
Installation and Servicing Instructions



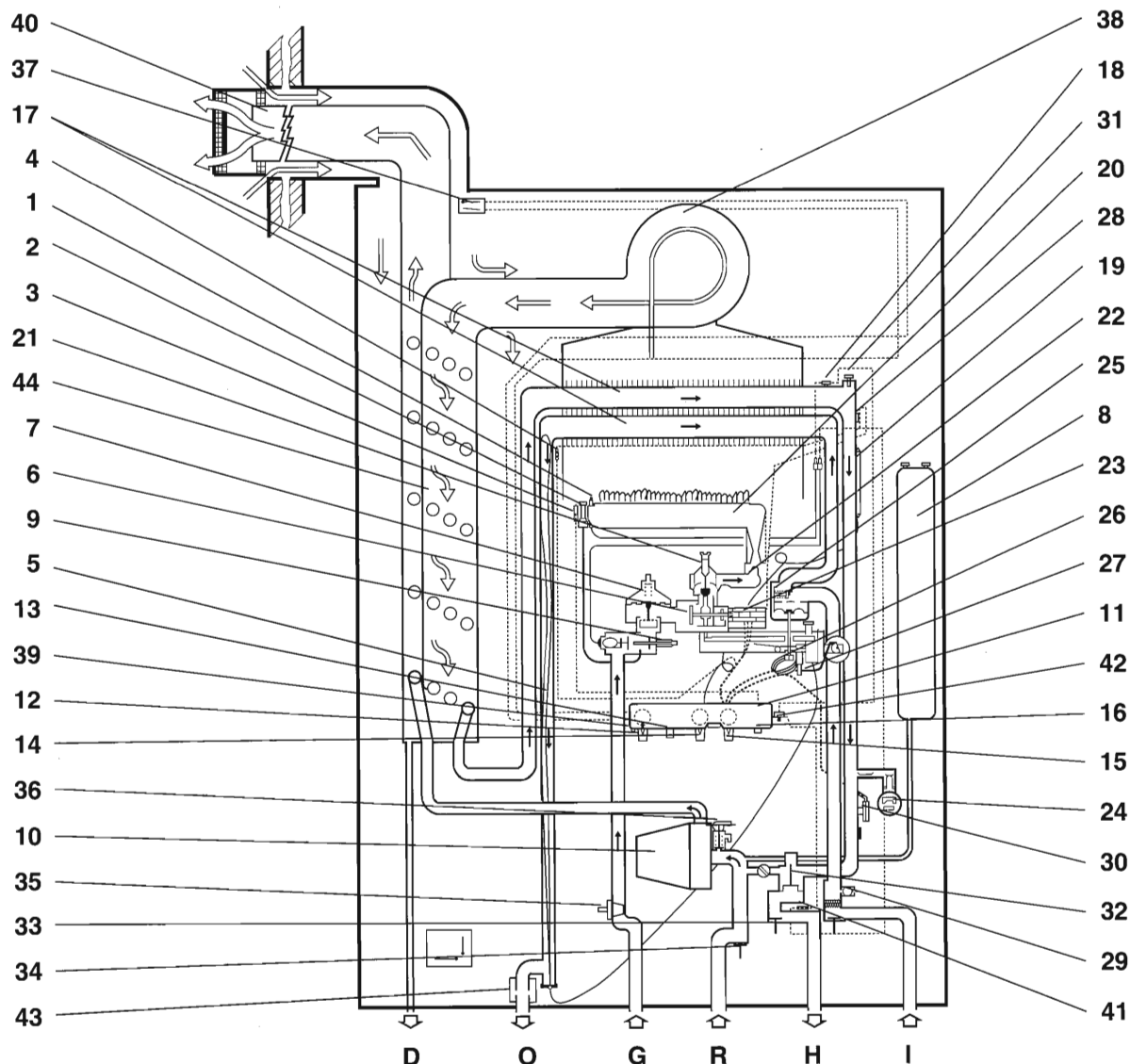
e.i.m. leblanc

type GVM C23

Fan assisted **Wall-Mounted
Condensing Combination Gas Boiler**
FOR NATURAL GAS ONLY

British gas tested and certified
G.C. APPLIANCE No. 47.241.05

NOTE TO INSTALLER : LEAVE THESE INSTRUCTIONS WITH THE USER.



D - Drain
 O - Hot water outlet
 G - Gas
 R - Heating return
 H - Heating flow
 I - Domestic C.W Inlet

- | | | |
|--|--|--------------------------------------|
| 1 - Thermocouple | 14 - Operating selector knob | 29 - Domestic pressure relieve valve |
| 2 - Pilot assembly | 15 - Hot water temperature selector | 30 - CH flow switch |
| 3 - Spark electrode | 16 - Electronic igniter push button | 31 - Heating manual air vent |
| 4 - Hot water limit thermostat (85°C) | 17 - Heat exchanger | 32 - Non return valve (Heating) |
| 5 - Hot water thermostat sensor | 18 - Overheat cut out thermostat | 33 - Heating flow isolating cock |
| 6 - Two ways gas control valve | 19 - Heating thermostat sensor | 34 - Heating return isolating cock |
| 7 - Main gas governor | 20 - Burner assembly | 35 - Gas cock (as gas tap) |
| 8 - Expansion vessel | 21 - Modulating gas valve | 36 - Heating pressure relieve valve |
| 9 - Push button and thermo-electric flame failure valve | 22 - Gas injectors manifold | 37 - Flue-gas safety pressure switch |
| 10 - Heating circulation pump | 23 - Two stage gas solenoid valve | 38 - Exhaust fan |
| 11 - Sealed electrical control box (as panel) | 24 - Heating pressure & temperature gauge (as thermomanometer) | 39 - Outer case safety switch |
| 12 - Heating temperature selector | 25 - Water valve diaphragm | 40 - Outer gas-flue assembly |
| 13 - Push button for thermo-electric flame failure valve | 26 - Double acting microswitches | 41 - Heating limit thermostat (flow) |
| | 27 - Domestic hot water thermostat adjuster | 42 - "Pilot off" push button |
| | 28 - Heating limit thermostat (95°C) | 43 - Temperature trim |
| | | 44 - Condensor |

**Diagrammatic layout only
 (For pipe connections see Installation part)**

INTRODUCTION

The GVM C23 is a wall-mounted, low water content, balanced flue, fan assisted combination boiler with two separated heat circuits. The central heating circuit is rated at 23.2 kW (79,200 Btu/h) output and has an "ON-OFF" burner switching action, controlled internally by built-in sensing thermostats and externally by a room thermostat and time clock (if required). The domestic hot water circuit has a modulated gas supply to the burner - this matches the heat output to suit the water flow between 6.3 kW (21,500 Btu/h) minimum to 21.5 kW (73.430 Btu) maximum hence there is no need for any additional external water flow reducer.

NOTE : It may still be necessary to fit a pressure reduction valve in accordance with water regulations in some site conditions (See page 9 "Hard water areas").

The boiler is supplied in one pack containing the main boiler assembly, incorporating the dual heat exchangers, the condensor, burner assembly, gas and water controls, the expansion vessel, the pressure relief valve and the fan.

The balanced-flue assembly is packed in the base of the carton inside the foam plastic block. The boiler has to be set to give central heating and hot water or hot water only from the front panel controls, adjusted to the range of temperatures shown on table I. It may also be fitted with an external room thermostat and time switch in accordance with the wiring diagram shown page 17. The boiler casing is of white enamelled mild steel and contains the operating controls, including a pressure temperature gauge and a centre viewing port to examine the pilot flame condition.

THIS BOILER IS DESIGNED FOR USE WITH FULLY-PUMPED, SEALED WATER SYSTEMS ONLY

GENERAL INSTALLATION REQUIREMENTS


This appliance must be installed in accordance with the following Statutory Regulations and British Standards Codes of Practice :

- Building Regulations (England and Wales).
- The Buildings Standards (Scotland) Regulations.
- Gas Safety (Installation and Use) Regulations 1984.
- Current I.E.E. Wiring Regulations and Local Water Authority By-Laws. Health & Safety Document N 635 "The electricity at work Regulations 1989".

CODES OF PRACTICE

BS.6891	Installation of low pressure gas pipework.
BS.6798	Installation of gas fired hot water boilers of a rated input not exceeding 60 kW.
BS.5449	Forced circulation hot water systems (domestic central heating system -smallbore and microbore).
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).

GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1984

It is the law that all gas appliances are installed by a competent person (e.g.) Corgi, identified by  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.

IMPORTANT

This appliance is tested and certificated by British Gas plc for safety and performance. No external devices, e.g. flue dampers, economisers, can be fitted.

TABLE 1 - PERFORMANCE DATA

CENTRAL HEATING		Maximum	Medium	Minimum
Heat Input (Gas)	kW	26.9		
	Btu/h	91,782		
Heat Output to Water Non Condensing at 80°C Flow 60°C Return.	kW	23.2		
	Btu/h	79,160		
Heat output - Fully Condensing 60°C Flow. 40°C Return	kW	25		
	Btu/h	85,300		
Preset heat output Non Condensing at 80°C Flow 60°C Return.	kW	23.2		
	Btu/h	79,160		
Burner Setting Pressure (Hot)	mbar	6.3		
	in wg	2.54		
Gas rate	m ³ /h	2.56		
	ft ³ /h	89.21		
C.H Water Temperature (Approx.)	°C	82		30
	°F	180		86

ΔT at 80°C flow temperature : 20°C

DOMESTIC HOT WATER		Maximum	Minimum
Heat Input Modulation (Gas)	kW	26.9	12.0
	Btu/h	91,782	40,950
Output to Water (Modulating)	kW	21.9	6.3
	Btu/h	74,725	21,500
Burner setting pressure	mbar	6.3	1.3
	in wg	2.54	0.58
Flow rate at 50°C Rise	mbar	6.6	
	G.P.M	1.4	
Flow Rate at 35°C Rise	l/min	9.4	
	G.P.M	2.0	
Outlet Water Temperature	°C	65	30
	°F	150	

GENERAL DATA

Main Burner Assembly	18 x bars
Gas/Water Control (monobloc)	elm leblanc
Burners Injectors Nat Gas	elm leblanc Ø 1.20 mm
Pilot Injector Nat Gas	elm leblanc Ø 0.30 mm
Gas Inlet Connection	22 mm copper
Inlet Connection D.H.W	15 mm copper
Outlet Connection D.H.W	15 mm copper
Flow Connection C.H	22 mm copper
Return Connection C.H	22 mm copper
Drain connection	15 mm copper
Main Water Pressure	Min. 1 bar / 14.7 psi Max. 5.0 bar / 72.5 psi
System Pressure C.H	Min. 0.5 bar / 7.25 psi Max. 1.0 bar / 43.5 psi
Fan	240 V~ 50 Hz type DROUARD EF 20.108
Electrical Supply	240 V~ 50 Hz - 150 W - Fused at 3 A
Internal Fuse Ratings - 20 mm	Main: F3 A-Transf.: T 0.25 A
Water Content C.H	0.9 / 0.19 gal
Water Content D.H.W	0.5 l / 0.11 gal
Pressure Relief Valve C.H	22 mm copper
Pressure relief Valve D.H.W	15 mm copper
Nett Weight	48 kg - 105.6 lb
Circulating Pump	Euramo GOLD L
Expansion vessel	5 l - pressure 0.5 bar

NOTE : Gas Rate Based on Cal Value 38.7 MJ/m³ - 1038 Btu/ft³

GAS SUPPLY

The boiler requires a **minimum** gas supply pipe of 22 mm copper or 3/4 in Bsp steel pipe.

The union service cock is supplied fitted to the boiler to facilitate the servicing.

The gas meter must be of adequate size to cope with the increased load and the test point pressure at the appliance inlet should be 20 mbar (8 in. w.g.). When an existing meter or service pipes are to be used, or if the outlet pressure at the meter test point is lower than 20 mbars (8 in. w.g.), the installation should be first checked by the Local Gas Region. The diameter is dependent on the length of the pipe between the gas meter and the boiler, and on the number of elbows, bends, tees. It is the reason why it has to be calculated. See information on gas pipe diameter page 5 and 6.

NOTE : All installation pipework must be fitted in accordance with BS. 6891. Only the Local Gas Region are allowed to remove or replace gas meters. Supply pipework must not be less than the appliance inlet connection size.

The complete installation must be tested for gas soundness and purged in accordance with the above code.

FLUEING

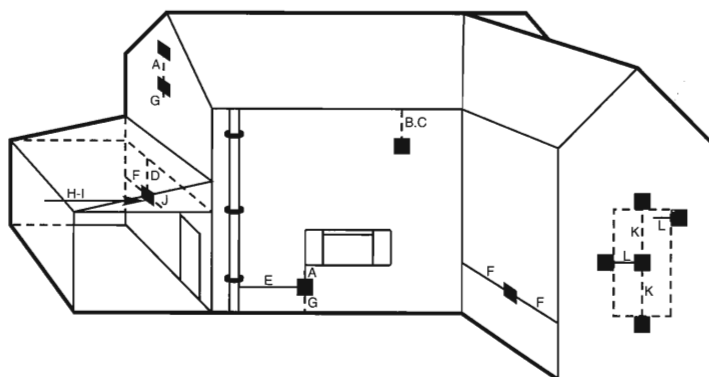
This boiler must be connected in accordance with the requirements of BS. 5440 Part 1.

Wall thicknesses available are shown on Table 3.

In some conditions a terminal guard is required by Building Regulations, particularly when the terminal could come into contact with people near the building or to subject a damage (see below).

As a guide, within a distance of 2 m (6 ft) above a balcony, ground or flat roof.

This terminal guard is available from our distributors.



TERMINAL POSITION	MINIMUM DISTANCE FANNED DRAUGHT
A Directly below an openable window or other opening e.g. air brick	300 mm
B Below gutters, soil pipes or drain pipes	75 mm
C Below eaves	200 mm
D Below balconies or car port roof	200 mm
E From vertical drain pipes and soil pipes	75 mm
F From internal or external corners	300 mm
G Above ground, roof or balcony level	600 mm
H From a surface facing a terminal	600 mm
I From a terminal facing a terminal	1200 mm
J From an opening in the car port (e.g. door, window) into dwelling	1200 mm
K Vertically from a terminal on the same wall	1500 mm
L Horizontally from a terminal on the wall	300 mm

AIR SUPPLY

Air supply for combustion and ventilation must be provided in accordance with BS.5440:2.

If the appliance is installed in a cupboard or compartment, permanent air vents are required in the cupboard or compartment, one at high level and one at low level, either direct to the outside air or to a room. Both high and low level air vents must communicate with the same room or must both be on the same wall to outside air.

The minimum effective areas required are given in Table 2.

Details of essential features of cupboard/compartment design, including airing cupboard installations, are given in BS.6798.

TABLE 2 - COMPARTMENT INSTALLATION

POSITION OF AIR VENTS	Air from room	Air direct from outside
High level and low level	256 cm ² (40 in ²)	128 cm ² (20 in ²)

ELECTRICAL SUPPLY

Wiring external to the appliance must be in accordance with the current I.E.E.

Wiring Regulations and any local regulations which apply.

The boiler is supplied for 240 V 50 Hz. Fuse the supply at 3 A.

The method of connection to the mains supply must facilitate complete electrical isolation of the boiler, preferably by use of a fused three-pin plug and unswitched shuttered socket outlet to the requirements of BS.1363.

Alternatively, a fused double pole switch, having a 3 mm (1/8 in) contact separation in both poles and serving only the boiler, may be used.

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

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

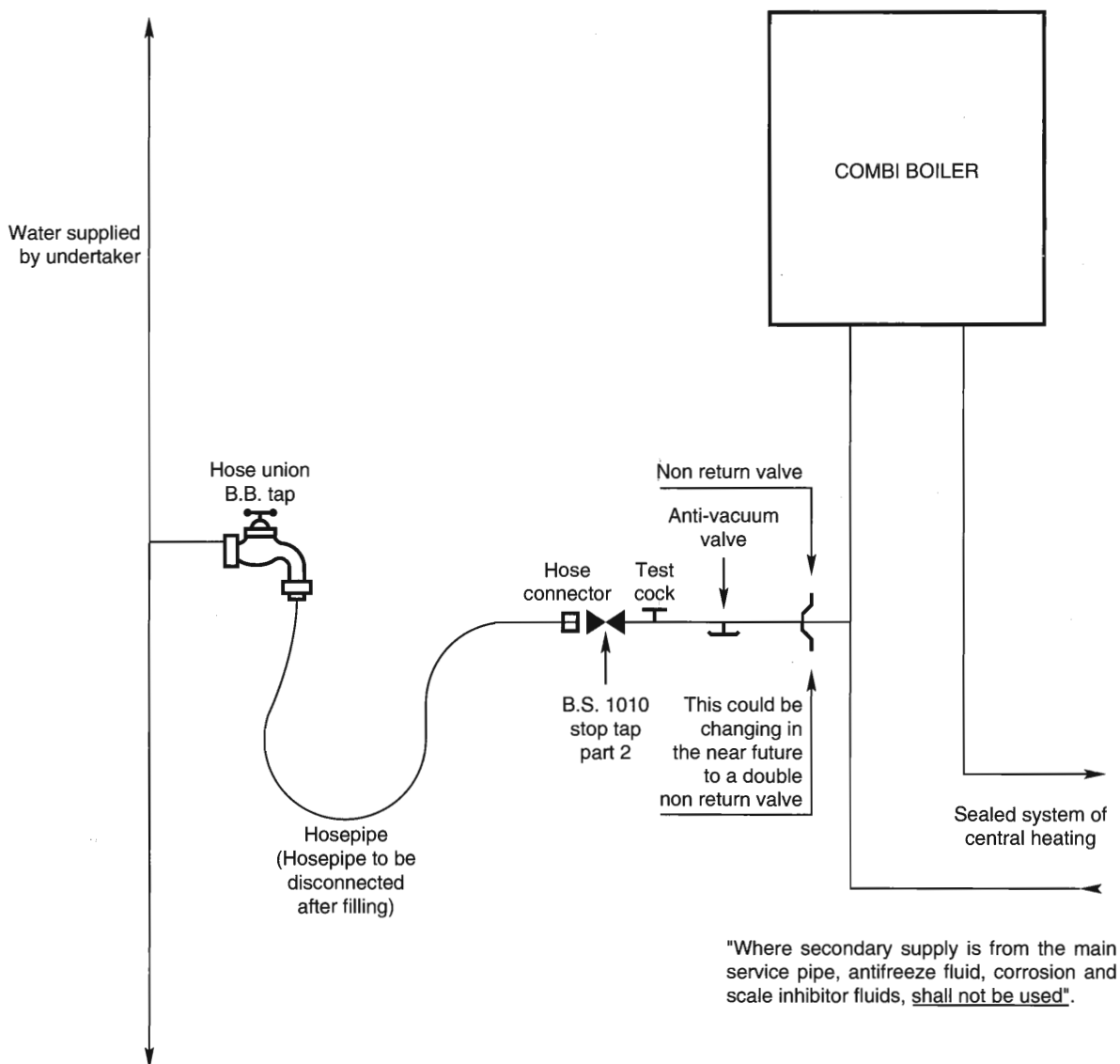
WATER REQUIREMENTS - CENTRAL HEATING

A direct mains water connection to sealed systems is NOT permitted by the Water Authorities: a suitable temporary filling arrangement is detailed in Figure 1 (See page 8).

The central heating system should be in accordance with the recommendations in BS.6798 and in addition, for smallbore and microbore systems, BS.5449:1

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

Copper piping to BS.2871 is recommended.



N.B. - The above mentioned fittings (other than the hose union taps) may form an integral part of the manufactured unit.

Figure 1

FLUE LENGTHS

The following flue kits are available and allow fitting in wall thickness shown on Table 3.

A - Standard flue kit	400 mm
B - Extension flue kit (short)	210 mm (supplied with the standard flue)
C - Extension flue kit (long)	1500 mm
D - Extension flue kit (1 short + 1 long)	2110 mm

TABLE 3

	REAR FLUE		SIDE FLUE (left)		SIDE FLUE (right)	
	mm	in	mm	in	mm	in
A	380	14.96	285	11.22	-	-
B	590	23.22	495	19.48	270	10.63
C	1880	74.01	1785	70.27	1560	61.41
D	2090	82.28	1995	78.54	1770	69.68

Ensure that you have the correct flue length before installing the appliance.

NOTE : Side flue lengths take account of a minimum 100 mm clearance between the boiler and the wall. Maximum thickness available decreases by the additional clearance over 100 mm.

DOMESTIC HOT WATER

A direct connection to the mains water supply should be made in 15 mm copper pipe, using a BS.1010 stop cock (fixed jumper) for isolation and servicing purposes.

If the mains pressure rises above 5.0 bar (73 psi) a pressure reduction valve must be fitted. Check with the Local Water Authority.

Direct connection to fixed head showers is allowed, but if a loose head shower can fall lower than 13 mm (in) above the top edge of the bath, a suitable anti-syphon valve must be fitted.

Copper piping to BS.2871:1 must be used for water supplies.

NOTE : The incoming mains water supply must be at a pressure higher than 1 bar (14.7 psi) providing a minimum flow rate of 2.7 l/min (0.6 gal/min) to operate the appliance.

HARD WATER AREAS

If this appliance is to be fitted in an area where the Temporary Hardness of the water exceeds 200 ppm, a water softener has to be fitted. Details of suitable types can be obtained from the distributors. Check with the local water authority.

LOCATION

THIS APPLIANCE IS NOT SUITABLE FOR EXTERNAL INSTALLATION.

The boiler can be installed on any non-combustible wall, which should be flat, vertical and adequate to support the weight of the boiler filled with water and ancillary fittings.

If it is to be installed in a Timber-Framed building, it must be fitted in accordance with the British Gas publication, Guide for Gas Installations in Timber-Framed Housing - Reference DM.2.

IMPORTANT

When the appliance is installed in a room containing a bath or shower any electrical switch or appliance control using mains electricity should be situated so that it cannot be touched by a person using the bath or the shower (See IEE Regulations).

It is recommended that the boiler is fitted on an outside wall, whenever possible, to facilitate direct flueing and drain pipework, although full facility is provided to pass the flue assembly through an adjacent (side) wall.

Ensure that the minimum clearances for servicing are available and leave adequate clearance in front of the boiler for operation (Figure 2, 2 B).

PERSONAL SAFETY

Observe the Health and Safety Code : always wear protective gloves when handling or lifting sheet metal components, and goggles when drilling or chiselling brickwork.

GUIDE TO SYSTEM REQUIREMENTS

1. The installation must comply with the requirements of BS.6798 and BS.5449.
2. The installation should be designed to work with flow temperatures of up to 82°C.
3. All components in the system must be suitable for a working pressure of 3.0 bar (45 psi) and a temperature of 110°C. Care should be taken when making joints to minimise any chance of leakage.
4. The following components are incorporated within the appliance : circulating pump, pressure gauge and temperature-indicator combined, range 0-4 (0-59 psi). Automatic by-pass valve, pressure relief valves to both heating and hot water circuits pre-set 3.0 bar (45 psi). Flow pressure valve (heating), flow pressure modulating valve (D.H.W, 5 litre expansion vessel (pressurised to 0.5 bar)).
5. Make-up water. Provision must be made for the replacement of water lost from the system. A suitable method is of temporary connection as shown in Figure 1, subject to local Water Authority requirements.
6. The maximum water capacity of the system should not exceed 110 litres (23.3 gals) and the system must be pre-pressurised to a minimum of 0.5 bar.

Should the system capacity exceed that stated, it will be necessary to install a second expansion vessel on the return pipework to the boiler.

For further details refer to BS.5449 and British Gas publication "Specifications for Domestic Central Heating and Hot Water".

PACKAGING

The boiler is supplied in one pack containing the boiler assembly, including the standard balanced flue assembly.

Also included is a package containing :

- Installation and Servicing Instructions,
- Users Instructions,
- A Carton Contents List,
- Warranty Card,
- Miscellaneous (see Carton Contents List),
- Mounting Template.

Remove the boiler from the pack by swinging upwards and lifting clear. Check all items for possible transit damage.

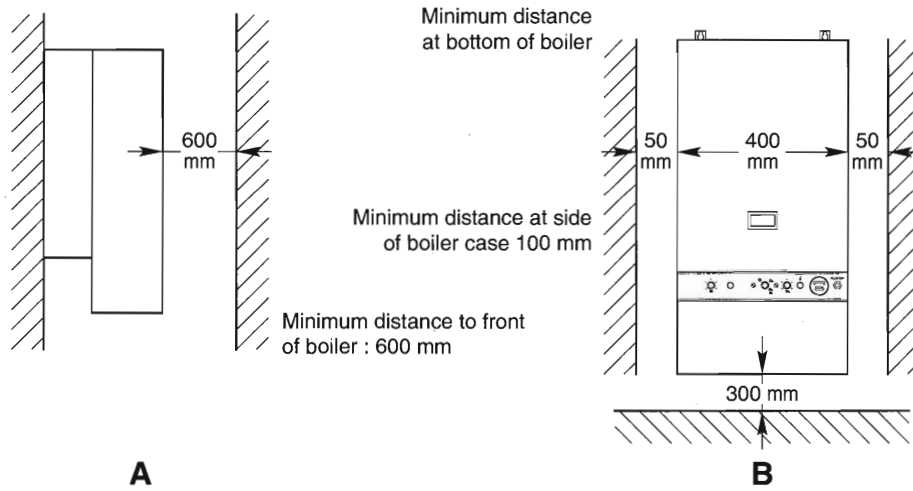


Figure 2

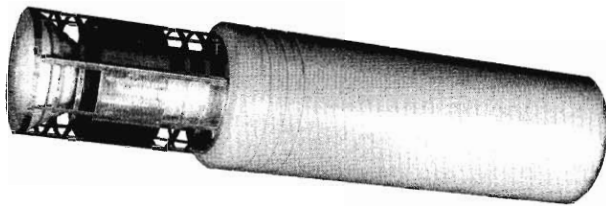
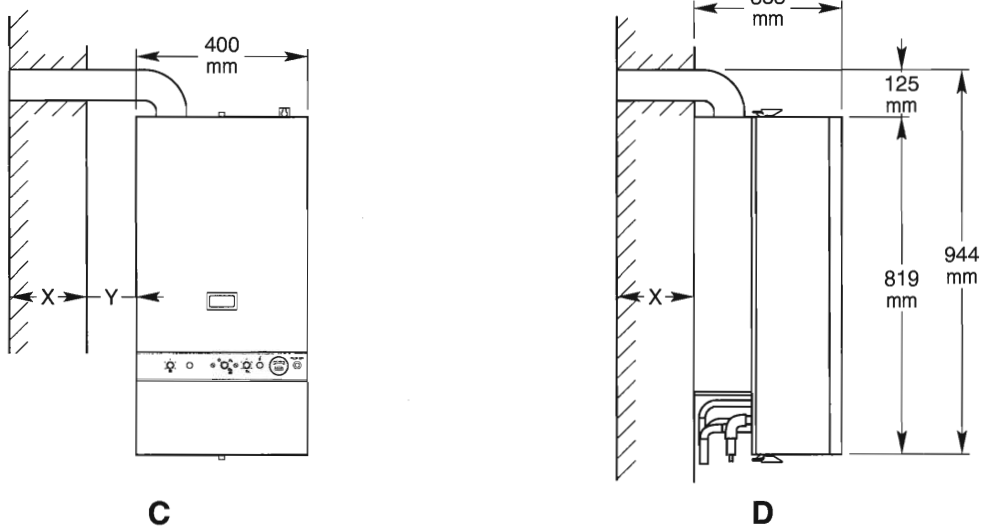


Figure 2 E

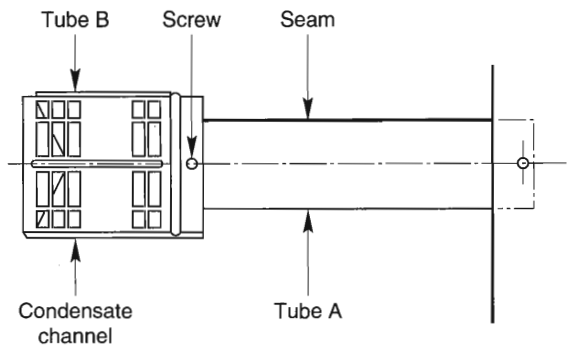


Figure 2 F

TABLE 4

Diameter of the hole		
in	mm	
4	102	A Standard flue kit
5	125	C Extension flue kits

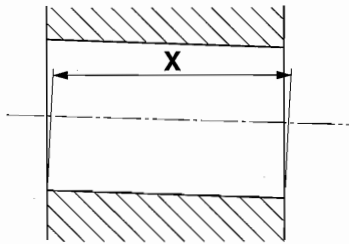


Figure 2 H

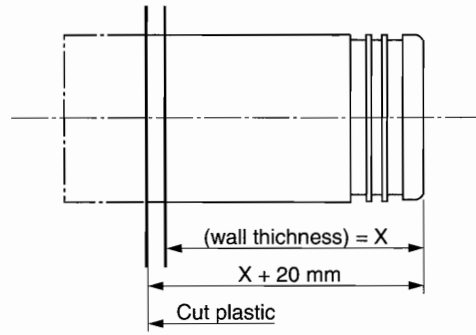


Figure 2 I

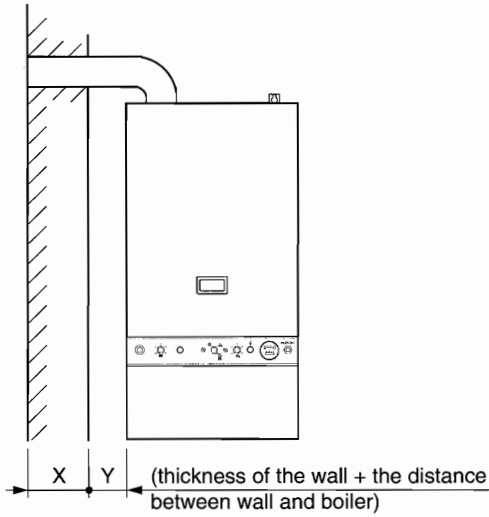


Figure 2 K

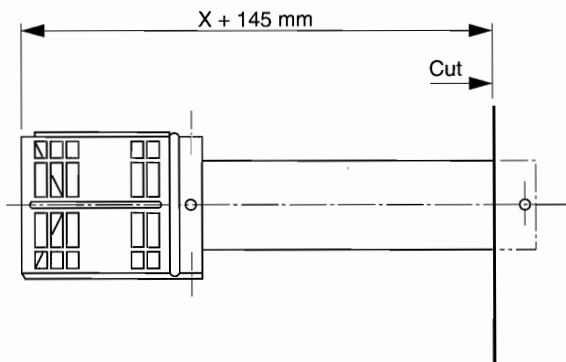
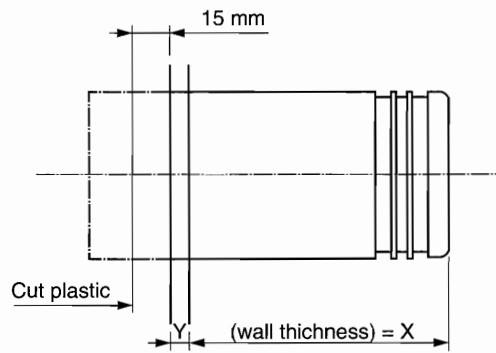


Figure 2 J

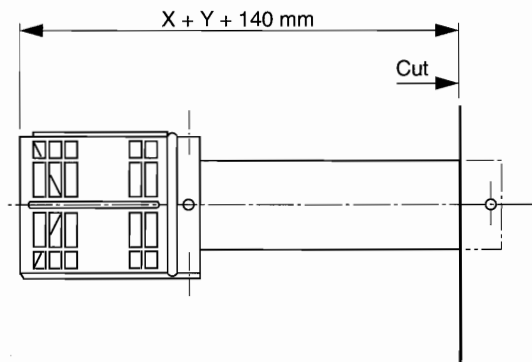


Figure 2 L

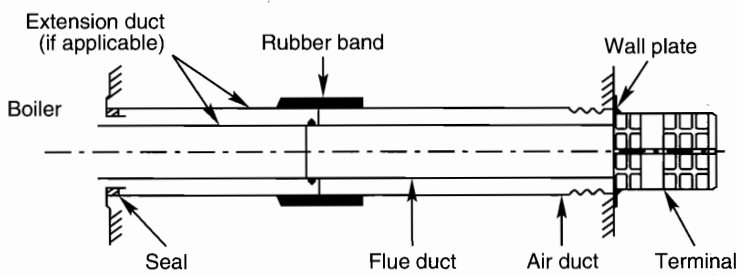


Figure 2 M

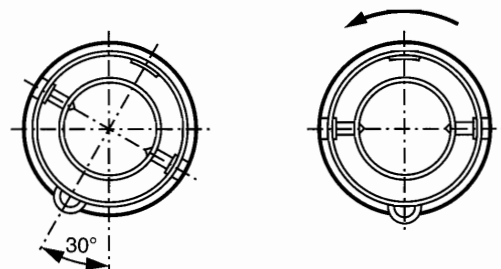


Figure 2 N

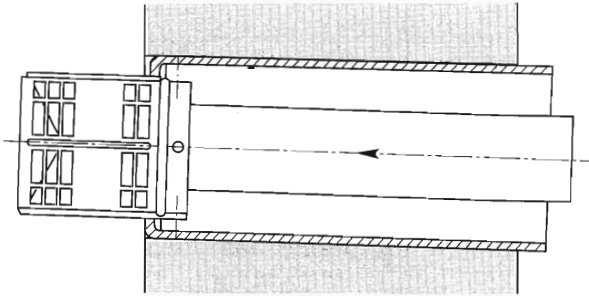


Figure 2 O

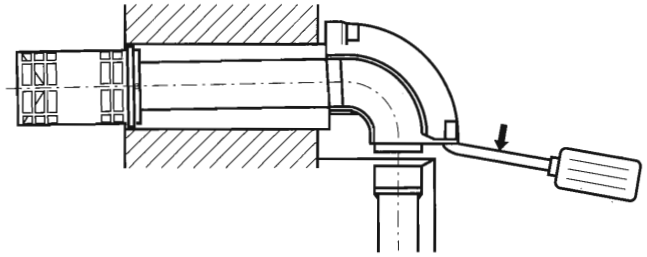


Figure 2 P

SECTION 1 : FIXING THE BOILER

- 1.1. Choose the position on the wall for the boiler to be fitted, taking the boiler's dimensions into account. The center line of the flue shall be situated a minimum of 0.4 m from any opening window and 0.6 m from any ventilation outlet. Also note that, for rear flue fitting, the flue is not central to the boiler. See template.
- 1.2. **IMPORTANT** : Ensure that the wall structure is such that it is capable of holding the weight of the boiler (for boiler weight, see general data, if necessary, use an alternative method for fixing).
Ensure that the wall is vertical and flat.
- 1.3. See Figure 2 the minimum clearance should be maintained between the sides and bottom of the boiler, so that the connections to the boiler can be made with ease and the boiler can be serviced.
- 1.4. Fit the terminal B on the flue duct A with 2 screws supplied (Figure 2 F).
IMPORTANT : The seam of the pipe has to be fitted opposite to the condensate channel of the terminal. (Figure 2 F).
- 1.5. Take the template and hang it on the wall in the chosen position, using the appropriate side of the template for either rear or side flue connection. Tape is enclosed in the box for the fixing off the template on the wall.
- 1.6. Drill out the two holes (8 mm) for the hanging position of the boiler at the top.
Fit wall plugs and screws, supplied, so that the heads are about 10 mm from the wall.
- 1.7. Make a hole in the wall for the flue assembly.
IMPORTANT : The diameter of the hole depends on the wall thickness and the extension needed to give a slope to the flue of approximately 30 to 40 mm per metre, sloping upwards towards the inside. Diameters of the hole are given in Table 4.
- 1.8. Measure exactly the thickness of the wall X. (Figure 2 H).
 - a. For rear flue connection :
 - Add 20 mm ie $X + 20$ mm on the air plastic duct.
 - Cut it at the calculated length at the plain end (Figure 2 I).
 - Take the metal duct with the terminal secured and from the end of the terminal, mark X and add 145 mm ie $X + 145$ mm and cut the metal duct at the calculated length at the plain end. (Figure 2 J).

- b. For side flue connection (left) :
- Measure the distance between the appliance and the wall Y and add 15 mm ie $X + Y + 15$ mm.
 - Cut the air plastic duct at the calculated length at the plain end (Figure 2 K).
 - Take the metal duct with the terminal secured and from the end of the terminal : report $X + Y$ and add 140 mm ie $X + Y + 140$ mm.
 - Cut the metal duct at the calculated length at the plain end. (Figure 2 L).
- c. For side flue connection (right) :
- Use the same calculation as left connection, fit the extension ducts supplied with the appliance on the cutted ducts.
- 1.9. From the plain end of the plastic duct, push the terminal end of the metal duct through until the terminal protrudes at the other end.
- NOTE** : In its correct position, the plain end of the metal duct should protrude beyond the plain end of the plastic duct by 10 mm.
- 1.10. Hang the boiler on the mounting screws, tighten the screws.
- 1.11. To assembly the two ducts :
- If extensions are used, take care that extensions fully engaged on Standart ducts, plastic duct, seal the connection with the rubber band delivered with the duct. (Figure 2 M).
 - Push the metal duct in the plastic duct, line the the notches with the raised seam on the terminal, turn the metal duct to clip it on the plastic duct. (Figure 2 N).
- 1.12. Push the assembly through the wall and over the terminal until the end of the plastic duct is flush with the outside wall. (Figure 2 O).
- Fit the metal bend onto the metal duct and turn it in order that the inlet of this elbow be in line with the condensation channel and both facing downward. Position the plastic bend over the metal bend.
 - Fit the metal bend on the boiler flue connection in using a screwdriver (fully pushed) as shown on Figure 2 P.
- Fit the plastic bend on the plastic duct (slowly to avoid to disconnect the metal duct) and fit it with the 4 screws delivered with.
- 1.13. Cement around the outside of the plastic duct having set to a downward slope from terminal to boiler. Ensure that the cement fills the cut grooves in the duct and make good the wall at the internal wall face.
- 1.14. Fit a plate outside by two m 6 mm screws.
- 1.15. Fit the terminal guard (if necessary) by :
- a. Placing the terminal guard over the terminal.
 - b. Make sure that the clearance between terminal and terminal guard is 50 mm.
 - c. Drill the 4 holes.
 - d. Fit the terminal guard by 4 screws of 6 mm.

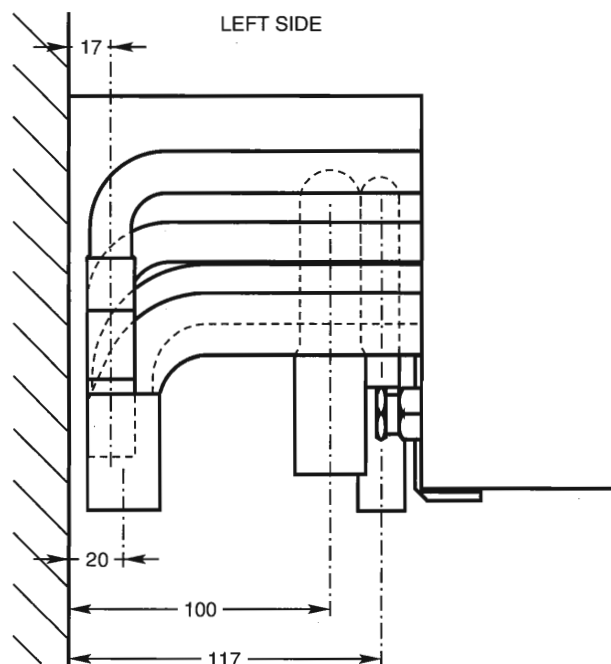
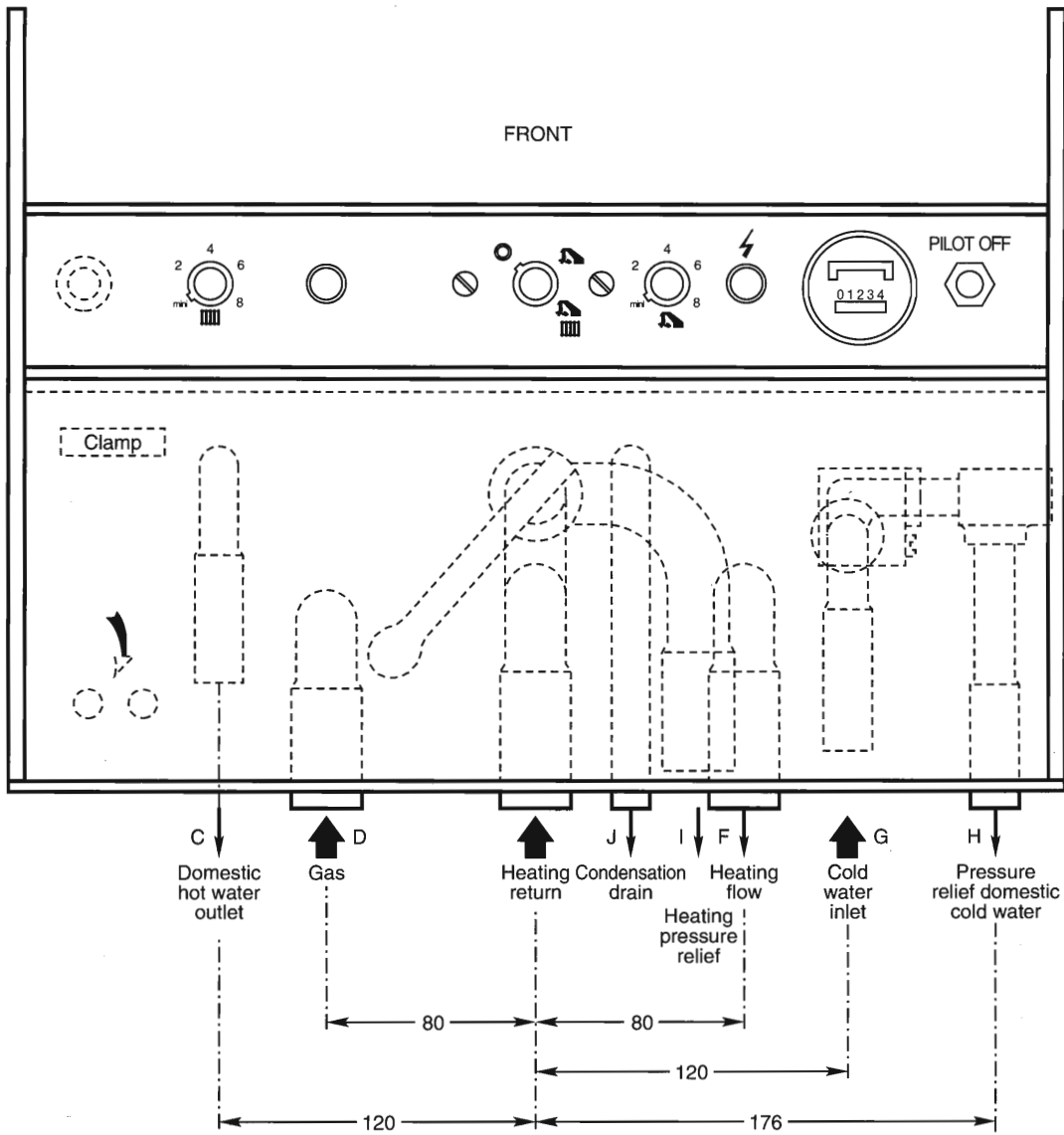


Figure 3 - Pipe connections

SECTION 2 : CONNECTING THE SUPPLY PIPES (Figure 3)

Figure 3 shows the five copper tail connections, identified as C, D, E, F and G, which are suitable for compression or capillary-soldered joints.

Key letters H and I indicate the two pressure-relief vent connections and J the condensation connection which should be extended through the outside wall and run to drain in the manner described in 2.6 below.

Remove all rubber sealing washers from the union connections at the boiler if using capillary soldered fittings.

The connections can, if required, be made prior to the completion of the full system installation.

- 2.1. Connect the gas supply 22 mm copper at D.
- 2.2. Connect the return pipe 22 mm copper at E, installing a draining cock at the lowestpoint in the pipework.
- 2.3. Connect the flow pipe 22 mm copper at F, and leave provision for the filling attachments.

NOTE : This appliance has integral isolation valves on the flow and return.

It is not necessary to fit others.

- 2.4. Connect the cold water mains supply 15 mm copper at G.
- 2.5. Connect the domestic hot water outlet pipework 15 mm copper at C.
- 2.6. Drill through the wall (if necessary) and connect discharge pipes 15 mm copper at H, and 22 mm copper at I. The condensation pipe 15 mm at J has to be connected to an existing or purpose built drain using suitably corrosion resistant materials, eg. plastics. Drainage pipe inside the house of at least 15 mm internal diameter and outside the house of at least 32 mm internal diameter shall be used ; these shall be fitted with a fall of at least 45 mm per meter run.
- 2.7. Replace all sealing washers, firmly clip the pipework to the wall and tighten all connections.
- 2.8. Make-good the internal and external wall surfaces around the discharge pipework.

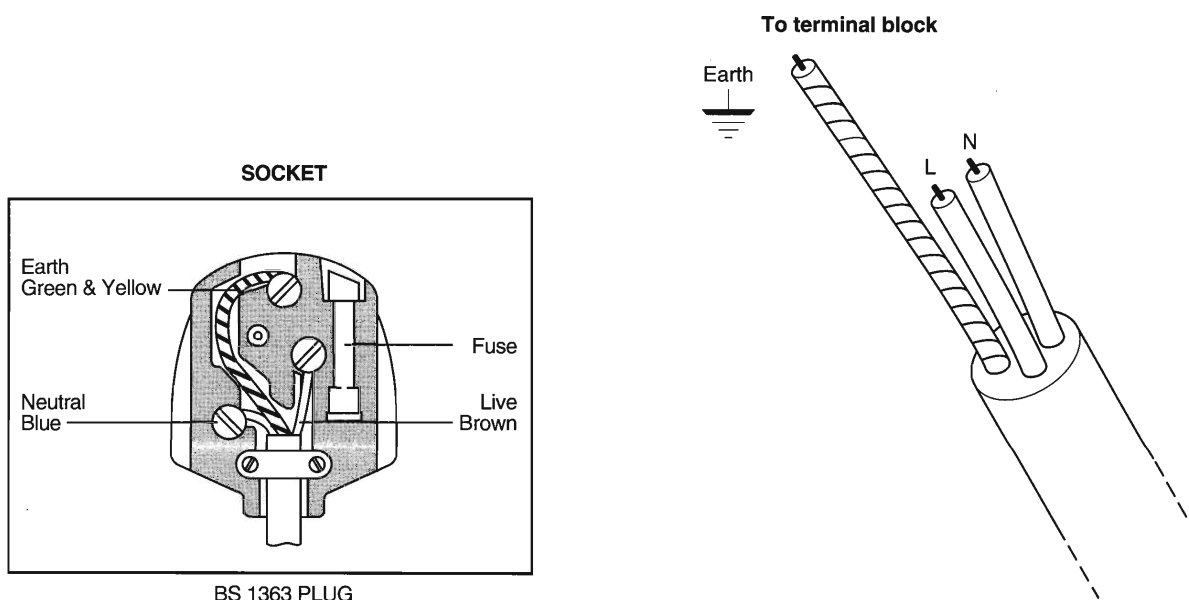


Figure 4

SECTION 3 : CONNECTING THE ELECTRICAL SYSTEMS (Figure 4)

WARNING - THIS APPLIANCE MUST BE EARTHED

A mains supply of 240 V 50 Hz single phase is required. Wiring should be in 3 core PVC Cable not less than 0.75 mm² (24 x 0.2 mm) to BS 6500, Table 16.

Wiring external to the boiler MUST be in accordance with the current I.E.E. wiring regulations and any local regulations which apply.

NOTE : Earth wire must be longer than L and N (Figure 4), so that the current carrying conductor become "taut" before the earthing conductor should the cable be pulled.

The supply connection must be made via a removable plug to an unswitched shuttered outlet socket. Both to the requirements of BS.1363, and fused at 3 A, wired as shown in Figure 4 or via a fused double pole switch, having 3 mm (1/8 inch) contact separation in both poles and serving only the boiler and system controls.

INTERNAL WIRING

1. Remove the boiler casing as described in Section 1 (Replacement of components).
2. Remove the terminal box screw and take off cover D (Figure 5).
3. Pass the mains lead through the left-hand cable clamp entry, and secure the clamp.
4. Wire the supply to terminals marked L.N. and secure the cable clamp.

NOTE : The mains lead connections MUST be made in such a way that, should the lead be pulled from its anchorage, the current-carrying conductors become taut before the earth conductor.

International wiring of Controls Panel is shown in Figure 7. A wiring diagram is also included behind the case.

EXTERNAL WIRING

All external wiring MUST conform to current I.E.E. Wiring Regulations.

NOTE : The time switch must have isolated contacts.

Do not use L and N connections in the terminal box of the boiler to connect the time-switch but connect as described Figure 6.

ROOM-THERMOSTAT AND TIME-SWITCH

Pass the room thermostat and time-switch cables through the right hand cable entry, remove the link and connect the output leads to the appropriate terminals, as described Figure 6.

Ensure that all cable runs are clear of sheet metal or hot components and, where applicable, are firmly clipped to the wall.

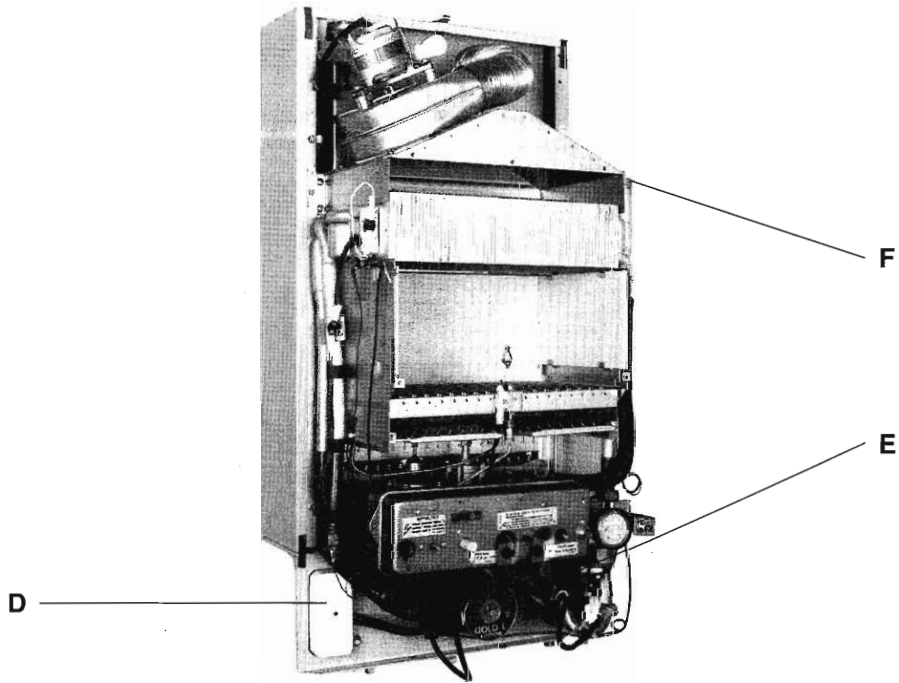
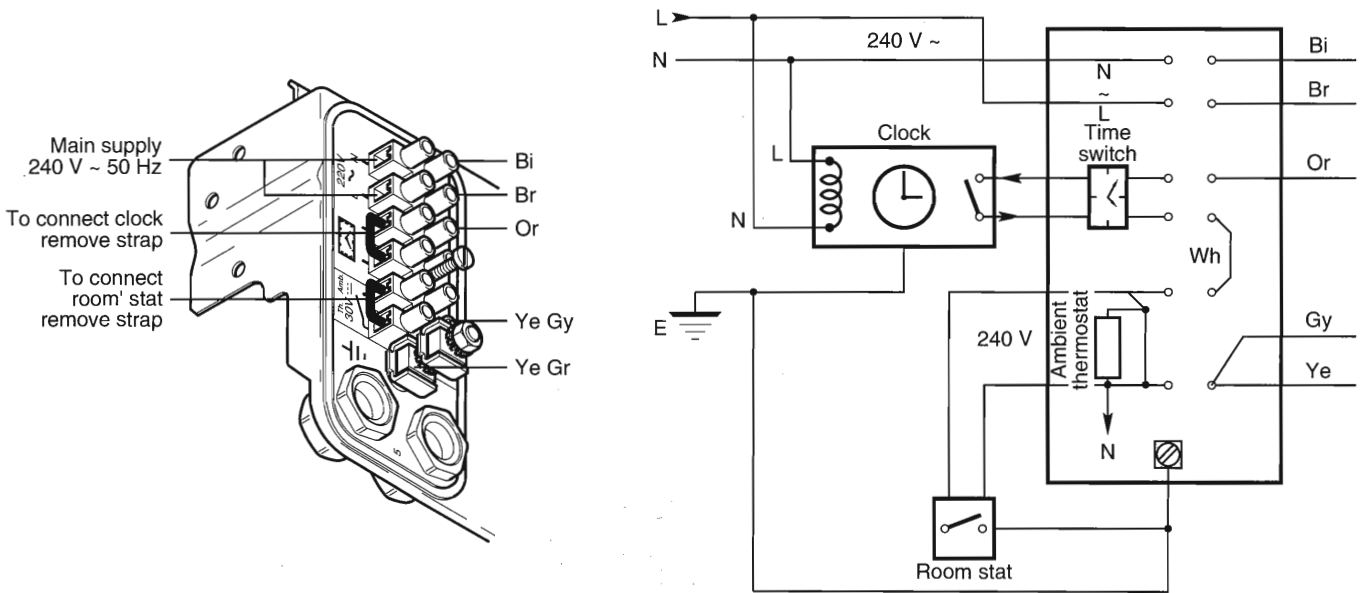
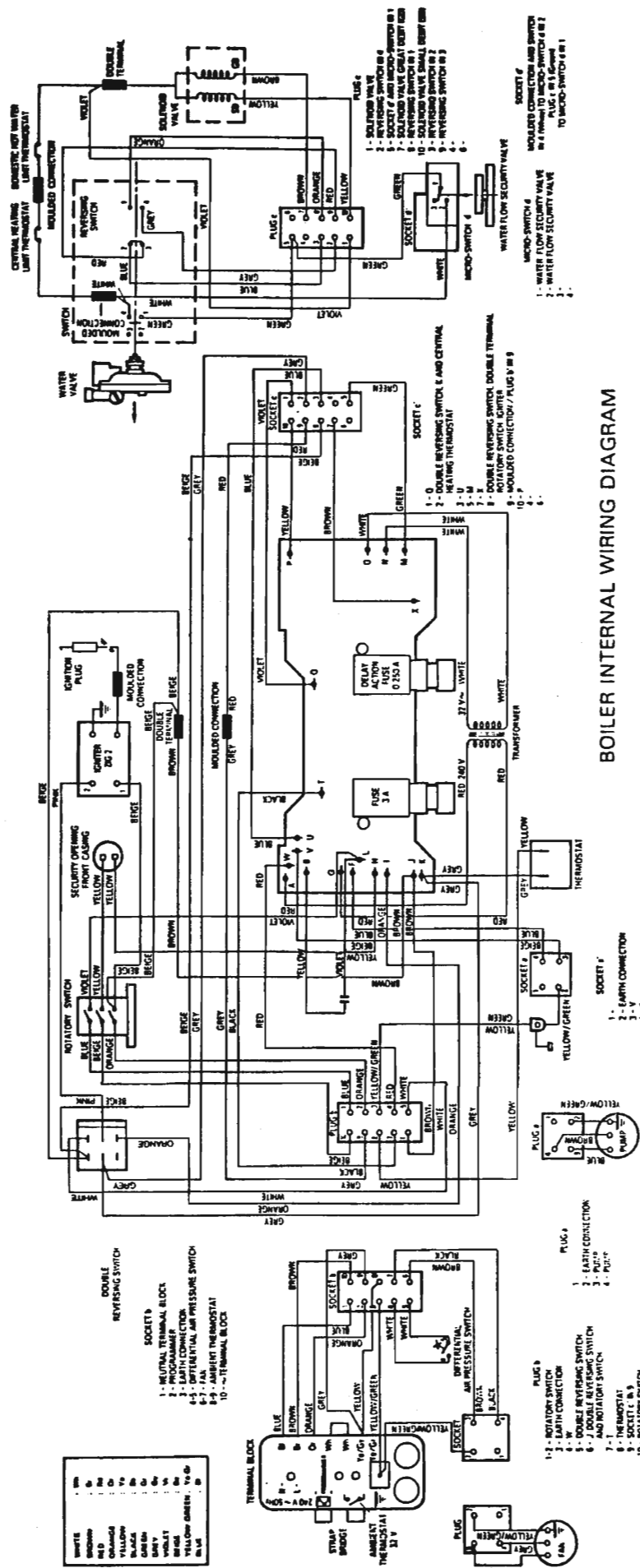


Figure 5



WHITE	: Wh
BROWN	: Br
RED	: Rd
ORANGE	: Or
YELLOW	: Ye
BLACK	: Bk
GREEN	: Gr
GREY	: Gy
VIOLET	: Vi
BEIGE	: Be
YELLOW-GREEN	: Ye-Gr
BLUE	: Bl
SALMON-PINK	: S-Pk

Figure 6



BOILER INTERNAL WIRING DIAGRAM

Figure 7

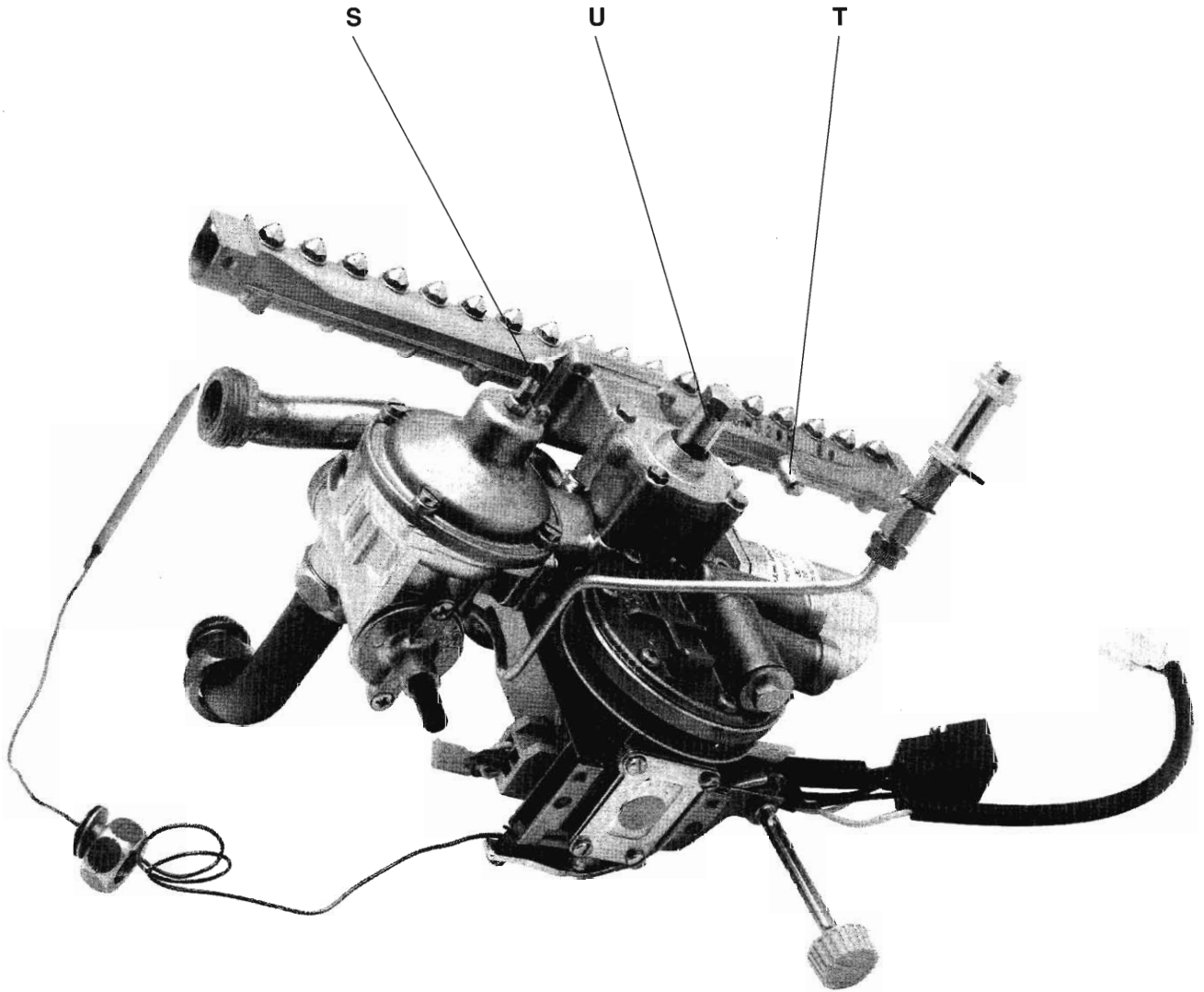


Figure 8

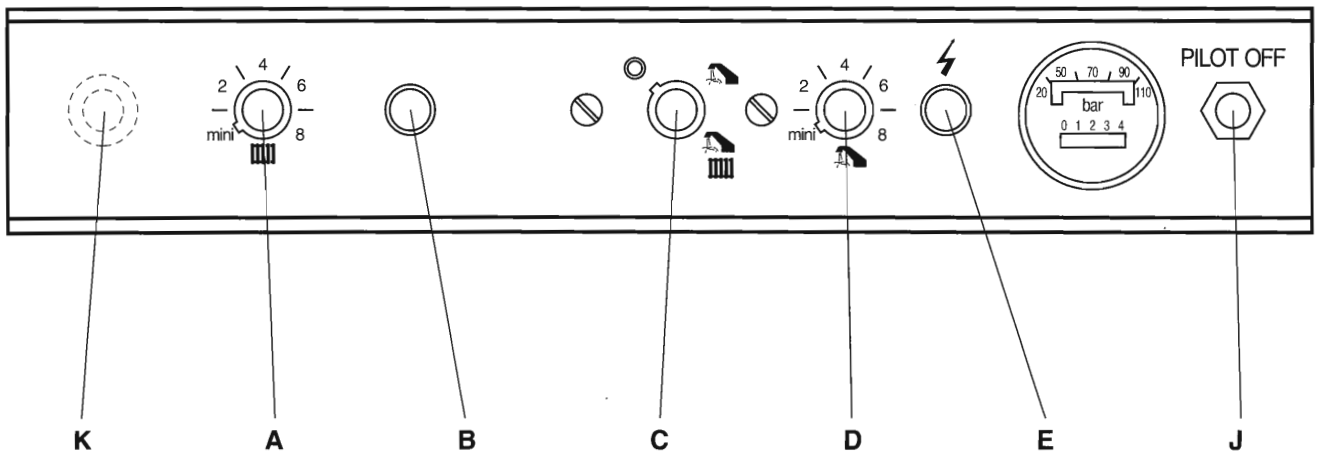


Figure 9

COMMISSIONING AND TESTING

WATER SYSTEM

Open all isolating valves M, N, L (Figure 21 & 22).

- a. Fill the central heating system by connecting a flexible hose as shown in Figure 1 and flush out the system via the drain cock in the return pipe in accordance with BS 7593:1992.
- b. Close off the drain cock and refill.
- c. Bleed off the air from all radiators and from the circulating pump by removing the front screw (see E - Figure 5) and from manual vent screw (see F - Figure 5) and fill to the required pressure.
- d. Water pressure in the central heating system must always be between 0.5 bar (7.4 psi) and 1 bar.
- e. Disconnect the flexible hose and bleed off water, if necessary, until the correct pressure is reached.
- f. Turn on each tap to clear air.
- g. Check out the whole system for water soundness.

GAS INSTALLATION

Turn on the main gas supply, open the appliance service cock and test the whole gas installation, including the meter, for gas soundness test in accordance with BS. 6891 and purge air out of the system via the test nipple service cock P (Figure 21).

CAUTION : Whilst carrying out this test, extinguish all naked lights, turn off pilot lights to any adjacent appliances, and open windows.

Turn off service cock. Replace test nipple screw.

ELECTRICAL INSTALLATION

Carry out a final electrical safety check to ensure continuity of earthing short circuit, polarity, resistance to earth and system conformity use a multimeter or similar instrument.

NOTE : These checks should only be carried out by a competent person.

Replace any covers removed.

INITIAL LIGHTING

Setting up the gas pressure :

- For gas settings, see Table I or Data Badge located on the appliance at the right hand lower back panel.
- The boiler is adjusted to a nominal gas input of 26.9 kW (91,782 Btu/h) for domestic hot water which is controlled by a modulating high/low gas valve.
- Any slight adjustments to this rate may be made by adjusting the main gas governor screw (See S - Figure 8 "Clockwise increases pressure").


Proceed with lighting as follows :

- With the outer casing still removed, remove the pressure test nipple screw T (Figure 8) and fit a suitable pressure gauge.
- Temporarily re-fit control knobs A, C, D - (Figure 9).

Set the domestic hot water as follows :

1. Check the water supply is on by turning on the nearest hot water tap (water should flow). Turn off.
2. Check the boiler pressure is not less than 0.5 bar shown on the lower scale of the gauge.
3. Check that the gas service cock is on.
4. Check that the electrical supply is switched on.
5. Set control knob C (Figure 9) to the position 0.
(located between the two casing screws of the control box).
6. Light the pilot as follows :

The boiler casing switch (K) must be held permanently in, as the case is not fitted. Use a piece of tape or a band wrapped around the control box.

- a. Set knob C to the position  (hot water).
 - b. Push in button B and hold (Figure 9).
 - c. After sufficient time to purge any air from the pilot, push in igniter button E should start.
 - d. Continue to hold in the igniter until the pilot lights.
 - e. Hold in button B for a further 10 seconds, then release. The pilot should now remain alight.
 - f. If the pilot goes out, wait 3 minutes and repeat this procedure, but hold in button B a little longer.
7. Check the pilot flame fully envelops the thermocouple tip and has a minimum flame design in accordance with Figure 10.

The recommended range of operating parameter for the thermocouple is 6 mV mini to 10 mV.

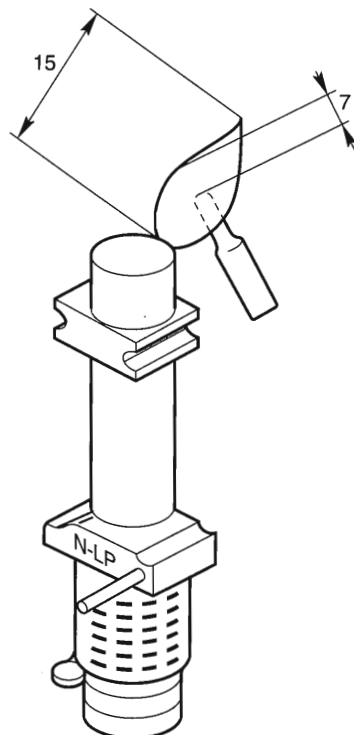


Figure 10

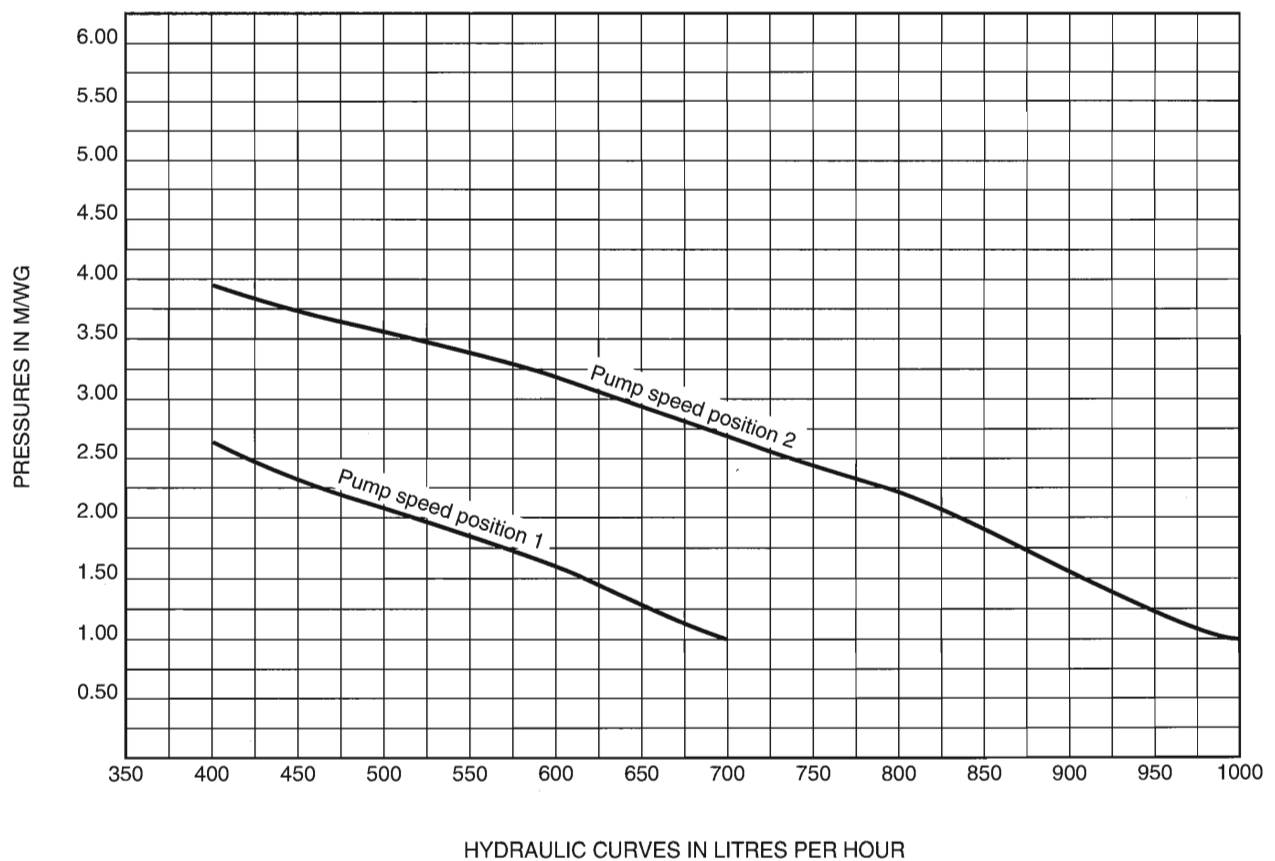


Figure 11

Test the domestic hot water operation as follows (the pump should not be operating) :

- a. Set the temperature control knob D (Figure 9) to Nr. 8 maximum fully clockwise.
- b. Set the selection knob C to the hot water position (tap), if it is not.
- c. Turn on fully the nearest hot water tap and the burner should light at its maximum rate, and fan speed will increase.
- d. Allow the boiler to warm up for 5 minutes then check the pressure at the burner T (Figure 8). This should be at maximum rate 6.3 mbar (2.54 in wg).

If this is not correct, set the governor S (Figure 8) to give the correct pressure.

Turn clockwise to increase.

Note the red seal is for factory use only and can be ignored.

- e. Check the low rate operation of the burner.

(NOTE : This setting is fixed and cannot be adjusted). Set knob D (Figure 9) to No. 4 and partially turn off the hot water tap. Allow a few minutes and the burner should now modulate to its low rate.

- f. Turn off the hot water tap.

Setting the pump and central heating input :

1. Set the pump rate. The circulating has flow settings selected by a rotary switch on the left-hand side of the pump. Switch to the desired position to suit the system flow/resistance. Figure 11 shows the flow resistance curve for each setting.
2. Turn on the central heating by setting control knob A (Figure 9) to maximum No. 8 fully clockwise and knob C (Figure 9) to the central heating symbol (tap and radiator) fully clockwise. Check that the room-stat and time switch (if fitted) are calling for heat and the burner should now light with the pump running.
3. Check the burner pressure. If adjustment is required in accordance with Table 1, remove the protective cap from adjusting screw U (Figure 8) and adjust input as required (clockwise to increase pressure).
4. Manually operate the room-stat and time switch to off and the burner should go out, leaving the pilot on. Switch back on again.
5. Turn control knob C to the "Off" position 0 (Figure 9) fully anticlockwise main burner will go off. Remove pressure gauge, refit test nipple screw.
6. Turn knob C fully clockwise to relight burner. Check for gas soundness on all appliance gas carrying components, including the burner pressure test nipple.
7. Check the pilot off button by pushing in. The burner should go out in a 3 seconds maximum time.
8. Relight the pilot. Check the thermocouple by turning off the appliance gas service cock and listening for a "click" in a 60 seconds maximum time.
9. Remove tape/band from boiler casing button.
10. Open gas service cock.
11. Using the indicator arrows provided, mark the respective set heat inputs on the appliance Data Badge.
12. Replace the boiler case in the reverse order to that described in Section 1 (Replacement of components).
13. Recheck the appliance operation to ensure that the boiler casing button is functioning correctly.

NOTE : The boiler has an overheat thermostat which cuts off the pilot flame.

In order to re-establish it, open an hot water tap in order to colder the boiler ; then relight the pilot.

HANDING OVER

After completing the installation and commissioning, the system can now be handed over to the householder.

Set the controls to the householder's requirements.

- a. Hand the User's Instructions to the householder and explain and demonstrate the lighting procedure.
- b. Explain the setting of the controls and the summer and winter requirements, shut-down procedures and frost procedures.
- c. Explain and demonstrate the functions of any time switch, room thermostat and the overheat safety device.
- d. Explain that the appliance has a safety device (overheatstat) which can extinguish the pilot, and in this case, the appliance has to be relighted. If electricity supplied is interrupted manual re-setting of the gas controls may be required.
- e. Draw to the attention of the householder their responsibilities under the Gas Safety (Installation and Use) Regulations 1984 and stress the importance of regular servicing by a competent person at least once a year.

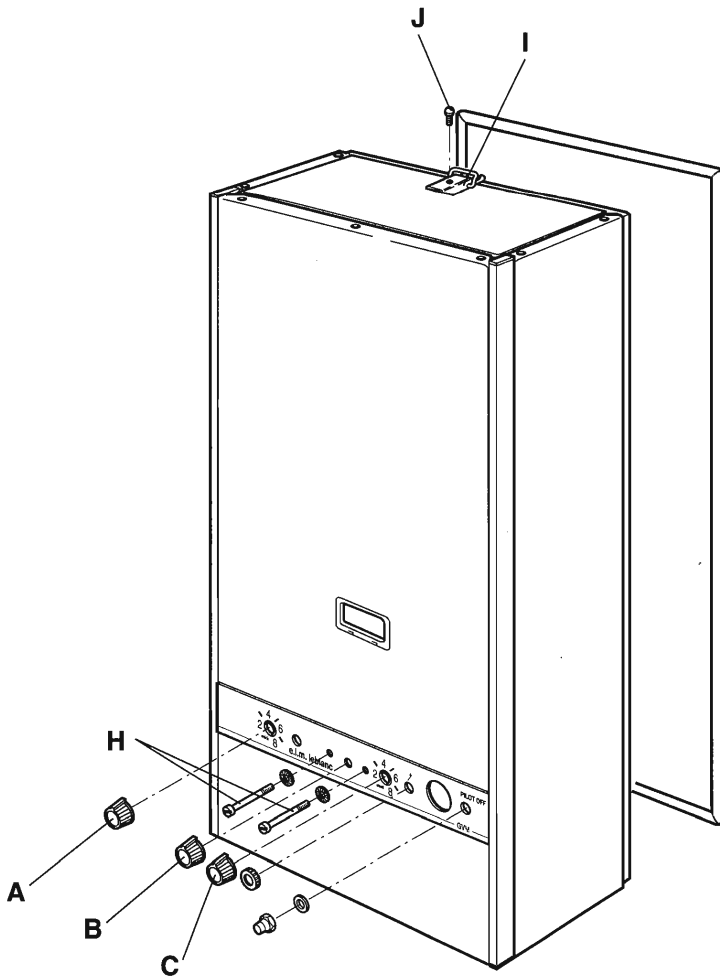


Figure 12

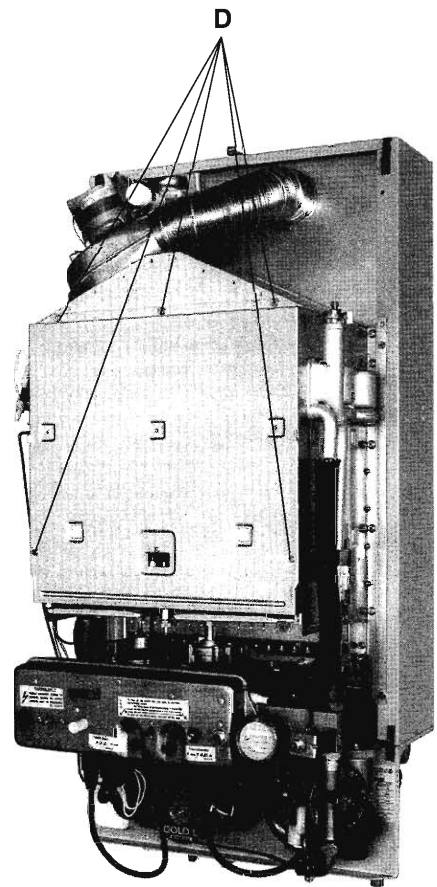


Figure 13

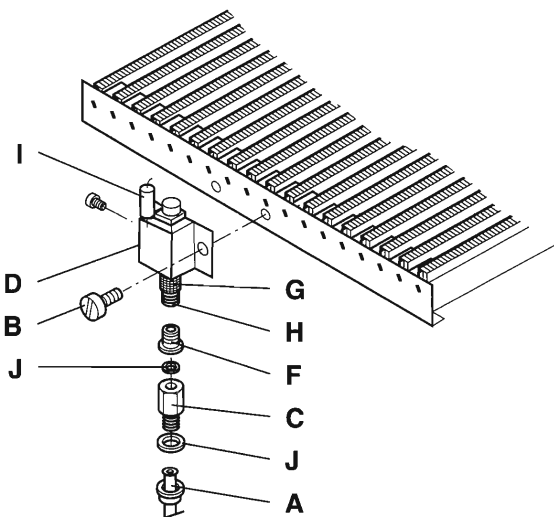


Figure 14

ANNUAL SERVICING - SCHEDULE

WARNING : Always isolate the electricity supply and turn off the gas supply at the appliance service cock before commencing any servicing.

For access to individual components, refer to the relevant section given under Section "Replacement of components".

1. Run the boiler and check the operation off its controles and switches.
2. Remove the boiler case (Section 1) and visually check all water carrying components for signs of leakage or deterioration.
3. Remove the combustion chamber front panel (Section 2) and check the insulation panels for damage or deterioration. Replace if necessary (Section 8).
4. Remove the main burner. Inspect, clean or exchange bars and injectors as necessary (Section 6).
Before replacing the main burner, cover the pilot tube, examine the heat exchanger and clean off any accumulation of deposit using an appropriate brush.
5. Remove any carbon deposits which have built up on the thermocouple tip.
6. Remove and clean the pilot assembly and injector (Section 3).
7. Replace components, covers and panels on completion of the service and run the boiler to ensure its correct operation in accordance with the Commissioning Procedures described in stage 6.
8. Check the General Installation for correct clearances, air supply, ventilation, etc. in accordance with General Safety Regulations.

NOTE : When cleaning injectors either blow out or wash out. Never use a pin or wire.

IMPORTANT : After completing any servicing or exchange of gas-carrying components, ALWAYS test for gas soundness and carry out functional checks of controls.

NOTE : When Servicing, the reassembly procedure will always be the reverse of the dismantling procedure unless otherwise stated.

REPLACEMENT OF COMPONENTS

SECTION 1 : TO GAIN GENERAL ACCES (Figure 12)

- 1.1. Pull off the 3 control knobs A, B, C.
- 1.2. Remove the 2 fixing screws H from the control panel and the two retaining nuts (Igniter and pilot off).
- 1.3. Unclip the 2 retaining clips I at the top and bottom of the case (unscrew before the retaining screw on, the top clips).
- 1.4. Carefully pull forward the case and remove.

SECTION 2 : TO ACCESS HEAT EXCHANGER AND BURNER ASSEMBLY (Figure 13)

- 2.1. Gain general access as described in Section 1.
- 2.2. Remove the five screws D securing the combustion chamber front panel, 3 top and 2 bottom.
- 2.3. Swing the panel outwards and up from the bottom to disengage the location lugs.

SECTION 3 : TO REMOVE THE AIR TRAY

Release the air tray under the burner by pushing backwards to depress the spring clips. Use an appropriate brush to clean it.

When it is refitted back, make sure that clips are correctly fitted.

SECTION 4 : TO REPLACE PILOT ASSEMBLY ELECTRODE (Figure 14)

- 4.1. Gain general access as described in Section 1.
- 4.2. Remove the combustion chamber front panel as described in Sections 2.2 and 2.3.
- 4.3. Undo the pilot supply union nut A at the pilot housing, taking care not to lose the sealing washer.
NOTE : For better access, release the air tray under the burner by pushing backwards to depress the spring clips.
- 4.4. Disconnect the spark electrode lead from the right-hand side of the control box.
Remove the pilot bracket fixing screw B to the right of the pilot burner.
- 4.5. Remove the pilot assembly electrode by swinging outwards from the burner and disengaging the location lugs D.
- 4.6. The pilot assembly including the electrode may now be stripped to its component parts Figure 14 in order to clean/replace complete pilot assembly (C, F, G, H) and electrode assembly I.

Reassembly notes

- a. Ensure that the pilot sealing washer J is re-fitted.
- b. Ensure that the pilot flame envelops the thermocouple tip as in Figure and that the spark electrode gap is set between 4.0 - 4.5 mm. (Figure 10).

SECTION 5 : TO REPLACE THE ELECTRICAL CONTROL BOX (Figure 15)

- 5.1. Gain general access as described in Section 1.
- 5.2. Remove the pressure gauge by releasing the spring retaining clip A and withdrawing the gauge B.
- 5.3. Unplug the 3 electrical connections C from the control box.
- 5.4. Disconnect the spark electrode lead D from the righthand side of the control box.
- 5.5. Withdraw the thermostat phial E from the C.H flow pipe on the right-hand side of the heat exchanger.
- 5.6. Remove the pilot switch bracket by removing the fixing screw F.
- 5.7. Draw the control box forward and out.
Access is now available to the major components.

SECTION 6 : TO REPLACE THE THERMOCOUPLE (Figure 16)

- 6.1. Gain general access as described in Section 1.
- 6.2. Remove the electrical control box as described in Section 5.
- 6.3. Release the air tray under the burner by pushing backwards to depress the spring clips.
- 6.4. Pull off the retaining spring clip A.
- 6.5. Draw the thermocouple body B downwards out of the burner rail assembly and the two screws securing the leads to the push button "Pilot off".
- 6.6. Remove the screw C securing the wires of the thermocouple to the overheat stat F on the C.H. flow pipe and the screw D securing the thermocouple of the second overheat stat G on the heat exchanger.
- 6.7. Undo the 10 mm nut E connecting the thermocouple to the rear of the thermo-electric valve body and remove.

NOTE : The recommended range of operating parameter for the thermocouple is 6 mV mini to 10 mV.

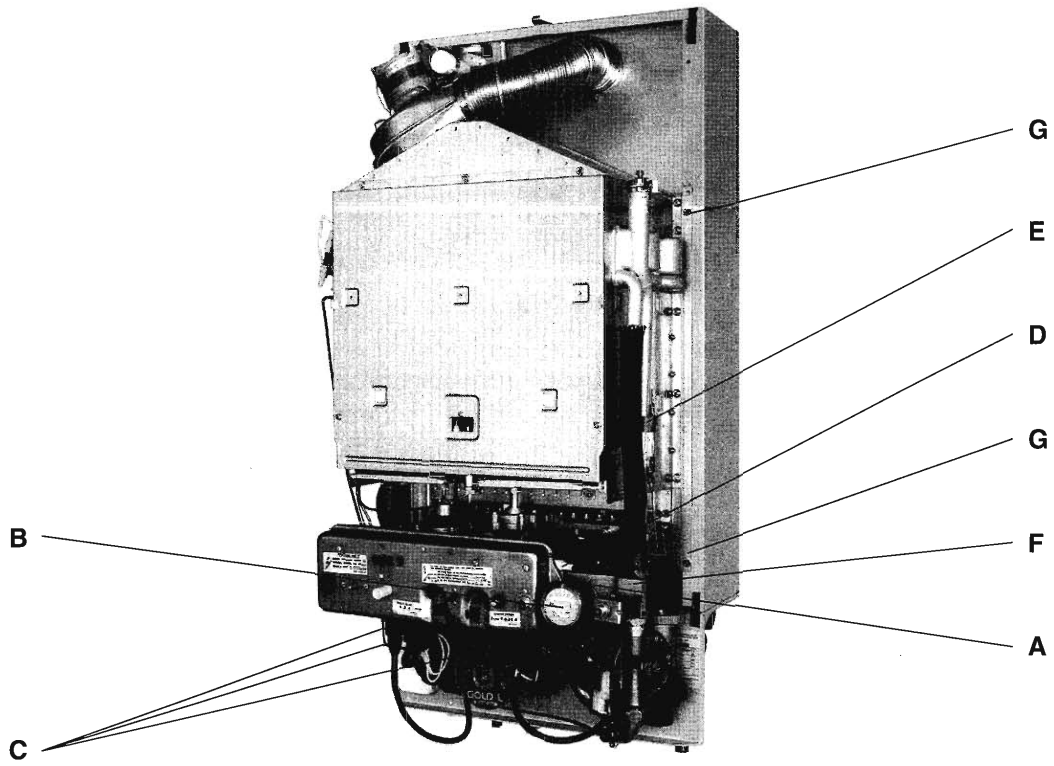


Figure 15

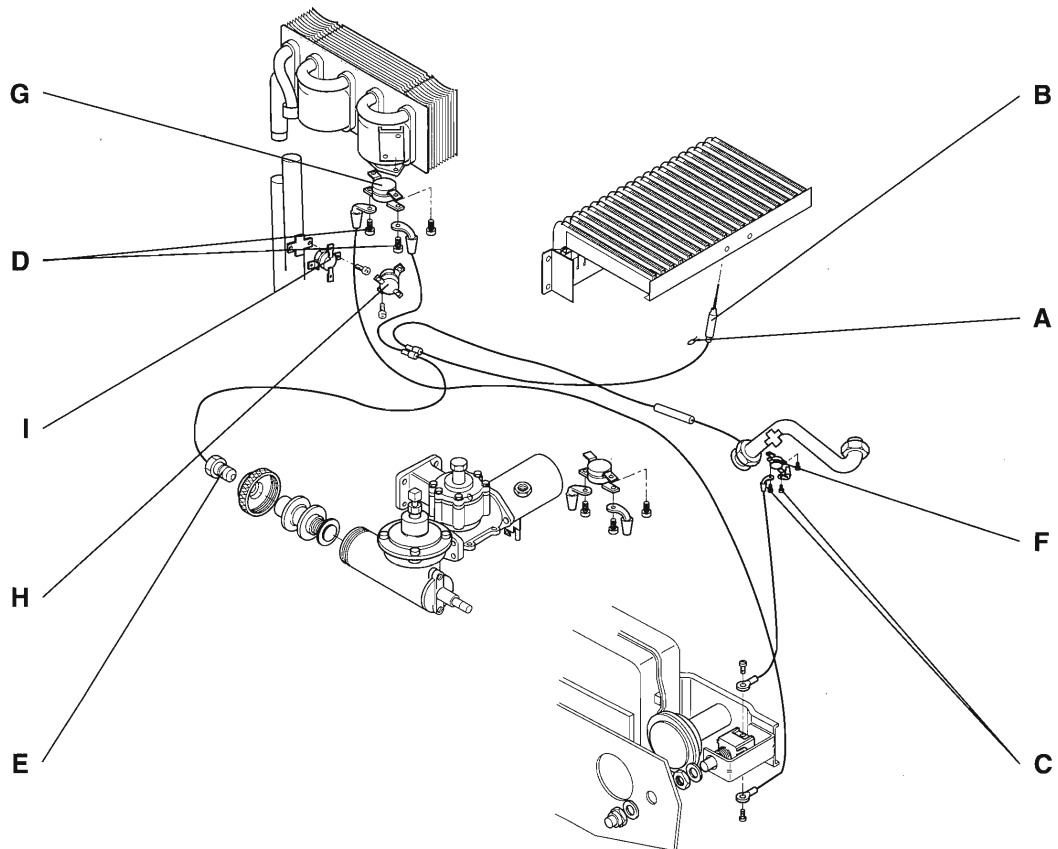


Figure 16

Reassembly notes

- a. Reform the new thermocouple as near to the shape of the old as is possible and refit it in the reverse order as described above.
- b. Ensure the air tray is relocated.
Refer to wiring diagram when reconnecting leads.

SECTION 7 : TO REPLACE THE BURNER MAIN INJECTORS (Figure 17)

- 7.1. Gain general access as described in Section 1.
- 7.2. Remove the combustion chamber front panel as described in Section 2 (2.2 and 2.3).
- 7.3. Disconnect the electrode assembly by unscrewing the fixing screw of the electrode bracket (Figure 14).
- 7.4. Disconnect the thermocouple by pulling out the thermocouple clip head and pull down the thermocouple head.
- 7.5. Undo the union A (Figure 14). Take care of the sealing washer J.
- 7.6. Remove the air tray A under the burner by pushing backwards to depress the clips and disengage the retaining lugs.
- 7.7. Remove the 2 screws B one at either end.
- 7.8. Unscrew the 4 screws E on the modulating valve (Figure 17 bis).
- 7.9. Remove the burner bar.
- 7.10. Remove the burner by removing the 4 screws C fixing it to the appliance backframe (2 at either end).

SERVICING NOTES : Inspect, clean or replace injectors if necessary.

SECTION 8 : TO REPLACE INSULATIONS PANELS

- 8.1. Remove the front panel as described in Section 2.
- 8.2. To replace front and back insulation panels, take off the 2 retaining clips, remove the insulation panels and replace.
- 8.3. To replace side insulation panels, take insulation panels, pull and replace.

SECTION 9 : TO REPLACE WATER VALVE MICRO-SWITCH (Figure 18)

NOTE : These micro-switches are located under the modulating box assembly (under the water valve).

- 9.1. Gain general access as described in Section 1.
- 9.2. Isolate and drain C.H circuit and remove the pump as described in Section 12 "Replacement of water-carrying components" (Page 30-32).
- 9.3. Remove the control box as described in Section 5.
- 9.4. Remove the fixing screw A of the plastic protector.
- 9.5. Disconnect the electrical connections B.
- 9.6. Remove the fixing screws C of the micro-switches support.
- 9.7. Remove the micro-switch assembly D.

Reassembly notes

To replace the micro-switch assembly, take care to position the small membrane and ring E correctly.

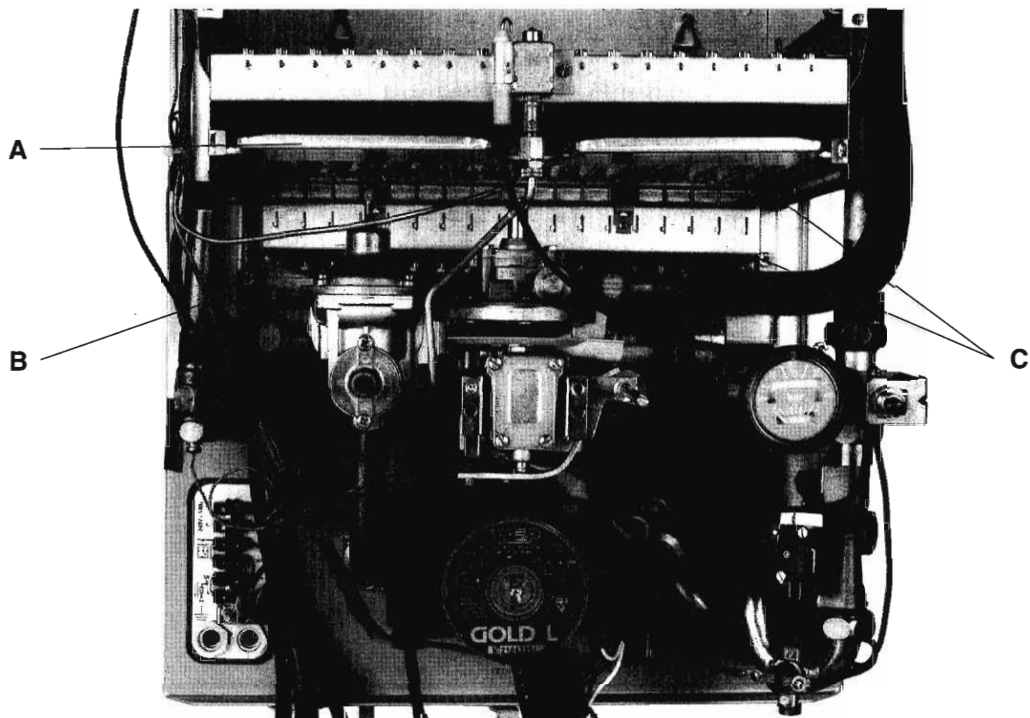


Figure 17

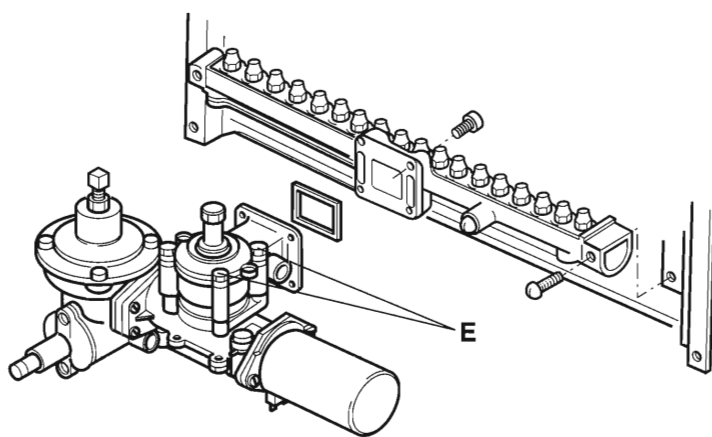


Figure 17 bis

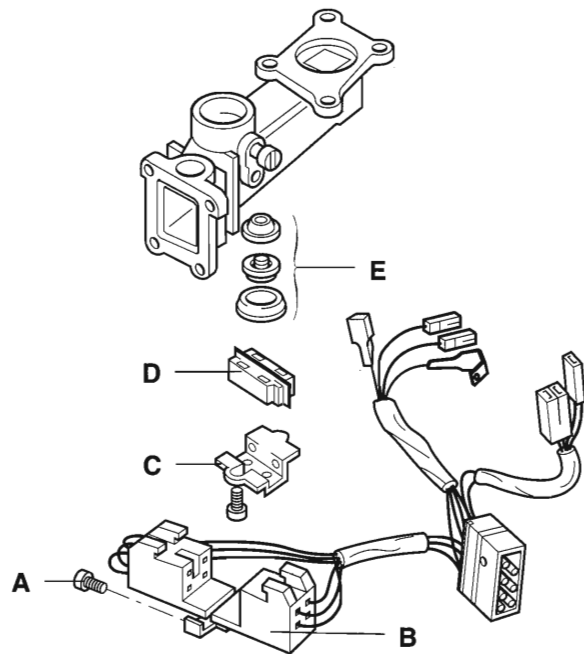


Figure 18

SECTION 10 : TO REPLACE THE SOLENOID ARMATURE AND COIL (R.H.S. of gas valve) (Figure 19)

- 10.1. Gain general access as described in Section 1.
- 10.2. Remove the electrical control box as described in Section 5.
- 10.3. Disconnect electrical connections A noting the position of the four colour-coded wires.
- 10.4. Remove the two screws B securing outer case of the solenoid.
- 10.5. Remove the armature and coil C and replace as necessary.

Reassembly notes

- a. Ensure armature is replaced with the O.ring D in the correct position as shown in Figure 19.
- b. Ensure that the rubber sealing washer E is located correctly and securely into its counterbore before assembling the solenoid outer case.
- c. Ensure that the electrical connections are correctly replaced. (See Figure 19).

SECTION 11 : TO REPLACE MAGNETIC UNIT (Figure 20)

- 11.1. Gain general access as described in Section 1.
- 11.2. Remove the electrical control box as described in Section 4.
- 11.3. Slacken and remove the thermocouple connection (10 mm) A.
- 11.4. Unscrew the magnetic unit end cap B, using 16 mm spanner.
- 11.5. Remove and replace the magnetic Unit C.

REPLACEMENT OF WATER-CARRYING COMPONENTS

GENERAL

Prior to the removal of any water-carrying components, the appropriate water circuit must be isolated and drained.

TO ISOLATE AND DRAIN WATER CIRCUITS

Domestic Hot Water circuit. (Figure 21)

- a. Gain general access as described in Section 1.
- b. Close cold water inlet L Isolating Valve.
- c. Open convenient hot water tap and drain the circuit.

Central Heating circuit. (Figure 21/22)

- a. Close flow isolating valve M.
- b. Close return isolating valve O.
- c. Drain the system by pushing the lever of the safety-relief valve N.

RECHARGING THE C.H SYSTEM

Ensure that all isolating valves are open and recharge the C.H. system as shown in Figure 1.

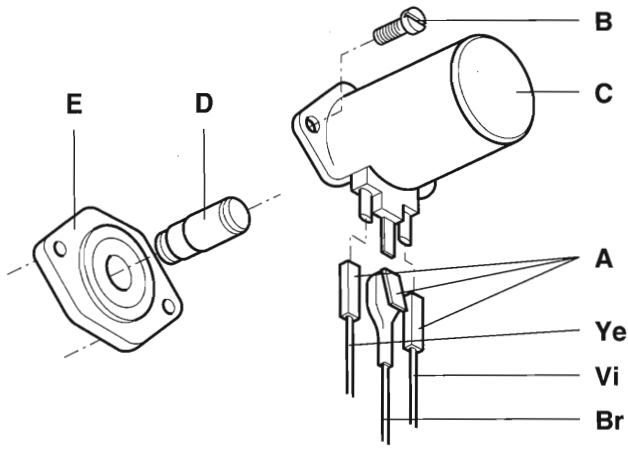


Figure 19

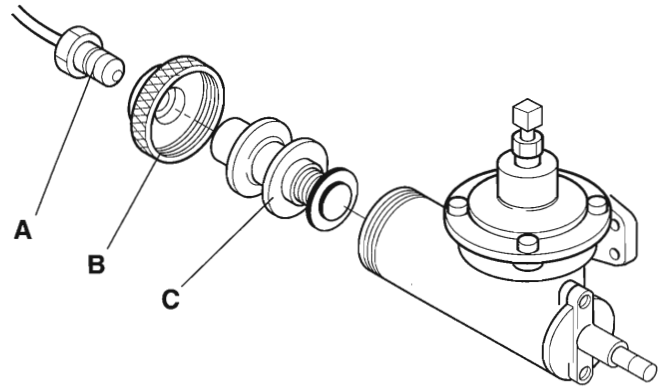
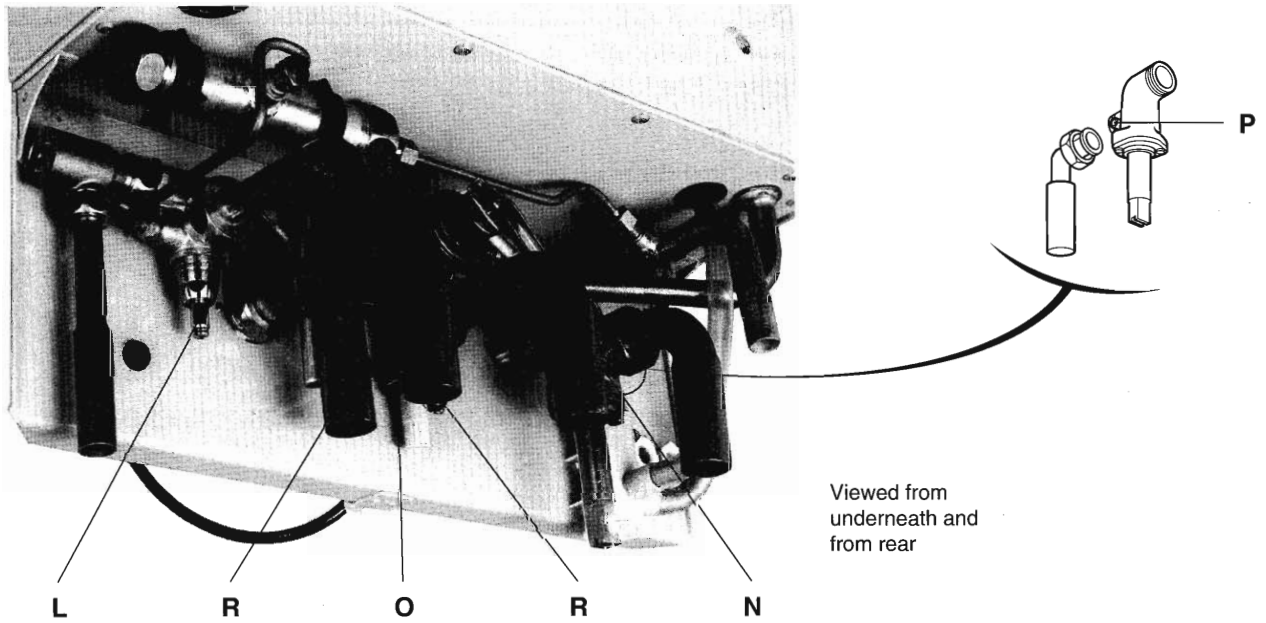


Figure 20



Viewed from underneath and from rear

Figure 21

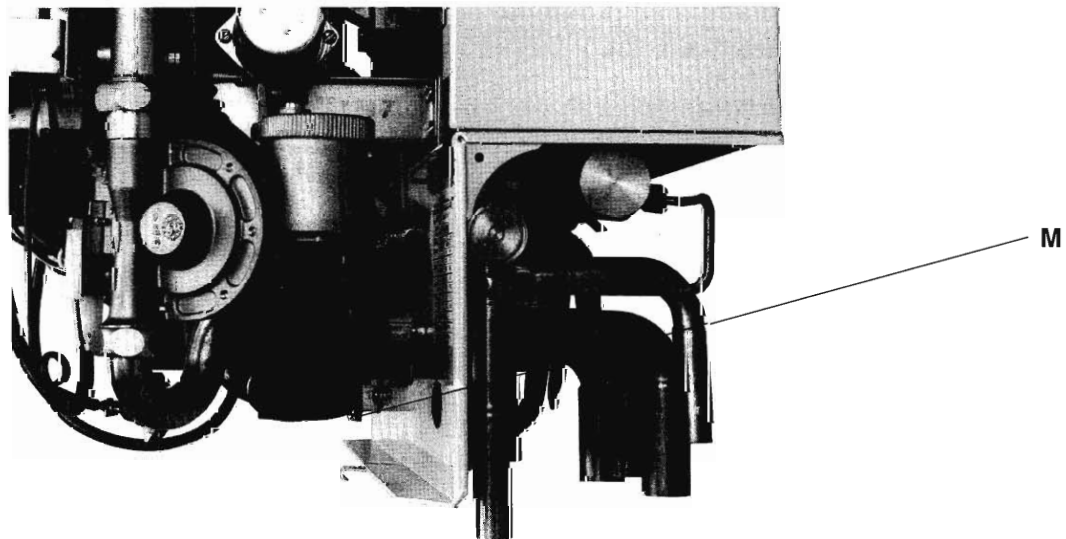


Figure 22

SECTION 12 : TO REPLACE THE WATER PUMP

- 12.1. Gain general access, as described in Section 1.
- 12.2. Isolate the C.H. circuit, as described above.
- 12.3. Disconnect plugs to the control box.
- 12.4. Remove the 2 hexagon headed screws and washers fitted through the rear bulkhead panel R (Figure 21).
- 12.5. Support the pump weight and pull forward to clear the centre spigot connection, then downwards and out.

SECTION 13 : TO REPLACE DOMESTIC HOT WATER THERMOSTAT (Figure 23)

- 13.1. Gain general access as described in Section 1.
- 13.2. Isolate D.H.W. circuit as described above.
- 13.3. Remove electrical control box as described in Section 4.
- 13.4. Remove the spring-clip A and the cam lever B.
- 13.5. Remove the thermostat bulb C. Care must be taken not to lose the modulating knife D located inside the thermostat body.
- 13.6. Disconnect the union nut securing the thermostat phial into the heat-exchanger pipe and remove the thermostat phial E.

Reassembly notes

- a. Ensure that a new sealing washer is fitted when replacing the thermostat phial.
- b. It is essential that the modulating knife is replaced onto the thermostat bulb with the knife edge running parallel to the boiler front (See Figure 23).
- c. It is also essential that all components are assembled onto the thermostat phial prior to re-fitting.
- d. Ensure that the brass union nut is tightly secured.
- e. Ensure that the cam lever is correctly fitted and that the adjustment screw is properly located and secured with the spring clip.

NOTE : The thermostat calibration is pre-set from the factory and no adjustment is possible.

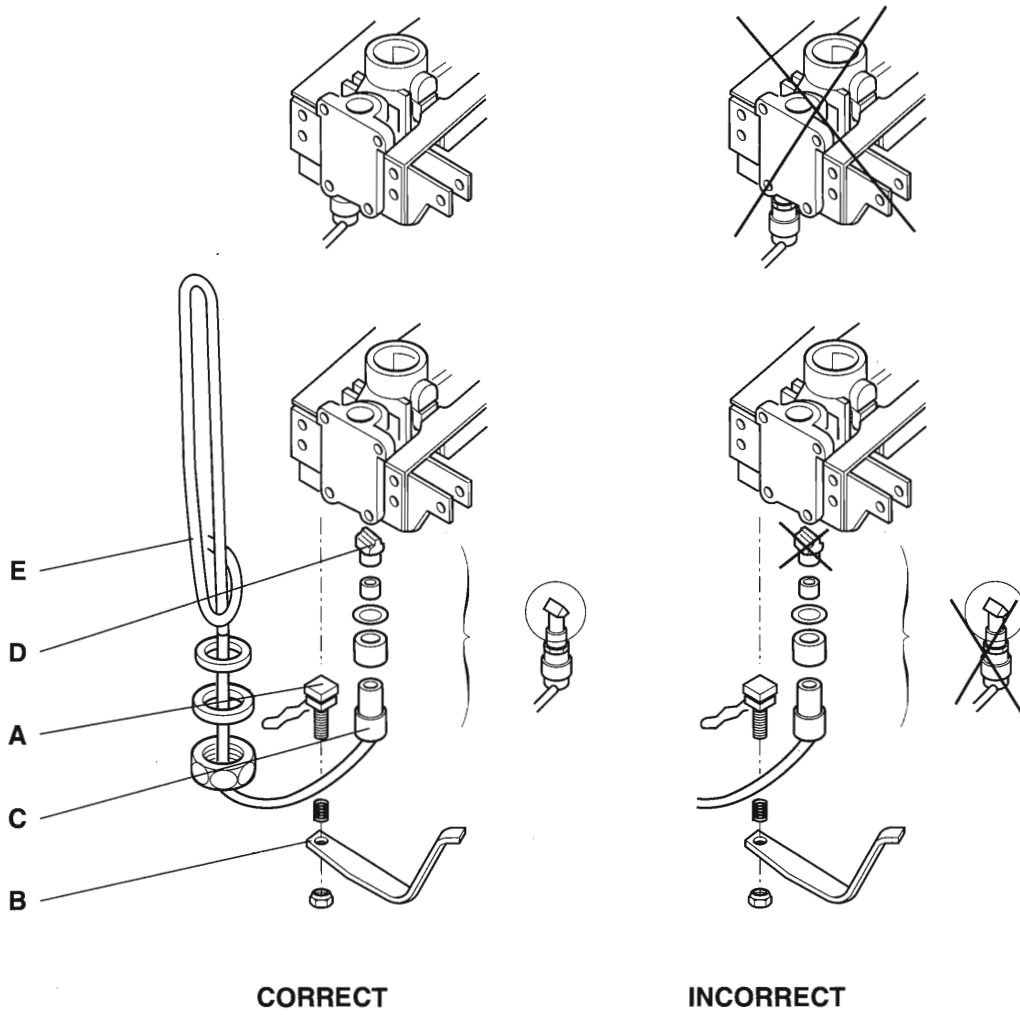


Figure 23

SECTION 14 : TO REPLACE THE HEAT EXCHANGER (Figure 24)

- 14.1. Gain general access, as described in Section 1.
- 14.2. Remove the electrical control box as described in Section 4.
- 14.3. Isolate and drain both water circuits, as described above.
- 14.4. Disconnect the leads to the overheat stat G by removing the terminal screws D (Figure 25).
- 14.5. Pull off the terminal leads to the two overheats stats I, H, noting their position (Figure 25).
- 14.6. Disconnect the brass union nut K and draw out the thermostat phial from the base of the D.H.W. flow pipe (Figure 24).
- 14.7. Disconnect the D.H.W. flow bulkhead union O (Figure 24).
- 14.8. Disconnect the D.H.W. from the water valve nuts P (Figure 24).
- 14.9. Disconnect the union nuts J and L on the heating body outlet pipes.
Unclip wire from domestic hot water flow Q (Figure 24).
- 14.10. Remove the circlip N retaining the automatic air vent pipe, lift upwards to disengage the O-ring connection, and remove the assembly (Figure 24 bis).
- 14.11. Remove combustion chamber front panel (Section 2).
- 14.12. Remove the heat exchanger block by drawing forwards and out.
- 14.13. Transfer 2 thermostats, one vent, 2 clips to secure the central heating control thermostat, and 2 to secure the left hand wire harness to the new heat exchanger assembly.

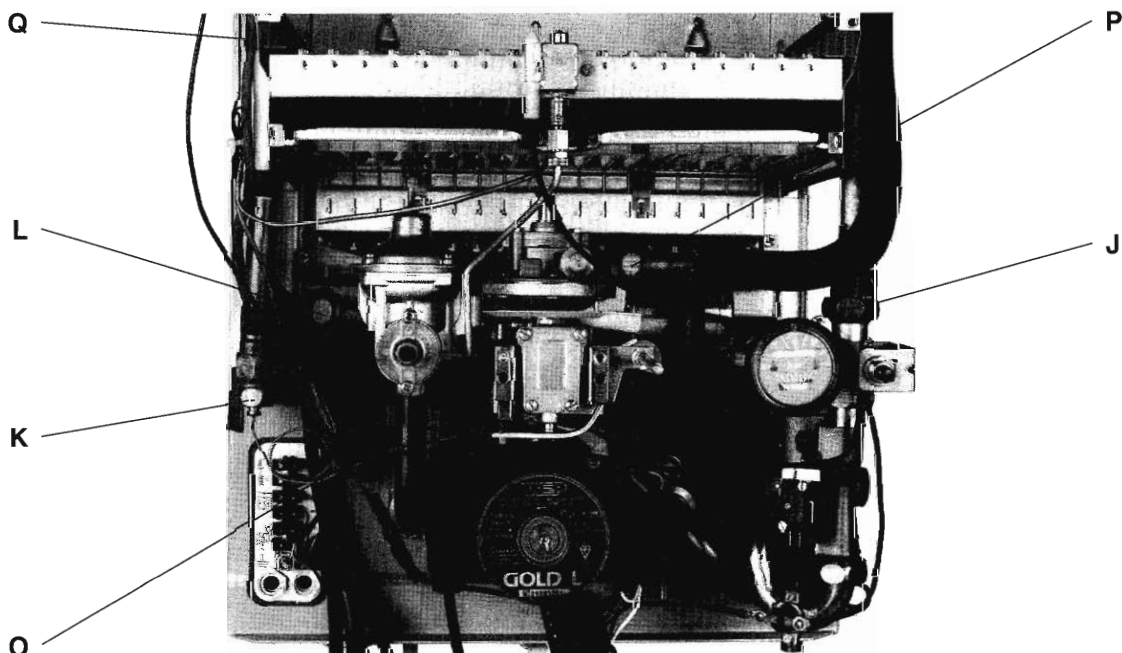


Figure 24

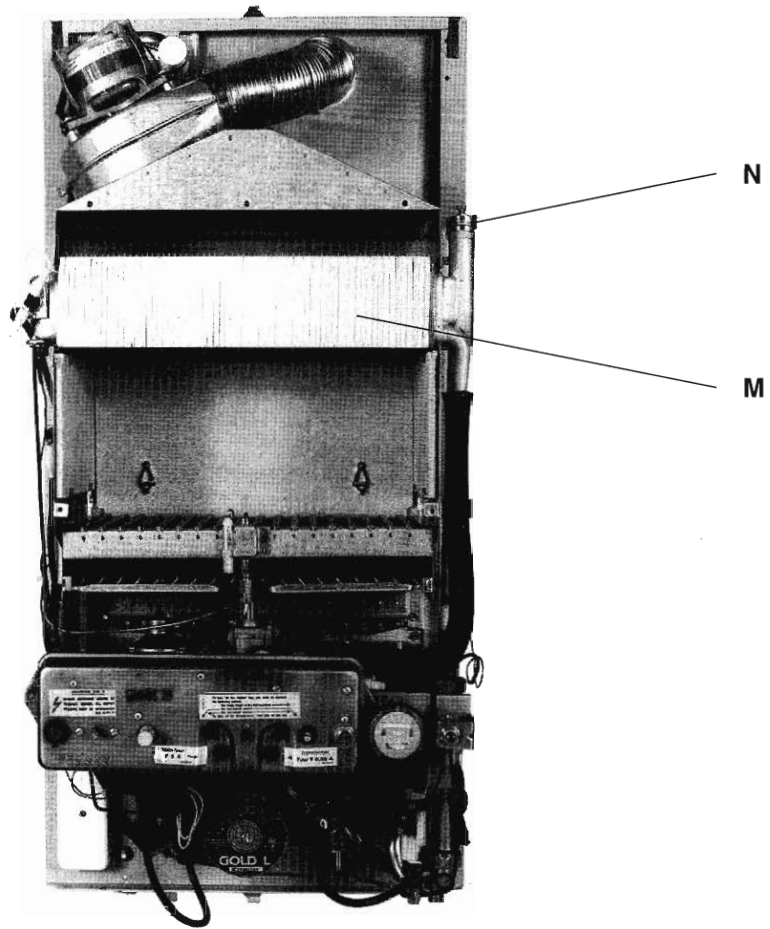


Figure 24 bis

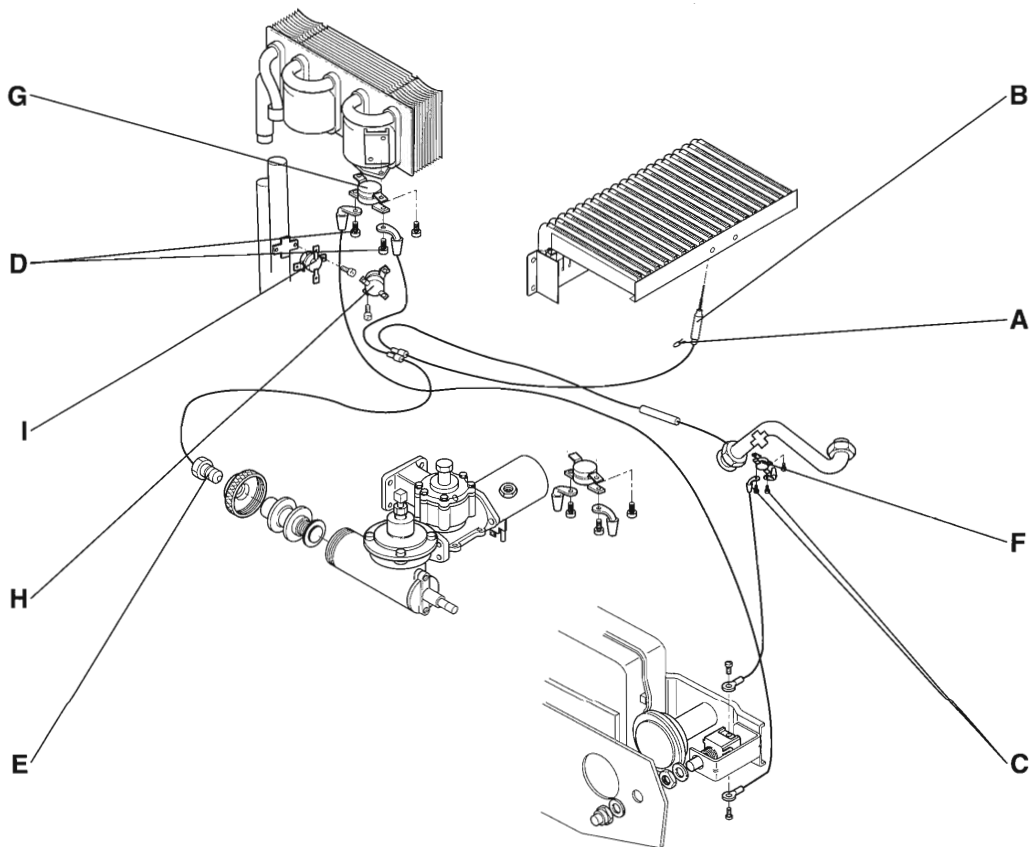


Figure 25

SECTION 15 : TO REPLACE THE D.H.W. FLOW VALVE (Figure 26)

- 15.1. Gain general access as described in Section 1.
- 15.2. Isolate and drain the D.H.W circuit as described above. (Page 30)
- 15.3. Remove the electrical control box as described in Section 4.
- 15.4. Disconnect the front connection A to the valve and ease the pipe slightly to allow access to the rear connection. Retain the rubber sealing washer.
- 15.5. Disconnect the rear connection B. Retain the rubber sealing washer.
- 15.6. Slacken the two screws C one at either side of the valve, located beneath the plastic protection disc D.
- 15.7. Remove the valve by pulling directly upwards.

Servicing notes

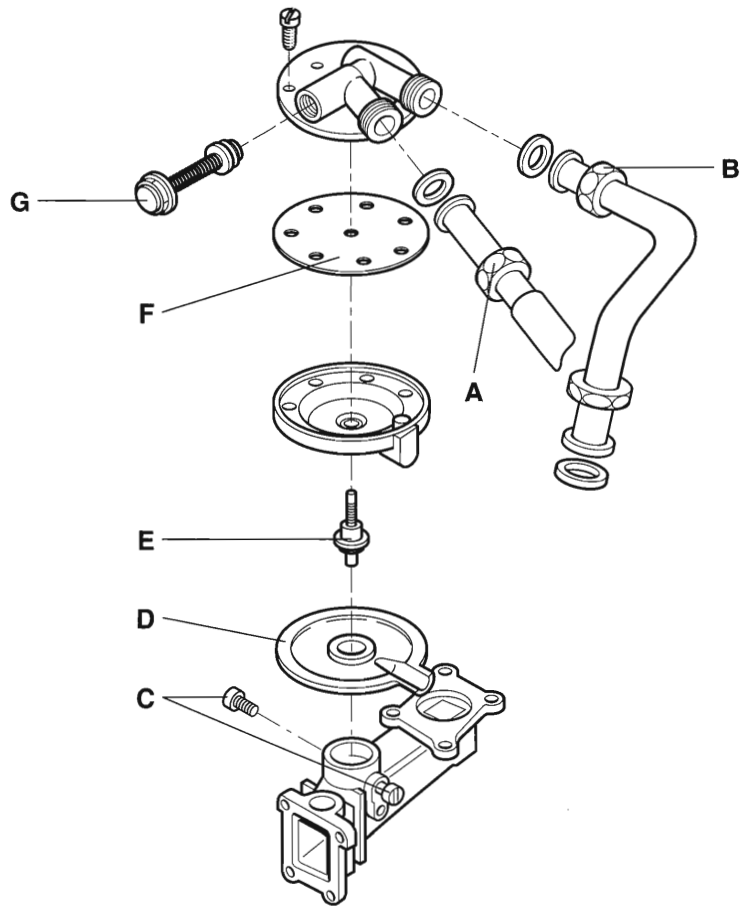
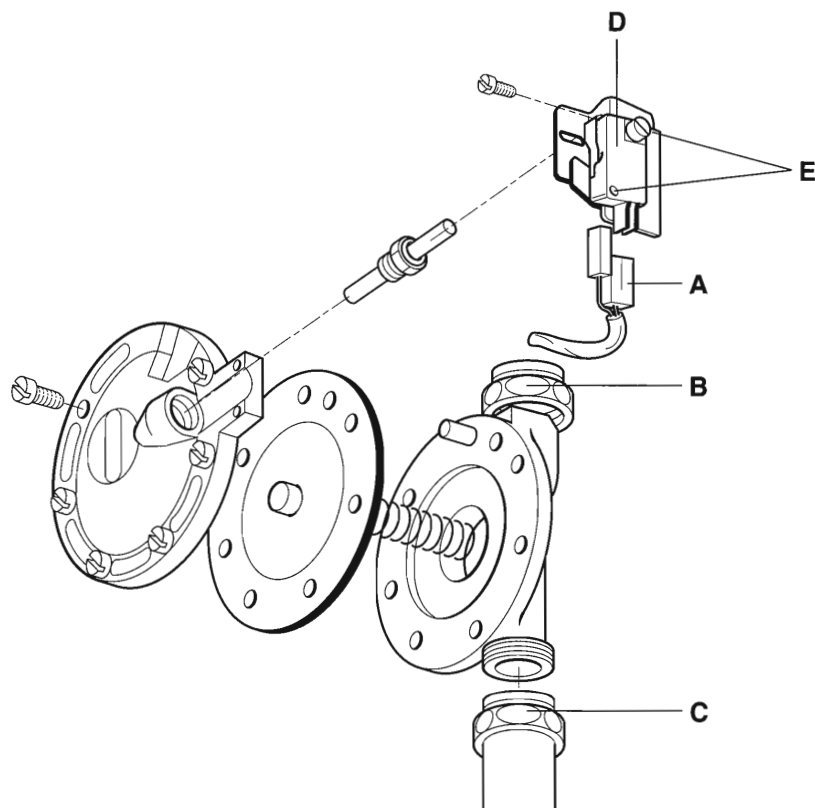
- a. Inspect and, where necessary, replace push rod assembly E in base of valve.
- b. Inspect and, where necessary, replace the valve diaphragm F.
- c. Remove, inspect and, where necessary, replace the by-pass piston assembly G.

SECTION 16 : TO REPLACE THE DIFFERENTIAL FLOW VALVE (R.H.S. of Boiler Controls) (Figure 27)

- 16.1. Gain general access as described in Section 1.
- 16.2. Isolate and drain the C.H. circuit as described in Replacement of Water-carrying components.
- 16.3. Disconnect the integral push-on connector A from the microswitch.
- 16.4. Disconnect the top and bottom unions B, C and remove valve complete.

Servicing notes

- a. Inspect and, where necessary, replace the valve microswitch D.
- b. This may be achieved by removing the two fixing screws E and replacing the microswitch.
- c. Care must be taken not to lose the insulation gasket.

**Figure 26****Figure 27**

SECTION 17 : REPLACEMENT OF VARIOUS OVERHEAT AND LIMIT THERMOSTATS

GENERAL

Gain general access as described in Section 1.

OVERHEAT STAT

To replace the main overheat stat G (Figure 28) :

- 17.1. Unscrew the 2 screws fixing the 2 wires.
- 17.2. Unscrew the 2 screws fixing the overheat stat, remove.

LIMIT STAT

To replace the C.H. limit stat H (Figure 28) :

- 17.3. Disconnect the 2 wires of the limit stat.
- 17.4. Remove the 2 fixing screws, remove the limit stat.

To replace the D.H.W. limit stat I (Figure 28) :

- 17.5. Disconnect the 2 wires of the limit stat.
- 17.6. Remove the 2 fixing screws, remove the limit stat.

SECTION 18 : TO REMOVE THE GAS CONTROL ASSEMBLY (Figure 29)

- 18.1. Isolate the flow and return of the central heating system.
- 18.2. Isolate the water supply.
- 18.3. Isolate the gas supply by the gas cock.
- 18.4. Remove the control box as described in Section 4.
- 18.5. Remove the pump as described in Section 11.
- 18.6. Remove wire from solenoid, noting its position, as described in Section 10.
- 18.7. Disconnect the flow safety valve wires D.
- 18.8. Undo the 2 nuts E on the water valve.
- 18.9. Undo the nut F directly under the main gas valve.
- 18.10. Undo the union J on the heat exchanger.
- 18.11. Remove the 4 fixing screws A on the back of the modulating box assembly G.
Disconnect the thermocouple nut from the main gas as described in Section 6.7.
- 18.12. Disconnect the thermocouple nut from the main gas valve as described in Section 6.7.
- 18.13. Undo the nut Y and remove D.H.W. phial from the heat exchanger.
- 18.14. Remove the front panel as described in Section 2.
- 18.15. Remove the air tray as described in Section 3.
- 18.16. Support the weight of the assembly and remove the 2 screws B on the main burner manifold.

Access is now available to replace the different parts on this assembly (gas governor, modulating valve assembly, main gas valve, water valve).

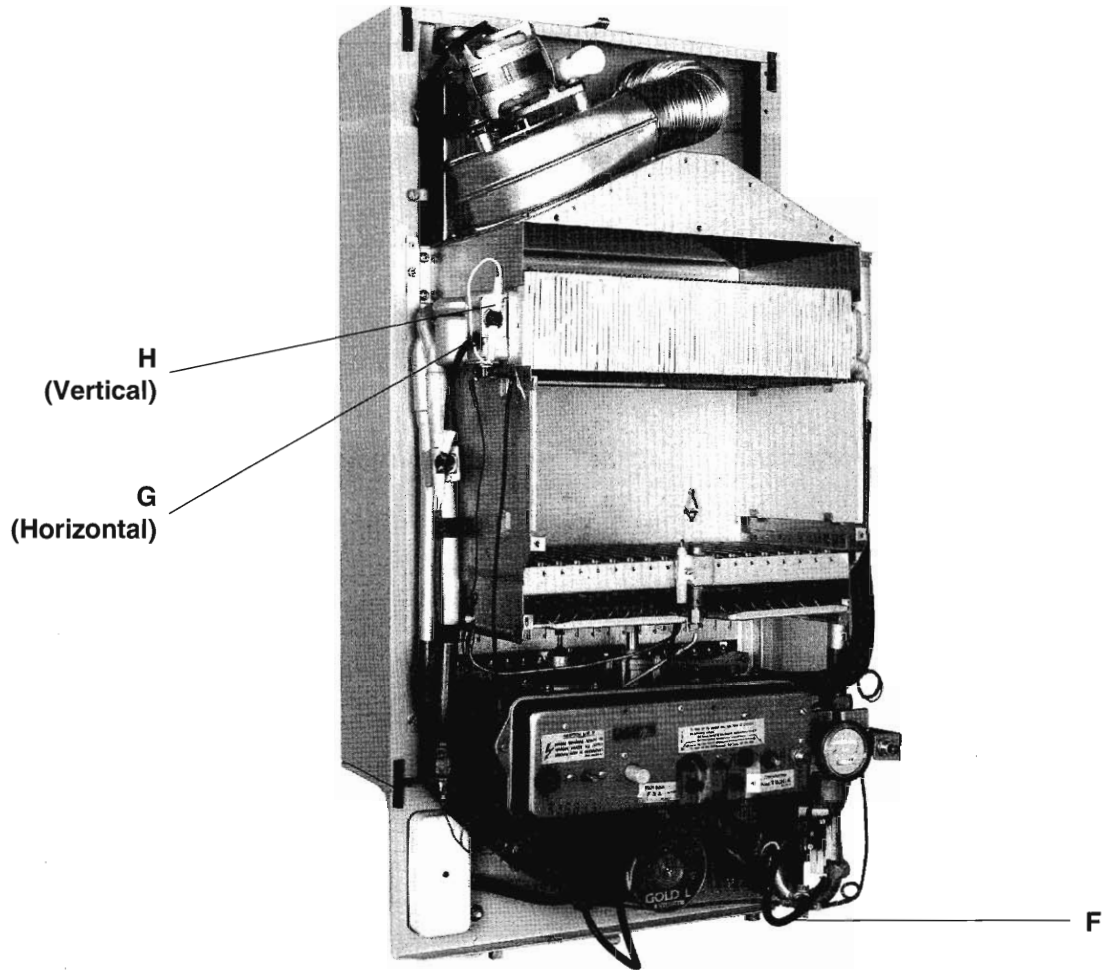


Figure 28

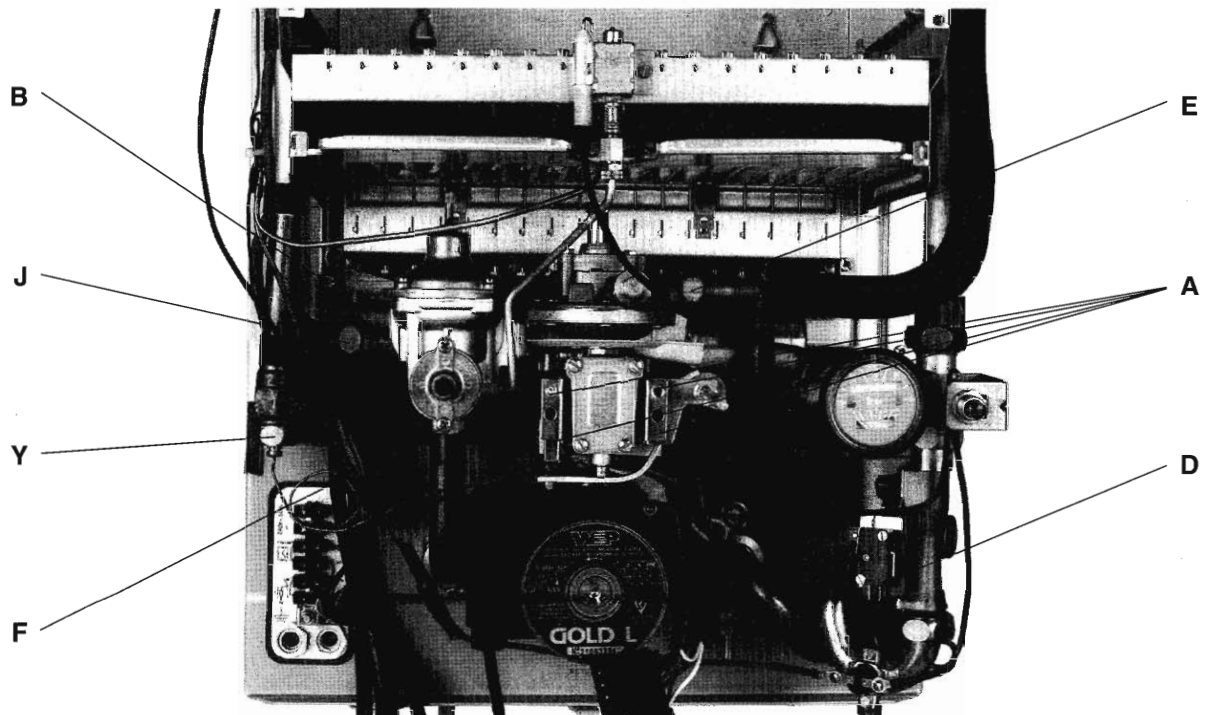


Figure 29

SECTION 19 : ELECTRICAL CONTROL BOX COMPONENTS

Should there any problem with the electrical control box components, the complete control box has to be changed and the faulty box sent to elm leblanc for repairs.

SECTION 20 : TO REPLACE THE FAN (Figure 30)

- 20.1. Gain general access as described in Section 1.
- 20.2. Disconnect the plug A of the fan on the left of it.
- 20.3. Unscrew the screw of the tightening clip on the bottom of the flexible flue pipe and pull the pipe out.
- 20.4. Unscrew the 4 screws B fixing the fan mounting plate.
- 20.5. Remove the fan.

SECTION 21 : TO REPLACE THE AIR SAFETY SWITCH (Figure 31)

- 21.1. Gain general access as described in Section 1.
- 21.2. Take off the fan.
- 21.3. Disconnect the wires from the air safety switch.
- 21.4. Unscrew the two fixing screws C of the air safety switch fixing plate.
- 21.5. Carefully pull the assembly in turning on a 1/4 of turn in order to pass the flap through the hole.

IMPORTANT : To refit the assembly, take care to avoid to twist the spindle of the flap.

SECTION 22 : TO REPRESSURISE THE EXPANSION VESSEL (Figure 31)

IMPORTANT : Only a qualified installer can refill the expansion vessel.

- Drain the CH water circuit as explained in : "Replacement of Water carrying components" (Page 30).
- Remove the cap B and recharge the expansion vessel.

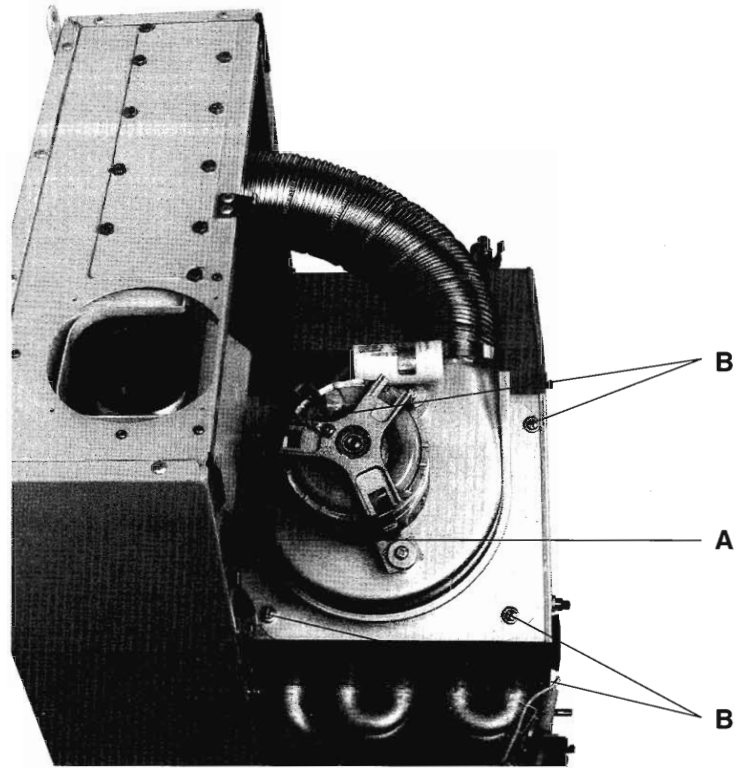


Figure 30

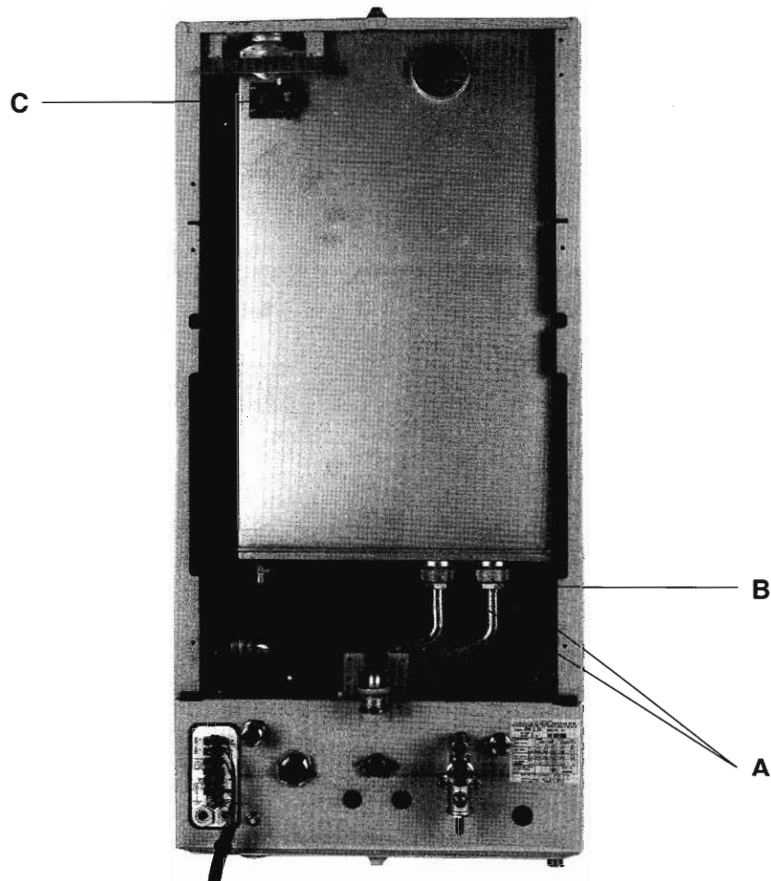
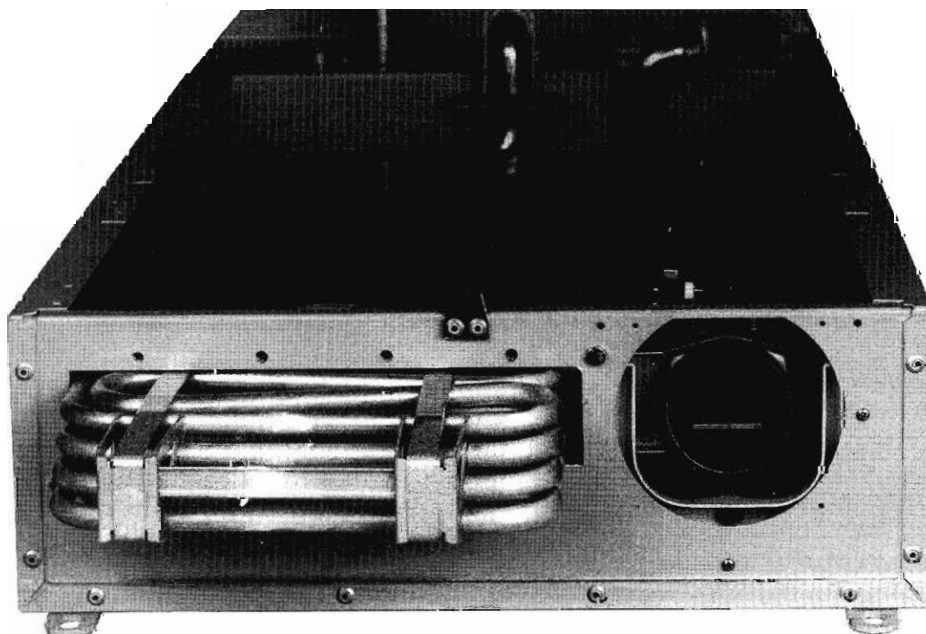


Figure 31

SECTION 23 : TO REPLACE THE CONDENSOR (Figure 31/32)

- 23.1. Gain general access as described in Section 1.
 - 23.2. Isolate and drain both water circuit as described in Section 5.
 - 23.3. Turn the gas cook off.
 - 23.4. Disconnect all plug of the control box as described in Section 5.
 - 23.5. Take off the pump as described in Section 12.
 - 23.6. Undo the 5 nuts fixing CH, DHW, gas pipe on the bottom plate.
 - 23.7. Unscrew the 4 fixing screws securing the support of the gas valve.
 - 23.8. Take off the fan as described in Section 20.
 - 23.9. Disconnect the wire of the air safety switch as described in Section 21.
 - 23.10. Unscrew the 4 screws G securing the support of the Heat Exchanger (two on each side), (Figure 15).
 - 23.11. Take off the assembly by lifting and pulling - be carefull to the weight.
 - 23.12. Undo the two nuts A (Figure 31).
 - 23.13. Unscrew the 8 screws fixing the plate on the top of the boiler (Figure 32).
 - 23.14. Take off the condensor from the top by taking the handle and pulling.
- Replace the condensor in the reverse order.

**Figure 32**

SECTION 24 : TO CLEAN THE CONDENSOR BOX

- Take off the condenser as explained in Section 23.
- Cut the plastic clips maintaining the drain pipe (on the bottom).
- Remove the two screws maintaining the top of the condenser box.
- Take off the condenser box by pulling down.
- Inspect, clean or replace if necessary.

SECTION 25 : TO CLEAN THE CONDENSATION COLLECTOR (Figure 33)

- Turn the boiler off.
- Take off the bottom part A of the collector by pulling down.
- Inspect, clean if necessary.

NOTE : The collector box has a ball as an anti return valve which can be eventually blocked, in this case :

- Take off the top part B of the collector by lifting up.
- Take the ball off and clean.

IMPORTANT : When refitting, make sure that the top and bottom parts are fully engaged.

SECTION 26 : TO REPLACE THE EXPANSION VESSEL

NOTE : The expansion vessel has rarely to be replaced. In the unlikely event of failure, as an alternative, a separate expansion vessel of the same specification may be connected as close as possible to the boiler leaving the original in position.

If however, the vessel must be replaced, use the following procedure :

- Take off the condenser box as explained in Section 23.
- Remove the two fixing screws of the expansion vessel support (top).
- Undo the nut of the expansion vessel connecting pipe.
- Take off the expansion vessel by lifting up to disengage it from its location.
- Exchange the expansion vessel and refit all parts in the reverse order.

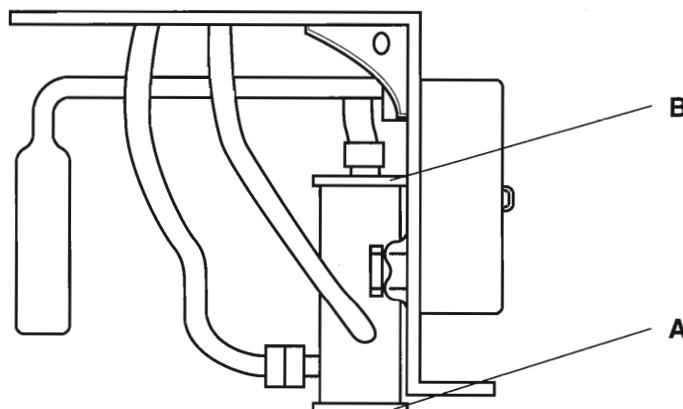
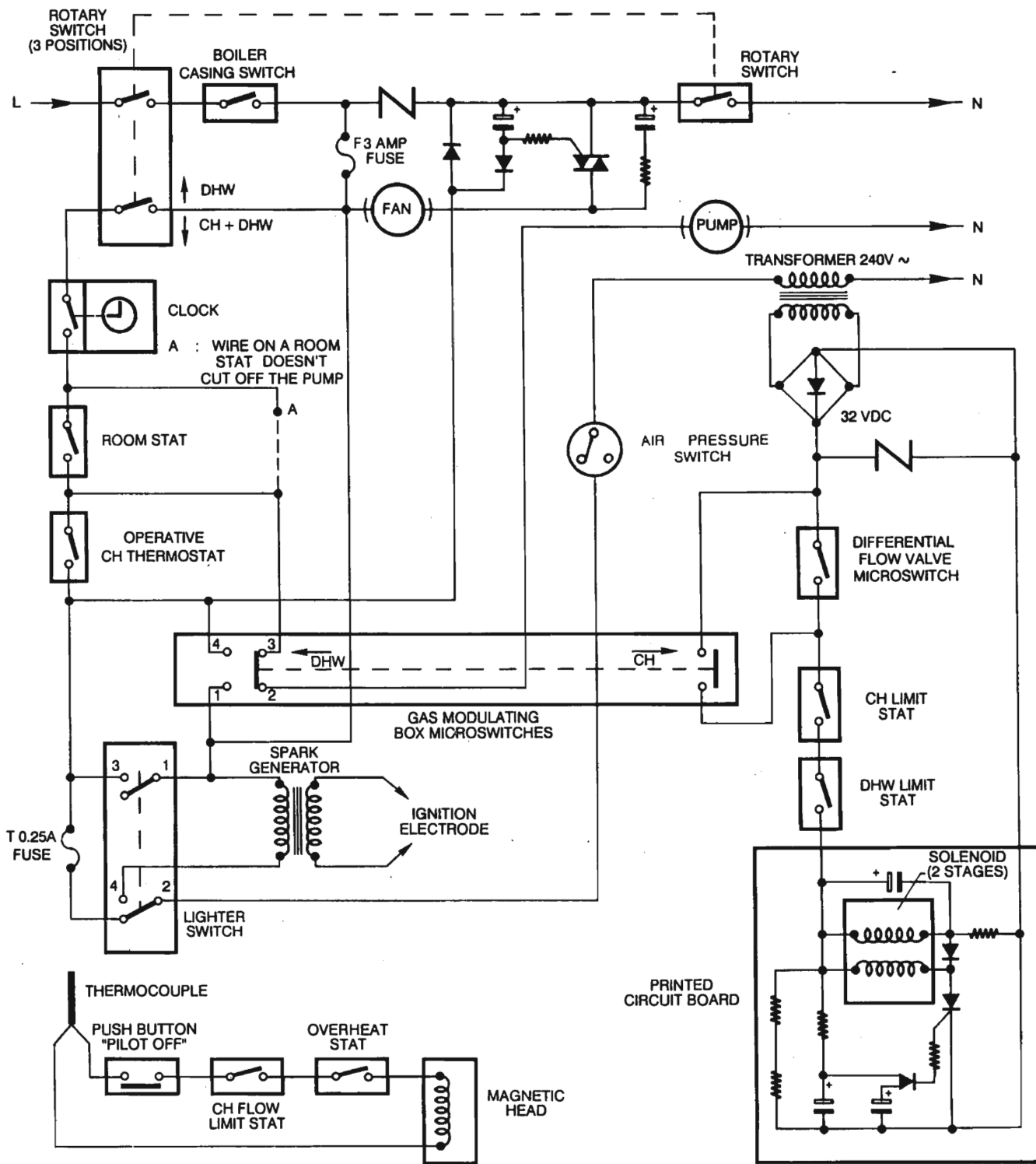


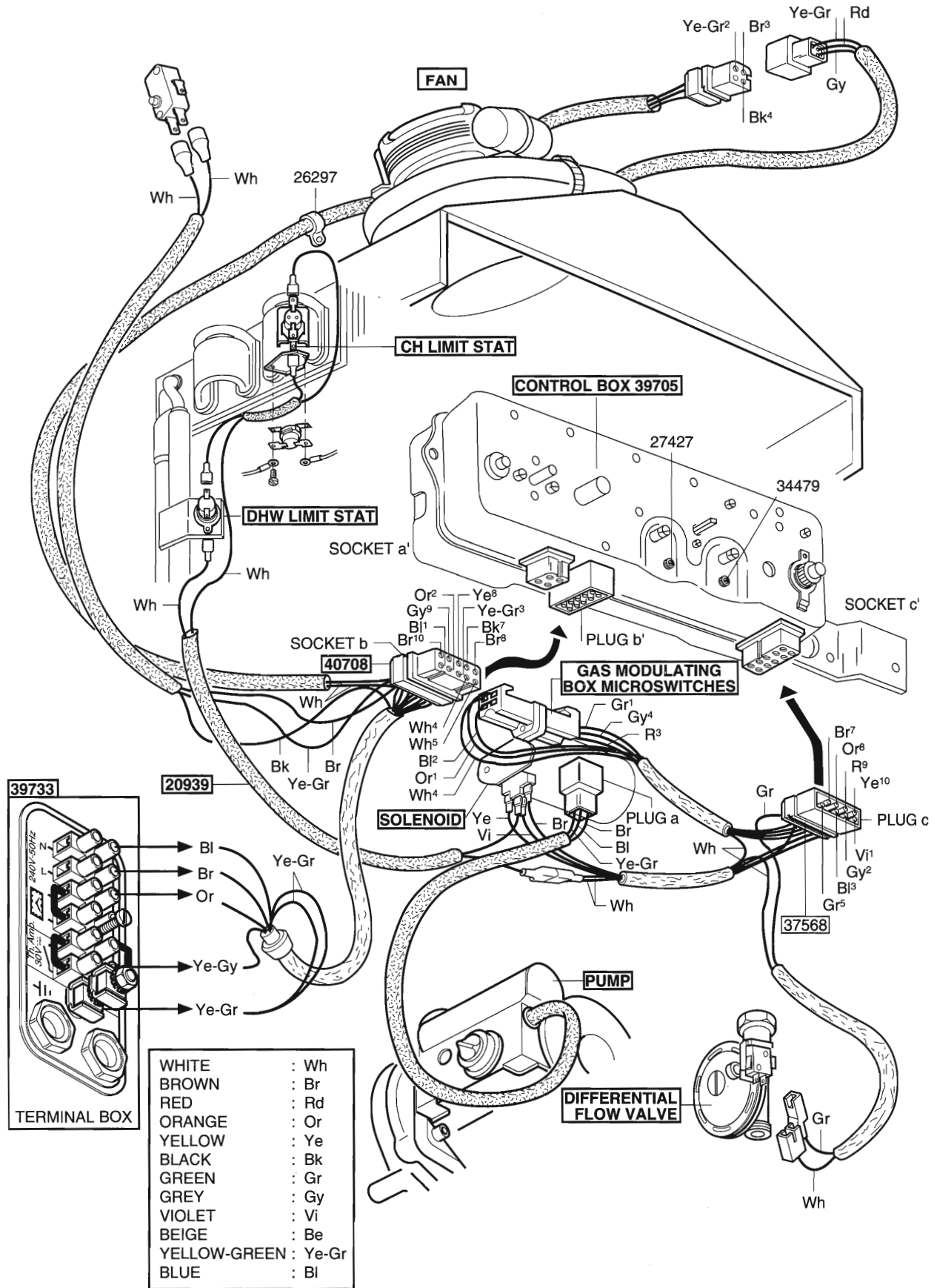
Figure 33

PARTS LIST

DESIGNATIONS	E.L.M REF.	G. C REF.
C.H Overheat stat 90°C	20705	370650
Circulating Pump	36634	371024
D.H.W diaphragm	33071	370994
D.H.W over heat stat 85°C	27339	370714
D.H.W plastic piston	34542	371013
D.W.H push rod spindle	26364	370698
Domestic hot water thermostat	39509	372052
Electrical control box	39705	371919
Fan	41316	372045
Fuse 0.250 A	34479	370010
Gas pilot nat gas with injector	39518	371911
Heat exchanger	39772	371935
Magnetic head	39385	371907
Main burner	39769	371932
Over heat stat.T.C. device (C.H. flow pipe 95°C)	39768	371931
Overheat stat T.C device (heat exchanger 120°C)	38239	371891
Igniter switch	39807	371936
Air pressure switch	36015	372018
Solenod valve	07704	370643
Spark electrode	07869	370647
Thermocouple	39516	371909
Thermomanometer (gauge)	07004	370625
Water valve microswitch assembly	39611	371915

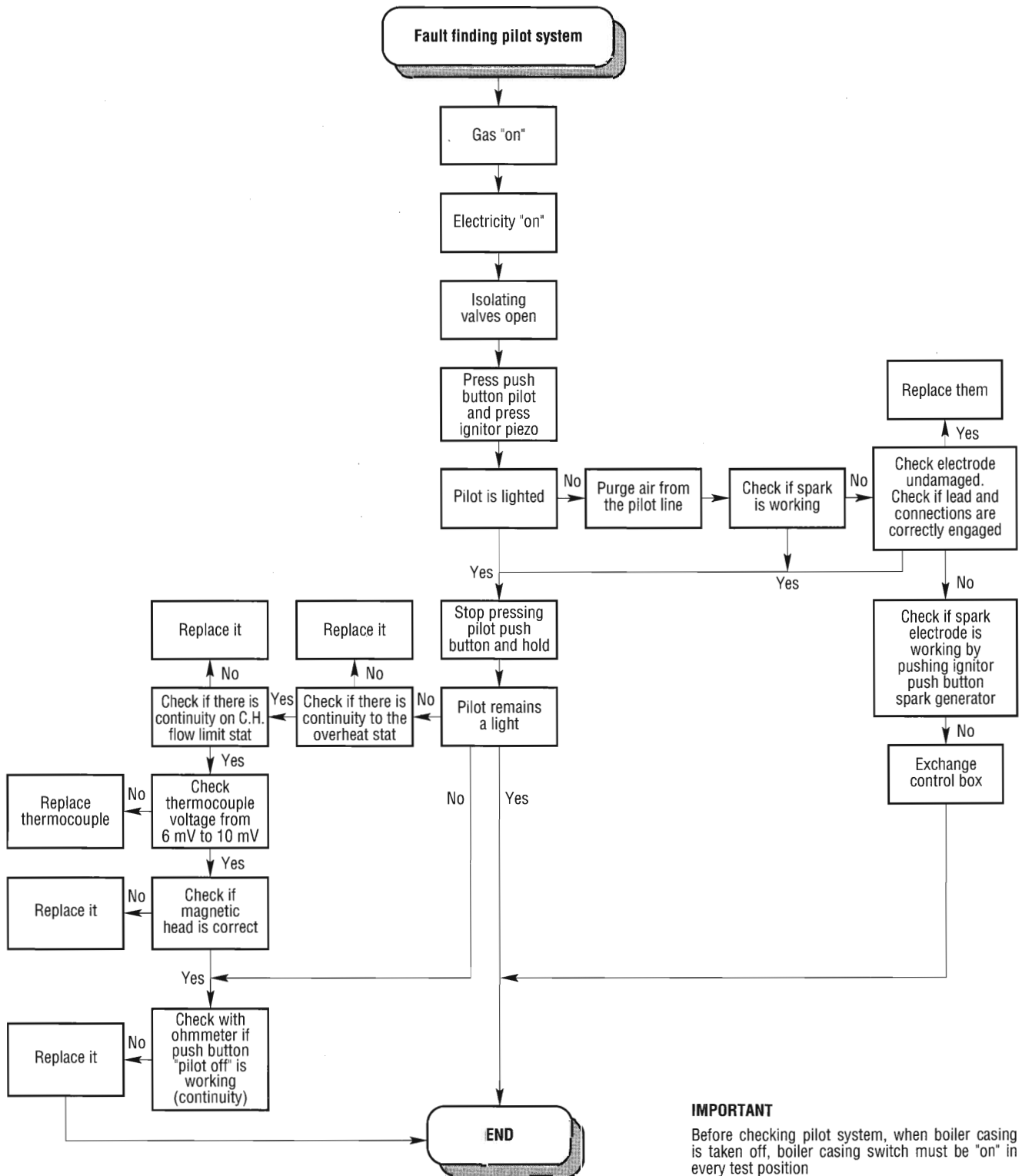


Functional flow diagram



Illustrated wiring diagram

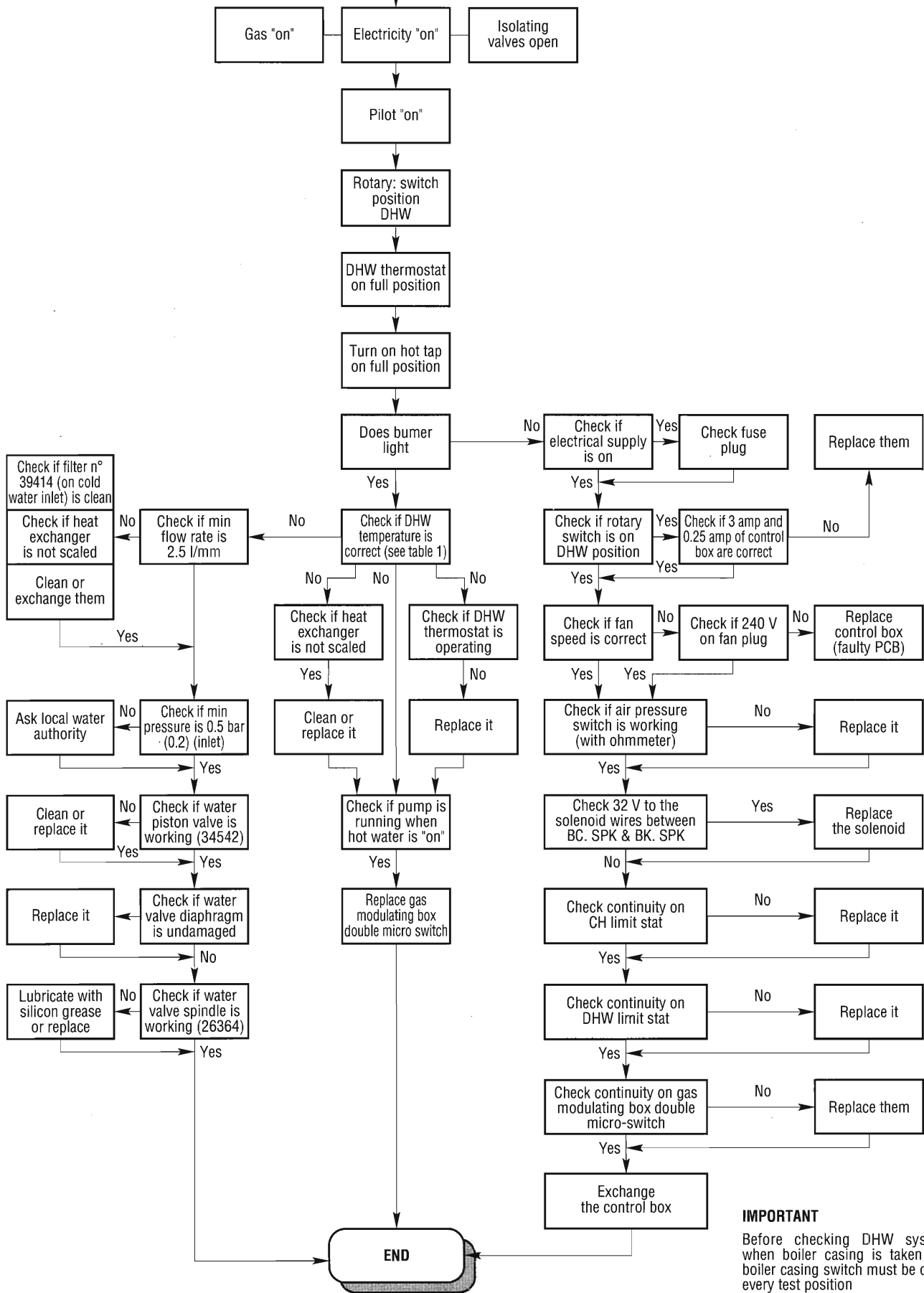
FAULT FINDING CHART



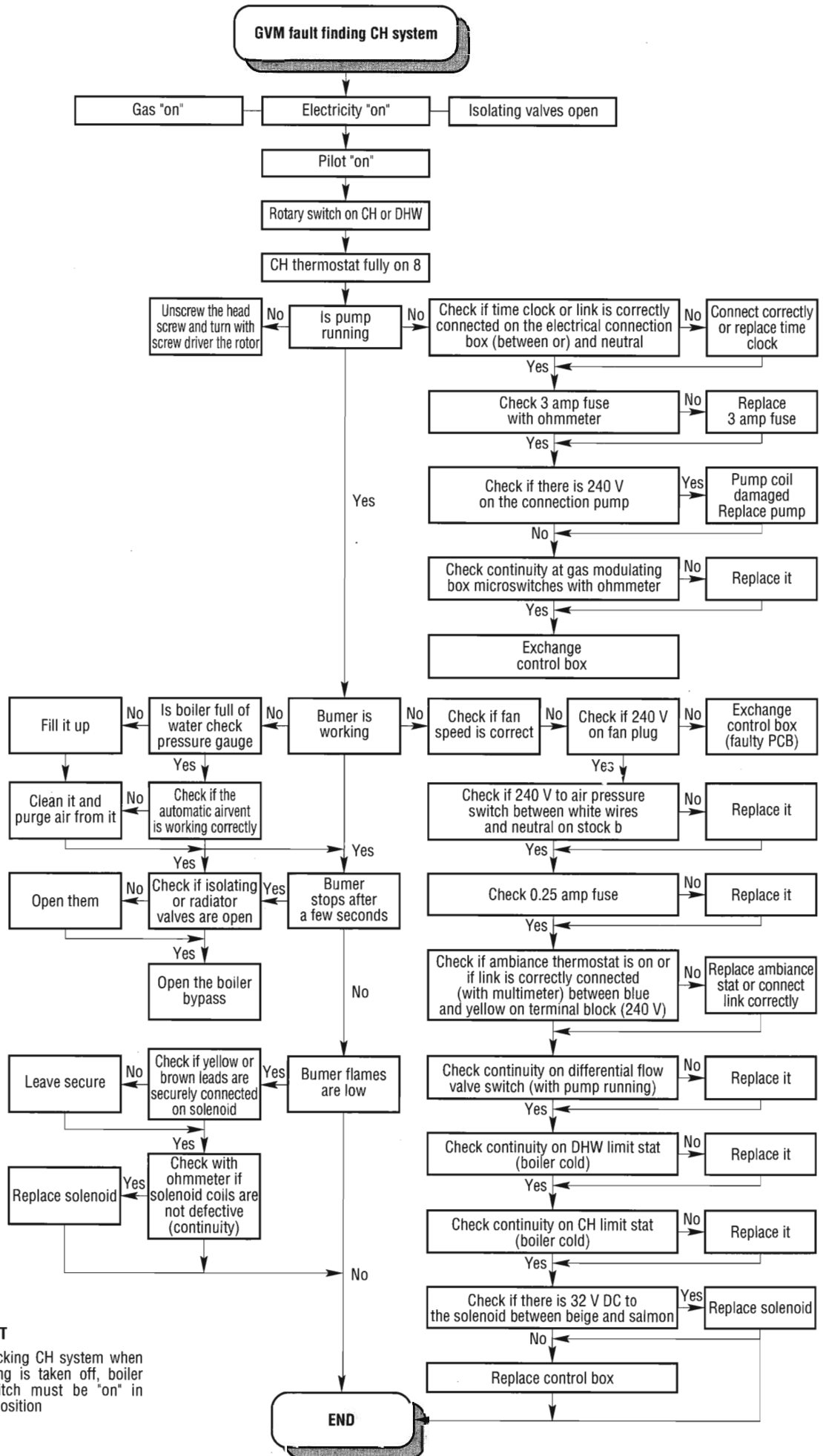
IMPORTANT

Before checking pilot system, when boiler casing is taken off, boiler casing switch must be "on" in every test position

Fault finding DHW system



IMPORTANT
 Before checking DHW system when boiler casing is taken off, boiler casing switch must be on in every test position



IMPORTANT
 Before checking CH system when boiler casing is taken off, boiler casing switch must be "on" in every test position

e.l.m. leblanc ltd reserve the right to alter this specification without notice.

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