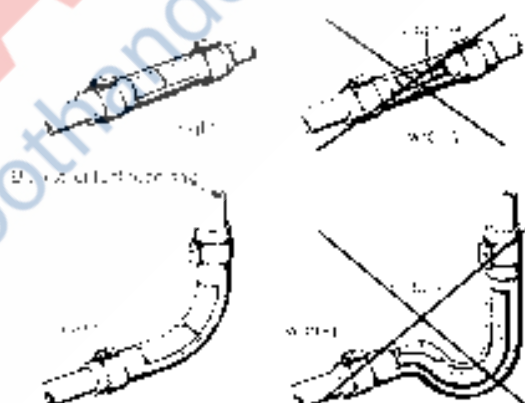
When installing the fuel line, fuel filter and fuel metering pump near the rear axle, be sure to take the spring deflection of the rear axle into consideration

Cut fuel tubes and pipes to length only with a sharp knife. Cuttings may not be accepted and must be burnt free

For connection of the fuel branches, always use rubber tubing; never plastic pipe.

Fuel pipes connected by means of a fuel pump

Fuel pipe sections must ABUT



### Fuel grades/Fuel at low temperatures

The heater can take without problem the same fuel you use in your tank. In the USA diesel fuel no. 1 and no. 2. Addition of used oil is not permitted.

The refineries automatically adapt their fuels to normal winter temperatures. (Winter Diesel)

Therefore difficulties can only arise at extremely low temperatures in the engine – see the vehicle's instruction manual

If the heater is operated from a separate tank, the following rules must be observed: at temperatures above 0°C any type of diesel fuel can be used

If no special cold-weather diesel fuel is available at low temperatures, mix kerosene or gasoline according to the adjacent table.

Temperature	Winter diesel oil	Additive
From 0°C to 15°C**	100%	–
From -15°C to -25°C	50%	50% kerosene or gasoline
From -25°C to -40°C	–	100% kerosene*

\* or special winter diesel oils

\*\* or in accordance with fuel manufacturer's specifications

The fuel line and the fuel pump must be filled with new fuel by operation for 15 minutes.

### Fuel for special cases

In special cases, the heaters can also be operated on extra light fuel oil (below 0°C) or kerosene. In doing so, consult the manufacturer.



## Function description/operating instructions

### Control elements

- 1 On/Off switch
- 2 Heater filter  
 (additional part, optional, see p. 2). The filters can be used to switch the heater on or off, using the filter or to press the switch-on time.

### Mode of operation

#### Procedure after switch-on

**Switch-on:** Set On/Off switch to "On".  
 The pilot light in the On/Off switch comes on.

Further procedure is automatic.

After about 3 secs.: Heater "On"  
 Heater coil of glow plug "On".

After about 33 secs.: Fuel conveying "On".

When a stable flame has been obtained: Glow plug off.

The heater now operates at full heating capacity (1600 W), and the air heated by the heat exchanger passes through the outlet into the space to be heated.

**Switch-off:** Set On/Off switch to "Off".  
 The pilot light goes off.

The power continues to operate to cool down, and finally shuts down automatically after about 3 minutes.

### Controls and safety equipment

The flame is monitored by the flame sensor (7), and the maximum safe temperature by the safety thermal output switch (8). Both affect the electronic control unit, which shuts down the heater in the event of faults.

1. If the heater fails to ignite within 180 seconds of the start of fuel pump operation, the flame goes out by itself during operation, a fault shutdown takes place, with the blower motor continuing to operate for about 3 minutes, during the glow plug is also on during the first 30 seconds. The fault shutdown can be cancelled by switching off and then back on.

2. In the event of overheating, the safety thermal output switch (8) is operated, the fuel supply is interrupted, and a fault shutdown follows with the blower motor continuing to operate as described above.  
 Once the cause of the overheat has been removed, the heater can be restarted by switching it off and then back on again.

Note: Depending on the quality of the insulation and the cause of the overheat, but not the fuel supply without flame may re-start during the time interval 2 minutes, and the device finally comes to a standstill. In this case, the device may be restarted for a short period after a full stop.

3. If, during start or operation, a short circuit or interruption occurs in motor, glow plug, fuel metering pump or flame monitor, a fault shutdown takes place, whereby with the blower motor continuing to operate as described above.

4. The operation of the blower motor is monitored periodically. If it fails to start or if the motor speed is below the minimum value, fault shutdown takes place.

5. When the heater is switched off, the glow plugs is switched on during the delayed shutdown for about 30 seconds (allowing for clearing of combustion residues). The heater must always be switched off when the tank is being filled.  
 The heater must not be operated in garages.

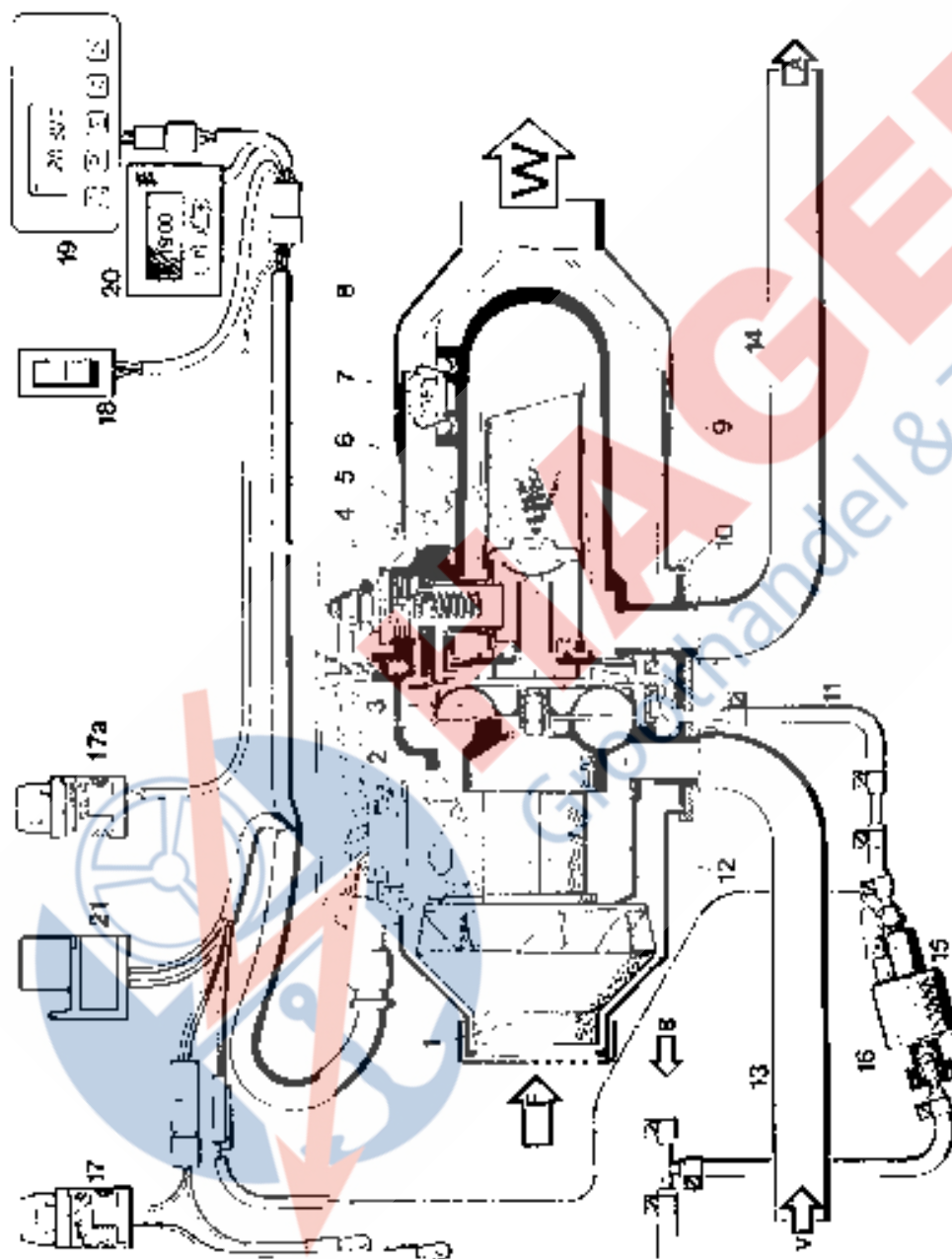
### In the event of trouble, first check the following:

- Fuel in the tank?
- Fuses OK?
- Flint and lines and connections OK?
- Combustion air and exhaust piping systems free?
- When changing over to winter operation, is there still summer quality diesel fuel in the lines?

### When combustion produces soot, check the following:

- Combustion air and exhaust piping systems clogged? ...  
 ... Remove cause of clogging.
- Fuel metering pump conveying too much? ...  
 ... Measure fuel quantity, replace metering pump if necessary.
- Deposit in heat exchanger? ...  
 ... Clean heat exchanger, or replace if necessary.

Sectional drawing



Parts List

- |   |                              |    |                        |    |               |
|---|------------------------------|----|------------------------|----|---------------|
| 1 | Head of the motor wheel      | 9  | Control valve          | 17 | Motor         |
| 2 | Electric motor               | 10 | Flange seal            | 18 | Control cable |
| 3 | Compressor air bleed wheel   | 11 | Label set              | 19 | Display       |
| 4 | Glow plug                    | 12 | Bracket holder         | 20 | Display       |
| 5 | Safety pressure relief valve | 13 | Control air connection | 21 | Control       |
| 6 | Compressor assembly          | 14 | Label set              |    |               |
| 7 | Control sensor               | 15 | Line connection        |    |               |
| 8 | Control exchange             |    |                        |    |               |