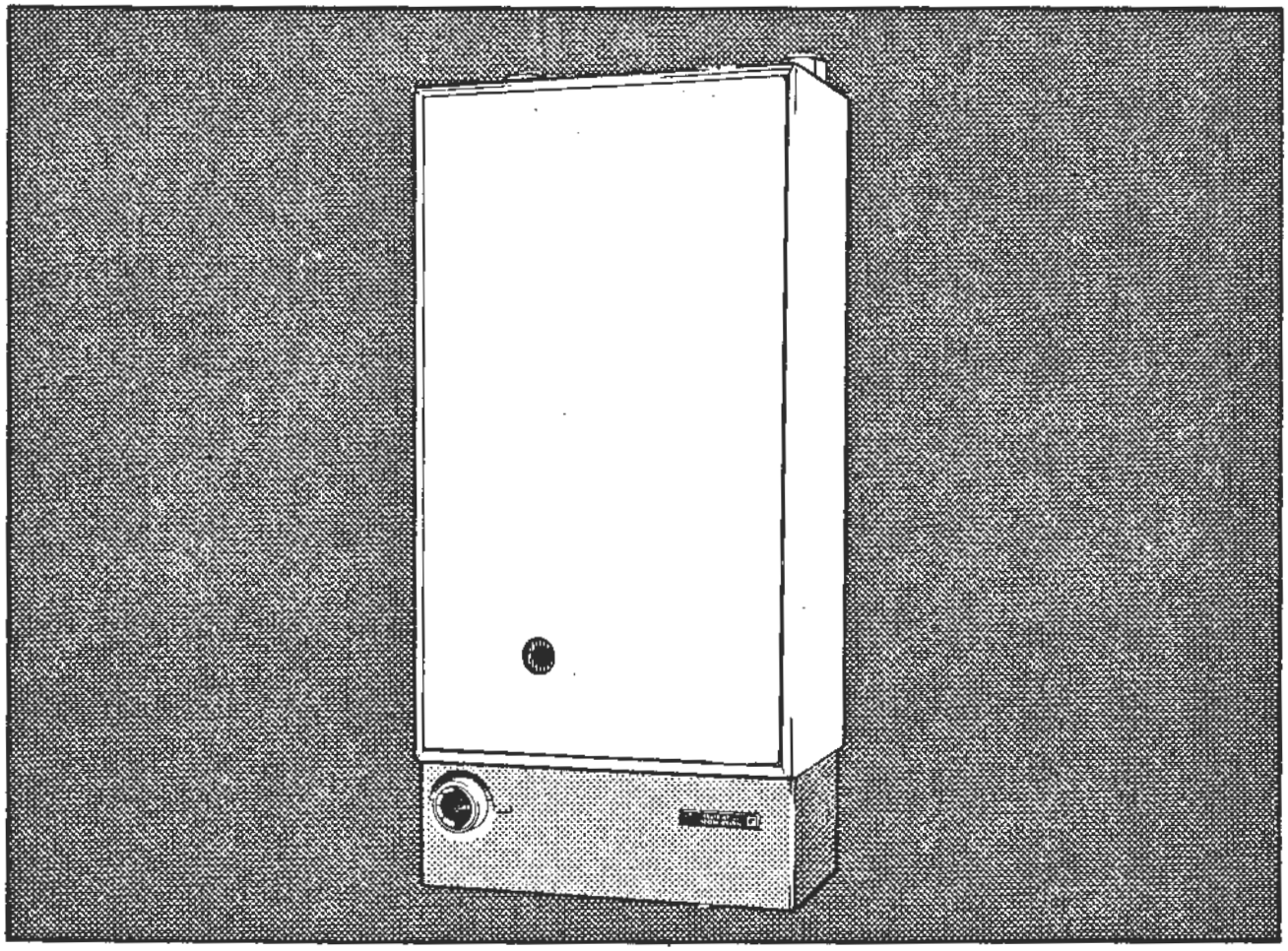
DO NOT TAKE (MASTER)

412886A/12/82

Glow-worm
FUELSAVER
25-30B, 30-40B, 40-50B
Balanced Flue

G.C. No. 41.315.79 25-30B, 41.315.81 30-40B, 41.315.83 40-50B



Installation and Servicing Instructions

(To be left with User, or at gas meter)

This boiler is for use on fully pumped systems only, and on natural gas only.

1 GENERAL

This unit is an automatic central heating boiler employing PUMPED CIRCULATION OF HOT WATER up to a temperature of approximately 82°C (180°F) as the medium of heat transmission. It can be used wherever the required output does not exceed 8.79 kW (30,000 Btu/h) for the 25-30B, 11.72 kW (40,000 Btu/h) for 30-40B, or 14.7 kW (50,000 Btu/h) for 40-50B and is designed for use on open vent or sealed central heating and domestic hot water systems using a DOUBLE FEED (FULLY INDIRECT) CYLINDER.

For details of the system installation a qualified Heating Engineer should be consulted.

It is essential that the unit is installed strictly in accordance with the instructions in this booklet and the attention of the installer is drawn in particular to the following points:

1.1 STATUTORY REQUIREMENTS

The installation of this boiler must be carried out by a qualified installer and must be in accordance with the relevant requirements of the Gas Safety Regulations, local building regulations, I.E.E. regulations,the local gas region, the local authority, the byelaws of the local water undertaking and relevant recommendations of British Standard Codes of Practice CP 331 Part 3: 1974, BS 5376 PART 2: 1976, BS 5440 PART 1: 1978, BS 5440 PART 2: 1976, BS 5449 PART 1: 1977 AND BS 5546: 1979.

1.2 BOILER LOCATION

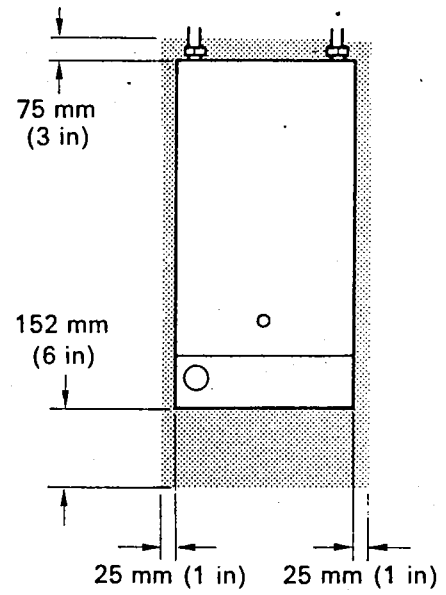
To comply with Building Regulations, a balanced-flue must not be within 300 mm (1 ft), measured vertically, from any openable window, or any ventilator, inlet to a ventilating system or similar opening.

Where a balanced-flue terminal is situated within 2 m (6½ ft) of the ground or 2 m (6½ ft) above a balcony or flat roof, it must be fitted with an approved guard to comply with Building Regulations, see 2.2.

The boiler position should be such that the following minimum clearances are provided as shown in diagram 2.

Right- and left-hand side of appliance—25 mm (1 in)
Top of appliance — 75 mm (3 in)
Underneath of appliance — 152 mm (6 in)

The boiler may be installed in any room although particular attention is drawn to the requirements of the I.E.E. Regulations and in Scotland, the electrical provision of the building regulations applicable in Scotland, with respect to the installation of the boiler in a room containing a bath or shower.



SPACE FOR INSTALLATION **Diagram 2**

2 FLUEING AND VENTILATION

2.1 BALANCED FLUE

Terminal positions that should be avoided for balanced flues are:

(a) Immediately beneath eaves or a balcony.

(b) At a re-entrant position on the face of a building.

(c) Adjacent to any projection on the face of a building, e.g. drain pipe or other obstructions.

(d) At ground level.

2.2 PROTECTING THE TERMINAL

Where the terminal is less than 2 m (6½ft) above the level of any ground, balcony, flat roof etc. to which any person has access and which adjoins the wall in which the terminal is situated, the terminal must be protected by a guard of durable material.

Guards are available from Tower Flue Components Ltd., Telephone Tonbridge 351555, quoting reference B. green, or from Quinnell, Barrett & Quinnell Ltd., 884 Old Kent Road, London S.E. 15, quoting reference Type B2.

2.3 CUPBOARD/COMPARTMENT VENTILATION

Details of essential features of cupboard/compartment design including airing cupboard installations are given in BS 5376:2.

Where the appliance is fitted in a cupboard or compartment, the ventilation area must be in accordance with table below.

Position of air vents	Air from Room	Air direct from outside
High and Low level	9.0 cm² per kW input (2in² per 5,000 Btu/h input	4.5 cm² per kW input (1in² per 5,000 Btu/h input)

NOTE Both the high level and low level air vents must communicate with the same room or must both be on the same wall to outside air.

3 WATER SYSTEM

3.1 PUMP

The pump should be fitted in the **flow-pipe from the boiler** and it is recommended that a pump producing at least 2.5 m (8ft) head at a flow rate through the boiler of 686 litre/h (2.5 gal/min) for the 25-30B, 916 litre/h (3.4 gal/min) for the 30-40B, or 1150 litre/h (4.2 gal/min) for the 40-50B, giving a temperature rise of approximately 11°C (20°F) is used. Examples of suitable approved pumps are SMC Commodore, Grundfos UPS 15 and the Euramo MXL 130.

3.2 BY-PASS

The flow through the boiler must not be allowed to fall below 491 litre/h (1.8 gal/min) for the 25-30B, 655 litre/h (2.4 gal/min) for 30-40B, or 820 litre/h (3.0 gal/min) for the 40-50B, while the burner is alight. It is important that if system controls such as thermostatic radiator valves or motorised zoning valves cause the flow through the boiler to fall below this rate, a by-pass must be fitted (see diagram 10). The use of a by-pass will mean that the temperature rise across the boiler will be less than that across the system because part of the water flow is being re-circulated round the boiler. **See 12. System Guidance.**

3.3 CYLINDER

The hot water cylinder must be a double feed (fully indirect) pattern. Single feed (self-priming) cylinders are not recommended, and must not be used on sealed systems.

3.4 SAFETY VALVE

A safety valve set to not more than 3 bar (43.5 lbf/in²) should be fitted to the flow pipe of the boiler where required by the local Gas Region.

3.5 OPEN WATER SYSTEMS

A 22 mm open vent pipe must be fitted in the flow line from the boiler and terminated above the cold feed and expansion cistern, which should not be less than 22 litre (5 gallon) capacity.

The cistern must not be situated more than 27.5 m (90 ft) above the boiler.

A 15 mm minimum cold feed must be fitted in the system. **See also System Guidance section.** A drain valve must also be fitted at the lowest point in the system; a drain point is sited on the boiler on the left-hand side. This is a small point intended for the draining of the boiler only, see diagram 7.

3.6 SEALED WATER SYSTEMS

3.6.1 General

The installation should comply with the appropriate requirements of BS 5376 Part 2 and BS 5449:1.

3.6.2 Safety valve

A spring-loaded safety valve complying with the relevant requirements of BS 759 shall be fitted and shall incorporate the following features:

(a) A pre-set, non-adjustable lift pressure of 3 bar (43.5 lbf/in²).
(b) A seating or valve face of suitable resilient material.
(c) A manual test device.
(d) Provision for connection to a drain pipe.

The safety valve shall be fitted either directly to the upper portion of the boiler water section or in the flow pipe, as near as is practicable thereto, with no intervening valve or restriction. It should be fitted in an upright position, accessible for testing. The safety valve shall be so positioned or any discharge pipe so arranged that discharge of water or steam from the valve cannot create a hazard to occupants of the premises or cause damage to electrical components and wiring.

3.6.3 Expansion vessel

A diaphragm type expansion vessel shall be connected at a point close to the inlet side of the circulating pump in a manner laid down in the vessel maker's instruction (see illustration of recommended system layout).

The expansion vessel must be chosen to suit the volume of water in the system. The charge pressure shall not be less than the static head at the point of connection.

The ratio of total system volume to expansion vessel volume depends on several factors such as vessel charge pressure, initial system pressure, and maximum boiler temperature. For most systems the ratio will be between 8:1 and 12:1 (see BS 5449:1 for specific information). The volume of water in the appliance alone is 0.87 litre (1.53 pint). Further details may be obtained from the British Gas Publication entitled "Material and Installation Specifications for Domestic Central Heating and Hot Water"

3.6.4 Pressure gauge

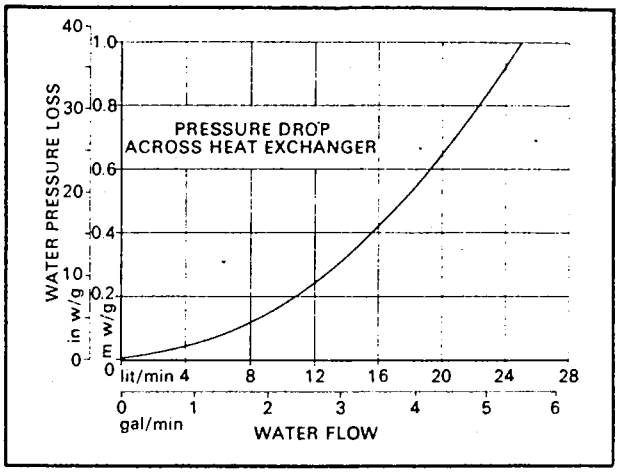
A pressure gauge with set pointer and covering at least the range 0 to 4 bar (0 to 60 lbf/in²) shall be permanently fitted to the system in a position visible to the person carrying out the filling operation.

3.6.5 Cylinder

The hot water cylinder shall be either of the indirect coil type or a direct cylinder fitted with an immersion calorifier.

3.6.6 Make-up

Provision shall be made for replacing water lost from the system from a make-up vessel mounted in a position higher than the top point of the system and connected through a non-return valve to the system on the return side of either the hot water cylinder of heating circuit. Where access to a make-up vessel would be difficult provision for make-up can be made by pre-pressurisation of the system.



3.6.7 Filling

There shall be no direct connection to the mains water supply or to a storage tank supplying domestic water even through a non-return valve without the approval of the local Water Authority. The system shall be filled with water either from the mains water supply or from a sealed system filler pump with a break tank (see sketch).

The system shall be fitted with a filling point at low level which shall have a stop valve. If direct mains filling is proposed a non-return valve and anti-vacuum valve shall be fitted on the mains side of the stop valve, and both valves shall be of a type approved by a National Water Council.

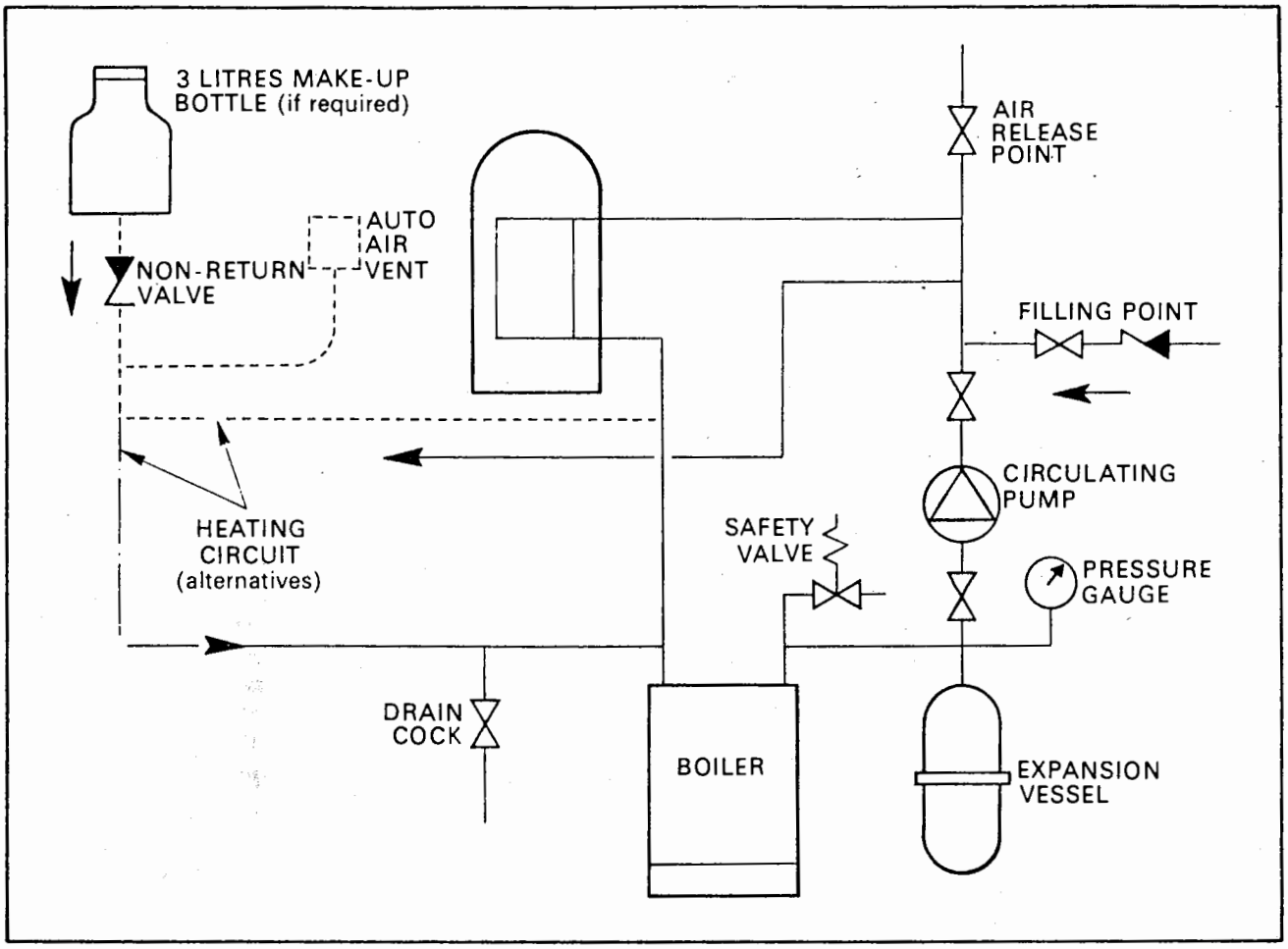
3.6.8 Commissioning (sealed systems only)

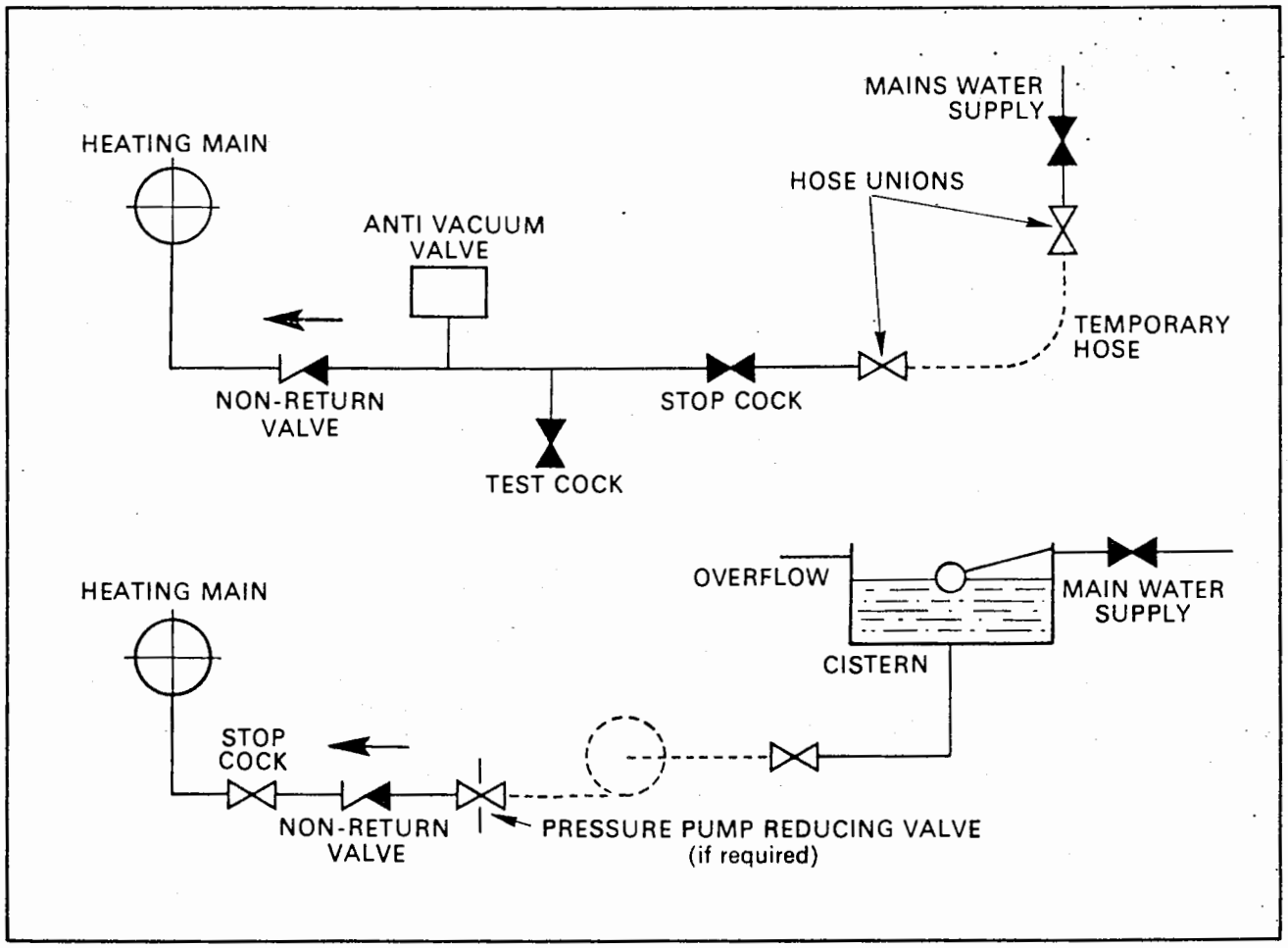
(a) Flush the whole system with cold water and fill until the pressure gauge registers 1.5 bar (22 lbf/in²). Clear any air locks and examine for leaks. Rectify where necessary.

(b) Check the operation of the safety valve preferably by allowing the water pressure to rise until the valve lifts. This should be within 0.3 bar (± 4.3 lbf/in²) of the pre-set pressure. Where the above is not possible a manual check should be conducted.

(c) Release cold water to initial design pressure. Light boiler and heat system to maximum working temperature. Examine for leaks; turn off boiler and drain the system while it is still hot.

(d) Refill and vent system. Adjust to initial design pressure.


3 LITRES MAKE-UP BOTTLE (if required)
AIR RELEASE POINT
AUTO AIR VENT
NON-RETURN VALVE
FILLING POINT
CIRCULATING PUMP
HEATING CIRCUIT (alternatives)
SAFETY VALVE
PRESSURE GAUGE
DRAIN COCK
BOILER
EXPANSION VESSEL


MAINS WATER SUPPLY
HEATING MAIN
HOSE UNIONS
ANTI VACUUM VALVE
TEMPORARY HOSE
NON-RETURN VALVE
STOP COCK
TEST COCK
HEATING MAIN
OVERFLOW
MAIN WATER SUPPLY
CISTERN
STOP COCK
NON-RETURN VALVE
PRESSURE PUMP REDUCING VALVE (if required)

4 INSTALLING THE BALANCED FLUE

4.1 Check that the balanced flue set supplied is suitable for the wall thickness through which it has to pass. The standard flue set is suitable for wall thicknesses 76mm—380mm (3—15ins.). The long flue set, available on special order, is suitable for wall thicknesses 380mm—580mm (15—22¾ins.).

4.2 Position the template provided on the wall in the required boiler position and mark location of balanced flue hole.

4.3 Cut the hole in the wall which will be 241mm (9½in) high by 292mm (11½in) wide to accept the wall liner.

4.4 Make good any plasterwork necessary at this stage. When dry, select the liner with the turned flange at one end and push into the cavity until the flange is flush to the wall. Fit the second half of the liner from inside so that it is flush with the outside brickwork. Tape the two liners together with the tape provided.

4.5 Now re-position the template on the wall in line with the wall opening.

4.6 Mark positions for the two fixing screws.

4.7 Drill and plug the top hole and fit a No. 10 x 50mm (2in) long wood screw.

4.8 **Drill and plug only at this stage** the bottom fixing hole, suitable for No. 10 x 50mm (2in) long wood screw.

5 PREPARE THE APPLIANCE

5.1 Remove the controls cover by pulling forward until it is clear of the appliance, thus exposing the controls.

5.2 Remove the front cover by turning the slotted screw underneath the main case (see diagram 9 item E) anti-clockwise until the bottom edge comes forward. (Should the block come off the screw by excessive movement, refit it with the inclined face to the top and front.)

5.3 Turn the screw fully clockwise after removing the front cover to enable the cover to be replaced easily and correctly later.

5.4 Remove the flue hood by undoing the two screws at the back of the flue hood and releasing the hook bolts from the water pipes on the heating body. Care should be taken to avoid knocking or distorting the top of the heating body.

5.5 Raise the bracket, at the top of the heater, to the vertical position.

5.6 Remove the backing strip from the sponge case seal provided and fit around the spigot on the back of the boiler with the wide adhesive edge to the back of the case.

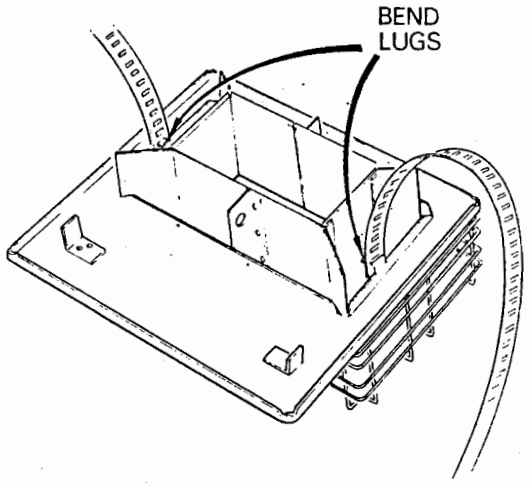


Diagram 3

6 FIT THE APPLIANCE AND FLUE SET

6.1 Fix slotted straps to terminal by inserting the lugs on the terminal into the end of each strap. Bend lugs towards the outside so that the straps are securely held.

6.2 Mount the appliance on the wall locating top bracket on screw. Push terminal up against the outside wall with the locating lugs resting on the lower surface of the opening. See diagram 4 showing the position of the lugs. Locate the terminal straps temporarily in the lugs on the back of the case as in diagram 5.
DO NOT BEND THE LUGS AT THIS STAGE.

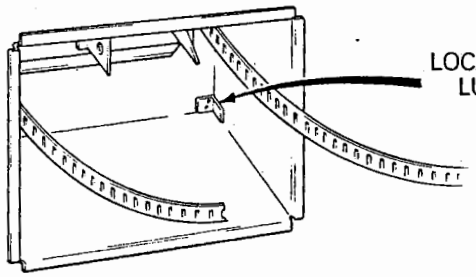


Diagram 4

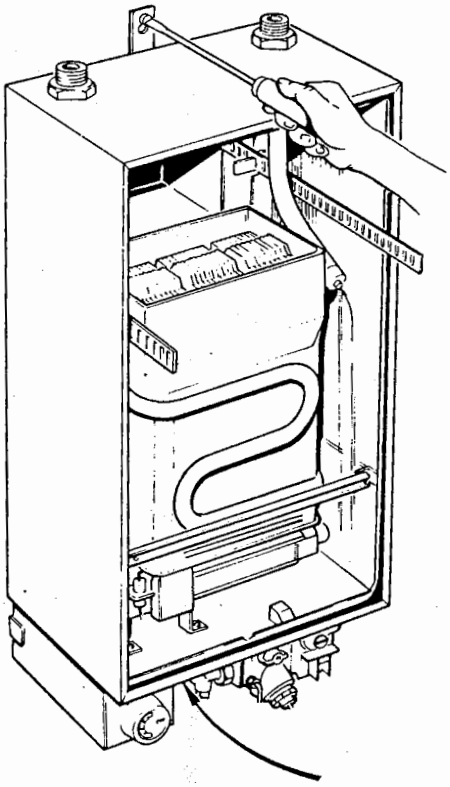


Diagram 5

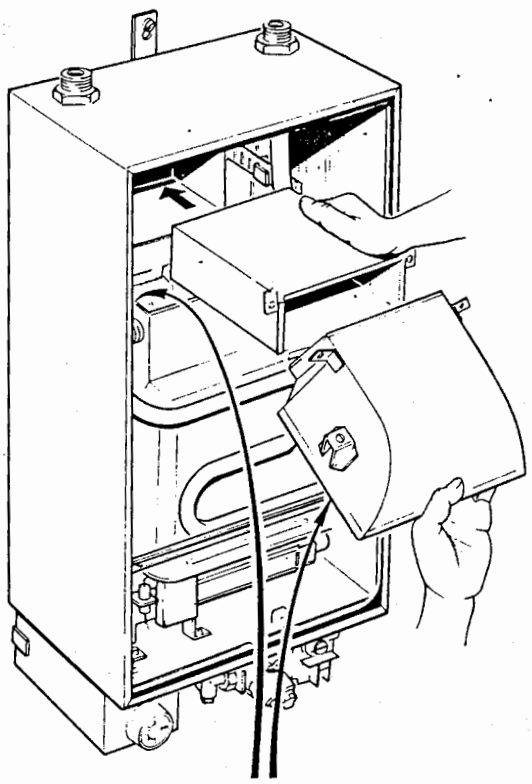


Diagram 6

6.3 Tighten top and bottom fixing screws. Remove one terminal strap, pull tight and locate in the lug. Bend lug inwards (towards the room). Repeat this operation for the other strap. Cut off excess strap length.

6.4 Assemble the two sections of flue duct and push into terminal ensuring that the unflanged end is against the terminal. Remove duct ensuring that the setting length is maintained, seal with tape provided, refit into terminal and make sure the flanged end of the duct is hooked over the lugs on the case.

For walls less than 230 mm (9in) remove extension sleeve and cut surplus off unflanged end of duct to suit wall thickness.

6.5 Fit flue hood to top of the heating body, ensuring that it is correctly located. Fit hook bolts over body bends. Insert two screws into the two brackets on the side of the flue hood, attach to the flue duct and tighten.

At this stage the front cover can be refitted. The top edge should be clipped in position before pressing in the bottom edge avoiding any case distortion as this would make the seal ineffective.

6.6 **NOTE:** It is possible to install the flue set from inside the building. Should this be required, follow the fitting instructions for fitting the wall liner and attaching the slotted straps to the terminal. Next fix a length of strong string to the terminal through the hole provided in the deflector baffle.

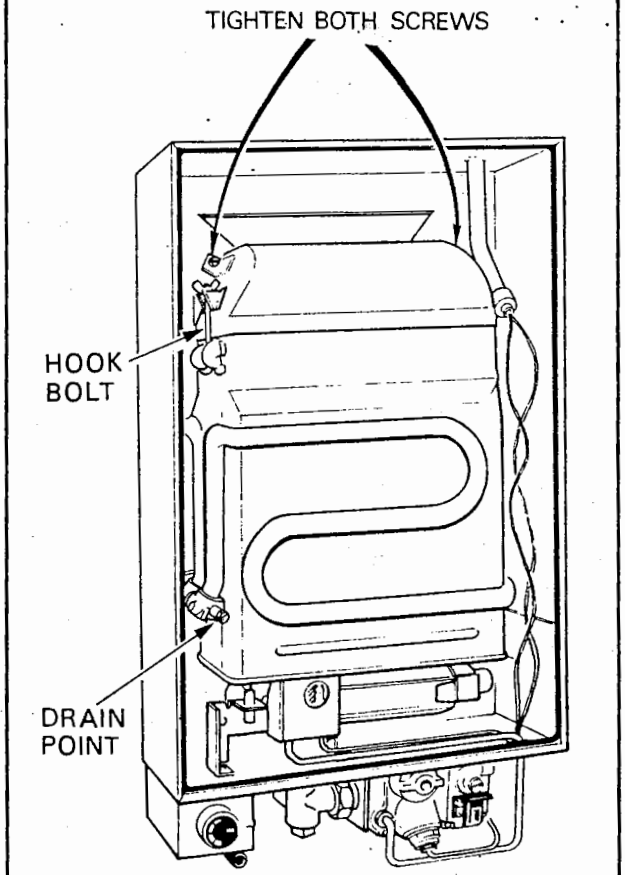


Diagram 7

The terminal can then be eased though the wall utilizing the string to retain it. Pass the string through the aperture at the rear of the casing, fix the casing to the wall as described and then locate the flue and fix in the manner described above.

7 GAS

The gas inlet to the appliance is Rc½ and is situated at the base of the appliance on the gas cock.

The gas meter must be capable of passing, in addition to all other demands, as follows:

Natural Gas

FUELSAVER 25-30B
1.06m³/h of 38MJ/m³ gas
(38ft³/h of 1000 Btu/ft³ gas)

FUELSAVER 30-40B
1.39 m³/h of 38 MJ/m³ gas
(50 ft³/h of 1000 Btu/ft³ gas

FUELSAVER 40-50B
1.75m³/h of 38 MJ/m³ gas
(63ft³/h of 1000 Btu/ft³ gas)

On Natural Gas the house service governor must ensure a constant inlet pressure of 20 mbar (8in w.g.). The gas installation should be in accordance with CP 331.3. The whole of the gas installation, including the meter should be inspected and tested for soundness and purged in accordance with the recommendations of CP 331.3.

8 WATER

The boiler is supplied with nuts and olives to accept 22 mm diameter copper tubing to BS 2871.

9 ELECTRICITY

9.1 Remove the control box by undoing the two fixing screws at the front above the thermostat knob and carefully easing the box forward and clear of its mounting position. The box will still be attached via the thermostat capillary and gas valve connections. Care should be taken, therefore, not to damage these connections. The mains voltage in the United Kingdom is 240V 50 Hz. The supply should be fused at 3A. The rating is approximately 6VA. Wiring to the appliance should be in accordance with I.E.E. Regulations. Three-core cable rated to take at least 3A (16/0.2mm) should be used. A terminal block is provided for the mains connection which is situated inside the control box. The mains supply cable must pass through the grommet provided adjacent to the terminal block and also be clamped using the cable clip provided on the outside of the control box.

9.2 Replace control box by carefully re-positioning and tighten two fixing screws with accompanying shakeproof washers above thermostat. Care should be taken not to trap any connections from the box.

9.3 The wiring should also comply with any local regulations.

WARNING: This appliance must be earthed.

9.4 PRELIMINARY ELECTRICAL SYSTEM CHECKS

The following checks should be carried out with a BGC Multimeter or equivalent.

9.4.1 **Earth Continuity Check**

Appliance must be electrically disconnected — meter set on Ω (ohms) x 1 scale and adjust zero if necessary.

(a) Test leads from any appliance earth point to earth pin on plug — resistance should be less than 1Ω (ohm).

If the resistance is greater than 1Ω (ohm) check all earth wires for continuity and all contacts clean and tight.

If resistance of earth is still greater than 1Ω (ohm) then this should be reported to your supervisor.

9.4.2 **Short Circuit Check**

Appliance electrically disconnected, all switches ON (including stats) —

(a) meter set on Ω (ohms) x 1 scale.

Test leads from L to N in appliance terminal strip/block—if meter reads 0 then there is a short circuit.

(b) meter set on Ω (ohms) x 100 scale

Repeat test with leads from L to E. If meter reads less than ∞ (infinity) there is a fault.

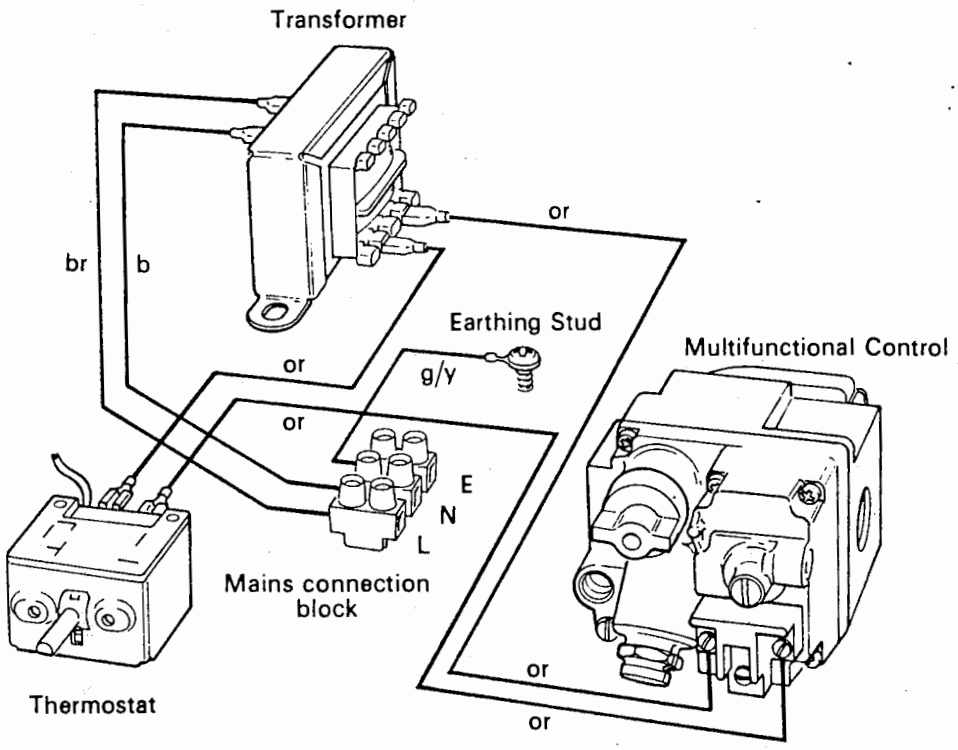


Diagram 8

9.4.3 **Polarity Check**

Appliance connected to mains supply and meter set on 300 Vac scale. Test at appliance terminal strip:—

(a) Test leads from L to N — meter reads approx. 240 Vac

(b) Test leads from L to E (⏚) — meter reads approx. 240 Vac

(c) Test leads from N to E (⏚) — meter reads from 0-15 Vac*

Thus the terminal marked L is the live terminal. If the low* Vac reading is given on terminals other than N to E (⏚) there is an electrical fault.

Repeat the test at the appliance plug/inlet spur to check the wiring system up to the appliance and rectify any fault. If necessary repeat the test at the supply system socket/spur — if the fault also occurs at this stage then there is a house system fault which requires attention by the Electricity Authority. The customer should be warned not to use the appliance until this examination has been carried out.

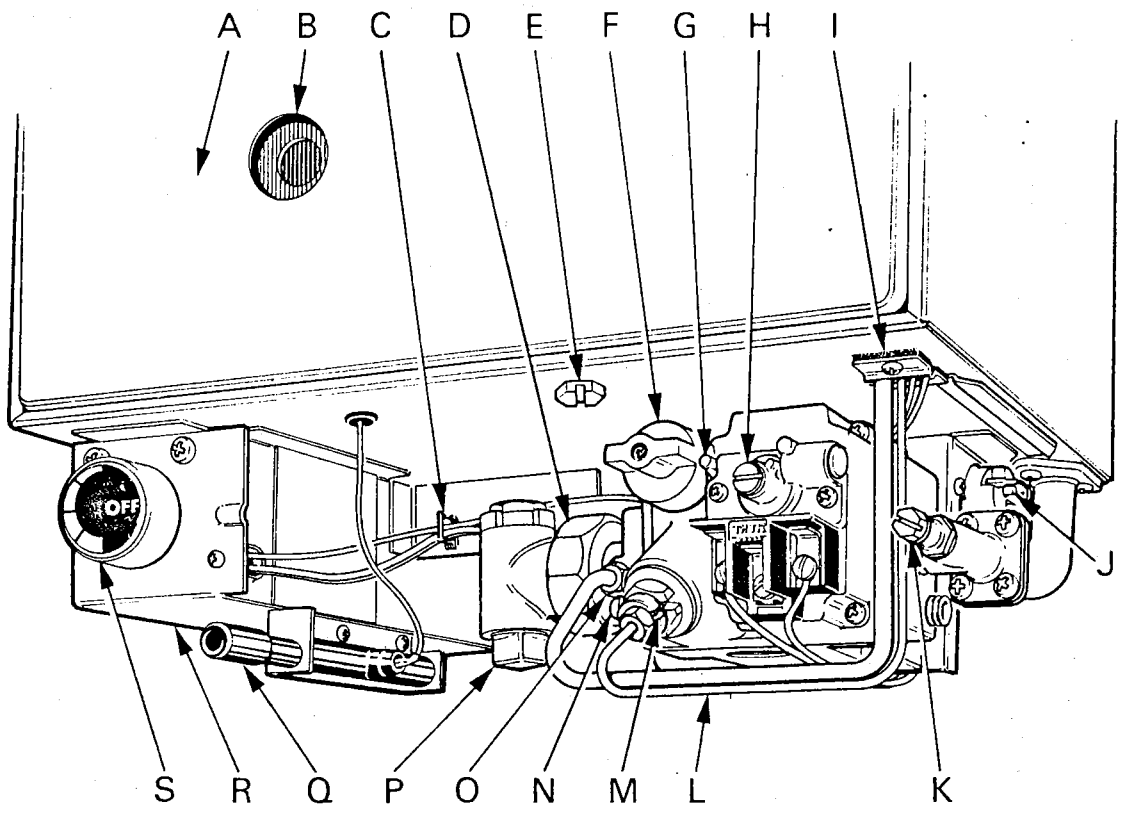
9.4.4 **Resistance to earth check**

Appliance must be disconnected from mains supply and meter set on Ω (ohms) x 100 scale. All switches, including stats, ON — Test leads from L to E — if meter reads other than infinity (∞) there is a fault which should be isolated. A detailed continuity check is required to trace the faulty component.

IMPORTANT This series of checks are the first electrical checks to be carried out during a fault finding procedure. On completion of the service/fault finding task which has required the breaking and remaking of electrical connections then the checks — A. Earth Continuity, C. Polarity and D. Resistance to Earth — **must** be repeated.

10 EXTERNAL CONTROLS

Any external controls, e.g. clock, room thermostat, cylinder thermostat, must be WIRED SEPARATELY AND ARRANGED TO INTERRUPT THE SUPPLY TO THE BOILER. If a frost thermostat is fitted it must be wired to override the external controls.



A Front Panel
B Viewing Window
C Clip
D Union Nut
E Ejection Screw
F Gas Control Knob
G Setting Point
H Burner Pressure Adjustment
I Sealing Plates
J High Limit Stat
K Pressure Test Point
L Thermocouple
M Thermocouple Interrupter
N Pilot Throttle
O Pilot Connection
P Gas Inlet Cock
Q Igniter Pushbutton
R Electrical Box
S Thermostat Knob

Diagram 9

11 REGULATION OF THE BOILER

11.1 Ensure that the system has been thoroughly flushed and is full of water and that all air is properly vented from the system, including the pump.

Before operating the appliance check that time clocks, room thermostats, domestic cylinder thermostats and other controls that may be used on the system are calling for heat and checked for correct operation.

Fit front cover if it has been removed. The top edge should be clipped in position before pressing in the bottom edge, avoiding any case distortion, as this would make the seal ineffective.

11.2 TURN BOILER THERMOSTAT TO "OFF" POSITION.

11.3 Turn on the main electricity supply to the unit and check that the pump is circulating water through the unit.

GAS CONTROL KNOB MARKING

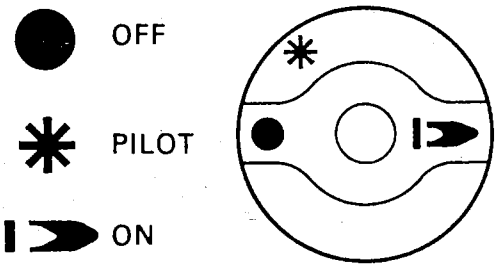


Diagram 9A

11.4 Turn on gas cock in main supply pipe. Turn gas control knob to "pilot" setting and press.

11.5 Press igniter knob and release. Check that pilot is alight through viewing window in front cover of the unit. When the pilot has lit, keep gas control knob depressed for 20 seconds and then release. If pilot does not remain alight repeat lighting procedure after 3 minutes has elapsed. If the gas valve knob is turned to the "OFF" position at this stage no attempt should be made to force it back to the "Pilot" position until three minutes have elapsed.

11.6 Turn gas control knob to "ON" setting, turn thermostat clockwise and the main burner should ignite gradually, taking 3 to 5 secs. to reach full flame and can be seen through viewing window. For checking purposes the table on page 2 shows the pressure at the burner test point (see diagram 9). If it is required to meter the gas rate the correct flow which the meter should pass is given in the section on GAS. This flow should be measured when the appliance is at thermal equilibrium, and with all other gas appliances served by the meter turned off.

If the burner pressure requires adjustment, remove the pressure regulator cover screw, see diagram 9 and adjust the internal grub screw to the required pressure. Turn clockwise to increase pressure. Replace cover screw.

11.7 Test for gas soundness around boiler components using sense of smell and leak detection fluid.

11.8 Check the operation of the flame failure device on the boiler to ensure that the burner shuts down within 60 seconds.

The thermocouple output in millivolts should be checked, with the thermocouple both in and out of circuit. Refer to the graph (diagram 13), the intersection of the two voltages on the graph must lie within area 'B' shown.

11.9 With the system controls allowing normal operation, allow the circuit to warm up, check that all radiators are warm.

11.10 Adjust the thermostat to the required setting, adjust systems controls to their required settings and instruct the user in the operation of the unit.

11.11 Replace controls cover.

11.12 Leave this Instruction Book with user or at the gas meter.

Ensure that the user has the Users' Operating Instructions.

12 SYSTEM GUIDANCE

12.1 The following information is for the general arrangement of the pipework and is intended for guidance purposes only.

It is, however, important that the relative positions of the pump, cold feed and open vent should be as illustrated in diagram 10. Any external controls *including the pump* must be wired separately and arranged to interrupt the electricity supply to the boiler. All controls should be installed in accordance with the appropriate manufacturers' instructions.

If, by the design of the system, there is a possibility that the water flow rate through the boiler could fall below the minimum requirement of 491 litre/h (1.8 gal/min) for the 25-30B, 655 litre/h (2.4 gal/min) for the 30-40B, or 818 litre/h (3.0 gal/min) for the 40-50B, a by-pass should be incorporated as this will ensure that part of the system water flow is being re-circulated through the boiler.

Insufficient water flow may lead to noise.

A suggested convenient position for the by-pass is shown on the pipework arrangement on the following page.

To adjust the by-pass the boiler should first be fired with the by-pass valve fully closed on full service, i.e. central heating and domestic hot water. The pump should then be set to give the 11°C (20°F) temperature rise across the boiler with the flow temperature of 82°C (180°F) approx. thus providing a flow rate through the boiler of 686 litre/h (2.5 gal/min) for the 25-30B, 916 litre/h (3.4 gal/min) for the 30-40B, or 1150 litre/h (4.2 gal/min) for the 40-50B.

Having achieved this condition the boiler should then be operated on domestic hot water only with the by-pass valve fully closed. If noise is experienced, indicating a reduced flow condition, the valve should be gradually opened to ensure the minimum flow rate is obtained.

When an inhibitor is to be used in the system contact should be made with the inhibitor manufacturers so that they can recommend their most suitable product.

12.2 PLEASE REMEMBER:

YOU MUST ALWAYS USE THE PUMP

YOU MUST ALWAYS INCORPORATE PUMPED PRIMARIES

THE PUMP MUST BE MAN ENOUGH FOR THE JOB

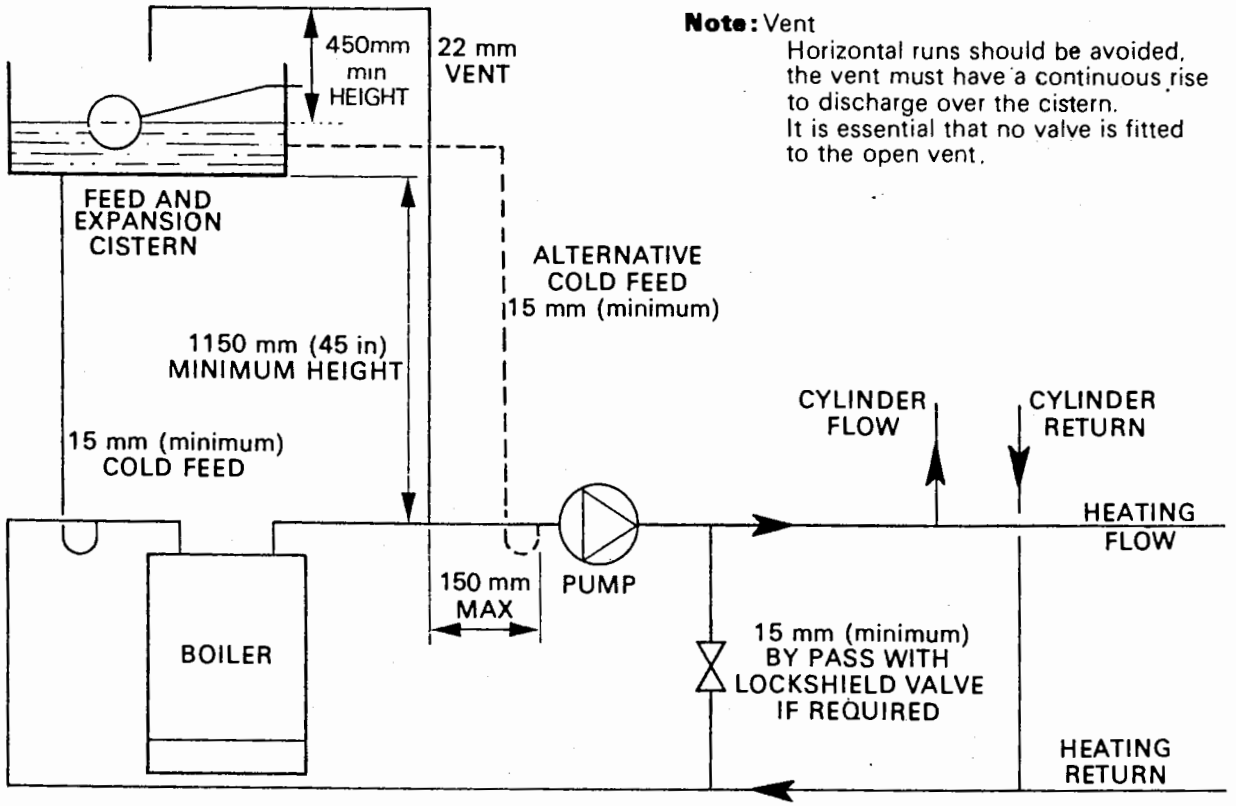
INCORRECT WIRING CAN BE DANGEROUS

STATIC HEAD IS IMPORTANT

BALANCE THE SYSTEM

VENT THE SYSTEM BEFORE FIRING THE BOILER

ALWAYS ALLOW ACCESS FOR SERVICING THE APPLIANCE AND ANY CONTROLS.



Note: Vent
Horizontal runs should be avoided, the vent must have a continuous rise to discharge over the cistern.
It is essential that no valve is fitted to the open vent.

DIAGRAMMATICAL LAYOUT SHOWING POSSIBLE RELATIONSHIP BETWEEN PUMP, COLD FEED AND VENT WHEN CLOSE TO THE BOILER.

Diagram 10

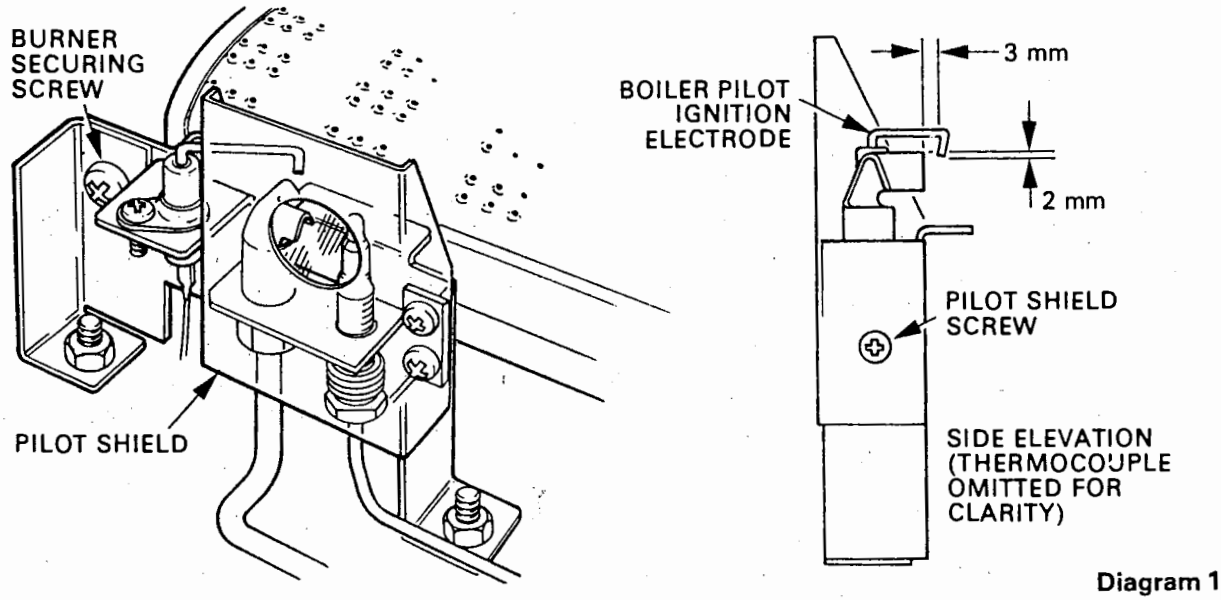


Diagram 11

13 SERVICING OF BOILER

Before carrying out servicing procedure always switch off electricity supply and turn off gas cock.

13.1 ROUTINE MAINTENANCE

13.1.1 Remove burner.

13.1.2 Inspect burner and pilot and brush them clean of any deposits.

13.1.3 Inspect heating body for deposits, using a mirror and torch as necessary.

For cleaning, remove flue hood by undoing the two screws at back of flue hood and releasing the hook bolts from the water pipes. Remove burner. Brush body deposits clear of heat exchanger, collect and remove from combustion chamber.

13.2 REMOVAL OF PARTS

13.2.1 **Important note**

Before carrying out servicing procedures or exchange of parts always DISCONNECT ELECTRICITY SUPPLY AND TURN OFF GAS AT INLET COCK.

13.2.2 **Front panel**

(a) Remove control cover by pulling forwards and clear of appliance.

(b) Turn slotted screw underneath case anti-clockwise to push lower edge of front panel forwards and pull panel clear.

(c) Turn screw clockwise to its fullest extent in readiness for refitting front cover later. (Should block come off screw, replace it with inclined face to top and front.)

13.2.3 **Main burner**

(a) Remove front panel.

(b) Remove the Pozidriv screw at the L.H. side of the pilot bracket. See diagram 11. This releases the main burner.

(c) Move the main burner to the left to clear the injector at the right hand end, then withdraw the main burner, injector end first. Take care not to damage pilot burner, electrode etc.

13.2.4 **Burner injector**

With the main burner removed as above, the injector can be unscrewed.

13.2.5 **Pilot burner and pilot injector**

(a) Remove front panel.

(b) Undo the screw at the R.H. side of the pilot shield, and remove pilot shield (see diagram 11).

(c) Remove main burner, taking care not to damage the electrode.

(d) Pull off ignition lead from electrode.

(e) Unscrew the tubing nut at the base of the pilot burner, releasing pilot pipe.

(f) Undo the two M4 pozidriv screws and hex. nuts securing the pilot burner.

(g) Unscrew the thermocouple nut.

(h) The pilot can now be lifted away.

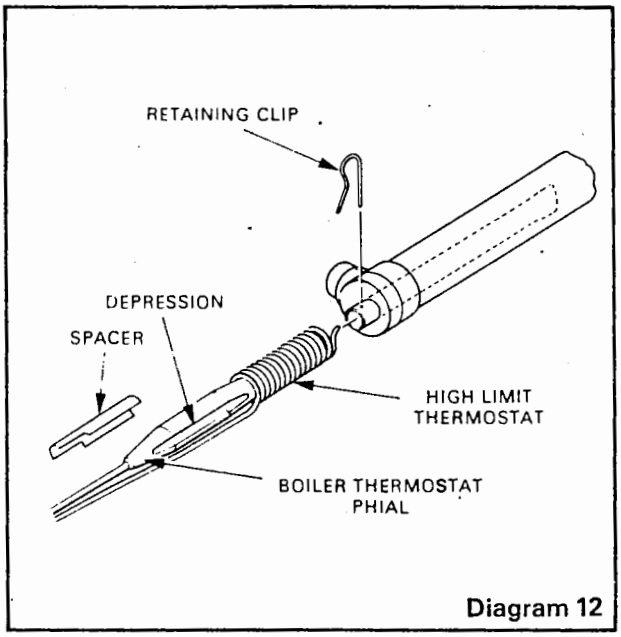


Diagram 12

NOTE: The pilot injector is loose in the base of the pilot burner and will drop out as the pilot is removed.

(j) Take care not to damage the electrode. Ensure that the spark gap is as shown in diagram 11.

13.2.6 **Thermocouple**

(a) Follow instructions a to h for pilot burner and pilot injector.

(b) Remove sealing plates and seals underneath casing at R.H. side.

(c) Undo thermocouple connection at gas valve and remove thermocouple.

(d) When replacing thermocouple, check that the electrode gap is as shown in diagram 11 and that the seals and sealing plates are replaced. Also check that the interrupter is located in the thermocouple connection at the gas valve. This connection must not be overtightened, a quarter of a turn beyond finger tight is sufficient.

13.2.7 **Electrode**

(a) Remove front panel and pilot shield.

(b) Pull off ignition lead from electrode.

(c) Remove the two hex. nuts and shakeproof washers securing the pilot bracket to the base.

(d) Raise the whole pilot assembly and ease forward so that the electrode clears the bottom edge of the heating body.

(e] Remove the Pozidriv screw securing the electrode.

(f) When replacing, check that the electrode spark gap is as shown in diagram 11.

13.2.8 **Gas Valve**

(a) Remove control cover by pulling forward clear of case.

(b) Unscrew thermocouple connection to gas valve.

(c) Remove interrupter from thermocouple connection.

(d) Disconnect orange leads from electrical connections on valve.

(e) Undo tubing nut on pilot tube connection.

(f) Undo union nut securing gas valve to gas inlet cock.

(g) Undo two Pozidriv screws to release bracket at L.H. side of valve.

(h) Undo four Pozidriv screws securing manifold at R.H. side of valve.

13.2.9 **Piezo generator**

(a) Remove control cover by pulling forward clear of case.

(b) Pull off tag of ignition lead.

(c) Undo two Pozidriv screws securing generator to control box.

13.2.10 **Boiler thermostat**

(a) Remove front panel.

(b) Remove retaining clip and spacer from phial pocket at top right-hand side of body.

(c) Withdraw boiler thermostat phial from pocket.

(d) Undo sealing plate screws and remove plates and seals underneath case at front R.H. side.

(e) Remove knob from front of electrical box by pulling off.

(f) Undo two top screws securing electrical box to control mounting bracket to release box. Support box so that leads are not strained.

(g) Undo screw clamping capillary inside electrical box.

(h) Remove leads from tags on boiler thermostat.

(j) Undo two screws securing boiler thermostat to front of electrical box and remove thermostat from box.

(k) Withdraw phial through hole in case.

NOTE: When replacing boiler and high limit thermostats (see diagram 12), ensure that capillary on high limit thermostat fits snugly against depression in side of thermostat phial. Push both components fully home in phial pocket, fit spacer and secure with retaining clip. Ensure that capillary is clamped securely inside electrical box and sealing plates and seals are correctly repositioned.

13.2.11 **High limit thermostat**

(a) Remove front panel.

(b) Detach leads from tags on high limit thermostat.

(c) Undo two screws to release body from mounting bracket.

(d) Remove retaining clip and spacer from phial pocket.

(e) Withdraw both phials from pocket.

(f) Undo sealing plate screws underneath case at front R.H. side and remove plates and seals. Withdraw phial through hole in case.

(g) When replacing boiler and high limit thermostats (see diagram 12) ensure that capillary on high limit thermostat fits snugly against depression in side of thermostat phial Push both components fully home in phial pocket, fit spacer and secure with retaining clip. Ensure that sealing plates and seals are correctly repositioned. Should the high limit thermostat operate, this indicates that a fault has developed. The device can be reset by pressing the reset button in the centre.

13.2.12 **Transformer**

(a) Remove control cover by pulling forward clear of case.

(b) Release orange gas valve lead from the spring clip on control mounting bracket (diagram 9).

(c) Unscrew two screws to release electrical control box from bracket and support the box so that leads are not strained.

(d) Disconnect live (brown) and neutral (blue) leads from the upper tags on transformer.

(e) Remove orange leads from tags on low voltage side of transformer.

(f) Undo two screws securing transformer to box and remove.

(g) When re-assembling, ensure live and neutral leads are connected to the upper tags.

13.2.13 **Heating body**

(a) Remove front panel.

(b) Remove burner.

(c) Remove retaining clip and spacer from phial pocket and withdraw both phials from pocket.

(d) Drain heating circuit of water (a drain cock is usually found at lowest point of heating system).

(e) Drain body only through drain point located at lower left-hand side of body.

(f) Remove flue hood by undoing the two screws at the back of the flue hood and releasing the hook bolts from the water pipes.

(g) Undo flow and return connections.

(h) Undo locknuts on flow and return bulkhead fittings.

(j) Undo two screws holding body retaining bracket and remove bracket.

(k) Carefully lower the body until the top tappings clear the casing and then turn through 90° to clear the pilot bracket, so that it can be withdrawn forward out of the case. Take care not to damage the pilot burner, electrode etc.

(l) When re-assembling, ensure that the flue hood is fitted correctly.

14 FAULT FINDING CHART

14.1 PILOT WILL NOT LIGHT

	Cause	Remedy
14.1.1	Operating instructions not correctly carried out.	Follow lighting instructions correctly.
14.1.2	Gas inlet pressure inadequate.	Check all cocks are open and gas line is unrestricted
14.1.3	Air in gas line.	Purge out air.
14.1.4	Gas supply to pilot restricted: (Check by applying match to pilot instead of pressing igniter).	
	(a) On undoing tubing nut at pilot multi-function control and pressing knob, gas does not flow freely.	Rectify blockage in multi-function control. Ensure pilot throttle is fully open.
	(b) On undoing tubing nut at burner and pressing control knob, gas does not flow freely.	Change blocked pilot tube.
	(c) As 14.1.4(b) but gas does flow freely.	Rectify blockage in pilot injector or pilot head.
14.1.5	Pull ignition lead off electrode. Hold end of lead close to burner, operate spark generator.	No spark — change ignition lead, if still no spark, change generator.
14.1.6	Electrode not correctly positioned in relation to pilot head.	Re-position electrode as shown in diagram 11.

14.2 PILOT WILL NOT STAY ALIGHT WHEN CONTROL KNOB IS RELEASED

	Cause	Remedy
14.2.1	High limit thermostat has tripped.	Reset high limit thermostat by pressing button, situated in centre of thermostat.
14.2.2	Pilot flame not impinging on thermocouple.	Check pilot injector or adjust pilot with adjusting screw on pilot throttle.

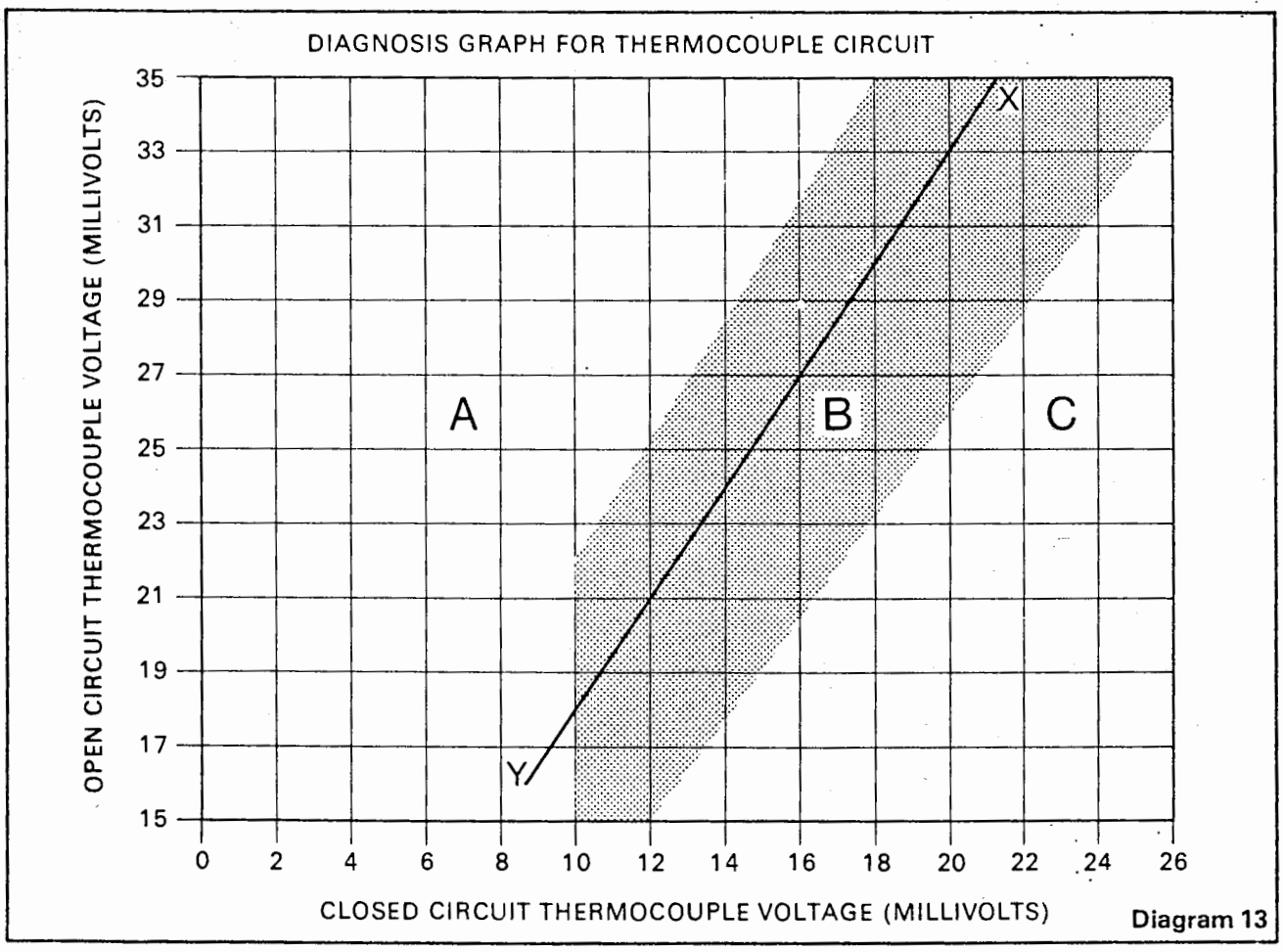
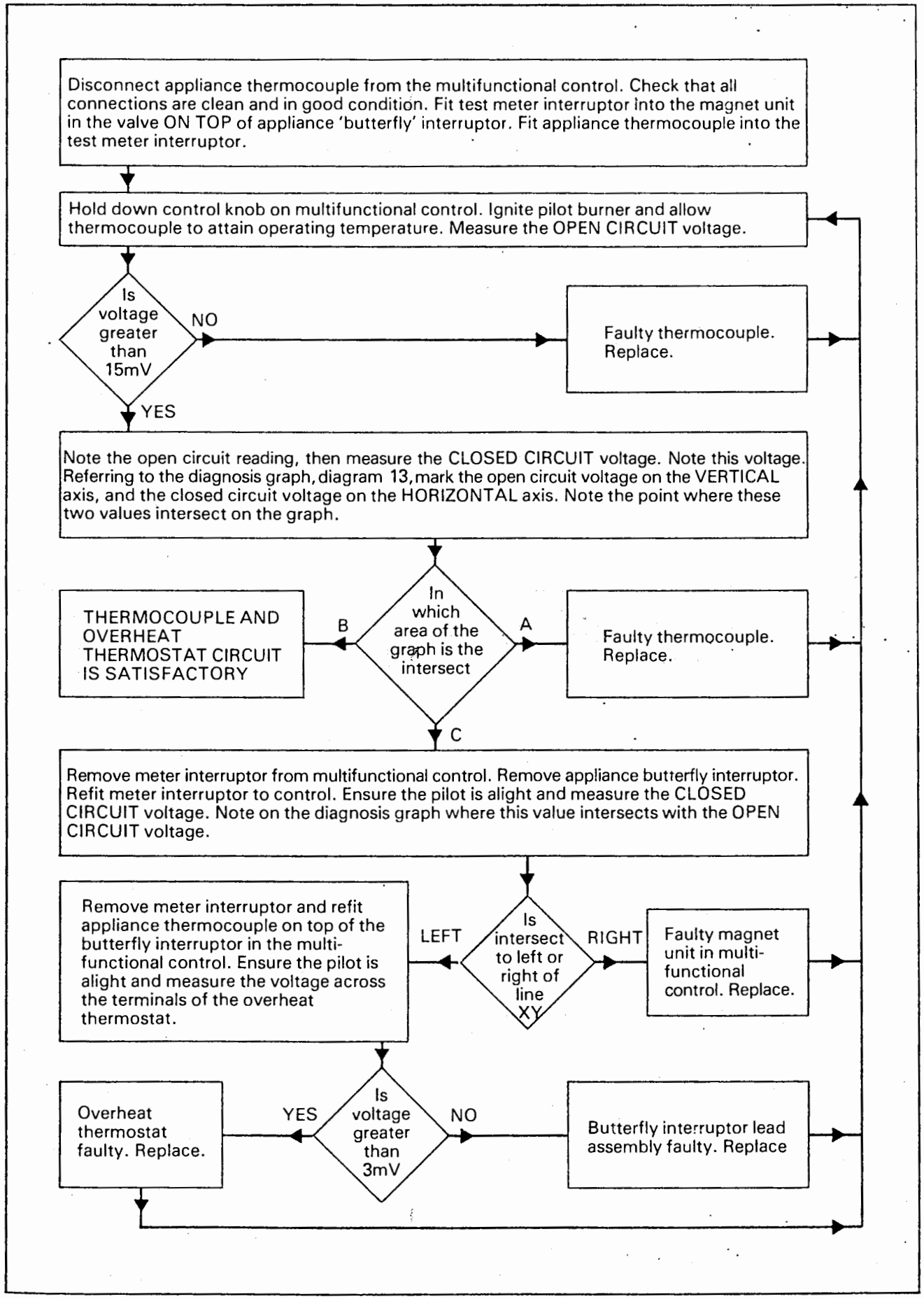


Diagram 13

14.2.3 To test the thermocouple and overheat thermostat circuit a meter with a range of 0-30mV is required together with a thermocouple interruptor test unit similar to the B.G.C. (Minitest 6) Multimeter and interruptor.



14.3 PILOT GOES OUT AFTER A PERIOD OF REMAINING ALIGHT

	Cause	Remedy
14.3.1	Front cover not correctly fitted.	Fit parts correctly.
14.3.2	Flue parts incorrectly fitted or not sealed properly.	Seal cavity or fit flue parts correctly as described in installation instructions.

14.4 BURNER WILL NOT IGNITE

	Cause	Remedy
14.4.1	Gas control knob in wrong position.	Check gas control knob is in "ON" position.
14.4.2	Boiler thermostat not on.	Check boiler thermostat is in an "ON" position. See also 14.4.3 on page 19.

14.5 THERMOSTAT WILL NOT CUT OUT

	Cause	Remedy
14.5.1	Thermostat phial not fitted in pocket.	Fit phial in pocket.
14.5.2	Faulty thermostat.	Replace thermostat.

14.6 OVERHEAT DEVICE CUTS OUT PREMATURELY

	Cause	Remedy
14.6.1	Air in heating body.	Vent system. Alter system layout if necessary.
14.6.2	Water circulation low or non-existent.	Pump not functioning correctly. Check pump wired to run while boiler is on. Alter layout if necessary.
14.6.3	Overheat device cuts out before boiler cycles on max boiler thermostat setting.	Change faulty overheat device.
14.6.4	Correctly set overheat device cuts prematurely. 1 and 2 satisfactory.	Change faulty heating body.

14.6.5 **Note:** If the overheat device has operated it must be reset by pressing the reset button at the centre of the device before the pilot can be re-established. See diagram 9.

14.7 INSUFFICIENT HEAT OUTPUT

	Cause	Remedy
14.7.1	Thermostat set too low.	Increase setting.
14.7.2	Inlet gas pressure inadequate.	Increase gas pressure.
14.7.3	Governor setting incorrect. (While measuring pressure ensure thermostat is on maximum setting.)	Check burner pressure against data plate. Reset only if pressure is more than 10% away from stated figure.

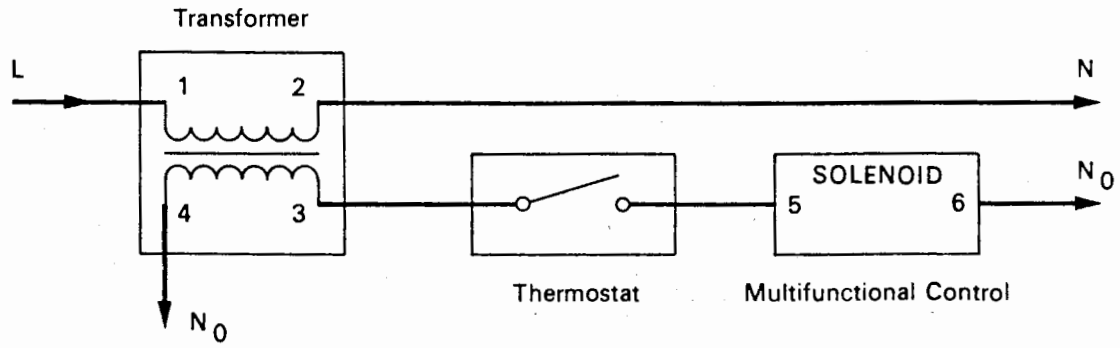
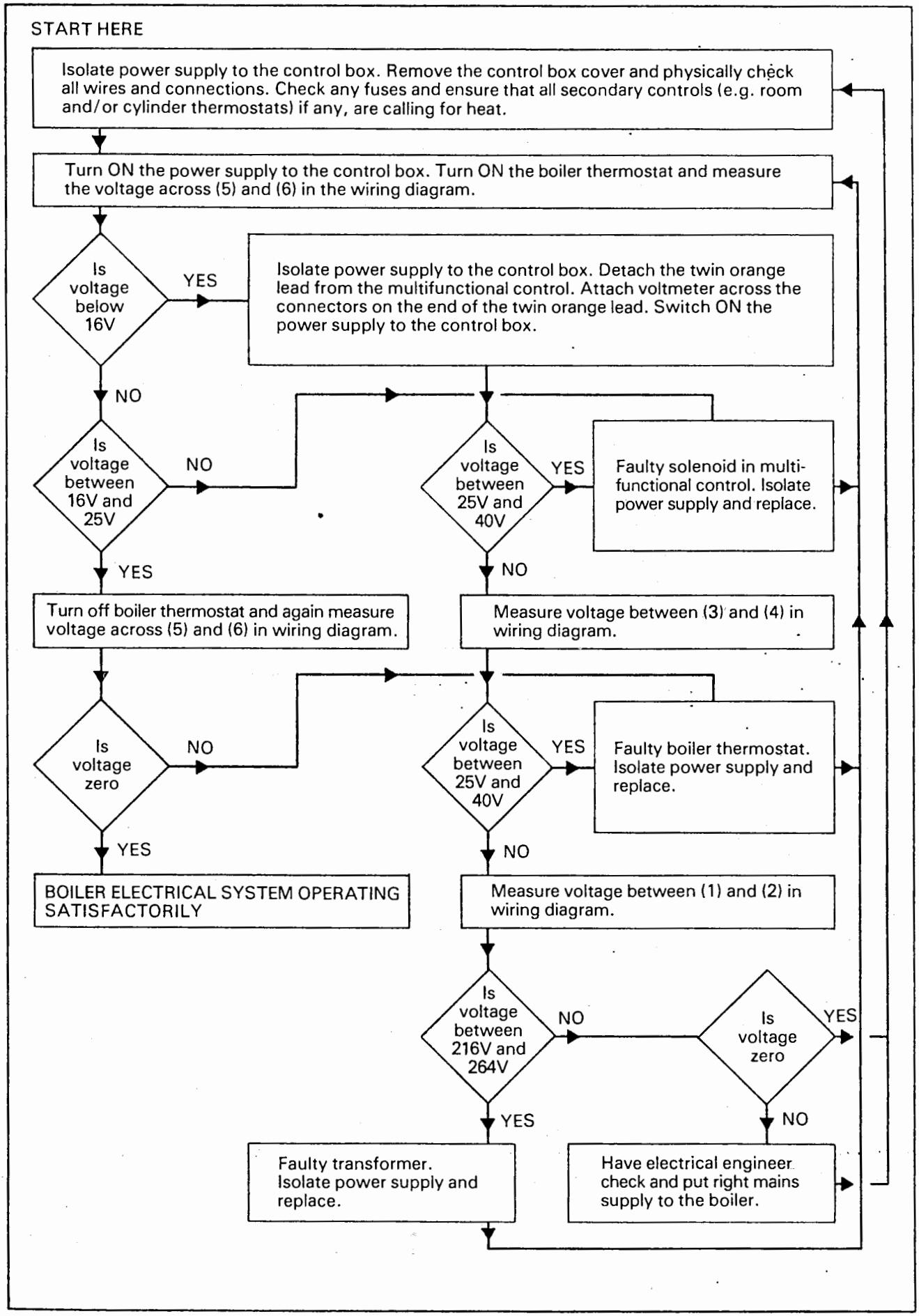


Diagram 14

14.4.3 Electrical fault finding, refer to wiring diagram (diagram 14) when using this chart.



14.8 APPLIANCE NOISY IN OPERATION*

	Cause	Remedy
14.8.1	Overgassed.	Check burner pressure against data plate and adjust if necessary, but only if pressure is more than 10% away from stated figures.
14.8.2	Complete lack of water flow.	Check system controls for correct installation or correct type of controls.
14.8.3	Air in system.	Remove air from system. When boiler is first commissioned the air dissolved may take some time to boil out, therefore attempts should be made to remove air periodically during the first weeks of the installation.
		Check venting of system as air bubbles can remain suspended in the water if system is not well vented.
14.8.4	Water flow rate.	Check that flow rate is correct. Check that pump is correct size and is correctly adjusted.
		By-pass not fitted or correctly set.

*There remains on most boilers a residual noise which is more noticeable at high temperatures. Normal operation of the boiler over a period should remove most noise.

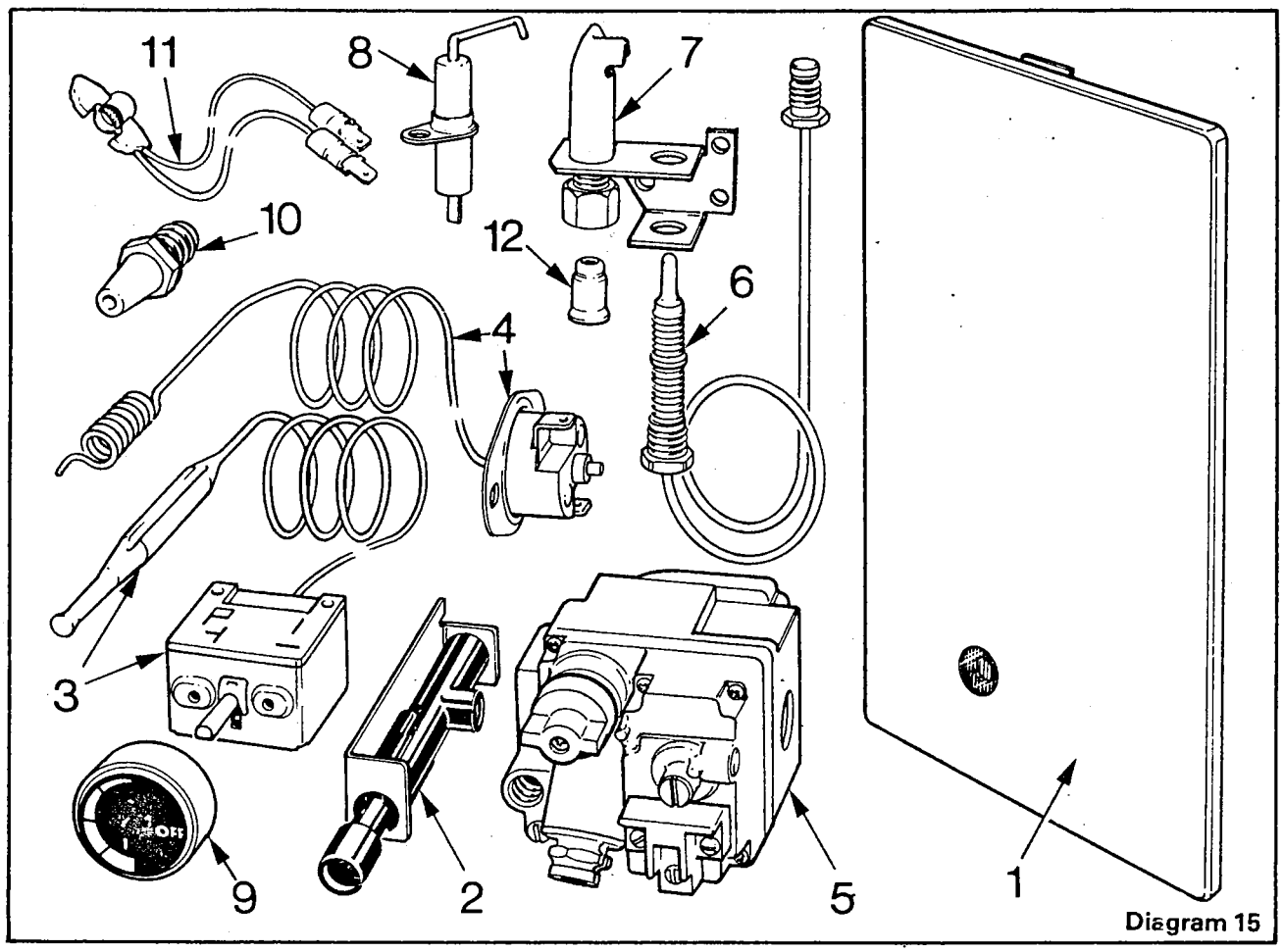


Diagram 15

15 SHORT LIST OF PARTS

The key number in the first column of this list will help you identify each part in diagram 15. When ordering spare parts, quote the part number and description, stating parts required for Fuelsaver 25-30B, 30-40B, or 40-50B central heating unit. Gas Regions should also include the G.C. Part Number.

Key No.	G.C. Part No.	Part No.	Description
1	330 365	412804	Front Cover
2	393 563	412805	Spark generator (Vernitron 66108) Alternatives
2	387 907	412805	Spark generator (Kigass D5037)
3	382 353	403046	Boiler Thermostat (Ranco C26—PO624)
4	382 351	403073	Overheat Thermostat (Ranco LM5—P8037)
5	393 746	412806	Unitrol gas valve (Robertshaw 7000BER S7AL 356. 501.774)
6	391 720	412854	Thermocouple (Robertshaw 29.18.0038)
7	391 721	412852	Pilot burner (Robertshaw 5CHL-1)
8	393 762	412853	Electrode
9	382 354	410935	Thermostat Knob
10	384 680	412819	Boiler injector (25-30B & 30-40B only)
10	384 748	411047	Boiler injector (40-50B only)
11	330 369	412816	Thermocouple interrupter (Robertshaw 21898)
12	391 722	412844	Pilot injector (Robertshaw 76360)

Because of our constant endeavour for improvement,
details may vary slightly from those given in this booklet.