



Installation & Servicing Instructions

To be left with the user

Fuelsaver U.F.B

30B

GC 41 319 32

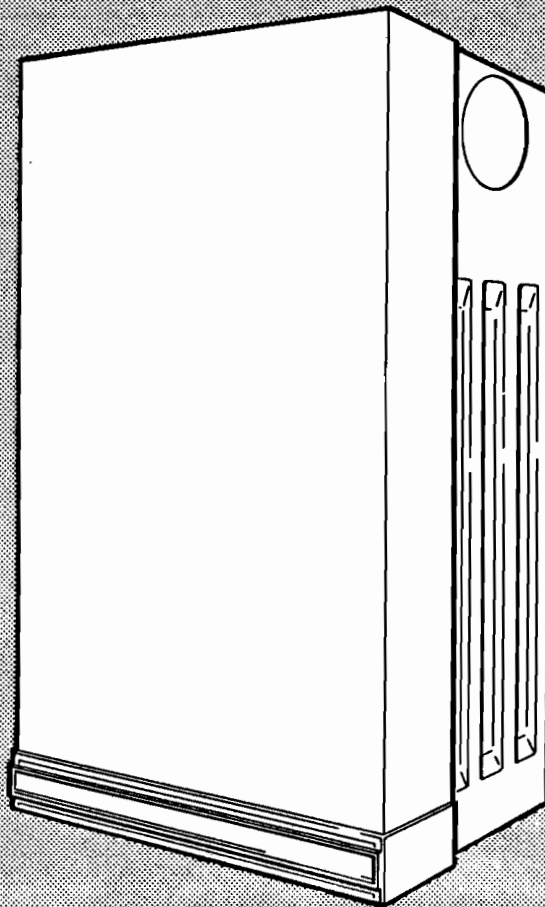
40B

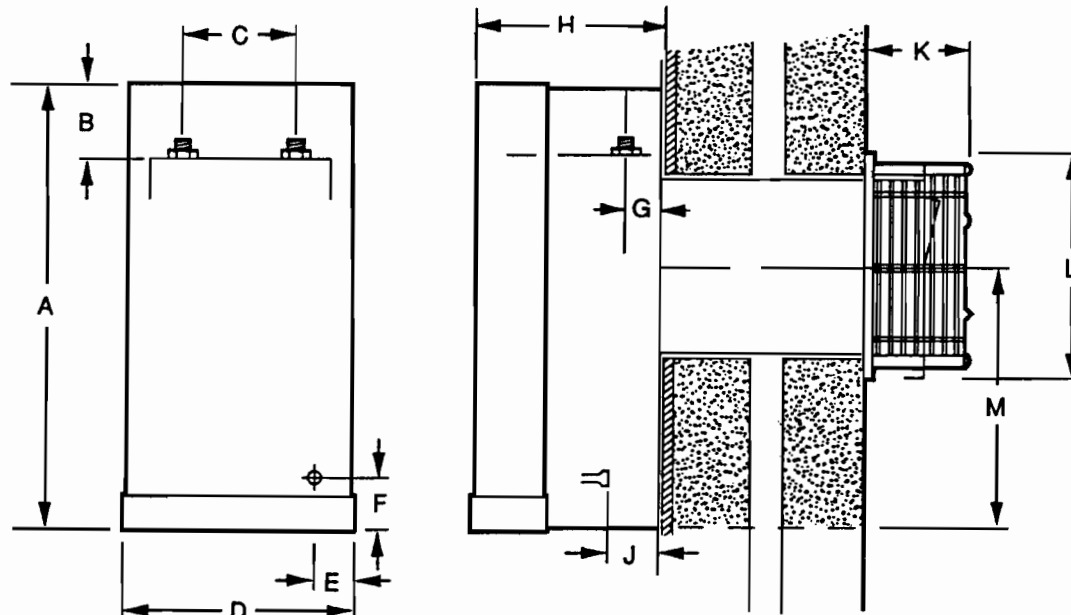
GC 41 319 33

50B

GC 41 319 34

Balanced Flue Boilers *with Honeywell Control*





NOTE: Dimensions A and H set at maximum

OVERALL DIMENSIONS (given in millimetres)

Diagram 1.1

MODELS	A	B	C	D	E	F	G	H	J	K	L	M
30	700 to 728	110	170	358	60	58	43	295 to 322	98	133	320	432
40, 50	700 to 728	110	242	358	40	58	43	295 to 322	98	133	284	452

Important Notice

This boiler is for use on natural gas only and cannot be used on any other gas.

This boiler is suitable for fully pumped systems only.

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

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

Sheet Metal Parts

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

1.1 Statutory Requirements

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

The Gas Safety (Installation and Use) Regulations, The Building Regulations, The I.E.E. Wiring Regulations, The Building Standards (Scotland)

Regulations (applicable in Scotland), Local Water Company Bye-laws, The Health and Safety at Work Act.

Detailed recommendations are contained in the current issue of the following British Standard codes of practice:

BS6798, BS5440 Part 1 and 2

BS5546 Part 1, BS5449, BS6891, BS6700, BS7074 Part 1 and 2.

1.2 DATA FUELSAVER U.F.B			
MODEL	30B	40B	50B
WEIGHT	22.6kg (49.8lb)	27.0kg (59.5lb)	27.5kg (60.6lb)
WATER CONTENT	0.45 litre (0.1gal)	0.50 litre (0.11gal)	0.60 litre (0.13gal)
GAS CONNECTION	Rc 1/2 in.		
WATER CONNECTION	22mm copper flow at right, return at left		
ELECTRICITY SUPPLY	240V ~ 50Hz, fused 3A.		
DATA LABEL	Bottom of inner case		

1.3 Range Rating

The boiler is range rated and may be adjusted to suit individual system requirements. The respective Table 1 gives the ratings and settings.

1.4 B.S.I. Certification

The boiler is certificated to the current issue British Standard 6332 Part 1, invoking the current issue of BS5258 Part 1 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, warranty and could also infringe the current issue if the Statutory Requirements.

1.5 Gas Supply

The gas installation shall be in accordance with the current issue of BS6891. On completion test the gas installation for soundness and purge in accordance with the above standard.

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 the I.E.E. Wiring Regulations 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. The 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, showing its purpose. See also Section 1.11.

Cables within the boiler casing must be to BS6500 Table 9 not less than 0.75mm² (24/0.20mm).

1.7 Contents of Packaging

The boiler is delivered in one pack, see diagram 1.2.

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.

TABLE 1. FUELSAVER U.F.B 30B

RANGE RATING		min	medium	max
NOMINAL HEAT INPUT	<i>kW</i>	7.33	9.16	10.99
	<i>Btu/h</i>	25,000	31,250	37,500
NOMINAL HEAT OUTPUT	<i>kW</i>	5.86	7.33	8.79
	<i>Btu/h</i>	20,000	25,000	30,000
BURNER SETTING PRESSURE	<i>m bar</i>	4.7	7.2	10.5
	<i>in.w.g</i>	1.9	2.9	4.2

TABLE 1. FUELSAVER U.F.B 40B

RANGE RATING		min	medium	max
NOMINAL HEAT INPUT	<i>kW</i>	10.99	12.82	14.65
	<i>Btu/h</i>	37,500	43,750	50,000
NOMINAL HEAT OUTPUT	<i>kW</i>	8.79	10.26	11.72
	<i>Btu/h</i>	30,000	35,000	40,000
BURNER SETTING PRESSURE	<i>m bar</i>	6.1	8.5	11.0
	<i>in.w.g</i>	2.4	3.4	4.4

TABLE 1. FUELSAVER U.F.B 50B

RANGE RATING		min	medium	max
NOMINAL HEAT INPUT	<i>kW</i>	14.65	16.49	18.32
	<i>Btu/h</i>	50,000	56,250	62,500
NOMINAL HEAT OUTPUT	<i>kW</i>	11.72	13.19	14.65
	<i>Btu/h</i>	40,000	45,000	50,000
BURNER SETTING PRESSURE	<i>m bar</i>	8.1	10.3	12.6
	<i>in.w.g</i>	3.3	4.1	5.1

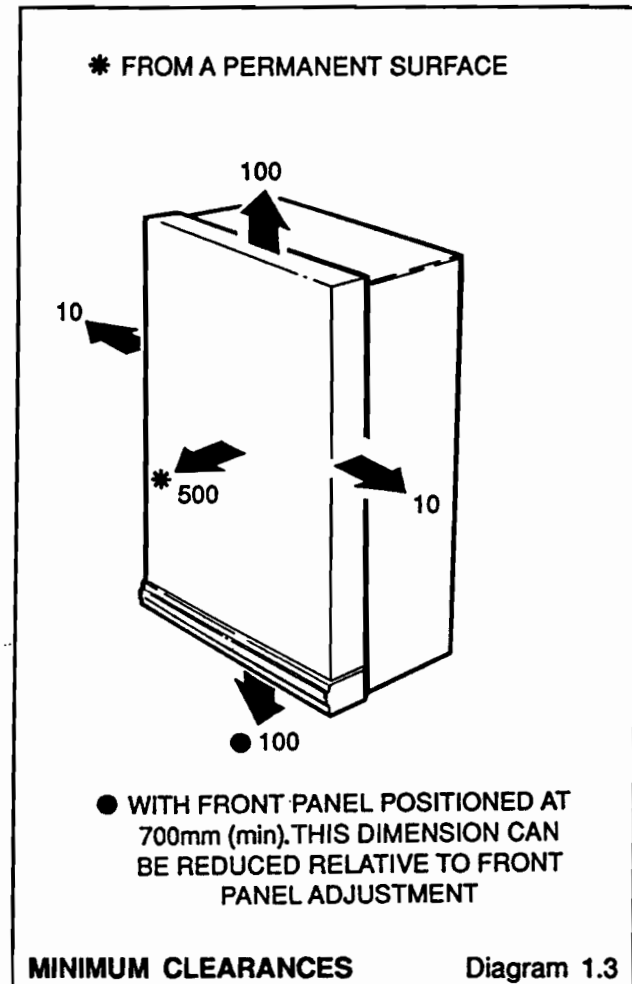
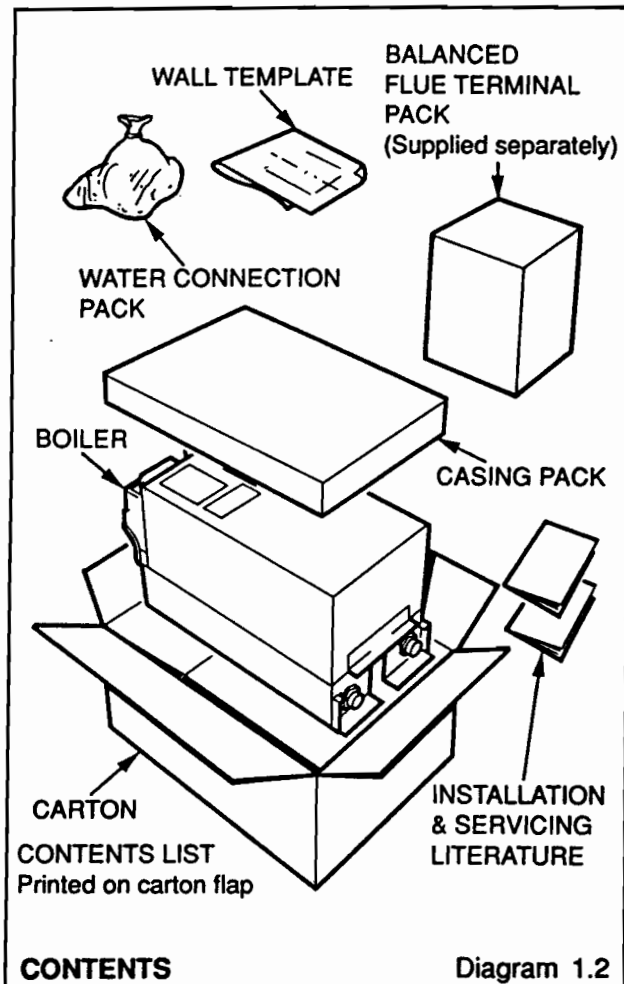
1.8 Water System

The boiler may be fitted to an open vented or sealed 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 the I.E.E. Wiring Regulations with respect to the installation of a boiler installed in a room containing a bath or shower. Any electrical switch or boiler control utilising 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) are applicable 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 1.3.

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

Additional clearances may be required for installation.

If fixtures are positioned next to the boiler they should be made removable for access to pipework.

Sufficient clearance 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/eaves.

2.2 Terminal Guard

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, see diagram 2.1.

Guards are available from: Tower Flue Components Ltd., Tonbridge 351555, quoting reference "A" black, or from Quinnell, Barrett and Quinnell Ltd., 884, Old Kent Road, London SE15, quoting reference type "E".

2.3 Wall Thickness

Check the thickness of the wall.

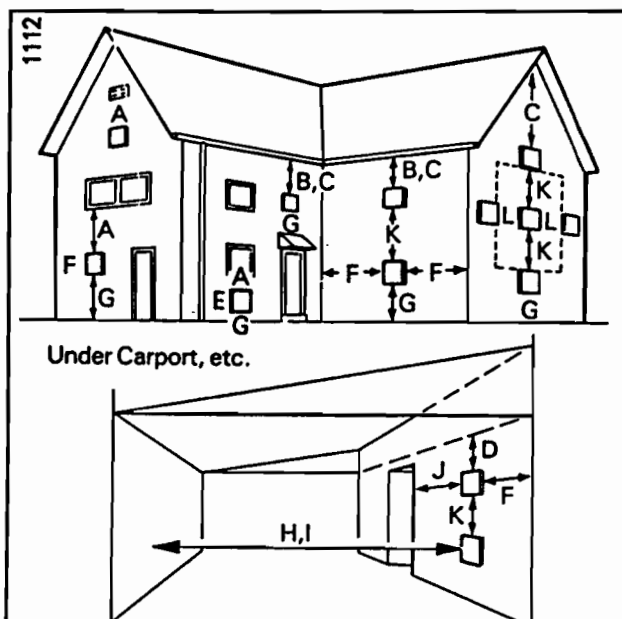
The standard flue set supplied is suitable for wall thickness 238mm to 330mm:

For other wall thicknesses kits are available:

U.F.B 30B -76 to 238mm Kit No 433518
324 to 580mm Kit No 433519

U.F.B 40B -76 to 238mm Kit No 433611
324 to 580mm Kit No 416193

U.F.B 50B -76 to 238mm Kit No 416205
324 to 580mm Kit No 433612



MINIMUM SITING DIMENSIONS FOR
BALANCED FLUE TERMINALS

POSITION	MINIMUM SPACING
A DIRECTLY BELOW AN OPENABLE WINDOW, AIR VENT, OR ANY OTHER VENTILATION OPENING	mm
B BELOW GUTTER, DRAIN/SOIL PIPE	300
C BELOW EAVES	300
D BELOW A BALCONY OR CAR PORT	600
E FROM VERTICAL DRAIN PIPES AND SOIL PIPES	75
F FROM INTERNAL OR EXTERNAL CORNERS	600
G ABOVE ADJACENT GROUND OR BALCONY LEVEL	300
H FROM A SURFACE FACING THE TERMINAL	600
I FACING TERMINALS	600
J FROM OPENING (DOOR/WINDOW) IN CAR PORT INTO DWELLING	1200
K VERTICAL FROM A TERMINAL	1500
L HORIZONTALLY FROM A TERMINAL	300

MINIMUM SITING DIMENSIONS FOR
BALANCED FLUE TERMINALS Diagram 2.1

2 Flue and Ventilation

2.4 Boilers In a Compartment

Where the installation of the boiler will be in an unusual location, special procedures 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 for 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 respective Table 2.

2.5 Timber Frame Building

If the boiler is to be installed 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.

TABLE 2. COMPARTMENT AIR VENTS

FUELSAVER U.F.B 30B				
VENTILATION REQUIREMENTS	HIGH LEVEL VENT AREA		LOW LEVEL VENT AREA	
FROM ROOM OR SPACE	100cm ²	(16in ²)	100cm ²	(16in ²)
FROM OUTSIDE	50cm ²	(8in ²)	50cm ²	(8in ²)
FUELSAVER U.F.B 40B				
VENTILATION REQUIREMENTS	HIGH LEVEL VENT AREA		LOW LEVEL VENT AREA	
FROM ROOM OR SPACE	132cm ²	(20in ²)	132cm ²	(20in ²)
FROM OUTSIDE	66cm ²	(10in ²)	6cm ²	(10in ²)
FUELSAVER U.F.B 50B				
VENTILATION REQUIREMENTS	HIGH LEVEL VENT AREA		LOW LEVEL VENT AREA	
FROM ROOM OR SPACE	165cm ²	(26in ²)	165cm ²	(26in ²)
FROM OUTSIDE	83cm ²	(13in ²)	83cm ²	(13in ²)

3 Water Systems

Notes:

Pump

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

Flow rates through the boiler:

UFB30 11.4Litre/min (2.5gal/min),

UFB40 15.2Litre/min (3.3gal/min),

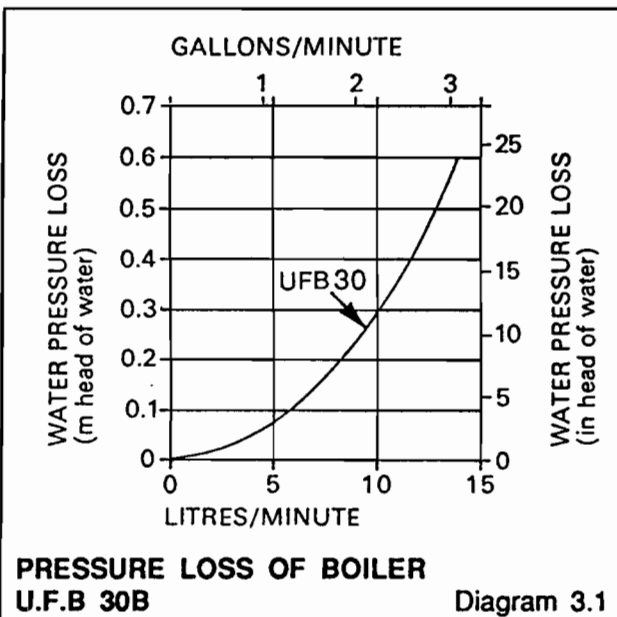
UFB50 18.9Litre/min (4.2gal/min)

See diagram 3.1. (UFB30), 3.2 (UFB40, UFB50) for pressure loss across the boiler.

High resistance microbore systems may require a higher duty pump.

Bypass

The flow through the boiler must not be allowed to fall above:



7.8Litre/min (1.7gal/min) - UFB30

10.5Litre/min (2.3gal/min) - UFB40

13.2Litre/min (2.9gal/min) - UFB50

A bypass must be fitted, see diagram 3.3

3 Water 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 cistern (minimum 22litre (5gal) capacity situated at a maximum height of 27.5metre 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 3.3.

3.2 Cylinder

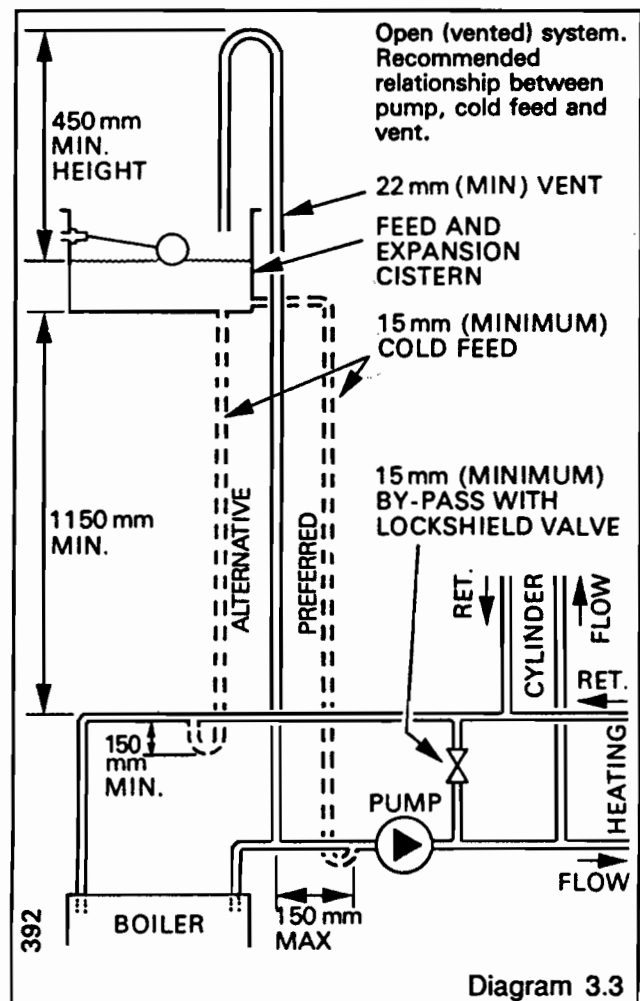
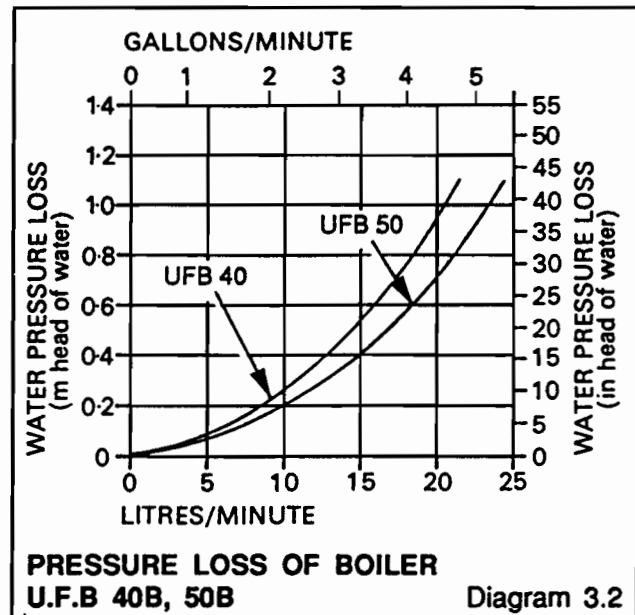
The hot water cylinder must be a double feed (fully indirect) type. Single feed (self priming) cylinders are not recommended.

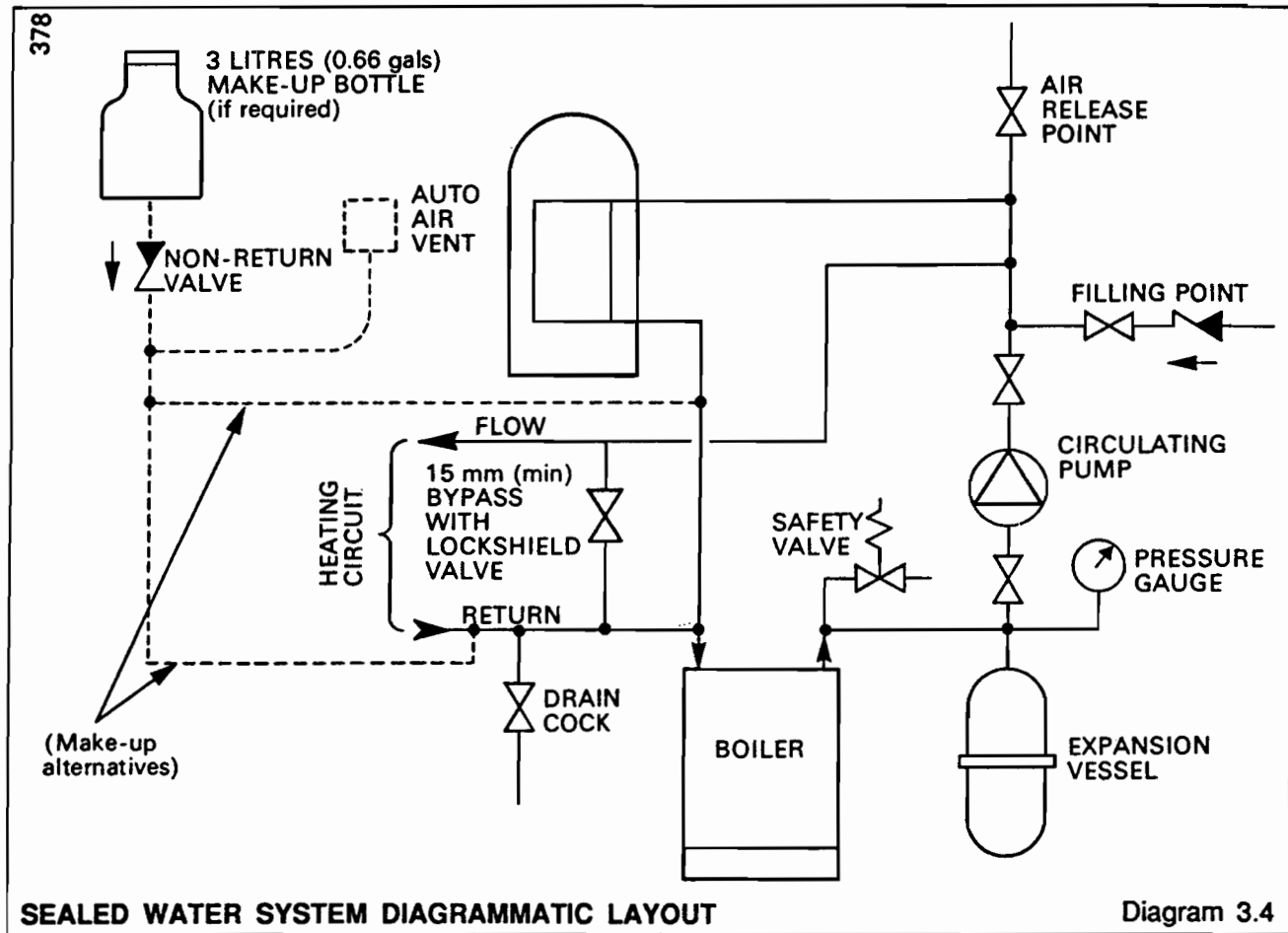
3.3 Inhibitor

Attention is drawn to the current issue of BS5449 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.

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





Sealed Water Systems

The installation should comply with the appropriate requirements of the current issue of BS5449, BS6759, BS6798, and BS7074 Part 1 and 2 see diagram 3.4 for layout.

3.4 Safety Valve

A safety valve must be fitted in a sealed 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.

3.5 Expansion Vessel

A diaphragm type expansion vessel, conforming to the current issue of BS4814 (see also BS7074 Part 1 and 2) must be connected at a point close to the inlet side of the circulating pump, see the diagrammatic layout, diagram 3.3 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 capacity of the boiler is given in Data Table 1.2.

3.6 Pressure Gauge

A pressure gauge with 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 ARE NOT SUITABLE.

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.

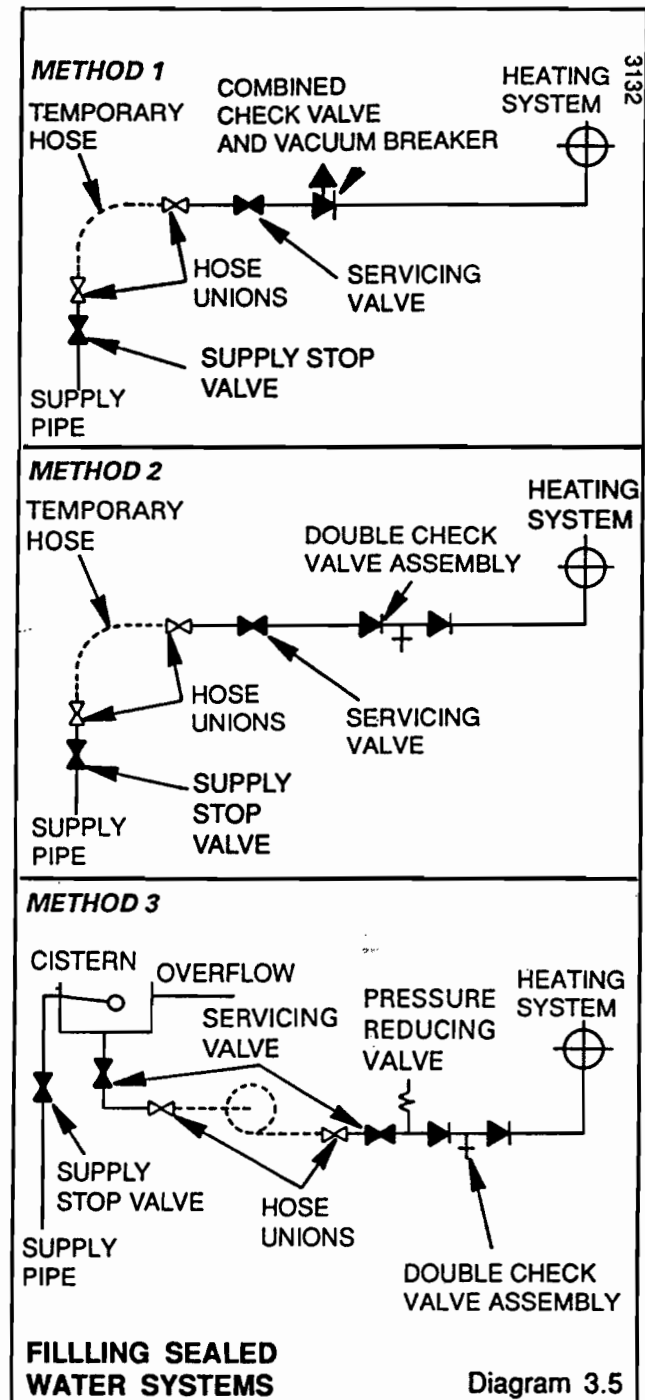
3.8 Water Make-up

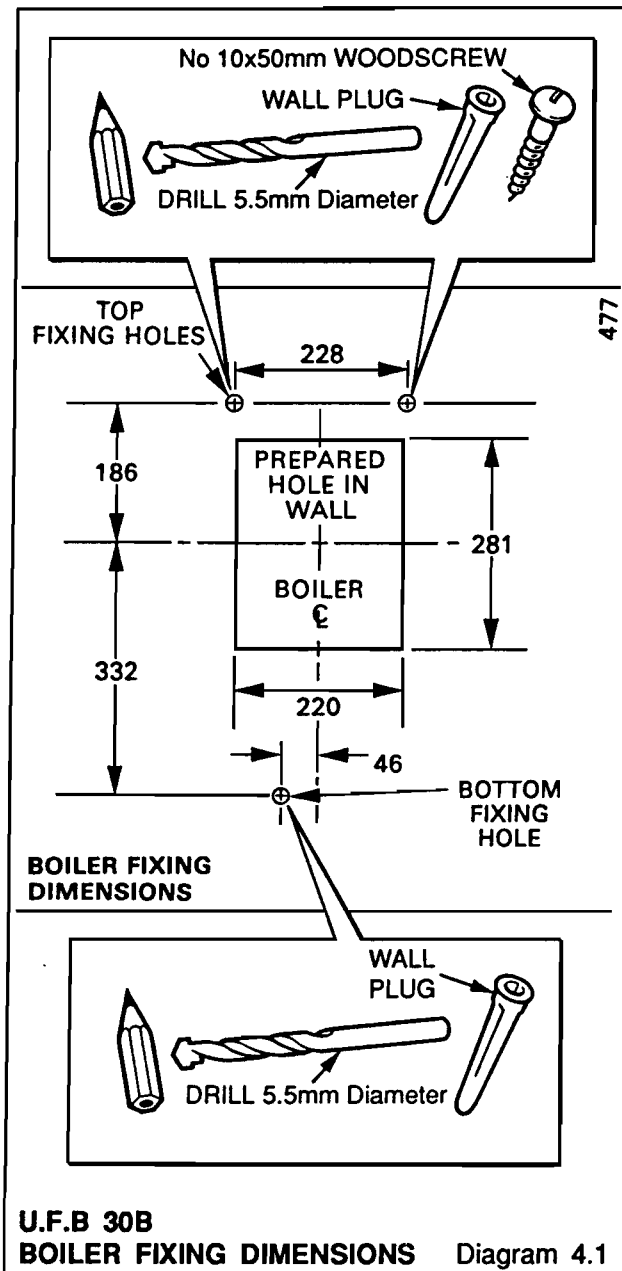
Provision must be made for replacing water lost from the system. A make up vessel or filling loop mounted above the highest point of the system and connected through a non-return valve to the system on the return side of either the hot water cylinder of heating system.

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

3.10 Filling a Sealed Water System

Provision for filling the system at low level must be made. Three methods are shown in diagram 3.5. There must be no permanent connection to the mains water supply, even through a non-return valve.





4.1 Unpacking

Open the carton, check the items supplied against the boiler pack contents list on the carton flap and diagram 1.2.

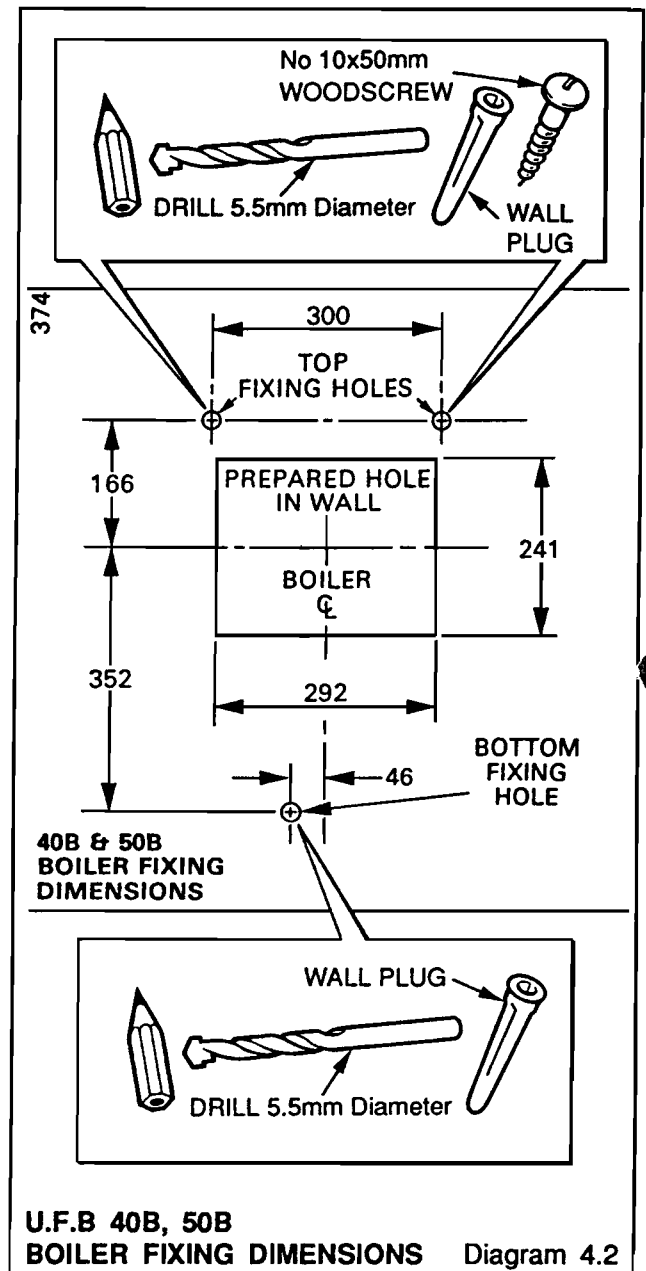
Place the boiler and casing pack to one side, until required.

4.2 Positioning

Place the template, provided, on the wall in the required position and mark location of the balanced flue hole, see diagram 4.1, UFB30 and 4.2 UFB40 and UFB50.

Cut the hole in the wall to accept the wall liner, see diagram 4.1, (UFB30), 4.2 (UFB40 and UFB50).

Make good any plasterwork at this stage. When dry, select the liner "G" from the balanced flue



terminal pack., see diagram 4.3 (UFB30) 4.4 (UFB40 and UFB50). Push into the hole until the flange is flush with the wall. Fit the liner "B" from inside so that it is flush the outside brickwork. Mark the two liner positions, then remove them both. 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.

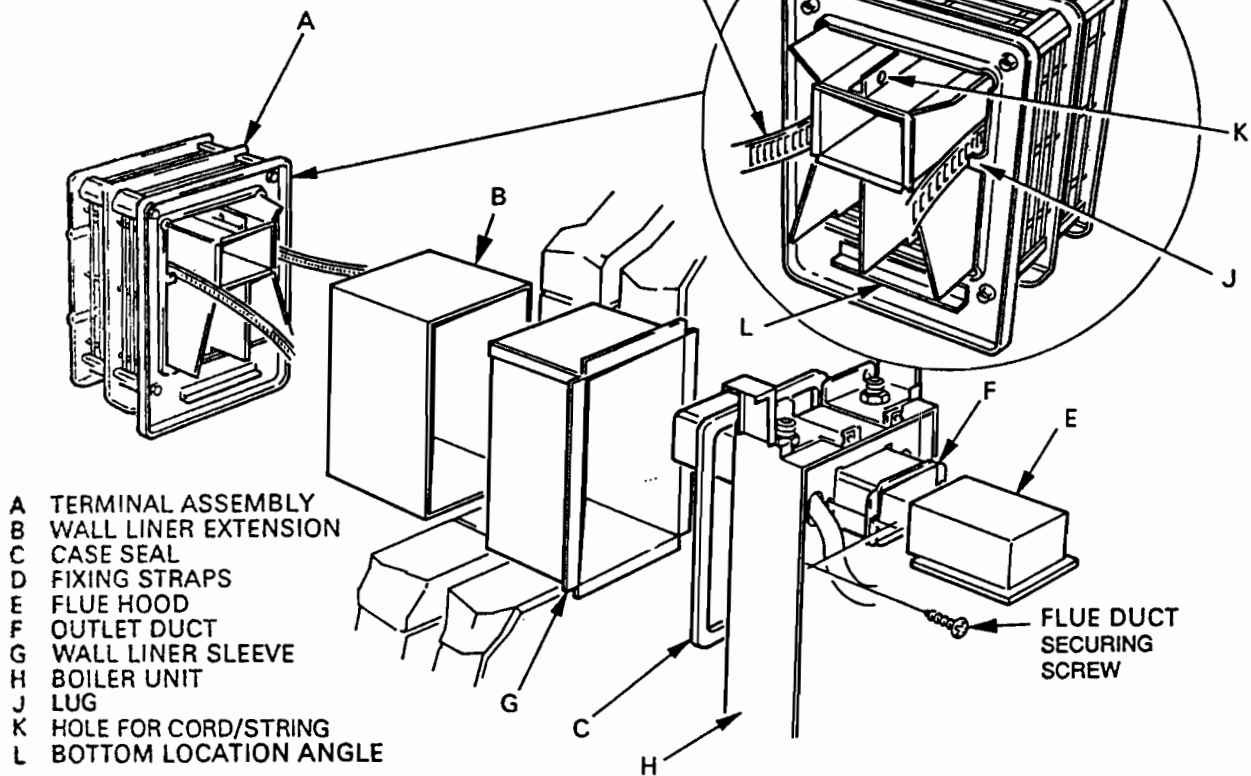
Reposition the template on the wall in line with the wall opening, or see diagram 4.1, (UFB30), 4.2 (UFB40 and UFB50).

Mark positions for the three fixing screws.

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

4 Flue and Appliance Preparation

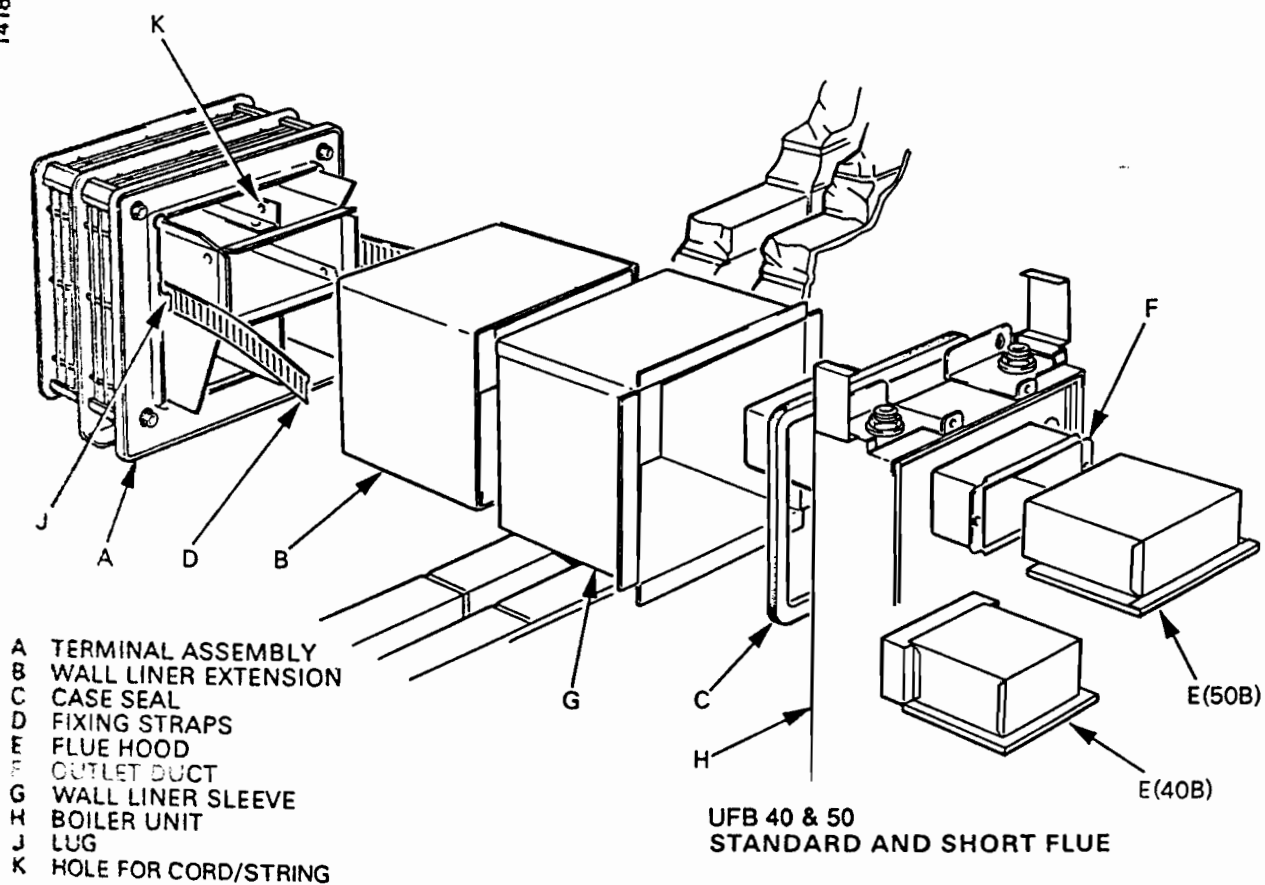
2438



U.F.B 30B STANDARD AND SHORT FLUE

Diagram 4.3

1418



U.F.B 40B , 50B STANDARD AND SHORT FLUE

Diagram 4.4

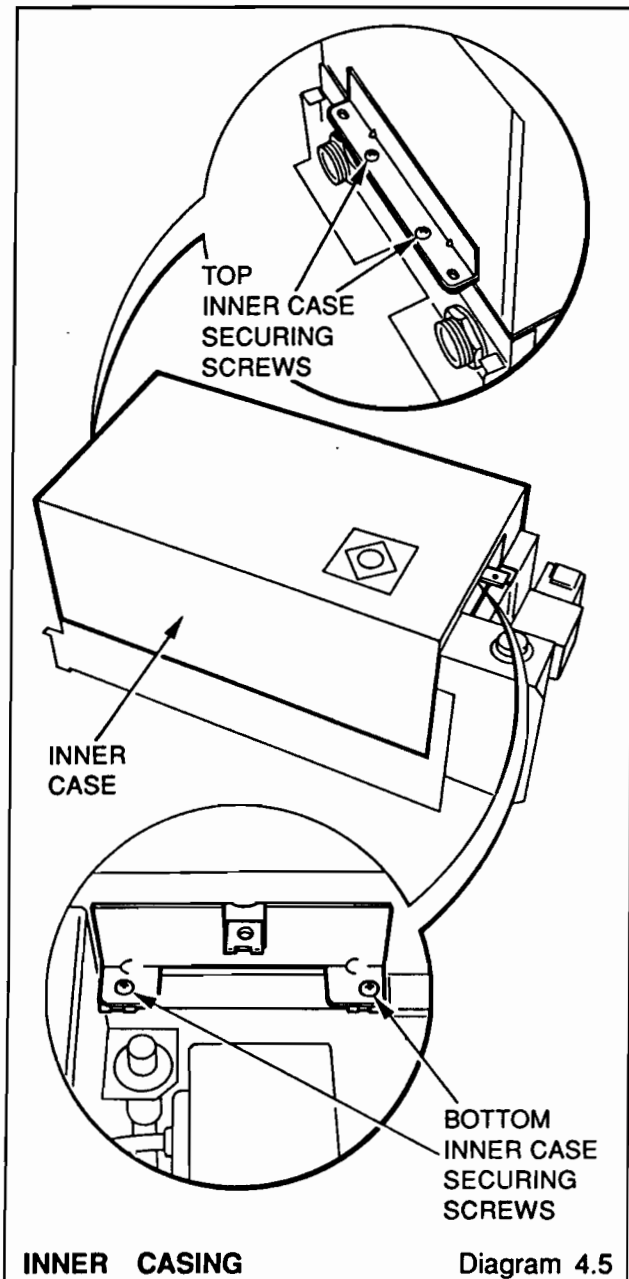
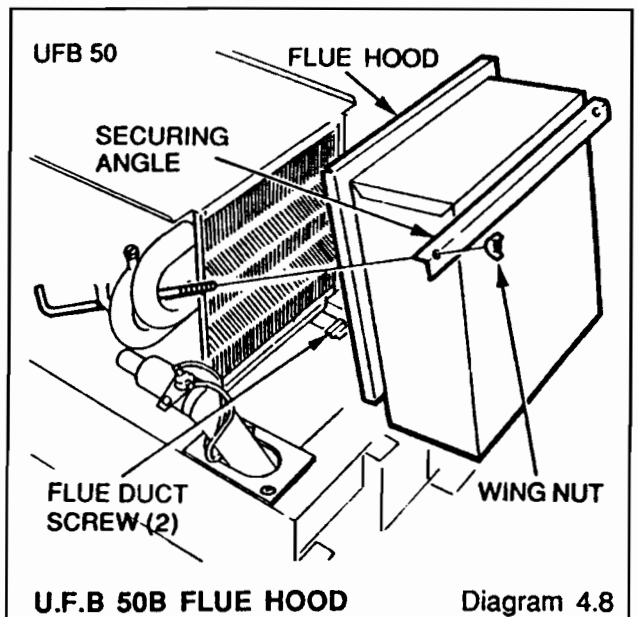
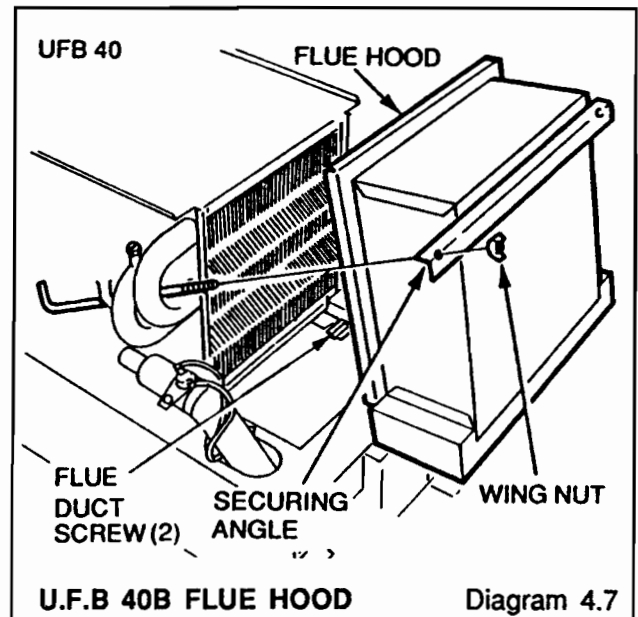
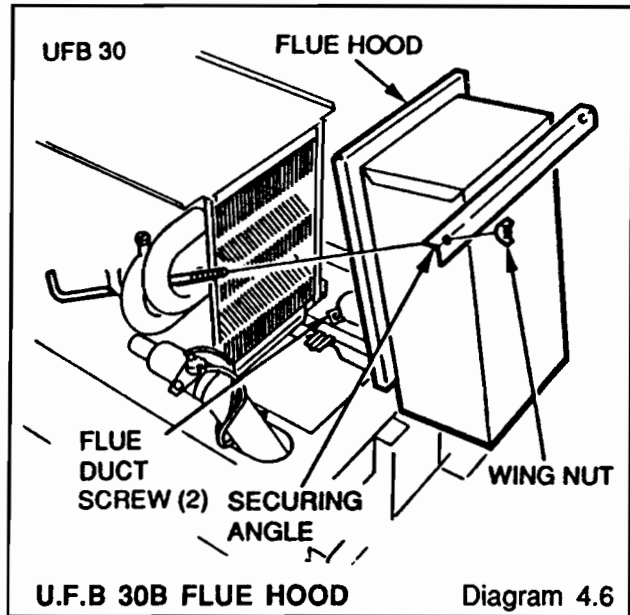
4.3 Appliance Preparation

Remove the inner case by undoing the screws at the top and bottom, see diagram 4.5.

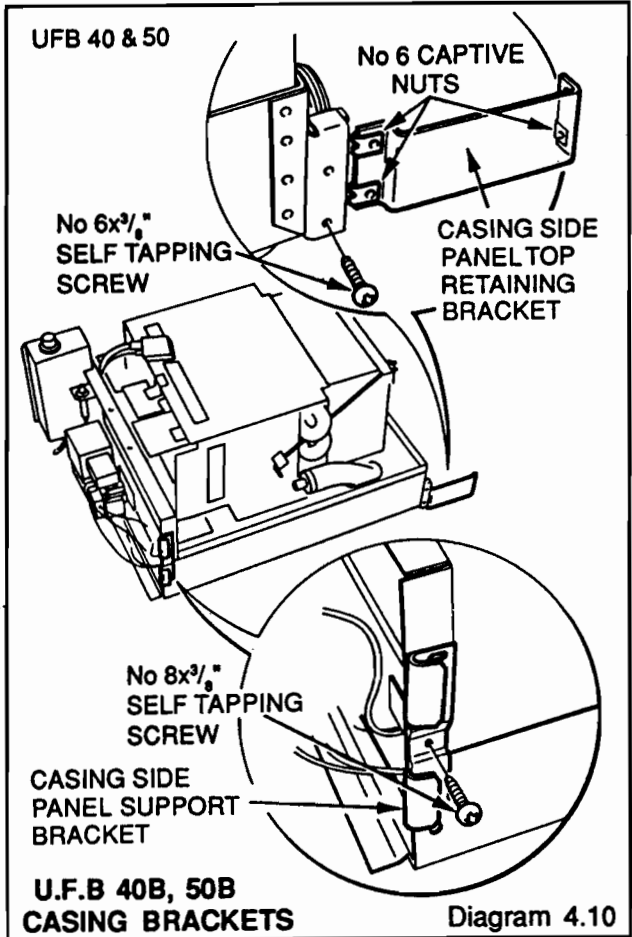
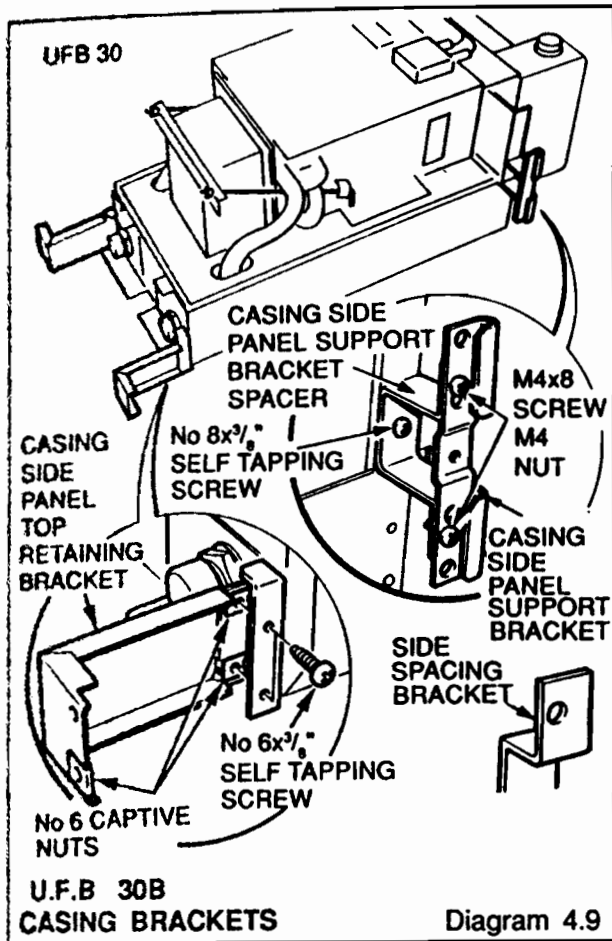
Remove the flue hood by releasing the wing nuts and remove angle, see diagram 4.6 (UFB30), 4.7 (UFB40) and 4.8 (UFB50). Lift off flue hood. Remove the two flue duct screws.

Fit sponge seal "C" around the spigot at the back of the boiler, adhesive face to the back of the case "H", see diagram 4.3 (UFB30) 4.4 (UFB40 and UFB50).

Fit the casing brackets, supplied in the fittings pack to the boiler as shown in diagram 4.9(UFB30), 4.10(UFB40 and UFB50).



4 Flue and Appliance Preparation



5.1 External Access Procedure

Remove the flue outlet duct "F" from the terminal "A", place on one side until required.

Fit the slotted straps "D" to the terminal "A" by placing over the lugs and then bending the lugs to secure, see diagram 4.3 (UFB30) 4.4 (UFB40 and UFB50).

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, see diagram 5.1.

Locate and support the terminal note, TOP is marked, see diagram 4.3 (UFB30) 4.4 (UFB40 and UFB50).

An alternative method of support is to attach a length of cord or string etc., to the terminal through the small hole in the top centre of the baffle, see diagram 4.3 (UFB30), 4.4 (UFB40 and UFB50). Attach a suitable weight to the free end of the cord etc. Pass the weight and cord through the hole in the wall.

Working from the inside, attach the straps to the lugs on the boiler, see diagram 5.2, bend the lugs and cut off excess strap length.

Push the flue duct "F" into the terminal with the unflanged end against the terminal. Ensure 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 tighten, see diagram 5.2.

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

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

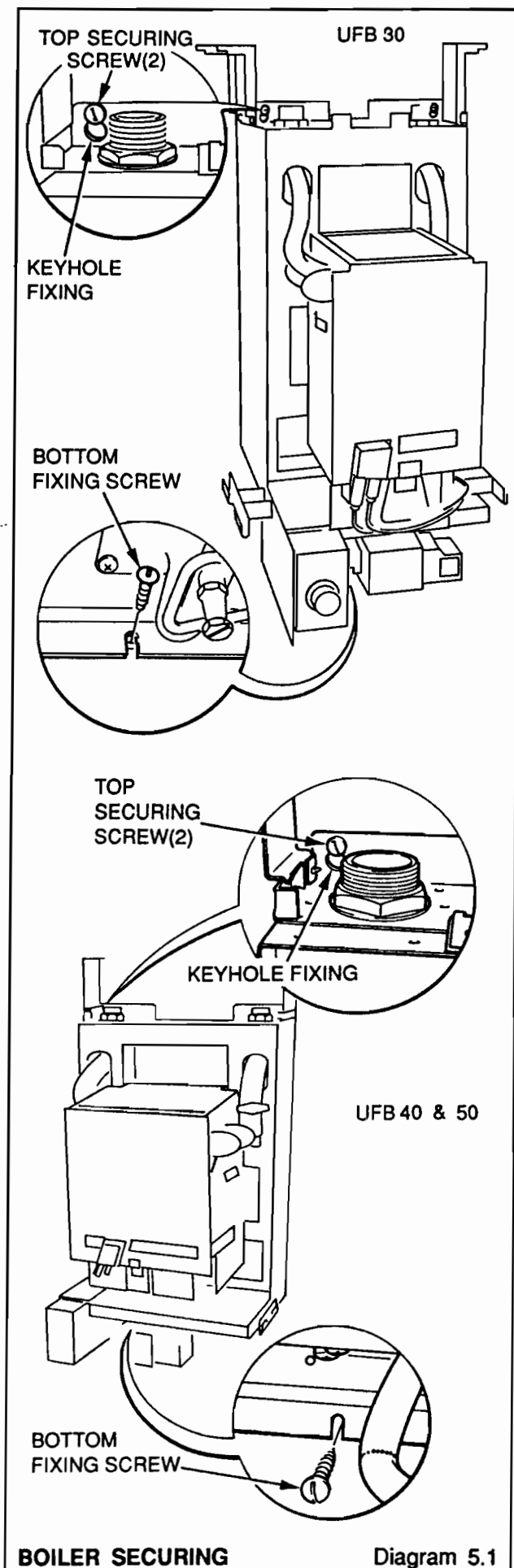
5.2 Internal Access Procedure

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 4.3 (UFB30), 4.4 (UFB40 and UFB50).

Fit the top two fixing 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.



5 Installation

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 air 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 boiler, see diagram 5.2, bend lugs to secure. Cut off excess strap length and remove cord.

Push the flue duct "F" into the terminal with the unflanged end against the terminal. Ensure 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.

Sealing plates are not fitted to the UFB30 and UFB40 models.

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

5.3 Installing the Long Flue Set

Refer to diagram(s) 5.3 (UFB30), 5.4 (UFB40 and UFB50).

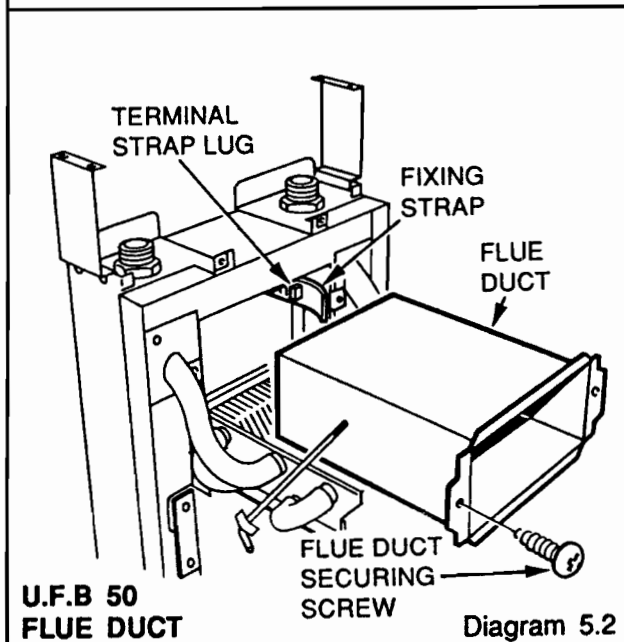
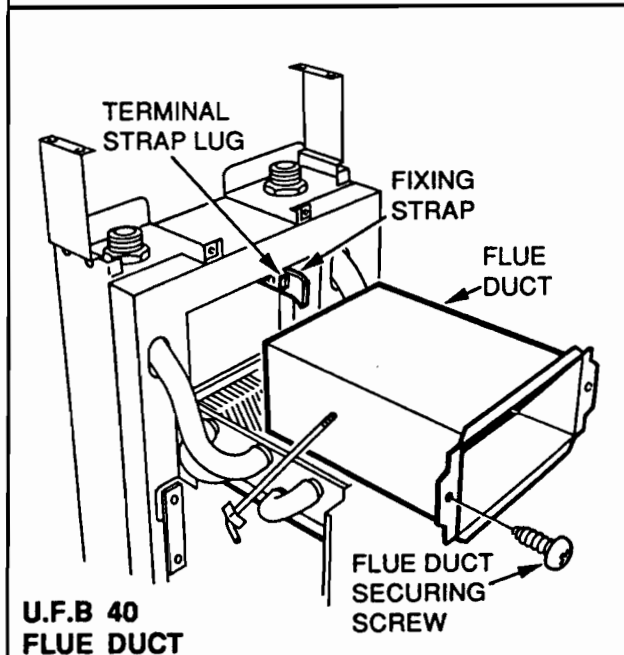
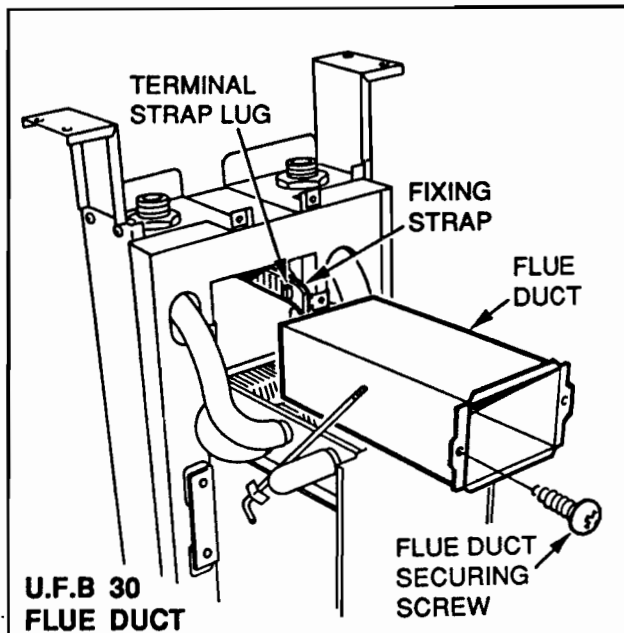
The flue duct "F", flue duct extension "K" and flue duct sleeve "J" need to be assembled together to suit wall thickness.

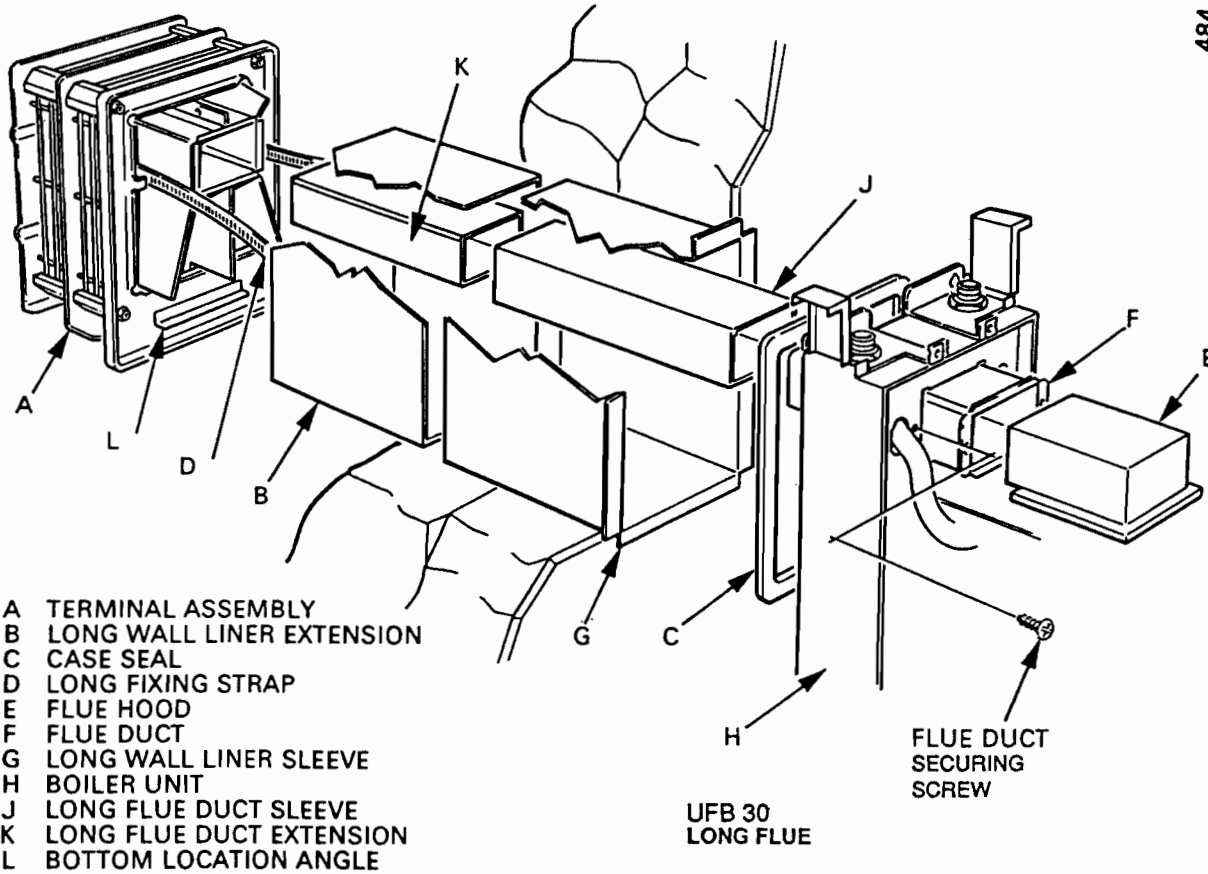
This assembly is 75mm longer than the wall liner assembly "B" and "G" already prepared, with a minimum overlap of 40mm at each joint. Use the tape provided to make a permanent assembly of these parts.

Push the flue duct assembly into the terminal with the unflanged end entering the terminal. Ensure 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 tighten.

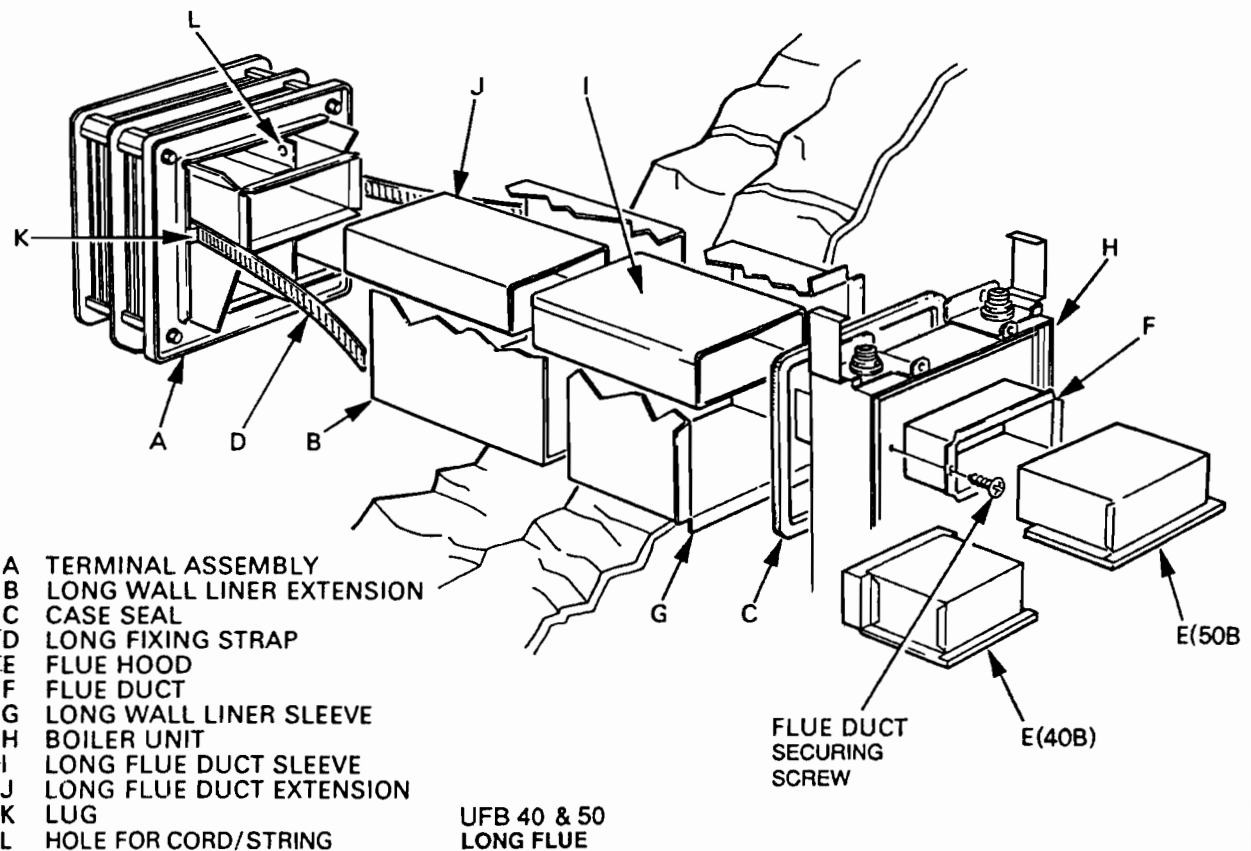
Replace the flue hood, securing angle, tie rods and wing nuts, do not overtighten.





LONG FLUE U.F.B 30B

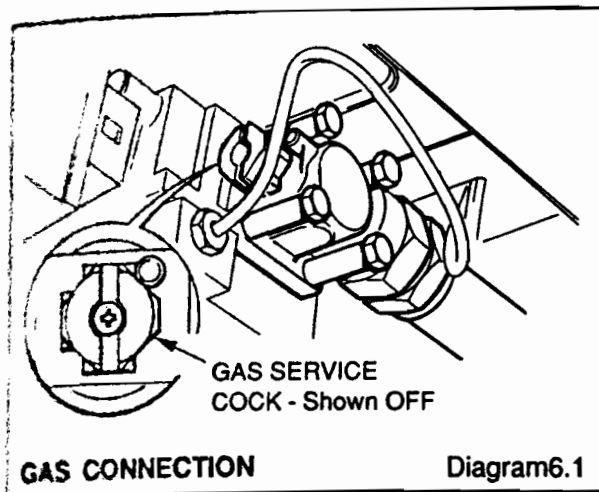
Diagram 5.3



LONG FLUE U.F.B 40B, 50B

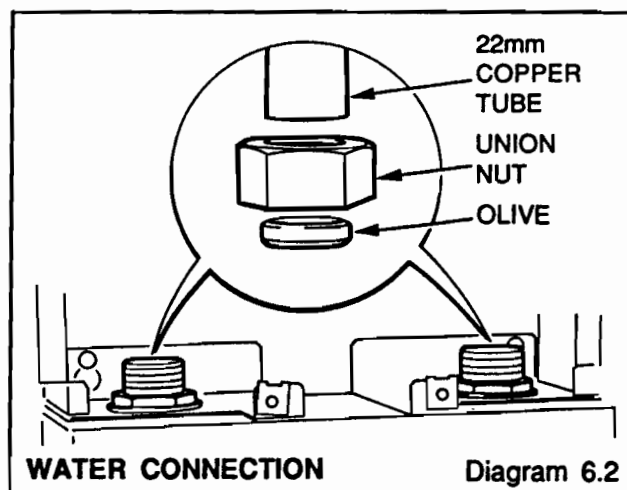
Diagram 5.4

6 Gas and Water Connection



Connect the gas supply to the Rc $\frac{1}{2}$ gas cock, see diagram 6.1.

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



Connect the boiler using the nuts and olives supplied to BS2871 copper tube, see diagram 6.2.

7 Electrical Wiring

The 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 backward to disengage the hinge at the rear see diagram 7.1. Take care not to damage the thermostat and capillaries.

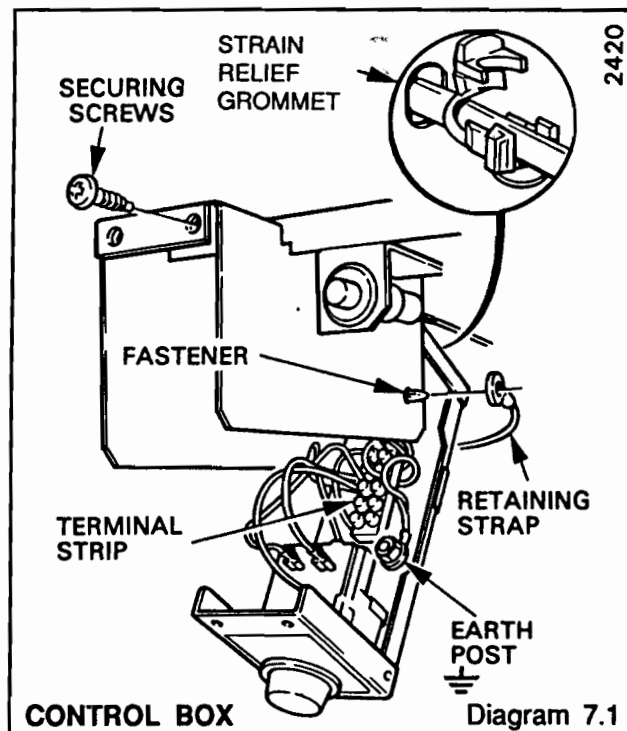
Thread the mains lead through the centre bottom grommet in the rear of the controls cover, through the clamp and connect to the terminal strip, see diagram 7.2.

Standard colours are, brown - live (L), blue - neutral (N) and Green/Yellow earth (E) or ∇

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

Make sure the cable is suitably secured.

When making connections, ensure 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.



7.2 Pump and External Controls Connections

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

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

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.

Ensure the supply cable and all external cables are secured.

7.3 Testing

Checks to ensure electrical safety must 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 on mains cables.
2. Test earth continuity and short circuit of all cables.
3. Test the polarity of the mains.

The installer is requested to advise and give guidance to the user of the controls scheme used with the boiler.

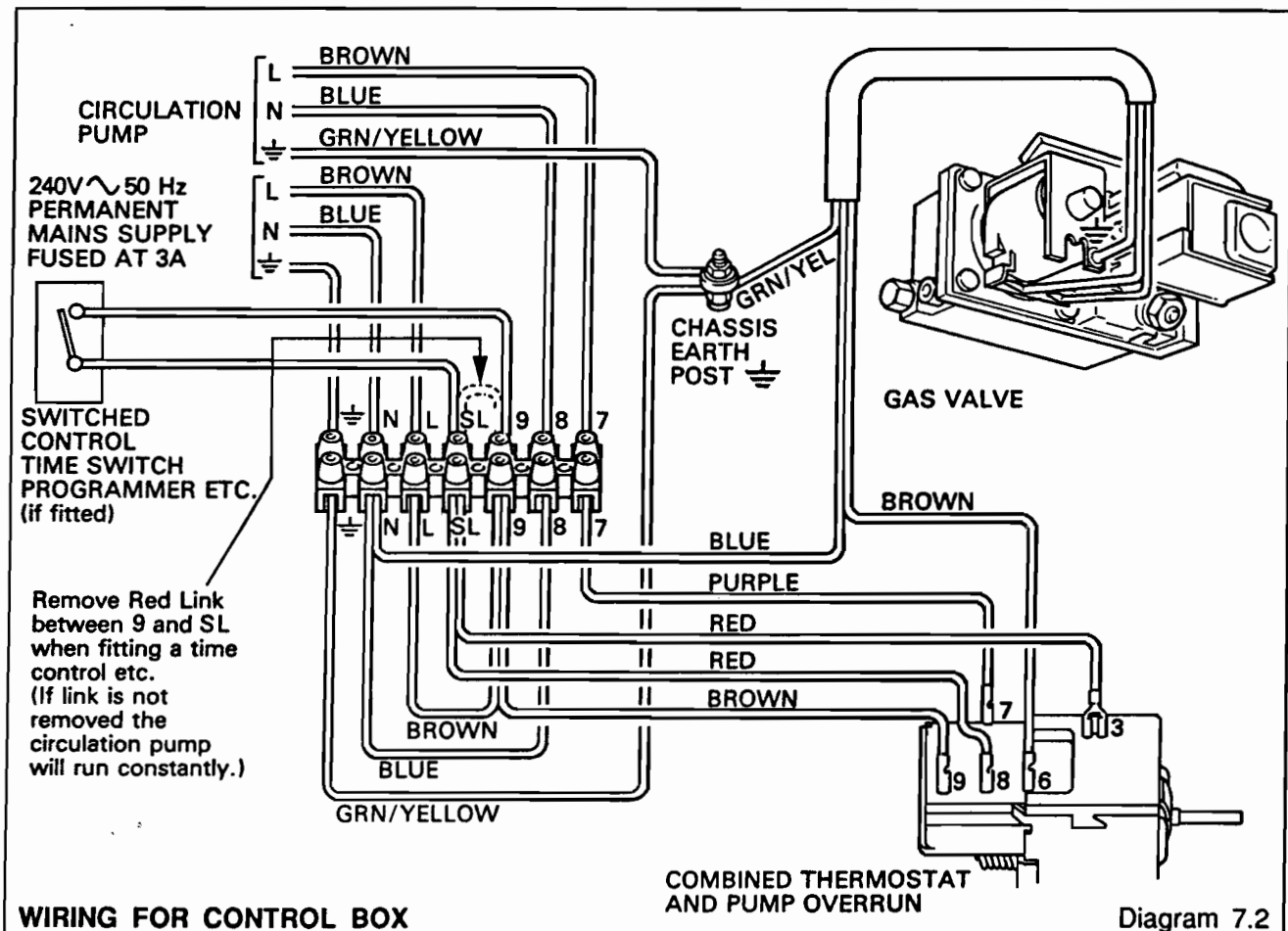


Diagram 7.2

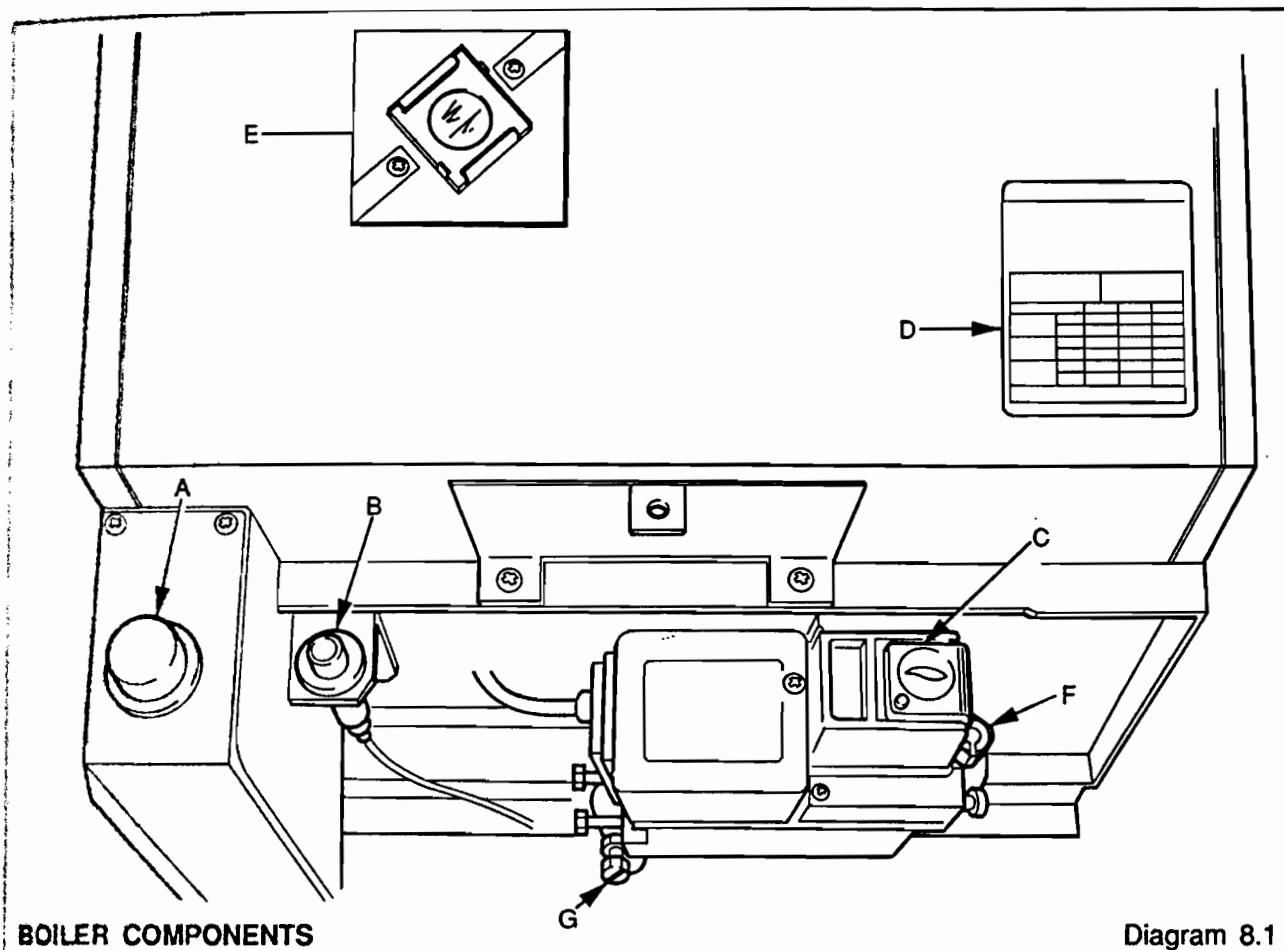


Diagram 8.1

8.1 All systems

Ensure that the system has been thoroughly flushed out with cold water without the pump in place. Refit the pump, fill the system with water, ensuring that all the 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 Systems Only

Flush the whole system with cold water without the pump in place. Refit the pump and fill until the pressure gauge registers 2.7bar (40lbf/in²). Clear any air locks 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 ± 0.3 bar (± 4.3 lbf/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

Identify the control by reference to diagram 8.1.

Turn boiler thermostat to "O" the off position. Remove gas pressure test point screw "G" and fit a suitable pressure gauge.

Turn the electrical supply on and check that the pump is circulating water through the unit.

Open all windows and extinguish any naked lights, pipes cigarettes etc.

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

Turn boiler gas service cock "F" to "On".

Depress control button "C", keep pressed in and at the same time operate the piezo unit button "B" until the pilot burner lights. After the pilot burner lights keep the button "C" depressed 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. (If the pilot still fails to remain alight refer to Fault Finding Section 12.7). Check the length of the pilot flame, it should envelop the thermocouple tip as shown in diagram 11.3. The pilot rate can be adjusted by turning a screw having first removed the gas valve cover by releasing the screw, see diagram 8.2.

8 Commissioning

Test pilot supply connections for gas soundness with a suitable leak detection fluid.

Refit the inner case with the screws previously removed.

Make sure that the pilot is alight and stable, view through window "E".

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

To set the burner pressure operate the boiler for 10 minutes, remove the gas valve cover, if not already removed, adjust the gas rate screw, see diagram 8.2 until the required pressure is obtained, see relevant Table 1 for setting pressures.

Align and attach the self adhesive arrow from the loose items pack, in the appropriate space beneath the "MIN" and "MAX" column on the Data badge.

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 the pressure gauge and refit the screw, ensure 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 to ensure that the gas valve shuts down within 60 seconds.

8.5 Flushing

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

The system should then be turned off and drained rapidly whilst hot.
Refill the system and vent all air as before.

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 only with one radiator in the main living area operating. The valve should be gradually opened to achieve a flow rate of:

7.8 Litre minute (1.7 gal/min) - UFB30

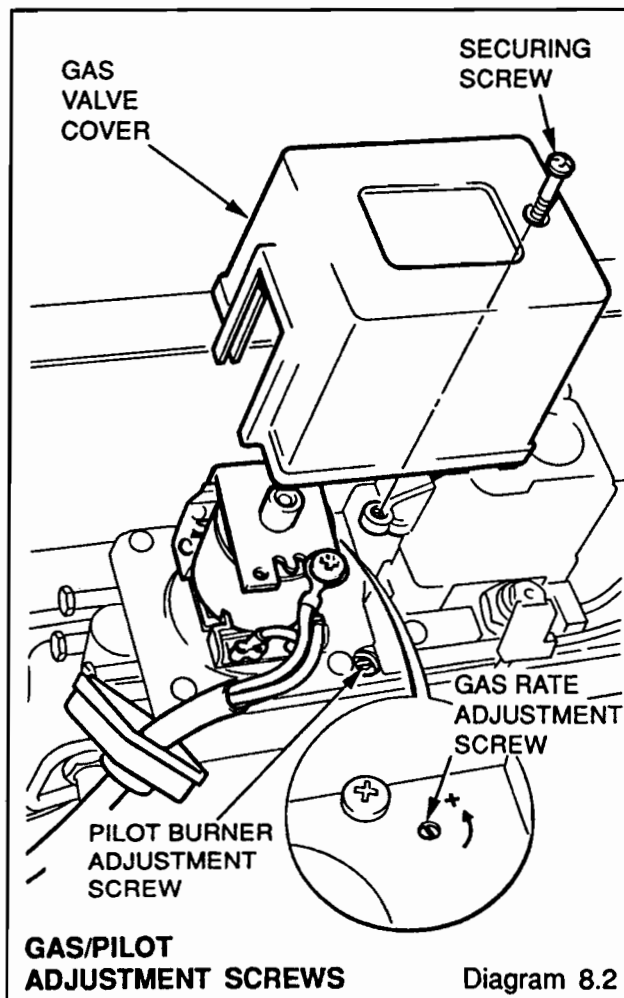
15.3 Litre/min (3.4 gal/min) - UFB40

19.2 Litre/min (4.2 gal/min) - UFB50

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.

If thermostatic radiator valves are fitted care must be taken to ensure an adequate flow rate through the boiler when the valves close.



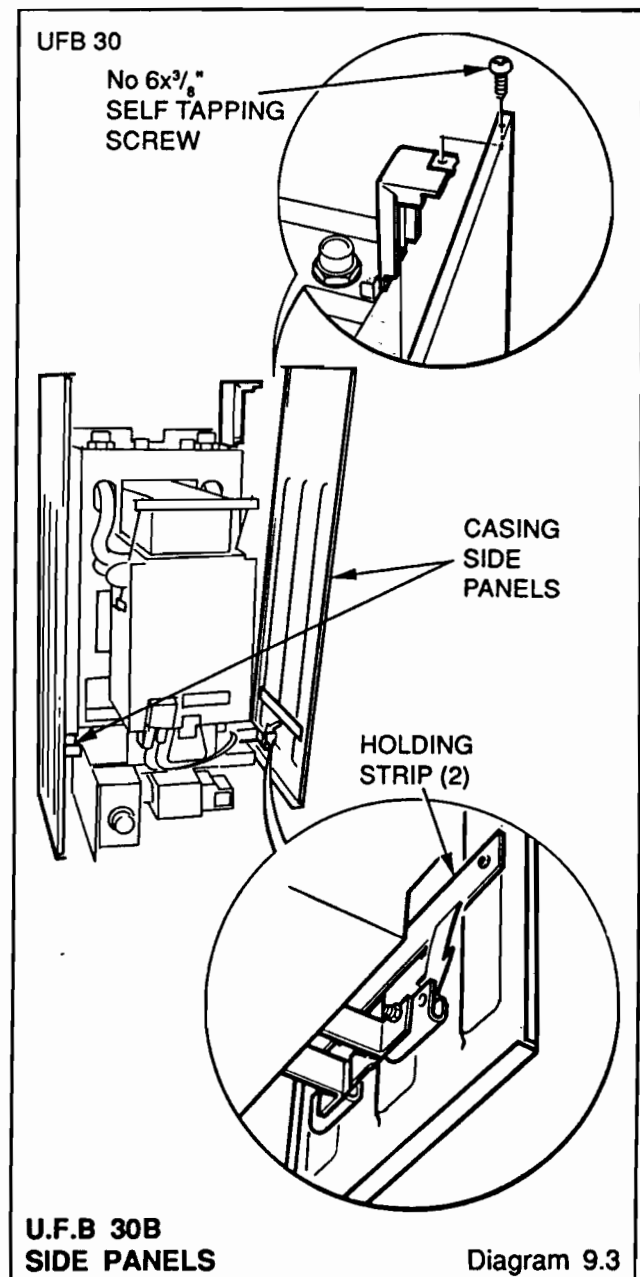
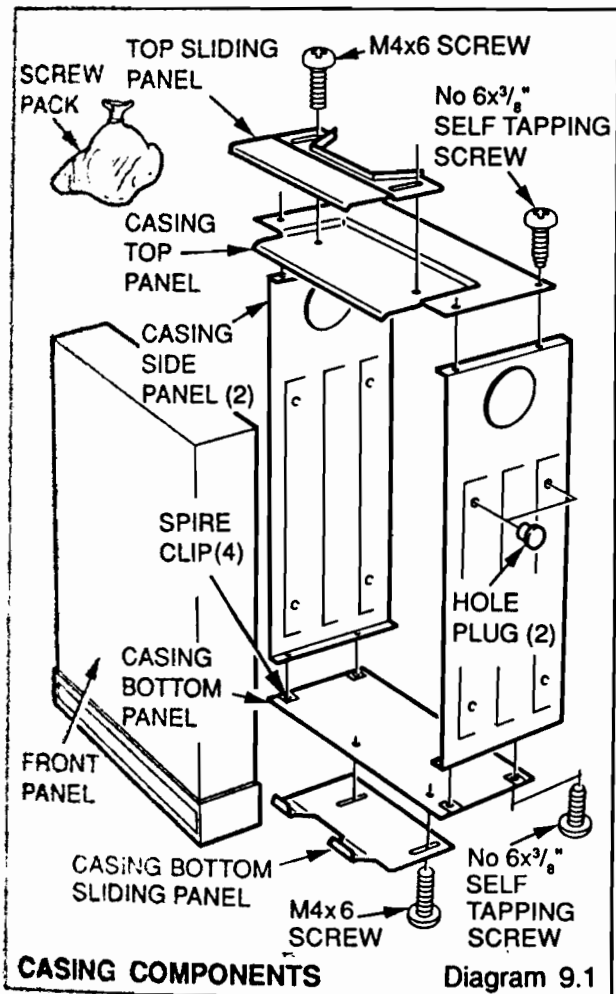
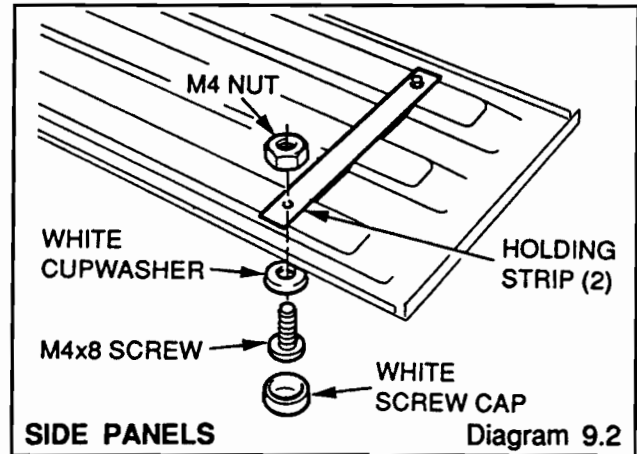
9 Casing

For casing assembly components, see diagram 9.1 and then proceed as below:

Fix the holding strip to the side panel(s), see diagram 9.2.

Fix the hole plugs, see diagram 9.1

Fix the casing side panels as shown in diagram, 9.3 (UFB30) and 9.4 (UFB40 and UFB50).

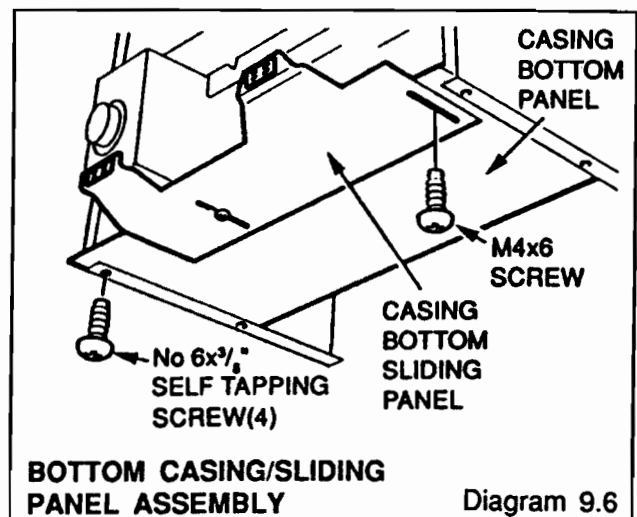
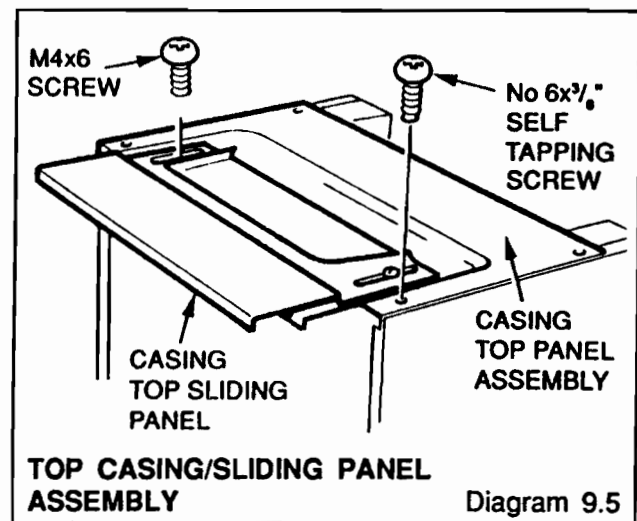
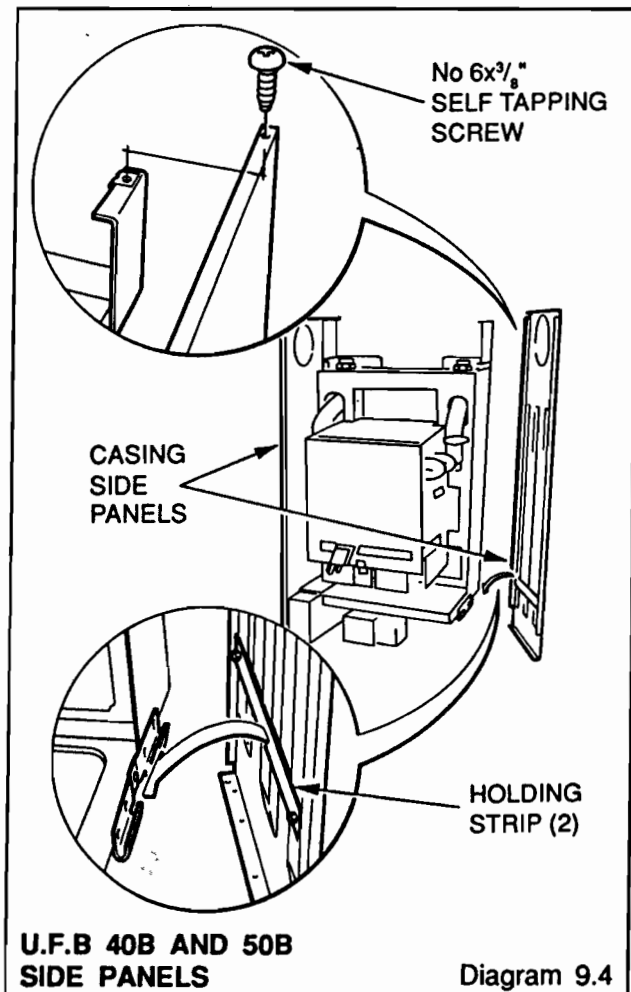


9 Casing

Fit the top and bottom casing panels as shown in diagram 9.5 and, 9.6.

Adjust to suit installation requirements as shown in diagram 9.7

Adjust the front panel to suit installation requirements as shown in diagram 9.8.



'D' IS DIMENSIONED FROM THE WALL FACE.

'D' - 2mm

CASING TOP SLIDING PANEL

'D'

CASING BOTTOM SLIDING PANEL

'D' - 1mm

TOP AND BOTTOM SLIDING PANEL ADJUSTMENT

Diagram 9.7

Diagram 9.7

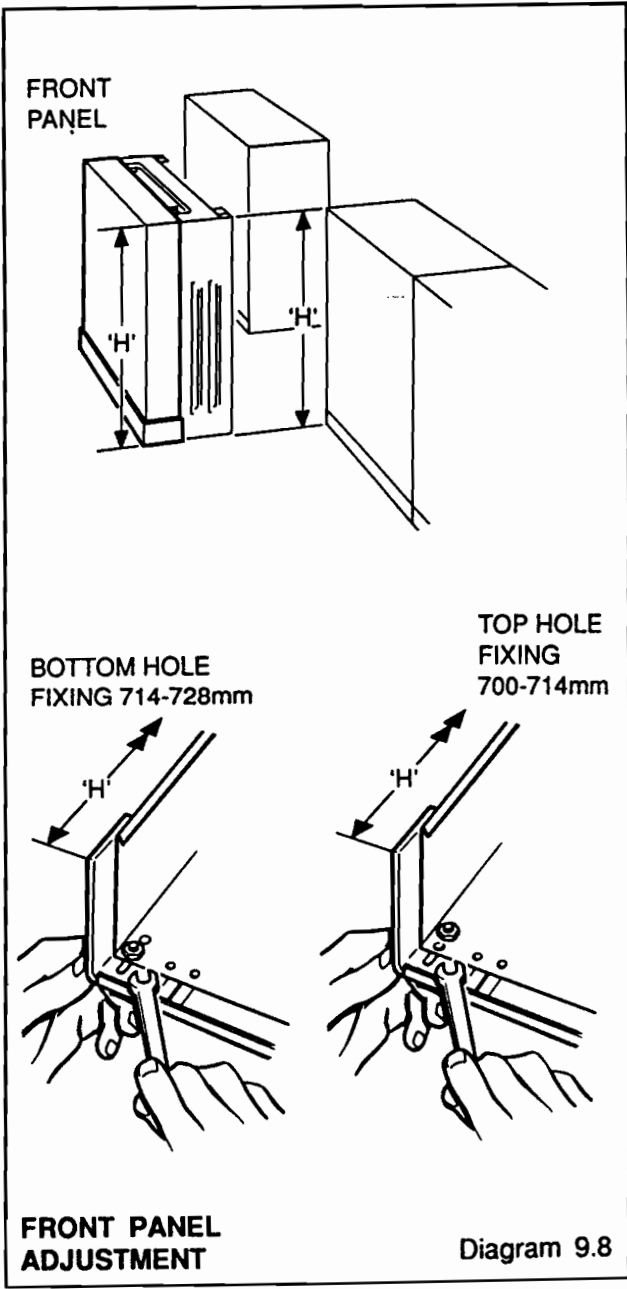


Diagram 9.8

10 Instruct User in the Correct Operation of the Boiler

Hand the User Instruction to the user for their retention.

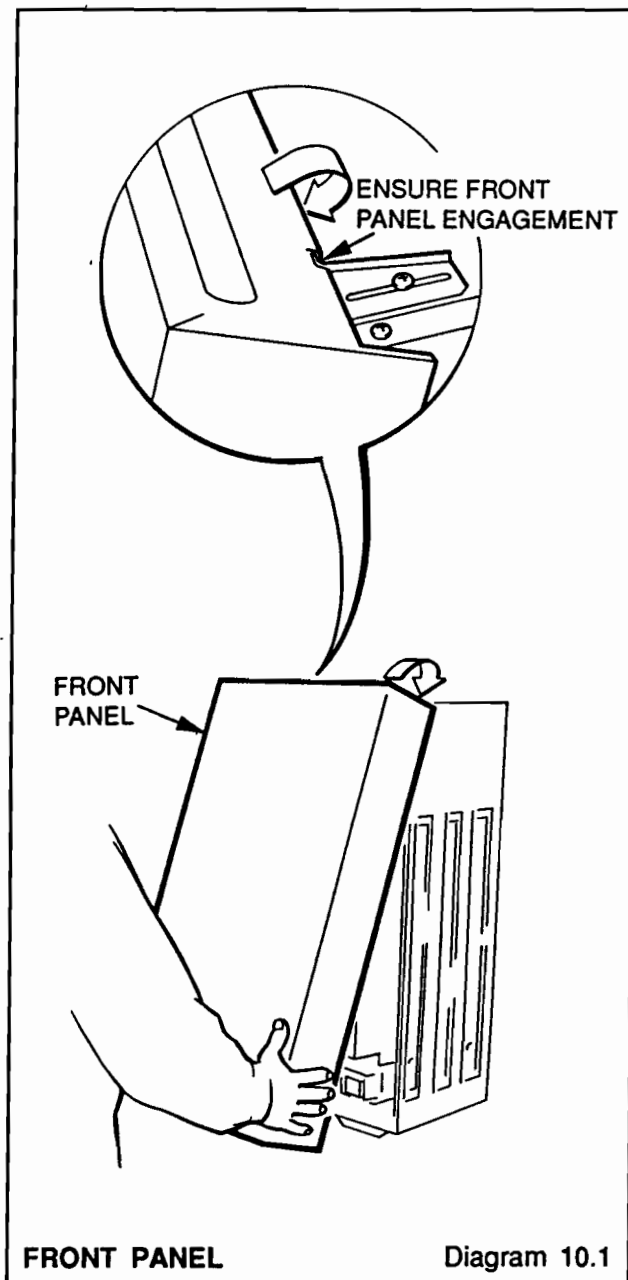
Instruct and demonstrate the safe and efficient operation of the boiler, heating system and domestic hot water system.

Fit the front panel, see diagram 10.1.

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 and usage, but in general once a year, at the end of the heating season should be enough.

It is the Law that servicing is carried out by a competent person.

Leave these instructions with the user for use during future service calls.



11 Servicing and Replacement of Parts

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.

11.1 Heating Body - Service

Remove front panel.

Remove inner case by releasing screws at top and bottom, see diagram 4.5.

To remove flue hood release wing nuts and lift off securing angle and flue hood, see diagram 11.1.

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 11.1.

Remove the two screws and washers securing the pilot burner and shield to the main burner, see diagram 11.2.

Pull the pilot assembly forward enough to allow the main burner to be freed from the injector. Raise the burner up at the front, with draw forward. Take care not to damage the insulation and the pilot burner and electrode assemblies. Place a sheet of paper in the combustion chamber and brush away any deposits. Remove paper.

11.2 Main Burner - Service

Generally follow instructions given in Section 11.1

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

DO NOT USE A BRUSH WITH METALLIC BRISTLES.

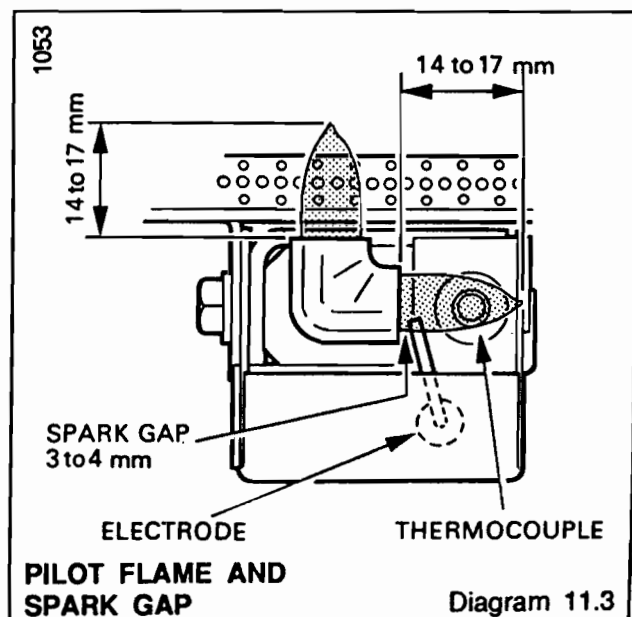
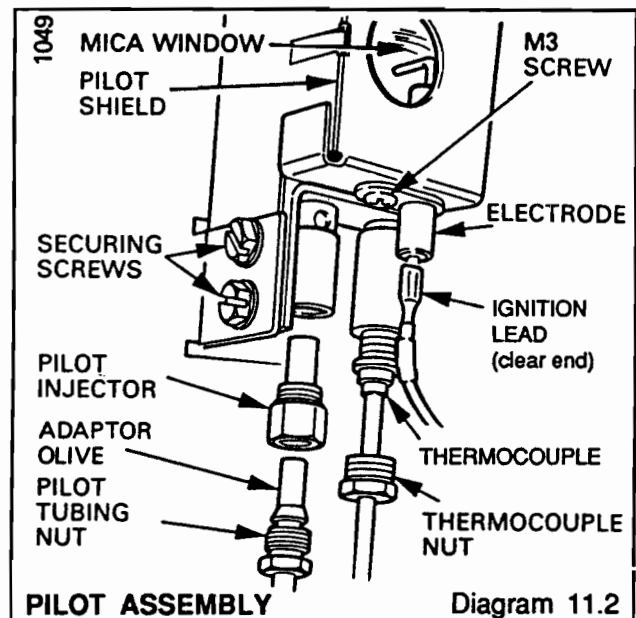
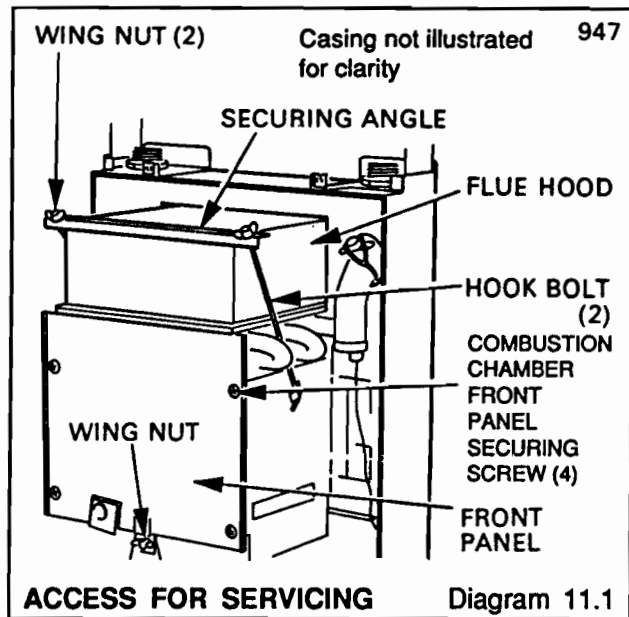
11.3 Main Injector

Generally follow instructions given in Section 11.1.

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 main burner ensure that it is pushed fully home onto the injector and that the guides are engaged on the injector manifold.



11.4 Pilot Burner and Injector

Generally follow the instructions given in Section 11.1.

With the front panel etc., 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 11.1.

Release the wing nuts securing the flue hood, see diagram 11.1.

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 11.2.

Remove pilot shield complete with electrode.

Unscrew thermocouple nut.

The pilot burner can now be lifted away.

Take care not to damage the electrode.

When replacing ensure that the spark gap is as shown in diagram 11.3.

11.5 Thermocouple

Generally follow the instructions in Section 11.1.

Release, but do not remove, the two screws securing the front and rear gland plates. Pull the front gland plate forward, see diagram 11.4. 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 at the gas valve. Check electrode spark gap, see diagram 11.3.

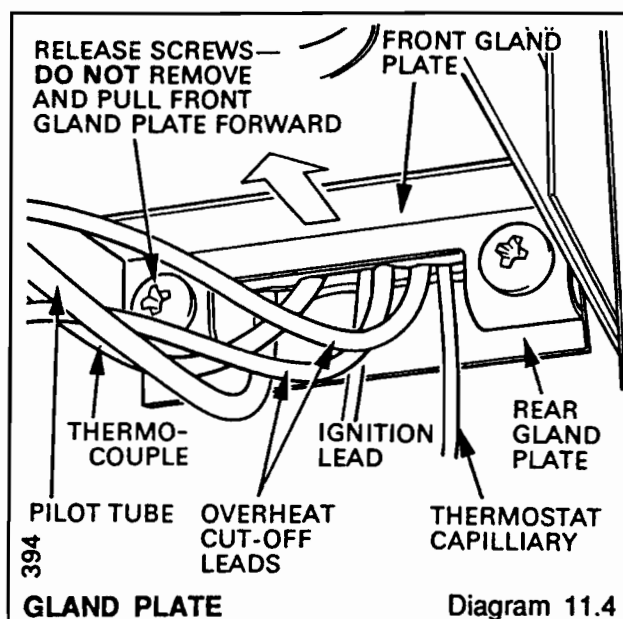


Diagram 11.4

11.6 Electrode

Generally follow the information under Section 11.4. Unscrew electrode from pilot shield.

When refitting check that the spark gap is as in diagram 11.3.

11.7 Overheat Cutoff

Generally follow the information under Section 11.5.

Remove the two screws securing the over heat cutoff to the clamp, see diagram 11.5.

Release connections at gas valve, see diagram 11.6.

Release but do not remove the two screws securing the front and rear gland plates, see diagram 11.4, 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 correctly located on the pipe.

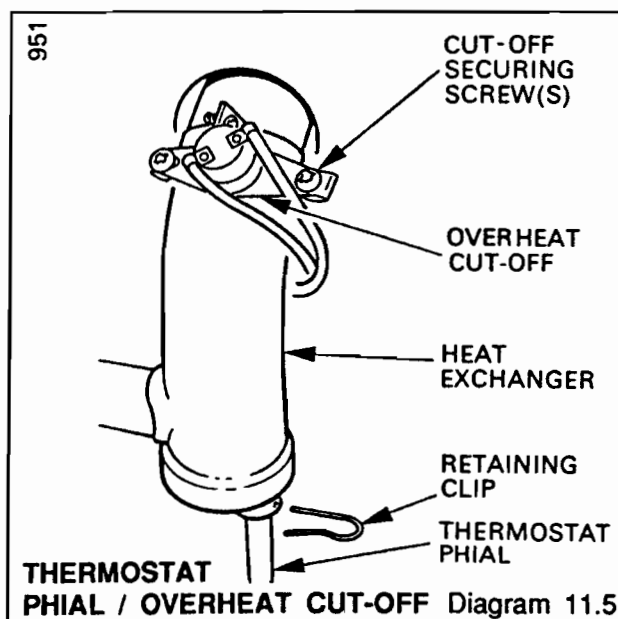


Diagram 11.5

11.8 Gas Valve

Remove front panel and if necessary the bottom casing panel.

Remove screw to release gas valve cover.

Disconnect all leads and pipes at valve, see diagram 11.6.

Undo the four screws each side of the valve to release the service cock and burner supply tube, take care not to damage the "O" rings, see diagram 11.6.

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

Remake all connections.

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 re-lighting - refer to Commissioning.

11.9 Electrical Control Box

Remove front and bottom casing panels.

Remove retaining clip from boiler thermostat phial pocket and withdraw the phial, see diagram 11.5.

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 toward 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 to ensure and ensure it is secured, with the retainer, in the pocket.

11.10 Piezo Unit

Remove front panel.

Disconnect ignition lead and remove backing nut from the piezo unit.

11.11 Ignition Lead

Remove the front panel and inner case.

Release, but do not remove, the two screws securing the front and rear gland plates. Pull the gland plates forward, see diagram 11.4.

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

11.12 Thermostat

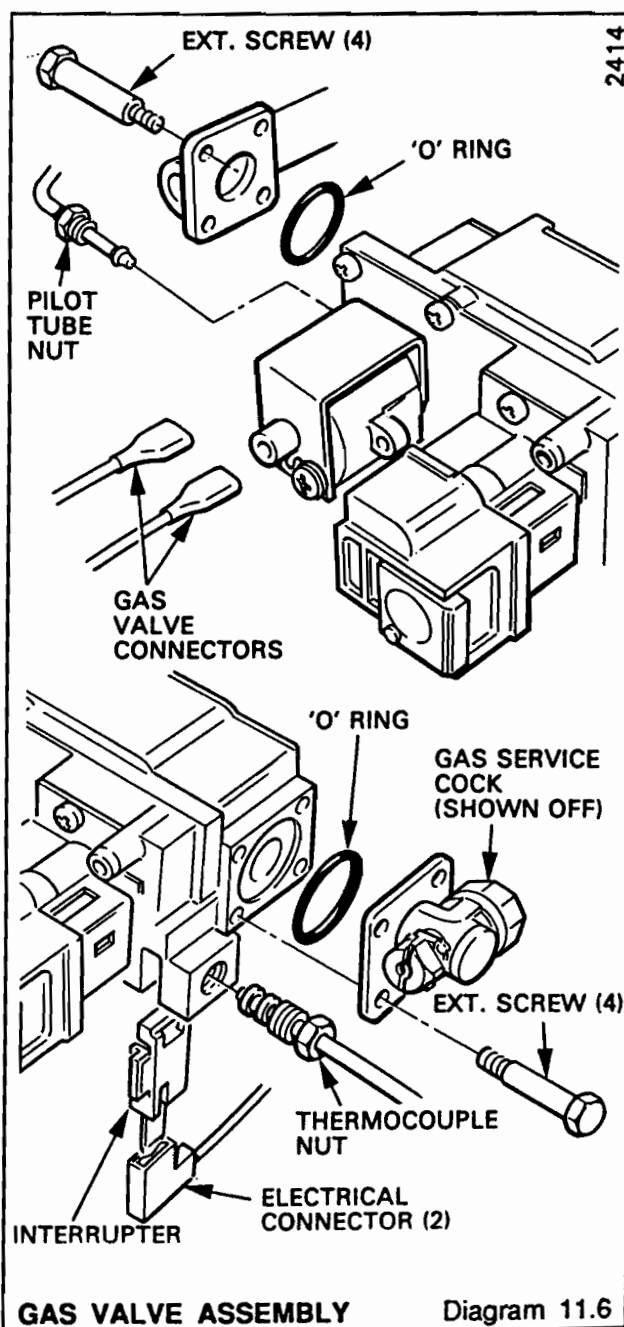
Remove front panel.

Remove and support the control box. See Section 11.9.

Remove The control knob and electrical connections from the 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 replacing smear the thermostat phial with the heat sink compound supplied, before replacing in the pocket.



FAULT AND CAUSE

REMEDY

12.1 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 overheating cutoff to operate _____ | Relight pilot |
| Overheat cut-off operating _____ | Refer to diagram 12.3. |
| Pump incorrectly wired _____ | Connect pump in accordance with diagram 7.2. |

12.2 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 12.9 |

12.3 Thermostat Will Not Cut Out

- | | |
|---|-----------------------|
| Thermostat phial not fitted into pocket _____ | Fit phial into pocket |
| Faulty thermostat _____ | Replace thermostat |

12.4 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 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 is satisfactory _____ | Change faulty heating body |

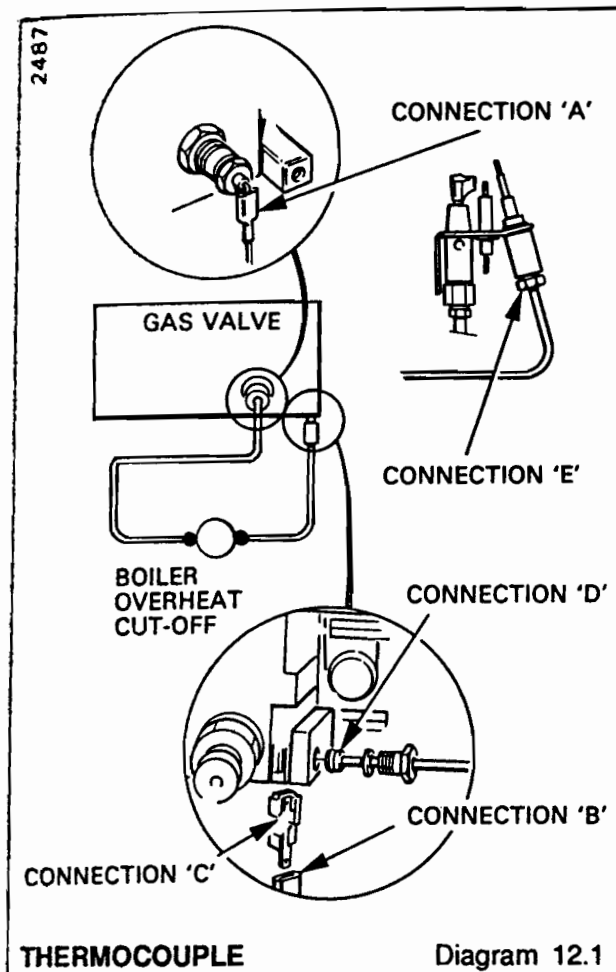
12.5 Insufficient Heat

- | | |
|--|---|
| 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 badge. Reset only if more than 10% away from required figure |

12.6 Appliance Noisy In Operation*

- | | |
|-----------------------------------|--|
| Overgassed _____ | Check burner pressure against data badge and adjust only if more than 10% away from stated required figure |
| Complete lack of water flow _____ | Check system controls for correct installation or correct type of controls |
| Air in system _____ | Remove air from system. When system first commissioned the air dissolved make 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 correctly set |

* 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



12.7 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.

Symptoms: The pilot burner fails to stay alight.

Test the thermocouple, overheat cutoff and thermocouple connectors, as described in Fault Finding Chart, 12.2.

Check the millivoltage of the thermocouple closed; circuit at points "A" and "E", see diagram 12.1.

This should be within the range 6 to 13mV.

Take the millivoltage drop reading and refer to thermocouple/overheat cutoff fault finding diagram 12.2.

THERMOCOUPLE AND BOILER OVERHEAT CUT-OFF FAULT FINDING

With the boiler cold, check connections of the thermocouple, boiler overheat cut-off and gas valve. Disconnect overheat cut-off connectors at points A and B at the gas valve, see diagram. Test continuity of the overheat cut-off. Is there continuity?

YES

Re-connect boiler overheat cut-off to points A and B. Disconnect thermocouple at point D of the gas valve. Test continuity between point C and the body of the gas valve. Is there continuity?

NO

Test continuity of thermocouple between inner connection point D and point E. Is there continuity?

YES

Thermocouple and boiler overheat circuit satisfactory.

NO

Faulty boiler overheat cut-off, renew.

YES

Faulty cut-off connectors into gas valve, either at A or C. Renew where faulty.

NO

Faulty thermocouple, renew.

2327

12.8 Electrical

Important: The preliminary electrical system checks contained in a Multimeter instruction book are the first 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, earth continuity, polarity and resistance to earth must be repeated.

To check the boiler thermostat and multi-functional control (gas valve), see diagram 12.3 and functional flow wiring diagram 12.4.

To check the thermostat pump over run circuit, see diagram 12.3 and functional flow wiring diagram 12.4.

12.9 Pilot

Refer to fault finding for pilot, see diagram 12.5.

ELECTRICAL FAULT FINDING

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

START

Isolate the supply. Gain access to the control box, check all connections etc. Restore supply. Using multimeter set at 240V.

Is there 240V between **L** and **N** ?

NO

Check incoming supply and fuses. Repair where required.

YES

Is there 240V between **9** and **N** ?

NO

Faulty Brown bridge wire between **L** and **9** Repair or renew.

YES

With Red Link removed between **9** and **SL** and Remote Controls Calling for Duty is there 240V between **SL** and **N** ?

NO

Faulty Remote Controls, inform customer.

YES

Is there 240V between **9** and **N** ?

NO

Faulty cable (BROWN) from terminal block to thermostat, repair or renew.

YES

Is there 240V between **8** and **N** ?

NO

Faulty cable (RED) from terminal block to thermostat, repair or renew.

YES

Is there 240V between **3** and **N** ?

NO

Faulty cable (RED) from terminal block to thermostat, repair or renew.

YES

Turn on thermostat. With appliance cold is there 240V between **6** and **N** ?

NO

Faulty thermostat, renew.

YES

Turn OFF thermostat. Is there 240V between **6** and **N** ?

YES

NO

Turn ON thermostat. Does main burner light?

YES

NO

Isolate supply. Remove gas valve cover. Restore supply. Is there 240V between 'L' and 'N' on gas valve?

NO

Faulty gas valve harness, renew.

NO

YES

Faulty gas valve, renew.

Turn ON thermostat. With appliance cold is there 240V between **7** and **N** ?

NO

YES

Turn OFF thermostat. Is there 240V between **7** and **N** ?

YES

Continued

Continued

Continued

□ MAIN TERMINAL STRIP

○ THERMOSTAT TERMINALS

2435

ELECTRICAL FAULT FINDING

Diagram 12.3

ELECTRICAL FAULT FINDING CONTINUED

```
graph TD; Start(( )) -- Continued --> Q1{Turn ON thermostat;  
Is there 240V between [7] and [N] ?}; Q1 -- YES --> Q2{Does pump run?}; Q1 -- NO --> A1[Faulty cable (PURPLE) between thermostat  
and terminal block, repair or renew.]; A1 -- Continued --> End(( )); Q2 -- YES --> Q3[With thermostat set to MAX allow appliance  
temperature to reach max.  
When appliance cuts out on temp. is there  
240V between (7) and [N] ?]; Q2 -- NO --> A2[Faulty pump, inform customer.]; A2 -- Continued --> End; Q3 -- YES --> Q4[With Remote Controls NOT Calling for Duty  
does pump stop when the appliance has  
cooled down?]; Q3 -- NO --> A3[Faulty thermostat, renew.]; A3 -- Continued --> End; Q4 -- YES --> EndState[CONTROLS IN ORDER]; Q4 -- NO --> J1(( )); J1 --> J2(( )); J2 -- YES --> EndState; J2 -- NO --> A3;
```

Continued

NO

Turn ON thermostat;
Is there 240V between [7] and [N] ?

YES

Does pump run?

NO

Faulty cable (PURPLE) between thermostat
and terminal block, repair or renew.

Continued

YES

With thermostat set to MAX allow appliance
temperature to reach max.
When appliance cuts out on temp. is there
240V between (7) and [N] ?

NO

Faulty pump, inform customer.

Continued

YES

With Remote Controls NOT Calling for Duty
does pump stop when the appliance has
cooled down?

NO

Faulty thermostat, renew.

Continued

YES

CONTROLS IN ORDER

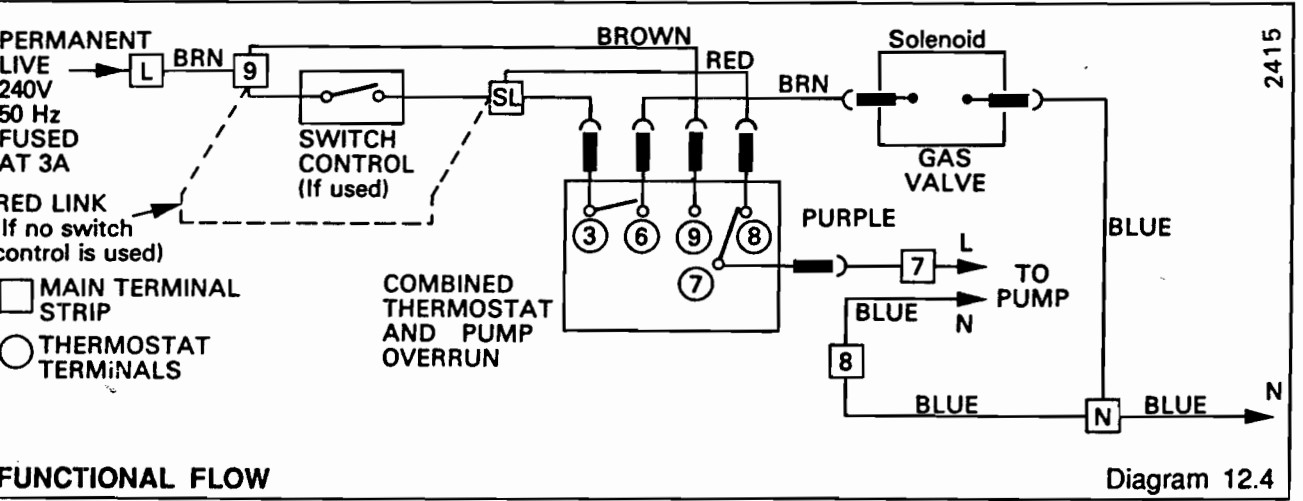
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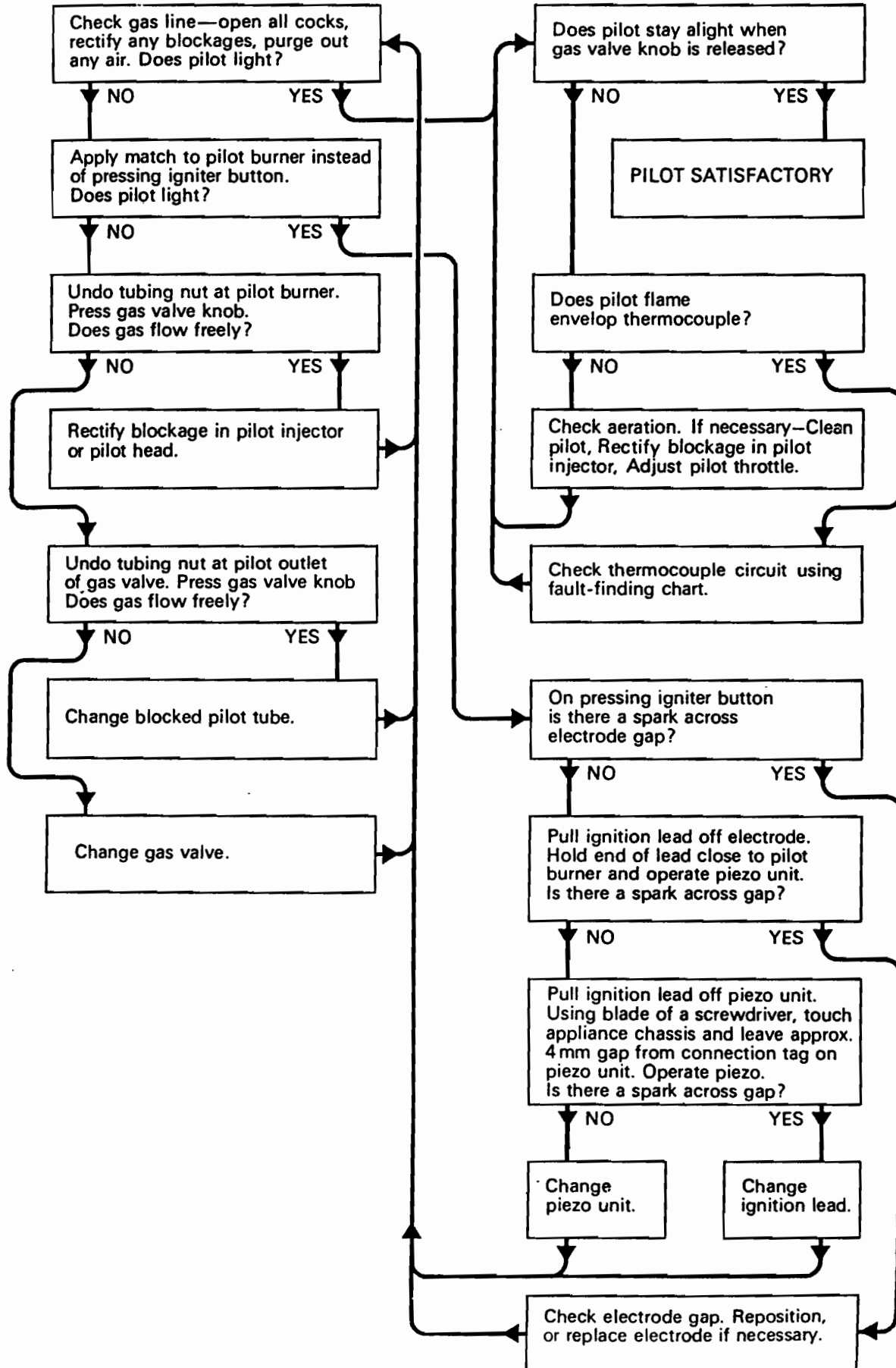
- [] MAIN TERMINAL STRIP
- () THERMOSTAT TERMINALS

Diagram 12.3 continued

ELECTRICAL FAULT FINDING (CONTINUED)

ELECTRICAL FAULT FINDING (CONTINUED) Diagram 12.3 continued

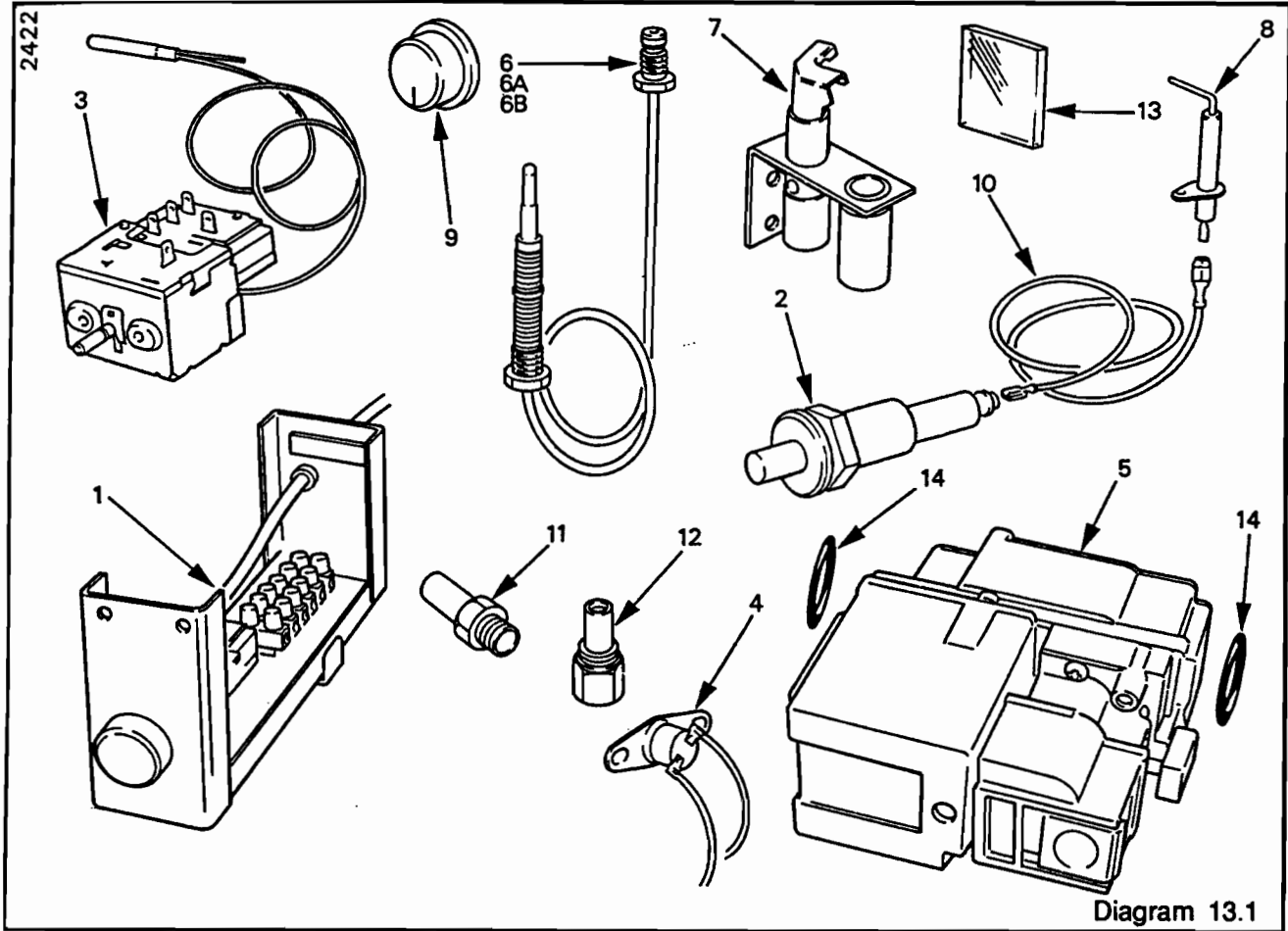


**PILOT WILL NOT LIGHT
START HERE**

BOILER PILOT FAULT-FINDING
Diagram 12.5

13.1 Ordering

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

Key	Part No	Description	GC Part
1	433504	Electrical control box	313 053
2	202700	Piezo unit	384 146
3	416189	Boiler thermostat assembly	384 145
4	800014	Over heat cutoff assembly	313 064
5	800015	Gas valve assembly inc 14	313 067
6	202412	Thermocouple	394 162
6	202413	Thermocouple	381 651
7	203415	Pilot burner - inc 12	394 161
8	202600	Electrode	384 189
9	416144	Thermostat knob	355 401
10	WW4606	Ignition lead	334 621
11	203011	Boiler injector - UFB30B 2.8	398 247
11	203004	Boiler injector - UFB40B 3.25	384 160
11	203002	Boiler injector - UFB50B 3.50	384 142
12	203509	Pilot injector	
13	411194	Sight glass	355 153
14	208040	"O" ring - for gas valve - 2 off	334 592



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