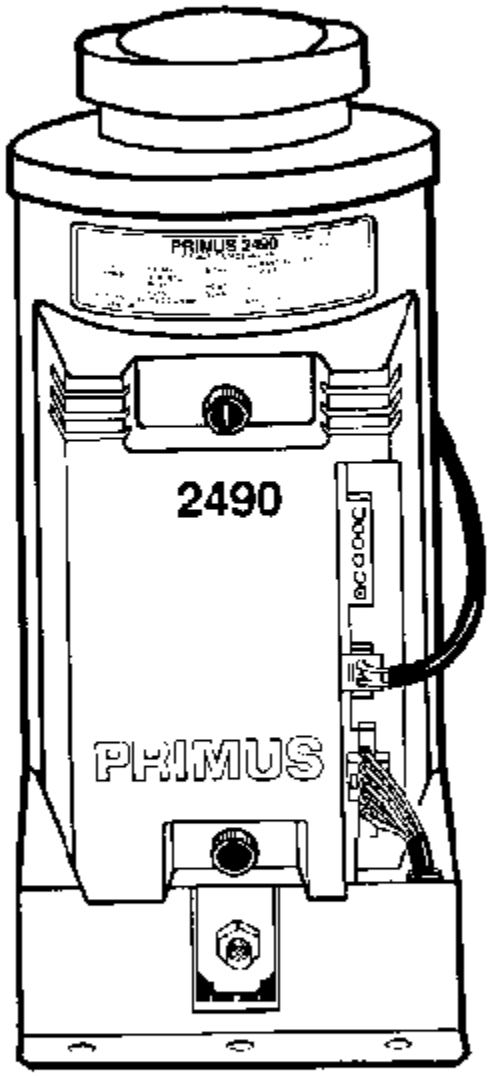
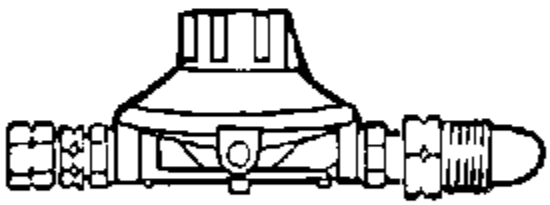
SYSTEM 2490





The system's heat source is the model 2490 boiler which has an output of 3 kW to 5 kW. The output is regulated with the help of the adjustable regulator on the gas cylinder, by means of which the operating pressure can be varied between 0.2 bar (3 psi) and 0.5 bar (7 psi).

Ignition is by means of an electronic spark, the flame being monitored by ionization. The monitoring system is electronic, and is built into the electronic control unit on the front of the boiler.

The supply voltage is between 6V and 20V DC. The boiler **can operate directly off a battery charger**.

Many caravans are fitted with electric in-line heaters, either complete with circulating pump (Part No. 7148 21) or without (Part No. 7149 61), with an output of 2 x 1 kW.

The heat emisssion system consists of convection radiators, an indirect cylinder and circulating pump (Part No. 8082 02).

The heat control system consists of an electronic control panel (Part No. 7190 81) and thermistor (Part No. 7140 01).

OTHER INFORMATION

The boiler's ignition and flame sensor are one and the same. Ignition and sensing of the flame take place in less than 1 second.

Safety cut-off is after 7-10 seconds. The boiler can be reset by switching it off and then on again (via the control panel).

FAULT TRACING

Start by trying to establish in which of the sectors the fault has developed. Apply Service Hints Nos. 1-4 (and see page 11). If the problem still remains unsolved, a more extensive inspection must then be carried out to trace its cause.

For fault tracing schedules for the components included in System 2490, please refer to the following pages:

FAULT TRACING SCHEDULE FOR MODEL 2490 BOILER

The type 2490 boiler can operate with a minimum working voltage of 9V. The starting voltage is derived from the yellow lead.

NOTE: The boiler **can also operate directly off a battery charger.**

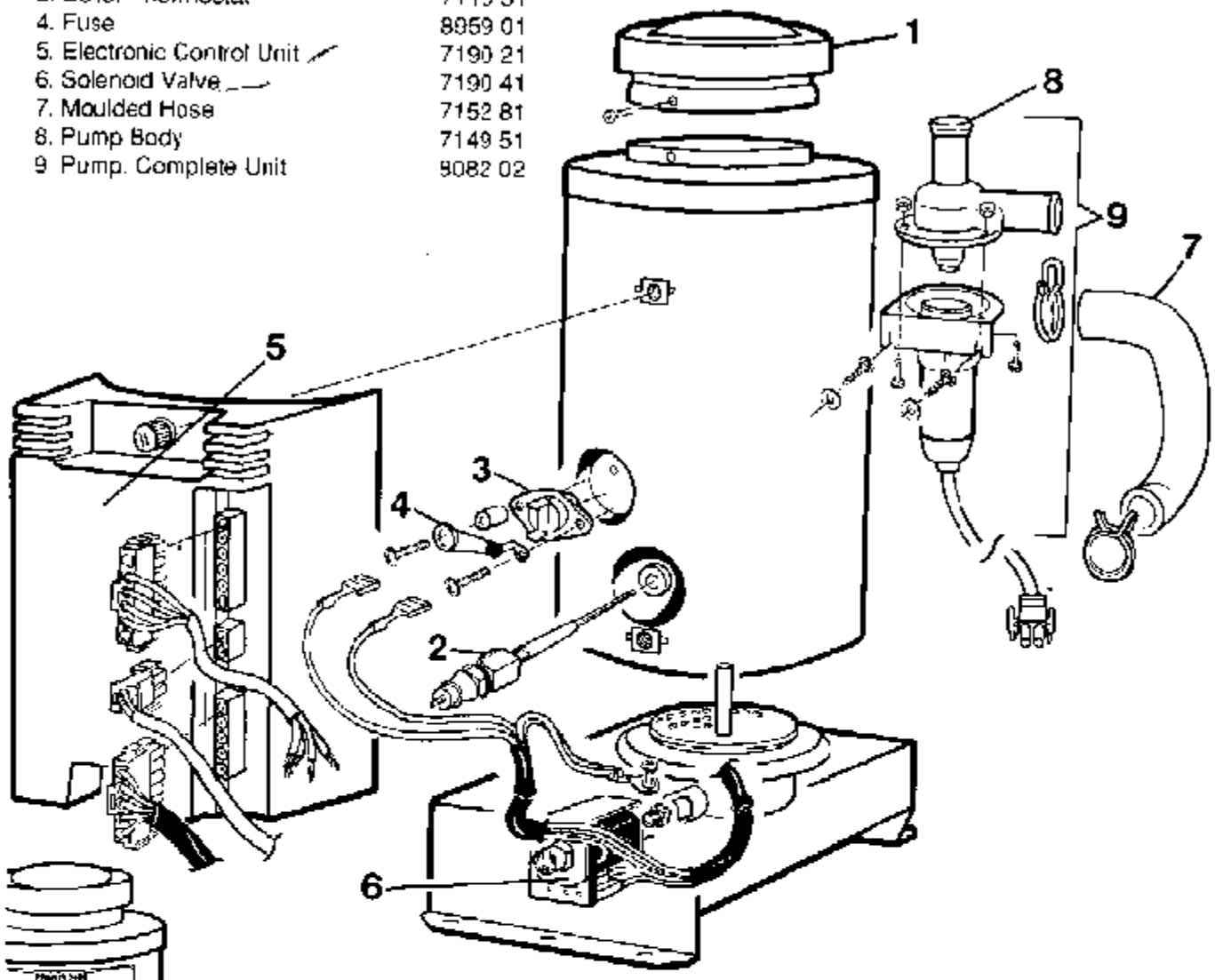
Check that there is a supply of gas to the boiler, and that the working voltage is correct. The boiler can be reset by pressing the switch marked 🔥 to switch it off, and then pressing it in again to switch it on. If the boiler does not start despite repeated pressing of the switch, try to trace and remedy the fault with the help of the following schedule.

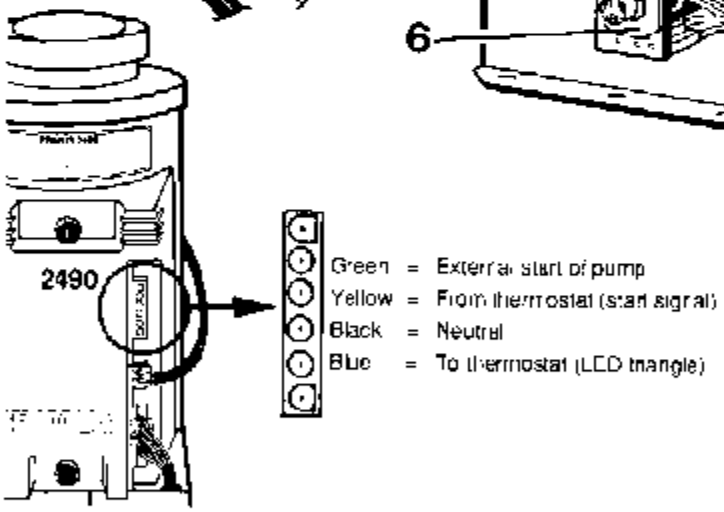
FAULT	CAUSE	REMEDY
A) There is no click from the solenoid valve, and the boiler does not start		
1. Fault in the boiler thermostat		If the boiler thermostat's terminal is not conducting a voltage, the thermostat is defective and should be replaced
2. Fault in the solenoid valve		Check the solenoid valve (see under **Checking the Solenoid Valve**, **page 31**), and replace it if it is defective
3. Fault in the electronic control unit		Replace the electronic control unit
B) There is a click from the solenoid valve, but the boiler does not start		
1. There is air in the gas cylinder		Bleed the gas cylinder
2. The gas is of the wrong type		Fit correct gas cylinder
3. The gas jet is blocked		Blow the gas jet clear, or replace it
4. Fault in the electrode is defective, or the contact is damaged between the electrode and the electronic control unit		Clean the contact surfaces, or replace the electrode. NOTE: Do not use force when installing or reassembling the electronic control unit
5. The spark is not reaching the contact surface		Check that the electrode is straight. If it is not, straighten it or replace it
C) The boiler starts, but stops after 7-10 seconds		
1. Fault in the solenoid valve		Check the solenoid valve (see under **Checking the Solenoid Valve**, page 31), and replace it if it is defective
2. Fault in the electronic control unit		Disconnect the supply voltage and then replace the electronic control unit
D) The boiler starts, but the fluid begins to boil		
1. There is air in the radiator system		Bleed the system
2. The circulating pump is not working		Check that the pump raises the level of fluid in the bleed hose leading to the header tank by disconnecting the pump cable and then reconnecting it. If necessary, replace the pump (see under CIRCULATING PUMP, PAGE 37)

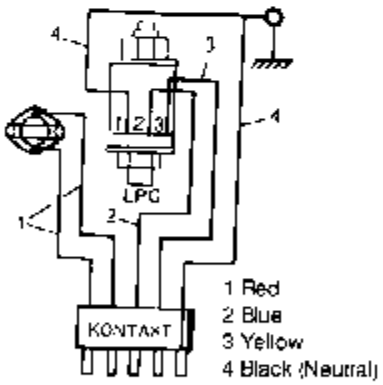
SPARE PARTS

FOR MODEL 2490 BOILER

1. Protective Cover	8597 01
2. Electrode	7193 11
3. Boiler Thermostat	7113 31
4. Fuse	8959 01
5. Electronic Control Unit	7190 21
6. Solenoid Valve	7190 41
7. Moulded Hose	7152 81
8. Pump Body	7149 51
9 Pump. Complete Unit	9082 02







When replacing the solenoid valve leave the boiler in original position, unscrew the gas pipe, disconnect electronic control unit and remove the two screws that hold it in position. The unit can then be removed from the front of the boiler.

The solenoid valve is held in position by two screws. These should be removed, and the valve can then be withdrawn from the mixer tube for the burner. The three leads will come with it, and can now be disconnected. There is a wiring diagram on the back of the electronic control unit

The gas jet is screwed directly into the solenoid valve, with a metal-to- metal seal. It is therefore important to ensure that the gas jet is tight (width across = 8 mm).

The electrode can be removed with an open end spanner (width across – 15 mm). When installing a new electrode, make sure that it is straight. Check that the electrode makes contact in the electronic control unit. Then slide the electronic control unit into position (do not use force), secure it with the two screws, and reconnect the cables.

CHECKING THE SOLENOID VALVE

Every solenoid valve has two windings, one that opens and one that holds, and therefore has three terminals (AMP 2.8 mm). The numerals 1, 2 and 3 are imprinted on the plastic housing of the valve, behind the terminals.

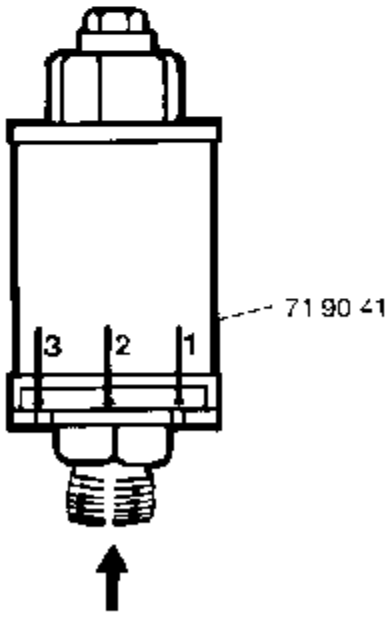
1 = Earth, 2 = Hold Winding, 3 = Open Winding

To check the solenoid valve, disconnect the leads on the valve, earth terminal 1 and apply + 12V to terminals 2 and 3. The valve should now open (a click is heard). Disconnect the lead to terminal 3. The valve should remain open. Then disconnect the lead to terminal 2. The valve should now close.

If the solenoid valve does **not** pass the above test it should be replaced.

Model 2480 boilers have two solenoid valves, one for stage 1 and one for stage 2. If the valve for stage 1 is not working, the valve for stage 2 cannot open.

Part Boiler	Opening Voltage	Working Pressure	Models
7144 81 black	8V	0.5 bar (7 psi)	2410/70/80
7156 21 blue coil, silver strap	10V	0.5 bar (7 psi)	2450
7190 41 black coil, nozzle onoutlet side	8V	0.5 bar (7 psi)	2490



CHECKING THE GLOW PLUG

To remove the boiler's glow plug, first remove the black box containing the electronic control system, or the top part of the boiler's front cover. All boilers have glow plugs with net sleeves, except model 2490.

Remove the glow plug, check that the coil is undamaged and that it glows. To do this, turn off the gas, start the boiler and earth the plug on the boiler's body.

NOTE: Glow plugs should **never** be connected direct to the 12V power supply from a battery. Maximum direct connected power supply 2.5V.

CHECKING THE SYSTEM THERMOSTATS

The system is controlled by one of two thermostats. It is normally controlled by the room thermostat. Alternatively it is controlled by the thermostat for the domestic hot water in the INDIRECT CYLINDER. If the boiler and the circulating pump have both stopped one of the controll thermostates has been activated and the selected temperature reached. (Determited by control panel switches.)
There are thermostates fittec for protection against overheating, one thermostat is in the BOILER and one is in the ELECTRIC IN LINE HEATER. If the BOILER stops and the circulating pump is working the BOILER thermostat has been activated. If the ELECTRIC IN LINE HEATER shuts of and the circulating pump is working the ELECTRIC HEATER thermostat has been activated. These are saftey thermostates to stop the Boiler or Electric In Line Heater from overheating
To determine which of the thermostates has been activated check to see if the pump is working or not.

WATER TEMPERATURE THERMOSTATS FOR PRIMUS BOILERS

Activating Temperature	Colour Coding	Boiler Model	Part No.
80°C	Green	2450 70/80/90	7110 3
94°C	Blue	2410	8605 0

FAULT TRACING SCHEDULE FOR ELECTRONIC CONTROL PANEL 7147 21

Check that:
1. The power supply is a stabilized DC voltage
2. The power supply is **at least** 10.5V
3. The panel is correctly connected

The control panel must pass the following test:

1. The minimum voltage between terminals 1 and 8 must be 10.5V (terminal 1 is the terminal furthest to the right when the control panel is horizontal, see the diagram below)

2. Press the button for starting the boiler, and set the thermostat so that the green LED above the button is lit. The voltage between terminals 5 and 8 must be 10.5V

3. Increase the thermostat setting so that the red LED is lit. The voltage between terminals 5 and 8 must continue to be at least 10.5V, and the voltage between terminals 6 and 8 should be 0.5V

4. Press the HOT WATER button, and check the voltages as in point 3 above

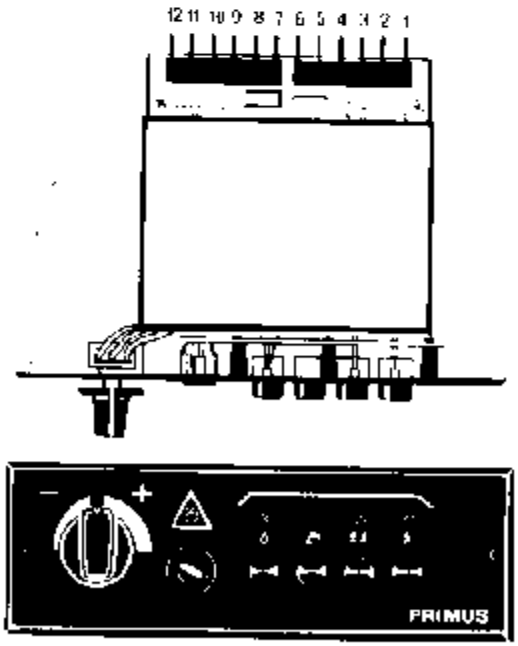
5. Press the button for the 1 kW output from the electric in-line heater (furthest to the right), and check that the voltages between terminals 2 and 8 and terminals 4 and 8 are at least 10.5V

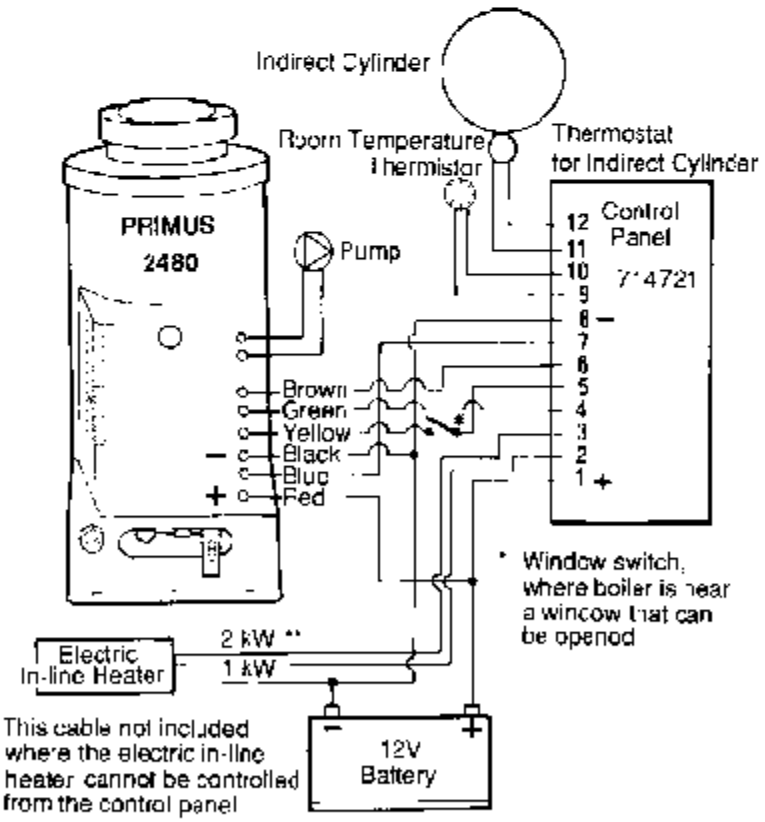
6. Press the button for the 2 kW output from the electric in-line heater and check that the voltages between terminals 3 and 8 and terminals 4 and 8 are at least 10.5V

If the panel passes the above test, it is free of defects and the problem lies with other components in the system such as the electric in-line heater or the boiler itself.

Panels that pass the above test but reveal irregularities during operation should be replaced.

The electronic control system is very accurate. To maintain the set temperature level the boiler operates frequently, for long and short periods of time depending on the heat demand. This gives accuracy of temperature.





FAULT TRACING SCHEDULE FOR ELECTRONIC CONTROL PANEL 7160 81

Check that:
1. The power supply is a stabilized DC voltage
2. The power supply is **at least** 10.5V
3. The panel is correctly connected
4. The fuse on the printed circuit board has not blown

The control panel must pass the following test:

1. The minimum voltage between terminals 1 and 8 must be 10.5V (terminal 1 is the terminal furthest to the right when the control panel is horizontal, see the diagram below)

2. Press the button for starting the boiler, and set the thermostat so that the green LED above the button is lit. The voltage between terminals 5 and 8 must be 10.5V

3. Press the TAP HOT WATER button, and check the voltages as in point 2 above

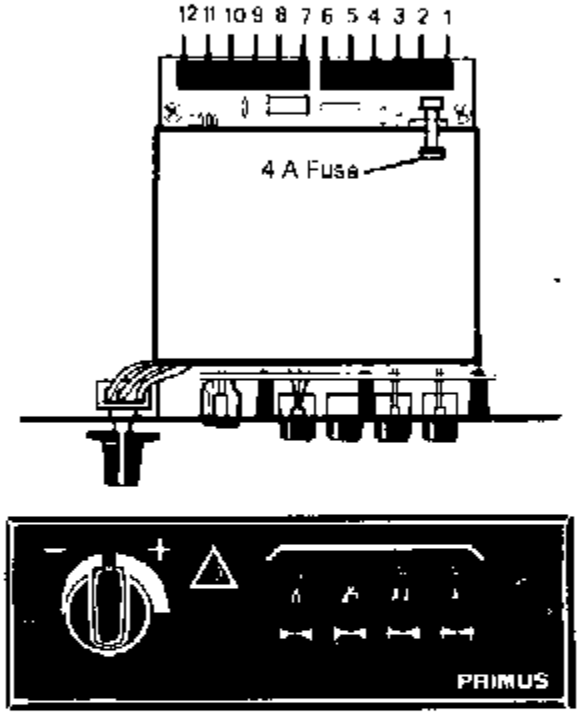
4. Press the button for the 1 kW output from the electric in-line heater (furthest to the right), and check that the voltages between terminals 2 and 8 and terminals 4 and 8 are 10.5V

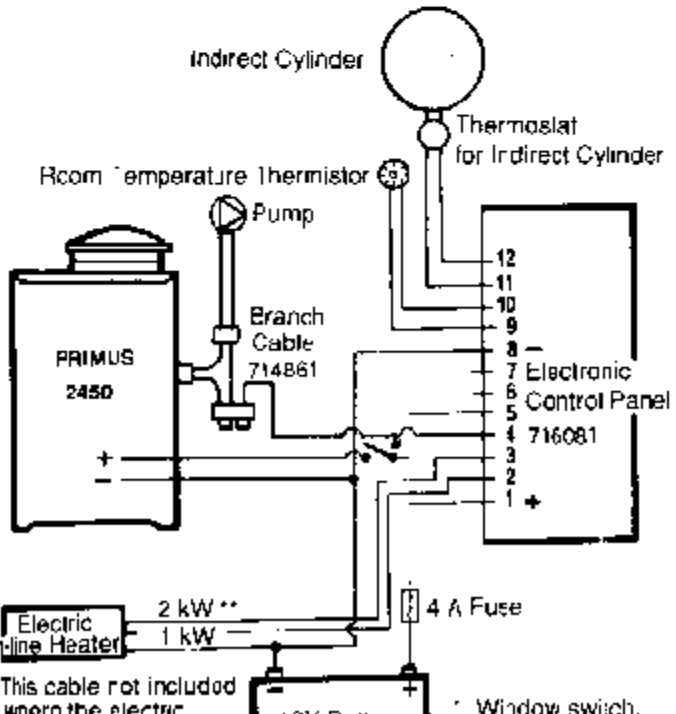
5. Press the button for the 2 kW output from the electric in-line heater, and check that the voltages between terminals 3 and 8 and terminals 4 and 8 are 10.5V

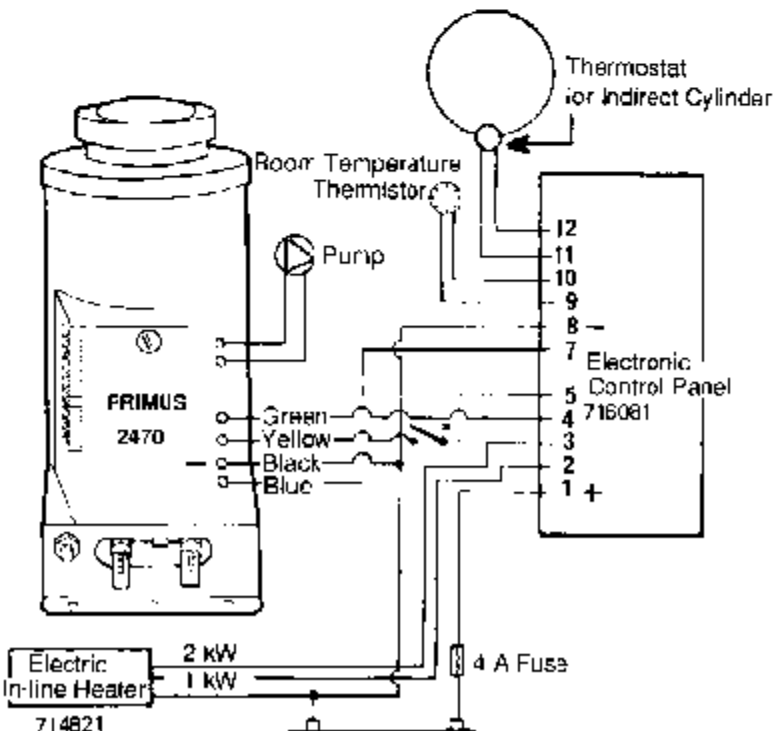
If the panel passes the above test, it is free of defects and the problem lies with other components in the system such as the electric in-line heater or the boiler itself.

Panels that pass the above test but reveal irregularities during operation should be replaced.

The electronic control system is very accurate. To maintain the set temperature level the boiler operates frequently, for long and short periods of time depending on the heat demand. This gives accuracy of temperature.







FAULT TRACING SCHEDULE FOR ELECTRONIC CONTROL PANEL 719081

Check that.
1. The power supply is **at least** 9V
2. The panel is correctly connected
3. The fuse on the printed circuit board has not blown

This panel can be connected directly to a battery charger.

The control panel must pass the following test:

1. The minimum voltage between terminals 1 and 8 must be 9V (terminal 1 is the terminal furthest to the right when the control panel is horizontal, see the diagram below)

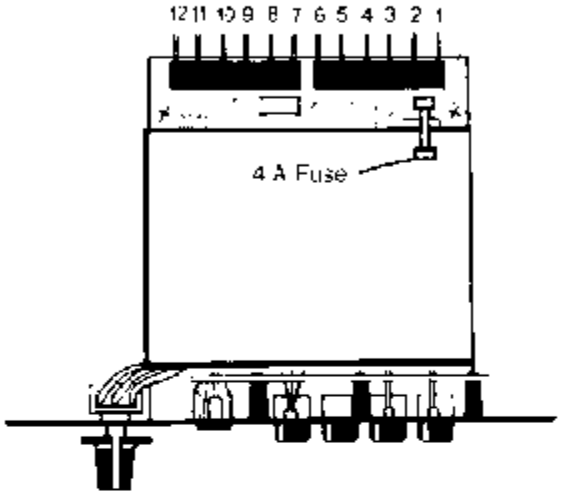
2. Press the button for starting the boiler, and set the thermostat so that the green LED above the button is lit. The voltage between terminals 5 and 8 must be 9V

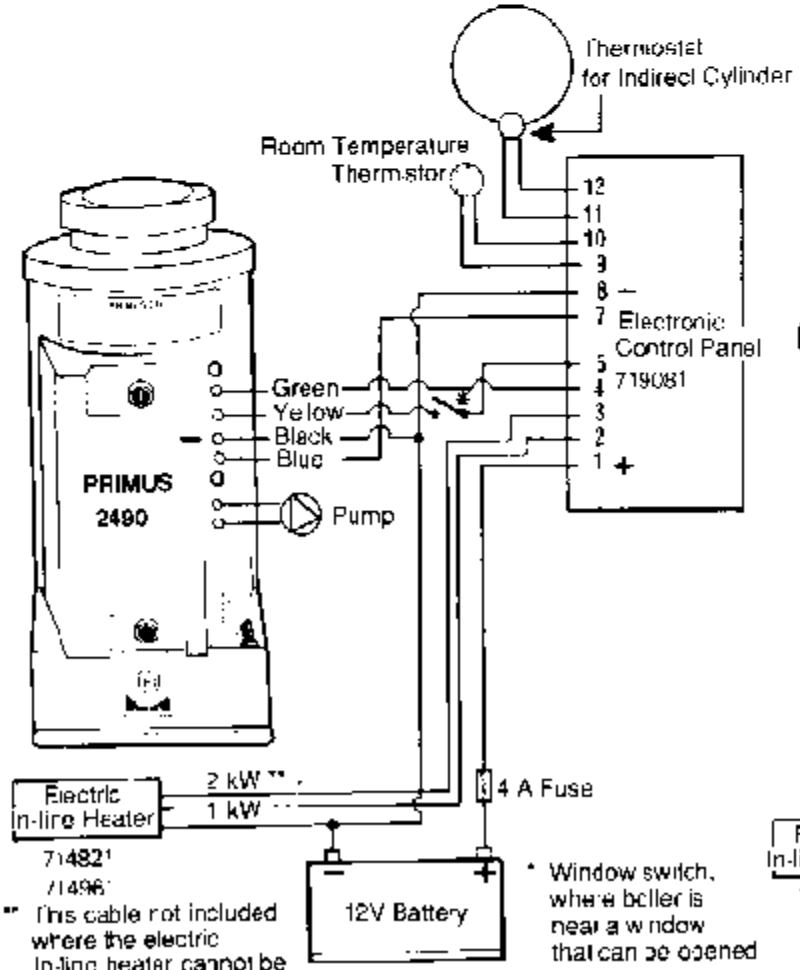
3. Press the TAP HOT WATER button, and check the voltages as in point 2 above

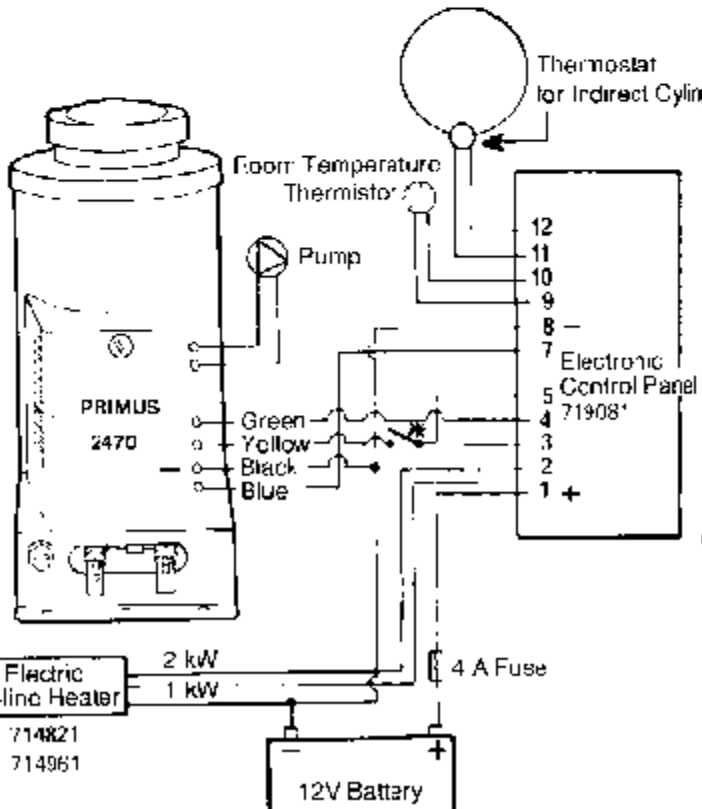
4. Press the button for the 1 kW output from the electric in-line boiler (furthest to the right), and check that the voltages between terminals 2 and 8 and terminals 4 and 8 are 9V

5. Press the button for the 2 kW output from the electric in-line heater, and check that the voltages between terminals 3 and 8 and terminals 4 and 8 are 10.5V

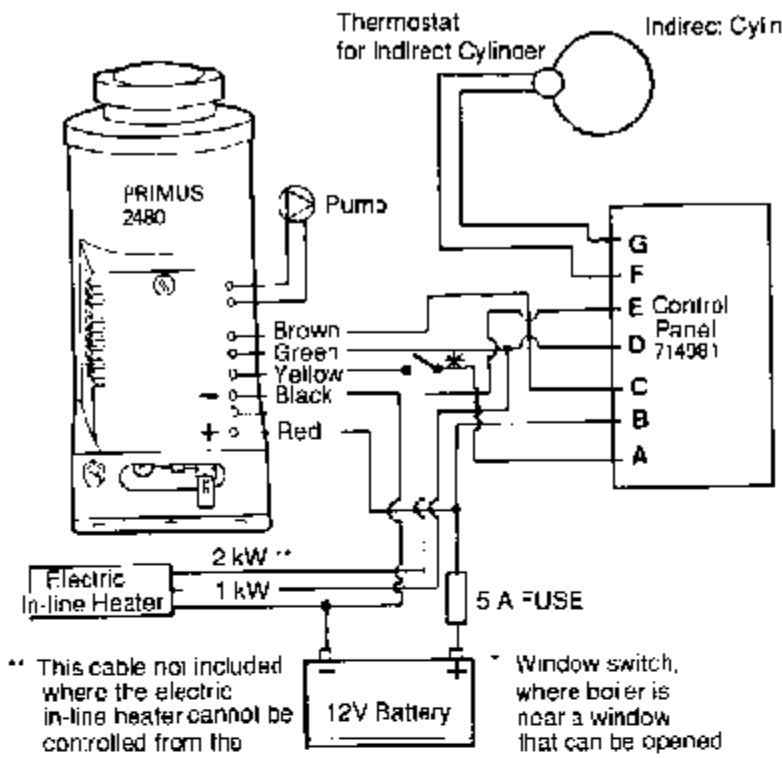
If the panel passes the above test, it is free of defects and the problem lies with other components in the system such as the electric in-line heater or the boiler itself.
Panels that pass the above test but reveal irregularities during operation should be replaced.
The electronic control system is very accurate. To maintain the set temperature level the boiler operates frequently, for long and short periods of time depending on the heat demand. This gives accuracy of temperature.



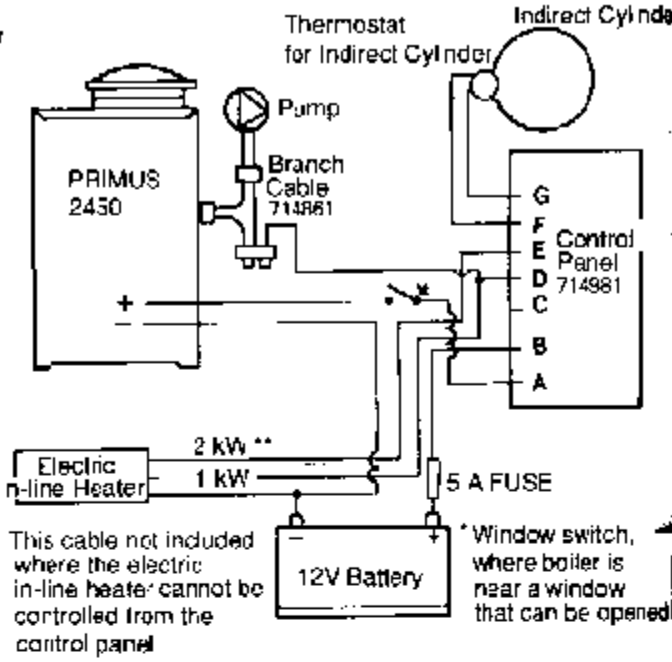


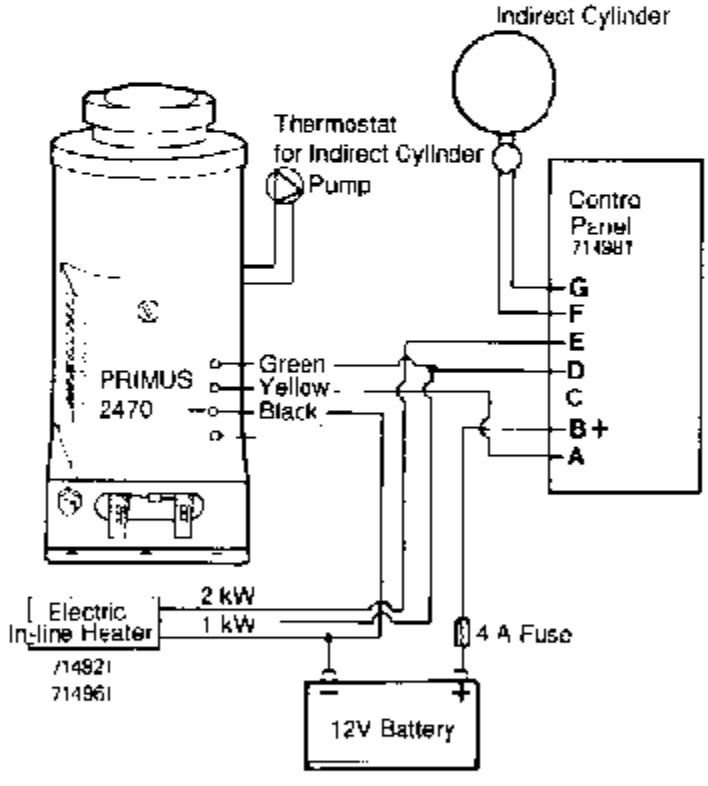


For model 2480 boiler with electric in-line boiler and indirect cylinder

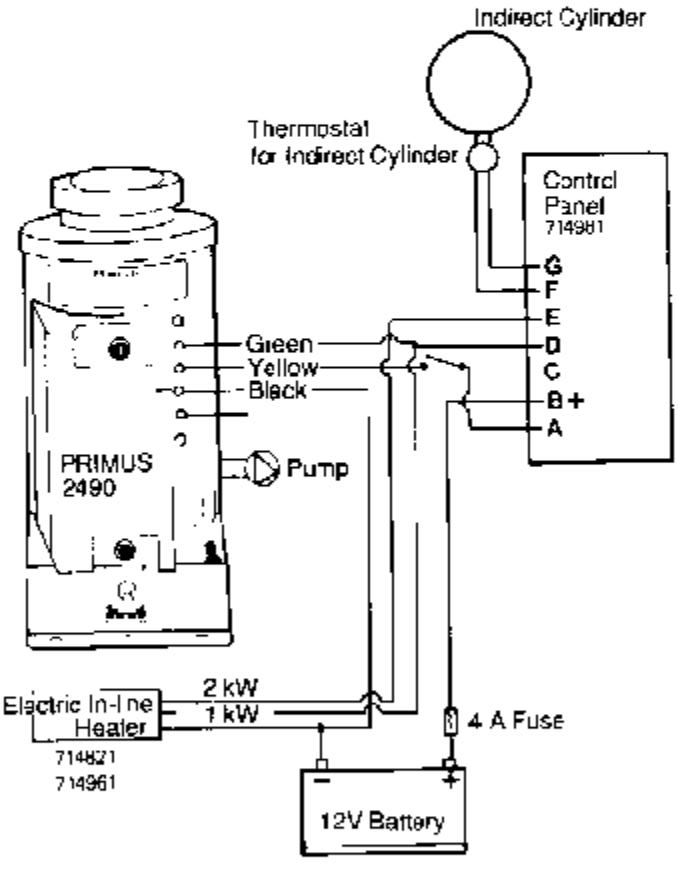


For model 2450 boiler with electric in-line heater and indirect cylinder





For model 2470 boiler with electric in-line heater and indirect cylinder



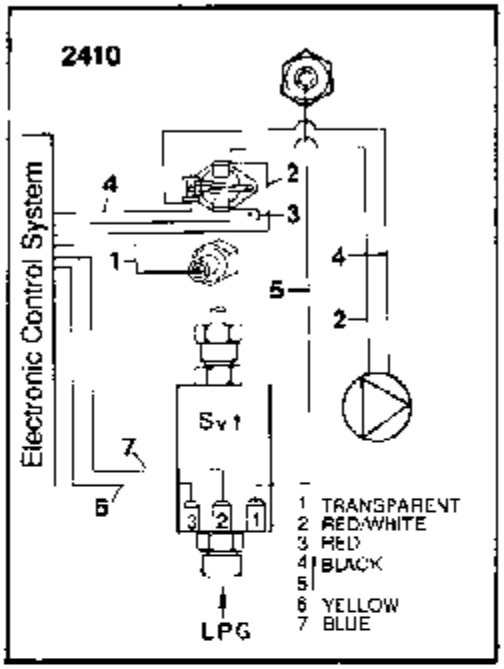
For model 2490 boiler with electric in-line heater and indirect cylinder

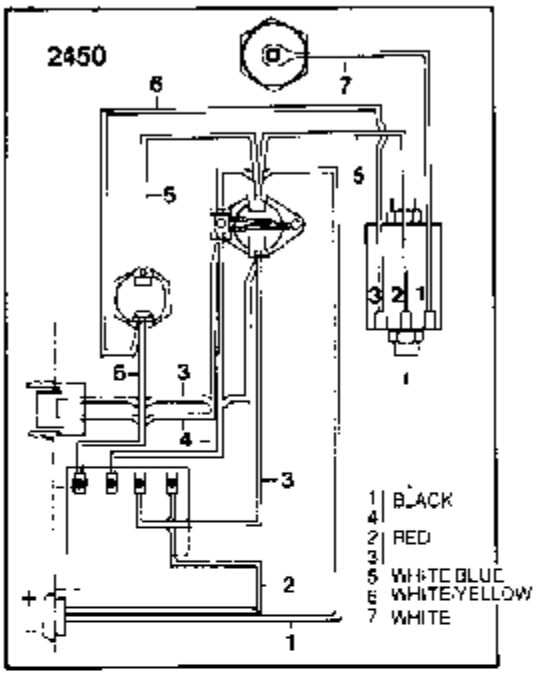
NOTE: Where a mains electric in-line heater complete with circulating pump is installed, the green cable should not be connected to the control panel.

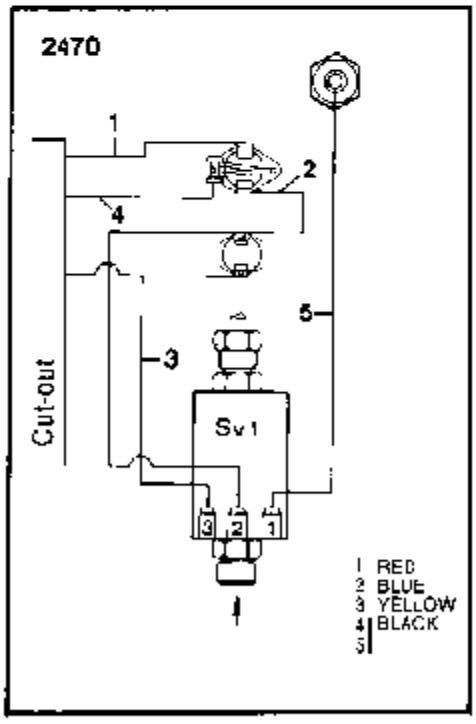
Where there is an opening window that is closer to the boiler's exhaust outlet than 1 m, a window switch must be fitted. (This is according to Swedish standards). The switch breaks the electric current to the boiler when the window is opened.

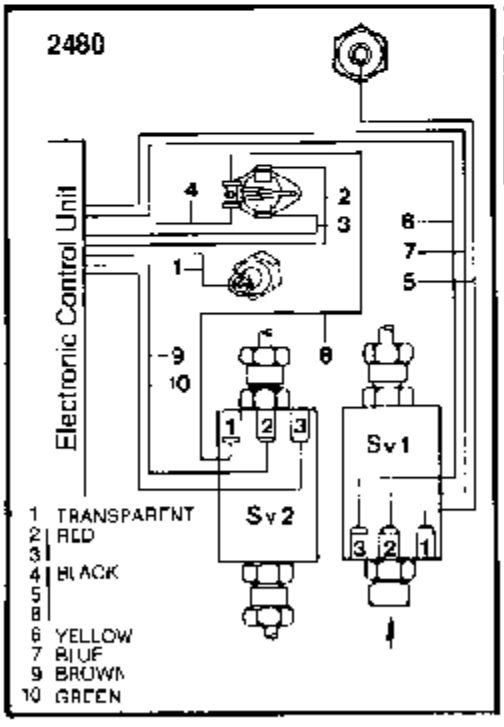
WIRING DIAGRAMS

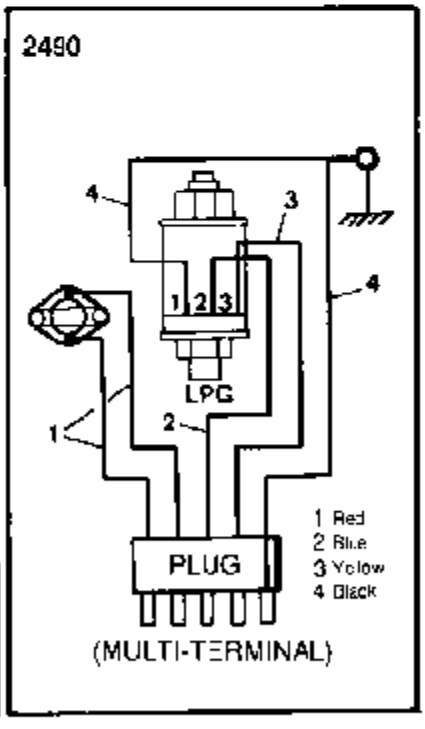
A diagram showing the internal wiring is to be found on the inside of the front cover of the boiler.











SPARE PARTS CROSS REFERENCE

Part No.	Description	Boiler 2410	Boiler 2450	Boiler 2470	Boiler 2480	Boiler 2490
715191	Glow Plug	x	x	x	x	
711031	Boiler Thermostat		x	x	x	x
860501	Boiler Thermostat	x				
895901	Thermal Melt Fuse	x	x	x	x	x
711011	Flame Sensor		x			
716291	Flame Sensor			x		
715061	Electrode	x			x	
719011	Electrode					x
715321	Solenoid Valve		x			
714481	Solenoid Valve	x		x	x	
719041	Solenoid Valve					x
715311	Cut-out relay		x			
716171	Electronic Control Unit			x		
716801	Electronic Control Unit					x
716811	Electronic Control Unit	x				
719021	Electronic Control Unit					x
714951	Pump Body	x	x	x	x	x
714981	Mechanical Contro Panel	x	x	x	x	x
714721	Electronic Control Panel				x	
716081	Electronic Control Panel	x	x	x		
719081	Electronic Control Panel	x	x	x		x
714471	Thermostat for Indirect Cylinder Model 9000 01 with Control Panel Part No. 7149 81					
715222	Model 9000 02 with Control Panel Part No. 7147 21 7180 81 or 7190 81					
716541	Relay Kit for Mains Electric In-line Heaters Parts Nos. 7148 21 and 7149 61					

Heating systems service manual