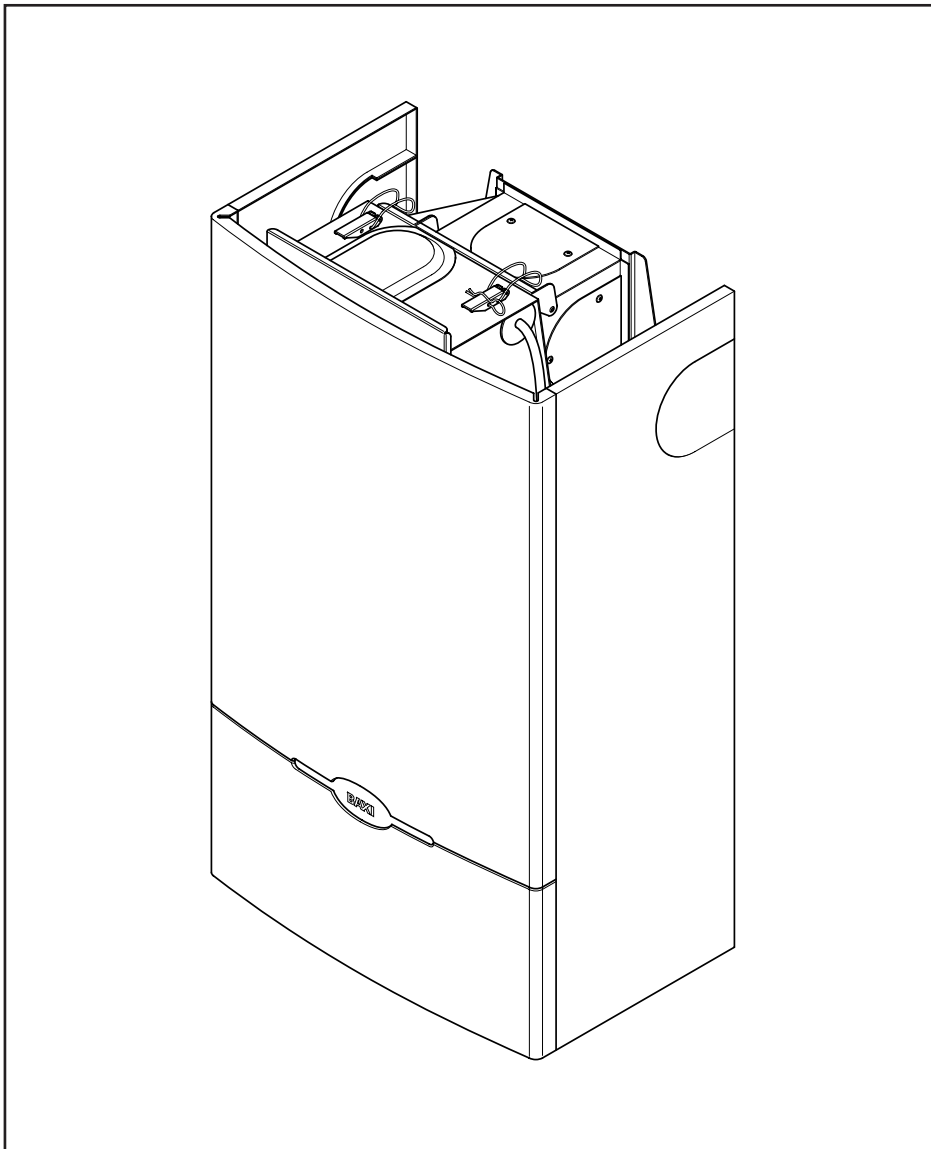


# Baxi Solo 3 PFL System

Wall Mounted Powered Flue System Boiler  
Gas Fired Central Heating Unit

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## Installation and Servicing Instructions



**BAXI**

## Natural Gas

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**Baxi Solo 3 PFL System 30**  
G.C.No. 41 075 25

**Baxi Solo 3 PFL System 40**  
G.C.No. 41 075 26

**Baxi Solo 3 PFL System 50**  
G.C.No. 41 075 27

**Baxi Solo 3 PFL System 60**  
G.C.No. 41 075 28

**Baxi Solo 3 PFL System 70**  
G.C.No. 41 075 29

**Baxi Solo 3 PFL System 80**  
G.C.No. 41 075 31

Baxi UK Limited is one of the leading manufacturers of domestic heating products in the UK.

Our first priority is to give a high quality service to our customers. Quality is built into every Baxi product - products which fulfil the demands and needs of customers, offering choice, efficiency and reliability.

To keep ahead of changing trends, we have made a commitment to develop new ideas using the latest technology - with the aim of continuing to make the products that customers want to buy.

Everyone who works at Baxi has a commitment to quality because we know that satisfied customers mean continued success.

We hope you get a satisfactory service from Baxi. If not, please let us know.

The boiler meets the requirements of Statutory Instrument "The Boiler (Efficiency) Regulations 1993 N° 3083" and is deemed to meet the requirements of Directive 92/42/EEC on the energy efficiency requirements for new hot water boilers fired with liquid or gaseous fuels:-

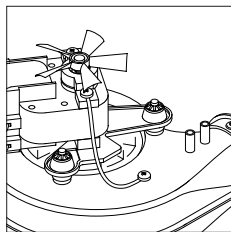
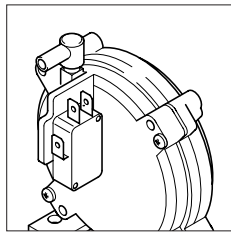
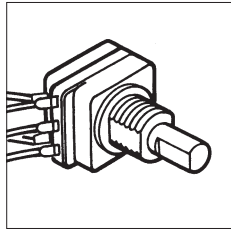
Type test for purpose of Regulation 5 certified by:  
Notified Body 0086.

Product/Production certified by:  
Notified Body 0086.

For use in GB/IE only



Baxi is a BS-EN ISO 9001  
Accredited Company



## Contents

Section	Page
<b>1.0 Introduction</b>	<b>4</b>
<b>2.0 General Layout</b>	<b>5</b>
<b>3.0 Technical Data</b>	<b>6</b>
<b>4.0 System Details</b>	<b>8</b>
<b>5.0 Site Requirement</b>	<b>11</b>
<b>6.0 Installation</b>	<b>14</b>
<b>7.0 Commissioning the Appliance</b>	<b>32</b>
<b>8.0 Fitting the Outercase</b>	<b>34</b>
<b>9.0 Overheat Cut-Off Device</b>	<b>35</b>
<b>10.0 Annual Servicing</b>	<b>36</b>
<b>11.0 Changing Components</b>	<b>38</b>
<b>12.0 Short Parts List</b>	<b>44</b>
<b>13.0 Fault Finding</b>	<b>45</b>

## 1.0 Introduction

### 1.1 Description

1. The Baxi Solo 3 PFL System is a gas fired room sealed fan assisted central heating system boiler with outputs as shown in the table below.

Model	Heat Output
30	8.79kW (30,000 Btu/h)
40	11.72kW (40,000 Btu/h)
50	14.65kW (50,000 Btu/h)
60	17.58kW (60,000 Btu/h)
70	20.5kW (70,000 Btu/h)
80	23.44kW (80,000 Btu/h)

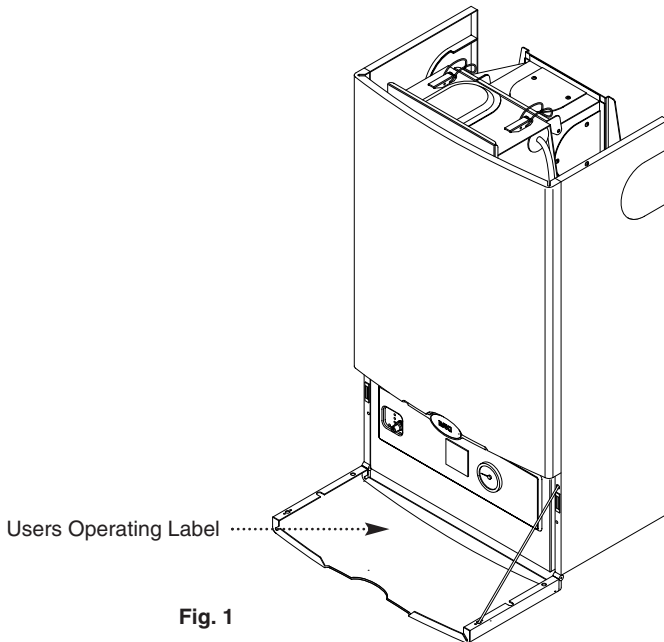


Fig. 1

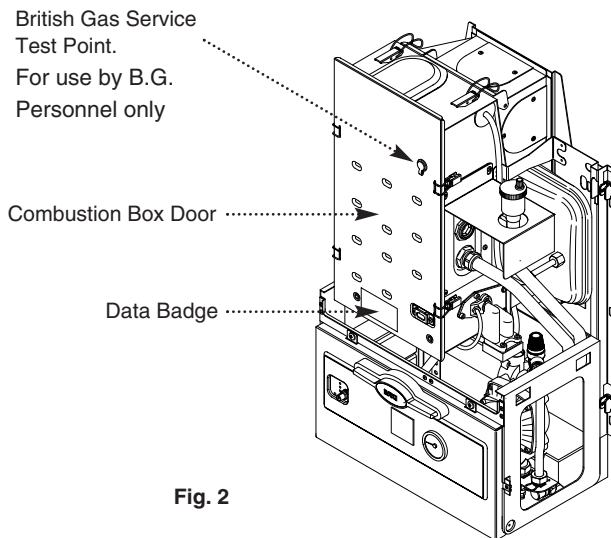


Fig. 2

#### IMPORTANT:

STATEMENT OF ADJUSTMENT. Check that the state of adjustment given on the data plate is compatible with local supply conditions

#### “Benchmark” Log Book

As part of the industry-wide “Benchmark” initiative all Baxi boilers now include an Installation, Commissioning and Service Record Log Book. Please read the Log Book carefully and complete all sections relevant to the appliance and installation. These include sections on the type of controls employed, flushing the system, burner operating pressure etc. The details of the Log Book will be required in the event of any warranty work. Also, there is a section to be completed at each subsequent regular service visit. The Log Book must be left with the user.

### 1.2 Installation

1. The appliance is suitable for installation only in G.B. and I.E. and should be installed in accordance with the rules in force. For Ireland install in accordance with I.S.813 “**INSTALLATION OF GAS APPLIANCES**”. The installation must be carried out by a CORGI Registered Installer or other competent person and be in accordance with the relevant requirements of the current **GAS SAFETY (Installation and Use) REGULATIONS**, the **BUILDING REGULATIONS (Scotland) (Consolidation)**, the **LOCAL BUILDING REGULATIONS**, the **CURRENT I.E.E. WIRING REGULATIONS** and the bye laws of the Local Water Undertaking. Where no specific instructions are given, reference should be made to the relevant **BRITISH STANDARD CODES OF PRACTICE**.

2. **All systems must be thoroughly flushed and treated with inhibitor (see Section 4.2).**

### 1.3 Important Information

#### Man-Made Mineral Fibre

a) Some component parts of this appliance (insulation pads, gaskets and rope seals) are manufactured from man-made mineral fibre.

b) Prolonged or excessive exposure to this material may result in some irritation to the eyes, skin or respiratory tract.

c) It is advisable to wear gloves when handling these items.

d) Irritant dust will only be released from the items if they are broken up or subjected to severe abrasion. In these instances a suitable dust mask and goggles should be worn.

e) Always thoroughly wash hands after installation, servicing or changing components.

f) When disposing of any items manufactured from man-made mineral fibre care must be exercised.

g) If any irritation of the eyes or severe irritation of the skin is experienced seek medical attention.

## 2.0 General Layout

### 2.1 Layout (Figs. 3 & 4)

1. Wall Plate
2. Automatic Air Vent
3. Expansion Vessel
4. Pressure Relief Valve
5. Circulation Pump
6. Water Pressure Gauge
7. Position of Optional Timer
8. Gas Tap
9. Control Knob
10. Electronics Housing
11. Gas Valve
12. Burner
13. Heat Exchanger
14. Fan Assembly
15. Pressure Switch
16. Overheat Thermostat
17. Thermostat Sensor

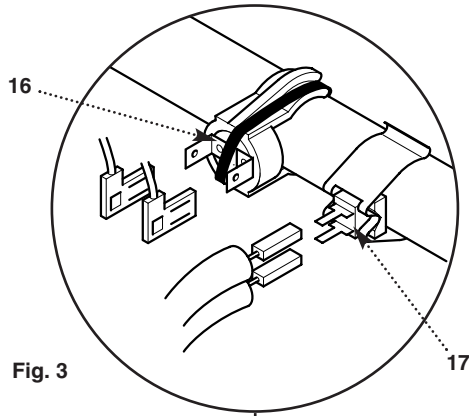


Fig. 3

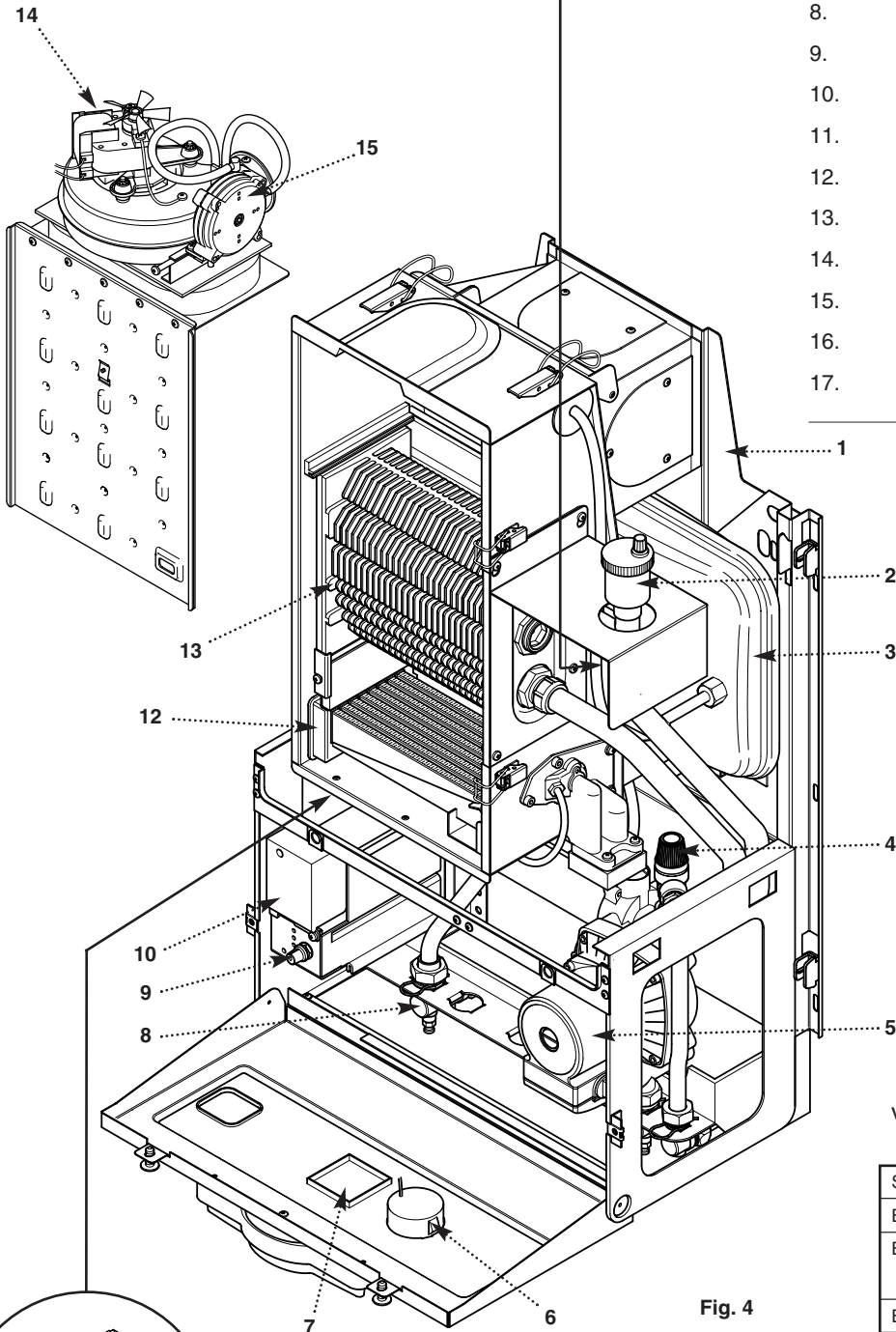


Fig. 4

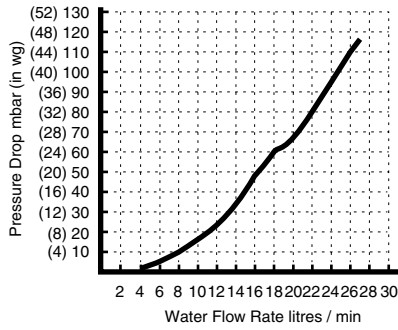
**B.S. Codes of Practice**, most recent version should be used

STANDARD	SCOPE
B.S. 6891	Gas Installation.
B.S. 5546	Installation of hot water supplies for domestic purposes.
B.S. 5449	Forced circulation hot water systems.
B.S. 6798	Installation of gas fired hot water boilers.
B.S. 5440: Pt 1	Flues.
B.S. 5440: Pt 2	Ventilation.
B.S. 7074: Pt 1	Sealed Systems

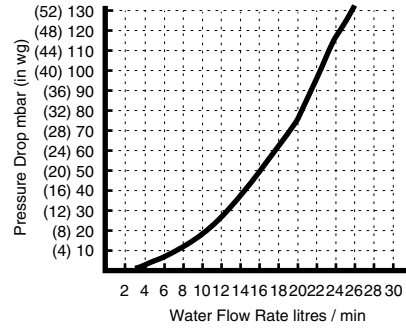
### 3.0 Technical Data

Model		30	40	50	60	70	80
Heat Output	kW	8.79	11.72	14.65	17.58	20.5	23.44
	Btu/h	30,000	40,000	50,000	60,000	70,000	80,000
Heat Input	kW	10.99	14.65	18.32	21.98	25.64	29.31
	Btu/h	37,500	50,000	62,500	75,000	87,500	100,000
Burner Pressure	mbar	16.0 ±0.5	16.0 ±0.5	16.0 ±0.5	16.0 ±0.5	16.0 ±0.5	16.0 ±0.5
	in wg	6.4 ±0.2	6.4 ±0.2	6.4 ±0.2	6.4 ±0.2	6.4 ±0.2	6.4 ±0.2
Gas Rate	CV 38mj/m <sup>3</sup>	1.04m <sup>3</sup> /h	1.39m <sup>3</sup> /h	1.74m <sup>3</sup> /h	2.08m <sup>3</sup> /h	2.43m <sup>3</sup> /h	2.78m <sup>3</sup> /h
	(after 10 mins)	36.86ft <sup>3</sup> /h	49.0ft <sup>3</sup> /h	61.3ft <sup>3</sup> /h	73.5ft <sup>3</sup> /h	86.75ft <sup>3</sup> /h	99.24ft <sup>3</sup> /h
Lifting Weight	kg	40	40	40	49.1	49.1	49.1
	lbs	88	88	88	108	108	108
Water Content	litres	2.1	2.1	2.1	2.6	2.6	2.6
	pints	3.2	3.2	3.2	4.5	4.5	4.5
Outercase	Height	850mm	850mm	850mm	850mm	850mm	850mm
Dimensions	Width	490mm	490mm	490mm	490mm	490mm	490mm
	Depth	320mm	320mm	320mm	320mm	320mm	320mm
Flue Terminal	Diameter	100mm					
Dimensions	Depth	70mm					
Connections	Flow	22mm Cu tail					
	Return	22mm Cu elbow					
Heat Exchanger		Cast iron monobloc					
System Design		fully pumped sealed systems only					
Gas Connection		22mm Cu tail					
Electrical Supply		230V ~ 50Hz fused 5A - 90W					
Controls		boiler thermostat, intermittent pilot & electronic flame sensing					
		timed pump over-run, frost protection thermostat					
Internal Fuse		4AF 250V to BS4256 situated on control board					

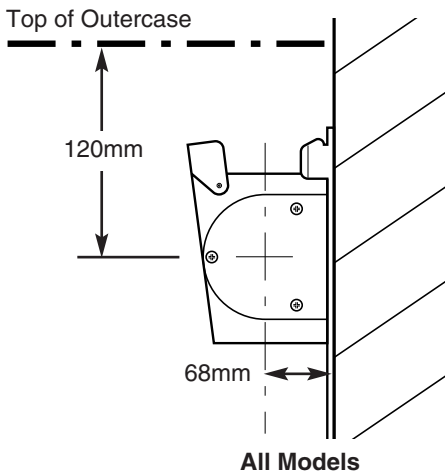
## Hydraulic Resistance Charts



30, 40 and 50 models



60, 70 and 80 models



### SEDBUK Declaration For Solo 3 PFL System

Model	Seasonal Efficiency (SEDBUK) (%)
30	79.4
40	78.4
50	78.0
60	78.5
70	78.2
80	78.7

This value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated have been certified by 0086.

- This appliance is only intended for installation on a governed supply.
- PMS = 3 bar pressure class 2
- Max CH water pressure 3 bar
- Type C<sub>12</sub> C<sub>32</sub> C<sub>52</sub>
- Nox class 1
- Appliance category I<sub>2H</sub> 2H - G20 - 20mbar
- Ref: 86/AU/588
- Burner Injector Sizes: 30=B31 40=B32 50=B33 60=B34 70=B35 80=B36
- This boiler is designed to operate at a maximum water temperature of 85° C.

## 4.0 System Details

### 4.1 Water Circulating Systems

#### Water Circulating Systems

1. The appliance is suitable for fully pumped sealed systems only.

**The following conditions should be observed on all systems:**

- The boiler must not be used with a direct cylinder.
- Drain cocks should be fitted to all system low points.
- All gas and water pipes and electrical wiring must be installed in a way which would not restrict the servicing of the boiler.
- Air vents should be fitted to all system high points.
- All components used in the system must be suitable for operation at 110°C (230°F).

### 4.2 Treatment of Water Circulating Systems

- All recirculatory water systems will be subject to corrosion unless an appropriate water treatment is applied. This means that the efficiency of the system will deteriorate as corrosion sludge accumulates within the system, risking damage to pump and valves, boiler noise and circulation problems.
- For optimum performance after installation this boiler and its associated central heating system must be flushed in accordance with the guidelines given in BS 7593:1992 "Treatment of water in domestic hot water central heating systems".
- This must involve the use of a proprietary cleanser, such as BetzDearborn Sentinel X300 or X400, or Fernox Superfloc. Full instructions are supplied with the products, but for immediate information please contact BetzDearborn (0151 420 9563) or Fernox (01799 550 811) directly.
- For long term protection against corrosion and scale, after flushing it is recommended that an inhibitor such as BetzDearborn Sentinel X100, or Fernox MB-1 or Copal is dosed in accordance with the guidelines given in BS 7593:1992.

**Failure to flush and add inhibitor to the system may invalidate the appliance warranty.**

- It is important to check the inhibitor concentration after installation, system modification and at every service in accordance with the manufacturer's instructions. (Test kits are available from inhibitor stockists.)
- For information or advice regarding any of the above contact the Baxi Helpline.

### 4.3 Bypass Requirements

1. The boiler is fitted with a pump overrun device which allows the removal of residual heat from the boiler.

**NOTE:** The pump overrun will operate for approximately 8 minutes. The system design must therefore always provide an open circuit for water to circulate between the boiler flow and return.

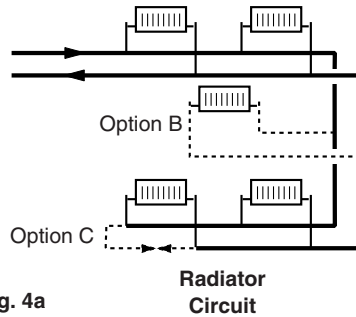


Fig. 4a

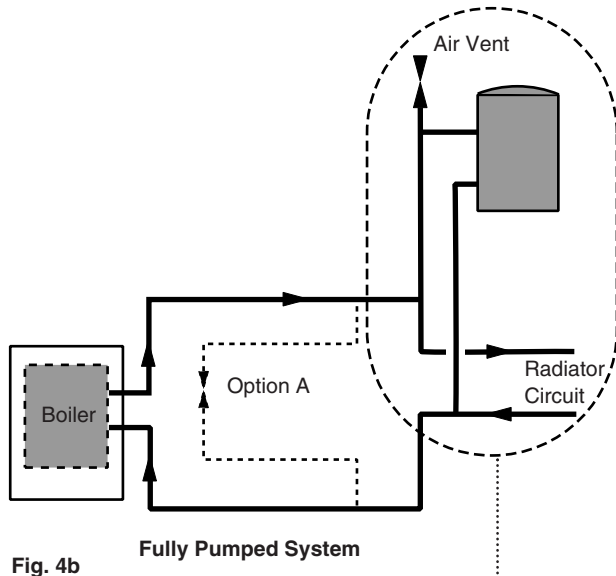


Fig. 4b

#### Examples of systems which require a bypass are:-

- A system controlled by non-electrical valves e.g. mechanical thermostatic control valves both on the radiators and the hot water circuit.
- A system using twin zone valves (e.g. Honeywell 'S' Plan) (Fig. 4c).
- A system using a 3 port diverter valve (Fig. 4d) does not normally require a bypass therefore this system is recommended. The exception to this is where thermostatic radiator valves are used and then a bypass is required.

**NOTE:** For 'S' Plan systems the bypass flow circuit must be situated between pump and zone valves as option A shows (Fig. 4b).

#### The bypass circuit can be:-

- For all boilers a minimum of 6 metres of 22mm copper pipe, (measured between the boiler flow and return connections). It should be fitted with a lock shield valve opened at least 1 full turn or a proprietary bypass valve set to give a minimum flow rate of 8 litres/min (1.8 gal/min) (Option C, Fig. 4a & Option A, Fig. 4b).
- A radiator fitted with lock shield valves. The radiator output should be a minimum of 800 watts (2,700 Btu/h). Typically a convector type radiator with an area of 3750 cm<sup>2</sup> (4 sq ft) is adequate (Option B, Fig. 4a).
- Any circuit that provides the same operating conditions as option A or option B (Figs. 4a & 4b).

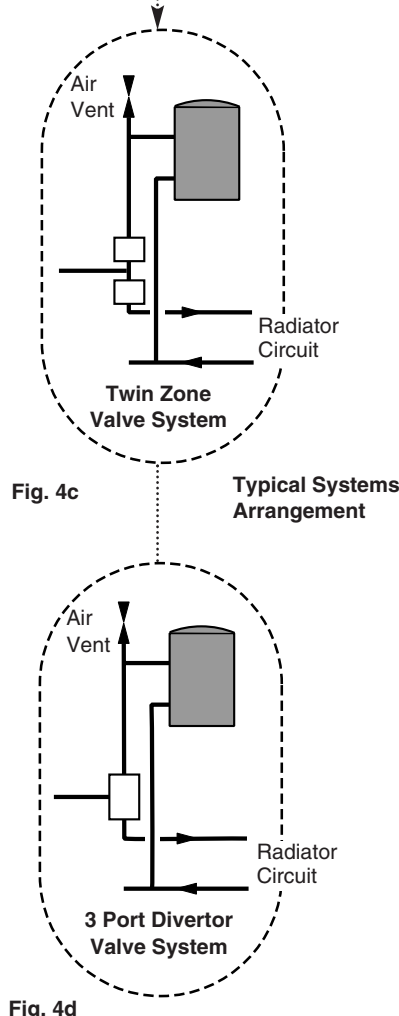


Fig. 4c

Fig. 4d



## 4.0 System Details

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### 4.4 Pipework

1. The sizes of flow and return pipes from the boiler should be determined by normal methods, according to the requirements of the system.
  2. The connections to the boiler are 22mm copper tails.
- 

### 4.5 System Components

1. All components used in the system must be suitable for operation at 110° C (230° F) and at the pressure allowed by the safety valve.
- 

### 4.6 System Controls

1. For optimum operating conditions, the heating system into which the boiler is installed should include a control system.
  2. Such a system will comprise of a timer control and separate room or cylinder thermostats as appropriate. (An integral twin channel programmer is available as an optional extra).
  3. The boiler should be controlled so that it operates on demand only.
  4. Operation of the system under control of the boiler thermostat & TRV's only does not produce the best results.
- 

### 4.7 Thermal Stores & Heat Stores

1. If a thermal store or heat store is being used, it should be one approved for use with the Baxi Solo 3 PFL System Boiler.
-

## 4.0 System Details

### 4.8 System Filling and Pressurising

1. A filling point connection on the central heating return pipework must be provided to facilitate initial filling and pressurising and also any subsequent water loss replacement/refilling.

2. The filling method adopted must be in accordance with all relevant water supply bye-laws and use approved equipment.

3. Your attention is drawn to: IRN 302 and Byelaw 14.

4. The sealed primary circuits may be filled or replenished by means of a temporary connection (Filling Loop) between the circuit and a supply pipe, provided a WRC approved double check valve or some other no less effective backflow prevention device is permanently connected at the inlet to the circuit and the temporary connection (Filling Loop) is removed after use (Fig. 5).

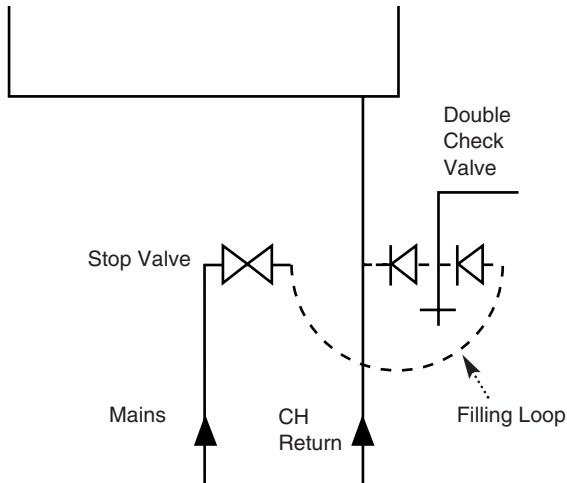


Fig. 5

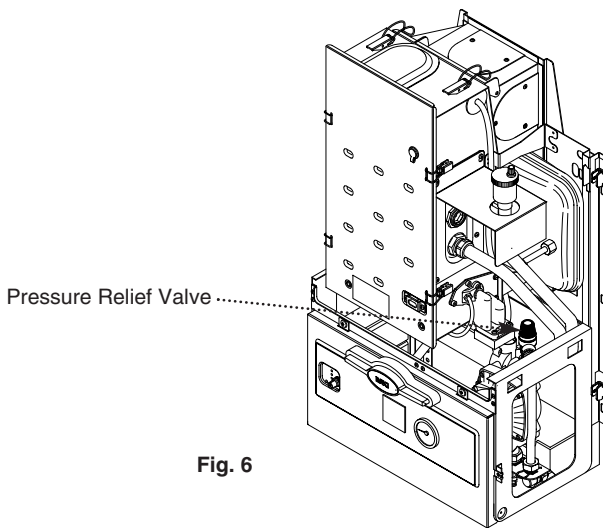


Fig. 6

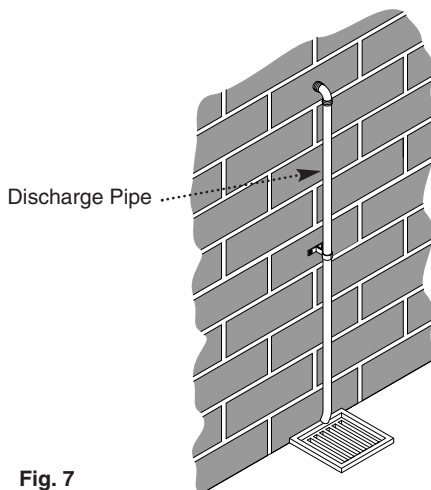


Fig. 7

### 4.9 Expansion Vessel

1. The appliance expansion vessel is pre-charged to 1 bar (10 lb/in<sup>2</sup>). Therefore, the minimum cold fill pressure is 1 bar. The vessel is suitable for correct operation for system capacities up to 125 litres (27.5gal). For greater system capacities an additional expansion vessel must be fitted - refer to BS 7074 Pt 1.

### 4.10 Pressure Relief Valve (Figs. 6 & 7)

1. The pressure relief valve is set at 3 bar, therefore all pipework, fittings, etc. should be suitable for pressures in excess of 3 bar.

2. The pressure relief discharge pipe should be not less than 15mm dia, run continuously downward, and discharge outside the building, preferably over a drain. It should be routed in such a manner that no hazard occurs to occupants or causes damage to wiring or electrical components. The end of the pipe should terminate facing down and towards the wall.

3. The discharge must not be above a window, entrance or other public access. Consideration must be given to the possibility that under fault conditions boiling water/steam could discharge from the pipe.

4. The pressure relief valve must not be used for draining the system/boiler.

## 5.0 Site Requirements

### 5.1 Location

1. The appliance may be fitted to any suitable wall with the flue passing through an outside wall and discharging to atmosphere in a position permitting satisfactory removal of combustion products and providing an adequate air supply. The appliance should be fitted within the building unless otherwise protected by a suitable enclosure ie. garage or outhouse. (The appliance may be fitted inside a cupboard. Cooling ventilation and insulation of the cupboard are not required, see section 5.5.)

2. If the appliance is fitted in a room containing a bath or shower reference must be made to the Current I.E.E. Wiring Regulations and Building Regulations. If the appliance is to be fitted into a building of timber frame construction then reference must be made to the Institute of Gas Engineers document UP7 ("Guide for Gas Installation in Timber Framed Dwellings").

3. Recommendations for flues are given in BS 5440 Part 1.

### 5.2 Minimum Clearances (Fig. 8)

1. A flat vertical area is required for the installation of the boiler.

2. These dimensions include the necessary clearances around the appliance for case removal, spanner access and air movement. Additional clearances may be required for the passage of pipes around local obstructions such as joists running parallel to the front face of the appliance.

3. If fitted inside a cupboard the clearance of 500mm shown is only necessary when the cupboard door is open. A clearance of 5mm ( $\frac{1}{16}$  in) is required when the door is closed.

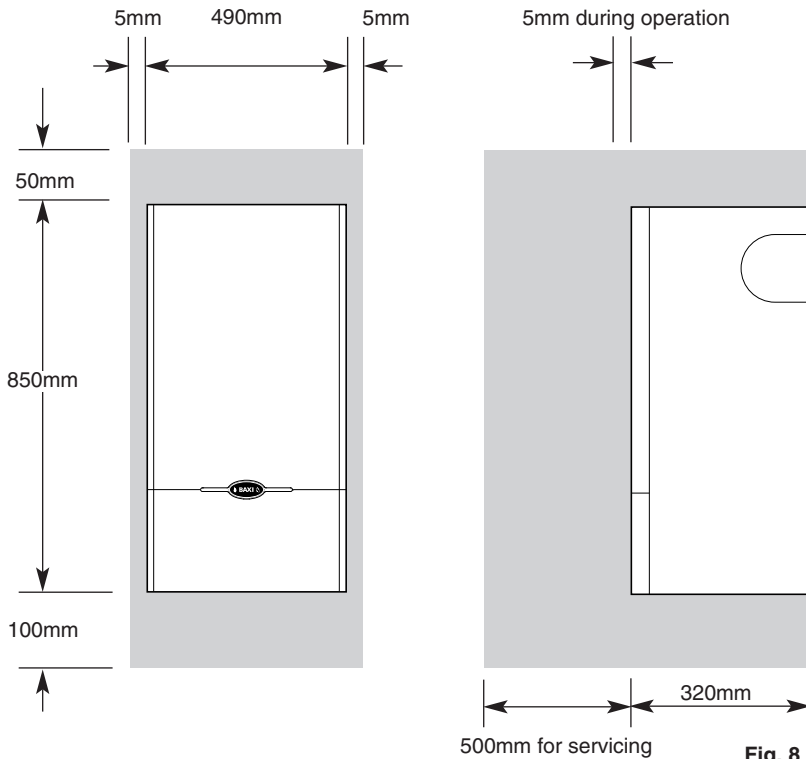


Fig. 8

### 5.3 Flue Position

1. For installations where the flue terminal is inaccessible from the outside, an internal fitting kit is available. This can be obtained free of charge from your local merchant.

2. The following guide lines indicate the general requirements for siting balanced flue terminals.

3. If the terminal is fitted within 1 metre (39in) of a plastic gutter, within 500mm (19½ in) of a painted eave or a painted gutter, an aluminium shield of at least 1 metre (39in) long should be fitted to the underside of the gutter or painted surface. An air space of 5mm ( $\frac{3}{16}$  in) should be left between shield and gutter (Fig. 9).

4. If the terminal discharges onto a pathway or passageway, check that combustion products will not cause a nuisance and that the terminal will not obstruct the passageway.

5. If the outer surface of an outside wall is of combustible material, it should be protected by fitting the flue trim provided.

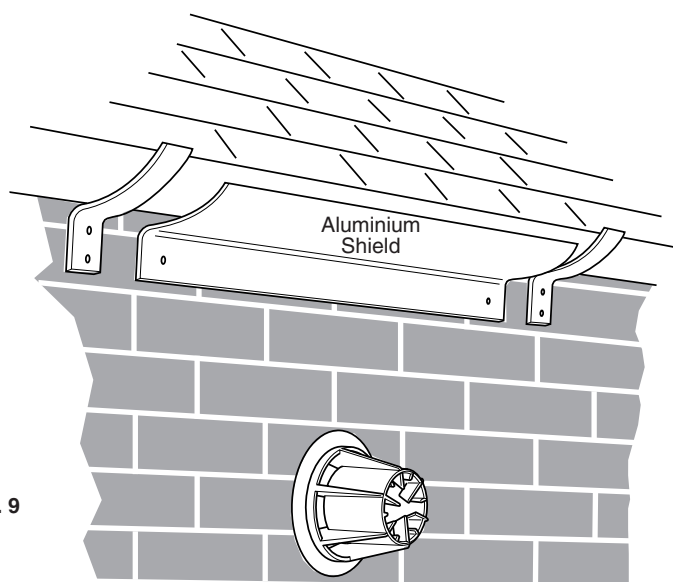


Fig. 9

## 5.0 Site Requirements

### 5.3 Flue Position (Cont)

**WARNING** - The addition of anything that may interfere with the normal operation of the appliance (e.g. FLUE DAMPERS, ECONOMISERS, etc.) without the express written permission of Baxi UK Limited could invalidate the appliance warranty and infringe the GAS SAFETY (Installation and Use) REGULATIONS.

If a terminal is less than 2 metres (78<sup>3</sup>/<sub>4</sub> in) above a balcony, above ground or above a flat roof to which people have access then a suitable terminal guard must be provided.

6. The flue terminal position must always be in accordance with the current edition of B.S. 5440 Part 1, and either Part J of the Building Regulations England and Wales or Part F of the Building Standards (Scotland) Regulations as appropriate.

7. Table 2 and Fig. 10 show the positioning of the flue terminal relative to buildings and other structures.

8. The dimensions of the flue terminal are shown in Section 3.0 Technical Data.

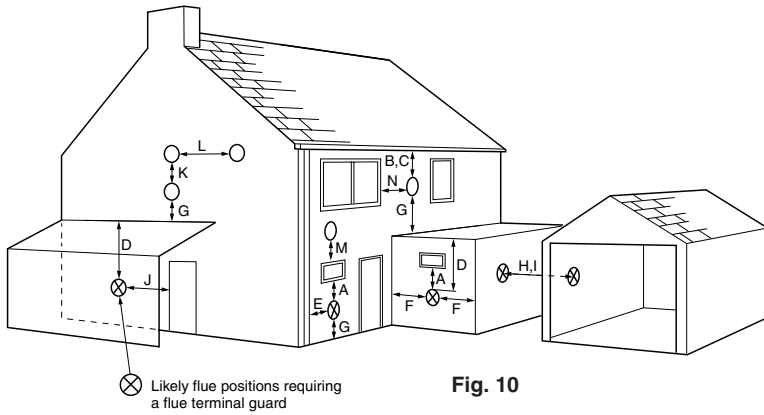
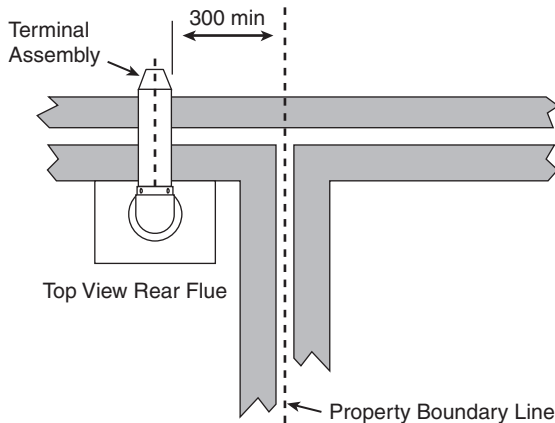


Fig. 10

Horizontal Terminal Position with Minimum Distance	(mm)
A Directly below an openable window, air vent or any other ventilation opening.	300
B Below gutter, drain/soil pipe.	150
C Below eaves.	200
D Below a balcony/car port roof.	200
E From vertical drain pipes and soil pipes.	150
F From internal or external corners.	300
G Above adjacent ground or balcony level.	300
H From a surface or boundary facing a terminal.	600
I Facing a terminal.	1200
J From opening (door/window) in carport into dwelling.	1200
K Vertically from a terminal on the same wall.	1500
L Horizontally from a terminal on the same wall.	300
M Above an opening, air brick, opening window etc.	300
N Horizontally to an opening, air brick, opening window etc.	300

Table. 2

**NOTE:** Scotland Only - The distance from a fanned draught appliance terminal installed at right angles to a boundary may not be less than 300mm in accordance with the diagram below.



Maximum lengths for side flue using the standard telescopic flue kit

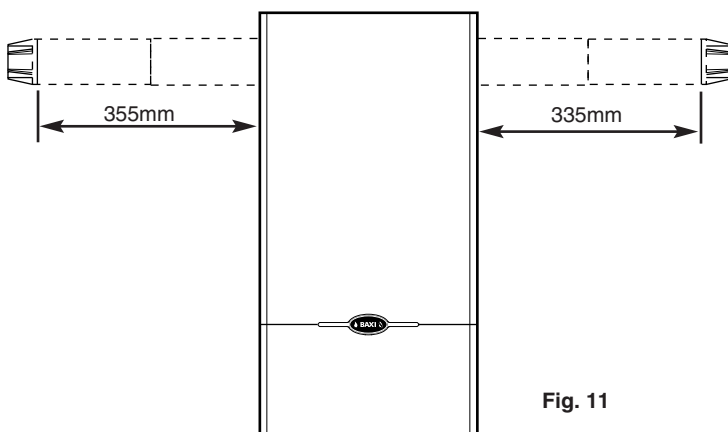


Fig. 11

### 5.4 Flue Dimensions

1. Flue extensions are available as optional extras for installations up to 3 metres horizontal.

2. Vertical flue kits are available up to 4 metres in length. Vertical twin flue kits are available up to 15 metres in length.

3. The standard telescopic flue is suitable for use with rear flue lengths between 100mm (4in) and 500mm (19<sup>5</sup>/<sub>8</sub> in).

4. Where it is intended to pass the flue through a combustible wall or timber framed dwelling, reference should be made to the Institute of Gas Engineers document UP7 - Guide for Gas Installations in Timber Framed Dwellings.

5. If the flue is more than 1 metre (39<sup>3</sup>/<sub>8</sub> in) long, it is required that it is supported.

6. All above dimensions are taken from the respective faces of the outer case.

## 5.0 Site Requirements

### 5.5 Ventilation of Compartments

1. Where the appliance is installed in a cupboard or compartment, no air vents are required.

**NOTE:** The ventilation label on the front of the outer case **MUST NOT BE REMOVED** when the appliance is installed in a compartment or cupboard.

2. B.S. 5440 Part 2 Clause 4.2 refers to room sealed appliances installed in compartments. This appliance will run sufficiently cool without ventilation.

### 5.6 Gas Supply

1. The gas installation should be in accordance with BS 6891.
2. The connection of the appliance is a 22mm copper tail on the tap rail (Fig. 12).
3. The pipework should be sized to account for the distance of the appliance from the meter, the pipe routing and maximum input of the appliance.

### 5.7 Electrical Supply

External wiring must be correctly earthed, polarized and in accordance with CURRENT I.E.E. WIRING REGULATIONS.

The mains supply is 230V ~ 50Hz fused at 5A.

**NOTE:** The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance.

Connection may be made via a fused double-pole isolator with a contact separation of a least 3mm in all poles and serving the appliance and system controls only.

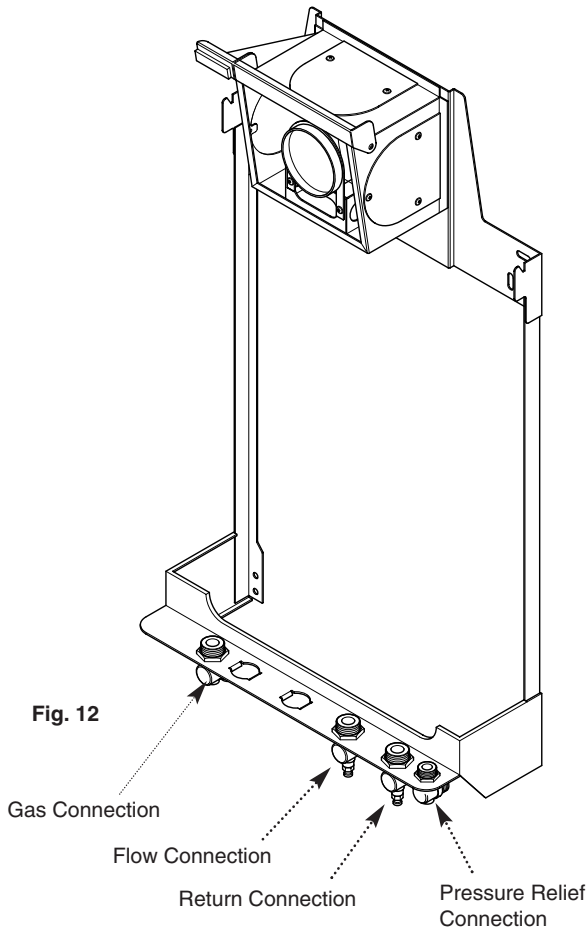


Fig. 12

Gas Connection

Flow Connection

Return Connection

Pressure Relief Connection

## 6.0 Installation

### 6.1 Initial Preparation

1. Open the hinged lower door panel and carefully disengage the door stay. Remove the door by opening it 90° and pulling forward (Fig. 13).
  2. Remove the 2 screws holding the outer case to the combustion box (Fig. 13).
  3. Place the outer case in a safe place until required.
  4. Remove the R clip from the latch securing the combustion box to the back plate and release the latches (Fig. 14a & 14b).
  5. Lift and remove the combustion box and backplate from the wall plate (Fig. 14). Place the combustion box and backplate on its back.
6. Proceed to the relevant section for flueing the appliance either to the Rear, Left, Right or Vertically.

**IMPORTANT** - When installing a Solo 3 System with a rear flue see section 6.2 Fan Outlet Restrictor before continuing the installation.

**NOTE:** For Vertical flueing or flue lengths greater than standard, the relevant optional extra kits must be obtained and their instructions followed.

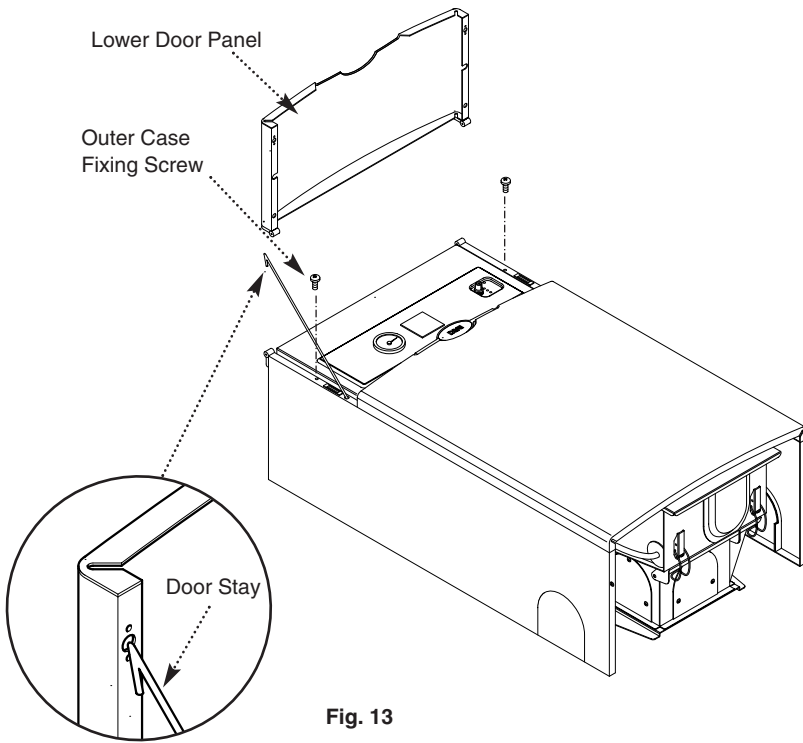


Fig. 13

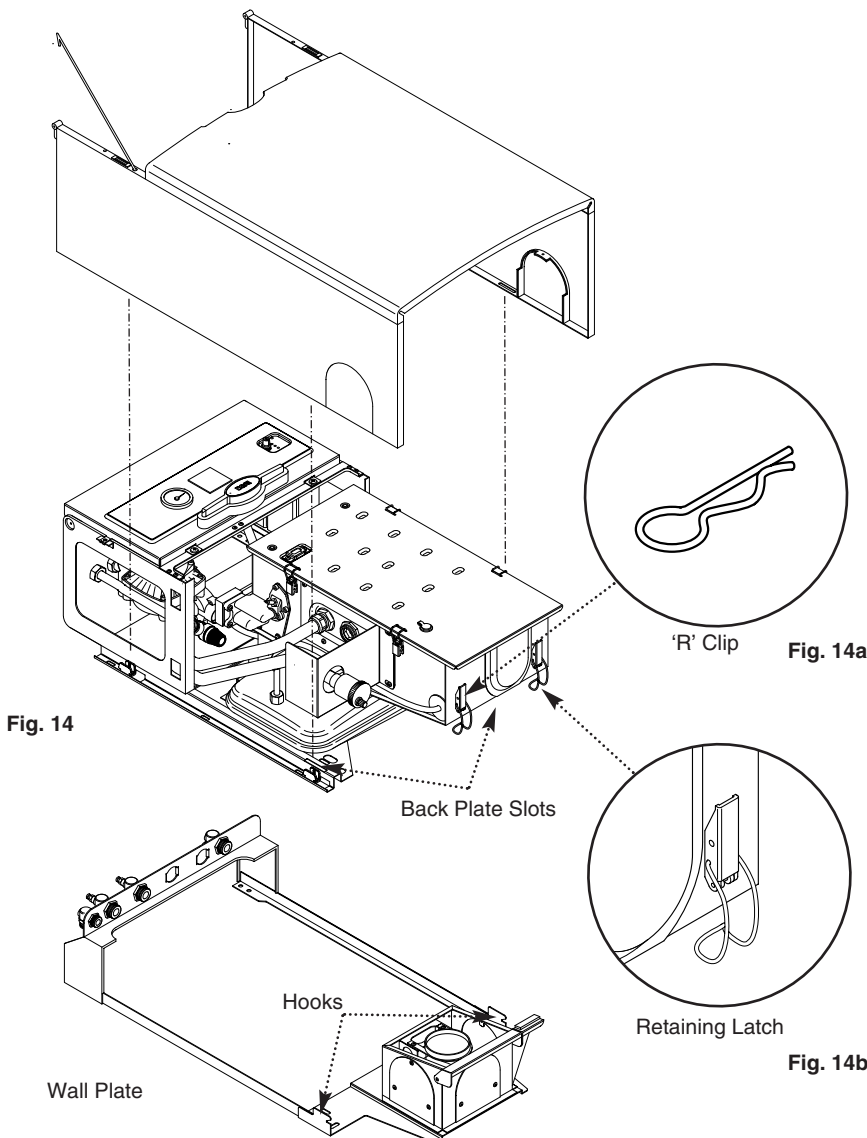


Fig. 14

'R' Clip Fig. 14a

Fig. 14b

## 6.0 Installation

### 6.2 Initial Preparation (continued)

1. Remove the fixing template (Fig. 14c) from the carton.

2. After considering the site requirements (see Section 5.2) position the template on the wall ensuring it is level both horizontally and vertically. If it is desired that the appliance is positioned centrally between two points, mark the wall accordingly and align the template centreline with this mark.

3. Mark at least four suitable fixing holes for the wall plate. Preferably the two at either side of the flue airbox should be used. Fixing points X and Y can be used for additional securing of the combustion box assembly to the wall. Points X must be used when the optional security kit is used.

4. Drill the anchorage holes 63mm (2½in) deep to accept suitable wall plugs.

5. Mark the centre of the flue hole (rear exit). For side exit, mark as shown. If required, mark the position of the gas, water and pressure relief discharge pipes. Remove the template.

6. Cut the hole for the flue (minimum diameter 107mm).

7. For rear flue applications continue as described in Section 6.4. Side flue installations are covered in Section 6.7.

### Fixing Template

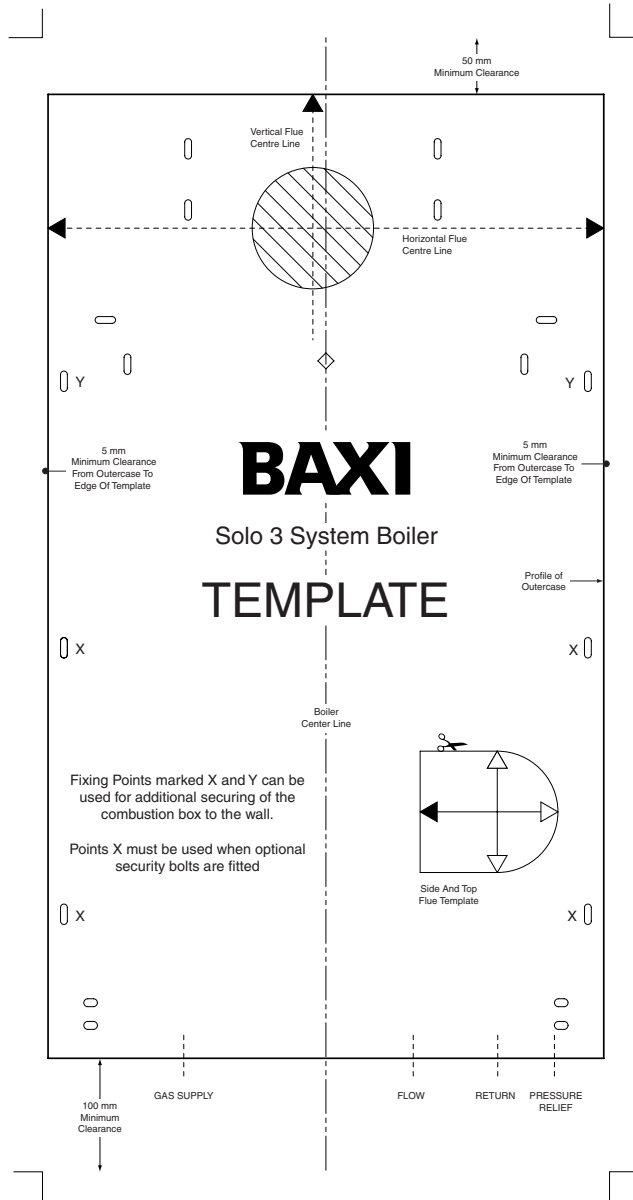


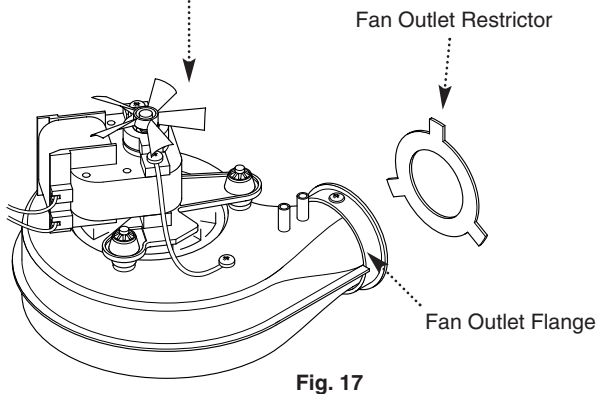
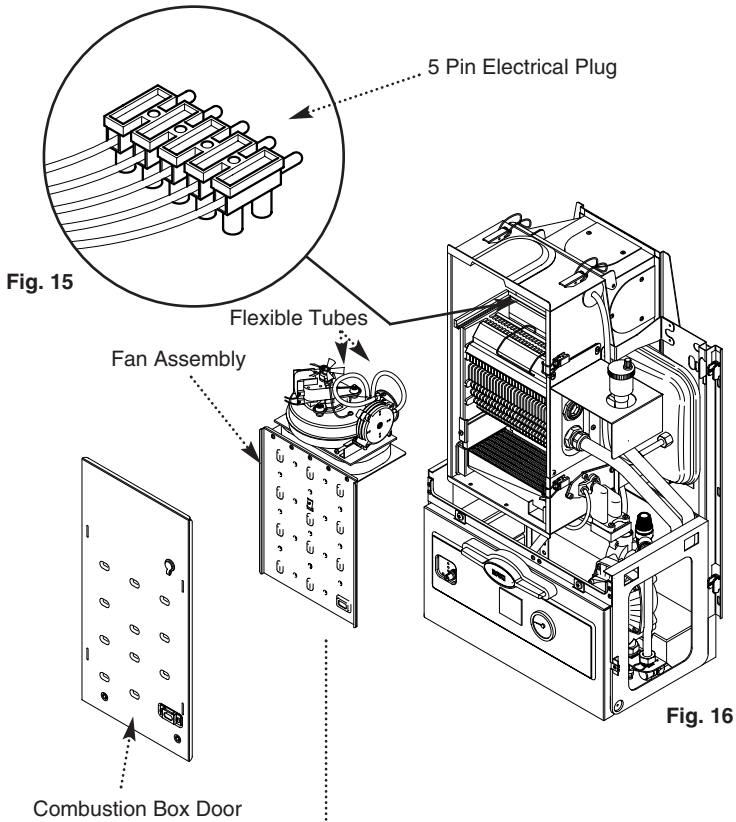
Fig. 14c

## 6.0 Installation

### 6.3 Fan Outlet Restrictor

#### Rear Flue only up to 500mm (19<sup>5</sup>/<sub>8</sub> in)

1. Release the four latches holding the combustion box door (Fig 16). Remove the combustion box door by pulling forward (Fig. 16).
2. Release the 5-pin electrical plug connecting the pressure switch and fan (Fig. 15). Withdraw the fan assembly by pulling forwards from the top edge (Fig. 16).
3. Take the restrictor (supplied in the kit of parts), check that the number stamped on the restrictor matches the appliance (e.g. 50 stamped on the restrictor is for 50 PF appliance)
4. Fit the restrictor to the fan outlet flange, bending the 3 lugs equally ensuring the restrictor seals against the fan outlet flange (Fig. 17).
5. Re-assemble the fan assembly and combustion box door ensuring that the flexible tubes from the fan unit to the pressure switch are routed correctly and that they are not kinked or flattened (Fig. 16).





## 6.0 Installation

### 6.4 Rear Flue Preparation

Wall thickness 285mm - 500mm ( $11\frac{5}{16}$  -  $19\frac{3}{8}$ ) go to section 5.6.

#### Wall Thickness 100mm - 284mm (4in - $11\frac{3}{16}$ in)

If the wall thickness is less than 285mm ( $11\frac{3}{16}$  in), it will be necessary to cut the components of the flue to the appropriate size.

1. Measure the wall thickness (Fig. 19). Mark this dimension on the **Flue Duct** from the flared end and cut the waste off the plain end (Fig. 20).

2. Take the **Flue Terminal Assembly** and measure from the terminal end the wall thickness and subtract 40mm (Fig. 21). Cut the waste off the plain end.

#### Wall Thickness - 40mm (all boilers)

3. The cardboard support should be installed onto the flue tubes to ensure the assembly is supported during cutting (Fig. 23 & 24).

4. Measure the same amount from the flange end of the **Air Duct** and cut the waste off the plain end (Fig. 22).

#### Wall Thickness - 40mm (all boilers)

6. Go to section 6.5.

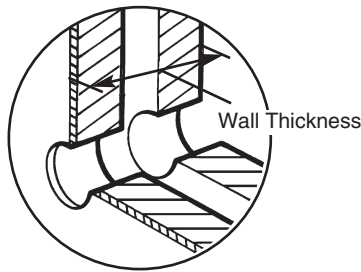


Fig. 19

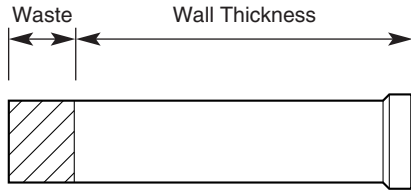


Fig. 20

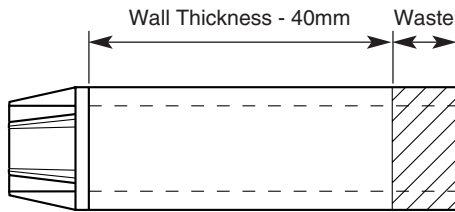


Fig. 21

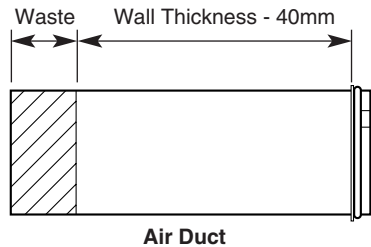


Fig. 22

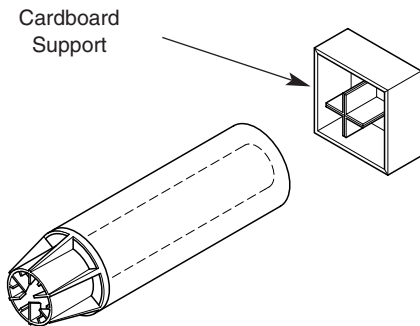


Fig. 23

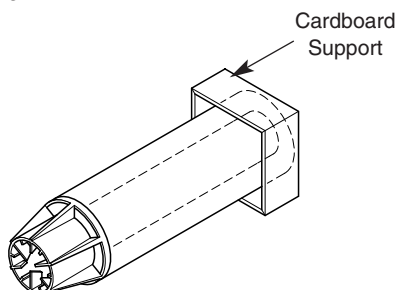


Fig. 24

## 6.0 Installation

### 6.5 Assembly of Rear Flue

1. Remove the rear air box blanking plate from the wall plate by releasing the three screws (Fig. 25).
2. Remove the blanking cap at the rear of the turret, by pushing and turning anti-clockwise to release the bayonet fitting (Fig. 25).
3. Locate the swaged end of the flue duct over the bayonet fitting on the turret, taking care not to damage the 'O' ring. Lock the flue duct in place by pressing in and turning clockwise (Fig. 26).
4. Engage the bayonet slots of the air duct over the location lugs on the back plate opening and press and turn clockwise to secure the air duct to the back plate (Fig. 27).
5. In order to increase security of the flue, the bayonet tags may be deformed to secure the flue in position.
6. Take the flue terminal assembly and engage on the flue and air ducts. Slide the flues together to the desired wall thickness.
7. Tape the outer duct sections together with the tape provided ensuring a good seal is made (Fig. 27a).

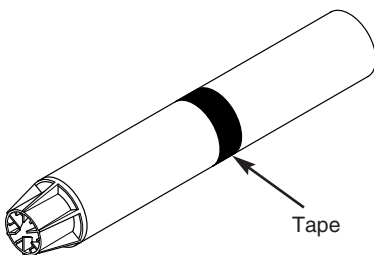
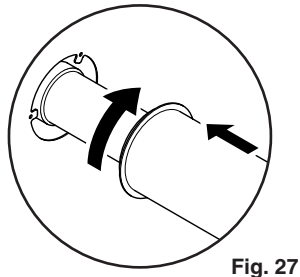
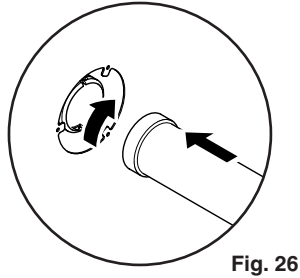
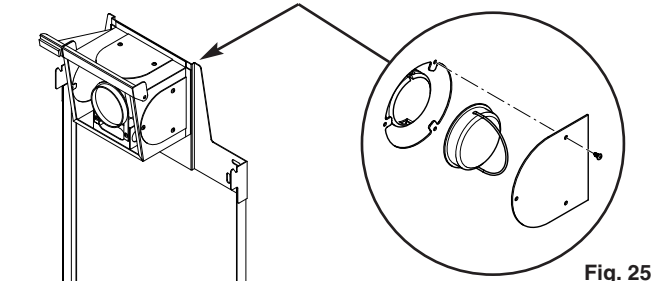


Fig. 27a

## 6.0 Installation

### 6.6 Fitting the Wall Plate

1. Engage the assembly into the hole previously cut in the wall and slide in place (Fig. 28).
2. Secure the assembly to the wall at the previously drilled anchorage points with suitable screws. Before finally tightening the screws, check that the assembly is level.
3. Make good between the wall and the air duct outside the building if the internal fitting kit has not been used (Fig. 29).
4. The flue trim provided may be fitted if required, to neaten the wall around the terminal (Fig. 30).

#### 5. To fit the flue terminal trim:

- a) The trim should be fitted once the flue is secure.
- b) Take the three edge clips from the kit and fit them equi-spaced onto the inner flange of the trim (Fig. 29a).
- c) With the flanges towards the wall pass the trim over the terminal. If required a bead of sealant may be applied to the rear face of the trim.
- d) Push firmly on the trim to ensure the edge clips engage on the flue.

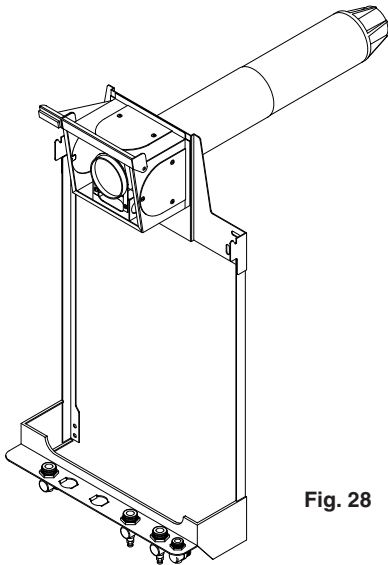


Fig. 28

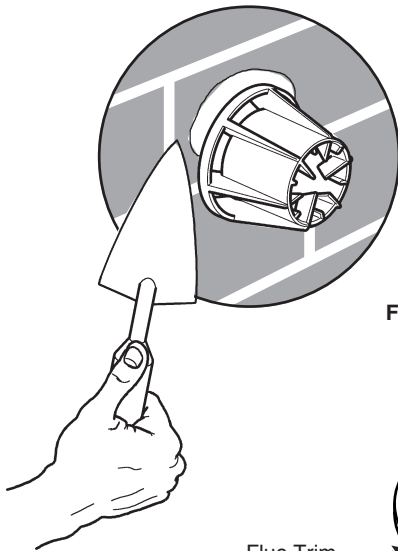


Fig. 29

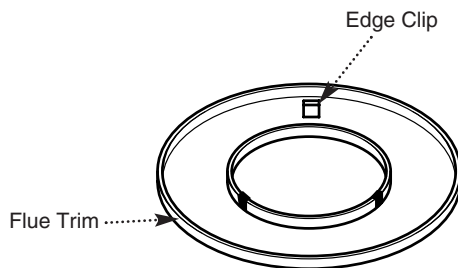


Fig. 29a

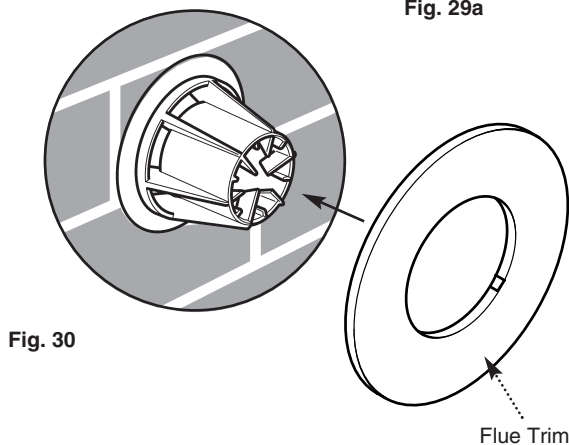


Fig. 30

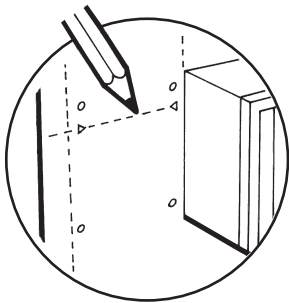
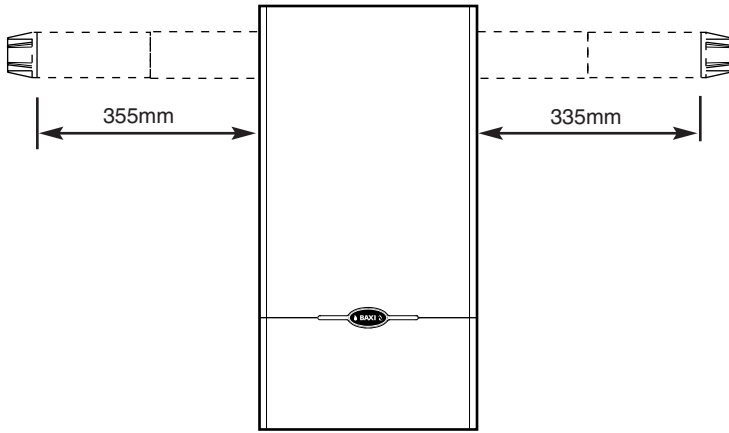


Fig. 31

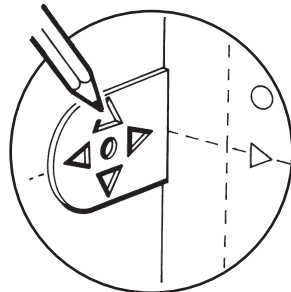


Fig. 34

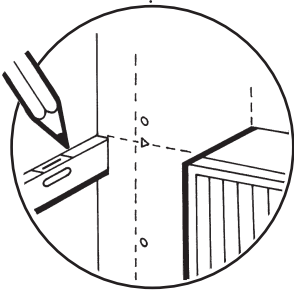


Fig. 32

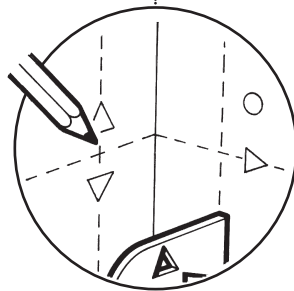


Fig. 35

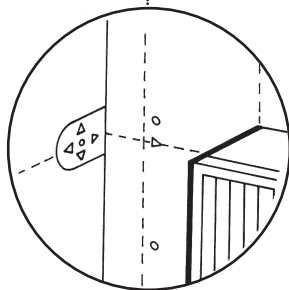


Fig. 33

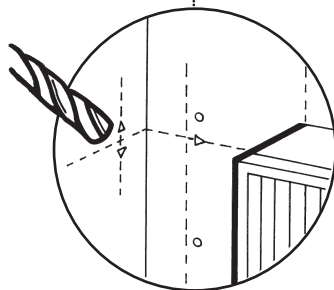


Fig. 36

## 6.0 Installation

### 6.7 Left or Right Flue

**NOTE:** If the flue terminal is inaccessible from outside the building, it is necessary to fix the internal fitting kit in position before continuing with the installation. (See section 5.15 Internal Fitting Kit of these instructions).

1. The procedure for fitting the appliance flued to the left or right hand side is the same.

2. **Left Hand Side** maximum flue 355mm.

3. **Right Hand Side** maximum flue 335mm.

4. **Optional flue extensions are available.**

5. Using the previously marked flue hole centre, mark the horizontal centre line for the flue assembly (Fig. 31).

6. Extend this line either left or right as required, to the corner of the room (Fig. 31).

7. Extend the horizontal centre line around the corner for approximately 300mm (12 in). Ensure that the line remains horizontal by checking with a spirit level (Fig. 32).

8. From the wall template cut out the 'D' shaped section. Line up the horizontal triangular cut outs with the extended 300mm (12 in) line and make sure that the flat of the template is butted up against the corner of the wall (Fig. 33).

9. If the appliance mounting wall is out of true, use string or a straight edge to determine the true corner position and mark a vertical line to accommodate the flat edge of the template.

10. Holding the template firmly, mark the vertical centre line for the flue assembly by marking the point at the outer corners of the upper and lower cut outs (Fig. 34).

11. Remove the template and draw a vertical line between the two marks. The intersection of the vertical and horizontal lines is the centre of the flue hole (Fig. 35).

12. For installations where the flue terminal is inaccessible from the outside, an internal fitting kit is available. This can be obtained free of charge from your local merchant.

13. If using the internal fitting kit a 117mm (4<sup>5</sup>/<sub>8</sub> in) diameter hole is required.

14. Cut a hole approximately 107mm (4<sup>1</sup>/<sub>4</sub> in) diameter in the masonry for the 100mm (4 in) diameter flue duct (Fig. 36). (Use of a core drill is recommended. When using a core drill, it is important to keep the drill level and square, particularly with the wall onto which the boiler is to be fitted).

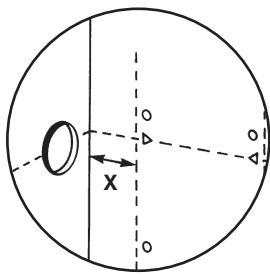


Fig. 37

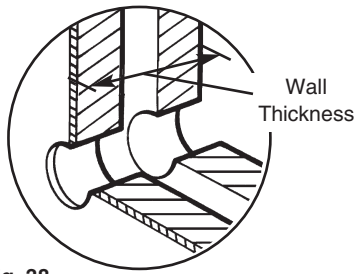


Fig. 38

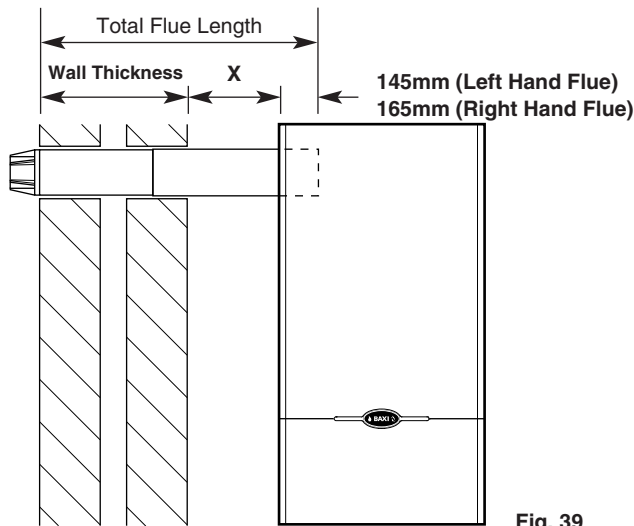


Fig. 39

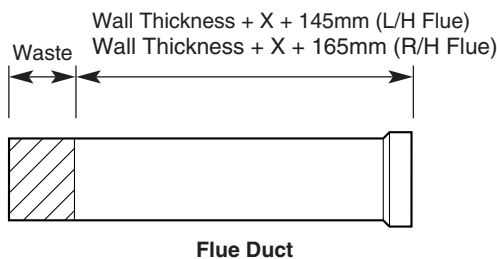


Fig. 40

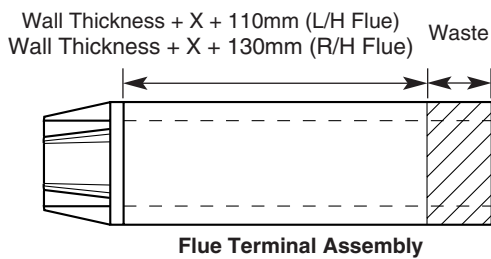


Fig. 41

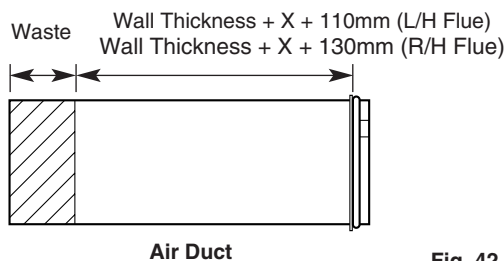


Fig. 42

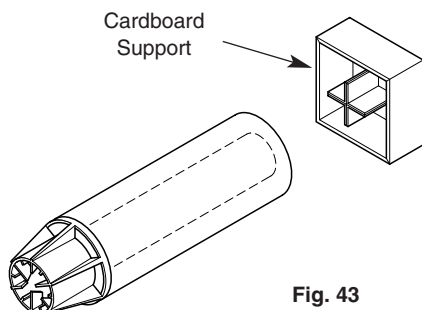


Fig. 43

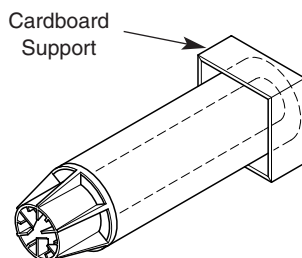


Fig. 44

## 6.0 Installation

### 6.8 Side Flue Preparation

1. For both Left and Right Hand Flue - Measure the distance from the wall to the nearest line marked from the template. This will be known as dimension **X** (Fig. 37).

2. Measure the thickness of the wall from the inside. This will be known as **Wall Thickness** (Fig 38).

3. To make up the total flue length, add 145mm (L/H Flue) or 165mm (R/H Flue) to the **Wall Thickness + X** dimension:

Total flue length =

**Wall Thickness + X + 145mm (L/H Flue)**

**Wall Thickness + X + 165mm (R/H Flue).**

**NOTE:** if total calculated flue length exceeds 500mm (19<sup>7</sup>/<sub>16</sub> in), a flue extension kit will be required.

### CUTTING THE FLUE

**NOTE:** If **Wall Thickness + X** is less than; **140mm (L/H Flue)** or **120mm (R/H Flue)**, it will be necessary to cut the components of the flue to make up the appropriate size.

4. Take the **Flue Duct** and measure the dimension below from the flared end. Cut the waste off the plain end (Fig. 40).

**Wall Thickness + X + 145mm (L/H Flue)**

**Wall Thickness + X + 165mm (R/H Flue)**

5. Take the **Flue Terminal Assembly** and measure from the terminal end the dimension below (Fig. 41). Cut the waste off the plain end.

**Wall Thickness + X + 110mm (L/H Flue)**

**Wall Thickness + X + 130mm (R/H Flue)**

6. Measure the same amount from the flange end of the **Air Duct** and cut the waste off the plain end (Fig. 42).

**Wall Thickness + X + 110mm (L/H Flue)**

**Wall Thickness + X + 130mm (R/H Flue)**

7. The cardboard support supplied in the flue pack should be installed onto the flue tubes of the flue terminal assembly to ensure the flue is supported during cutting (Fig. 43 & 44).

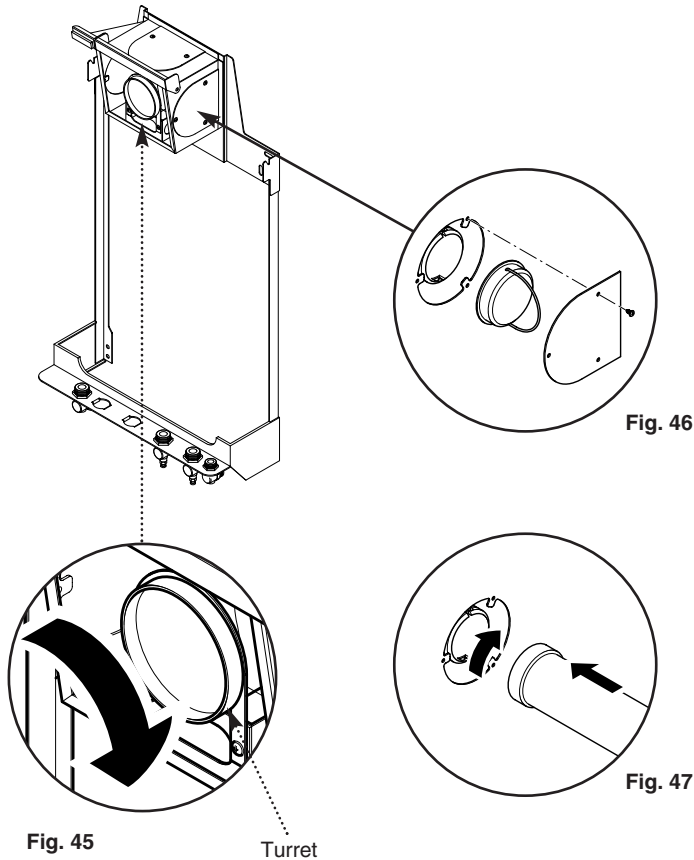
## 6.0 Installation

### 6.9 Fitting the Flue and Wall Plate

1. **NOTE:** There are two options for fitting the flue and wall plate they are:

**Method A** - Fitting the flue and wall plate as an assembly (usually used where there are no side clearance problems).

**Method B** - Pre-fitting the flue through the wall, fitting the wall plate to its position on the wall and then connecting the two together (usually used where side clearances are restrictive).



### 6.10 Method A

1. Remove the left or right hand air box blanking plate, as appropriate, from the back plate air box by releasing the three screws (Fig 46).

2. Rotate the turret to face the selected opening (Fig. 45) and remove the side blanking cap by pushing in and turning anti-clockwise to release the bayonet fitting (Fig. 46).

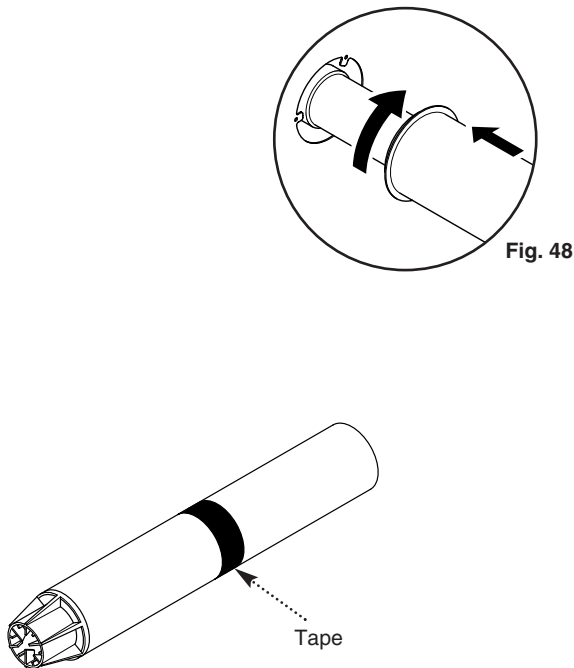
3. Locate the swaged end of the flue duct over the bayonet fitting on the turret, taking care not to damage the 'O' ring. Lock the flue in place by pressing in and turning clockwise (Fig. 47).

4. Ensure that the 'O' ring seal is in position against the sealing flange.

5. Fit the air duct over the flue duct and draw towards the air box on the back plate. Engage the bayonet slots of the air duct over the location lugs of the back plate opening and press and turn clockwise to secure the air duct to the air box (Fig. 48).

6. In order to increase security of the flue, the bayonet tags may be deformed to secure the flue in position.

7. Take the flue terminal assembly and engage on the flue and air ducts. Slide the flues together to the desired flue length. Tape the outer duct sections together with the tape provided ensuring a good seal is made (Fig. 49).



## 6.0 Installation

### 6.10 Method A (Cont)

7. Engage the assembly into the hole previously cut in the wall and slide into place (Fig. 50).

8. Secure the assembly to the wall at the previously drilled anchorage points with suitable screws. Before finally tightening the screws, check that the assembly is level.

9. Make good between the wall and the air duct inside and outside the building if the internal fitting kit has not been used (Fig. 51).

10. The flue trim provided may be fitted if required, to neaten up the make-up around the terminal (Fig. 52).

#### 11. To fit the flue terminal trim:

a) The trim should be fitted once the flue is secure.

b) Take the three edge clips from the kit and fit them equi-spaced onto the inner flange of the trim (Fig. 51a).

c) With the flanges towards the wall pass the trim over the terminal. If required a bead of sealant may be applied to the rear face of the trim.

d) Push firmly on the trim to ensure the edge clips engage on the flue.

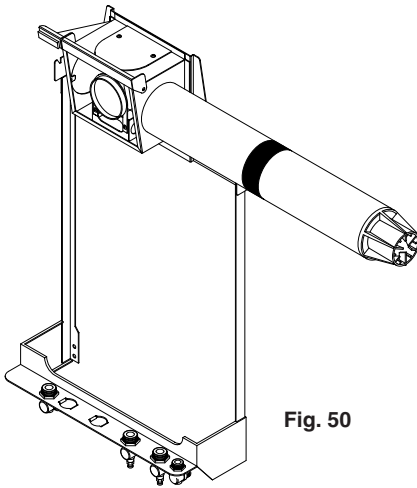


Fig. 50

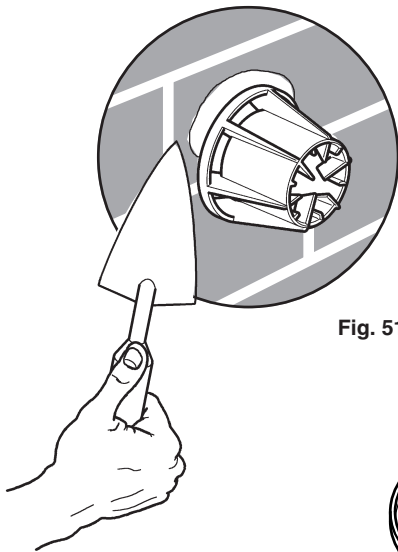


Fig. 51

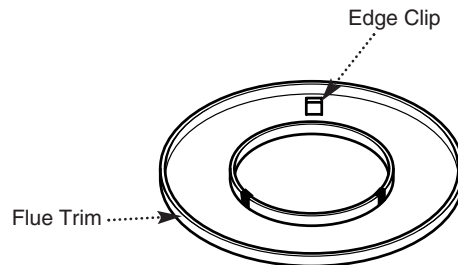


Fig. 51a

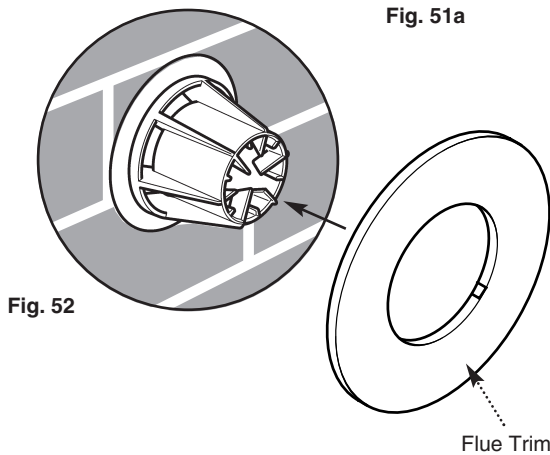


Fig. 52

## 6.0 Installation

### 6.11 Method B

1. Remove the left or right hand air box blanking plate, as appropriate, from the back plate air box by releasing the three screws (Fig. 54).

2. Rotate the turret to face the selected opening (Fig. 53) and remove the side blanking cap by pushing in and turning anti-clockwise to release the bayonet fitting (Fig. 54).

3. Locate the swaged end of the flue duct over the bayonet fitting on the turret, taking care not to damage the 'O' ring. Lock the flue duct in place by pressing in and turning clockwise (Fig. 55).

4. Engage the bayonet slots of the air duct over the location lugs on the back plate opening and press and turn clockwise to secure the air duct to the back plate (Fig. 56).

5. Engage the flue and air ducts into the hole previously cut in the wall and through holes in other partitions (cupboards, walls etc.).

6. Secure the back plate to the wall at the previously drilled anchorage points with suitable screws. Before finally tightening the screws, check that the assembly is level.

7. Take the flue terminal assembly and pass through the cut hole from outside. Engage on the flue and air ducts. Slide the flues together to the desired wall thickness. Tape the outer duct sections together with the tape provided ensuring a good seal is made (Fig. 57).

8. In order to increase security of the flue, the bayonet tags may be deformed to secure the flue in position.

9. Make good between the wall and the air duct inside and outside the building if the internal fitting kit has not been used (Fig. 58).

10. The flue trim provided may be fitted if required, to neaten up the make-up around the terminal (Fig. 59).

#### 11. To fit the flue terminal trim:

a) The trim should be fitted once the flue is secure.

b) Take the three edge clips from the kit and fit them equi-spaced onto the inner flange of the trim (Fig. 58a).

c) With the flanges towards the wall pass the trim over the terminal. If required a bead of sealant may be applied to the rear face of the trim.

d) Push firmly on the trim to ensure the edge clips engage on the flue.

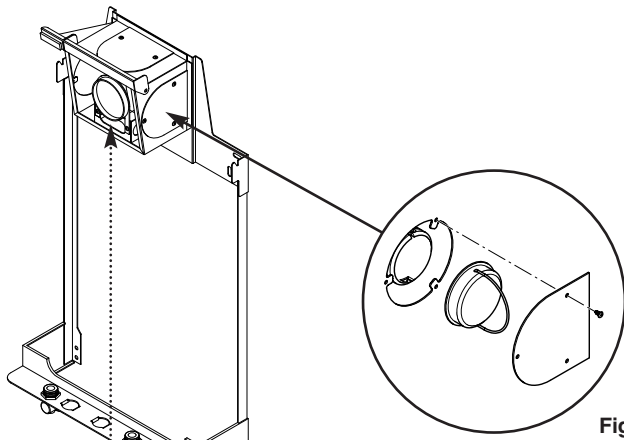


Fig. 54

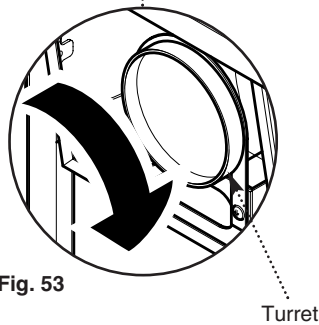


Fig. 53

Turret

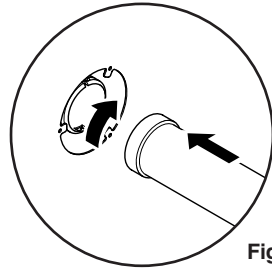


Fig. 55

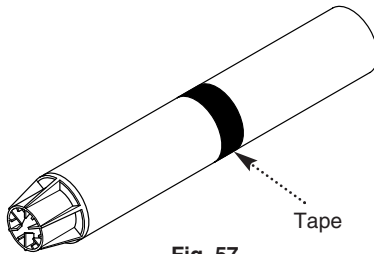


Fig. 57

Tape

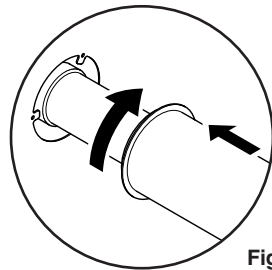


Fig. 56

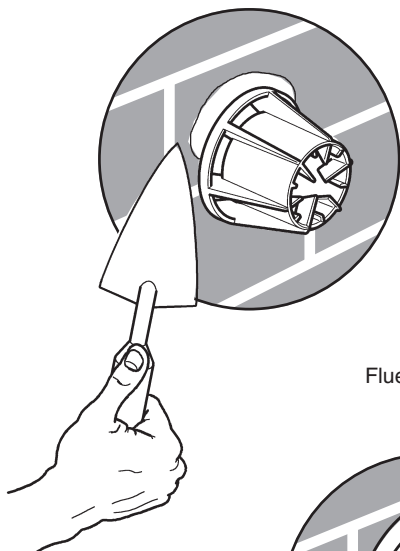


Fig. 58

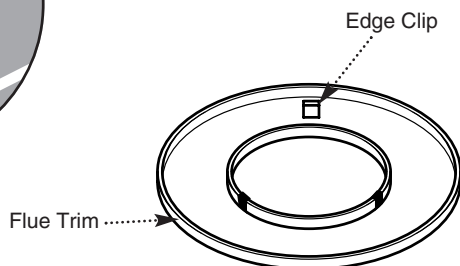


Fig. 58a

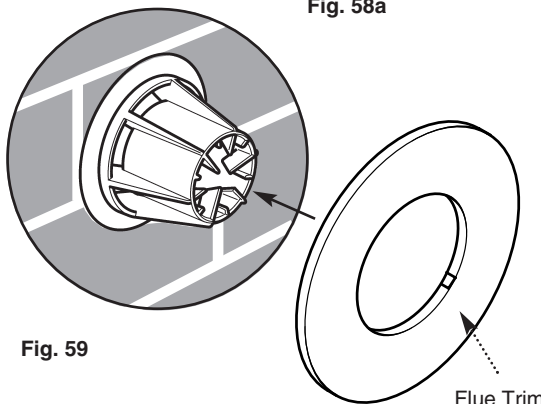


Fig. 59

Flue Trim



## 6.0 Installation

### 6.12 Terminal Guard

1. When codes of practice dictate the use of terminal guards, they can be obtained from most plumbers and builders merchants nationwide.
2. When ordering a terminal guard, quote the appliance model number.
3. There must be a clearance of at least 50mm between any part of the terminal and the guard.

### 6.13 Fitting a Terminal Guard (Fig. 60)

1. Position the guard over the terminal on the outside wall. Ensure the guard is equally spaced about the terminal. Mark the fixing positions.
2. Drill and plug fixing the positions then secure the guard to wall.

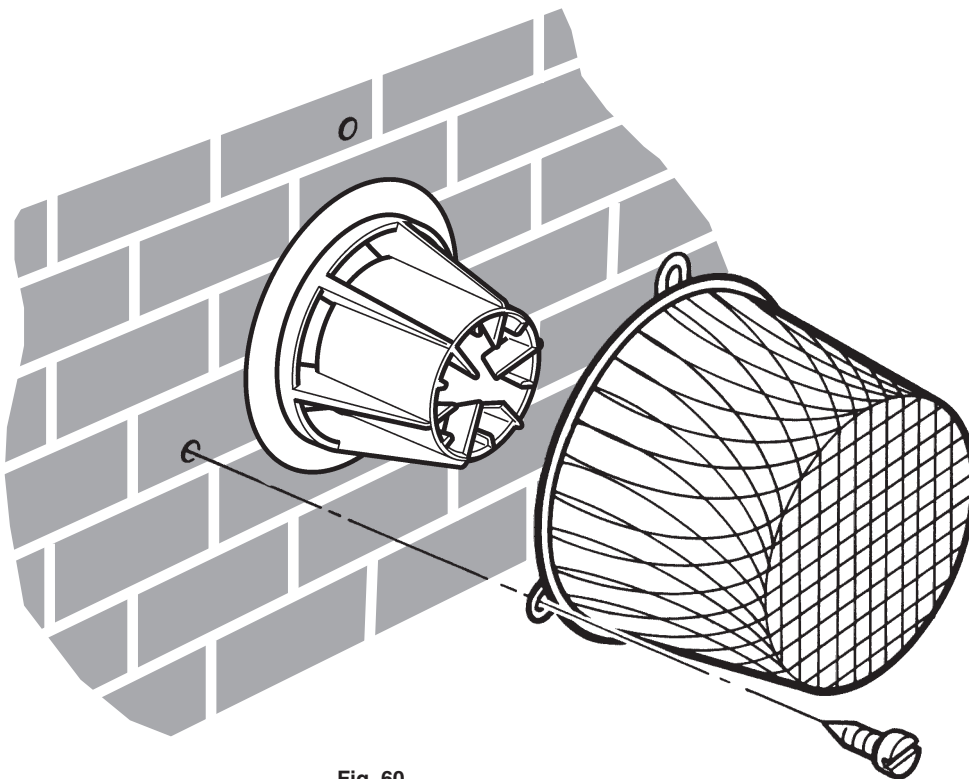


Fig. 60

## 6.0 Installation

### 6.14 Internal Fitting Kit

1. The internal fitting kit (available from merchants quoting Baxi Part N<sup>o</sup>. 236441) is suitable for walls between 100mm (4in) and 285mm (11<sup>3</sup>/<sub>8</sub>in) in thickness.

2. **TO INSTALL THE KIT** - Mark the flue hole centre as described in section 6.3 or 6.8. Cut a hole in the masonry approximately 117mm (4<sup>5</sup>/<sub>8</sub> in) diameter for the internal fitting kit. The use of a core drill is recommended. (When using a core drill, it is important to keep the drill level and square).

3. Measure the wall thickness and from this dimension subtract 10mm (<sup>3</sup>/<sub>8</sub> in) (Fig. 61).

4. Remove the wall liner from its packing and remove the end piece (Fig. 62).

5. Mark off the dimension, wall thickness - 10mm (<sup>3</sup>/<sub>8</sub> in), measuring from the beaded end of the duct and cut off the remaining length of the duct. Ensure that the cut is square and reasonably straight (Fig. 63).

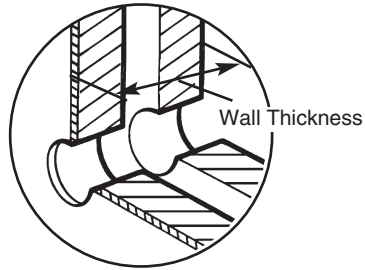


Fig. 61

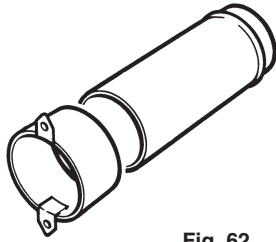


Fig. 62

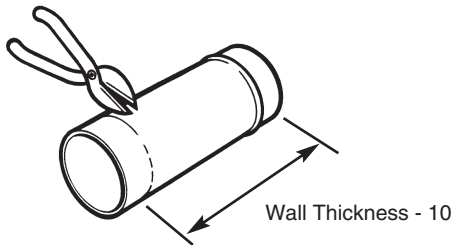


Fig. 63

## 6.0 Installation

### 6.14 Internal Fitting Kit (Cont)

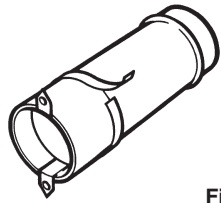


Fig. 64

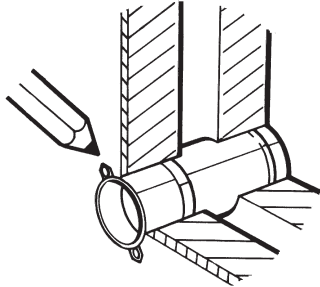


Fig. 65

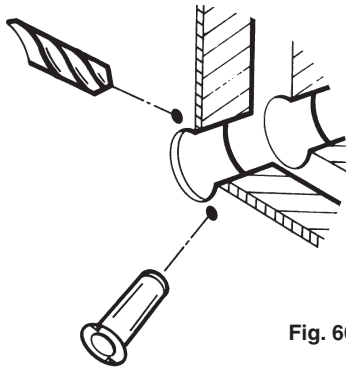


Fig. 66

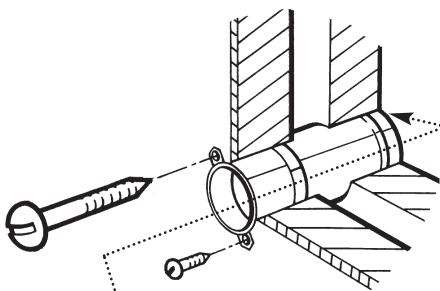


Fig. 67

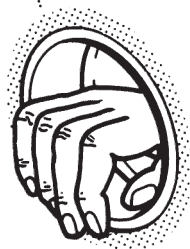


Fig. 68

6. Refit the end piece to the liner and open out to the thickness of the wall. Seal the two pieces together using the tape provided with the kit (Fig 64).

7. Slide the assembled wall liner into the hole in the wall until the tags stop against the inner wall with the seam of the liner uppermost. Mark the positions of the holes in the tags on the wall and then rotate liner so that tags reveal marks (Fig. 65).

8. Drill and plug the wall in these positions (Fig. 66).

9. Rotate liner back until the tags align with the holes drilled and secure it to the wall using suitable screws (Fig. 67).

10. Make good between the edge of the liner and the outside wall with cement mortar or a similar substance, by reaching through the liner and pressing the mortar between liner and the outside brick work (Fig. 68). Make good between the liner and the inside wall. Apply soap solution to the 'O' ring inside the liner.

11. The rest of the installation may now proceed as described.

## 6.0 Installation

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### 6.15 Connection and Flushing

1. Connect the gas, water and pressure relief discharge pipes to the valves on the wall plate using the copper tails supplied. Ensure that the sealing washers are fitted correctly to the water connections.

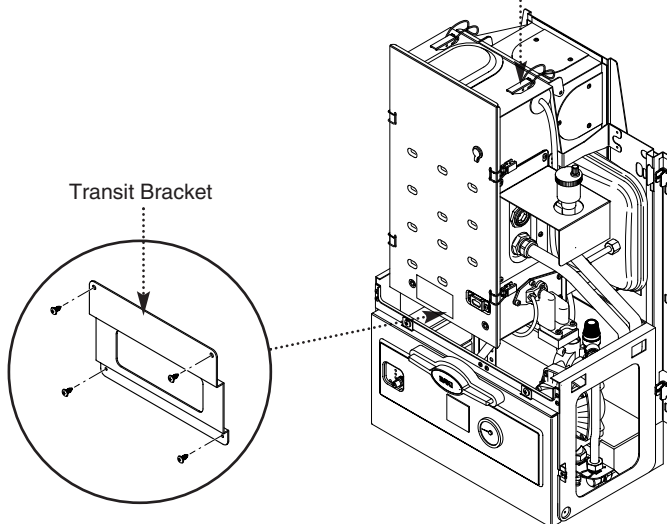
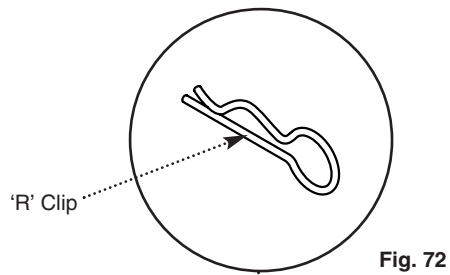
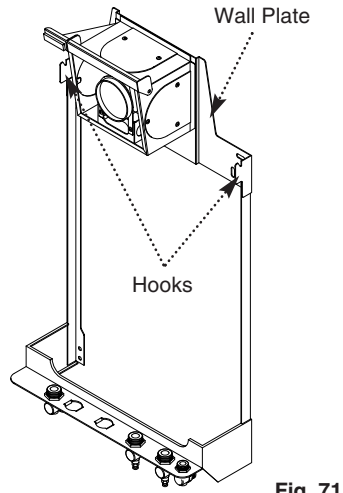
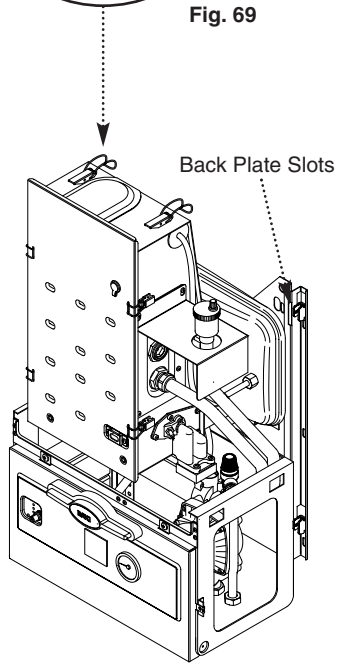
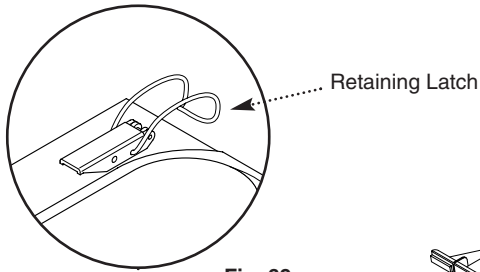
2. Connect the filling loop and fill and thoroughly flush the system (see system details, section 4.2 & 4.7).

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## 6.0 Installation

### 6.16 Fitting the Combustion Box Assembly

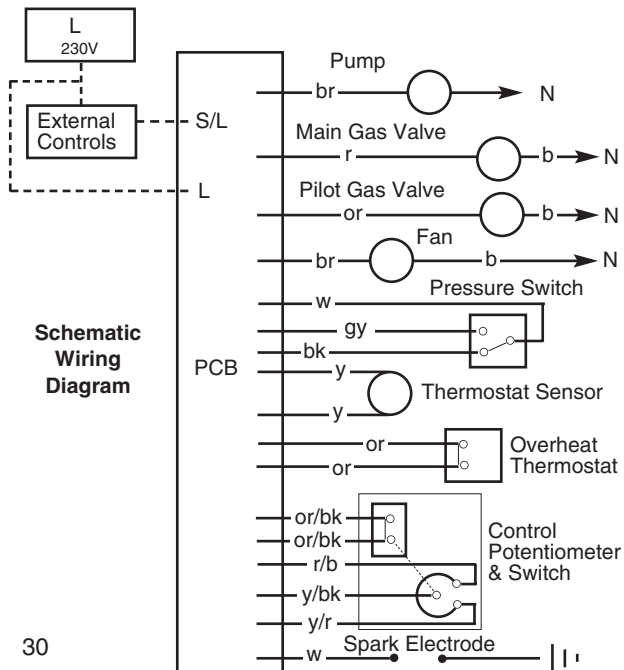
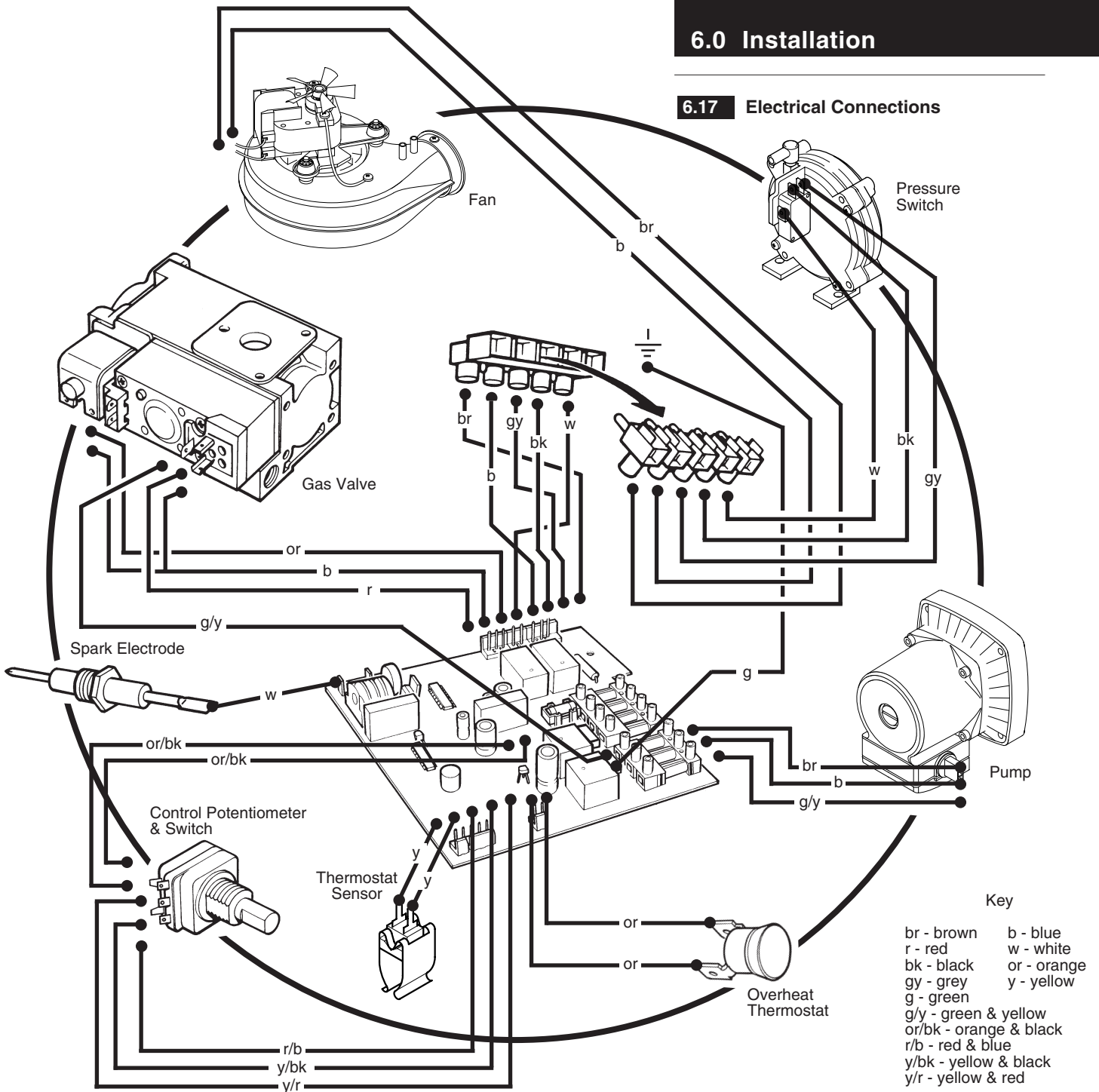
**CAUTION:** Care must be taken when lifting the boiler on to the backplate. Get assistance if required.



1. Remove the sealing tape from the taps.
2. Offer the combustion box assembly up to the wall plate and locate the slots on the back plate on to the hooks on the wall plate (Fig 70 & 71).
3. While fitting the combustion box care must be taken not to damage the boiler pipework and fittings.
4. Engage the two retaining latches and secure the right hand one with the 'R' clip previously removed (Fig 69 & 72).
5. Take the three washers from the kit and insert them between the water flow and return pipes, pressure relief discharge pipe and their corresponding taps. The pressure relief washer is the smaller of the three.
6. Tighten all the nuts to the taps.
7. Undo the four screws securing the transit bracket to the combustion box door and chassis. Remove the bracket and discard.

## 6.0 Installation

### 6.17 Electrical Connections



**NOTE:** The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance. Connection may be made via a fused double pole isolator with a contact separation of at least 3mm (1/8 in) in all poles and serving the appliance and system controls only. All cables should be routed to avoid hot surfaces.

**WARNING - THIS APPLIANCE MUST BE EARTHED.** 4 core input cable for connection to the appliance must be not less than 0.75mm<sup>2</sup> (24 x 0.2mm) PVC grade to IEC 227 code 53 (heat resisting). External controls and the appliance MUST be supplied via the same isolator.

**NOTE:** Polarity of the appliance MUST be correct otherwise the appliance will not operate correctly.

## 6.0 Installation

### 6.18 Making the Electrical Connections

1. Remove the cover from the control box by removing the 2 screws (Fig. 74).
2. Slide the box forward for easier access.
3. Route the supply cable via the control box from the rear of the appliance.
4. The terminal strips may be removed by carefully pulling forward. Connect the supply cable to the terminal strip (Fig. 77).

**IMPORTANT** - When installing in conjunction with a thermal store or heat store please refer to the store manufacturers installation instructions when wiring the boiler.

5. The pump is connected to the boiler P.C.B. terminals.
6. A permanent live must be connected to the 'L' terminal.
7. The switched live must be connected to the 'S/L' terminal.
8. Clamp the cable in the grip provided. Ensure that the length of the supply cable is such that the current carrying wires become taut before the earth wires if the cable should pull out of the cable clamp (Fig. 76).
9. Tuck the cable along the side of the box and clip to the wall where necessary. Make sure sufficient slack is left to allow the box to slide forward for future access. A cable clip is fitted at the side of the box.
10. For optional integral clock kit follow instructions provided.

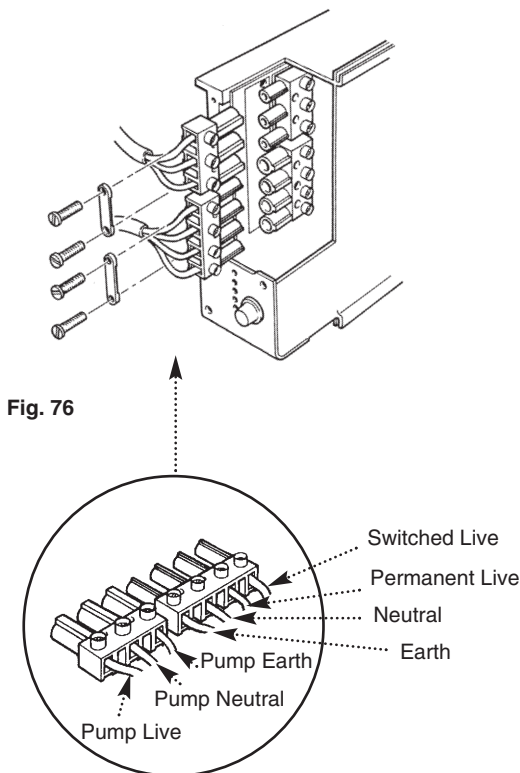
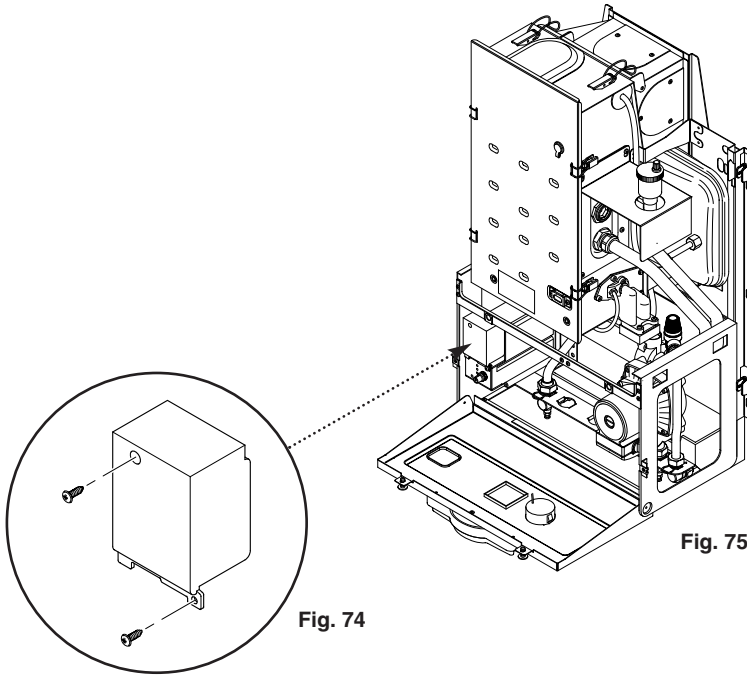


Fig. 77

## 7.0 Commissioning the Appliance

### 7.1 Commissioning the Appliance

1. Pressurise the system to 1.0 bar then close and disconnect the filling loop. Check for water leaks.
2. Purge away air from the supply pipe at the gas service cock. (BS 6891: 1988) (Fig. 78).
3. Ensure that the electrical supply is isolated.
4. Check the electrical supply for earth continuity, polarity, short circuit and resistance to earth.
5. Turn the gas service cock to the ON position and check for gas soundness up to the gas valve.
6. Loosen the pressure test point screw on the gas control valve (there is no need to completely remove this screw to check the burner pressure) and connect a pressure gauge (Fig. 81).
7. Turn the boiler thermostat control knob fully anti-clockwise to the OFF position marked 0 (Fig. 79).
8. Ensure that the electricity supply is turned ON and set any external controls to the ON position.
9. Turn the boiler thermostat knob fully clockwise.
10. The fan will start running and after approximately 10 seconds, the ignition spark will commence.
11. The sparking will continue until the pilot light is established (Fig. 82) and then the main burner will light from the pilot flame.
12. Check that both the main burner and the pilot are alight by observing through the viewing window. The indicator lights should also be illuminated.
13. Should this sequence not occur, then refer to the fault finding section of these instructions.

**NOTE:** The pilot rate for this appliance is factory set, sealed and therefore non-adjustable.

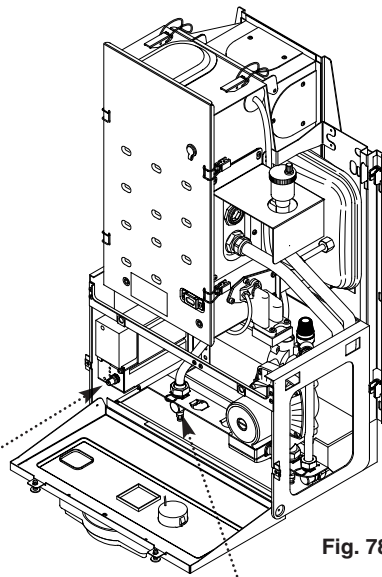


Fig. 78

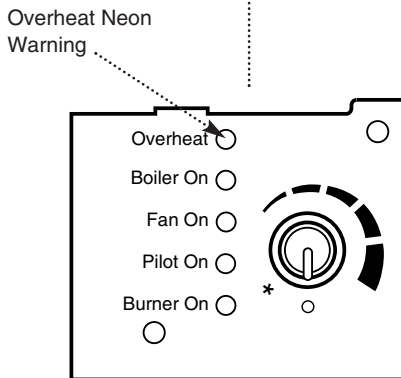


Fig. 79

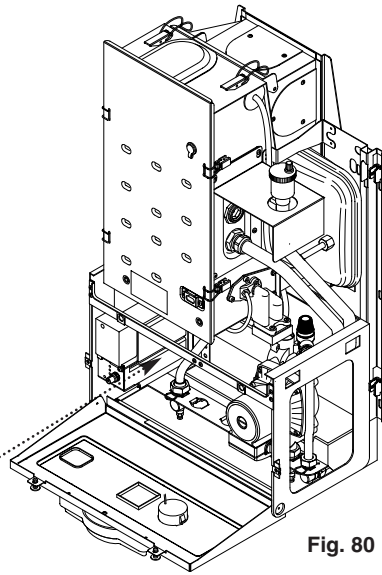


Fig. 80

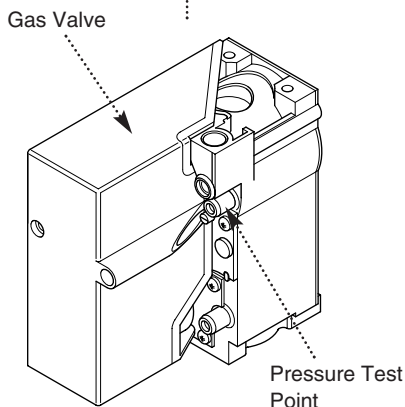


Fig. 81

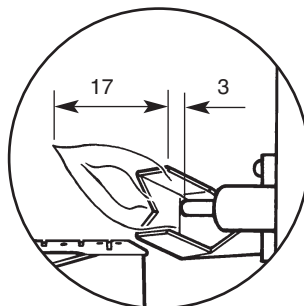


Fig. 82



## 7.0 Commissioning the Appliance

Model	Input P		Setting Pressure	
	kW	Btu/h	mbar	in wg
30	10.99	37, 500	16.0 ± 0.5	6.4 ± 0.2
40	14.65	50, 000	16.0 ± 0.5	6.4 ± 0.2
50	18.32	62, 500	16.0 ± 0.5	6.4 ± 0.2
60	21.98	75, 000	16.0 ± 0.5	6.4 ± 0.2
70	25.64	87, 500	16.0 ± 0.5	6.4 ± 0.2
80	29.31	100,000	16.0 ± 0.5	6.4 ± 0.2

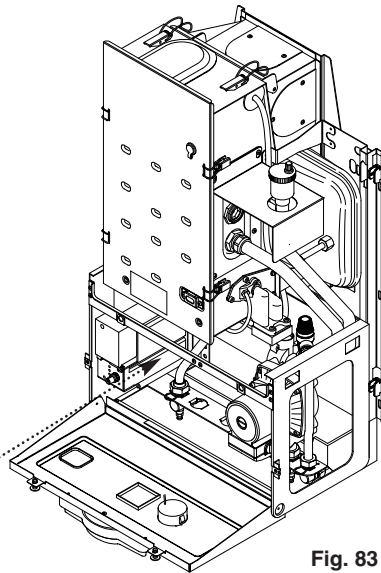


Fig. 83

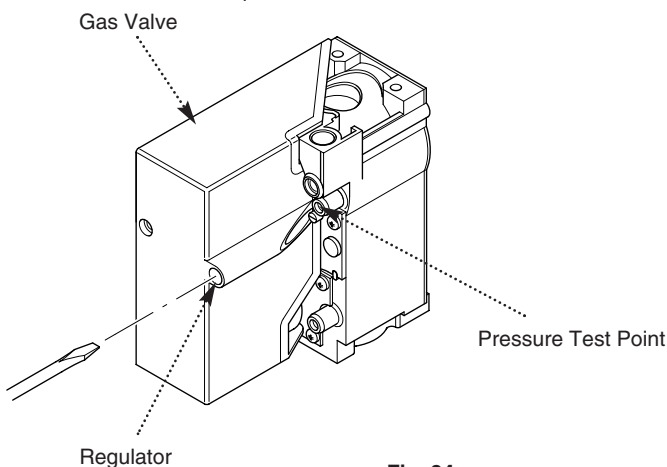


Fig. 84

### 7.1 Commissioning the Appliance (Cont)

1. The burner pressure is factory set.
2. From the table opposite check that the main burner pressure is correct after the appliance has been running for 10 minutes. If necessary, adjustment to main burner pressure can be made by altering the regulator as shown (Fig. 84).
3. Check for gas soundness, with main burner alight, using leak detection fluid.
4. Turn the boiler thermostat to the OFF position marked 0. Remove the pressure gauge and screw home the pressure test point screw. Turn the boiler thermostat knob to the required setting (Fig. 84).
5. The boiler and system should be run and then flushed and treated in accordance with BS 7593:1992 and the flushing agent / inhibitor manufacturers instructions. Pressurise the system to 1.0 bar then close and disconnect the filling loop.
6. When all the air has been removed from the water circuit, the pump and radiators should be balanced to achieve the design temperature drop across the system.
7. Make a final check for gas soundness and set any timer control, room thermostats etc. to the customer's specific requirements.
8. The boiler is protected by an integral frost-stat, but if the boiler is not to be used for a long period of time, the system should be drained.

**NOTE:** The frost thermostat operates even if the boiler thermostat is in the OFF position and it is necessary therefore, if the system is drained, for the external electrical and gas supplies to be isolated.

It is recommended that a label be affixed to the appliance to draw attention to the fact that the system has been drained.

**WARNING** - If the system is filled with very cold water and the boiler lit, the action of the frost protection thermostat will prevent the boiler from shutting down before the water temperature reaches 10°C.

9. Carefully read and complete all sections of the "Benchmark" Installation, Commissioning and Service Record Log Book that are relevant to the appliance and installation. The details of the Log Book will be required in the event of any warranty work. The Log Book must be handed to the user for safe keeping and each subsequent regular service visit recorded.

## 8.0 Fitting the Outercase

### 8.1 Fitting the Outercase

1. The warning label may be removed unless the boiler is to be fitted within a cupboard or compartment.

2. If the appliance is flued to the left or to the right, remove the relevant infill panel from the case by removing the retaining clips and fixing screws (Fig. 87).

3. Offer the outer case up to the wall plate. Engage the slots in the case over the hooks on the back plate. Ensure that the case is positively located (Fig. 86).

4. Using the two screws previously removed, secure the outer case to the combustion box (Fig. 85).

5. Replace the lower front door panel, relocate the door stay and hinge upwards, ensuring it is secured by the two magnets (Fig. 87 & 88).

6. Instruct the user in the operation of the boiler controls. Hand over the Users Operating, Installation and Servicing Instructions and the Log Book giving advice on the necessity of regular servicing.

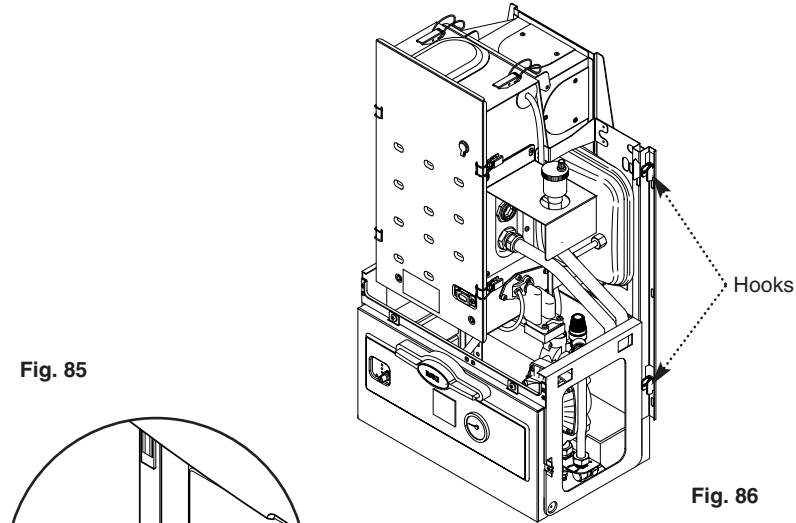


Fig. 85

Fig. 86

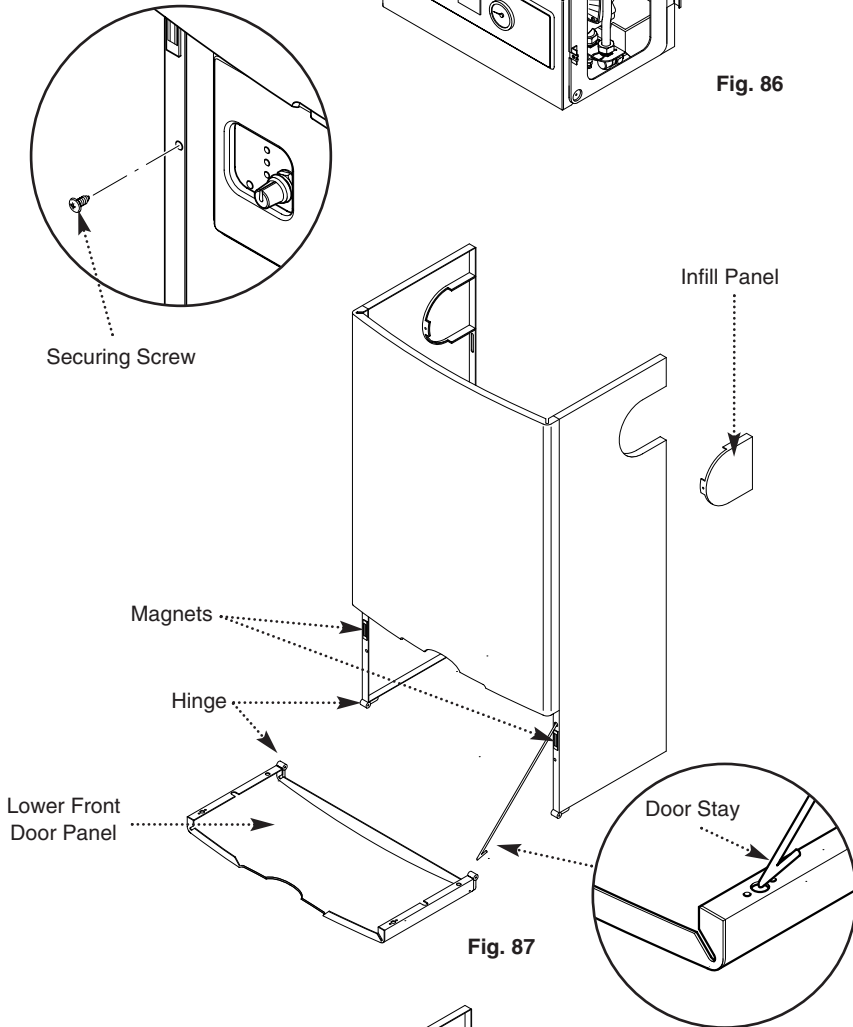


Fig. 87

Fig. 88

## 9.0 Overheat Cut-off Device

### 9.1 Operation

1. The overheat cut-off device is of the manual reset type and therefore it is important that the user knows how to reset the control should it ever operate.

**NOTE:** Cut-off is indicated by illumination of the overheat neon light on the control box.

2. Hinge the lower door panel down (Fig 89).

3. **To reset the boiler** - Turn the boiler thermostat control knob fully anti-clockwise to the OFF position marked '0' (Fig. 90). Wait ten seconds, then turn the control knob clockwise to the required thermostat setting. The red neon will go out and the boiler will start automatically.

4. If the overheat cut-off operates repeatedly, refer to the fault finding chart at the rear of this booklet and investigate the cause.

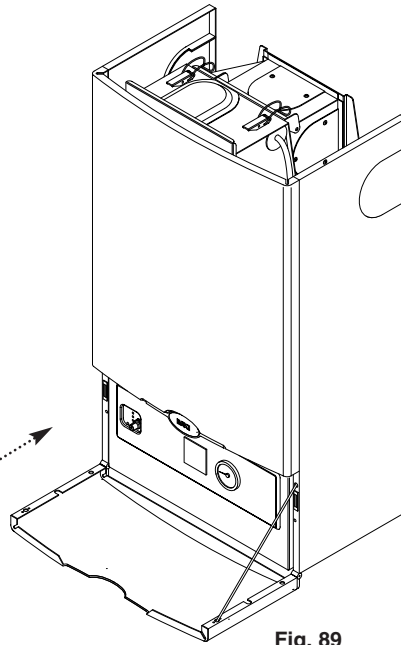


Fig. 89

Overheat Neon  
Warning

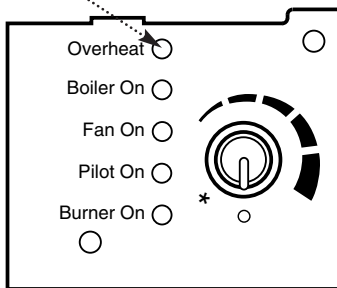


Fig. 90

## 10.0 Annual Servicing

### 10.1 Dismantling the Boiler

1. For reasons of safety and economy the boiler should be serviced annually. ( For location of British Gas service test point see Changing Components section of these instructions).

2. Before servicing the boiler please read Section 1.3 Important Information.

3. After servicing, complete the relevant section of the "Benchmark" Installation, Commissioning and Service Record Log Book. This should be in the possession of the user.

4. Isolate the gas and electrical supplies to the boiler.

5. Open the hinged lower door panel and carefully disengage the door stay. Remove the door by opening it 90° and pulling forward (Fig. 93).

6. Remove the outer case from the boiler by unscrewing the two screws and lifting the case clear (Fig. 91).

7. Release the four latches retaining the combustion box door and remove the door (Fig. 95).

8. Release the 5-pin electrical plug connecting the pressure switch and fan (Fig. 94). Withdraw the fan assembly by pulling forwards from the top edge (Fig. 95).

Fig. 91

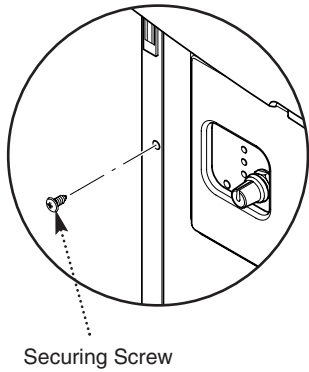


Fig. 92

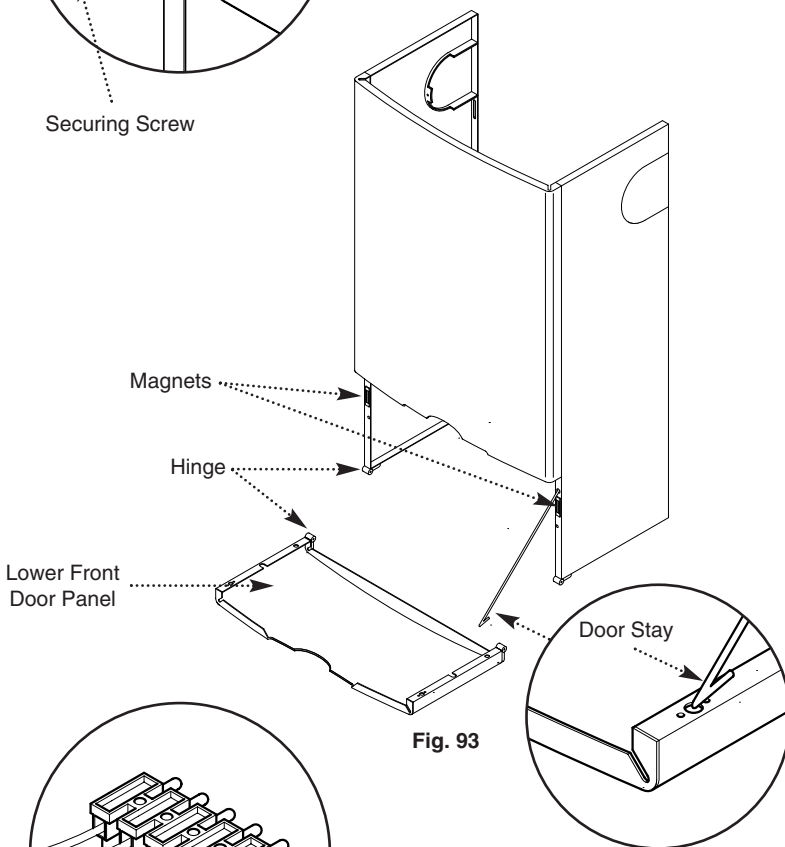
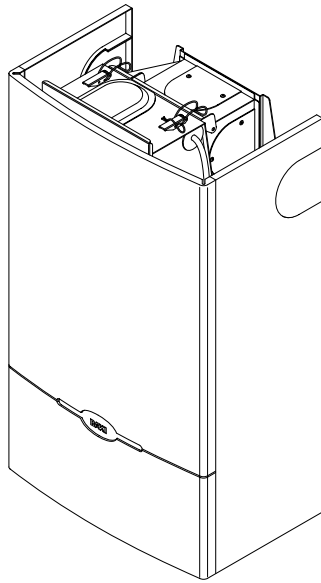
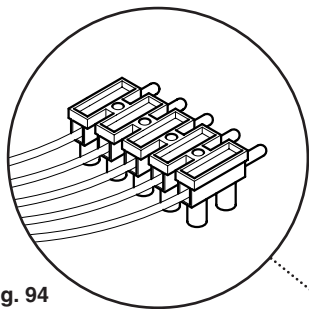
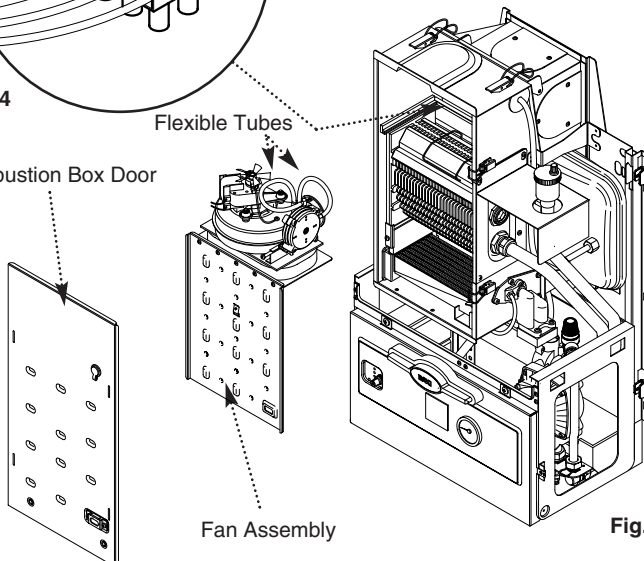


Fig. 94



Combustion Box Door



## 10.0 Annual Servicing

### 10.2 Cleaning the Combustion Box

1. Remove the burner assembly by pulling it forward (Fig. 97).
2. Lightly brush any dirt from the top of the burner blades and ensure that the ports are free from obstruction.
3. Remove the baffle retaining clip and lift the baffles from the heat exchanger (Fig. 95a & 96).

### 10.3 Cleaning the Heat Exchanger

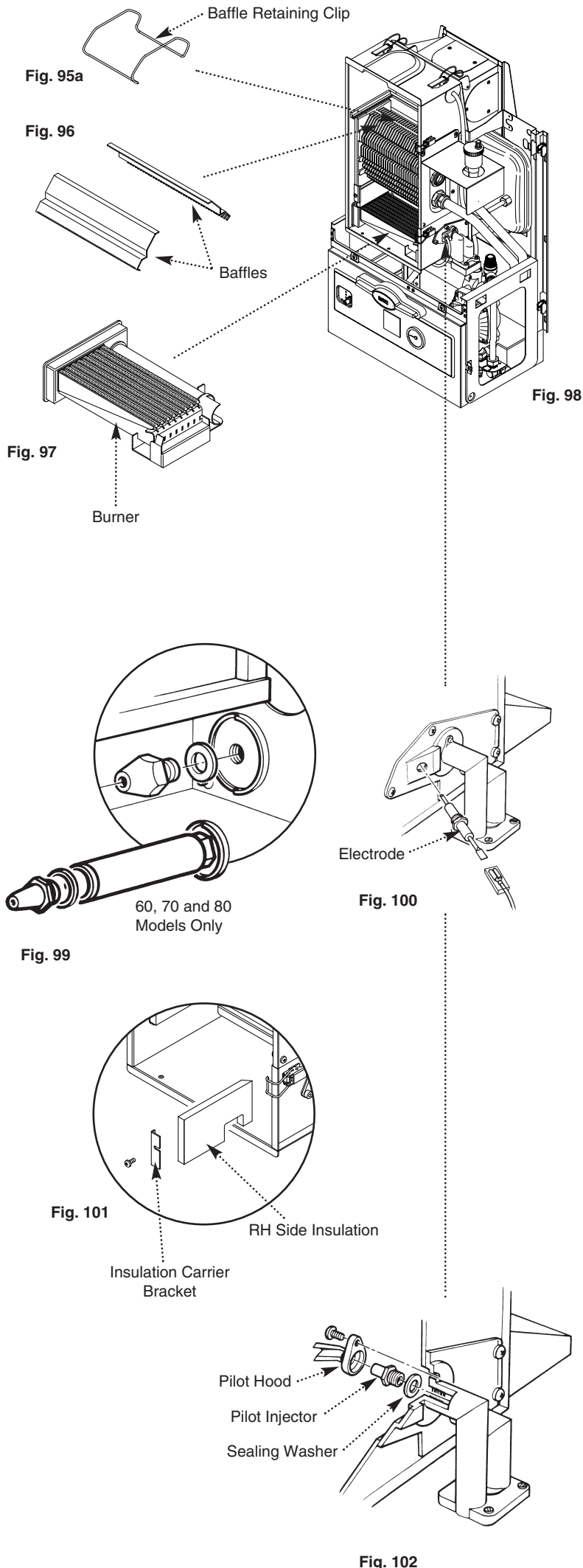
1. The heat exchanger may be cleaned by insertion of a thin metal strip e.g. a hack saw blade or steel rule, from above or below, taking care not to damage any insulation.
2. Clean the front and rear fin sections and ensure that any blockages are cleared.

### 10.4 Cleaning the Burner Injector

1. Remove the injector which is screwed into the burner feed manifold (Fig. 99).
2. Examine and clean carefully, then replace ensuring that the copper washer is in position. Tighten the injector fully.

### 10.5 Cleaning the Pilot

1. Disconnect the spark electrode lead at the electrode (Fig. 100).
2. Unscrew the electrode from the manifold and withdraw the electrode (Fig. 100).
3. Remove the right hand side insulation carrier bracket by releasing the screw. Remove the side insulation (Fig. 101).
4. Release the screw securing the pilot hood and remove (Fig. 102).
5. Carefully remove the pilot injector (Fig. 102). Examine and clean it as necessary. Do not use a wire or pin to clean the injector orifice.
6. Examine the sealing washer (Fig. 102) and replace if it is damaged in any way. Reassemble in reverse order.
7. Replace all components in reverse order **ensuring that the flexible tubes from the fan unit to the pressure switch are routed correctly and that they are not kinked or flattened** (Fig. 95).
8. Check that the seal to the combustion box door is good.
9. Re-commission the boiler before use, checking for gas soundness and ensuring all controls are working correctly.
10. Complete the relevant section of the "Benchmark" Installation, Commissioning and Service Record Log Book and hand it back to the user.



British Gas Service  
Test Point.  
For use by B.G.  
Personnel only

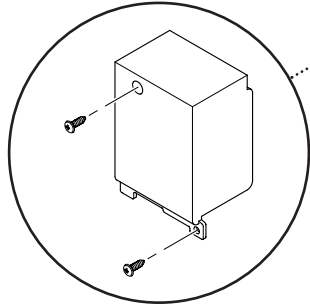


Fig. 103

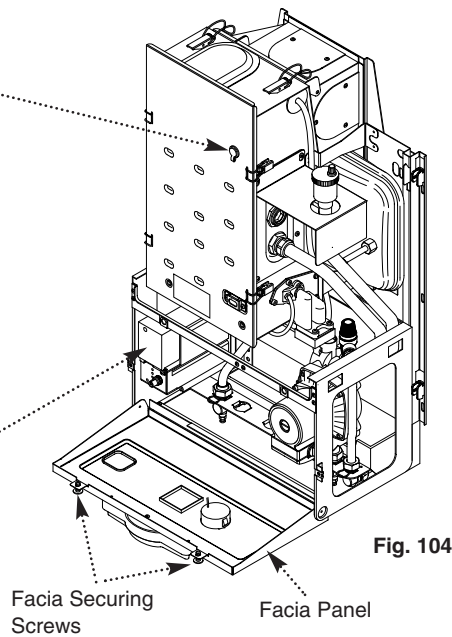


Fig. 104

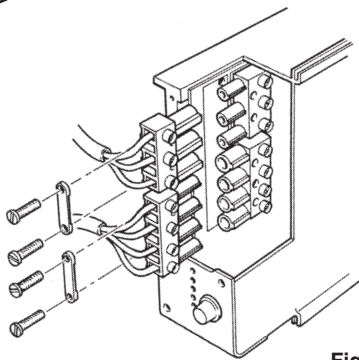


Fig. 105

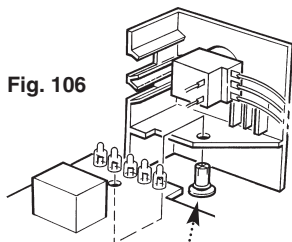


Fig. 106

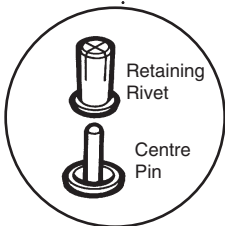


Fig. 107

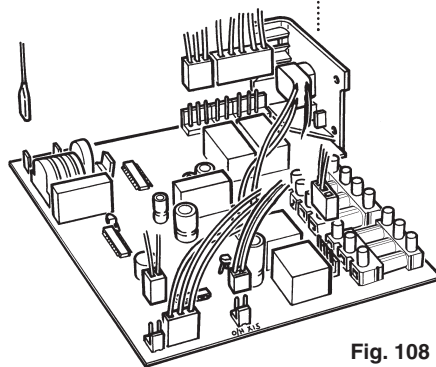


Fig. 108

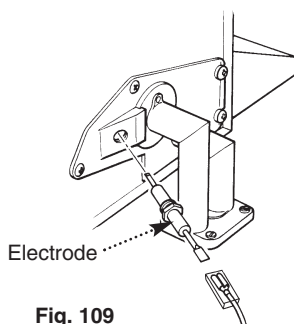


Fig. 109

## 11.0 Changing Components

### 11.1 Changing Components

1. Before changing any components ensure that the gas and electrical supplies are isolated.
2. Before changing any components please read Section 1.3 Important Information.
3. Open the hinged lower door panel and carefully disengage the door stay. Remove the door by opening it 90° and pulling forward (see Fig.93).
4. Remove the outer case from the boiler by unscrewing the two screws and lift the case clear.

### 11.2 Replacing the Circuit Board

1. Ensure that the electrical supply is isolated.
2. Undo the 1/4 turn screws and drop the facia panel down (Fig. 104).
3. Remove the cover from the front of the controls box (Fig. 103).
4. Release the supply and pump feed cables from the cable clamps and unplug the connection blocks from the circuit board (Fig. 105).
5. Remove the screw retaining the thermostat control panel and slide the circuit board from the box.
6. Carefully withdraw the centre pin from the retaining rivet which then allows the retaining rivet to be removed. Remove the thermostat control panel (Fig. 106 & 107). (On reassembling ensure the control panel is located over the retaining rivet body before inserting the centre pin).
7. Disconnect the plugs from the sockets on the circuit board (Fig. 108).
8. Replace new circuit board in reverse order checking that the connections are correct as shown in the diagram (See Electrical Connections section 6.18 of these instructions) and that the harness is retained in the strain reliefs.

### 11.3 Ignition Electrode (Fig. 109)

1. Disconnect the spark electrode lead at the electrode.
2. Unscrew the electrode from the manifold and withdraw the electrode.
3. Replace the new electrode in reverse order, ensuring that the sleeving is pushed over the end of the electrode.



## 11.0 Changing Components

### 11.4 Gas Valve (Fig. 110 & 111)

1. Undo the ¼ turn screws and drop the facia panel down.
2. Disconnect the electrical connections from the valve, noting their positions.
3. Undo the screw retaining the valve cover and remove the cover.
4. Undo the nut on the valve feed pipe at the tap rail. Carefully remove the washer for re-use.
5. Remove the screws securing the outlet adaptor to the valve. If necessary pull the electrical box forward to improve access.
6. Undo the screws retaining the valve mounting bracket to the combustion box.
7. Manoeuvre the valve and feed pipe away from the appliance, taking care not to lose the gasket.
8. Note the orientation of the feed pipe relative to the valve. Remove the screws holding the feed pipe flange to the valve.
9. Examine the gaskets and washers and replace them if they are damaged in any way.
10. Transfer the mounting bracket to the new valve.
11. Reassemble the new valve in reverse order of dismantling, ensuring that the gaskets and washer are correctly fitted.
12. Check burner pressure is 16mbar  $\pm$  0.5 (See section 7.1 paragraph 2 if burner pressure needs adjusting).

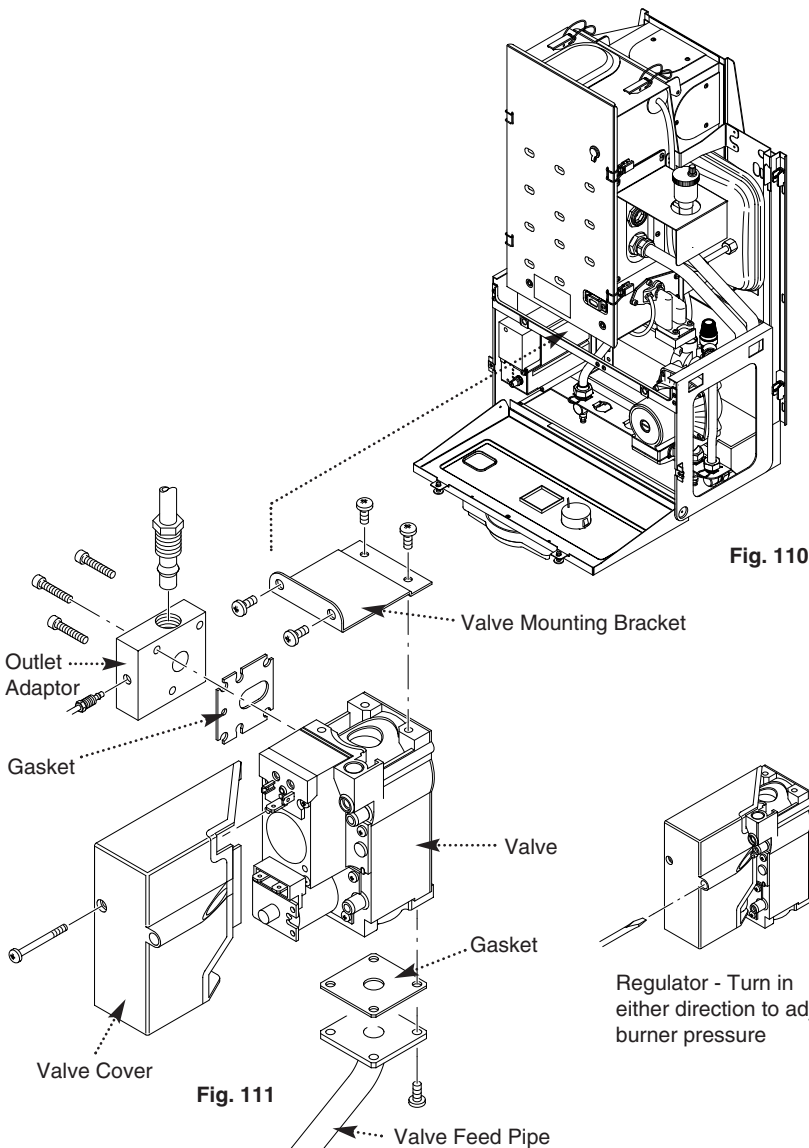


Fig. 110

Fig. 111

Regulator - Turn in either direction to adjust burner pressure

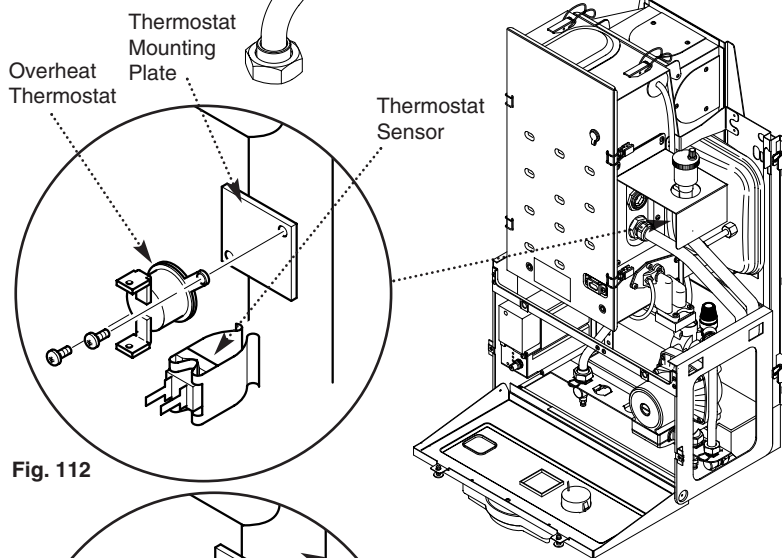


Fig. 112

### 11.5 Thermostat Sensor (Fig. 112 & 113)

1. Disconnect the two electrical tags from the sensor.
2. Prise the clip and sensor off the flow manifold.
3. Clip the new sensor to the pipe and reconnect the wires. Either wire can be connected to either spade terminal - there is no polarity.

### 11.6 Over-Heat Thermostat (Fig. 112 & 113)

1. Disconnect the two electrical tags from the overheat thermostat.
2. Remove the two screws securing the thermostat to the pipe.
3. Ensure the thermostat mounting plate is clean and free of debris. Fit the new thermostat using the screws previously removed.
4. Connect the two electrical tags to the terminals on the overheat thermostat - either wire can be connected onto either terminal - there is no polarity.

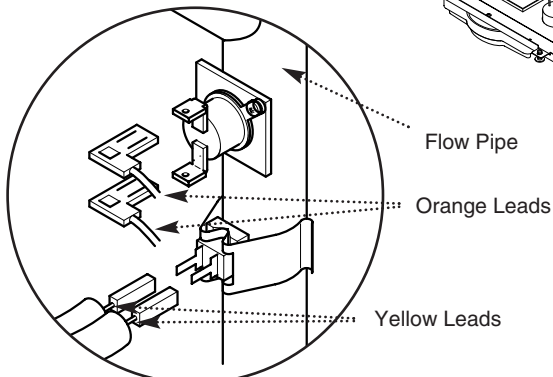


Fig. 113

## 11.0 Changing Components

### 11.7 Changing Components (Cont)

1. To change Fan - Pressure Switch - Burner - Burner Injector - Pilot Burner Injector - Gas Manifold, proceed as follows:-

2. Release the four latches holding the combustion box door. Remove the combustion box door by pulling forward from the bottom and unhooking its top edge (Fig. 115).

3. Disconnect the 5-pin pressure switch and fan plug (Fig. 114). Withdraw the fan assembly by pulling forwards from the top edge (Fig. 115).

### 11.8 Fan (Fig. 116)

1. Disconnect the two flexible tubes from the venturi situated on the fan.

2. Disconnect the 2 fan wires from the connection on the electrical plug. Remove the 3 screws securing the fan to the fan hood.

3. Remove the two screws securing the fan outlet flange to the fan and remove. Clean all sealing mastic from the outlet flange.

4. Fit the outlet flange onto the new fan, fix with the 2 screws and seal the outside gap between the fan body and the outlet fan with the mastic provided.

5. Fit the new fan and re-assemble all components in reverse order of dismantling ensuring that the flexible tubes from the fan unit to the pressure switch are routed correctly and that they are not kinked or flattened (Fig. 115), reconnect the new fan wires into the connections on the electrical plug - either wire can be connected into either connection.

### 11.9 Pressure Switch (Fig. 117)

1. Disconnect flexible tubes noting their positions.

2. Remove the screw securing the pressure switch to its bracket and unhook the pressure switch.

3. Disconnect the 3 electrical terminals from the pressure switch. Note the position of the tags before removal and reconnect in correct order.

4. Fit new pressure switch and re-assemble all components ensuring that the flexible tubes from the fan unit to the pressure switch are routed correctly and that they are not kinked or flattened (Fig. 115). Ensure that the electrical terminals are connected to their correspondingly marked tags.

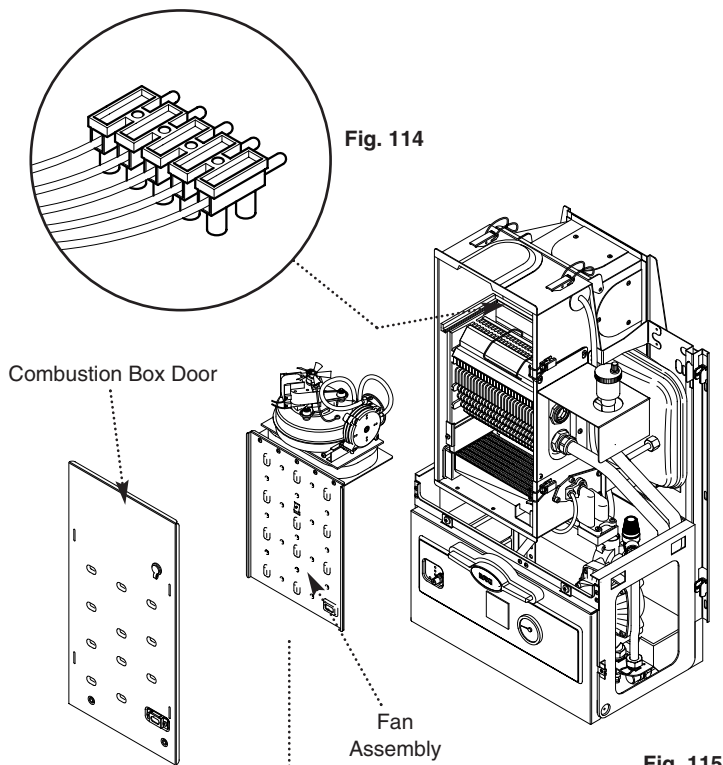


Fig. 114

Fig. 115

Fig. 116

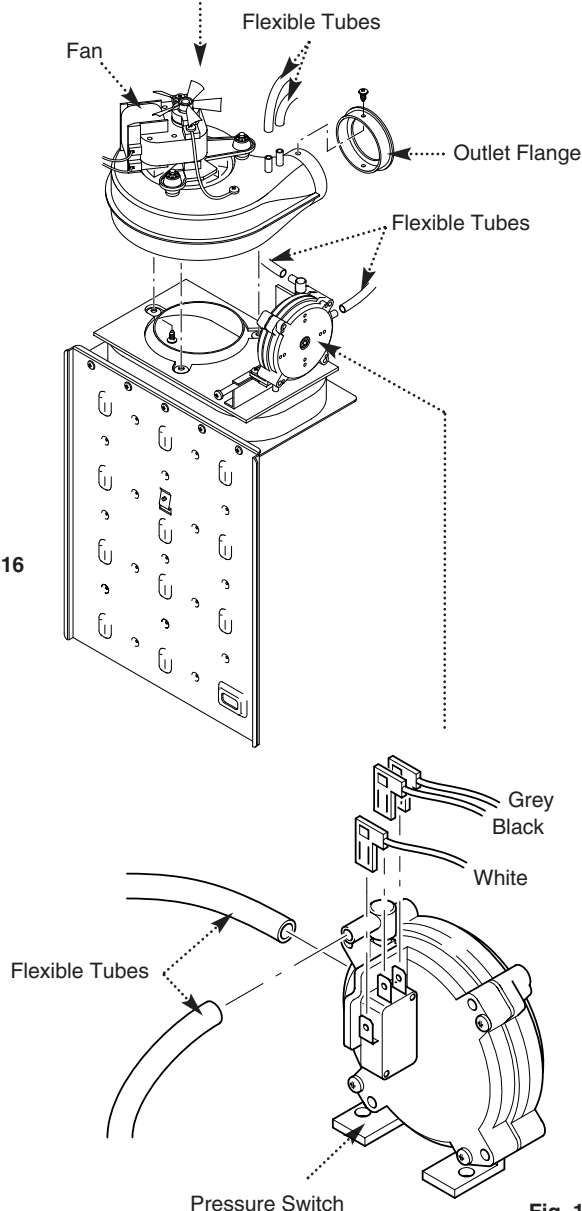


Fig. 117



## 11.0 Changing Components

### 11.10 Burner (Fig. 118)

1. Remove the burner assembly by pulling it forward.
2. Fit new burner and re-assemble all components in reverse order of dismantling.

### 11.11 Burner Injector (Fig. 120)

1. Release and remove the burner injector which is screwed into the burner feed manifold.
2. Fit the new burner injector ensuring that the copper washer is in position. Tighten the injector fully.
3. Re-assemble all components in reverse order.

### 11.12 Pilot Burner Injector (Fig. 121)

1. Remove the right hand side insulation carrier bracket by releasing the screw. Remove the side insulation panel (Fig. 122).
2. Release the screw securing the pilot hood and remove. Carefully remove the pilot injector. Fit the new pilot injector ensuring the new sealing washer is in position. Tighten the injector fully.
3. Re-assemble all components in reverse order.

### 11.13 Gas Manifold (Fig. 123)

1. Undo the ¼ turn screws and drop the fascia panel down.
2. Pull the electrode lead off the electrode.
3. Remove the right hand side insulation carrier bracket by slackening the screw. Remove the burner. Remove the side insulation panel (Fig. 122).
4. Undo the three screws securing the brass inlet adaptor to the manifold.
5. Remove the two screws securing the manifold from the inside of the combustion box and slide the manifold forward from under the two rear locating studs, taking care not to lose the gasket.
6. Remove the electrode
7. Replace all ancillary components onto manifold and replace manifold by sliding rear edge backwards under the two rear locating studs and securing from inside the combustion box using the two screws previously removed. Ensure that the sealing gasket is properly positioned and undamaged.

Fig. 118

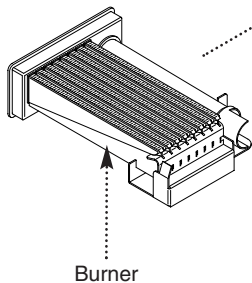


Fig. 119

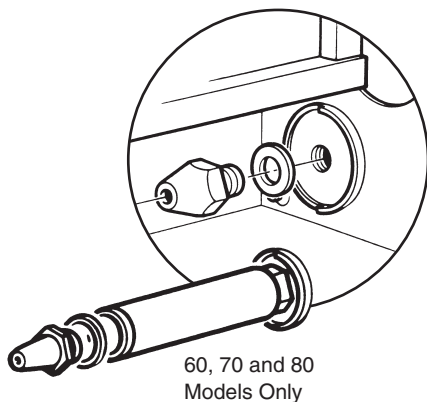
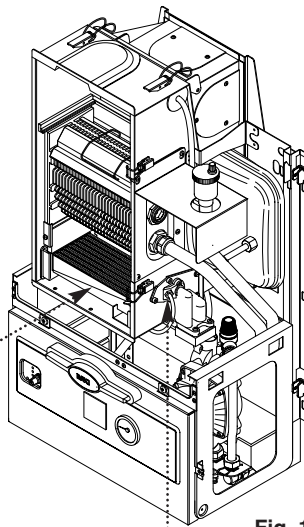


Fig. 120

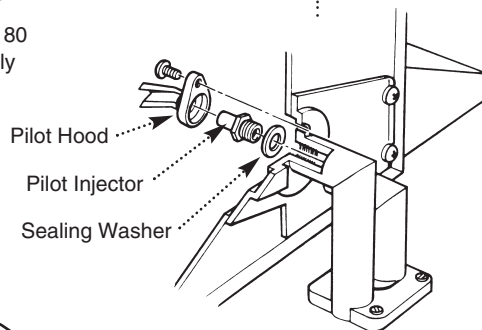


Fig. 121

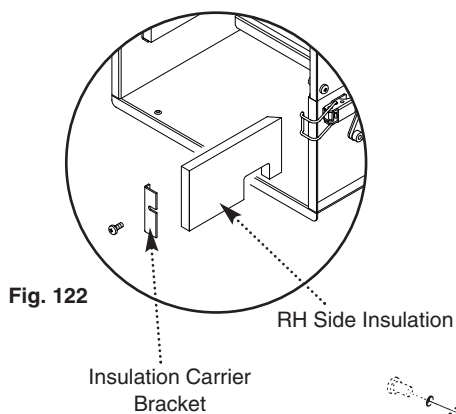


Fig. 122

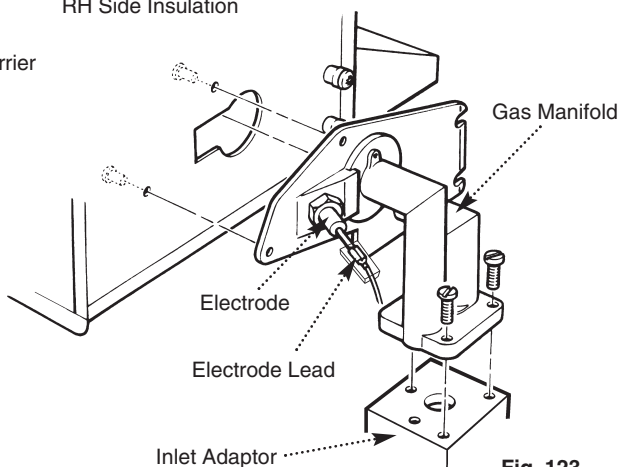


Fig. 123

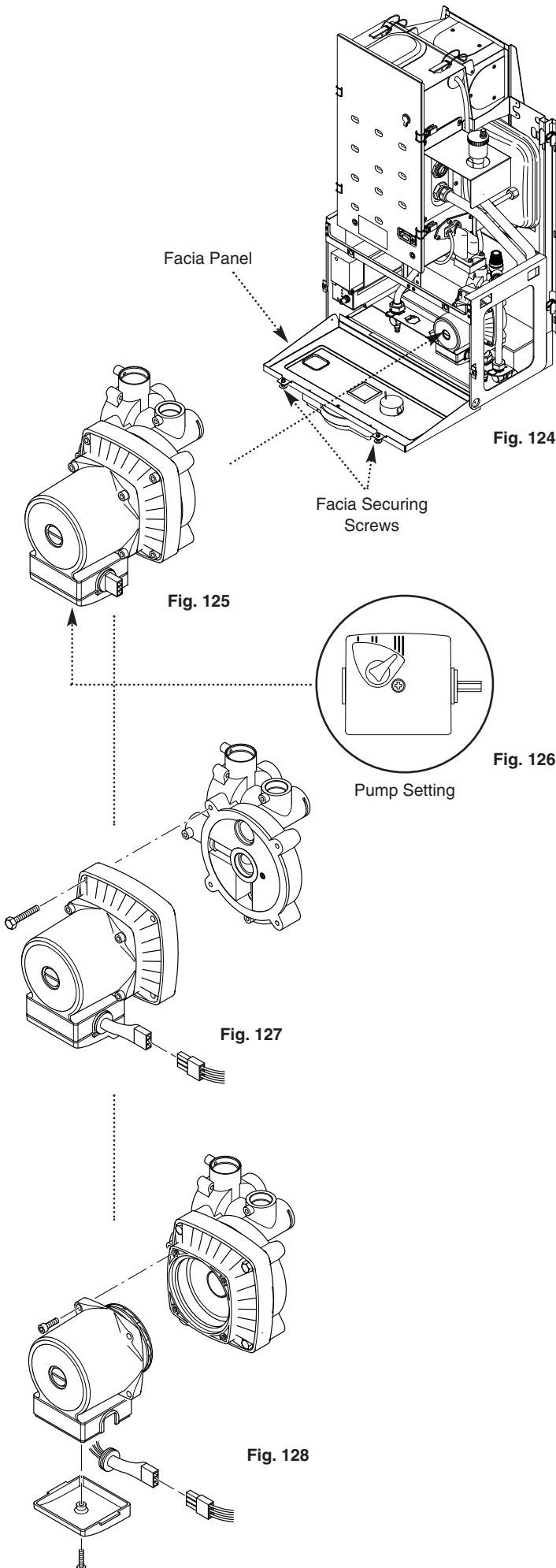
## 11.0 Changing Components

### 11.15 Pump (Head Only) (Fig. 128)

1. If only the head needs replacing. A standard Grundfos UPS 15-60 pump head is interchangeable.
2. Isolate the appliance from the water system by closing the flow and return taps.
3. Drain the boiler of water.
4. Undo the  $\frac{1}{4}$  turn screws and drop the facia panel down.
5. Unplug the wiring harness from the pump.
6. Remove the four socket head screws securing the pump head and separate it from the housing.
7. Check that the new pump has been switched to setting N°3.
8. Remove the screws retaining the pump electrical covers on the original and replacement heads.
9. From the replacement UPS 15-60 pump head remove the strain relief cable gland and discard.
10. Remove the plug connector from the old pump head and wire it into the UPS 15-60 pump head.
11. Replace the electrical cover to the new pump head and assemble with the electrical box at 6 o'clock to the housing.
12. Reconnect the wiring harness plug
13. Repressurise and recommission the system.

### 11.16 Pump (Complete) (Fig. 125 & 127)

1. Isolate the appliance from the water system by closing the flow and return taps.
2. Drain the boiler of water.
3. Undo the  $\frac{1}{4}$  turn screws and drop the facia panel down.
4. Unplug the wiring harness from the pump.
5. Remove the four screws retaining the pump backplate to the hydraulic manifold.
6. Remove the pump.
7. Fit the new pump and reassemble in reverse order.
8. Repressurise and recommission the system.



## 11.0 Changing Components

### 11.16 Pressure Gauge

1. Isolate the appliance from the water system by closing the flow and return taps.
2. Drain the boiler of water.
3. Undo the  $\frac{1}{4}$  turn screws and drop the fascia panel down.
4. Undo the nut on the gauge capillary at the boiler flow connection (Fig. 131).
5. Press in the two lugs on the gauge body, and pass the gauge and capillary through the fascia (Fig. 130).
6. Fit the new gauge in reverse order and recommission the appliance.

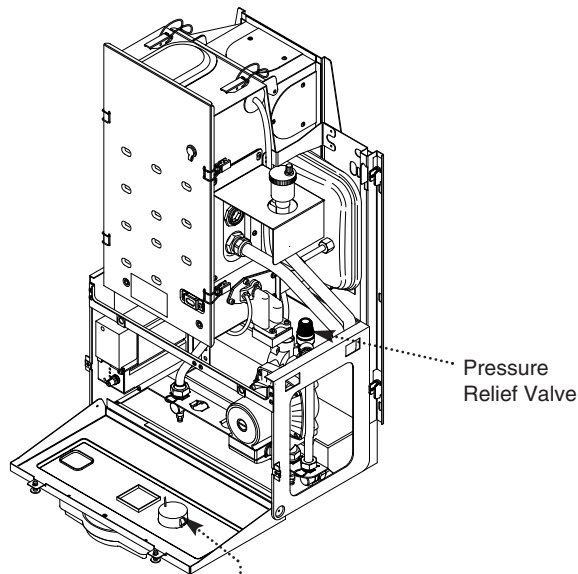


Fig. 129

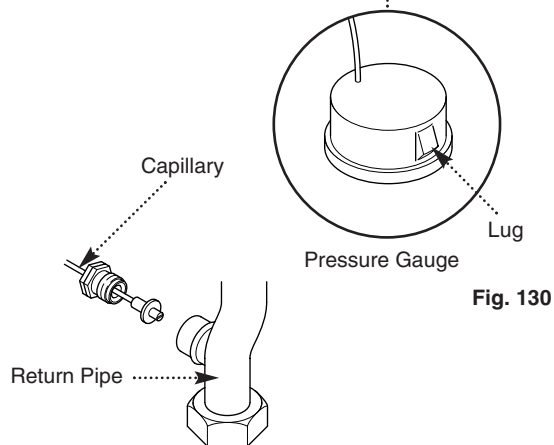


Fig. 130

Fig. 131

### 11.17 Pressure Relief Valve (Fig. 129)

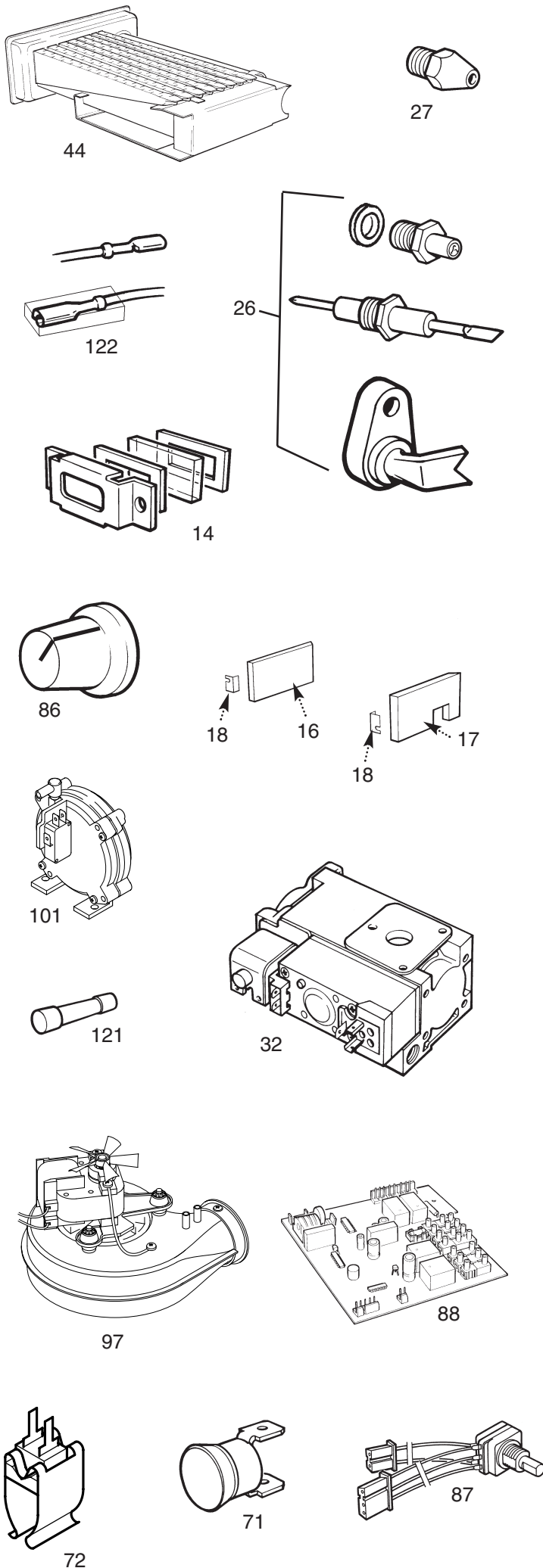
1. Isolate the appliance from the water system by closing the flow and return taps.
2. Drain the boiler of water.
3. Undo the  $\frac{1}{4}$  turn screws and drop the fascia panel down.
4. Undo the nut on the pressure relief pipe and slacken the screw holding the valve to the manifold.
5. Fit the new valve in reverse order and recommission the appliance.

### 11.18 Re-pressurising Expansion Vessel

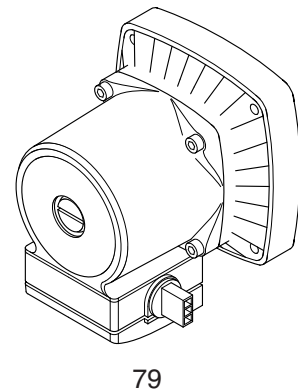
1. The charge pressure is 1.0 bar.
2. Close the central heating flow and return isolating valves.
3. Drain the boiler of water.
4. The expansion vessel valve is situated to the right of the combustion box, below the expansion vessel.
5. Pressurise to 1.0 bar.
6. Open the isolating valves and recharge the system to 1.0 bar.
7. Vent the system as necessary.

## 12.0 Short parts list

### 12.1 Short Parts List

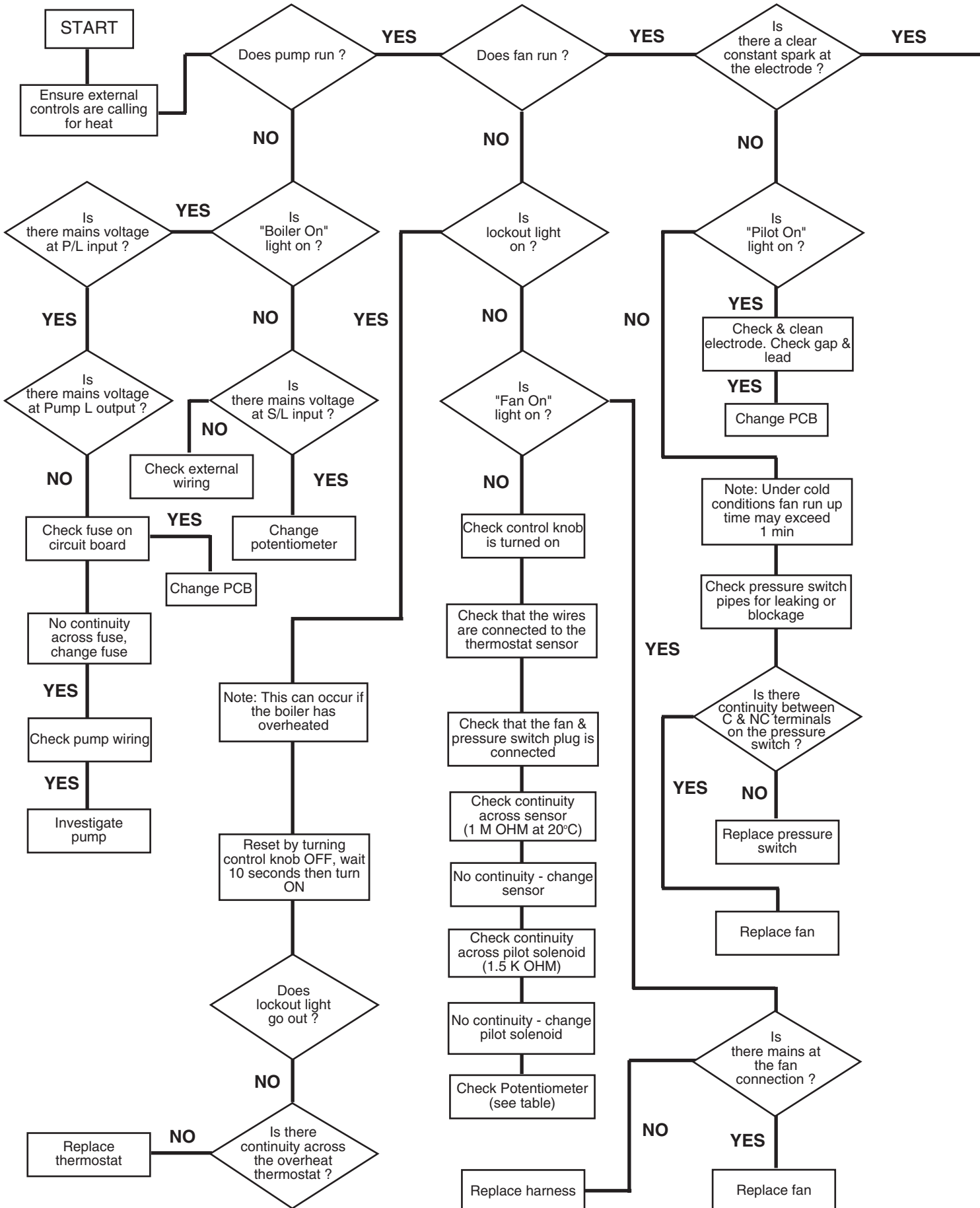


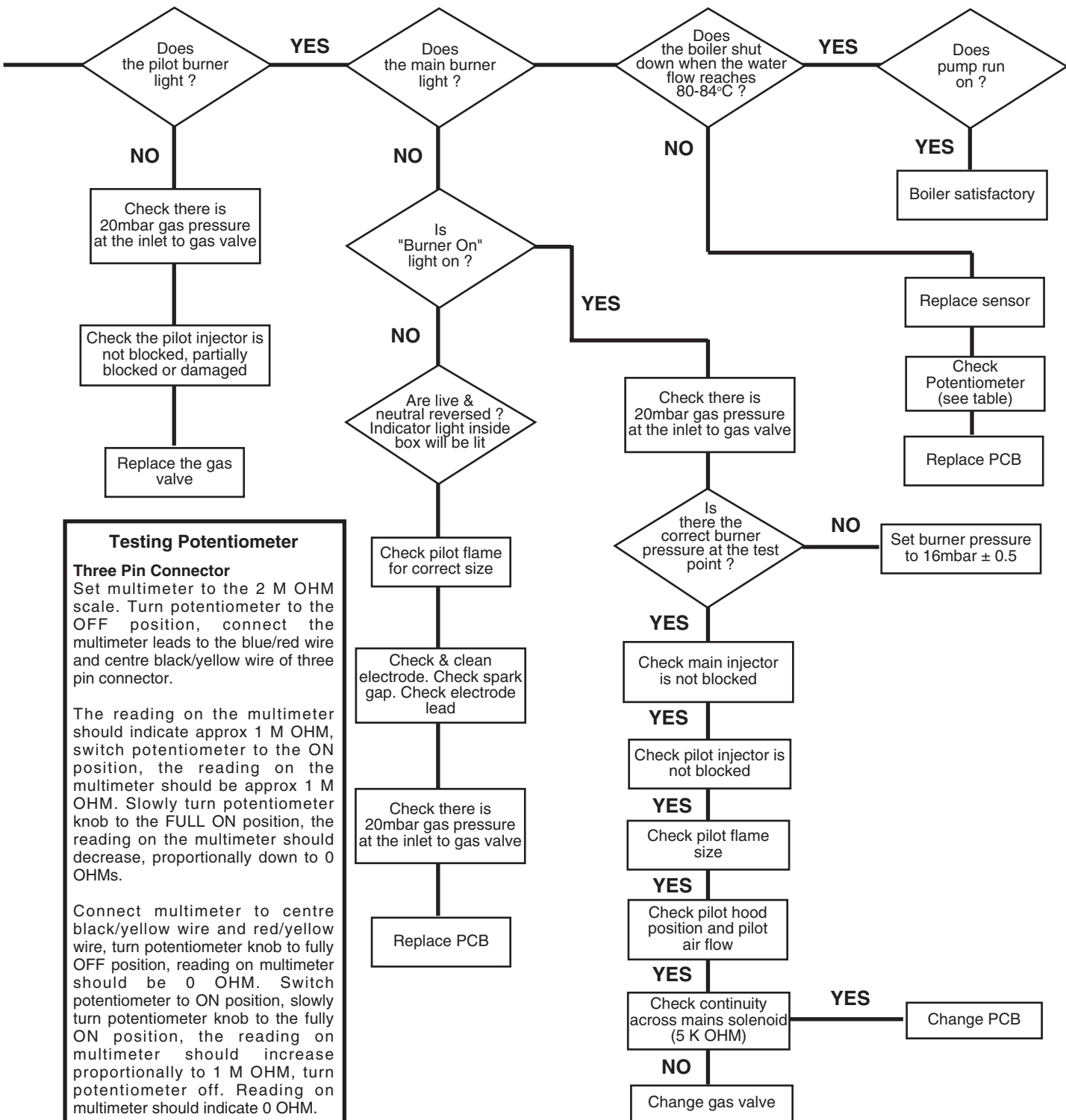
Key N°	Description	Model	G.C. N°	Manuf'rs Part N°
44	Burner	30, 40, 50	364 878	231708
		60, 70, 80	364 879	231709
27	Burner Injector	30		246176
		40		246177
		50		246178
		60		246161
		70		246162
80		246163		
26	Pilot Kit	All models	170 558	236142
122	Electrode Lead	All models		246200
86	Control Knob	All models	364 886	230981
14	Viewing Window Kit	All models	364 588	224183
101	Pressure Switch	30, 40, 50		246053
		60, 70		246054
		80	E26 221	246055
17	Insulation R.H.	All models	364 889	230653
16	Insulation L.H.	All models	364 980	230652
18	Retaining Clip	All models	364 891	230817
32	Gas Valve	All models	E24 690	245122
72	Overheat Thermostat	All models		5106746
121	Fuse	All models	364 892	231402
97	Fan	30, 40, 50		246051
		60, 70, 80		246052
71	Thermostat	All models		246064
88	Control Board	All models	379 031	231711
87	Potentiometer	All models	379 960	231252
79	Pump	All models	E02 762	241157
93	Pressure Gauge	All models	E02 796	241190
73	Automatic Air Vent	All models	E02 759	241154



Before starting FAULT FINDING carry out preliminary electrical system checks i.e. Earth Continuity, Polarity, Short Circuit and Resistance to Earth. Ensure that the system is correctly pressurised.

## 13.0 Fault Finding





### Testing Potentiometer

#### Three Pin Connector

Set multimeter to the 2 M OHM scale. Turn potentiometer to the OFF position, connect the multimeter leads to the blue/red wire and centre black/yellow wire of three pin connector.

The reading on the multimeter should indicate approx 1 M OHM, switch potentiometer to the ON position, the reading on the multimeter should be approx 1 M OHM. Slowly turn potentiometer knob to the FULL ON position, the reading on the multimeter should decrease, proportionally down to 0 OHMs.

Connect multimeter to centre black/yellow wire and red/yellow wire, turn potentiometer knob to fully OFF position, reading on multimeter should be 0 OHM. Switch potentiometer to ON position, slowly turn potentiometer knob to the fully ON position, the reading on multimeter should increase proportionally to 1 M OHM, turn potentiometer off. Reading on multimeter should indicate 0 OHM.

#### Two Pin Connector

Check potentiometer is in OFF position.

Set multimeter to continuity, connect multimeter leads to both potentiometer leads. Turn potentiometer to the on position, the multimeter's audible alarm should now be sounding to indicate continuity.

### Warning

It is important that both the air and flue ducts are cut to their correct lengths also ensure that the flue duct is fully engaged.

Failure to comply with the recommended fitting instructions will adversely affect the operation of the appliance.

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