



**POTTERTON**  
wall hung gas combination boiler

INSTALLATION AND  
SERVICING INSTRUCTIONS

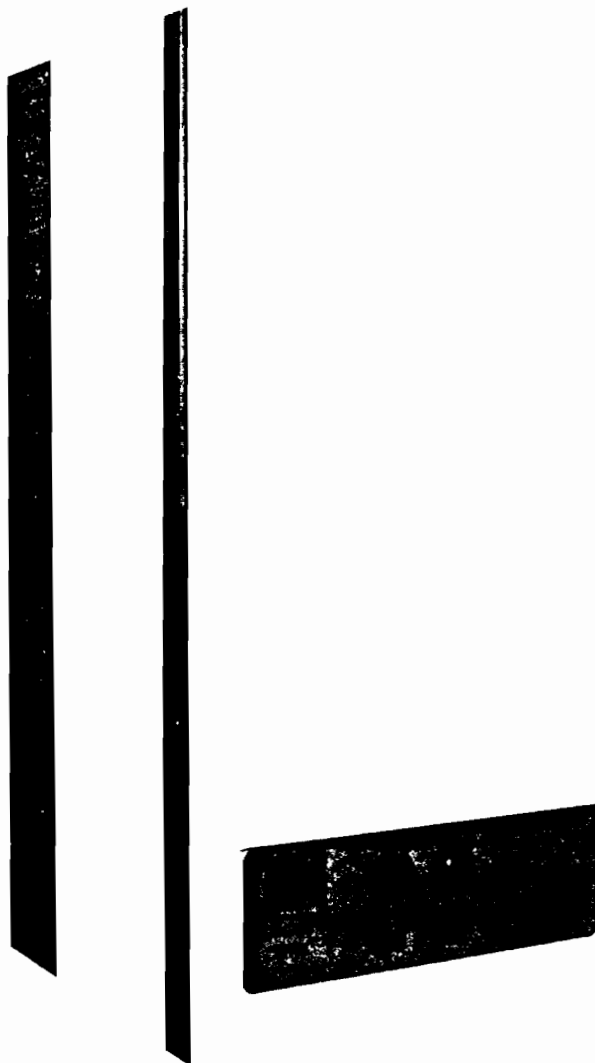
G C No 47 590.02

Wall mounted,  
Fanned, Room Sealed  
Combination Boiler

FOR USE WITH NATURAL  
GAS ONLY.

*Lynx*  
Electronic

These instructions are to be followed and the  
specification of the appliance must not be modified.



**Installation and Servicing Instructions**

LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER.

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Table 1 GENERAL DATA

Heat Input	Max.	29.31 kW	(100,000 Btu/h)
	Min.	12.3 kW	(42,000 Btu/h)
Heat Output	Max.	23.45 kW	(80,000 Btu/h) Modulating to
	Min.	8.8 kW	(30,000 Btu/h)
Gas Rate	Full	45.6 l/m	1.6 ft <sup>3</sup> /m
	Ignition	18.2 l/m	0.6 ft <sup>3</sup> /m
Inlet Pressure		20 mbar	8.0 in w.g.
Burner Pressure	Max.	13.4 mbar	5.4 in w.g.
	Min.	1.6 mbar	0.64 in w.g.
	Ignition	1.0 mbar	0.4 in w.g.
Main Burner		FURIGAS 126, 500, 017	
Gas Control Valve		HONEYWELL VR 8925M 2003	
Burner Injector		BRAY 23 2300	
Electrical Supply		240V	50 Hz;
External Fuse Rating		3 A	
Internal Fuse Rating F1		2 A.T.	
Internal Fuse Rating F2		1 A.T.	
Dry Weight		50 kg	(110 lbs)
Water Content C.H.		0.908 litres	(1.6 pints)
Water Content D.H.W.		0.516 litres	(0.9 pints)
Gas Supply Connection		Rc½"	(½" B.S.P.) Gas Cock
Inlet Connection D.H.W.		15 mm compression Isolating Valve	
Outlet Connection D.H.W.		15 mm copper pipe	
Flow Connection C.H.		22 mm compression Isolating Valve	
Return Connection C.H.		22 mm compression Isolating Valve	
Safety Discharge Pipe		15 mm copper	
Sealed Water System C.H. System			
Max. Pressure		3 bar	44 p.s.i.
Minimum working pressure		0.5 bar	7.35 p.s.i.
10 litre expansion vessel. Pre-charge Pressure		0.5 bar	7.35 p.s.i.
Central Heating Flow Temperature		Max. Load 85°C Min. Load 90°C	
D.H.W. Flow rate 40°C Rise		8.4 l/m (1.85 g/m)	
D.H.W. Temperature Max.		65°C	
D.H.W. Temperature Min.		35°C	
D.H.W. Max Pressure		10 bar	147 p.s.i.
D.H.W. Min Operating Pressure (Dynamic)		1.0 bar	14.7 p.s.i.
D.H.W. Expansion vessel. Pre-charge Pressure		3.5 bar	51.5 p.s.i.

## INTRODUCTION

The Potterton "Lynx" is a fully automatic, wall mounted, fan assisted, room sealed, combination boiler.

It adjusts automatically to provide central heating outputs of 8.8 kW (30,000 Btu/h) to 23.45 kW (80,000 Btu/h) maximum, with an instantaneous Domestic hot water priority, at an output of 23.45 kW (80,000 Btu/h).

This type of combination boiler has the advantage that tanks and copper cylinders are not required, and with the flexibility of the fluing arrangement and small terminal makes siting and installation easy.

The combination boiler is designed for use with a fully pumped sealed system only.

It is supplied fully tested and assembled, with a circulating pump, diverter valve, pressure gauge, safety valve, water flow switch and expansion vessels. Fig. 1 shows the main components of the boiler assembly.

The appliance has two completely separate heating systems embedded into an all copper heat exchanger. Both systems are completely independent. A SUMMER/WINTER

selector switch controls the choice of service between central heating and hot water, or hot water only. The internal water flow system is shown in Fig. 2.

With the SUMMER/WINTER selector switch set to SUMMER and the BOILER switch set to ON, the combination boiler fires only when the domestic hot water is drawn off.

With the SUMMER/WINTER switch set to WINTER the central heating is supplied at the required pre-set temperature until the domestic hot water (D.H.W.) is drawn off. The combination boiler then automatically switches to maximum output and supplies, via the diverter valve, a domestic hot water output of 23.45 kW (80,000 Btu/h).

At the minimum D.H.W. draw-off rate of 2.8 l/m the maximum temperature is limited to 65° Celsius by the modulating gas control.

The combination boiler has a white casing which can be removed for servicing; the control box can then be hinged down on its pivot for accessibility, this will expose the data badge, which is on the left hand side of the rear panel, and the serial number badge mounted on the right hand side of the bulk head.

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# Installation Instructions

## GAS SUPPLY

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### GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1984

It is the law that all gas appliances are installed and serviced by competent persons, in accordance with the above Regulations. Failure to install appliances correctly could lead to prosecution.

It is in your own interest, and that of safety, to ensure that the law is complied with.

For Health and Safety Information see page 34.

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The local Gas Region should be consulted, at the installation planning stage, in order to establish the availability of an adequate supply of gas.

An existing service pipe must NOT be used without prior consultation with the Local Gas Region.

A gas meter can only be connected by the Local Gas Region, or by a Local Gas Region Contractor.

An existing meter should be checked, preferably by the Gas Region, to ensure the meter is adequate to deal with the rate of gas supply required.

Installation pipes should be fitted in accordance with BS 6891.

Pipework from the meter to the combination boiler must be of an adequate size.

Do NOT use pipes of a smaller size than the combination boiler inlet gas connection.

The complete installation must be tested for gas soundness and purged as described in BS 6891.

## 1. GENERAL INFORMATION

Both the user and the manufacturer rely heavily on the installer, whose job it is to install the combination boiler, and connect it to a correctly designed heating system. Acquaint yourself with the British Standards concerning installation requirements. If you need advice on any points your Potterton Regional Technical Services Office would be pleased to help. It is recommended that tools suitable for brass fittings are used, and have a capability to accommodate hexagon sizes up to 50mm.

### CODES OF PRACTICE / Ref: Documents

#### CODES OF PRACTICE

I.E.E. Regulations

Model Water Bye Laws

Building Regulations/Building Standards  
Scotland.

BS. 6891 Low pressure installation pipes

BS. 6798 Boilers of rated input not exceeding 60kW

BS. 5449:1 Forced circulation hot water systems (smallbore and microbore domestic central heating systems).

BS. 5546 Installation of gas hot water supplies for domestic purposes (2nd family gases)

BS. 5440:1 Flues (for gas appliances of rated input not exceeding 60 kW)

BS. 5440:2 Air supply (for gas appliances of rated input not exceeding 60 kW)

BG. DM2 Guide for gas installation in timber framed buildings

#### NOTE:

A type sample of the Lynx Combination Boiler has been tested and examined by British Gas, and is certified to comply with the relevant requirements of BS 5258 Part 1 1986, BS 6332 Part 1 1983 and the relevant B.G./S.B.G.I. agreements, also tests based on BS 5386 Part 1. It is therefore important that no external control devices e.g. flue dampers, economisers etc, be directly connected to this appliance unless covered by these installation and service instructions or otherwise recommended by Potterton International Limited in writing. If in doubt please enquire.

Any direct connection of a control device not recommended by Potterton International Limited could invalidate the B.G. certificate and the normal appliance warranty and could also infringe the Gas Safety Regulations.

Manufacturers instructions must NOT be taken in any way as over-riding statutory obligations.

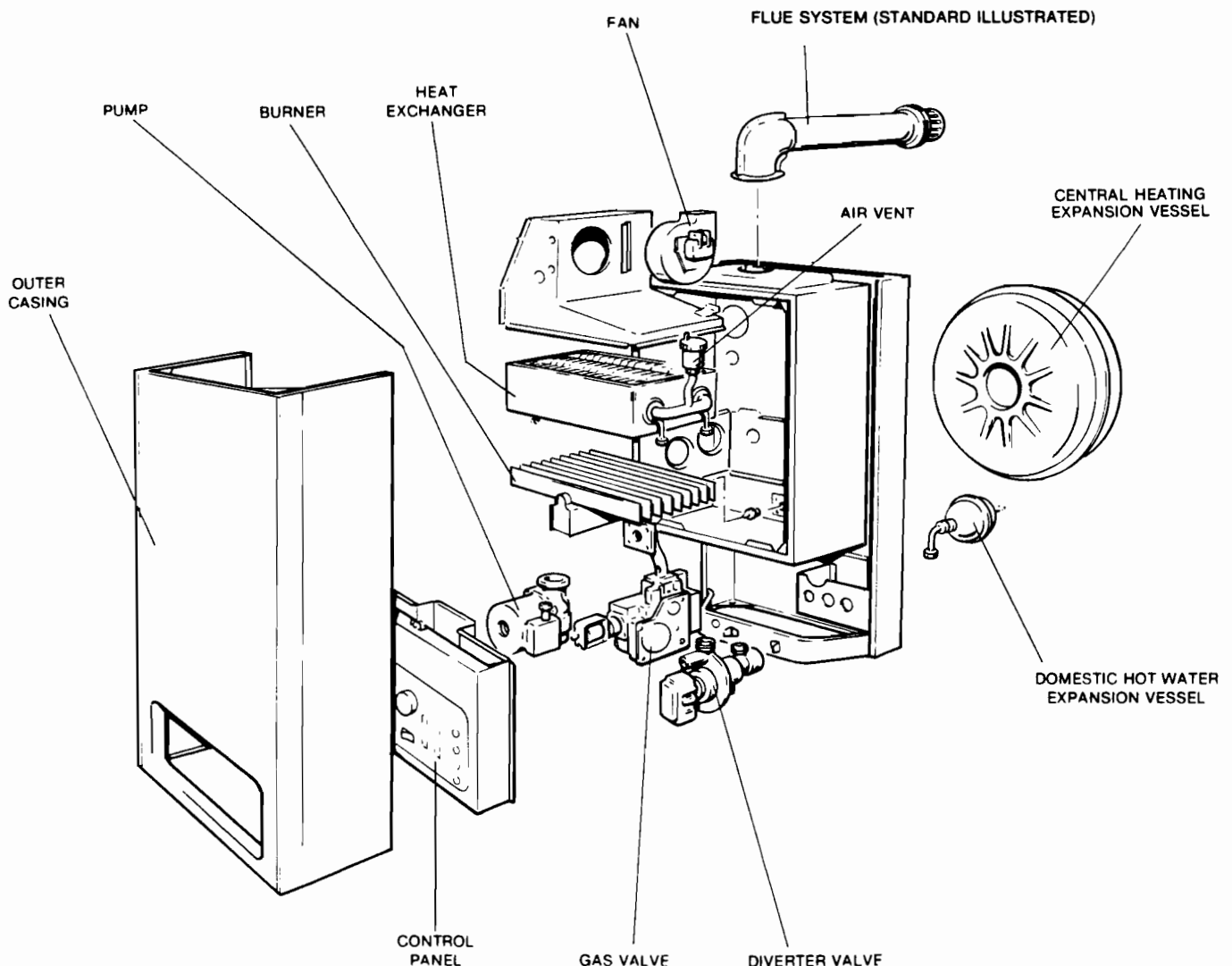


FIG. 1 GENERAL ARRANGEMENTS

## 2. LOCATION OF BOILER

In siting the combination boiler, the following limitations MUST be observed:

(1) The position selected for installation should be within the building, unless otherwise protected by a suitable enclosure, and must allow adequate space for installation, servicing and operation of the combination boiler, and for air circulation around it.

(2) This position MUST also allow for a suitable flue termination to be made. The combination boiler must be installed on a flat vertical wall which is capable of supporting the weight of the combination boiler, and any ancillary equipment.

The appliance may be installed on a combustible wall, subject to the requirements of the Local Authorities and Building Regulations.

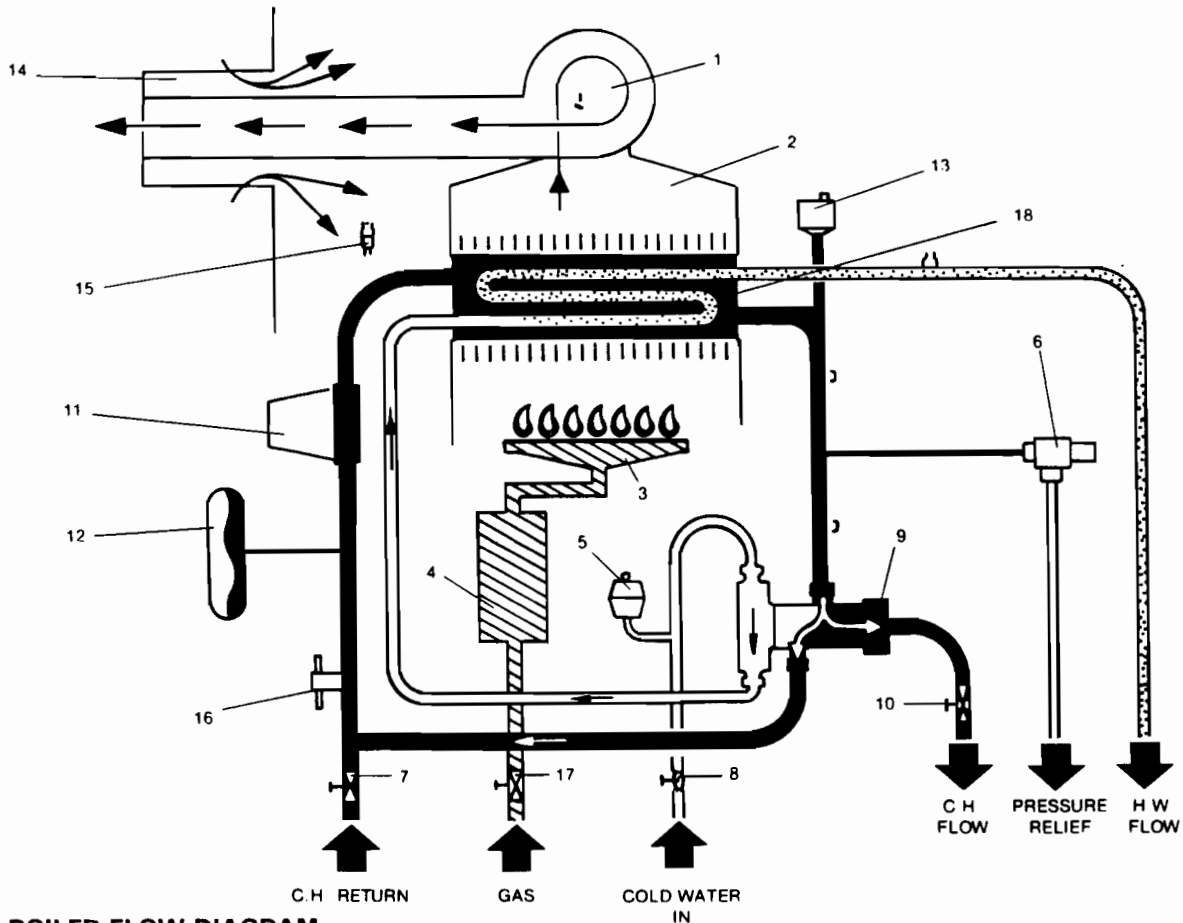


FIG. 2 BOILER FLOW DIAGRAM

### KEY

- |                           |                              |                            |
|---------------------------|------------------------------|----------------------------|
| 1 FAN                     | 6 PRESSURE RELIEF VALVE      | 12 C.H. EXPANSION VESSEL   |
| 2 FLUE HOOD               | 7 C.H. RETURN VALVE          | 13 AUTOMATIC VENT          |
| 3 BURNER                  | 8 COLD WATER INLET VALVE     | 14 AIR DUCT                |
| 4 GAS VALVE               | 9 DIVERTER VALVE             | 15 AIR FLOW SWITCH         |
| 5 D.H.W. EXPANSION VESSEL | 10 C.H. FLOW ISOLATING VALVE | 16 WATER FLOW SWITCH       |
|                           | 11 PUMP                      | 17 GAS ISOLATING COCK      |
|                           |                              | 18 COMBINED HEAT EXCHANGER |

## IMPORTANT NOTICE

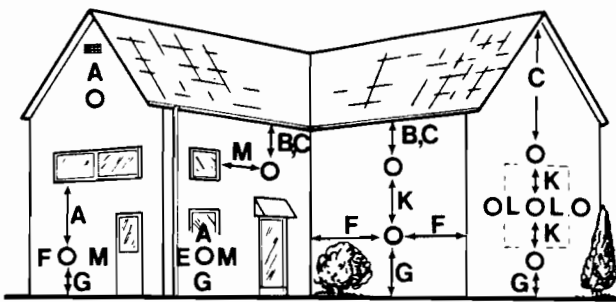
If the combination boiler is to be fitted in a timber framed building it should be fitted in accordance with the British Gas publication 'Guide for Gas Installations in Timber Frame Housing'. Reference DM2. If in doubt advice must be sought from the Local Gas Region of British Gas.

The combination boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current I.E.E. Wiring Regulations, and in Scotland, the electrical provisions of the Building Regulations applicable in Scotland, with respect to the installation of the combination boiler in a room or internal space containing a bath or shower.

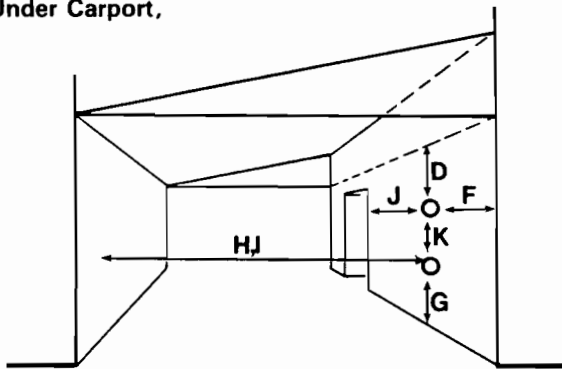
Where a room-sealed appliance is installed in a room containing a bath or shower, any electrical switch or appliance control, utilising mains electricity should be so situated that it cannot be touched by a person using the bath or shower.

A compartment used to enclose the combination boiler MUST be designed and constructed specifically for this purpose. An existing cupboard, or compartment, may be used provided it is modified accordingly.

Where installation will be in an unusual location, special procedures may be necessary. BS 6798 gives detailed guidance on this aspect.



Under Carport,



POSITION	MINIMUM DISTANCE
	mm
A DIRECTLY BELOW AN OPENABLE WINDOW, AIR VENT, OR ANY OTHER VENTILATION OPENING	300
B BELOW GUTTER, DRAIN/SOIL PIPE	75
C BELOW EAVES	200
D BELOW A BALCONY/CARPORT ROOF	200
E FROM VERTICAL DRAIN PIPES AND SOIL PIPES	75
F FROM INTERNAL OR EXTERNAL CORNERS	300
G ABOVE ADJACENT GROUND OR BALCONY LEVEL	300
H FROM A SURFACE FACING THE TERMINAL	600
I FACING TERMINALS	1,200
J FROM OPENING (DOOR/WINDOW) IN CARPORT INTO DWELLING	1,200
K VERTICALLY FROM A TERMINAL ON THE SAME WALL	1,500
L HORIZONTALLY FROM A TERMINAL ON THE SAME WALL	300
M ADJACENT TO OPENING	300
	600

FIG. 3 TERMINAL POSITION  
MINIMUM DISTANCE

### 3. FLUE TERMINAL AND DUCTING

(See Fig. 3, 17 & 17A)

The maximum standard air inlet and flue ducts length is 740mm. This is suitable for a maximum wall thickness of 508mm, and a minimum wall thickness of 76mm, at both side and rear. These ducts can be set horizontally, at any angle to the combination boiler, through 360 degrees, to a miniature terminal on the outside wall of the building. If dimension 'Y' (see Fig. 17 & 17A) is greater than 740mm, a 3m extension kit is available (Part No. 300204). Two Vertical flue kits are also available suitable for flue lengths of 2.6m (Part No. 300540) and 4m (Part No. 300580) for terminating through a roof.

The siting of the flue terminal on the outside wall of the building is shown in (Fig. 3). If the flue terminates less than 2m above a balcony, above the ground or above a flat roof to which people have access, then a suitable terminal guard must be fitted. (Potterton Part No. 205792).

#### NOTE:

Where a flue terminal is installed less than 850mm from a plastic, or painted gutter; or 450mm from painted eaves, an aluminium shield 750mm long, should be fitted to the underside of the gutter or painted surface.

#### IMPORTANT

It is absolutely ESSENTIAL, to ensure that products of combustion discharging from the terminal cannot re-enter the building, or any other adjacent building, through ventilators, windows, doors, natural air infiltration, or forced ventilation/air conditioning.

If products of combustion are found to be re-entering any building, the appliance MUST be turned OFF IMMEDIATELY, and the Local Gas Region consulted.

### 4. AIR SUPPLY (See Table 2)

Detailed recommendations for air supply are given in BS. 5440:2. The following notes are intended for general guidance:

It is NOT necessary to have a purpose provided air vent in the room or internal space in which the combination boiler is installed.

If the combination boiler is to be installed in a cupboard or compartment, permanent air vents are required (for cooling purposes) in the cupboard/compartment, at both high and low levels.

The air vents must either communicate with a room/or be direct to outside air.

TABLE 2 AIR SUPPLY

Position of air vent	Air from room/ internal space	Air direct from outside
High Level	264 cm <sup>2</sup> 40 in <sup>2</sup>	132 cm <sup>2</sup> 20 in <sup>2</sup>
Low Level	264 cm <sup>2</sup> 40 in <sup>2</sup>	132 cm <sup>2</sup> 20 in <sup>2</sup>

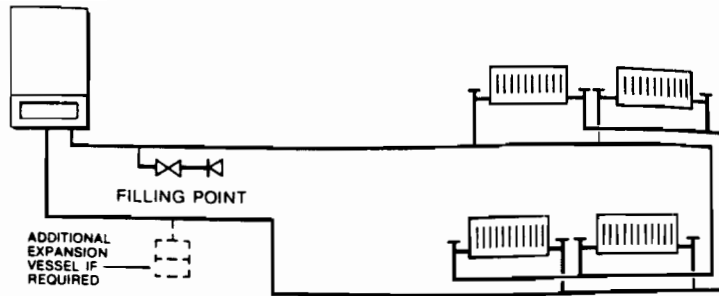


FIG. 4 TYPICAL SEALED SYSTEM

**5. GUIDE TO SYSTEM REQUIREMENTS** (see Figs. 4 & 6)

The combination boiler is specifically designed for "Sealed Systems" only. Therefore the central heating system should be in accordance with the relevant recommendations given in BS. 6798/1987 and also, smallbore and microbore systems BS. 5449 Part 1.

The boiler does not require a by-pass for heat dissipation purposes, but the boiler will only operate if the flow rate exceeds 8 L/min (1.8 gall/min). In systems which are fitted with Thermostatic Radiator Valves on all radiators, it may be beneficial to include a valved by-pass if the boiler is required to operate when only one or two radiators are to be heated. In these situations the by-pass should be adjusted such that when all radiators are closed the boiler will switch off.

The installation should be designed to work with flow temperatures of up to 85° Celsius. All components of the system must be suitable for a working pressure of 3 bar (45 psi) and a temperature of 110° Celsius. The following components are incorporated within the appliance.

- a) Circulating pump.
- b) Diverter valve
- c) Safety valve with a non-adjustable pre-set lift pressure of 3 bar (45 p.s.i.)
- d) Pressure gauge covering the range 0-6 bar (0-90 psi)
- e) 10 litre expansion vessel with initial charge pressure of 0.5 bar.
- f) Water flow switch.

The domestic hot water system must be in accordance with the relevant recommendations of BS 5546. Copper tubing to BS 2871:1 is recommended for water carrying pipework and MUST be used for pipework carrying potable water.

Ancillary pipework, not forming part of the useful heating surface, should be lagged to prevent heat loss and any possible freezing, particularly where pipes run through roof spaces and ventilated under-floor spaces.

**MAINS WATER FEED: CENTRAL HEATING**

There must be no direct connection to the mains water supply, even through a non-return valve, without the approval of the Local Water Authority.

**6. PERMISSIBLE METHODS OF FILLING**

(1) **Cistern Method** (see Fig.5)

The system may be filled by one of the following methods: Through a cistern used for no other purpose, via a ballvalve permanently connected directly to a service pipe and/or cold water distributing pipe. The static head available from the cistern should be adequate to provide the initial system design pressure. The cold feed pipe from the cistern should include a non-return valve, and a stop-valve with an automatic air vent connected between them, with the stop-valve being located, between the cistern and the automatic air vent. The stop valve may remain open during normal operation of the system, if automatic water make-up is required,

NOTE: Cistern to be supplied through a temporary connection from a service pipe or cold water distributing pipe.

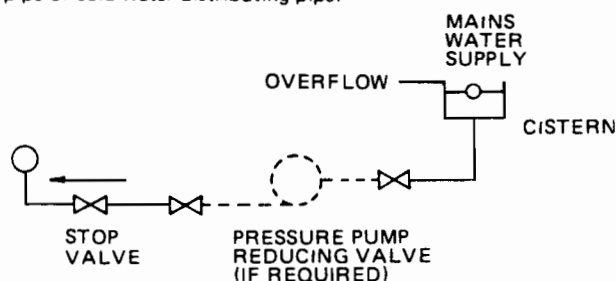


FIG. 5 CISTERN FILLING METHOD

OR  
(2) **Booster Pump Method** (see Fig.5)

The system may be filled through a self contained unit comprising a cistern pressure booster pump if required, and if necessary, an automatic pressure-reducing valve or flow restrictor. The cistern should be supplied through a temporary connection from a service pipe or cold water distributing pipe. The unit may remain permanently connected to the heating system to provide limited automatic water make-up.

(3) **Mains Topping Up Method** (see Fig.5A)

Here the temporary connection is supplied from a service pipe, or distributing pipe, which also supplies other draw-off points at a lower level.

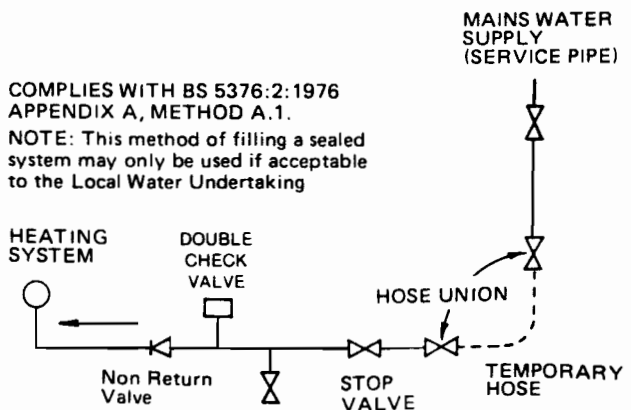


FIG. 5A MAINS TOPPING-UP METHOD



A combined double check valve shall be installed upstream of the draw-off point, through a temporary hose connection from a tap supplied from the mains, where the mains pressure is excessive a pressure-reducing valve shall be used to make filling easier. The following fittings shall form a permanent part of the system and shall be fitted in the order stated.

- a) A stop valve complying with the requirements of BS 1010 Part 2 (the temporary hose from the draw-off tap shall be connected to this fitting).
- b) A test cock
- c) Double check valve of an accepted type.
- d) A non-return valve of an accepted type.

(4) **Provisions for Make Up Water** (see Fig. 4)

Provision can be made for replacing water loss from the system either:

- a) from a manually filled make-up bottle with a readily visible water level. The bottle should be mounted at least 150mm (6 in) above the highest point of the system and be connected through a non-return valve to the return side of the heating system.
- b) Where fitting a make-up vessel would be difficult re-pressurisation of the system can be done. See section on FILLING.

If the capacity of the central heating system should exceed 156 litres, an additional vessel should be installed on the return to the combination boiler from the heating system (Fig. 4). Guidance on vessel sizing is given in (Table 3).

Reference should be made to British Gas Publications "Material and Installation Specifications for Domestic Central Heating and Hot Water".

Draining taps should be at least ½ in BSP nominal size and be in accordance with BS 2879.

(7) **INSTALLATION TO AN EXISTING CENTRAL HEATING SYSTEM**

The combination boiler is designed to operate on a sealed system only. Therefore if the existing system is of the open water type it will have to be modified to comply with BS.6798.

If the existing system does not give a minimum flow rate of 8 litres/min. and a single radiator heat emittance is required, a suitable bypass will be necessary.

Before installing a new combination boiler to an existing system flush out the old system with a recommended descaling agent at least twice.

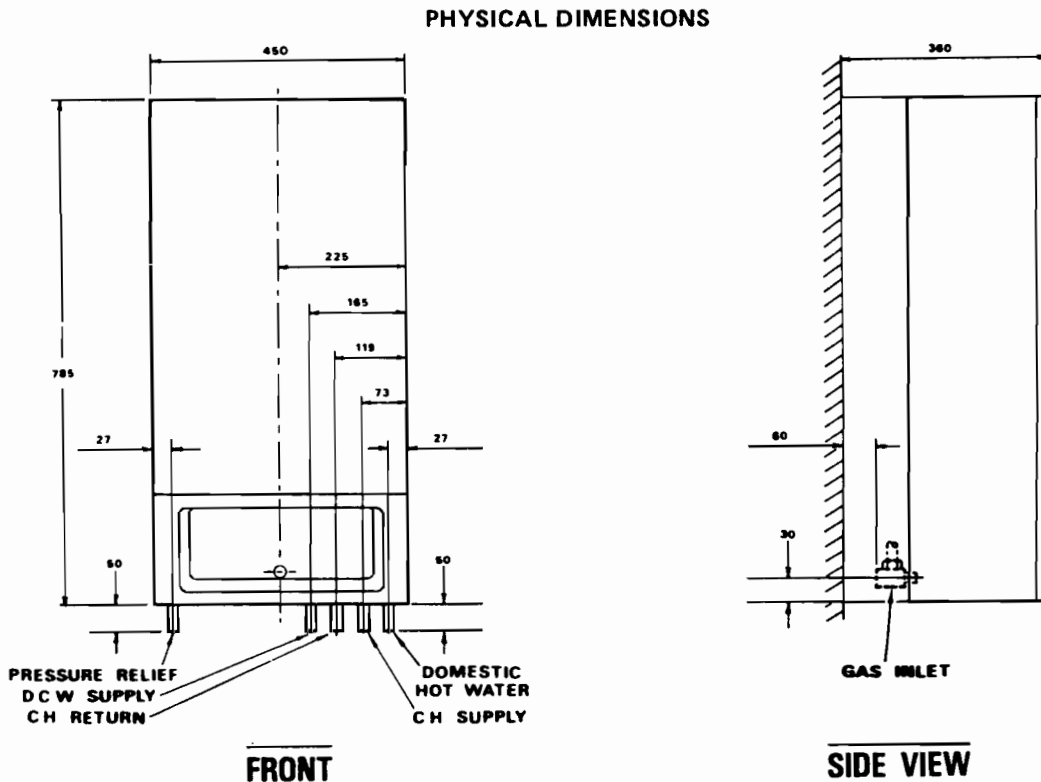
Also check pipework and renew any corroded pipework or fittings. Valve glands must be repacked or replaced wherever necessary and any defective controls exchanged.

(8) **HARD WATER AREAS**

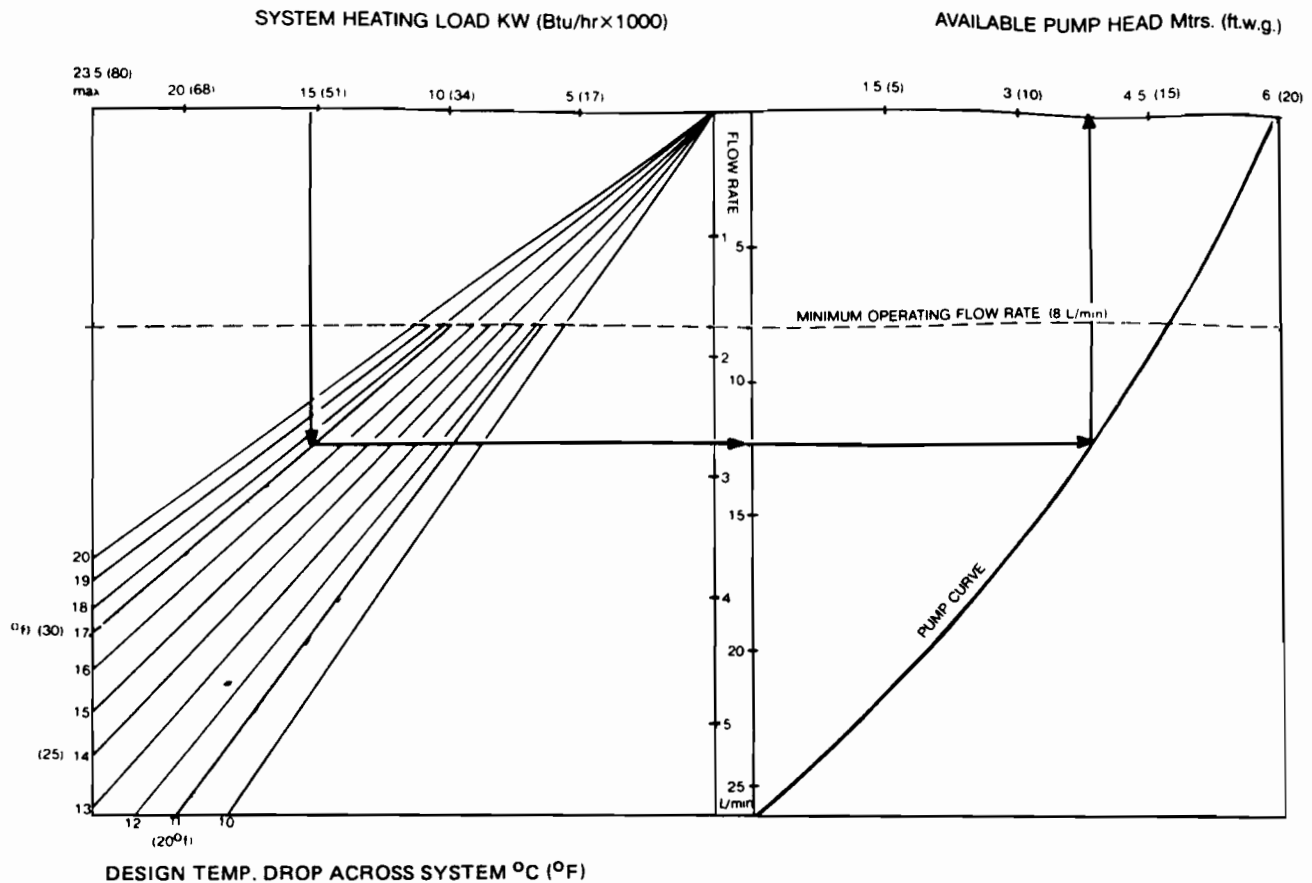
If the area of installation is recognised as a hard water area, (above 200 p.p.m.) it is essential that a 'SUITABLE' water treatment device of an electronic, magnetic or galvanic type be installed in the mains water supply, e.g. 'SALAMANDER SCALEMASTER'.

To assess water hardness, immerse the test strip supplied, for about one second in a water sample (NOT IN RUNNING WATER) so as to moisten the white zone.

Inspect the strip after 1-2 minutes, check the zones, if two or more zones have changed colour the hardness of the water is above 200 p.p.m.



**FIG. 6. PUMP PERFORMANCE CURVE Hydraulic Pressure Loss**



**TABLE 3 SIZING OF ADDITIONAL EXPANSION VESSELS:**

Deduct from the value given in the table the 10 litre vessel supplied.

Safety valve setting (bar)	3.0									
Vessel charge pressure (bar)	0.5				1.0			1.5		
Initial system pressure (bar)	0.5	1.0	1.5	2.0	1.0	1.5	2.0	1.5	2.0	
Total water content of system	EXPANSION VESSEL VOLUME (LITRES)									
litres	2.1	3.5	6.5	13.7	2.7	4.7	10.3	3.9	8.3	
25	4.2	7.0	12.9	27.5	5.4	9.5	20.6	7.8	16.5	
50	6.3	10.5	19.4	41.3	8.2	14.2	30.9	11.7	24.8	
75	8.3	14.0	25.9	55.1	10.9	19.0	41.2	15.6	33.1	
100	10.4	17.5	32.4	68.9	13.6	23.7	51.5	19.5	41.3	
125	12.5	21.0	38.8	82.6	16.3	28.5	61.8	23.4	49.6	
150	14.6	24.5	45.3	96.4	19.1	33.2	72.1	27.3	57.9	
175	16.7	28.0	51.8	110.2	21.8	38.0	82.4	31.2	66.2	
200	18.7	31.5	58.3	124.0	24.5	42.7	92.7	35.1	74.5	
225	20.8	35.0	64.7	137.7	27.2	47.5	103.0	39.0	82.7	
250	22.9	38.5	71.2	151.5	30.0	52.2	113.3	42.9	91.0	
275	25.0	42.0	77.7	165.3	32.7	57.0	123.6	46.8	99.3	
300	27.0	45.5	84.1	179.1	35.7	61.7	133.9	50.7	107.6	
325	29.1	49.0	90.6	192.8	38.1	66.5	144.2	54.6	115.8	
350	31.2	52.5	97.1	206.6	40.9	71.2	154.5	58.5	124.1	
375	33.3	56.0	103.6	220.4	43.6	76.0	164.8	62.4	132.4	
400	35.4	59.5	110.1	239.2	46.3	80.7	175.1	66.3	140.7	
425	37.5	63.0	116.5	247.9	49.0	85.5	185.4	70.2	148.9	
450	39.6	66.5	123.0	261.7	51.8	90.2	195.7	74.1	157.2	
475	41.6	70.0	125.9	275.5	54.5	95.0	206.0	78.0	165.5	
500										
For system volumes other than those given above, multiply the system volume by the factor across	0.0833	0.140	0.259	0.551	0.109	0.190	0.412	0.156	0.331	

Note: This pressure can be increased up to 1.5 bar to suit high static head situations, see item 10, other appliance components in the SERVICING INSTRUCTIONS.

The volume of water should be multiplied by 0.8 factor to take into account the flow temperature.

**(9) PUMP PERFORMANCE CURVE**

The circulating pump fitted within the appliance should be capable of satisfying most system requirements. Fig. 6 indicates the amount of pump head available for the system. The boiler resistance is already taken into account in this curve.

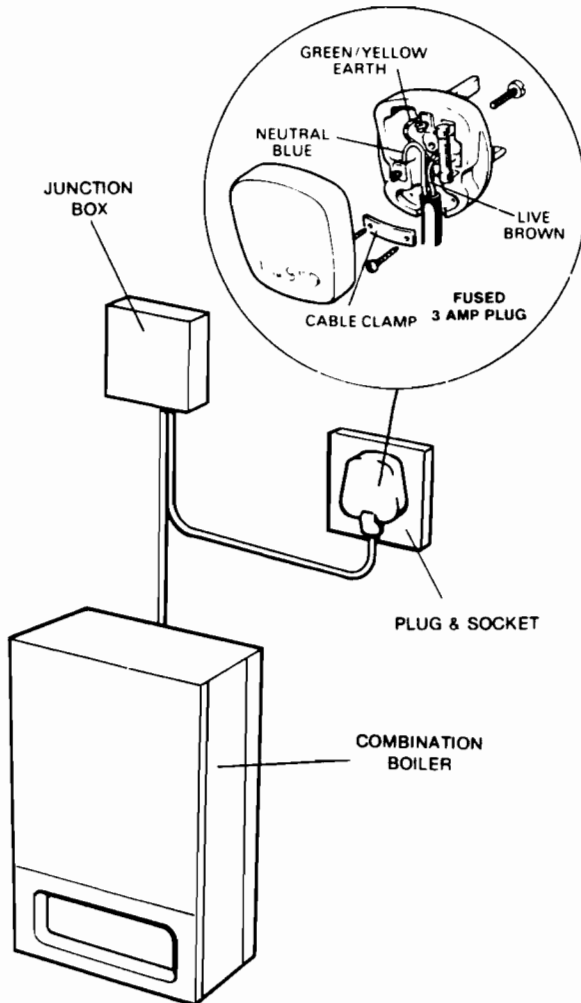
**HOW TO USE FIG. 6.**

Starting with the required 'SYSTEM HEATING LOAD' draw a vertical line downwards so that it intersects the chosen 'SYSTEM DESIGN TEMPERATURE DROP' line (normally this would be 11°C (20°F) although up to 17°C (30°F) can be used without increasing radiator sizes). From this intersection point draw a horizontal line so that it intersects the 'PUMP CURVE'. From this intersection draw line vertically upwards.

The 'AVAILABLE PUMP HEAD' can now be read from the horizontal scale and the corresponding 'FLOW RATE' from the vertical scale in the centre of the chart.

The system must be designed so that its hydraulic resistance does not exceed the available head unless an additional circulating pump is fitted. More available head can be achieved by choosing a greater temperature difference.

If the flow rate through the boiler is less than 8 l/min, then the burner will not ignite. This is to maintain maximum fuel economy. If flow rates of less than 8 l/min cannot be avoided then a system by-pass should be fitted.



**FIG. 7 BASIC WIRING ARRANGEMENT**

**(10) ELECTRICAL SUPPLY** (see Figs. 7 and 8)

Wiring external to the appliance **MUST** be in accordance with the current I.E.E. Regulations, and any Local Regulations which apply. The combination boiler is supplied for 240 Volt ~ 50 Hz, Single Phase. To protect the appliance it is essential that the electrical supply is fused at a 3 Amp rating.

**THIS APPLIANCE**

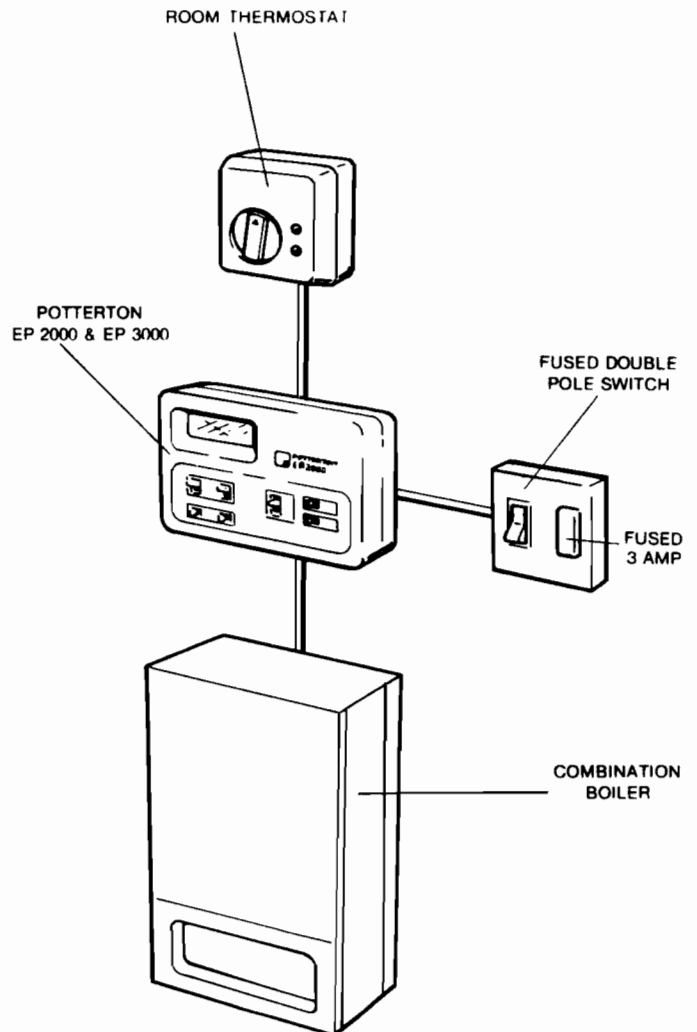
**MUST BE EARTHED**

The combination boiler must **not** be used as a wiring centre for ancillary controls, it is therefore **essential** that a junction box is used. The method of connection to the mains electricity supply **MUST** provide means of completely isolating the electrical supply to the combination boiler and its ancillary controls, preferably by the use of a fused three-pin plug and shuttered socket-outlet, both complying with the requirements of BS 1363. (Fig. 7).

**OR**

Alternatively, a **3 A fused** double-pole switch, having a 3mm contact separation on both poles, can be used. (See Fig. 8).

The point of connection to the mains should be readily accessible and adjacent to the combination boiler.



**FIG. 8 POTTERTON RECOMMENDED ARRANGEMENT**

(11) CLEARANCES AROUND THE APPLIANCE (see Fig.9)

Additional clearances to those given below may be necessary for installation, as conditions vary from site to site. This is left to the discretion of the installer.

The position selected for the appliance must provide the following minimum clearances which are necessary for operation and servicing, 450mm at the front of the combination boiler, 5mm each side, and 160mm at the top.

A minimum clearance of 150mm is required between the bottom of the appliance and any surface.

For low level installations, or where the appliance is adjacent to a right hand wall, installation may be found easier if the gas and water pipes are pre-formed and fitted, before wall-mounting the combination boiler.

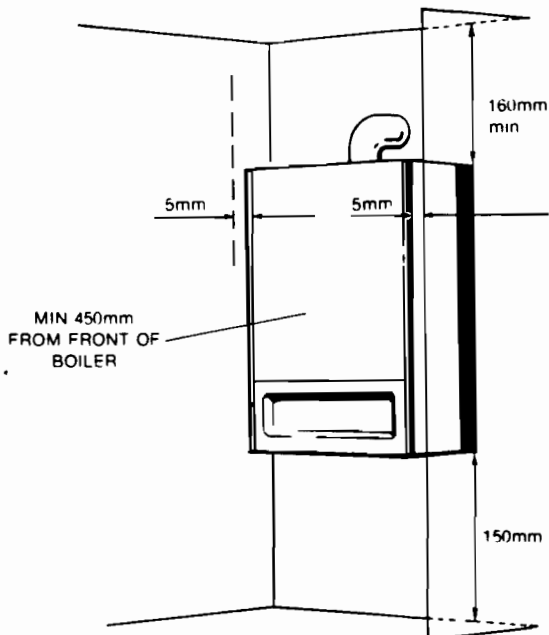


FIG. 9 CLEARANCES AROUND THE APPLIANCE

## INSTALLATION

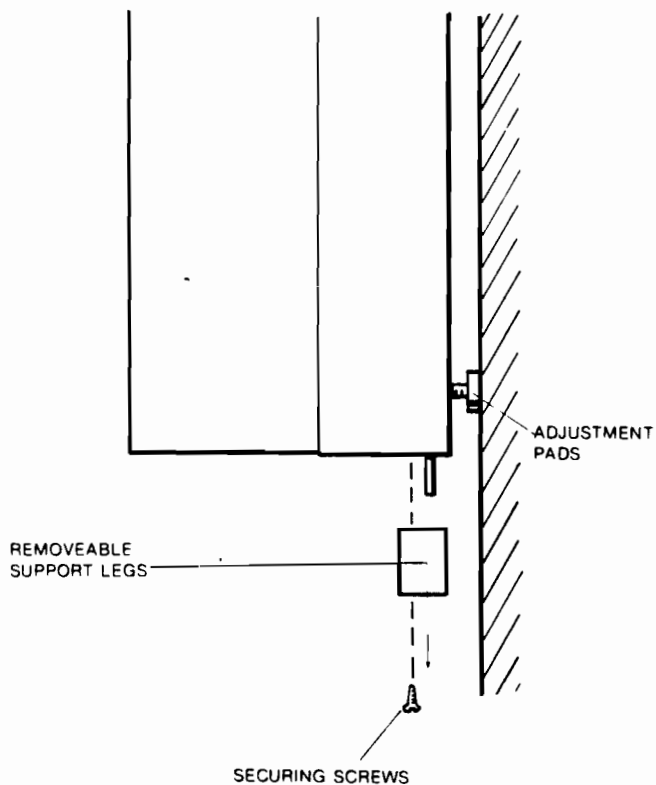


FIG. 10 BOILER ALIGNMENT

It is **MOST IMPORTANT** that this appliance is installed in a **VERTICAL POSITION**, with the flue/air duct passing through the wall in a **HORIZONTAL PLANE**. A minor deviation from the horizontal is acceptable, provided that this results in a downward slope of the flue/air duct away from the combination boiler.

Two adjustment pads located at the bottom of the combination boiler back panel, are provided to facilitate combination boiler alignment (see Fig. 10).

### 1. UNPACKING

#### Preparation

**Note:** Two removable support legs are fitted to the base of the boiler to protect the pipework, care must still be taken when handling the combination boiler to prevent damage to pipework situated at the base of the appliance (see Fig. 10).

The appliance will arrive on site in two separate cardboard cartons.

**(2) THE SMALL CARTON: Terminal Assembly Pack.**  
Part No. 300202

Containing

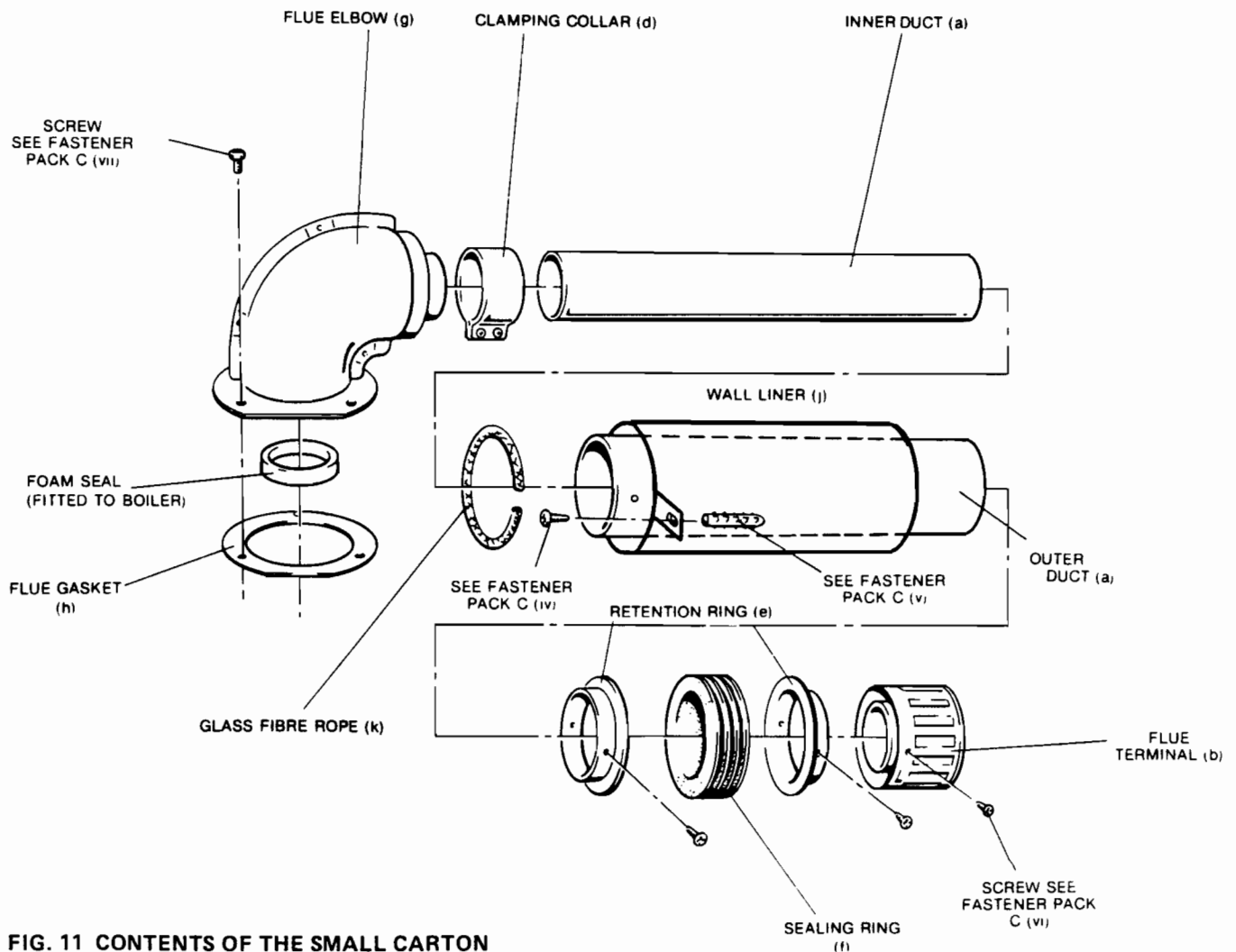
**(1) THE LARGE CARTON: The Combination Boiler assembly pack. Part No. 300201.**

Containing

- a) The combination appliance fully assembled. Part No. 300201.
- b) The Installation/Serviceing and Users instructions. Part No. 559176.
- c) The wall fixing template. Part No. 300209.

- a) Inner and outer ducts. Part No. 300264/300265.
- b) Flue Terminal Part No. 300260.
- c) Fastener Pack containing: Pt. No. 300203
  - i) Woodscrew No. 12 x 50 Hex. 3-off
  - ii) Wall Plug No. 12 x 40 Nylon 3-off
  - iii) Washer Flat M.S. 2-off
  - iv) Woodscrew No. 8 x 25 2-off
  - v) Wall Plug No. 8 x 25/30 2-off
  - vi) Screw No. 4 x 6mm Pan Hd 8-off
  - vii) Screw M4 x 10 Hex Hd 3-off
- d) A Clamping Collar Part No. 300344
- e) Retention Ring Part No. 205807 2-off
- f) Wall Sealing Ring Part No. 205645
- g) Flue Elbow Part No. 300330
- h) Flue Elbow Gasket Part No. 300345
- i) Wall Liner Part No. 205643, 100mm dia.
- k) Glass Fibre Rope Part No. 650613

IF USING A 3 METRE FLUE SYSTEM FOLLOW THE INSTRUCTIONS SUPPLIED WITH THE SYSTEM.



**FIG. 11 CONTENTS OF THE SMALL CARTON TERMINAL ASSEMBLY PACK (STANDARD FLUE)**

a) Unpack the cartons and check the contents.

b) Remove the outer casing as follows, undo the securing screw at the base of the outer casing, pull the base of the casing forward and lift off of the supporting top hooks. Place the casing safely to one side (see Fig. 12). There is a transit packing piece of cardboard under the casing, this must be removed before installation.

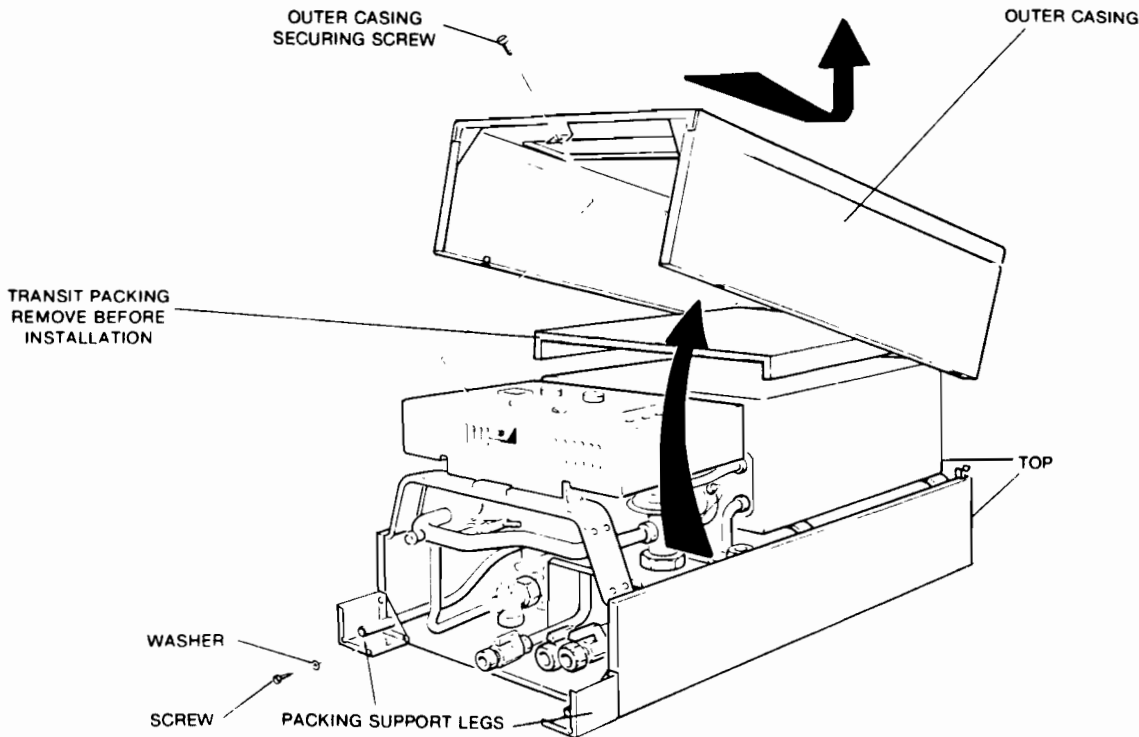


FIG. 12 REMOVE OUTER CASING

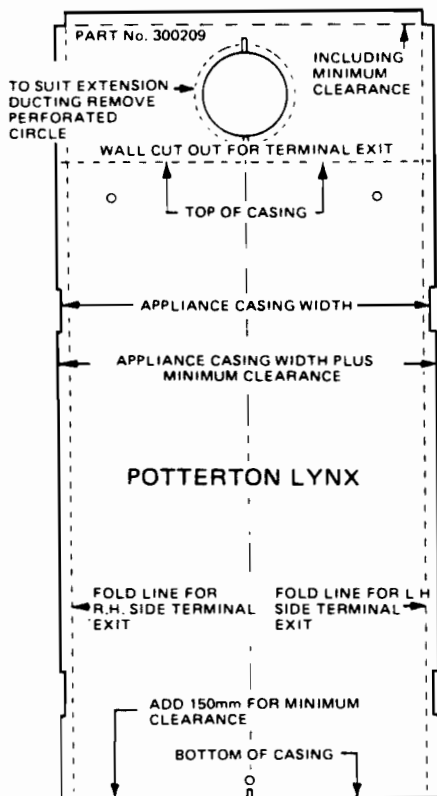


FIG. 13 WALL FIXING TEMPLATE

## 2. THE WALL FIXING TEMPLATE (Fig. 13)

### NOTE:

The wall fixing template has been designed to simplify the marking out of the wall, for appliances with either rear or side flue outlet. When using the template ensure that a minimum of 5mm clearance will be provided between the combination boiler and any side wall. Allowance should be made if the corners of the wall are not square, or vertical, and the template position adjusted accordingly. Two cut-outs are provided on the template, (top and bottom) for plumbline accuracy.

- Tape the wall fixing template to the wall in the selected position (see Fig. 13).
- Mark out the position of the hole for the flue duct terminal assembly.
- Carefully drill or cut the appropriate circular hole in the wall for insertion of the flue duct assembly. If drilling use a minimum diameter core bit of 4 in (102mm). Ensure the hole is cut square to the wall.
- From the terminal assembly pack remove the wall liner and the two wall liner mounting screws, washers and wall plugs contained in the polythene bag. Measure the wall thickness and cut the wall liner to suit, remove the sharp edges. Bend fixing tag into position shown (see Fig. 14).

- e) Insert the wall liner with the seam uppermost and drill the two No. 8 x 30mm wall liner fixing holes and insert the two No. 8 wall plugs (see Fig. 14).
- f) Secure with the two screws and washers provided (see Fig. 14).
- g) Make good the inner and outer wall. Making good the outer wall can be carried out from inside the building on wall thicknesses up to 12 in.: Above a 12 in. wall thickness, provision will have to be made to make good the outer wall from outside.
- h) Place the template over the fixed wall liner ensure the template is level. Mark out the three 7mm dia. holes, drill to 50mm deep and insert the three plastic wall plugs provided in the terminal assembly pack (see Fig. 15).

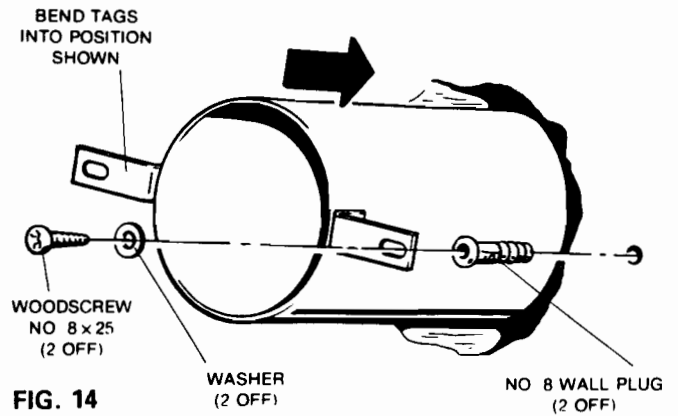


FIG. 14

Remove from the terminal assembly pack, two No. 12 x 50mm wall fixing screws. Insert into the top two wall plugs and leave 5mm proud.

- j) Lift the appliance into position, ensure the screw heads go through the two pear shaped mounting holes (see Fig. 16). Take up any wall irregularities by using the finger adjustment pads (see Fig. 10). Fully tighten the two top mounting screws.

**NOTE:** A terminal wall plate is available, to improve the wall appearance around the terminal (Potterton Part No. 205868) if required.

If the height of the terminal from the ground is less than 2m, a terminal guard must be fitted.

### 3. AIR/FLUE ASSEMBLY (see Fig. 11)

**NOTE: THE OUTER DUCTING IS PRE-DRILLED AT ONE END, ALWAYS MARK AND CUT AT THE PLAIN END (see Fig. 19)**

- a) Take the inner flue duct and outer air duct from the Terminal Duct Assembly pack.
- b) Measure the wall thickness accurately, and make a note of this measurement, depending upon the direction of the flue already agreed prepare the terminal duct assembly as follows:

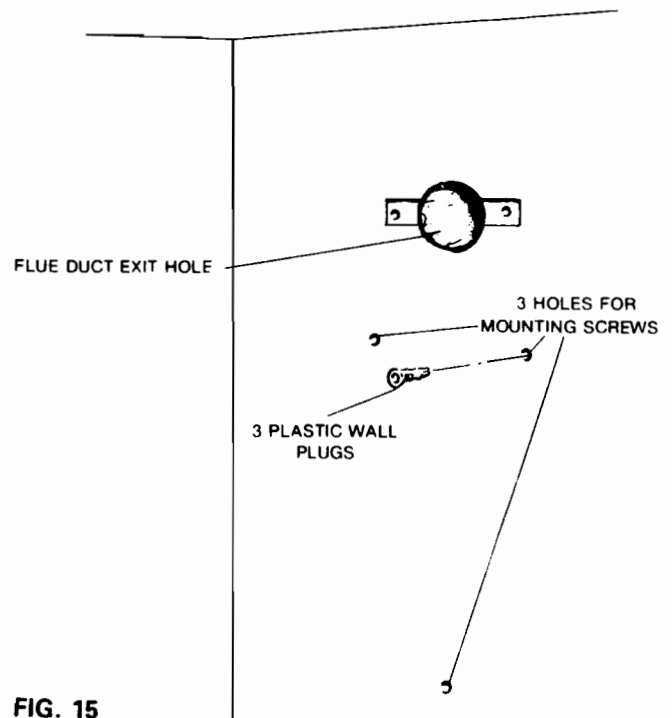


FIG. 15

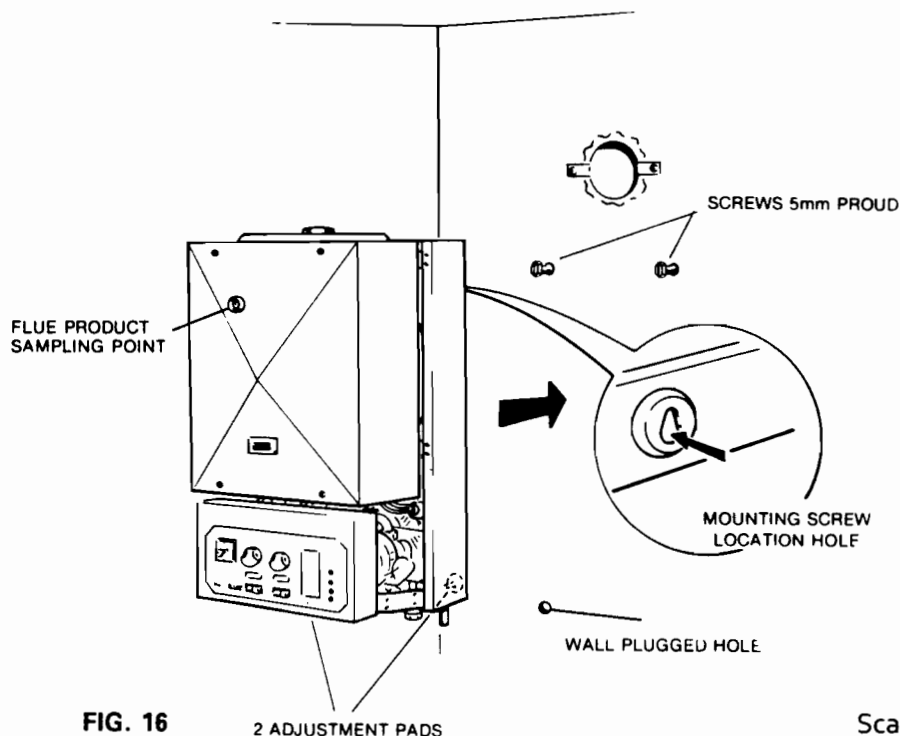


FIG. 16

2 ADJUSTMENT PADS

(1) FOR REAR FLUE OUTLET (Fig. 17)

- Select the flue duct (small duct) and 'MARK OFF' the cutting dimension, which is equal to X distance plus 160mm.
- Cut the duct square to the mark and remove all the burrs and sharp edges.
- Select the air duct (larger duct) and 'MARK OFF' (at the plain end) the cutting dimension which is X distance plus 136mm.
- Cut the duct square to the mark and remove all burrs and sharp edges.

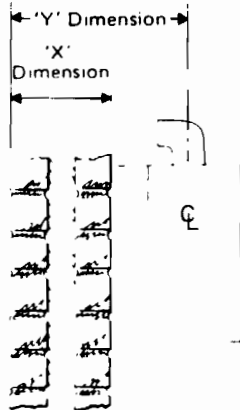


FIG. 17

FLUE ASSEMBLY REAR OUTLET

'Y' Dimension	Less than 740mm	Greater than 740mm Less than 3 metres
		(Use R/S Standard flue Part No. 300202)

(2) FOR SIDE FLUE OUTLET (Fig.17A)

- Select the flue duct (smaller duct) and 'MARK OFF' the cutting dimension which is X distance plus 180mm.
- Cut the duct square to the mark and remove all burrs and sharp edges.
- Select the air duct (larger duct) and 'MARK OFF' (at the plain end) the cutting dimension which is X distance plus 155mm.
- Cut the duct square to the mark and remove all burrs and sharp edges.

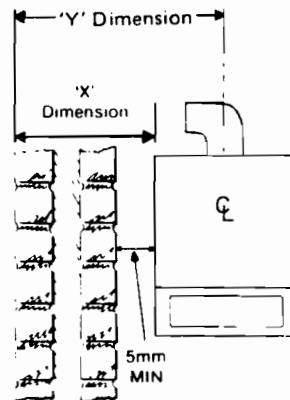


FIG. 17A

FLUE ASSEMBLY SIDE OUTLET

'Y' Dimension	Less than 740mm	Greater than 740mm Less than 3 metres
		(Use R/S Standard flue Part No. 300202)

4. ASSEMBLY

- Assemble the flue duct to the elbow by sliding the clamping collar over the inner flue duct, butt the end of the duct to the elbow spigot, slide the clamping collar over the joint. Ensure that the seal at the bottom of the collar is in line with either of the two webbs inside the elbow and tighten the two screws (Fig. 18).
- Select the air duct, and slide over the flue duct, (the pre-drilled end to engage on-to the elbow), then push onto the elbow spigot. Drill two 2mm dia holes through the pre-drilled air duct into the elbow and secure with the screws provided (see Fig. 19).

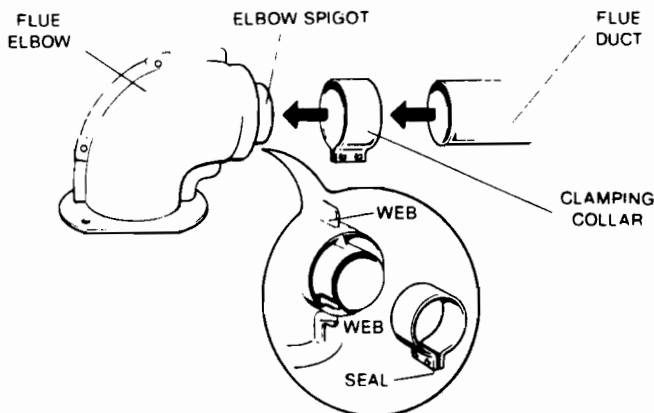


FIG. 18

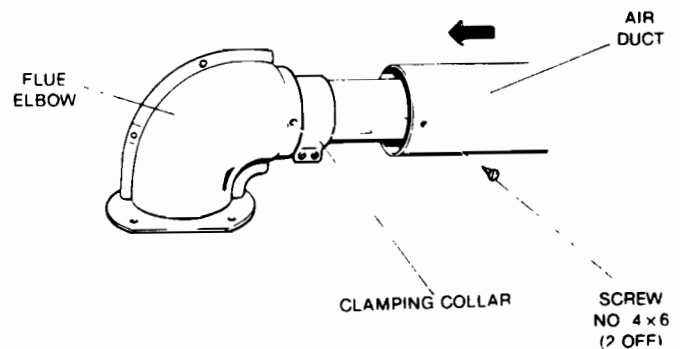


FIG. 19



c) Assemble the retention and sealing rings by sliding one retention ring over the air duct followed by the sealing ring, and then the remaining retention ring, as shown in (Fig. 20) leave loose. Fully locate the ends of both ducts into the terminal.

d) Drill two 2mm dia holes using the pre-drilled holes in the terminal as a guide into the air duct, and secure with the screws provided (see Fig. 21).

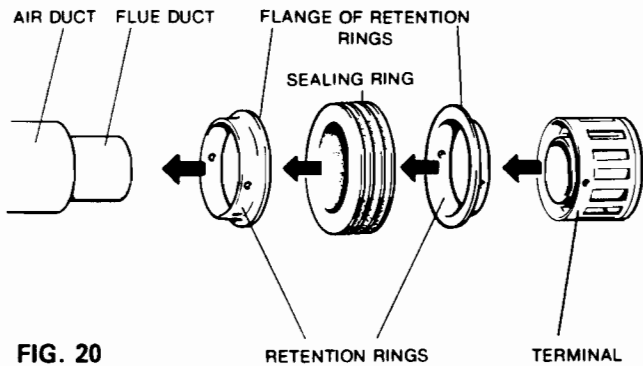


FIG. 20

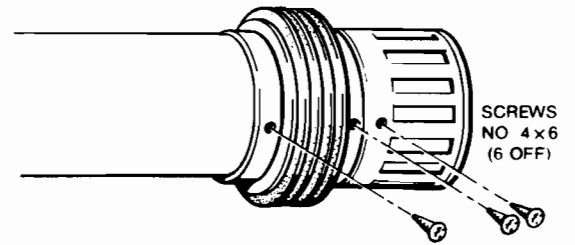


FIG. 21

e) Slide the duct sealing ring and the two retention rings into position, so that the assembly butts up against the flue terminal. Hold the duct retention ring in this position, and drill two fixing holes 2mm in dia through each ring, using the pre-drilled holes in the retention ring flange, as a guide, secure with the four screws provided (see Fig. 21).

g) Coat the sealing ring with a soap solution and slide the flue assembly into the wall liner (see Fig. 23) secure the elbow onto the combination boiler flue spigot, using the three screws provided. Fit the glassfibre rope around the air duct to make a seal between the air duct and the wall liner (see Fig. 24).

Remove and discard the packing support legs and its securing screws (see Fig. 10).

f) Ensure the special foam seal is correctly positioned over the flue spigot on the top of the boiler (position the elbow gasket to align with the three holes on the top of the boiler with the flat to the rear) (see Fig. 22).

Using the two adjustment pads located at the bottom of the appliance back panel (see Fig. 10), adjust as necessary until the appliance is perpendicular to its base, check the alignment with a spirit level, insert and fully tighten the bottom boiler mounting screw.

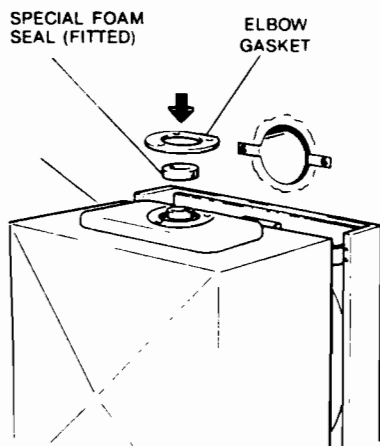


FIG. 22

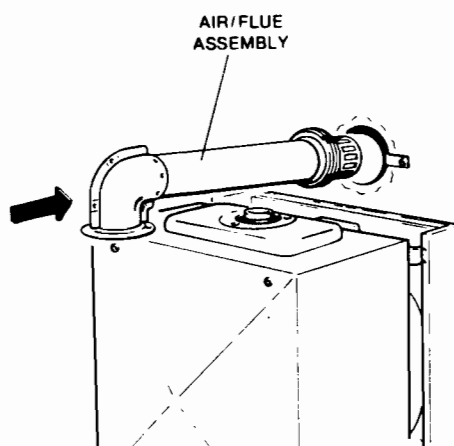


FIG. 23

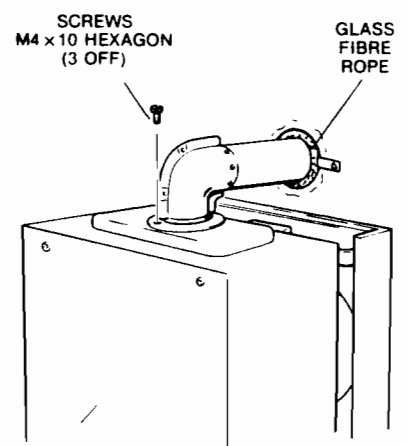


FIG. 24

## 5. GAS CONNECTION (See Fig. 25)

A minimum gas pressure of 20 mb (8 in w.g.) must be available at the combination boiler inlet, at full flow rate (see General Data).

Install a gas supply pipe NOT LESS THAN 15mm O.D. to the combination boiler and connect to the gas service cock situated at the bottom centre of the appliance.

## 6. DHW SUPPLY

a) The domestic hot water circuit does not need a safety valve, but it is essential to ensure that the pressure of the cold water supply does not exceed 10 bar, if in doubt it is advisable to install a pressure reducing valve. The minimum pressure needed to operate the domestic hot water system is 0.4 bar with a flow of approximately 3 litres per min. The regulator screw on the cold water outlet of the diverter valve may be adjusted to prevent excess volume flow (see Fig. 42 SERVICE SECTION)

Flush out all foreign matter from the supply pipe before connecting to the appliance.

b) Connect the cold water supply to the isolating cock marked D.C.W. supply. Connect the hot water outlet pipe to the pipe end marked DHW supply.

**NOTE:** It is recommended that a filter is fitted on the cold water supply to the boiler.

## 7. C.H. WATER CONNECTIONS (See Fig. 25)

a) Before any central heating connections are made to the combination boiler all system valves should be opened and the system thoroughly flushed out with cold water.

b) Connect the central heating return pipe to the isolating cock marked CH return.

c) Connect the central heating flow pipe to the isolating cock marked C.H. flow.

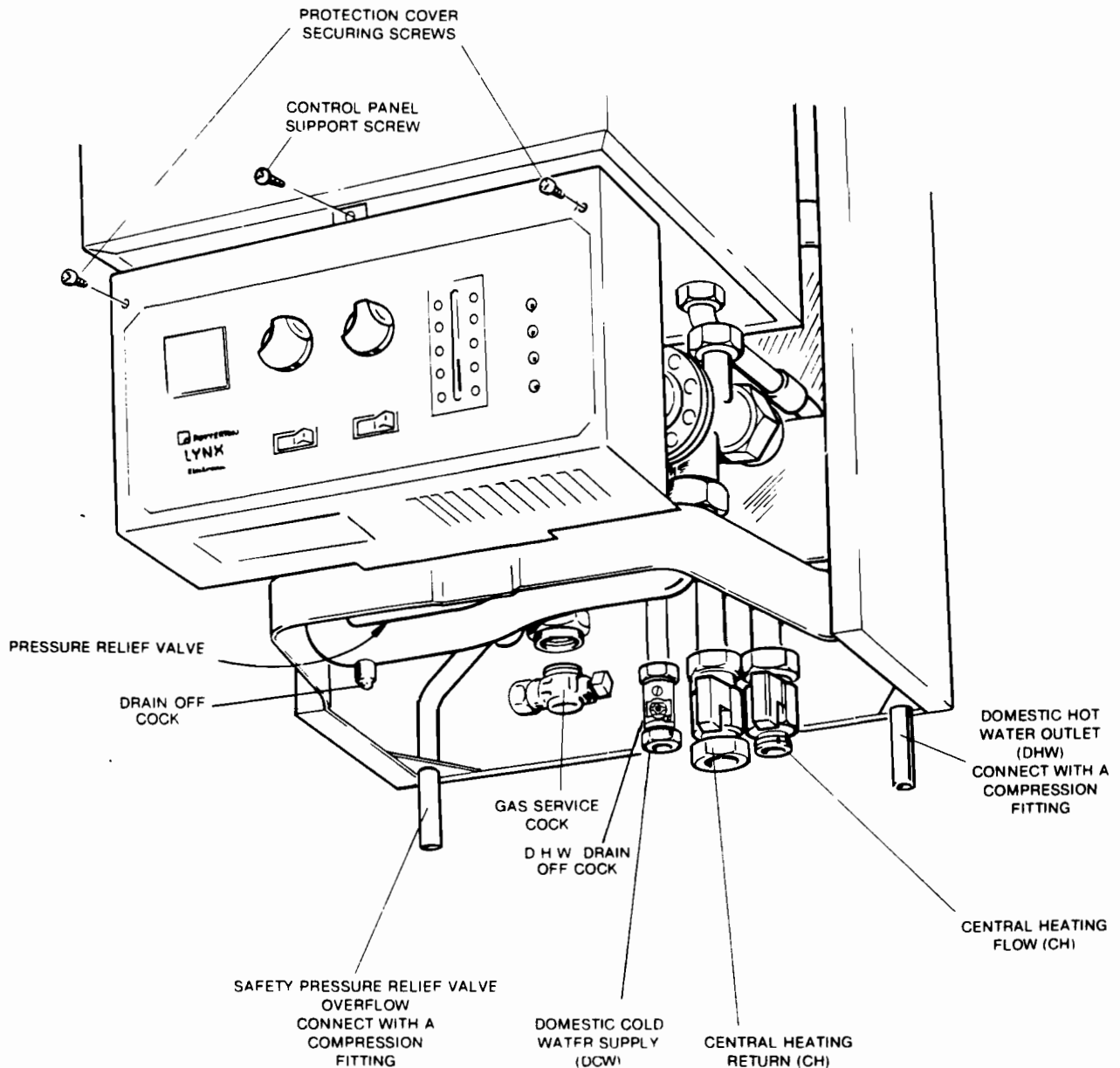


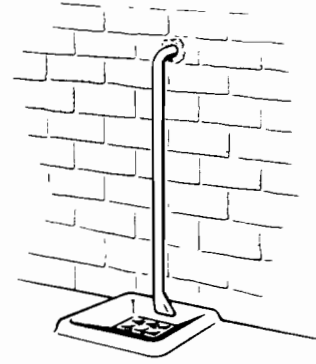
FIG. 25

**8. PRESSURE RELIEF VALVE (Fig. 26)**

The pressure relief valve located on the left hand side of the appliance is pre-set at 3 bar.

Install a pressure relief valve discharge pipe, not less than 15mm o.d. and connect to the valve. It must discharge to the outside of the building, where possible over a drain. The discharge must be such that it will not be hazardous to occupants or cause damage to external electric components or wiring. The pipe should be fluted and directed towards THE WALL.

**IT MUST NOT DISCHARGE ABOVE AN ENTRANCE, OR WINDOW, OR ANY TYPE OF PUBLIC ACCESS. THE INSTALLER MUST CONSIDER THAT THE OVERFLOW COULD DISCHARGE BOILING WATER.**



**FIG. 26 PRESSURE RELIEF VALVE DISCHARGE**

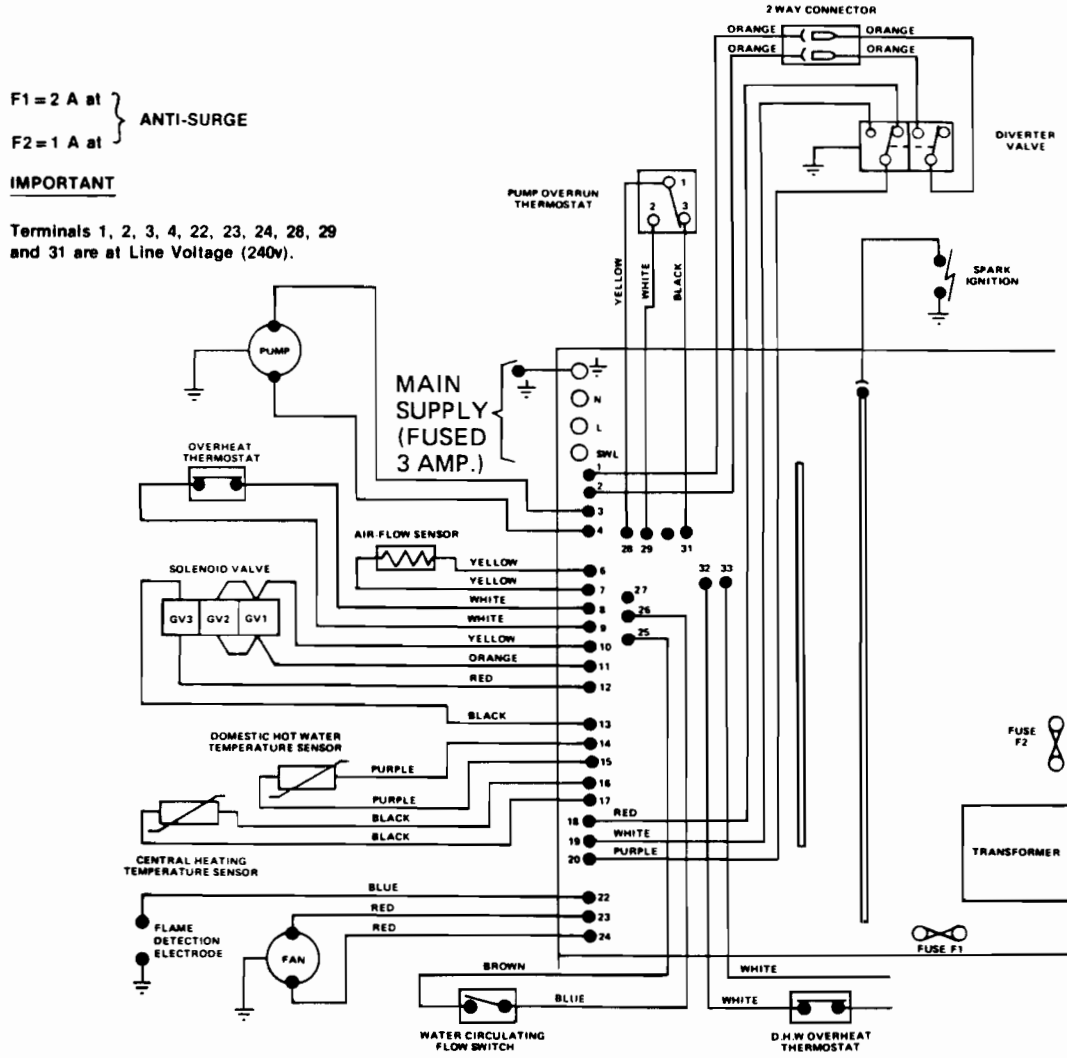
**9. WIRING THE APPLIANCE (see Fig. 7, 7A and 27)**

The internal wiring of the control box is shown in Fig. 27 this wiring diagram is also on the controls panel cover.

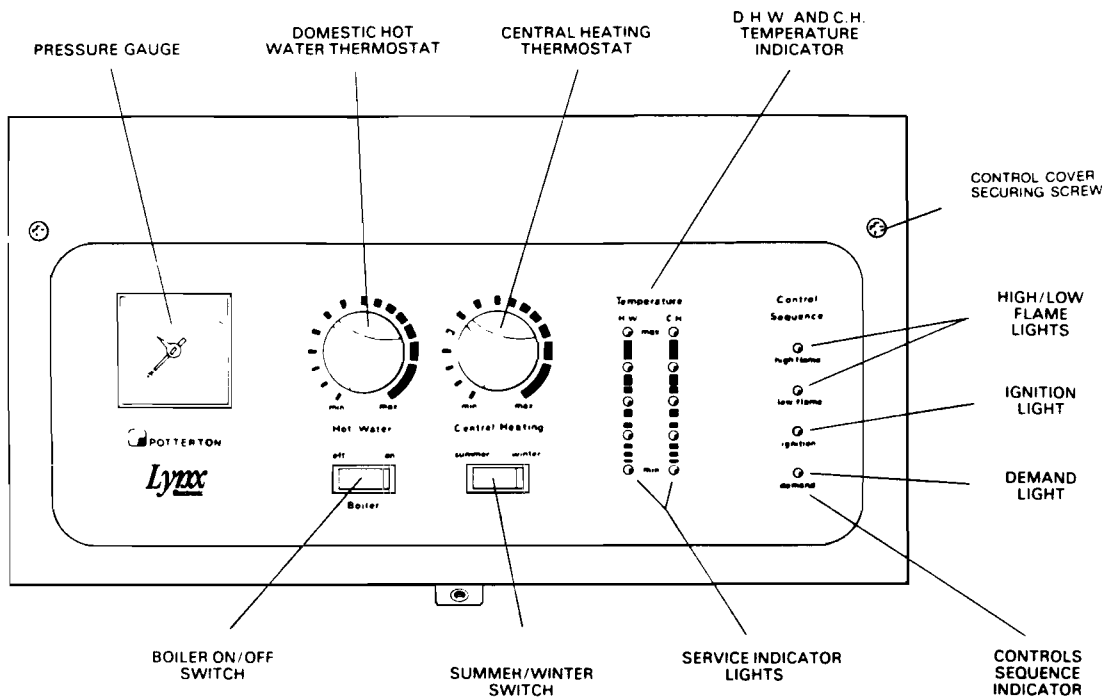
- a) Undo the two fixing screws from the front of the control panel which holds the controls cover in position.
- b) Undo the single retaining screw on the top of the control panel (see Fig. 28) lower the control panel it rests on its horizontal stop, remove control cover.

- c) Pass a four-core cable (a minimum cable size of 0.75mm<sup>2</sup>) through the bulkhead hole on the left hand side connect to the terminal block L.N. SW/L. The earth terminal must be connected directly to the earth pillar on the panel (see Fig. 29) using the cup washers provided.

**NOTE: If secondary controls are not being used, provide a permanent Live supply to both L and SWL terminals.**



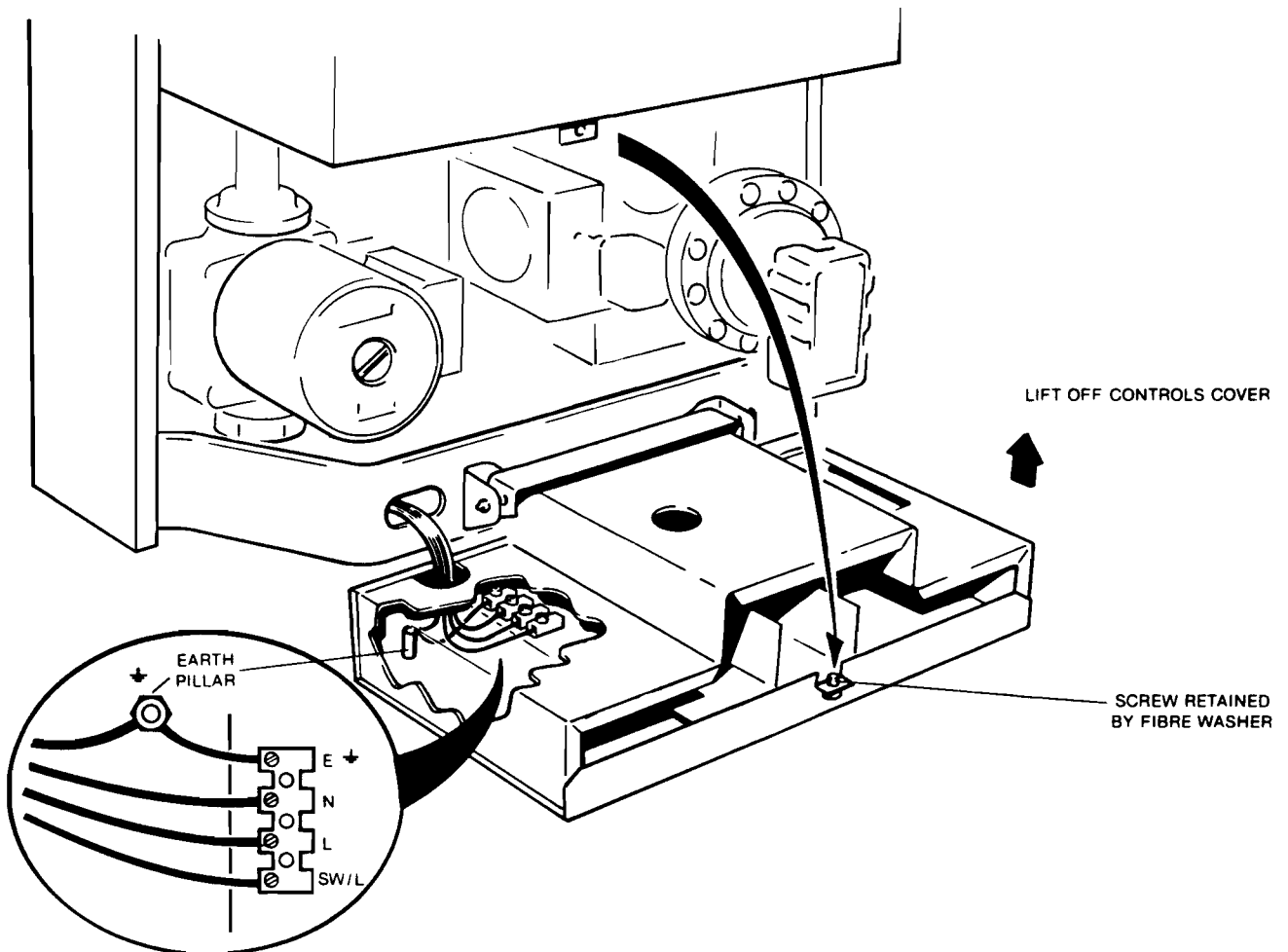
**FIG. 27 BOILER WIRING DIAGRAM**



**FIG. 28 CONTROL PANEL**

- d) Secure the cables in the clamp provided.
- e) Replace and secure the controls cover and the control panel.

**NOTE:**  
The electrical mains lead must be fused at 3 Amp, and the connection must be made in such a way that should the lead disengage from the cable clamp, the current carrying conductors become taut before the earth conductor.



**FIG. 29 ELECTRICAL CONNECTIONS**

## 10. COMMISSIONING

Each Lynx Combination Boiler has been through a rigorous operational procedure at our factory and should not require any further adjustment. If in the unlikely event of the appliance not operating correctly please turn to the Fault Finding and Logic Sequence charts on pages 36 and 37.

### (1) ELECTRICAL INSTALLATION

Preliminary electrical systems checks to ensure electrical safety shall be carried out by a competent person. Those checks are outlined in the 'Instructions for British Gas Multimeter' Booklet. If a fault has occurred on the appliance the fault finding procedure should be followed as specified under the servicing section of this document.

### (2) THE GAS INSTALLATION

The whole of the gas installation including the meter, should be inspected and tested for soundness and purged in accordance with the recommendations of BS 6891. Purging air from the gas line may be carried out by loosening the union on the gas service cock and purging. Retighten the union when completed and check for gas soundness.

**N.B.** Open all doors and windows, extinguish naked lights and **DO NOT SMOKE** when carrying out the gas soundness tests and purging.

### (3) INITIAL LIGHTING (Refer Fig.30)

- a) Thoroughly flush out the whole of the heating system with cold water.
- b) Fill and vent the system until the pressure gauge registers 1.5 bar (21.5 psi), and examine for leaks.
- c) Check the operation of the safety valve by further raising the water pressure until the valve lifts. This should occur at 3 bar ( $\pm .03$  bar) (see Fig. 33).
- d) Release water from the system until minimum system design pressure is reached which is 0.5 bar (7 psi).  
Set the pressure gauge indicator to coincide with this pressure.

**NOTE:** The pre-charge pressure of the expansion vessel shall be not less than the hydrostatic head.

### WARNING

Before lighting the Combination boiler, ensure that the boiler front cover has been correctly fitted. The outer casing should be left off for the time being. Carry out the following procedure in the order listed.

- e) Check that the boiler on/off switch is off and the summer/winter switch is set to summer. Orange line is visible when switch is 'ON'.
- f) Check that the DHW and CH thermostats are set to minimum.
- g) Check the gas service cock is ON.

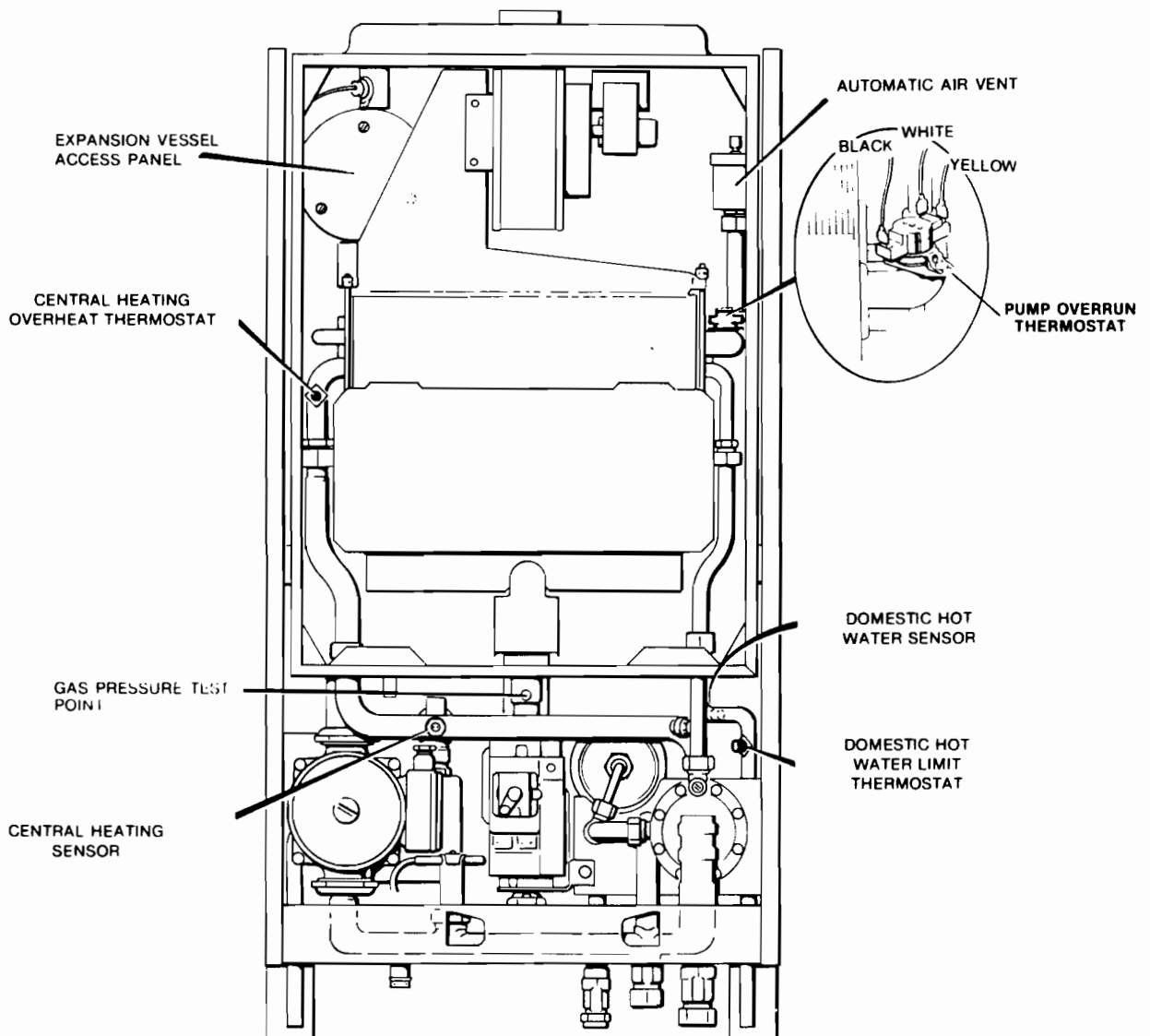


FIG. 30

- h) Ensure that the system is full of water and that the boiler isolating valves and radiator valves are open. The pump is set to maximum flow. No. 3 setting. This setting must not be altered.
- i) Ensure that any time controls are in an ON condition, and any room thermostats are calling for heat.
- j) Switch on the main electricity supply to the combination boiler.
- k) Switch the boiler on/off switch 'ON'.
- l) Turn the HOT WATER thermostat to max:
- m) Fully open a DHW tap. (After a short delay the boiler will fire, the D.H.W. indicator and the ign. L.E.D. will glow.) When the main flame has established the high flame L.E.D. will be illuminated, and the ign L.E.D. will extinguish.
- n) Turn off the DHW tap.
- o) Lower the control panel (one screw) and remove the screw in the gas pressure test nipple, (see Fig. 30) and fit a pressure gauge via a flexible tubing to the burner gas pipe.

**WARNING:** The pipes under the appliance could be hot, avoid contact with bare skin.

- p) Fully open the DHW taps, to ensure that the appliance fires at maximum burner pressure, and operate the boiler for 10 minutes to stabilise the burner temperature.  
Test for gas soundness around the gas components

using leak detector fluid.

- q) Check the minimum burner pressure by disconnecting one of the Modureg electrical connections (c).
- r) Check the minimum and maximum gas pressures against Table 4. If any adjustment is necessary see Section 4, Gas Pressure Adjustment.

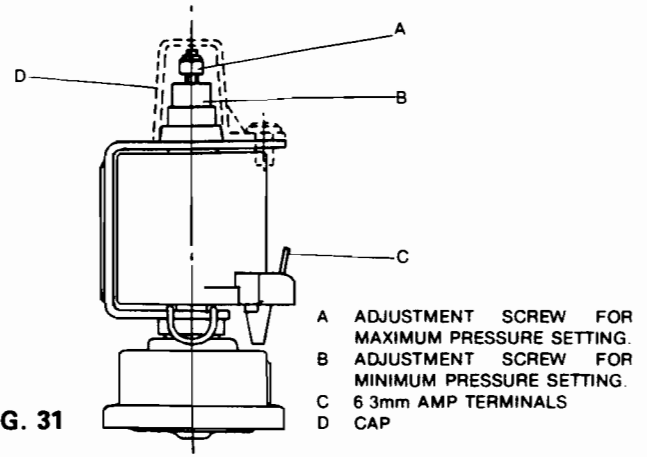


TABLE 4		Pressure	Gas Rate	Tolerance
Max. Burner Pressure	Set Adjuster 'A'	13.4 mb	1.6 cu ft/min 45.6 l/min	13.74 mb 13.05 mb
Min Pressure	Set Adjuster 'B'	1.0 mb	0.644 cu ft/min 18.2 l/min	1.05 mb 0.95 mb
<b>Inlet Pressure 20 mb</b>				

#### (4) GAS PRESSURE ADJUSTMENT

**NOTE:** The gas pressures are set at the factory and should not require further adjustment, if gas pressure readings are being obtained which differ from that stated in Table 4, check that the inlet pressure is correct and that the appliance is at full gas rate. To ensure this always put a high water flow through the domestic water side of the system when measuring the maximum gas pressure.

##### a) Adjustment of the Modureg Valve

4.2 Set the pressures to the values in Table 4 by adjusting the gas valve in the following manner.

**NOTE:** The minimum pressure setting must first be adjusted as any adjustment of the minimum pressure setting influences the maximum pressure settings.

##### b) Adjusting Minimum Pressure (see Fig. 31)

- (i) Remove Cover (D)
- (ii) Disconnect one of the electrical connections of the Modureg (C).
- (iii) The minimum rate pressure adjustment has to be done with decreasing pressure, by turning the minimum rate adjustment nut (B) anti-clockwise until the desired minimum outlet pressure is obtained.
- (iv) Reconnect the electrical connections of the Modureg. Polarity is not important.

##### c) Adjusting the Maximum Pressure (see Fig. 31)

- (i) Adjust the maximum pressure by turning the maximum rate adjustment nut (A) clockwise to increase the pressure, and anti-clockwise to decrease, until the desired pressure is obtained. (See Table 4). Turn off the D.H.W. taps.
- (ii) Replace Cover (D)

##### d) Products of Combustion measurements

If required the combustion performance can be assessed by placing a suitable sampling probe into the testpoint on the fluehood (see Fig. 16).

Typical values are:

CO% 0.005  
 CO<sub>2</sub>% 6.60

- (1) Remove the pressure gauge and tube and replace the screw in the pressure test nipple.

#### (5) THERMOSTAT CONTROLS

##### a) To Operate the Appliance: Central Heating (See Fig. 28)

The right hand control knob enables you to control the temperature of the C.H. water as it leaves the appliance. This knob can be set between Min and Max setting. The graduation Min to Max correspond approximately to a temperature of 60° Celsius to 85° Celsius. Under a min load condition the flow temperature can rise to 90°C.

(The temperature of the central heating flow is indicated on the C.H. L.E.D. Bar Display).

The appliance is fitted with a SUMMER/WINTER switch which will allow you to switch off the central heating during the summer months.

#### b) Hot Water

(i) The left-hand control knob enables you to control the temperature of the domestic hot water as it leaves the appliance.

The knob can be set between Min and Max. The graduation Min to Max corresponds approximately to a temperature of 35° Celsius to 65° Celsius.

#### (6) D.H.W. FLOWRATE SETTING

- a) Switch the ON/OFF switch to 'ON'.
- b) Turn the left hand control knob to maximum.
- c) Switch the Summer/Winter switch to Summer.
- d) Fully open all D.H.W. taps, and ensure that water flows freely from them.
- e) Close all taps except the furthest one from the boiler.
- f) Check that the boiler is firing at maximum burner pressure.
- g) The indicator lights on the control panel will operate in the following order: (see Fig. 37)
  - (i) Demand light on
  - (ii) Service indicator light on
  - (iii) Ignition light illuminated (only during ignition)
  - (iv) Temperature indicator lights show increasing water temperature.
  - (v) High/Low flame light indicates the level of firing, of the main burner.
- h) Adjust the D.H.W. flowrate by turning the throttle screw on the diverter valve (see Fig. 42 in the Service Section) until a D.H.W. temperature of approximately 50°C. This corresponds to a flow rate of about 8.4 l/m. The D.H.W. can be adjusted by this method to suit the customer's requirements.
- i) Turn off D.H.W. Tap.  
Secure the control panel, and fit outer casing.

#### (7) CENTRAL HEATING

- a) Set the ON/OFF switch on the front of the appliance to 'OFF' and leave for at least 20 seconds, (indicator L.E.D.s are off).
- b) Ensure that all the external controls such as a clock or room thermostat are switched 'ON'.
- c) Set the ON/OFF switch to 'ON' and the SUMMER/WINTER switch to 'WINTER'. The boiler will sequence as described in section 7 a, b, c, d, e.

The appliance will now operate in accordance with the pre-selected temperature demand, set on the right hand temperature control knob.

#### (8) APPLIANCE PROTECTION DEVICES

The appliance is fitted with several protection devices, operation of any of these devices will result in the appliance failing to operate. In most cases switching 'OFF' the mains supply switch for a period of at least 20 seconds, and then switching 'ON' again will restore the combination boiler to normal operation.

#### NOTE:

While the appliance is being used to provide hot water, at any draw off point, the central heating will not operate. When hot water is no longer required the appliance will automatically revert to central heating.

#### (9) HANDING OVER TO THE USER

After completion of installation and commissioning of the system, the Installer should hand over to the Householder by the following actions:

- a) Hand the 'User's Instructions' to the Householder and explain his/her responsibilities under the 'Gas Safety (installation and Use) Regulations 1984'.
- b) Explain and demonstrate the lighting and shutting down procedures.
- c) The operation of the boiler including the use and adjustment of ALL system controls should be fully explained to the Householder. This then ensures the greatest possible fuel economy consistent with household requirements of both heating and hot water consumption. Advise the User of the precautions necessary to prevent damage to the system, and to the building, in the event of the system remaining inoperative during frost conditions.
- d) Explain the function and the use of the boiler SUMMER/WINTER and ON/OFF switches.
- e) Explain and demonstrate the function of time and temperature controls, radiator valves, etc., for the economic use of the system.
- f) If an optional Programmer is fitted, then draw attention to the Programmer Kit User's Instructions and hand them to the Householder.
- g) Stress the importance of regular servicing by a qualified Heating Engineer and that a comprehensive service should be carried out AT LEAST ONCE A YEAR.

# Servicing Instructions

## SERVICING

To ensure continued efficient operation of the appliance it is necessary to carry out servicing and cleaning at regular intervals. The frequency of cleaning will depend upon the particular installation conditions and usage but in general, once per year should be adequate.

## WARNING

Before the start of any maintenance work, disconnect the mains electricity supply to the appliance by removing the plug from the socket or by switching off at the external isolating switch. The appliance gas supply should be isolated at the gas service cock, if dismantling gas carrying components.

The following notes apply to the appliance and its controls (see Fig. 1) but it should be remembered that attention must also be paid to the heating and hot water circuits with special attention to radiator valves, thermostats, clocks, leaking hot water taps etc.

Where it is necessary to replace a gasket that relies on adhesive for securing — this adhesive will be supplied with the gasket as a spare item.

In all cases prior to servicing, remove the outer case (see Instruction under, "To Service the Appliance"). Operate the appliance by turning the hot water services on to a high water flow, and observe the main burner.

Check that the flame covers all the flame ports and is of a light blue colour. Yellow flames and excessive lifting of flames indicate poor combustion. It is preferable to measure the CO% and CO<sub>2</sub>% content of the flue gas. This is achieved by placing a suitable sampling probe into the test point on the fluehood (see commissioning section ). page 21, sub-section 4.5).

## IMPORTANT

After completing any servicing or replacement of a gas carrying component, it is essential that a test for gas soundness is made and functional checks of controls operation carried out.

**TO SERVICE THE APPLIANCE (Follow the following sequence 1-10)**

### 1. REMOVE THE OUTER CASING (see Fig. 12 Page 13 — Installation Section)

- a) Remove the single securing screw located at the base of the outer casing.
- b) Ease the base of the outer casing forward and lift to release the casing from the securing clips at the top of the appliance.
- c) Grip the casing firmly and remove. Place in a safe place away from the immediate working area of the appliance.

### 2. REMOVE THE INNER COVER

- a) Remove the four securing screws and place the cover in a safe place.

### 3. REMOVE THE FAN ASSEMBLY

- a) Disconnect the two electrical connections from the fan motor and the earth connection from the motor bearing housing.
- b) Support the fan and remove the two fixing screws and bracket from the front of the flue hood. Lower the fan assembly and carefully withdraw it from the appliance. Place in a safe place until required.

### 4. REMOVE THE FLUE HOOD

- a) Slacken only the screw on the left-hand side of the flue hood and remove the two remaining screws.
- b) Remove the two knurled nuts and retaining rods. Lift out the flue hood to expose the top surface of the heat exchanger.

### 5. REMOVE THE COMBUSTION CHAMBER FRONT PANEL

Remove the four screws securing the combustion chamber front panel. Remove the panel ensuring that the insulation remains in position on the panel. The underside of the combustion chamber is now exposed.

### 6. REMOVE THE BURNER

Remove the burner fixing screw at the front of the burner, and disconnect the spark electrode lead. Pull the burner forward, releasing it from the injector. Further forward movement of the burner will allow access for removal of the sensing electrode lead from its connector.

#### NOTE:

It is unnecessary to remove any other components for annual servicing. To measure main burner gas pressure it will be necessary to lower the electronic control panel by removing the securing screw and lowering the panel. The burner pressure is measured by using the test point on the burner feed pipe just above the gas valve. See Fig. 30, Page 20.

If the boiler has been operating, care must be taken to avoid contact with the hot water pipes on the underside of the appliance.



## 7. TO INSPECT AND CLEAN THE APPLIANCE

(See Fig. 32)

Before carrying out any cleaning operation, cover the electrical control panel with a piece of waterproof material to protect it from debris.

- a) Inspect the heat exchanger for any blockage. Deposits of any material should be brushed away using a soft brush. **Note: Do not use brushes with metallic bristles.**
- b) Examine internal pipe-work connections and automatic air vent for any water leaks. Rectify if necessary.
- c) Examine the combustion chamber insulating material and renew if damaged.
- d) Remove and examine the main burner injector, clean or renew, as necessary.

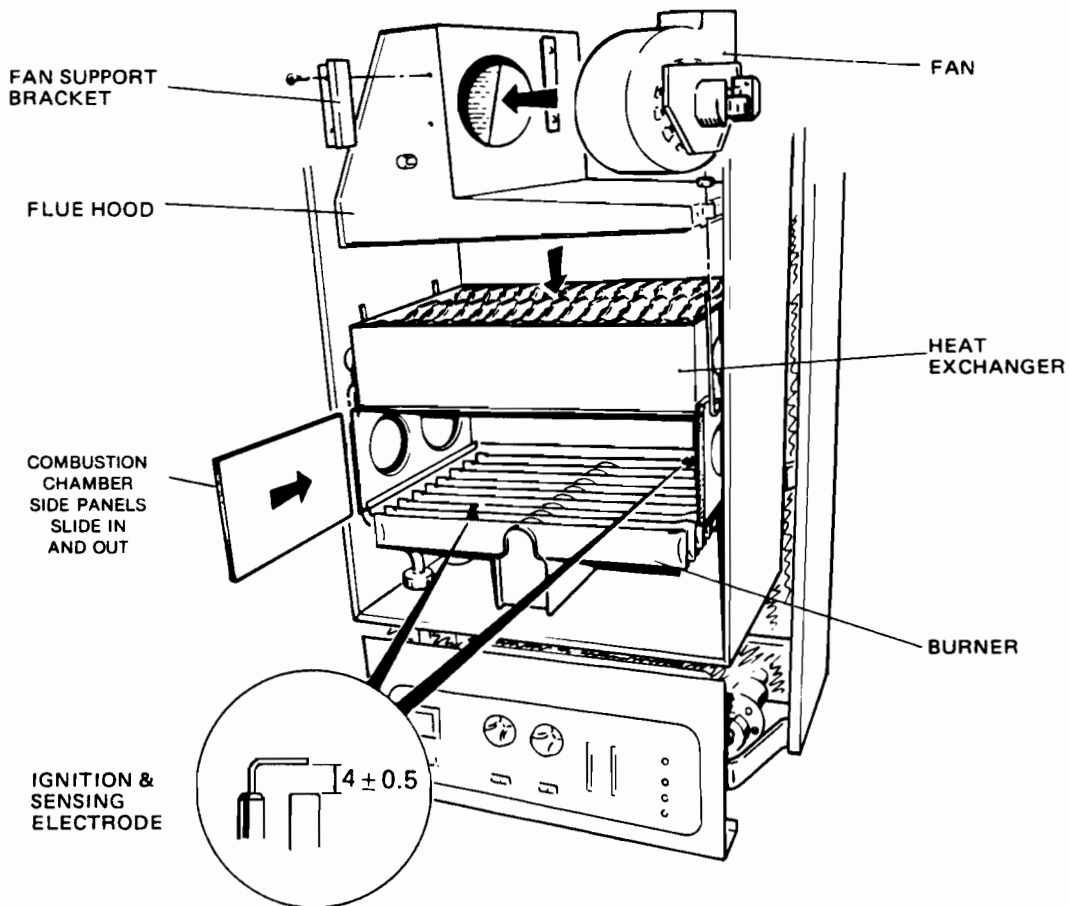


FIG. 32

- e) Inspect the main burner and remove any deposits with a soft brush. Check the electrodes for damage or deterioration, clean or renew as necessary. Ensure that the spark gaps are correct to dimensions specified in Fig. 32.
- f) Examine the fan for any mechanical damage, check to ensure free running of the fan wheel. Clean the wheel if necessary with a soft brush. Check sealing gasket and renew if damaged.
- g) Examine flue duct and flue hood and ensure that there is no obstruction. Examine the gasket at the entry into the flue duct.

It is essential that a good seal is made at the outlet to the fan, renew this gasket if there are any signs of damage or deterioration, using the adhesive supplied.

**Reassemble all components in reverse order.**

## 8. GAS PRESSURES—ADJUSTMENT

See Commissioning Section 4.

## 9. THE SEALED SYSTEM

Check that the pressure in the system is being maintained. The pressure gauge is fitted with a red marker which indicates the initial filling pressure of the system. If the pressure gauge needle indicates a lower cold pressure than the red indicator, this shows the system has lost pressure and should be repressurised. The correct procedures are shown in the installations section. See permissible methods of filling Page 7.

## 10. OTHER COMPONENTS

No other servicing is required on any other appliance components. It is advisable to operate the isolating taps to maintain free operation. It is recommended that the pressure relief valve is operated during service. It may occasionally be necessary to replenish the pre-charge in the expansion vessel. This can be readily achieved by use of an air pump or compressed air line. Access can be made to the charging point on the respective vessels, as follows:

- a) Central Heating expansion vessel—through the access panel adjacent to the flue hood, remove flue hood as referred in section 1.4. Undo the three screws and, remove the cover allowing access to vessel charge points, see Fig. 30.
- b) Domestic Hot Water expansion vessel—by removing from the appliance and recharging on a compressed air line to 3.5 bar pressure (see section expansion vessels/mini expansion vessel).

## 11. REPLACEMENT OF COMPONENTS

### WARNING

Before attempting to remove any component from this appliance first disconnect the mains electricity supply by removing the plug from the socket or by switching off the appliance at the isolating switch. **Note:** the appliance ON/OFF switch must not be used, as the means of isolating, as this switch does leave parts of the supply circuit live.

### NOTES:

The appliance gas supply should be isolated at the gas service cock.

The heating and Domestic Hot Water circuits can similarly be isolated at their respective valves. A drain point is provided in the Heating circuit under the appliance. (See Fig. 25).

**NOTE:** Before removing any component from the central heating circuit on the appliance, reduce the pressure by closing the isolating valves and opening the safety valve.

### IMPORTANT

After removal or replacement of any gas carrying part a test for gas soundness must be made.

## 12. CENTRAL HEATING OVERHEAT THERMOSTAT (see Fig. 30)

- a) Remove the outer casing and the inner cover as previously described. See sequences 1 to 2 'To service the appliance'.
- b) The thermostat is located on to the heating flow pipe situated on the left hand side of the heat exchanger. Disconnect the two electrical leads.
- c) Undo the two fixing nuts and remove the thermostat from the mounting plate.
- d) Fit the new overheat thermostat taking care not to touch the exposed disc of the thermostat. Reassemble in reverse order. Polarity of the electrical connections is not important.

## 13. DOMESTIC HOT WATER OVERHEAT THERMOSTAT (see Fig. 33)

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance', and lower the control panel (1 screw).
- b) To gain access close the domestic cold water supply valve and drain water by opening hot water draw-off taps and the drain screw on the valve.
- c) Remove the mini expansion vessel.
- d) Disconnect the electrical leads from the D.H.W. overheat thermostat and remove the thermostats two securing pillar nuts.
- e) Fit the new thermostat and reassemble in the reverse order. Open isolating valves and check for leaks.

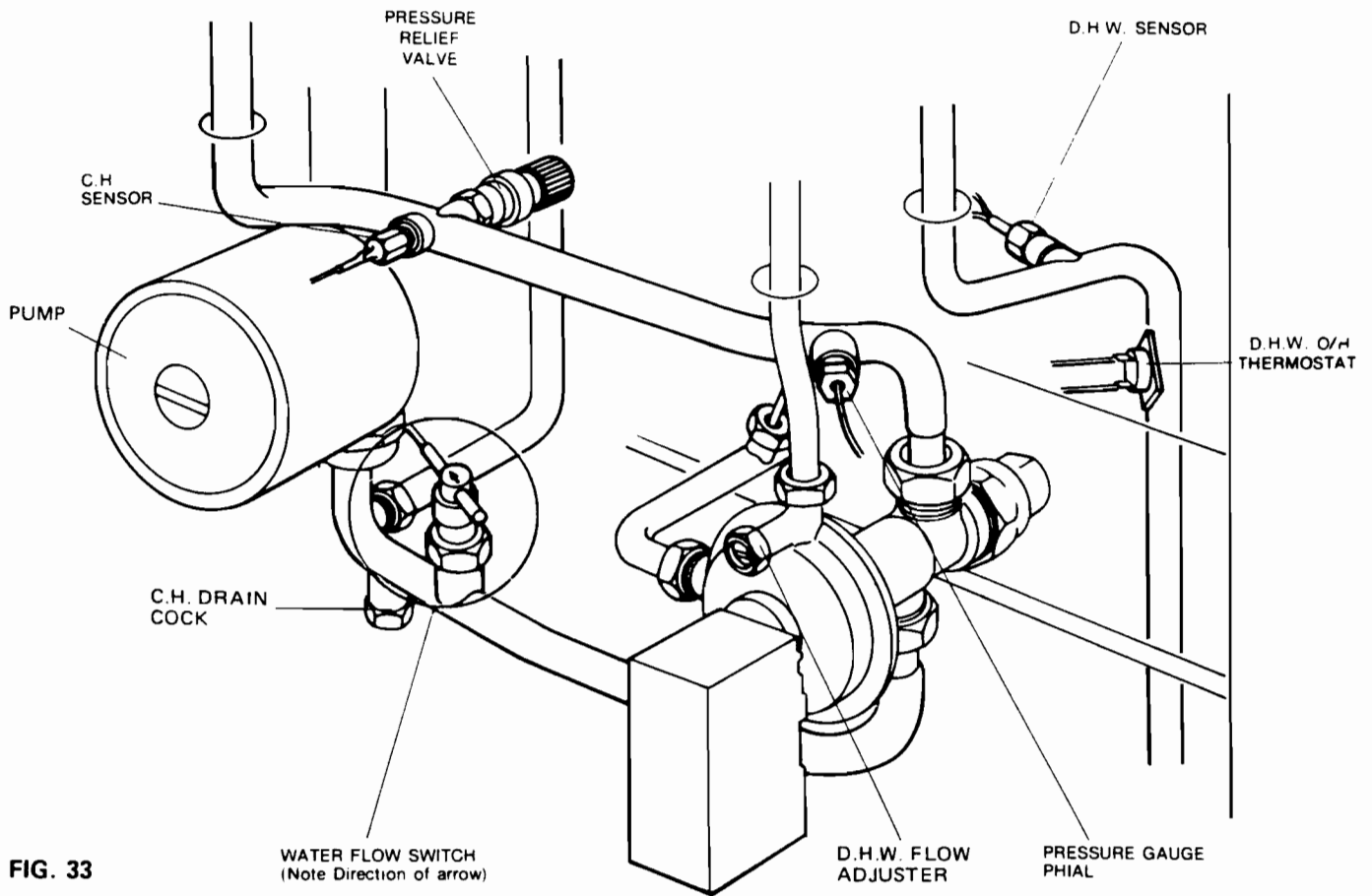


FIG. 33

#### 14. PUMP OVERRUN THERMOSTAT

(see Fig. 34)

- a) Remove the outer casing and the inner cover as previously described. See sequences 1 to 2 'To service the appliance'.
- b) The thermostat is located on the U-bend on the right side of the heat exchanger. Disconnect the three electrical connections noting lead colours and locations.
- c) Remove the front fixing nut, and slacken only the rear fixing nut, then remove the thermostat from the mounting plate.
- d) Fit the new pump overrun thermostat. Re-assemble in reverse order, renewing any worn or broken insulation (High Temperature Insulation 130°C). The three electrical connections must be located in their correct positions.

viz: —

- lead colour yellow to terminal 1
- lead colour white to terminal 2
- lead colour black to terminal 3

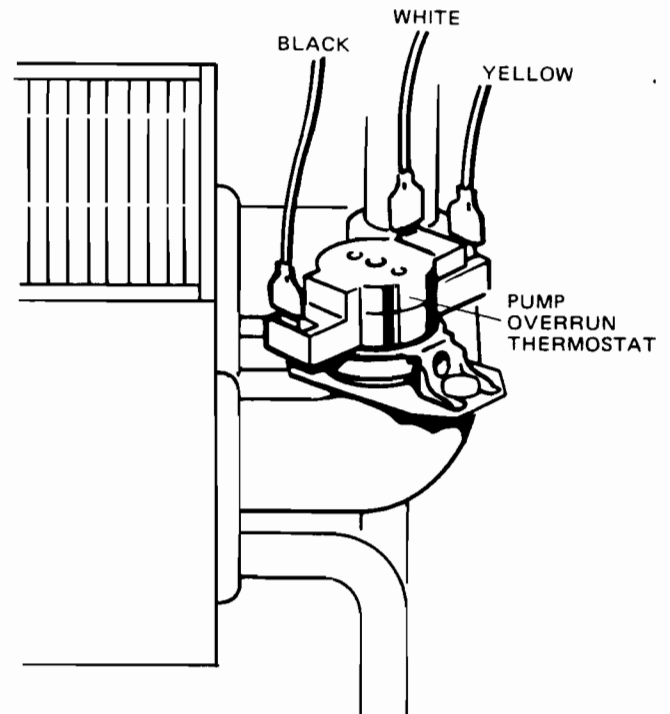


FIG. 34 PUMP OVERRUN THERMOSTAT

## 15. IGNITION AND SENSING ELECTRODE

(see Fig. 32)

- a) Remove the Outer Casing and Inner Cover, and burner assembly as previously described. See sequences 1, 2, 5 and 6 'To service the appliance'.
- b) Remove the appropriate retaining screw and lift the electrodes out of its support bracket.
- c) Fit new electrode(s) and reassemble in reverse order, checking that the gap measures  $4\text{mm} \pm 0.5\text{mm}$  for either electrode.

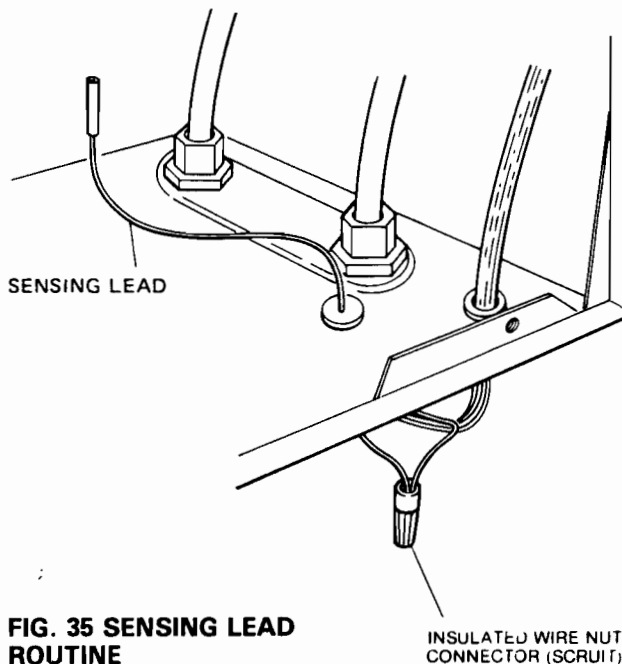
## 16. IGNITION LEAD AND SENSING LEAD

### Ignition Lead

- a) Remove the outer casing, and inner cover, and burner assembly as previously described. See sequences 1, 2 and 6 'To service the appliance'. Lower the electronic control panel by undoing the securing screw and remove the cover, (two screws).
- b) Remove Heyco Bush from the control panel and disconnect the lead at the electrical control board; and at the spark electrode, remove, making a note of the route.
- c) Fit new lead.
- d) Reassemble in reverse order, and route lead as previously noted. Secure Heyco Bush into position.

### Sensing Lead (see Fig. 35)

- a) Carry out as a) above.
- b) Remove the sensing lead from the sensing electrode.
- c) Unscrew the insulating connector and pull the sensing lead through the casing.
- d) Reassemble in reverse order.



**FIG. 35 SENSING LEAD ROUTINE**

## 17. MAIN BURNER (see Fig. 32)

- a) Remove the outer casing, the inner cover and burner assembly as previously described. See sequences 1, 2, 5 and 6. 'To service the appliance'.
- b) Remove the electrodes from the burner and reassemble onto the new burner. Fit the new burner and ensure the burner is pushed back on the injector. Reassemble in reverse order.

## 18. BURNER INJECTOR

- a) Remove the outer casing, inner cover and burner assembly as previously described. See sequences 1, 2, 5 and 6 'To service the appliance'.
- b) Remove the burner injector from its connection at the rear of the combustion chamber.
- c) Fit the new injector with sealing washer and tighten.
- d) Reassemble in reverse order.

## 19. GAS CONTROL VALVE AND FIRST SOLENOID VALVE (see Fig. 36)

- a) Remove the outer casing, the inner cover and burner assembly as previously described. See sequence 1, 2, 5 and 6 'To service the appliance'. Lower the electrical control panel by undoing the securing screw.
- b) Remove the four fixing screws which hold the burner feed pipe to the boiler back panel.
- c) Remove the electrical connections from the Modureg and second solenoid valve.
- d) Remove the gas control valve fixing screw.
- e) Undo the Union nut on the gas service cock and lift the gas valve assembly clear of the gas service cock. Pull the gas control forwards so that the assembly passes between the horizontal flow pipe and the control panel support frame. See Fig. 36.
- f) Before removing completely disconnect the electrical leads from the first solenoid on the rear of the gas control.

- g) If a new gas control valve is to be fitted transfer the service cock nut/liner and the burner feed pipe to the new valve. Replace the 'O' ring seal.
- h) To renew the first solenoid remove the four securing screws and detach the solenoid. Re-fit

using a new gasket. The correct replacement solenoid will be fitted with a white plastic terminal block.

- i) Reassemble in reverse order. Before fitting the valve into position, connect the two spade connectors (yellow and orange wire) to the first solenoid, polarity is not important (see Fig. 36A). Re-commission appliance as in commissioning procedure.

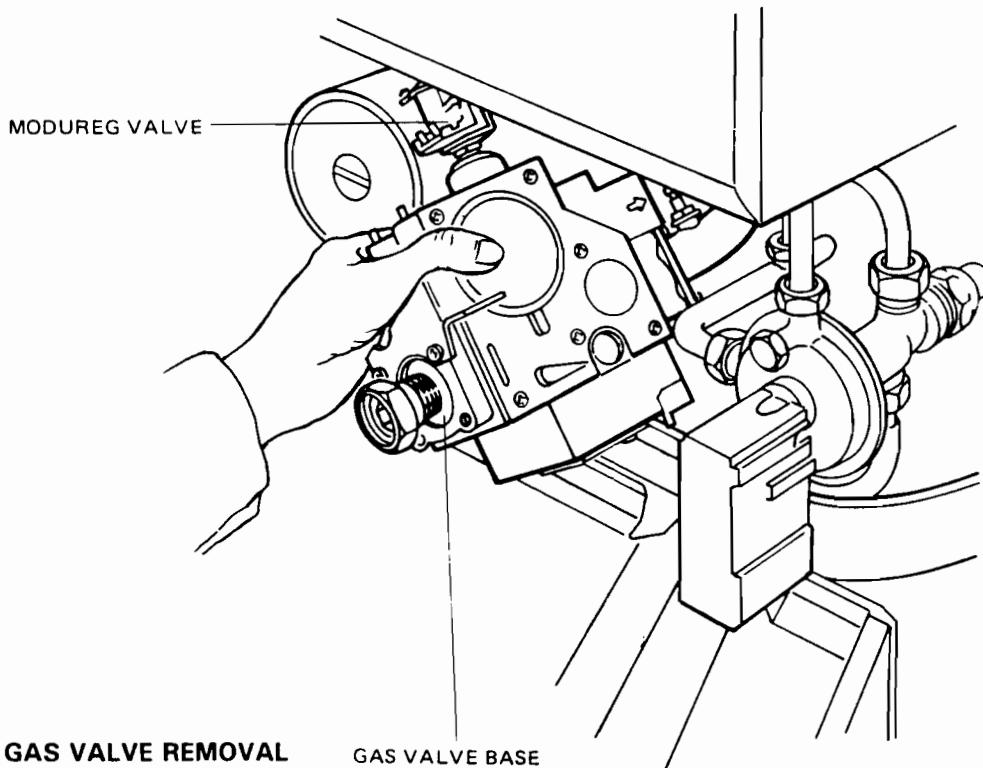


FIG. 36 GAS VALVE REMOVAL

GAS VALVE BASE

## 20. MODUREG COIL (see Fig. 36A)

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance'.
- b) Lower the electrical control panel.
- c) Disconnect the electrical connections to the Modureg valve.
- d) Remove the Modureg coil housing and bracket, by withdrawing the spring clip and pulling the housing forward to disengage from the spindle.
- e) Fit coil housing and bracket. The correct replacement will have a white coil housing.
- f) Replace in reverse order.

Reset the gas pressure—see commissioning section 4.

## 21. SECOND SOLENOID VALVE (see Fig. 36A)

- a) Remove the outer casing as described previously see sequence 1 'To service the appliance'.
- b) Lower the electrical control panel.

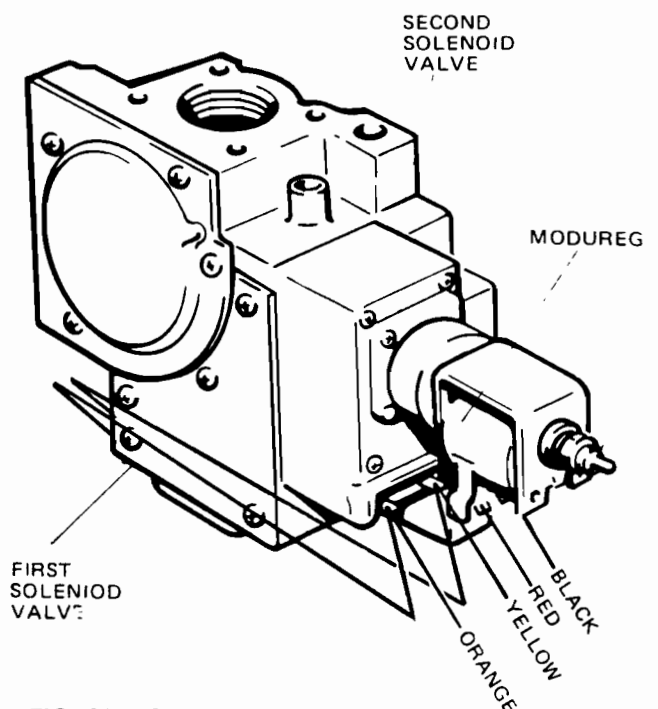


FIG. 36a GAS VALVE

- c) Disconnect the electrical connections to the second solenoid valve, and Modureg.
- d) Remove Modureg Valve and Gasket.
- e) Remove the second solenoid valve (four screws). Refit using new gasket. The correct replacement solenoid will be fitted with a white plastic terminal block. Fit the Modureg to the new solenoid valve.
- f) Replace in reverse order.
- g) Re-commission the appliance as described in the Installation Instructions, page 20.

## 22. CASE SEAL

- a) Remove the outer casing and inner cover as previously described. See sequence 1 and 2 'To service the appliance'.
- b) The seal is secured at four corner points. Lift corner pieces out of retaining hole.
- c) Fit new seal and re-assemble, in reverse order.

## 23. SIGHT GLASS WITH SECURING FRAME

- a) Remove the outer casing and inner cover as previously described. See sequences 1 and 2 'To service the appliance'.

- b) Straighten the four tags on rear of inner cover, and remove sight glass assembly. (Withdraw from the front of the inner cover).
- c) Replace the new sight glass and securing frame, use the new gasket each side of the glass to seal.
- d) Reassemble in reverse order using the silicon supplied to seal the tags.

## 24. SUMMER/WINTER AND ON/OFF SWITCHES

(see Fig. 37)

- a) Remove the outer casing as previously described, see sequence 1 'To service the appliance'.
- b) Lower the electrical control panel by undoing the securing screw and remove the cover (two screws).
- c) Remove the electronic control boards to provide access to switches, see Section 27 and 28 'Electronic control P.C.B. and Distribution Board'.
- d) Press retaining lugs on switch body and remove the switch from the front face of the control panel.
- e) Fit new switch and reassemble in reverse order. Ensure that the switch is the correct way round in the panel, i.e. when the switch is ON, the orange indicator can be seen on the left hand side, when viewed from the front panel. For the central heating switch, the orange indicator can be seen when switched to WINTER.

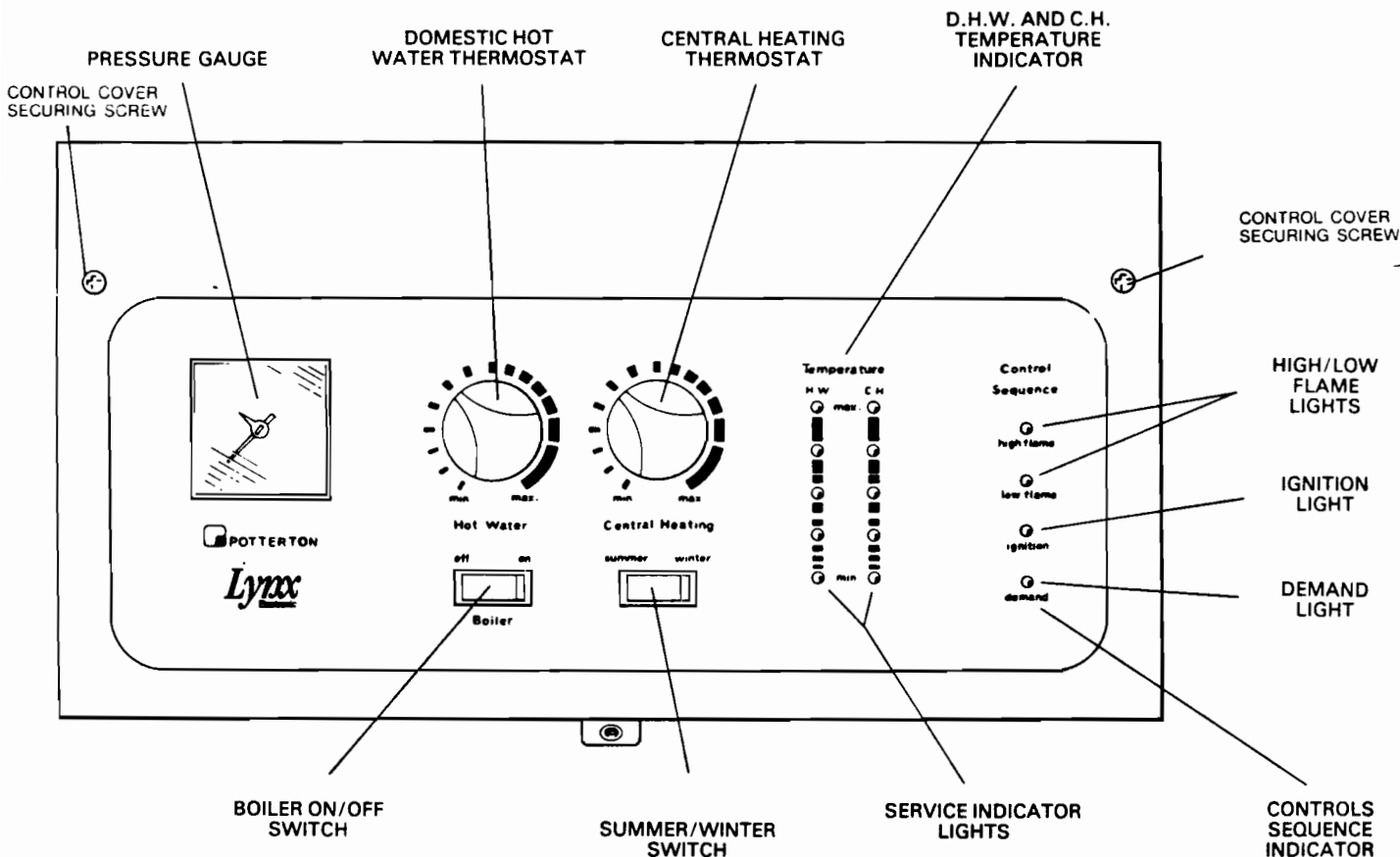


FIG. 37

## 25. ELECTRONIC CONTROLS (see Fig. 38)

1. Full Sequence Control Board, (daughter board Part No. 407687).
  2. Modulating Control Board, (daughter board Part No. 407686).
  3. Distribution Board, (mother board Part No. 407685).
- a) Remove the outer casing as previously described. See sequence 1 'To service the appliance'.
  - b) Lower the electronic control panel by undoing the securing screw and removing the cover (two screws).
  - c) The electronic controls are now exposed. The Full sequence control board and the modulating boards can now be unclipped from the distribution board, care must be exercised when removing the boards, that components are not damaged.

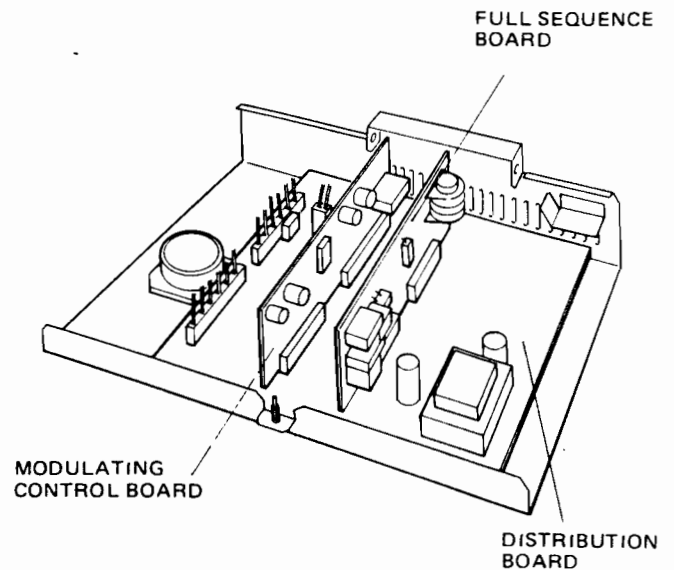


FIG. 38 ELECTRONIC CONTROL BOARDS

## 26. TO REMOVE THE FULL SEQUENCE CONTROL BOARD

(see Fig. 38)

- a) Remove the H/T Spark Lead edge clip from the end of the board.
- b) By holding the front edge and top of the board, ease the board off its clips.
- c) The board can now be exchanged, or placed in a clean safe place until required for reassembly.

## 27. TO REMOVE THE MODULATING BOARD

(see Fig. 38)

- a) By holding the front edge and top of the board, ease the board off its clips.
- b) The board can now be exchanged or placed in a clean safe place until required for reassembly.

## 28. TO REMOVE THE DISTRIBUTION BOARD

(see Fig. 38)

- a) Remove the full sequence control board and modulating board as previously described in sequences 26 and 27.
- b) Pull off the two thermostat knobs from the front of the control panel.
- c) Remove the connections from the two switches, the two 3 pin, and a two pin molex plug connections on the left hand side of the board, and the main input/switched line connections.
- d) Remove the six securing screws, (access to one may be easier if the diverter valve micro switches are first removed) (see page 31 section 35). The board can now be exchanged, or placed in a clean safe place until required for reinsertion.
- e) Reassembly is in reverse order; when replacing the Molex Plugs or inserting the P.C. boards into their clips, ensure that the connections are correctly aligned, pressure should then be applied directly to the plastic moulding, rather than to the board.

## 29. AIR-FLOW DETECTOR (see Fig. 39)

- a) Remove the outer casing and inner cover as previously described, see sequences 1 and 2 'To service the appliance'.
- b) Disconnect the electrical connections at the side of the airflow detector housing.
- c) Remove the airflow detector housing (one screw). The airflow detector can now be easily removed.
- d) Remove the airflow detector from its housing (one screw).
- e) Refit airflow detector and reassemble in reverse order.

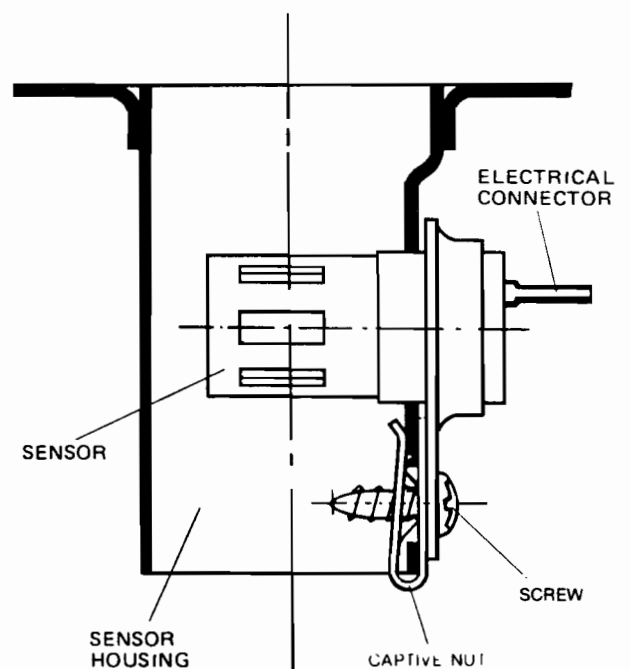


FIG. 39 AIR FLOW SENSOR

### 30. FAN (see Fig. 40)

- a) Remove the fan from the unit as described previously. See sequences, 1, 2 and 3 'To service the appliance'.
- b) Fit new fan into position ensure the fan is located correctly (see Fig. 40) ensuring that a good seal is made between the fan outlet and the flue. Renew gasket if damaged. Reassemble in reverse order and check that the electrical wiring and connections are not damaged.

### 31. D.H.W. and C.H. WATER TEMPERATURE SENSOR(S) (see Figs. 33 and 25)

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance'.
- b) Lower the electronic control panel by undoing the securing screw.
- c) Before removing the hot water or central heating sensor, first close the isolating valves for the circuit involved. Reduce the system pressure by opening the pressure relief valve then drain the water from the heating unit by undoing the drain plug for D.H.W., close the cold water inlet valve, open the lowest tap then undo the D.H.W. drain cock on the isolation valve (see Fig. 25).

- d) Disconnect the electrical connections from the sensor(s) and unscrew from its housing.
- e) Refit the new sensor(s) and washer. Reassemble in reverse order. If necessary recharge the C.H. system as described in the Installation Instructions, and check for leaks.

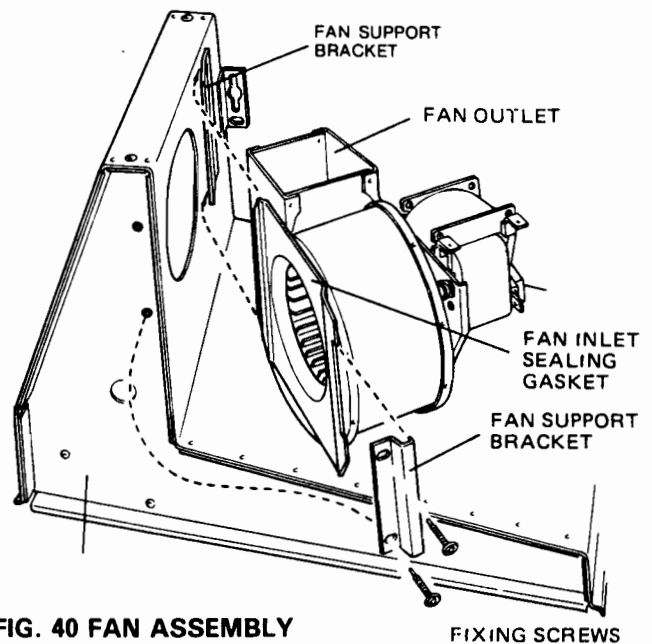


FIG. 40 FAN ASSEMBLY

### 32. PRESSURE GAUGE (see Fig. 41 and 33)

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance'.
- b) Lower the electronic control panel by undoing the securing screw and lowering the panel.
- c) Close the central heating isolating valves, reduce the system pressure by opening the safety valve, then drain the water from the heating unit by undoing the drain plug (see Fig. 33).
- d) Remove the pressure sensing element from its housing on the pipework and free the capillary from the cable clips, taking note of the routing of the capillary.

- e) Remove the two fixing nuts and clamps which secure the pressure gauge into position.
- f) Remove the pressure gauge from the rear of the control panel, withdrawing the capillary through the cut out in the chassis.
- g) Fit the new pressure gauge, in its correct position. Reassemble in reverse order. Use the new washer to seal the sensor element. Ensure that the capillary follows the route previously noted. The surplus capillary should be coiled adjacent to the sensor. Recharge the system as described in the installation instructions (page 7) and check for leaks.

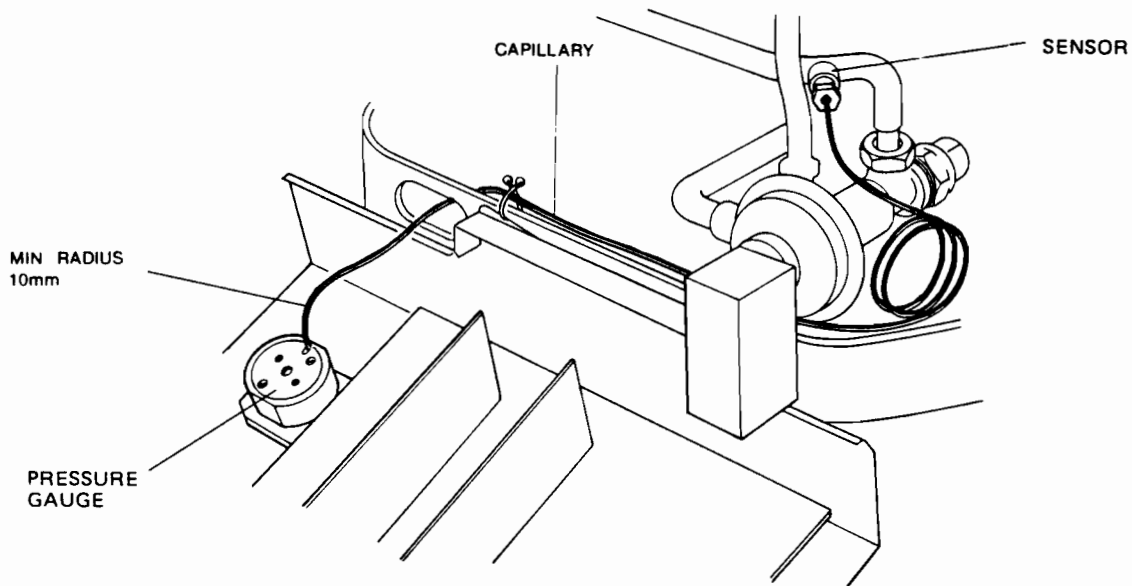


FIG. 41 PRESSURE GAUGE CAPILLARY ROUTE



### 33. WATER FLOW SWITCH

(see Fig. 33)

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance'.
  - b) Close the central heating isolating valves, reduce the system pressure by opening the safety valve, then drain the water from the heating unit by undoing the drain plug (see Fig. 33).
  - c) Lower the electronic control panel by undoing the securing screw, and lowering the panel.
  - d) Remove cover from rear of electronic control panel (two screws).
  - e) Disconnect 3 pin plug from P.C.B. Undo the union nut in the pipework, and remove the flow switch from the appliance. Feed the lead through the hole in the bulkhead, note the route of the cable.
  - f) Fit new flow switch ensuring that the cable entry is towards the pump and is in line with the pipe, see Fig. 33. Reassemble in reverse order, recharge the system as described in the installation instructions, and check for leaks.
- c) Remove the terminal cover on the side of the housing and disconnect the wire from the terminal block.
  - d) Close the central heating isolating valves, reduce the system pressure by opening the safety valve, then drain the water from the heating unit by undoing the drain plug (see Fig. 33).  
Remove the pump by: –
    - e) Undoing the two brass hexagon nuts either side of the pump.
    - f) It is advisable when removing the pump body, to loosen and turn the water flow switch through 90° to prevent damage.
    - g) Fit the new pump and reassemble in reverse order, ensure that the pump terminal block is on the right hand side. (The flow of water through the pump is upwards) and reset the water flow switch to its original position, see Fig. 33. Re-charge the system as described in the installation instructions. Ensure that the pump is set to speed No. 3, where adjustment is available, and check for leaks.

### 34. PUMP (see Fig. 33)

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance'.
- b) Lower the electronic control panel secured by one screw, and cover with a waterproof material.

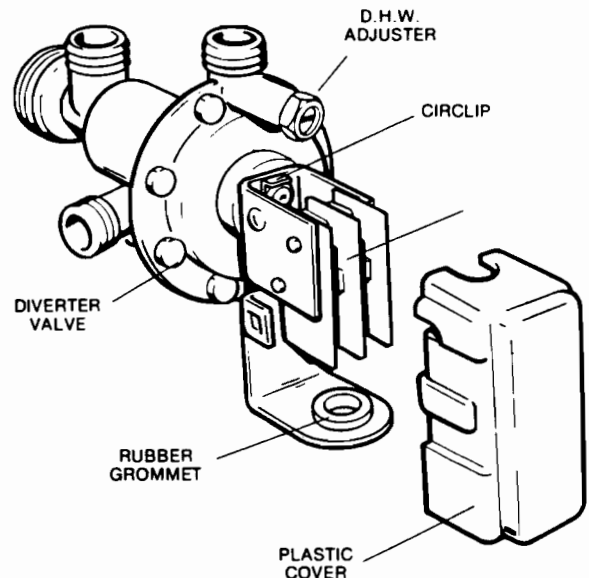
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### 35. DIVERTER VALVE MICRO SWITCH ASSEMBLY

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance'.
- b) Lower the electronic control panel secured by one screw. The diverter valve micro switch assembly can now be accessed.
- c) To release the assembly: See Fig. 42
  - (i) Remove the cover fixing screw and remove the plastic cover.
  - (ii) Pull off the retaining circlip and remove the micro switch assembly from the diverter valve. Remove the earth connection from the valve.
  - (iii) Disconnect the three wires from the connections at the micro switch, noting which terminals they come from (see Fig. 45).
  - (iv) Disconnect the remaining wires from the connector in the wiring harness external to the assembly.
- d) Connect the three wires in the order indicated in Fig. 45 to the new switch assembly.

**NOTE:** Replacement of individual micro switches should not be attempted.

- e) Replace in reverse order ensuring that all the cables pass through the grommet and that the cover retaining screw is screwed in position.



**FIG. 42 DIVERTER VALVE**

### 36. DIVERTER VALVE (see Fig. 43).

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance'.
- b) Lower the electronic control panel secured by one screw. The diverter valve and the diverter valve micro switch assembly can now be accessed.
- c) Disconnect the diverter valve micro switch assembly by disengaging the retaining circlip. The assembly can now be pushed to one side clear of the diverter valve body.
- d) To remove the diverter valve completely close the central heating flow and return isolating valves and the domestic cold water supply isolating valve. Reduce the system pressure by opening the pressure relief valve then drain the water from the heating unit by undoing the drain plug. Open the lowest H/W tap in the circuit, then undo the D.H.W. drain plug on the cold water inlet isolating valve (see Fig. 33 and 25).
- e) If access is restricted on the right hand side, remove the internal by-pass pipe by undoing connections at the pump flow switch, pump, diverter valve C.H. Return and expansion vessel connector then remove the pipe, (further access can be gained by removal of the gas valve).
- f) Refit the diverter valve, using the new sealing washers supplied for each connection. Reassemble in reverse order, ensuring that the micro switch is correctly secured to its housing with the circlip. Recharge the system as described in the Installation Instructions, and check for leaks.

### 37. EXPANSION VESSELS

#### Mini Expansion Vessel

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance'.
- b) Lower the electronic control panel secured by one screw. Close the isolating valve on the cold water supply. Drain the water out of the lowest tap, and undo drain plug on the isolating valve. Collect the residual water.
- c) Disconnect the union nut on the pipe connection to the mini vessel at feed pipe end.
- d) Remove the expansion vessel from the appliance, including the pipe connection. Transpose mini expansion vessel pipe connections to the new vessel. Reassemble in reverse order, using new gaskets. Open the isolating valve, and check for leaks.

### 38. CENTRAL HEATING EXPANSION VESSEL

In the unlikely event of a failure of the C.H. expansion vessel it is recommended that a new vessel be fitted— exterior to the boiler. It should be positioned on the return pipe (see Fig. 4), and as close to the boiler as possible. If, however, the vessel must be replaced then the following procedure may be used:

- a) Remove the outer casing as described previously. See sequence 1 'To service the appliance'.
- b) Close all the isolating valves and drain off the water in the unit and interconnecting, hot water pipework, as previously described under diverter valve 36c above.

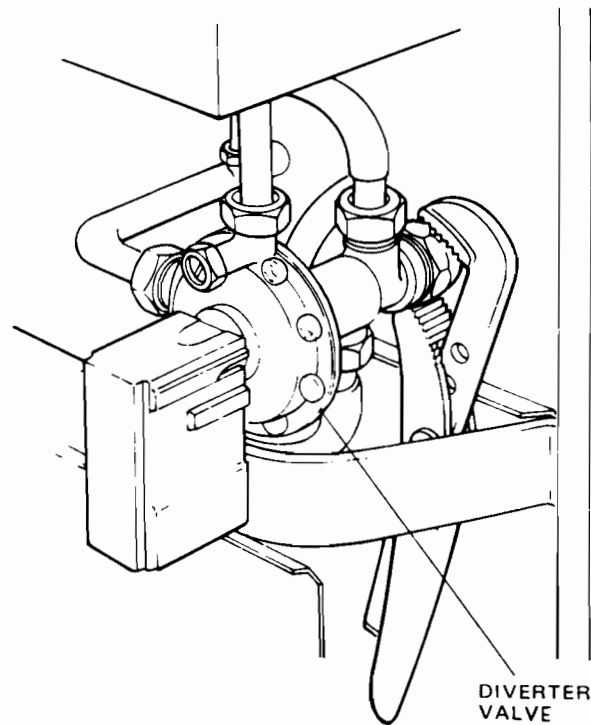


FIG. 43 DIVERTER VALVE REMOVAL

- c) Lower the electrical control panel and remove cover. Disconnect electrical connection, L. N. E. and Sw L, and free from the cable clamp.
- d) Isolate the gas supply at the gas service cock, and undo the union nut.
- e) Remove the glassfibre rope seal, disconnect the flue air elbow at the top of the appliance, (3 screws), leave the flue in situ.
- f) Undo the upper most valve connections on the C.H. flow and return pipes, and on the cold water mains feed, similarly disconnect D.H.W. flow pipe, D.C.W. supply pipes and pressure relief pipes.
- g) Remove the bottom securing screw then loosen the appliance securing screws and lift unit off the wall. Place unit face downwards on the floor.
- h) Access can now be made to the expansion vessel. Undo the water connection and loosen the screws in the top bracket to release vessel from the appliance.
- i) Fit a new expansion vessel and reassemble in reverse order, using new gaskets. Re-charge the system as described in the Installation Instructions, and check for leaks.

### 39. HEAT EXCHANGER (see Fig. 32)

- a) Remove the burner as described previously. See sequences 1-6 'To service the appliance'. Remove the combustion chamber insulation by sliding the side panels forward, this will expose the two combustion chamber securing screws which should be removed (two screws).
- b) To remove the Heat-exchanger completely, close the C.H. flow and return isolating valves and the D.C.W. supply isolating valve. Reduce the pressure of the system by opening the pressure relief valve: Then drain the water from the H.E. by undoing the drain plug. Open the lowest H.W. tap in the circuit, then undo the D.H.W. drain-plug on the cold water inlet isolating valve (see Fig. 23 and 25).
- c) Disconnect the electrical connections from the pump overrun thermostat and the O/H thermostat.

Before removing the heat exchanger cover the electronic controls with a waterproof material.

- d) Undo the four Union nuts at the base of the combustion chamber and lift out the heat exchanger.
- e) The heat exchanger waterway can now be descaled or a replacement heat exchanger can be fitted, in which case the overheat thermostat, pump overrun thermostat, air vent and pipe must be transferred to the new heat exchanger. When fitting a new heat exchanger, before finally tightening the four tubes nuts, temporarily fit the burner and check the distance between the top face of the burner to the underside of the heat exchanger. This distance must be  $137 \pm 2\text{mm}$ .
- f) Remove the burner and tighten the four Union nuts. Reassemble in reverse order, recharge the system as described in the Installation Instructions and check the joints for leaks. Fit new gaskets where necessary.

#### 40. AUTOMATIC AIR VENT (see Fig. 30)

- a) Remove the outer casing and inner cover as described previously. See sequences 1 and 2 'To service the appliance'.
- b) Close the central heating isolating valves, reduce the system pressure by opening the safety valve, then drain the water from the heating unit by undoing the drain plug (see Fig. 33).
- c) Hold body of air vent and undo the Union nut.
- d) Fit new air vent and sealing washer ensuring the air vent cap is left loose. Reassemble in

reverse order and recharge the system as described in the Installation Instructions.

#### 41. PRESSURE RELIEF VALVE (see Fig. 33)

- a) Remove the outer casing as described previously, see sequence 1 'To service the appliance'.
- b) Lower the control panel.
- c) Close the central heating isolating valves, reduce the system pressure by opening the safety valve, then drain the water from the heating unit by undoing the drain plug (see Fig. 33).
- d) Undo both nuts on the pressure relief valve and remove.
- e) Replace with the new pressure relief valve using a new seal gasket, reassemble in reverse order. Recharge the system and check for leaks.

#### 42. FAULT FINDING (see Fig. 4)

Before attempting any electrical fault finding, carry out the preliminary electrical system check as detailed on page 6 to 9 of the instructions for the 'BRITISH GAS MULTIMETER'. Figs. 44 and 45.

For the replacement of faulty component, (see the Servicing Section).

To assist in fault-finding, the logic sequence of the electronics control circuit precedes the fault-finding charts. Figs. 46 and 47.

### HEALTH AND SAFETY INFORMATION FOR THE INSTALLER AND SERVICE ENGINEER

Under the Consumer Protection Act 1987 and section 6 of the Health and Safety at Work Act 1974, we are required to provide information on substances hazardous to health.

Small quantities of adhesives and sealants used in the product are cured and present no known hazards.

The following substances are also present.

#### Insulation & Seals

Material	— Ceramic Fibre; Alumino — Silicone Fibre
Description	— Boards, Ropes, Gaskets
Known Hazards	— Some people can suffer reddening and itching of the skin. Fibre entry into the eye will cause foreign body irritation. Irritation to respiratory tract.
Precautions	— People with a history of skin complaints may be particularly susceptible to irritation. High dust levels are only likely to arise following <b>harsh</b> abrasion. In general, normal handling and use will not present discomfort, follow good hygiene practices, wash hands before consuming food, drinking or using the toilet.
First Aid	— Medical attention must be sought following eye contact or prolonged reddening of the skin.

#### Heat Exchanger

Material	— Copper with lead/tin coating.
Description	— Finned copper tube.
Known Hazards	— Inhalation or ingestion of lead dust or fumes may cause headache and nausea.
Precautions	— Unused heat exchangers present minimal risk to health other than normal hygiene practices would demand regarding washing before eating etc. Deposits found on or below a heat exchanger that has been in use could contain lead oxide. Avoid inhalation by using a vacuum cleaner in conjunction with other cleaning tools when servicing the appliance.

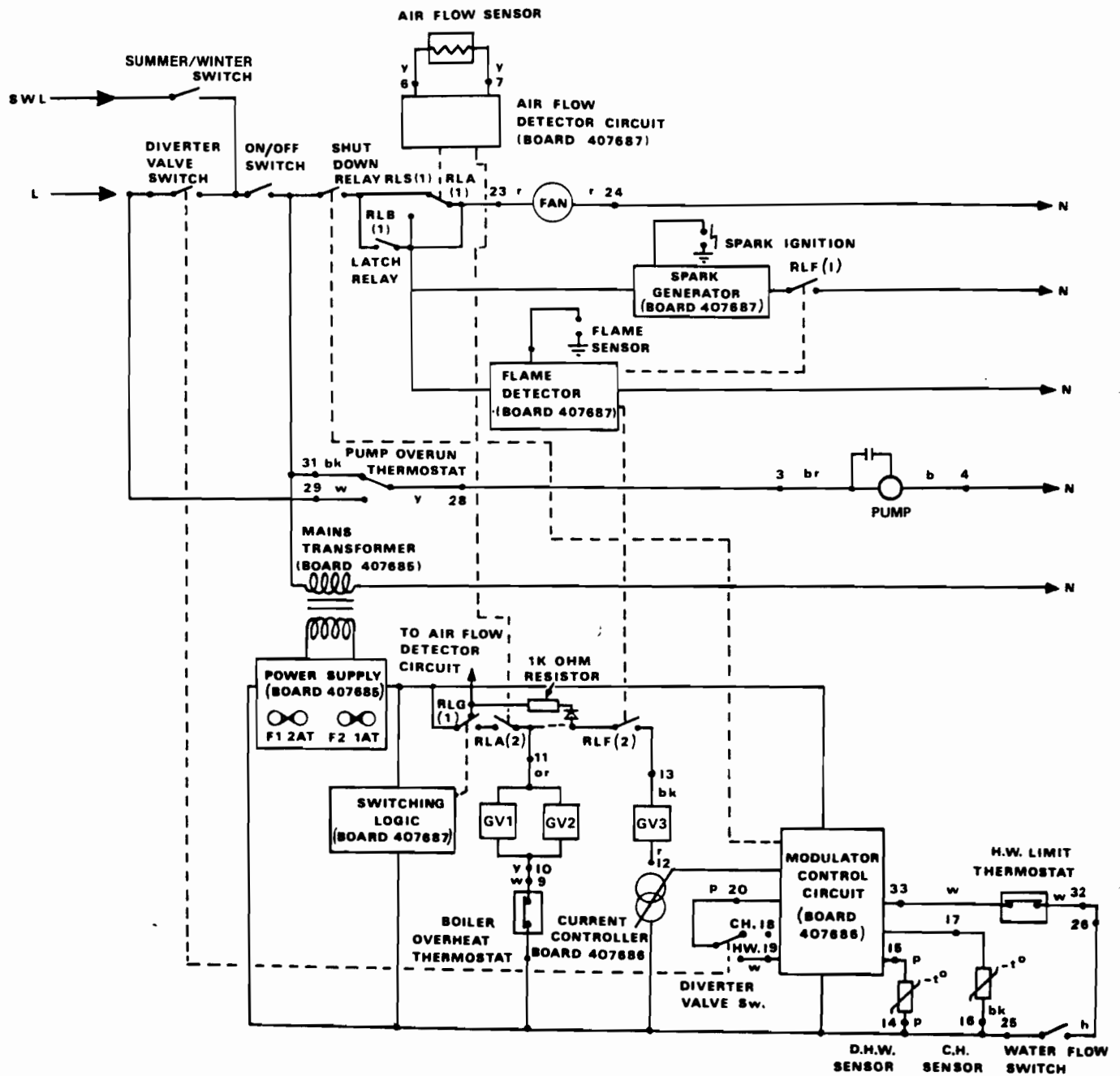


FIG. 44 FUNCTIONAL FLOW DIAGRAM OF ELECTRICAL WIRING

NOTE: All contacts in 'Cold and Unenergised' position.

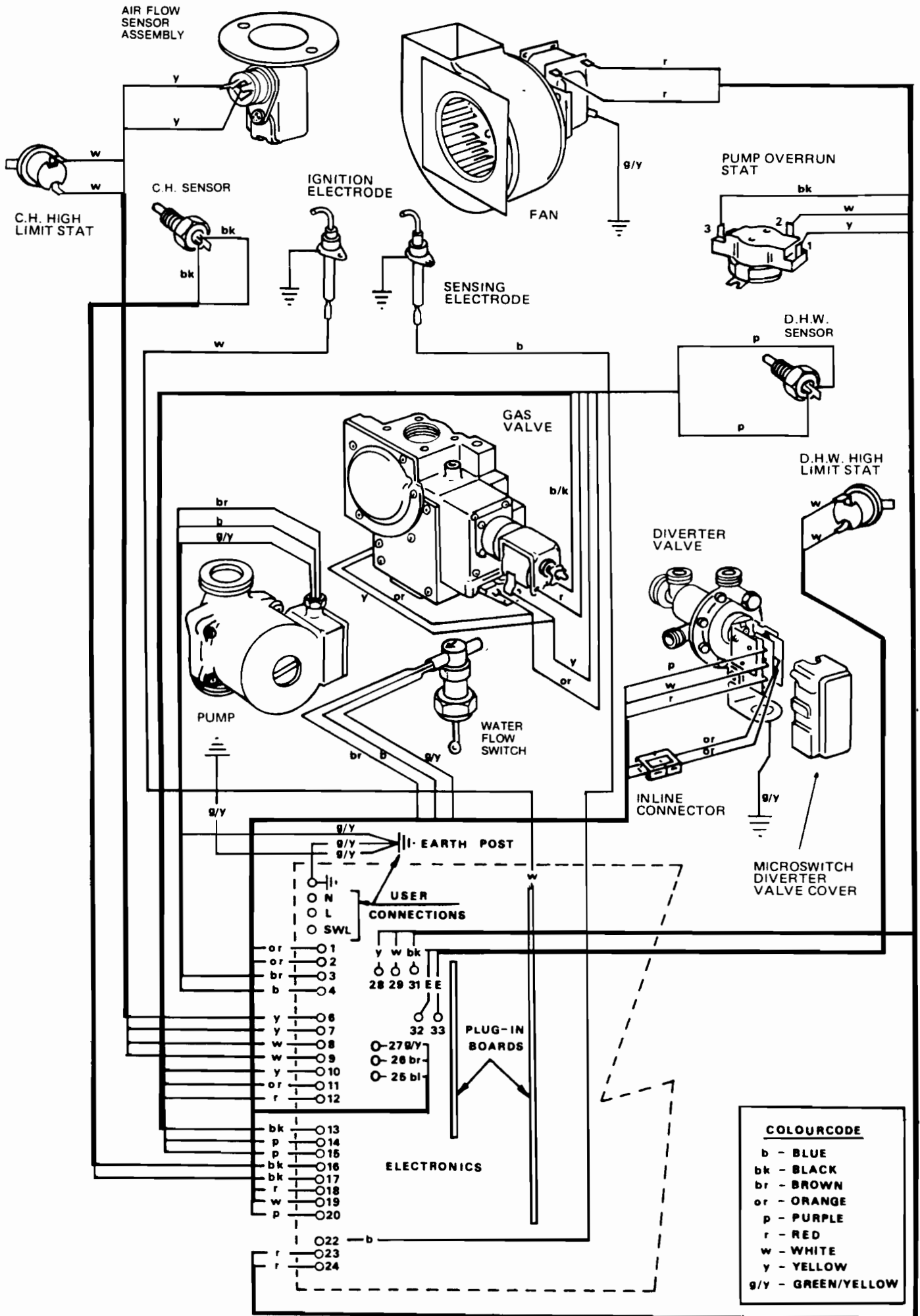


FIG. 45 PICTORIAL SCHEMATIC WIRING DIAGRAM

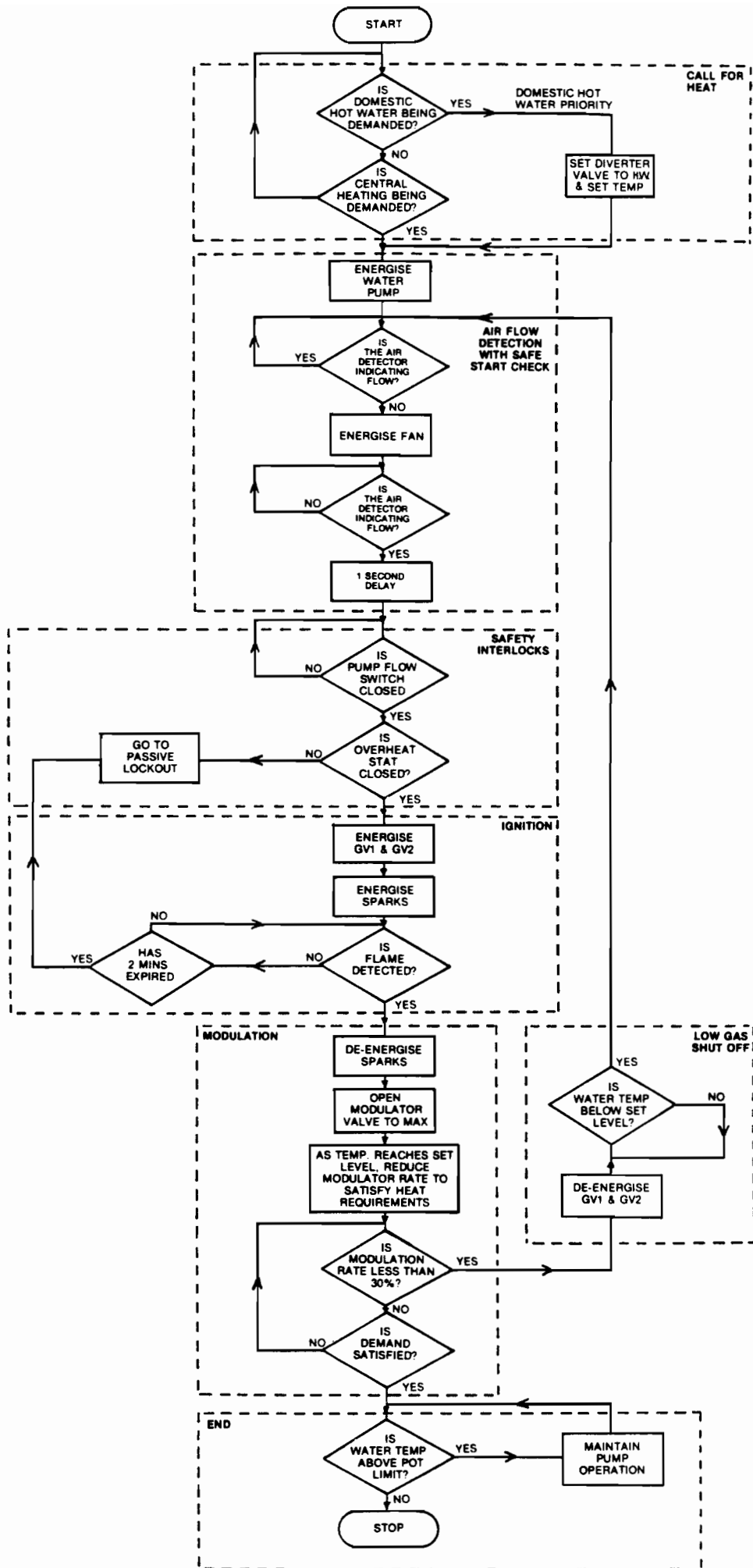


FIG. 46 LOGIC SEQUENCE

# COMBI FAULT FINDER

Before Proceeding ensure the connectors on the distribution board are fully pushed home.  
Carry out preliminary electrical safety checks, in accordance with "Regulations for Electrical Installations"

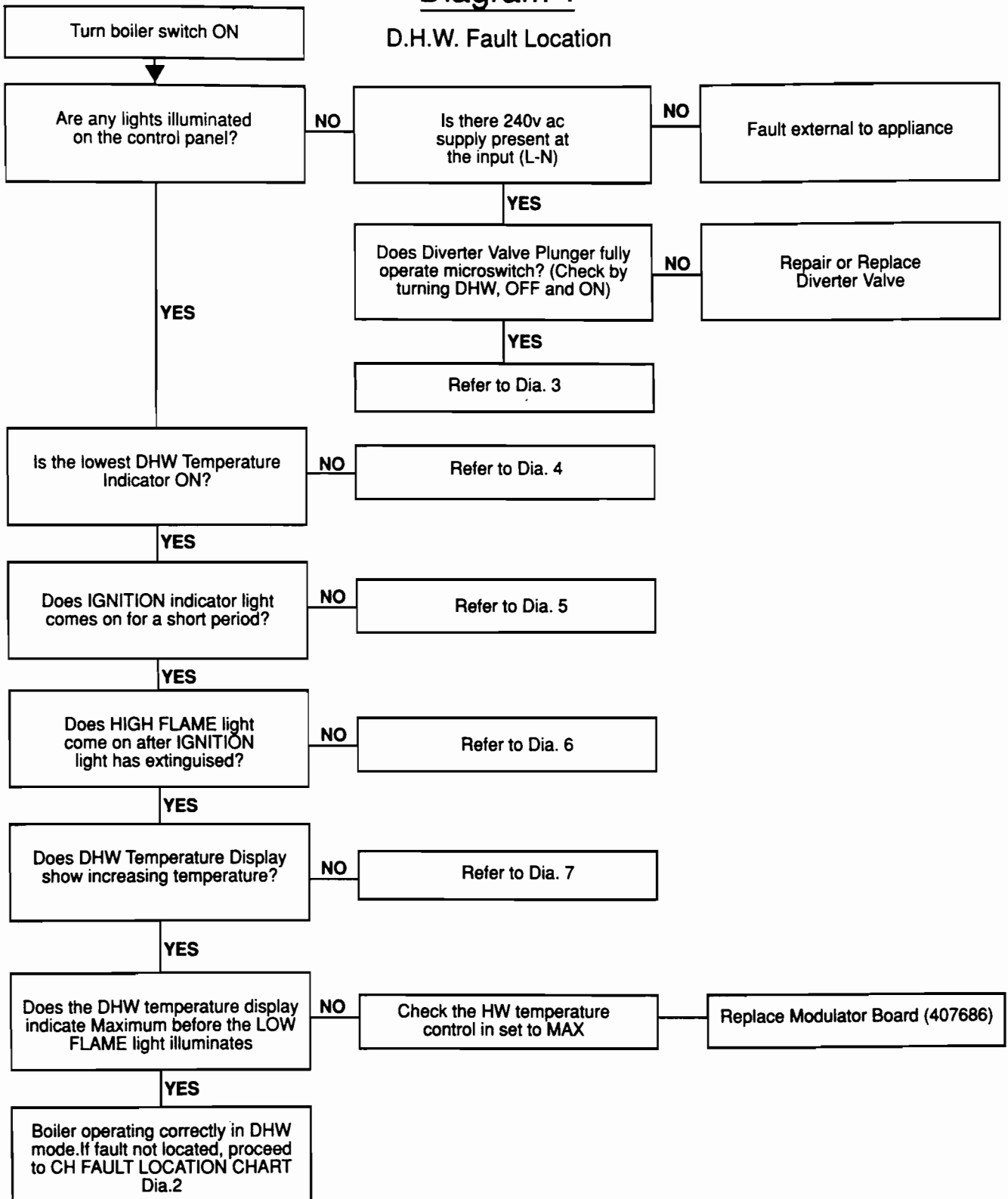
## Set Initial Conditions

- Set main boiler switch to OFF
- Turn ON external electricity supply
- Turn ON gas supply
- Set DHW temperature control to MAX position
- Set SUMMER/WINTER switch to SUMMER
- Turn DHW tap to deliver approx 4.5 litres minute

Follow the procedure listed first in Diagram 1 - D.H.W Fault Location and Diagram 2 - C.H. Fault Location then refer to the appropriate symptom diagrams (3-7)

## Diagram 1

### D.H.W. Fault Location

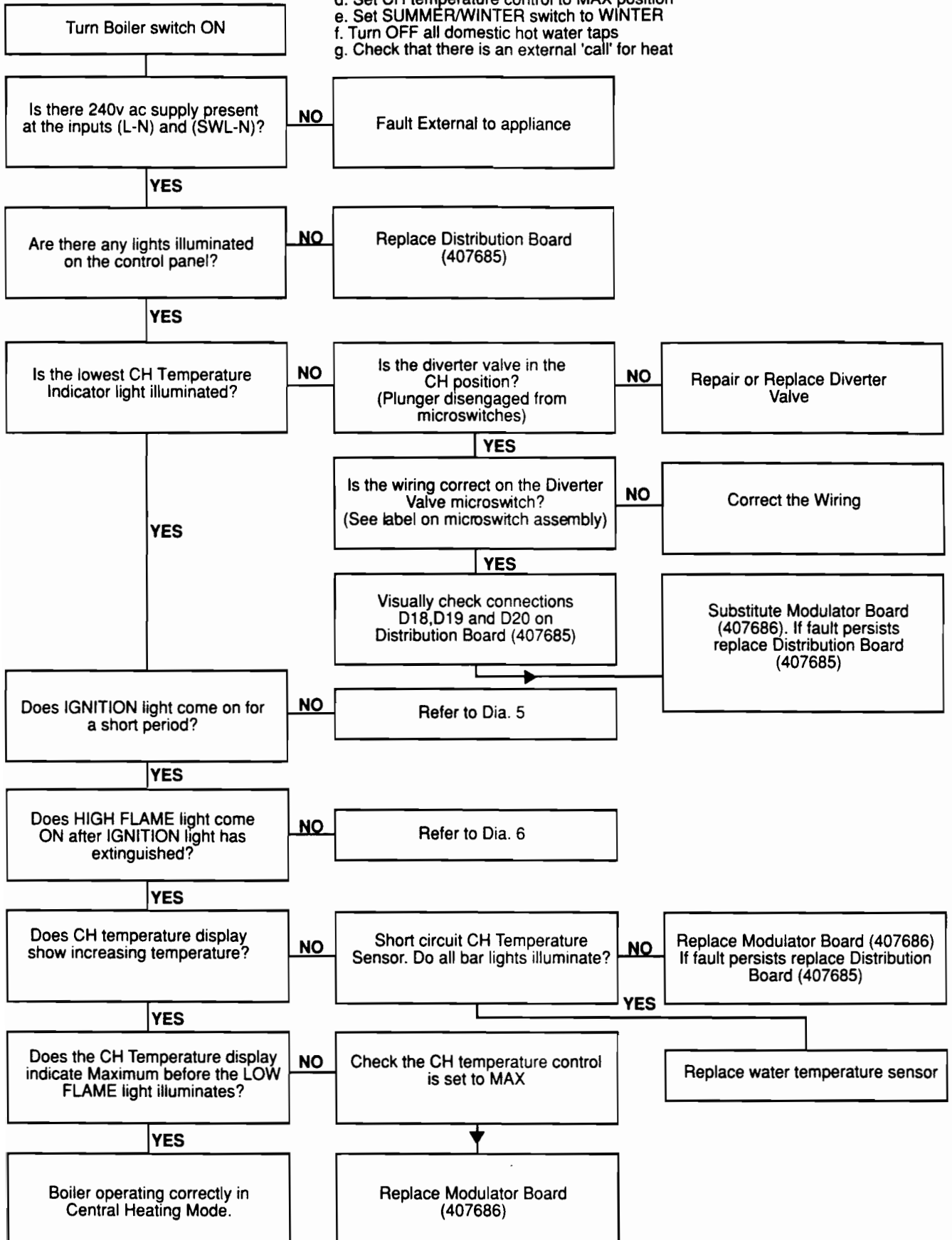


# Diagram 2

## CH Fault Location. (Diagram 1 already followed)

Set Initial Conditions

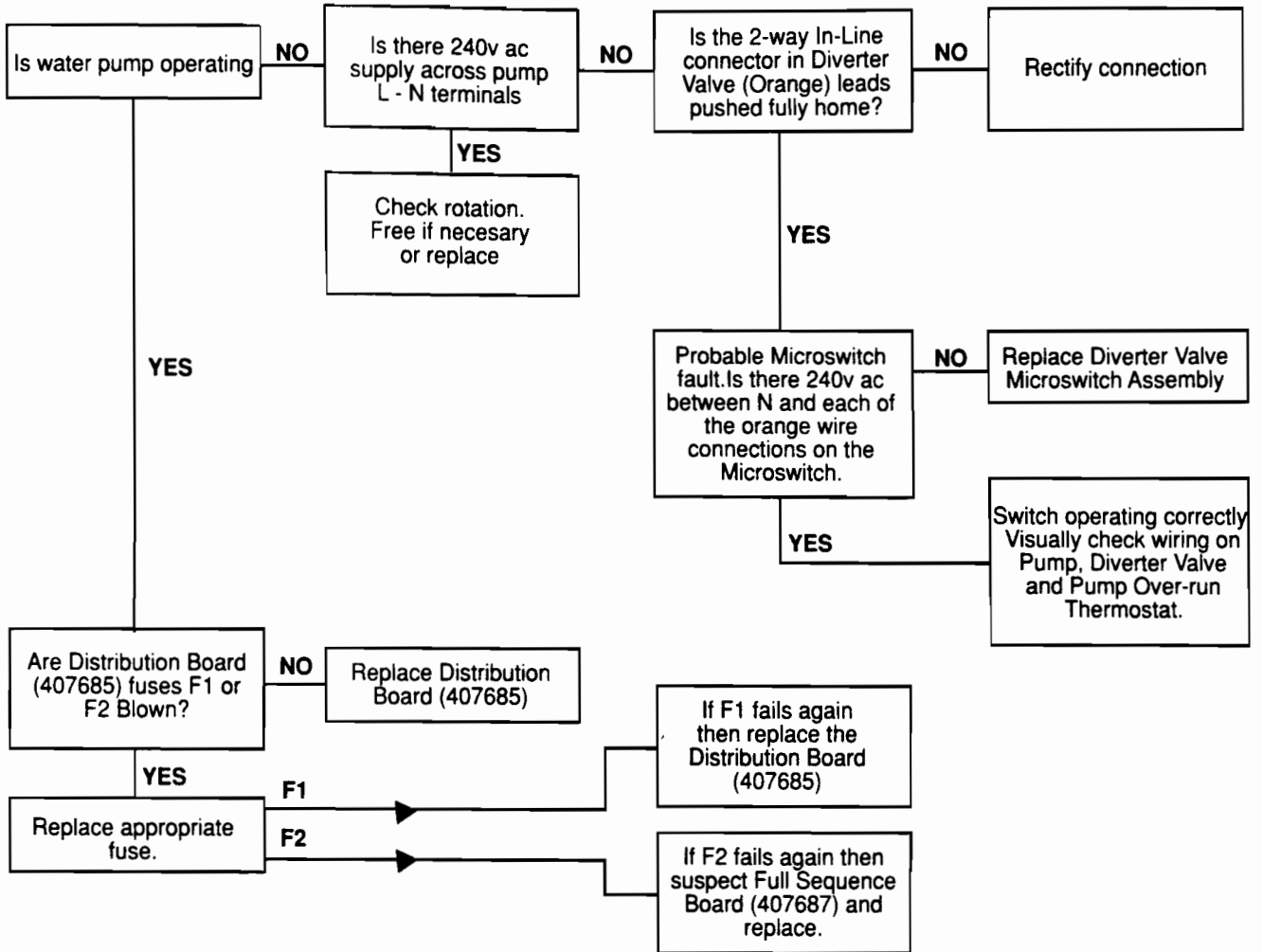
- a. Set Main Boiler Switch to OFF
- b. Ensure electricity supply is ON
- c. Ensure Gas supply is ON
- d. Set CH temperature control to MAX position
- e. Set SUMMER/WINTER switch to WINTER
- f. Turn OFF all domestic hot water taps
- g. Check that there is an external 'call' for heat





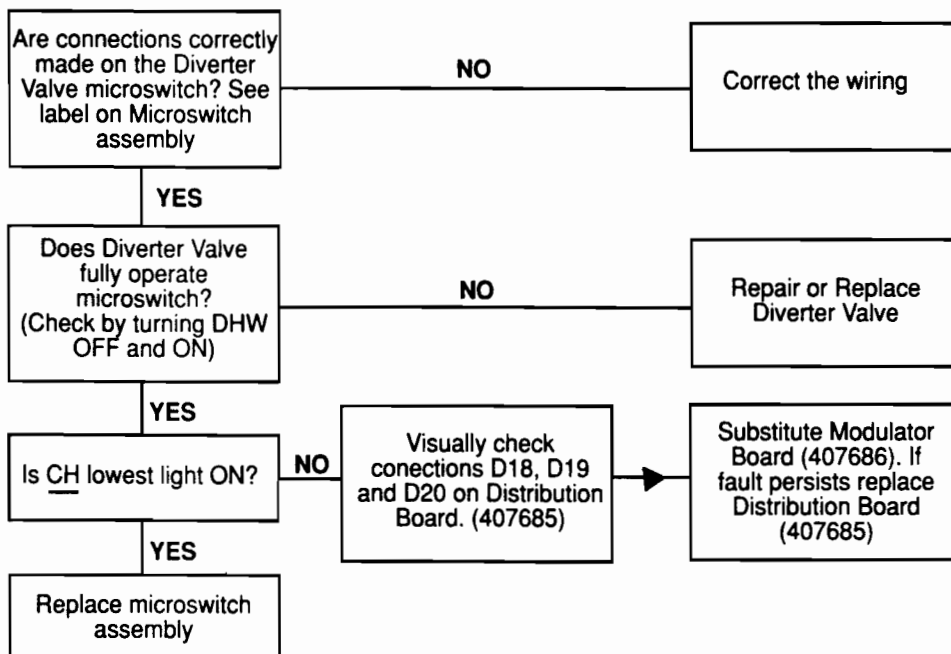
# Diagram 3

Symptom - All Panel Lights OFF



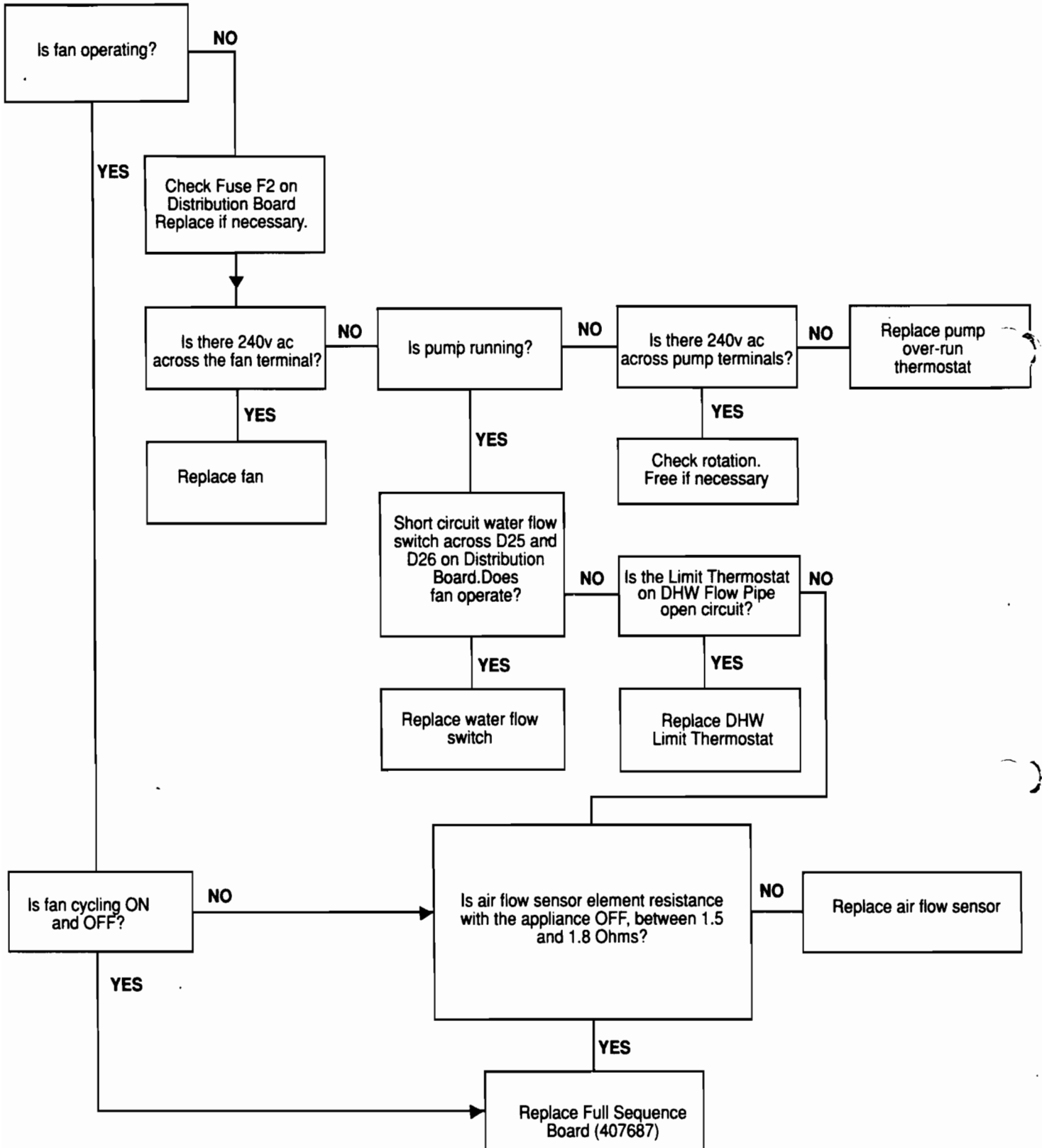
# Diagram 4

Symptom - DHW lowest indicator is OFF (Demand light is ON)



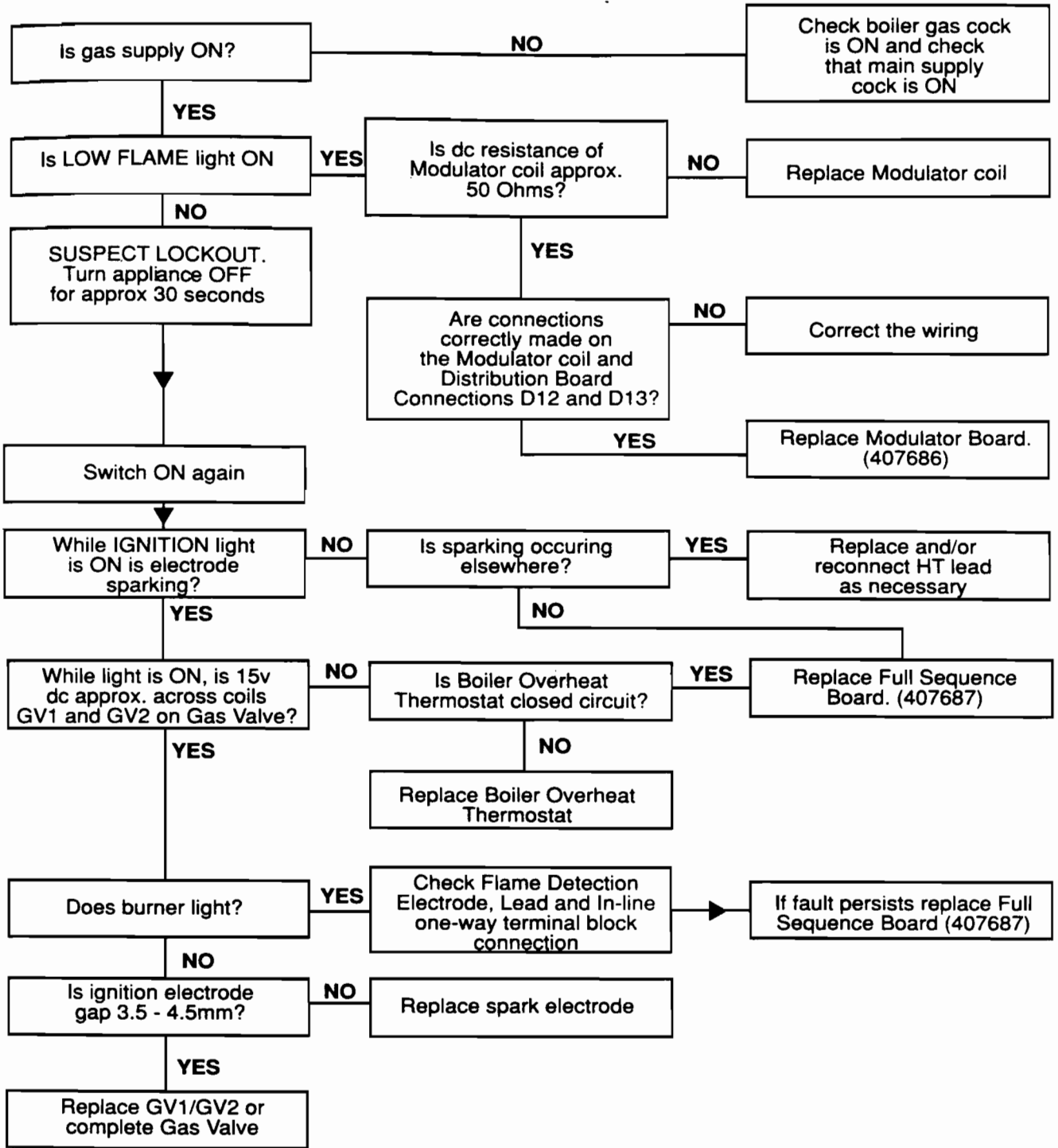
# Diagram 5

Symptom - Ignition Light Does Not come ON



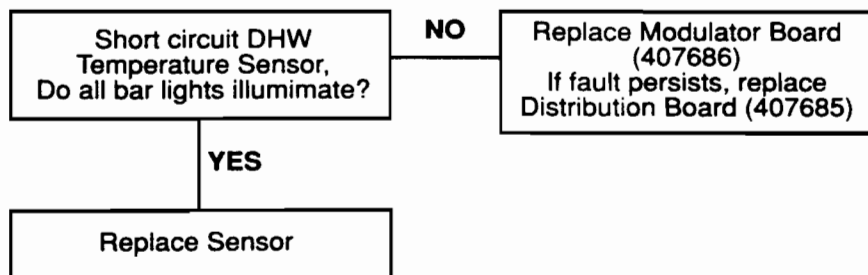
# Diagram 6

Symptom - No High Flame Light



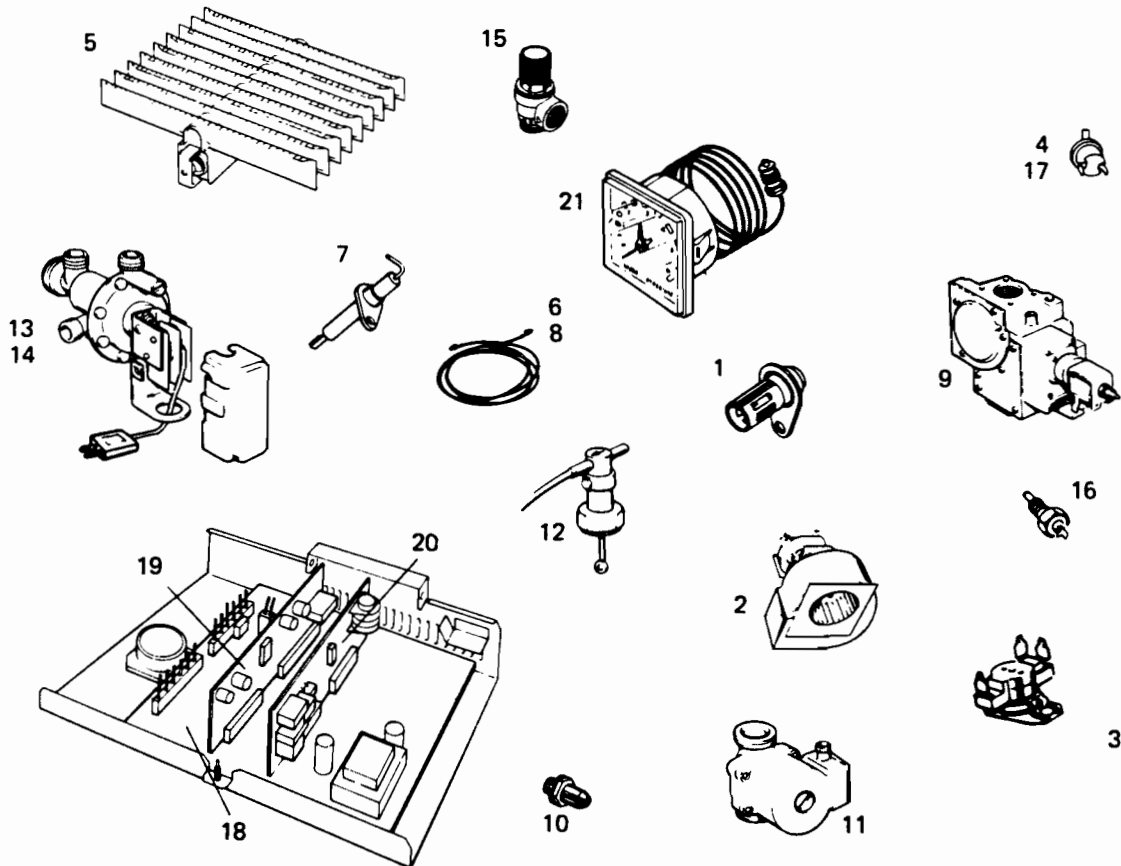
# Diagram 7

Symptom - Display does Not show increasing temperature



# PARTS LIST

Item No.	Description	No. Off	Potterton Part No.	G.C. Part No.
1	Air Flow Sensor	1	300303	337 215
2	Fan assembly - C/W Gasket	1	907600	337 224
3	Thermostat - pump overrun	1	404497	381 895
4	Thermostat - overheat central heating	1	404493	381 896
5	Main Burner - Furigas Type 126.500.017	1	414628	381 899
6	Electrode sensing lead assembly	1	407683	337 246
7	Electrode - sensing and spark	2	407681	381 897
8	Electrode spark lead assembly	1	407689	337 247
9	Gas valve - Honeywell - C/W 'O' Ring	1	607617	381 894
10	Main burner injector - Bray Cat. No. 23-2300	1	410961	398 357
11	Pump with gaskets	1	411139	389 375
12	Flow switch assembly	1	300397	337 270
13	Diverter valve assembly (includes item 14)	1	300409	337 271
14	Double micro switch and lead assembly	1	907635	337 272
15	Pressure Relief Valve 3 bar	1	430002	381 914
16	Temperature sensor DHW and CH	2	430011	337 322
17	Thermostat - overheat domestic hot water	1	404494	381 900
18	Distribution board - C/W mounting panel	1	907613	<u>337 295</u>
19	Modulator board	1	407686	<u>337 296</u>
20	Full sequence board	1	407687	337 297
21	Pressure gauge	1	430010	337 300



"All descriptions and illustrations contained in this leaflet have been carefully prepared but we reserve the right to make changes and improvements in our products which may affect the accuracy of the information contained in this leaflet"

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