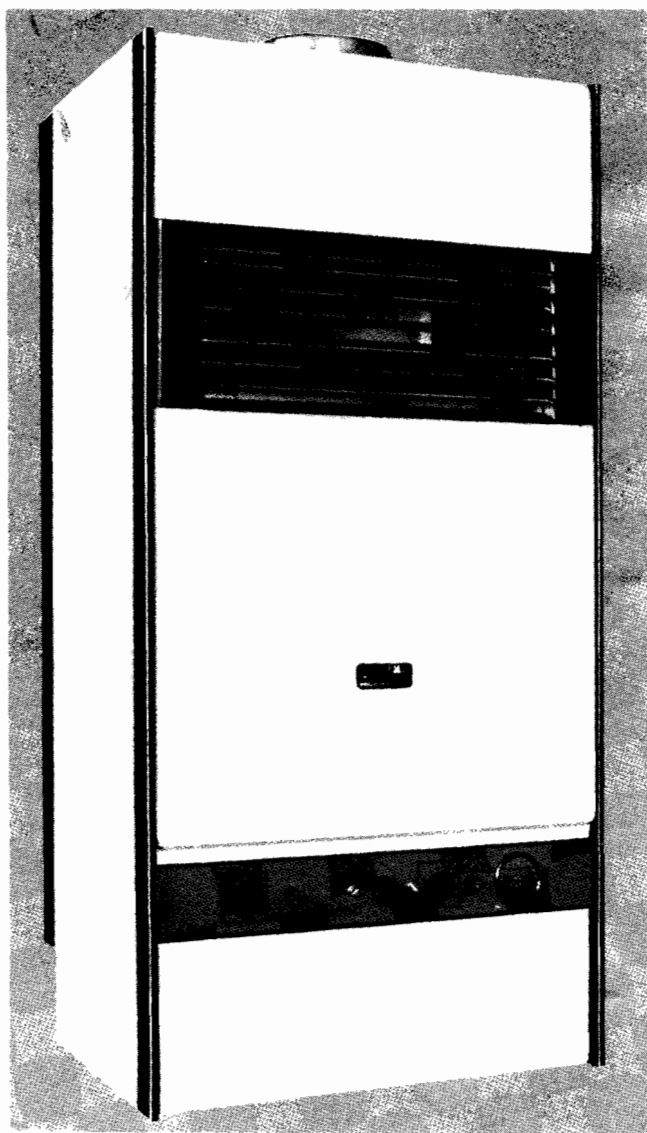


SV7

Installation and Servicing Instructions



e.l.m. leblanc

TYPE GLM 5.20

**Open Flued Wall Mounted
Combination Gas Boiler**

FOR NATURAL GAS ONLY

British Gas Tested and Certified

G. C. APPLIANCE Nr. 4724103

NOTE TO INSTALLER :

LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER

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TABLE I
PERFORMANCE DATA

Central Heating		Maximum	Medium	Minimum
Heat Input (Gas)	kW Btu/h	30.0 102500	17.0 58000	8.6 29250
Heat Output to Water	kW Btu/h	23.4 80000	14.0 47600	6.3 21500
Preset Heating Adjustment	kW Btu/h	30.0 102500		
Burner Setting Pressure (Hot)	mbar in w.g.	7.6 3.1	3.2 1.3	0.7 0.3
Gas Rate	m ³ /h ft ³ /h	2.8 99.0	1.6 56.0	0.8 28.0
C.H. Water Temperature (Approx.)	°C °F	82 180		30 86
ΔT at 80 °C Temperature flow :	20 °C			

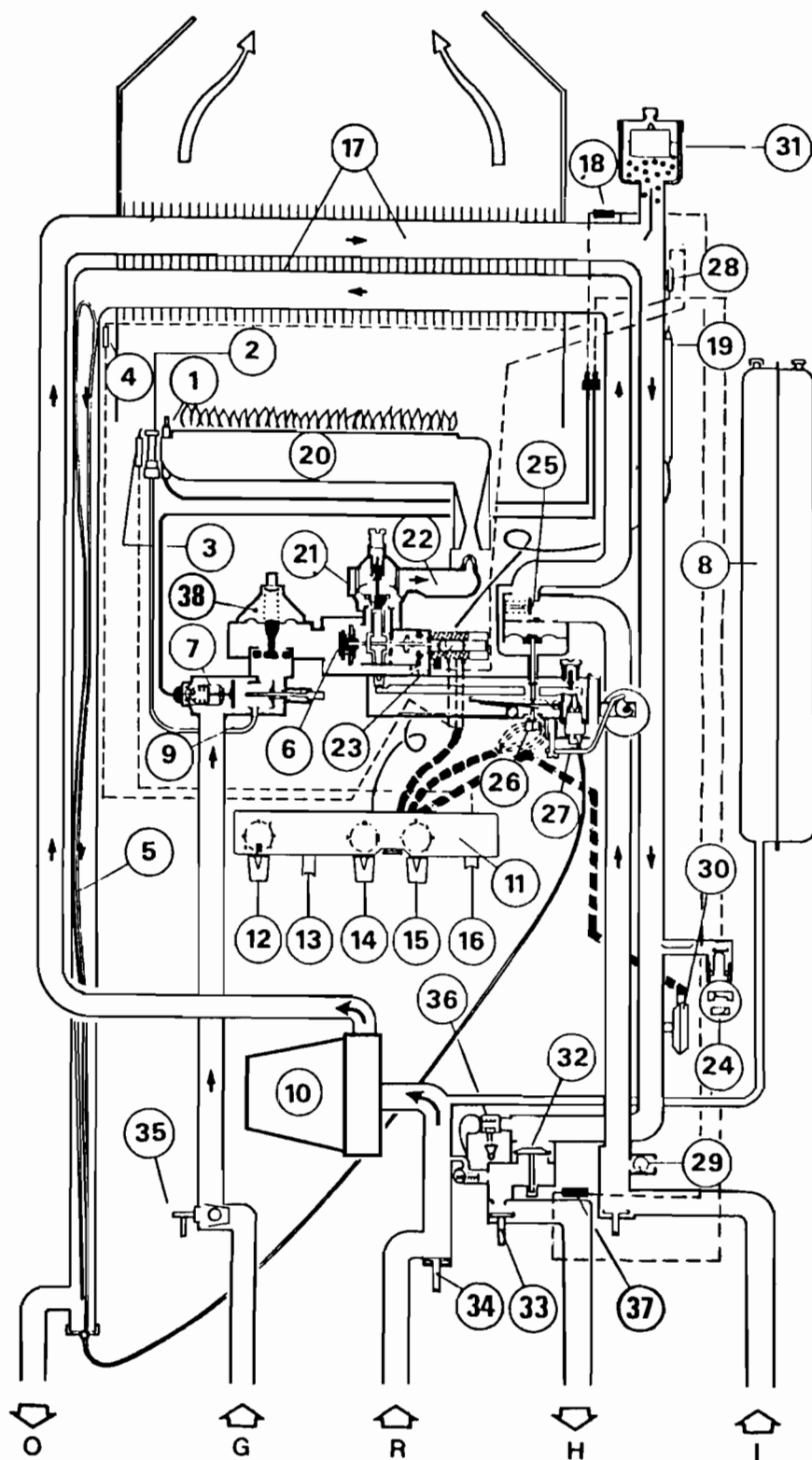
Domestic Hot Water		Maximum
Input to Water (Modulating)	kW Btu/h	30.0 102500
Flow Rate At 50 °C Rise	l/mn G.P.M.	6.7 1.5
Water Temperature Range	°C °F	65 150

GENERAL DATA

Main Burner Assembly	18 × bars
Gas/Water Control (monobloc)	elm leblanc
Burners Injectors Nat Gas	elm leblanc Ø 120
Pilot Injector Nat Gas	elm leblanc Ø 30
Gas Inlet Connection	Ø 22 mm copper
Inlet Connection D.H.W.	Ø 15 mm copper
Outlet Connection D.H.W.	Ø 15 mm copper
Flow Connection C.H.	Ø 22 mm copper
Return Connection C.H.	Ø 22 mm copper
Main Water Pressure	Min. 0.4 bar/5.80 psi - Max. 5.0 bar/72.5 psi
System Pressure C.H.	Min. 0.5 bar/7.25 psi - Max. 3.0 bar/43.5 psi
Electrical Supply	125 mm / 5 in
Flue Outlet	240 V ≈ 50 Hz Fused at 3 amp
Internal Fuse Ratings : 20 mm.	Main : F 3 A - Transformer : T 0.25 A
Water Content C.H.	0.6 l / 0.13 gall
Water Content D.H.W.	0.5 l / 0.11 gall
Pressure Relief Valve C.H.	Ø 22 mm copper
Pressure Relief Valve D.H.W.	Ø 15 mm copper
Net Weight	42 kg / 92.5 lbs
Circulating Pump	Euramo GOLD L
Power consumption	85 - 100 Watt

NOTE : Gas Rate Based on Cal Value 38.7 MJ/m³ - 1038 Btu/f³

- 1 - Thermocouple
- 2 - Pilot assembly
- 3 - Spark electrode
- 4 - Hot water limit thermostat (fixed)
- 5 - Hot water thermostat Phial
- 6 - Two ways gas control valve
- 7 - T.C. magnetic valve
- 8 - Expansion vessel
- 9 - Push button for thermo-electric flame failure valve
- 10 - Heating circulation pump
- 11 - Sealed electrical control box (as panel)
- 12 - Heating temperature selector
- 13 - Push button for thermo-electric flame failure valve
- 14 - Operating selector knob
- 15 - Hot water temperature selector
- 16 - Piezo igniter button
- 17 - Heat exchanger
- 18 - Over heat cut out device
- 19 - Heating thermostat Phial
- 20 - Burner assembly all gas
- 21 - Modulating gas valve
- 22 - Injectors support unit
- 23 - Two stage gas solenoid valve
- 24 - Pressure and temperature gauge (as thermomanometer) (heating)
- 25 - Diaphragm water valve
- 26 - Double acting microswitch
- 27 - Domestic hot water thermostat adjuster
- 28 - Heating limit thermostat (fixed)
- 29 - Domestic pressure relief valve
- 30 - Heating water flow pressure safety valve
- 31 - Heating automatic air vent
- 32 - Non return valve (Heating)
- 33 - Central heating flow isolating cock
- 34 - Central heating return isolating cock
- 35 - Gas isolating cock (as tap gas)
- 36 - Heating pressure relief valve
- 37 - Heating Flow limit stat
- 38 - Regulator



H - Heating Flow.
 O - Hot water Outlet.
 G - Gas.
 R - Heating Return.
 I - Domestic Inlet (Cold).

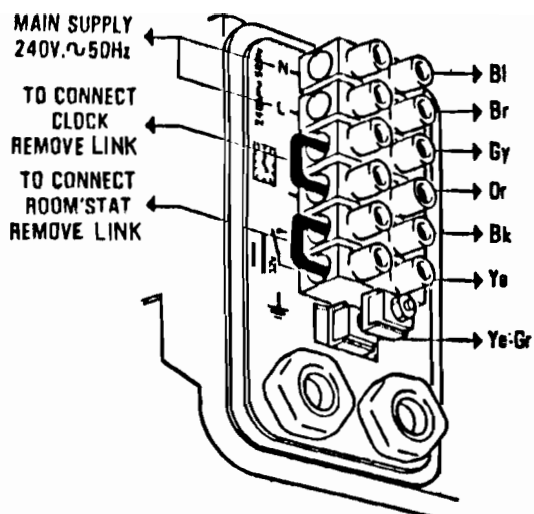


Fig. 1

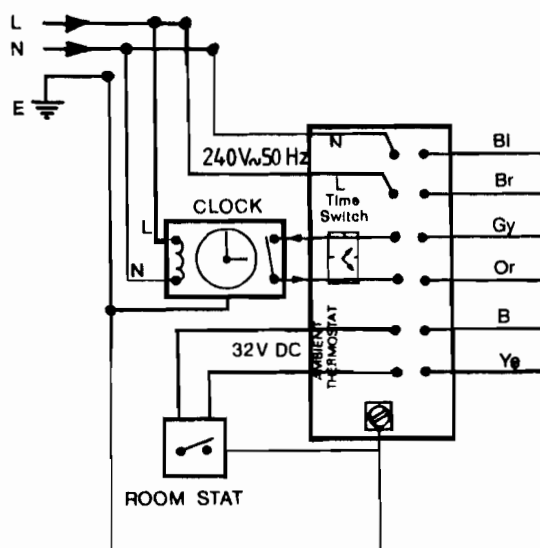


Fig. 2

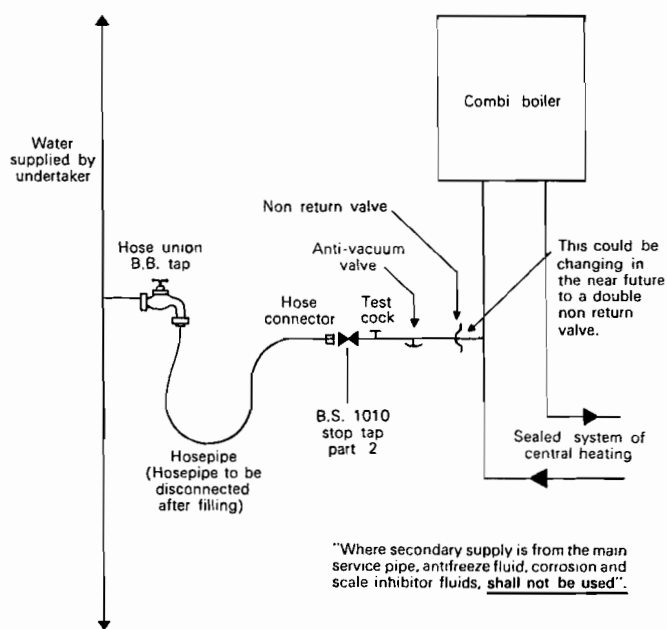


Fig. 3

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

INTRODUCTION

The GLM5.20 is a wall-mounted, low water content, open-flued combination boiler with two separated heat circuits. The central heating output can be range-rated between 6.3 kW (21,500 Btu/h) minimum to 23.4 kW (80,000 Btu/h) maximum. This circuit has an ON-OFF burner switching action, controlled internally by built-in sensing thermostats and externally by room stat and time clock (if installed). The domestic hot water circuit has a modulated gas supply to the burner. This matches the heat input to suit the water flow, between 8.6 kW (29,250 Btu/h) minimum to 30 kW (102,500 Btu/h) maximum and obviates the need for any additional external water flow reducer.

IMPORTANT: To conform to the requirements of the National Water Authority; where the water mains supply pressure is in excess of 73 p.s.i. 5 bar (169 ft), a Pressure Limiting or Pressure Reducing Valve **must be fitted** by the installer into the mains supply in an inconspicuous but accessible position, preferably between 3 and 5 metres (10 to 16 ft) before the appliance. Such a valve must be a type approved by the National Water Authority and **must not pass more than 73 p.s.i. (5 bar) pressure** to the appliance.

The boiler is supplied in two packs. The smaller pack contains the back frame assembly, which includes the expansion vessel and a pre-plumbed bulkhead fitting, enabling the back frame to be fitted to the wall and the piping up of the central heating and hot water systems to take place without the boiler unit in place. This greatly facilitates easier access to the rear connections. This unit also contains built-in isolation valves on the flow-return and cold water supply inlet connections. The larger pack contains the main boiler assembly, incorporating the dual heat exchangers, burner assembly, gas and water controls and the pressure relief valves. The boiler may be set to give central heating-hot water or hot water only from the front panel controls to the range of temperatures shown in Table I. It may also be fitted with external room thermostat and time switch in accordance with the wiring diagram shown in Fig. 1 and 2.

The boiler casing is of white enamelled mild steel and the front panel 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.

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 : 1 - 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. Only those controls described in these instructions have received safety approval and meet the above regulations.

Gas Supply

The boiler requires a minimum gas supply pipe of 22 mm copper or 3/4 in steel pipe. The union service cock is supplied fitted to the boiler to facilitate 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 mbar (8 in.w.g.), the installation should be checked first by the Local Gas Region.

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.

Fluing

Open Flue - This boiler must not be installed in a bedroom or any room containing a bath or a shower.

Flue - 125 mm (5 in) diameter (BS. 715).

The boiler must be connected to a suitable flue which will provide a consistent updraught without undue cooling of the flue gases. The requirements of BS.5440 : 1 should be followed.

Horizontal flue runs shall be avoided and the flue should terminate in accordance with the relevant recommendations given in BS.5440 : 1. The flue must be fitted with a terminal, preferably one which has been tested and found satisfactory by British Gas.

Existing chimneys may be suitable but must be swept first and usually require an approved liner to be fitted.

If in doubt regarding the suitability of a flue, consult the local Gas Region for advice.

If the flue is required to be taken through the wall behind the boiler, adequate space should be allowed for a suitable flue-bend to be fitted, following a minimum vertical rise of straight flue of 600 mm (24 in).

When the flue is taken through a ceiling and into a roof space, or the room above, it must be provided with a sleeve of non-combustible material and of a size to allow an air space between the sleeve and flue of 25 mm (1 in) minimum. A suitable non-combustible plate or sleeve must be fitted to centralize the flue and maintain a 25 mm air gap. The space between the plate/sleeve and the flue pipe should be filled with mineral wool or similar non-combustible, non-conducting material.

Air Supply

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

1. If the appliance is installed in a room, the room must have a permanent air vent either direct to the outside air or to an adjacent room which itself has a permanent air vent direct to the outside air. The minimum effective area of the air vent(s) required is : 104 cm² (16 in²).

NOTE - When calculating air requirements, account must be taken of any other fuel burning appliances located within the same room.

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. Where the cupboard or compartment is ventilated to a room, the room itself must have an air vent direct to outside air of minimum effective area 104 cm² (16 in²). Details of essential features of cupboard/compartment design, including airing cupboard installations, are given in BS.6798.
3. A spillage test, as detailed in BS.5440 : 1, must be carried out and any remedial action taken to ensure that installation meets these standards. If there is any type of extract fan fitted in the premises, spillage of the products from the boiler flue could occur when the fan is in operation, unless adequate air inlet area from outside is provided.

TABLE 2

POSITION OF AIR VENTS	OPEN FLUE	
	Air from room	Air direct from outside
High Level	270 cm ² (42 in ²)	135 cm ² (21 in ²)
Low Level	540 cm ² (84 in ²)	270 cm ² (42 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 \approx 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.

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 Fig. 3.

The central heating system should be in accordance with the recommendations in BS. 5376 : 2 and in addition, for smallbore and microbore systems, BS. 5449 : 1. Draining cocks should be at least 1/2 in BSP. nominal size and in accordance with BS. 2879. Copper piping to BS. 2871 is recommended.

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.

Some Water Authorities require that 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 (1/2 in) above the top edge of the bath, a suitable anti-siphon valve must be fitted.

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

Note : The incoming mains water supply must be at a pressure higher than 0.4 bar (6 psi) providing a minimum flow rate of 2.7 l/h (0.6 gall), 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, it is strongly recommended that an in-line water softener is fitted.

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.

If the boiler is to be installed in a cupboard or compartment, it must be purpose-made or modified to meet the requirements of BS. 6798.

Important Note : This boiler must not be fitted in a bedroom, bathroom or any room containing a shower or bath.

It is recommended that an outside wall is chosen whenever possible to facilitate direct fluing and drain pipework.

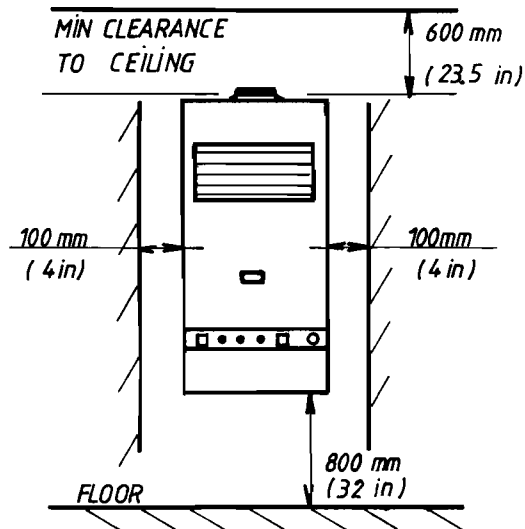
Ensure that the minimum clearances for servicing are available and leave adequate clearance in front of the boiler for operation.

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

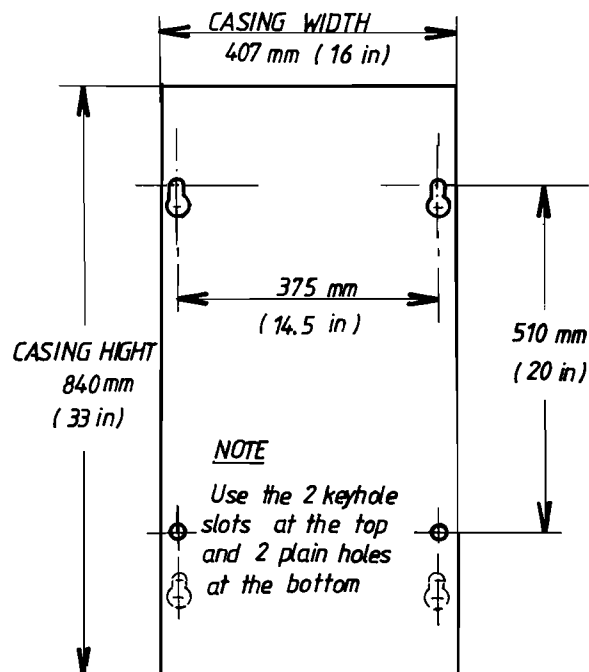
1. The installation must comply with the requirements of BS. 6798 and BS. 5449 : 1.
2. The installation should be designed to work with flow temperatures of up to 82 °C.
3. All components in the system must be suitable for a working pressure of 3.0 bar (45 psi) and a temperature of 110 °C. Care should be taken when making joints to minimise any chance of leakage.



MINIMUM CLEARANCES FOR SERVICING AND OPERATION

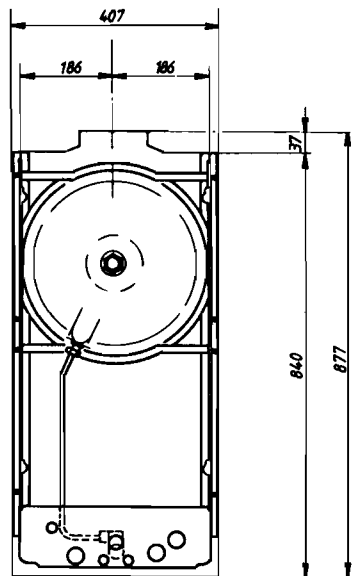
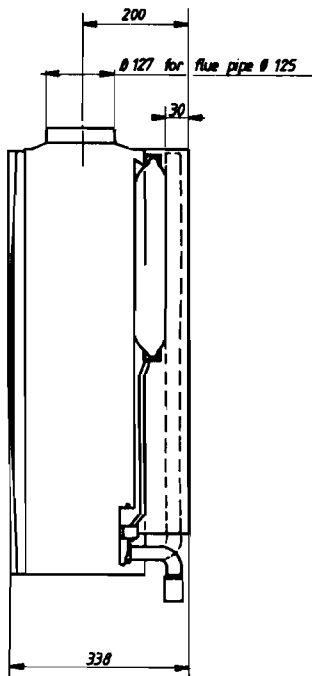
NOTE: Additional clearances will be necessary for installation

- Bottom to worktop: 400 mm (16 in)
- Front panel to clear space 600 mm (24 in)



WALL FIXING DIMENSIONS TO PLAIN WALLS

Fig. 4



BOILER DIMENSIONS

Fig. 5

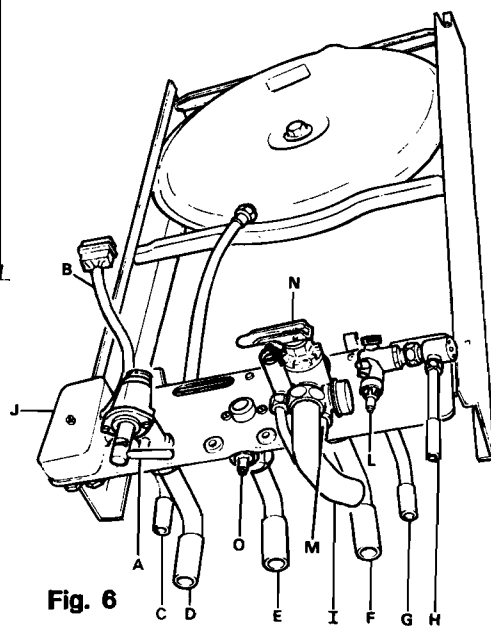


Fig. 6

4. The following components are incorporated within the appliance :

Circulating Pump, Pressure Gauge and Temperature-indicator combined, Range 0-4 bar (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 (pre-pressurised).

5. Make-up Water. Provision must be made for the replacement of water lost from the system. A suitable method is by temporary connection as shown in Fig. 3, 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 : 1 and British Gas publication "Specifications for Domestic Central Heating and Hot Water".

Packaging

The boiler is supplied in two packs.

The smaller pack contains the back frame assembly, which includes the expansion vessel and pre-plumbed bulkhead fitting, together with an accessory package, containing - Angle Bend - Wall Plugs and Screws.

Unpack assembly and place to one side. Check contents in the accessory pack against the carton check-list. **NB. (Installation & Servicing Instructions are despatched in this pack).**

The Large pack contains the main boiler assembly, including the outer case and controls. Under this, in a separate cardboard box, is the pump and a loose bottom grille. Remove the boiler from the pack by swinging upwards and lifting clear (as shown in the carton check-list). Lay the boiler on its back on a dust sheet clear of the fixing site. Remove the pump from its housing in the pack and check all items for possible transit damage.

The Accessory pack should contain : - User's Instructions, Warranty Card, Gaskets, Screws and Washers, Data badge Indication labels. Check contents in the accessory pack against the carton check-list.

Proceed with the installation.

STAGE 1 - Fixing the Backframe

Using the back frame as a template, mark the position of the two upper fixings, taking account of the MINIMUM clearances indicated in Fig. 4.

Drill through the marked centres, using an 8 mm (5/16 in) masonry drill and fit wall plugs.
Screw in the 2 wood screws to within 6 mm (1/4 in) of the wall face.

Hang the backframe over the screws via the keyhole slots, square up with a spirit level and mark the position of the bottom fixing holes, (not keyhole slot), see Fig. 4. Remove backplate.

Drill through the marked centres as before and fit wall plugs.

Replace the backframe on the upper fixings, screw in lower fixing screws and tighten. Fully tighten top fixing screws.

STAGE 2 - Connecting the Supply Pipes

For ease of installation, it is recommended that the supply pipes are connected at this stage without the boiler in position. (Fig. 6) 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 discharge connections which should be extended through the outside wall and run to drain in the manner described in BS. 6798.

The angle bend fitting for connection I is to be found in the accessory pack in the small carton.

Note : If either of the discharge connections are to be taken out at right angles behind the main boiler case, the wall should be drilled at this stage, ensuring that the angle bend does not foul valve spindle 'M'.

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

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

1. Connect the gas supply 22 mm copper at 'D'.
2. Connect the return pipe 22 mm copper at 'E', installing a draining cock at the lowest point in the pipework.

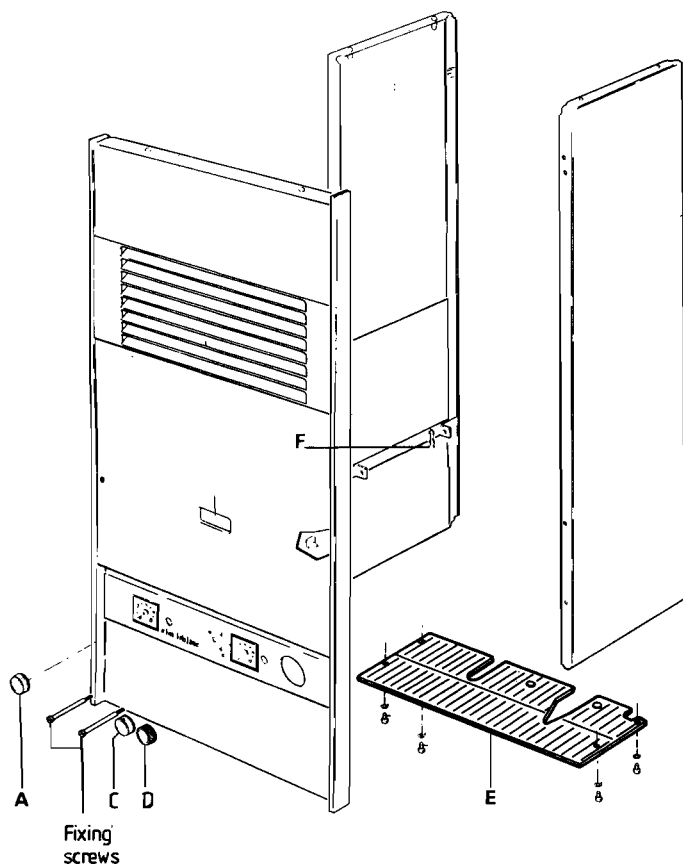
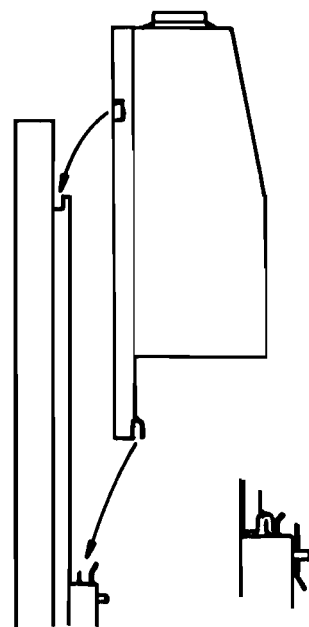


Fig. 7



BOILER - BACK FRAME LUGS

Fig. 8

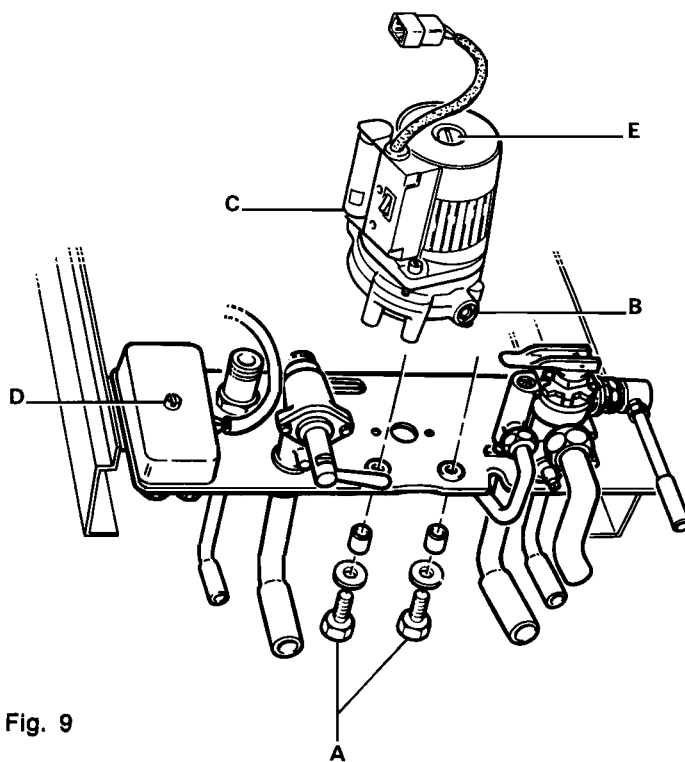


Fig. 9

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.
4. Connect the cold water mains supply 15 mm copper at 'G', and fit an isolating cock to BS. 1010 in the supply pipework.
5. Connect the domestic hot water outlet pipework 15 mm copper at 'C'.
6. Drill through the wall (if necessary) and connect discharge pipe 15 mm copper at 'H'.
7. Drill through the wall (if necessary) and connect discharge pipe 22 mm copper at 'I'.
8. Replace all sealing washers, firmly clip the pipework to the wall and tighten all connections.
9. Make-good the internal and external wall surfaces around the discharge pipework. **NB.** This can be completed at the same time as the flue installation (Stage 4).

STAGE 3 - Fixing the Boiler Assembly

Remove the front and side panels (Fig. 7).

- a. Pull off the 3 control knobs 'A', 'C' & 'D'.
- b. Remove the 2 fixing screws from the Control Panel (Fig. 7).
- c. Pull the base of the front panel forward and lift to disengage the top location pegs.
- d. Remove and discard the 2 circlips (transit fixings) holding the side panels to the backframe.
- e. Remove the side panels, one screw each side of the electrical control box.
- f. Disengage the fixing lugs by easing forwards at the bottom and then lifting off from the top location pegs.

To hang the boiler on the back frame (Note : It is advisable to wear protective gloves) (Fig. 8).

- a. Remove all plastic transit plugs from fitments (both assemblies).
- b. Lift the boiler slightly higher than the back frame and slide down into the engagement lugs, aligning the connecting pipes with their respective fitments.
Check that the Peg on the backframe is located in the spring clip on the bottom of the boiler assembly, this indicates correct backframe/boiler assembly relationship.

Connecting to the bulkhead :

- a. Fix the straight connection (gas supply) to the gas service cock and tighten the union joint.
- b. Ensure that the sealing washers have all been fitted correctly and tighten the water connection unions.
- c. Remove the pump with fixing screws, washers and spacers from its cardboard box. Lubricate the 'O' ring seals on the bulkhead spigots with soapy water, engage the pump over the spigots and fasten with the 2 screws, washers and spacers from the rear as shown ('A' Fig. 9).
- d. Connect the pump wiring connections to the Control Box (plug & sockets).
- e. Check that all joints and screws are securely tightened.

STAGE 4 - Fixing the Flue

This boiler is designed with a built-in draught diverter suitable for secondary flue connection with sheet metal flue size 125 mm diameter (5 in.) to BS. 715. The flue should be terminated with an approved terminal, but it is vitally important that the flue is installed in accordance with the requirements of BS. 5440 : 1 and the Building Regulations. No other flue breaks should be incorporated. Ensure that the necessary permanent ventilation openings as stated in Air Supply (page 6) are present in the room. If not, fit appropriately-sized air vents.

NOTE : When using flue pipe to BS. 567 a purpose designed adaptor must be fitted to the draught diverter outlet.

Check the General Installation Requirements Page 5.

For general guidance purposes, 2 typical types of installation are shown (Fig. 10).

Cover the boiler with a dust sheet : do not re-fit the outer casing at this stage.

Proceed with the flue installation.

- a. Carry out any building work.
- b. Fit the flue, ensuring that it is adequately supported throughout its length.
- c. Make good internal and external wall surfaces around the flue and ensure all flue joints are properly sealed.

Note : A "spillage" test **MUST** be carried out during the commissioning.

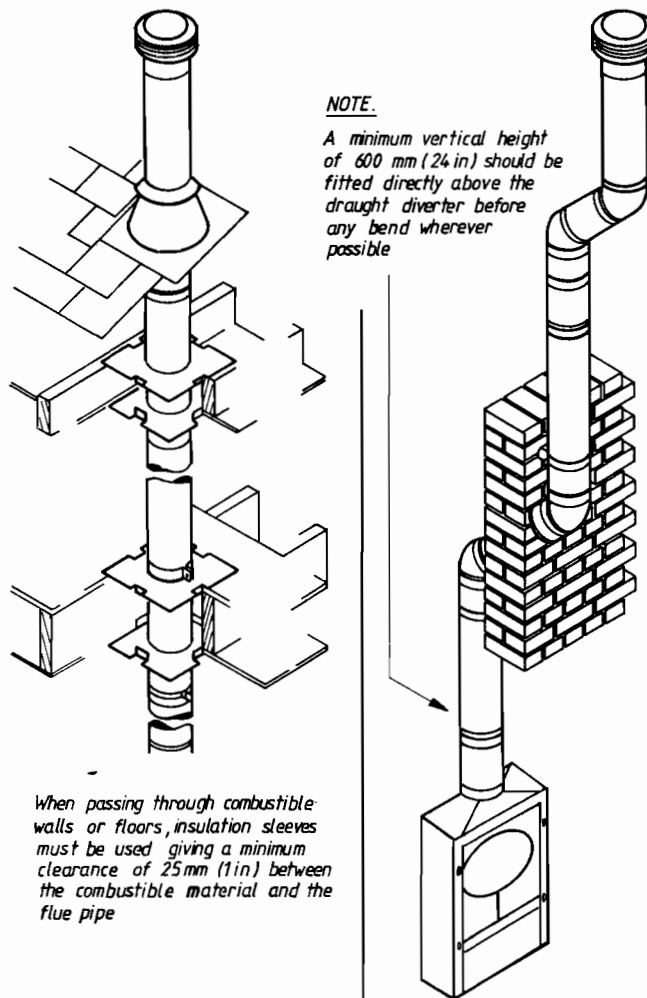


Fig. 10

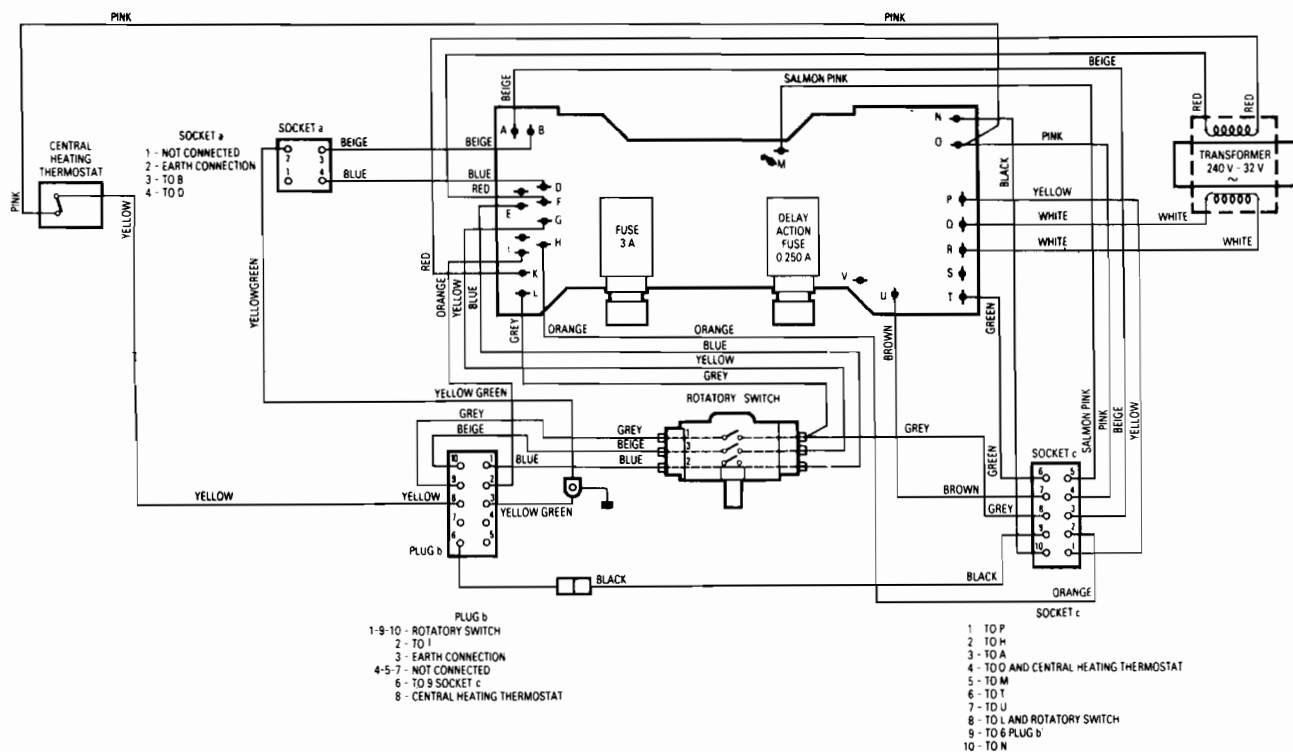
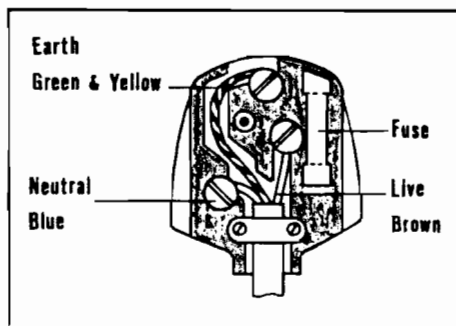


Fig. 11

SOCKET



To terminal block

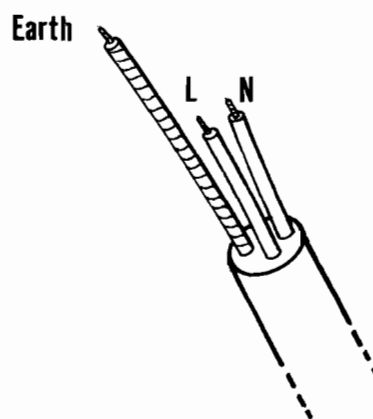
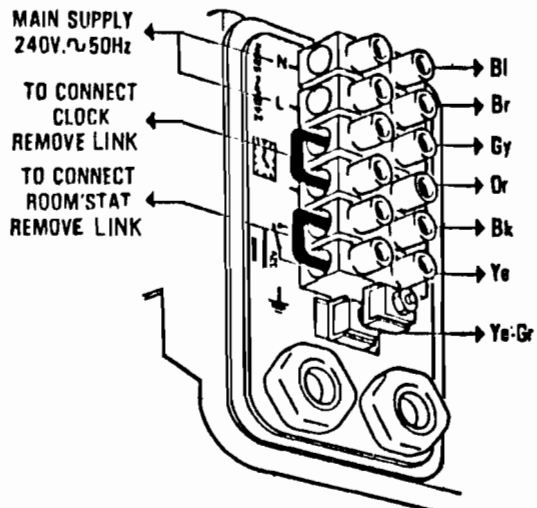


Fig. 12

INTERNAL ELECTRICAL CONNECTIONS



BROWN	: Br
ORANGE	: Or
YELLOW	: Ye
BLACK	: Bk
GREEN	: Gr
GREY	: Gy
YELLOW-GREEN	: Ye Gr
BLUE	: BI

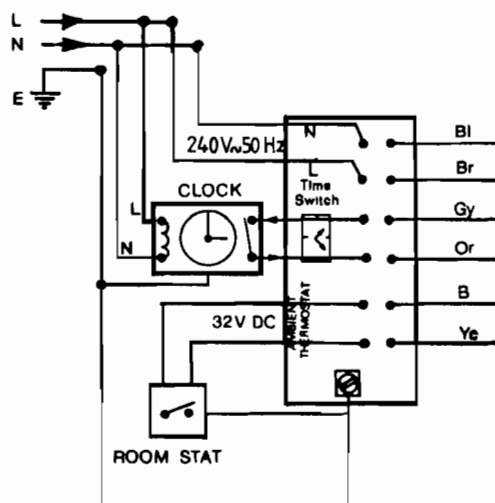


Fig. 13

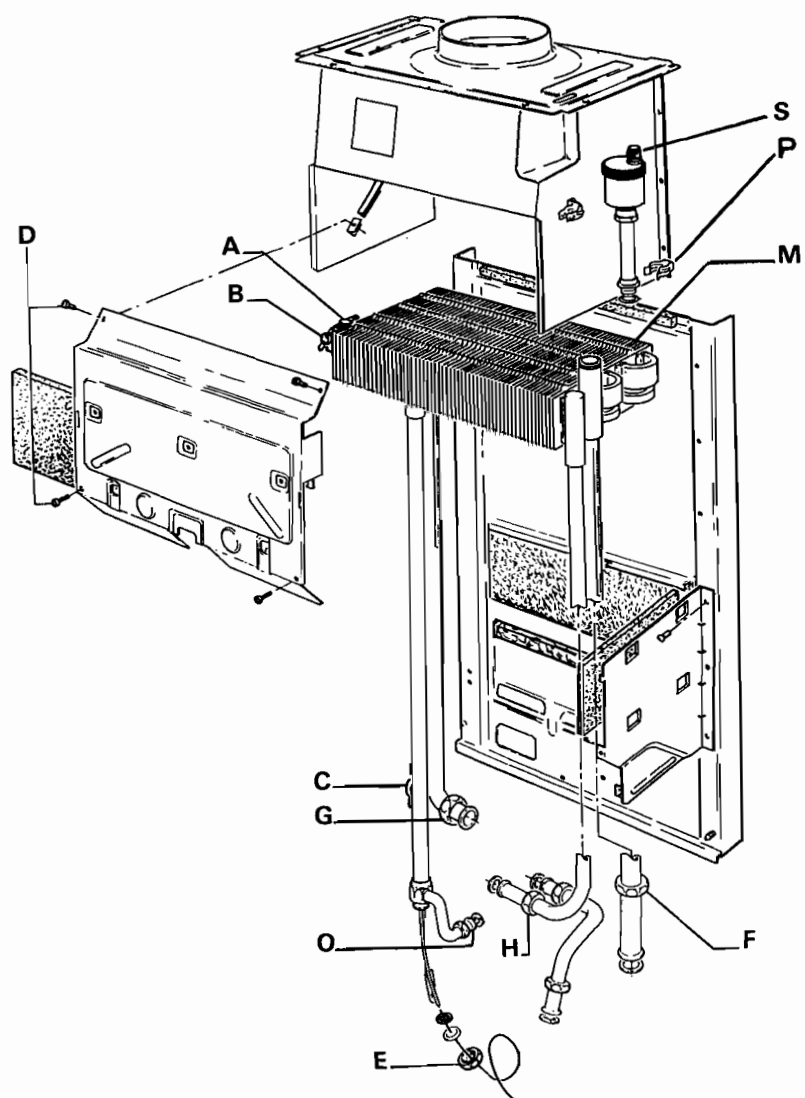


Fig. 14

STAGE 5 - Connecting the Electrical Systems



WARNING - THIS APPLIANCE MUST BE EARTHED

A mains supply of 240 V \approx 50 Hz single phase is required. Wiring should be in 3 core PVC Cable not less than 0.75 mm². 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 (Fig. 12).

NOTE : P.V.C. three core cable must conform to BS. 6500 Table 15 or 16.

The supply connection must be made via a removable plug to an unswitched shuttered outlet socket. The both to the requirements of BS. 1363, and fused at 3 A, wired as shown in Fig. 12 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 terminal box screw and take off cover ('D' Fig. 9).
2. Pass the mains lead through the left-hand cable clamp entry, and  and secure the clamp.
3. Wire the supply to terminals marked L.N. entry, and  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.

Internal wiring of Controls Panel is shown in Fig. 11. A wiring diagram is also included behind the front panel.

EXTERNAL WIRING

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

Note : — The time switch must have isolated contacts and the room-thermostat should be suitable for low voltage.

- **Do not use L and N connections in the terminal box of the boiler to connect the time-switch but connect as described Fig. 13.**

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 Fig. 13.

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

COMMISSIONING AND TESTING

Water System

- a. Fill the central heating system by connecting a flexible hose as shown in Fig. 3 and flush out the system via the draining cock in the return pipe work.
- b. Close off the draining cock and refill.
- c. Bleed off the air from all radiators and from the circulating pump by removing the front screw plug (see 'E' Fig. 9). Loosen the Automatic air vent screw (see 'S' Fig. 14) fitted on the flow header and fill to the required pressure.
- d. Water pressure in the central heating system must always be greater than 0.5 bar (7.4 psi). To determine the correct pressure for the system, measure from the base of the boiler to the top of the highest radiator in metres and allow 0.5 bar (7.4 psi) for each metre of height. Even if this is less than 0.5 bar, fill to a pressure of 0.5 bar (7.4 psi).
- e. Disconnect the flexible hose and bleed off water, if necessary, until the correct pressure is reached.
- f. Check out the whole system for water soundness.

Gas Installation

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

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

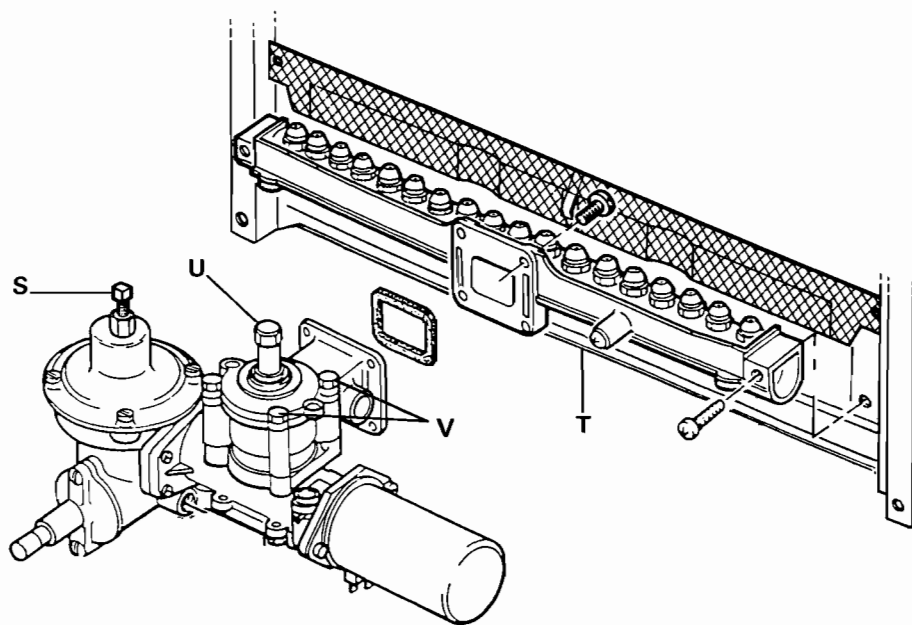


Fig. 15

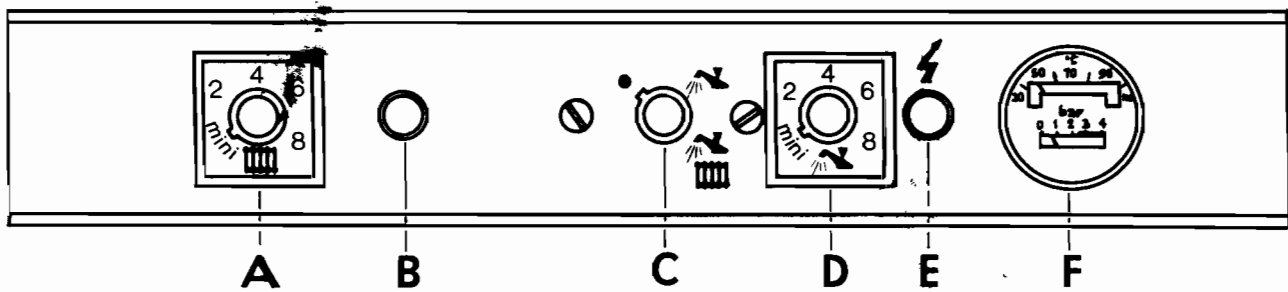


Fig. 16

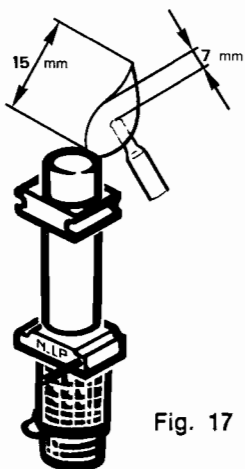


Fig. 17

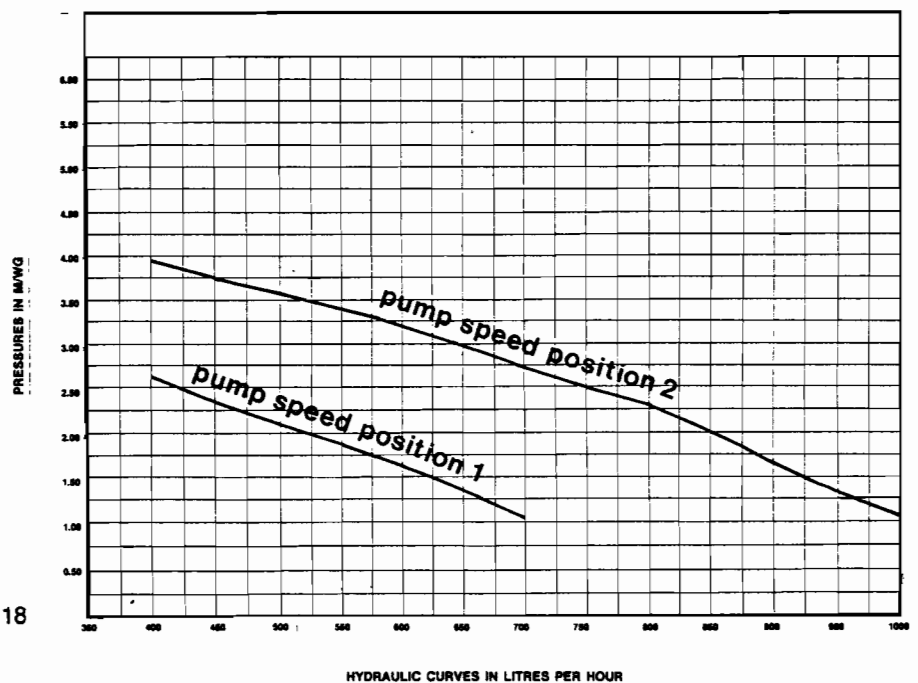


Fig. 18

Electrical Installation

Carry out a final electrical safety check to ensure continuity of earthing and system conformity, using a British Gas 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 Pressures :

For gas settings see Table I Page 2 or Data Badge located on the appliance on the top of the flue hood (Page 30).

The boiler is adjusted to a Nominal gas Input of 30 kW (102,500 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' Fig. 15 -, (Clockwise increases pressure).

This boiler is range-rated with on-off burner action for the central heating output, and is supplied pre-set to its maximum output rate of 23.4 kW (80,000 Btu/h). For lower outputs, the regulator screw (See U. Fig. 15) must be adjusted, (Anti-clockwise to decrease).

Where any adjustment is made the new setting shall be indicated on the Data Badge using the appropriate indication label supplied. (See Table 1 for C.H. SETTING pressure).

Proceed with lighting as follows :

With the outer casing still removed, unscrew the burner pressure test nipple screw T (Fig. 15) and fit a suitable pressure gauge.

Temporarily re-fit control knobs 'A', 'C', 'D' - (Fig. 7).

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).
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' (Fig. 16) to the 'Off' position.
6. Light the pilot as follows :
 - a. Push in button 'B' (Fig. 16) and hold.
 - b. After sufficient time to purge any air from the pilot, push in and release the igniter button 'E' (Fig. 16). A click will be heard.
 - c. Continue to operate the igniter until the pilot lights.
 - d. Hold in button 'B' for a further 10 seconds then release. The pilot should now remain alight.
 - e. 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 as shown (Fig. 17). Note that the recommended range of operating parameters for the thermocouple is : 5 mV mini to 8 mV.

Test the Domestic hot water operation as follows :

1. Set the temperature control knob 'D' (Fig. 16) to No. 8 maximum.
2. Set the selection knob 'C' (Fig. 16) to the hot water position (tap).
3. Turn on fully the nearest hot water tap and the burner should light at its maximum rate.
4. Allow the boiler to warm up for 5 minutes then check the pressure at the burner test point. This should be at maximum rate - 7.6 mbar (3.1 in w.g.). If this is not correct, set the governor 'S' (Fig. 15) to give the correct pressure (Turn clockwise to increase).
5. Check the low rate operation of the burner. (Note : This setting is fixed and cannot be adjusted). Set knob 'D' (Fig. 16) 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. The pump should not be operating.
6. Turn off the hot water tap.

Setting the pump :

1. Set the pump rate. The circulating pump has 2 flow settings selected by a rocker switch on the left-hand side. Switch to the desired position to suit the system flow/resistance. (Fig. 18) shows the flow resistance curve for each setting.
2. Turn on the central heating by setting control knob 'A' (Fig. 16) to maximum No. 8 and knob 'C' (Fig. 16) to the central heating symbol (tap and radiator). Check that the room-stat and time switch (if fitted) are calling for heat and the burner should now light at maximum rate with the pump running.

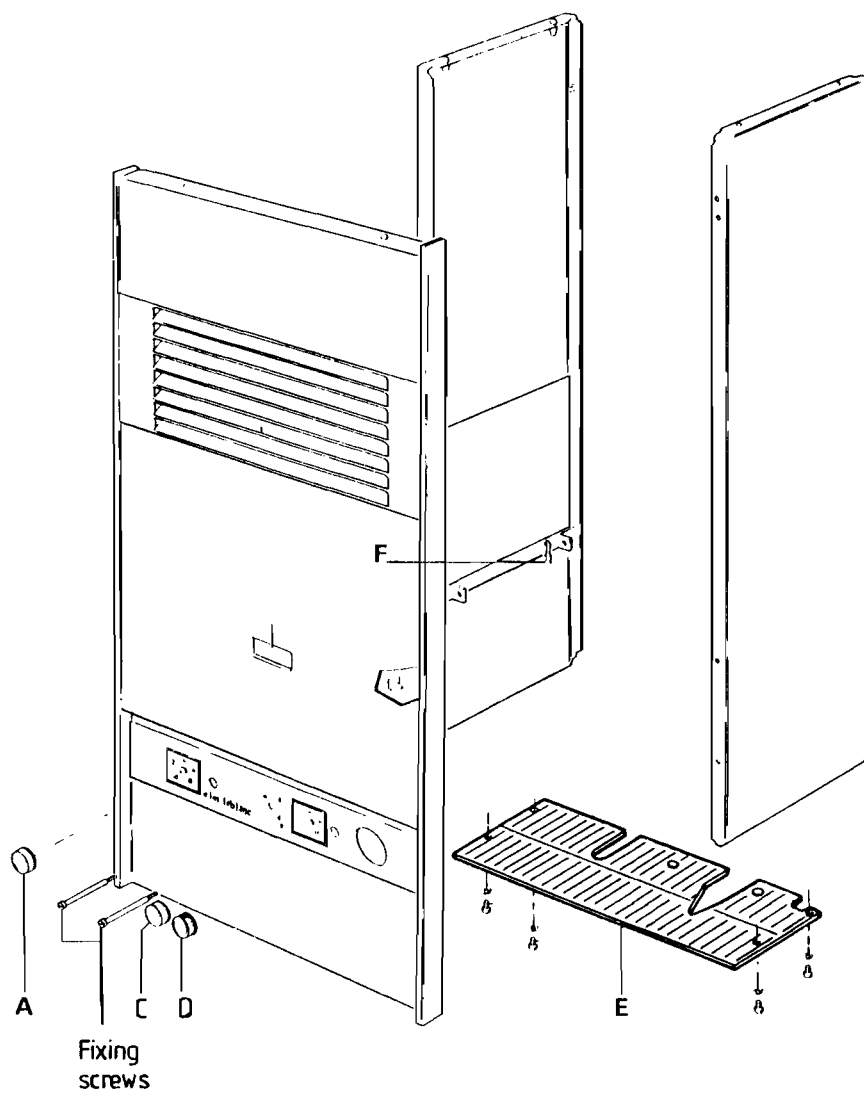


Fig. 19

3. Manually operate the room-stat and time switch to off and the burner should go out, leaving the pilot on. Switch back on again.
4. Turn control knob 'C' to the 'Off' position (spot). The main burner will go off.
5. Check the drop out time of the flame failure device by turning off the appliance gas service cock and listening for a 'click' - This MUST always be less than 60 seconds.
6. Finally, remove the pressure gauge and refit the test nipple screw, ensuring a gas-tight seal is made.

Spillage Test :

1. Remove the 3 control knobs temporarily fitted. Replace the side and front panels in the reverse order to that in Stage 3 (Fig. 19).
2. Additionally, fit the bottom grille 'E' (Fig. 19) using the 4 screws and washers provided (found in the large carton) and refit the 3 control knobs over the outer case.
3. Re-light the pilot as previously described (Page 17).
4. Set control knob 'C' to 'Hot Water' position and knob 'D' to Maximum setting. Turn on the nearest hot water tap fully and the appliance will now be burning at its maximum input. Allow at least 10 minutes for the heater and flue system to thoroughly warm up and carry out a flue spillage test in accordance with BS. 5440 : 1 (See 'General Requirements - Air Supply'). Carry out a general check for water soundness and correct any faults that may have occurred.

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 the function of the boiler overheat thermostat and the action required to re-establish the boiler operation.
- d. Explain and demonstrate the functions of any time switch and room thermostat.
- 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.

ANNUAL SERVICING SCHEDULE

For access to individual components refer to the relevant section given under REPLACEMENT OF COMPONENTS.

1. Run the boiler and check the operation of its controls and switches.
2. Check the condition of the Flue and Flue Terminal and carry out a Spillage Test in accordance with BS. 5440 : 1. Correct any faults found.
3. Remove the outer casing and visually check all water carrying components for signs of leakage or deterioration.
4. Remove the Combustion Chamber front panel and check the insulation panels for damage or deterioration.
5. Examine the Heat Exchanger and clean off any accumulation of deposits using an appropriate brush.
6. Remove any carbon deposits which have built up on the thermocouple tip.
7. Remove and clean the pilot assembly and injector. Check that the pilot flame is correct.
8. Inspect and, if necessary, clean the Lint Arresters fitted to the Main Burner manifold.
9. Clean the Main Burner bars and injectors. Inspect, clean or exchange as necessary.
10. 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 Page 15.
11. 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.

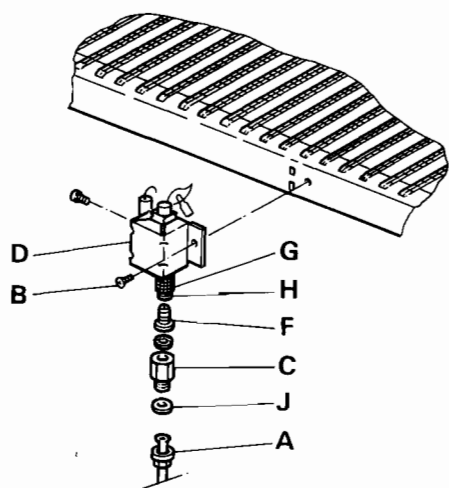


Fig. 20

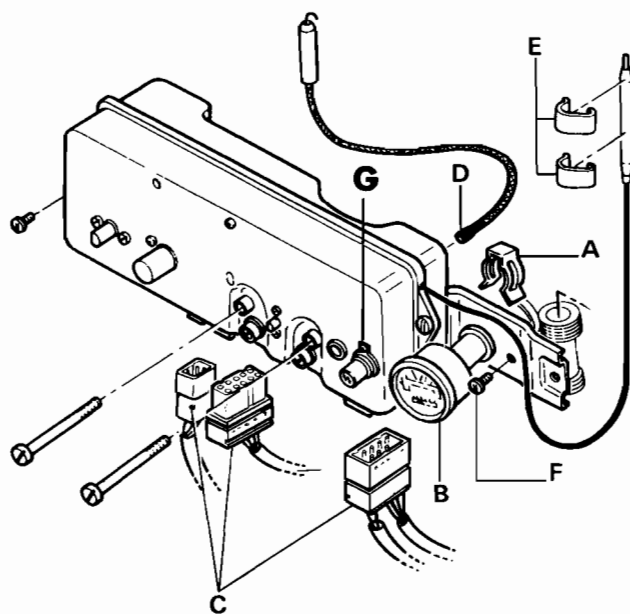


Fig. 21

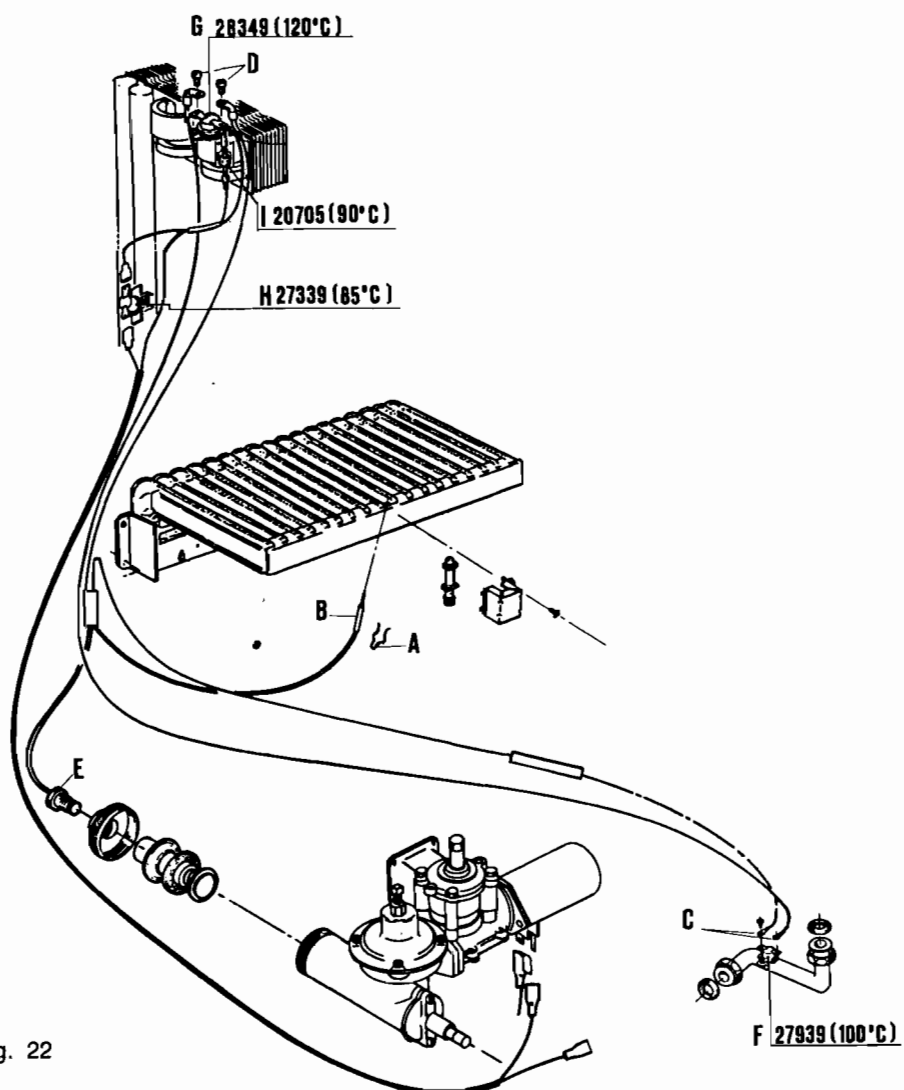


Fig. 22

SERVICING

- WARNING :** Always isolate the electricity supply and turn off the gas supply at the appliance service cock before commencing any servicing.
- 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 Access (Fig. 7)

- 1.1. Pull off the 3 control knobs 'A', 'C', 'D'.
- 1.2. Remove the 2 fixing screws from the Control Panel.
- 1.3. Pull the base of the front panel forward and lift to disengage the top location pegs.
- 1.4. Remove the bottom grille 'E' (4 fixing screws).
- 1.5. Remove the side panel fixing screws, one screw each side of the electrical control box.
- 1.6. Disengage the fixing lugs by easing forwards at the bottom and then lifting off from the top location pegs.

Section 2 : To access heat exchanger and burner assembly (Fig. 14)

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

Section 3 : To replace pilot assembly (Fig. 20)

- 3.1. Gain general access as described in Section 1.
- 3.2. Undo the pilot supply union nut 'A' at the pilot housing, taking care not to lose the sealing washer 'J'.
NB. - For better access release the Air Tray under the burner by pushing backwards to depress the spring clips.
- 3.3. Disconnect the spark electrode lead from the rear of the Control Box. Remove the Pilot Bracket fixing screw 'B' to the right of the Pilot Burner.
- 3.4. Remove the Pilot Assembly and Electrode by swinging outwards from the Burner and disengaging the location lugs 'D'.
- 3.5. The Pilot Assembly including the Electrode may now be stripped to its component parts (Fig. 20) in order to clean/replace Injector, Pilot, Aeration Gauze, Filter, and Electrode.

Reassembly Notes

- a. Ensure that the Pilot sealing washer is re-fitted.
- b. Re-engage the Air Tray onto its location lugs if necessary.
- c. Ensure that the Pilot Flame envelops the thermocouple tip as in Fig. 24 and that the Spark Electrode gap is set between 4.0 - 4.5 mm.

Section 4 : To replace the Electrical Control Box (Fig. 21)

- 4.1. Gain general access as described in Section 1.
- 4.2. Remove the pressure gauge by releasing the spring retaining clip 'A' and withdrawing the gauge 'B'.
- 4.3. Unplug the 3 electrical connections 'C' from the Control Box.
- 4.4. Disconnect the Spark Electrode Lead 'D' from the rear of the Control Box.
- 4.5. Unclip the Thermostat phial 'E' from the C.H. Flow pipe on the Right-hand side of the Heat Exchanger.
- 4.6. Remove the Control Box by removing the single retaining screw 'F' at the right-hand side of the bracket. Draw the control box forward and out.
Access is now available to the major components.

Section 5 : To Replace the Thermocouple (Fig. 22)

- 5.1. Gain general access as described in Section 1.
- 5.2. Where there is limited side access remove the Electrical Control Box as described in Section 4.

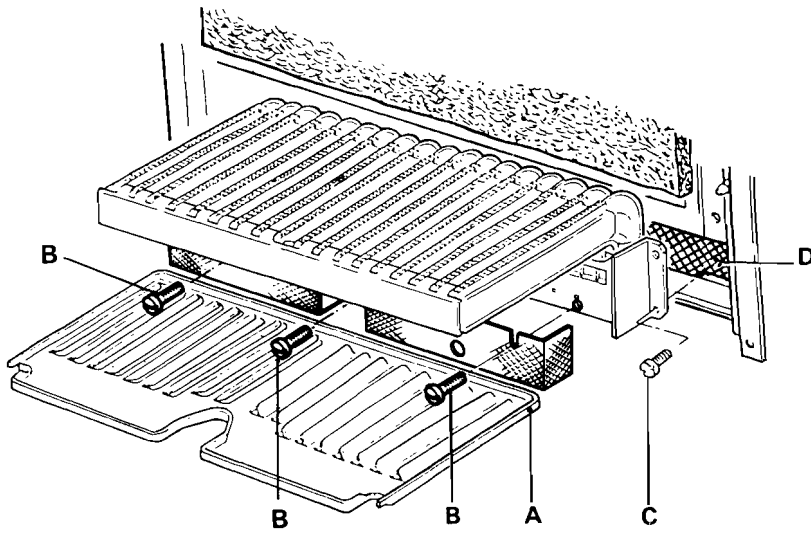


Fig. 23

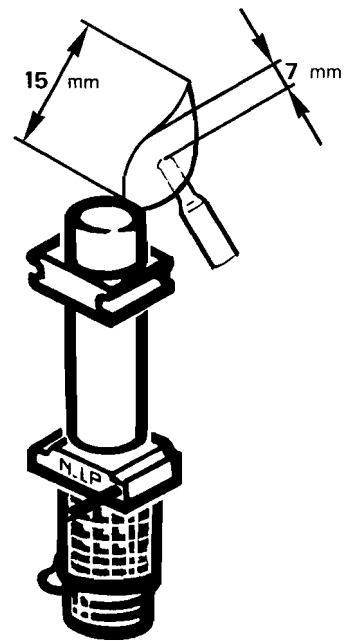


Fig. 24

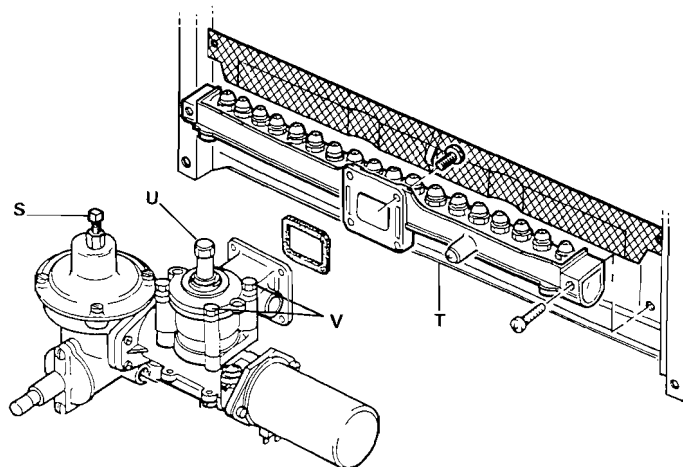


Fig. 25

5.3. Pull off the retaining spring clip 'A'.

5.4. Draw the Thermocouple body 'B' downwards out of the Burner Rail Assembly.

Where it is required remove the T.C. Overheat Stats.

5.5. Overheat Stat 'F' on the C.H. flow pipe : Remove the two screws 'C' securing the wires to the Overheat Stat and the two screws fixing the Overheat Stat on the C.H. flow pipe.

5.6. Overheat Stat 'G' on the Heat Exchanger : Remove the two screws 'D' securing the wires to the Overheat Stat and the two screws fixing the Overheat Stat on the Heat Exchanger.

Where it is required remove the Thermocouple Assembly complete.

5.7. Remove the two Overheat Stats 'F' and 'G' from the heat exchanger and the C.H. flow pipe as described in 5.5 and 5.6 above.

5.8. Undo the 8 mm nut 'E' connecting the Thermocouple to the rear of the Thermo-Electric valve Body and remove.

Reassembly Notes

Reform the new Thermocouple as near to the shape of the old as is possible.

Wires from the bottom go to Heating Flow pipe Overheat Stat.

Wires from the top go to Heat Exchanger Overheat Stat.

Ensure the Air Tray is relocated.

Check the pilot flame fully envelops the thermocouple tip as shown (Fig. 24). Note that the recommended range of operating parameters for the thermocouple is : 5 mV mini to 8 mV.

Section 6 : To remove the burner bar (Fig. 23 and 25)

6.1. Gain general access as described in Section 1.

6.2. Remove the Combustion Chamber Front Panel by removing the 4 screws and swinging the panel outwards and up from the bottom to disengage the alignment lugs as described in Section 2.

6.3. Remove the thermocouple as described in Section 5 (5.1 to 5.4).

6.4. Undo the pilot supply union at the pilot housing, taking care not to lose the sealing washer.

6.5. Release the Air Tray 'A' under the Burner by pushing backwards to depress the Spring Clips.

6.6. Disconnect the spark electrode from the rear of the control box.

6.7. Unscrew the 3 screws 'B' of the front lint arrester and remove it (Fig. 23).

6.8. Unscrew the 4 screws 'V' of the modulating valve (Fig. 25).

6.9. Unscrew the 2 screws 'C' of the burner bar (Fig. 23).

6.10. Remove the burner bar.

Servicing Notes

Inspect, clean or replace injectors if necessary and clean the rear gauge.

Section 7 : To replace the burner (Fig. 23)

7.1. Remove the burner bar as described in section 6.

7.2. Remove the burner by removing the 4 screws 'C', fitting it to the appliance backframe.

Section 8 : To replace the Lint Arresters (Fig. 23)

8.1. Gain general access as described in Section 1.

8.2. Remove the Electrical Control Box, as described in Section 4.

Front

8.3. Slacken the three fixing screws 'B'.

8.4. Ease Arrester downwards to clear the screws.

8.5. Slide Arrester sideways and remove.

Rear

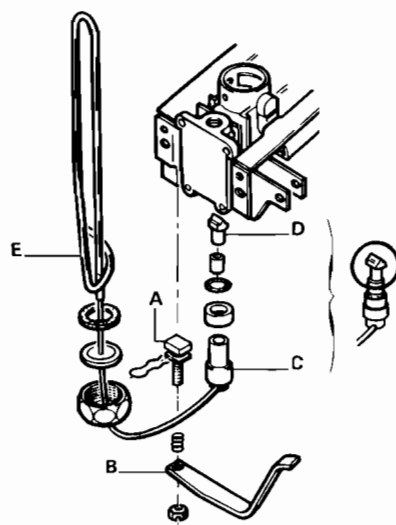
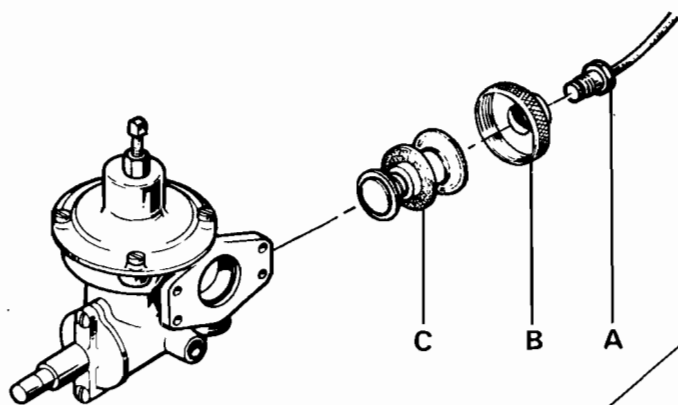
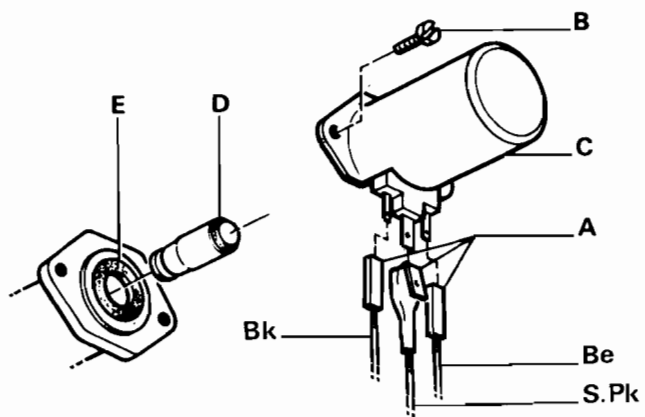
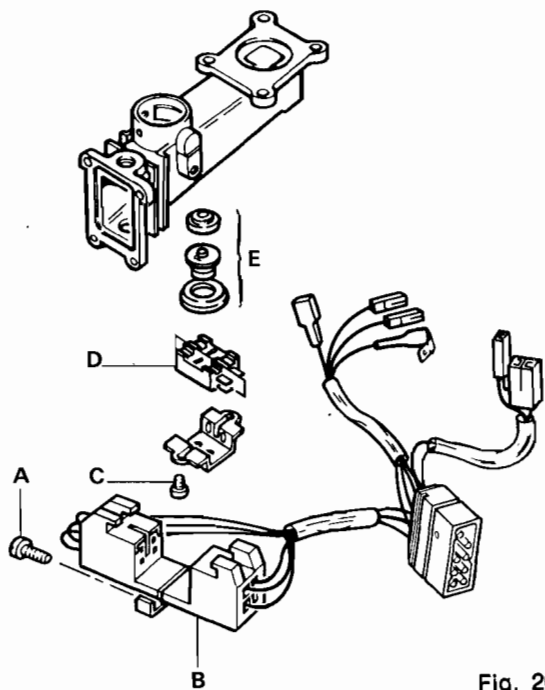
8.6. Remove the burner as described in Section 7.

8.7. Remove the two screws 'C', one at each end.

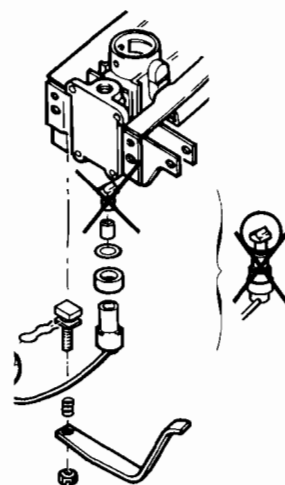
8.8. Lift Arrester 'D' upwards to remove.

Reassembly Notes

Care should be taken to ensure that the Arresters are correctly located.



CORRECT



INCORRECT

Section 9 : To Replace Gas Modulating Box Micro-switches (Fig. 26)

- 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 REPLACEMENT OF WATER-CARRYING COMPONENTS Section 12.
- 9.3. Remove the fixing screw 'A' of the plastic protector.
- 9.4. Disconnect the electrical connections 'B'.
- 9.5. Remove the fixings screws 'C' of the micro-switches support.
- 9.6. Remove the micro-switches assembly 'D'.

Reassembly Notes

Before replacing the micro-switches, replace carefully the small rubber diaphragm and the brass ring assembly 'E'.

Section 10 : To Replace the Solenoid Assembly (R.H.S. of Gas Valve) - (Fig. 27).

- 10.1. Gain general access as described in Section 1.
- 10.2. Remove the electrical control box as described in Section 4.
- 10.3. Disconnect electrical connections, 'A' noting the position of the four colour-coded wires.
- 10.4. Remove the two screws 'B' securing the Solenoid Assembly 'C'.
- 10.5. Remove the Solenoid Assembly 'C' and Armature, and replace as necessary.

Reassembly Notes

- (a) Ensure Armature is replaced with the O-ring 'D' in the correct position as shown in Fig. 27.
- (b) Ensure that the Rubber Sealing Washer 'E' is located correctly and securely into its counter-bore before assembling the Solenoid Assembly.
- (c) Ensure that the electrical connections are correctly replaced.

Section 11 : To Replace Magnetic Unit (Fig. 28)

- 11.1. Gain general access as described in Section 1.
- 11.2. Where there is limited side clearance remove the electrical control box as described in Section 4.
- 11.3. Slacken the Thermocouple Connection (8 mm) 'A'.
- 11.4. Unscrew the Magnetic Unit End Cap 'B', using 12 mm spanner.
- 11.5. Remove and replace 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 (Fig. 6)

Domestic Hot Water circuit

- (a) Gain general access as described in Section 1.
- (b) Close cold water inlet Isolating Valve 'L'.
- (c) Open convenient hot water tap and collect water locally when union broken.

Central Heating circuit

- (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 Fig. 1.

Section 12 : To Replace the Water Pump (Fig. 9)

- 12.1. Gain general access, as described in Section 1.
- 12.2. Isolate the C.H. circuit, as described above.
- 12.3. Remove the 2 hexagon headed screws, spacers and washers, fitted through the rear bulkhead panel.
- 12.4. 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 (Fig. 29)

- 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 securing and adjustment screw 'A' to the cam lever.
- 13.5. Remove the cam lever 'B' by sliding it to the left-hand side.
- 13.6. Remove the thermostat bulb 'C'. Care must be taken not to lose the modulating knife 'D' located inside the thermostat body.
- 13.7. Disconnect the union nut securing the thermostat phial into the heat-exchanger pipe, and remove the thermostat phial 'E'.

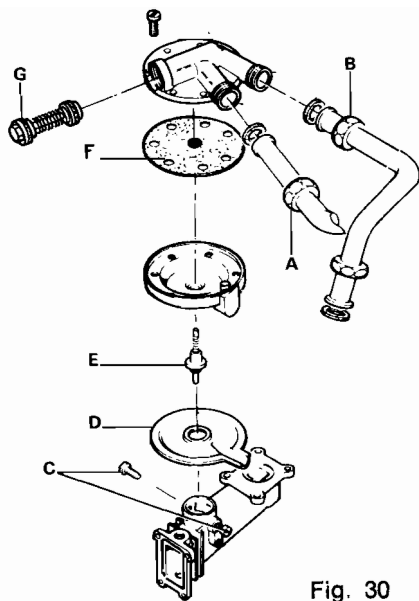


Fig. 30

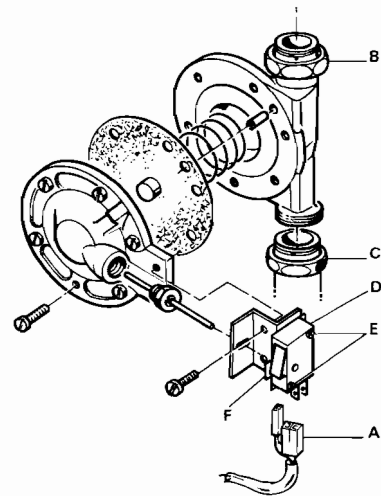


Fig. 31

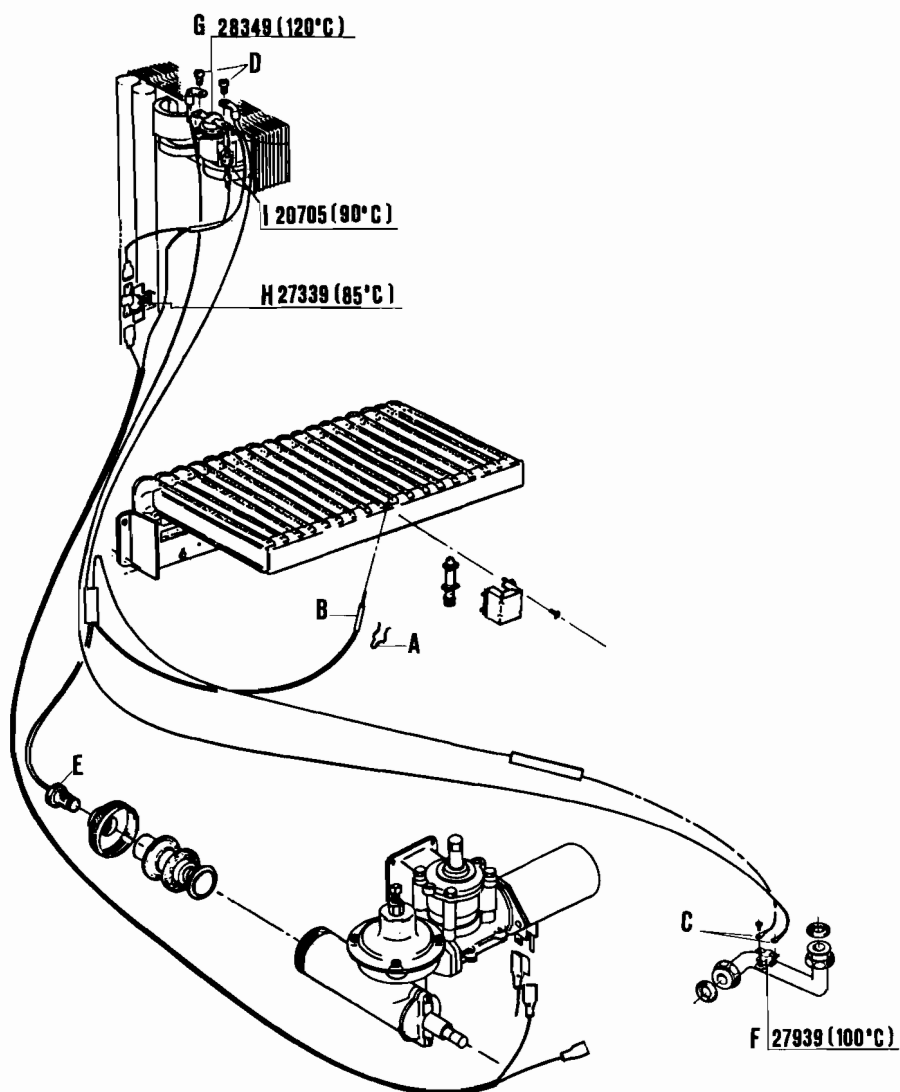


Fig. 32

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.
- (c) It is also essential that all components are assembled to the thermostat phial prior to re-fitting. See Fig. 29 for correct assembly.
- (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.

Section 14 : To Replace the Heat Exchanger (Fig. 14)

- 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 'A' by removing the terminal screws.
- 14.5. Pull off the terminal leads to the two Overheat Stats 'B', 'C' noting their position.
- 14.6. Disconnect the brass union nut 'E' and draw out the thermostat phial from the base of the D.H.W. flow pipe.
- 14.7. Disconnect the D.H.W. flow bulkhead union 'O'.
- 14.8. Disconnect the C.H. flow pipe union 'F'.
- 14.9. Disconnect the union nuts ('G' and 'H') on the heating body outlet pipes.
- 14.10. Remove the circlip 'P' retaining the automatic air vent pipe, lift upward to disengage the O.ring connection, and remove the assembly.
- 14.11. Remove the clips retaining the Thermostat Phial attached to the C.H. flow pipe and the clips retaining the Overheat Stats Wiring to the D.H.W. flow pipe.
- 14.12. Remove the heat exchanger block ('M') by drawing forwards and out.

Section 15 : To Replace the D.H.W. Flow Valve (Fig. 30)

- 15.1. Gain general access as described in Section 1.
- 15.2. Isolate and drain the D.H.W. circuit as described above.
- 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) (Fig. 31)

- 16.1. Gain general access as described in Section 1.
- 16.2. Isolate and drain the C.H. circuit as described above.
- 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 :

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

Section 17 : To remove the D.H.W. Overheat Stat 'H' and the C.H. Overheat Stat 'I' on Solenoid circuit (Fig. 32)

- 17.1. Gain general access as described in Section 1.
- 17.2. To remove the D.H.W. Overheat Stat 85 °C 'H', pull off the terminal leads to the Overheat Stat and remove the two screws fixing the Overheat stat on the D.H.W. flow pipe.
- 17.3. To remove the C.H. Overheat Stat 90 °C 'I', pull off the terminal leads to the Overheat Stat and remove the two screws fixing the Overheat Stat on the left side of the top of the heat exchanger.

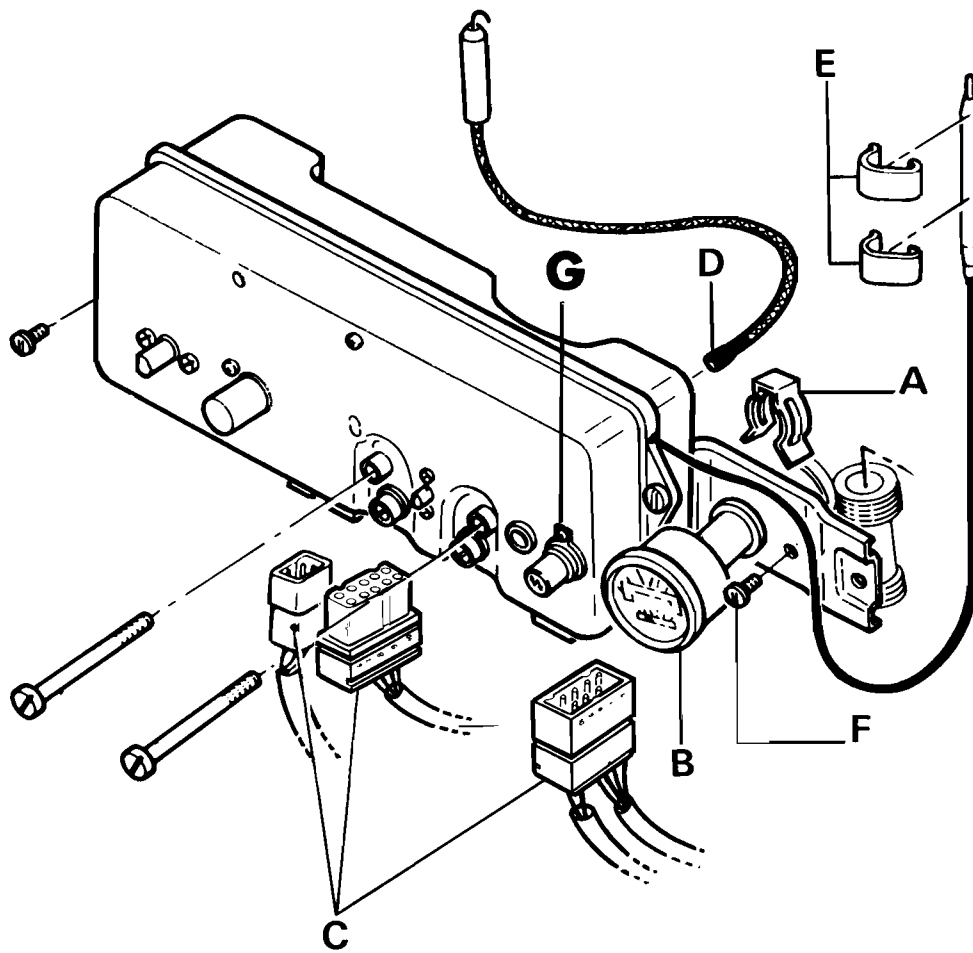


Fig. 33

Section 18 : Electrical control box

IMPORTANT NOTE : With the exception of the piezo unit, the integral components within the electrical control box must not be replaced individually. The electrical control box is supplied by e.l.m. leblanc as a complete exchange unit.

Where a component within the control box fails a new control box must be fitted and the defective unit should be returned to e.l.m. leblanc ltd, 12 Chesterfield Way (Off Pump Lane) HAYES - MIDDLESEX UB3 3NW.

18.1. Remove the electrical control box as described in Section 4.

Section 19 : To replace the Piezo Unit (Fig. 33)

19.1. Gain general access as described in Section 1.

19.2. Disconnect the spark electrode lead 'D' from the piezo unit.

19.3. Remove the screw 'G' securing the piezo unit.

19.4. Withdraw the piezo unit.

PARTS LIST

Designation	e.l.m. Ref.	G.C. Nr
Heat Exchanger	37305	
Main Burner	37331	
Circulating Pump	36634	
Domestic hot water thermostat	24579	
C.H. Overheat stat 90 °C	20705	
D.H.W. Overheat Stat 85 °C	27339	
Overheat Stat T.C. device (heat exchanger 120 °C)	28349	
Overheat Stat T.C. device (C.H. flow pipe 100 °C)	27939	
Thermocouple	39517	
Magnetic head	39385	
D.H.W. push rod spindle	26364	
D.H.W. plastic piston	34542	
D.H.W. diaphragm	33071	
Electrical control box	39521	
Fuse 0.250 A.	34479	
Fuse 3 A.	27427	
Piezo unit	07729	
Solenoid valve	07704	
Gas pilot Nat Gas with injector	39518	
Spark electrode	07869	
Thermomanometer (gauge)	07004	

Référence 46T 12 - 03.11.88/3 (JD)



BS 5258
BS 5386


e.i.m. leblanc ltd.

12 Chesterfield Way
Pump Lane - HAYES
Middlesex - UB3 - 3NW

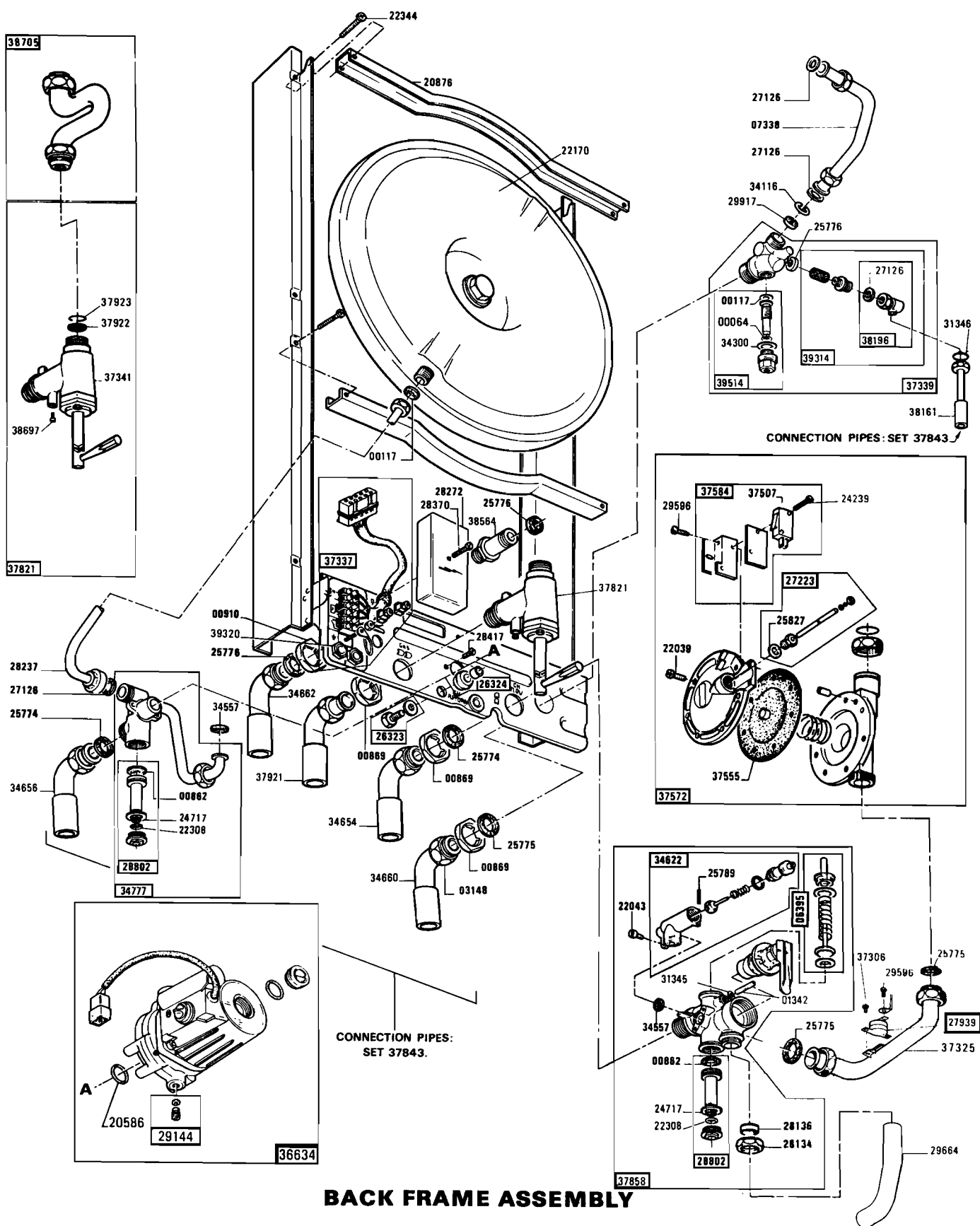
Open-Flued Wall Mounted Combination Gas Boiler

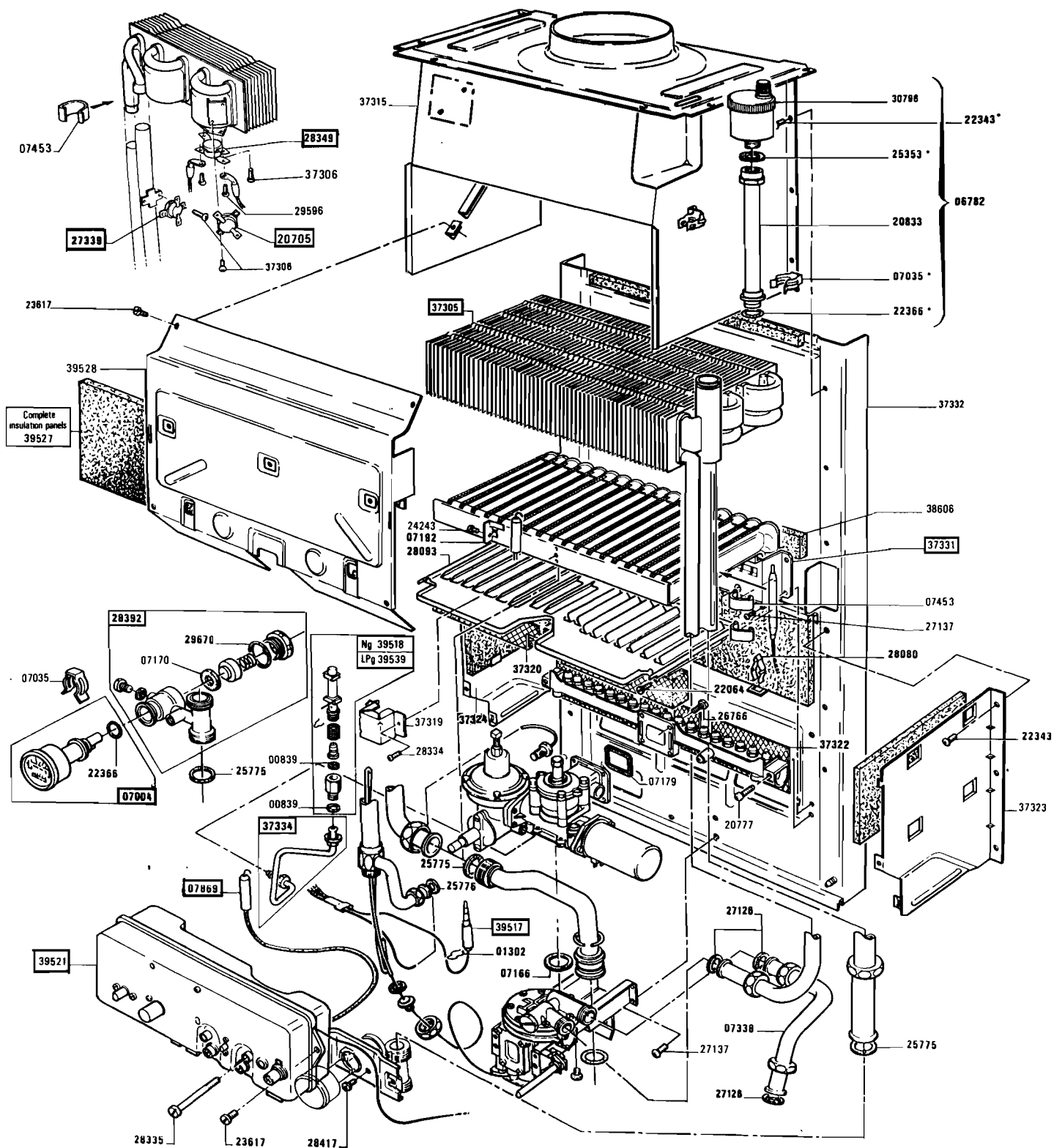
Type **GLM 5.20**

British Gas Tested And Certificated - G.C. N° 4724103

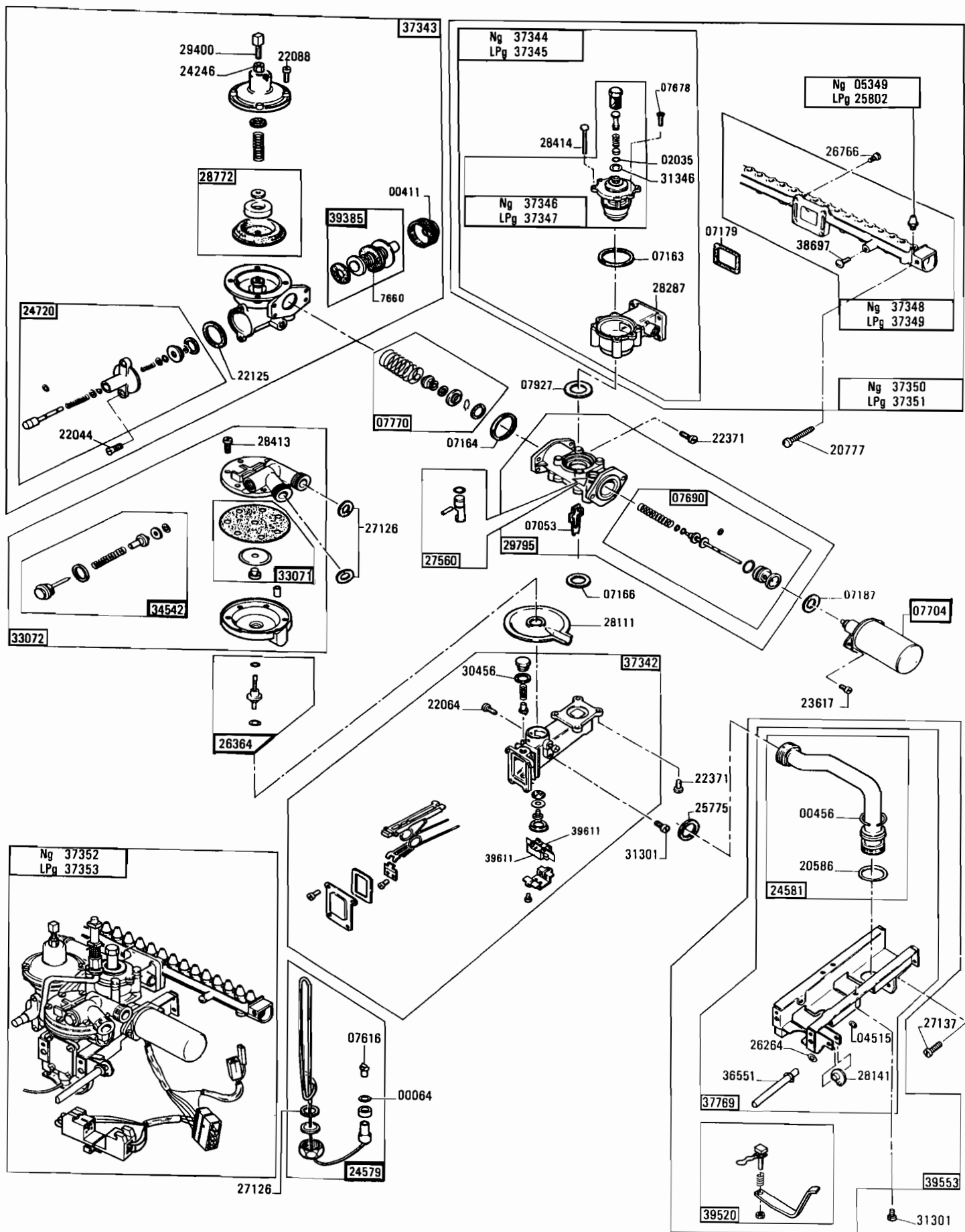
SERIAL N° 9.		Water Max. Working Pressure = 150 psi			
<div>N</div> <div>GAS GROUP - NATURAL Cat. I_N</div> <div>ELECTRICAL SUPPLY: 240 V ~ 50 Hz</div> <div>FUSED AT 3 A</div> <div>POWER INPUT 100 W</div> <div>CONFORMS TO BS 3456</div> <div>Ref. 34029</div>	BURNER Injector Size 1,2 mm		PILOT Injector Size 0,3 mm		
	RANGE RATING		Min	Mid	Max
	HEAT INPUT	kW	8.6	17	30
		Btu/h	29 250	58 000	102 500
	HEAT OUTPUT	kW	6.3	14	23.4
		Btu/h	21 500	47 600	80 000
	HOT BURNER PRESSURE	mbar	0.7	3.2	7.6
		in wg	0.3	1.3	3.1
AFFIX ARROW					

DATA BADGE

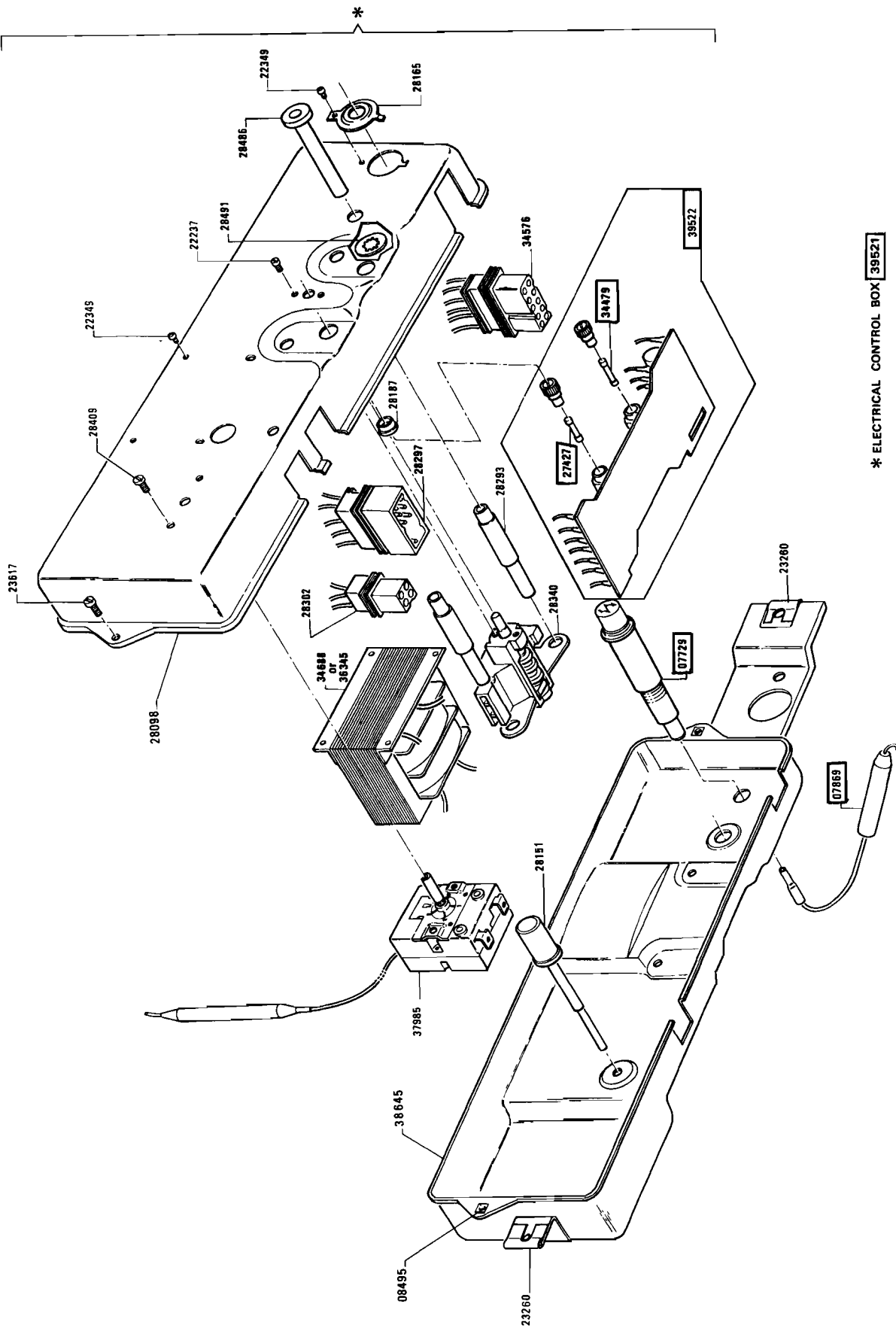




INNER OF THE BOILER ASSEMBLY

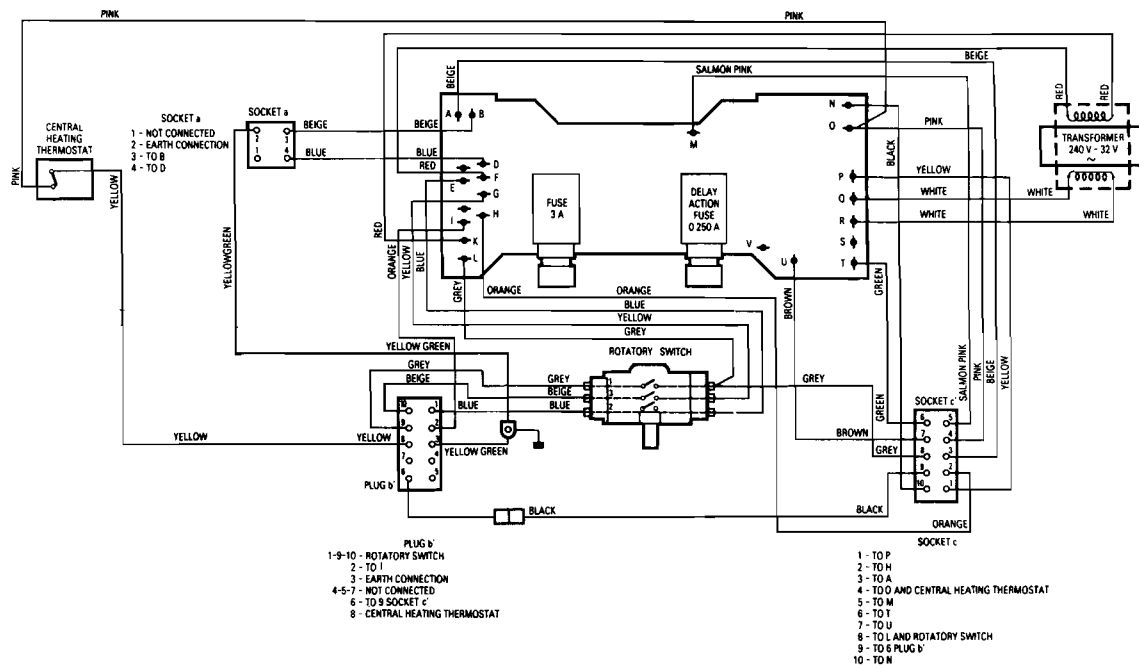


GAS AND WATER VALVE ASSEMBLY

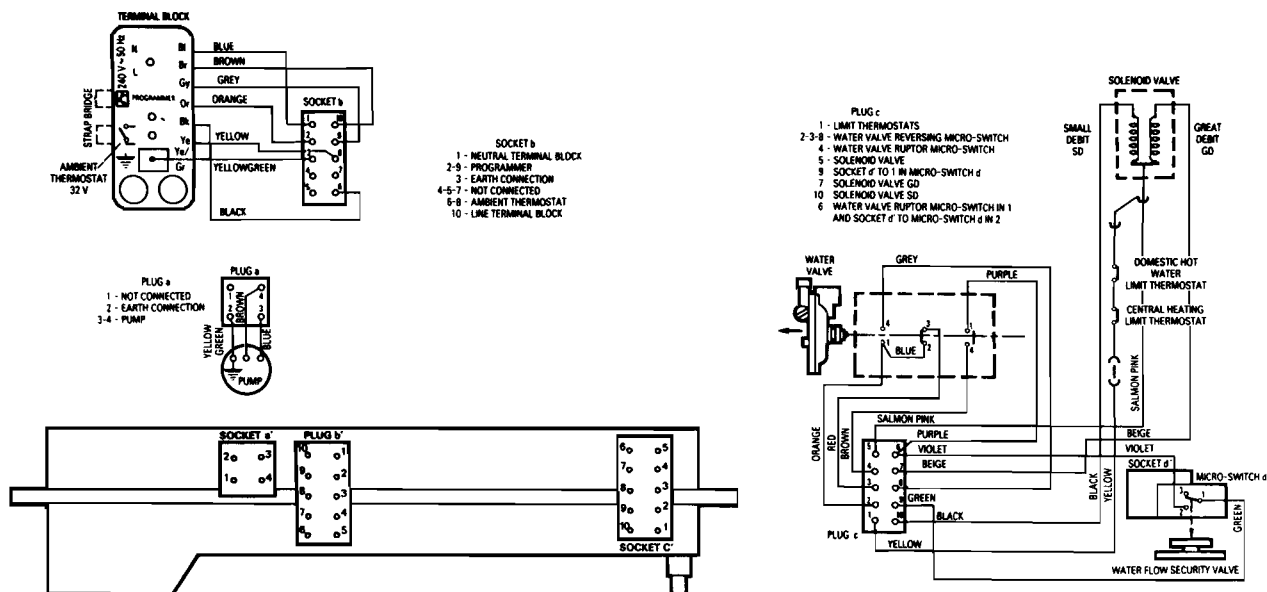


* ELECTRICAL CONTROL BOX 39521

ELECTRICAL CONTROL BOX ASSEMBLY

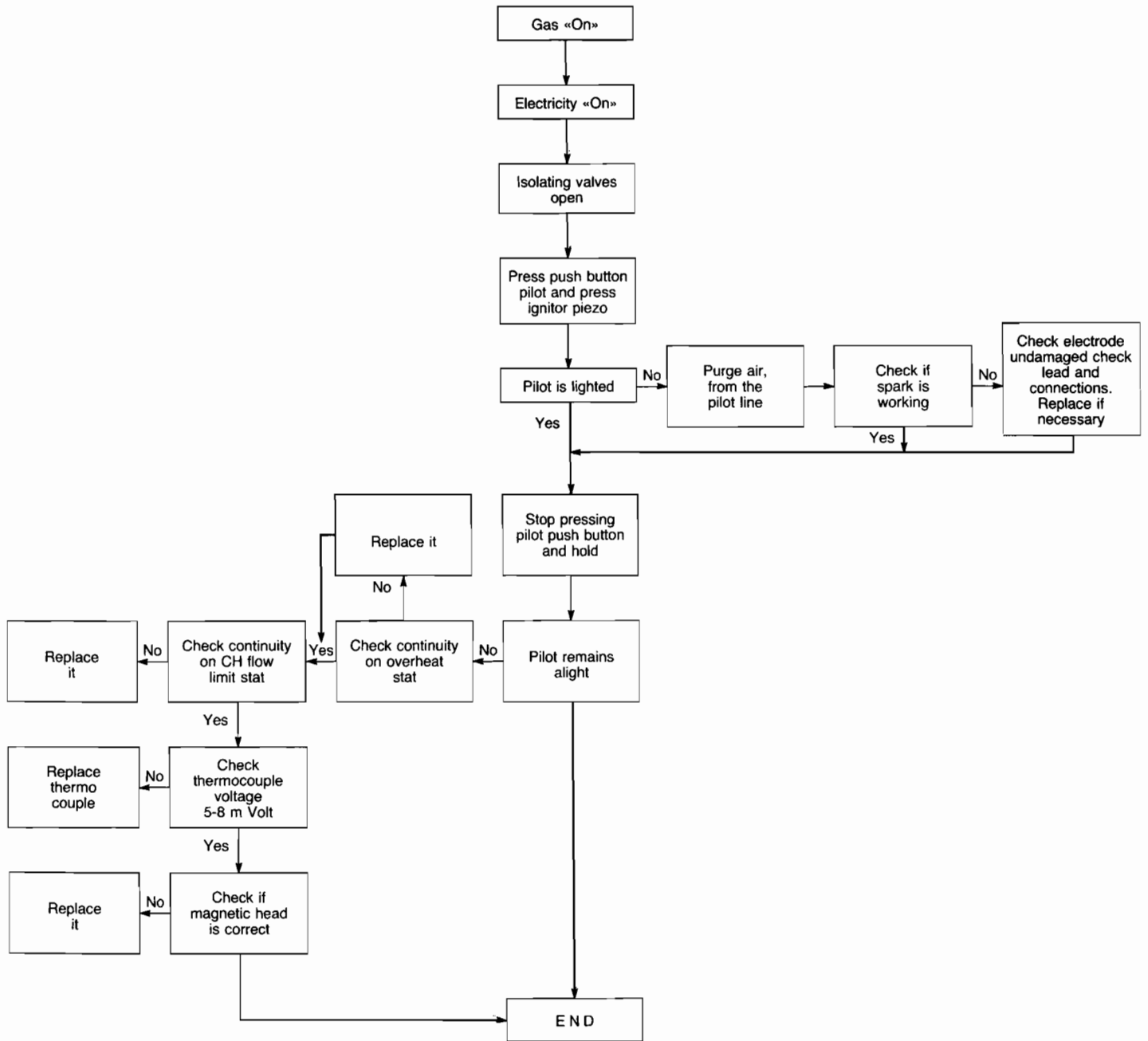


ELECTRICAL CONTROL BOX WIRING DIAGRAM

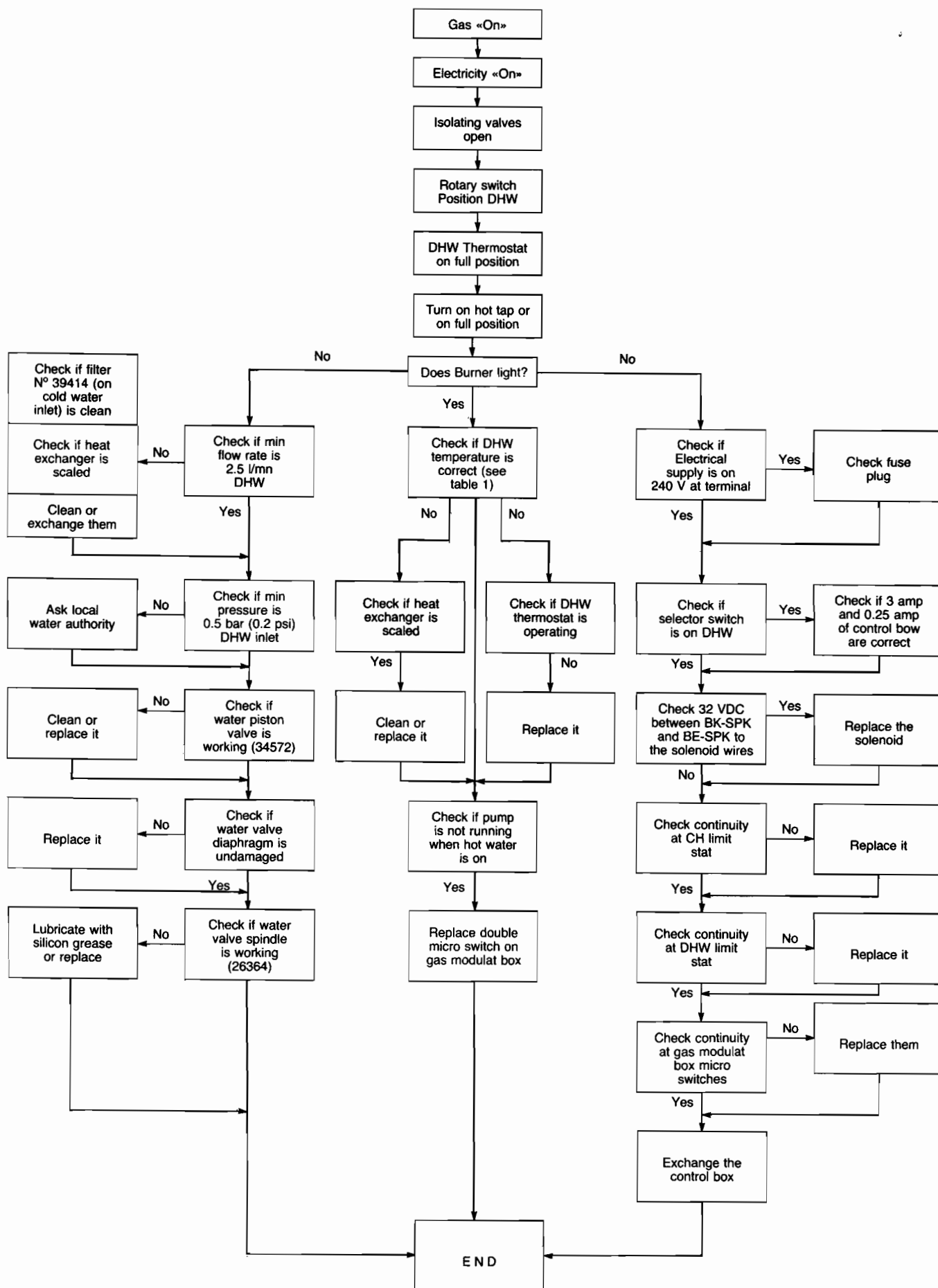


BOILER INTERNAL WIRING DIAGRAM

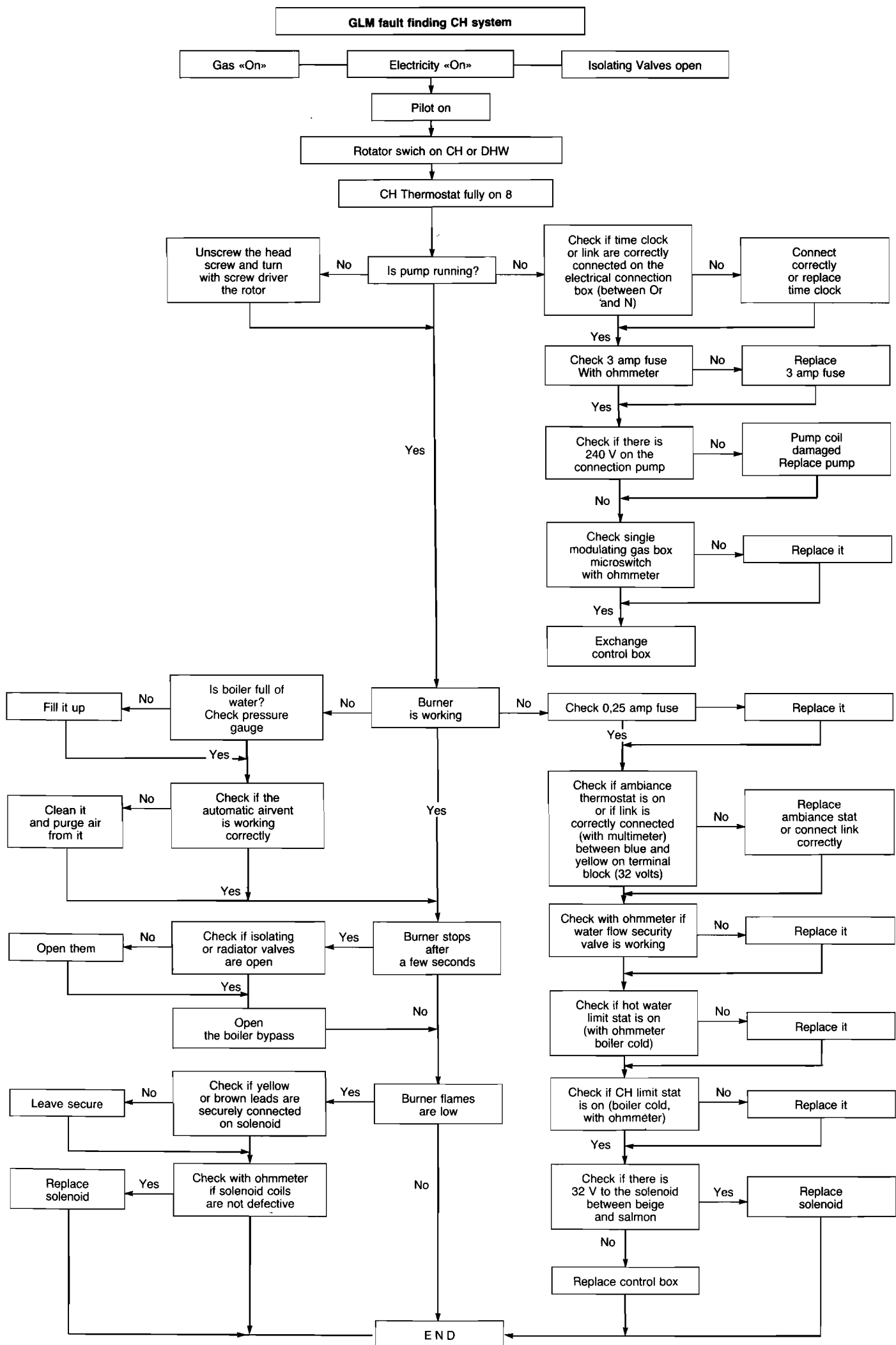
Fault finding GLM Pilot



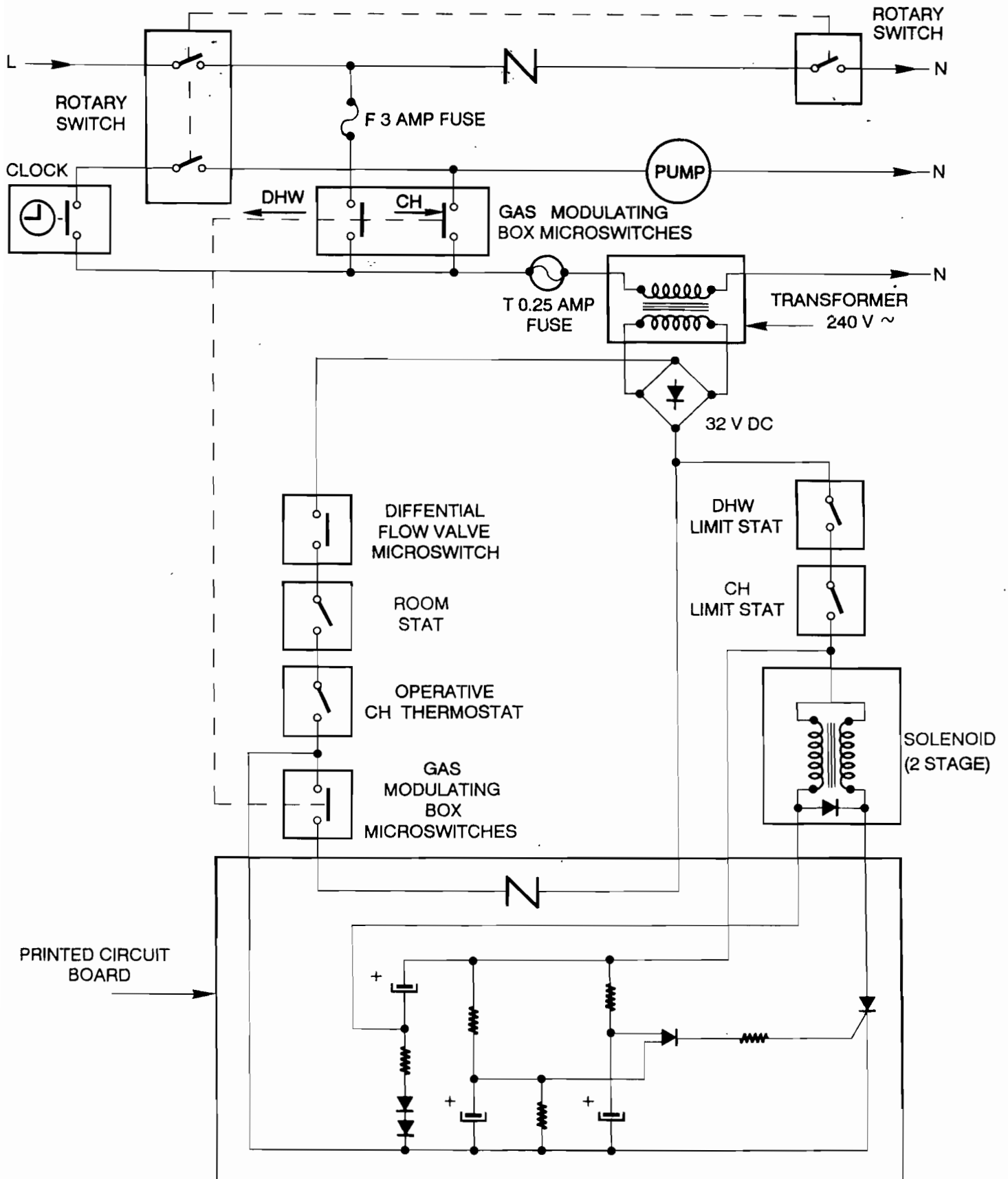
Fault finding GLM DHW



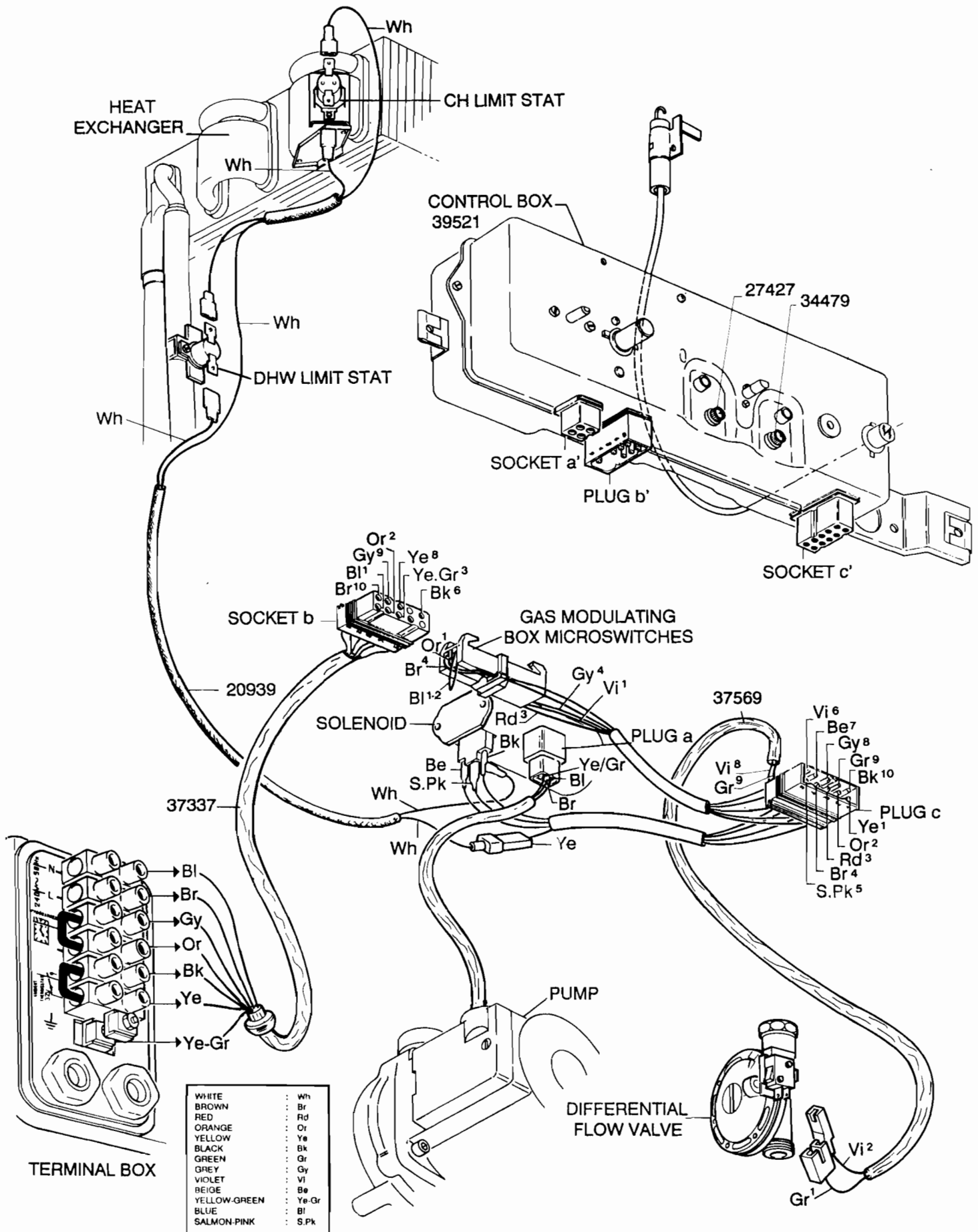
GLM fault finding CH system



FUNCTIONAL FLOW DIAGRAM



ILLUSTRATED WIRING DIAGRAM



GLM - PILOT AND DOMESTIC HOT WATER SYSTEM

PROBLEM	CAUSE	TEST	REMEDY
I. - Pilot			
Pilot doesn't light	<ul style="list-style-type: none"> — Gas cock is off — Gas pilot line is full of air — Pilot filter is blocked by dust — Bad electrode position — Spark electrode lead is cut — Piezo igniter button doesn't work 		<ul style="list-style-type: none"> — Open it — Purge it — Replace it — Adjust it (4.0 ad 4.5 mm between thermocouple and electrode) — Replace it — Replace it
Pilot doesn't remain alight	<ul style="list-style-type: none"> — Faulty thermocouple — Overheat stat is off — C.H. flow limit stat is off — Faulty magnetic head 	<ul style="list-style-type: none"> — Measure with voltmeter if there is between 6 and 13 mV (on thermocouple) — When boiler is less than 110 °C temp. with a ohmmeter, check continuity — On C.H. pipe flow, when temperature is less 90 °C, check continuity of C.H. limit stat — Disconnect thermocouple from magnetic head — Take voltage (between 5 and 8.5 mV) 	<ul style="list-style-type: none"> — Replace it — If not, replace it — If yes replace magnetic head
II. - Domestic Hot Water			
No Hot water burner doesn't light	<ul style="list-style-type: none"> — Plug fuse is faulty — Wrong electrical connection — Rotary switch is off — 3 amp or 0.25 amp fuses faulty — Faulty rotary switch — Faulty D.H.W. limit stat — Faulty C.H. limit stat — Faulty water valve micro-switches — Faulty solenoid — Faulty control box (faulty components) 	<ul style="list-style-type: none"> — Check it with ohmmeter — Check if lead and neutral are in good position (see drawing) — Check with ohmmeter — Turn it on D.H.W. and C.H. position, C.H. thermostat on lower position, open tap (fully) — Check it with ohmmeter (boiler temperature less 80 °C) — Check it with ohmmeter (boiler temperature less 90 °C) — Turn on tap (fully position) rotary switch on D.H.W. position. Take with multi-meter, voltage to D.H.W. limit stat — Open tape (fully position): - rotactor switch on D.H.W. - take voltage with multi-meter between beige and salmon wires (32 volts) — Open tape - rotary switch on D.H.W. - take voltage with multi-meter to the D.H.W. limit stat 	<ul style="list-style-type: none"> — Replace it — Eventually change positions — Turn in D.H.W. position — Replace faulty fuse — If burner is working replace rotary switch — Replace it — Replace it — If no volt, replace double microswitch — If 32 volts, replace solenoid — If no voltage replace control box

GLM - CENTRAL HEATING SYSTEM

PROBLEM	CAUSE	TEST	REMEDY
III. - D.H.W. (General problem)	— Insufficient debit of water	— Check if there is minimum of 2.5 l/min	— Turn tap on fully position
	a) filter (of cold water inlet connection) is obstructed	— Disconnect the safety domestic water pressure valve and check the filter	— Clean or exchange the filter
	b) Heat exchanger is scaled	— Check if hot water flow tap is fully open, adjust D.H.W. thermostat on 8, take the hot water temperature (minimum debit 2.5 l/min - normal temperature is 65 °C)	— Descale heat exchanger
	— Insufficient pressure	— Check the cold water pressure minimum 0.5 bar	— Contact Water Authority
	— Water valve piston is not working correctly	— Disconnect control box, undo the nut located in front of the water valve, check piston	— Clean or replace piston water
IV. - D.H.W. Temperature is not correct	— Water valve diaphragm is damaged	— Unscrew the seven water screws valve, open it and check diaphragm	— Exchange diaphragm
	— Water valve spindle is faulty	— Check if you hear a "click" when tap is opening	— Remove spindle, lubricate with silicon grease or replace it
	— Heat exchanger scaled	— See III b	— Descale it
	— Double microswitch water valve closed circuit in the same time as the simple microswitch	— Pump is running when hot water is on	— Replace double micro-switch
	— D.H.W. thermostat is faulty	— Check temperature of hot water with D.H.W. thermostat on 8. Normal temperature will be between 60 and 65 °C	— Replace D.H.W. thermostat

GLM - CENTRAL HEATING SYSTEM

PROBLEM	CAUSE	TEST	REMEDY
I. - Boiler doesn't work (No pump - No burner lighted)	— No electrical supply	— Check between L and N of terminal block if there is 240 V with multimeter	— Replace the plug fuse
	— Bad contact on strap of time clock and room thermostat	— Check between orange and N on the terminal block if 240 V	— Secure correctly the strap or connect correctly time clock
	— 3 amp fuse is faulty	— Check with ohmmeter fuse 3 amp	— Replace 3 amp fuse
	— Rotactor switch is faulty	— Check between N and grey on terminal block if there is 240 V	— Replace rotactor switch
	— Pump blocked		— Unscrew and take off the main screw on the pump head. Turn clockwise the rotor
	— Single water valve switch is faulty	— Check between neutral and leave connection pump if there is 240 V	— Replace the single micro-switch water valve
II. - Pump is working but no flames to the main burner	— Boiler not completely full of water	— Check on pressure gauge and check the automatic airvent	— Purge central heating circuit and fill at minimum 1 bar pressure
	— Water flow security valve is not working	— When boiler requests heat, microswitch must be on	— Open isolating valve — Open every radiator valve — Open boiler by pass
		— Check diaphragm	— Replace it if needed
	— Faulty 0.25 amp fuse	— Check it with ohmmeter (boiler off)	— Replace it
	— Faulty microswitch of water flow security valve	— Check with ohmmeter	— Replace it
	— Faulty D.H.W. limit stat	— When boiler is cold (less 80 °C) check it with ohmmeter	— Replace it
	— Faulty C.H. limit stat	— When boiler is cold (less 90 °C) check it with ohmmeter	— Replace it
	— Faulty solenoid	— Check 32 volts to the solenoid wire (between beige and salmon)	— If yes replace solenoid — If no replace control box
III. - Burner is working with low flames	— Bad connection to the solenoid	— Check if yellow or brown lead are securely connected	— Connect correctly
	— Faulty control box (components) wire	— Check if 32 volts to the solenoid wire	— If not, replace control box
	— Second solenoid coil is faulty	— Check solenoid with ohmmeter	— Exchange solenoid
IV. - General Boiler very noisy	— Poor fixing to wall		— Refix boiler to wall and leave secure
	— Air in the boiler		— Purge air from the head pump screw, automatic airvent and radiators
	— Pump speed too high		— Variator pump on lower speed
	3A fuse blows continually	— Printed circuit or transformer of control box shorting	— Replace control box

— Modifications for improvement reserved —

e.l.m. leblanc Ltd

12, Chesterfield Way
Off Pump Lane
HAYES MIDDX UB3 3NW

Tel. 01.848.75.22
Telefax : 01.848.19.84

MANUFACTURER

e.l.m. leblanc s.a.

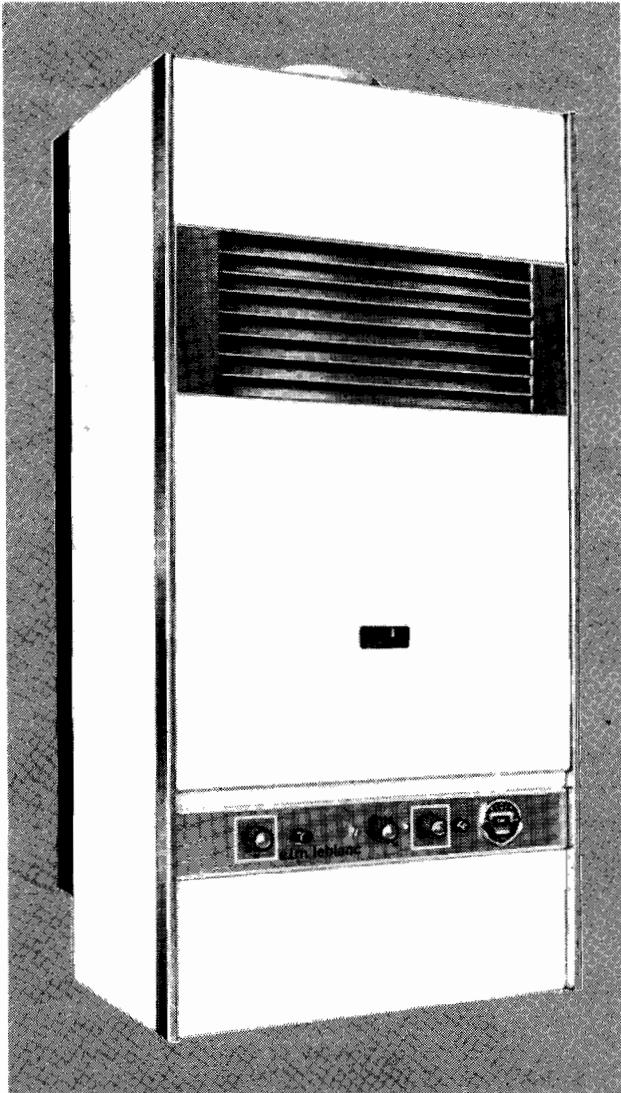
123-125, rue Diderot - 93700 DRANCY
(FRANCE)

Tél. : (1) 48.30.11.12

Telex : 235 406

Telefax : (1) 48.30.86.21

INSTALLATION & SERVICING
INSTRUCTIONS



e.l.m. leblanc

TYPE GLM 5.20

COMBINATION
GAS FIRED

WALL HUNG
BOILER

THESE INSTRUCTIONS ARE FOR NATURAL GAS MODELS ONLY

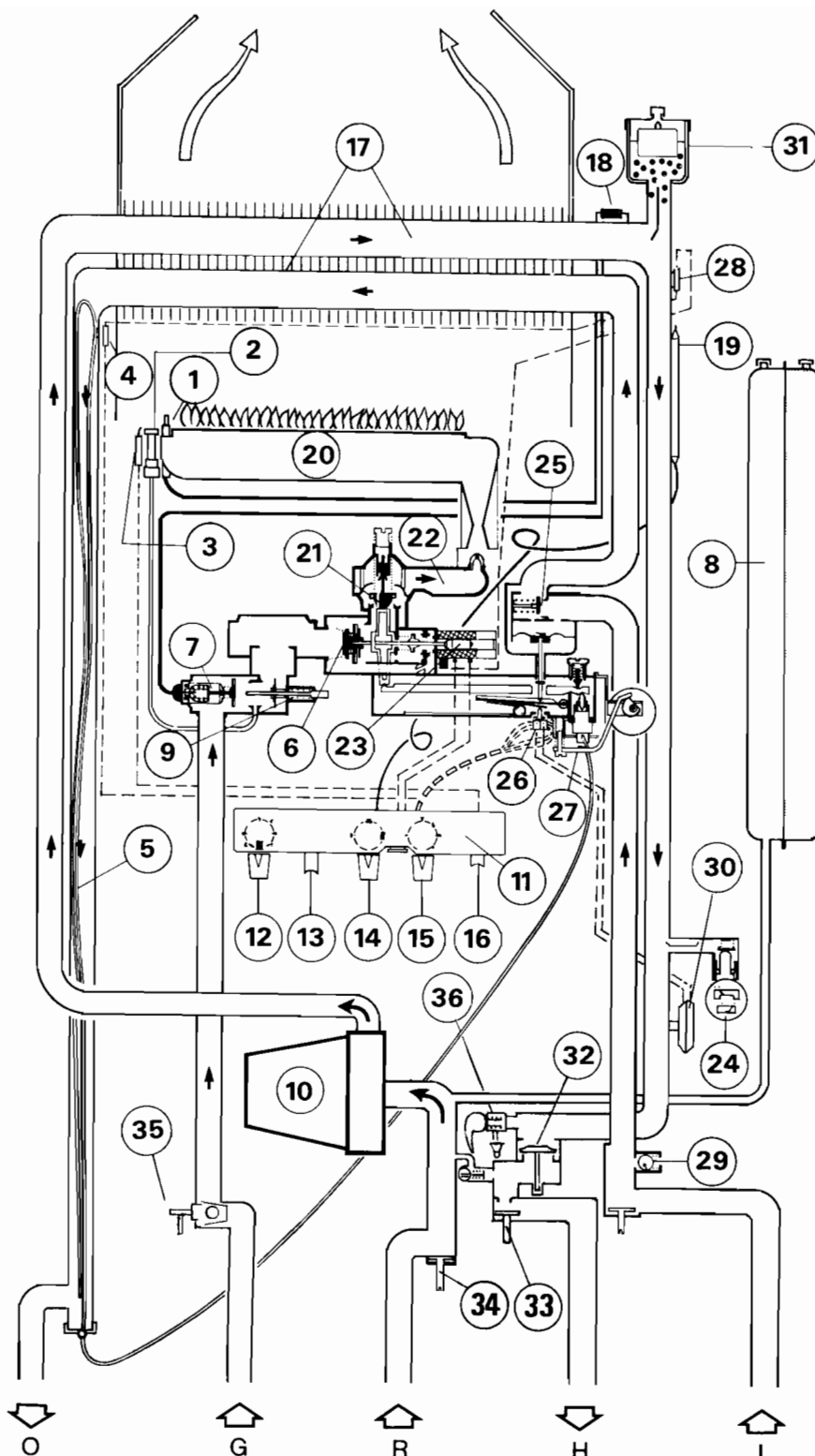
DAMAGE

The carton should be opened and the appliance inspected as soon as possible after delivery. Damage must be reported to the distributor (see last sheet) **WITHIN THE CUSTOMARY 3 DAYS OF DELIVERY** as claims on the Carriers cannot be made after that time.

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- 1 - Thermo couple
- 2 - Pilot assembly
- 3 - Spark electrode
- 4 - Hot water limit thermostat (fixed)
- 5 - Hot water thermostat Phial
- 6 - Two ways gas control valve
- 7 - T.C. magnetic valve
- 8 - Expansion vessel
- 9 - Push button for thermo-electric flame failure valve
- 10 - Heating circulation pump
- 11 - Sealed electrical control box (as panel)
- 12 - Heating temperature selector
- 13 - Push button for thermo-electric flame failure valve
- 14 - Operating selector knob
- 15 - Hot water temperature selector
- 16 - Piezo igniter button
- 17 - Heat exchanger
- 18 - Over heat cut out device
- 19 - Heating thermostat Phial
- 20 - Burner assembly all gas
- 21 - Modulating gas valve
- 22 - Injectors support unit
- 23 - Two stage gas solenoid valve
- 24 - Pressure and temperature gauge (as thermomanometer) (heating)
- 25 - Diaphragm water valve
- 26 - Double acting microswitch
- 27 - Domestic hot water thermostat adjuster
- 28 - Heating limit thermostat (fixed)
- 29 - Domestic pressure relief valve
- 30 - Heating water flow pressure safety valve
- 31 - Heating automatic air vent
- 32 - Non return valve (Heating)
- 33 - Central heating flow isolating cock
- 34 - Central heating return isolating cock
- 35 - Gas isolating cock (as tap gas)
- 36 - Heating pressure relief valve



H - Heating Flow.
O - Hot water Outlet.
G - Gas.
R - Heating Return.
I - Domestic Inlet (Cold).

Diagramatic layout only
For pipe connections see Installation.

INTRODUCTION

The GLM 5.20 brings a new concept to central heating design for domestic dwellings contained in an attractive wall-hung boiler finished in stoved white.

As you can see from Fig. 1, this combination boiler is self-contained and needs connection to the mains electricity, gas and water supplies, as the boiler is pre-wired, pre-plumbed and tested before leaving the factory.

This type of combination boiler has the advantage that no tanks or copper cylinders are needed and it can be hung at high level in standard kitchen units or cupboards. It can supply continuous hot water as the demand is heated instantaneously.

When the Central Heating system is not required one simply turns the switch to 'Hot Water Only' on the control. The unit has two completely separate heating systems within the all copper heat exchanger, both being self reliant.

Manufactured to the highest standards and specifications by elm leblanc (France), who have produced over 1000,000 combination boilers, ensures that this boiler, if properly maintained, should give you years of trouble-free use.

DESIGN

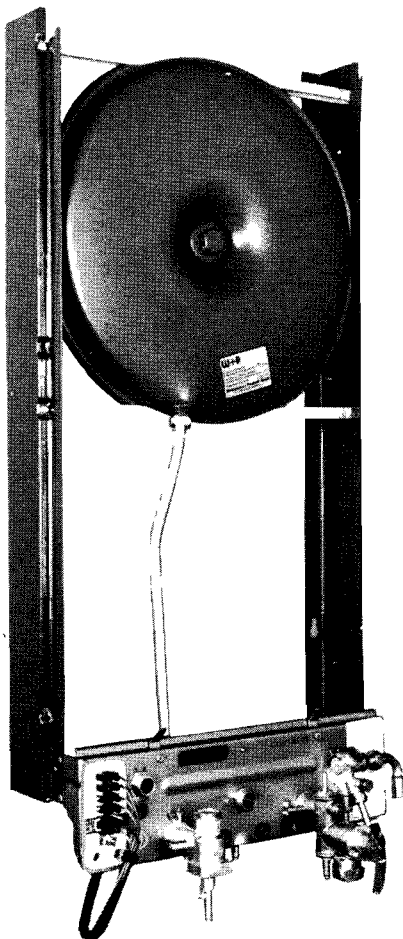
The GLM 5.20 is a wall-hung central heating and instantaneous hot water boiler having a heat output of 23,2 kW (79.180 Btu/h).

The boiler, a central heating and hot water appliance, was designed with great care and thought, with the installer, service engineer and, of course, the user in mind. Fig. 2 gives you an outline of the boiler's construction.

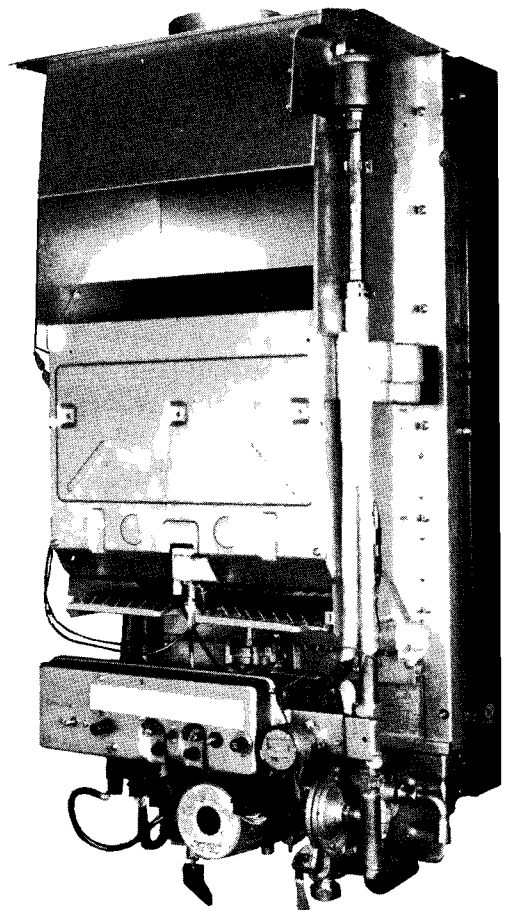
To make easier the setting up, this boiler is delivered in two parts:

1° A front boiler part which contains a copper heat exchanger designed to give the highest efficiency ; an all gas burner ; an electrical control box containing all electrical components for heating regulation and safety devices ; a water-valve and gas-valve sub-assembly.

2° A back boiler part containing an expansion vessel to stabilise pressures for the sealed Heating circuit ; a plate with all heating domestic-water and electrical connections.



Back boiler part



Front boiler part

CENTRAL HEATING SYSTEM

The heating system for the boiler must not be directly connected to the incoming water mains supply. (For further information see Installation Heating Section, pages 6,7,8).

Although the GLM 5.20 could be used in conjunction with a central heating header tank, we suggest and advise that it should be used as a sealed system.

The heating system is fitted with a pressure relief valve (36), (Fig. 2, p. 3), and should the pressure within the system reach 3 bars it will operate. The boiler also is fitted with an integral expansion vessel (8) to stabilise the rising pressures. The heating water passes through the pump (10) and up around the heat exchanger (17) into the outlet and past the heating thermostat phial (19) which is clipped to the heating outlet pipe within the boiler. The thermostat is a two-stage type operating the gas solenoid valve (23) (32v DC). This thermostat is not a modulating type and the gas input is at maximum until the temperature reaches 5 °C below the set temperature. The Boiler's gas input then drops to the low burning rate which is adjustable between 25% and 33% of the maximum output of 79.180 Btu/hr (23.2 Kw). (For gas setting pressures, see Technical Information - Commissioning, pages 14, 15 and 16).

When turning on the central heating by either Knob A or C, (see users instructions Fig. 3 ; page 2), the burner will light at the low rate two seconds before increasing to full rate. When the temperature set by Knob A is reached, the burner will go out but the pump will continue working at all times unless the boiler control Knob C is switched to domestic water only ; (see controls, page 10 or unless a time switch and/or room thermostat are fitted. If a time switch or room thermostat are fitted they must only be connected as described in the instructions, page 9. The heating system has a maximum temperature setting of 85 °C. If for any reason, this temperature is exceeded, the Heating Limit Thermostat (28) will cause the main gas to go off leaving the pilot on. Main gas is automatically restored when the Heat Exchanger has cooled. On domestic water circuit a Hot water limit Thermostat (4) operate in the same manner.

If even higher temperatures occur, the **Overheat Cut-out Device** (18) operates the Thermocouple, thereby turning off the appliance completely. Manual operation is then necessary to re-start the boiler. If the Overheat Device operates again, check for defects.

The water pressure in the central heating is essential. In case of deficiency of water, a heating water flow/pressure safety valve will switch off the electrical circuit of the burner. The circuit will be restored after filling of the central heating circuit (see page 16).

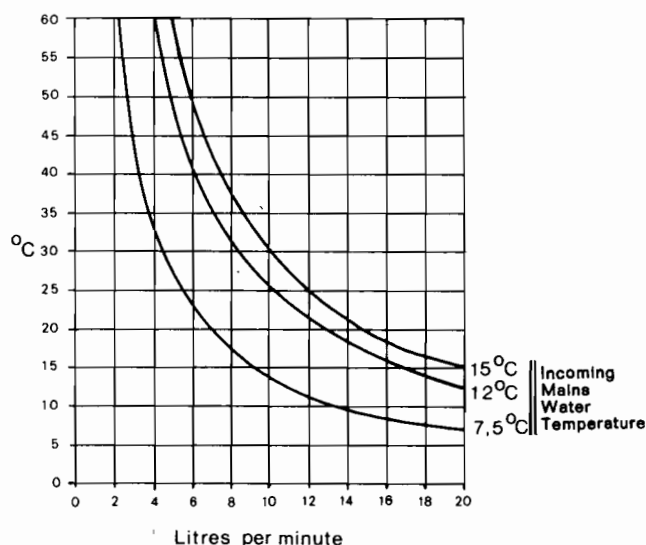
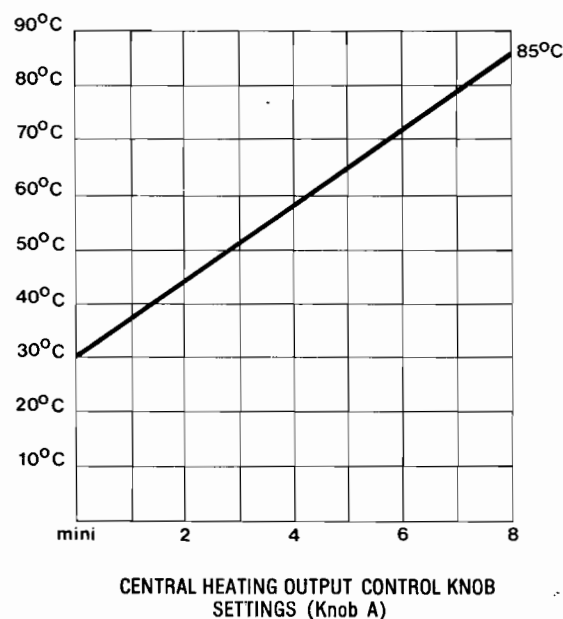


Fig. 3

DOMESTIC HOT WATER SYSTEM

This side of the appliance has a maximum working pressure of 146 p.s.i. (10 bar). The mains water supply passes into the unit via an integral stop cock up into the diaphragm pressure valve. The mains water pressure must be at least 0.4 bar (5.875 p.s.i.), (13ft.6inc head), with a flow rate of at least 2.7 litres (0.59 gals.) per minute. Should the pressure within the appliance exceed this maximum, an integral pressure relief valve will pass the excess pressure.

IMPORTANT : To conform to the requirements of the National Water Council ; if the water mains supply pressure is at any time in excess of 73 p.s.i., (5 bar), (169ft), a Pressure Limiting or Pressure Reducing Valve **must be fitted** by the installer into the mains supply in an inconspicuous but accessible position, preferably between 3 and 5 metres (10 to 16 ft.) before the appliance. Such a Valve must be of a type approved by the N.W.C. and **must not pass more than 73 p.s.i. (5 bar)** pressure to the appliance. Any water treatment device to be used must be fitted before the Reducing Valve.

Should the mains supply pressure be less than 0.4 bar (5.875 p.s.i.), (13'6''), at any time, the diaphragm pressure valve (25) (Fig. 2) will not be pushed down and in turn will not operate the microswitches beneath the valve ; thus supply of electricity to the control box will not pass to the gas valve which will remain closed.

When the water conditions are favourable, the water will pass through the diaphragm pressure valve (25) the electrical supply operates the necessary controls ; the gas comes on first at low rate, then up to maximum. As the water passes through the copper heat exchanger and down through the outlet, it passes the integral domestic water thermostat (5) which will govern the water temperature to a maximum of 65°C. at 6.7 litres per minute. Should the water flow be less than 6.7 litres per minutes, the thermostat will govern the gas input.

The domestic water has a maximum output of 23.2kW : 79.180 Btu/hr and a minimum output at low burning rate of 6.3kW : 21.500 Btu/hr.

The maximum and minimum outputs will, of course, be regulated by the incoming water temperature and litres per minute outlet.

INSTALLATION REQUIREMENTS

The installation must only be carried out by a qualified installer and should conform to the regulations as covered by British Gas Corporation and Institution of Electrical Engineers. No responsibility will be accepted by the manufacturer or distributor if these conditions are not observed.

The installation of the boiler must also be in accordance with the relevant requirements of the Gas Safety Regulations, Building Regulations, IEE Regulations and the bye laws of the local water undertaking.

It should be in accordance also with any relevant requirements of the local Gas Region and the local Authorities, plus the relevant recommendations of the following British Standards and codes of practice ;

B S 5376 - 2 Boilers of rated input, not exceeding 60 Kw.

B S 5449 - 1 Forced circulation hot water systems (small bore and microbore domestic central heating systems).

C P 342 Centralised hot water supply.

REPLACING OLD BOILER

IMPORTANT : Before commencing to connect the boiler, if is necessary to wash out the circuit to eliminate swarf, solder, grease, etc., which could be carried into the boiler and interfere with its operation.

If the installation is old, it would be preferable to carry out this cleaning with an appropriate detergent type product and to install, at the lowest point on the return, a decanting vessel of sufficient capacity to receive the particles and oxides which come off the internal surfaces during operation.

DO NOT USE SOLVENT OR AROMATIC HYDROCARBON (petrol, paraffin, etc.) **FOR CLEANING.** To avoid electrolytic problems which could arise from the use of different materials in the circuit, it is recommended to use a neutralising product which avoids gas production and possible oxide formation. These products should be added in accordance with the maker's recommendations.

SERVICE PIPES

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.

METERS

A gas meter is connected to the service pipe by the local Gas Region.

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

INSTALLATION PIPES

Installation pipes should be fitted in accordance with C.P. 331 - 3.

Pipe work from the meter to the boiler must be of adequate size. Do not use pipes of a smaller size than the boiler gas connection (22 mm).

The complete installation must be tested for soundness as described in the above code.

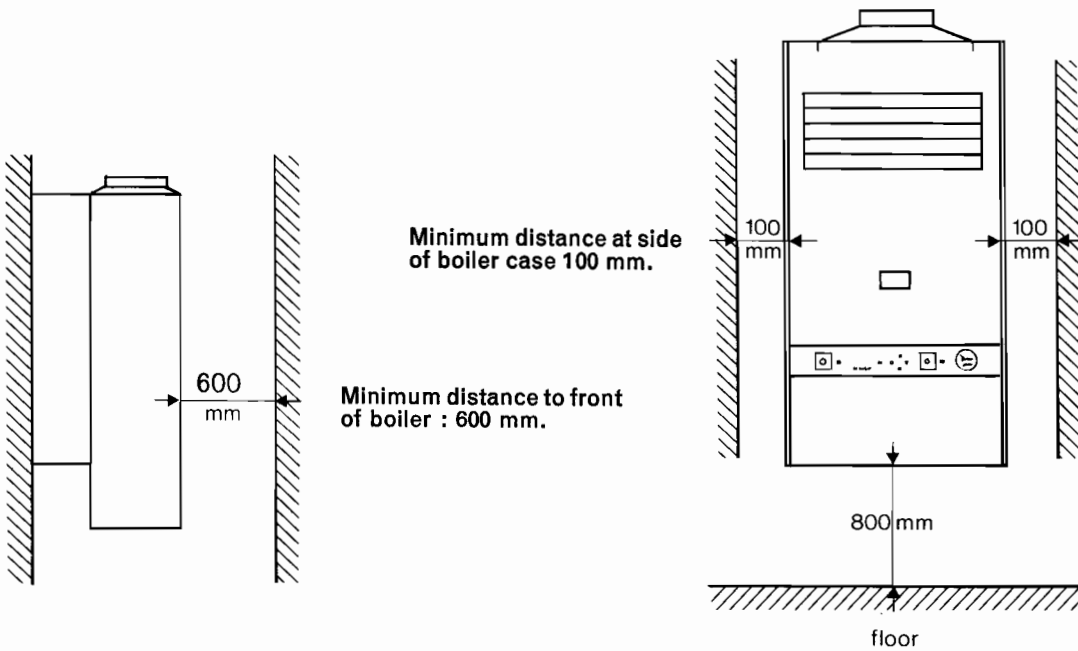
GAS CONNECTION

The gas supply connecting to the boiler must be made in 22 mm pipe or tube and a union gas cock to British Standard **must** be fitted.

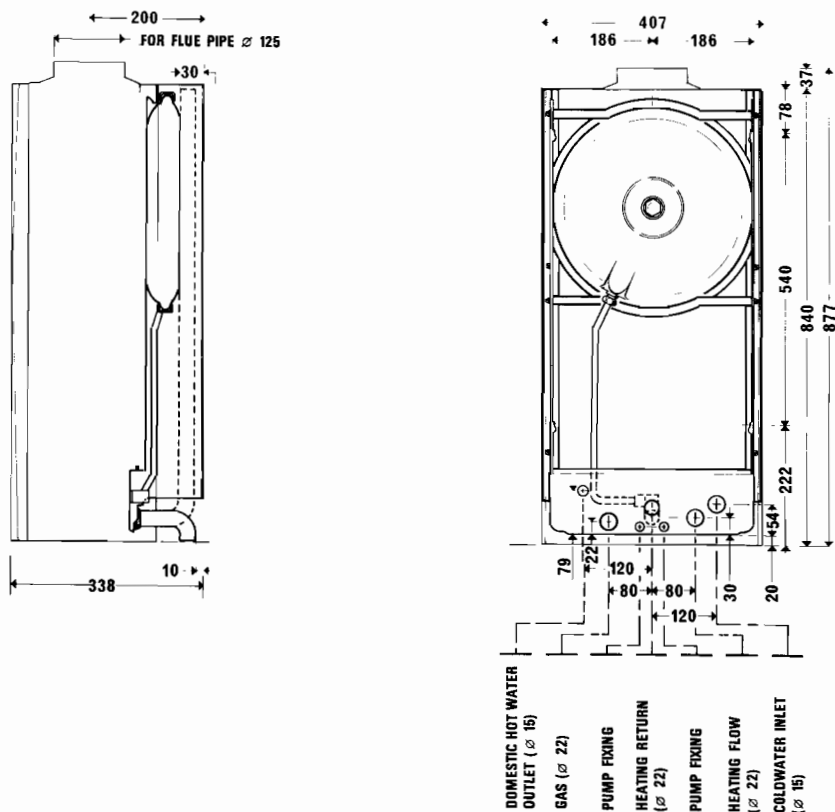
FIXING OF THE BOILER

1. Choose the position of the wall for the boiler to be fitted, taking into consideration boiler dimensions.
2. **VERY IMPORTANT** : The clearance is shown on the diagram as under should be maintained between The sides and bottom of the boiler so that connections to the boiler can be made with ease and the boiler case can be removed for repair and servicing.

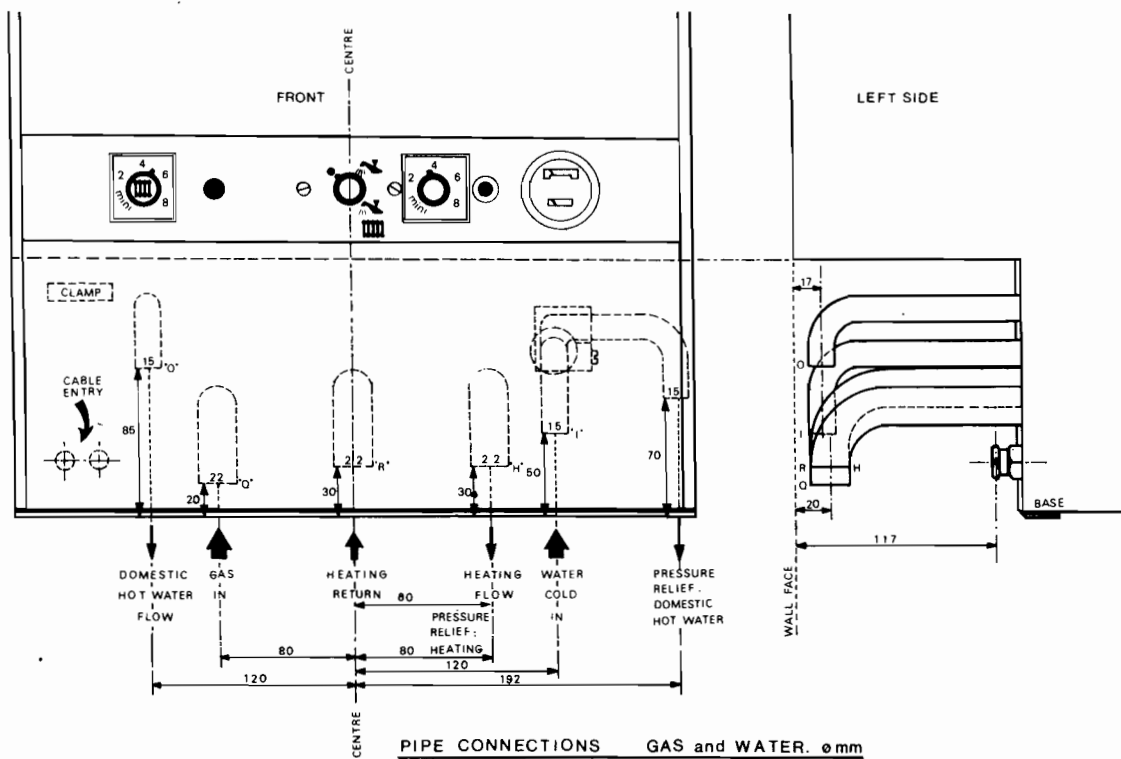
Ensure that the wall structure is such that it is capable of holding the weight of the boiler. For boiler weight, see technical instructions. Where necessary use an alternative method for fixing.



BOILER DIMENSIONS

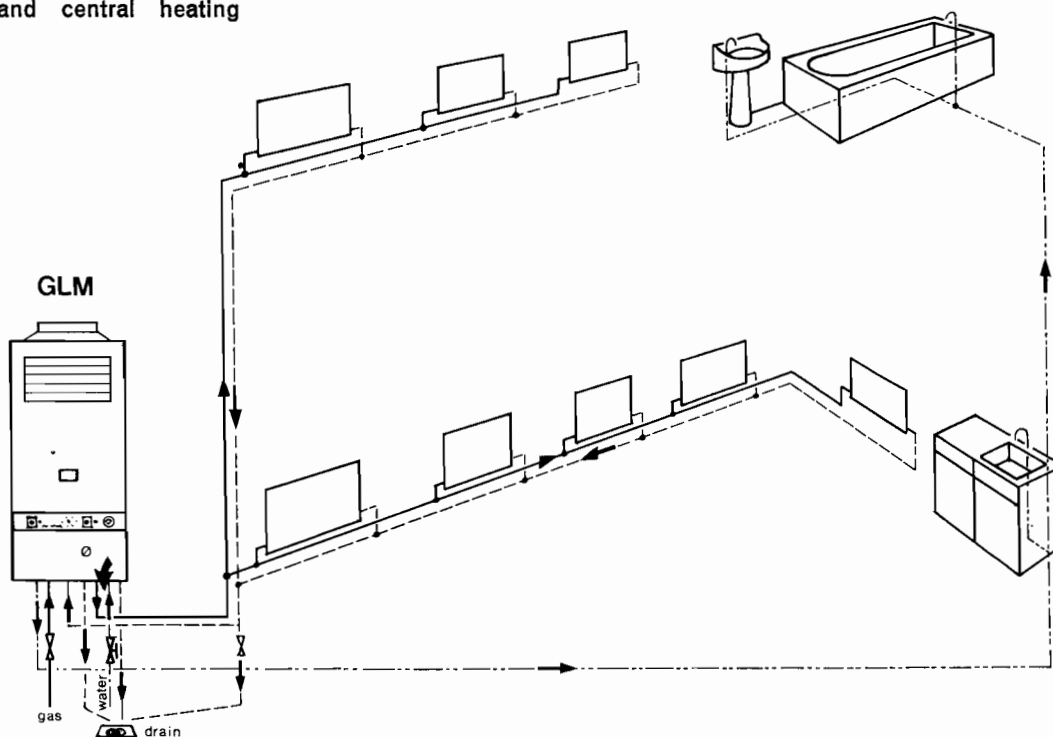


PIPES CONNECTIONS-GAS AND WATER Ø mm



TYPICAL LAYOUT

IMPORTANT : See page 5 for spécial requirement of the National Water Council at point Ø below. (Removable connection between cold supply and central heating system).



BOILER LOCATION

The provision for satisfactory flue termination must be made. The location must also provide adequate space for servicing and air circulation around the boiler.

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

Where the installation of the boiler will be in an unusual location, special procedures may be necessary and B.S.5376 - 2 gives detailed guidance on this aspect.

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

Details of essential features of cupboard/compartment design including airing cupboard installations are given in B.S.5372 - 2.

Detailed recommendations for air supply are given in B.S.5440 - 2.

The following notes are intended to give general guidance:

The boiler does not require the room containing it to have a purpose provided air vent.

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 high and low levels. These air vents may communicate with a room or direct to the outside air.

The minimum effective areas of the permanent vents required in the cupboard or compartment are as follows:

Position of air vents	Air from room	Air direct from outside
High level	253 cm ² (10'12)	126 cm ² (5'12)
Low level	253 cm ² (10'12)	126 cm ² (5'12)

NOTE:

Both air vents must communicate with the same room or must both be on the same wall to outside air.

FITTING OF TIME SWITCH, PROGRAMMER OR ROOM THERMOSTAT

WARNING

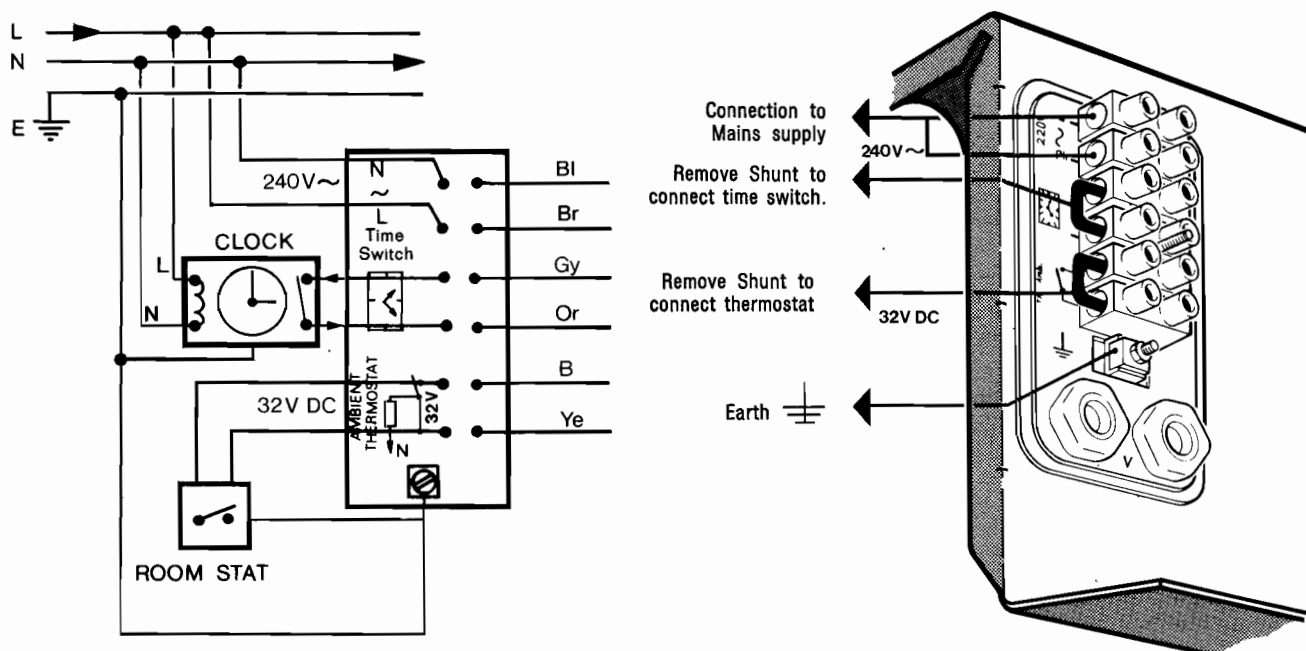
The cover of the terminal block and the case of the boiler, must not be removed before disconnecting the power supply to the boiler.

IMPORTANT

Ensure that an earth connection is made.

Although the boiler already has two integral thermostats to control the domestic and central heating systems, it may be required to fit a further control to the central heating system. Should this work be carried out, these controls must be wired as per instructions and illustrations as in fig. 4. Should these requirements not be carried out and the additional controls fitted in any other way faults will occur on the boiler which could result in damage to the electrical components within the boiler. Should damage occur, the distributor will not accept responsibility for components if controls are wired incorrectly.

DIAGRAM FOR WIRING OF TIME SWITCH, PROGRAMMER, AND ROOM THERMOSTAT.



NOTE : Type of time switch must be with free contacts.

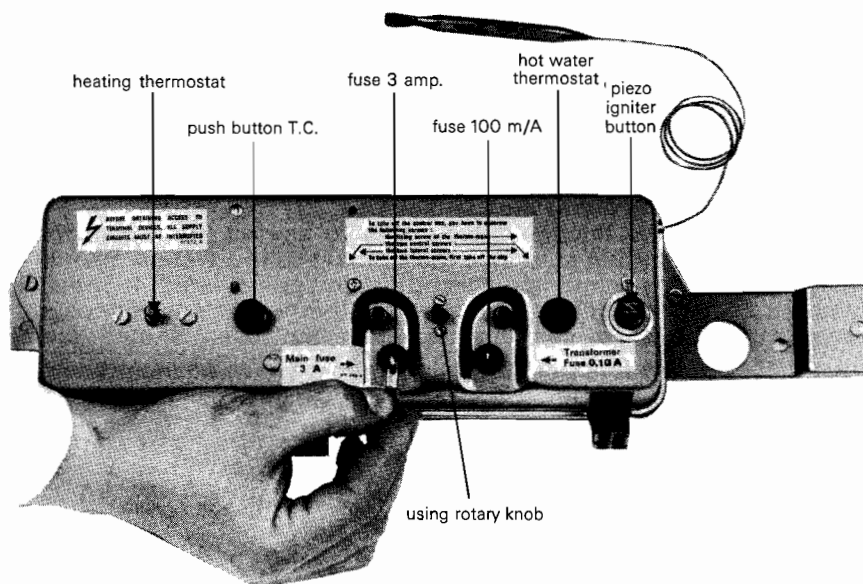
CONTROLS

Controls within the boiler have been designed especially for this particular unit by elm leblanc. The main control of the boiler is made via the main control box (fig. 5). This contains the heating thermostat, the piezo ignition device, transformer, condensers and a printed circuit board with components to convert to D.C., and to stabilise voltage. Also the main fuses, 3 amp, for the 240 volts controls, and 100 m/A for the transformer are positioned within this box.

Other electrical controls such as safety devices are fitted throughout the boiler. There are safety switches fitted to the heat exchanger, one for the domestic system which operates at 85 °C. and another for the heating system which operates at 95 °C, to close the electrical supply to the two stage magnetic valve (23) (Fig. 2) which stops gas to the main burner.

An Over-heat Cut-out Device and Flame Failure Device are fitted via the Thermocouple (18). These will cause the Boiler to close down completely, including the Pilot light if a temperature of 98 °C should be reached or should the Pilot light be extinguished for any reason. Detailed drawings of the Electrical Controls are given in the Wiring Diagrams (pages 11, 12) ; but we must advise you that should a fault arise within the Control system, an authorised agent of the supplier should be called to make any necessary adjustment or repairs.

CONTROL BOX LAYOUT



ELECTRICAL SUPPLY

WARNING This appliance must be earthed.

This appliance is equipped for use on 240 v. AC only.

All external wiring must be in accordance with the current IEE regulations for electrical equipment in buildings.

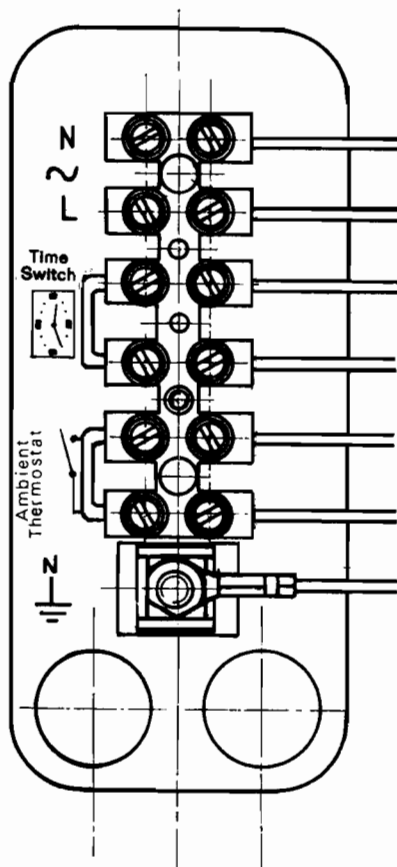
Connection to the boiler must be made in the appropriate input cable size (0.75 mm, 24 - 0.20 mm to BSI 6500, 1975). Connection to the terminal block is made through the rear of the boiler base, See fig. 8. Ensure that cable is firmly fastened into cable retaining clips. Remove cable holding screws and push cable through into terminal box. Strip wire and connect to terminal block as illustrated in fig. 4. Ensure that cable holding screws for terminal block are replaced and secured. Ensure that the incoming earth cable is connected. Replaced terminal box cover and replace outer case before trying to light boiler.

The boiler is supplied for 240 volts AC, 50 Hz. Fuse rating is 3 amp. Power input 145 watts.

The method of connection to the mains electricity supply should facilitate complete electrical isolation of boiler, preferably by use of a fused, double pole switch or spur box, serving only the boiler.

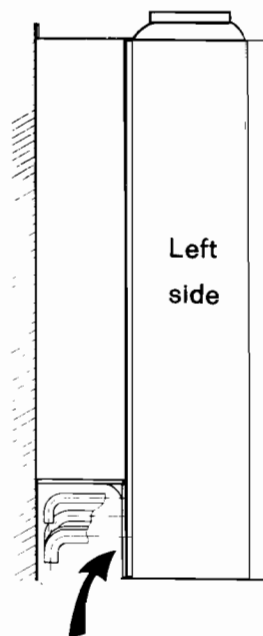
Alternatively, a fused three-pin plug shuttered socket outlet, both complying with the requirements of BS 1363, may be used.

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



Terminal Block

Fig. 7

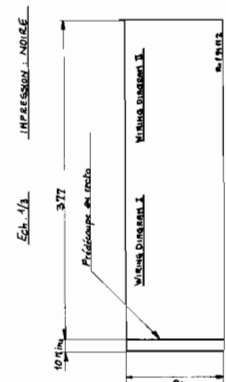
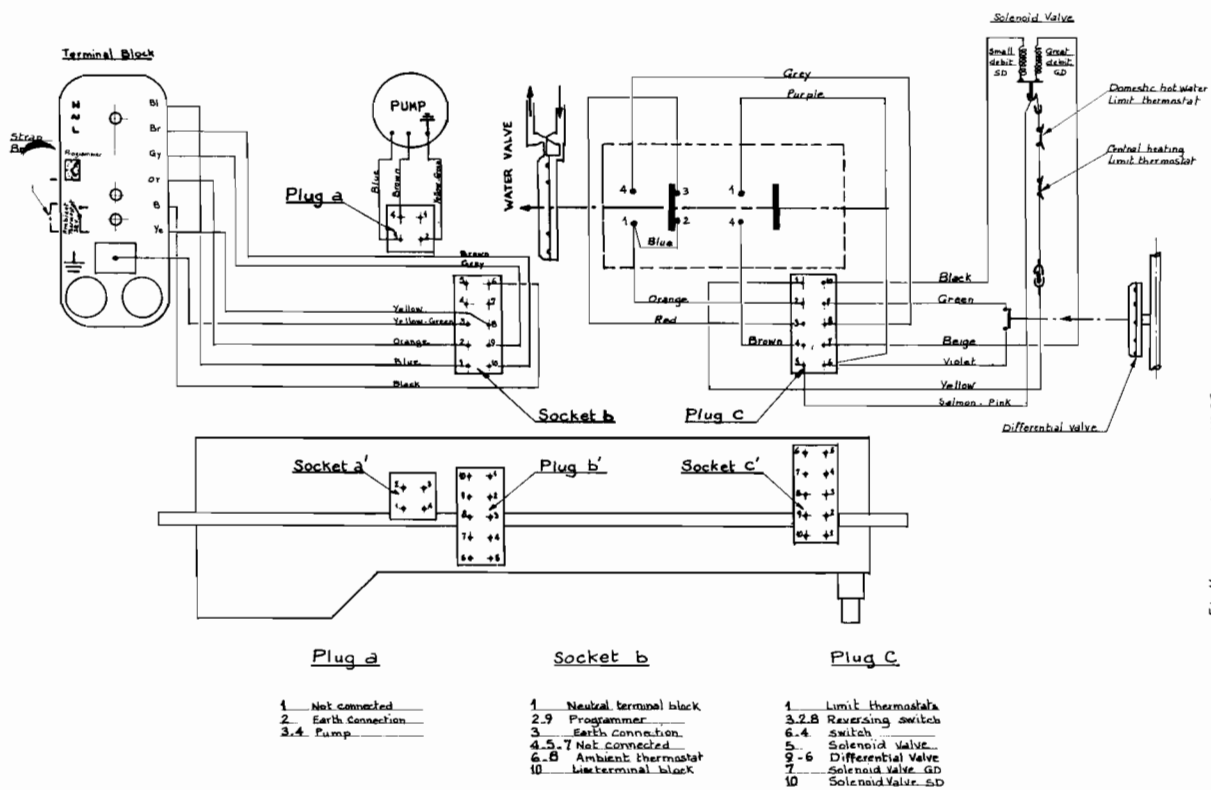


Cable entry

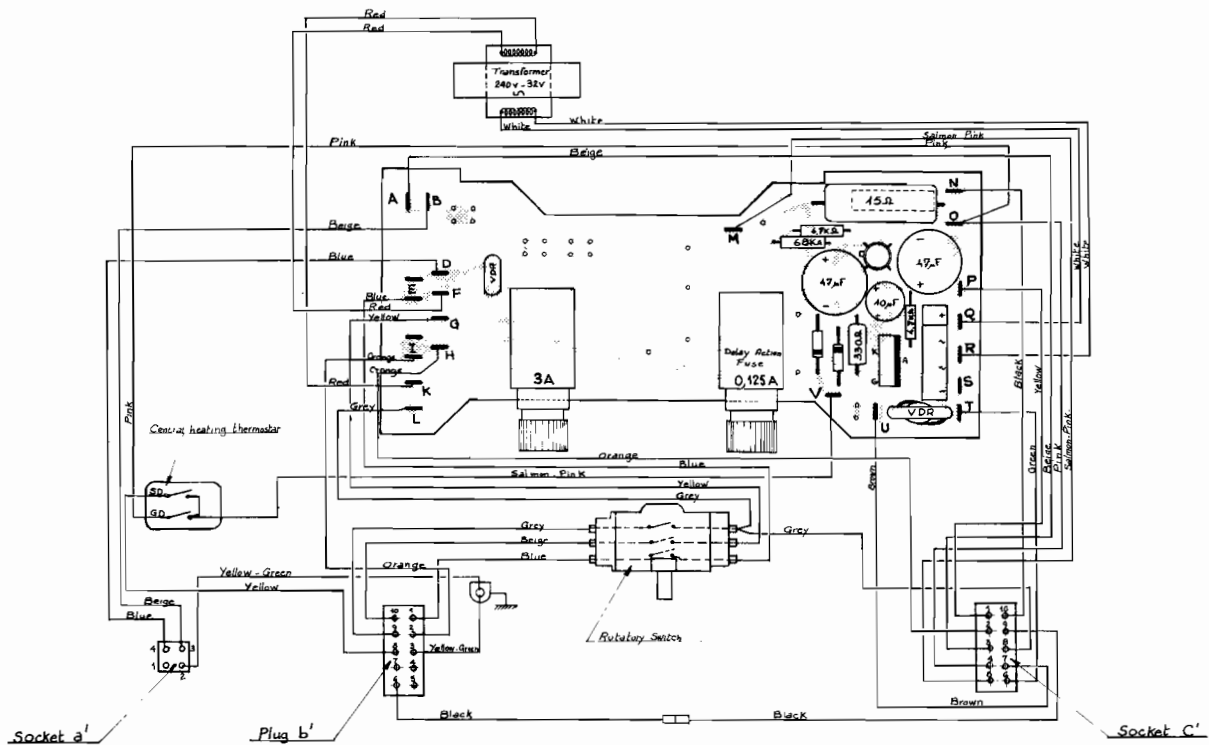
Fig. 8

WIRING DIAGRAM

WIRING DIAGRAM I



WIRING DIAGRAM II

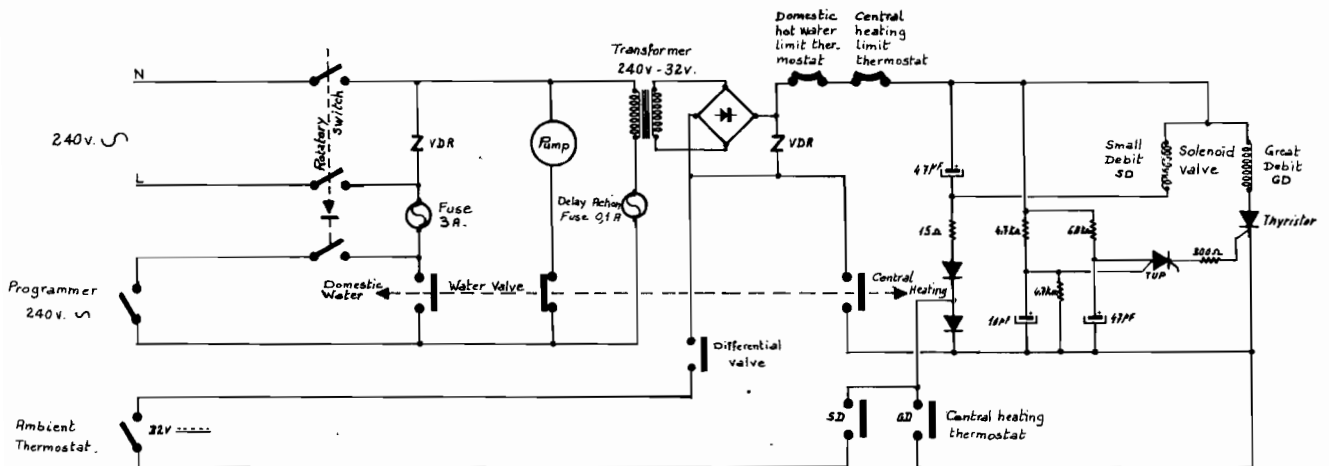


1. Not Connected
2. Earth Connection
3. to B
4. to D

- 1.9-10. Rotatory switch
2. to I
3. Earth Connection
4.5.7 Not Connected
to 9 socket c'
6. Central heating thermostat

1. to P
2. to H
3. to A
4. to Q and Central heating thermostat
5. to M
6. to T
7. to U
8. to L and Rotatory Switch
9. to 6 plug b'
10. to N

OPERATIVE WIRING DIAGRAM



WATER AND GAS CONNECTIONS TO THE BOILER

A fully illustrated drawings shows the connections to the boiler and they are also individually marked on the boiler itself. (See pages 7 and 8).

1. Connect the incoming mains water supply pipe to the boiler (marked 'I') (15 mm) ensuring that an approved water isolating valve is fitted on the incoming pipe so that the mains supply may be shut off should it be necessary to remove the boiler at any time for repairs or service.
2. Ensure that the mains pressure is at a minimum of 0.4 bars with a minimum flow of 2.7 litres per minute. If this pressure and flow rate is not available the boiler will not operate.
3. Connect the heating flow pipe (marked 'H') (22 mm) to the boiler. An isolating valve is already fitted within the boiler so that the water may be turned off without draining the system.
4. Connect the heating return pipe (Marked 'R') (22 mm) to the boiler. An isolating valve is already fitted within the boiler so that the water may be turned off without draining the system.
5. Connect the domestic water flow pipe to the boiler (marked 'O') (15 mm).
6. Ensure that the pressure relief valve connections are made and that they are run to a position on the outside of the wall to an external drain, but allowing any flow through these pipes to be seen.
Note: National Water Council Regulations state that an overflow or expansion pipe must not be fitted into a sink, handbasin or W.C.
7. Pressure Relief Valve Connections / Domestic 15 mm
Central Heating 22 mm
8. Connect the gas supply as illustrated on drawing and as marked 'G' (22 mm). Ensure that the union gas cock is fitted to the incoming supply so that the boiler may be completely removed for service or repair without having to turn off the gas from the meter position.

FILLING A CENTRAL HEATING SYSTEM

The boiler is designed to be used with a sealed central heating system. National Water Council Regulations state clearly that no permanent connection may be made between the heating system and incoming mains water supply. We have therefore enclosed a detailed drawing showing the typical way of installation for filling of the central heating system (On Page 13).

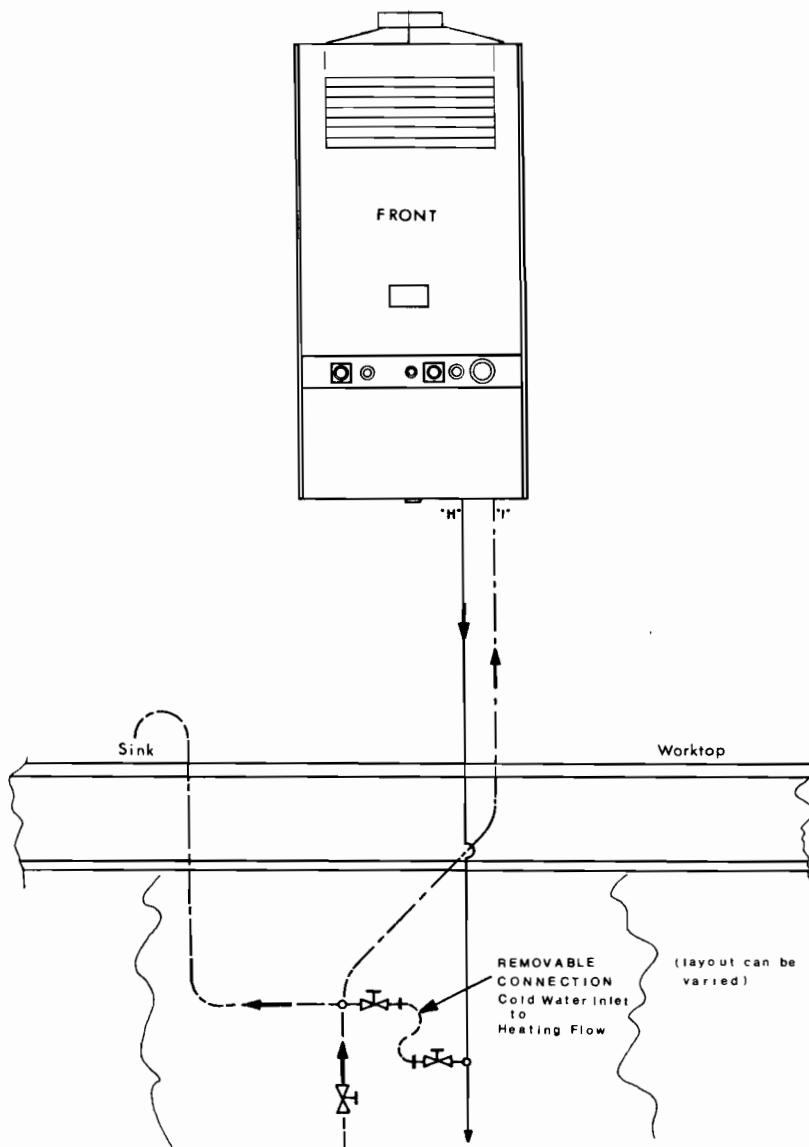
Before beginning to fill the system, loosen the automatic air vent screw as illustrated in Fig. 2, No 31, so that air may escape from the system as filling takes place. Check that all pipe fittings and connections are watertight.

VERY IMPORTANT

Central Heating Pressure

The central heating water pressure should be at a minimum of 0.5 bars when full and no more than a maximum of 3 bars. To determine the required pressure an approximate measurement should be made from the base of the boiler to the highest position of the highest radiator.

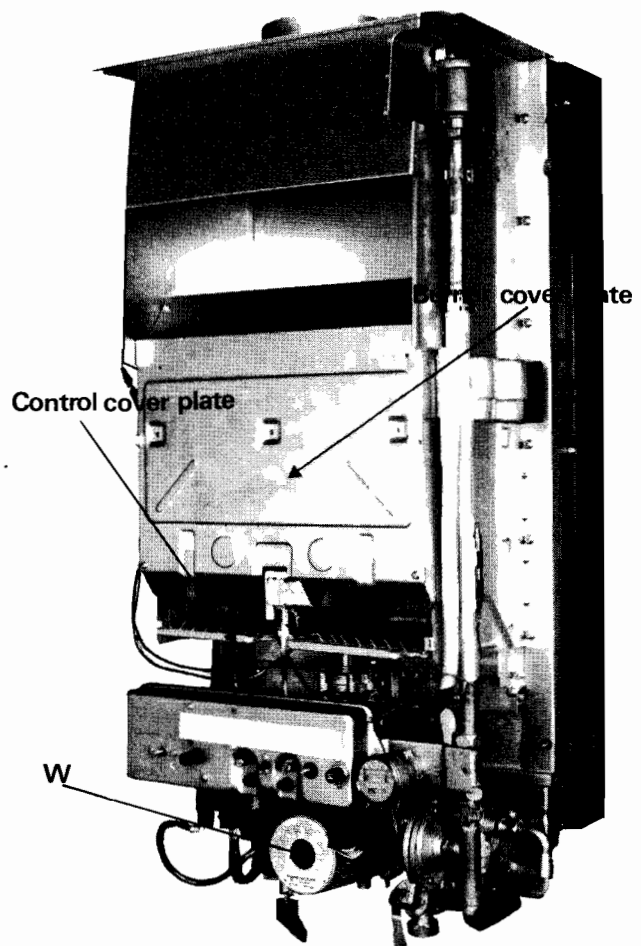
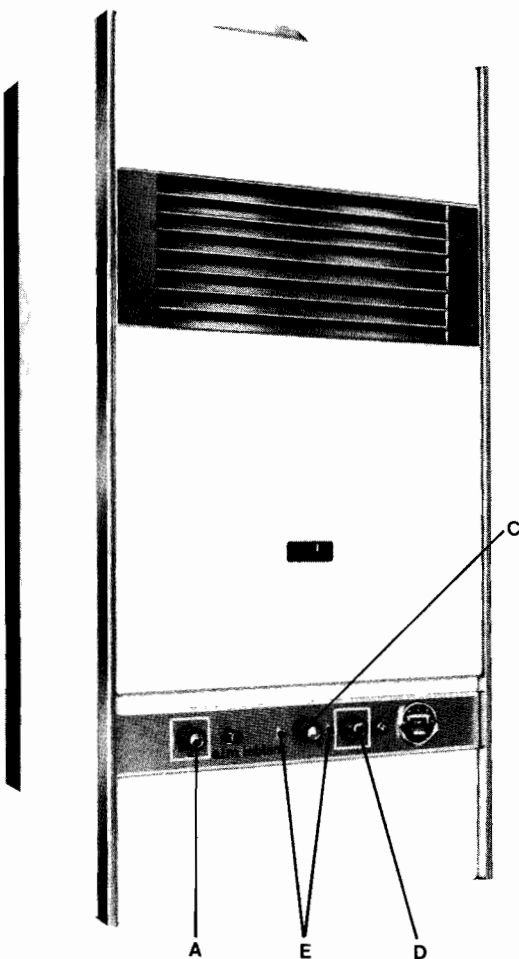
For every metre measured, a pressure of 0.1 bar is required within the heating system. Should this distance be less than 5 metres, a pressure of 0.5 bars must still be made and if the distance measured is more than 30 metres the central heating pressure should not reach more than 3 bars. The Boiler is fitted with an integral expansion vessel of 5 litres capacity which allows a maximum system capacity of 110 litres giving an average maximum temperature of 80°C (2 1/2 % volume expansion).



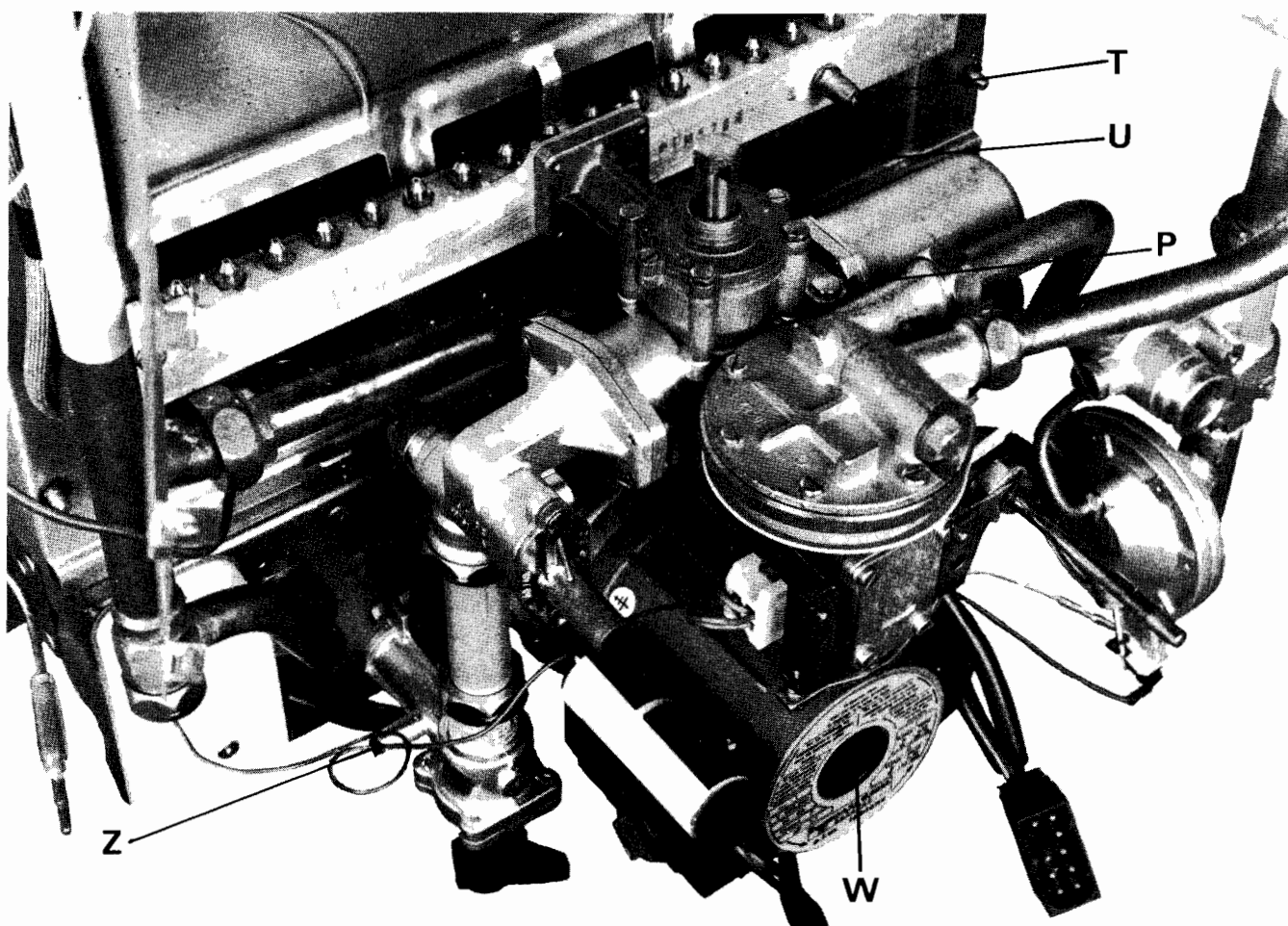
CHECKING AND SETTING-UP PRESSURES COMMISSIONING

After checking all gas supply connections for soundness. Purge air from pipes at screw "Z".

1. Light the boiler as described in "Users Instructions".
2. Remove the outer front panel for that unscrew the two screws with a screw-driver "E" (fig. 8).
3. Turn Knob "C", to position for Central Heating and Hot Water, (Tap & Radiator) (fig. 8).
4. To purge the Pump - remove the plug "W", from pump-face (See illustration below) (fig. 8).
5. Insert a screwdriver into the pump to turn armature of the pump. (This may not be necessary as the armature may already be free).
6. Replace the plug "W", tightly.
7. Turn knob "C" back to position for Central Heating and hot water (fig. 8).
8. Remove the sealing screw from the Main Burner Test Point "T" and fix tube the for the Manometer (water gauge).
9. Turn knob "C" back to position for Central Heating and hot water (fig. 8).



10. Turn knobs "A", and "D", (See users Instructions and fig. 8 page 14).
11. Central heating should now be in operation.
12. If the Main Burner does not light, check that room thermostat, time switch or programmer are all calling for heat.
13. With central heating operating at maximum output, the manometer should show a pressure of 8.5 m/bar (3.38" WG).
14. It is possible to adjust From 23.2 kW to 8.7 kW, the Heating Output independantly of the domestic gas output with Screw-head "U" (fig. 9). The heating gas output has been adjusted at 13,9 kW in the Factory. For increasing to 23,2 kW screw, the screw head "U". For reducing unscrew it.
15. An adjustment of low burning rate must be made by the capstan plug "P" (fig. 9), (on left for Natural gas, on right for LP gas).
16. Turn knob "C", to position showing Tap only (hot-water-only position).
17. The pump will now stop.
18. Open a Hot Water Outlet Tap. This allows water to flow through the heat exchanger.
19. The main burner will now light at the maximum rate.
20. The burner pressure will now read as 13 above.
21. Remove the manometer tube from the test point and replace the sealing screw.
22. Remove the special clamp from the red Case Switch.
23. Replace the Outer Case ensuring that both front screws are fitted tightly.
24. **VERY IMPORTANT** : Hand the "Instructions for Use" to the user.



TECHNICAL INFORMATION

GAS		
Gas input C.H. and D.H.W. (I.C.P.)	26.2 kW	89,420 Btu/hr
Gas Output Heating Maximum	23.2 kW	79,180 Btu/hr
Gas Output Heating Minimum	8.7 kW	29,690 Btu/hr
Gas Output Domestic Hot Water Modulating - Maximum	23.2 kW	79,180 Btu/hr
Minimum	6.3 kW	21,500 Btu/hr
Main Burner Pressure		
Maximum Heating Output	8.5 m bar	3.38 in.w.g.
For Heating Output of 48,000 Btu/hr	3,2 m bar	
Main burner Pressure		
Maximum Domestic	8.5 m bar	3.38 in.w.g.

ELECTRICAL

Boiler for use on - 240 Volts A.C.	50 Hz
Power Input	120 Watts
Main fuse	3 Amps
Transformer Fuse	250 M.A.

WATER

Maximum Domestic Water Temperature	65°C: 150°F
Maximum Heating Water Temperature	85°C: 185°F
Domestic Hot Water Flow at 65°C	6.7 Litres/Min. for 50°C Rise.
Minimum Incoming Mains Water Pressure	0.4 Bars
Minimum Incoming Mains Flow	2.7 Litres/Min. (0.59 gallons/min.)
Maximum Incoming Water Pressure	73 p.s.i. (5 bars) (10.65 Kn/m²)
	See also N.W.C. requirement ; page 5 ; paragraph 2 ; regarding Pressure Reducing Valves.
Heating Minimum Circuit Pressure	0.5 bars
Heating Maximum Circuit Pressure	3.0 bars

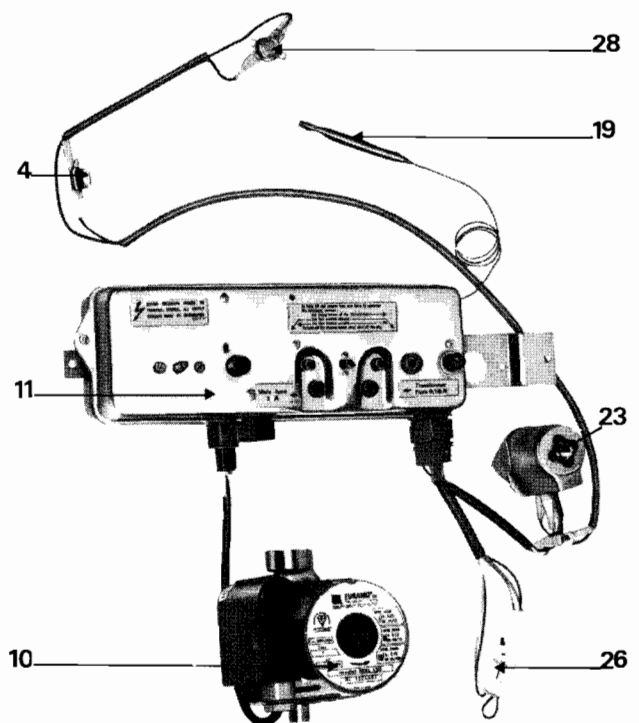
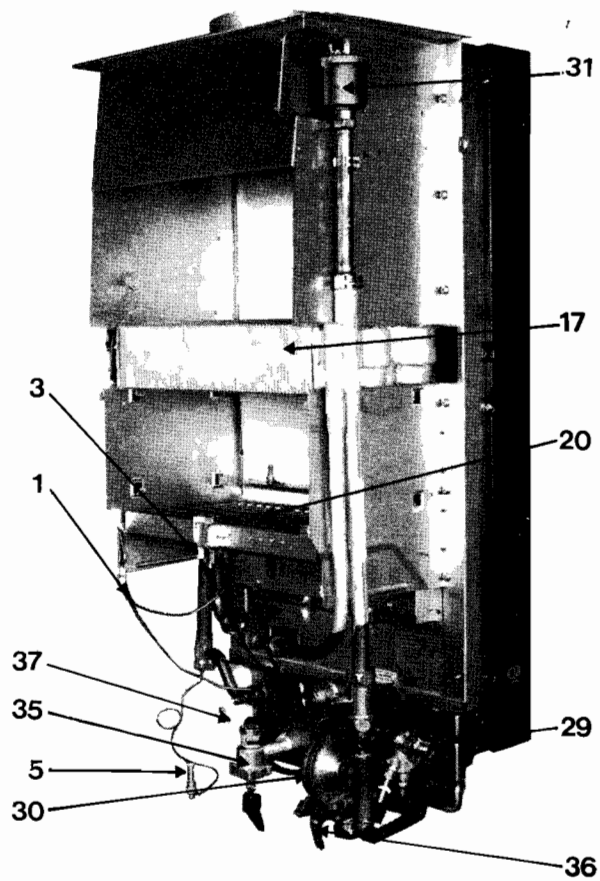
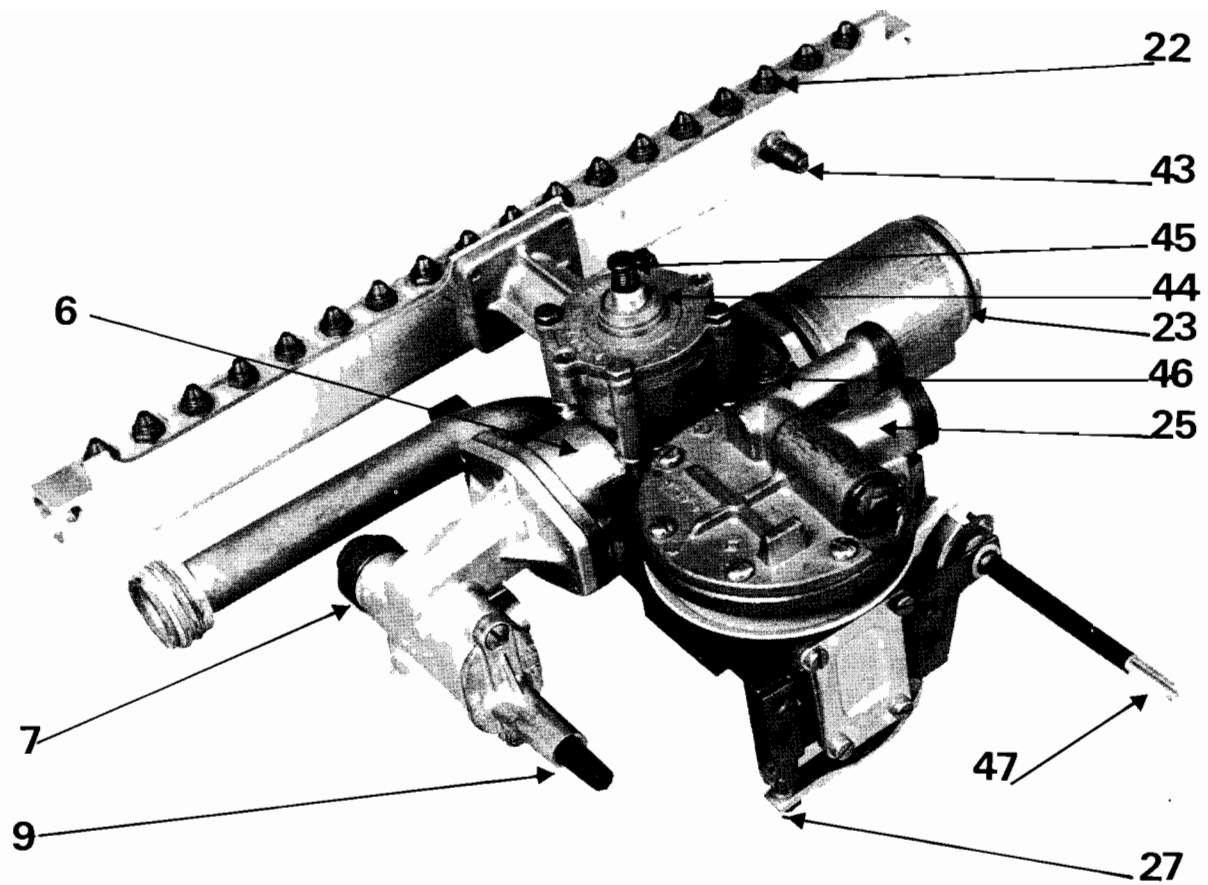
FOR HEATING CIRCUIT PRESSURES - SEE INSTALLATION (PAGE 16)

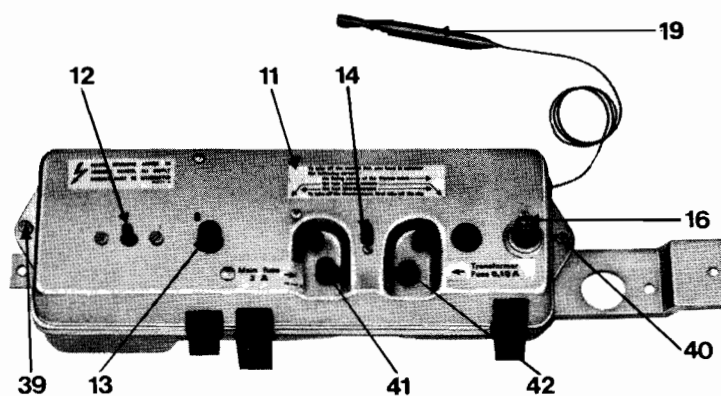
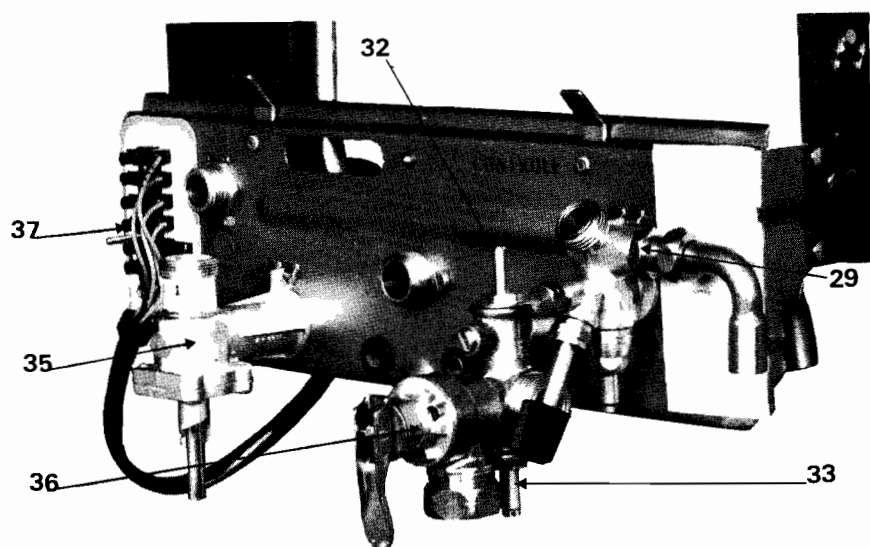
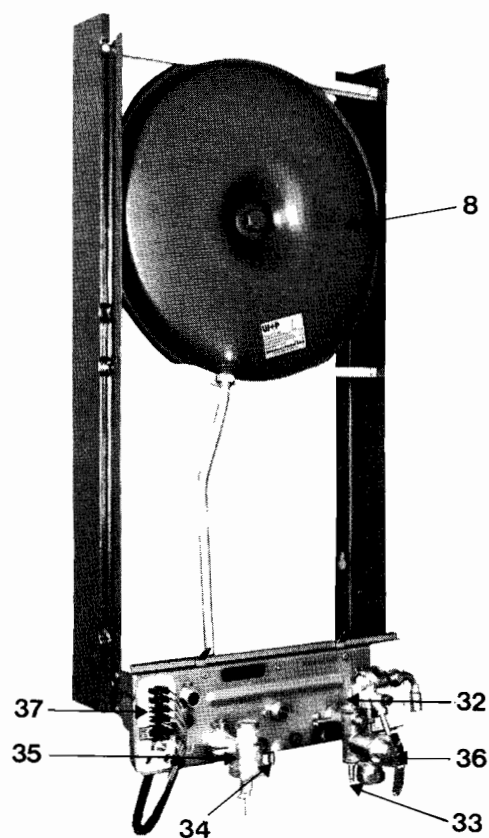
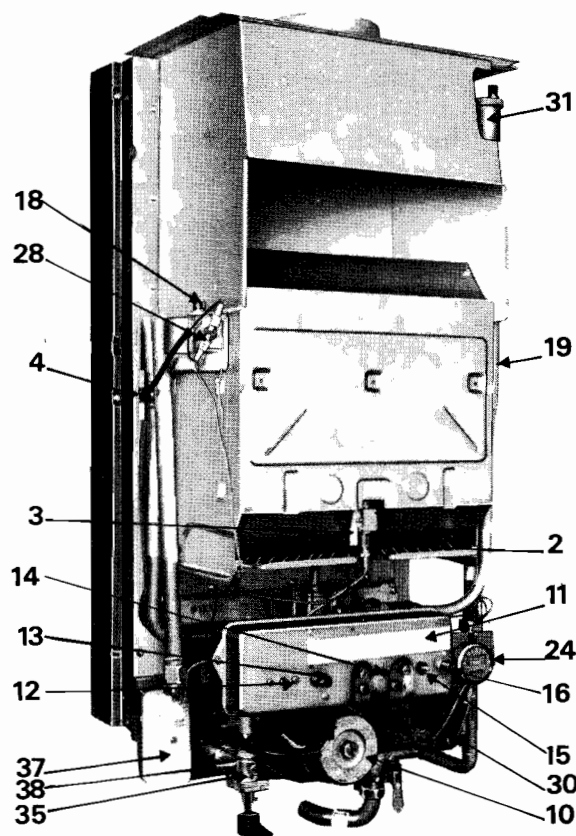
GENERAL

Mains Burner Jets Natural Gas: 18 × 1.2 Ø mm	Domestic Water Incoming Mains Connection
Pilot Jet Natural Gas: 1 × 0.30 Ø mm	15 mm
Central Heating Motor Pump: 240 V - 50 Hz (0,24, 0,32, 0.39 Amps) (49. 70. 90 Watts) Type LMT	Domestic Water Flow Connection: 15 mm
MXL 130 3 Speeds.	Domestic Water Pressure Relief Valve Connection
Nett Weight: 42 Kg.	15 mm
Maximum Pump Head (see page 23)	
Heating Flow Connection: 22 mm	
Heating Return Connection: 22 mm	
Heating Pressure Relief Valve Connection: 22 mm	

BOILER WATER CAPACITY

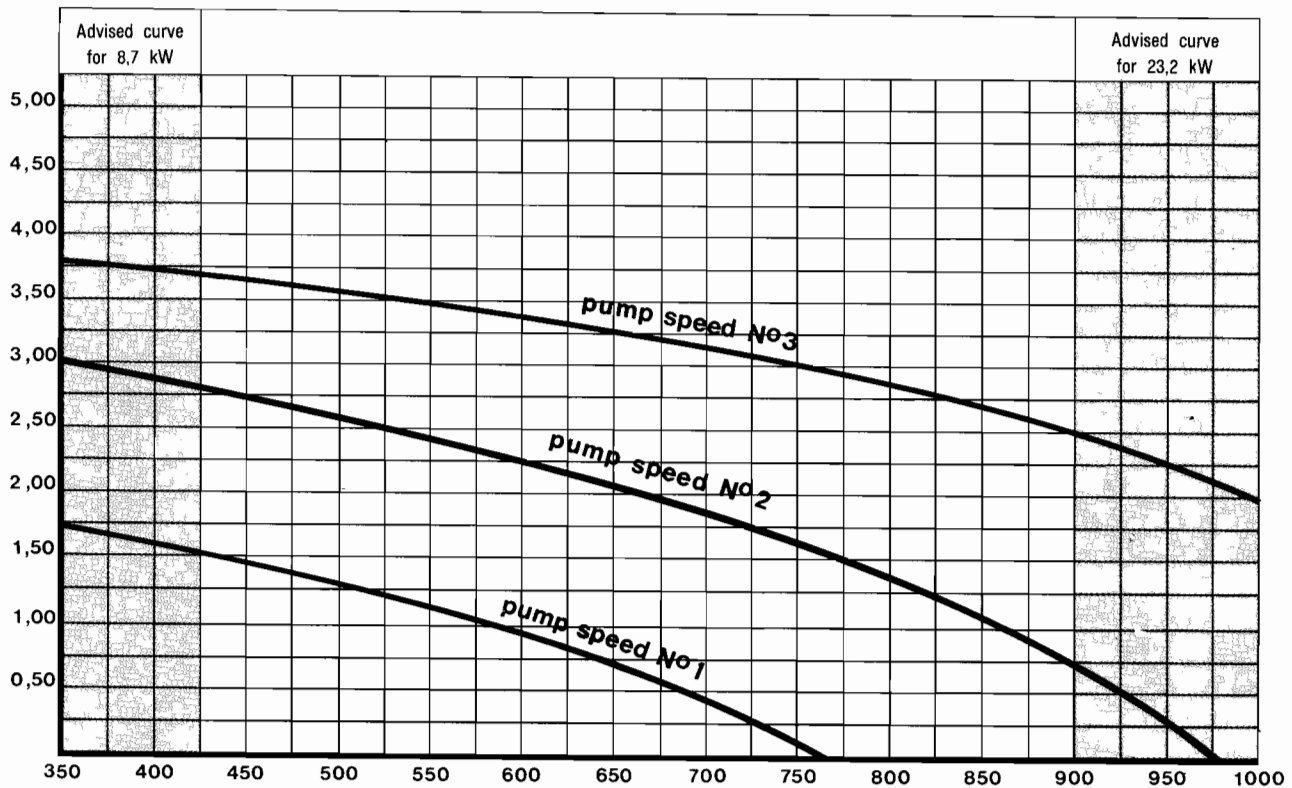
Heating	0,6 Lit.
Domestic	0,5 Lit.





PUMP CHARACTERISTICS OUTLET OF THE BOILER

PRESSURES IN M/WG



HYDRAULIC CURVES IN LITRES PER HOUR

PARTS LIST

- | | |
|--|---|
| 1 - Thermo-couple | 26 - Double acting microswitch |
| 2 - Pilot assembly | 27 - Domestic hot water thermostat adjuster |
| 3 - Spark electrode | 28 - Heating limit thermostat (fixed) |
| 4 - Hot water limit thermostat (fixed) | 29 - Domestic pressure relief valve |
| 5 - Hot water thermostat Phial | 30 - Heating water flow/pression safety valve |
| 6 - Two ways gas control valve | 31 - Heating automatic air vent |
| 7 - Thermo-electric safety valve | 32 - Non return valve (heating) |
| 8 - Expansion vessel | 33 - Central heating flow isolating cock |
| 9 - Push button for thermo-electric flame failure valve | 34 - Central heating return isolating cock |
| 10 - Heating circulation pump | 35 - Gas isolating cock (as gas tap) |
| 11 - Sealed electrical control box (as panel) | 36 - Heating pressure relief valve |
| 12 - Heating temperature selector | 37 - Electrical terminal connection |
| 13 - Push button for thermo-electric flame failure valve | 38 - Main gas pressure test nipple |
| 14 - Operating selector knob | 39 - Control box securing screw |
| 15 - Hot water temperature selector | 40 - Control box securing screw |
| 16 - Piezo igniter button | 41 - 3 amp. fuse and holder |
| 17 - Heat exchanger | 42 - 160 m.A. fuse and holder |
| 18 - Over heat cut out device | 43 - Burner gas adjustment pressure nipple |
| 19 - Heating thermostat Phial | 44 - Heating maximum gas regulator |
| 20 - Burner assembly all gas | 45 - adjustment screw (fixed in factory) |
| 21 - Modulating gas valve | 46 - Low burning rate adjustment |
| 22 - Injectors support-unit | 47 - Domestic water thermostat spindle |
| 23 - Two stage gas solenoid valve | |
| 24 - Pressure and temperature gauge (as thermomanometer) (heating) | |
| 25 - Diaphragm water valve | |

— Modifications for improvement reserved —

e.l.m. leblanc Ltd

12, Chesterfield Way
Off Pump Lane
HAYES MIDDX UB3 3NW

Tel. 01.848.75.22

Telefax : 01.848.19.84

MANUFACTURER :

e.l.m. leblanc s.a.

123-125, rue Diderot - 93700 DRANCY
(FRANCE)

Tél. : (1) 48.30.11.12

Telex : 235 406

Telefax : (1) 48.30.86.21