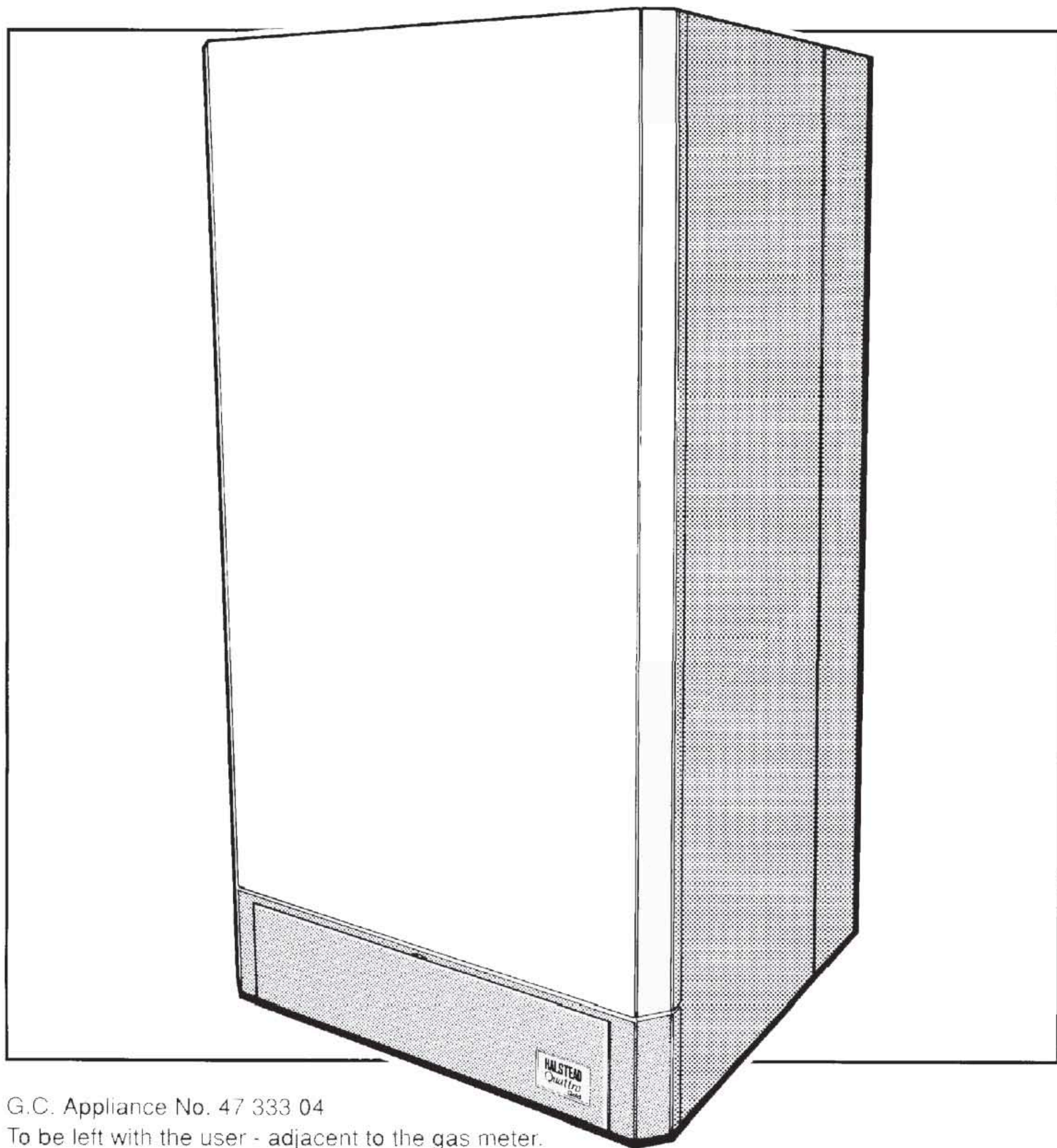


INSTALLATION AND SERVICING INSTRUCTIONS

HALSTEAD *Quattro* GOLD
FULLY AUTOMATIC FAN ASSISTED
BALANCED FLUE COMBINATION BOILER
FOR USE WITH NATURAL GAS ONLY



G.C. Appliance No. 47 333 04

To be left with the user - adjacent to the gas meter.

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systems with a vertical outlet.

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The Quattro Gold is a fully automatic, wall mounted, fan assisted balanced flue gas combination boiler for use on natural gas only. The appliance incorporates automatic direct burner ignition and a fully modulating gas control. The Quattro Gold features an attractive white enamelled casing with an inset control panel situated behind a plastic cover.

The appliance provides central heating at outputs between 8.8kW (30,000Btu/h) and 23.4kW (80,000Btu/h) with instantaneous domestic hot water at outputs between 8.8kW (30,000Btu/h) and 30kW (102,400 Btu/h). Heat output is controlled according to demand on both domestic hot water and central heating by the modulating gas control. The appliance always gives priority to domestic hot water supply.

The boiler is supplied with a standard concentric air and flue duct suitable for flue lengths of up to 750mm (29½in). The duct assembly is connected to the boiler via a turret which can exit the boiler in any horizontal direction. A vertical outlet kit is also available for installations where an outside wall is not accessible and it is desired to fit the duct 'through the roof'.

Installation using the standard flue kit is described in the main text of these instructions and an appendix at the rear of this booklet describe installations involving the vertical outlet kit. **NO OTHER FLUE KITS OR EXTENSIONS MAY BE USED WITH THIS APPLIANCE.**

The appliance can be installed from inside the room without access to the external wall providing that a wall liner is fitted and the wall thickness is less than 0.5m (19in). The wall liner is available as an optional extra. See section 4 for further details. (Note: If the vertical outlet kit is to be used, access to the roof is necessary.)

The boiler is designed for use with sealed primary water systems and incorporates a circulation pump, diverter valve, pressure gauge, safety valve and CH expansion vessel. Provision is made for expansion of DHW and therefore a separate DHW expansion vessel is not required. Isolation valves are fitted to service connections, and an automatic heating bypass is fitted to maintain an adequate flow rate through the boiler.

If thermostatic radiator valves are installed we recommend that one radiator is fitted with lockshield valves (normally in the bathroom).

A frost thermostat and an electronic time clock (with override switch) are fitted as standard equipment, and the boiler may be used with any certified mains voltage room thermostat.

2 TECHNICAL SPECIFICATIONS

2.1 PERFORMANCE DATA

Mode	Output kw (Btu/h)	Input kw (Btu/h)	Burner Pressure mbar (inwg)
Central Min	8.8 (30,000)	12.4 (42,300)	1.3 (0.5)
Heating Max.	23.4 (80,000)	29.4 (100,500)	8.8 (3.5)
DHW. Min.	8.8 (30,000)	12.4 (42,300)	1.3 (0.5)
Only Max.	30.0(102,400)	37.0 (126,200)	13.8 (5.5)

DOMESTIC HOT WATER (DHW) PERFORMANCE

DHW flow rate for 35°C temperature rise*	= 12.3 l/min (2.7gpm)
Max. (continuous)DHW outlet temperature	= 60°C (140°F)
Max. DHW temperature at nominal gas rate	= 50°C (122°F)
Min. DHW inlet pressure for boiler operation	= 0.5 bar (7 psi)
Min. DHW inlet pressure for nominal gas rate	= 1.5 bar (22 psi)
Max. DHW inlet pressure	= 10 bar (140 psi)

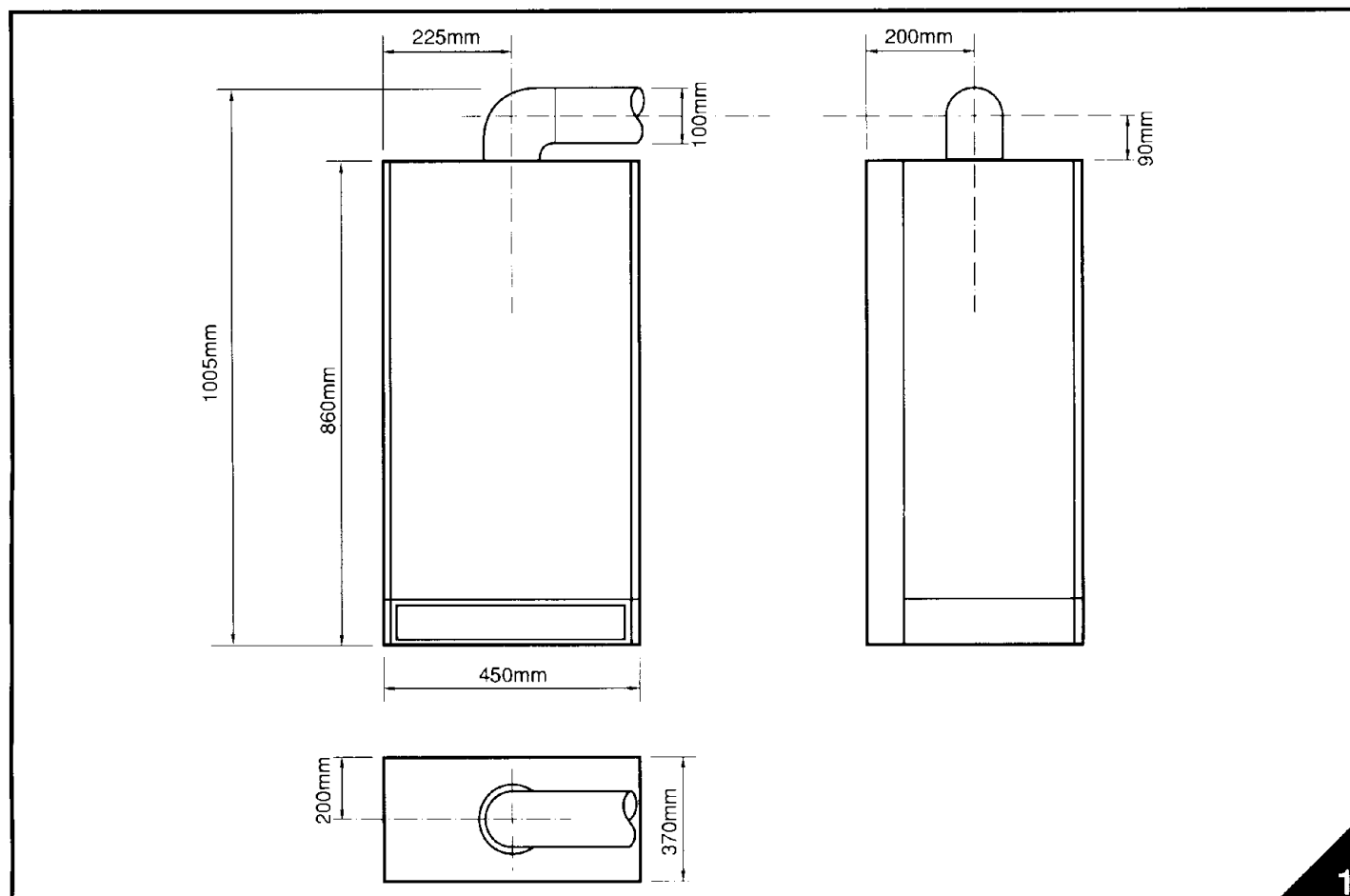
* Above incoming cold water temperature (assuming that the cold inlet temperature is below 15°C).

2.2 MINIMUM CLEARANCES

The following minimum clearances must be maintained for installing and servicing the appliance.

Above the appliance casing	200 mm	8 in
At the R.H.S	5 mm	¼ in
At the L.H.S	5 mm	¼ in
Below the appliance casing	200 mm	8 in
In front of the appliance.	450 mm	18 in

2.4 OVERALL APPLIANCE DIMENSIONS



2.3 GENERAL SPECIFICATIONS

Main burner injectors	1.30mm diameter 14 off
Total water capacity	1.9 l (0.4 gals)
Minimum CH water flow	22 l/min (4.9 gpm)
Minimum DHW water flow	2.8 l/min (0.6 gpm)
Minimum static head	0.5 bar (7.3 psi)
Maximum static head	2.5 bar (36.5 psi)
Empty weight	48 kg (106 lb)
Max lift weight	45 kg (99 lb)
Total weight (Full)	50 kg (110 lb)
Electrical Supply	220 - 240 Volts 50 Hz, Fused at 3A.
Internal Fuses	2A & 315mA.
Max Power Consumption	160 Watts
Max Gas Consumption DHW	3.5 m³/h (125 ft³/h)
Max Gas Consumption CH	2.8 m³/h (99 ft³/h)
Max CH Temperature Approx	85°C (185 F)
Integral expansion vessel	8 ltr. capacity

CONNECTION SIZES

Gas Connection	Rc ½
Central Heating Flow	22 mm Compression
Central Heating Return	22 mm Compression
Domestic Water Inlet	15 mm Compression
Domestic Water Outlet	15 mm Compression
Pressure Relief Valve Outlet	15 mm Compression

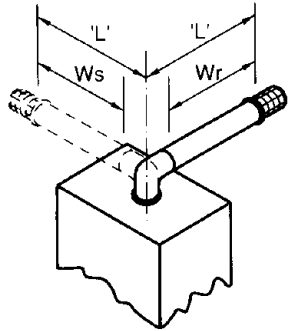
2.5 AIR/FLUE DUCT SPECIFICATIONS

The Quattro Gold is supplied complete with a 750mm air/flue duct assembly. This may be used as shown in figures 2 and 3.

NO OTHER FLUE COMPONENTS OR EXTENSIONS MAY BE USED WITH THIS APPLIANCE (if an application requires

a flue length between 750mm and 3000mm a standard **HALSTEAD QUATTRO** boiler must be specified instead of the **QUATTRO GOLD** boiler).

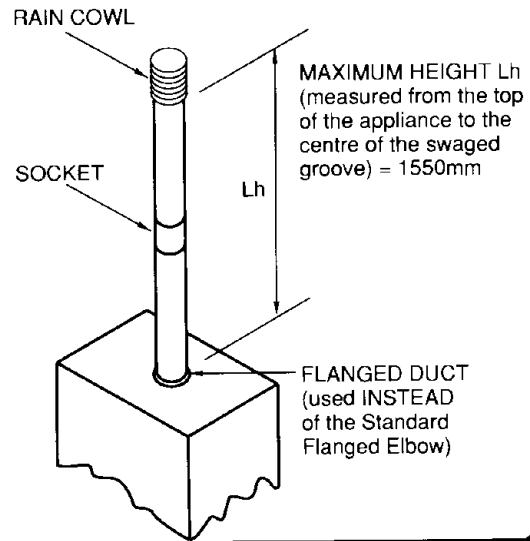
STANDARD FLUE ASSEMBLY USING EITHER SIDE OR REAR OUTLET



Flue length 'L' (measured from the boiler outlet centre line to the outside wall face) = 750mm
Maximum wall thickness W_r (Rear outlet) = 550mm
Maximum wall thickness W_s (Either side outlet) = 520mm.
(Allowing for minimum clearance of 5mm)

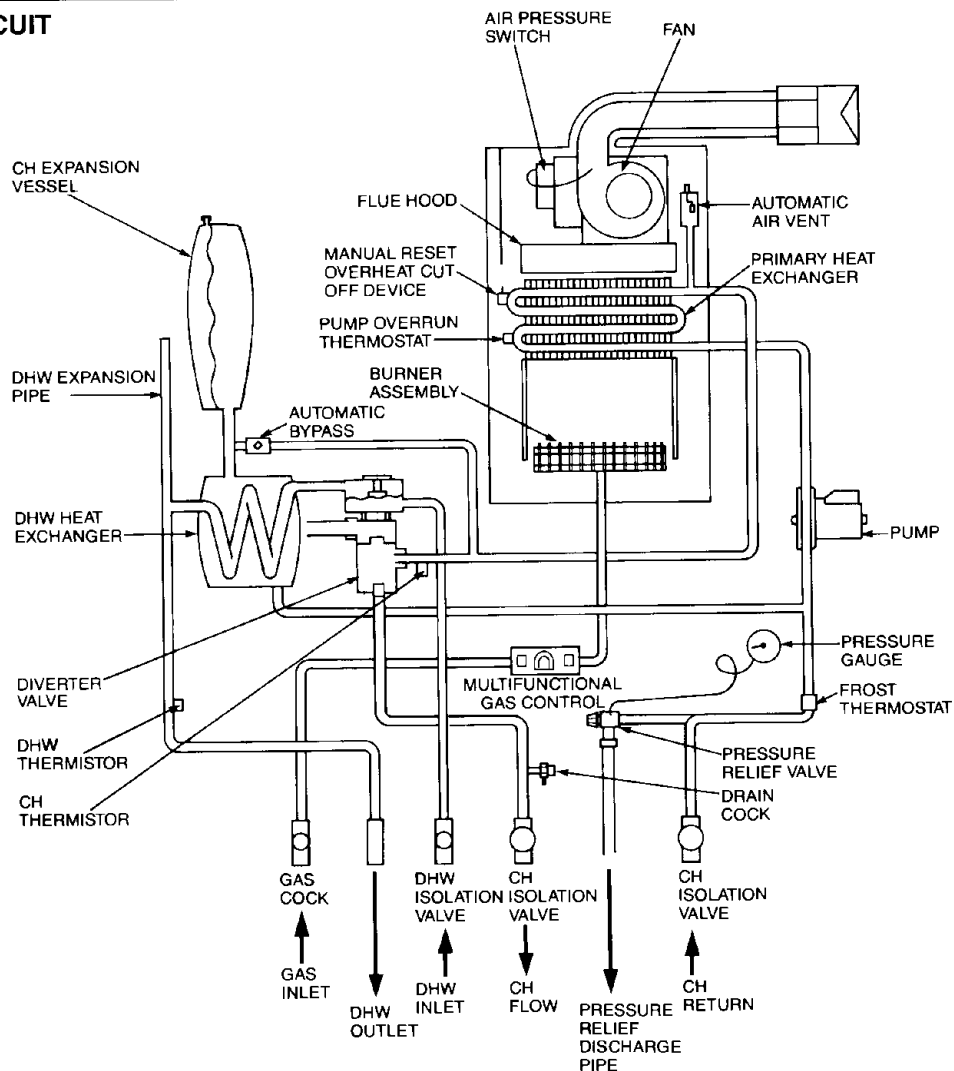
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VERTICAL APPLICATION: Requires a Vertical Flue Kit comprising Flanged Duct, Socket and Rain Cowl

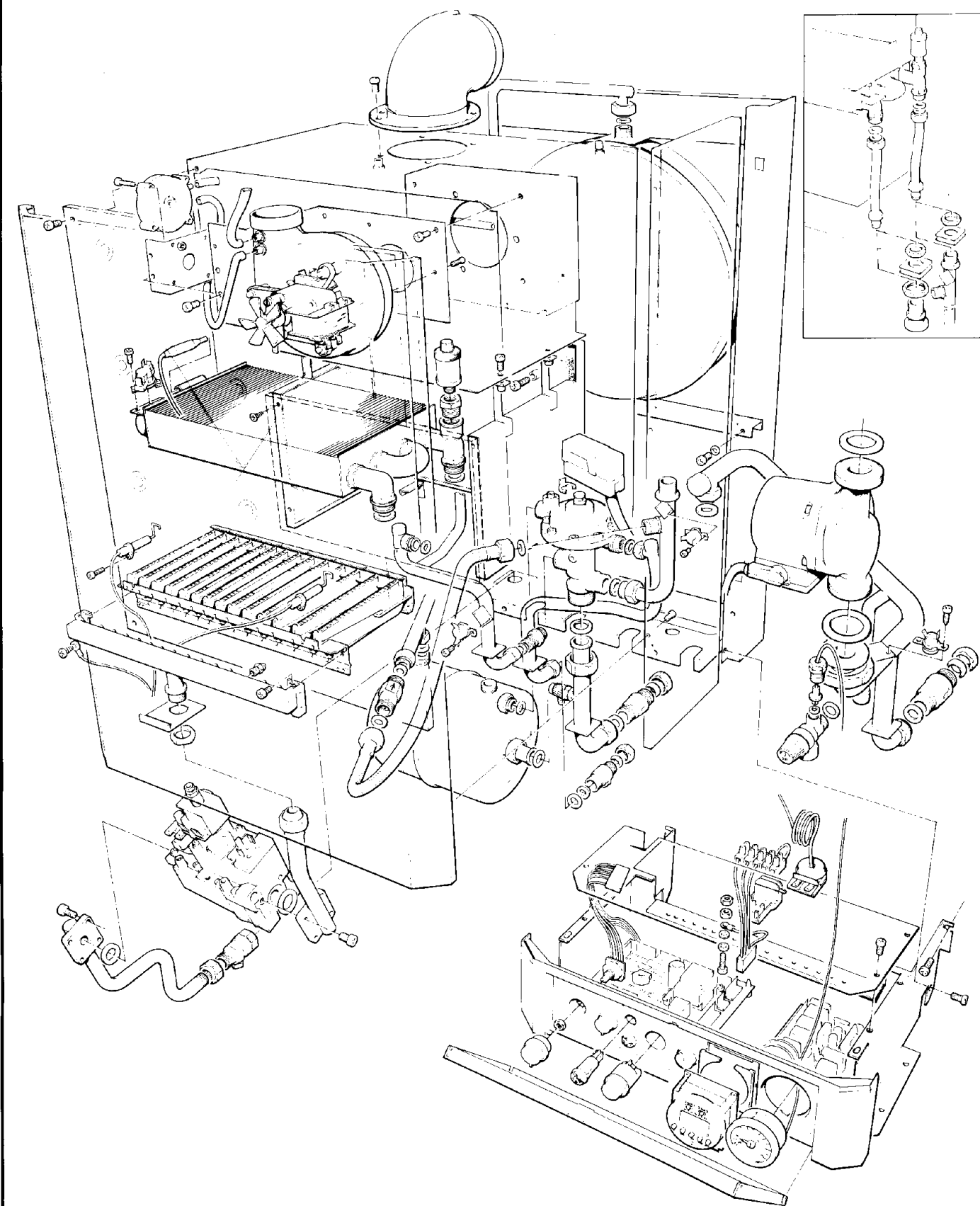


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HYDRAULIC CIRCUIT



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3 INSTALLATION REQUIREMENTS

3.1 STATUTORY REQUIREMENTS

GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1984 (AS AMENDED).

It is the law that all gas appliances are installed by a registered person, 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.

In addition to the above regulations, this appliance must be installed in accordance with the current IEE Wiring Regulations for electrical installation, local building regulations, the Building Standards (Scotland) (Consolidation) Regulations, bye laws of the local water undertaking and Health and Safety Document No. 635 'The Electricity at Work Regulations 1989'.

It should also be in accordance with the relevant recommendations in the current editions of the following British Standards and Codes of Practice: BS5449, BS5546, BS5440:1, BS5440:2, BS6798, BS6891, and BG.DM2

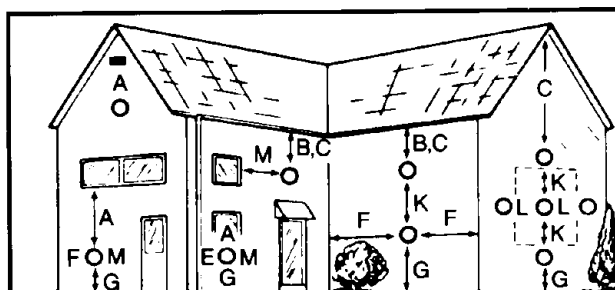
IMPORTANT NOTE: Manufacturer's instructions must NOT be taken in any way as over-riding statutory obligations.

3.2 BOILER POSITION

The following limitations **MUST** be observed when sitting the boiler:

- The boiler is not suitable for external installation. 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 appliance, and for air circulation around it. (Section 2.4 and 3.4)
- This position **MUST** allow for a suitable flue system and terminal position. (Section 2.5 and 3.3) The combination boiler must be installed on a flat vertical wall which is capable of supporting the weight of the appliance and any ancillary equipment.
- 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.
- If the appliance is to be installed in a room containing a bath or a shower, any electrical switch or control utilising mains electricity must be so situated that it cannot be touched by a person using the bath or shower. 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.
- A compartment used to enclose the appliance **MUST** be designed and constructed specifically for this purpose. An existing cupboard, or compartment, may be used provided it is modified accordingly. BS 5376:2 gives details of the essential features of cupboard / compartment design, including airing cupboards.
- Where installation will be in an unusual location, special procedures may be necessary. BS 6798 gives detailed guidance on this aspect.

3.3 FLUE TERMINAL POSITION



Under Carport with open sides

Position	minimum spacing
A Directly below an openable window, air vent, or any other ventilation opening	300mm 12in
B Below gutter, drain/soil pipe	75mm 3in
C Below eaves	200mm 8in
D Below a balcony	200mm 8in
E From vertical drain pipes and soil pipes	75mm 3in
F From internal or external corners	300mm 12in
G Above adjacent ground or balcony level	300mm 12in
H From a surface facing the terminal	600mm 24in
I Facing terminals	1200mm 48in
J From opening (door/window) in car port into dwelling	1200mm 48in
K Vertically from a terminal on the same wall	1500mm 60in
L Horizontally from a terminal on the same wall	300mm 12in
M Adjacent to opening	300mm 12in
N Below carport	600mm 24in

3.3 FLUE TERMINAL POSITION

Detailed recommendations for flue installation are given in BS 5440:1. The following notes are for general guidance.

- The boiler **MUST** be installed so that the terminal is exposed to the external air.
- It is important that the position of the terminal allows free passage of air across it at all times.
- It is **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, other sources of natural air infiltration, or forced ventilation / air conditioning.
- The minimum acceptable dimensions from the terminal to obstructions and ventilation openings are specified in Fig. 6.
- If the terminal discharges into a pathway or passageway check that combustion products will not cause nuisance and that the terminal will not obstruct the passageway.
- Where the lowest part of the terminal is fitted less than 2m (78ins) above ground, above a balcony or above a flat roof to which people have access, the terminal **MUST** be protected by a purpose designed guard. (Available as an optional extra)
- Where the terminal is fitted within 850mm (34in) of a plastic or painted gutter, or 450mm (18in) of painted eaves, an aluminium shield at least 750mm long must be fitted to the underside of the painted surface.
- The air inlet / flue outlet duct **MUST NOT** be closer than 25mm (1in) to combustible material.
- In certain weather conditions the terminal may emit a plume of steam. This is normal but positions where this would cause a nuisance should be avoided.

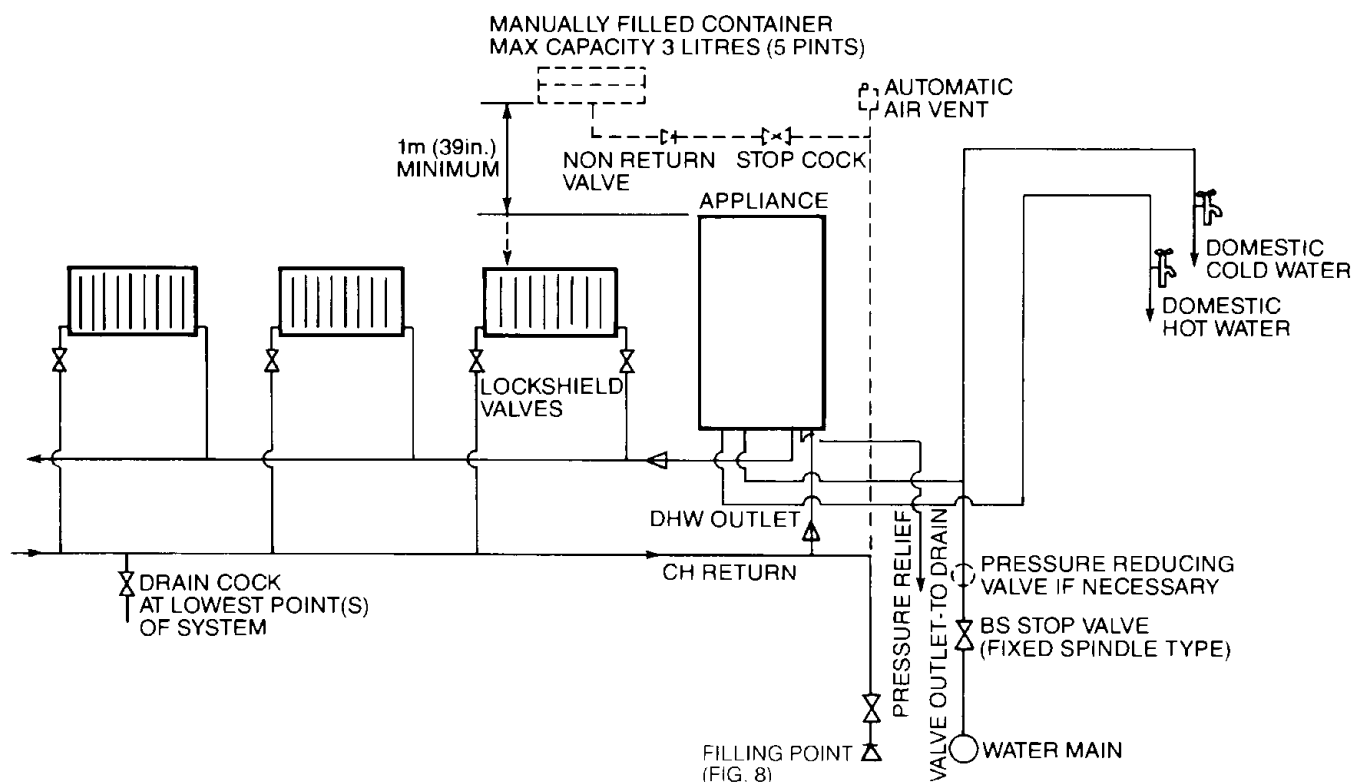
3.4 VENTILATION REQUIREMENTS

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

- It is not necessary to have a purpose provided air vent in the room or internal space in which the appliance is installed.
- If the boiler is to be installed in a cupboard or compartment, permanent air vents are required for cooling purposes in the cupboard or compartment at both high and low levels. Both air vents must communicate with either the same internal room / space or be on the same wall to external air. Each air vent communicating with another room or internal space must have a minimum effective area of 360cm² (58 in²). If the ventilation is direct to air from outside the building, the necessary areas quoted above may be halved.

3.5 GAS SUPPLY

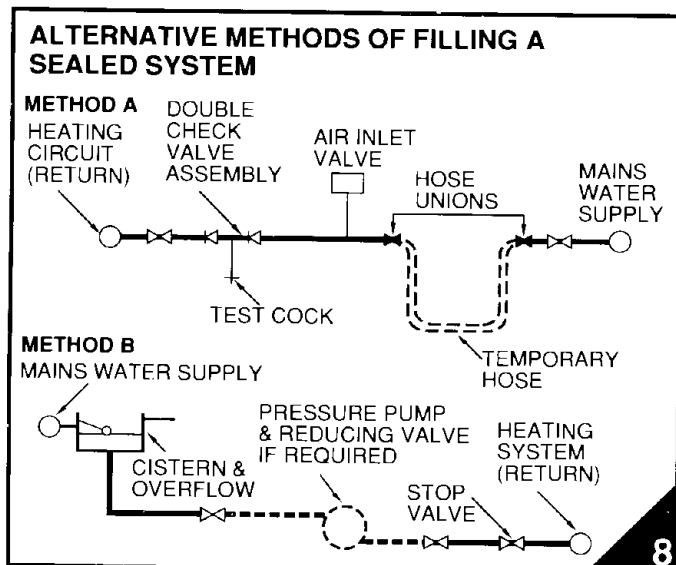
- The Local Gas Region should be consulted at the installation planning stage in order to establish the availability of an adequate supply of gas.
- An existing service pipe **MUST NOT** be used without prior consultation with the Local Gas Region.
- A gas meter can only be connected by the Local Gas Region or by a Local Gas Region Contractor.
- An existing meter should be of sufficient size to carry the maximum boiler input plus the demand of any other installed appliance. (BS 6891: 1988). The gas required for the Quattro Gold is 3.5m³ / h (125 ft³/h). A minimum of 22mm dia. pipework to within 1 metre of the appliance gas cock.
- The governor at the meter must give a constant outlet pressure of 20 mbar (8 in.wg) when the appliance is running.
- The gas supply line should be purged. **WARNING:** Before purging open all doors and windows, also extinguish any cigarettes, pipes, and any other naked lights.
- The complete installation must be tested for gas soundness.



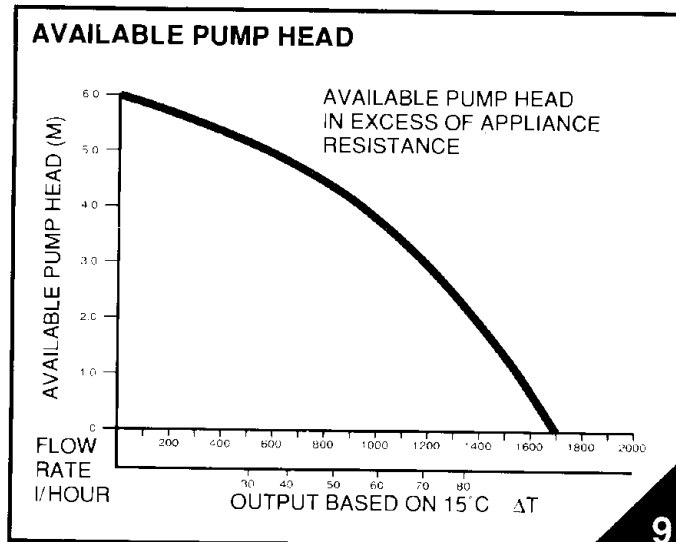
NOTE: The boiler incorporates an automatic bypass, hence no other system bypass is necessary. **However at least one radiator (preferable in the bathroom) must be permanently open, ie. fitted with two lockshield valves.**

3.6 SEALED WATER SYSTEMS - CENTRAL HEATING

- This appliance is designed for connection to sealed central heating water systems. Refer to Fig. 7 for a typical system design.
- A sealed system must only be filled by a competent person using one of the approved methods shown in Fig. 8. The system design should incorporate the connections appropriate to one of these methods.
- The available pump head is given in Fig. 9.
- A minimum flow rate corresponding to a heating differential of 15°C must be obtained at all times.
- An automatic heating by-pass is fitted within the appliance.
- The following paragraphs outline the specifications of the items fitted to the boiler.



8



9

PUMP

The available head shown in Fig. 9 is that in excess of the appliance hydraulic resistance, i.e. that available for the system.

EXPANSION VESSEL

Fig. 10 shows the maximum system volume that the integral expansion vessel can sustain under different charge pressure conditions. If the system volume exceeds that shown, an additional expansion vessel must be fitted and connected to the heating system primary return pipe as close as possible to the appliance. If an extra vessel is required, ensure that the total capacity of both vessels is adequate. Further details are available in the current issues of BS5449 and BS6798.

NOTE: If the pressure gauge indicates 2.65 bar or greater when the appliance is at maximum temperature with all radiators in circulation an extra expansion vessel is required.

PRESSURE GAUGE

A pressure gauge is situated on the appliance control panel. This can be viewed by lowering the plastic panel cover.

PRESSURE RELIEF VALVE

A pressure relief valve set at 3 bar (43.5 psi) is supplied with the appliance.

EXPANSION VESSEL REQUIREMENTS

Vessel charge and initial system pressure	bar	0.5	1.0	1.5
	psi	7.3	14.5	21.8
Total water content of system using 8ltr. (1.76 gal.) capacity expansion vessel supplied with appliance		96ltr.	73ltr.	50ltr.
		21 gal	16 gal	11 gal
For systems having a larger capacity multiply the total system capacity in litres (gallons) by the factor to obtain the total minimum expansion vessel capacity required litres (gallons).		0.0833	0.109	0.156

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3.7 DOMESTIC HOT WATER SYSTEMS

- Check that the mains water pressure is sufficient to produce the required DHW flow rate, but does not exceed the maximum DHW pressure (10 bar). If necessary, a pressure reducing valve must be fitted to the mains supply before the DHW inlet connection.
- The final 600mm (24in) of the mains supply pipe to the boiler must be copper.
- A restrictor is fitted within the appliance inlet valve to restrict the maximum water flow to a rate of 15 l/min (3.3 gpm). (Higher flow rates would not damage the appliance but would lower the water temperature rise below an acceptable level.
- If the appliance is installed in an area where the temporary hardness of the water supply is high, say over 150ppm, the fitting of an in line scale inhibitor may be an advantage. Consult the Local Water Undertaking if in doubt.
- For specific information relating to fittings (eg. Showers, washing machines etc) suitable for connection in the DHW circuit, consult the Local Water Undertaking. However the following information is given for guidance:
DOMESTIC HOT/COLD WATER SUPPLY TAPS AND MIXING TAPS. All equipment designed for use at mains water pressure is suitable.
SHOWERS & BIDETS. Any mains pressure shower or bidet complying with the Local Water Undertaking byelaws is suitable.

3.8 ELECTRICITY SUPPLY (240V 50Hz) Fuse 3A

- Wiring external to the appliance must be in accordance with the current I.E.E. Wiring Regulations for electrical installation and any local regulations which apply.
- The mains cable must be at least 0.75mm² (24/0.2mm) PVC Insulated to BS6500 table 16.)
- THIS APPLIANCE MUST BE EARTHED.** (Failure to provide a satisfactory Earth connection may result in appliance malfunction)
- The method of connection to the mains supply must facilitate complete electrical isolation of the appliance. Either a 3A Fused three pin plug and unswitched shuttered socket outlet, both complying with BS1363, or a 3A fused double pole switch having a 3mm contact separation in both poles and serving only the boiler (and its external controls) may be used.

3.9 EXTERNAL CONTROLS

The appliance may be used with any certificated mains voltage room thermostat as described in section 4.

4 INSTALLING THE APPLIANCE

4.1 UNPACKING THE APPLIANCE

The appliance with standard flue kit is supplied in a single cardboard carton. If the appliance is to be installed without access to the outside wall, a wall liner kit is required.

Open the carton and check the contents against the following lists.

BOILER COMPONENTS:

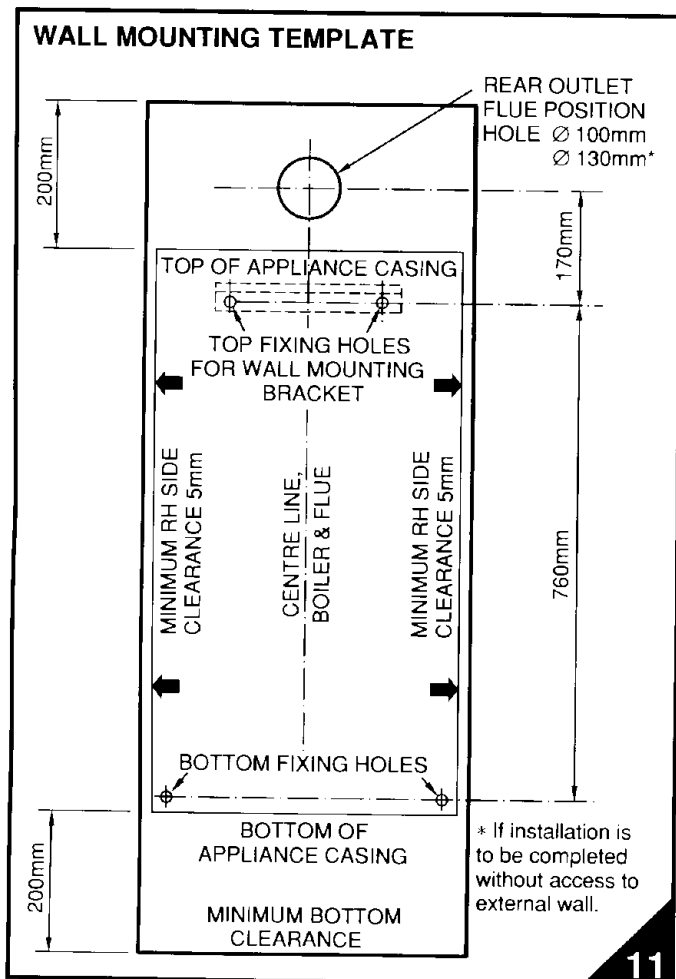
Boiler (Assembled.)
Boiler casing - front and both side panels
Installation, Servicing, and Users instructions.
Wall mounting template (Paper)
Wall mounting bracket & fixing screws with wall plugs
Plastic bags containing:
Aluminium wall sealing ring
Fixing screws
Gaskets

FLUE COMPONENTS:

Inner duct (flue) c/w flue terminal and location springs.
Outer duct (air)
Silicon rubber seal
Flue elbow
Protective sleeve

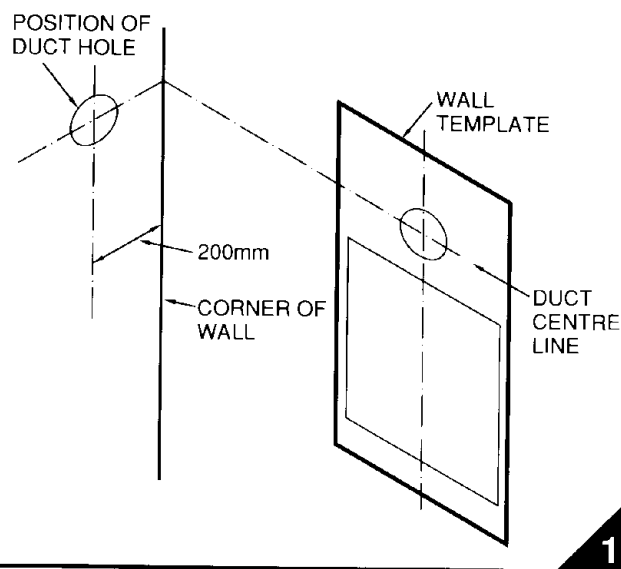
4.2 PREPARING THE WALL

Before installing the appliance ensure that the chosen location is suitable (Section 3.2) and that the requirements for flue position, (Section 3.3), & minimum clearances, (Section 2.4) are satisfied. These minimum clearances are essential to provide access for servicing, and are included on the wall mounting template.



- Open the paper template (Fig. 11) and tape the template onto the wall in the desired position. (Ensuring that the centre line is level).
- Mark the position of the two wall mounting bracket fixing holes and the two lower fixing holes.
- REAR OUTLET ONLY:** If the installation is to use a rear outlet, mark the position of the air/flue duct hole (from the paper template) onto the rear wall.
- SIDE OUTLET ONLY:** If the installation is to use a LH or RH side outlet, mark the position of the centre line of the air/flue duct hole (from the paper template) onto the rear wall. Extend this mark horizontally until reaching the side wall face, then draw the position of the air/flue duct hole as detailed in Fig. 12.
- Remove the paper template and check the dimensions between the centre lines of the flue and fixing holes shown in Fig. 11. Drill the top two fixing holes using a 10mm masonry drill and the bottom two fixing holes using a 6mm masonry drill. Fit the plastic plugs provided.

MARKING THE POSITION OF A SIDE FLUE

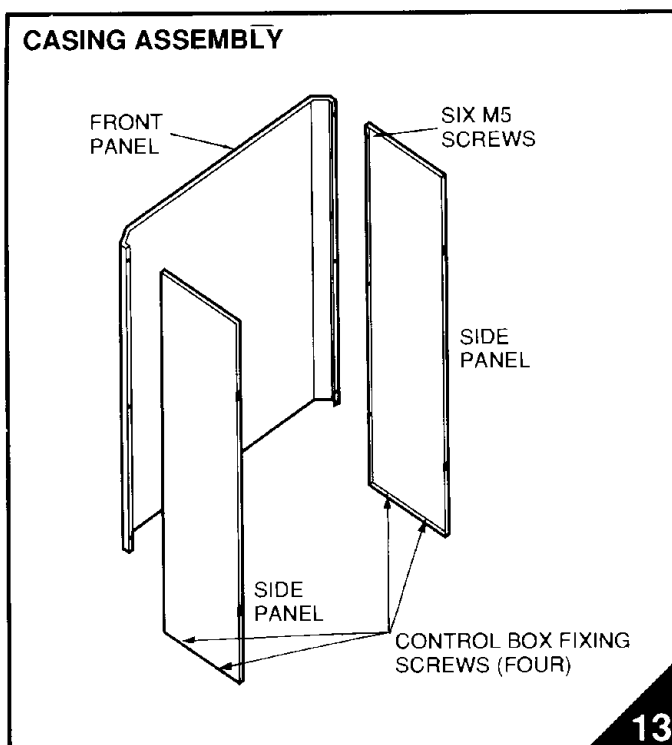


- Cut the hole in the wall for the flue / air duct. The diameter should not be less than 100mm (4in) and must be horizontal. If the hole is not accessible from the outside of the building, its minimum diameter should be sufficient to allow the insertion of the wall liner (130mm (5 1/4 in) diameter) which will be sealed with mortar. Refer to Fig. 17 (The wall liner is available as an optional extra.)
- Accurately measure the wall thickness, and note this dimension for use later.
- Secure the wall mounting bracket in position using the screws provided. Ensure that the bracket is the correct way up (screws at the bottom)

4.3 MOUNTING THE BOILER

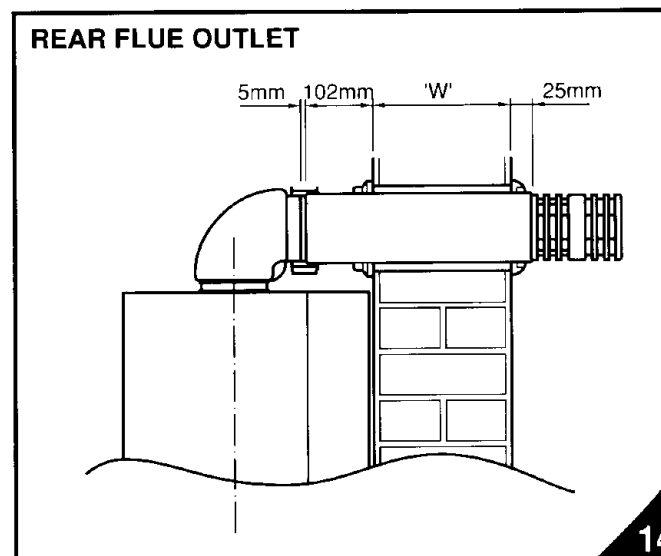
- Lift the boiler into position. The upper cross member locates onto the wall mounting bracket. Slide the appliance sideways (if necessary) until the lower frame fixing holes line up with the wall plugs. Fit the two lower fixing screws to prevent any further movement.

- b) Assemble the boiler casing panels with reference to Fig. 13, then move the casing to a safe place away from the boiler. (The casing should not be fitted to the boiler until the installation is complete and the boiler has been commissioned).



ALL INSTALLATIONS

- b) Cut the air duct square to the mark and remove all burrs and sharp edges.
- c) Refer to Fig. 16. Hold the air duct at the plain end, and slide the flue duct (small duct) inside the air duct (terminal first) until the external swage of the terminal stops against the internal swage of the air duct, then mark off the length to be cut which leaves 28mm protruding flue duct.
- d) Remove and cut the flue duct square to the mark and remove all burrs and sharp edges.



4.4 FLUE/AIR DUCT AND TERMINAL PREPARATION

If the wall thickness is less than 0.5m (19in) the flue/air duct may be fitted without access to the outside wall providing that the optional wall liner kit is used. (This consists of a pipe, 0.5m long and 129mm outside diameter with a 1mm wall thickness.)

4.4.1 FLUE/AIR DUCT LENGTHS

- a) Installations using only the standard ducts are described in this section. Vertical installations are described in appendix 1 at the rear of this booklet.

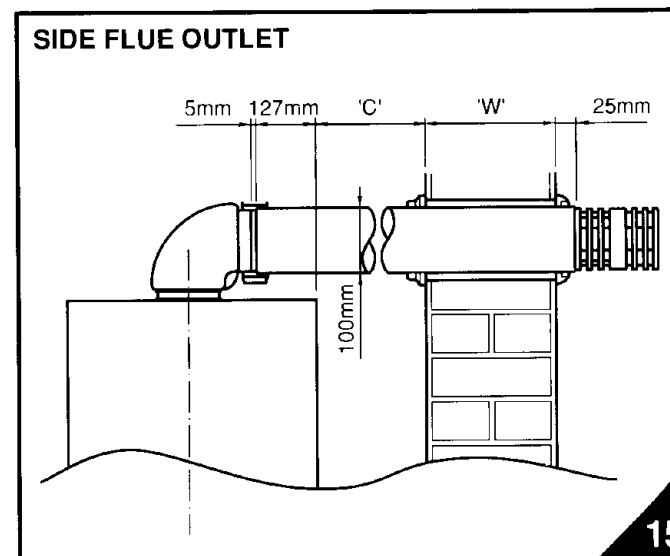
4.4.2 CUTTING THE FLUE/AIR DUCT TO THE CORRECT LENGTH

(A) REAR FLUE OUTLET ONLY. (Fig 14)

- a) Select the air duct (larger duct) and starting at the formed end, 'mark off' the length to be cut which is:
- $$102\text{mm} + \text{Wall thickness 'W'} + 25\text{mm}$$
- $$(4\text{in} + \text{Wall thickness 'W'} + 1\text{in})$$

(B) SIDE FLUE OUTLET ONLY. (Fig 15)

- a) Select the air duct (larger duct) and starting at the formed end, 'mark off' the length to be cut which is:
- $$127\text{mm} + \text{Clearance 'C'} + \text{Wall thickness 'W'} + 25\text{mm}$$
- $$(5\text{in} + \text{Clearance 'C'} + \text{Wall thickness 'W'} + 1\text{in})$$



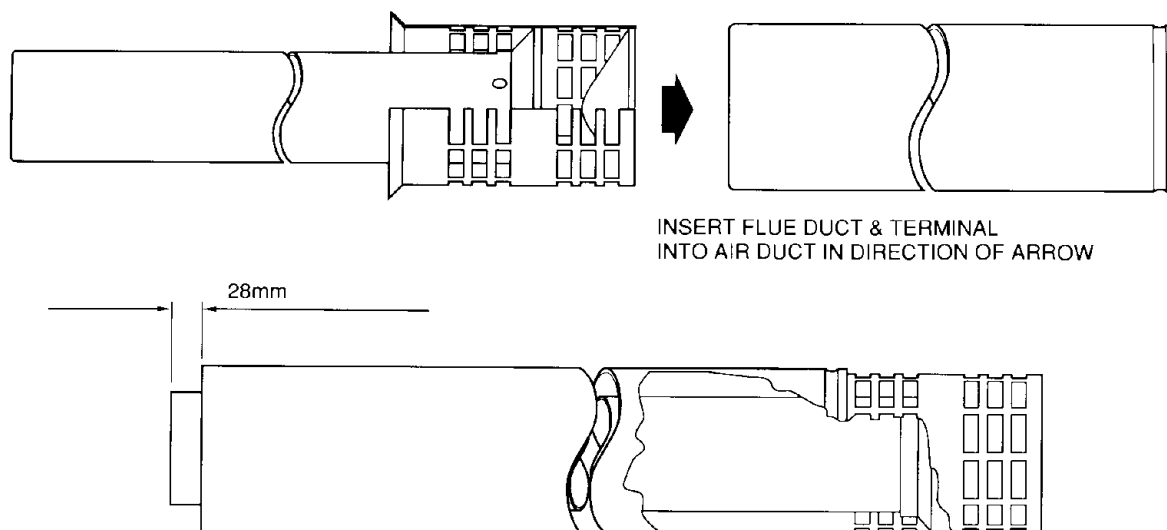
4.5 FLUE AND AIR DUCT INSTALLATION

4.5.1 INSTALLATIONS FROM INSIDE THE ROOM

(Wall thicknesses up to 0.5m (19¾in) only), Hole diameter to accept wall liner must be 130mm (5¼in) Fig. 17.

- a) A wall liner, 127mm (5 in) internal diameter, 500mm (19¾in) long is available as an optional extra for use when fitting the flue/air duct from inside the building, (or where it is required to seal the hole through a cavity wall). Cut the liner to the wall thickness, insert into the hole, and seal with mortar at inner and outer wall faces. Access to the outside can be made by inserting ones hand through the liner.

DUCT ASSEMBLY PROCEDURE



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- b) Refer to Fig. 16. Push the flue duct assembly into the air duct in the direction shown in Fig. 16 until the external swaged ring on the flue terminal stops against the internal swage on the air duct.
- c) From inside the building slide the duct assembly into the wall liner until the sealing ring passes completely through the wall, then pull the air duct back until the ring is pulled up to the wall surface. (Fig. 17)
- d) Proceed to section 4.5.3.

4.5.2 INSTALLATIONS FROM OUTSIDE THE BUILDING. (Hole diameter 100mm (4in))

- a) Refer to Fig. 16. Push the flue duct assembly into the air duct in the direction shown in Fig. 16 until the external swaged ring on the flue terminal stops against the internal swage on the air duct.
- b) From inside or outside the building, slide the duct assembly into the wall until the sealing ring forms a good seal against the outside wall.

4.5.3 CONNECTING THE DUCT ASSEMBLY ALL INSTALLATIONS

- a) With reference to Fig. 17, slide on the white rubber seal, check that the rubber sealing ring (F) is pulled up to the wall and that the duct assembly is horizontal.
 - b) Push the thinner section of the rubber sleeve (B) over the air duct as shown in Fig. 17.
 - c) Push the elbow socket onto the flue duct.
- NOTE:** There will be a gap of approximately 5mm (1/4in) between the end of the AIR duct and the elbow. This can be seen in Fig. 15 and will be sealed by steps (f) and (g).
- d) Fit the elbow onto the top of the appliance, taking care to ensure that the fan outlet and flue duct are correctly engaged into the flue elbow.
 - e) Secure the elbow to the top of the appliance using the four screws provided.

- f) Check that the rubber sleeve is over the flue elbow as shown in Fig. 17 and ensure that it forms a satisfactory seal.
- g) Fit the protective collar over the rubber sleeve and tighten the securing screws.
- h) Where necessary (see section 3.3 (f)) fix the terminal guard centrally over the terminal.

4.6 GAS CONNECTIONS

Connect the gas supply to the gas service cock using a suitable jointing compound.

4.7 WATER CONNECTIONS

- a) Connect the central heating pipework to the flow and return connections (Fig. 21).
- b) Connect the DHW supply and outlet to the appropriate connections (Fig. 21).

4.8 PRESSURE RELIEF VALVE CONNECTION

Connect a suitable discharge pipe from the pressure relief valve. The discharge pipe should be a minimum of 15mm copper, and should avoid sharp corners or upward pipe runs where water may be retained. The discharge pipe must terminate in an area where any discharge will not cause a hazard but will be noticed.

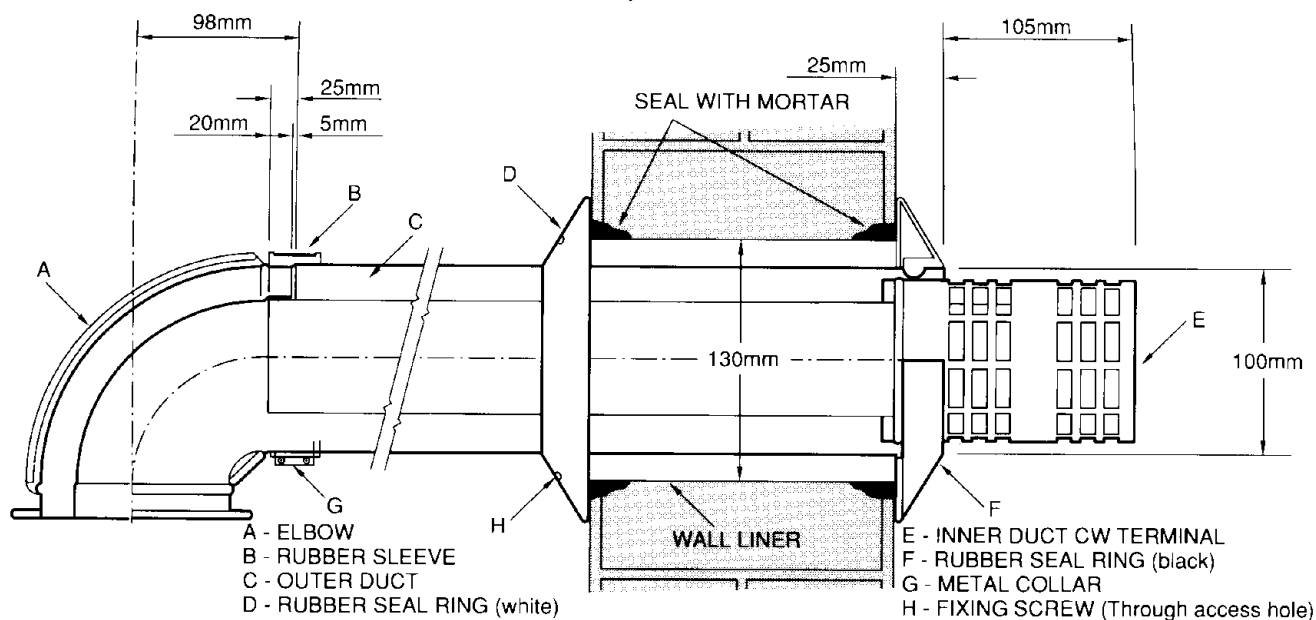
4.9 WIRING INSTRUCTIONS (Refer to Section 3.8/3.9)

The external wiring is connected to the boiler via a terminal block on the top of the control box.

1 metre of cable is supplied pre-wired to the boiler. If a longer length is required then follow the procedure on page 11.

- a) Lower the control box to an angle of approximately 45° by removing the two temporary screws (Fig. 18).

FLUE & AIR DUCT ASSEMBLY (SECTIONAL VIEW)



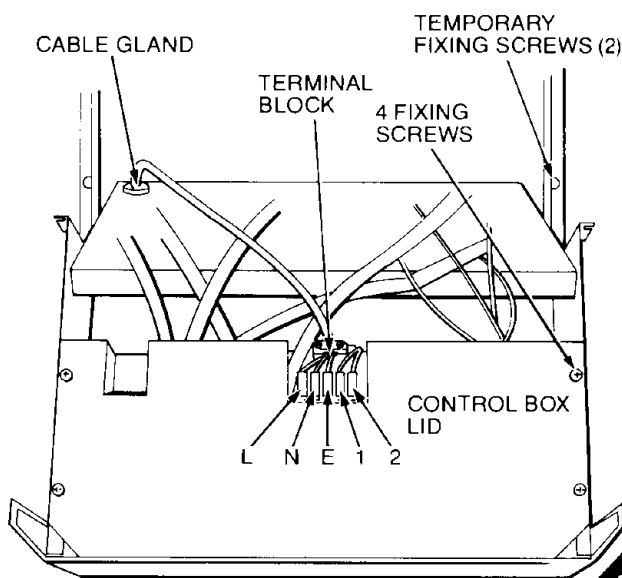
17

- b) Pass the supply cable through the strain relief clamp in the connection plate at the bottom of the boiler on the LHS and connect to the terminals marked L, N, and $\perp$ on the terminal block (Fig. 18). ENSURE that the earth conductor length is such that if pulled from its anchorage the current carrying conductors become taut before the earth conductor. All cables must be secured in the anchorage.
- c) If a room thermostat is to be used, remove the link between terminals 1 and 2 and connect the switching conductors in their place. If the room thermostat requires a neutral supply, connect this to the N terminal.

NOTE: no other connections should be made to the mains supply terminals.

- d) Connect the mains plug. (Brown wire to L, Blue wire to N, and Green/yellow wire to Earth terminal).
- e) Carry out electrical systems checks with a suitable test meter:- Earth continuity, polarity, resistance to earth, and short circuit.

ELECTRICAL CONNECTIONS



18

5 COMMISSIONING & TESTING

Before commissioning the appliance, the whole gas installation including the meter **MUST** be purged and tested for gas soundness in accordance with BS 6891:1988.

IMPORTANT: Open all doors and windows, extinguish naked lights, and **DO NOT SMOKE** whilst purging the gas line.

Before commencing the commissioning procedure, ensure that the gas service cock is turned on, the electricity supply is isolated, and that the DHW and CH isolation valves are in the closed position.

5.1 FILLING THE WATER SYSTEM

- Open the CH flow and CH return valves. Items 'E' and 'G', Fig. 21.
- Remove the sealed chamber front panel (4 screws - Fig. 23). **Loosen the automatic air vent cap on the flow pipe near the heat exchanger.**
- Fill the system with water using one of the approved methods described in section 3.6 to about 2.0 bar. Vent the system via the radiator valves and system air vents in accordance with normal practice. Ensure that all system air vents are closed.
- Check the system for water soundness and refit the sealed chamber front panel.
- Check the operation of the pressure relief valve (Fig. 4) by rotating the plastic head anti-clockwise 1/4 of a turn and checking that water is discharged. Ensure that the valve seats correctly and does not leak. If the valve leaks or is stuck closed, replace it.

f) IMPORTANT

- Completely drain the appliance and heating system, thoroughly flush the system, and refill as in (c) to the

system design pressure (between 0.5 and 1.5 bar) Follow the commissioning procedure described below, then repeat this instruction with the system hot. It is recommended that the system is cleaned with a recognised system cleaner such as Fernox or Sentinel.

- Open the DHW Inlet valve (Item 'D' Fig. 21), open and close each hot tap in turn and clear air bubbles.
- Remove the pump end cap and using a screwdriver rotate the rotor, replace cap.**

5.2 COMMISSIONING THE BOILER

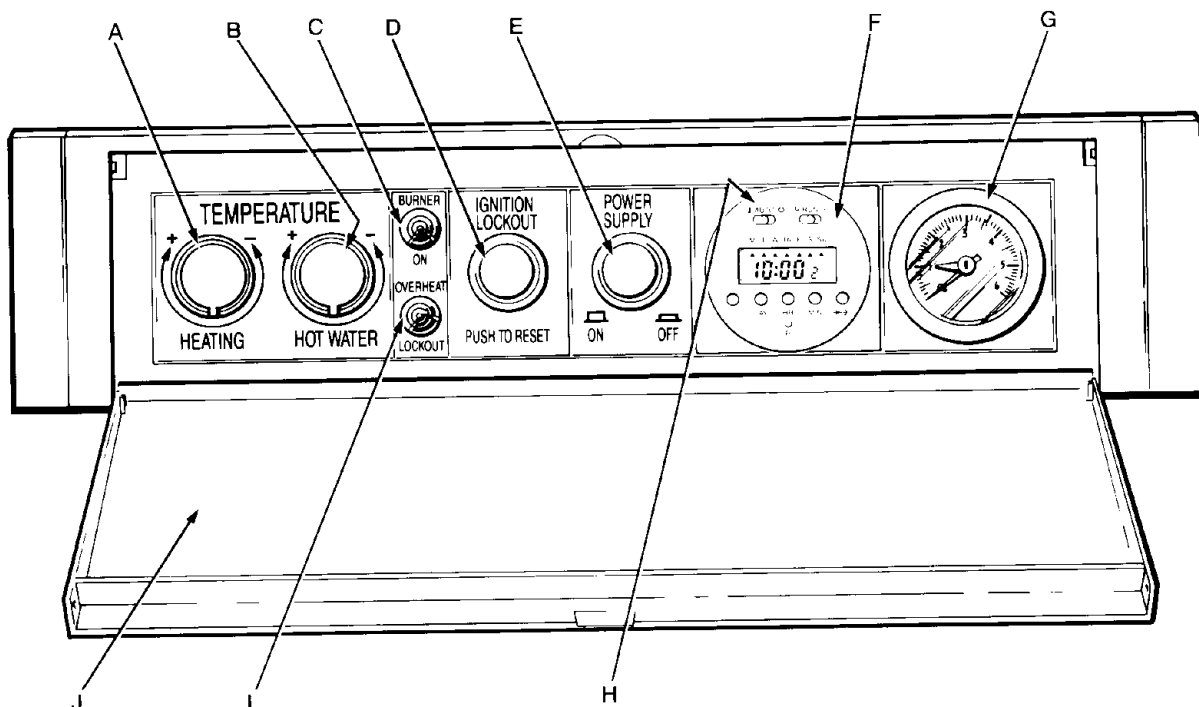
- Loosen the screw and connect a pressure gauge to the burner pressure test point on the gas valve. (Fig. 24).
- Ensure that the clock override switch on the fascia panel ('H', Fig. 19) is set to the 'OFF' position (hot water only), then turn the hot water thermostat ('B' Fig. 19) to maximum (fully clockwise). Turn on the electrical supply and press the power supply button ('E', Fig. 19). Fully open any DHW tap and the burner will light.

If the burner fails to light after 10 seconds the ignition lock-out will operate. Wait 15 seconds and press ignition lock-out reset button.

- Allow the boiler to run for at least 10 minutes and check that the burner pressure is 13.8 mbar (5.5 inwg) +/- 10%. The DHW burner pressure is factory set and should not require adjusting. If the burner pressure is low, check that the appliance has not started to modulate (This will occur if the DHW flow rate is low. If modulation is suspected, open all DHW taps to maximise flow and re-check burner pressure.)

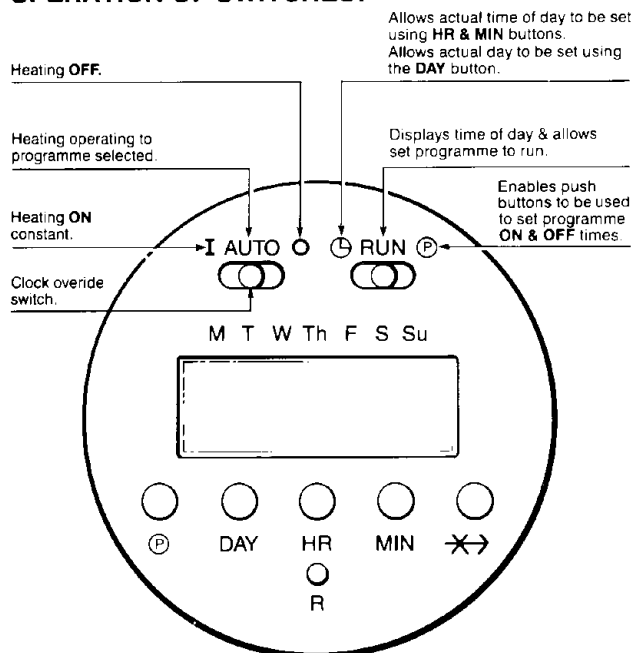
If it is necessary to adjust the DHW burner pressure the method is described in section 9.6 - Gas valve replacement.

FASCIA PANELS & CONTROLS

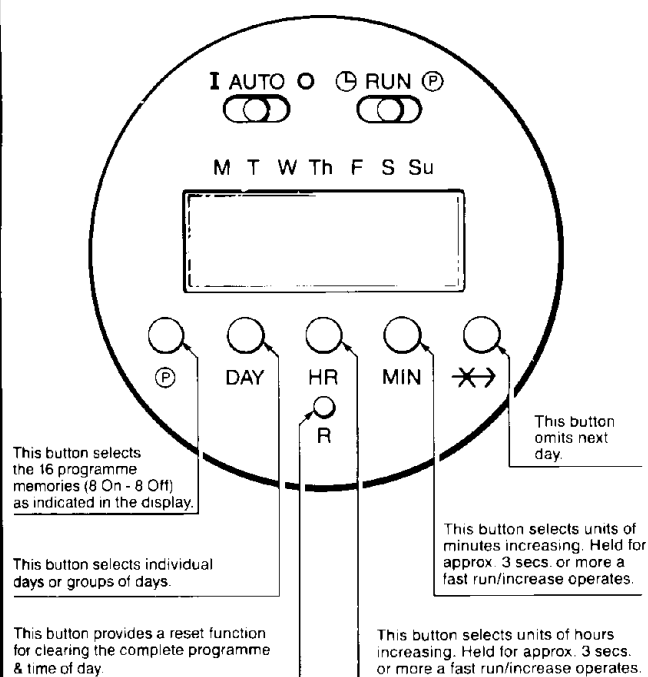


g) SETTING THE CLOCK

OPERATION OF SWITCHES:



OPERATIONS OF BUTTONS:



20

OMIT NEXT DAY $\rightarrow$

This button allows you to skip the next day programme without clearing the total set programme.

Commences at midnight of the day selected and continues for 24hrs allowing the first programme of the following day to commence normal running. A sign is displayed.

If pressed again during the OFF day, another 24hrs are added. A flashing arrow is displayed under the selected OFF day.

To cancel the omit function press the button again. The $\rightarrow$ indication on the display will disappear.

PROGRAMMING THE TIMER:

A Press $\bigcirc$ (reset) to clear any previous inputs.

B Switch to $\text{RUN } \textcircled{P}$

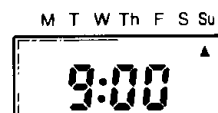
C Set time of day using $\bigcirc$ $\bigcirc$
HR MIN

D Set actual day using $\bigcirc$
DAY

An arrow will be displayed under the actual day

Set to $\text{RUN } \textcircled{P}$

Actual time of day will be displayed (flashing colon)



E Set to $\text{RUN } \textcircled{P}$

F Select day or group of days by pressing $\bigcirc$
DAY

G Select ON/OFF switch selection ($8 \text{ ON} * 8 \text{ OFF}$) by pressing $\bigcirc$ $\textcircled{P}$

(Number and symbol in the display indicates the selection)



ON and OFF

H Select time of ON/OFF programme required by pressing $\bigcirc$ $\bigcirc$
HR MIN

I When all the switching selections for the next days are completed, set to $\text{RUN } \textcircled{P}$

J Ensure the switch is set to Auto. Timer is now set to run automatically on times programmed. $\text{I AUTO } \bigcirc$

K To use omit functions press $\rightarrow$

(The sign will be displayed - indicating selection) The omit function will then operate from midnight for 24hrs. During this period a flashing arrow will be displayed under the applicable day and the $\rightarrow$ sign will not be displayed. (Programme commences again 24hrs. on).

- d) Close the DHW tap and ensure that the 'burner on' neon ('C', Fig. 19) goes off, burner goes out, and pump stops.
- e) Ensure that the room thermostat (if fitted) is calling for heat. Turn the heating thermostat knob ('A' Fig. 19) to maximum (fully clockwise), then turn the clock override switch ('H' Fig. 19) to the **I** position. The burner will light.

NOTE: that the central heating burner pressure is factory set at approx. 8.8 mbar. If adjustment is necessary refer to section 9.11 page 24.

- f) Slide the clock override switch to the 'timed' (Auto) position and check the operation of the clock and room thermostat (If fitted).

5.3 DOMESTIC HOT WATER FLOWRATE

A flow restrictor is supplied fitted to the appliance to ensure that no adjustment is necessary. However if the temperature of the hot water is too low it is possible to reduce the flow rate by adjusting the flow restrictor situated on the diverter valve. Should the mains flow rate be below the minimum required it is possible to remove the flow regulator from the DHW inlet cock.

5.4 FINAL CHECKS

- a) Remove pressure gauge and tighten burner pressure test point screw. Relight burner and test for gas soundness.
- b) Fit the boiler casing as described: Leave the control box at a 45° angle as described in section 4.9(a). Lift the casing into position from in front of the boiler and slide it slightly downwards until the tabs on the side panels locate in the slots in the frame. Lift the control box back into position and secure it to the casing using the four fixing screws underneath. (Note that the temporary screws holding the control box in position (Fig. 18) should be discarded)
- c) Set the heating and hot water thermostats to the required settings. Ensure that the clock override switch is in the timed position, and check that the time clock is set at the desired time periods. Set the room thermostat (if fitted) to the required setting.

5.5 IGNITION LOCK-OUT

In the event of an ignition failure, wait 15 seconds, then press the ignition re-set button ('D' Fig. 19) once to re-set the ignition system. (Failure to wait 15 seconds causes a further delay).

5.6 OVERHEAT THERMOSTAT

- a) This appliance is fitted with an overheat thermostat. In the event of overheating, the appliance will shut down and the 'overheat' neon will light. If an overheat condition occurs allow the appliance to cool, then press the overheat re-set button once located underneath the appliance at the rear.

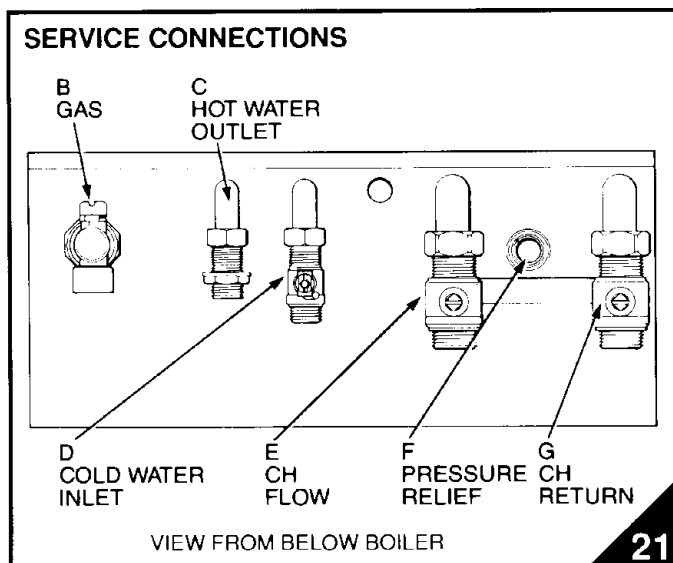
5.7 FROST THERMOSTAT

- a) This appliance is fitted with a frost thermostat. In the event of very cold conditions (when the internal pipework temperature falls below 5°C) the boiler will light for a few minutes to protect the appliance and system from potential frost damage.

5.8 USER'S INSTRUCTIONS

Upon completion of commissioning and testing the system, the installer should hand over to the user, with reference to the following.

- a) Give the 'Users Instructions' to the householder and emphasise their responsibilities under the 'Gas Safety (Installation and Use) Regulations 1984' (as amended).
- b) Explain and demonstrate the lighting and shutdown procedures.
- c) Advise the householder on the efficient use of the system, including the use and adjustment of all system controls for both DHW and CH.
- d) 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.
- e) Explain the function of the boiler over-heat thermostat, and how to reset it. Emphasise that if cut-out persists, the boiler should be turned off and the installer or service engineer consulted.
- f) Stress the importance of an annual service by a registered heating engineer.



6 ROUTINE SERVICING

To ensure continued efficient operation of the appliance, it is recommended that it is checked and serviced as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage but in general once a year should be adequate. It is the law that any service work must be carried out by a competent person such as British Gas or other CORGI registered personnel.

The boiler incorporates a flue sampling point on the top panel in front of the flue outlet. If the service engineer has a suitable equipment to analyse the flue gas, the plastic cap may be removed and a 6mm inside diameter sample tube fitted. Do not forget to replace the plastic cap after use.

Before commencing any service operation, ISOLATE the mains electrical supply, and TURN OFF the gas supply at the main service cock.

Service the appliance by following the full procedure detailed below. :

a) MAIN BURNER ASSEMBLY

(Refer to figure 23 except where stated)

- 1 Remove the outer casing as follows: Remove the four control box fixing screws and lower the control box to an angle of approximately 45°. Slightly lift both casing side panels and then lift the whole casing clear of the appliance.
- 2 Remove the sealed chamber front panel (4 screws)
- 3 Unscrew the 4 screws securing the combustion chamber front panel and remove the panel, taking care not to damage the insulation
- 4 Unscrew the small screw retaining the ignition electrode at LHS of burner and withdraw the electrode from the burner. Repeat this for the detection electrode on the RHS, and the burner earth wire.
- 5 Unscrew the burner manifold union and the manifold locking nut. Disengage the burner location bracket. Take care to support the multifunctional control to prevent strain on the gas supply fittings.
- 6 Lift the front of the burner sufficiently to disengage the manifold thread. Carefully withdraw the burner.
- 7 Remove the burner manifold by disconnecting the four posi-head screws.
- 8 Inspect and, if necessary, clean the injectors.
- 9 Inspect and, if necessary, clean the main burner bars.

b) IGNITION AND DETECTION ELECTRODES

- 10 Inspect the ignition and detection electrodes. Clean if necessary. If either electrode shows signs of damage or wear, replace it.

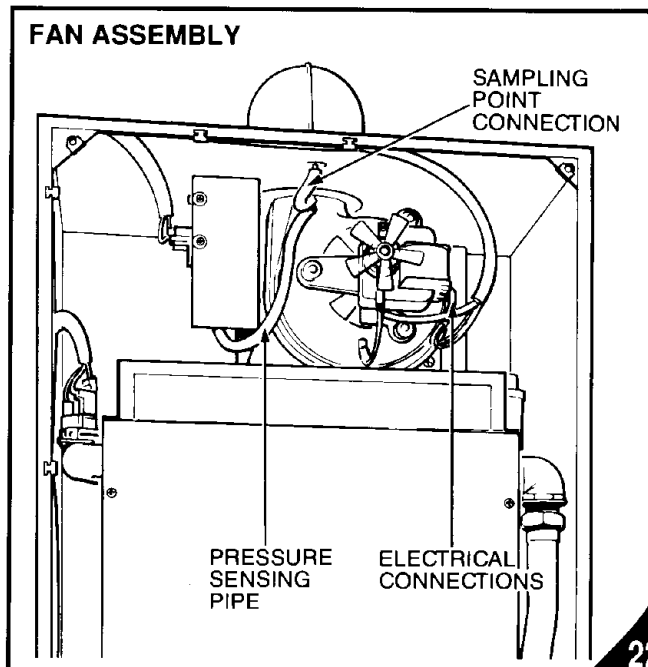
c) FAN ASSEMBLY

- 11 Disconnect the electrical connections to the fan.
- 12 Pull off the pressure sensing tube and the sampling tube near the fan scroll (Fig. 22).
- 13 Remove the two screws securing the pressure switch bracket and lower pressure switch.

- 14 Remove the four screws securing the fan assembly base plate. (Fig. 24) and remove the fan assembly by tilting.
- 15 Inspect the fan assembly (especially the impeller) for dirt deposits, or debris by looking through the air intake. If necessary remove the three screws retaining the fan base plate and clean the fan impeller. Disconnect the remaining pressure switch sampling tube and place the unit on the LHS near the heat exchanger.

d) HEAT EXCHANGER

- 16 Remove the four collector hood fixing screws, lift the collector hood assembly, then tilt and remove the collector hood.
- 17 Inspect the heat exchanger from both above and below the fins. If necessary clean the fins with a suitable soft, non metallic brush.



e) RE-ASSEMBLY AND RE-COMMISSIONING

- 18 Re-assemble all components in reverse order except the outer casing which should not be re-fitted until the sealed system checks in (f) have been completed. Ensure that all joints and seals are correctly fitted. (Polarity is immaterial on the fan L and N connections). When re-fitting the burner assembly, push the burner assembly backwards until the burner location bracket return stops against the casing return edge as shown in Fig. 23. The ignition electrode (red dot on base) must be on the LHS of the burner.
- 19 Unscrew and connect a pressure gauge to the burner pressure test point on the multifunctional control. (Fig. 24). Turn on the gas and electricity supply and light the appliance as described in section 5.
- 20 Check the operation of the appliance in both central heating and DHW modes and ensure that the burner pressure after at least 10 minutes running is as stated on the data plate or in section 2.1. Adjust if necessary as described in section 5.
- 21 Remove the pressure gauge and tighten the sealing screw. Re-light the appliance and test for gas soundness.

f) SEALED WATER SYSTEM

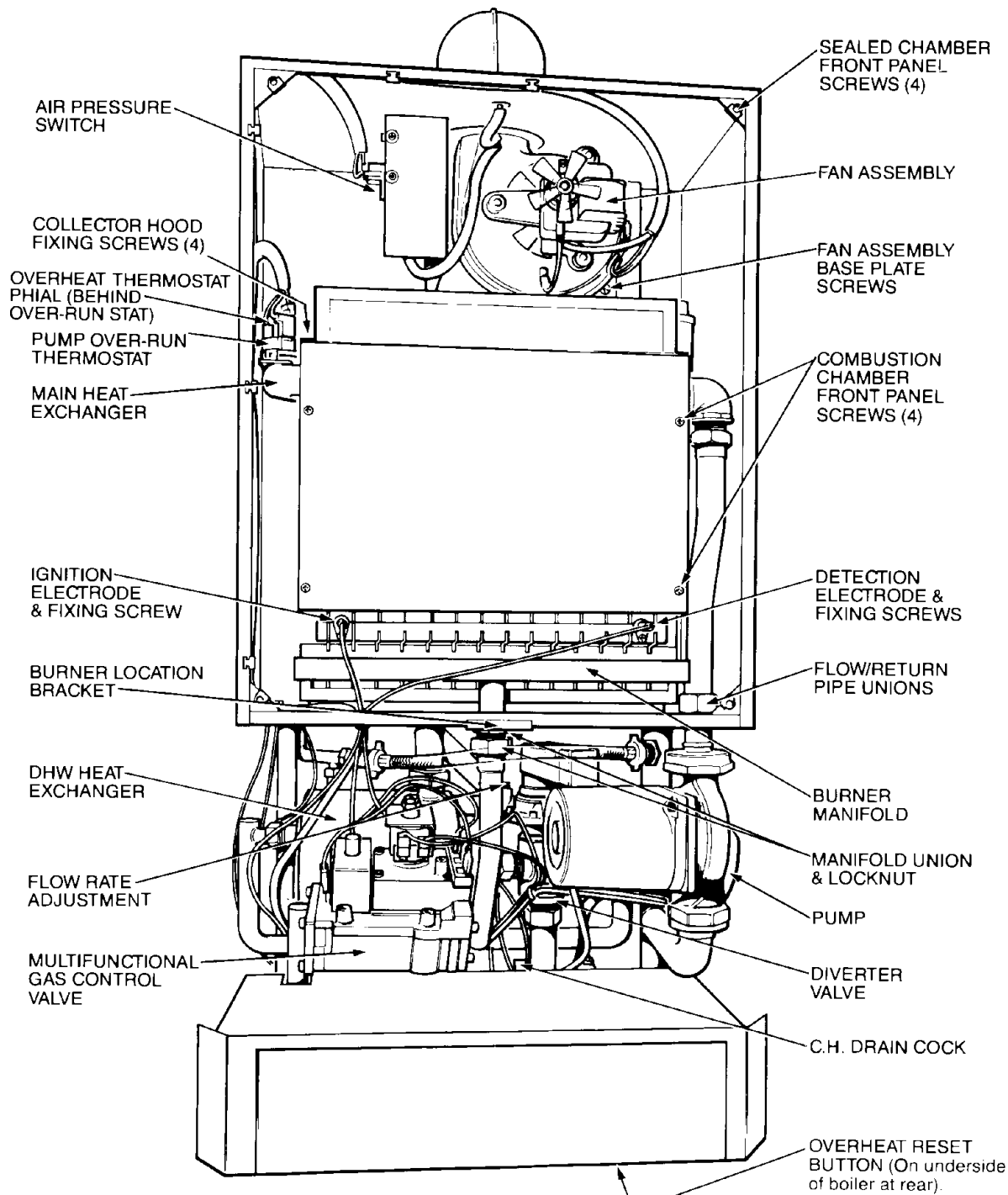
- 22 Check the operation of the pressure relief valve as described in section 5.1 (e).
- 23 Check the correct operation of the pressure gauge by noting the reading and check that the pressure increases when the boiler is hot. Replace the gauge if the readings are suspect.
- 24 Check that the sealed system is at its original (hot) design pressure. (Indicated by the pointer on the pressure gauge)

If not, re-pressurise the system as described in section 5. Search for and rectify any leaks causing loss of water.

g) FINAL CHECKS

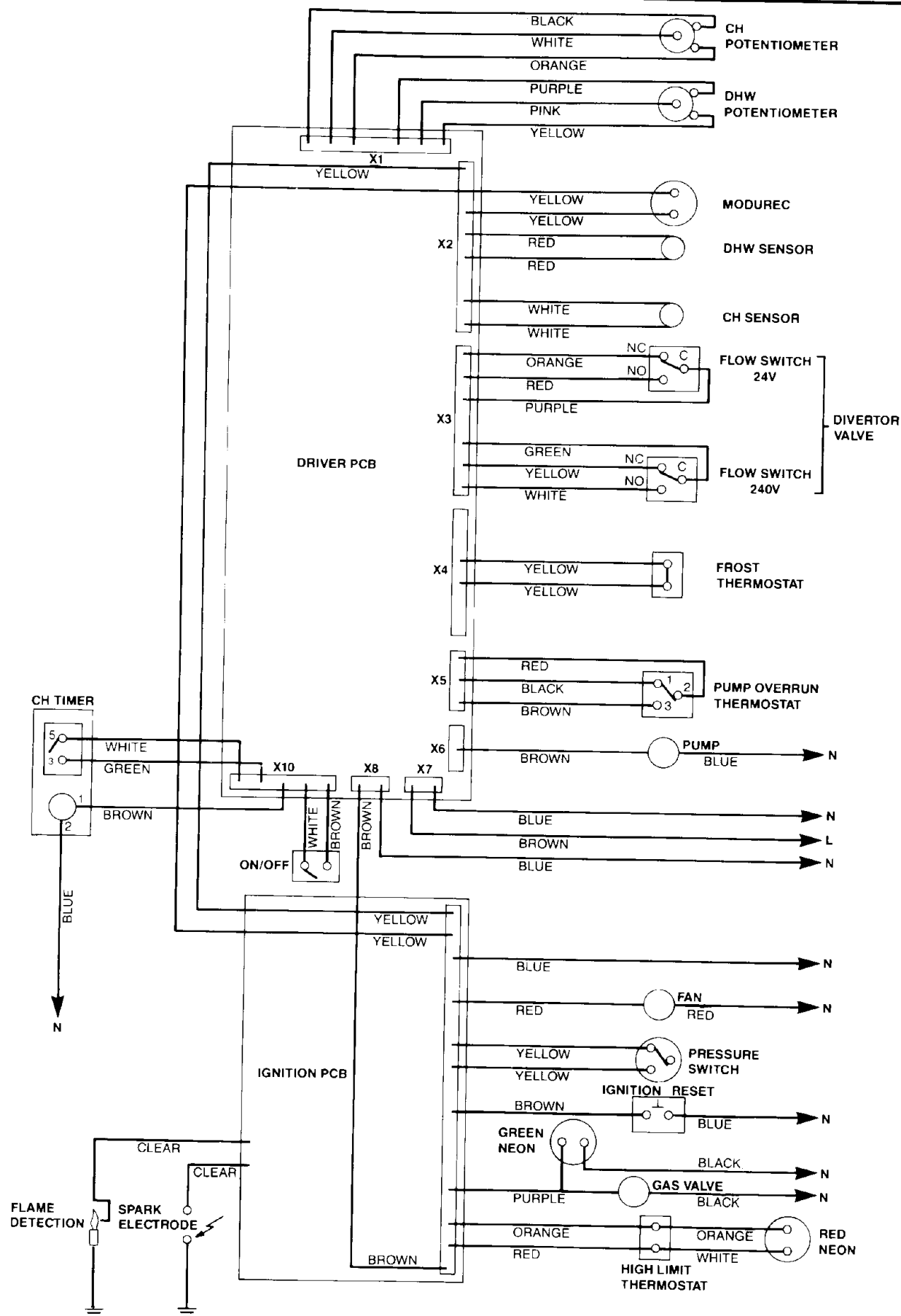
- 25 Refit the outer casing.
- 26 Return all appliance and external controls to their original settings.

LOCATION OF SERVICEABLE COMPONENTS

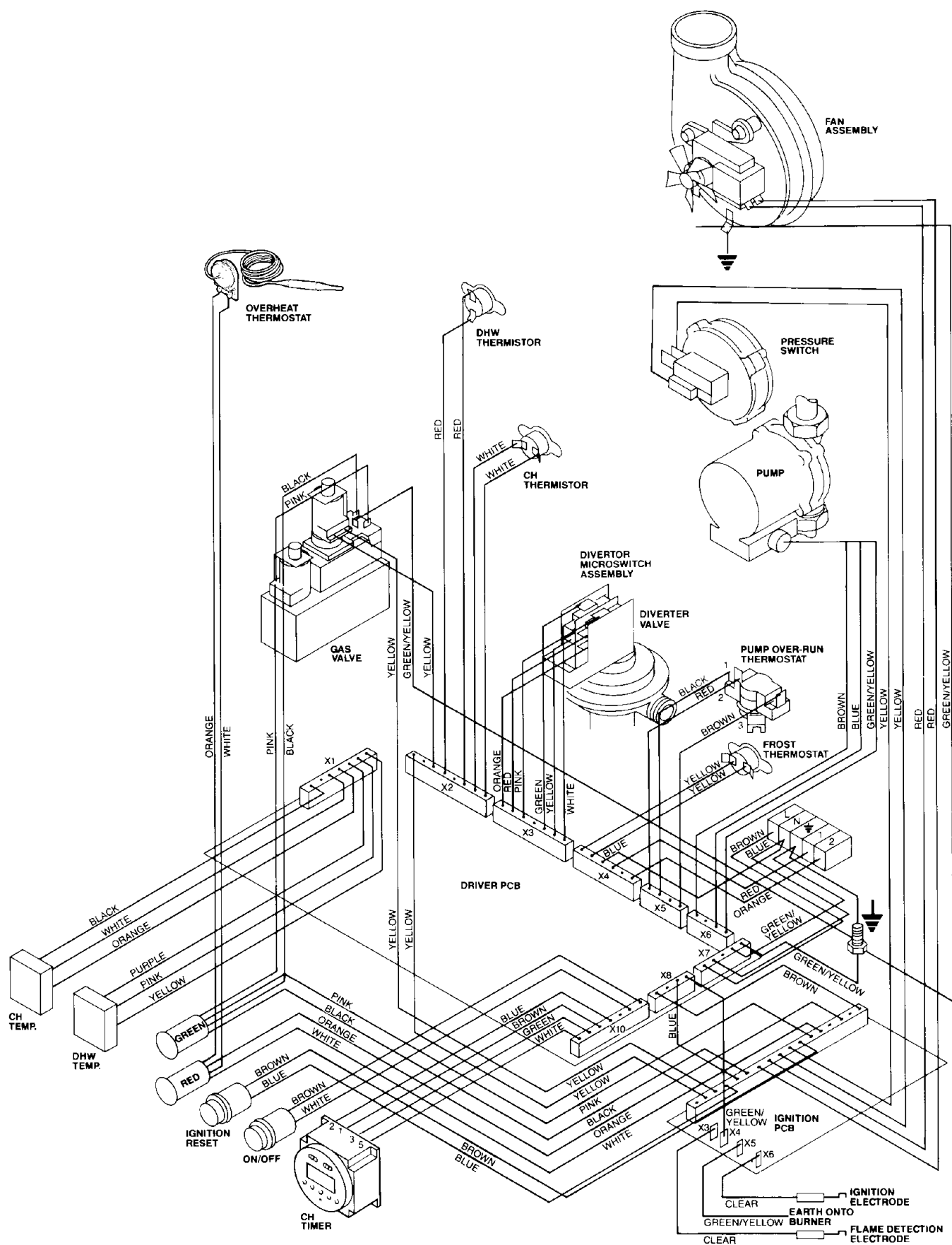


7 INTERNAL WIRING DIAGRAMS

7.1 FUNCTIONAL FLOW WIRING DIAGRAM



7.2 ILLUSTRATED WIRING DIAGRAM



8 FAULT FINDING

8.1 GENERAL

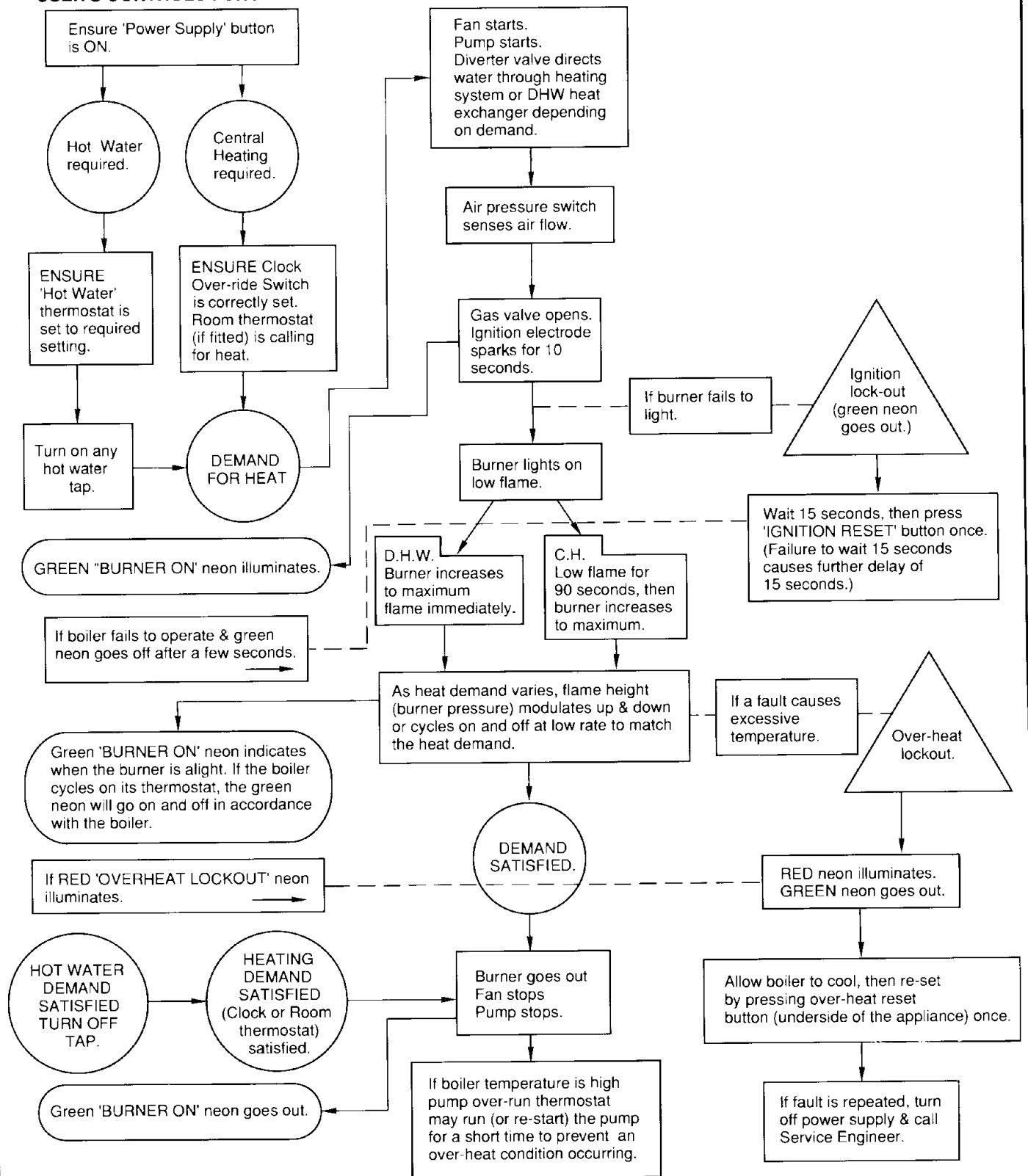
Use the following flow chart to identify basic faults
If the fault cannot be identified, continue with the
flow charts in sections 8.2 and 8.3.
Before looking for a fault condition, always check that:
The mains electrical supply is turned ON.
The clock and any room thermostat are calling for heat.

The gas service cock is open.
The heating system is at it's initial design pressure.
The DHW and CH isolation cocks are open.
Always conduct the preliminary electrical system checks,
i.e. earth continuity, short circuit, polarity, and resistance
to earth before attempting any electrical fault finding.

USER'S CONTROLS FUNCTIONS

BOILER FUNCTIONS

FAULT CONDITIONS



8.2 FAULT FINDING - CENTRAL HEATING MODE

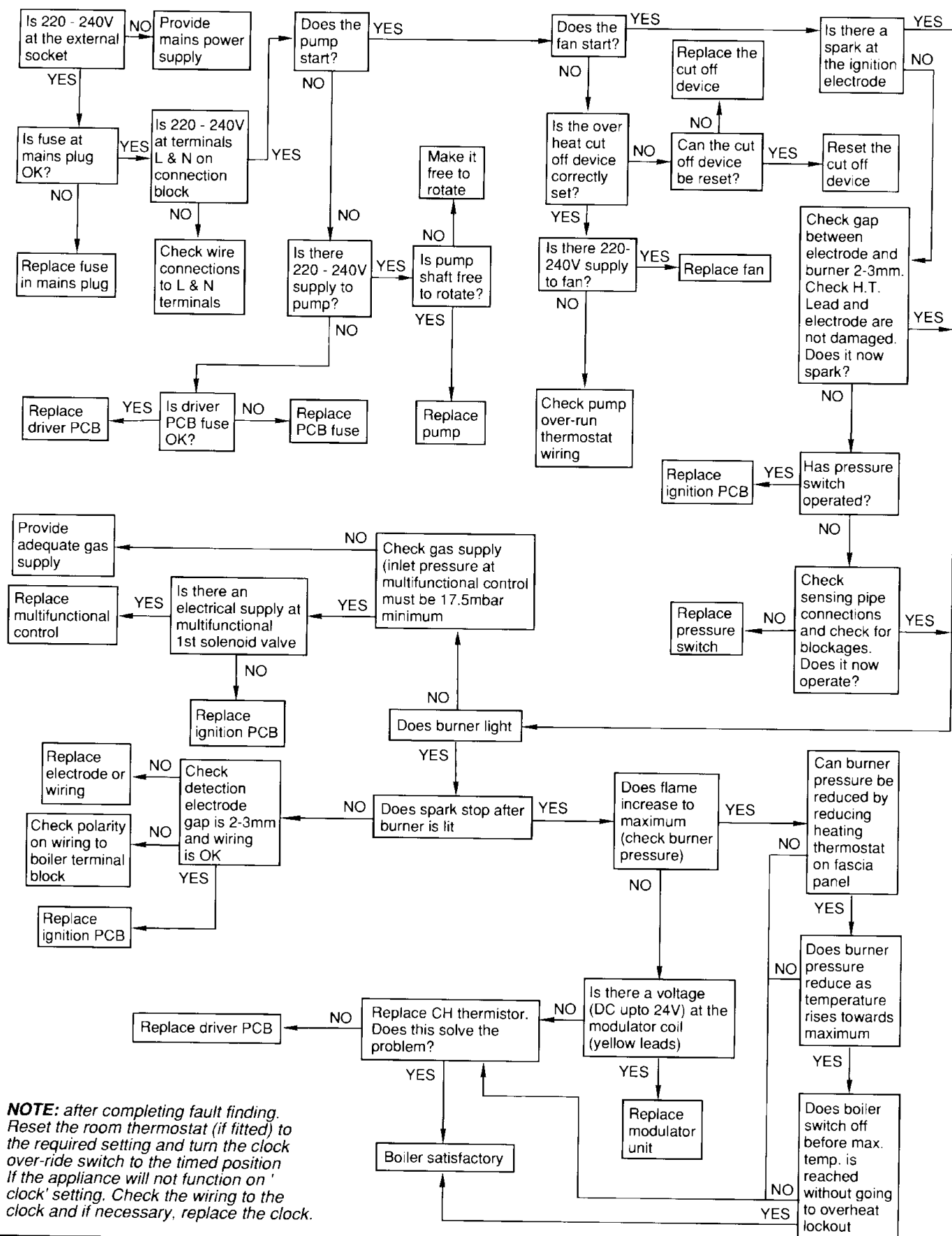
Start with the appliance in a cold condition.

Check that:-

The power switch is 'ON' and the clock is set to the 'ON' position.

The room thermostat (if fitted) is calling for heat and no DHW taps are on.

The heating thermostat is set to maximum.



NOTE: after completing fault finding. Reset the room thermostat (if fitted) to the required setting and turn the clock over-ride switch to the timed position. If the appliance will not function on 'clock' setting. Check the wiring to the clock and if necessary, replace the clock.

8.3 FAULT FINDING - DOMESTIC HOT WATER MODE

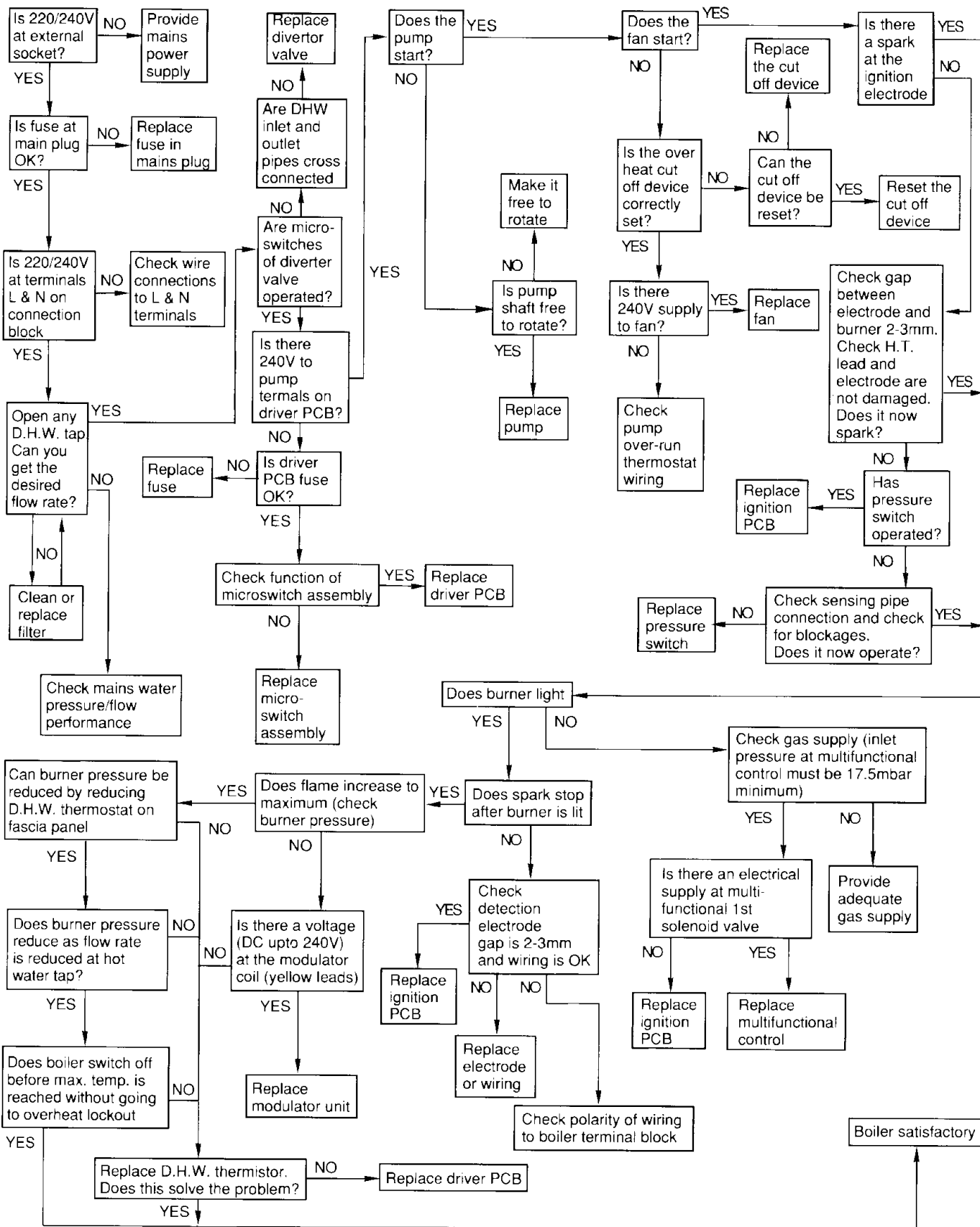
Start with the appliance in a cold condition.

Check that:-

The power switch is 'ON' and the clock is set to the 'OFF' position.

No DHW taps are running.

The 'hot water' thermostat is set to maximum.



9 REPLACEMENT OF PARTS

Before commencing any service operation, ISOLATE the mains electrical supply, and TURN OFF the gas supply at the main service cock.

It is the law that any service work must be carried out by a registered person.

9.1 HEAT EXCHANGER

- a) Remove the outer casing as follows: (Refer to Fig. 13) Remove the four control box fixing screws and lower the control box to an angle of approximately 45°. Slightly lift both casing side panels and then lift the whole casing clear of the appliance.
- b) Remove the sealed chamber front panel (4 screws).
- c) Unscrew the small screw retaining the ignition electrode (identified by a red dot on base of electrode) at LHS of burner and withdraw the electrode from the burner. Repeat this for the detection electrode on the RHS of the burner and the burner earth wire.
- d) Unscrew the small screw retaining the ignition electrode and withdraw the electrode from the burner. Repeat this for the detection electrode on the RHS of the burner and the burner earth wire.
- e) Unscrew the burner manifold union and the manifold locking nut. Disengage the burner location bracket.
- f) Lift the front of the burner sufficiently to disengage the manifold thread. Carefully withdraw the burner.
- g) Disconnect the electrical connections to the fan.
- h) Pull off the pressure sensing tube and the sampling tube near the fan scroll. Remove the two screws securing the pressure switch bracket and lower the pressure switch.
- i) Remove the four screws securing the fan assembly base plate (Fig. 23) and remove the fan assembly by tilting the assembly.
- j) Remove the overheat thermostat phial from its pocket and pump delay thermostat (Fig. 23) without disconnecting the wires.
- k) Remove the four collector hood fixing screws (Fig. 23), lift the collector hood assembly, then tilt and remove the collector hood.
- l) Isolate the CH flow and return valves. ('E' & 'G', Fig. 21)
- m) Drain the heat exchanger using the drain cock on the return pipe. (Fig. 23)
- n) Unscrew the two flow and return pipe unions inside the base of the combustion chamber (Fig. 23), then lift and slide out the heat exchanger complete with the flow & return pipe stubs.
- o) Transfer the flow pipe, return pipe, and automatic air vent, onto the new heat exchanger, then re-assemble all components in reverse order. Ensure that all joints and seals are correctly fitted. (Polarity is immaterial on the fan connections but very important on the pump delay thermostat and air pressure switch - refer to the wiring diagrams in section 7).

9.2 COMBUSTION CHAMBER INSULATION

The design of this appliance is such that the combustion chamber insulation should not require replacement unless mechanically damaged. To replace the insulation front panel, proceed as follows:

- a) Remove the combustion chamber front panel as described in section 9.1 steps a,b and c.

- b) Replace the front insulation panel. Re-assemble in reverse order.

Should the rear or side panels become damaged, replace them as follows.

- a) Remove the heat exchanger as described in section 9.1, steps a to n.
- b) Remove the side insulation panels followed by the rear panel.
- c) Re-assemble in reverse order, refill, and re-commission the system as described in section 5.

9.3 FAN ASSEMBLY

- a) Remove the outer casing and the sealed chamber front panel as described in section 9.1, steps a and b.
- b) Disconnect the electrical connections to the fan.
- c) Pull off the pressure sensing tube and sampling tube near the fan scroll. Remove the two screws securing the pressure switch bracket and lower the pressure switch. (Fig. 23)
- d) Remove the four screws securing the fan assembly mounting plate (Fig. 23) and remove the fan assembly by tilting the assembly forwards.
- e) Remove the three screws securing the fan plate.
- f) Replace the fan, and re-assemble all components in reverse order. Ensure that all joints and seals are correctly fitted. (Polarity is immaterial on the fan L and N connections.)

9.4 MAIN BURNER

- a) Remove the main burner by following section 9.1, steps a to f.
- b) Replace the burner and re-assemble all components in reverse order. Ensure that all joints and seals are correctly fitted.

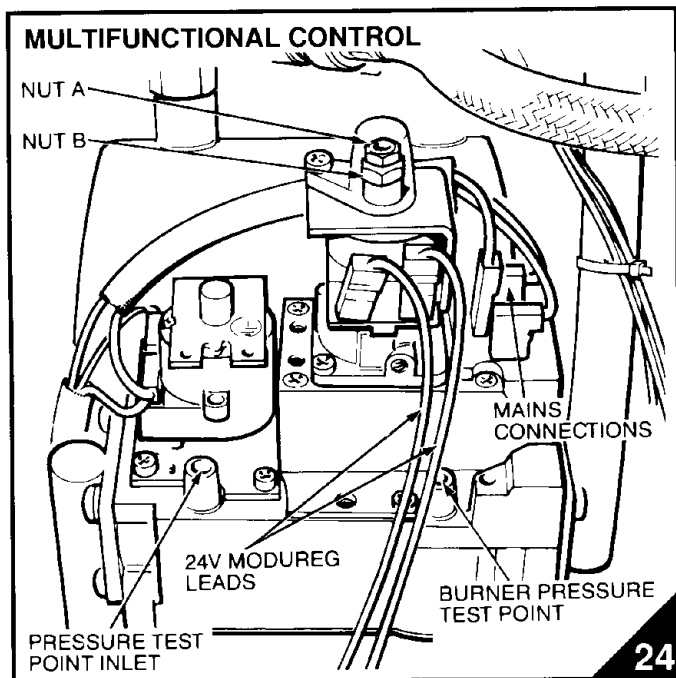
9.5 IGNITION AND DETECTION ELECTRODES

- a) Remove the required electrode as described in section 9.1 steps a to d.
- b) Replace the electrode(s) and re-assemble all components in reverse order. Ensure that all joints and seals are correctly fitted. The ignition electrode must be on the LHS of the burner.

9.6 MULTIFUNCTIONAL GAS CONTROL

- a) Remove the outer casing as described in section 9.1 (a).
- b) Disconnect the electrical connections to the multifunctional gas control, consisting of two push on 24V connectors, four mains connections, and an earth.
- c) Unscrew the burner manifold union.
- d) Unscrew the four pozi-head screws securing the multifunctional gas control inlet pipe, and remove the multifunctional gas control complete with the outlet pipe.

- e) Transfer the outlet pipe onto the new multifunctional gas control, using a new gasket. (Supplied with the control.)
- f) Fit the new assembly into the appliance using the other new gasket supplied on the control inlet, and re-assemble in reverse order.
- g) Re-light the appliance, check for gas soundness, and re-commission in accordance with section 5, 5.1 & 5.2. In addition it will be necessary to set the DHW heat inputs, as follows:
- h) **SET THE DHW INPUT AS FOLLOWS:**
 - i) Remove the sealing cap of the proportioning unit (Fig. 24) (Single fixing screw).
 - ii) Using a 10mm spanner, turn brass nut 'B' to attain the required DHW max burner pressure of 13.8 mbar. Turn the nut clockwise to increase the pressure or anti-clockwise to decrease it.



- iii) Check that the maximum pressure is correctly set by turning on and off the DHW inlet valve several times and ensuring that the pressure returns to that previously adjusted.
- iv) Isolate the mains electricity supply and disconnect (pull off) the two 24V modulation leads (Fig. 24). Restore the mains supply. The appliance will light on minimum input only.
- v) Set the minimum pressure of 1.3 mbar by holding nut 'B' in position with a 10mm spanner and rotating the plastic nut 'A' with a 7mm spanner until the correct pressure is obtained. Turn the nut clockwise to increase the pressure or anti-clockwise to decrease it.

It is essential that the max pressure has been set prior to adjusting the minimum pressure.

Check that the minimum pressure is correctly set by turning on and off the DHW inlet valve several times and ensuring that the pressure returns to that previously adjusted.

- vi) Isolate the mains electricity supply and re-connect (push on) the two 24V modulation leads (Polarity is immaterial). Restore the mains supply.

The appliance will light and achieve maximum input. Check that the burner pressure is 13.8mbar. (If it has changed repeat from step (i)).

- vii) Refit the proportioning unit sealing cap.

- viii) Reduce the DHW draw off rate to the minimum necessary to maintain the burner alight by carefully adjusting the DHW Inlet valve and check that the burner pressure decreases in response to DHW temperature rise. Fully open the inlet valve.

- ix) Close the DHW tap and ensure that the burner is extinguished and the pump stops.

- i) Re-fit the casing and set the boiler controls as required.

9.7 PRESSURE SWITCH

- a) Remove the outer casing and the sealed chamber front panel as described in section 9.1, steps a and b.
- b) Remove the 2 screws securing the pressure switch to its mounting bracket.
- c) Disconnect the short pressure sensing tube from the rear of the pressure switch and the long sensing tube from the fan scroll.
- d) Remove the switch from the bracket (two screws) and fit the new one.
- e) Transfer the electrical connections to the new switch.
- f) Fit the new switch and re-assemble in reverse order referring to the wiring diagrams (Section 7) if necessary.

9.8 OVERHEAT CUT OFF DEVICE

- a) Remove the outer casing and the sealed chamber front panel as described in section 9.1 steps a and b.
- b) Unscrew the front screw securing the pump over-run thermostat and loosen the rear screw. Pivot the thermostat to gain access to the overheat cut off device phial pocket. DO NOT DISCONNECT the wires from the pump over-run thermostat.
- c) Remove the securing clip from the end of the phial pocket and slide out the overheat cut off device phial. Scrape off any residual heat transfer paste and deposit it back in the pocket.
- d) Unclip the thermostat capillary and withdraw the phial from the sealed chamber.
- e) From underneath the appliance, remove the securing nut on the overheat cut off device body, and release the device.
- f) Transfer the electrical wires onto the new device, and replace in reverse order. ENSURE that the retaining clip is re-fitted and that the pump over-run thermostat makes good contact with the flange.

9.9 THERMISTOR - CH or DHW

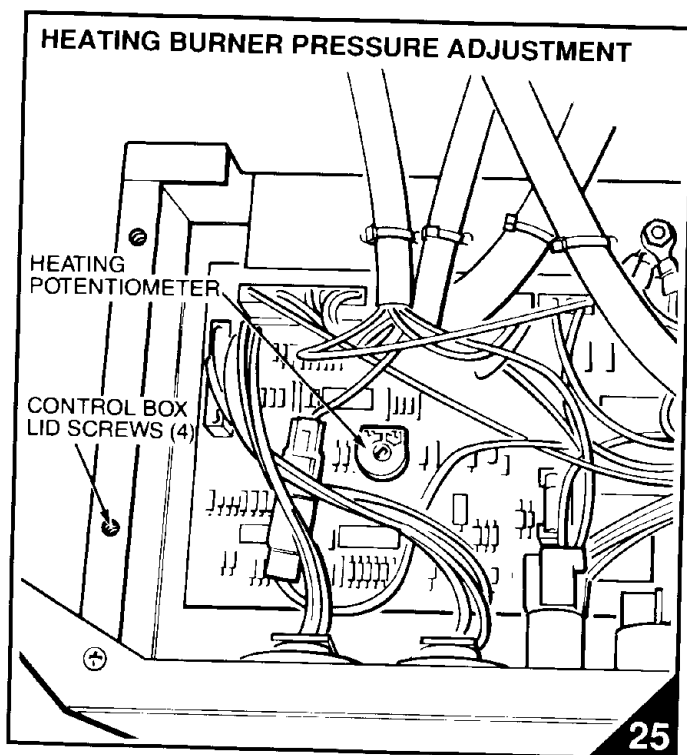
- a) The thermistors are screwed to flanges on the flow pipe (CH) and DHW outlet pipe (DHW). The thermistors do not enter the waterways, therefore it is not necessary to drain the appliance.
- b) Remove the outer casing as described in section 9.1 step a.
- c) Pull off both electrical connections from the faulty thermistor, and remove the thermistor (2 screws). Note that the polarity of the thermistor connections is immaterial. Re-assemble in reverse order.

9.10 IGNITION PCB

- Remove the outer casing as described in section 9.1 step a.
- Remove the control box cover (4 screws).
- Pull off all of the connections from the ignition PCB (Smallest PCB situated on the RHS of the control box.)
- Replace the PCB and re-assemble in reverse order.

9.11 DRIVER CONTROL PCB

- Remove the outer casing as described in section 9.1 step a.
- Remove the control box cover (4 screws).
- Pull off all of the connections from the control PCB (largest PCB situated on the LHS of the control box) and detach from its fixings. Loosen neon lights on the fascia panel and remove the PCB from the LHS of the box.
- Replace the PCB and re-assemble in reverse order.
- Check (and adjust if necessary) the heating burner pressure as follows:



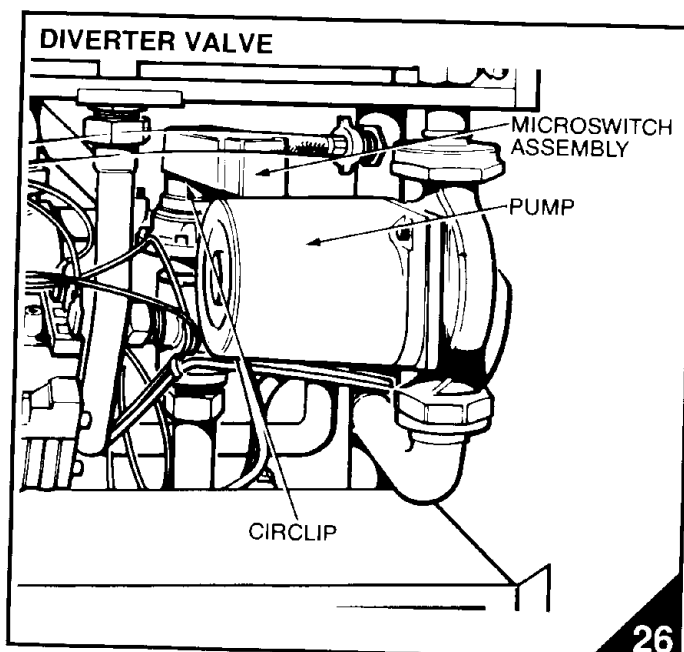
- Ensure that the room thermostat (If fitted) is calling for heat. Turn the heating thermostat knob ('A' Fig. 19) to maximum (fully clockwise) and the burner will light.
- Allow the boiler to run for at least 10 minutes and check that the burner pressure is as stated in section 2.1. If the burner pressure is low, check that the appliance has not started to modulate (This will occur if heating system is almost up to temperature.) If it is necessary to adjust the CH burner pressure this can be done by carefully adjusting the heating potentiometer which is accessed by removing the control box lid (Fig. 25). Operate the power on/off switch a few times to check that the correct pressure is maintained.

9.12 PUMP (OR PUMP HEAD)

- Remove the outer casing as described in section 9.1 step a.
- Isolate the CH flow and return valves ('E' & 'G', Fig. 21), and drain the appliance through the drain plug on return pipe. (Fig. 23)
- If replacing only the pump head, unscrew the four hexagonal screws in the flange. If replacing the full pump, support the pump and unscrew both union connections.
- Transfer the electrical connections onto the new pump, (or pump head) and re-assemble in reverse order. Refill and recommission the system as described in section 5.1.

9.13 DHW HEAT EXCHANGER

- Remove the outer casing as described in section 9.1 step a and the multifunctional control as stated in section 9.6.
- Isolate the CH flow and return valves ('E' & 'G', Fig. 21), and drain the appliance through the drain plug on the return pipe.
- Isolate the DHW inlet valve ('D', Fig. 21), and drain the DHW circuit by opening all DHW taps.
- Disconnect all union connections to the DHW heat exchanger and remove the heat exchanger.



- Fit new heat exchanger and re-assemble in reverse order using the new gaskets supplied with the heat exchanger. Refill and re-commission the system as described in section 5.1.

9.14 DIVERTER VALVE - COMPLETE

- Remove the outer casing as described in section 9.1 step a and pump as stated in section 9.12.
- Isolate the CH flow and return valves ('E' & 'G', Fig. 21), and drain the appliance through the drain plug on the return pipe.
- Isolate the DHW inlet valve ('D', Fig. 21), and drain the DHW circuit by opening all DHW taps.
- Pull out the circlip (Fig. 26) and lift off the microswitch assembly. Disconnect all union connections to the diverter valve and remove the diverter valve.
- Fit new diverter valve and re-assemble in reverse order using the new gaskets supplied. Refill and re-commission the system as described in section 5.1.

9.15 DIVERTER VALVE - MICROSWITCH ASSEMBLY

- a) Remove the outer casing as described in section 9.1 step a.
- b) Pull out the microswitch circlip, (Fig. 26) and lift off the microswitch assembly.
- c) Transfer the electrical connections onto the new microswitch assembly. Refer to the wiring diagrams in section 7.
- d) Re-fit the outer casing.

9.16 C.H. EXPANSION VESSEL

In the unlikely event of failure of the expansion vessel diaphragm it is acceptable to leave the vessel in position and to fit a replacement vessel (of similar or greater capacity) external to the appliance but as close as possible to the CH return.

It is necessary to remove the appliance from the wall in order to replace the expansion vessel. Remove the expansion vessel by unscrewing top union and cross member support screws. Then pull cross member downwards to release expansion vessel.

9.17 AUTOMATIC BYPASS VALVE

- a) Remove the outer casing as described in section 9.1 step a.
- b) Isolate the CH flow and return valves ('E' & 'G', Fig. 21), and drain the appliance through the drain plug on the return pipe.
- c) Disconnect the union connections on either end of the bypass valve and replace the valve, ensure that the arrow points towards the back of the appliance.
- d) Re-assemble in reverse order, refill and re-commission the system as described in section 5.1

9.18 CONTROL BOX SWITCHES OR NEONS

- a) Remove the outer casing as described in section 9.1 step a.
- b) Remove the control box cover (4 screws).
- c) Squeeze the switch (or neon) to depress the retaining clips, then withdraw the switch forwards.
- d) Pull off the connections to the switch.
- e) Fit the new switch and re-assemble in reverse order, with reference to the wiring diagrams in section 7.

9.19 PRESSURE GAUGE

- a) Remove the outer casing as described in section 9.1 step a.
- b) Remove the control box cover (4 screws).
- c) Isolate the CH flow and return valves ('E' & 'G', Fig. 21).
- d) Squeeze the gauge to depress the retaining clips, then

ease the gauge forwards.

- e) Unscrew the pressure sensor from the top of the safety valve and cover the tapping to minimise water loss. Screw in the new pressure gauge sensor after first threading it through the fascia panel.
- f) Re-assemble in reverse order. Refill and re-commission the system as described in section 5.1

9.20 PRESSURE RELIEF VALVE

- a) Remove the outer casing as described in section 9.1 step a.
- b) Isolate the CH flow and return valves ('E' & 'G', Fig. 21), and drain the appliance through the drain plug on the return pipe.
- c) Unscrew the pressure sensor from the top of the pressure relief valve.
- d) Unscrew the union supporting the outlet pipe from the valve, and remove the valve by unscrewing the union. (Spanner access is available from underneath the boiler.)
- e) Fit the new pressure relief valve using a suitable jointing compound and re-assemble in reverse order. Refill and re-commission the system as described in section 5.1

9.21 AUTOMATIC AIR VENT

- a) Remove the outer casing as described in section 9.1 step a.
- b) Remove the collector hood as described in section 9.1 steps g to k (except j).
- c) Isolate the CH flow and return valves ('E' & 'G', Fig. 21), and drain the appliance through the drain plug on the return pipe.
- d) Replace the automatic air vent and re-assemble in reverse order and re-fill and re-commission the system as described in section 5.1.

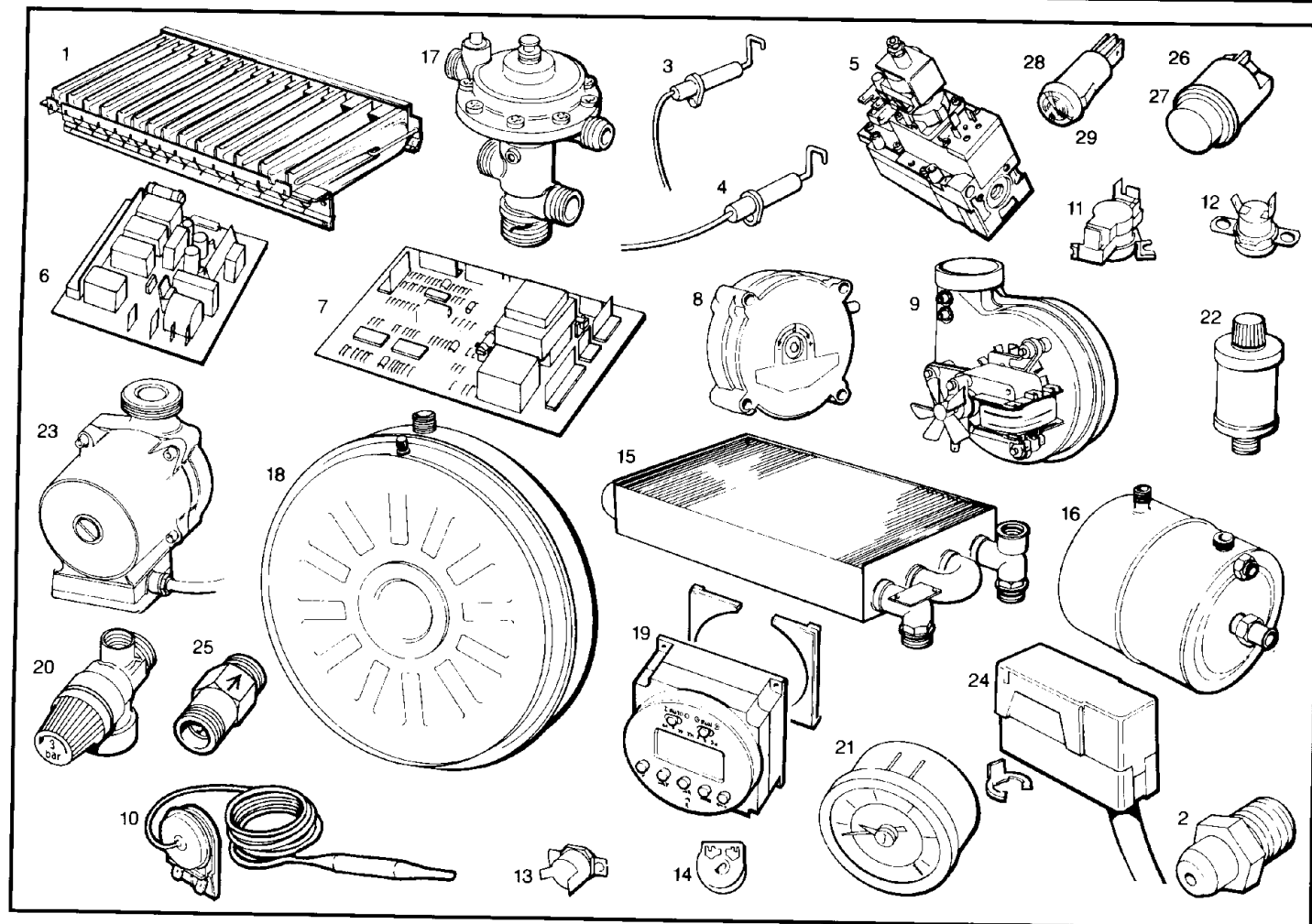
9.22 TIME CLOCK

- a) Remove the outer casing as described in section 9.1 step a.
- b) Remove the control box cover (4 screws).
- c) Push out the plastic insert incorporating the clock, from behind the panel.
- d) Replace the clock assembly (including a new panel) and transfer the connections one at a time to the new clock. Replace, and re-assemble in reverse order, with reference to the wiring diagrams in section 7.

9.23 PUMP OVER-RUN THERMOSTAT

- a) Remove the outer casing and sealed chamber front panel as described in section 9.1, steps a and b.
- b) Unscrew the two screws securing the pump over-run thermostat.
- c) Transfer the electrical connections **ONE AT A TIME**, and ensure that they are connected to the correct terminals on the new thermostat. If necessary refer to the wiring diagrams in section 7.
- d) Re-assemble in reverse order. **ENSURE** that the new pump

10 SHORT PARTS LIST



KEY	G.C. PART NO.	DESCRIPTION	NO OFF	MAKER'S PT. NO.
1	181 000	MAIN BURNER Polidoro 401-0181-02	1	700515
2	378 172	INJECTOR NP 1.3	14	701514
3	379 259	ELECTRODE (IGNITION)	1	500565
4	379 258	ELECTRODE (DETECTION)	1	500566
5	379 260	GAS CONTROL Honeywell VR4605M 3008	1	500561
6	379 262	IGNITION PCB Honeywell 54561D 1001	1	500562
7	379 261	CONTROL PCB Honeywell W4115B	1	500563
8	379 263	AIR PRESSURE SWITCH EACO6	1	550510
9	181 001	FAN ASSEMBLY Sifan 1701-019	1	601003
10	379 267	OVERHEAT THERMOSTAT RANCO LM7	1	550519
11	379 264	LIMIT THERMOSTAT 60T23	1	550515
12	379 266	FROST THERMOSTAT 26TXE21	1	550516
13	379 265	THERMISTOR 6655RN-428-3	2	550513
14	000 000	POTENTIOMETER 16 PESA 103MC16	2	550518
15	181 002	HEAT EXCHANGER Giannoni PR20/323	1	450904
16	379 268	CALORIFIER Giannoni B26	1	450903
17	181 003	DIVERTER VALVE Giannoni V35	1	550567
18	386 720	EXPANSION VESSEL Zilmet 531/T8L	1	450905
19	000 000	TIME CLOCK Diehl 884	1	600512
20	397 677	PRESSURE RELIEF VALVE 3141 3bar	1	862009
21	379 272	PRESSURE GAUGE IMIT	1	550514
22	379 079	AUTOMATIC AIR VENT 5020	1	450908
23	383 722	PUMP Grundfos 15-60	1	851088
24	181 004	DIVERTER MICROSWITCH ASSEMBLY	1	988209
25	181 005	AUTOMATIC BYPASS VALVE	1	450909
26	379 270	POWER SWITCH	1	300637
27	379 271	RESET BUTTON	1	300638
28	379 273	GREEN NEON	1	300640
29	379 274	RED NEON	1	300639

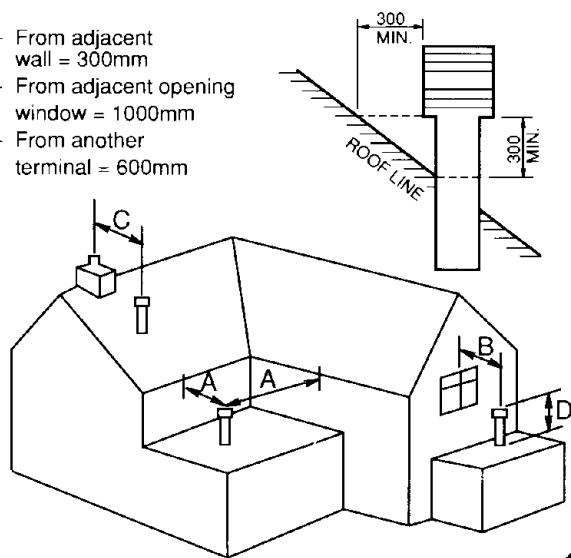
APPENDIX I

SUPPLEMENTARY INSTRUCTIONS FOR FLUE SYSTEMS WITH A VERTICAL OUTLET. (FIG. 3)

- Read the installation requirements and flue specifications described in the main section of the installation and servicing instructions, but refer to Fig. A1 below instead of Fig. 6 in section 3.3.
- Follow the installation procedure described in the main section of the installation instructions up to section 4.2

SPECIAL REQUIREMENTS FOR VERTICAL BALANCED FLUE

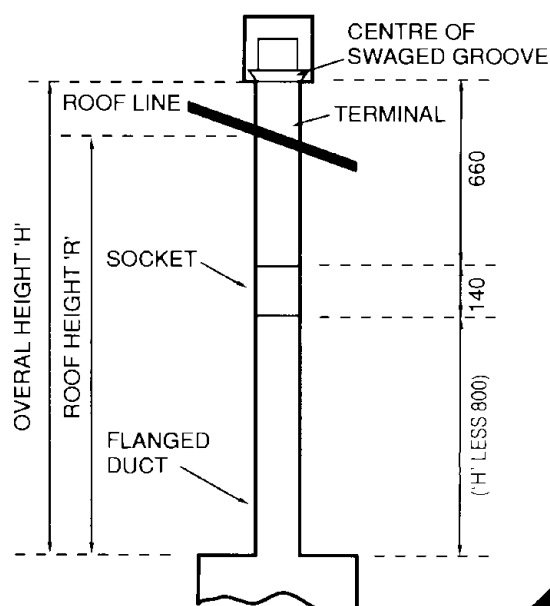
- From adjacent wall = 300mm
- From adjacent opening window = 1000mm
- From another terminal = 600mm



A1

- Using the wall mounting template and the dimensional information given in section 2.4 and 2.5 (Fig. 3), work out where the boiler and flue are to be positioned and make the necessary hole(s) in the ceiling/roof.

FLUE SYSTEM DIMENSIONS

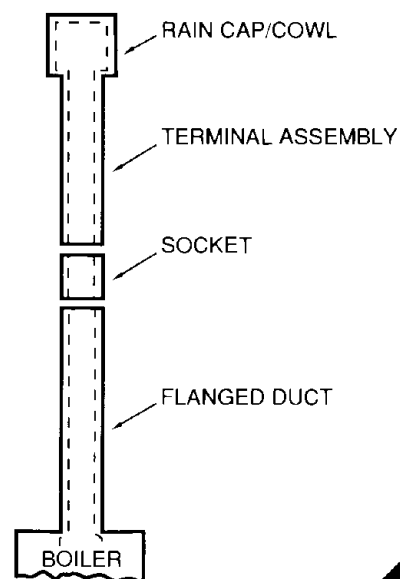


A2

- Fix the boiler to the wall as described in section 4.2 and 4.3.

- Measure the vertical distance from the top of the appliance casing to the roof level - distance 'R' Fig. A2.

FLUE SYSTEM ASSEMBLY

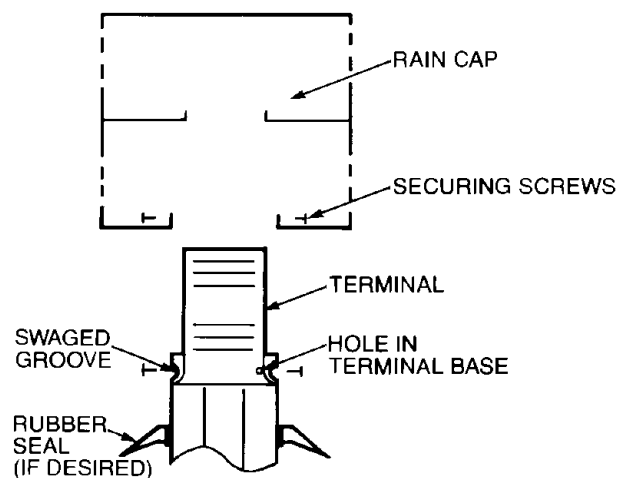


A3

- Slide the rubber sealing ring down the air duct to expose the swaged groove as shown in Fig. A4.
- Add 300 to distance 'R' to arrive at the overall height 'H'. This is the minimum required distance between the flange on the flanged duct and the centre of the swaged groove on the terminal air duct.
- Referring to figures A2 and A3, calculate the required length of the flanged duct to achieve the overall height 'H'. Remember to allow for the overlap at each extension duct joint.. (The dimensions given in figure A2 are assembled lengths.)

NOTE: If the required height 'H' is less than 850mm it is necessary to cut both the flanged duct and the standard terminal duct.

TERMINAL ASSEMBLY & RAIN CAP FITTING



A4

- i) Cut all ducts to the required lengths and remove any burrs. Cut the terminal assembly flue duct to the same length as the corresponding air duct. (The flue duct is supplied slightly longer for use horizontally)
- j) Fit the flanged air duct to the boiler using the 4 screws provided. Slide in the flue duct and ensure both ducts are flush (Fig. A3).

NOTE: the flanged elbow is not required and must be discarded.

- k) Decide where the sealing plate is to be fitted and slide it over the relevant air duct. (This is to make good the hole inside the ceiling for aesthetic purposes)
 - l) Fit the socket as shown in Fig. A3. Drill and secure with the self tapping screws provided as above.
 - m) Assemble the flue terminal assembly as shown in Fig. 16.
 - n) Refer to figure A4. Locate the hole in the flue terminal base and screw the self tapping screw provided through the hole in the swaged groove. This prevents the terminal from slipping down the air duct.
 - o) If desired, slide the rubber seal ring over the terminal and below the groove. (This can be used as an extra seal above the flashing)
- Slide the rain cap over the terminal as shown in Fig. A4 and screw the two securing screws firmly into the swaged groove to support the cap.
- p) From outside the building, slide the terminal assembly through the hole in the roof until the plain ends locate in the sockets. From inside the building drill and secure the air duct into the socket with the two remaining self tapping screws.
 - q) Make good the seal around the air duct using a suitable flashing.
 - r) Complete the installation as described in section 4.6 onwards.

WARNING:-

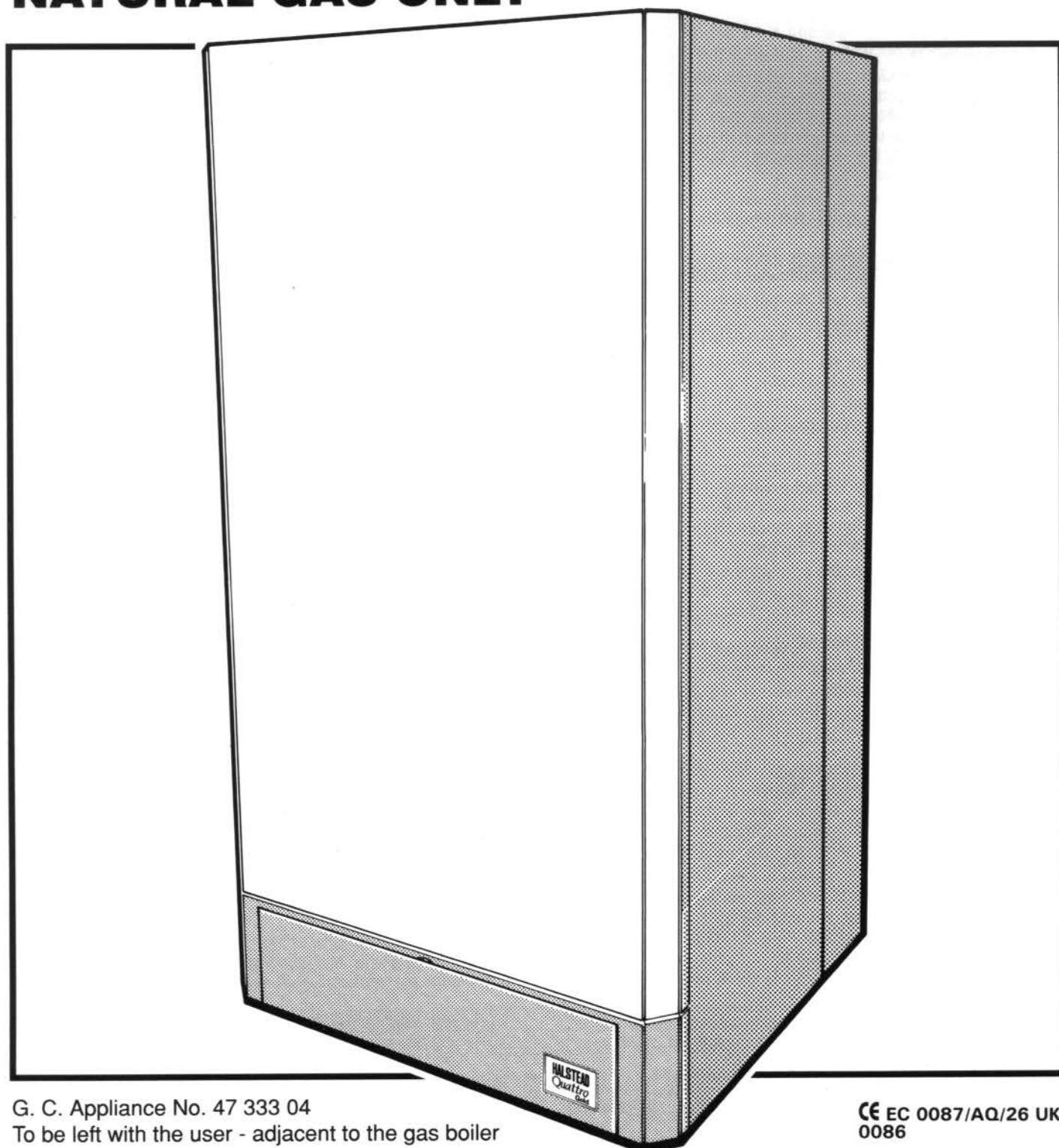
All joints **MUST** be secured with the self tapping screws provided.

The air/flue system **MUST** be adequately supported.

Length 'H' Fig. A2 must not exceed 1550mm.

USER INSTRUCTIONS

HALSTEAD *Quattro* GOLD **FULLY AUTOMATIC WALL MOUNTED** **FAN ASSISTED BALANCED FLUE** **COMBINATION BOILER FOR USE WITH** **NATURAL GAS ONLY**



G. C. Appliance No. 47 333 04
To be left with the user - adjacent to the gas boiler

CE EC 0087/AQ/26 UK
0086

GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1984. (As amended).

It is the law that all gas appliances are installed by a registered person 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.

WARNING: It is essential that the appliance is correctly earthed. An electricity supply of 230V ~ 50Hz is required fused at 3 Amp.

Read these instructions carefully before attempting to operate the appliance.

1 INTRODUCTION

The Halstead Quattro Gold Combi is a fully automatic, wall mounted, fan assisted balanced flue combination boiler.

When operating the heating mode, the appliance provides central heating as required and produces instantaneous hot water upon demand up to a maximum output of 30kw (102,400Btu/h). When the heating is turned off, the appliance continues to supply hot water whenever it is required.

A frost thermostat and an electronic time clock (with override switch) are fitted as standard equipment, and the heat output is automatically controlled by the fully modulating gas valve (within its pre-set limits). There are user adjustable thermostats to control the temperature of both central heating and domestic hot water.

A pressure gauge is fitted, and an overheat thermostat is incorporated to protect against fault conditions.

2 APPLIANCE FUNCTION

A demand for hot water will be sensed by the appliance detecting water flow (providing that the flow rate is above 2.8 l/m (0.6 gpm). The fan will start and the burner will light.

If the draw off rate is near the maximum design flow rate the appliance will run continuously at full output until a tap is either turned off or the flow rate is reduced in which case the heat output will reduce accordingly to maintain a steady temperature.

Hot water is made available almost immediately at the appliance outlet, but the final temperature and time taken for the hot water to reach a tap depends upon the thermostat setting, the rate at which water is, drawn off, and the length of the pipe between the boiler and the tap.

When the tap is turned off, the appliance will revert to heating mode if there is a demand for heating, otherwise the burner will be extinguished pending the next demand for hot water.

3 OPERATING INSTRUCTIONS

TO LIGHT THE APPLIANCE:- (Refer to diagram)

- 1) Check that the gas and electricity supplies are ON and that the water isolation valves underneath the appliance are turned ON.
- 2) Press the 'POWER SUPPLY' button. If heating is required, turn the heating thermostat to maximum (fully clockwise) and set the clock override switch to the ON position. Turn up the room thermostat (if fitted). The burner will light and the green 'BURNER ON' neon will glow.

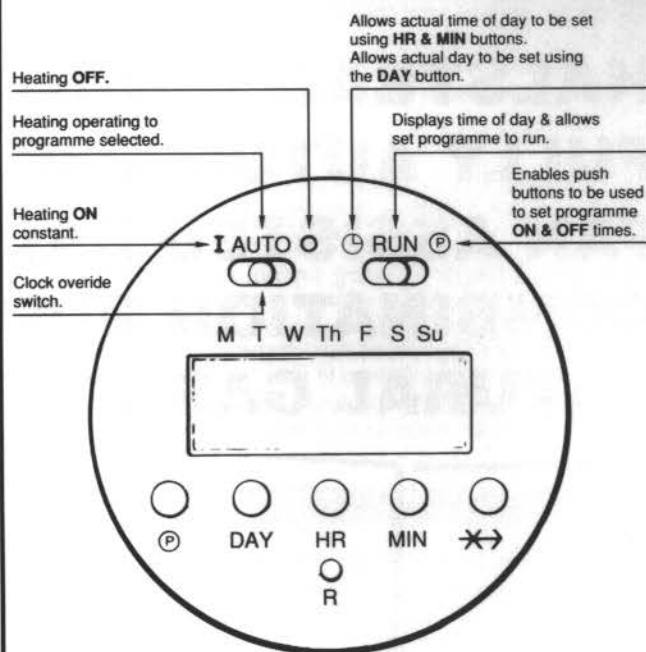
If the green neon does not light, press the ignition re-set button once and the burner should now light. If the red neon lights, press the OVERHEAT RE-SET BUTTON.

- 3) If heating is not required, turn the clock override switch to the OFF position.
- 4) Hot water will be supplied as soon as any tap is turned on. Adjust the temperature of the water (if necessary) using the HOT WATER THERMOSTAT.

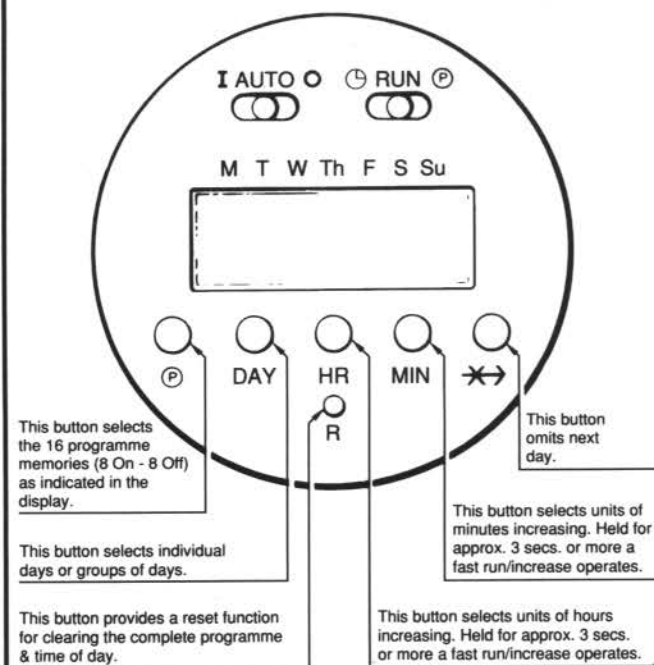
NOTE: that when operating in heating mode, priority is automatically given to providing hot water when the demand arises.

4 SETTING THE CLOCK

OPERATION OF SWITCHES:



OPERATION OF BUTTONS:



20

OMIT NEXT DAY ⇨

This button allows you to skip the next day programme without clearing the total set programme.

Commences at midnight of the day selected and continues for 24hrs allowing the first programme of the following day to commence normal running. A sign is displayed.

If pressed again during the OFF day, another 24hrs are added. A flashing arrow is displayed under the selected OFF day.

To cancel the omit function press the button again. The indication on the display will disappear. ⇨

PROGRAMMING THE TIMER:

- A** Press  (reset) to clear any previous inputs.
- B** Switch to 
- C** Set time of day using  
- D** Set actual day using 
An arrow (▲) will be displayed under the actual day, e.g. Sunday
Set to 
Actual time of day will be displayed (flashing colon)
- E** To set programme:
Set to 
- F** First ON programme will be indicated by: 
Select day or group of days by pressing 
Indicator ▲ will show day(s) selected
e.g.  First 'ON' period will be for Monday to Friday
Set 'ON' time by using:  
- G** Set first 'OFF' programme by pressing  once indicated by 

Select day or group of days by pressing 
(This will be the same as first 'ON' programme)
Now set 'OFF' time using:  

- H** Repeat for next 'ON' programme, indicated by  and for next 'OFF' programme, indicated by 
Note: All 'ON' and 'OFF' programmes work in pairs
For example:  (ON) and  (OFF) = First pair
 (ON) and  (OFF) = Second pair
Etc., Up to 8 pairs
The day(s) selected for each pair **must** match
You must set **day(s)** and time individually for each 'ON' and 'OFF' period.

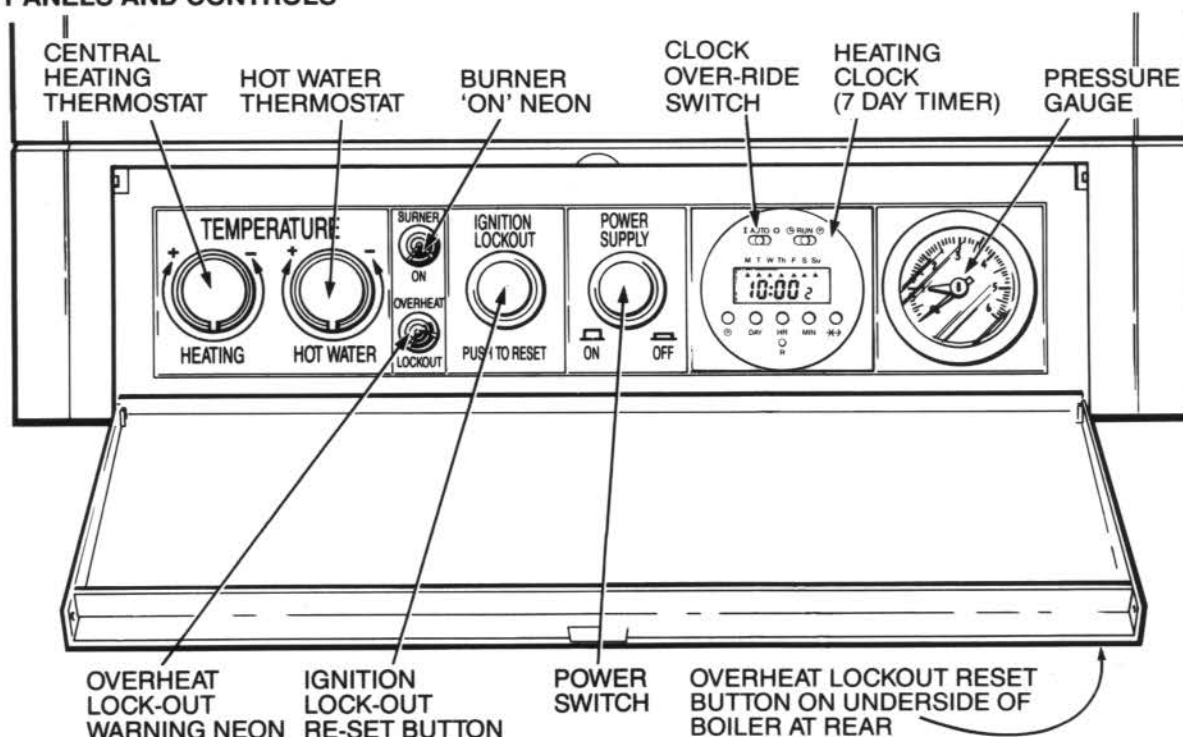
- I** When all the switching selections for the next days are completed, set to 
- J** Ensure the switch is set to Auto. Timer is now set to run automatically on times programmed. 
- K** To omit next day press 
(The sign will be displayed - indicating selection) The omit function will then operate from midnight for 24hrs. During this period a flashing arrow will be displayed under the applicable day and the  sign will not be displayed. (Programme commences again 24hrs. on).

TO TURN THE APPLIANCE OFF:-

For Short Periods:
Switch the CLOCK OVER-RIDE SWITCH to the OFF position.
For Longer Periods:
Switch the POWER SWITCH to the OFF position. Do not isolate the mains electricity or gas supply if frost protection is required.

NOTE: A frost thermostat is fitted as standard, but this can only provide frost protection if the gas and electrical supplies are maintained.

FASCIA PANELS AND CONTROLS



5 MINIMUM CLEARANCES

The following MINIMUM CLEARANCES must be available for servicing the appliance:-

Above the appliance casing	200mm	(8in.)
At the R.H.S.	5mm	(1/4in.)
At the L.H.S.	5mm	(1/4in.)
Below the appliance casing	200mm	(8in.)
In front of the appliance	450mm	(18in.)

6 ROUTINE SERVICING

To ensure continued efficient operation of the appliance, it is recommended that it is checked and serviced as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage but in general once a year should be adequate. It is the law that any service work must be carried out by a registered engineer such as British Gas or other CORGI registered personnel.

7.1 OVERHEAT THERMOSTAT

The appliance is fitted with an overheat thermostat. In the event of overheating, the appliance will shut down and the 'overheat' neon will light. If an overheat condition occurs allow the appliance to cool, then press the overheat re-set button once (situated underneath the appliance at the rear).

If the cut-out condition is repeated, turn off the electrical supply and consult your installer or service engineer.

7.2 IGNITION LOCK-OUT

In the event of an ignition failure, wait 5 seconds, then press the ignition re-set button once to re-set the ignition system.

7.3 FROST THERMOSTAT

The appliance is fitted with a frost thermostat. In the event of very cold conditions (when the internal pipework falls below 5°C) the boiler will light for a few minutes to protect the appliance and system from potential frost damage.

7.4 PRESSURE GAUGE

The gauge on the fascia panel indicates the approximate system pressure. If the normal running pressure is seen to decrease over a period of time there is a water leak and you should consult your installer or service engineer.

7.5 ELECTRICAL SUPPLY

The mains plug used must be a 3 pin type to BS1363, and fused at 3A. THIS APPLIANCE MUST BE EARTHED.

NOTE: An interruption in the electricity supply whilst the burner is alight may cause the overheat thermostat to operate. If, when the electrical supply is restored, the red neon is lit, then press the O/H reset button once to allow the appliance to operate.

To connect a mains plug:

As the colour of wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol - or coloured green and yellow. The wire which is coloured blue must be connected to the terminal marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal marked with the letter L or coloured red.

7.6 VENTILATION

If the appliance is installed in a compartment it MUST NOT be used for storage purposes. Any ventilation provided for the appliance during installation MUST NOT be blocked and a periodic check must be made to ensure that the vents are free from obstructions.

7.7 CLEANING

Use only a damp cloth and mild detergent to clean the appliance outer casing. DO NOT use abrasive cleaners.

8 SAFETY

It is essential that the instructions in this booklet are strictly followed for the safe and economical operation of this appliance.

The appliance functions as a fan assisted balanced flue unit. The flue terminal MUST NOT BE OBSTRUCTED under any circumstances. If damaged, turn off the appliance and consult the installer, service engineer, or local Gas Region.

If it is known or suspected that a fault exists on the appliance it MUST NOT be used until the fault has been rectified by a competent person.

WARNING:-

If a gas leak is suspected or exists, turn off the gas supply to the appliance at the gas service cock.

Do not operate any electrical switches. Do not operate any electrical appliance. Open all windows and doors. Do not smoke. Extinguish all naked lights. Contact the local Gas Region immediately.

**HALSTEAD
BOILERS
LIMITED**

4 First Avenue, Bluebridge Industrial Estate, Halstead, Essex CO9 2EX.
Tel: (01787) 475557 Fax: (01787) 474588

SERVICE HOTLINE (01203) 351424

Halstead Boilers are continuously improving its products and therefore reserves the right to change specifications without prior notice and accepts no liability for any error or omission in the information contained in this document.

HB 03-96-750622