

Troubleshooting

The troubleshooting manual is valid for the following heater:

B 2 L – 12 V Control
 20 1607 01 00 00 On – Off
 20 1609 01 00 00 High – Low
 20 1634 01 00 00 On – Off
 20 1661 01 00 00 On – Off
 20 1671 01 00 00 On – Off

D 2 L – 12 V Control
 25 1507 01 00 00 On – Off
 25 1534 01 00 00 On – Off
 25 1597 01 00 00 Full – 1/4
 25 1632 01 00 00 Full – 1/4
 25 1684 01 00 00 Full – 1/4
 25 1690 01 00 00 Full – 1/4

B 2 L-S – 12 V Control
 20 1627 01 00 00 On – Off
 20 1633 01 00 00 On – Off

D 2 L-S – 12 V Control
 25 1529 01 00 00 On – Off
 25 1541 01 00 00 On – Off

**UNCONTROLLED
 COPY**

CHECK ISSUE STATUS PRIOR TO USE

DATE: **20 OCT 1994**

Contents	Page	Page	
Which heater model has been installed?	2	Repair instructions	18
Table: heaters in WESTFALIA vehicles / POST vehicles/VW-Factory-fitted	2	Removing the outer casing	19
Making a test cable.....	3	Removing and installing the printed circuit board.....	19
Check before troubleshooting/check values.....	3	Removing and installing the ignition spark generator.....	19
Troubleshooting.....	4-7	Removing and installing the heating coil switch.....	20
Wiring diagrams		Removing and installing the temperatur switch	20
B 2 L 20 1609 01	8	Removing and installing the safety thermal cutout switch.....	20
B 2 L 20 1634 01 } without heating	9	Removing and installing the electric motor	21
B 2 L-S 20 1633 01 } coil switch	9	Removing and installing the blower.....	22
B 2 L 20 1634 01 } with heating	10	Removing and installing the heat exchanger with combustion chamber	23
B 2 L-S 20 1633 01 } coil switch	10	Assembling the heater.....	23
B 2 L 20 1661 01	11	Measuring the fuel quantity.....	24
B 2 L 20 1671 01	12		
D 2 L 25 1534 01 }	13		
D 2 L-S 25 1541 01 }	13		
D 2 L 25 1597 01	14		
D 2 L 25 1632 01	15		
D 2 L 25 1684 01	16		
D 2 L 25 1690 01	17		

Which heater model has been installed?

The rating plate on the heater indicates the heater version and model installed.

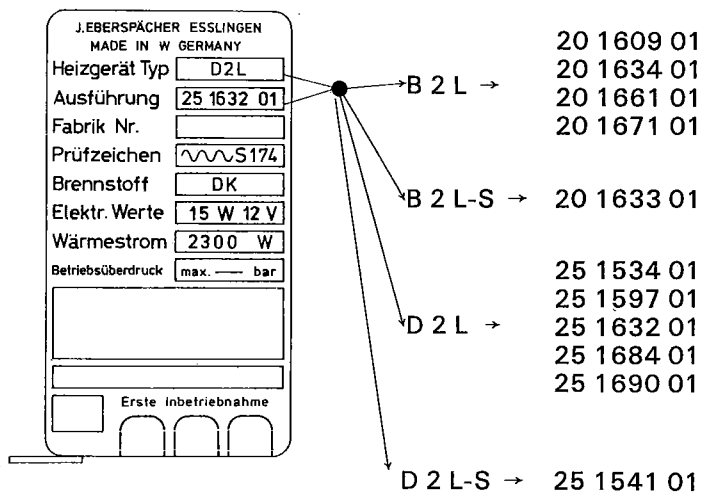
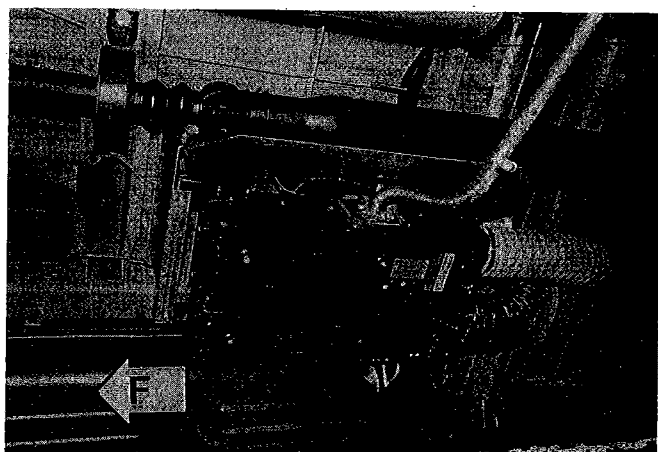


Table: Heaters in WESTFALIA vehicles/POST vehicles/VW Factory-fitted

Vehicle model	Fuel	from	year	to	Heater model	Version
JOKER and MOSAIK retrofit kit	petrol	1. 79		12. 80	B 2 L	20 1609 01 00 00
	petrol	1. 81		7. 84	B 2 L	20 1634 01 00 00
	petrol	8. 84		—	B 2 L	20 1661 01 00 00
	diesel	12. 80		7. 84	D 2 L	25 1534 01 00 00
	diesel	8. 84		3. 88	D 2 L	25 1597 01 00 00
	diesel	4. 88		—	D 2 L	25 1690 01 00 00
SVEN HEDIN and JAMES COOK	petrol	8. 80		12. 82	B 2 L-S	20 1633 01 00 00
	petrol	1. 83		7. 84	B 2 L	20 1634 01 00 00
	petrol	8. 84		—	B 2 L	20 1661 01 00 00
	diesel	8. 80		12. 82	D 2 L-S	25 1541 01 00 00
	diesel	1. 83		7. 84	D 2 L	25 1534 01 00 00
	diesel	8. 84		3. 88	D 2 L	25 1597 01 00 00
	diesel	4. 88		—	D 2 L	25 1690 01 00 00
MARCO POLO	petrol	5. 84		—	B 2 L	20 1661 01 00 00
	diesel	5. 84		3. 88	D 2 L	25 1597 01 00 00
	diesel	4. 88		—	D 2 L	25 1690 01 00 00
POST vehicles VW bus Type 2 – Model 25	petrol	1. 82		7. 84	B 2 L	20 1634 01 00 00
	petrol	8. 84		—	B 2 L	20 1661 01 00 00
	diesel	1. 82		7. 84	D 2 L	25 1534 01 00 00
	diesel	8. 84		3. 88	D 2 L	25 1597 01 00 00
	diesel	4. 88		—	D 2 L	25 1690 01 00 00
VW Factory-fitted						
VW bus Type 2 – Model 25	petrol	—		—	B 2 L	20 1671 01 00 00
	diesel	—		—	D 2 L	25 1684 01 00 00

WESTFALIA, WEINSBERG, VOLL are companies fitting out POST vehicles.

The heater installations differ in their hot air guidance systems and controls depending on the equipper and heater model.

Check before troubleshooting:

The troubleshooting chart omits the following faults, which must be checked as a general principle beforehand:

1. Faulty wiring (short-circuit, break)
2. Corroded contacts/no earth connection
3. Battery voltage less than 10 V
In the glow phase, measure the voltage at the control unit between terminals 3 and 4
4. Mechanical damage to components
5. Fuel tank empty

If no fault can be found, continue to trace it using the troubleshooting chart.

Check values

Temperature switch delayed shutoff time
120 to 220 secs.

Blower motor speed at rated voltage (measured after switching off the glow plug):

B 2 L / D 2 L = 2 900 to 3 300 rpm

B 2 L-S / D 2 L-S = 3 600 to 4 100 rpm

Making a test cable

With a test cable, it can be quickly ascertained whether the cause of a fault lies in the heater including control unit, and fuel supply system or in the operating and regulation system.

To do so, connect the test cable to the 8 or 10 pin plug instead of to the operating system and check that the heater is functioning correctly using the troubleshooting chart (test steps ①).

When this has been ensured, remove the test cable, reconnect the control system and continue the search for the fault there (test steps ②).

The test cable should be 1.5 m long.

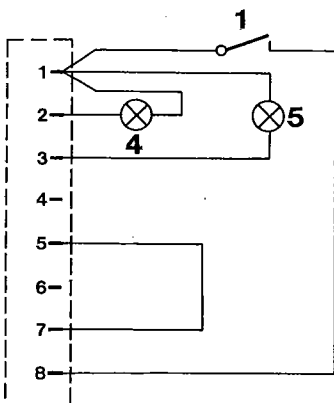
Test cable for heaters

B 2 L / B 2 L-S

20 1609 01 00 00
20 1634 01 00 00
20 1633 01 00 00

D 2 L / D 2 L-S

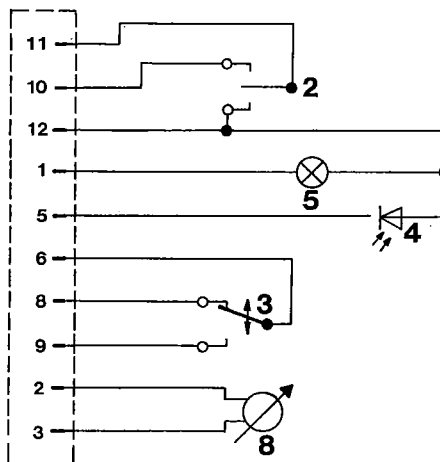
25 1534 01 00 00
25 1541 01 00 00



Test cable for heater

B 2 L

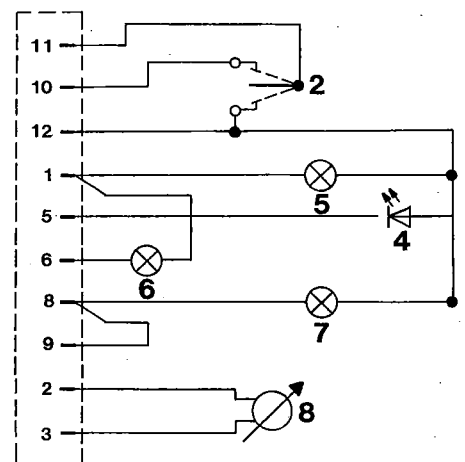
20 1661 01 00 00
20 1671 01 00 00



Test cable for heater

D 2 L

25 1597 01 00 00
25 1632 01 00 00
25 1684 01 00 00
25 1690 01 00 00



- 1 Heating switch
2 Heating-Ventilation switch

- 3 Heating-Reventilation switch
4 Overheat indicator

- 5 Pilot light
6 Glow plug signal

- 7 Metering pump signal
8 Ohmmeter for measured value 800 Ω – 1150 Ω

①

Troubleshooting Fault → Cause	No blower noise approx. 5 secs. after switching on	Blower runs for approx. 5 secs. after switching on; then cuts out automatically	Blower runs approx. 5 secs. after switching on. Pump ticks after approx. 30 secs. Automatic cutout after approx. 3 mins.	Blower runs approx. 5 secs. after switching on. Pump does not tick after approx. 30 secs. Automatic cutout after approx. 3 mins.	Heater cuts out automatically and permanently during heating operation. Red pilot light on = overheat	No reduction of heating capacity in "Low" position	Insufficient heating capacity in "High" position or heater cuts out by itself. Red pilot light not on	Heater gives off smoke and soot	Blower continues to run after switching off longer than the normal delayed cutout time of 3 - 4 mins.	Ventilation and slow reventilation functions not working	Heater does not reduce capacity D 2 L keeps switching to low heating capacity when started. B 2 L always runs at low speed and does not generate heat
Main fuse or motor current fuse defective	○										
Safety thermal cutout switch actuated					○						
Safety thermal cutout switch does not close (open)		○									
Glow plug in D 2 L Glow ignition plug in B 2 L coked/defective	○ D 2 L		○ B 2 L								
Heating coil switch Ignition spark generator defective (B 2 L only)			○ B 2 L								
Temperature switch does not switch cold to hot			○								
Temperature switch does not switch hot to cold								○			
Control unit not transmitting pulses for fuel metering pump				○							
Reed relay in control unit has no contact		○									
Relay in control unit sticking								○			
Fuel metering pump not working				○							
Fuel metering pump supplying too much					○		○				
Fuel metering pump supplying too little			○								
Fuel line leaking Cup strainer in metering pump clogged			○								

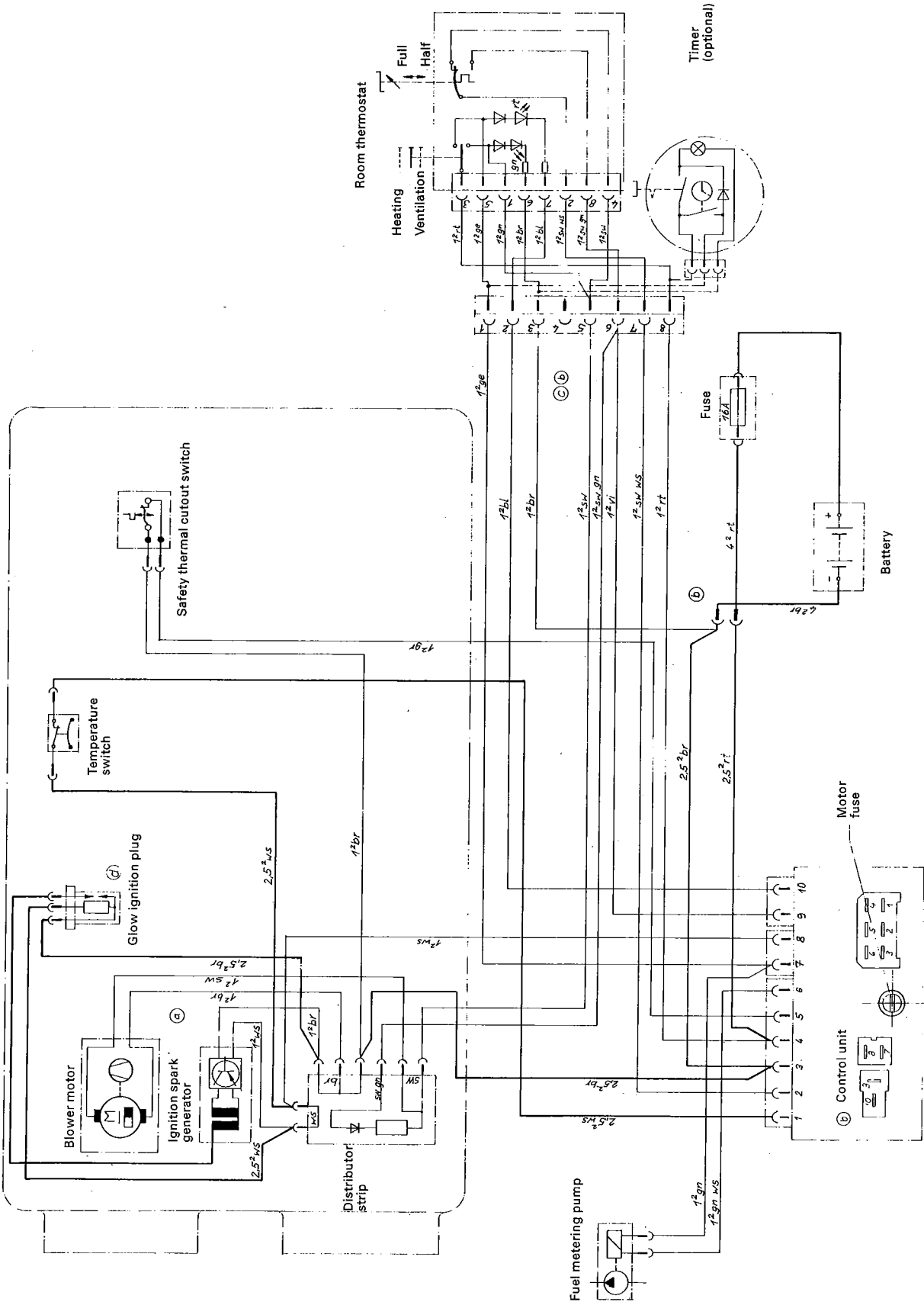
Check	Remedy
Visual check/continuity check Main fuse: short-circuit in the wiring, heating coil coked Motor current fuse: blower damaged	Replace 16 A main fuse Replace motor current fuse (only use EBERSPÄCHER fuse links)
Red pilot light flashing or steady after automatic cutout. Measure blower speed, Measure fuel quantity (see p. 24)	Remove blockage on intake or discharge side, replace blower (see p. 22) replace fuel metering pump switch off and back on
No negative on terminal 5 (control unit) in switched off condition	Replace safety thermal cutout switch (see p.20)
Visual check	Replace plug
Heating coil switch: opening temperature 45°C, closing temperature 25°C. Ignition spark generator: hold high-voltage cable approx. 5 mm against earth	Replace heating coil switch (see p.20) Replace ignition spark generator (see p. 19)
Heater cuts out automatically after approx. 3 minutes. No delayed cutout	Replace temperature switch (see p.20)
No continuity between terminals 1 and 8 (control unit) when heater is switched off	Replace temperature switch (see p.20)
Connect pilot light to metering pump. If there are no pulses:	Replace control unit
See under Fault	Replace control unit
Blower continues to run after switching off longer than the normal delayed cutout time of 3 - 4 minutes, furthermore voltage present at the glow plug connection	Replace control unit
Connect pilot light to the metering pump. If there are pulses:	Replace the metering pump
Measure the fuel quantity (see p. 24). If outside the permissible tolerance:	Replace the metering pump
Measure the fuel quantity (see p. 24). If outside the permissible tolerance:	Replace the metering pump
Visula check	Bleed, seal, and replace cup strainer

Troubleshooting Fault → Cause	No blower noise approx. 5 secs. after switching on	Blower runs for approx. 5 secs. after switching on, then cuts out automatically	Blower runs approx. 5 secs. after switching on. Pump ticks after approx. 30 secs. Automatic cutout after approx. 3 mins.	Blower runs approx. 5 secs. after switching on. Pump does not tick after approx. 30 secs. Automatic cutout after approx. 3 mins.	Heater cuts out automatically and permanently during heating operation. Red pilot light on = overheated	No reduction of heating capacity in "Low" position	Insufficient heating capacity in "High" position or heater cuts out by itself. Red pilot light not on	Heater gives off smoke and soot	Blower continues to run after switching off longer than the normal delayed cutout time of 3 - 4 mins.	Ventilation and slow reventilation functions not working	Heater does not reduce capacity	D 2 L keeps switching to low heating capacity when started. B 2 L always runs at low speed and does not generate heat
① Hot air hose damaged or dropped of							○					
Heating air line clogged (intake or discharge side)					○							
Combustion air line or exhaust line clogged								○				
Blower motor speed too low					○							
Electric motor defective	○											
Blower damage	○											
P.C.B. in heater defective. Heater versions: 20 1661/25 1597/25 1684 20 1671/25 1632/25 1690 (relay coil interrupted)	○											
Relay sticking										○		
② P.C.B. in heater defective. Heater versions: 20 1634 25 1534 20 1633 25 1541							○					
P.C.B. in heater defective. Heater version 20 1609	○											
P.C.B. in heater defective. Heater version 20 1609 (diode does not block)							○					
Control elements defective	○											
Room thermostat does not switch over or temperature switch does not switch over						○	○					
Room thermostat defective Heater versions: 20 1661/25 1597/25 1684 20 1671/25 1632/25 1690				○								○
Power lead to room thermostat interrupted (short-circuit)											○	○

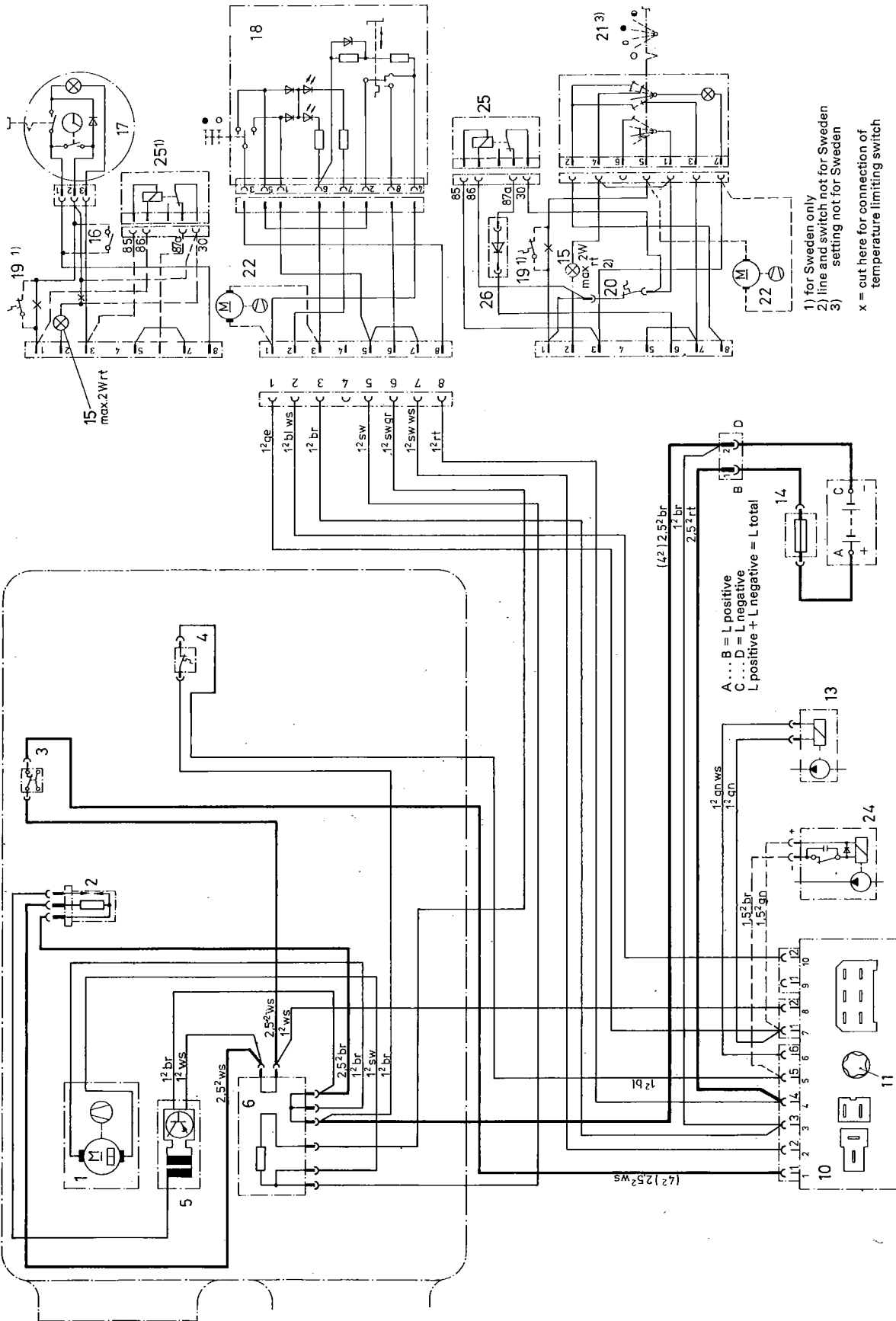
Check	Remedy
Visual check	Attach or replace hot air hose
Visual check	Remove blockage
Visual check	Remove blockage
Detach cold air hose, measure speed at motor shaft (see p. 3 for check values)	Replace electric motor (see p.21)
Detach cold air hose. If it is possible to turn the shaft of the electric motor:	Replace electric motor (see p.21)
Detach cold air hose. If it is not possible to turn the shaft of the electric motor:	Repair the blower (see p. 22)
Detach the control unit plug, apply positive voltage to terminal 2. If the electric motor does not run:	Replace the P.C.B. (see p. 19)
See under Fault	Replace the P.C.B. (see p. 19)
Switch on the heater, set thermostat from "8" to "1" or detach one connection from temperature control switch. Blower must switch from high to low speed. If it does not run with low speed:	Replace the P.C.B. (see p. 19)
Start the unit at room thermostat setting "1". Electric motor runs at room thermostat setting "8", electric motor does not run at thermostat setting "1"	Replace the P.C.B. (see p. 19)
At setting "8", the metering pump frequency halves when the temperature switch is thrown	Replace the P.C.B. (see p. 19)
Continuity check	Replace operating elements
Continuity check	Replace room thermostat or temperature controller
Carry out measurement at heater plug terminal 2 and 3 (target value 800 Ω - 1.15 K Ω)	Measured value OK: replace room thermostat Measured value not OK: replace sensor in heater
Carry out measurement at heater plug terminal 2 and 3 (target value 800 Ω - 1.15 K Ω)	Interruption: eliminate short-circuit

Wiring diagrams

B 2 L – Version 20 1609 01



B 2 L - Version 20 1634 01 } without heating coil switch
 B 2 L-S - Version 20 1633 01 }

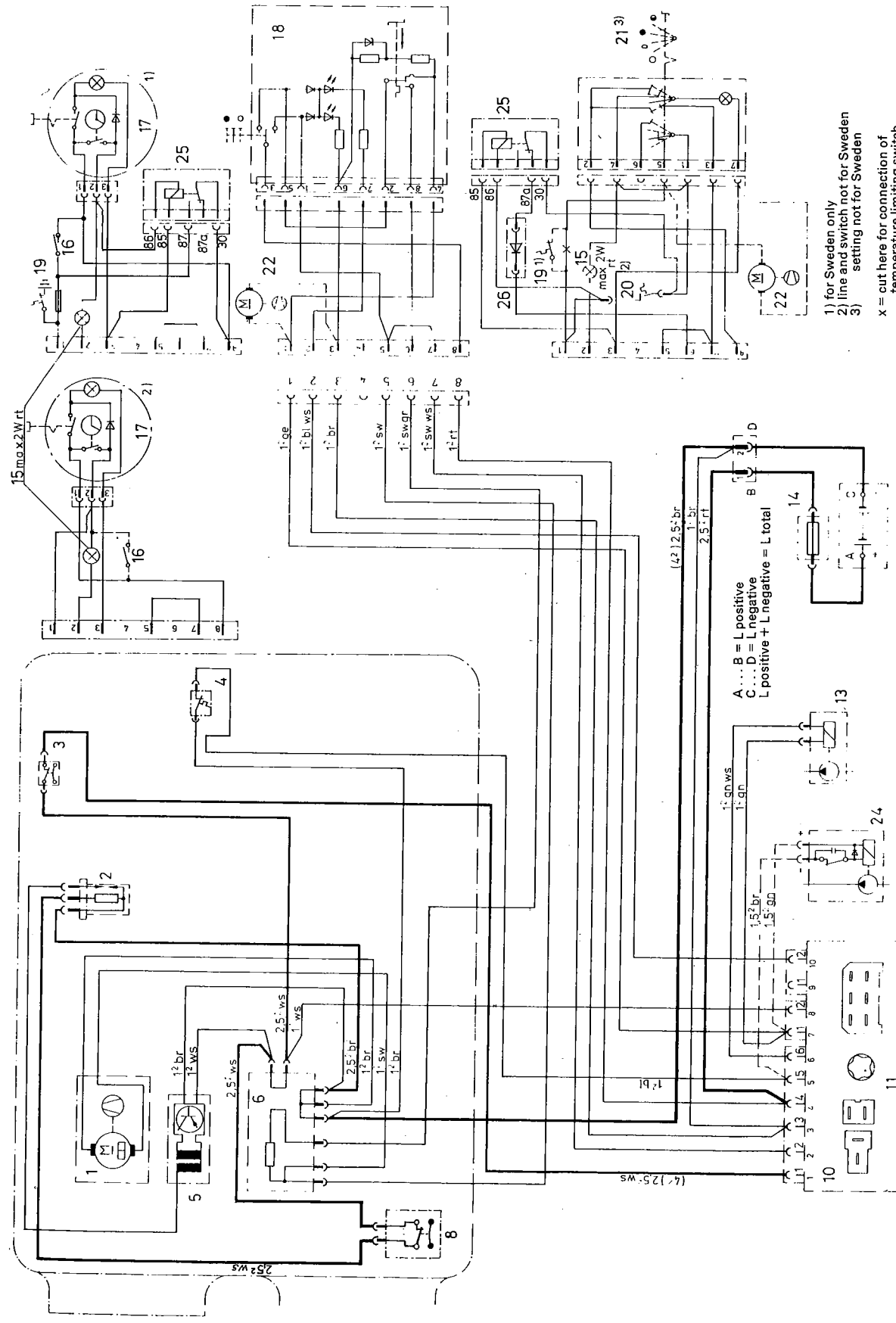


Parts list

- 1 Blower motor
- 2 Glow ignition plug
- 3 Temperature switch
- 4 Safety thermal cutout switch
- 5 Ignition spark generator
- 6 Distributor strip
- 10 Control unit
- 11 Motor fuse
- 13 Fuel metering pump
- 14 Main fuse 16 A
- 15 Fault indicator red
- 16 Switch for continuous operation
- 17 Timer
- 18 Room thermostat
- 19 Temperature limiting switch
- 20 Temperature control switch
- 21 Universal switch
- 22 Additional blower
- 24 Recirculation pump
- 25 Relay in conjunction with item 21
- 26 Diode

1) for Sweden only
 2) line and switch not for Sweden
 3) setting not for Sweden
 x = cut here for connection of temperature limiting switch

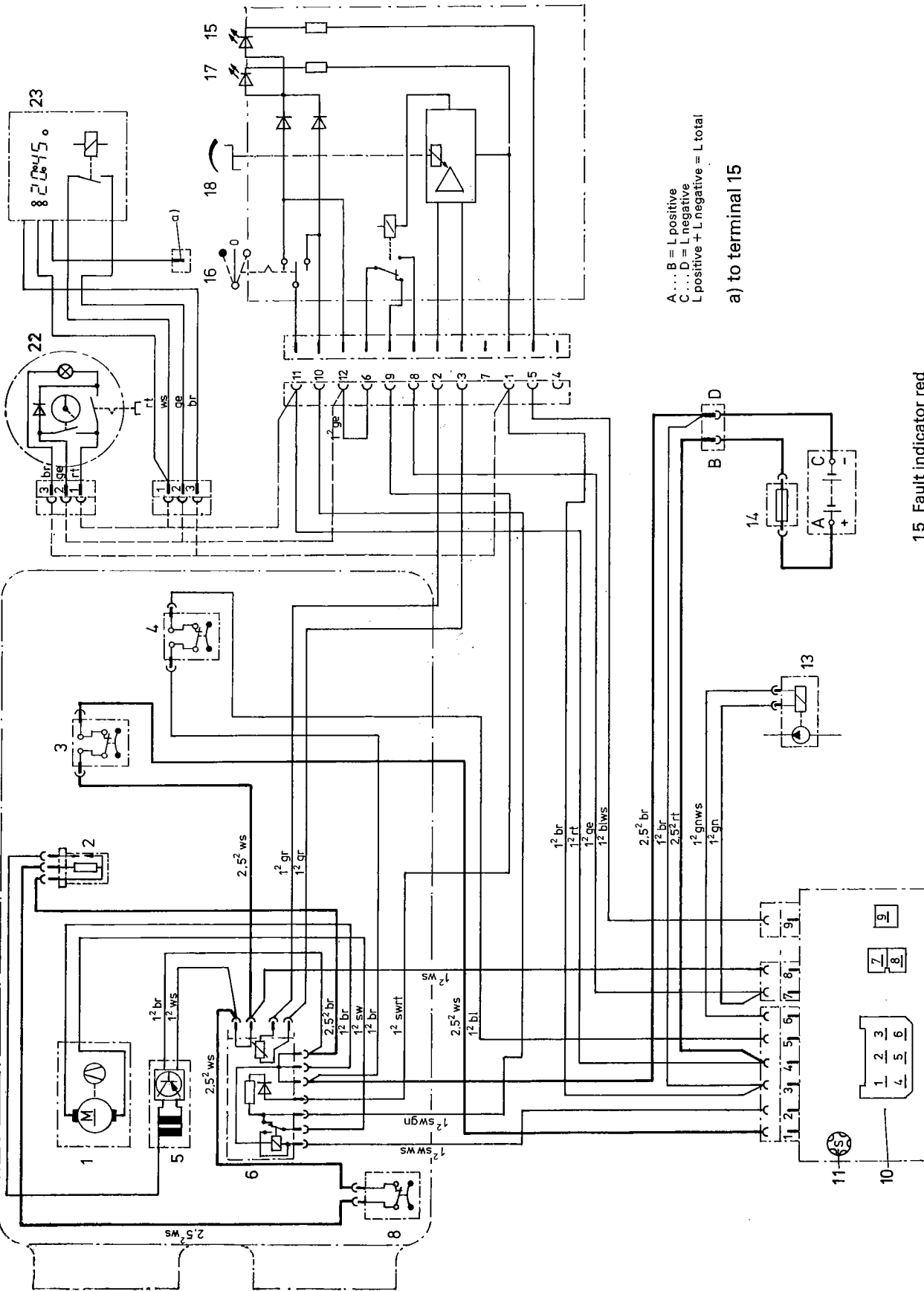
B 2 L - Version 20 1634 01 } with heating coil switch
 B 2 L-S - Version 20 1633 01 }



Parts list

- 1 Blower motor
- 3 Temperature switch
- 4 Safety thermal cutoff switch
- 5 Ignition spark generator
- 6 Distributor strip
- 8 Heating coil switch
- 10 Control unit
- 11 Motor fuse
- 13 Fuel metering pump
- 14 Room thermostat
- 15 Fault indicator red
- 16 Switch for continuous operation
- 17 Timer
- 18 Room thermostat
- 19 Temperature limiting switch
- 20 Temperature control switch
- 21 Universal switch
- 22 Additional blower
- 24 Recirculation pump
- 25 Relay } in conjunction with item 2
- 26 Diode }

20.1633.00.00.00



A... B = L positive
 C... D = L negative
 L positive + L negative = L total

a) to terminal 15

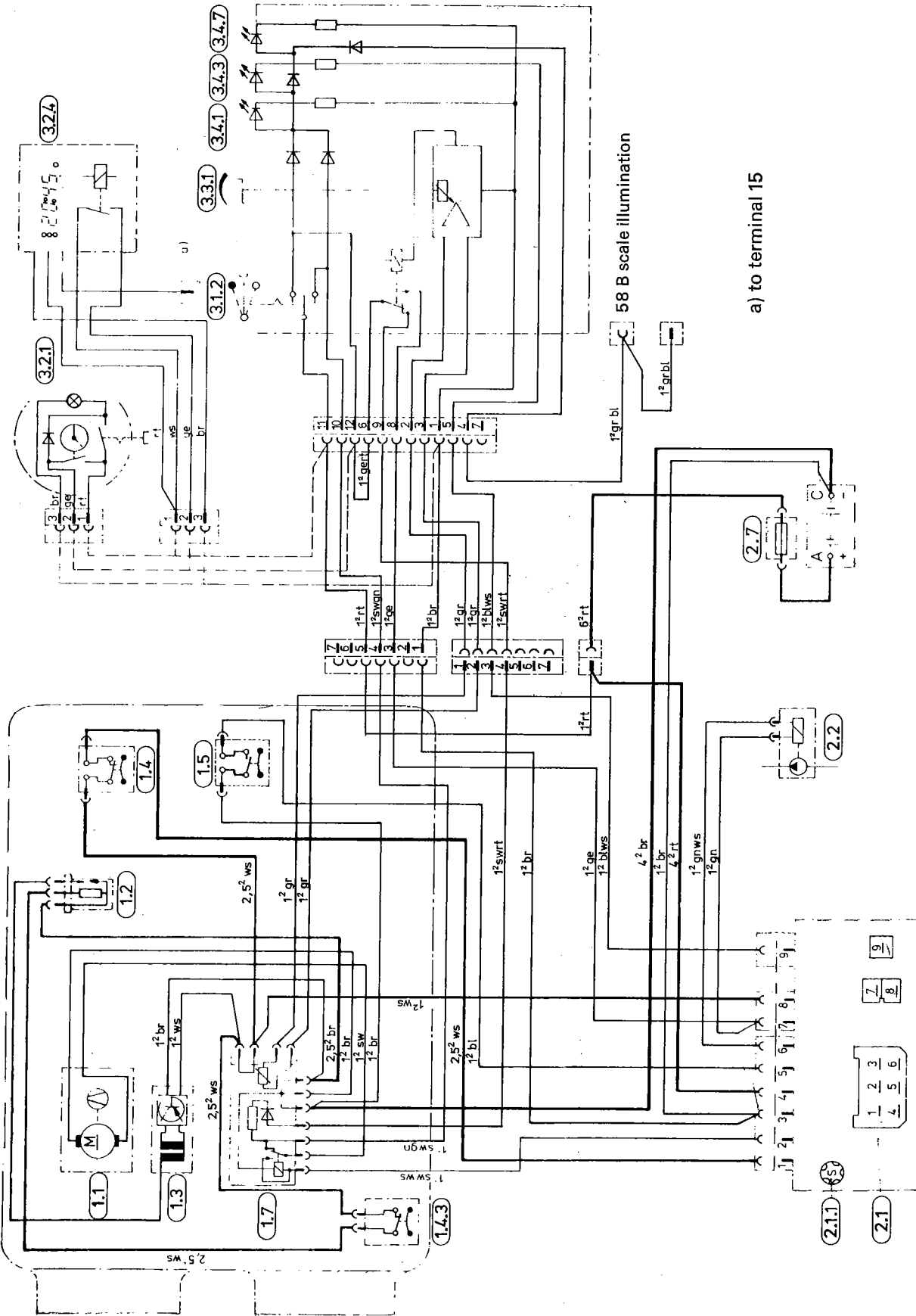
- 15 Fault indicator red
- 16 Switch for continuous operation and ventilation } in item 18
- 17 Operating pilot light green
- 18 Room thermostat
- 22 Timer (1)
- 23 Digital timer (1)

- 10 Control unit
- 11 Motor fuse (in item 10)
- 13 Fuel metering pump
- 14 Main fuse 16A

- 5 Ignition spark generator
- 6 Printed circuit board with room temperature sensor
- 8 Heating coil switch

- 1 Blower motor
- 2 Glow ignition plug
- 3 Temperature switch
- 4 Safety thermal cutout switch

Parts list



Parts list

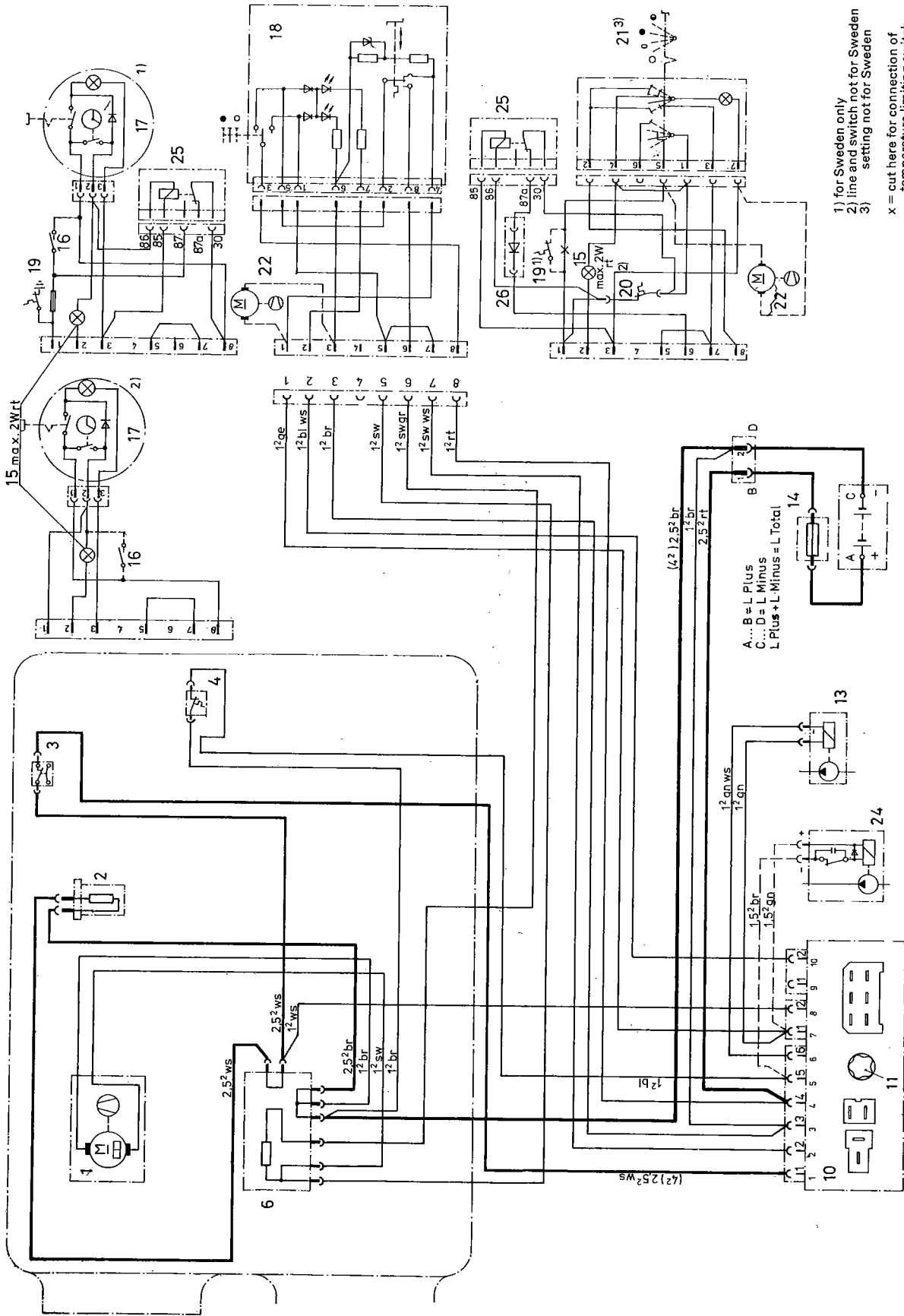
- 1.1 Blower motor
- 1.2 Glow ignition plug
- 1.3 Ignition spark generator
- 1.4 Temperature switch
- 1.4.3 Heating coil switch
- 1.5 Safety thermal cutout switch
- 1.7 Printed circuit board with room temperature sensor

- 2.1 Control unit
- 2.1.1 Motor fuse
- 2.2 Fuel metering pump
- 2.7 Main fuse 16 A

- 3.1.2 Switch for continuous operation and ventilation
- 3.2.1 Timer
- 3.2.4 Digital timer
- 3.3.1 Room thermostat
- 3.4.1 Operating pilot light green
- 3.4.3 Fault indicator red
- 3.4.7 Illumination

D 2 L - Version 25 1534 01

B 2 L-S - Version 25 1541 01

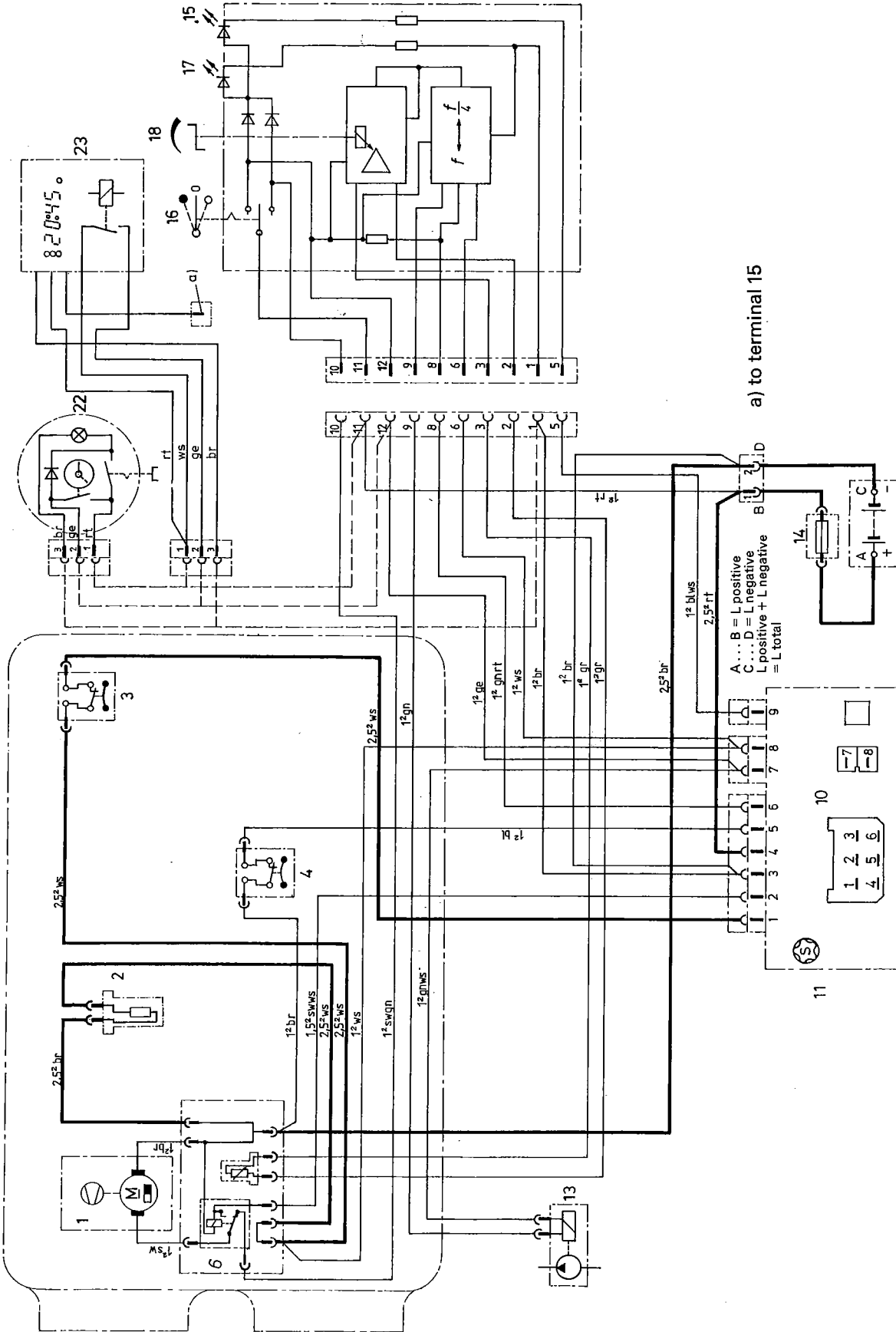


1) for Sweden only
 2) line and switch not for Sweden
 3) setting not for Sweden
 x = cut here for connection of temperature limiting switch

Parts list

- 1 Blower motor
- 2 Glow plug
- 3 Temperature switch
- 4 Safety thermal cutout switch
- 6 Distributor strip
- 10 Control unit
- 11 Motor fuse
- 13 Fuel metering pump
- 14 Main fuse 16 A
- 15 Fault indicator red
- 16 Switch for continuous operation
- 17 Timer
- 18 Room thermostat
- 19 Temperature limiting switch
- 20 Temperature control switch
- 21 Universal switch
- 22 Additional blower
- 24 Recirculation pump
- 25 Relay } in conjunction with item 21
- 26 Diode }

25 1507 00 96 01 - G

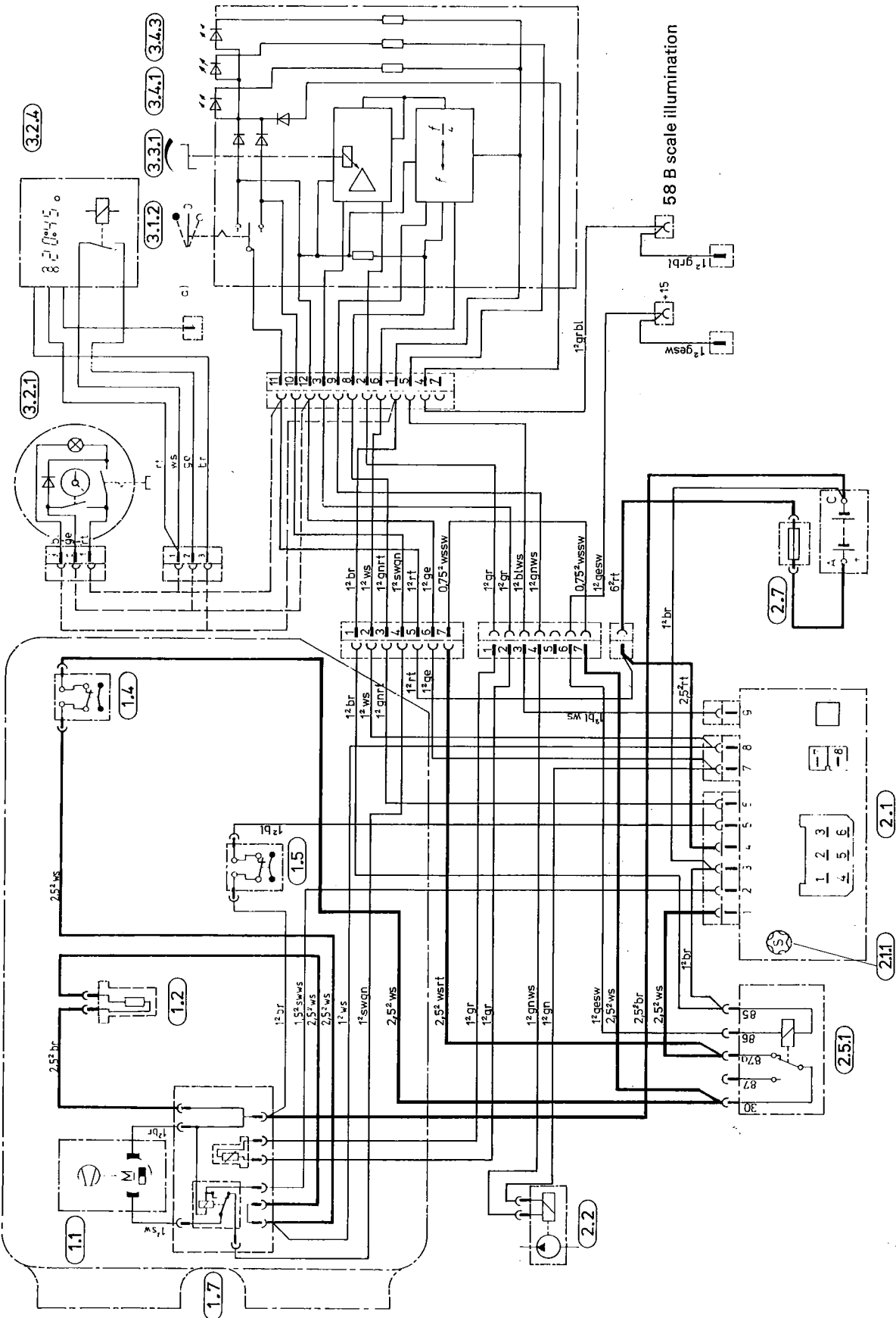


Parts list

- 1 Blower motor
- 2 Glow plug
- 3 Temperature switch
- 4 Safety thermal cutout switch
- 6 Printed circuit board with room temperature sensor (B)
- 10 Control unit
- 11 Motor fuse (in item 10)
- 13 Fuel metering pump
- 14 Main fuse 16 A
- 15 Fault indicator red switch for continuous operation } in item 18
- 16 Switch for continuous operation
- 17 Operating pilot light green
- 18 Room thermostat
- 22 Timer (1)
- 23 Digital timer (1)

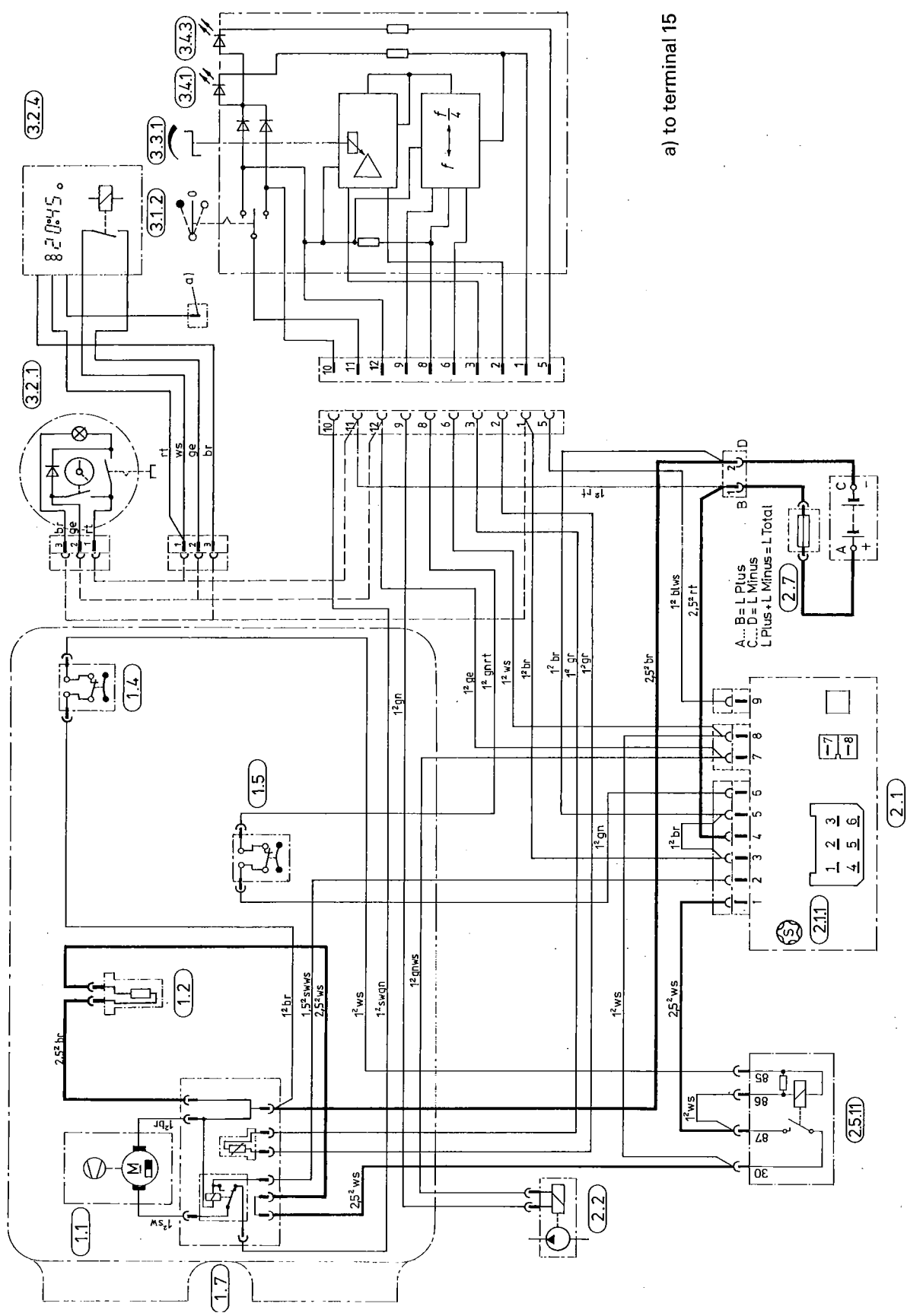
Sp 25 1597 00 96 01 - 1

D 2 L – Version 25 1632 01



- Parts list**
- 1.1 Blower motor
 - 1.2 Glow plug
 - 1.4 Temperature switch
 - 1.5 Safety thermal cutout switch
 - 1.7 Printed circuit board with room temperature sensor
 - 2.1 Control unit
 - 2.1.1 Motor fuse
 - 2.2 Fuel metering pump
 - 2.5.1 Glow plug relay
 - 2.7 Main fuse 16 A
 - 3.1.2 Switch for continuous operation
 - 3.2.1 Timer
 - 3.2.4 Digital timer
 - 3.3.1 Room thermostat
 - 3.4.1 Operating pilot light green
 - 3.4.3 Fault indicator red

Sp 25 1632 00 96 01 – 1

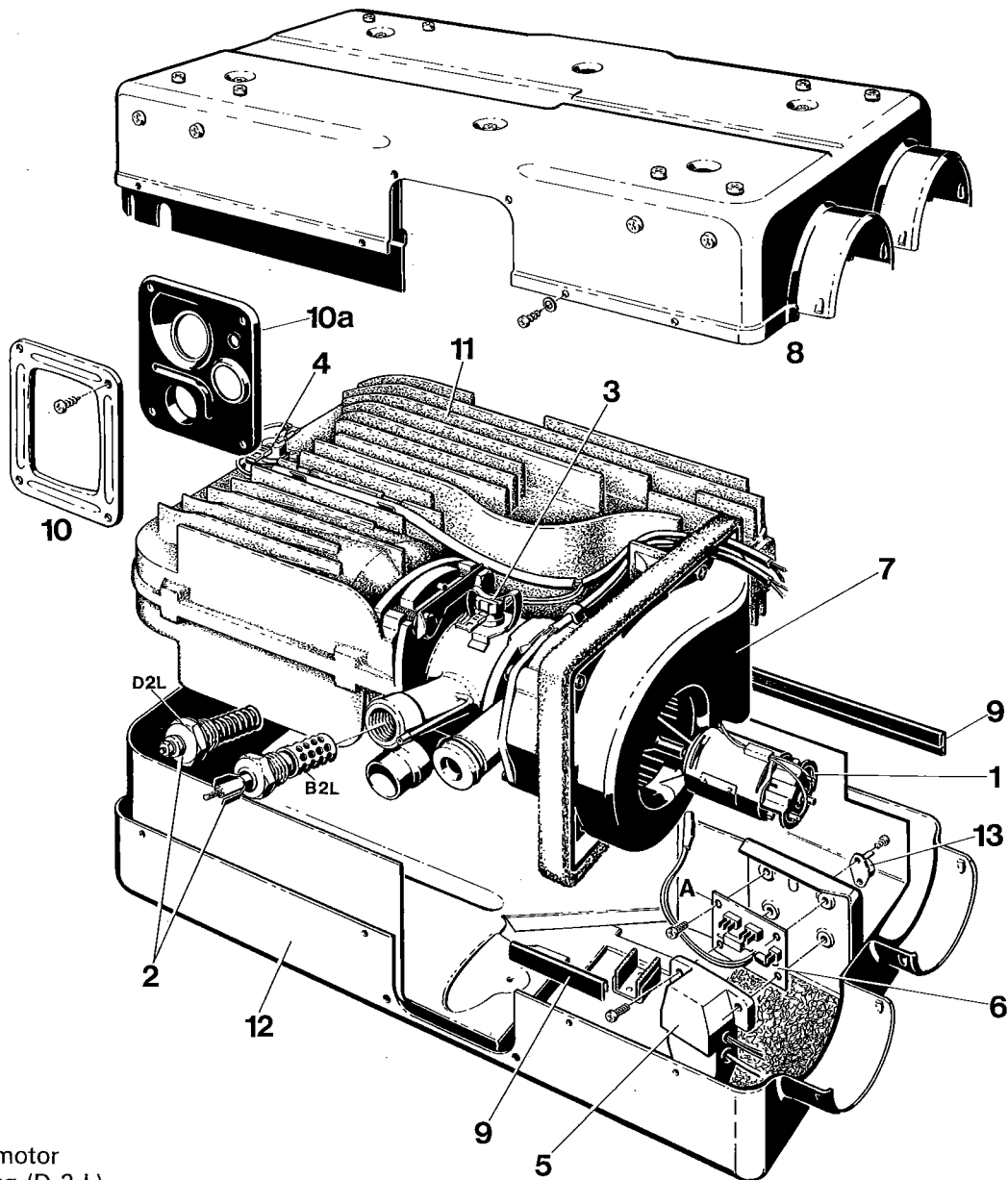


Parts list

- 1.1 Blower motor
- 1.2 Glow plug
- 1.4 Temperature switch
- 1.5 Fuel metering pump
- 1.7 Safety thermal cutout switch
- 2.1 Printed circuit board with room temperature sensor
- 2.1.1 Control unit
- 2.1.1.1 Motor fuse
- 2.2 Glow plug
- 2.5.11 Safety thermal cutout switch
- 2.7 Main fuse 16A
- 3.1.2 Switch for continuous operation
- 3.2.1 Timer
- 3.2.4 Digital timer
- 3.3.1 Room thermostat
- 3.4.1 Operating pilot light green
- 3.4.3 Fault indicator red

Repair instructions

illustrated is heater B 2 L with heating coil switch,
without room temperature sensor



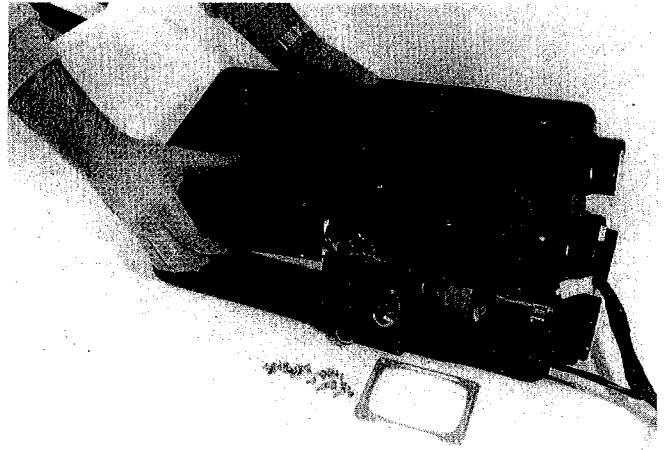
- 1 Electric motor
- 2 Glow plug (D 2 L)
- 3 Glow-ignition plug (B 2 L)
- 4 Temperature switch
- 5 Safety thermal cutout switch
- 6 Ignition spark generator (B 2 L)
- 7 Printed circuit board
- 8 Blower (heating air and combustion air)
- 9 Casing, upper half
- 10 Sealing strips
- 10a Reinforcing plate
- 11 Seal
- 12 Heat exchanger
- 13 Casing, lower half
- 14 Heating coil switch

A Two upper fixing screws only in design 201609 01

1. Removing the outer casing

Removal: Unscrew the support plate. Remove the screws from the outer casing sections and take off the top half. Snap the rubber seal out of the top casing half.

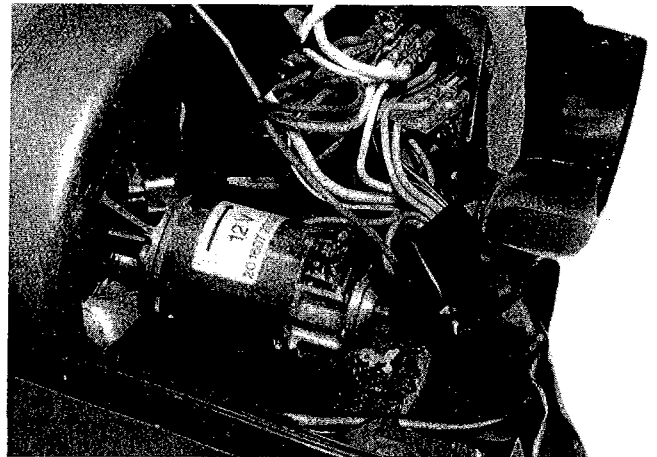
Installation: Installation is in reverse order. See also repair step 10 "Assembling the heater" on p. 23.



2. Removing and installing the printed circuit board

Removal: Bend the holding bracket upwards and expose the cable harness. Pull the room temperature sensor out of its holder (20 1661 / 25 1597 / 25 1684 / 25 1690 only). Undo the screws from the ignition spark generator and remove the latter. Detach the cable from the printed circuit board.

Installation: Installation is in reverse order. **Please note** the cable colours printed on the board and the wiring diagram. See also repair step 10 "Assembling the heater" on p. 23.



3. Removing and installing the ignition spark generator (B 2 L only)

Function: The ignition spark generator supplies, during starting and control operation, the glow ignition plug with the voltage necessary for formation of an ignition spark.

Removal: Remove the clip and matching piece from the plug and remove the latter. Detach the plug connector from the glow ignition plug and unscrew the plug connector from the plug cable. Undo the screws from the ignition spark generator. Detach white and brown cables from the printed circuit board. Pull plug cable out of the insulating hose and remove the ignition spark generator.

Installation: Installation is in reverse order. See also repair step 10 "Assembling the heater" on p. 23.



