



Installation & Servicing Instructions

To be left with the user

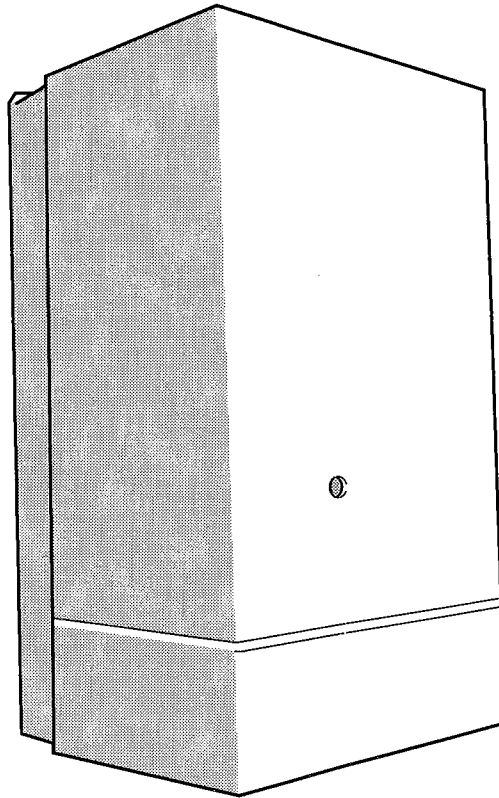
Economy *plus*

24B

G.C. No. 41 313 90

Balanced Flue Boiler

2405



This is a Cat I_{2H} Appliance



BS 6332
BS 5258

HEATCALL

Customer Services:

Tel: (01773) 828100

One Contact Total Service

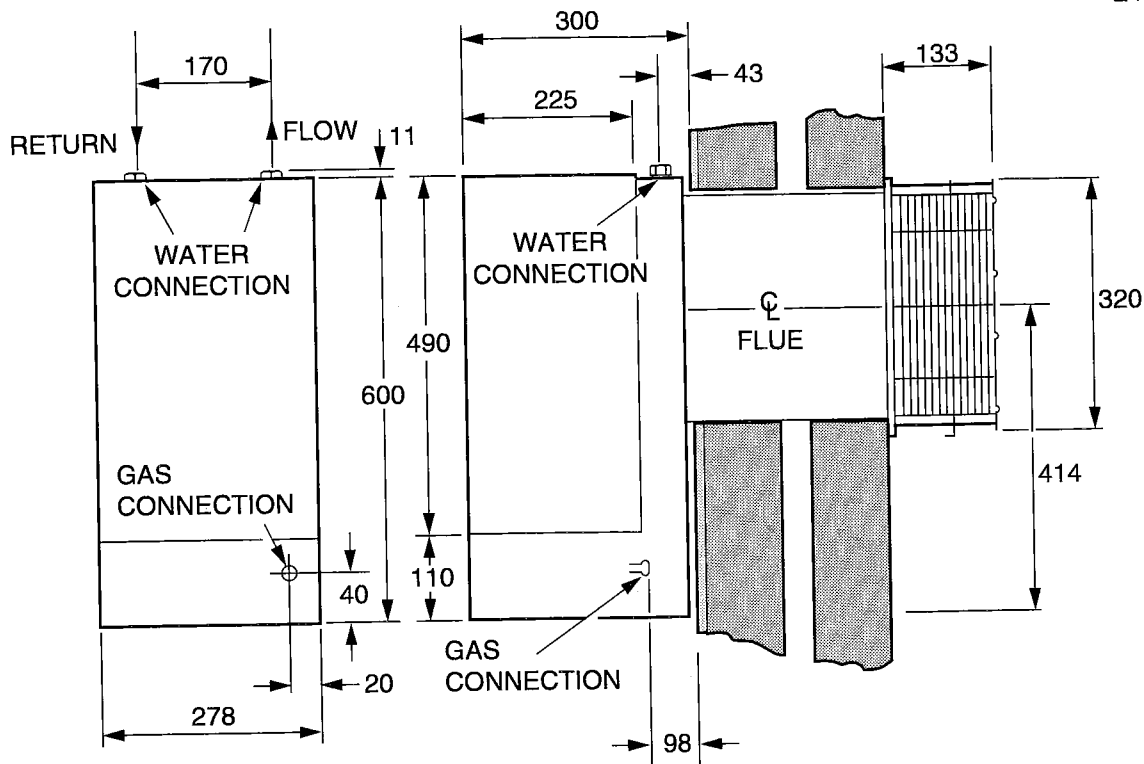
Fax: (01773) 828070

Hepworth Heating Ltd.,

Nottingham Road, Belper, Derbyshire. DE56 1JT

General/Sales enquiries:

Tel: (01773) 824141 Fax: (01773) 820569



OVERALL DIMENSIONS (GIVEN IN MILLIMETRES)

Diagram 1.1

These instructions consists of two parts, Installation and Servicing Instructions and Instructions for Use which includes the Guarantee Registration Card. The instructions are an integral part of the appliance and must, to comply with the current issue of the Gas Safety (Installation and Use) Regulations be handed to the user on completion of the installation.

1 General Notes and Information

This boiler is suitable for fully pumped systems only.

IMPORTANT NOTICE

This boiler is for use only on G20 gas.

The boiler thermostat has a fixed setting to give a water flow temperature of about 65°C.

Sheet Metal Parts

WARNING. When installing or servicing the boiler care should be taken when handling sheet metal parts, to avoid any possibility of personal injury.

Wherever possible, all materials, appliances and components to be used shall comply with the requirements of applicable British Standards.

Where no British Standard exists, materials and equipment should be fit for their purpose and of suitable quality and workmanship.

1.1 Statutory Requirements

The installation of this boiler must be carried out by a competent person in accordance with the relevant requirements of the current issue of:

Manufacturer's instructions, supplied.

The Gas Safety (Installation and Use) Regulations, The Building Regulations, The Building Standards (Scotland) Regulations (applicable in Scotland), Local Water Company Bye-laws, The Health and Safety at Work Act, The Control of Substances Hazardous to Health, The Electricity at Work Regulations and any applicable local regulations.

Detailed recommendations are contained in the current issue of the following British Standards and Codes of Practice:

BS6798, BS5440 Parts 1 and 2, BS5546 Part 1, BS5449, BS6891, BS6700, BS7478, BS7593, BS7671.

Manufacturer's notes must not be taken as overriding statutory obligations.

1.2 Data

Weight:	22.6kg(49.8lb)
Water content:	0.45Litre(0.1gall)
Gas connection:	Rc $\frac{1}{2}$ ($\frac{1}{2}$ inBSP)
Water connection:	22mm copper - flow at right.
Electrical supply:	240V~50Hz fused 3A
Data label:	Bottom right, inner case.
Injector:	Marked 2.8 or Cat 30/850

1.3 Rating

Nominal heat input	8.79kW (30,000Btu/h)
Nominal heat output	7.03kW (24,000Btu/h)
Burner setting pressure	7.2mbar (2.9in wg)

1.4 B.S.I. Certification

This boiler is certificated by The B.S.I for performance and safety. It is, therefore, important that no alteration is made to the boiler without permission, in writing, from Hepworth Heating Ltd.

Any alteration that is not approved by Hepworth Heating Ltd., could invalidate the B.S.I. Certification of the boiler, the warranty and could also infringe the current issue of the Statutory Requirements.

CE Mark

This boiler meets the requirements of Statutory Instrument, No.3083, The Boiler (Efficiency) Regulations and therefore is deemed to meet the requirements of Directive 92/42/EEC on the efficiency requirements for new hot water boilers fired with liquid or gaseous fuels.

Type test for purpose of Regulation 5 certified by:-
Notified body 0086.

Product/production certified:- Notified body 0086.

The CE mark on this appliance shows compliance with:-

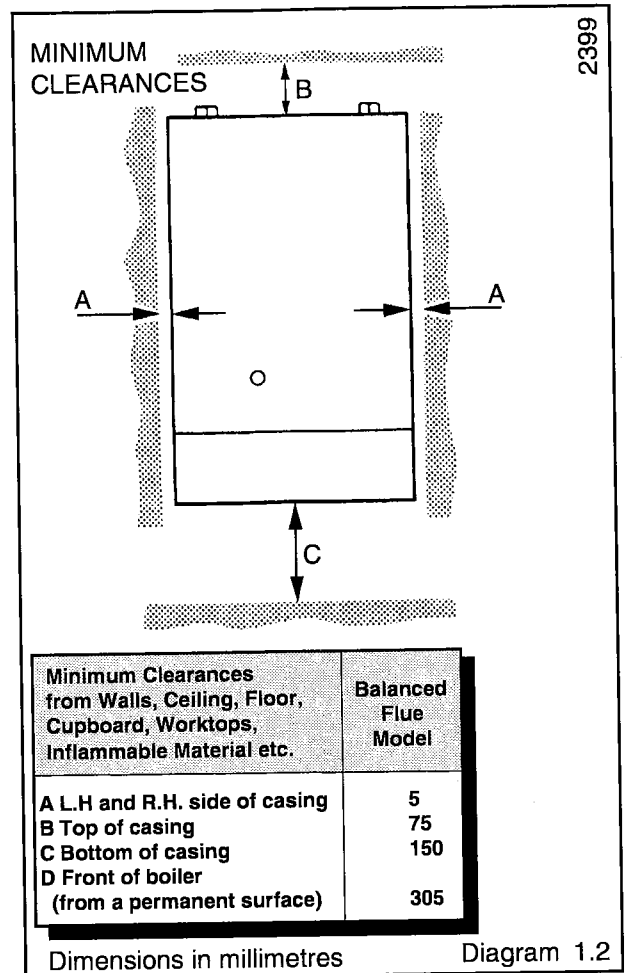
1. Directive 90/396/EEC on the approximation of the Laws of the Member States relating to appliances burning gaseous fuels.
2. Directive 73/23/EEC on the harmonization of the Laws of the Member States relating to electrical equipment designed for use within certain voltage limits.
3. Directive 89/336/EEC on the approximation of the Laws of the Member States relating to electromagnetic compatibility.

1.5 Gas Supply

The gas installation shall be in accordance with the current issue of BS6891.

The supply from the governed meter must be of adequate size to provide a steady inlet working pressure of 20mbar (8in wg) at the boiler.

On completion test the gas installation for soundness using the pressure drop method and a suitable leak detection fluid, purge in accordance with the above standard.



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Diagram 1.2

1.6 Electrical Supply

WARNING, this boiler must be earthed.

All system components shall be of an approved type and shall be connected in accordance with the current issue of BS7671 and any applicable local regulations.

Connection of the boiler and system controls to the mains supply must be through a common isolator and must be fused at 3A maximum. This method of connection should be, preferably, an unswitched shuttered socket outlet and 3 pin plug, both to the current issue of BS1363.

Alternatively, a double pole isolating switch may be used, provided it has a minimum contact separation of 3mm in both poles. The isolator should be clearly marked with its purpose.

Wiring to the boiler must be insulated PVC flexible type to the current issue of BS6500 Table 16 not less than 0.75mm^2 (24/0.20mm).

1.7 Contents of Packaging

The boiler is delivered in one pack.

The other pack contains the balanced flue terminal assembly and accessories.

Refer to Section 2 to check that the flue terminal assembly supplied is suitable.

1.8 Water System

The boiler may be fitted to an open vented or sealed water system, see Section 3 for further details.

1.9 Draining Tap

A draining tap must be provided at the lowest points of the system which will allow the entire system, boiler and hot water cylinder to be drained.

Draining taps shall be to the current issue of BS2879.

1.10 Safety Valve

A safety valve need not be fitted to an open vented system.

1.11 Location

This boiler is not suitable for outdoor installation.

The boiler may be installed in any room, although particular attention is drawn to the requirements of the current issue of BS7671 with respect to the installation of a boiler in a room containing a bath or shower.

Any electrical switch or boiler control using mains electricity should be so situated that it cannot be touched by a person using the bath or shower. The electrical provisions of the Building Standards (Scotland) Regulations apply to such installations in Scotland.

The boiler must be mounted on a flat wall which is sufficiently robust to take its weight.

1.12 Boiler Location

Refer to diagram 1.2

The boiler must be positioned so that at least the minimum operational and servicing spaces are provided.

Additional space may be required for installation.

If fixtures are placed next to the boiler they should be made removable.

Sufficient space must be left in front of the boiler for servicing.

2.1 Terminal Position

The minimum acceptable spacings from the terminal to obstructions and ventilation openings are shown in diagram 2.1.

Where the terminal is fitted within 850mm (34in) below plastic guttering or within 450mm (18in) of painted eaves or painted gutters and aluminium shield 750mm (2ft6in) long should be fitted to the underside and immediately beneath the guttering or eaves.

2.2 Terminal Protection

A terminal guard is required if persons could come into contact with the terminal or the terminal could be subject to damage.

If a terminal guard is required, it must be positioned to provide a minimum of 50mm clearance from any part of the terminal and be central over the terminal.

Guards are available from:

Tower Flue Components Ltd.,
Morley Road,
Tonbridge,
Kent
TN9 1RA

quoting reference "A"

2.3 Wall Thickness

Check the thickness of the wall.

The standard flue set supplied is suitable for wall thickness 238 to 330mm.

Kits are available for wall thicknesses:

76 - 238mm - Part No. 443235
324 - 580mm - Part No. 443236

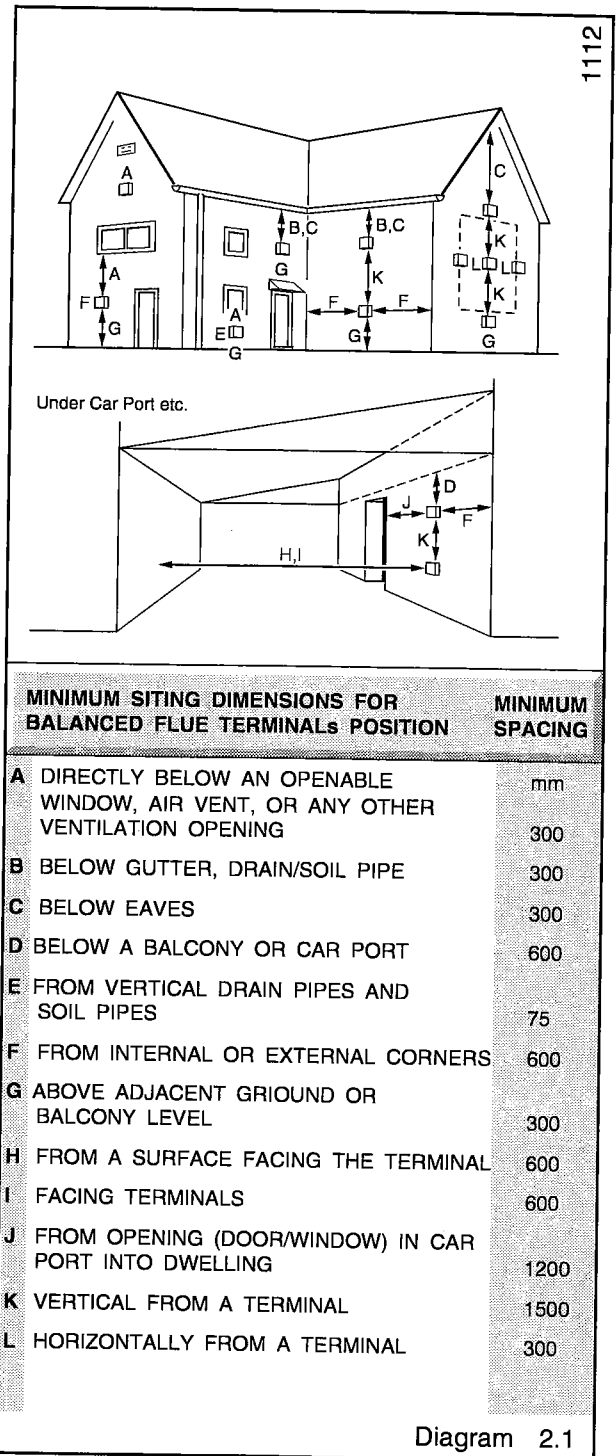
2.4 Boilers in a Compartment

Where the installation of the boiler will be in an unusual location, special procedure are necessary, the current issue of BS6798 gives detailed guidance on this aspect.

A compartment used to enclose the boiler must be designed and constructed specifically for this purpose. An existing cupboard or compartment modified for the purpose may be used. Details of essential features of cupboard or compartment design are given in the current issue of BS6798.

The doorway opening should be of sufficient size to allow easy removal of the boiler.

Where the boiler is fitted in a cupboard or compartment, permanent high and low level ventilation must be provided. The minimum ventilation areas required are given in the table, refer to the current issue of BS5440 Part 2 for further guidance.



2.5 Timber Frame Buildings

If the boiler is to be fitted in a timber frame building it should be fitted in accordance with the British Gas Publication "Guide for Gas Installation in Timber Framed Housing" reference DM2. If in doubt seek advice from the local gas undertaking or Hepworth Heating Ltd.

3 Water Systems

Notes:

PUMP

The pump, with integral valves, should be fitted in the flow pipework from the boiler, it should produce a temperature difference across the boiler of 11°C (20°F).

See diagram 3.1 for pressure loss across the boiler.

Microbore systems may require a higher duty pump.

BYPASS

The flow rate through the boiler must not be allowed to fall below 6.4 Litre/min (1.4gall/min) whilst the burner is alight.

A bypass MUST be fitted, see diagram 3.3.

Open Vented Systems

3.1 Water System

For an open vented system the boiler must be supplied from an unrestricted water supply taken from a feed and expansion tank, situated at a maximum height of 27.5 metre (90ft) above the boiler.

The cold feed supply must be 15mm minimum size.

It is important that the relative positions of the pump, cold feed and open vent are as shown in diagram 3.2.

3.2 Cylinder

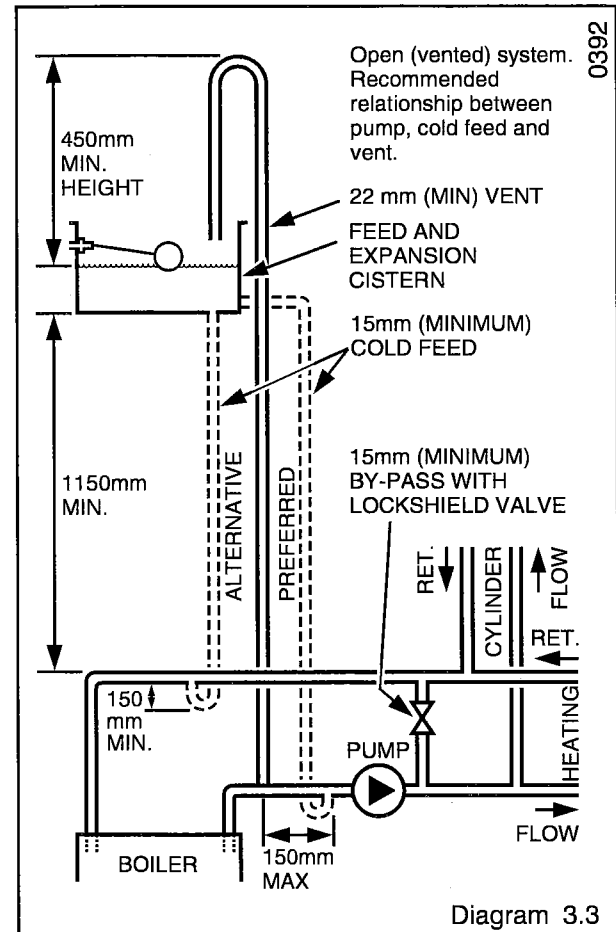
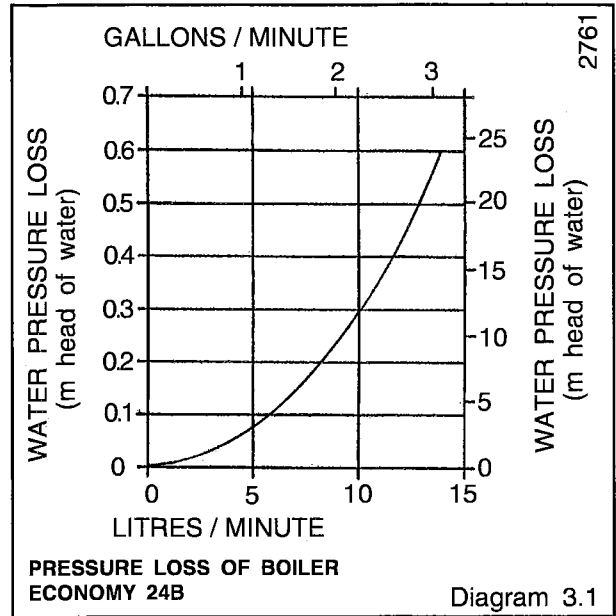
The hot water cylinder must be a double feed fully indirect type. Single feed, self priming types are not recommended.

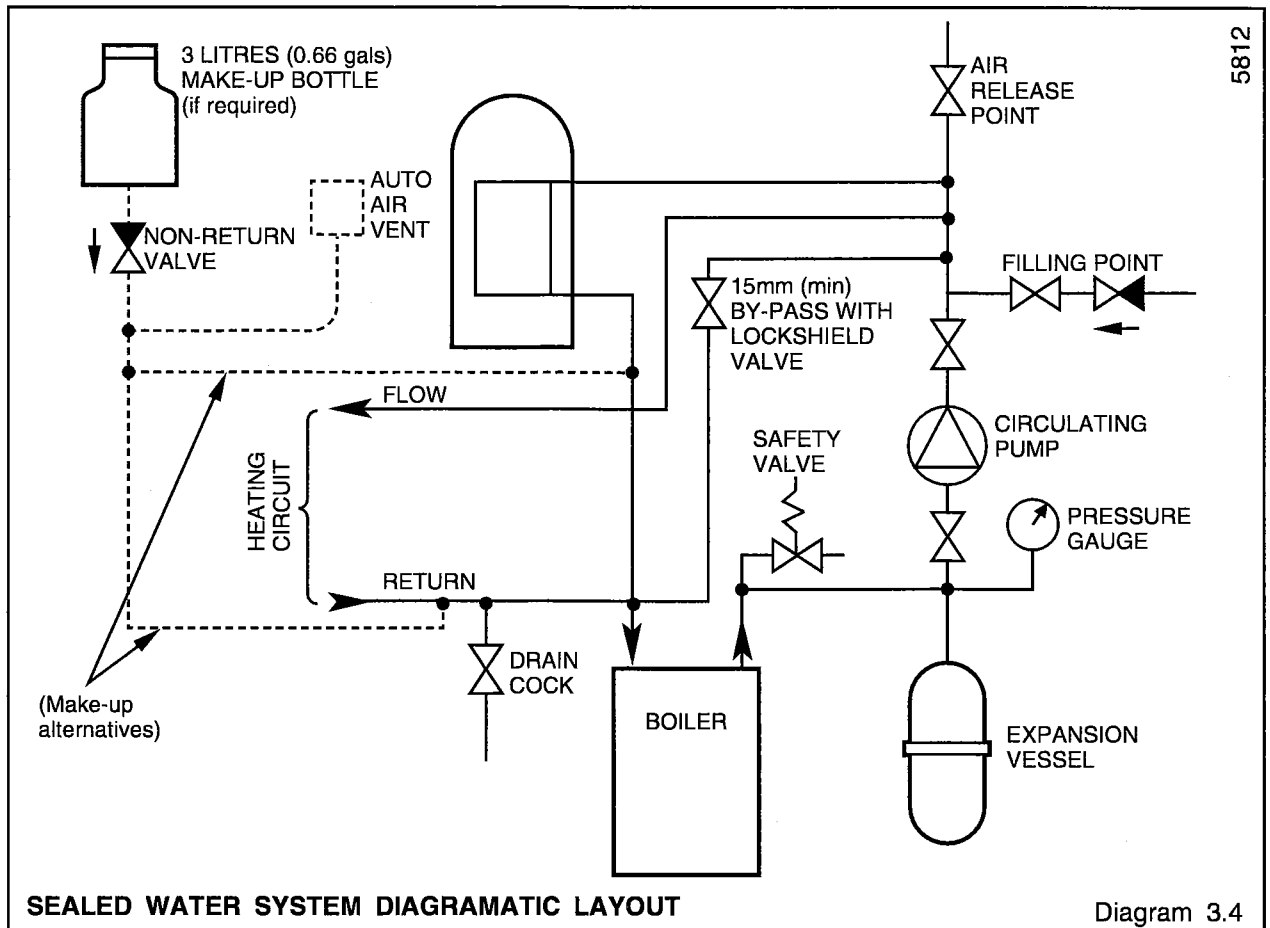
3.3 Inhibitor

Attention is drawn to the current issue of BS5449 and BS7478 on the use of inhibitors in central heating systems.

If an inhibitor is to be used, contact the manufacturer for their recommendations for the best product to use.

When installing this boiler in an existing system take special care to drain the entire system, including the radiators, then thoroughly cleaning out before fitting the boiler, whether or not adding an inhibitor.





Sealed Water Systems

The installation should comply with the appropriate requirements of the current issue of BS4814, BS5449 BS6759 BS6798 and BS7074 Part 1 and 2.

See diagram 3.4 for a suggested layout.

3.4 Safety Valve

A safety valve must be fitted to a sealed water system.

It shall be preset, nonadjustable with a lift pressure of 3bar, incorporating seating of a resilient material, a test device and a connection for drain.

The drain from the safety valve must be routed clear of any electrical fittings and positioned so that any discharge can be seen.

3.5 Expansion Vessel

A diaphragm type expansion vessel, conforming to the current issue of BS4814 (see also the current issue of BS7074 Part 1 and 2) must be connected at a point close to the inlet side of the circulating pump, see diagram 3.4, unless laid down differently by the manufacturer.

The expansion vessel volume depends on the total water system volume and the initial system design pressure. For any system an accurate calculation of the vessel size is given in the current issue of BS7074 Part 1.

Example, for an initial system design pressure of 0.7bar, the minimum total vessel volume required is $0.063 \times \text{Total System volume}$.

Note, a higher initial design pressure requires a larger volume expansion vessel.

Guidance on vessel sizing is also given in the current issue of BS5449 and BS7074 Part 1.

The charge pressure must not be less than the static head of the system, that is, the height of the highest point of the system above the expansion vessel.

The water content of the boiler is given in the Data Table 1.

3.6 Pressure Gauge

A pressure gauge with a set pointer and covering at least the range 0 to 4bar (0 to 60lb/in²) shall be permanently fitted to the system in a position where it can be seen when carrying out the filling operation.

3.7 Cylinder

SINGLE FEED INDIRECT CYLINDERS MUST NOT BE USED.

The hot water cylinder must be of the indirect coil type. It must be suitable for working at a gauge pressure of 0.35bar above the safety valve setting.

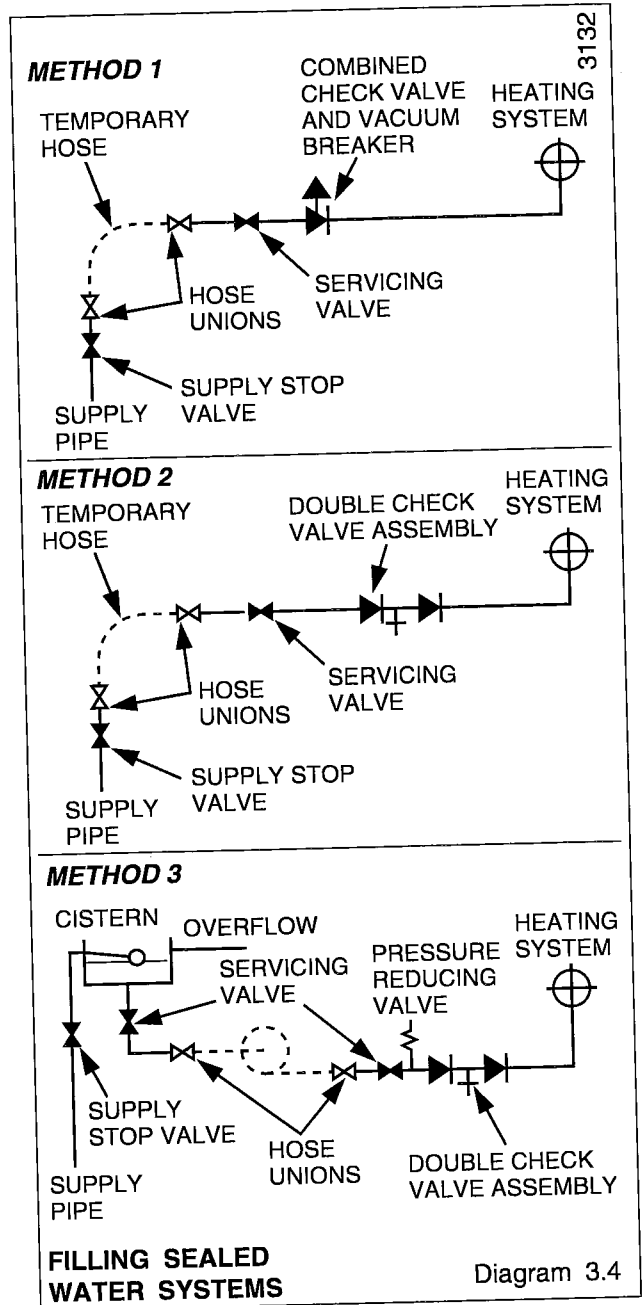
3.8 Water Make-up

Provision must be made for replacing water lost from the system. A make up vessel mounted above the highest point of the system and connected through a non-return valve to the system on the return side of either the hot water cylinder or heating system.

Alternatively, provision for make up can be made by using a filling loop.

3.9 Filling a Sealed Water System

Provision for filling the system at low level must be made. Three methods are shown in diagram 3.4. There must be no permanent connection to the mains water supply, even through a non-return valve.



4 Flue and Appliance Preparation

4.1 Positioning

Place the template, provided, on the wall in the required position and mark location of the balanced flue hole, see diagram 2.1.

Cut hole in the wall to accept the wall liner, see diagram 4.1.

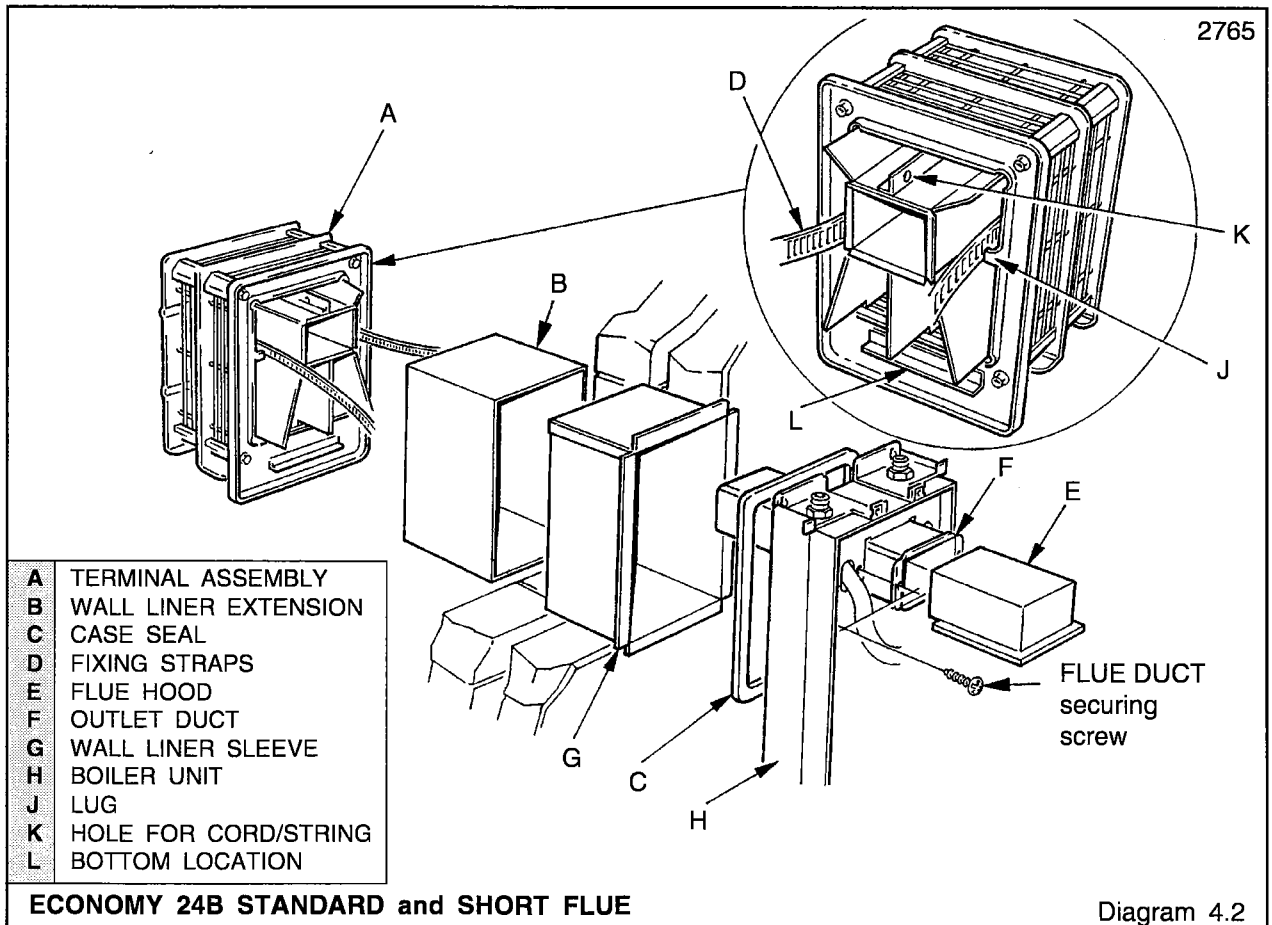
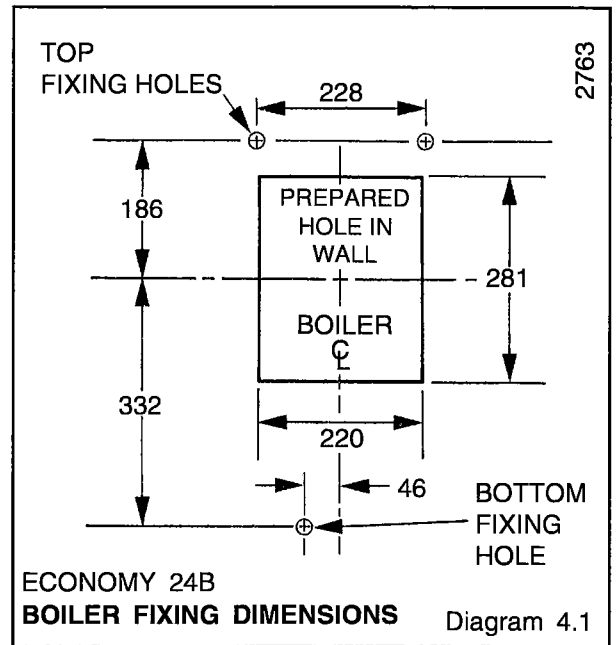
Make good to any plasterwork at this stage. When dry, select the liner "G", see diagram 4.2. Push into the hole until the flange is flush with the internal wall. Fit the liner "B" from inside so that it is flush with the outside brickwork. Mark the two liner positions and remove. Align the marks on the liners and tape them together with the tape provided.

The wall liner "B" is not required for wall thickness less than length of duct "G" on the short flue set. For lesser wall thickness than duct, "G" cut the plain end to required length.

Reposition the template on the wall in line with the wall opening, or refer to diagram 4.1.

Mark position for the three fixing screws.

Drill and plug the fixing holes, suitable for No10x50mm wood screws and plugs.



4 Flue and Appliance Preparation

4.2 Appliance Preparation.

Remove the controls cover by pulling it forwards and off.

Remove the outer case by undoing the screw at the bottom and unhooking at the top.

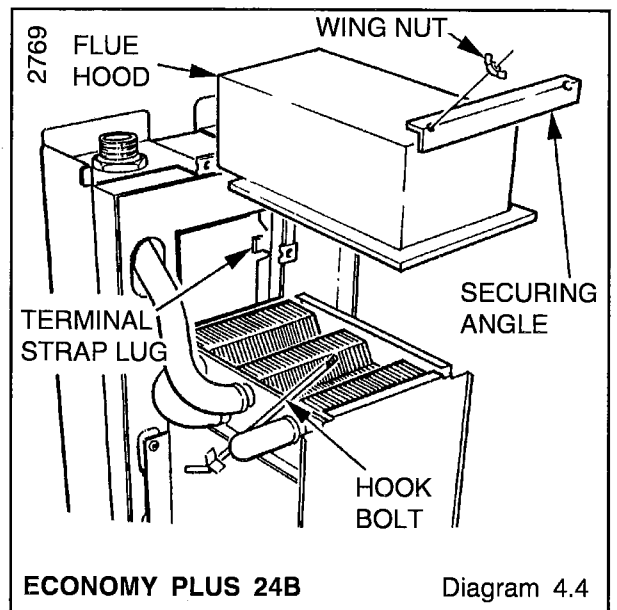
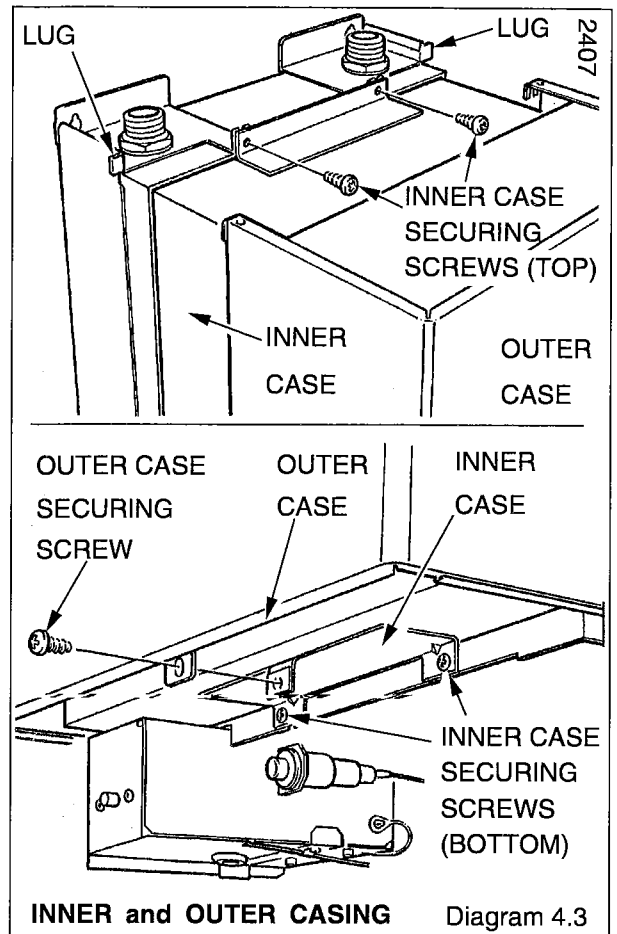
Remove the inner case by undoing the screws at the top and bottom, see diagram 4.3.

Remove the flue hood by releasing the wing nuts and remove angle, see diagram 4.4. Lift off flue hood.

Remove the two flue duct screws.

Fit sponge seal "C" around the spigot at the back of the boiler, adhesive face to the back of the case "H", see diagram 4.2.

Take the side strips from the packaging and hook them over the top edge of the side panel and secure with a screw at the bottom.



5 Installation

5.1 External Access Procedure

Fit the slotted straps "D" to the terminal "A" by placing over the lugs and then bending the lugs to secure, see diagram 4.2.

From the inside fit the wall liner assembly "B" and "G" into the hole.

Fit the top two fixing screws, allow them to stand proud to accept the keyhole fixing slots on the boiler.

Mount the boiler and tighten the top screws and fit bottom screw.

Locate and support the terminal, note, TOP is marked, see diagram 4.2.

An alternative method of support is to attach a length of cord or string to the terminal through the small hole in the top centre of the baffle, see diagram 4.2. Attach a suitable weight to the free end of the cord. Pass the weight and cord through the hole in the wall.

Working from inside, attach the straps to the lugs on the boiler, see diagram 4.4. bend the lugs and cut off excess strap length.

Push the flue duct "F" into the terminal with the unflanged end against the terminal. Make sure that the lower flange duct "F" fits behind the combustion chamber rear panel. For a wall less than 230mm thick cut to required length at the plain end of the duct.

Refit the two screws through the duct flange, but do not over tighten.

Replace flue hood, securing angle, tie rods and wing nuts.

Refit the inner cover and secure with the screws previously removed.

5.2 Internal Access Procedure

If required the terminal can be installed from inside the premises.

Fit the slotted straps "D" to the terminal "A" by placing over the lugs and then bending the lugs to secure, see diagram 4.2.

Fit the top two screws, allow them to stand proud to accept the keyhole fixing slots on the boiler.

Attach a length of cord to the terminal through the small hole provided in the top centre of the baffle.

Fit the liner assembly "B" and "G" into the hole through the wall.

Pass the terminal through the wall liner assembly, using the cord with a suitable weight attached to hold the terminal in position. Note, the terminal TOP is indicated and the flange on the wall plate is to be located inside the wall liner assembly.

Hook the appliance onto the screws passing the string and weight through the duct in the back of the appliance.

Tighten the two upper screws and fit the bottom screw.

Attach the two slotted straps from the terminal to the two lugs on the appliance, see diagram 4.4. bend lugs to secure. Cut off excess strap length and remove cord.

Push the flue duct "F" into the terminal with the walls less end against the terminal. Make sure that the lower flange duct "F" fits behind the combustion chamber rear panel. For walls less than 230mm thick cut to required length at the plain end of the duct.

Refit the two screws through the duct flange, but do not overtighten.

Replace flue hood, securing angle, tie rods and wing nuts.

Refit inner cover and secure with the screws previously removed.

5.3 Installing the Long Flue Set

Refer to diagram 5.1.

The flue duct "F", flue duct extension "K" and flue duct sleeve "J" need to be assembled together to suit wall thickness.

This assembly is 75mm longer than the wall liner assembly "B" and "G" already prepared, with a minimum overlap of 40mm at each joint. Use the tape provided to make a permanent assembly of these parts.

Push the flue duct assembly into the terminal, with the walls less end entering the terminal. Make sure that the lower flange duct "F" fits behind the rear panel of the combustion chamber.

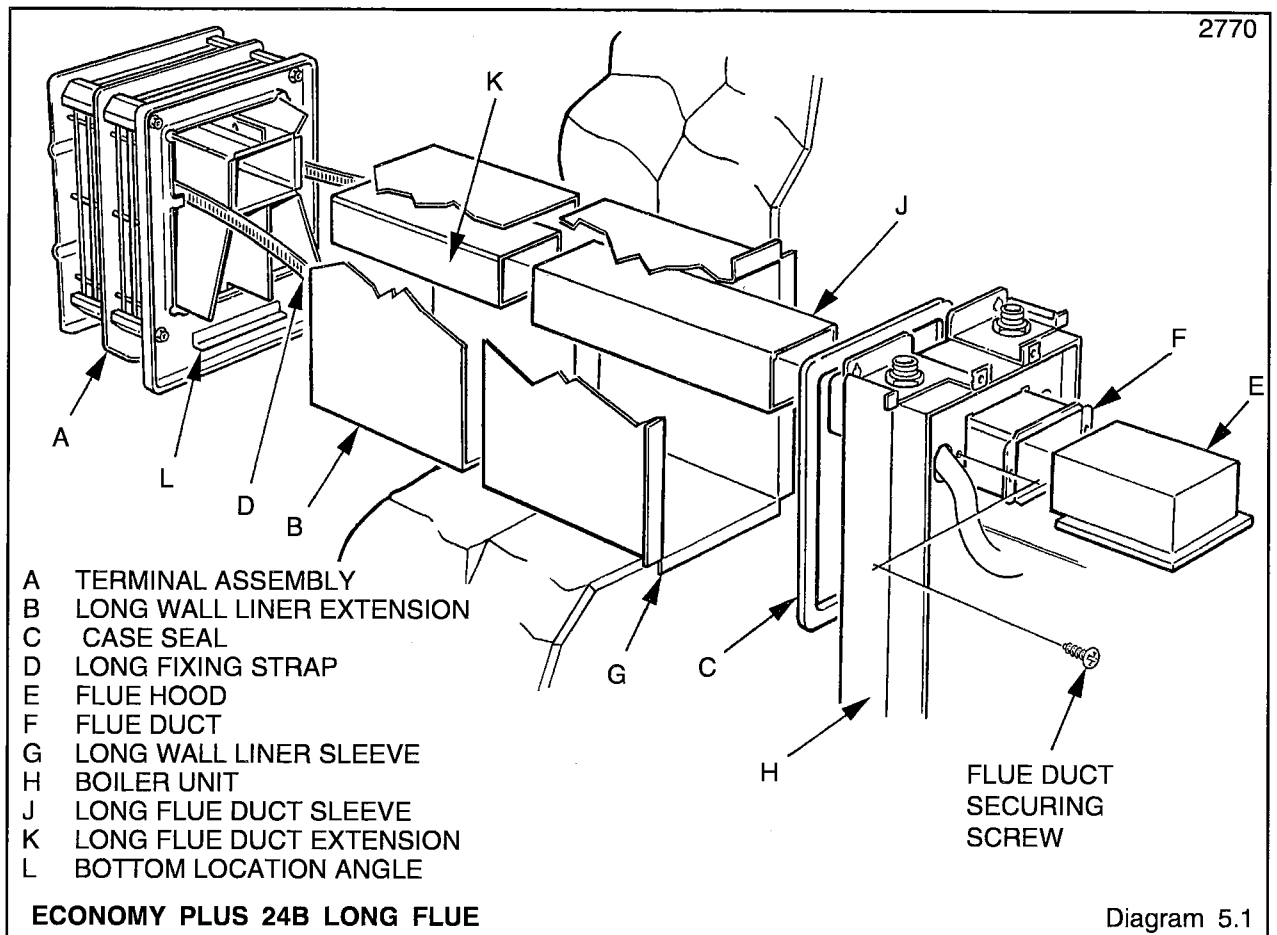
Refit the two screws through the duct flange, but do not over tighten.

Replace the flue hood, securing angle, tie rods and wing nuts, do not over tighten.

Refit the inner cover and secure it with the screws previously removed.

5 Installation

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6 Gas and Water Connection

6 Gas and Water Connection.

Connect the gas supply to the Rc $\frac{1}{2}$ gas cock.

The whole of the gas installation, including the meter should be inspected, tested for gas soundness and purged in accordance with the current issue of BS6891.

Connect the water to the boiler using nuts and olives supplied to BS2871 copper tube.

7 Electrical Wiring

Warning. This boiler must be earthed and have a permanent mains supply.

7.1 Electrical Connection

To remove the control box release the two screws at the front, see diagram 7.1, lower the box until it is clear then push backwards to disengage the hinge at the rear, see diagram 7.1. Take care not to damage the thermostat and capillaries.

Standard colours are, brown - live (L), blue - neutral (N) and green/yellow - earth (E) or \perp .

The mains cable outer insulation must not be cut back external to the cable clamp.

Thread the mains lead through the clamp in the rear of the control box and connect to the terminal strip, see diagrams 7.1. and 7.2.

When making connections, make sure that the earth conductor is made of a greater length than the current carrying conductors, so that if the cable is strained the earth conductor would be the last to become disconnected.

Make sure the supply cable and all external cables are secured and away from hot surfaces.

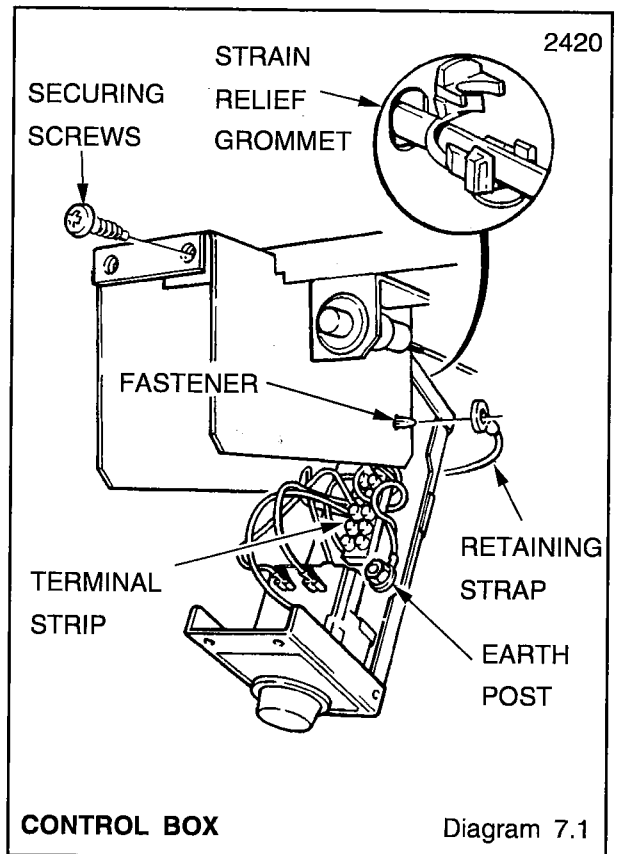
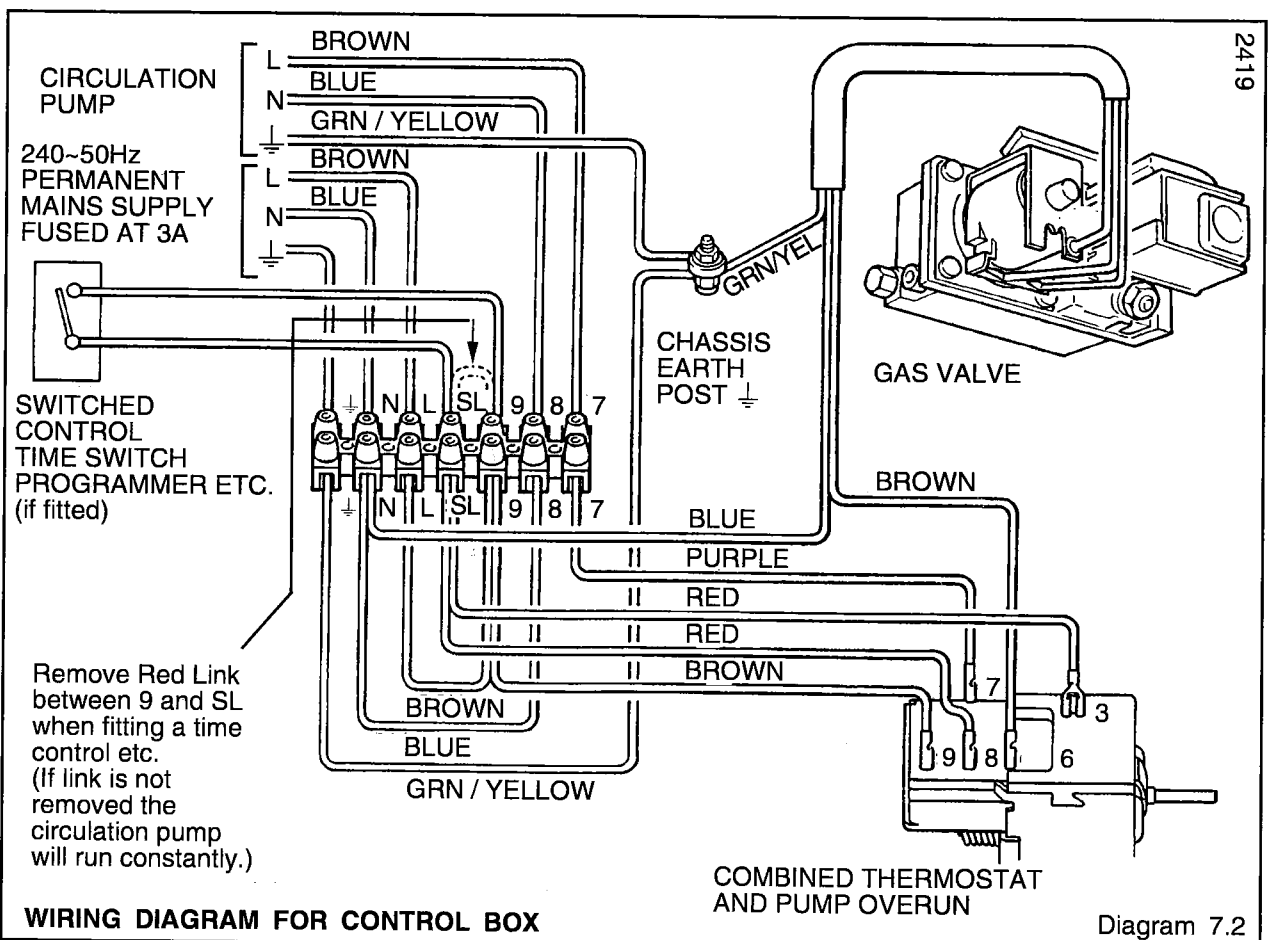


Diagram 7.1



WIRING DIAGRAM FOR CONTROL BOX

Diagram 7.2

7.2 Pump and External Controls Connections

The pump must be wired into the boiler control box as shown in diagram 7.2.

Take the strain relief grommets from the loose items pack. Place around the external controls and pump connection cables respectively. Squeeze the sides of the grommets when pushing them into the obround holes in the rear of the control box, see diagram 7.1.

Any external controls must only be wired to interrupt the Red link between terminals 9 and SL.

Make sure the supply cable and all external cables are secured.

7.3 Testing

Checks to ensure electrical safety should be carried out by a competent person.

After installation of the system, preliminary electrical system checks as below should be carried out.

1. Test insulation resistance to earth of mains cable.
2. Test earth continuity and short circuit of all cables.
3. Test the polarity of the mains.

8.1 All Systems

Make sure that the system has been thoroughly flushed out with cold water without the pump in place. Refit the pump, fill the system with water, making sure that all air is properly vented from the system and pump.

Before operating the boiler check that all external controls are calling for heat.

8.2 Sealed Water Systems

Flush the whole system with cold water without the pump in place. Refit the pump and fill until the pressure gauge registers 1.5bar (21.5lbf/in²). Clear any airlocks and check for water soundness.

Check the operation of the safety valve, by allowing the water pressure to rise until the valve opens. The valve should open within +/- 0.3bar (+/- 4.3lbf/in²) of the preset pressure. Where this is not possible conduct a manual check and test.

Release cold water to initial system design pressure.

The set pointer on the pressure gauge should be set to coincide with the indicating pointer.

8.3 Initial Lighting and Testing

Refit the outer case, see diagram 4.3.

Identify the control by reference to diagram 8.1.

Turn boiler thermostat to "O" the off position

Remove gas pressure test point screw "K" and fit a suitable pressure gauge.

Turn the electrical supply on and check that the pump is working.

OPEN ALL WINDOWS AND PUT OUT ANY NAKED LIGHTS, PIPES OR CIGARETTES.

Turn on the main gas supply and purge in accordance with the current issue of BS6891.

Turn boiler gas service cock "J" to on.

Push in control button "B", keep pushed in and at the same time operate the piezo unit button "C" until the pilot burner lights. After the pilot burner lights keep the button "B" pushed in for about 15 seconds. If the pilot burner fails to light or stay alight a safety device prevents immediate relighting. Do not attempt to relight until the safety device has reset. Check the length of the pilot flame, it should envelop the thermocouple tip as shown in diagram 10.3. The pilot rate can be adjusted by turning screw "L", having first removed the gas valve cover, see diagram 8.1. Test pilot supply connections for gas soundness with a suitable leak detection fluid.

Fit the outer case, secure with the screws previously removed.

Make sure that the pilot is alight and stable, look through window "G".

Set the boiler thermostat knob "A" between "1" and "2" and check that the burner lights smoothly. Check the gas connections for gas soundness with a suitable leak detection fluid.

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The burner pressure is preset, but may need adjustment, adjust by screw "H", see Section 1.3.

The gas rate is about 0.85m³/h (30ft³/h).

Should any doubt exist about the gas rate this should be checked at the meter, using a stop watch to time at least one cubic foot of gas consumption.

Remove pressure gauge and refit the screw, making sure that a gas tight seal is made.

Replace gas valve cover.

8.4 Testing

Check the operation of the flame failure device on the boiler, by turning the gas service cock off, to ensure that the gas valve shuts down within 60 seconds, indicated by a click from the valve.

8.5 Flushing

Allow the system to reach maximum working temperature and examine for water leaks.

The boiler should then be turned off and the system drained, whilst still hot, as rapidly as possible to complete the flushing process.

Refill the system, vent and again check for water soundness.

8.6. Adjustment - All Systems

When commissioning the system the boiler should first be fired with the bypass valve fully closed on full service, that is central heating and domestic hot water. The system should then be balanced, adjusting the pump and lockshield valve as necessary. Having achieved a satisfactory condition operate the boiler with the bypass valve fully closed on minimum load, normally this will be central heating with only one radiator in the main living area operating. The valve should be gradually opened to achieve a flow rate of 6.4 litre/min (1.4gall/min).

UNDER NO CIRCUMSTANCES SHOULD THIS VALVE BE LEFT IN THE FULLY CLOSED POSITION.

Operate the boiler again on full service and check the balancing, making further adjustments as necessary.

Do not attempt to adjust the thermostat calibration screw.

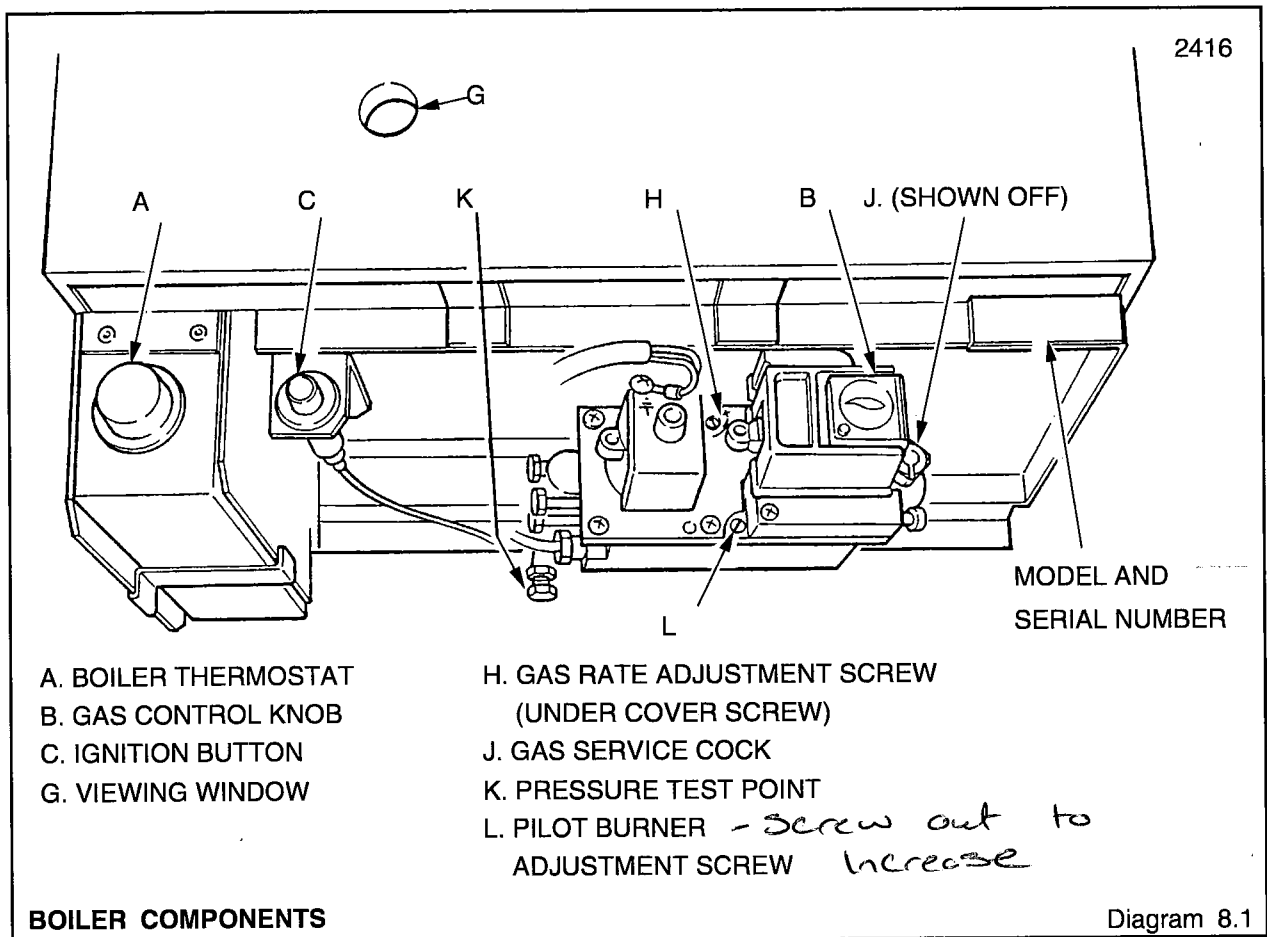
If thermostatic radiator valves are fitted care must be taken to make sure of an adequate flow rate when the valves close, refer to the current issue of BS7478 for guidance.

Refit controls cover.

8.7 Sealed Water Systems

Sealed water systems should be adjusted to the initial design pressure and any set pointer repositioned.

8 Commissioning



9 Instruct User in Correct Operation of the Boiler

9 Instruct the User in the Correct Operation of the Boiler

Hand the Instructions for Use to the user for their retention.

Instruct and demonstrate the safe and efficient operation of the boiler, heating system and domestic hot water supply.

Advise the user, that to ensure the continued efficient and safe operation of the boiler it is recommended that it is checked and serviced at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage, but in general once a year should be enough.

Draw attention, if applicable, to the current issue of the Gas Safety (Installation and Use) Regulations, Section 35, which imposes a duty of care on all persons who let out any property containing a gas appliance.

Reminder, leave these instructions with the user.

10 Servicing and Replacement of Parts

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Servicing and replacement of parts must be carried out by a competent person.

Before commencing a service or replacing parts isolate the gas and electrical supplies.

Unless stated otherwise all parts are replaced in the reverse order to removal.

10.1 Heating Body - Service

Remove controls cover by pulling it forward and off.

Remove outer casing by releasing the screw at the bottom and unhooking at the top.

Remove inner case by releasing the screw at the top and bottom, see diagram 4.3.

To remove flue hood release wing nuts and lift off securing angle and flue hood, see diagram 10.1.

Remove the combustion chamber front panel by undoing the wing nut at the bottom front and the four screws securing it to the combustion chamber sides, see diagram 10.1.

Remove the two screws and washers securing the pilot burner and shield to the main burners, see diagram 10.2.

Pull the pilot assembly forward enough to allow the main burner to be freed from the injector. Raise the burner up at the front, withdraw forward. Take care not to damage the insulation and the pilot burner and electrodes assemblies.

Place a sheet of paper in the combustion chamber and brush away any deposits.

Remove paper.

10.2 Main Burner - Service

Generally follow instructions given in Section 10.1.

With the main burner removed brush or vacuum any deposits away, make sure that the flame ports are clean.

DO NOT USE A BRUSH WITH METALLIC BRISTLES.

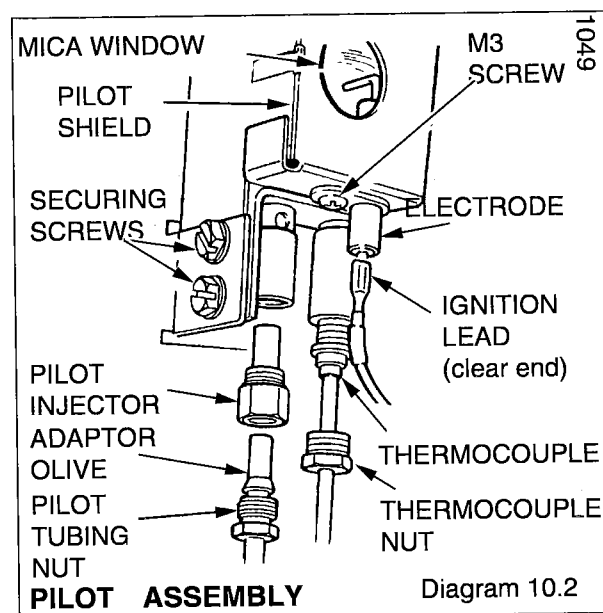
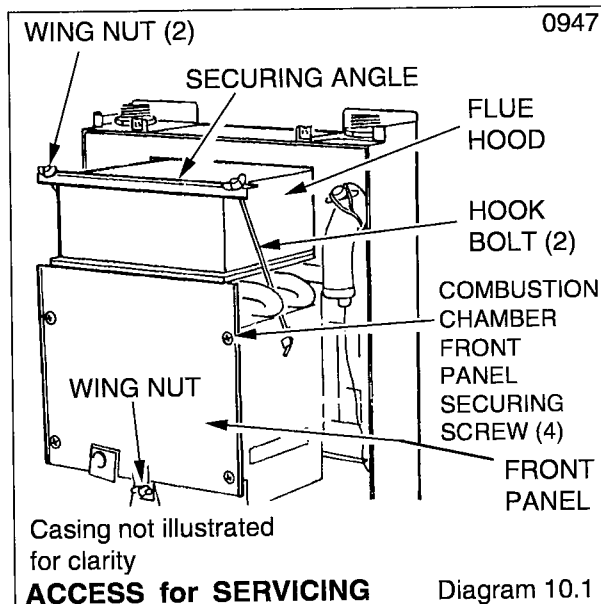
10.3 Main Injector

Generally follow instructions given in Section 10.1.

With the main burner removed the injector can be unscrewed and replaced as necessary using a new sealing washer.

If cleaning do not use a wire or sharp instrument on the hole.

When replacing the main burner make sure that it is pushed fully home onto the injector and that the guides are engaged on the injector manifold.



10.4 Pilot Burner and Injector

Generally follow the instructions in Section 10.1.

With the main case and controls cover removed as above, pull off ignition lead from electrode.

Unscrew the tubing nut at the base of the pilot burner, releasing the pilot pipe. Remove the pilot injector by unscrewing from the pilot burner, see diagram 10.2.

Release the wing nuts securing the flue hood, see diagram 10.1.

Remove combustion chamber front panel as above.

Remove the two screws and washers securing the pilot burner and pilot shield to the main burner, see diagram 10.2.

Remove pilot shield complete with electrode.

Unscrew the thermocouple nut.

The pilot burner can now be lifted away.

Take care not to damage the electrode.

When replacing make sure that the spark gap is as shown in diagram 10.3.

10.5 Thermocouple

Generally follow the instructions given in Section 10.1.

Release, but do not remove, the two screws securing the front and rear gland plates. Pull the front gland plate forwards, see diagram 10.4. Disconnect the thermocouple at the gas valve and remove.

Use the old thermocouple as a pattern when fitting the new one. Do not tighten more than a quarter turn beyond finger tight the nut at the gas valve.

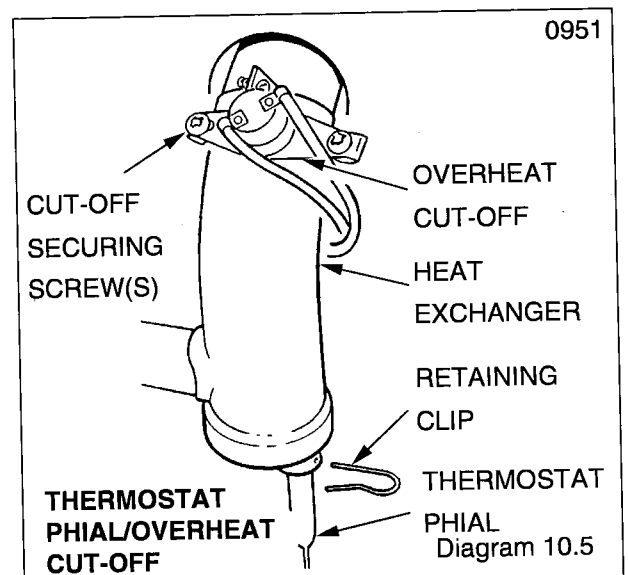
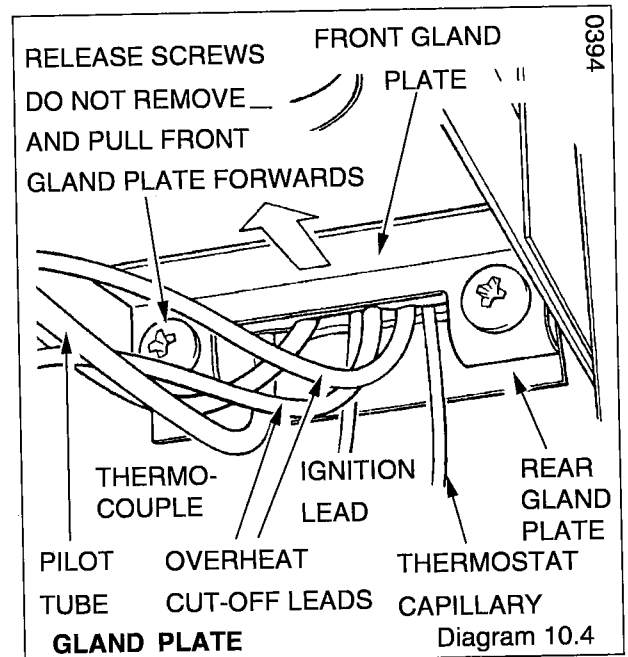
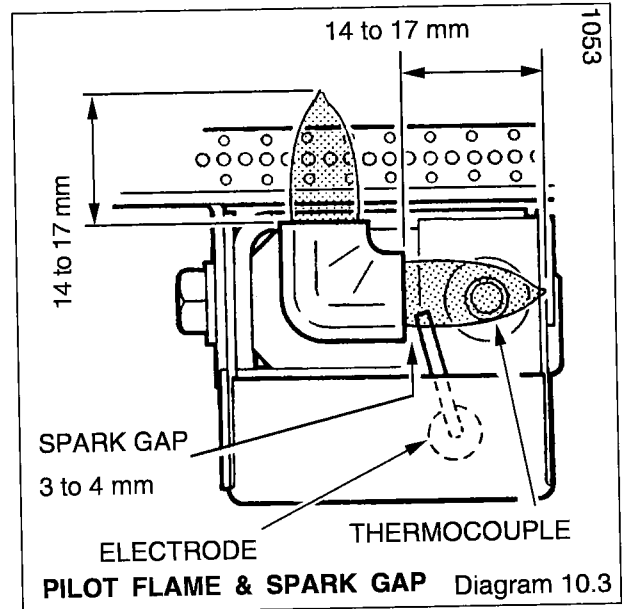
Check the spark gap, see diagram 10.3.

10.6 Electrode

Generally follow the instructions given in Section 10.4.

Unscrew the electrode from the pilot shield.

When refitting check that the spark gap is as in diagram 10.3.



10.7 Over Heat Cutoff

Generally follow the information under Section 10.4.

Remove the two screws securing the over heat cutoff to the clamp, see diagram 10.5.

Release connections at the gas valve, see diagram 10.6.

Release but do not remove the two screws securing the front and rear gland plates, see diagram 10.4 and withdraw the cutoff leads.

When refitting smear a little of the heat sink compound, supplied, between the face of the cutoff and the water pipe, ensure that it is correctly fitted on the pipe.

10.8 Gas Valve

See diagram 10.6.

Gain access as under Section 10.4.

Remove screw to release gas valve cover.

Disconnect all leads and pipes at the valve.

Undo the four screws each side of the valve to release the service cock and burner supply tube, take care not to damage to the "O" rings.

Re-assembly note, when refitting the gas valve take care not to damage the "O" rings.

Do not tighten the thermocouple nut more than a quarter turn beyond finger tight.

It will be necessary to purge the pipework and valve before relighting - refer to Commissioning.

10.9 Electrical Control Box

Remove controls cover and outer casing as above, refer to Section 10.1.

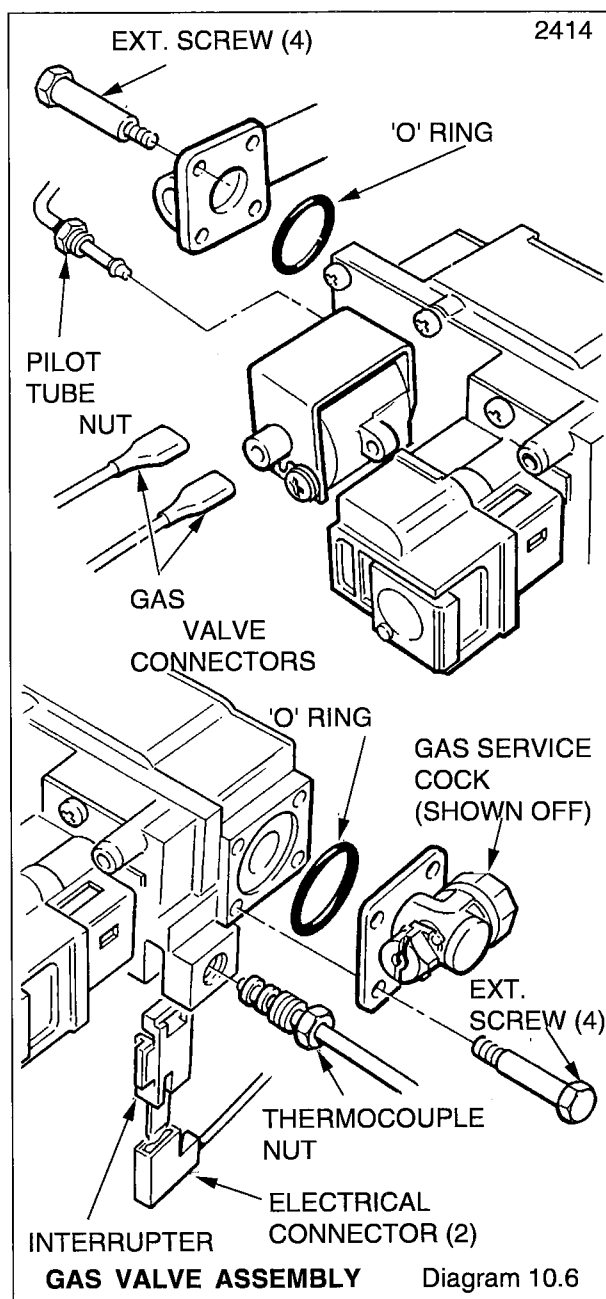
Remove retaining clip from boiler thermostat phial pocket and withdraw the phial, see diagram 10.5.

Remove the control box by undoing the two fixing screws at the front and lower the front of the box until it is clear of the cover. Push box towards the rear of the boiler to disengage the hinge and lower, see diagram 7.1.

Withdraw the thermostat capillary through the bottom of the air duct.

Disconnect cables (a) mains, L.N. and E (b) pump at terminal 8, 7 and earth stud, (c) cables at gas valve, (d) disconnect any remote controls at terminal 9 and SL.

When replacing refer to diagram 7.2 for electrical connections. Smear the thermostat phial with heat sink compound and ensure that it is secured, with the retainer, in the pocket.



10.10 Piezo Unit

Gain access as Section 10.4.

Disconnect ignition lead and remove backing nut for piezo unit.

10.11 Ignition Lead

Remove controls cover and outer casing as above.

Release, but do not remove, the two screws securing the front and rear gland plates. Pull the gland plates forward, see diagram 10.4.

Remove ignition lead, when replacing ensure that the clear end is fitted to the electrode.

10.12 Thermostat

Gain access as Section 10.4.

Remove and support control box, see Section 10.9.

Remove control knob and electrical connections from thermostat body.

Pull off the connectors from the thermostat terminals. Remove the two screws securing the thermostat to the control box. The thermostat may now be removed withdrawing the capillary through the bottom of the air duct.

When refitting the two screws which secure the thermostat to the control box, make sure that the restrictor plate is replaced with the locating lug at the lower edge.

When replacing smear the thermostat phial with the heat sink compound supplied, before replacing in the pocket. Make sure that it is secured by the retainer.

11 Fault Finding

Fault and Cause

Remedy

11.1 Pilot Goes Out after a Period of Remaining Alight

- Front cover not correctly fitted. _____ Fit parts correctly.
- Flue parts not fitted or sealed properly. _____ Seal cavity or fit flue parts correctly as described in installation instructions.
- Electrical supply failure causing over heat cutoff to operate. _____ Relight pilot.
- Operating cut-off operating. _____ Refer to Section 11.3.
- Pump incorrectly wired. _____ Connect pump in accordance with diagram 7.2.

11.2 Main Burner Will Not Light

- External, remote controls not "On." _____ Check that any remote controls are calling for heat.
- Boiler thermostat not on. _____ Check boiler thermostat is in an "On" position, see also Section 11.9.

11.3 Thermostat Will Not Cut Out

- Thermostat phial not fitted in pocket. _____ Fit phial in pocket.
- Faulty thermostat. _____ Replace thermostat.

11.4 Overheat Cutoff Cuts Out Prematurely

- Air in heating body. _____ Vent system. Alter system layout if necessary.
- Water circulation low or stopped. _____ Pump not functioning correctly. Check pump is wired directly to the boiler. Alter system if necessary.
- Overheat cutoff operates before boiler cycles on maximum boiler thermostat setting. _____ Change faulty overheat cutoff.
- The correctly set overheat cutoff operates prematurely. There is no air in the heating body and water circulation satisfactory. _____ Change faulty heating body.

11.5 Insufficient Heat

- Thermostat set too low. _____ Increase setting.
- Inlet gas pressure inadequate. _____ Increase gas pressure.
- Governor setting incorrect. (ensure thermostat is on maximum setting). _____ Check burner pressure against data label. Reset only if more than 10% away from required figure.

11.6 Appliance Noisy in Operation*

- Overgassed. _____ Check burner pressure against data label and adjust only if more than 10% away from stated required figure.
- Complete lack of water. _____ Check system controls for correct installation or correct type of controls.
- Air in system. _____ Remove air from system. When system is first commissioned the air dissolved may take some time to boil out, therefore attempts should be made to vent air 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.
- Water flow rate. _____ Check that flow rate is correct. Check that pump is correct size and is correctly adjusted. Bypass not fitted or set correctly.

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

11.7 Thermocouple and Overheat Device

To test the thermocouple, a meter with a range of 0 to 30mV is required, similar to the British Gas Multimeter.

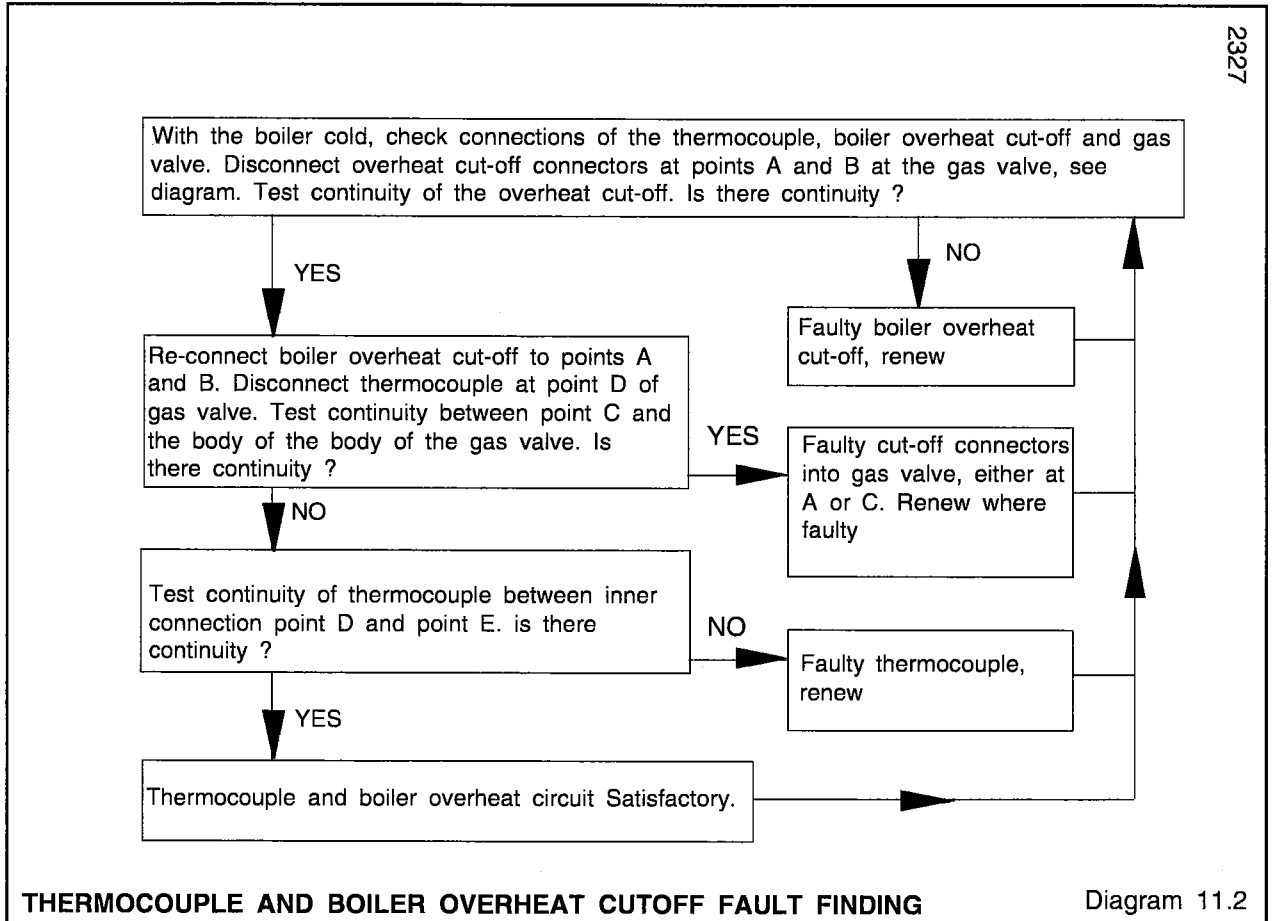
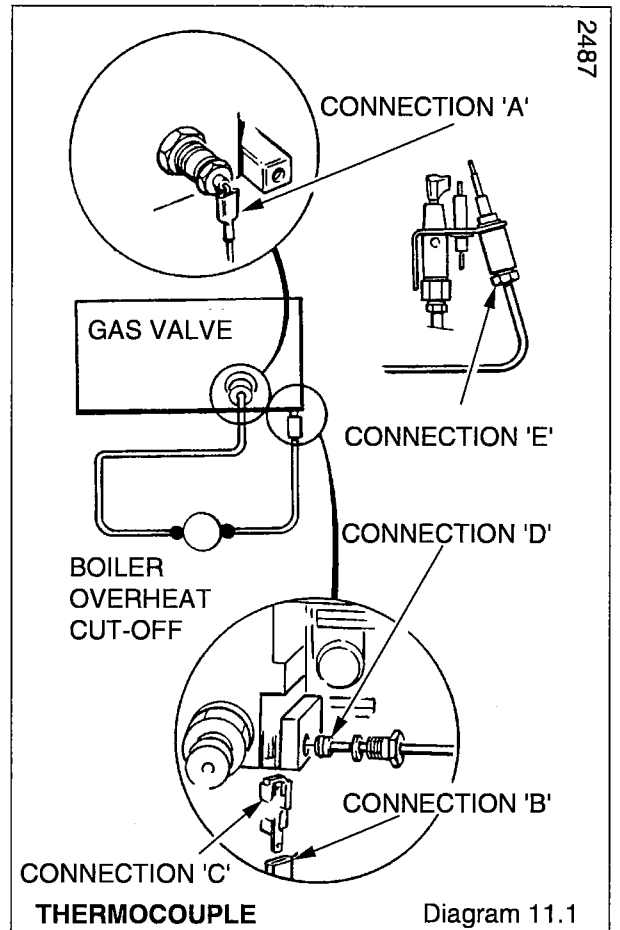
Symptom - The pilot fails to stay alight.

Test the thermocouple, overheat cut off and thermocouple connectors, as described in fault finding chart, diagram 11.2.

Check the millivoltage of the thermocouple closed circuit at point "A" and "E" see diagram 11.1.

This should be within the range 6 to 13mV

Take the millivolt drop reading and refer to the thermocouple and overheat cut off fault finding diagram 11.2.



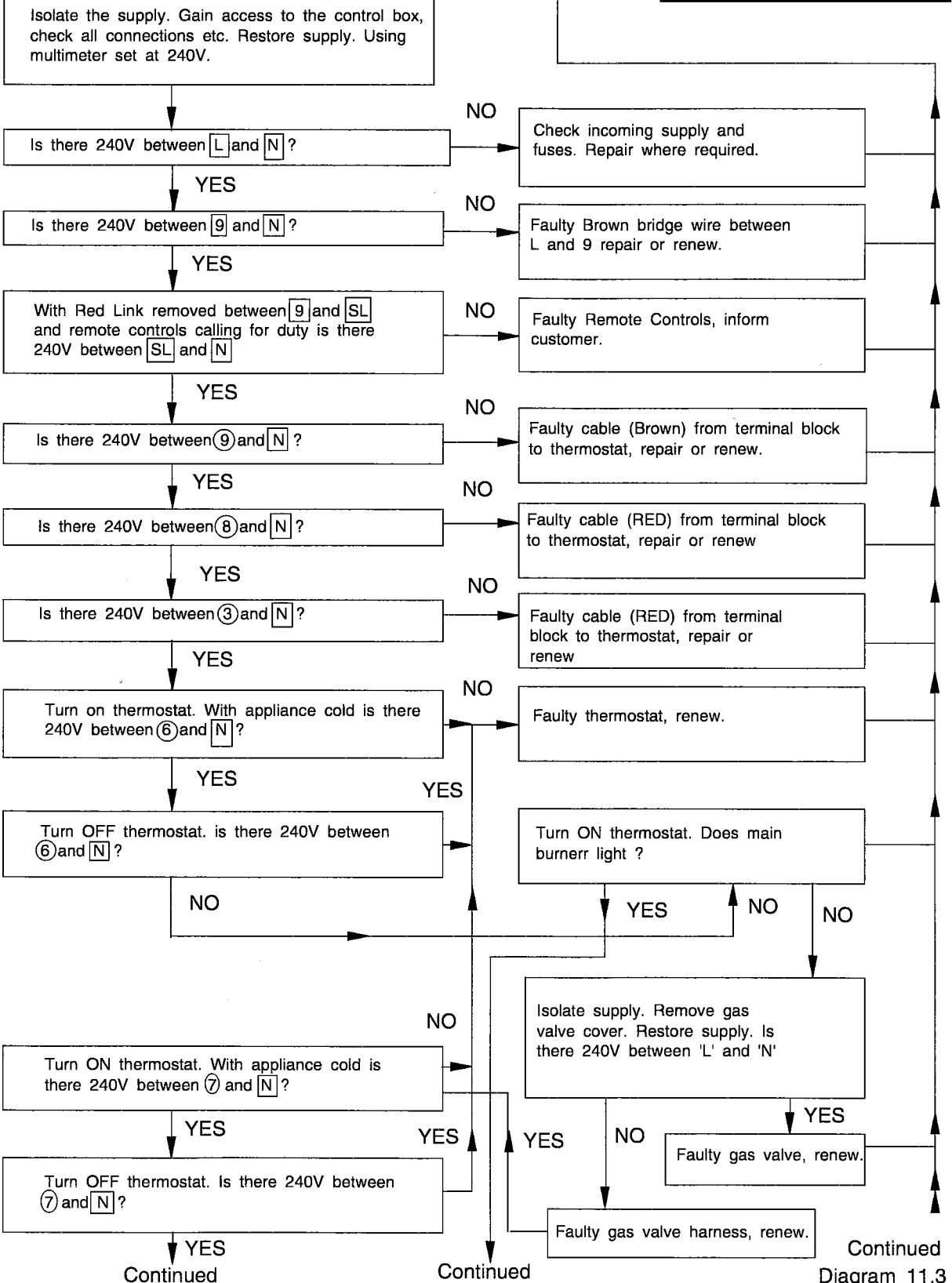
11 Fault Finding

ELECTRICAL FAULT FINDING

Ensure that all services are available at the appliance, that is Gas, Electricity, Water. With Pilot Lit

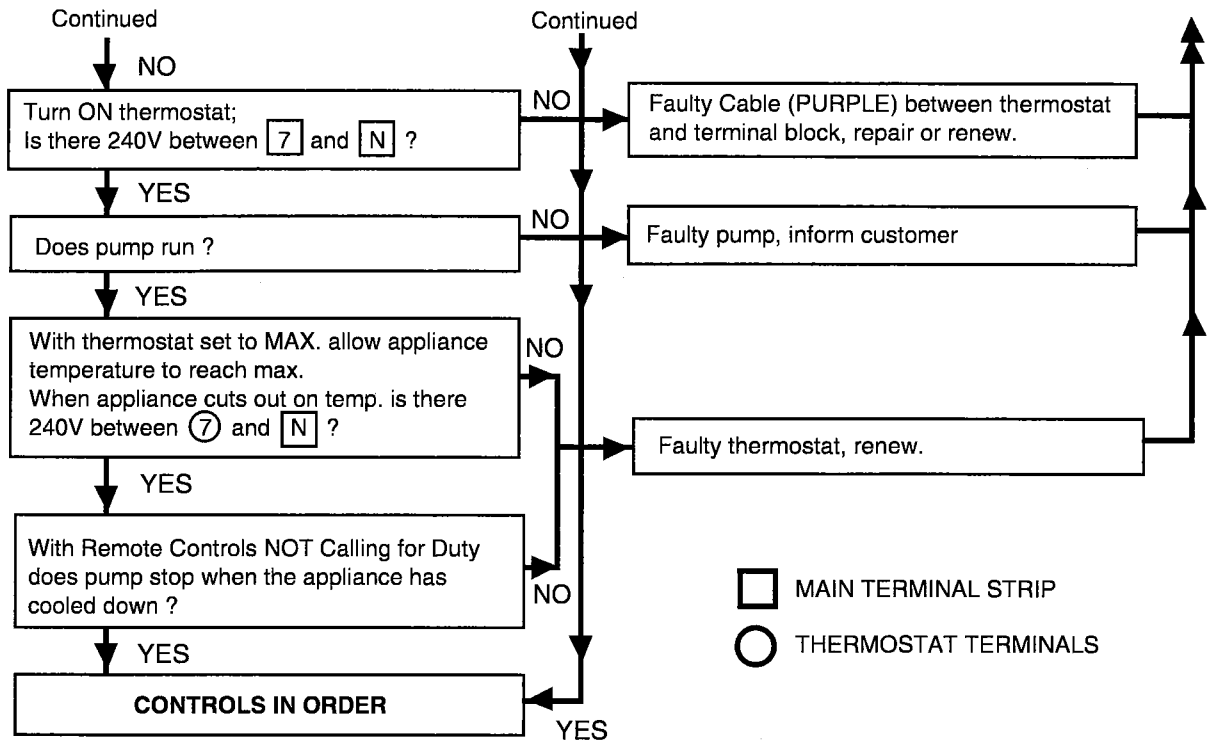


START



ELECTRICAL FAULT FINDING CONTINUED

4403A



ELECTRICAL FAULT FINDING CONTINUED

Diagram 8.3 continued

11.8 Electrical

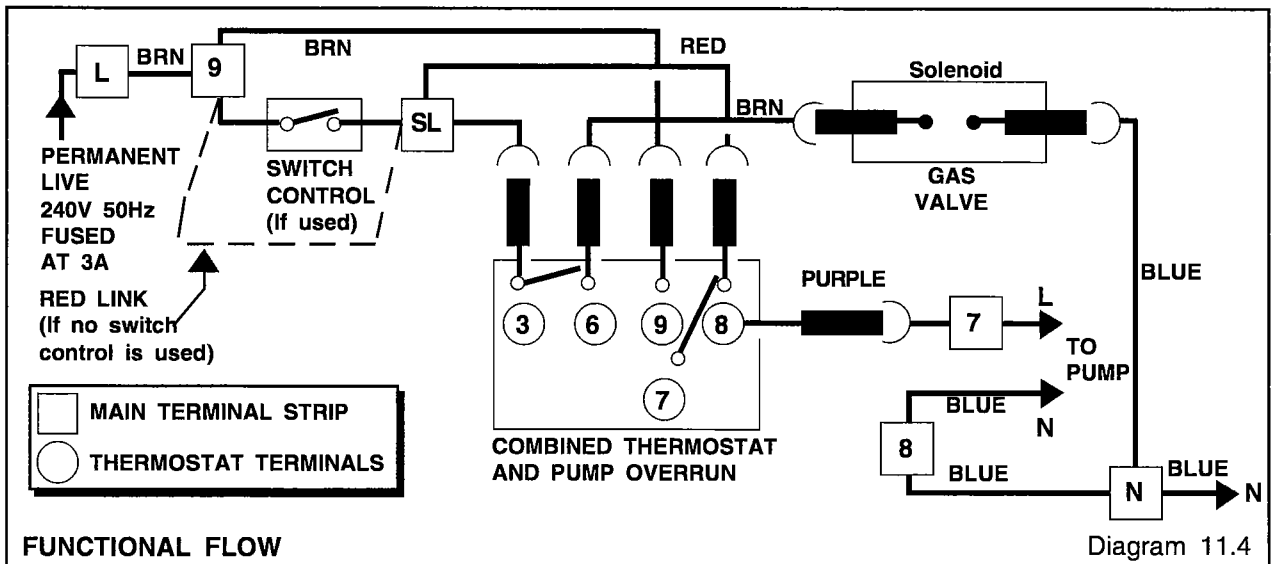
IMPORTANT, the preliminary electrical system checks contained in the British Gas Multimeter instruction book or equal are the first checks to be carried out during a fault finding procedure. On completion of the service and fault finding task which has required the breaking and remaking of electrical connections then the checks, earth continuity, polarity and resistance to earth must be repeated.

To check boiler thermostat and multifunctional control (gas valve), see diagram 11.3 and functional flow wiring diagram 11.4.

To check thermostat pump over run circuit see diagram 11.3 and functional flow wiring diagram 11.4.

11.9 Pilot

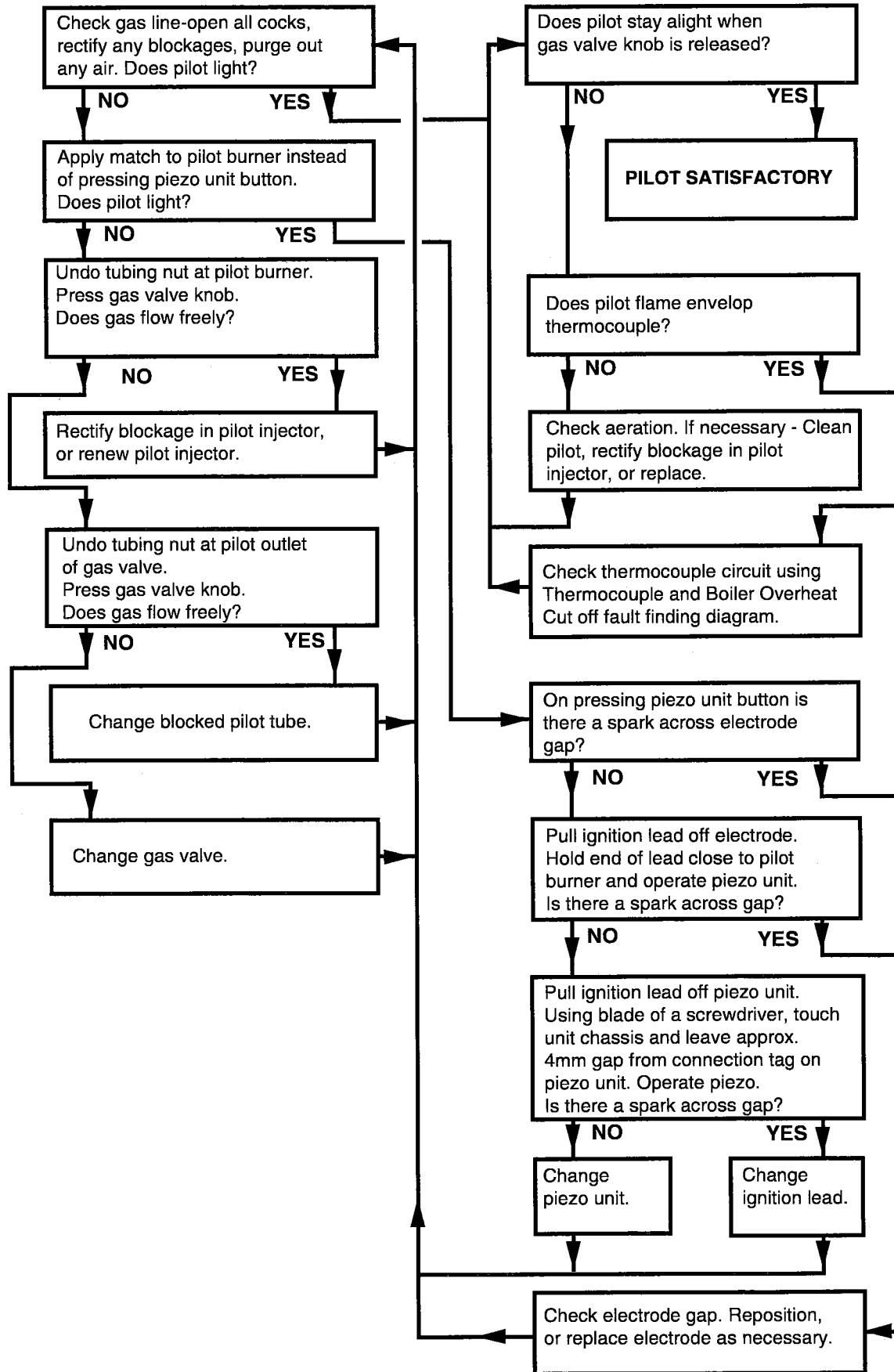
Refer to fault finding for pilot diagram 11.5.



FUNCTIONAL FLOW

Diagram 11.4

**PILOT WILL NOT LIGHT
START HERE**



BOILER PILOT FAULT FINDING

Diagram 11.5

12.1 Spare Parts

When ordering spare parts, quote the part number, description from diagram 12.1, serial number and model from the label on the boiler, see diagram 8.1.

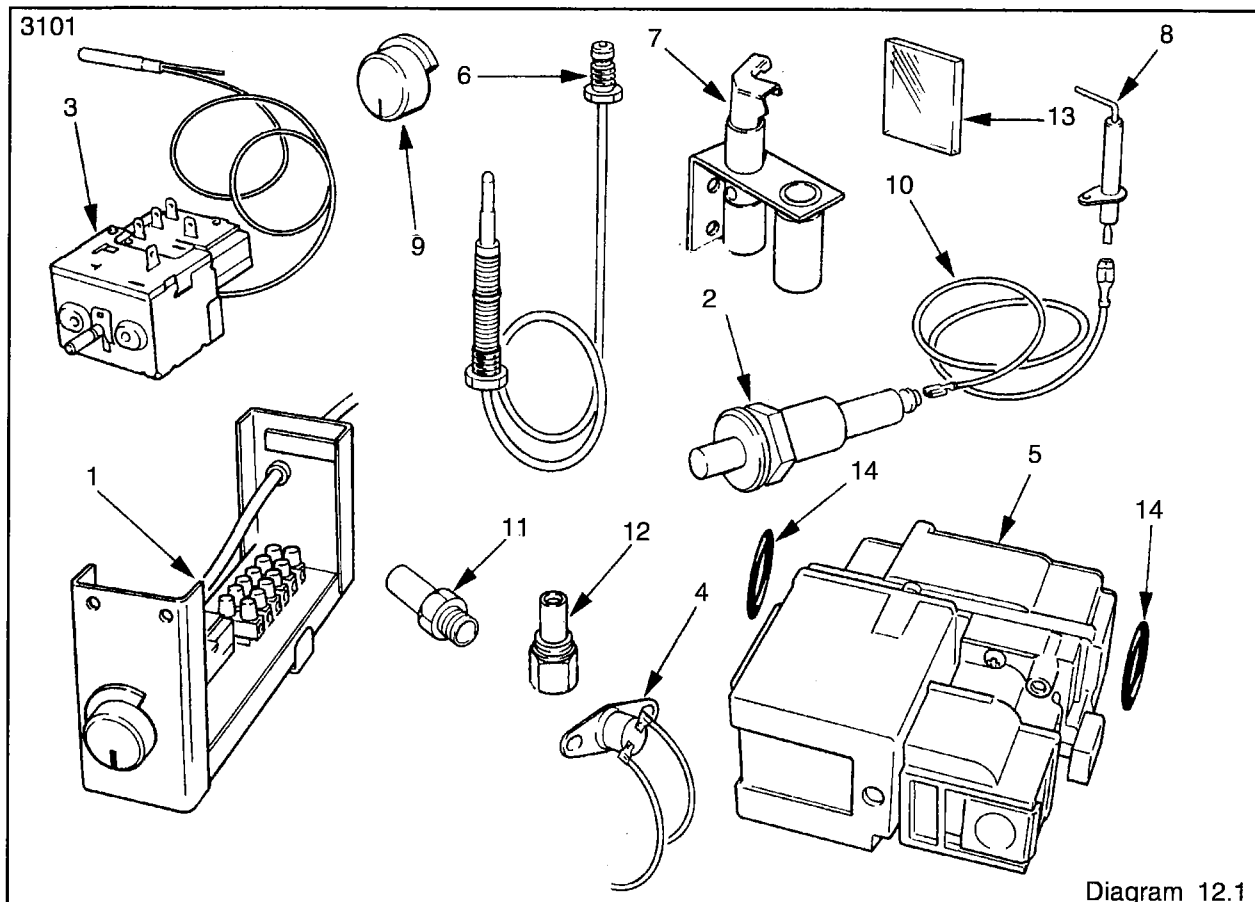


Diagram 12.1

	Glow-worm No.	Description.	GC Part No.
1	433504	Electrical control box	313 053
2	900501	Piezo unit	384 146
3	416189	Boiler thermostat	384 145
4	800014	Overheat cutoff assembly	313 064
5	800015	Gas valve assembly inc 14	313 067
6	900000	Thermocouple	381 651
7	203415	Pilot burner inc 12	394 161
8	202600	Electrode	384 149
9	416144	Thermostat knob	355 401
10	WW4606	Ignition lead	334 621
11	203011	Boiler injector	398 247
		Marked 2.8 or Cat 30-850	
12	203509	Pilot injector	394 163
13	411194	Sight glass	355 153
14	208040	"O" ring gas valve (2 off)	334 592

Information for the Installer and Service Engineer.

Under Section 6 of The Health and Safety at Work Act 1974, we are required to provide information on substances hazardous to health.

The adhesives and sealants used in this appliance are cured and give no known hazard in this state.

INSULATION PADS/CERAMIC FIBRE, GLASSYARN, MINERAL WOOL

These can cause irritation to skin, eyes and the respiratory tract.

If you have a history of skin complaint you may be susceptible to irritation. High dust levels are usual only if the material is broken.

Normal handling should not cause discomfort, but follow normal good hygiene and wash your hands before eating, drinking or going to the lavatory.

If you do suffer irritation to the eyes or severe irritation to the skin seek medical attention.

THERMOSTATS

These contain very small amounts of xylene in the sealed phial and capillary. If broken, under normal circumstances the fluid does not cause a problem, but in cases of skin contact, wash with cold water.

If swallowed drink plenty of water and seek medical attention.

Because of our constant endeavour for improvement details may vary slightly from those in the instructions.