

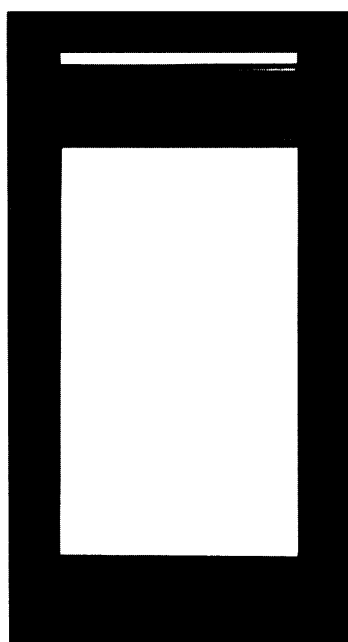


# DANESMOOR

**SLPJ 12-14, SLPJ 15-19, SLPJ 20-25**

**FLOOR STANDING OIL-FIRED PRESSURE JET APPLIANCES**

## **INSTALLATION AND SERVICING INSTRUCTIONS**



### **BOILER OUTPUT**

Hot Water and Central Heating

SLPJ 12-14	MINIMUM 12 kW (41,000 Btu/h) MAXIMUM 14 kW (48,000 Btu/h)
SLPJ 15-19	MINIMUM 15 kW (51,000 Btu/h) MAXIMUM 19 kW (65,000 Btu/h)
SLPJ 20-25	MINIMUM 20 kW (68,000 Btu/h) MAXIMUM 25 kW (85,000 Btu/h)

THESE INSTRUCTIONS APPLY TO UK MODELS ONLY

THESE INSTRUCTIONS ARE TO BE LEFT WITH THE APPLIANCE



Bosch Group

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## 1. GENERAL INFORMATION

The Worcester Danesmoor range of appliances covered in these instructions have been designed to serve domestic central heating and hot water requirements ranging from 12 kW to 25 kW and may be used on sealed or open vent primary systems.

The appliances are factory set to burn 28 second Kerosene heating oil and the output can be altered to suit the application by adjusting the burner as specified in Tables 2 to 5.

The 15-19 and 20-25 appliances may be converted to burn 35 second gas oil by changing the nozzle and burner settings as specified in Tables 3 to 5.

A flueless kit is available which allows the user to dispense with the need for a conventional chimney. The kit incorporates a silencer which eliminates excessive combustion noise and an electronic control unit to prevent fume odour and the collection of dangerous gases.

**Under no circumstances may 35 second gas oil be burnt when operating on low level discharge.**

## 2. TECHNICAL DATA

Table 1

SPECIFICATIONS			
Model	SLPJ 12-14	SLPJ 15-19	SLPJ 20-25
POWER SUPPLY	240V 50 Hz	240V 50 Hz	240V 50 Hz
HEATING FLOW	1 in. BSP	1 in. BSP	1 in. BSP
HEATING RETURN	1 in. BSP	1 in. BSP	1 in. BSP
FUEL LINE	¼ in. BSP	¼ in. BSP	¼ in. BSP
CONVENTIONAL FLUE DIAMETER	100 mm (4 in.)	100 mm (4 in.)	125 mm (5 in.)
FLUE REQUIREMENT	Class 2 Below 260°C	Class 2 Below 260°C	Class 2 Below 260°C
HEARTH TEMPERATURE	Below 100°C	Below 100°C	Below 100°C
MAXIMUM STATIC HEAD	30 m (98 ft.)	30 m (98 ft.)	30 m (98 ft.)
PRIMARY WATER CAPACITY	20 litres (4.4 gal.)	20 litres (4.4 gal.)	23.5 litres (5.2 gal.)
WEIGHT	102 Kg (224 lbs.)	105 Kg (231 lbs.)	116 Kg (256 lbs.)
HEIGHT	855 mm (33.8 in.)	855 mm (33.8 in.)	855 mm (33.8 in.)
WIDTH	370 mm (14.6 in.)	370 mm (14.6 in.)	370 mm (14.6 in.)
DEPTH	595 mm (23.0 in.)	595 mm (23.0 in.)	595 mm (23.0 in.)
BURNER	Worcester Novajet I or Inter B9A	Electro Oil Inter 2011B or Inter B9B	Electro Oil Inter 2011C
CONTROL THERMOSTAT RANGE	55° C minimum Cut In to 82°C maximum Cut Out		
CONTROL THERMOSTAT DIFFERENTIAL	5.5°C		
HIGH LIMIT THERMOSTAT SET POINT	97°C Cut Out		

SLPJ 12-14 Table 2 Worcester Novajet Burner

NOMINAL BOILER RATINGS AT NORMAL OPERATING TEMPERATURES								
Fuel	Nozzle	Pump Pressure (p.s.i.)	Fuel Flow (Kg/h)	Flue Gas Temp. (°C)	% CO <sub>2</sub>	Approx. Air Setting	Appliance Output	
							kW	Btu/Hr
28 Sec. Kerosene	0.40 80°H	120	1.17	215	9.0—9.5	1.5	12	41,000
28 Sec. Kerosene	0.50 80°H	100	1.37	230	9.5—10.0	2	14	48,000

**SLPJ 12-14 Table 3. Electro Oil Inter B9A Burner** (See Fig. 18)

NORMAL BOILER RATING AT NORMAL OPERATING TEMPERATURES								
Fuel	Nozzle	Pump Pressure (p.s.i.)	Fuel Flow (Kg/h)	Flue Gas Temp (°C)	% CO <sub>2</sub>	Approx. Air Setting	Appliance Output	
							kW	Btu/Hr
28 Sec. Kerosene	0.40 60°S	120	1.17	215	9.0-9.5	8.0	12	41,000
28 Sec. Kerosene	0.50 60°S	100	1.37	230	10.0-10.5	8.75	14	48,000

**SLPJ 15-19 Table 4. Electro Oil Inter B9B Burner** (See Fig. 18)

NORMAL BOILER RATING AT NORMAL OPERATING TEMPERATURES								
Fuel	Nozzle	Pump Pressure (p.s.i.)	Fuel Flow (Kg/h)	Flue Gas Temp (°C)	% CO <sub>2</sub>	Approx. Air Setting	Appliance Output	
							kW	Btu/Hr
28 Sec. Kerosene	0.55 80°H	100	1.45	225	9.0-9.5	8.75	15	51,000
28 Sec. Kerosene	0.55 80°H	130	1.65	235	9.5-10.0	9.25	17	58,000
28 Sec. Kerosene	0.60 80°H	110	1.84	245	10.0-10.5	9.50	19	65,000
35 Sec. Gas Oil	0.50 80°H	160	1.88	245	10.0-10.5	9.50	19	65,000

**SLPJ 15-19 Table 5. Electro Oil Inter 2011B Burner**

NORMAL BOILER RATING AT NORMAL OPERATING TEMPERATURES								
Fuel	Nozzle	Pump Pressure (p.s.i.)	Fuel Flow (Kg/h)	Flue Gas Temp (°C)	% CO <sub>2</sub>	Approx. Air Setting	Appliance Output	
							kW	Btu/Hr
28 Sec. Kerosene	0.55 80°H	100	1.45	225	9.0-9.5	5.5	15	51,000
28 Sec. Kerosene	0.55 80°H	130	1.65	235	10.0-10.5	6.0	17	58,000
28 Sec. Kerosene	0.60 80°H	110	1.84	245	11.0-11.5	6.5	19	65,000
35 Sec. Gas Oil	0.50 80°H	160	1.88	245	10.5-11.0	6.5	19	65,000

**SLPJ 20-25 Table 6. Electro Oil Inter 2011C Burner**

NORMAL BOILER RATING AT NORMAL OPERATING TEMPERATURES								
Fuel	Nozzle	Pump Pressure (p.s.i.)	Fuel Flow (Kg/h)	Flue Gas Temp (°C)	% CO <sub>2</sub>	Approx. Air Setting	Appliance Output	
							kW	Btu/Hr
28 Sec. Kerosene	0.60 80°H	120	1.90	210	10.0-10.5	5.5	20	68,000
28 Sec. Kerosene	0.75 80°H	110	2.16	230	10.0-10.5	6	22.5	77,000
28 Sec. Kerosene	0.75 80°H	135	2.42	245	10.5-11.0	7	25	85,000
35 Sec. Gas Oil	0.60 80°S	140	2.19	230	10.5-11.0	7.5	22.5	77,000
35 Sec. Gas Oil	0.60 80°S	170	2.47	245	11.0-11.5	8	25	85,000

### 3. DIMENSIONS

Fig. 1.

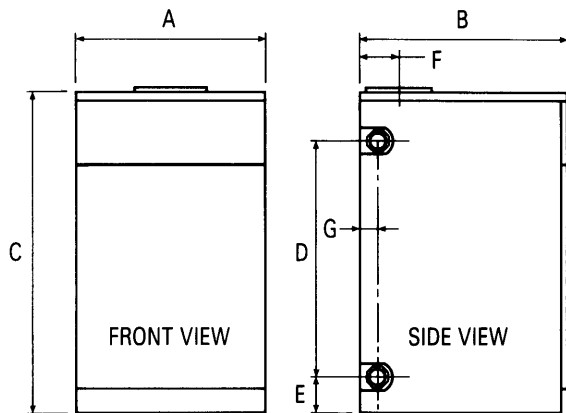


Table 5

MODEL	A	B	C	D	E	F	G
SLPJ 12-14	370	595	855	715	50	87	50
SLPJ 15-19	370	595	855	715	50	87	50
SLPJ 20-25	370	595	855	715	50	92	50

### 4. SITING THE APPLIANCE

- The appliance should be positioned on a non-combustible solid base as near to the chimney as possible. Care should be taken to ensure that the appliance is level; use packing at the corners where necessary.
- The following clearances must be left to allow access for installation and servicing:
  - Above—300 mm (12 in.)
  - In front—600 mm (24 in.)
  - Right and left hand side—none required.

### 5. AIR SUPPLY

In order to ensure clean and efficient combustion an adequate supply of air must be delivered to the combustion chamber. To provide sufficient air a suitable inlet should be provided into the room or space in which the boiler is situated, the sizes of which are detailed below. An air brick or other form of continuous air supply may have to be built into the installation in order to ensure an adequate supply of air.

If the appliance is to be installed in a confined space or compartment, two air vents are required — one at high level and one at low level.

If the air supply is taken direct from outside the minimum free area required is 550mm<sup>2</sup>/kW (0.85in<sup>2</sup>/kW) at high level and 550mm<sup>2</sup>/kW at low level.

If the air supply is taken from another room the minimum free area required (in addition to that for combustion air) is 1100mm<sup>2</sup>/kW (1.7in<sup>2</sup>/kW) at high level and 1100mm<sup>2</sup>/kW at low level.

Table 6

APPLIANCE	AREA OF AIR INLET	
	cm <sup>2</sup>	in. <sup>2</sup>
SLPJ 12-14	105	16.5
SLPJ 15-19	138	21.5
SLPJ 20-25	176	27.5

### 6. REMOVAL OF THE CABINET

For installation and servicing of the appliance the cabinet should be removed as follows:

- Remove the cabinet top panel by lifting squarely upwards to release the four ball stud connections.
- The front panel is removed by pulling the bottom of the panel forwards to release the ball studs and lifting the panel upwards and forwards to release from its supporting ledge.
- Prior to removing the side panels the appliance kick strip must be removed. Then release the three black pozi-drive self tapping screws located in the upper flange of each side panel and ease clear of the electrical box. Finally slide the side panel forwards to release from the locating lugs on the base plate.

### 7. FLUE

See Figs. 2 and 3.

A flue system must be provided in accordance with BS5410: Part 1 and the Building Regulations, Part J, Section J2.

#### 1. CONVENTIONAL FLUE

(See Fig. 2.)

Conventional Flue Diameter	SLPJ 12-14	100 mm (4 in.)
	SLPJ 15-19	100 mm (4 in.)
	SLPJ 20-25	125 mm (5 in.)

The boiler is fitted with a conventional flue locating spigot. The flue pipe fits into the spigot and should be correctly sealed with fire cement.

**NOTE.** The size of flue must never be reduced from the take-off diameter. An increase in flue size is permissible provided that the joint is sealed correctly.

#### Fig. 2. Flue Installation

The flue termination must be a minimum of 1m (39.4 in.) above the highest point of protrusion through the roof.

Where possible take flue above apex—if not above apex an O.H. pot is advisable.

ALWAYS TAKE FLUE ABOVE EAVES.

Brick Chimney.  
Use of liner  
recommended.

Flues must not be reduced  
from boiler take off diameter.

Use as few bends as  
possible.

Use 135° Bends.

When installed the flue should be vertical and contain as few bends as possible. Where bends are necessary, a maximum of two are permitted and 135 degree bends should be used.

All brick and masonry chimneys should be lined with a suitable non-combustible material, properly jointed and able to withstand the effects of the working temperature of the appliance and any condensate which may form.

Down draught conditions will adversely affect the operation of the boiler and must be avoided. Where possible the flue should be extended beyond the apex of the roof and should always be taken beyond the eaves of the building. Where down draught is experienced an OH pot or Marcone Cowl should be fitted to the flue termination.

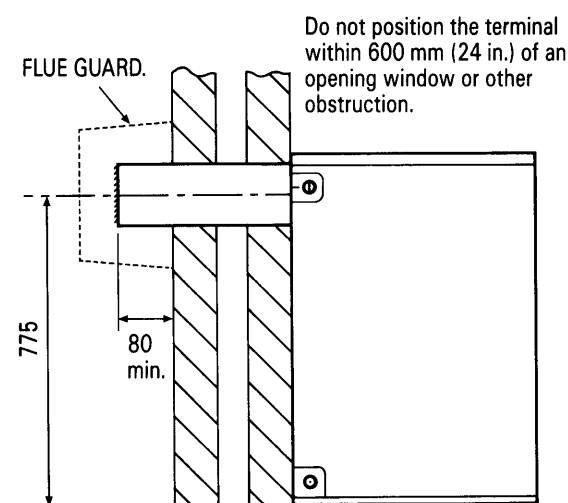
The natural flue draught must be checked in the flue pipe immediately above the appliance. The flue draught should be no less than 0.75 mm w.g. and no greater than 5.1 mm w.g. If a flue draught greater than 5.1 mm w.g. is experienced a draught stabiliser should be introduced into the flue and adjusted to achieve a flue draught within the specified range.

## 2. LOW LEVEL DISCHARGE

(See Fig. 3.)

The SLPJ series of appliances may be converted to discharge the products of combustion at low level. For this purpose a special flueless kit and associated ducting is available, allowing the conventional flue to be discarded. Detailed instructions for converting the appliance to low level discharge are supplied with the conversion kit.

**Fig. 3. Flue Installation (Rear Entry)**



## 8. OIL SUPPLY

The burners on all the appliances are supplied so as to be connected to a single pipe gravity feed system. Details of how to convert the burners to a two-pipe sub-gravity feed system are shown in Fig. 4. If a single pipe system is employed then the tank must be positioned such that the oil level does not exceed 4 m (13 ft.) above the level of the burner oil pump and in addition the oil level must be at least 0.3 m (1 ft.) above the level of the oil pump. Should it prove impossible to site the tank below the 4 m maximum oil level a head breaking device must be installed between the tank and the burner (e.g. BM-30A). If a double pipe system is used then the maximum suction height allowable is 3.5 m (11.5 ft.)

The oil storage tank must be installed in accordance with BS799: Part 5. The tank should be arranged with a slope of 1 in 24 away from the outlet valve with a sludge cock at its lower end. (See Figs. 5a and 5b.)

Having decided upon a single pipe or double pipe system, the size of the pipe diameter must be determined. Tables 7 and 8 enable the correct pipe diameter to be chosen for the position of the oil storage tank relative to the burner for the two different systems.

Using the tables choose the correct diameter fuel pipe for the position of the oil storage tank. The fuel pipe should be laid as level as possible to avoid air pockets and unnecessary friction losses. The following components should be fitted in the fuel line between the storage tank and burner:

1. A manual isolating valve installed as close to the tank as possible.
2. A fire valve in accordance with BS799: Part 2 as shown in Fig. 5. The fire valve should be fitted externally with a fire detection element located in the boiler house.
3. A filter paper element complying with the requirements of BS799: Parts 2, 3 and 4 should be fitted in the fuel line between the isolating valve and the burner and as near to the latter as possible.

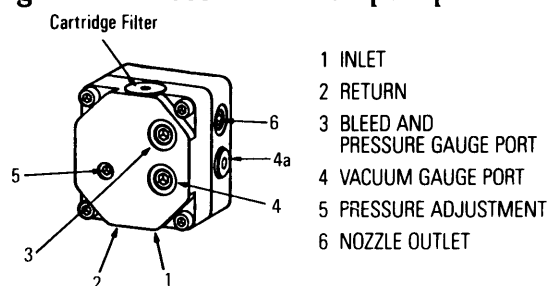
A bracket is provided for the use of a Crosland filter within the case of the appliance. The filter requires two M6 screws.

Where this option is preferred it may be found necessary to rotate the burner through 180° depending on the type of burner fitted to the appliance.

The bracket also contains a 1/4" BSP full socket. This may be used as a permanent connection point for the incoming oil line.

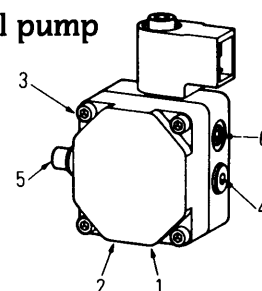
4. An additional hand operated shut-off valve should be fitted in an accessible position, as close to the appliance as possible.

**Fig. 4a. Danfoss BFP 41 oil pump**



To convert to a two pipe system, remove plug 4a and insert the grub screw provided into the threaded hole. Connect flow and return pipes to (1) and (2).

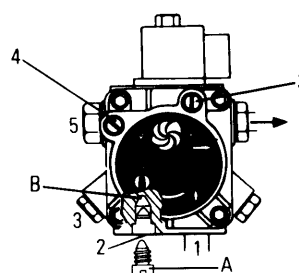
**Fig. 4b. BFP 11 oil pump**



To convert to a two pipe system, remove the pump front cover and insert the grub screw provided into the threaded hole. Connect flow and return pipes to (1) and (2).

**Note:** When removing the pump front cover ensure that a suitable receptacle is placed below the pump to catch the oil residue.

**Fig. 4c. Suntec AS47C oil pump**



To convert to a two pipe system remove the return port plug (2) and insert the grub screw (A) provided into the threaded hole (B). Connect flow and return pipes to (1) and (2).

**Table 7 Single Pipe Gravity Feed System**

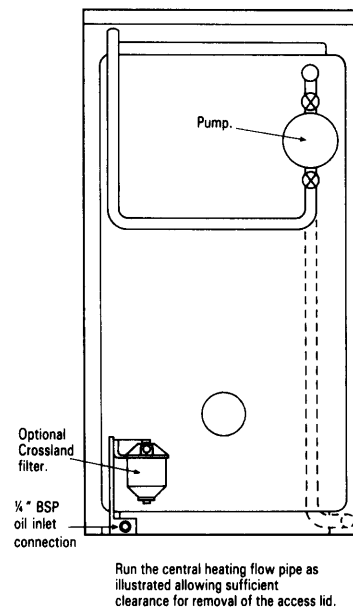
HEAD H (metres)	MAXIMUM ALLOWABLE PIPE RUN (metres)	
	8 mm I/D	10 mm I/D
0.5	10	20
1.0	20	40
1.5	40	80
2.0	60	100

**Table 8 Double Pipe Lift System**

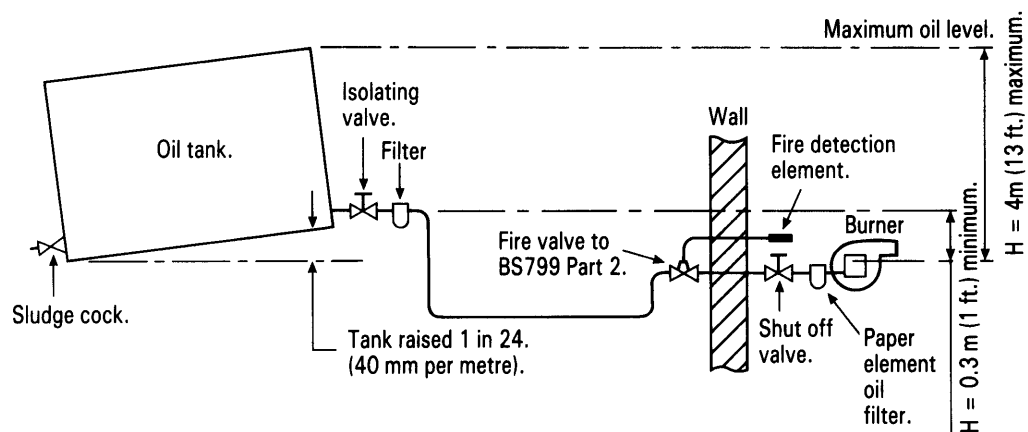
HEAD H (metres)	MAXIMUM ALLOWABLE PIPE RUN (metres)	
	8 mm I/D	10 mm I/D
0	35	100
-0.5	30	100
-1.0	25	100
-1.5	20	85
-2.0	15	70
-2.5	11	50
-3.0	8	30
-3.5	6	20

**NOTE.** These tables are applicable for all burners specified on the Danesmoor range of appliances.

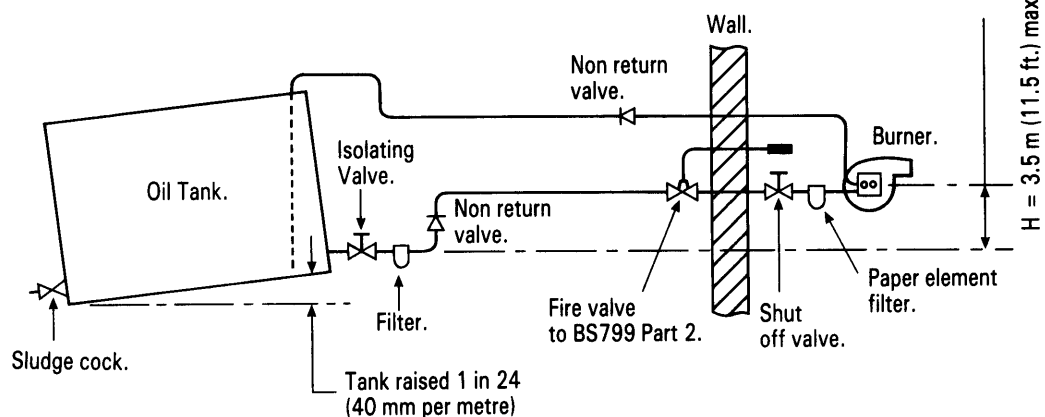
**Fig. 6. Pump Connections**



**Fig. 5a. Oil Supply—Single pipe system.**



**Fig. 5b. Oil Supply—Double pipe system**



## 9. SYSTEM CONSIDERATIONS

The appliance is suitable for connection to all conventional indirect hot water systems utilising an indirect double feed cylinder. When making the water connections, the following should be noted:

1. The 1 in. BSP flow and return sockets are located at the rear of the appliance, two at high level (flow) and two at low level (return). Connection may be made to any combination of sockets.
2. Provision has been made for locating the circulating pump within the appliance cabinet. If so required, the socket located in the top front of the boiler should be used and the flow pipe run either side of the boiler. (See Fig. 6.)
3. There is no requirement for a system by-pass.
4. The pressure jet burner fitted to the appliance has full automatic control and hence there is no requirement for heat leak radiators.

Having completed the necessary water connections those connections not utilised should be plugged and the system may then be filled.

## 10. OPEN VENT PRIMARY SYSTEM

### 1. GENERAL

The following points are for guidance only. The system installation should be carried out in accordance with BS5449: Part 1.

### 2. FEED AND EXPANSION CISTERN

The feed and expansion pipes must rise continuously from the appliance and must be at least 22 mm in diameter. The cistern must be arranged to provide a minimum static head of 1 metre (3 ft.) above the top of the highest point in the heating circuit.

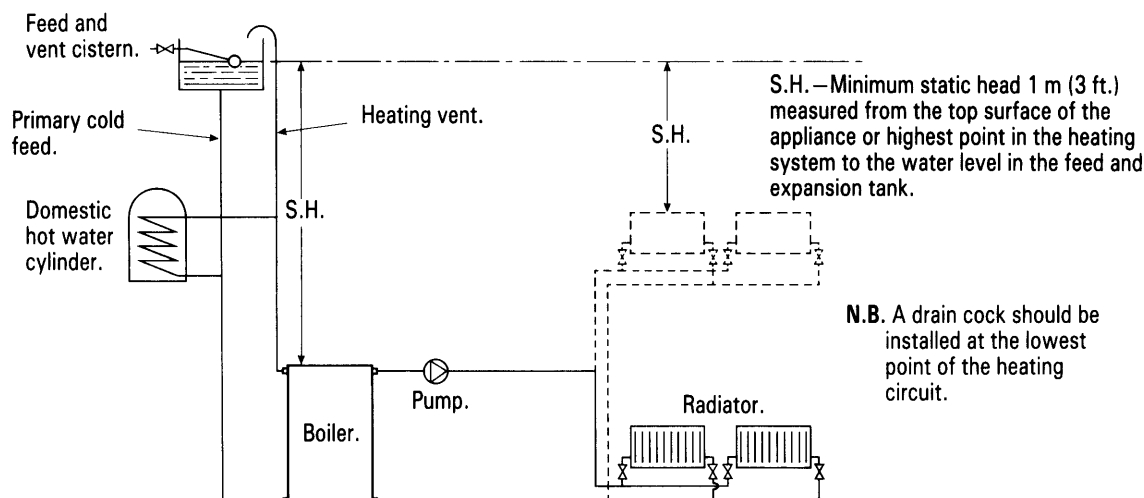
### 3. FILLING AND VENTING

Air in the appliance is expelled through the vent pipe or dissipated into the system. Manual air vents should be fitted at any high point in the system.

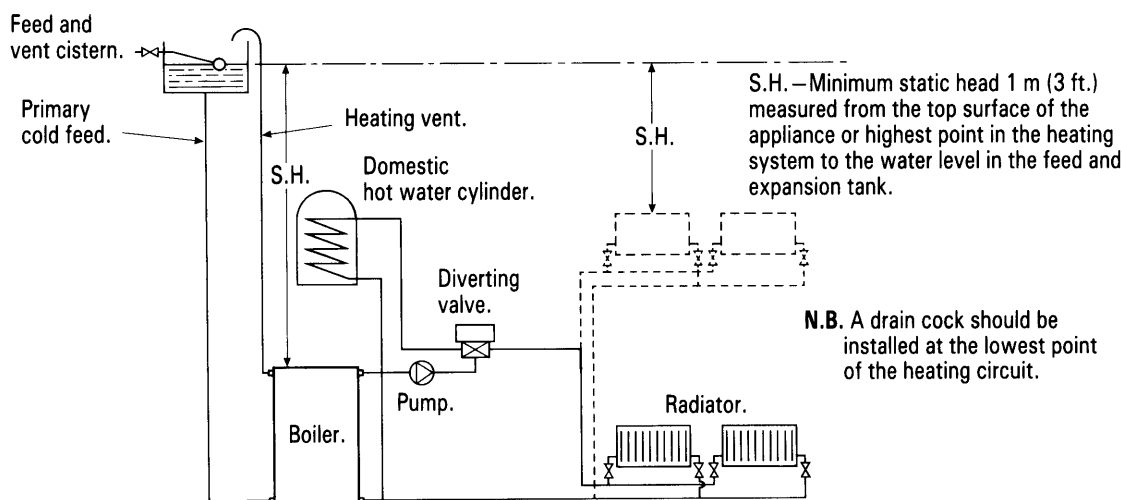
### 4. PUMP

The pump should be set in accordance with the heating load requirements to give a flow and return differential temperature of 11°C under full load conditions.

**Fig. 7. Typical Open Vent Gravity Primary System.**



**Fig. 8. Typical Open Vent Fully Pumped System (Honeywell 'Y' plan).**



## 11. SEALED PRIMARY SYSTEM

**NOTE:** The appliance is supplied suitable for an open vent system only. If it is to be used on a sealed system the high limit thermostat must be changed to a Ranco 107°C manual reset thermostat, type reference LM7-P5075, available from Worcester Heat Systems (Part No. ZAMAJ230).

### GENERAL

The system should be installed in compliance with the requirements of BS5449: Part 1. The boiler must be fitted with a spring loaded safety valve set to operate at 3 bar (45 p.s.i.) and the pipe connections made throughout the system must be capable of sustaining a pressure of up to 3 bar.

The following is a list of major items which must be fitted to the system.

1. Safety valve—3 bar
2. Pressure gauge—0 to 4 bar
3. Expansion vessel
4. Automatic air vent.

## 12. ELECTRICAL

See Figs. 9 to 16.

1. To gain access to the electrical terminal strip.
  - (a) Isolate the mains electrical supply.
  - (b) Remove the cabinet top panel by snatching squarely upwards.
  - (c) Release the four pozi-drive screws securing the cover of the electrical control box and remove.

### 2. MAINS WIRING

**LIVE**—Brown, **NEUTRAL**—Blue, **EARTH**—Green/Yellow.

The method of connection to the appliance must facilitate the

complete isolation of the appliance, preferably via a 5 amp fused three-pin plug and unswitched shuttered socket outlet, both complying with the requirements of BS 1363.

Alternatively, connection may be made via a double pole isolator with a contact separation of 3 mm in all poles and supplying the boiler and controls only.

**Mains Cable:** 0.75 mm<sup>2</sup> (24 x 0.20 mm) to BS6500 Table 16.

Should the factory fitted mains cable need to be replaced then the new cable must be connected into the terminals marked **L**, **N** and **E** on the appliance terminal strip. The cable should then be passed through the cable clamp located in the left hand side of the electrical tray and routed neatly away from hot surfaces to a convenient exit point from the cabinet. The external wiring between the appliance and the electrical supply shall comply with current IEE wiring regulations, and any local regulations which apply. The appliance must be earthed.

### 3. PROGRAMMER

(See Fig. 11a.)

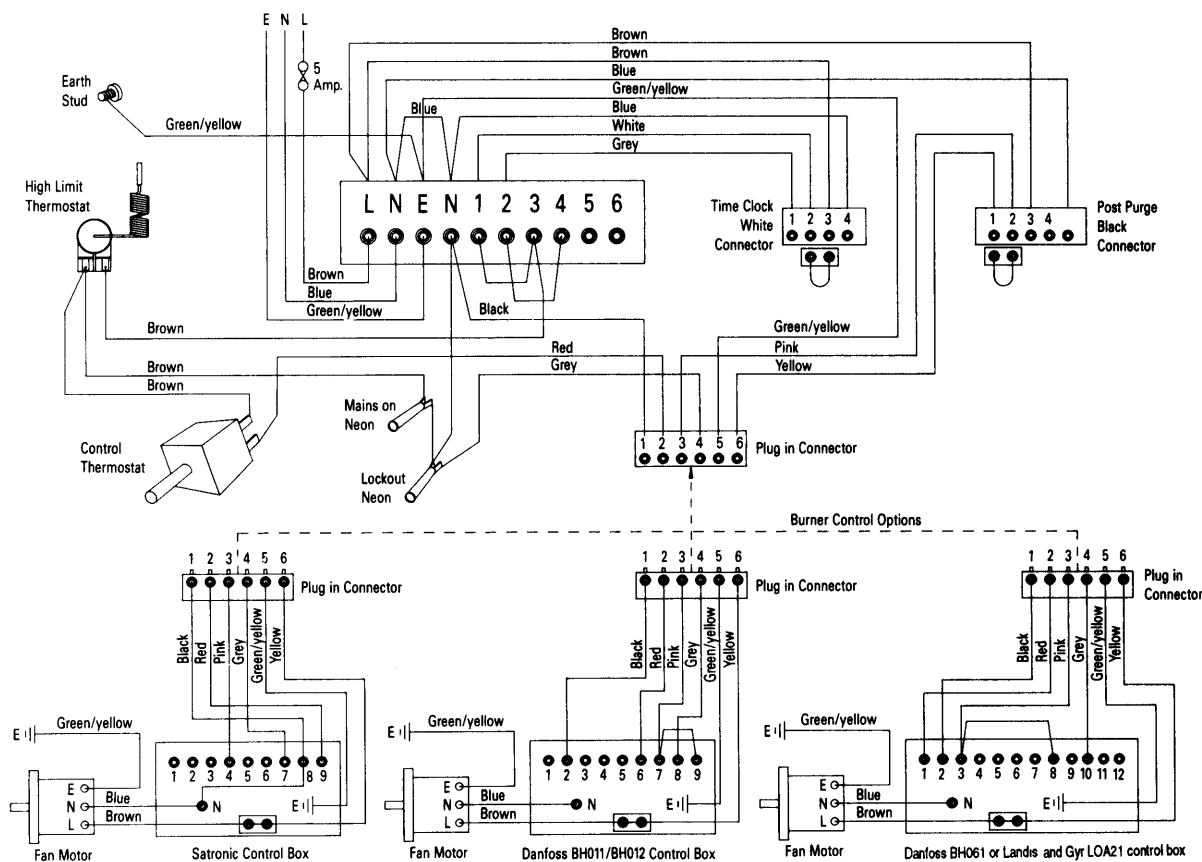
A plug in, colour co-ordinated, 2 channel electronic programmer is available from Worcester Heat Systems Limited. Full instructions covering installation and operation of the programmer are included with the kit.

The programmer will give fully independent central heating (CH) and hot water (HW) programmes when the switch on the rear of the unit is set to P.

Where the appliance is used on a gravity feed system the system will only function correctly on heating if the programmer switches the hot water programme on at the same time. To ensure that this is always the case the programmer is supplied with a gravity system switch on the rear of the unit which must be set to G.

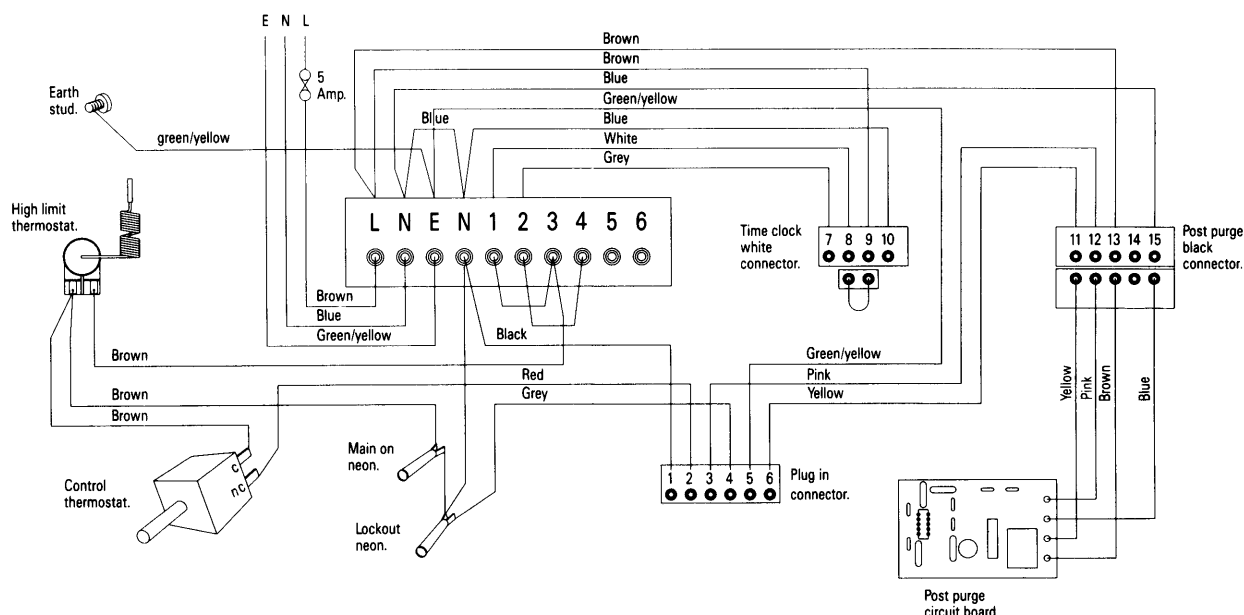
If an external programmer is to be fitted to the boiler the link plug should be removed from the programmer terminal strip. (See Fig. 11b.) The **LIVE**, **NEUTRAL** and **EARTH** wires should be connected to the **LIVE**, **NEUTRAL** and **EARTH** terminals on

**Fig. 9. Wiring Diagram (Standard).**





**Fig. 10. Wiring Diagram (Flueless Kit Fitted).**



the main terminal strip and the switched lines connected to terminals 1 and 2. Alternatively, the **LIVE, NEUTRAL** and **EARTH** from the programmer may be connected to a separate live supply with the switched lines again connected to terminals 1 and 2. With this method it is important that the user is warned that both the boiler supply and the programmer supply must be switched off before the electrical cover is removed.

**NOTE.** It is most important that the boiler mains lead is connected to the permanent mains supply and is not switched by an external time switch.

#### 4. BASIC CONTROL (Room Thermostat)

(See Fig. 12.)

As supplied the hot water and central heating circuits are controlled by the boiler thermostat. Additional control may be obtained by the use of a room thermostat, having removed the link from terminal 2 to terminal 4.

#### 5. OFF ON NO DEMAND (Room and Cylinder Thermostats)

(See Fig. 13.)

Referring to Fig. 11, with this control the boiler is allowed to cool when both the cylinder and room thermostats are de-energised. The boiler control thermostat must be set to a temperature above that of the cylinder thermostat for the control system to function correctly.

#### 6. HONEYWELL 'S' PLAN

(See Fig. 14.)

The 'S' Plan provides complete control on installations having pumped circulation to both the domestic hot water and radiator circuits.

The domestic hot water and radiator circuits are independently controlled by two motorised valves via a cylinder thermostat and a room thermostat. Both thermostats switch the water circulator and the boiler on and off.

#### 7. HONEYWELL 'Y' PLAN

(See Fig. 15.)

The 'Y' Plan provides complete control on installations having pumped circulation to both the domestic hot water cylinder and radiator circuits.

The domestic hot water and radiator circuits are controlled by a 3 port motorised valve via a cylinder thermostat and a room thermostat. Water flow is diverted to either circuit or to both circuits at the same time. Both thermostats switch the water circulator and the boiler on and off.

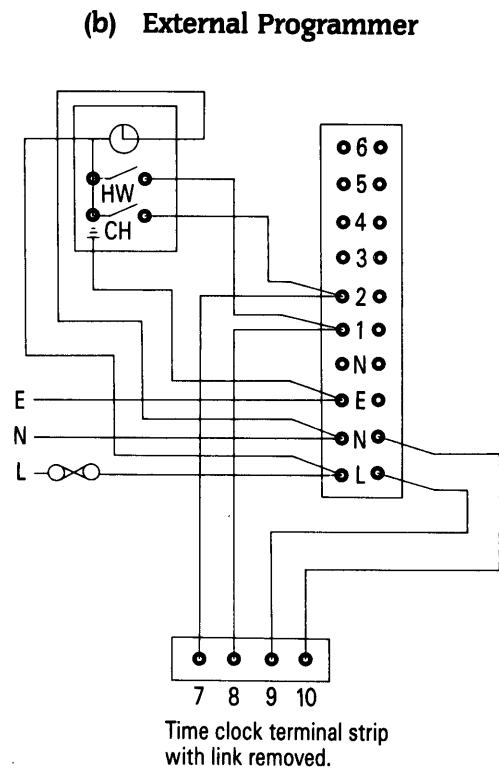
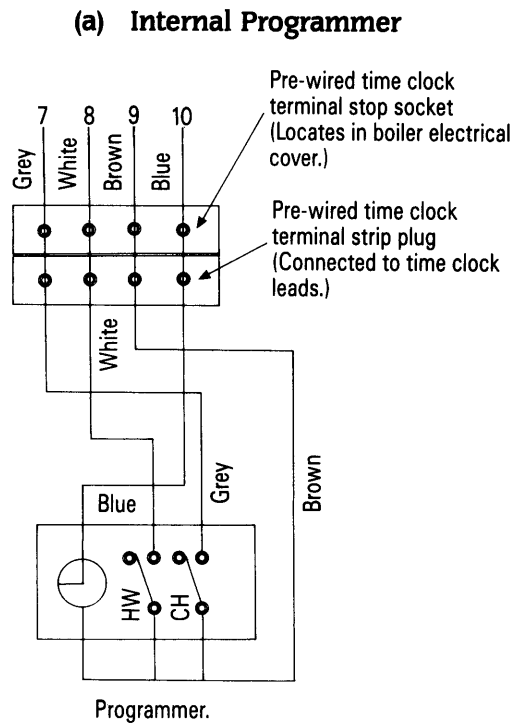
**NOTE.** The 'Y' plan requires a live feed from the hot water 'off' switch position. In order to achieve this, using a WHS programmer, remove the orange wire from terminal 9 and pull back through the tie wraps. Do not attempt to cut the tie wraps. Ensure that the brown wire is firmly secured in terminal 9. Connect the orange wire to terminal 6.

#### 8. FROST PROTECTION

(See Fig. 16.)

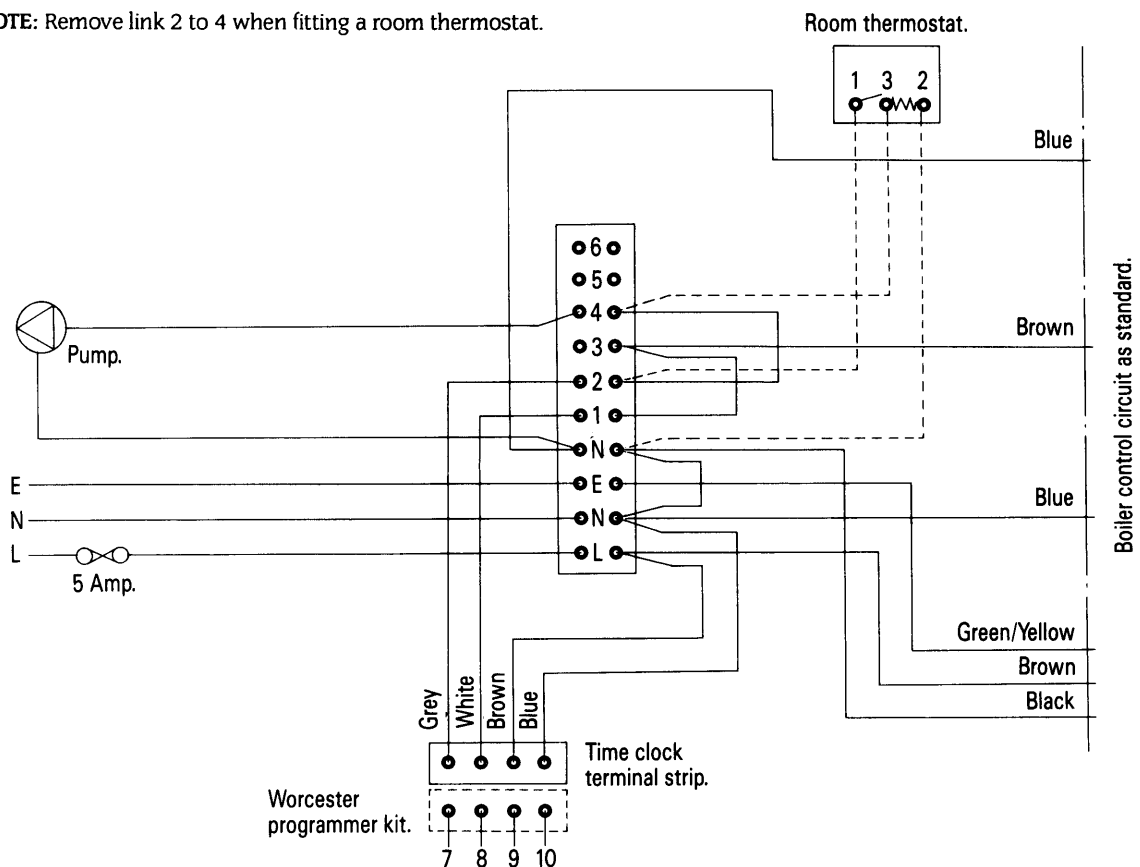
For full frost protection a single pole double switch thermostat should be fitted so that both the boiler and the circulating pump circuits are energised under frost conditions. A suitable frost thermostat is manufactured by SOPAC Ltd.

**Fig. 11. Programmer Connections.**



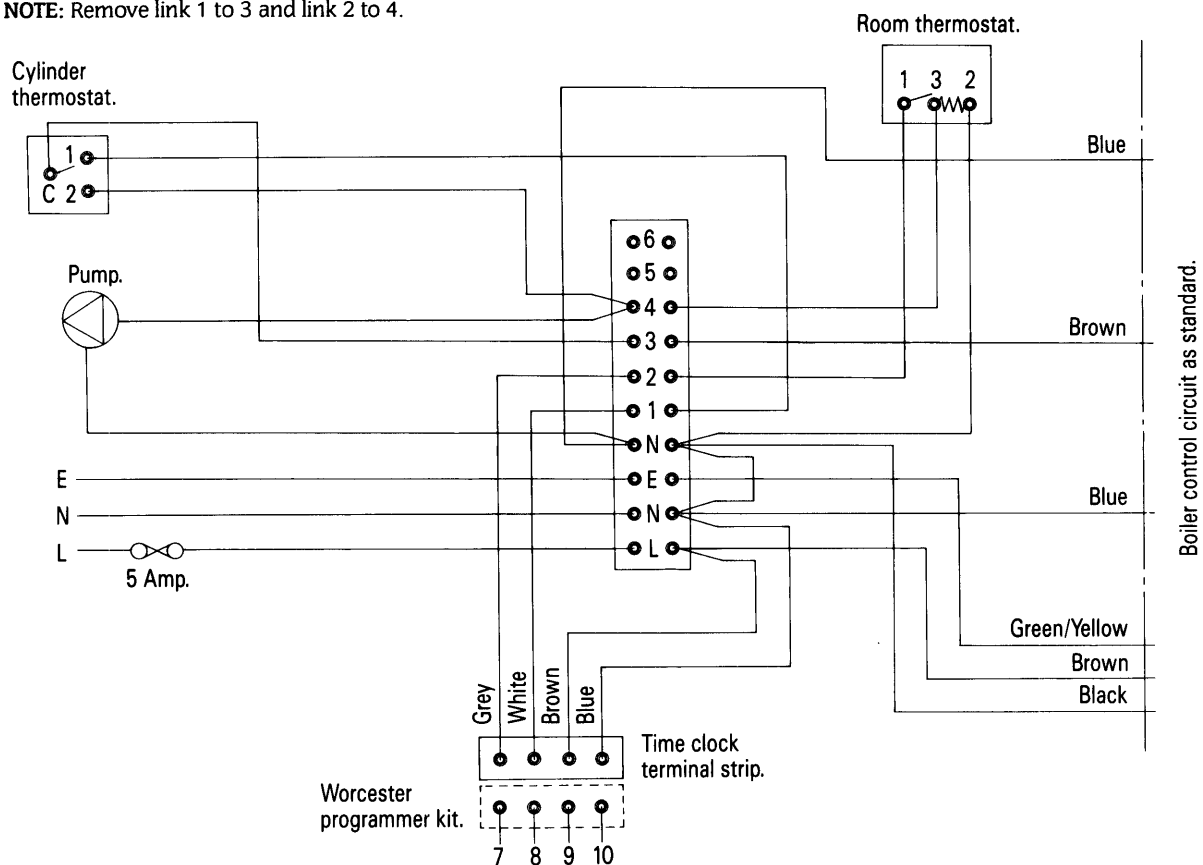
**Fig. 12. Standard Wiring.**

**NOTE:** Remove link 2 to 4 when fitting a room thermostat.



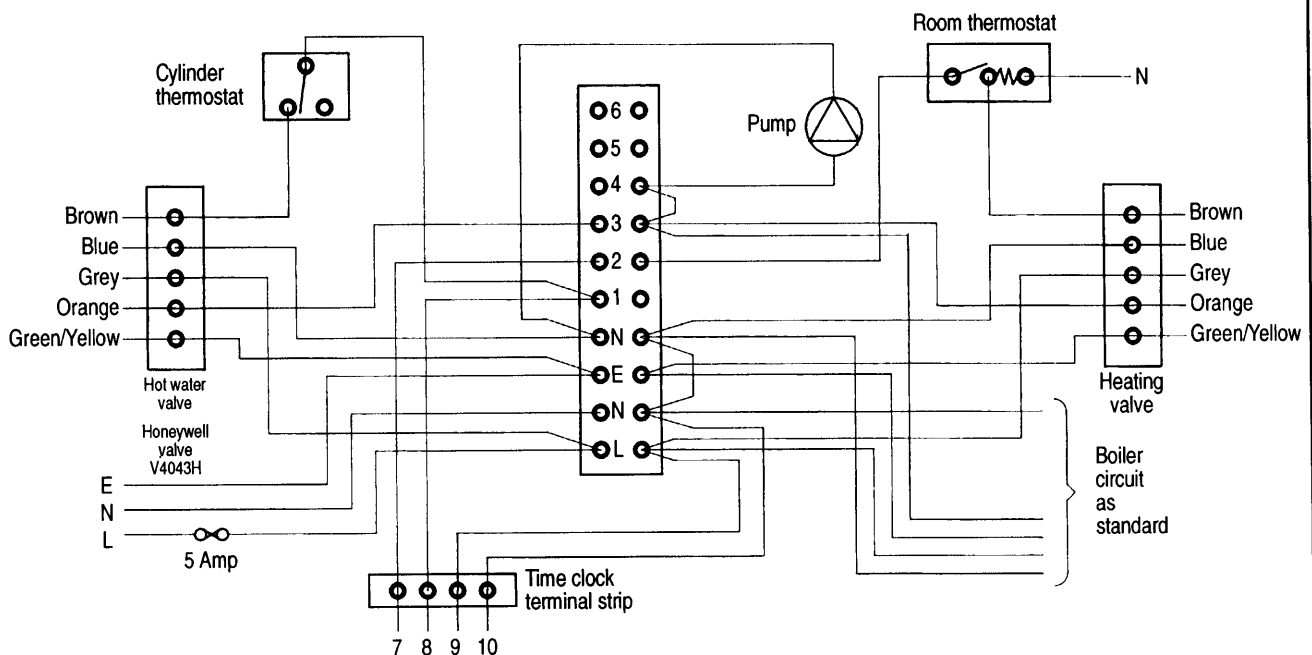
**Fig. 13. Off On No Demand.**

**NOTE:** Remove link 1 to 3 and link 2 to 4.



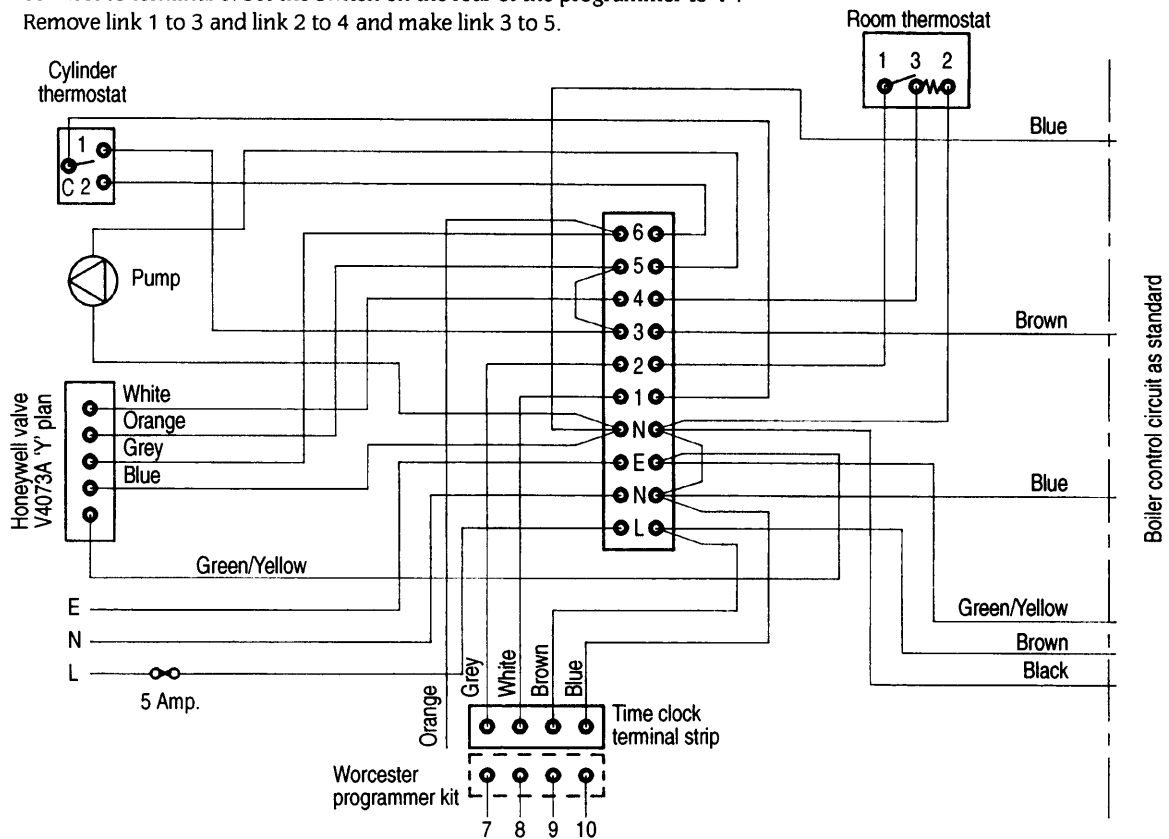
**Fig. 14. Honeywell 'S' Plan.**

**NOTE:** When using a WHS programmer set the switch on the rear of the programmer to 'P'.  
Remove link 1 to 3 and link 2 to 4 and make link 3 to 4.

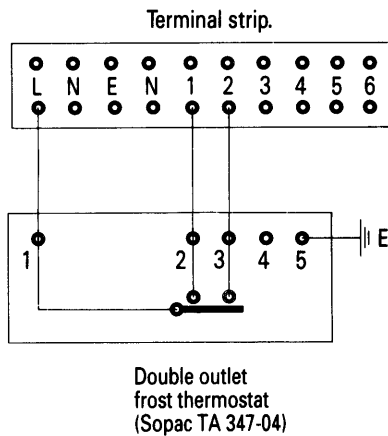


**Fig. 15. Honeywell 'Y' Plan.**

**NOTE:** When using a WHS programmer remove the orange wire from terminal 9 and connect to terminal 6. Set the switch on the rear of the programmer to 'P'. Remove link 1 to 3 and link 2 to 4 and make link 3 to 5.



**Fig. 16. Frost Protection.**

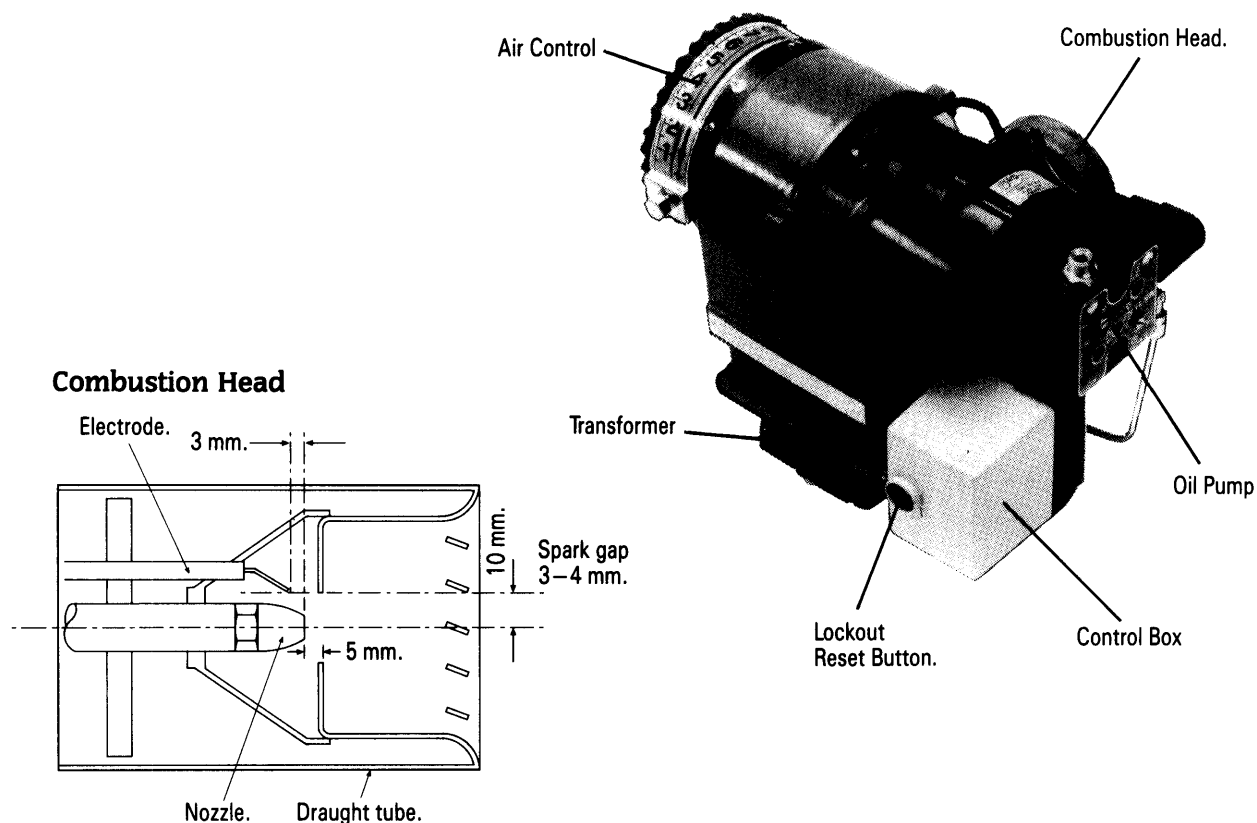


## 13. COMMISSIONING THE APPLIANCE

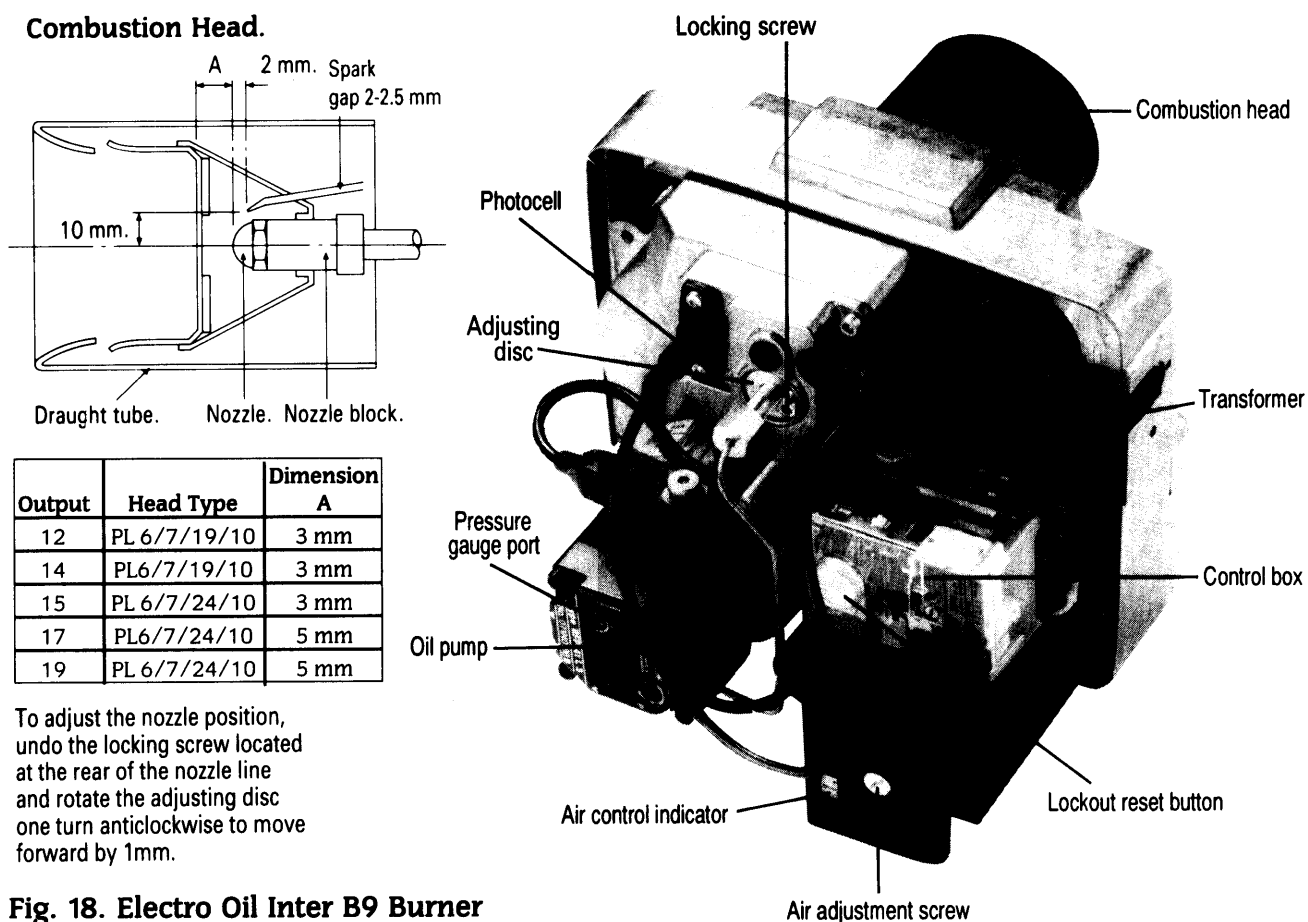
Remove the appliance cabinet, fill the system and check for leaks. The following procedures should then be adopted.

1. Remove the burner from the boiler by releasing the two M6 retaining screws located in the burner housing ring. Check that nozzle and electrode settings are correct for the relevant burner. (See Figs. 17 to 19.) Remount the burner.
2. Check that the appliance is correctly wired as described in Section 12.
3. Check that all baffles are correctly located and the heatshield is correctly mounted (where fitted) as shown in Fig. 20.
4. Check that the two thermostat phials are correctly located in the boiler thermostat pocket positioned in the top front of the boiler.
5. Disconnect the flexible hose from the boiler oil pump and open all fuel supply valves, drawing off at least 2.5 litres of oil, then reconnect the hose.
6. Release the fuel bleed port on the burner pump and fit a length of tubing from the port into a suitable receptacle. Turn on the boiler thermostat and allow the burner to run through to lockout. Wait two minutes and reset the burner control box. Repeat the procedure at least three times or until a steady stream of oil, without air, is exhausted from the bleed port. Relock the bleed port and disconnect the tube.

**Fig. 17. Worcester Novajet Burner.**

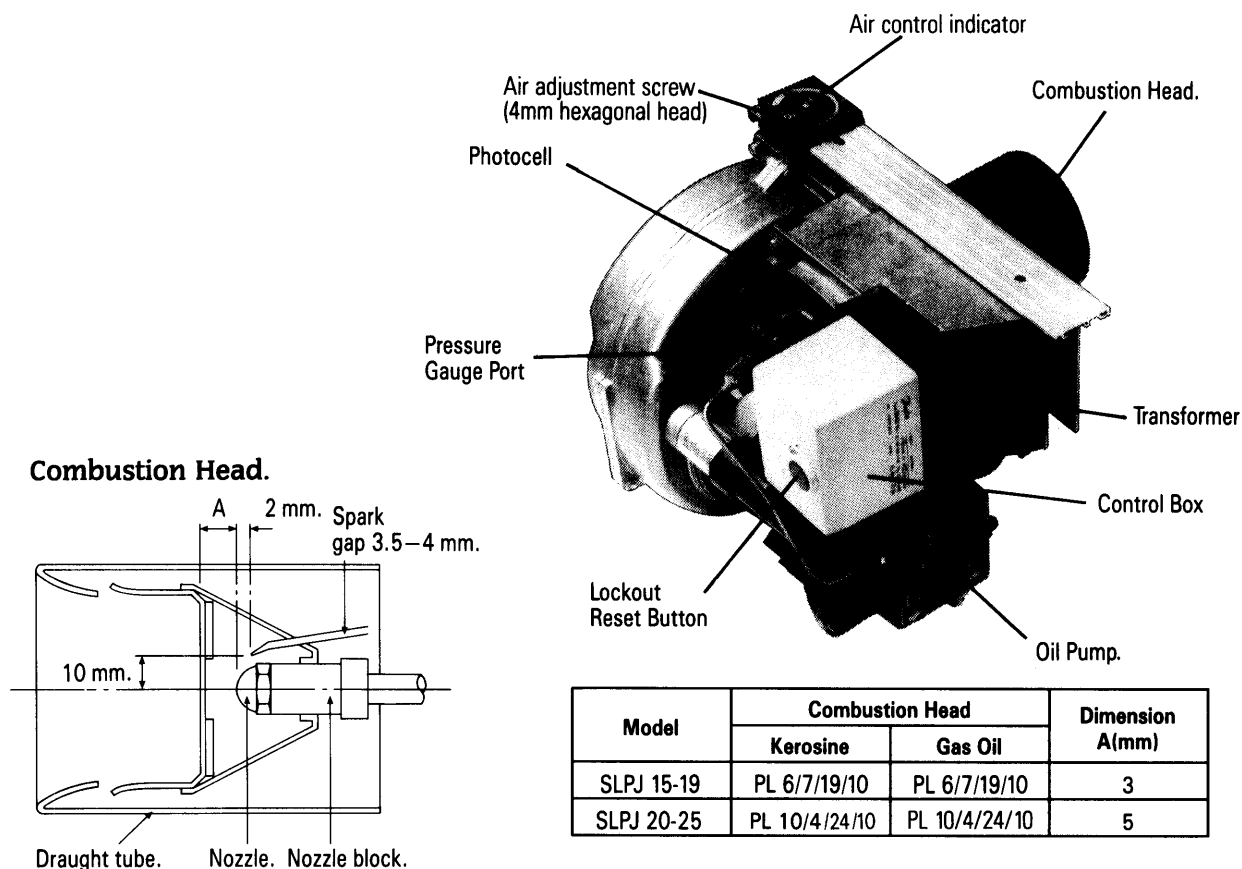


**Combustion Head.**



**Fig. 18. Electro Oil Inter B9 Burner**

**Fig. 19. Electro Oil Inter 2011 Burner**



- Adjust the air shutter and pump pressure to the settings recommended in Tables 2 to 6. After a pre-ignition period of approximately 15 seconds the burner should ignite. Flame sensing is carried out by means of a photocell mounted in the burner body. Should the boiler fail to establish a normal firing pattern, (or should flame failure occur during running), the absence of a flame is sensed and the control box is monitored to a safe lockout condition and the boiler is shut down. The lockout indicator light in the boiler control panel will illuminate indicating that the burner has gone to lockout. In this instance wait two minutes, remove the appliance front cover and press the red lockout reset button mounted in the burner control box. Another start sequence is then initiated. Repeat the procedure until a flame is established.

**NOTE.** Persistent lockout when running indicates a fault and a Service Engineer should be consulted.

- Run the boiler for approximately three minutes and switch off checking that there is no after-spurting from the nozzle. This can be detected by oil saturation on the blast tube. If after-spurting occurs remove the burner from the boiler, unscrew the nozzle and, while holding the burner in a vertical position, fill the nozzle holder with oil. Refit the burner and continue to

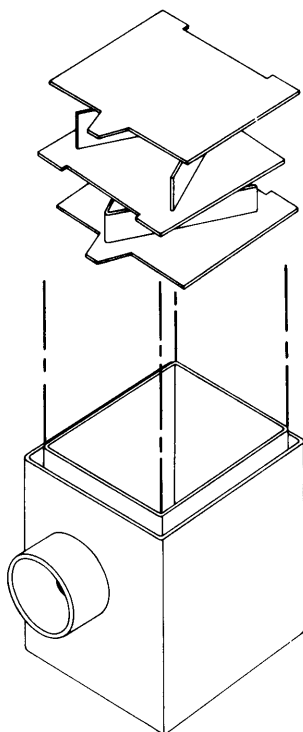
run the boiler for three minute periods until after-spurting stops.

**NOTE.** In order that after-spurting is reduced to a minimum during the commissioning period it is recommended that a pressure gauge only is fitted on the external pressure gauge port on the Electro Oil 2011 (see Fig. 19). Use of a 'T' piece will increase the oil line volume and hence increase the degree of after-spurting.

- Run the boiler for a further 15 minute period and then finally fine tune the air shutter setting to give the CO<sub>2</sub> levels specified in Tables 2 to 6.
- Check that the smoke reading is in the range 0–1. If this cannot be achieved then check that the burner head is set correctly and the nozzle is in good condition.
- Check that the flue temperature does not exceed the values specified in Tables 2 to 6. If this is the case then check that the baffles are correctly located. If the baffles are correctly located then reduce the pump pressure since nozzle variations of up to  $\pm 15\%$  may occur.

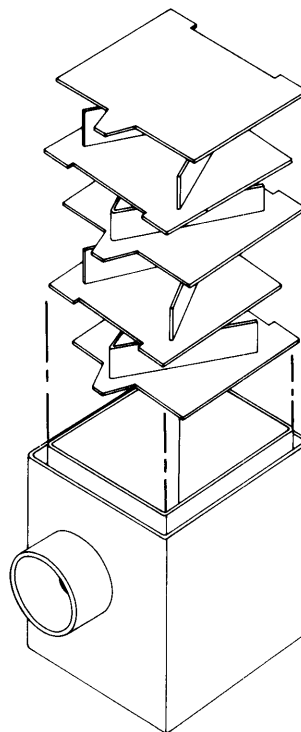
**NOTE.** A flue gas sampling point is located on the boiler top plate.

**Fig. 20a. Location of Boiler Flueway Baffles—SLPJ 12-14.**



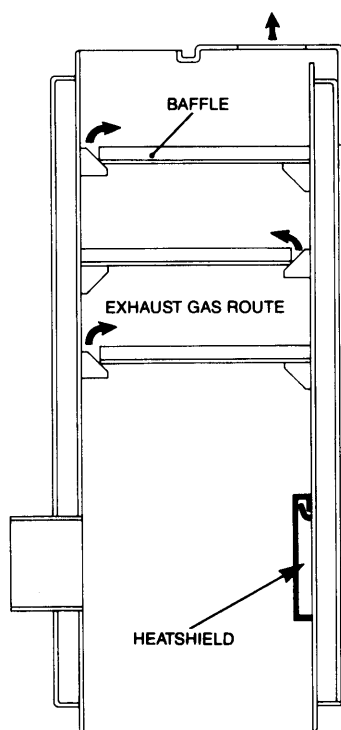
ENSURE THAT ALL BAFFLES ARE FIRMLY SEATED IN A HORIZONTAL POSITION.

**Fig. 20b. Location of Boiler Flueway Baffles—SLPJ 15-19.**



ENSURE THAT ALL BAFFLES ARE FIRMLY SEATED IN A HORIZONTAL POSITION.

**Fig. 20c. Location of Boiler Flueway Baffles—SLPJ 20-25.**



ENSURE THAT ALL BAFFLES ARE FIRMLY SEATED IN THE POSITIONS SHOWN.

## 14. USERS INSTRUCTIONS

Hand the users instructions to the user or purchaser for retention and instruct them in the efficient and safe operation of the appliance and the heating/hot water system.

Advise the user or purchaser of the precautions necessary to prevent damage to the heating/hot water system and to the building in the event of the heating system remaining inoperative during frost conditions.

Finally advise the user or purchaser that for continued efficient and safe operation of the appliance it is important that adequate servicing is carried out by a qualified engineer at least once per year for 28 second kerosene and twice per year for 35 second Gas Oil.

Worcester Heat Systems Limited will be pleased to discuss and offer a comprehensive maintenance contract.

Set the system controls to the users requirements.

## 15. ROUTINE CLEANING AND INSPECTION

1. The following should be carried out at least once per year for 28 second kerosene and twice per year for 35 second Gas Oil, to ensure efficient trouble free operation.
  - (a) Carry out a pre-service check noting any operational faults.
  - (b) Check and clean the burner.
  - (c) Check and clean the baffles.
  - (d) Check the heat shield (on SLPJ 20-25 only).
  - (e) Check the refractory base.
  - (f) Check that the flue terminal is unobstructed and clean as necessary.

- (g) If the appliance has been installed in a compartment check that the ventilation areas are clear.
- (h) Clean the heat exchanger.
- (i) Clean all oil filters.

Some of the servicing points are covered more fully in the following instructions.

## 2. PRE-SERVICE CHECK

- (a) Remove the cabinet front and top panels as described in Section 6.
- (b) Operate the appliance and system, noting any faults which may need to be corrected during the service.

**WARNING.** Disconnect the electrical supply at the mains before commencing any servicing. Turn off the oil at the service cock.

## 3. CLEANING THE BURNER

- (a) Disconnect the electrical lead from the control box by depressing the two locking ears on the plug and pulling downwards.
- (b) Disconnect the flexible hose.
- (c) Slacken the two M6 burner locking screws and remove the burner.
- (d) Clean the fan impeller using the following procedure:-

### Worcester Novajet

- (i) Remove the three screws holding the plastic air control housing in position and withdraw the housing.
- (ii) Remove the three screws holding the inner plastic housing in position and remove this ensuring it is free of any debris.
- (iii) Remove the two screws holding the transformer lid in position and pivot into the open position.
- (iv) Clean both sides of the impeller and remove any debris from the burner housing.
- (v) Check that the impeller rotates freely.
- (vi) Reassemble the components.

### Electro Oil Inter B9 Burner

- (i) Remove the two screws holding the combustion head in position and withdraw the combustion head and air guide collar.
- (ii) Remove the three remaining screws holding the front cover plate in position and withdraw the cover to expose the fan impeller.
- (iii) Clean both sides of the fan impeller and remove any debris from the burner housing.
- (iv) Check that the impeller rotates freely.
- (v) Clean the air inlet passage and check that the adjustment mechanism operates freely.
- (vi) Reassemble the components.

### Electro Oil Inter 2011

- (i) Remove the acoustic fan inlet cover.
- (ii) Remove the three screws holding the fan cowl in position and remove the cowl noting how the fan control flap is positioned.
- (iii) Check that the air control flap pivots freely and ensure that the air path to the burner head is clear.
- (iv) Clean both sides of the fan impeller and remove any debris from the burner housing.
- (v) Check that the impeller rotates freely.
- (vi) Re-assemble the components.
- (e) Remove the combustion head and thoroughly clean all deposits.
- (f) It is strongly recommended that the oil atomising nozzle is replaced at each service. If this is not possible then remove and clean the integral filter, but under no circumstances should the nozzle be stripped into its component parts and never attempt to clean the nozzle tip.

- (g) Check and reset the electrodes, where necessary, as shown in Figs. 17 to 19.
- (h) Replace the combustion head and check that the nozzle lies central to the combustion head and the head settings are as shown in Figs. 17 to 19.
- (i) Withdraw the photocell from its housing and clean.
- (j) Remove the oil pump cover and internal filter. Clean the filter using Kerosene or white spirit.
- (k) Re-assemble the pump and reconnect the electrical and oil supplies to the burner.
- (l) Check the silicon rubber O-ring seal and replace if necessary.
- (m) Remove the paper element from the external oil filter and replace. If the filter contains a washable element then thoroughly clean in Kerosene or white spirit and re-assemble into the filter.

## 4. CLEAN THE BOILER

- (a) Remove the boiler top access door by releasing the two M10 nuts and check the fibreglass rope seal. Replace the seal if necessary.
- (b) Remove the baffles and clean and check their condition. Replace any baffles considered to be badly corroded.
- (c) Thoroughly clean all of the heat exchanger surfaces using a stiff wire brush and vacuum clean all loose debris from the combustion chamber.
- (d) Remove and check the heat shield where fitted (SLP 20-25 model only).
- (e) Check the condition of the refractory base and repair any minor cracks with fire cement. If the base is considered to be beyond minor repair then the refractory material must be removed and re-cast.
- (f) Check and clean the flue.
- (g) Replace the items in reverse order noting the baffle positions shown in Fig. 20.

## 5. RECOMMISSION THE BURNER

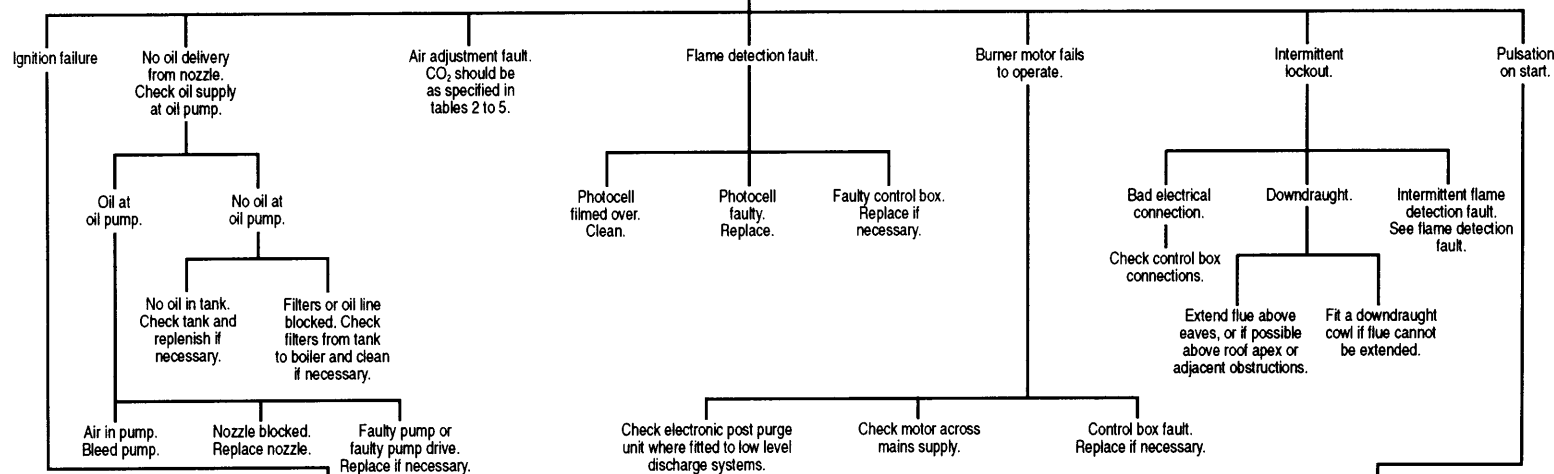
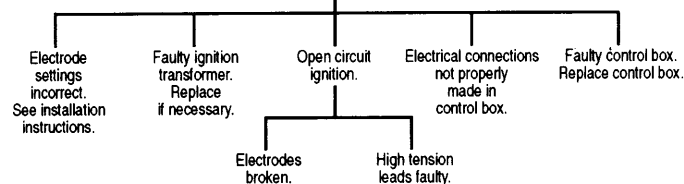
- (a) Replace the burner holding firmly forward while securing the two locking screws. Check that the O-ring gasket forms a good seal.
- (b) Turn on the oil supply at the service cock.
- (c) Recommission the burner as described in Section 13.



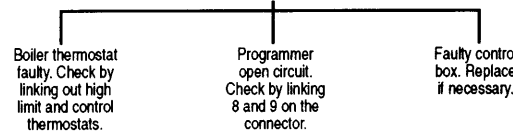
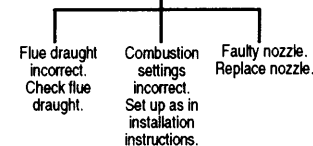
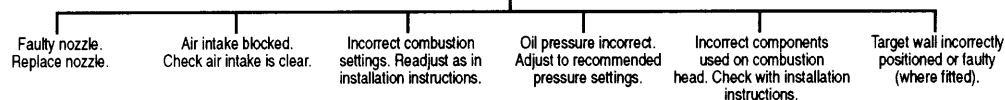
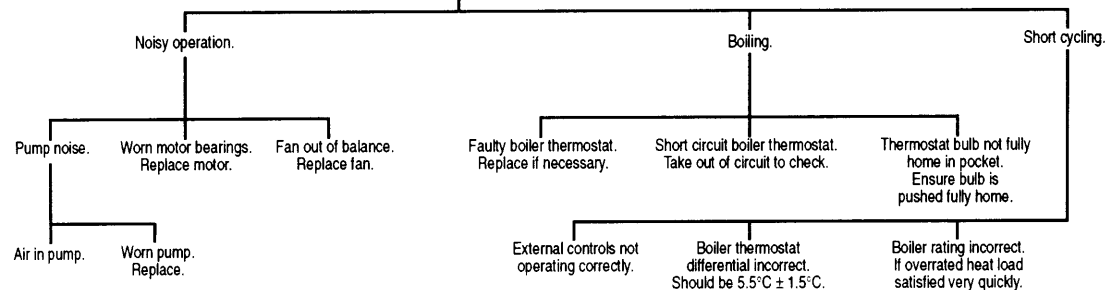
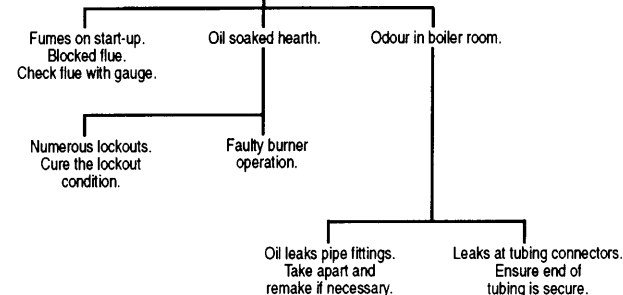
**LOCKOUT**

INDICATED BY RED LAMP ON CONTROL BOX

To Re-set wait 2 minutes and press re-set button

**IGNITION FAILURE****BURNER FAILS TO START**

Boiler does not respond to a call for heat.

**PULSATION ON START****HIGH SMOKE NUMBER****FAULTY BOILER OPERATION****OIL SMELLS**

## 17. SHORT PARTS LIST

### Burner Components – Worcester Novajet

Part		Manufacturers Reference	Qty	WHS Part No.
Burner Control 1.	Box	Satronic TF830B	1	ZFSPA056X
	Photocell	Satronic MZ770	1	ZFPJT215X
Burner Control 2.	Box	Danfoss BH061	1	ZFPJT233X
	Photocell	Danfoss LDS057H7085 or 7084	1	ZFPJT235X
Burner Control 3	Box	Danfoss BH061 or Landis and Gyr LOA21	1	ZFPJT233X
	Photocell	Danfoss LDS057H7085 or Landis and Gyr QRB1S – 50.7	1	ZFPJT235X

### Burner Components – Electro Oil

Part		Manufacturers Reference	Qty	WHS Part No.
Burner Control 1.	Box	Satronic TF830B	1	ZFSPA056X
	Photocell	Satronic MZ770	1	ZFPJT215X
Burner Control 2.	Box	Danfoss BH011/BH012	1	ZFPJT015X
	Photocell	Danfoss LD057H2052	1	ZFPJT197X
Burner Control 3	Box	Danfoss BH061 or Landis and Gyr LOA21	1	ZFPJT233X
	Photocell	Danfoss LDS057H7085 (or 7084) or Landis and Gyr QRB1S – 50.7 (or – 35.4)	1	ZFPJT235X





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