

Glow worm

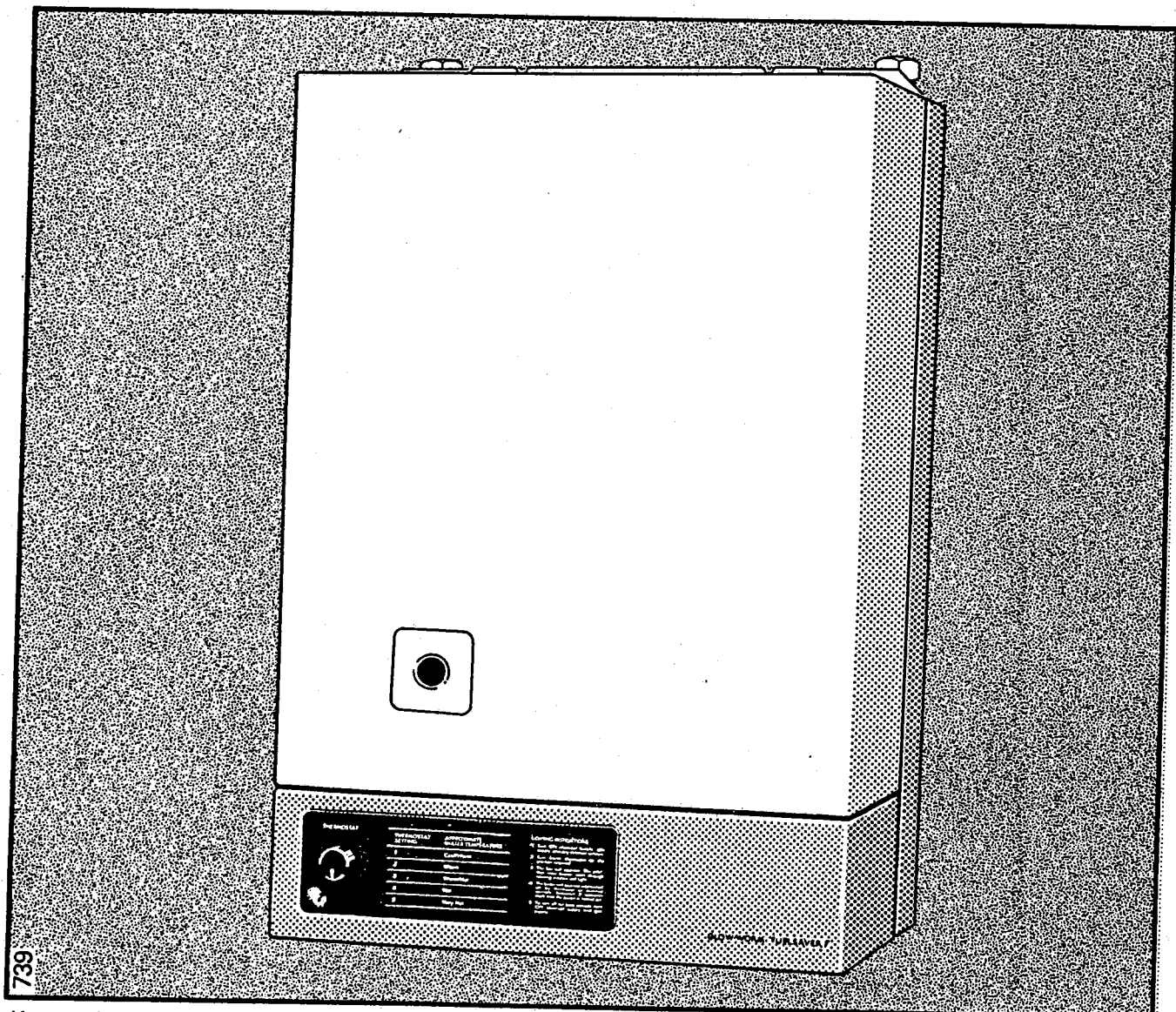
Installation & Servicing Instructions

To be left with the user

FUELSAVER 65F G.C Number 41 313 33

FUELSAVER 80F G.C Number 41 313 23

Fanned Flue Boilers



739

1 General

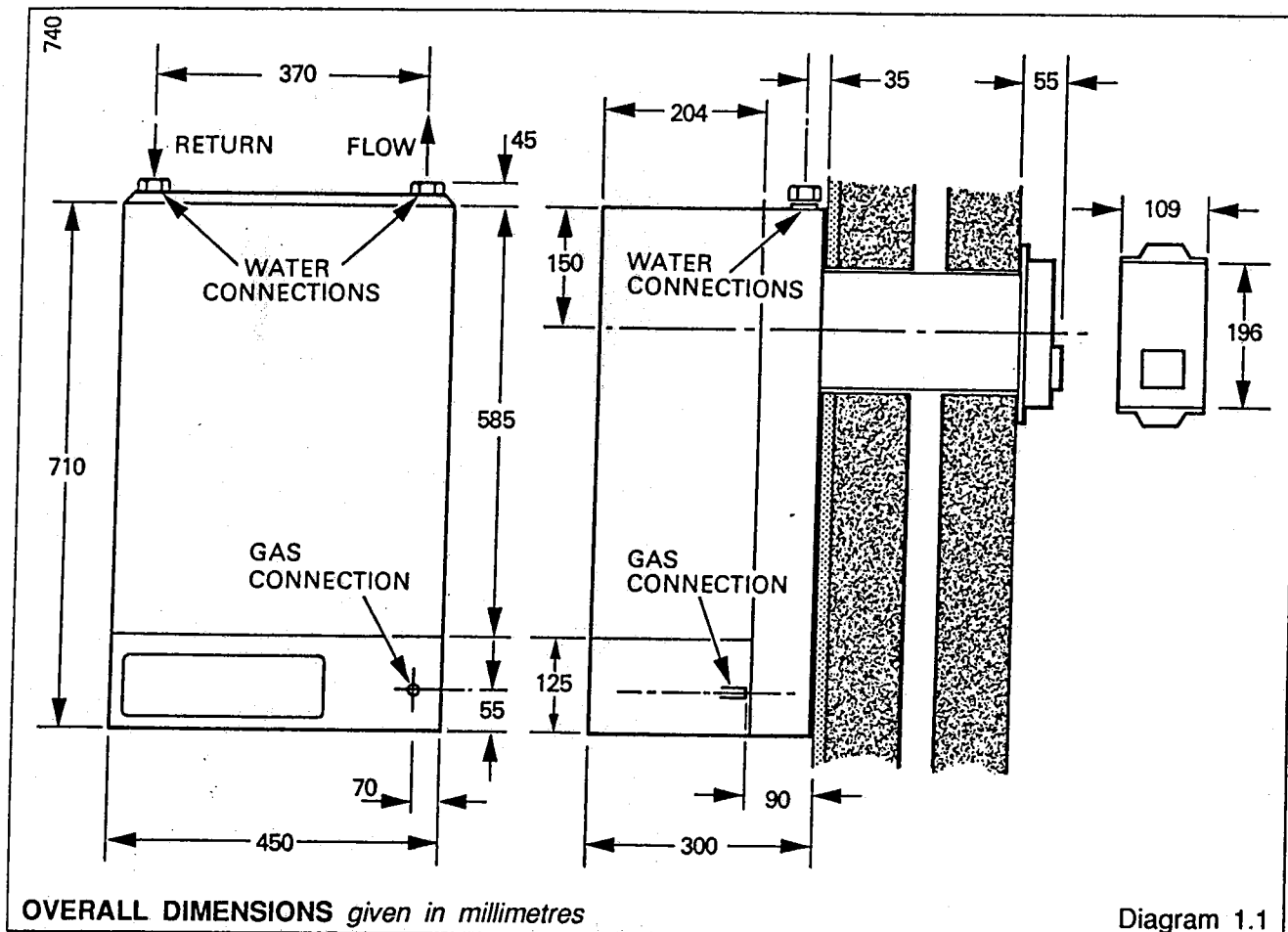


Diagram 1.1

1 General

IMPORTANT NOTICE: The Fuelsaver 65F and 80F are for use on natural gas only and must not be used on any other gas.

The Fuelsaver 65F and 80F are for use on fully pumped systems only.

All dimensions given are in millimetres.

1.1 Data

| | |
|-------------------|---------------------------------------|
| Gas connection | Rc $\frac{1}{2}$ ($\frac{1}{2}$ BSP) |
| Water connection | 28mm copper |
| Electrical supply | 240V~50Hz fused 3A |
| Water content | 0.8 litre (1.4 pint) |
| Injector - marked | 4.5 |

1.2 Range Rating

These boilers are range rated and may be adjusted to suit individual systems. The appropriate table gives the settings and outputs.

The boiler input is factory preset at maximum rating and should be adjusted to suit the system requirements.

A self adhesive arrow indicator is supplied in the loose items pack for fixing on to the data badge, to indicate the adjusted setting.

| FUELSAVER 65F | | | | |
|-------------------------|--------|--------|--------|--------|
| RANGE RATING | | min | medium | max |
| NOMINAL HEAT INPUT | kW | 17.1 | 20.6 | 24.0 |
| | Btu/h | 58,500 | 70,250 | 82,000 |
| NOMINAL HEAT OUTPUT | kW | 13.2 | 16.1 | 19.1 |
| | Btu/h | 45,000 | 55,000 | 65,000 |
| BURNER SETTING PRESSURE | m bar | 4.3 | 5.9 | 7.7 |
| | in.w.g | 1.7 | 2.4 | 3.1 |

| FUELSAVER 80F | | | | |
|-------------------------|--------|--------|--------|---------|
| RANGE RATING | | min | medium | max |
| NOMINAL HEAT INPUT | kW | 20.5 | 24.9 | 29.3 |
| | Btu/h | 70,000 | 85,000 | 100,000 |
| NOMINAL HEAT OUTPUT | kW | 16.1 | 19.8 | 23.4 |
| | Btu/h | 55,000 | 67,500 | 80,000 |
| BURNER SETTING PRESSURE | m bar | 6.9 | 9.9 | 13.6 |
| | in.w.g | 2.8 | 4.0 | 5.4 |

1.3 Boiler Operation

The boiler is fully automatically controlled, wall mounted, fanned flue, room sealed boiler, specially designed for fully pumped systems, giving ease of siting, installation and servicing.

The operation of the boiler is very simple with the user only having to turn the thermostat knob on or off as required.

1.4 Procedure

It is essential that the boiler is installed strictly in accordance with the instructions in this booklet.

1.5 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.

1.6 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:

The Gas Safety (Installation and Use) Regulations, The Building Regulations, The Building Standards (Scotland) Regulations (applicable in Scotland) The I.E.E. Wiring Regulations, Local Water Company Bye-laws.

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

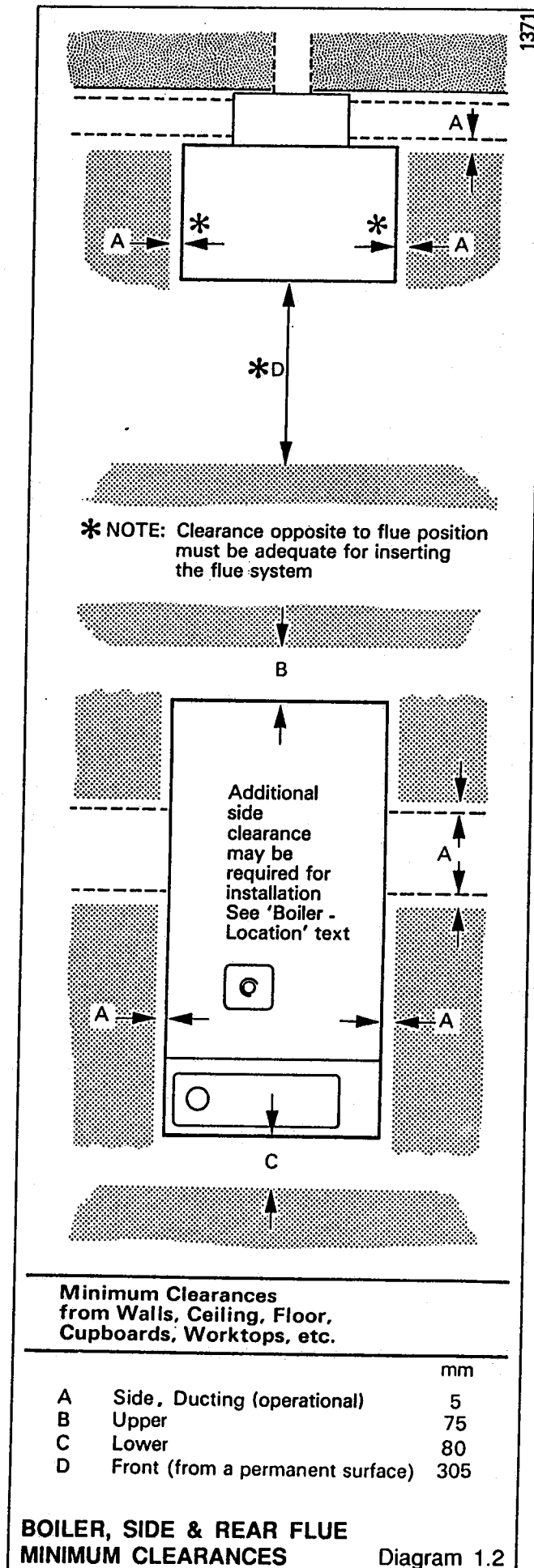
BS5440 Part 1 and 2, BS6798, BS6700, BS5449, BS6891.

1.7 Boiler Location

The boiler position should be such that the minimum clearances are provided as shown in diagram 1.2.

The boiler may be installed in any room, although particular attention is drawn to the requirements of The I.E.E. Wiring Regulations with respect to the installation of the boiler in a room containing a bath or shower. Any electrical switch or boiler controls using mains electricity should be so positioned that it cannot be touched by a person using the bath or shower. The electrical provisions of the Building Standards (Scotland) Regulations are applicable to such installations in Scotland.

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



1 General

A compartment used to enclose the boiler must be designed and constructed specifically for this purpose. An existing cupboard or compartment may be used provided that it is modified for the purpose. Refer to the ventilation requirements, Section 2. Details of essential features of cupboard or compartment design are given in the current issue of BS6798.

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

Combustible materials in the wall surface must be protected by a non-combustible sheet, at least the size of the boiler and not less than 25mm thick.

1.8 Gas Supply

The gas installation should be fitted in accordance with the current issue of BS6891. Pipework from the meter to the boiler must be of adequate size, a smaller size than the boiler inlet gas connection should not be used. The complete installation must be tested for soundness as described in the current issue of BS6891.

1.9 Electrical Installation

The electrical installation must be carried out by a competent person. All external components shall be of the approved type and shall be connected in accordance with the current issue of The I.E.E. Wiring Regulations and any local regulations which apply.

The boiler must be earthed.

Connection to the mains supply should be, preferably, through a standard unswitched shuttered socket and 3 pin, fused 3A plug, both to the current issue of BS1363.

Alternatively, a 3A fused double pole isolating switch may be used, having a minimum contact separation of 3mm, serving only the boiler and system controls.

Heat resistant flexible cable of at least 0.75mm² (24/0.20mm) to the current issue of BS6141 must be used for all connections to the control box.

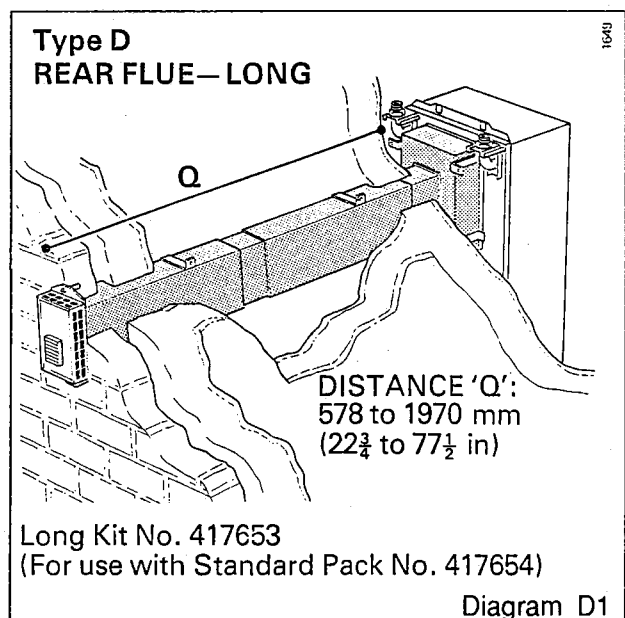
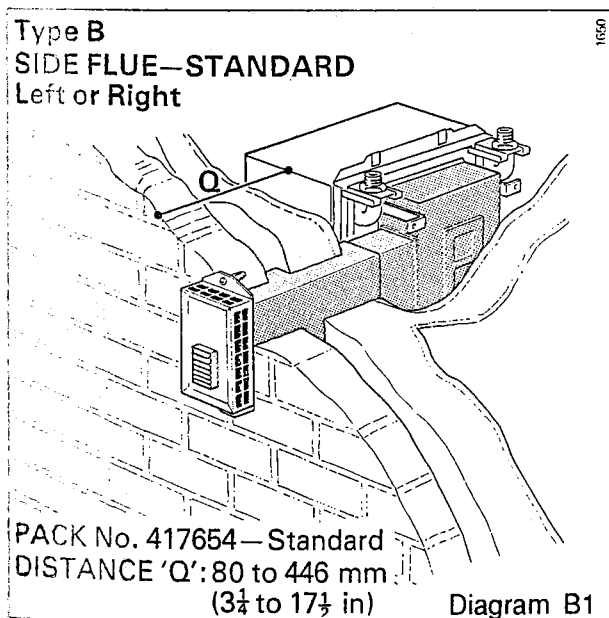
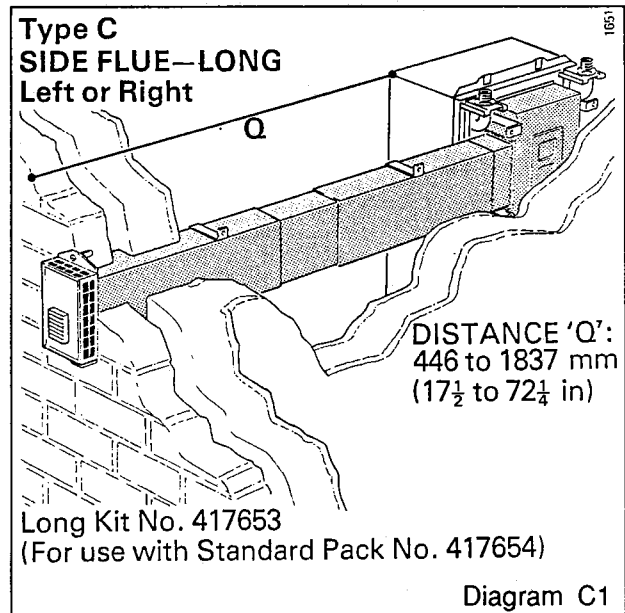
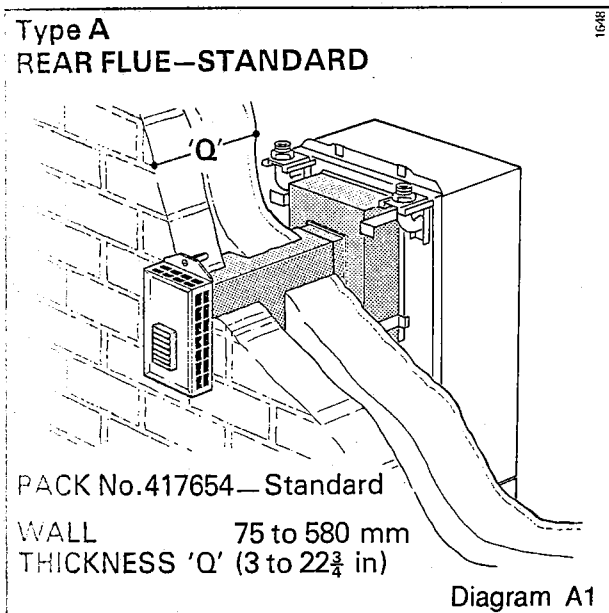
2.1 Flue Unit

Detailed recommendations for flues are given in the current issue of BS5440 Part 1.

The boiler must be installed so that the terminal is exposed to the external air. It is important that the position of the terminal allows the free passage of air across it at all times.

Various types of flue systems are available to suit various installation requirements. See diagrams A1, B1, C1 and D1.

Note: Any flue kits will have to be ordered as an extra, to be used with the standard flue pack, by quoting the kit numbers.



2 Flue and Ventilation

The minimum acceptable spacings from the terminal to obstructions, other terminals and ventilation openings are given in diagram 2.1

Car port or similar extensions of a roof only, or roof and one wall, require consideration with respect to openings, doors and vents or windows under the roof. Care is required to protect the roof if made from plastic sheeting. Seek further advice if the car port consists of a roof and two or more walls, from the local gas undertaking.

If the terminal is fitted within 850mm of a plastic or painted gutter or 450mm of painted eaves, an aluminium shield of at least 750mm long should be fitted on the underside of the gutter or painted surface.

The air inlet/products outlet duct and the terminal of the boiler must not be closer than 25mm to combustible material. Refer to the current issue of BS5440 Part 1.

2.2 Timber Frame Housing

If the appliance 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.

2.3 Terminal Guard

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

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.

Suitable guards are available from:

Tower Flue Components Ltd., telephone Tonbridge 351555, quoting their reference Type "H" or Quinnell, Barrett and Quinell Ltd., 884, Old Kent Road, London, SE15, their reference "C52".

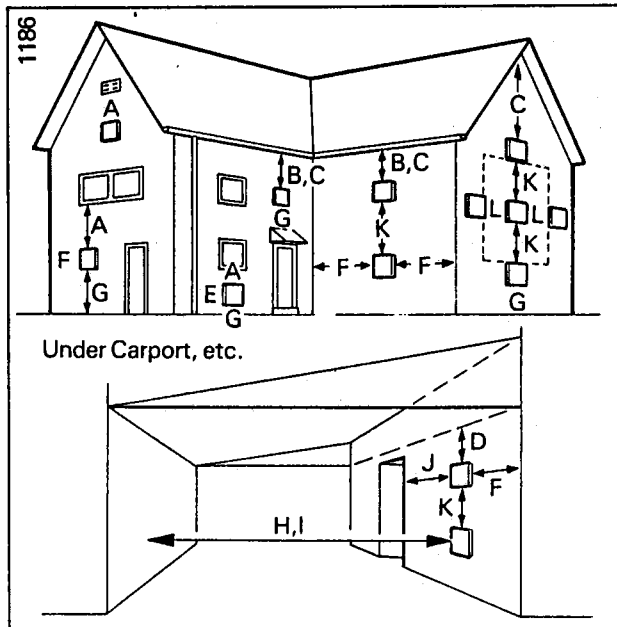
2.4 Room Ventilation

Where the boiler is fitted in a room or internal space, no permanent air vent is required.

2.5 Cupboard and Compartment Ventilation

Where the boiler is fitted in a cupboard or compartment, the ventilation area must be in accordance with The Compartment Air Vent Table.

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



| MINIMUM SITING DIMENSIONS FOR FANNED FLUE TERMINALS | | MINIMUM SPACING |
|---|---|-----------------|
| POSITION | | |
| A | DIRECTLY BELOW AN OPENABLE WINDOW, AIR VENT, OR ANY OTHER VENTILATION OPENING | mm |
| B | BELOW GUTTER, DRAIN/SOIL PIPE | 25 |
| C | BELOW EAVES | 25 |
| D | BELOW A BALCONY OR CAR PORT | 25 |
| E | FROM VERTICAL DRAIN PIPES AND SOIL PIPES | 25 |
| F | FROM INTERNAL OR EXTERNAL CORNERS | 25 |
| G | ABOVE ADJACENT GROUND OR BALCONY LEVEL | 300 |
| H | FROM A SURFACE FACING THE TERMINAL | 600 |
| I | FACING TERMINALS | 1200 |
| J | FROM OPENING (DOOR/WINDOW) IN CAR PORT INTO DWELLING | 1200 |
| K | VERTICAL FROM A TERMINAL | 1500 |
| L | HORIZONTALLY FROM A TERMINAL | 300 |

Diagram 2.1

| COMPARTMENT AIR VENT TABLE | | | | |
|----------------------------|---------------------------------|--------------------|-------------------------|--------------------|
| POSITIONS OF AIR VENTS | AIR VENT AREAS | | | |
| | AIR FROM ROOM OR INTERNAL SPACE | | AIR DIRECT FROM OUTSIDE | |
| | 65F | 80F | 65F | 80F |
| HIGH VENT | 220cm ² | 264cm ² | 110cm ² | 132cm ² |
| LOW VENT | 220cm ² | 264cm ² | 110cm ² | 132cm ² |

3.1 Pump

The pump should be fitted in the flow from the boiler and it is recommended that a pump producing at least 2.5metres (8ft) head is used to give a temperature difference of about 11°C (20°F) between the flow and return. The pump should then give a flow rate through the boiler as follows:

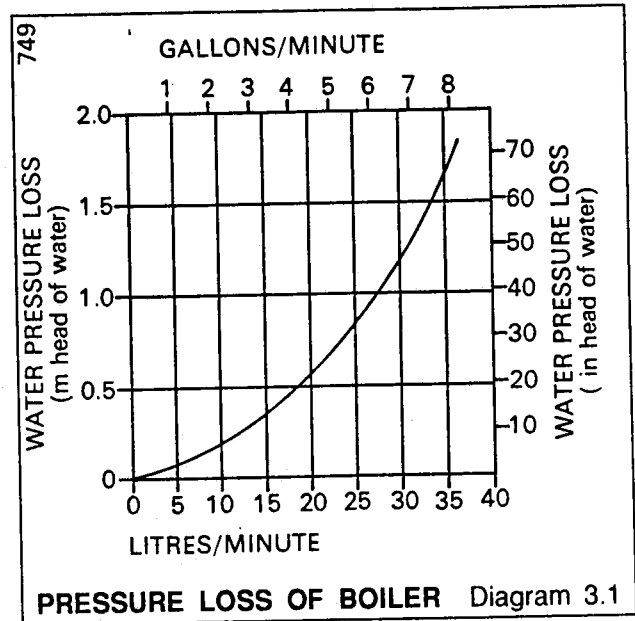
Fuelsaver 65F 24.8litres/min (5.5gals/min)

Fuelsaver 80F 30.6litres/min (6.7gals/min)

For details of pressure loss of the boiler, see diagram 3.1.

High resistance microbore systems may require a higher duty pump.

Fit a pump with integral valves or fit isolating valves as close to the pump as possible.



3.2 By-pass

It is essential to fit a by-pass on all installations. A suggested convenient position is shown in diagram 3.2.

3.3 Domestic Hot Water Cylinder

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

3.4 Safety Valve

The provision of a safety valve is not necessary for an open vented system, however, if a safety valve is fitted it must comply with the details in Section 4.2.

A safety valve must be fitted to a sealed system, see Section 4.2.

3.5 Open (Vented) Water Systems

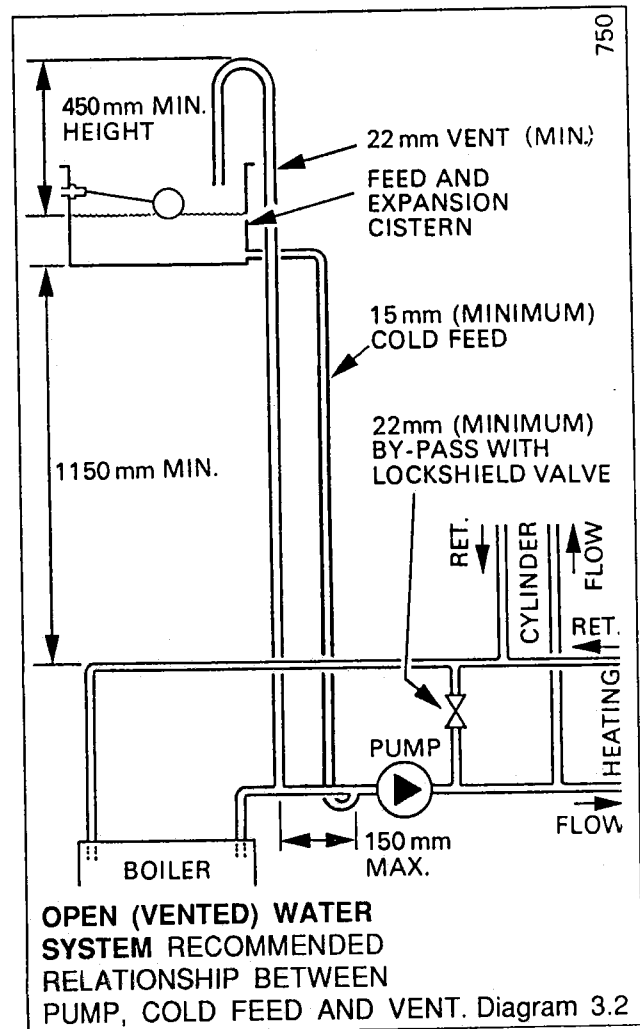
A 22mm diameter unobstructed open vent must be fitted in the flow from the boiler, terminating above the cold feed and expansion cistern, which should have a capacity of not less than 22litre (5gallons).

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

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

A 15mm minimum diameter cold feed must be fitted in the system.

For an open (vented) water system it is important that the relative position of the pump, cold feed and open vent should be as shown in diagram 3.2.



3.6 Controls

Any external boiler control must be connected to replace the red link between terminals 7 and 12 (SL) on the boiler.

The pump must be connected directly to the boiler control box, as shown in diagram 9.3.

All controls should be installed in accordance with the appropriate manufacturers' instructions.

3.7 Draining Taps

A draining tap must be provided at the lowest points of the system which will allow the drainage of the entire system and hot water storage cylinder.

Draining taps shall be to the current issue of BS2879.

A drain point is provided on the boiler for heat exchanger draining.

3.8 Water Connections

The boiler is supplied with nuts and olives to accept 28mm diameter copper tube to BS2871.

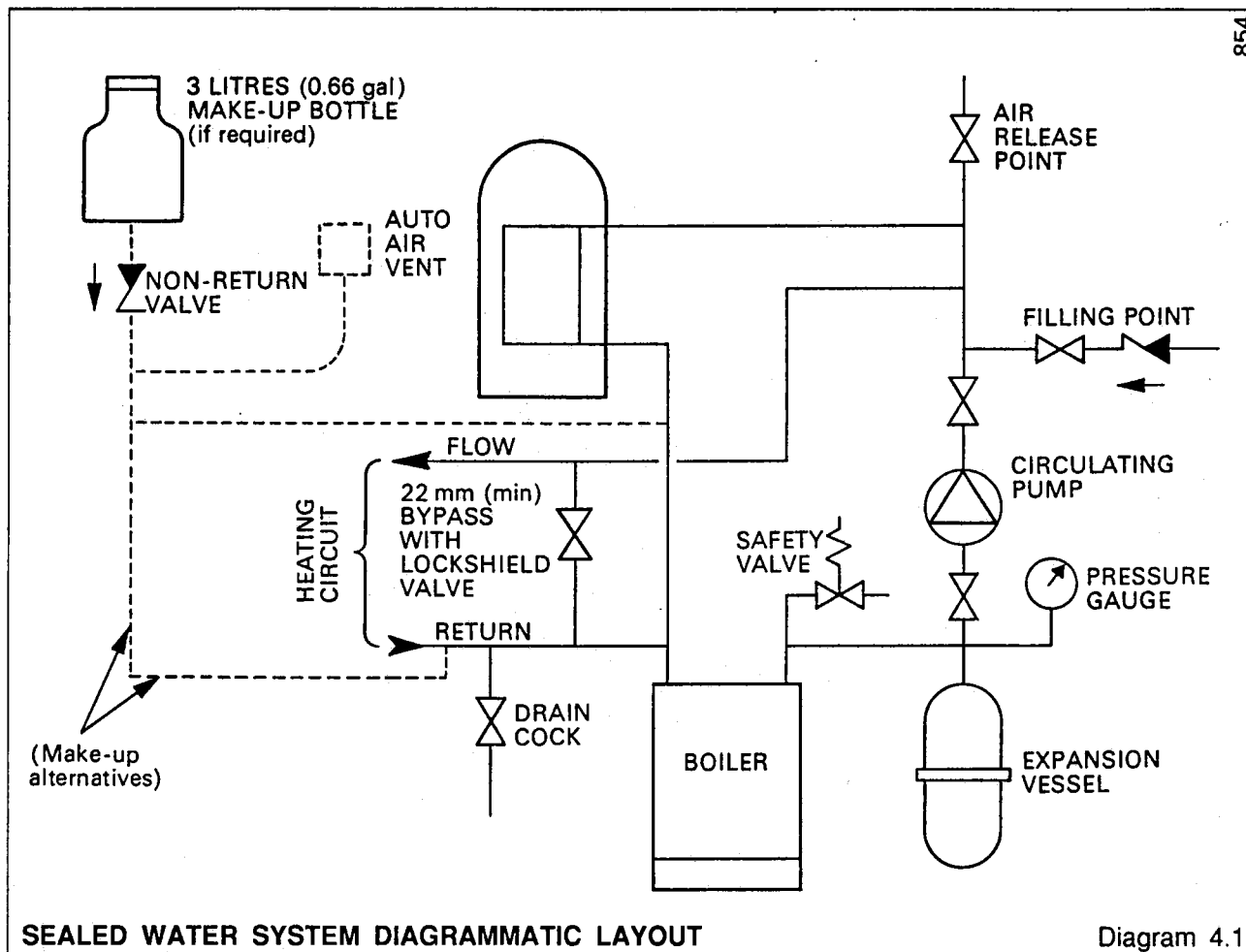
The right hand connection is the flow from the boiler.

3.9 Inhibitor

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

If an inhibitor is to be used contact a manufacturer so that they can recommend their most suitable product.

When installing a Fuelsaver into an existing system, special care should be taken to drain the entire system, including radiators, then thoroughly flush before installing the boiler whether adding an inhibitor or not.



4.1 General Requirements

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

4.2 Safety Valve

A safety valve must be fitted in a sealed system.

The safety valve must be fitted in accordance with the current issue of BS6798.

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.

4.3 Expansion Vessel

A diaphragm type expansion vessel, conforming to the current issue of BS4814 (see also the current issue of BS7074 Parts 1 and 2) must be connected at a point close to the inlet side of the circulating pump, see diagram 4.1 for a diagrammatic layout, 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 BS7070 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 the Data Table.

4.4 Pressure Gauge

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

4 Sealed Water Systems

4.5 Domestic Hot Water Cylinder

SINGLE FEED INDIRECT CYLINDERS ARE NOT SUITABLE

The hot water cylinder must be either of the indirect coil type or a direct cylinder fitted with an immersion heater calorifier. It must be suitable for working at a gauge pressure of 0.35bar above the safety valve setting.

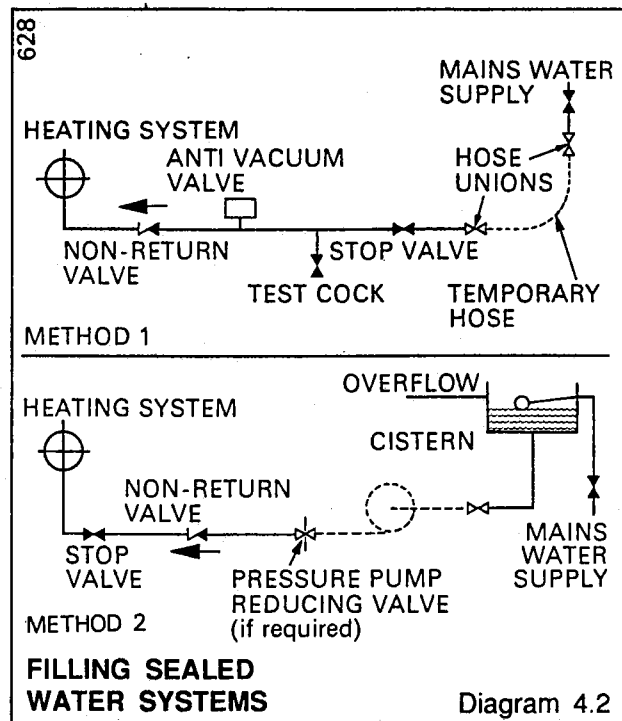
4.6 Water Make Up

Provision should be made for replacing water loss from the system using a make up bottle or filling loop mounted in a position higher than the top point of the system, connected through a non-return valve to the return side of either the heating circuit or the hot water cylinder.

Alternatively, provision for make up can be made by pre-pressurisation of the circuit.

4.7 Filling Sealed Systems

Provision for filling the system at low level must be made. Three methods are shown in diagram 4.2. There must be no permanent connection to the mains water supply, even through a non-return valve.



Remove cardboard fitting and wall template from the boiler and remove the rear side panels which are packed within this fitting.

Slide the controls cover forward to remove from the boiler.

Remove the boiler from the carton and place it on its back. The fittings pack will be found in the carton.

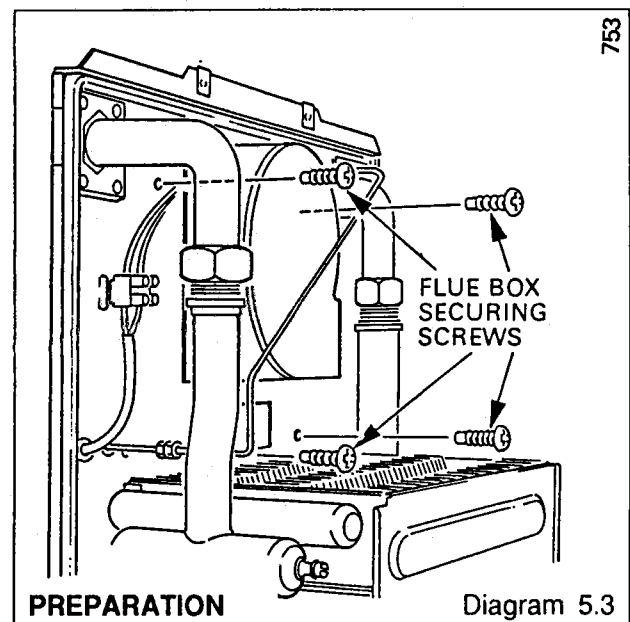
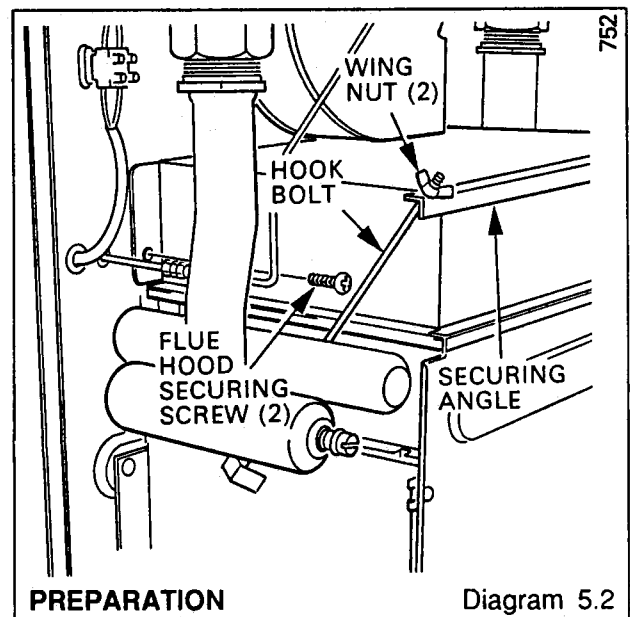
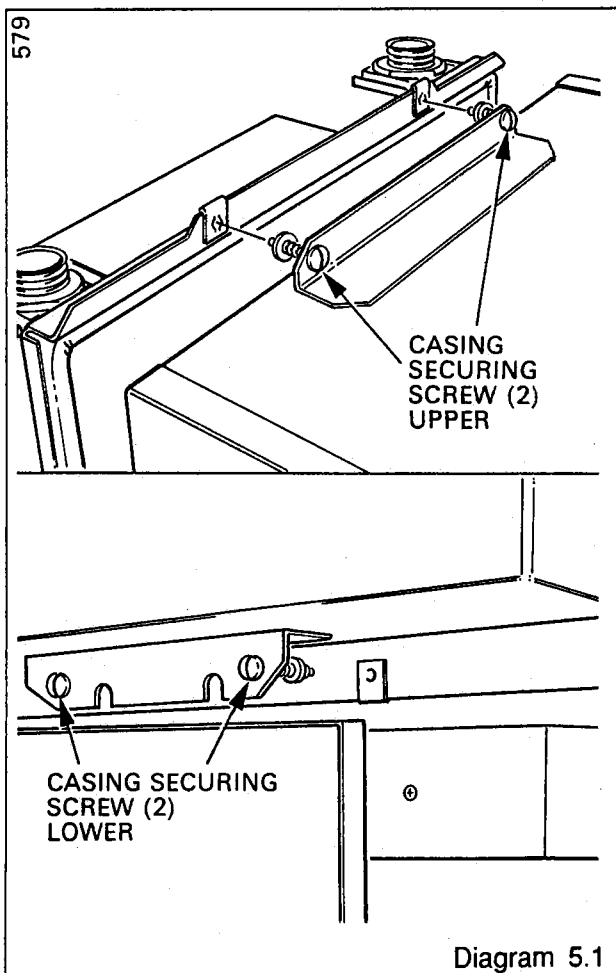
Remove the outer case after unscrewing the two upper and two lower securing screws, see diagram 5.1.

Remove the wing nuts holding the securing angle, see diagram 5.2. and remove the flue hood angle.

Remove the two screws securing the flue hood to the back plate and lift off the flue hood.

Remove the flue box from behind the back panel of the boiler by removing the four screws, see diagram 5.3.

The flue box is used with the flue components to mount on the wall, as described in the flue instructions.



6 Flue Ducting

Refer to the instructions supplied with the flue pack or long flue kit to be used, ensuring that the flue is correct for the installation.

The flue box, lower support bracket and flue system must now be fitted, to enable the boiler to be installed, refer to the appropriate flue system instructions.

7 Boiler Fixing

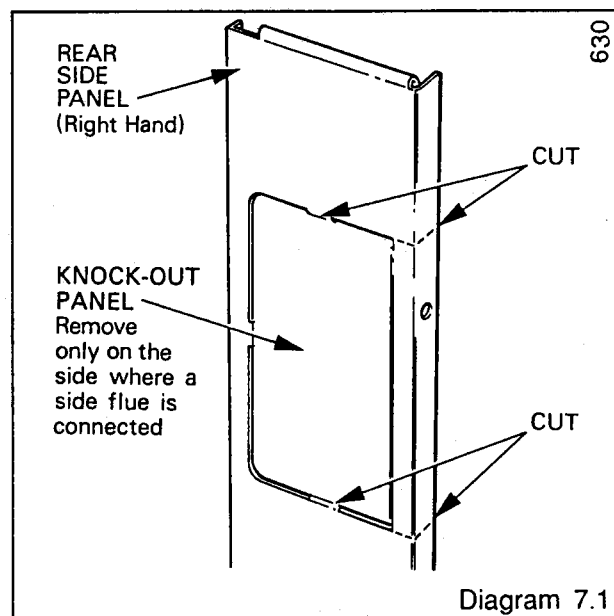
Proceed as follows after installing the flue system required:-

Take one or both rear side covers, if required, then hook on at the top and secure with the No.6 self tapping screws provided.

In the case of a side flue installation, the rear side cover on the flue side will require the knock-out panel removing after the larger flange has been cut as shown in diagram 7.1.

Position the boiler centrally on the lower support bracket on the wall and ease back to the flue box, securing with the four screws previously removed, see diagram 5.3.

Replace the flue hood, make sure a good seal is made to the back panel, by replacing the two screws at the rear and securing the angle with wing nuts. Do not overtighten the wing nuts.



8 Gas Supply

The gas inlet to the boiler is Rc $\frac{1}{2}$ ($\frac{1}{2}$ in BSP) and is situated at the base of the boiler on the gas cock.

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

Fuelsaver 65F 2.3m³/h (82ft³/h)

Fuelsaver 80F 2.8m³/h (100ft³/h)

The meter governor must ensure a constant pressure of 20mbar (8in wg).

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

9 Electrical Wiring

9.1 Supply Cable Connection

THIS BOILER MUST BE EARTHED AND HAVE A PERMANENT MAINS SUPPLY.

Remove the control box by supporting the box and removing the two fixing screws at the front above the fascia, then lower the front of the box until it is clear of its cover. Push box toward the rear of the boiler to disengage its hinging arrangement, lower the box and pull forward clear of its cover,

see diagram 9.1. The box will still be attached to the boiler by the retaining strap. If the box is to be removed entirely, pull the strap off the fastener. Care should now be taken not to damage thermostat or overheat cutoff capillaries or electrical cables.

Using heat resistant flexible cable of suitable length and rating as stated in Section 1.10, thread the mains cable through the hole in the rear of the control box, through the cable clamp and connect to the terminal strip and earth stud, see diagrams 9.2 and 9.3.

When making the connections, ensure that the earth conductor is made of a greater length than the live and neutral conductors, so that if the cable is strained the earth conductor would be the last to be disconnected.

For installations with less than 150mm lower clearance, allow an extra 300mm of installation cable to allow servicing of the control box.

It is essential that the live and neutral conductors are correctly reconnected.

The electrical isolator must isolate both the boiler and system controls, be adjacent to the boiler and clearly marked as to its use.

9.2 Pump Cable Connection

The pump must be connected directly to the boiler control box as shown in diagram 9.3, passing the cable through the hole in the rear of the control box.

9.3 Electrical Installation

The whole of the electrical installation must comply with the current issue of the I.E.E. Wiring Regulations and any local regulations which apply.

All cable and connections must be of the approved type.

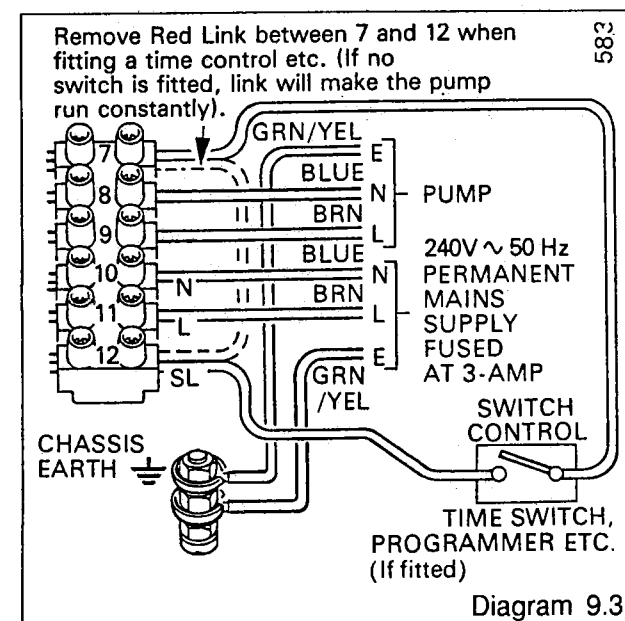
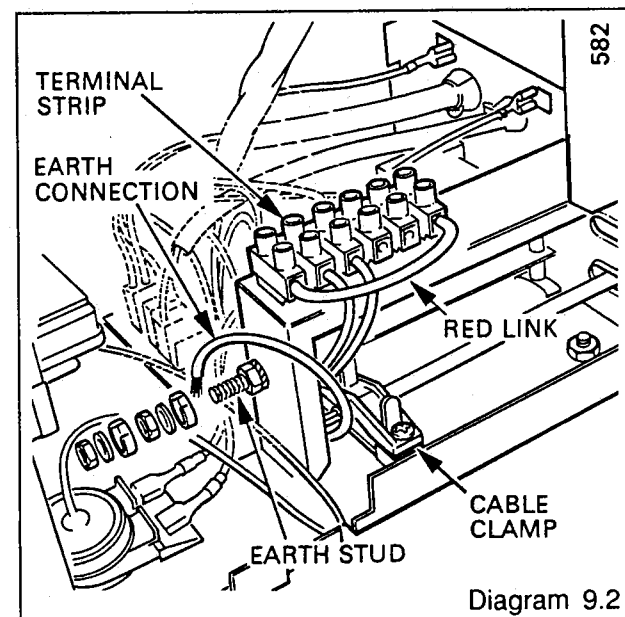
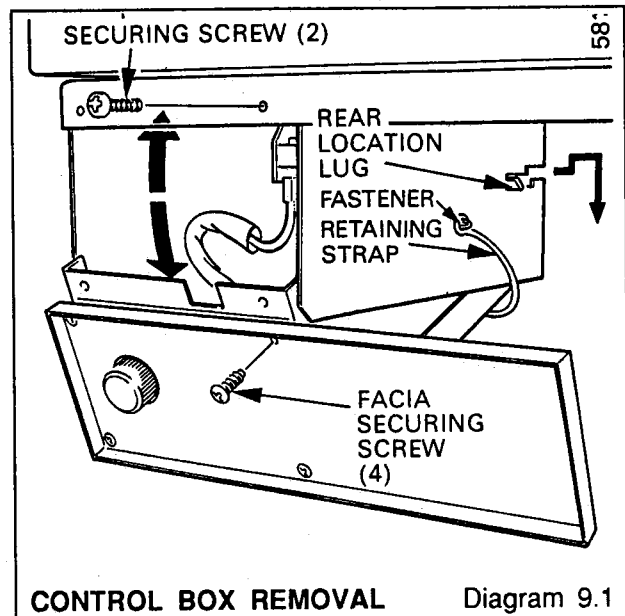
9.4 Testing

In the event of an electrical fault after installation of the boiler, preliminary system checks must be carried out as described in a Multimeter instruction book.

9.5 Control Schemes

If any control systems are to be used remove the red link between 7 and 12 in the boiler control box.

The installer is requested to advise the user of any controls system fitted and to give guidance on its use.



10.1 Final Assembly

Position the self adhesive arrow indicator on to the data badge against the output to which the boiler is to be set. The arrow is in the loose items pack.

Fit the casing using the two upper and two lower screws previously removed, see diagram 5.1.

DO NOT OPERATE THE BOILER WITHOUT THE CASING BEING FITTED.

10.2 Open Vented Systems

The system must be thoroughly flushed out with cold water without the pump in place. Then refit the pump and fill the system, making sure that all air is properly vented from the system and pump.

10.3 Sealed Systems

Flush to whole system with cold water without the pump in position. Refit the pump and fill the system, making sure that all air is properly vented from the system, including the pump.

Check the operation of the safety valve, preferably by allowing the water pressure to rise until the valve opens. This should be within $\pm 0.3\text{bar}$ ($\pm 4.3\text{lb}/\text{in}^2$) of the preset pressure. Where this is not possible a manual check should be carried out.

Release cold water pressure to initial system design pressure.

10.4 Electrical Supply

Check that the mains electrical supply to the boiler is switched off and that the boiler thermostat is turned to "O", the Off position.

10.5 Gas

Turn on the main gas supply at the gas cock.

WARNING: Open all windows and extinguish any naked lights in the room. Put out pipes and cigarettes.

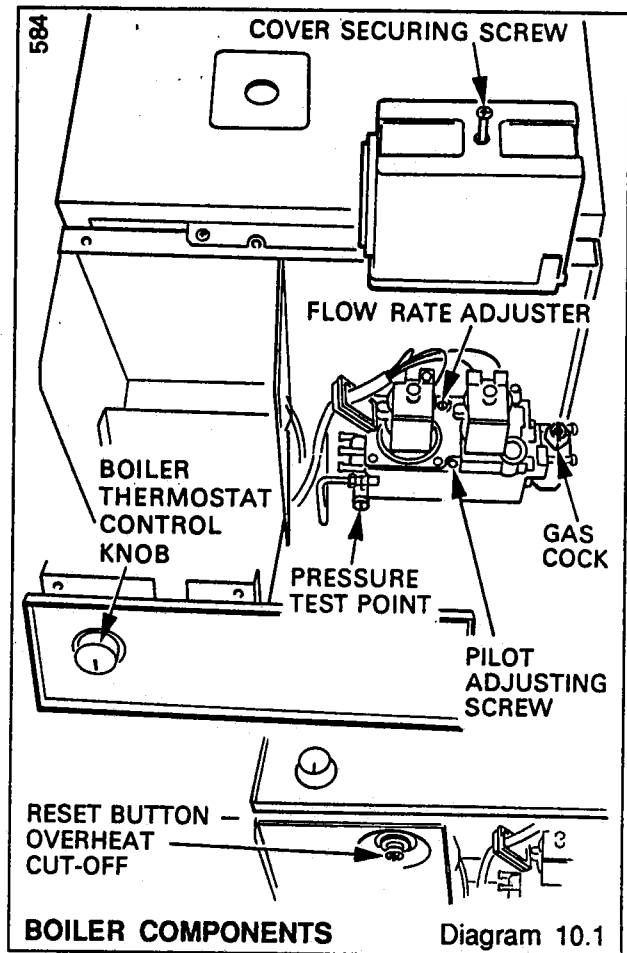
Purge air from the gas supply.

in accordance with the current issue of BS6891.

Turn gas cock on and test for gas soundness around the boiler components using a suitable leak detection fluid.

10.6 Initial Lighting

Note: Before lighting the burner, ensure that the casing has been fitted correctly and that the edge of the cover makes a tight seal with the sealing strip in the groove around the boiler back plate.



Remove the pressure test point screw and fit a suitable pressure gauge, see diagram 10.1.

To remove the gas valve cover, release the securing screw, see diagram 10.1.

WARNING: The gas valve operates on mains voltage, terminals will be come "Live".

Ensure that the time control, and any other remote controls, if fitted, are calling for heat.

Switch on the main electrical supply to the system and check that the pump is working.

Turn the boiler thermostat clockwise to a high setting and after a period of time the main burner will light, check by looking through window in boiler casing.

If the burner does not light, press the reset button, under the control box, see diagram 10.1.

Should the burner still not light, check all all electrical connections and refer to fault finding, Section 15.

The pilot rate is preset and no adjustment should be necessary.

Set the gas rate required by means of the flow rate adjusting screw, see diagram 10.1, turning clockwise to decrease. Beware of mains voltage on gas valve terminals. Refer to pressure settings Tables for heat output. Turn off the electrical supply to the boiler.

Remove the pressure gauge and replace the test point screw, ensuring that a gas tight seal is made.

Replace gas valve cover and secure with the screw previously removed.

10.7 Testing

Relight the burner and check that there is adequate air for combustion by the correct appearance of the flames.

Should any doubt exist about the gas rate check the rate at the meter after 10 minutes.

The gas rate should be in the range of:

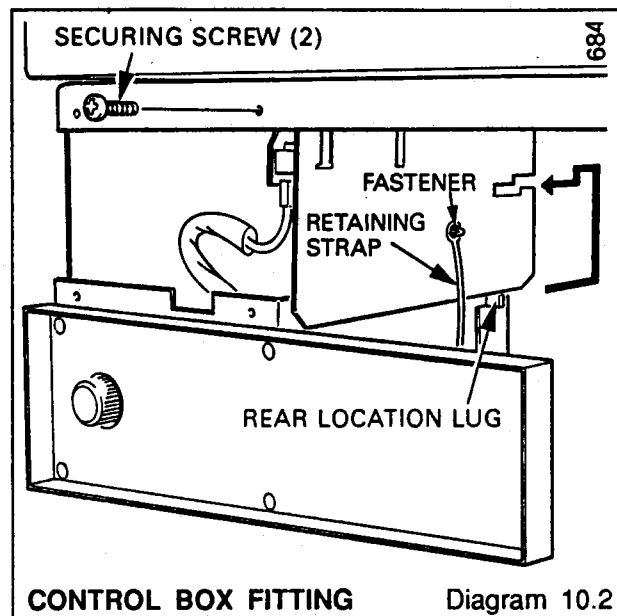
Fuelsaver 65F: 1.65 to 2.3m³/hr (58.5 to 82ft³/hr)

Fuelsaver 80F: 2.0 to 2.8m³/hr (70 to 100ft³/hr)

The gas rates are for guidance only, depending upon the heat setting.

The boiler will give off a "burning smell" for a short period of time after initial lighting.

Replace the control box, engage tabs on side of box on to the bottom edge of cover and slide box backward. When box is at the rear of cover raise rear of box to engage pivot arrangement, raise front of box and remove the two screws previously removed, see diagram 10.2. Refit the plastic strap on to the fastener if the control box has been removed completely.



11 Commissioning and Testing the System

Check that any remote controls control the boiler as required.

For sealed systems refer also to Section 4.

Allow the system to reach maximum working temperature and examine for water leaks. The boiler should then be turned off and the system drained as rapidly as possible whilst still hot.

Refill the system, vent all air and check for water soundness.

Sealed systems should be adjusted to the initial system design pressure. Any set pointer on the pressure gauge should be set to coincide with the indicating pointer.

The pump over run will keep the pump running when the burner has shut down, as long as the water temperature within the boiler is above a predetermined limit.

When commissioning the system the boiler should be fired with the by-pass valve fully closed on full service, that is central heating and domestic hot water service. The system should then be balanced, adjusting the pump and lockshield valves as necessary. Having achieved a satisfactory condition operate the boiler with the by-pass valve fully closed on minimum load, normally this will be on central heating only with one radiator operating, in the main living area. The valve should then be gradually opened to achieve the flow rate of:

Fuelsaver 65F: 24.8litre/min (5.5 gal/min)

Fuelsaver 80F: 30.6litre/min (6.7 gal/min)

Adjust the thermostat to the required setting, adjust system controls.

Operate the boiler again on full service and check that the balancing is correct, making further adjustments as required.

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

Check that when the pump is switch on or off air is not drawn into the system, or water discharged from the open vent.

The boiler will not work unless the casing is correctly located, sealed and secured to the back panel.

- 1) Mains supply to boiler "On"
- 2) Gas supply "On"
- 3) All remote system controls calling for heat.
- 4) Turn the boiler thermostat knob clockwise to the setting required, the following automatic sequence will start:
- 5) The fan will run.
- 6) The air pressure switch operates.
- 7) The first, pilot, solenoid valve opens.
- 8) The spark igniter operates.

9) Pilot burner will light.

10) Ignition spark stops.

11) The second solenoid opens, giving main burner operation until the boiler thermostat or other remote system control switches the boiler off.

When the boiler switches off, all burners go out, the complete lighting sequence will operate when heat is again required.

Note: If the boiler thermostat is turned off, wait for 30 seconds before turning on again.

Completion 13

Refit the controls cover by sliding it on to the runners.

Instruct the user in the operation of the system and controls.

Hand the User Instructions to the user for their retention, instruct and demonstrate the efficient and safe operation of the system.

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

It is the law that any servicing must be carried out by a competent person.

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

14 Servicing

Servicing Notes: Servicing must be carried out by a competent person.

Before starting a service, turn off the gas supply at the service cock and isolate the boiler from the electrical supply.

The boiler will not work unless the case is correctly fitted, sealed and secured to the back panel. Before turning the boiler on again make sure that this checked.

14.1 Heat Exchanger Cleaning

Remove the controls cover by pulling it forward clear of the boiler.

Unscrew the two upper and two lower casing securing screws and remove the casing by drawing it forward, see diagram 14.1.

Remove the wing nuts and flue hood securing angle, see diagram 14.2

Remove the two screws securing the flue hood to the backplate and lift off the flue hood.

Remove the combustion chamber front panel by removing the wing nut at the bottom front and the four screws securing to the combustion chamber sides.

Disconnect ignition lead from the electrode.

Support the main burner and unscrew the tubing nut at the base of the pilot burner.

Remove the two screws securing pilot burner assembly to the main burner, see diagram 16.8.

Spring the pilot tube downward sufficiently to allow the main burner to move forward to disengage from the injector at the rear. Raise the burner up through the combustion chamber and remove. Take care not to damage the insulation inside the combustion chamber.

Cover the pilot tube and injector for protection. Brush the heat exchanger clear of any deposits, collect them and remove.

14.2 Burner, Injector and Pilot Cleaning

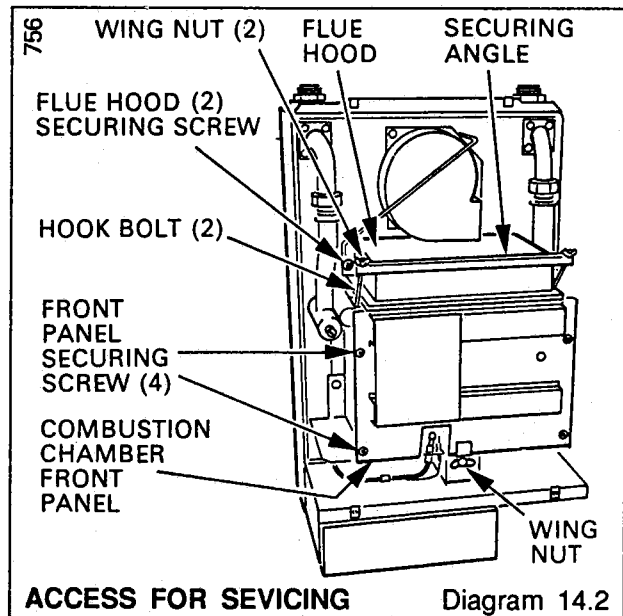
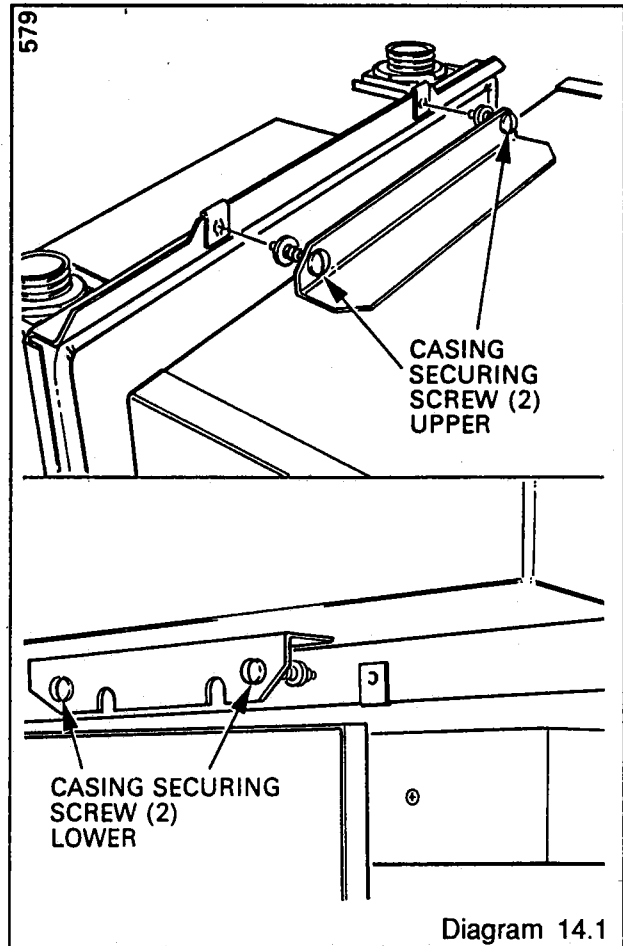
With the main burner removed, brush off any deposits from the burner, ensuring that the flame ports are unobstructed.

Do not use a brush with metallic bristles.

Check the main burner injector for blockage and or damage and remove if necessary. Replace with the sealing washer in position.

Inspect the pilot burner and ignition electrode, clean in necessary. Check the condition of components.

When replacing make sure that the main burner is pushed fully home on to the injector and between the vertical guides near the injector.

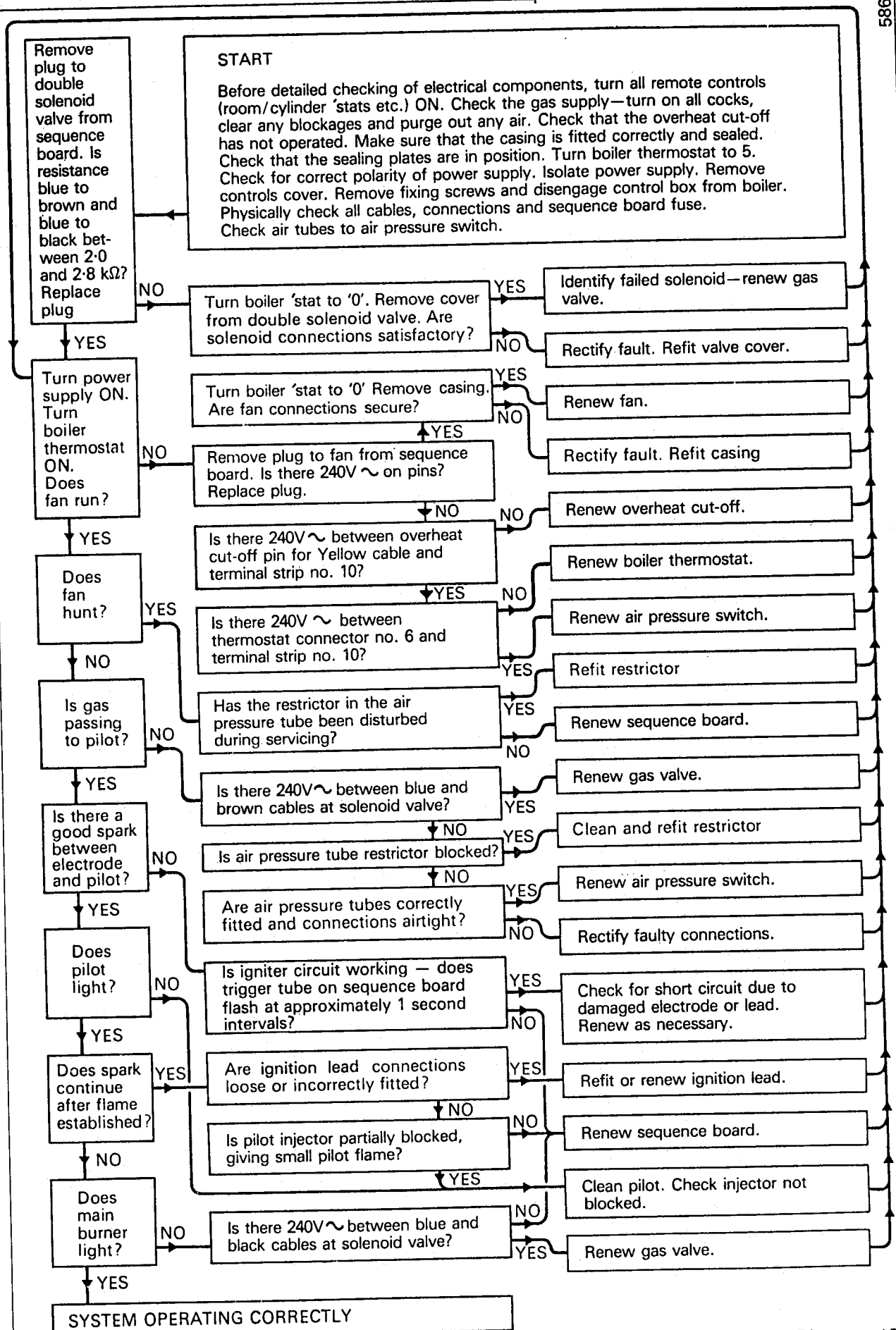


When replacing the flue hood make sure a good seal is made to the back panel by replacing the two screws at the rear. Do not overtighten the wing nuts when replacing.

14.6 Operational Checks

After completion of the service, before fitting the casing, check the casing seal to ensure that it is in good condition, if necessary renew.

Light the boiler and carry out the operational checks as described in Section 10.

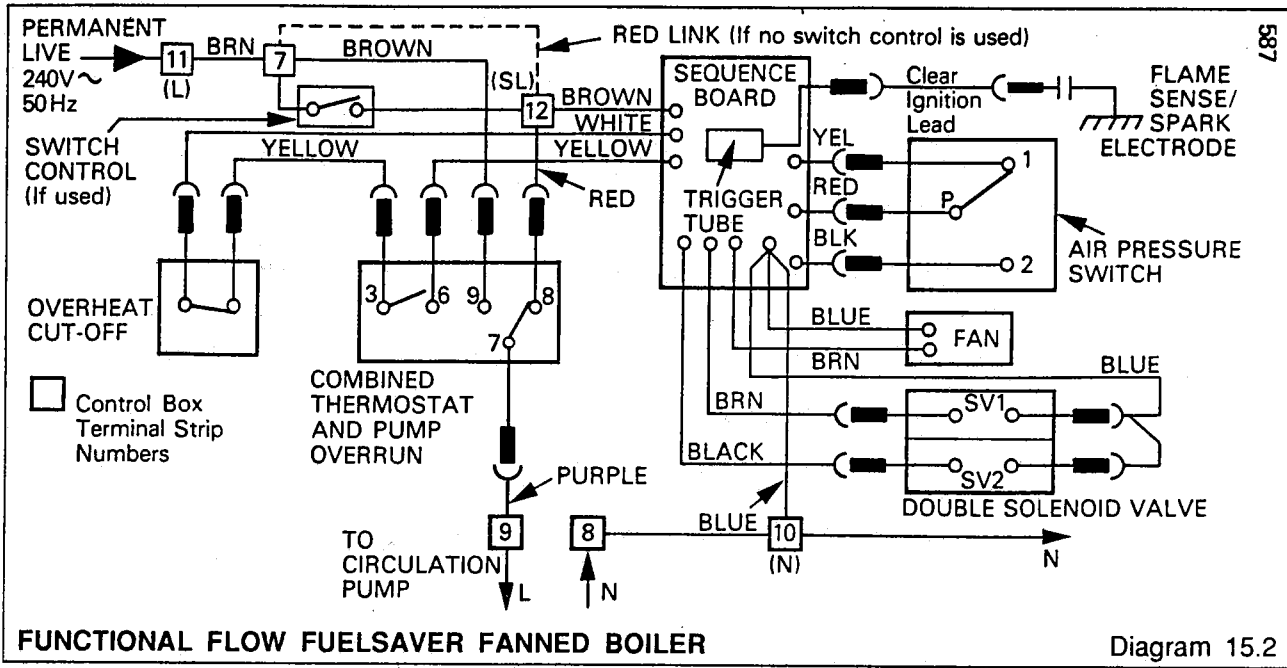


BOILER FAULT FINDING

Diagram 15.1

15 Fault Finding - Electrical

587



Important: The preliminary electrical system checks contained in a multimeter instruction book are the first checks to be carried out during a fault finding work.

On completion of the service or 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.

Refer to fault finding diagram 15.1 and the functional flow diagram 15.2.

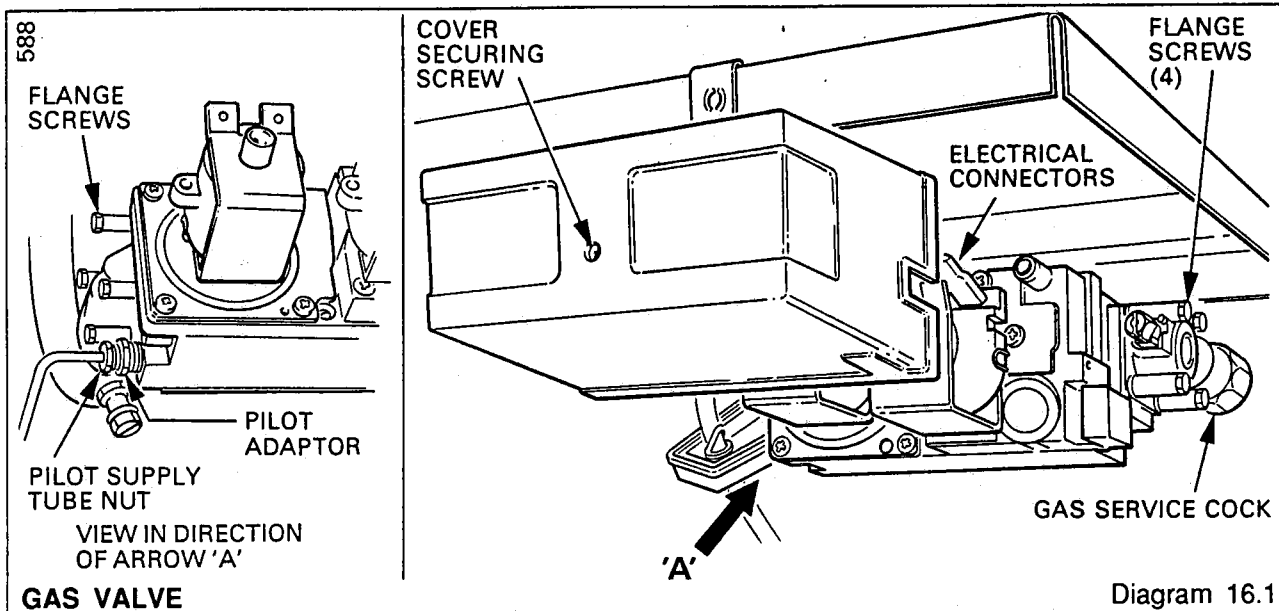
A spare fuse for the sequence board is fitted inside the control box.

Note: The boiler will not work unless the outer case is fitted correctly, sealed and secured to the back panel.

| Cause | Remedy |
|---|---|
| 15.2 Burner will not light | |
| Electrical fault _____ | Refer to fault finding diagram 15.1. |
| Boiler thermostat not working. _____ | Check that boiler thermostat is in an "On" position and working correctly. |
| Overheat cutoff operated. _____ | All system to cool and press reset button, see diagram 10.1. |
| Case Seal Fault. _____ | Make sure that the case is fitted correctly and sealed. Check that sealing plates are in position. |
| 15.3 Thermostat Will Not Cut Out | |
| Thermostat phial not correctly fitted. _____ | Fit phial in pocket, using heat sink compound and secure with pin. |
| Faulty thermostat. _____ | Replace. |
| 15.4 Overheat Device Cuts Out Prematurely | |
| Air in heating body. _____ | Vent system. Alter system layout if necessary. |
| Water circulation low or stopped. _____ | Pump not working correctly. Check that pump is connected to the boiler, to work while boiler is on. Alter layout if necessary. |
| Overheat cutoff works before boiler cycles on maximum boiler thermostat setting. _____ | Change faulty overheat cutoff. |
| Correctly set overheat cutoff works prematurely. (First two items above are satisfactory). _____ | Change faulty heating body. |
| 15.5 Not Enough Heat | |
| Thermostat set too low. _____ | Increase setting. Check for correct operation. |
| Gas supply pressure inadequate. _____ | Check gas supply, clear any blockages, make sure all cocks are fully open. |
| Burner pressure incorrect (While measuring pressure ensure thermostat is on maximum setting). _____ | Check burner pressure against data badge. Reset only if more than 10% away from required figure. |
| 15.6 Boiler Noisy Whilst Working* | |
| Over gassed. _____ | Check burner pressure against data badge and adjust if necessary, but only if more than 10% away from required figures. |
| Complete lack of water flow. _____ | Check system controls for correct installation or correct type of controls. |
| Air in system. _____ | Remove air from system. When boiler first commissioned the air dissolved may take some time to boil out, therefore, attempts should be made regularly during the first weeks of use to remove the air. Check venting of the 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 of correct size and is correctly adjusted. By-pass not fitted or set correctly. |

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

16 Replacement of Parts



Notes: Replacement of parts must be carried out by a competent person.

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

Before removing any parts turn off the gas supply at main service cock and isolate the electrical supply to the boiler.

The boiler will not work unless the casing is correctly fitted, sealed and secured to the back plate.

16.1 Main Burner Injector

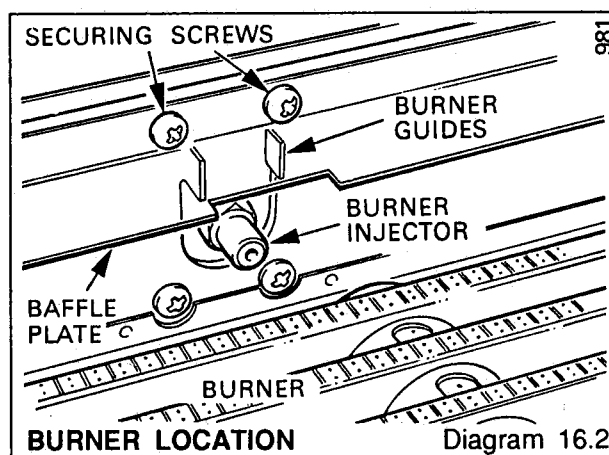
Remove the main burner as Section 14.1.

Remove the combustion chamber baffle, secured with two screws, see diagram 16.2.

Unscrew the injector for replacement.

Renew the sealing washer to ensure gas soundness.

When replacing the main burner make sure that it is pushed fully home on the injector and between the vertical guides near the injector.



16.2 Gas Valve

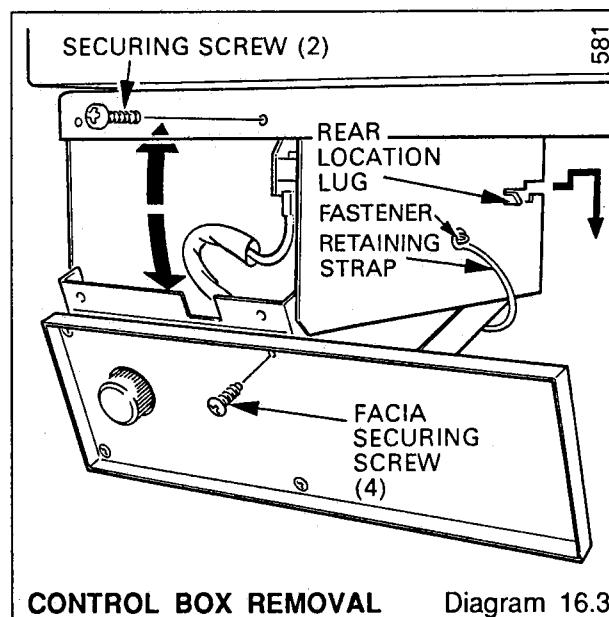
Remove the controls cover by sliding it forward.

Remove the four screws and control fascia from the control box, see diagram 16.3

Disconnect the electrical connections at the gas valve.

Disconnect the pilot supply at the gas valve and transfer the pilot adaptor to the replacement valve.

Remove the four screws from the flanged connections at each end of the gas valve and remove the valve.

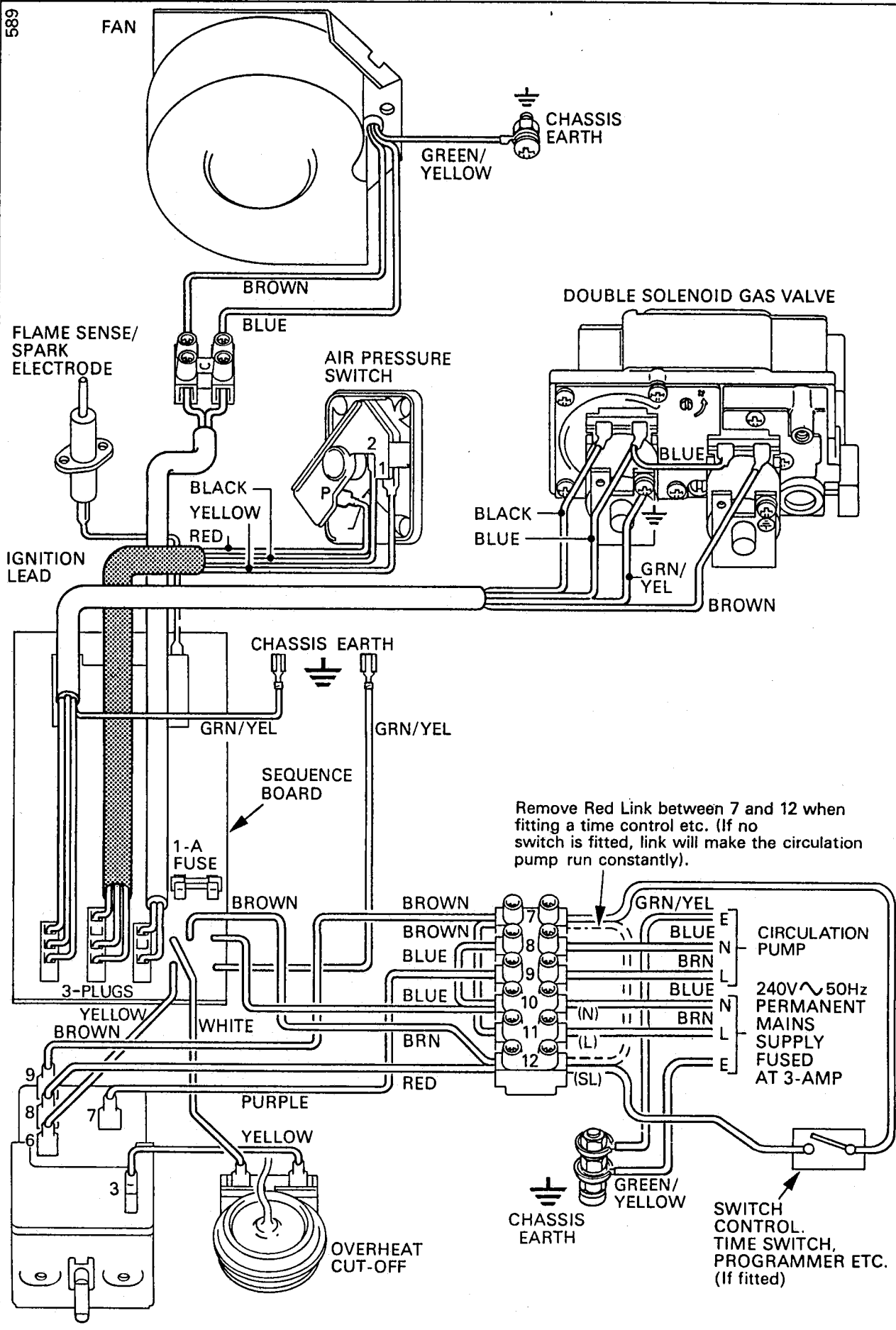


Ensure that the "O" rings are in place in the flanged connections when replacing.

The supply may have to be purged after this work.

Test for gas soundness with a suitable leak detection fluid.

589



ACCESS FOR SEVICING

Diagram 16.4

16 Replacement of Parts

16.3 Air Pressure Switch

Remove the controls cover by sliding it forward and turn off gas cock.

Remove the controls box by supporting the box and undoing the two fixing screws at the front, above the fascia, and lower the front of the box until it is clear of its cover. Push box towards the rear of appliance to disengage its hinging arrangement, lower rear of box and pull forward clear of its cover, see diagram 16.3. The box will still be attached to the appliance by the plastic retaining strap. If the box is to be removed entirely, pull the strap off the plastic fastener. Care should now be taken not to damage the thermostat and overheat cutoff capillaries or any electrical cables.

Disconnect the electrical connections at the air pressure switch, see diagram 16.5.

Push the air pressure switch upward against the spring plate and pull the bottom to the left to disengage from its clip.

Disconnect the flexible tubes at the rear of the switch, taking care not to lose the air restrictor in the lower connection.

When replacing the tubes to the air pressure switch, note that the air restrictor must be fitted into the lower connection marked.... Make sure that the flexible tubes are not kinked when replacing.

Refer to diagram 16.4 when reconnecting electrical connections.

Replace the control box; engage tabs on side of box on to bottom edge of cover and slide box backward. When box is at rear of cover raise rear of box to engage pivot arrangement and raise front of box and replace two screws previously removed, see diagram 16.5. Refit the plastic strap on to the fastener if the control box has been removed completely.

16.4 Air Restrictor

Isolate electrical supply and release or remove the control box as in Section 16.3.

Remove the air pressure switch as in Section 16.3, see diagram 16.5.

Remove the restrictor from the air pressure switch connection. Renew it or clean by blowing out any obstruction

When fitting air restrictor and pressure switch ensure that the flexible tubes are not kinked.

Refit control box as in Section 16.3.

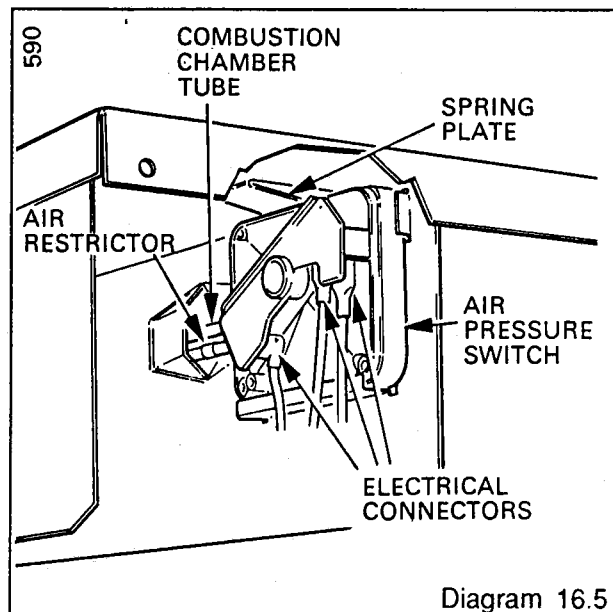
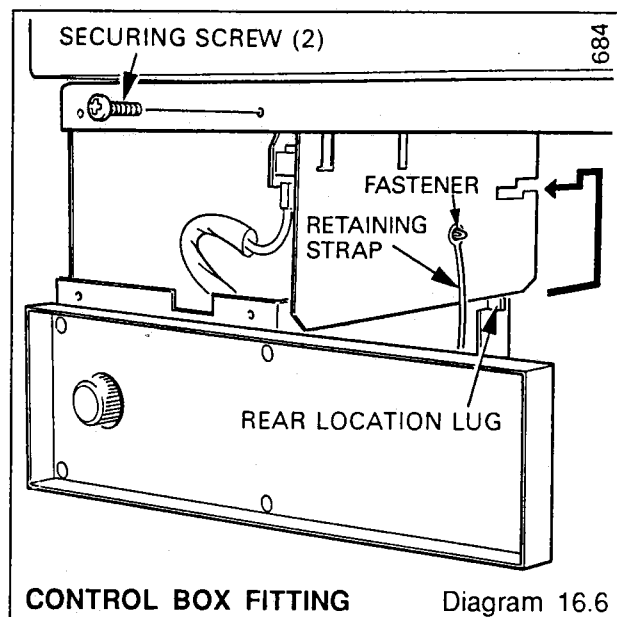


Diagram 16.5



CONTROL BOX FITTING

Diagram 16.6

16.5 Sequence Board

Remove the controls cover by sliding it forward.

Disconnect the three plugs at the front of the board and the ignition lead at the back, see diagram 16.4.

Disconnect the white cable, to the overheat cutoff.

Disconnect the yellow cable from No.6 terminal on the thermostat.

Disconnect the live and neutral (brown and blue) connections on the board at the terminal strip and the board earth cable (green/yellow).

The board can now be eased off the two front fixing studs and removed from the rear location tags and support posts.

To reconnect, refer to diagram 16.4.

Refit control box.

16.6 Thermostat

Remove the controls cover by sliding it forward.

Remove the fascia by removing the four small screws, see diagram 16.3.

Pull off the thermostat knob.

Release the control box or remove if fitted at minimum clearance, see Section 16.3.

Remove the outer casing after unscrewing the two upper and two lower securing screws, see diagram 14.1.

Remove the sealing angle on the right hand side where the thermostat capillaries pass through the back panel, see diagram 16.7.

Remove the screw and nut securing the capillary clips to the control box to release the capillary. Pull surplus through the hole in the back panel.

Remove the clip securing the thermostat phial and coil into the pocket. Remove the phial and the coil, see diagram 16.7.

Feed the phial capillary through the hole in the back panel and pull clear at the bottom.

Disconnect the leads at the thermostat. Remove the two screws securing the thermostat and remove it.

To reconnect refer to diagram 16.4.

Refit the control box as Section 16.3.

When fitting thermostat push the phial upward at the rear right hand side of the boiler into the guide until it is visible and can be passed through the sealing angle hole in the back panel, pulling available capillary through the hole.

When replacing the phial and coil, smear them with the heat sink compound supplied and secure in the pocket with the clip, see diagram 16.7.

Feed surplus capillary back through the hole in the back panel before fitting the sealing angle.

16.7 Overheat Cutoff

Slide the controls cover forward.

Release the control box or remove if installed at minimum lower clearance as Section 16.3.

Remove the outer casing as described in paragraph 5 of Section 16.5.

Remove the sealing angle as in paragraph 6 of Section 16.6, pulling surplus capillaries through the hole in the back panel.

Remove the clip securing the phials in the pocket and pull out both phials, see diagram 16.7. Feed the coiled capillary through the hole in the back panel.

Remove the screw and nut securing the capillary clips to the control box and release the capillary.

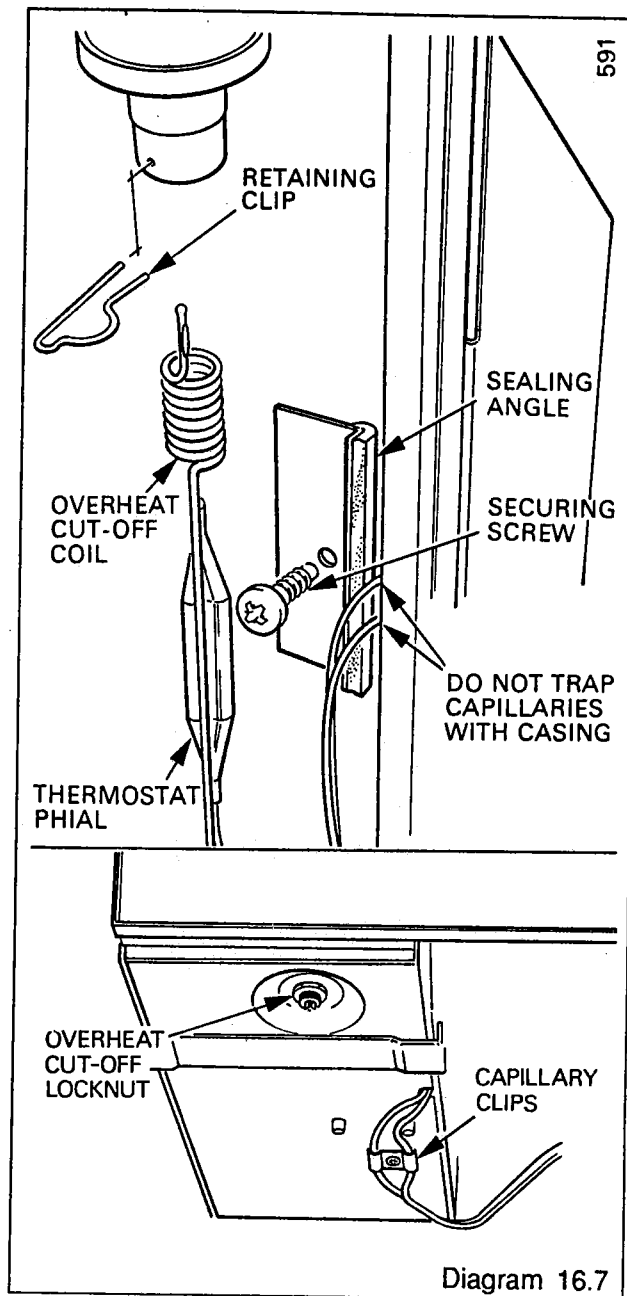


Diagram 16.7

Disconnect the connectors at the overheat cutoff, noting their positions.

Remove the nut securing the cutoff and remove it.

When fitting overheat cutoff, push the coiled capillary upward at the rear right hand side of the boiler into the guide until it is visible and can be passed through the sealing angle hole in the back panel, pulling all available capillary through the hole.

When replacing the coiled capillary at the top and the phial below it, both should be smeared with the heat sink compound supplied, before replacing and securing in the pocket with the clip.

Feed surplus capillary back through the hole in the back panel before fitting sealing angle.

Do not trap capillaries with the casing.

Refit control box as Section 16.3.

16 Replacement of Parts

16.8 Ignition Lead

Remove the controls cover by sliding it forward.

Remove the outer casings as described in paragraph 5 of Section 16.5.

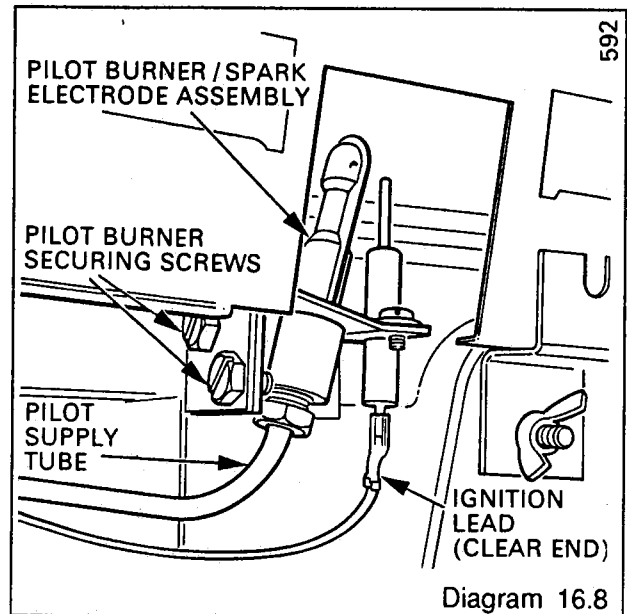
Release the control box or remove it if installed at minimum lower clearance as paragraph 3 of Section 16.3.

Pull off the ignition lead at the connection at the back of the sequence board and electrode, see diagrams 16.4 and 16.8.

Remove one of the sealing angles where the lead passes through the back panel and replace the lead, feeding it through in the same way as the original, securing it to the pilot supply tube by passing through the plastic tubing guides.

Fit the clear end to the electrode.

Refit the control box as Section 16.3.



16.9 Pilot Burner and Electrode Assembly

Remove the controls cover by sliding it forward.

Remove the outer casing as described in paragraph 5 of Section 16.5.

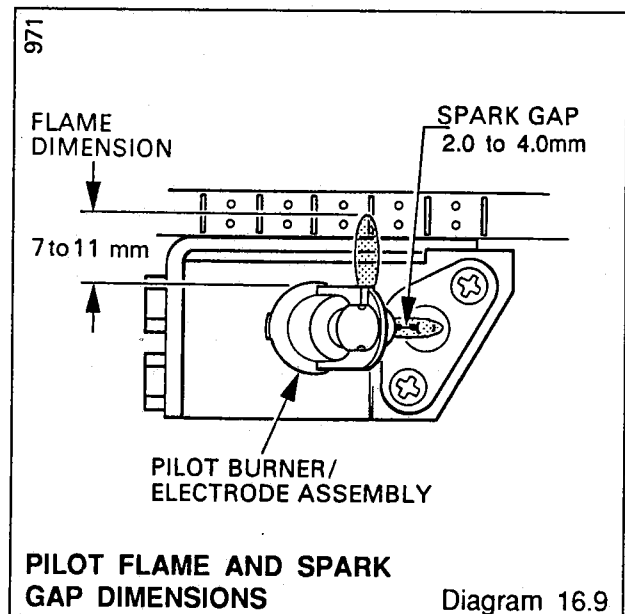
Pull off ignition lead from electrode.

Disconnect the pilot supply at the base of the pilot burner, see diagram 16.8.

Remove the two screws securing the pilot burner assembly to the burner, making it free to be replaced.

Check the spark gap, see diagram 16.9.

Check pilot flame length, see diagram 16.9.



16.10 Fan Assembly

Remove the controls cover by sliding it forward.

Remove the casing as described in paragraph 5 of Section 16.5.

Disconnect the cables from the fan at the two way terminal strip and the earth connection. Release the cables from the plastic support clip.

Remove the screw and clip securing the flue box tube to fan casing.

Remove the three screws securing the fan assembly, withdrawing forward and upward. Do not disturb the position of the flue box tube, see diagram 16.10.

Make sure that the gasket is fitted to the fan and refit plastic clip to route and support the cables.

16.11 Heat Exchanger Body

Remove the controls cover by sliding it forward.

Remove the outer casing as described in paragraph 5 of Section 16.5.

Drain the boiler circuit of water at the drain off tap(s). A drain point is provided for draining residual water from the boiler, see diagram 16.10.

Remove the flue and combustion chamber front panel as in Section 14.1.

Remove the retaining clip and thermostat phials as in Section 16.6.

Remove the burner as in Section 14.1. and cover the pilot tube as in paragraph 10.

Remove the four screws securing the combustion chamber sides to the back plate, see diagram 16.10 and lower the combustion chamber, taking care not to damage the insulation.

Disconnect the flow and return unions above the heat exchanger.

The heat exchanger assembly can now be removed and replaced.

Replace the heat exchanger. Locate the lugs on the combustion chamber sides into the slots in the side plates of the heat exchanger.

Lift the heat exchanger and combustion chamber together and secure with the four screws to the back plate.

When replacing the combustion chamber front cover, loosely fit screws until the flue hood has been secured.

Smear the thermostat phial and coil with heat sink compound supplied.

Feed capillaries as in paragraph 13 of Section 16.6. Ensure that they are fully pushed into the pocket and are retained by the clip, see diagram 16.7.

When refitting the flue hood make sure a good seal is made to the back panel by replacing the two screws at the rear.

Do not overtighten the wing nuts securing the flue hood angle.

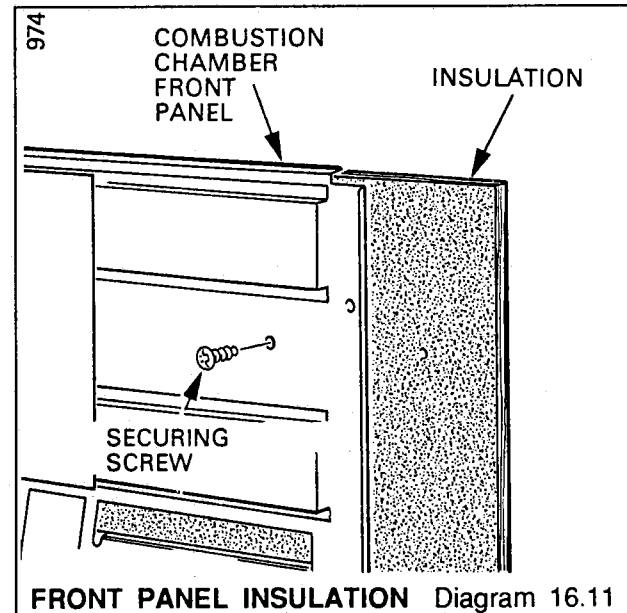
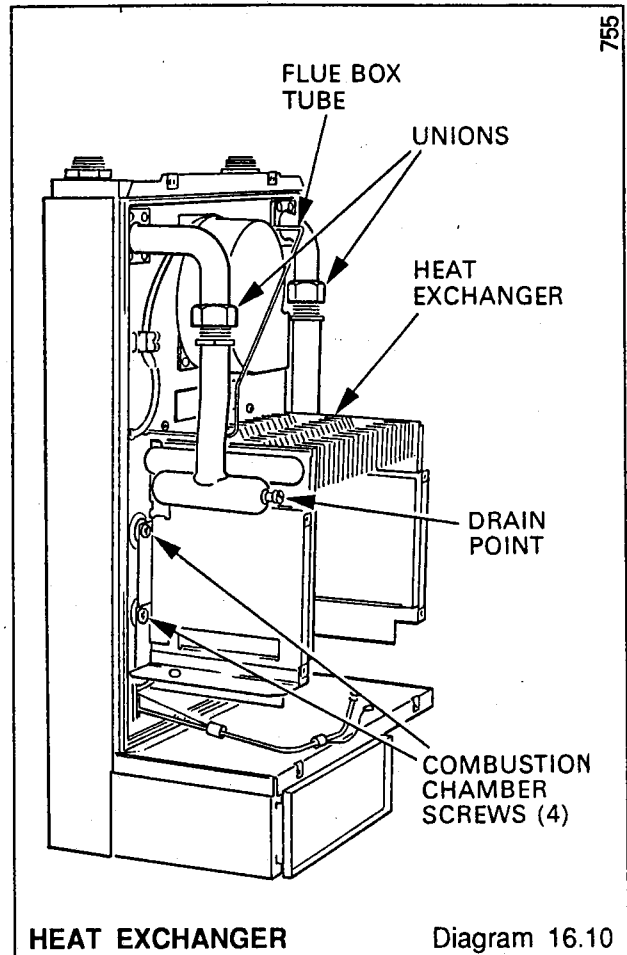
16.12 Combustion Chamber Insulation

Remove the combustion chamber front panel and other parts as described in Section 14.1 paragraphs 1 to 5.

Remove the screw securing the front insulation and slide out, see diagram 16.11.

The side insulation can be removed by sliding forward.

Follow the instructions in paragraphs 1 to 11 in Section 16.11 to gain access to the rear insulation. Lift out rear insulation.



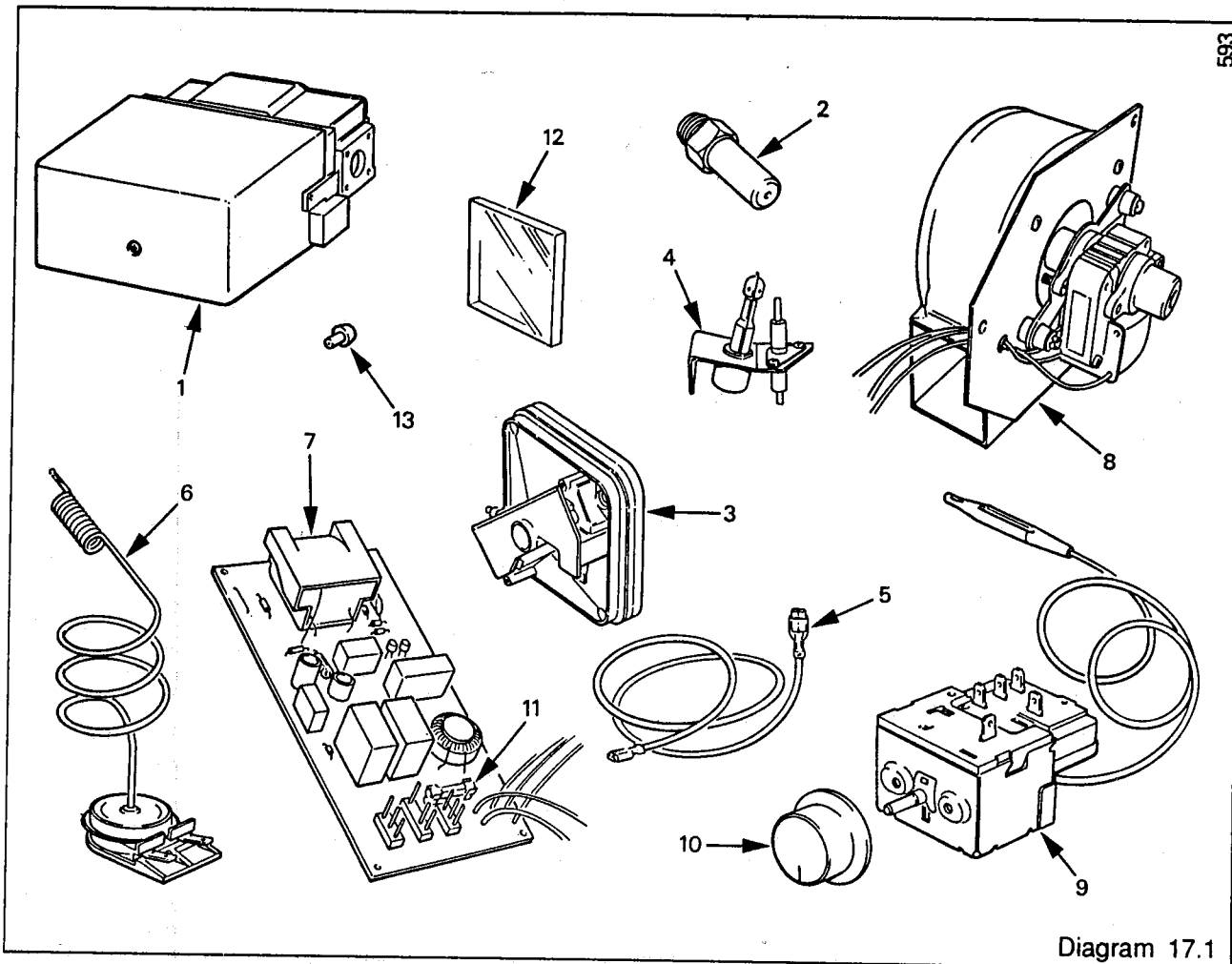


Diagram 17.1

When ordering spare parts quote the part number, description and the appliance name and its serial number, visible after the controls cover is removed by sliding it forward. The GC number should also be given to the local gas undertaking.

| Key No | Glow-worm Part No | Description | GC Part No |
|--------|-------------------|---------------------------------|------------|
| 1 | 417517 | Gas control assembly | 334 702 |
| 2 | 203045 | Main injector 4.5 | 312 525 |
| 3 | 202032 | Air pressure switch - 65F | 394 279 |
| 3 | 202026 | Air pressure switch - 80F | 394 181 |
| 4 | 417268 | Pilot burner/electrode assembly | 334 602 |
| 5 | WW4612 | Ignition lead | 355 500 |
| 6 | 202505 | Overheat cutoff assembly | 395 799 |
| 7 | 417281 | Control circuit board | 334 623 |
| 8 | 417135 | Fan assembly - 65F | 334 610 |
| 8 | 417637 | Fan assembly - 80F | 312 503 |
| 9 | 202504 | Thermostat assembly | 395 779 |
| 10 | 416144 | Thermostat knob assembly | 355 401 |
| 11 | 202015 | Fuse - 1A 2x20mm | 334 750 |
| 12 | 411194 | Sight glass | 355 153 |

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