

IDEAL CAVALCADE 40 & 50 Combined Central Heating Boiler & Gas Fire

Installation & Servicing Boiler Unit

CAUTION

To avoid the possibility of injury during the installation, servicing or cleaning of this appliance, care should be taken when handling the edges of sheet steel components.

Note:

The appliances are for use with **NATURAL GAS ONLY**

B.G.C. Appliance No's

IDEAL CAVALCADE 40	44.392.22
IDEAL CAVALCADE 50	44.392.23

NOTE TO INSTALLER:

LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER

Table 1

GENERAL DATA

Boiler Size		CAVALCADE 40	CAVALCADE 50
Main Burner Bar		Aeromatic 19/12 3209	
Gas Control		Satchwell DB1	
Burner Injector		Aeromatic 93-7 125	Aeromatic 93-7 135
Hydraulic Resistance @ 11°C (20°F) Temp. Difference	mbar	10	
	in.w.g.	4	
Gas Supply Connection		Rc½	
	in.BSP	½	
Flow Connections (TWO)		Rc1	
	in.BSP	1	
Return Connections (TWO)		Rc1	
	in.BSP	1	
Flue Outlet Size	mm	125	
	in.	5	
Maximum Static Water Head	m	27.5	
	ft	90	
Electric Supply		240 volt, 50 Hz, A.C. Single Phase	
External Fuse Rating		3 amp	
Water Content	litre	3.65	
	gal	0.8	
Dry Weight	kg	49.55	
	lb	109	

Table 2

PERFORMANCE DATA

Boiler Size				CAVALCADE 40	CAVALCADE 50
Boiler Input	**	MINIMUM	kW	10.1	14.2
			Btu/h	34 500	48 500
	MAXIMUM	kW	15.5	19.5	
		Btu/h	53 000	66 500	
Boiler Output to Water		MINIMUM	kW	7.3	10.3
			Btu/h	25 000	35 000
	MAXIMUM	kW	11.7	14.7	
		Btu/h	40 000	50 000	
Burner Setting Pressure		MINIMUM	mbar (gauge)	5.7	8.2
			in.w.g.	2.3	3.3
	MAXIMUM	mbar (gauge)	13.3	14.7	
		in.w.g.	5.3	5.9	
** Note: To obtain gas consumption:					
(a) in l/s – divide heat input (kW) by C.V. of the gas (MJ/m ³).					
(b) in ft ³ /h – divide heat input (Btu/h) by C.V. of the gas (Btu/ft ³).					

INTRODUCTION

The CAVALCADE 40 and CAVALCADE 50 are combined central heating boiler and gas fire units.

They are to be fitted in a fireplace, or standard builder's opening, at the base of a chimney.

They should NOT be installed in a bedroom, bed-sitting room or any room, or space, containing a bath or shower.

The units are for use on NATURAL GAS ONLY and MUST NOT be used on any other gas.

The CAVALCADE 40 Boiler is range rated from 7.3 kW (25 000 Btu/h) to 11.7 kW (40 000 Btu/h) output, and the CAVALCADE 50 Boiler from 10.3 kW (35 000 Btu/h) to 14.7 kW (50 000 Btu/h) output.

The CAVALCADE range of fires all have a heat input of 6.45 kW (22 000 Btu/h), EXCEPT the Cavalcade 'E', which is 5.28 kW (18 000 Btu/h).

The appliance is supplied as a package, containing the boiler unit (mounted on a pallet), with a Hardware Pack attached to the deflector.

A cardboard template is supplied in the boiler package.

The fire unit is supplied separately.

IMPORTANT

Gas Safety Regulations, 1972:

It is the law that all gas appliances are installed by competent persons, (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.

The installation of the boiler MUST also be in accordance with I.E.E. Regulations, the by-laws of the Local Water Undertaking, any relevant requirements of the Local Authority, and the relevant recommendations of the following British Standards:

Codes of Practice:

- CP. 331:3 Low pressure installation pipes
- BS. 5376:2 Boilers of rated input not exceeding 60 kW.
- BS. 5449:1 Forced circulation hot water systems (smallbore and microbore domestic central heating systems).
- BS. 5871 Installation of gas fires, convectors and fire/back boilers (2nd Family Gases).
- 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).

Manufacturer's notes must NOT be taken, in any way, as over-riding statutory obligations.

The appliance is designed for installation in a standard builder's recess, or opening, which should be to the dimensions shown in Fig. 2.

The floor of the recess MUST be flat and level, and made of insulating, non-combustible material. A flat, vertical, area MUST be available around the fireplace opening for mounting the various gas fires — refer Fig. 2.

The fire surround, and control box, are supplied in the fire carton.

If the fire is to be fitted above a non-combustible hearth, then the floor of the boiler recess MUST be at the same level as the hearth.

If however, the floor beneath the fire is to be covered with

carpeting, or other type of floor covering, then a MINIMUM underfire clearance MUST be maintained.

In order to comply with this requirement, the floor of the boiler recess MUST be raised to give the necessary clearance above the normal floor level.

In the case of the 'G' and 'GL' Model fires, the MINIMUM underfire clearance required is 125mm (5in). The floor of the boiler recess MUST therefore, be raised a MINIMUM of 25mm (1in) ABOVE the normal floor level.

In the case of the 'E' Model fire, MINIMUM underfire clearance required is 102mm (4in).

The floor of the boiler recess MUST therefore, be raised a MINIMUM of 25mm (1in) ABOVE the normal floor level.

The CAVALCADE 'EL' and 'B' Model fires are designed for MOUNTING ON THE HEARTH ONLY.

In the majority of cases it will be necessary to remove the tiled surround to wall-mount the fire.

IN ANY CASE, THE MINIMUM HEIGHT OF THE FIRE OPENING — 545mm (21½in), MUST BE AVAILABLE, WHEN MEASURED FROM THE NEW FLOOR LEVEL OF THE RECESS.

Surrounds up to 50mm (2in) in thickness around the opening may be accommodated, by using the boiler template placed in line with the front face of the surround, so bringing the boiler forward in the recess.

If fitted with projecting side piers, the face of the surround MUST be flat on either side of the fire opening, within the following measurements between inside faces of piers:

Cavalcade 'G'	865mm (34in)
Cavalcade 'GL'	895mm (35¼in)
Cavalcade 'B'	1016mm (40 1/8in)
Cavalcade 'EL'	825mm (32 5/8in)
Cavalcade 'E'	853mm (33 11/16in)

FLUE

Where a standard brick chimney is used, it should be lined with a 125mm (5in) diameter, acid-resistant, flue liner, preferably of a type that has been tested, and found satisfactory, by British Gas.

If the chimney has been in previous use, then it MUST be swept clean and inspected.

The liner MUST be connected, and sealed, to the boiler flue outlet socket.

A flue terminal, preferably of a type that has been tested, and found satisfactory, by British Gas, MUST be fitted, waterproofed and sealed, to the liner.

The annular space, between liner and chimney, MUST be sealed at top and bottom.

If a new chimney is used, which is constructed of, or lined with, a non-porous acid-resistant material, a flue liner will NOT be necessary. However, a short length of flue liner should be connected from the boiler flue outlet to the flue in the chimney, using an adapter where necessary.

In installations where there is no chimney breast, or opening, in which the boiler can be fitted, and a false chimney breast has been built around the boiler, or where false extensions have been built at the side, or sides, of a chimney breast, to envelop pipes, cables etc., — appropriate

sealing of the boiler compartment MUST be carried out to prevent combustion products spilling into the false spaces. The sealing will usually mean a horizontal sealing plate fitted just above the level of the boiler draught diverter to prevent products from entering the false spaces above, and the sealing of any gaps left by pipes, cables etc., passing through the walls of the compartment.

For further guidance on flues, refer to BS.5440 Pt. 1.

GAS SUPPLY

A gas meter is connected to the service pipe by the Local Gas Region, or a local Gas Region Contractor. 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 should be fitted in accordance with CP. 331 Pt. 3.

Pipework from the meter to the appliance MUST be of adequate size. Do NOT use pipes of a smaller size than the appliance inlet gas connection.

The complete installation MUST be tested for soundness as described in the above Code.

Any part of the gas supply pipe, running within the chimney recess, should be suitably sleeved or protected (e.g. coated, or wrapped with P.V.C. tape.)

A three-way gas cock is fitted on the inlet to the appliance, to isolate the appliance for servicing, refer Fig. 6.

A minimum gas pressure of 20 mbar (8in.w.g.) MUST be available at the appliance inlet.

AIR SUPPLY

A purpose provided ventilation opening, communicating with the outside air, is required.

The minimum effective area of the permanent air vent(s) required is as follows:

Cavalcade 40	67cm ² (10in ²)
Cavalcade 50	86cm ² (13in ²)

The vent(s) MUST open either directly into the room in which the appliance is installed, or into an adjoining room, or space, that is provided with a same size opening communicating with the outside air.

The air grilles must NOT have provision for closing, or adjustment, and should be sited to avoid risk of accidental damage or blockage.

If other methods of ventilation are envisaged, the Local Gas Region should be consulted before proceeding.

Note:

The use of an extractor fan, in the room in which the appliance is installed, or in an adjoining room, may cause the spillage of combustion products from the diverter relief outlets.

Where such installations occur, a spillage test, with the FAN RUNNING, as detailed in BS.5440:1, MUST be carried out.

If any spillage is detected, corrective action MUST be taken.

If in any doubt, consult the Local Gas Region.

WATER CIRCULATION SYSTEMS

The appliance is suitable for the following indirect, open vented systems: — Combined gravity domestic hot water and pumped central heating. Combined pumped domestic

hot water and pumped central heating. Pumped central heating only. Gravity domestic hot water only, up to a maximum domestic hot water cylinder storage capacity of 180 litres (40 gallons)

The appliance must NOT be used for direct hot water supply, for sealed systems, or gravity heating systems.

The boiler MUST be vented. If venting cannot be done via a flow connection, a separate vent MUST be fitted by the Installer.

Note:

A distributor tube, packed in the bag of fittings, is supplied with each boiler.

On systems with pumped circuits, this distributor tube MUST be fitted into the tapping selected for system pumped return, — refer Fig. 7, Page 10, for details of distributor tube position.

If the system does NOT include a pumped circuit, i.e. provides gravity domestic hot water only, discard the distributor tube.

Draining taps MUST be located in accessible positions which permit the draining of the whole system, including the boiler and hot water storage vessel. Draining taps should be, at least ½in. nominal size, and be in accordance with BS.2879.

GRAVITY DOMESTIC HOT WATER and PUMPED CENTRAL HEATING

In a combined and pumped heating and gravity domestic hot water system, the gravity flow and return connections MUST be made to one side of the boiler, and the pumped flow and return connections to the opposite side.

The distributor tube MUST be used with the pumped return.

The use of a cylinder thermostat is recommended. This will prevent excessive domestic hot water temperatures and thus reduce gas consumption.

The schematic pipework graph in Fig. 4 has been calculated on the assumption that not more than seven elbows are used in the gravity loop, including entry to the boiler. For each extra elbow, in excess of seven, (R) must be reduced by 300mm (12in), or (H) increased by 100mm (4in).

The pipe runs for gravity circulation should be planned with reference to the diagram, and graph, illustrated by Fig. 4.

Whatever value is selected for (R), (i.e. the horizontal distance between the centre line of the cylinder and the boiler tapplings used — measured along the pipe run), the value of (H), (i.e. the vertical distance between the top of the boiler and the base of the cylinder), MUST be, at least, that indicated by the graph.

Gravity hot water piping, and fittings, MUST be, at least 28mm (1in) in diameter.

PUMPED CENTRAL HEATING and DOMESTIC HOT WATER

The flow and return connections to a fully pumped system may ONLY be made diagonally, i.e. left hand flow with R.H. return or, right hand flow with left hand return.

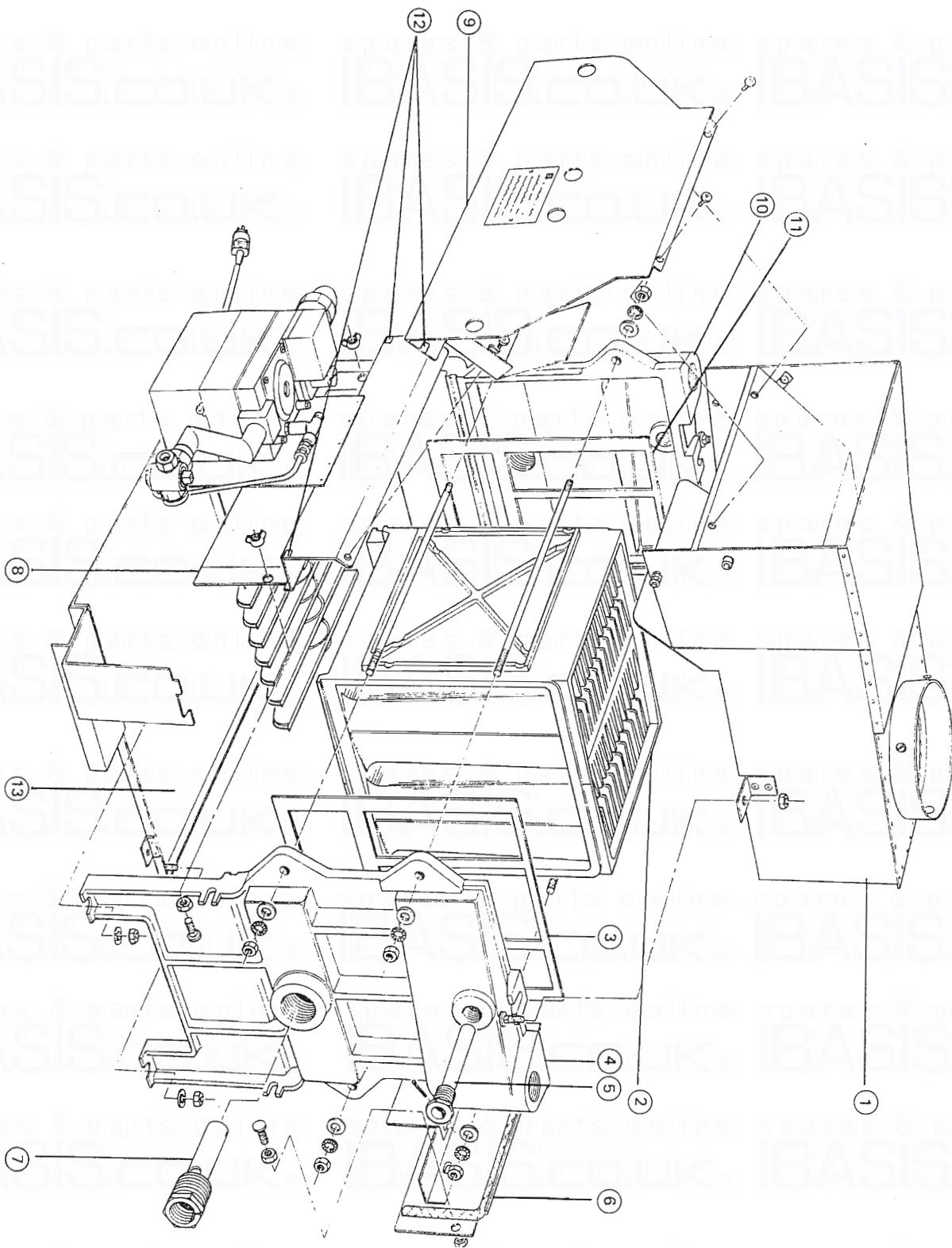
ELECTRICAL SUPPLY

External wiring MUST be in accordance with the I.E.E. Regulations and any Local Regulations which apply.

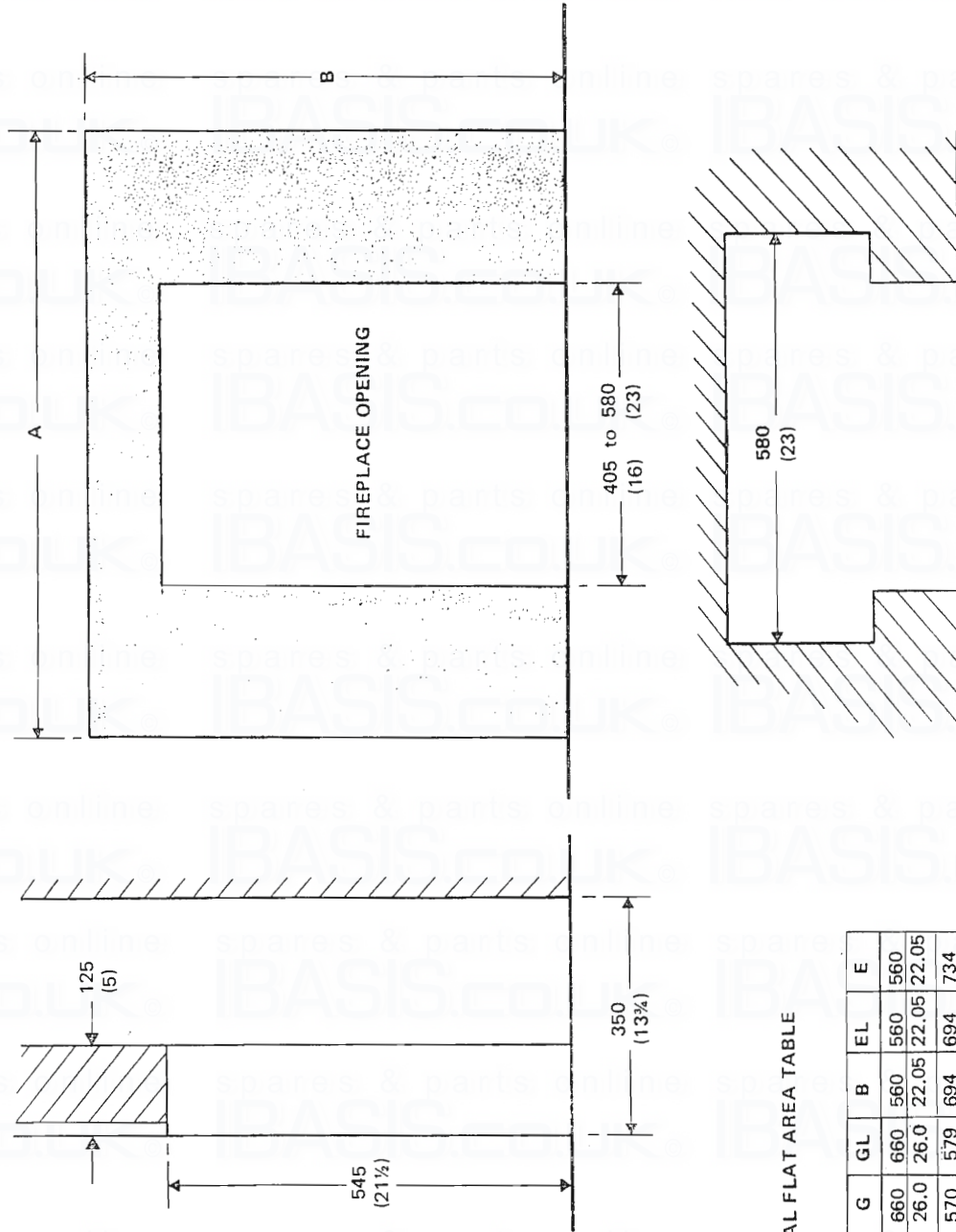
The boiler is supplied for 220/240 volts, 50 Hz, A.C., Single Phase. Fuse rating is 3 amp.

For wiring instructions — refer 'Electrical Connections' — page 10.

- LEGEND:
1. Draught Diverter
 2. Heat Exchanger
 3. End Plate Gasket
 4. R.H. End Plate
 5. Thermostat Pocket
 6. Back Panel
 7. Distributor Tube
 8. Gas Valve/Burner Assembly
 9. Deflector Panel
 10. L.H. End Plate
 11. End Plate Gasket
 12. Cable Clips
 13. Boiler Baseplate



All dimensions in mm (in)



VERTICAL FLAT AREA TABLE

FIRE	G	GL	B	EL	E
mm	660	660	560	560	560
A in	26.0	26.0	22.05	22.05	22.05
mm	570	579	694	694	734
B in	22.5	22.8	27.3	27.3	28.9

PLAN VIEW

All dimensions in mm (in)

IMPORTANT:- The points shown must be in line with the finished plaster or tile face.

SIDE VIEW (RIGHT)

FRONT VIEW

PLAN VIEW

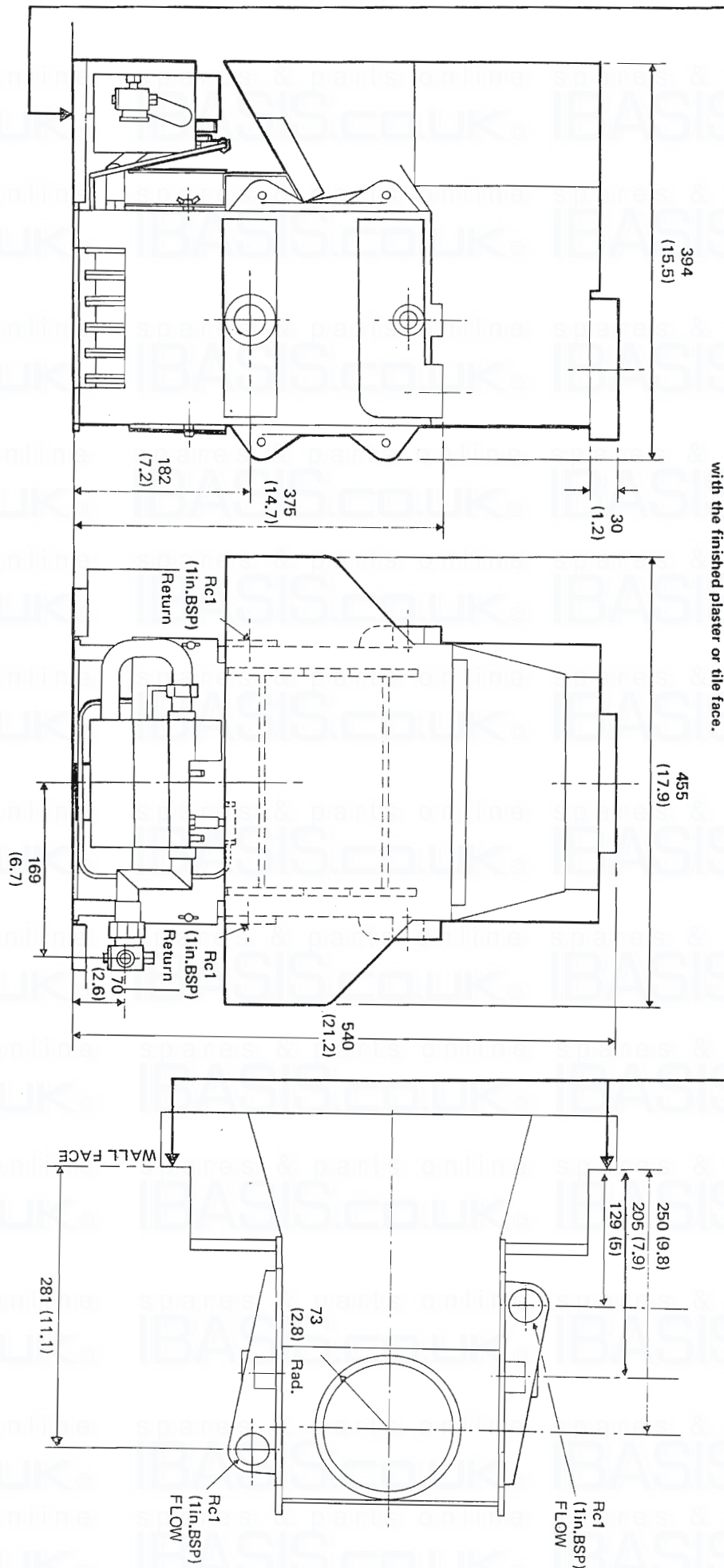
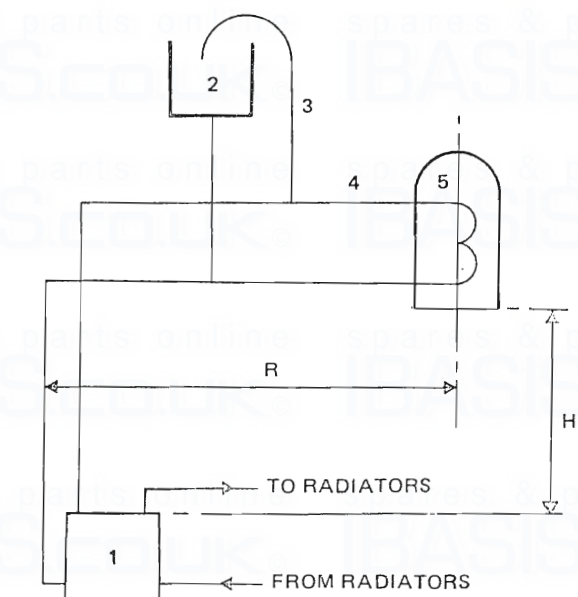


Fig. 3

**BOILER DIMENSIONS
and WATER CONNECTIONS**



LEGEND:

1. Heat Exchanger
2. Cold Feed
3. Vent 22mm Pipe
4. 28mm Pipe
5. Cylinder

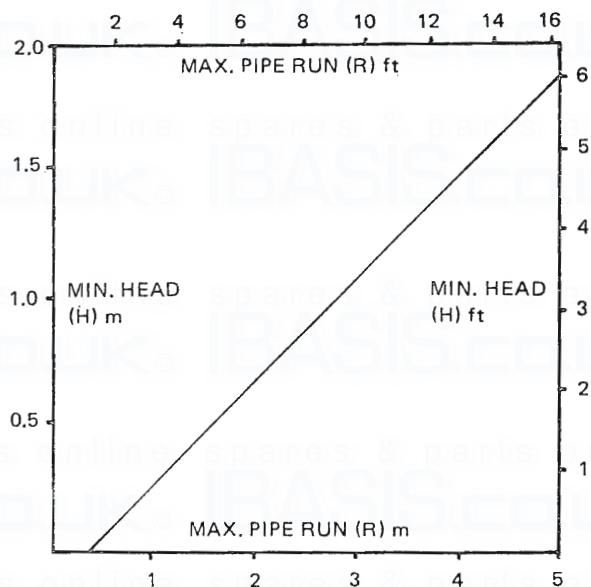


Fig. 4

**GRAPH –
Schematic Pipework**

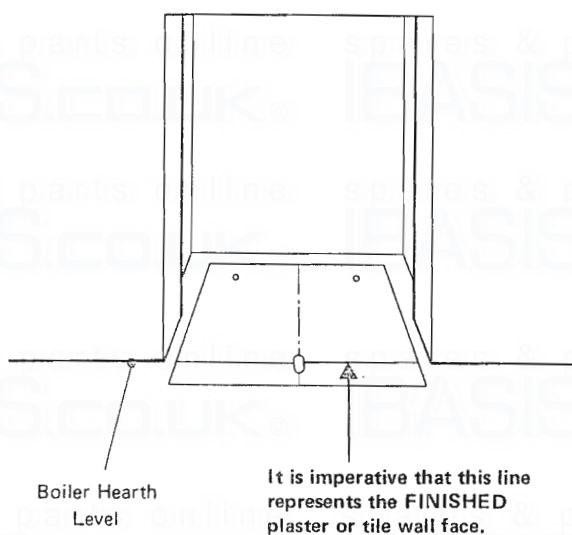


Fig. 5

BOILER FLOOR TEMPLATE

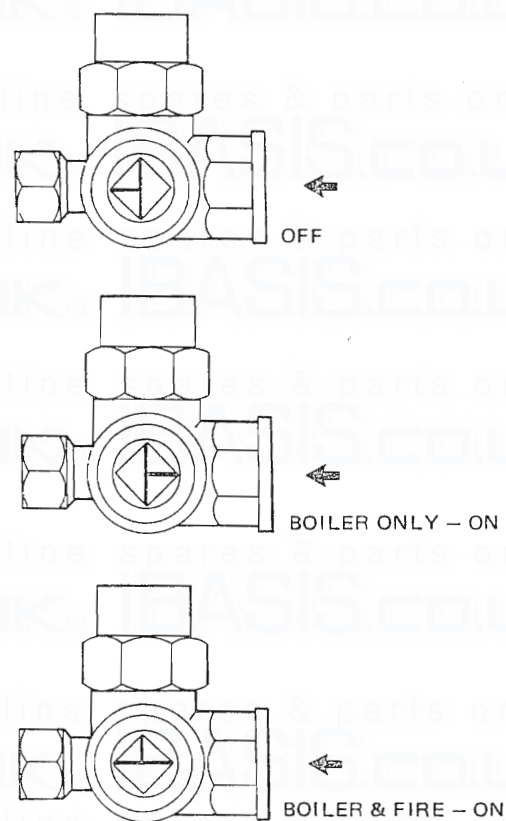


Fig. 6

THREE-WAY GAS COCK

INSTALLATION

If the chimney has been in previous use with a solid fuel, gas or oil burning appliance — have it swept thoroughly and inspected.

Take out the firebrick, if fitted, from the builder's recess.

Any register plate, restrictor, damper, etc., in the flue should be removed. In cases where removal is not possible without structural work being carried out, the plate, damper, etc., may be left in the flue, provided that it is secured in the fully open position.

Remove all debris, and rubble, from the recess.

Measure the recess and, if necessary, open up to the minimum dimensions required.

If using a tiled surround, check for suitability.

Check the floor level of the recess and, if necessary, make up to the required level — refer page 4: Installation Requirements, and Fig. 2.

Unpack the boiler carton and remove the boiler from the wooden base.

A template, for positioning the boiler in the opening, is included in the carton.

Mark a centre line in the recess — from the front finished face to the rear.

When positioning the boiler floor template it is imperative that the finished face line marked on the front of the boiler floor template is in line with the FINISHED plaster or tile face.

Using the boiler template provided, mark off the positions of the two fixing screws for securing the appliance in the recess. Full instructions for this operation are printed on the template.

Drill the marked holes, and plug the holes in the recess with the plugs provided in the hardware pack, — refer Fig. 5.

If the gas supply is from the left, then the pipe must be brought across the back of the opening (BEHIND the boiler), and then forward in order to make the necessary connection to the three-way gas cock on the right hand side of the boiler, as shown in Fig. 6.

Where necessary, line the flue, terminating the lower end of the liner 530mm (20 7/8in) ABOVE the finished boiler hearth level. Fit the flue outlet terminal and make good. Fit, and seal, a plate at the base of the chimney. Note position of flue — refer Fig. 3. Under NO circumstances lift the boiler by the gas manifold.

The diverter may be removed for access to the flow connections.

Undo the two screws, holding the downdraught deflector to the diverter, undo the two M8 nuts, holding the diverter to the heat exchanger end panels. Lift off the diverter and place on one side, in an upside down position, in order not to damage the protruding baffle.

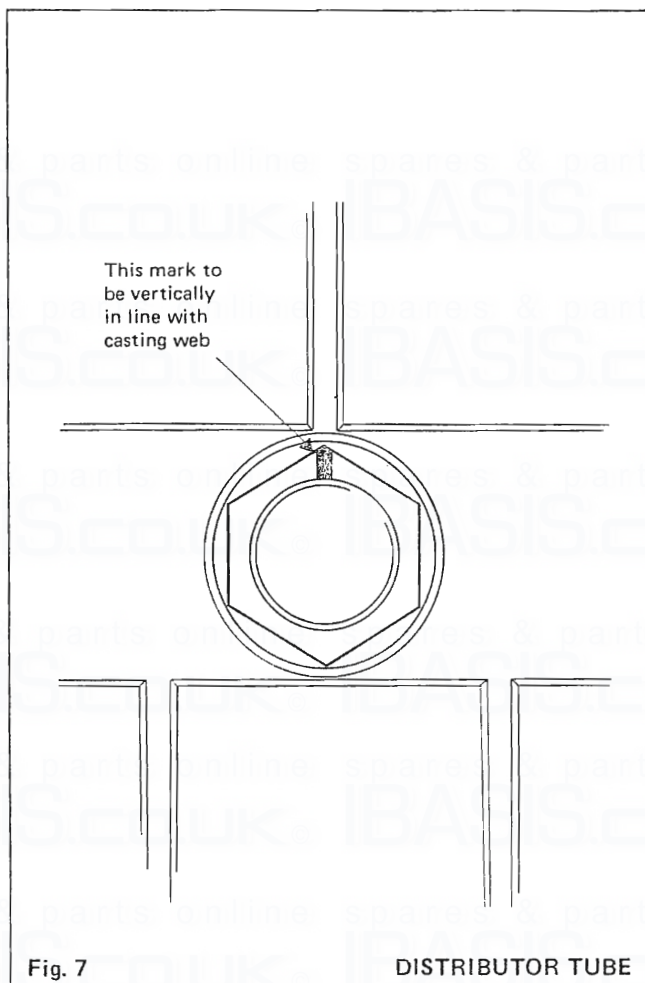
Unclip the gas valve lead from the deflector. Remove the deflector by slackening the two screws holding it to the front plate. Retain for use later.

Choose the boiler tappings suitable for the system to be used, bearing in mind the requirements given under the heading 'Water Circulation System'.

Remove the distributor tube from the hardware pack, previously attached to the deflector. Screw the tube home, with the vertical web cast on the boiler end plate in alignment with the index mark on the distributor tube bushing, refer Fig. 7.

Discard the tube if there is no pumped circuit.

Tightly plug any tappings not used with the plugs provided



in the hardware pack, and an approved jointing compound.

Position the boiler in the opening, and secure the boiler to the floor with the 1 1/2in. x No. 10 screws provided.

Fit the gas pipe to the three-way gas cock, at the right hand side of the boiler.

All water connections to the boiler can now be installed.

Where water pipes run within the chimney recess, they should be suitably sleeved or protected — e.g. coated or wrapped with PVC tape.

It is IMPORTANT that NO pipes cross the boiler where the diverter will be fitted.

Replace the diverter on to the boiler by pushing the liner up and fitting it into the diverter socket. Fasten the diverter to the boiler with the two M8 nuts and bolts previously removed. Secure the liner to the socket by tightening the two self-tapping screws provided in the flue socket. Seal securely between the liner and the socket, with approved fire cement.

The area around the builder's opening will now need to be made good, (refer Fig.2), if not already done.

It is now necessary to open the top of the fire carton, and take out the separate pack, containing the fire surround, and also the fire installation instructions. In these instructions — refer to the section 'Installation' : (1) : Fire Surround and Boiler Control Box.

ELECTRICAL CONNECTION

The appliance MUST be efficiently earthed.

A mains supply of 220/240 volts, 50 Hz, A.C., Single Phase, is required.

ALL external controls, and associated wiring, MUST be suitable for mains voltage. Wiring should be in three-core, PVC insulated, cable, NOT less than 24/0.2mm. Wiring external to the boiler MUST be in accordance with the I.E.E. Regulations, and any Local Regulations which apply.

The method of connection to the mains electricity supply should facilitate complete electrical isolation of the boiler, preferably by the use of a fused plug and shuttered socket outlet. Should such a plug be used for connection to the mains, it MUST be of three-pin type, wired as shown in Fig.8, fused at 3 amp, and complying with the requirements of BS.1363. Alternatively, a fused double-pole switch, or fused spur box, serving ONLY the boiler, may be used.

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

For the correct operation of the appliance, it is IMPERATIVE that the supply polarity at the gas valve is correct – refer to 'Fault Finding', relevant the checking of supply polarity.

INTERNAL WIRING

—refer Figs. 9–12

For 'B', 'EL' and 'E' Fires ONLY:

Remove the control box heatshield.

Remove the front of the control box to gain access to the internal wiring, by unfastening the two screws – one at the left hand side and one underneath the box.

The schematic internal wiring of the control box is illustrated by Figs. 9 & 10.

A wiring diagram is also fitted to the control box front.

EXTERNAL CONTROLS

The wiring diagrams, illustrated by Figs. 13–20, cover the systems most likely to be fitted to this appliance. The diagrams each show the additional fuel effect wiring required for the fire variants – in dotted lines.

If a programmer is installed with the Fuel Effect fires, then

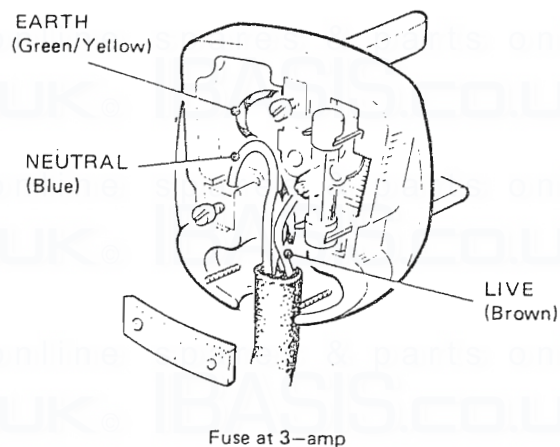


Fig. 8

THREE-PIN PLUG

link L2–L1, in the control box, MUST be removed, and the box wired as shown.

All possible combinations of external controls cannot be illustrated.

Difficulty in wiring up should NOT arise, providing the following directions are observed :

1. Controls that switch the system ON and OFF, e.g. a time switch, MUST be wired in series in the live mains lead to the boiler.
2. Controls that over-ride an ON/OFF control, e.g. a frost

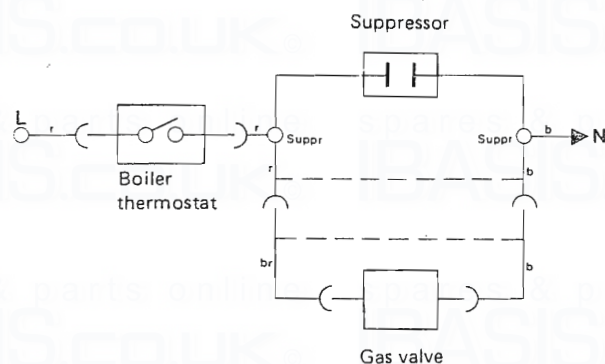


Fig. 9

INTERNAL WIRING – Flow

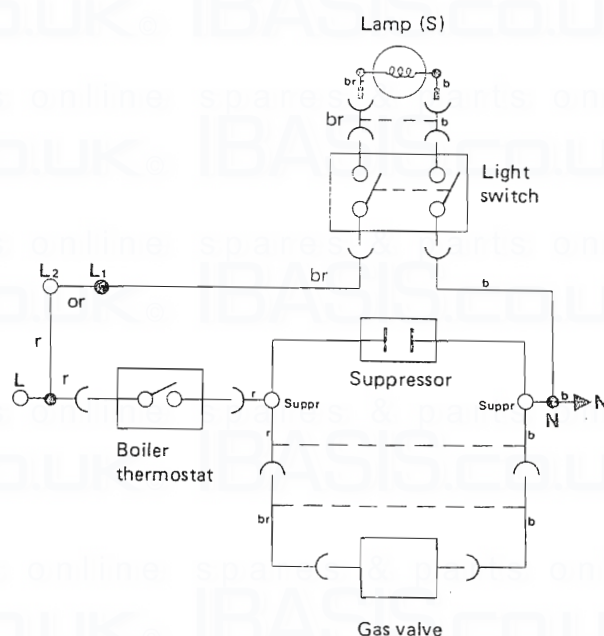
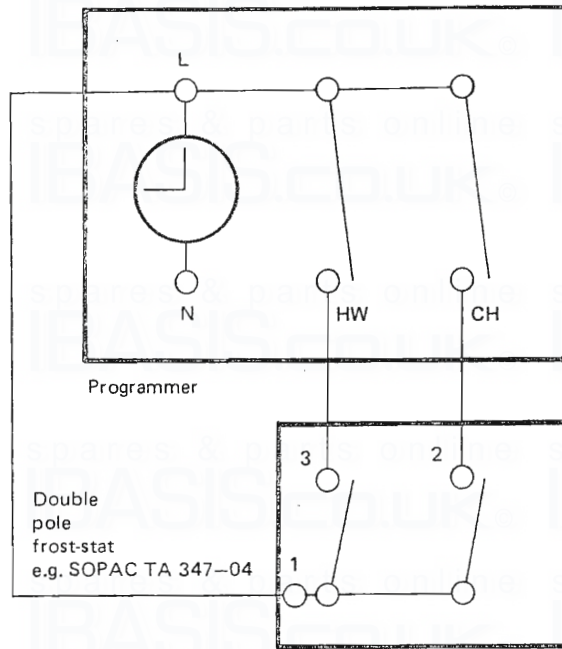


Fig. 10

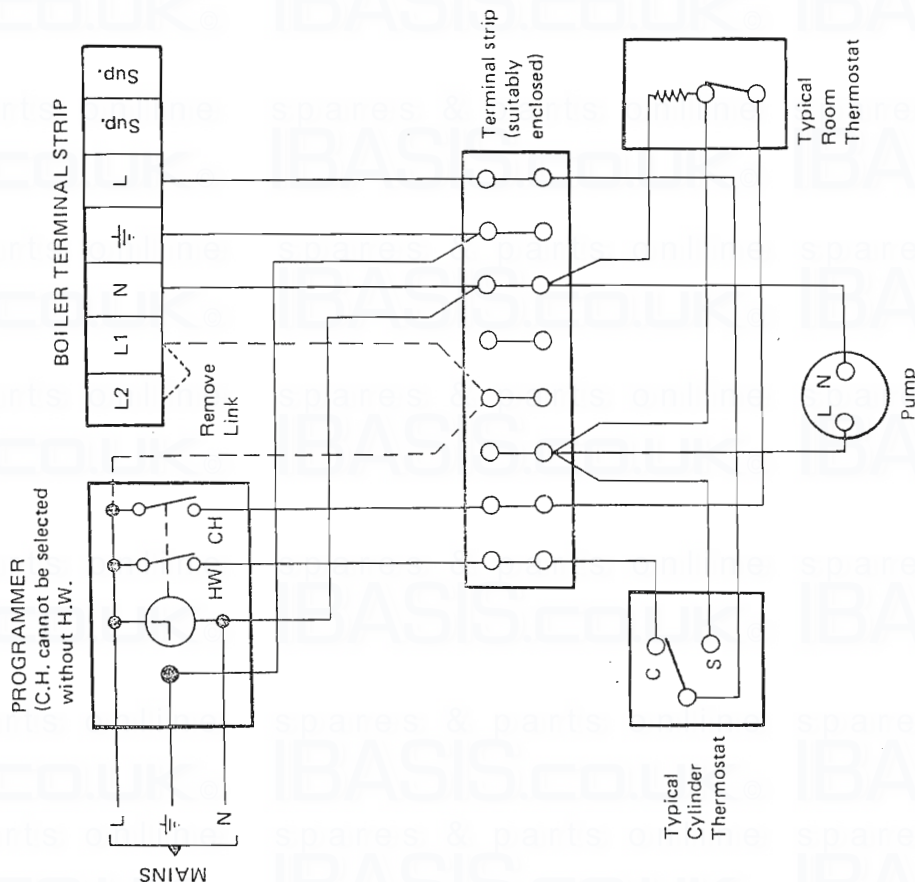
INTERNAL WIRING – Flow



THE FROST STAT SHOULD BE WIRED TO THE PROGRAMMER AS SHOWN,
WITHOUT DISTURBING OTHER WIRING

Fig. 13

DOUBLE POLE FROST STAT WIRED TO PROGRAMMER



NOTES:

1. Some earth wires are omitted for clarity.
ENSURE PROPER EARTH CONTINUITY WHEN WIRING.
2. If cylinder thermostat not used, delete all wiring to it, but link Programmer HW to boiler L terminal.
3. Wiring shown dashed is only necessary for fuel effect fires.
In such cases, the ORANGE link L2-L1 should be removed.

Fig. 14

GRAVITY H.W. PUMPED C.H.

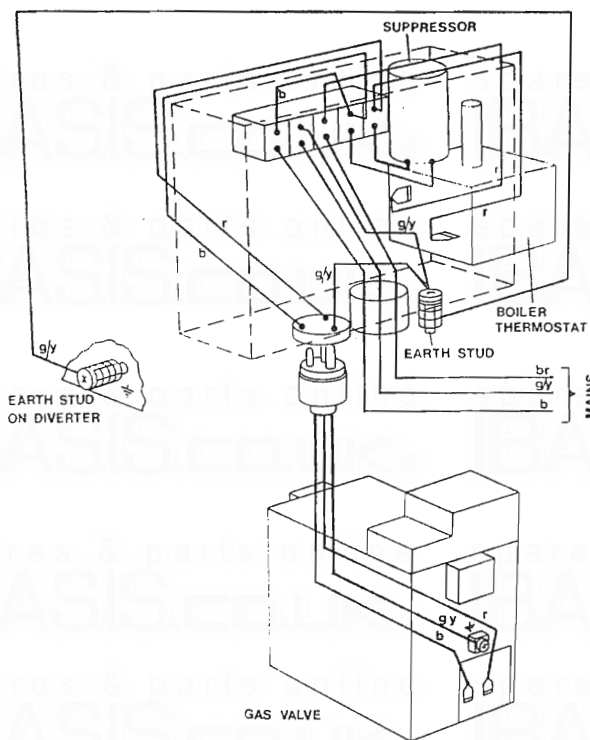


Fig. 11

INTERNAL WIRING —
Pictorial

thermostat, MUST be wired into the mains lead in parallel with the control(s) to be over-riden — refer Fig. 13.

3. Controls that switch the circulating pump only ON and OFF, e.g. a room thermostat, MUST be wired in series with the pump, in the live pump lead.
4. If a proprietary system is used, follow the instructions supplied by the Manufacturers.

It is preferable that the mains lead comes from the right of the builder's opening.

If it does come from the left hand side, position the cable AWAY from hot surfaces, by running it across the front of the front plate extension, using the cable clips provided — refer Fig. 1.

For a cable entering from the right hand side, use the right hand clip provided.

Ensure the cable is safely positioned AWAY from the hot surfaces in the recess, BEFORE reaching the cable clips on the boiler.

Run the main lead from the right hand cable clip up, and through, the gland nut in the bottom of the control box, and into the terminal strip at the marked position.

The earth wire of the mains cable should be made LONGER than the live and neutral conductors when attaching to the terminal strip.

Tighten the gland on to the lead.

Replace the control box front and plug in the lead from the gas valve to the control box.

Secure the earth lead to the stud provided on the lower right hand side of the diverter.

For 'B', 'EL' and 'E' Fires ONLY :

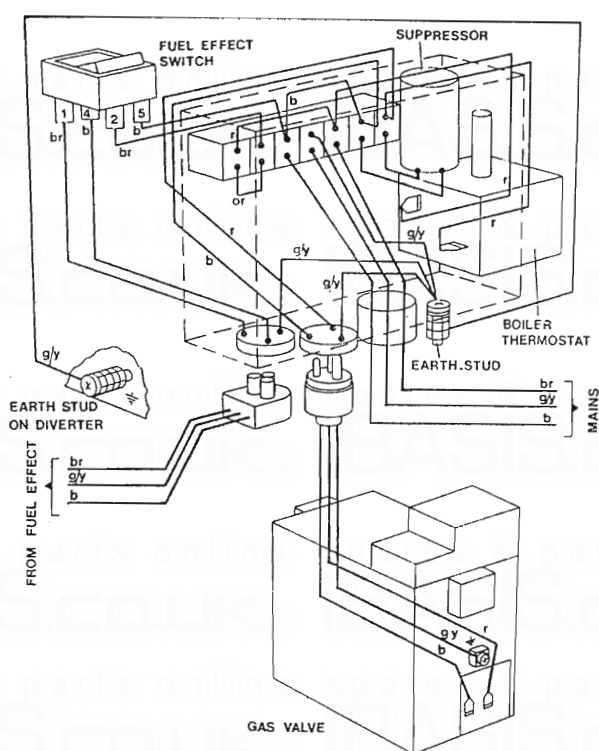


Fig. 12

INTERNAL WIRING —
Pictorial

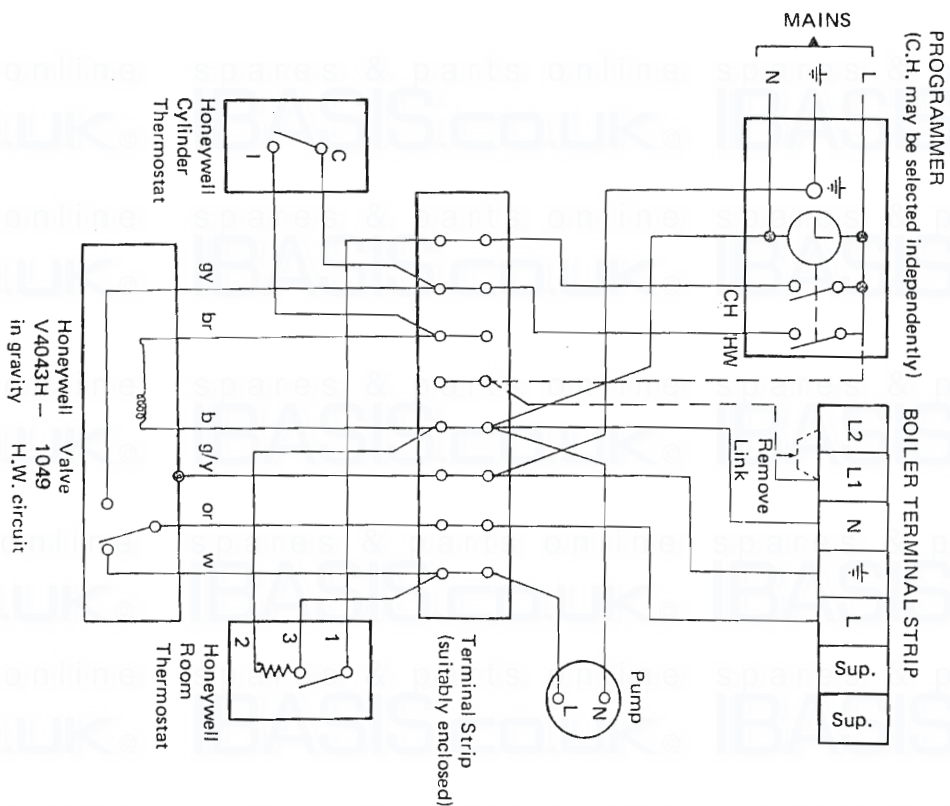
Replace the control box heatshield.

Advice on required modifications to the wiring may be obtained from the component Manufacturers.

Note:

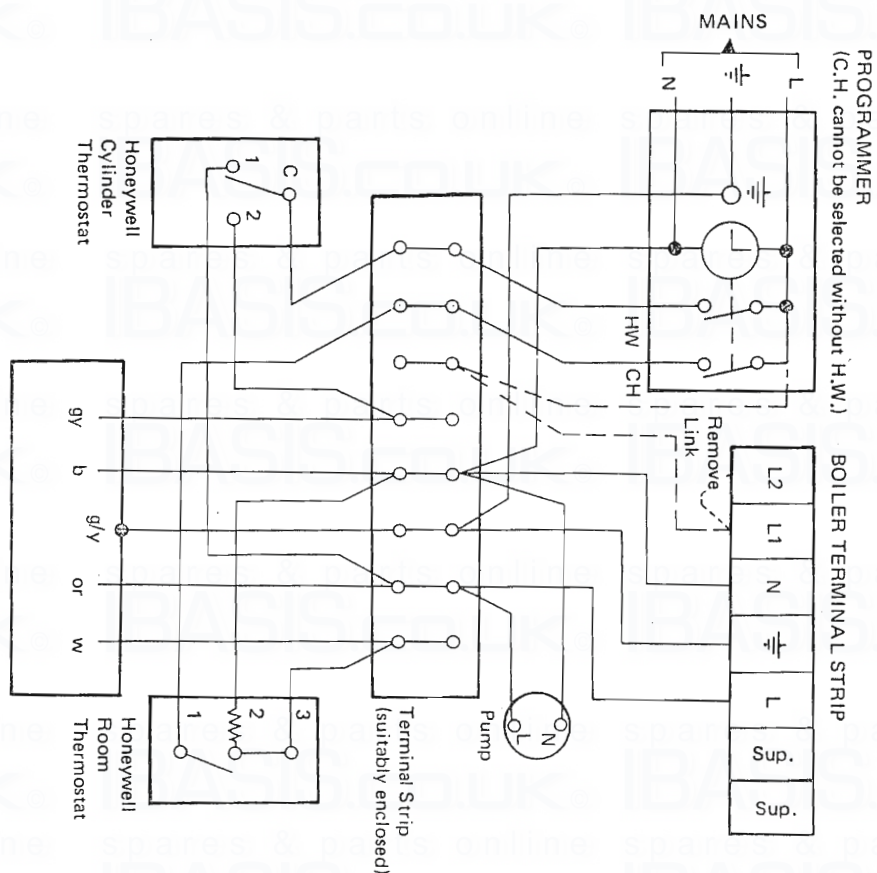
1. Connections between the frost thermostat and time control should be made without disturbing other wiring.
2. The frost thermostat should be sited in a cool place in the house, but where it can sense heat from the system.
3. In cold weather, the boiler should be turned OFF at the time over-ride switch ONLY.

All other switches, including the mains supply and the boiler thermostat, MUST be left in the running position.



GRAVITY H.W.
HONEYWELL 'C' Plan

Fig. 15



FULLY PUMPED SYSTEM
HONEYWELL 'Y' Plan

Fig. 16

NOTES:

1. Some earth wires are omitted for clarity.
ENSURE PROPER EARTH CONTINUITY WHEN WIRING.
2. Numbering of terminals on thermostats applies only to the Manufacturer mentioned.
3. This is a fully controlled system — set the boiler thermostat to MAXIMUM.
4. Wiring shown dashed is only for fuel effect fires.
In such cases, the ORANGE link L2—L1 should be removed.

NOTES:

1. Some earth wires are omitted for clarity.
ENSURE PROPER EARTH CONTINUITY WHEN WIRING.
2. Numbering of terminals on thermostats applies only to the Manufacturer mentioned.
3. This is a fully controlled system — set the boiler thermostat to MAXIMUM.
4. Wiring shown dashed is only necessary for fuel effect fires.
In such cases, the ORANGE link L2—L1 should be removed.

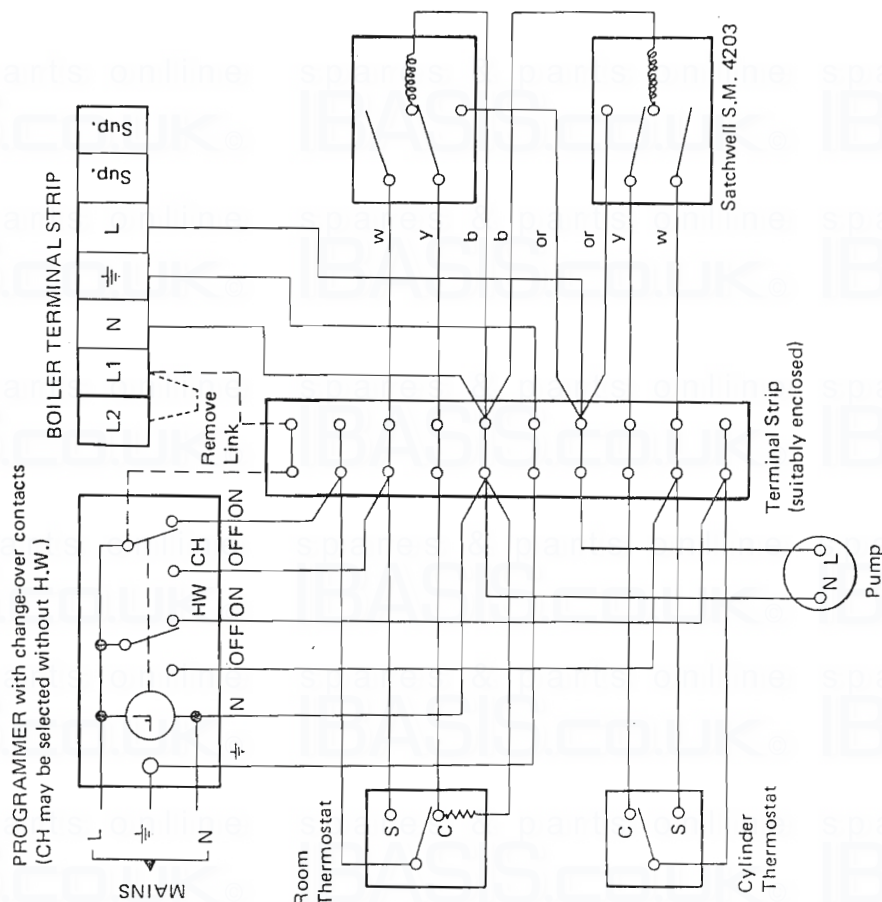


Fig. 17

FULLY PUMPED SYSTEM – Two Motorised Valves

NOTES:

1. Some earth wires are omitted for clarity.
2. ENSURE PROPER EARTH CONTINUITY WHEN WIRING.
3. This is a fully controlled system – set the boiler thermostat to MAXIMUM.
4. SATCHWELL SM.4203 valves illustrated. Other makes may require auxiliary contacts to be separately energised.
4. Wiring shown dashed is only necessary for fuel effect fires. In such cases, the ORANGE link L2–L1 should be removed.

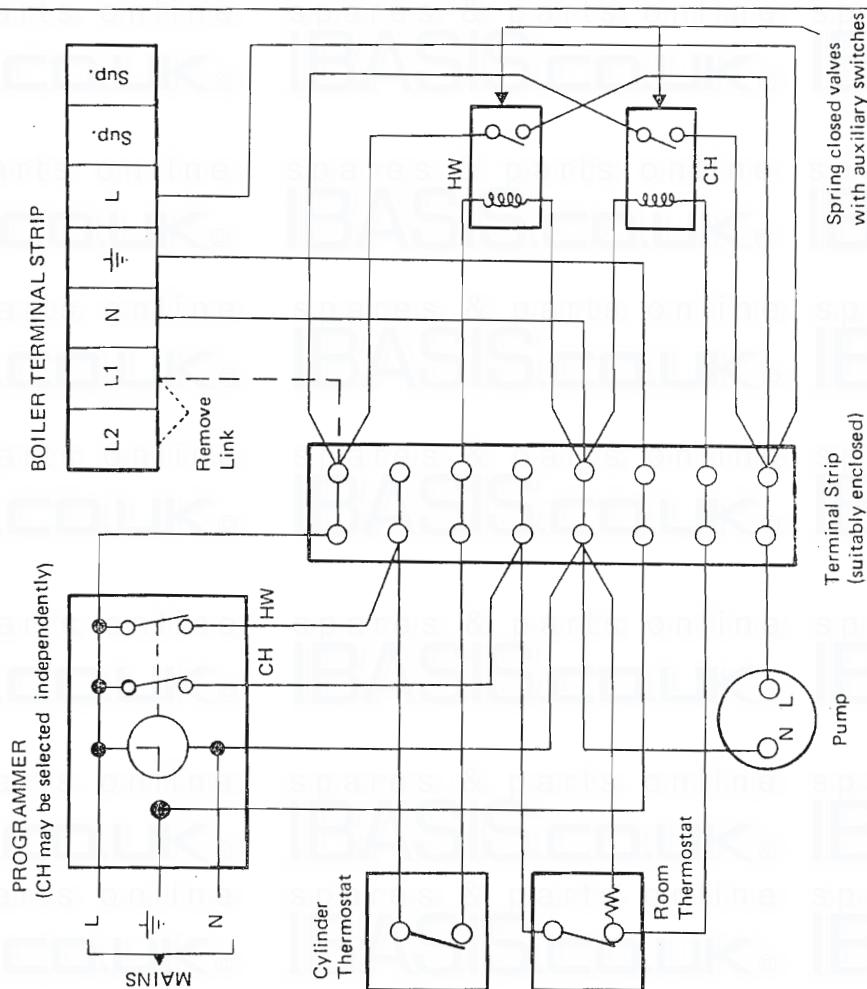
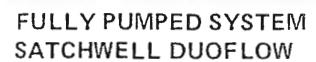


Fig. 18

FULLY PUMPED SYSTEM – Two Spring Return Valves

NOTES:

1. Some earth wires are omitted for clarity.
2. ENSURE PROPER EARTH CONTINUITY WHEN WIRING.
3. This is a fully controlled system – set the boiler thermostat to MAXIMUM.
3. Wiring shown dashed is only necessary for fuel effect fires. In such cases, the ORANGE link L2–L1 should be removed.



PROGRAMMER with change-over contacts
(CH may be selected independently)

BOILER TERMINAL STRIP

FULLY PUMPED SYSTEM
DRAYTON FLOWSTAT

The diagram illustrates the electrical wiring for a fully pumped system using a Drayton Flowstat. The components and their connections are as follows:

- Programmer:** Features a 'Mains' switch (L, N), a 'CH' (Central Heating) selector switch, and an 'OFF' position. It also includes a 'Remove Link' terminal.
- Boiler Terminal Strip:** Contains terminals for L2, L1, N, a ground symbol, L, Sup. (Supply), and another Sup. terminal.
- Cylinder Thermostat (CS1):** A two-terminal device connected to the L and N terminals of the boiler terminal strip.
- RB2 Relay:** A multi-terminal relay with terminals labeled 1 through 8, A, B, and bk. It is connected to the CH and OFF contacts of the programmer, the 'Remove Link' terminal, and the L and N terminals of the boiler terminal strip.
- TA/M4 Valve:** A four-terminal valve connected to terminals 1, 2, 3, and 4 of the RB2 relay, and terminals A, B, and bk of the cylinder thermostat.
- RTM or RTM Room Thermostat:** A two-terminal device connected to terminals 5 and 6 of the RB2 relay.

Wiring Details:

- The 'Mains' switch (L, N) is connected to the L and N terminals of the boiler terminal strip.
- The 'CH' contact of the programmer is connected to terminal 1 of the RB2 relay.
- The 'OFF' contact of the programmer is connected to terminal 2 of the RB2 relay.
- The 'Remove Link' terminal is connected to terminal 3 of the RB2 relay.
- The L and N terminals of the boiler terminal strip are connected to terminals 4 and 5 of the RB2 relay, respectively.
- The L and N terminals of the boiler terminal strip are also connected to the L and N terminals of the TA/M4 Valve.
- The L and N terminals of the boiler terminal strip are connected to terminals 6 and 7 of the RB2 relay, respectively.
- The L and N terminals of the boiler terminal strip are connected to terminals 8 and 9 of the RB2 relay, respectively.
- The L and N terminals of the boiler terminal strip are connected to terminals A and B of the cylinder thermostat, respectively.
- The L and N terminals of the boiler terminal strip are connected to terminals 1 and 2 of the TA/M4 Valve, respectively.
- The L and N terminals of the boiler terminal strip are connected to terminals 3 and 4 of the TA/M4 Valve, respectively.
- The L and N terminals of the boiler terminal strip are connected to terminals 5 and 6 of the TA/M4 Valve, respectively.
- The L and N terminals of the boiler terminal strip are connected to terminals 7 and 8 of the TA/M4 Valve, respectively.
- The L and N terminals of the boiler terminal strip are connected to terminals 9 and 10 of the TA/M4 Valve, respectively.

Fig. 20

COMMISSIONING AND TESTING

ELECTRICAL INSTALLATION

Checks to ensure electrical safety should be carried out by a competent person.

In the event of an electrical fault after the installation of the appliance, preliminary electrical system checks shall be carried out, i.e. earth continuity, polarity and resistance to earth — as described in the British Gas Multimeter book.

GAS INSTALLATION

The whole of the gas installation, including the meter, should be inspected, and tested, for soundness, and should be purged in accordance with the recommendations of CP. 331, Pt. 3.

Purging air from the gas installation may be expedited by turning the three-way gas cock so that gas will pass to the boiler only, loosening the union on the inlet gas cock and purging until gas is smelled. Retighten the union and check for gas soundness.

WARNING:

Whilst effecting the required gas soundness test, and purging air from the gas installation, open all windows and doors, extinguish naked lights and DO NOT SMOKE.

WATER CIRCULATING SYSTEM

The whole of the system should be thoroughly flushed out with cold water WITHOUT the pump in position.

Ensure that all valves are open.

With the pump fitted, the system should be filled and airlocks cleared.

Check for water soundness.

INITIAL LIGHTING OF BOILER

— Refer Fig. 21

The inlet gas cock must have been OFF for at least three minutes before initiating the lighting sequence.

Check that all drain cocks are closed, and that stop valves in the flow and return lines are open.

Undo the hexagon set screw in the burner pressure test nipple (A) and connect a gas pressure gauge via a flexible tube.

Check that the inlet gas cock is turned ON to the boiler only, and that the boiler thermostat control knob is at OFF.

Switch ON the mains electrical supply and check that any external controls, which may be included in the system, are ON.

Turn the boiler thermostat knob to position VI.

By looking through the sight glass (C), observe that the spark ignites the pilot burner. A sensor probe, mounted in the pilot burner bracket, will sense the flame.

It may be necessary to go through the ignition sequence several times before the valve is purged of air.

Should the pilot burner fail to ignite, turn the boiler thermostat knob to OFF and wait for three minutes.

The lighting sequence can then be initiated again by turning the thermostat knob to position VI.

The main burner will light from the pilot burner at a low rate, (less than 5 mbar (2in.w.g.) burner setting pressure), a short period after the pilot flame is established.

The gas rate will then steadily increase to full rate, over a period of up to two minutes.

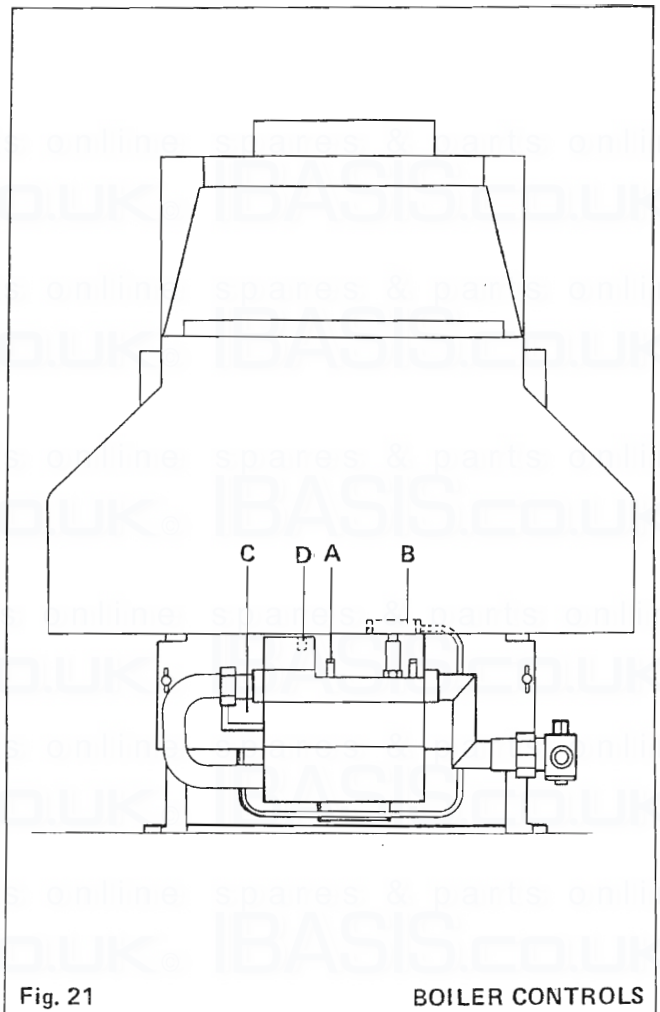


Fig. 21

BOILER CONTROLS

It is IMPORTANT to operate the boiler for ten minutes to stabilise the burner temperature.

Test for gas soundness around the boiler gas components using leak detection fluid.

Pilot Adjustment

With the pilot burner only operating at the start of the ignition sequence, check that the pilot burner flame covers 12mm ($\frac{1}{2}$ in) of the sensor probe tip.

To adjust, remove the cover from the end of the restrictor (B) and turn the adjustment screw in the restrictor ANTI-CLOCKWISE to INCREASE the flame, or CLOCKWISE to DECREASE the flame.

Check the burner setting pressure against the values quoted in Table 2.

Main Burner Adjustment

Remove the protective cap and turn the adjusting screw (D) CLOCKWISE to INCREASE the burner setting pressure and ANTI-CLOCKWISE to DECREASE it.

Replace the protective cap.

Turn the boiler thermostat control knob to OFF.

Remove the gas pressure gauge and tube, and replace the hexagon set screw in the pressure test nipple.

Test for gas soundness around test nipple.

Replace the downdraught deflector plate, using the four screws, two at the top and two at the bottom.

Ensure also that the gas valve lead is secured in the clip fitted to the deflector plate.

GENERAL CHECKS

Make the following checks for correct operation:

1. Check that there is no spillage of products of combustion from the boiler draught diverter, by carrying out a spillage test as detailed in BS.5440:1.

2. Check the operation of the flame failure device in the gas control. The flame failure device must cut off the gas to the burner within 60 seconds.

With the burner alight again, pull the flame detection lead from its terminal at the gas valve. The burner and pilot flames should shut down immediately. Replace the flame detection lead.

3. Turn the boiler thermostat OFF and ON, and check that the pilot burner, and main burner, are extinguished and relit in response.

4. The correct operation of external system controls should be proved. Turn each, in turn, to OFF and ON and check that the main burner, or circulating pump, as the case may be, responds.

5. With the system HOT, examine all water connections for soundness. Then turn OFF the gas, electricity and water supplies to the appliance, and drain down whilst the system is still hot.

In order to complete the flushing process, refill and vent the system, and again check for water soundness.

6. Finally, set the controls to the User's requirements.

The temperatures quoted below are approximate and may vary between installations:

Knob Setting	Flow Temperature	
	°C	°F
I	54	130
II	60	140
III	66	150
IV	71	160
V	77	170
VI	82	180

The boiler is now ready to have the gas fire section of the appliance fitted.

HANDING OVER

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

1. Hand the User's Instructions Publication to the householder and explain his/her responsibilities under the Gas Safety Regulations.
2. Explain, and demonstrate, the lighting and shutting down procedures.
3. The operation of the boiler and the use, and adjustment, of ALL system controls, should be fully explained to the householder, to ensure the greatest possible fuel economy, consistent with household requirements of both heating and hot water consumption. Advise the User of the precautions necessary to prevent damage to the system, and to the building, in the event of the system remaining in-operative during frost conditions.
4. Explain the function, and the use, of the boiler thermostat, and any external controls that may be fitted to the system.
5. Stress the importance of regular servicing by the Local Gas Region, or by a qualified Heating Engineer.

WARNING:

Switch off, and disconnect, the electricity supply, and turn off the inlet gas cock, before servicing the appliance.

A comprehensive service should be carried out at least once a year.

The User is advised to make a contract with the Gas Region, or a qualified Heating Engineer.

In order to service the boiler, the fire will first have to be removed. Reference should be made to the relevant Fire Installation and Servicing Instructions.

When the fire has been removed ('G', 'GL', fires ONLY), also remove the side relief grilles and fire support plate.

Disconnect the gas supply union at the 3-way gas cock.

BURNER

Unplug the gas valve wiring harness from the control box.

Unclip the gas valve lead from the deflector plate.

Remove the two screws holding the downdraught deflector plate to the diverter, and slacken the two screws at the bottom of the deflector.

Remove the deflector.

Remove the wing nuts securing the burner front plate and remove the burner assembly, complete with the gas valve, from the boiler.

Remove the nut securing the burner end cap. The cap may now be levered off with a small screwdriver.

The circular gauze can now be removed from the burner bar.

Clean the gauze to remove any deposits of lint, fluff etc., and brush off any deposits that may have fallen on the burner blades.

Ensure that the flame ports are unobstructed, and remove any debris that may have collected in the boiler body.

Note:

Brushes with metallic bristles must NOT be used.

Inspect the pilot burner and electrodes — ensure that they are clean and in good condition.

In particular, check that :

1. The pilot burner is firmly secured.
2. The ignition and detection electrodes, and leads, are clean, undamaged and secure.
3. The pilot observation window is clean and undamaged.

FLUEWAYS

Remove the complete burner assembly as detailed above.

Remove the two screws holding the front diverter baffle inside the diverter, and withdraw the baffle. Remove the single screw holding the rear diverter baffle in, and withdraw the baffle.

Remove all loose deposits from the heat exchanger, particularly from the flueways formed between the fins, by brushing from above and below.

Sweep the debris from the combustion chamber floor.

Refit the rear baffle, sliding it between the two supports. Refit the front baffle, burner assembly and deflector plate.

Complete the gas and electrical connections.

PILOT BURNER

Light the boiler and check that:

1. The pilot flame impinges on the sensor head, and that the position of the sensor probe, relative to the pilot burner and the main burner, is as shown by Fig. 25.
2. The pilot flame covers 12mm (½in) of the sensor tip.

Remove cap from the restrictor and turn the adjuster screw (B), Fig. 21, ANTI-CLOCKWISE to INCREASE the flame or CLOCKWISE to DECREASE the flame.

After each service, reference should be made to Table 2, which quotes details of the rated output with the related burner setting pressure and heat input.

Any required adjustments should be made by using the burner setting pressure adjustment screw (D), illustrated in Fig. 21.

REPLACEMENT OF COMPONENTS

WARNING:

Always turn off the gas supply, and switch off the electricity supply, before working on the appliance.

Note:

To replace the following components, it will be necessary to remove the fire. Reference should be made to the relevant Fire : Installation and Servicing Instructions.

CONTROL BOX

For 'B', 'EL' and 'E' Fires ONLY

Remove the control box heatshield by removing the screw retaining it to the control box.

Remove the gas valve plug connection, beneath the control box.

Remove the split pin from the thermostat pocket and withdraw the phial and spacer.

Pull off the knob from the shaft.

Remove the control box front by unfastening the two securing screws, one underneath the control box, and one on the left hand side.

Undo the mains connection from the terminal strip, slacken the gland nut and pull the lead through.

Undo the earth lead from the earth stud.

Remove any external connections also.

If a fuel effect fire is fitted, pull off the four electrical connections to the lamp switch.

Undo the two screws holding the control box to the top panel.

Remove the complete control box, fit the replacement and re-assemble in reverse order, ensuring that the thermostat phial spring steel spacer is also correctly refitted.

BOILER THERMOSTAT

For 'B', 'EL' and 'E' Fires ONLY

Remove the control box as detailed under 'Control Box'.

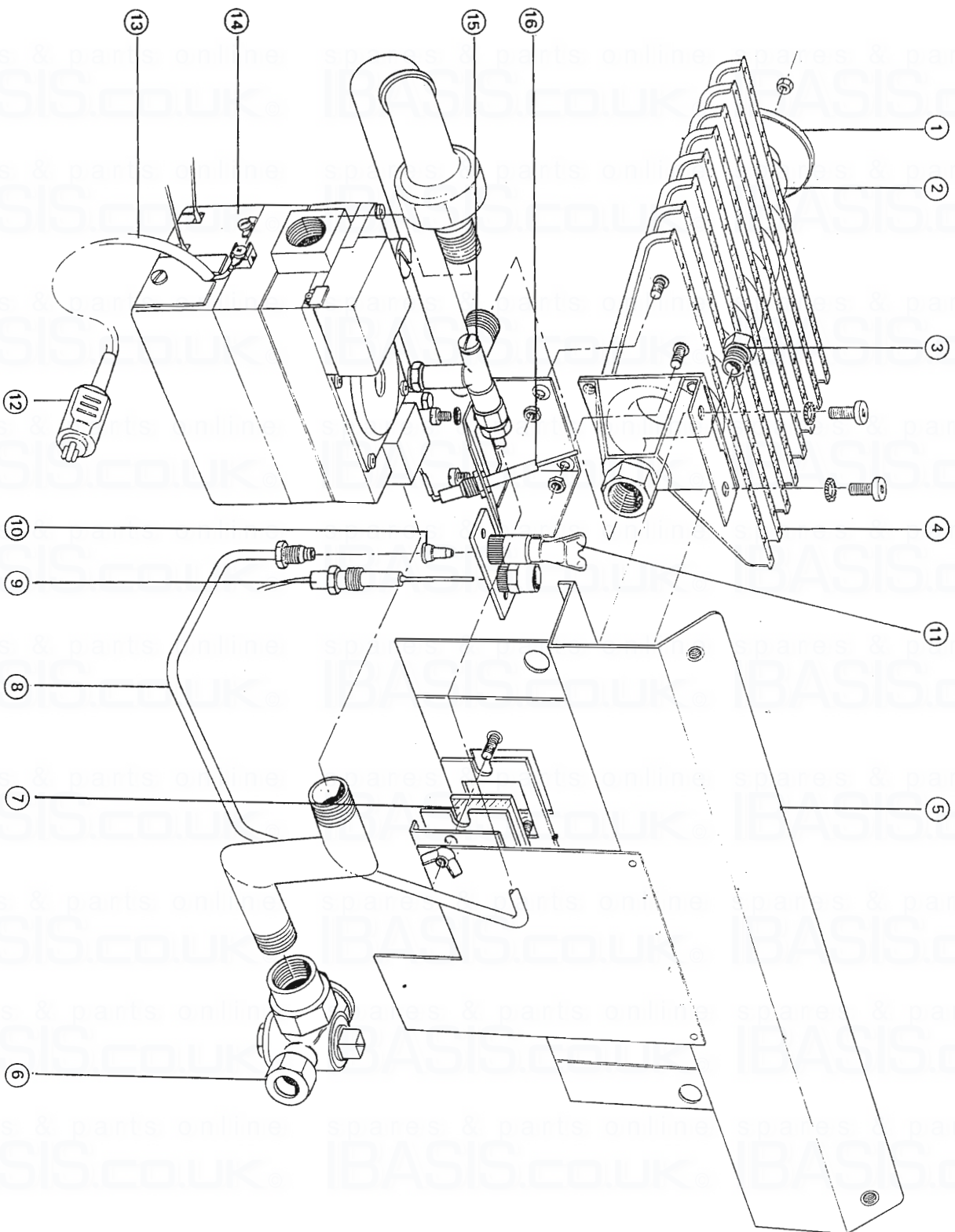
Pull off the two electrical connections to the thermostat head.

Undo the two screws holding the thermostat to the control box.

Remove the thermostat, fit the replacement and re-assemble in reverse order, ensuring that the thermostat phial spring steel spacer is also correctly refitted.

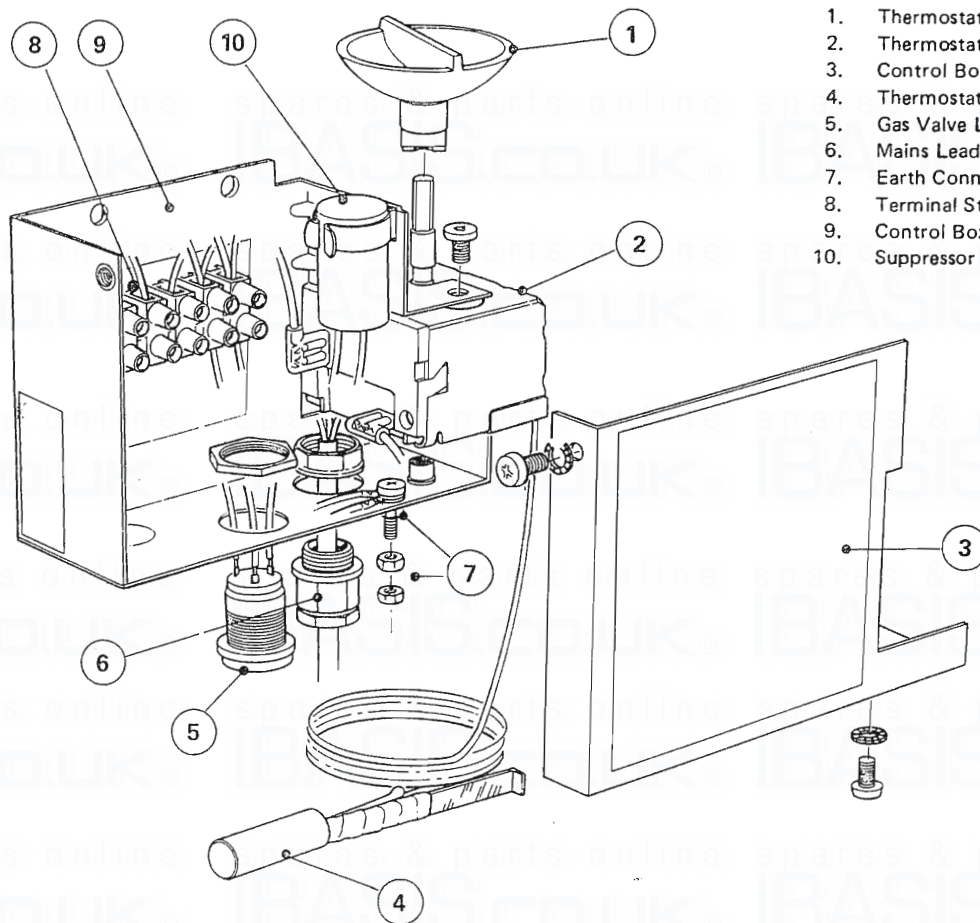
For 'G', 'GL', Fires ONLY

Remove the gas valve plug connection, beneath the control



LEGEND:

1. Burner End Cap
2. Burner Gauze
3. Burner Injector
4. Main Burner
5. Burner Front Plate
6. Gas Cock
7. Sight Glass
8. Pilot Pipe
9. Sensor Electrode
10. Pilot Injector
11. Pilot Burner
12. Mains Plug
13. Mains Lead
14. Gas Valve
15. Pilot Restrictor
16. Spark Electrode

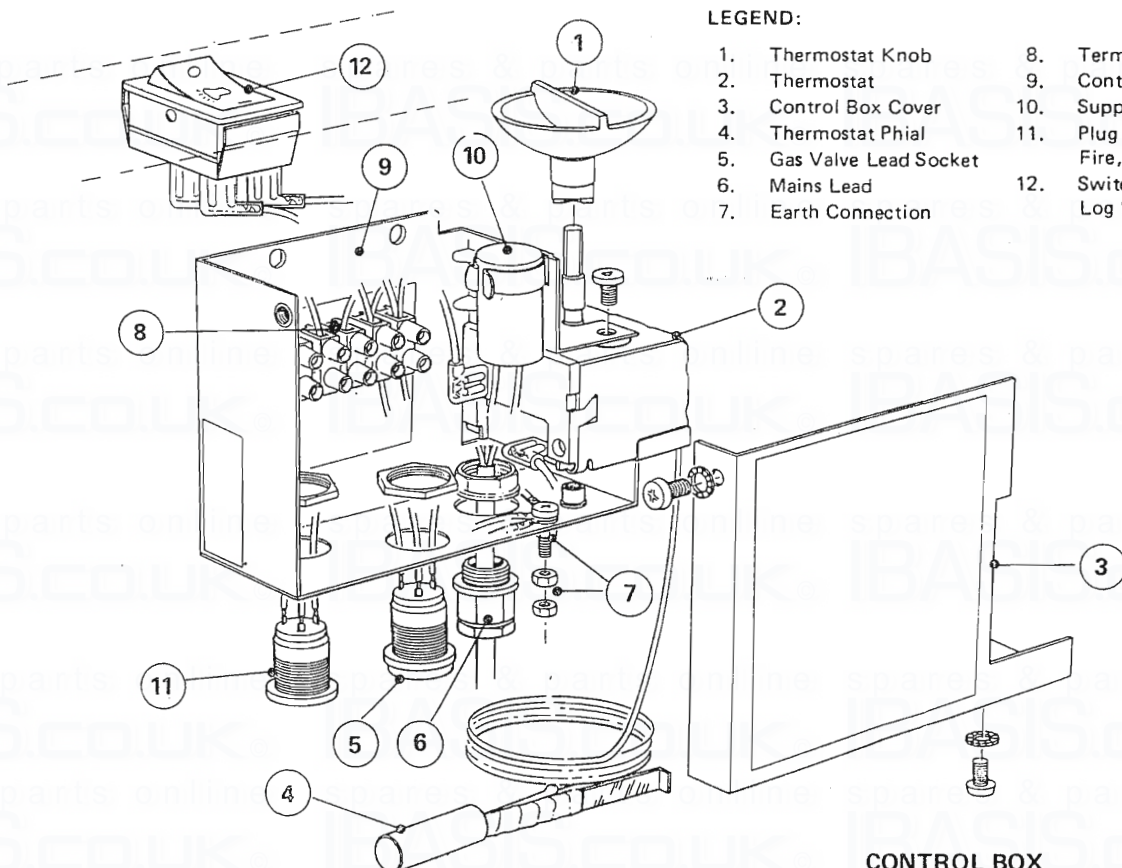


LEGEND:

1. Thermostat Knob
2. Thermostat
3. Control Box Cover
4. Thermostat Phial
5. Gas Valve Lead Socket
6. Mains Lead
7. Earth Connection
8. Terminal Strip
9. Control Box
10. Suppressor

Fig. 23

CONTROL BOX –
Exploded View



LEGEND:

- | | |
|--------------------------|--|
| 1. Thermostat Knob | 8. Terminal Strip |
| 2. Thermostat | 9. Control Box |
| 3. Control Box Cover | 10. Suppressor |
| 4. Thermostat Phial | 11. Plug and Socket – Fire, Log Effect |
| 5. Gas Valve Lead Socket | 12. Switch – Fire, Log Effect |
| 6. Mains Lead | |
| 7. Earth Connection | |

Fig. 24

CONTROL BOX
FUEL EFFECT FIRE – Applications
Exploded View

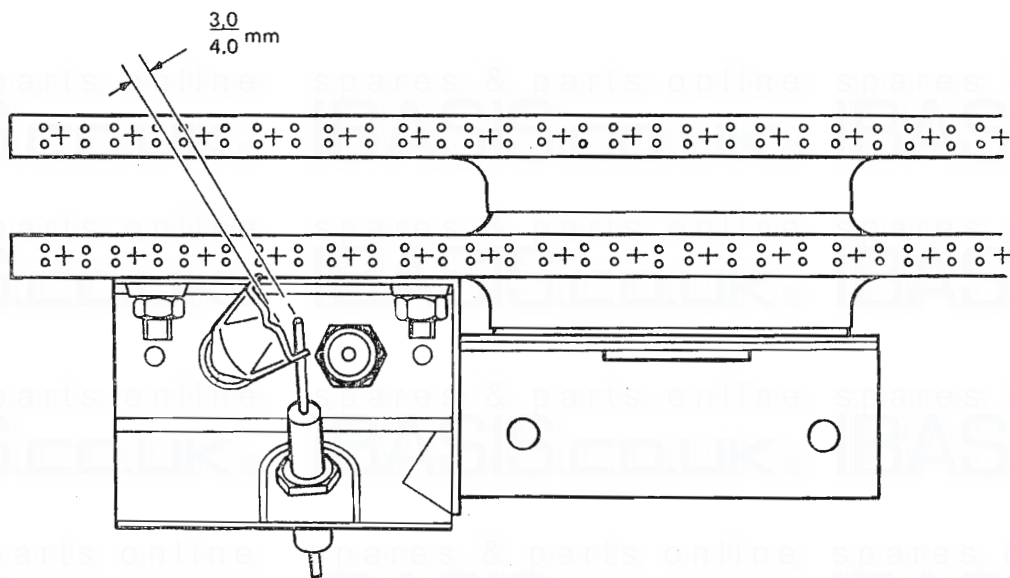


Fig. 25

IGNITION ELECTRODE – Positioning

box.

Remove the split pin from the thermostat pocket, and withdraw the phial and spacer.

Pull off the knob from the shaft.

Remove the control box front by unfastening the two securing screws, one underneath the control box, and one on the left hand side.

Remove the thermostat as detailed for 'B', 'EL' and 'E' fires.

LAMP SWITCH (For Fuel Effect Fires ONLY)

Remove the control box as detailed under 'Control Box'.

Push the two tabs, moulded on to the switch body, TOWARDS the switch and push it out through the top panel.

Re-assemble in reverse order.

IGNITION ELECTRODE

Remove the burner assembly, as detailed under the heading 'Burner' in the Servicing section.

This electrode is fitted in front of the pilot burner.

Unplug the igniter lead from the electrode. Undo the nut securing the electrode to the bracket, and withdraw the electrode.

Fit the replacement electrode and re-assemble in reverse order.

Check that the spark gap is as given in Fig. 25.

FLAME DETECTION ELECTRODE

Remove the burner assembly as detailed under the heading 'Burner' in the 'Servicing' section.

This electrode is fitted opposite the pilot burner.

Remove the electrode by unfastening the nut fixed to the electrode body and unscrewing the complete electrode from the pilot burner bracket.

Fit the replacement electrode and re-assemble in reverse order.

IGNITER LEAD

Unplug the lead from the electrode and the generator.

Remove the lead.

Fit the replacement lead to the electrode and generator.

SIGHT GLASS

Remove the burner assembly, as detailed under the heading 'Burner' in the 'Servicing' section. Unfasten the two wing nuts holding the sight glass assembly to the burner front plate.

When fitting the replacement assembly, MAKE CERTAIN the parts are in correct order, i.e. gasket, glass, gasket and frame.

Retighten the two wing nuts to ensure an airtight seal, but DO NOT OVERTIGHTEN.

PILOT BURNER

Remove the burner assembly as detailed under the heading 'Burner' in the 'Servicing' section.

Remove the burner assembly by unfastening the two securing screws.

Unfasten the pilot pipe connections at the gas valve and the pilot burner.

Pull off the igniter lead from the electrode.

Unscrew the sensor electrode from the pilot burner.

Undo the nut securing the ignition electrode, and remove the electrode.

Unfasten the two screws holding the pilot burner to the bracket. Retain the screws and washers.

Remove the pilot burner from the bracket.

Fit the new pilot burner, with the cutout in the base TOWARDS the main burner, ensuring that the pilot injector is in position when refitting the pilot pipe.

Re-assemble in reverse order.

PILOT RESTRICTOR

Unfasten the pilot pipe fitting at the restrictor.

Remove the restrictor and adapter from the gas valve and fit the adapter to the new restrictor.

Fit the replacement restrictor complete with adapter to the

gas valve, and reconnect the pilot pipe fitting.

GAS VALVE COMPLETE

Unplug the gas valve lead from the control box and unclip the gas valve lead from the deflector plate.

Remove the downdraught deflector plate by unfastening the two screws at the top, in the diverter, and the two screws at the bottom, above the burner front plate.

Undo the pilot pipe fitting at the restrictor.

Unplug the electrode leads from the gas valve base.

Undo the screw holding the mains lead cover to the base, and remove the cover.

Unplug the two electrical connections.

Unscrew the earth connection from the valve body.

Undo the union at the three-way gas cock and the union in the gas line after the valve, and remove the valve.

Remove the inlet and outlet gas pipes and fit them to the replacement valve, ensuring that the alignment mark on the inlet gas pipe is in line with the arrow on top of the gas valve — use an approved jointing compound.

WARNING:

When fitting the inlet and outlet pipes to the replacement valve, CARE MUST BE TAKEN to avoid damaging the plastic control module on the bottom of the valve.

Remove the restrictor and adapter from the valve and fit to the replacement valve.

Fit the replacement gas valve in reverse order, ensuring that the mains connection and ignition/detection leads are fitted correctly.

Refer to Table 2 for details of rated output and the related burner setting pressure and heat input.

Any required adjustments should be made using the burner setting pressure adjustment screw (B), illustrated in Fig. 21.

Replace the downdraught deflector baffle.

GAS VALVE — LESS Ignition Control Module

Remove the gas valve, as detailed under 'Gas Valve Complete'.

Place the valve on its side on a flat surface.

Slacken the two screws, one at each end of the valve, which hold the ignition control module to the base of the valve.

The module may now be carefully separated from the valve and placed alongside.

The cover inside the module may be removed by lightly pushing the module sides apart.

Unplug the wiring harnesses from the module.

Fit the new gas valve to the control module in reverse order, taking care NOT to trap the wires.

Remove the inlet and outlet pipes from the old valve and fit them to the new valve, ensuring that the alignment mark on the inlet gas pipe is in line with the arrow on top of the gas valve — use an approved jointing compound.

WARNING:

When fitting these pipes to the replacement valve, CARE MUST BE TAKEN to avoid damaging the plastic control module on the bottom of the valve.

Remove the restrictor and adapter from the valve and fit to the replacement valve.

Fit the replacement gas valve, now complete, in reverse order, ensuring that the mains connection and ignition/detection leads are fitted correctly.

Refer to Table 2 for details of rated output and the related burner setting pressure and heat input.

Any required adjustments should be made using the burner setting pressure adjustment screw (B), illustrated in Fig. 21.

Replace the downdraught deflector baffle.

IGNITION CONTROL MODULE

Remove the gas valve, as detailed under 'Gas Valve Complete'.

Place the valve on its side on a flat surface.

Slacken the two screws, one at each end of the valve, which hold the ignition control module to the base of the valve.

The module may now be carefully separated from the valve and placed alongside.

The cover inside the module may be removed by lightly pushing the module sides apart.

Unplug the wiring harness from the module.

Take the new control module and remove the inside cover by lightly pushing the sides of the module apart.

Plug the wiring harness from the valve into the new module and replace the inside cover, taking care NOT to trap the wires.

Re-assemble in reverse order.

Fit the replacement gas valve, now complete, to the boiler, in reverse order, ensuring that the mains connection and ignition/detection leads are fitted correctly.

Refer to Table 2 for details of rated output and the related burner setting pressure and heat input.

Any required adjustments should be made using the burner setting pressure adjustment screw (D), illustrated in Fig. 21.

Replace the downdraught deflector baffle.

MAIN BURNER

Remove the burner assembly, as detailed under the heading 'Burner' in the 'Servicing' section.

Remove the front plate and pilot burner as described under 'Pilot Burner'.

Undo the two nuts holding the pilot burner bracket to the burner, and remove.

Remove the burner injector from the burner.

Unscrew the main burner from the gas pipe, using the hexagon at the front of the burner.

Fit the new burner in reverse order, being CAREFUL not to damage the main burner injector.

Replace the downdraught deflector baffle.

IMPORTANT

Use an approved jointing compound when replacing the main burner injector, the main burner, or gas valve.

FAULT FINDING

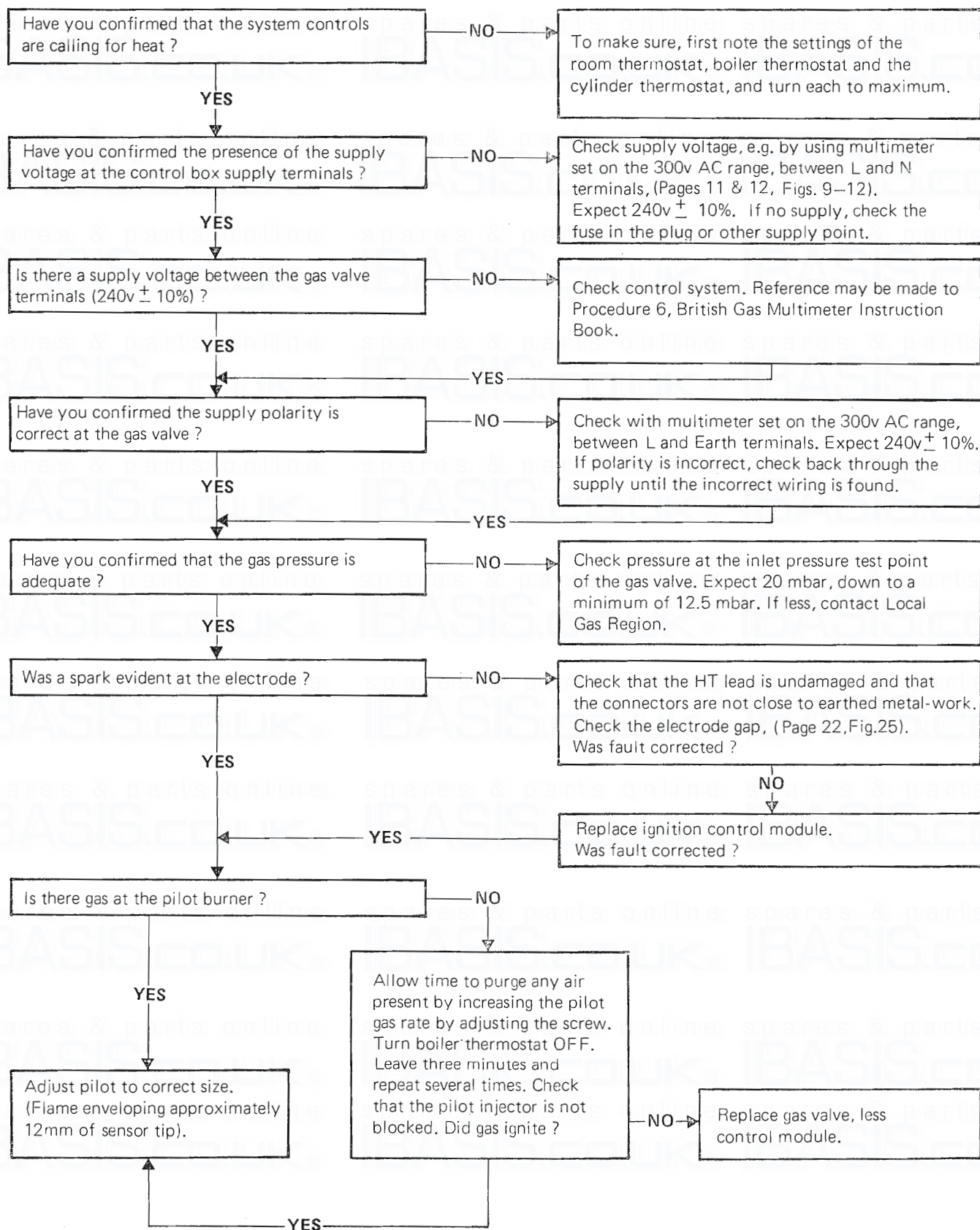
Before attempting any electrical fault finding, always carry out the preliminary electrical system checks, as detailed on pages 6–9 of the Instructions for British Gas Multimeter.

Detailed instructions on the replacement of faulty components will be found in the Servicing section of this booklet.

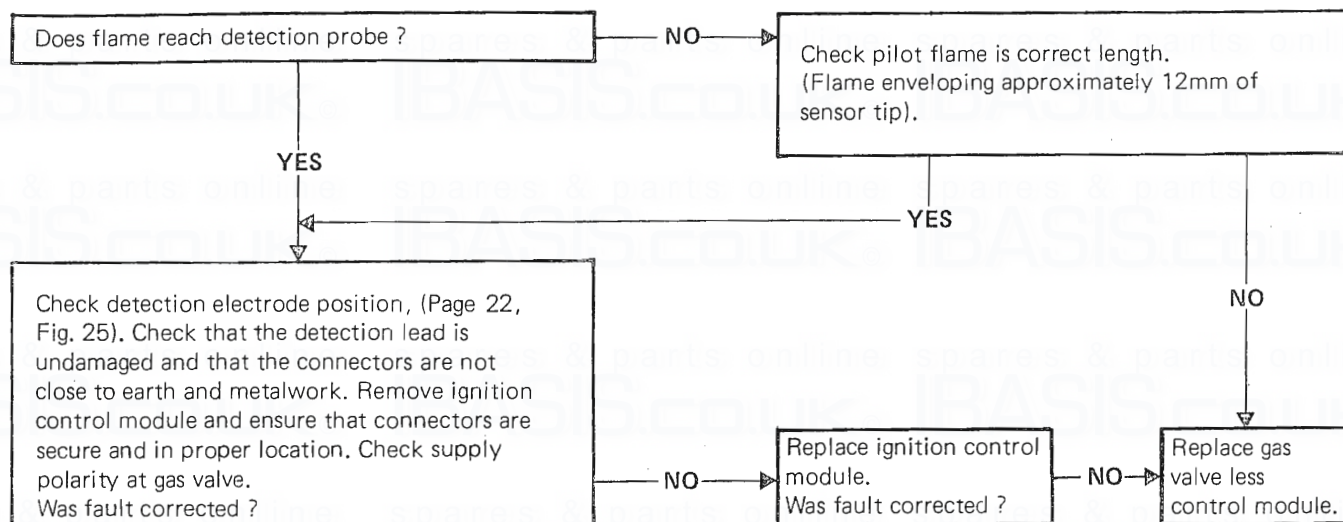
The fire will have to be removed to enable the following fault tracing work to be carried out. Reference should be made to the relevant Fire Installation and Servicing Instructions.

Turn the inlet gas cock to allow gas to pass to the boiler ONLY.

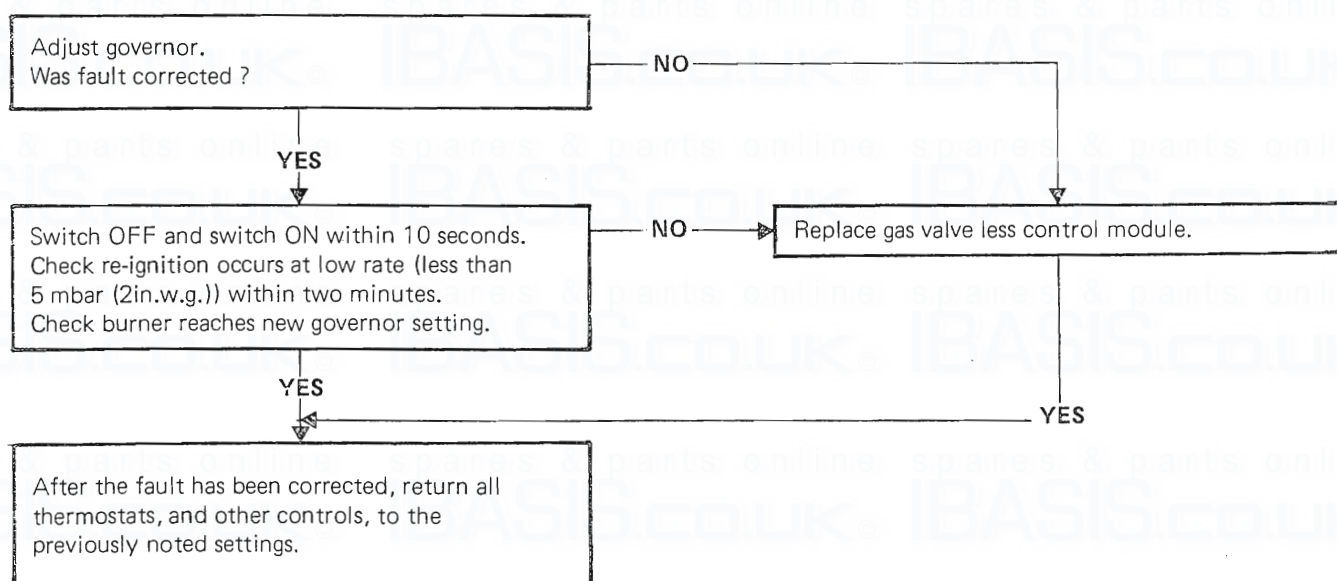
1. NO IGNITION



2. BURNER WILL NOT REMAIN LIT



3. BURNER DOES NOT REACH CORRECT PRESSURE



SHORT LIST OF PARTS

The following list comprises parts commonly required as replacements due to damage, expendability, or such that their failure, or absence, is likely to affect safety or performance.

This List is extracted from the B.G.C. List of Parts, which contains all available spare parts.

Copies of the B.G.C. Lists are held by Gas Regions, Stelrad Distributors and by Merchants.

IDEAL CAVALCADE 40 & 50

When ordering spares, please quote:

1. Boiler/Fire Model.
2. B.G.C. Appliance Number.
3. Description.
4. Maker's Part Number.
5. Quantity.

Key No.	B.G.C. Part No.	Description	No. Off	Maker's Part No.
17	190 473	Sight glass assembly, comprising: sight glass, frame, 2 gaskets and 2 x M5 wing nuts	1	119928574
18	384 852	Boiler burner bar — AEROMATIC Ltd. 19/12 3209 — (less injector), with removable end cap and gauze tube.	1	519928571
19	384 963	Burner injector — AEROMATIC Ltd 93—7 125 — Cavalcade 40	1	519938573
19.A	384 853	Burner injector — AEROMATIC Ltd 93—135 — Cavalcade 50	1	519928572
20	384 854	Burner gauze tube	1	519928575
21	384 855	Burner end cap, with 1 x M5 nut	1	519928576
22	391 574	Pilot burner — HONEYWELL Q314A 5823 with BCR 18 injector, 2 fixing screws and 2 shakeproof washers	1	119928620
23	390 794	Pilot burner injector — HONEYWELL BCR 18	1	169120177
26		Sensor probe — VERNITRON SKNP 1496	1	588922001
27		Ignition probe — VERNITRON SKNP 1495	1	588922002
29	190 471	Ignition lead assembly	1	119928597
31	190 186	Pilot restrictor — SPERRY T.1927	1	580390009
32	384 857	Gas valve — SATCHWELL DB1 601—1—351 (Includes Key No's 33 and 34)	1	588921900
33	384 858	Gas valve, LESS ignition control box — SATCHWELL 9018—601	1	588921910
34	384 859	Ignition control box — SATCHWELL 9017—601	1	588921920
40.A	191 562	Fuel effect switch — ARCO ELECTRIC C.1450 (Special)	1	119938552
41	190 481	Control box panel and cover, with 2 x M4 x 6 lg. pozi pan hd. screws (Includes Key No's 42, 43 & 45) — G/GL Box	1	119928551
41.A	191 561	Control box — AS ABOVE — for Fuel Effect Fires	1	119938551
42		Thermostat — RANCO CL6 P0105 — with 48in. capillary	1	589040051
43	384 689	Suppressor — ITT TS121A — 'Can' type — 85mm leads	1	589040030
45	190 483	Thermostat knob	1	588920051

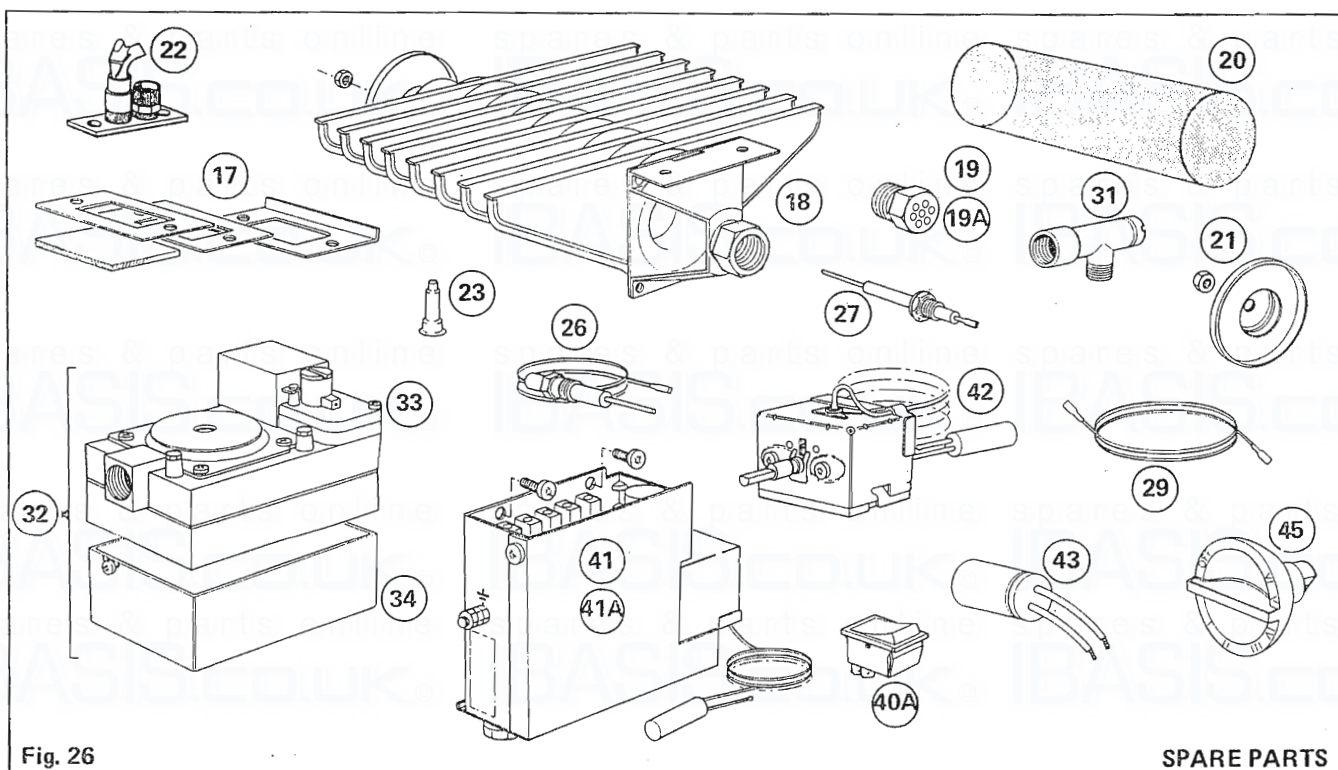
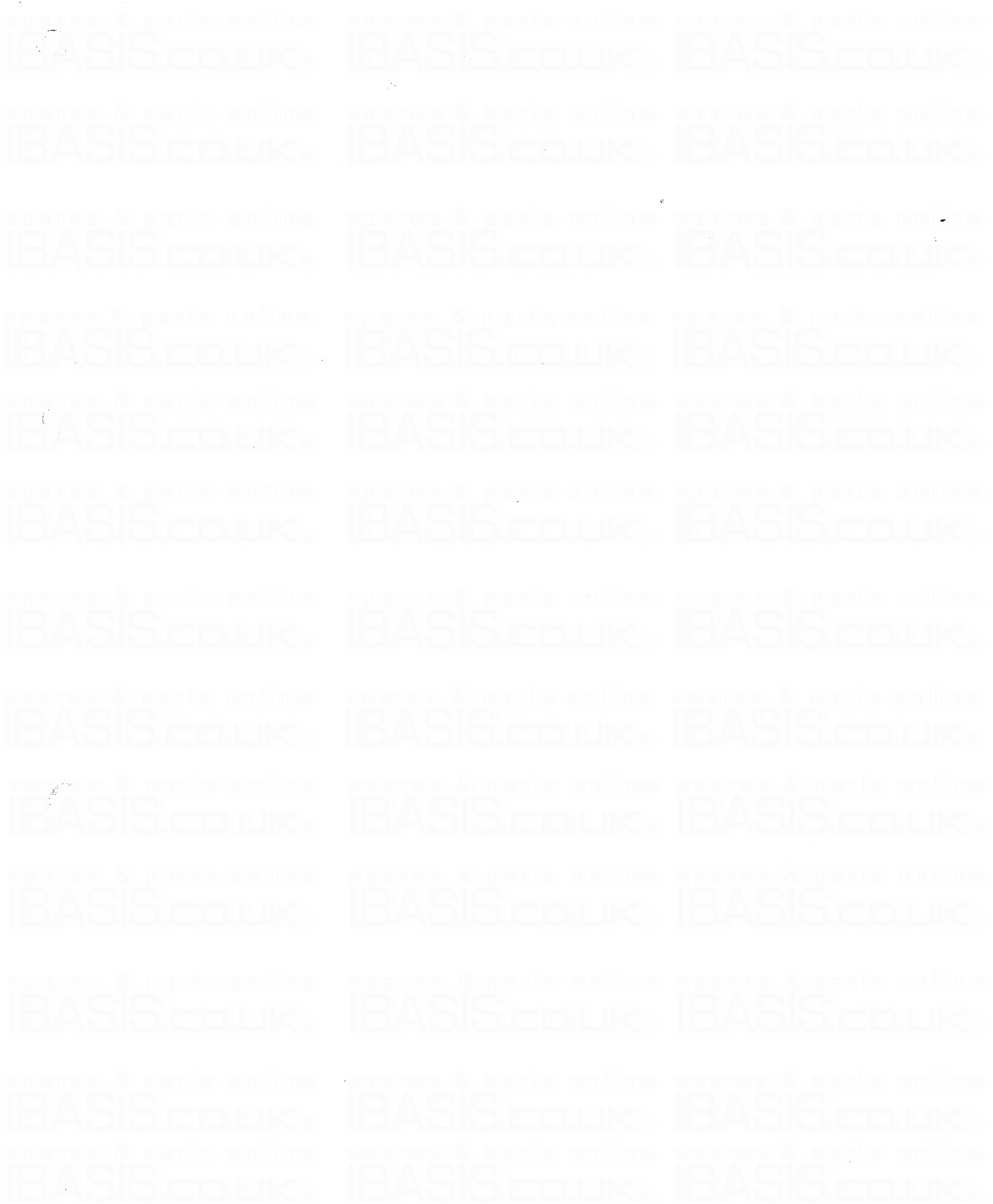


Fig. 26

SPARE PARTS





BS.5258

**THIS SYMBOL IS
YOUR SAFEGUARD**

Products bearing this BSI Safety Mark are made to a safety standard under a stringent scheme of supervision and control monitored by the Quality Assurance Department of the British Standards Institution.

STELRAD GROUP pursues a policy of continuing improvement in design and performance of its products. The right is therefore, reserved to vary specification without notice.

STELRAD GROUP Limited

Sales and Marketing
P.O. Box 103, National Avenue
Kingston upon Hull.
North Humberside. HU5 4JN
Telephone: 0482 492251 Telex: 527032

Head and Registered Office:
Newtown Road, Henley-on-Thames, Oxfordshire RG9 1HL
Registration No. London 322137

A SUBSIDIARY OF METAL BOX p.l.c.

H.0297 (4) 4/83

Printed in England.

**STELRAD
GROUP**