



## At the Heart of your Home Heatranger 368K

## Installation and Servicing Instructions

### Consumer Protection

As manufacturers and suppliers of cooking and heating products. We take every care to ensure, as far as is reasonably practical, that these products are so designed and constructed as to meet the general safety requirement when properly used and installed. To this end, our products are thoroughly tested and examined before despatch.

**IMPORTANT NOTICE:** Any alteration that is not approved by Aga-Rayburn could invalidate the approval of the appliance, operation of the warranty and could affect your statutory rights.

### Important

This appliance may contain some of the materials that are indicated. It is the Users/Installers responsibility to ensure that the necessary personal protective clothing is worn when handling where

applicable, the pertinent parts that contain any of the listed materials that could be interpreted as being injurious to health and safety, see below for information.

**Firebricks, Fuel beds, Artificial Fuels** - when handling use disposable gloves.

**Fire cement** - when handling use disposable gloves.

**Glues and Sealants** - exercise caution - if these are still in liquid form use face mask and disposable gloves.

**Glass Yarn, Mineral Wool, Insulation Pads, Ceramic Fibre, Kerosene/Gas Oil** - may be harmful if inhaled. May be irritating to skin, eyes, nose and throat. When handling avoid contact with skin or eyes. Use disposable gloves, face-masks and eye protection. After handling wash hands and other exposed parts. When disposing of the product, reduce dust with water spray, ensure that parts are securely wrapped.

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**IMPORTANT:** IN ORDER TO MAINTAIN OPTIMUM PERFORMANCE FROM THIS APPLIANCE, IT IS ESSENTIAL THAT THE INITIAL COMMISSIONING IS UNDERTAKEN BY SELECTED, TRAINED INSTALLATION/SERVICING ENGINEERS. YOUR RAYBURN STOCKIST WILL PROVIDE ADVICE ON THE LOCATION OF THE NEAREST INSTALLING ENGINEER, AND WE RECOMMEND YOU CONTRACT OUT THE PERIODICAL SERVICING OF THE APPLIANCE TO THIS ENGINEER.

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## INTRODUCTION

The Rayburn Heatranger 368K is a combined cooker/boiler appliance, providing central heating, domestic hot water and cooking facilities.

It is available with a vertical flue outlet only. The cooker burner operates on natural draught. The boiler burner is fan assisted in conjunction with full sequential controls.

The boiler is designed for use with open vented water systems only. Operating either with gravity D.H.W. via the cooker burner (for Summer use) or a modified Fully Pumped Central Heating Systems as detailed in these instructions.

### NOTE: SMOKE/SMELL EMITTED DURING INITIAL USAGE

Some parts of the cooker have been coated with a light covering of protective oil. During initial operation of the

cooker, this may cause smoke/smell to be emitted and is normal and not a fault with the appliance, it is therefore advisable to open doors and or windows to allow for ventilation. Lift the insulating lids to prevent staining the linings.

|                   |             | Cooker Only<br>LOW | Cooker Only<br>HIGH | Cooker LOW<br>Boiler ON | C |
|-------------------|-------------|--------------------|---------------------|-------------------------|---|
| Heat Input        | kW<br>Btu/h | 2.9<br>9,870       | 8.2<br>28,000       | 26.6<br>90,900          |   |
| Heat Output Water | kW<br>Btu/h | 0.85<br>2,900      | 2.5<br>8,530        | 18.4<br>62,900          |   |
| Oil Input Rate    | cc/minute   | 4.5 – 4.75         | 13.0 – 13.5         | 42.50 – 44.75           | ! |

### Boiler Water Connections

### Weight Capacity of Boiler

12.5 litres

**Flow (one)** Rp 1 (1in BSP int)  
**Return (one)** Rp 1 (1in BSP int)

Both connections are located towards the rear edge of the appliance L.H. side panel.

### Weight of Appliance

348kg

**Oil Valve Inlet** Rp 1/4 (1/4in BSP int)

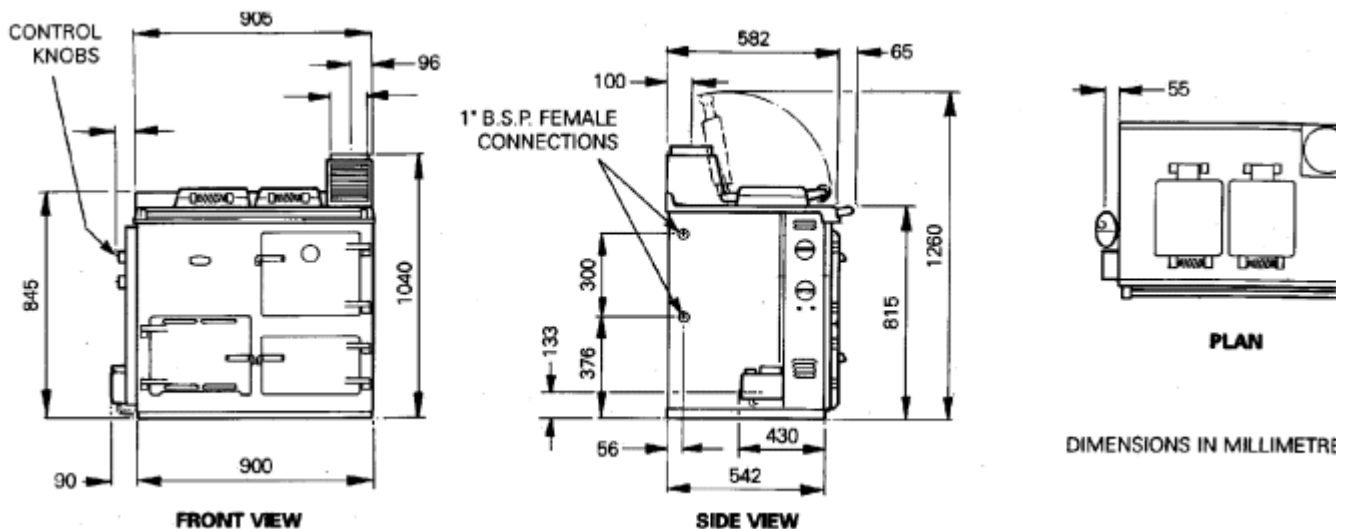
### Appliance Overall Dimensions

Height: 975mm  
 Width: 997mm  
 Depth: 647mm

**Flue Outlet Dia.** 127mm

**Electrical Supply** 240V ~ 50Hz 5 amp Fused

**FUEL - COMMERCIAL  
 KEROSENE current issue to  
 BS. 2869: Class C2 suitable  
 vapourising burners**



DESN 510837 B

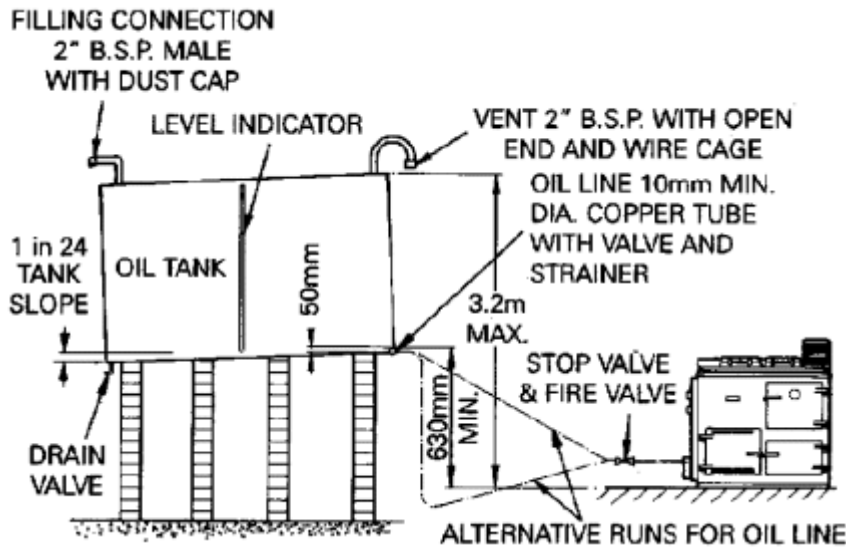


Fig. 1 - Oil Storage Tank and Pipeline details DESN 511014

## INSTALLATION INSTRUCTIONS

The installation of the appliance must be in accordance with the relevant requirements of the current Building Regulations, current I.E.E. Wiring Regulations and the bylaws of the local Water Authority.

It should be in accordance with any relevant requirements of the Local Authority and the relevant recommendations of the following current British Codes of Practice:

**BS. 5410** Installation of oil fired space heating and hot water supply purposes. Part 1. Boilers of rated output not exceeding 44kW.

**BS. 5449** Central heating for domestic premises. Part 1. Forced circulation hot water systems.

### Building Regulations

**J/1/2/3** Provision for introduction of air supply and discharge of products of combustion for appliances. Section 1- Parts A and B.

**BS. 4543** Specification for chimney for oil fired appliances. Part 3.

### Building Regulations

**J/1/2/3** Provision for protection against fire and heat.

**THIS APPLIANCE IS A CONTROLLED SERVICE BY DEFINITION AND REQUIRES EITHER FITMENT UNDER THE REMIT OF BUILDING CONTROL OR INSTALLATION BY AN OFTEC REGISTERED 105 TECHNICIAN (CLASSED AS COMPETENT PERSON) WHO CAN SELF CERTIFY HIS OWN WORKS.**

## EXTERNAL TERRAIN

Before commencing Installation assess the location of the site, whether there are tall trees, buildings or hills close by that may affect flue draughts as this will determine the choice of flue terminal. See "[Chimney Terminations](#)"

## LOCATION

This appliance must be installed on a solid floor, base or plinth made of incombustible material which is capable of supporting the total weight.

The location chosen for the appliance must permit installation and the provision of a satisfactory flue and an adequate air supply. The location must also provide adequate space for servicing and air circulation around the appliance. See '[Installation of Appliance](#)'

Where the cooker is to stand in a recess or against a wall which is to be tiled, **in no circumstances should the tiles overlap the cooker top plate.**

## OIL STORAGE - see Fig.1

The minimum recommended oil tank size is 1400 litres (300 gallons) and the Codes of Practice governing its installation are covered by BS.5410.

The requirements for mild steel tanks should be to BS.799: Part 5 and plastic tanks to OFTEC Standard OFS T100.

### Oil Supply Line

The oil line from the storage tank to the appliance **MUST** be fitted with a remote acting fire valve such as Teddington KBB/C/155, located outside the building, or where the supply enters a wall on the inside of the building and with its heating sensing phial located as near as practicable on the valve side of the cooker.

We also recommend an additional remote acting fire valve be fitted close to the oil control valve, with its sensing phial located in the burner housing, but not touching, the inner burner door.

## FLUE SYSTEM - see Fig.2

Detailed recommendations for fluing are given in the current Building Regulations J/1/2/3.

The following notes are intended to give general guidance:-

The cross sectional area of the flue serving the appliance must be not less than the area of the flue outlet of the appliance and be at least 4.5m high.

The flue pipe to be used must be not less than 125mm (5in) internal diameter. Flue pipes and fittings should be constructed from one of the following materials:-

- a) Mild Steel with a wall thickness of 3mm minimum
- b) Stainless Steel to BS. 1449 Part 2
- c) Cast Iron to BS. 41
- d) Mild Steel, acid resistant vitreous enamel lined to BS. 1344 Part 2

## CHIMNEYS

Chimneys should be built of masonry or be assembled from factory-made insulated components and be at least 4.5m. high.

Masonry chimneys may be built of any masonry material, with a lining, or if flue blocks, without a lining.

The chimney lining should be 150mm minimum diameter and be formed of moisture and acid resistant liners to BS.1181 with rebated or socketed joints uppermost.

Alternatively, linings may be imperforate clay flue pipes as described in BS.65 or flue blocks to BS. 1289 and installed to BS.6461 Part 1.

An 150mm minimum diameter factory-made insulated chimney, complying to BS.4543 may be fitted and installed to BS. 7566 Parts 1 to 4.

### **Chimney Terminations**

All chimneys should terminate above roof level in accordance with current Building Regulations and statutory requirements as outlined in BS. 6461: Part 1 and BS. 7566: Parts 1 to 4.

**NOTE: If the house is subject to down draughts or if there are large buildings, hills, or tall trees close by that may cause down draughts then an anti-down draught cowl MUST be fitted. For standard chimneys this could be an OH or Marcone pot. If the flue is factory made prefabricated metal flue then a proprietary cowl can be used for this purpose.**

### **Chimney Cleaning**

Ensure there are accessible airtight flue cleaning doors in order to obtain cleaning access to the complete chimney. Providing the appliance is operating correctly, an annual chimney flue cleaning will suffice, but if in doubt, arrange for a half yearly clean, preferably at the beginning/end of the central heating season.

### **High Chimney Draughts**

The appliance is fitted with an integral flue stabiliser, able to control the draught in the flue pipe to about 6.0mm w.g. A well sealed, tall exposed chimney on a hill, is an instance where generated draughts could be in excess of this figure.

Should this occur, an additional flue stabiliser must be fitted either in the flue pipe or chimney, but in the same room as the appliance.

Draughts in excess of 6.0mm w.g. must then be controlled by adjusting this additional stabiliser down to this figure.

## **AIR SUPPLY**

Detailed recommendations for air supply are given in the current Building Regulations J/1/2/3.

The following notes are intended to give general guidance:-

The minimum effective area of the permanent air vent in the outside wall must be 82.5cm<sup>2</sup> (12.8in<sup>2</sup>).

### **Air Extract Fans**

Building Regulations 1990 permit the installation of an air extract fan in a kitchen containing an oil fired appliance. The appliance must be able to operate effectively whether or not the fan is running as follows:-

1. Ensure the fan duty is capable of coping with the respective kitchen room volume. Avoid an oversize fan duty performance.

- Follow the directions recommended by the fan manufacturer on the necessary air ingress needed for the fan or overhead cooker hood, then add this compensatory area to that recommended for the appliances primary air needs, to form a permanent air vent.
- Ensure the wall location of the fan does not deprive the appliance of primary air.

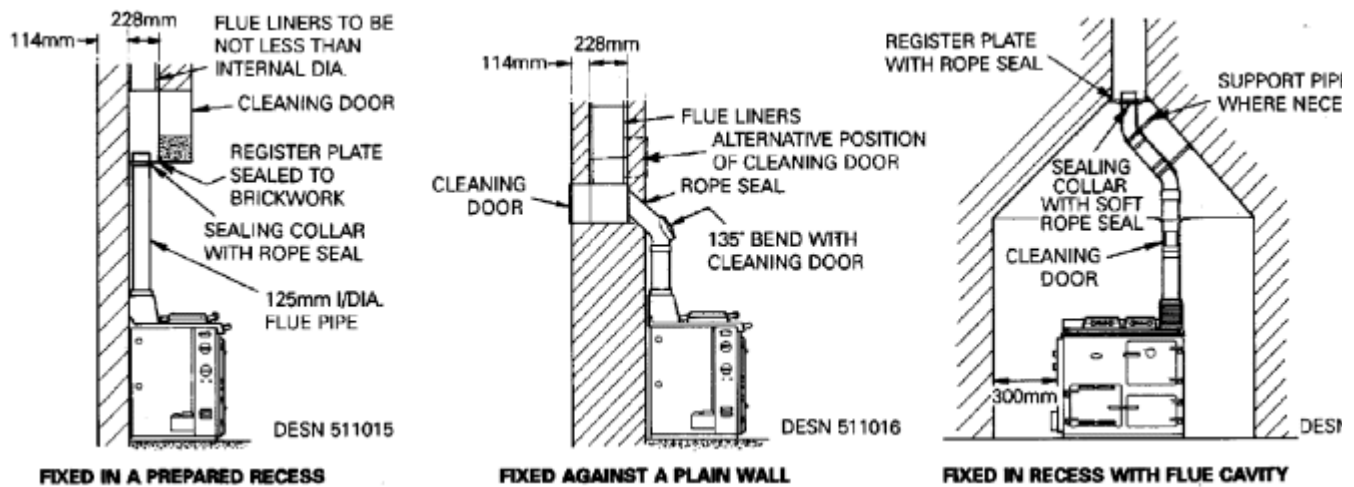


Fig.2 - Flue Layouts

## WATER CIRCULATION SYSTEMS

Detailed recommendations for the water circulation system are given in BS.5449: Part 1 (for smallbore and microbore central heating systems) and BS.6700.

Draining taps must be located in accessible positions which permit the draining of the whole system, including the appliance and hot water storage vessel. Draining taps should be at least  $\frac{1}{2}$ in BSP nominal size and be in accordance with BS. 2879.

The appliance boiler section should be connected to a cistern water supply, subject to a maximum head of 18.25m.

A suggested fully pumped system is shown in Fig.4. However when deciding on the type of system - **NOTE** the following requirements:-

- The circulating pump **MUST** be running when the boiler burner is **ON**.
- The system **MUST** be capable of gravity feed to the domestic hot water tank without the pump running. This allows the cooker burner to provide domestic hot water without the aid of the pump for summer use, and in case of electrical power failures.

### FAILURE TO DO THIS WILL INVALIDATE THE WARRANTY.

|  |   |
|--|---|
| Boiler Output                              | 17.6kW (60,000 Btu/h)                       |
| Temperature differential across the boiler | 10°C - 14°C<br>(18°F - 25°F)                |
| Water Flow Rate                            | 1091 - 1515 litres/h<br>(240 - 333 galls/h) |

Refer to boiler section pressure loss curve - Fig.3.

### **Circulation Pump**

It is recommended that the selected pump be of a proprietary type and manufacture, and be adequate to give the required temperature differential between the flow and return.

The pump should be able to meet the requirements of the system design and be fitted in a readily accessible position.

It may be positioned either on the boiler section flow or the return depending on the system design. The boiler section pressure loss curve, see [Fig.3](#) indicates the loss of head across the boiler section and should be considered when selecting the correct pump size.

### **Gravity Domestic Hot Water and Pumped Heating**

The 28mm O.D. primary flow pipe must rise continuously from the boiler section to the cylinder to ensure good gravity circulation and extended to provide an open vent. The 28mm O.D. primary flow and return pipes must not exceed 10m in length. Pipe runs in excess of 5m must be lagged.

To obtain Domestic Hot Water gravity circulation with the circulating pump on, the special injector tee (supplied with the appliance) must be connected to the heating/cylinder return pipes with the outlet of the tee connected directly to the boiler return pipe within 600mm.

**NOTE:** THIS PROVIDES DOMESTIC HOT WATER FROM THE COOKER BURNER ONLY - WHEN THE BOILER IS GOING THE PUMP MUST BE RUNNING. UNDER NO CIRCUMSTANCES SHOULD THE BOILER BURNER OPERATE WITHOUT THE PUMP RUNNING.

### **Fully Pumped System**

The domestic hot water flow pipes may be pumped provided that domestic hot water gravity circulation can take place in the event of pump failure or loss of electrical power or when the pump and boiler burner cuts out, either due to circuit satisfaction or end of programme. See [Fig.4](#) for system schematic. The boiler section is suitable for use with most types of central heating control systems.

### **Isolating Valves**

Isolating valves (preferably of the keyless type) must be fitted to the inlet and outlet of the circulating pump to facilitate service and replacement of pump without draining the system.

### **Hot Water Storage Vessel**

It is recommended that an indirect 190 litre (40 gallon) hot water storage cylinder of the double feed type e.g. (Manufactured by Albion Cylinders) complying with the BS. 1566 Part 1: DF Type 10.

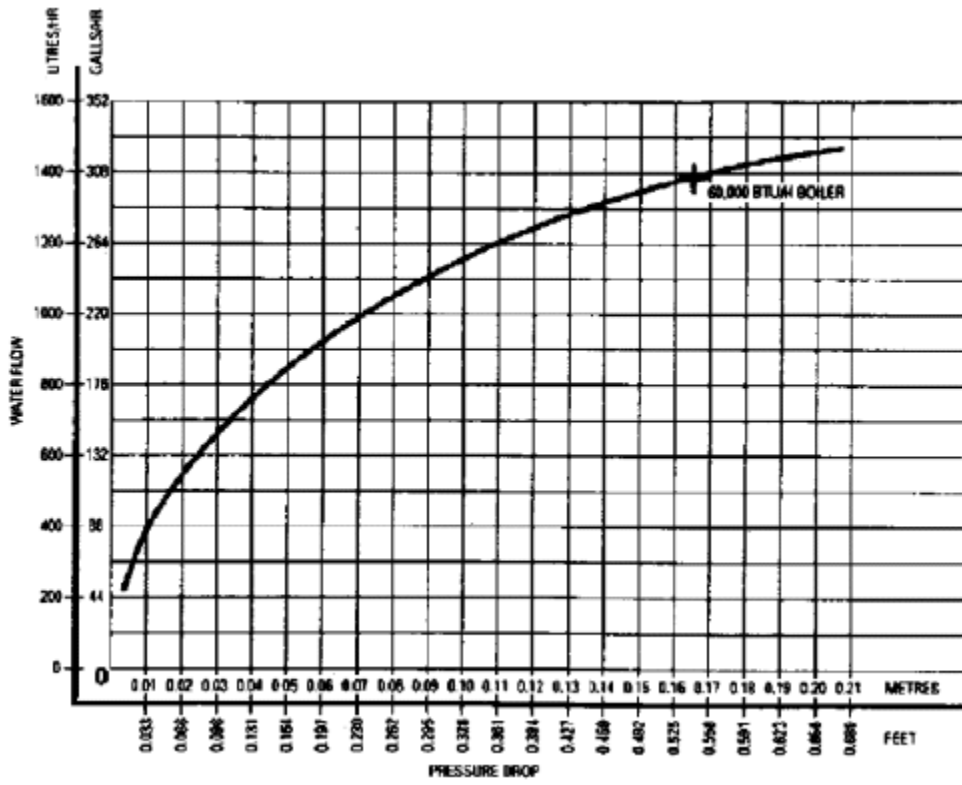
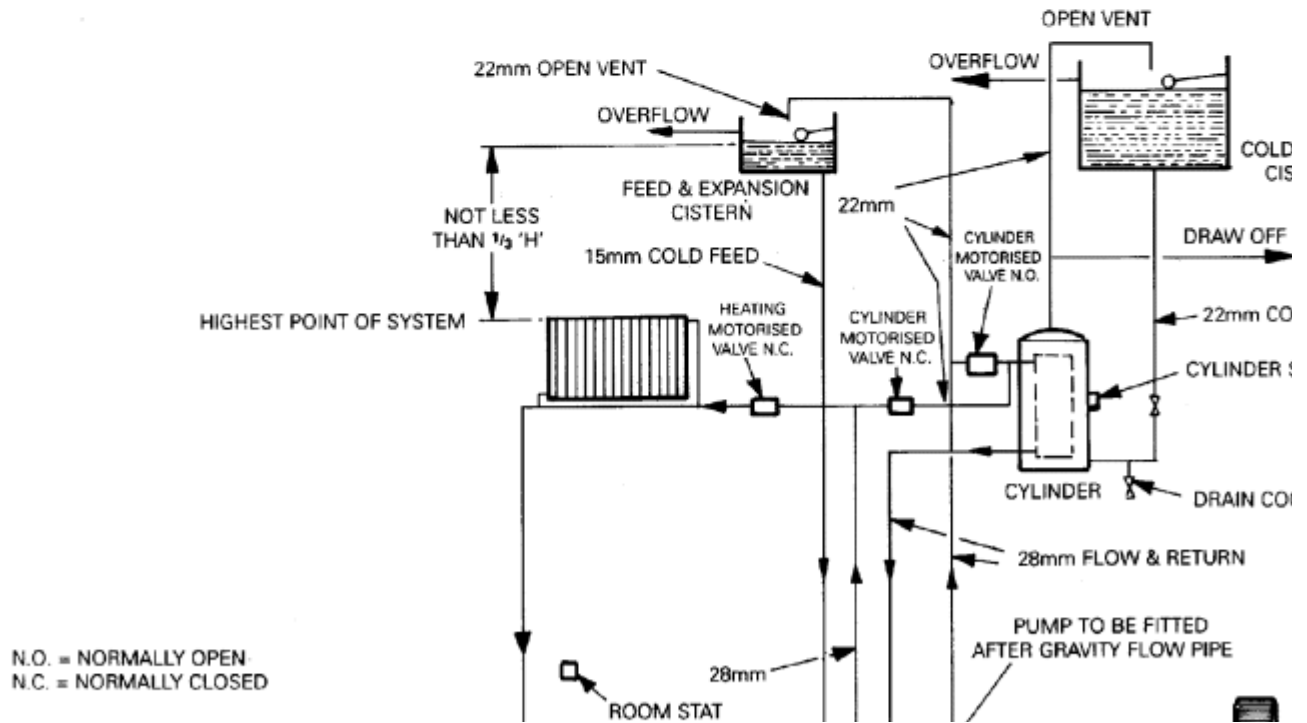
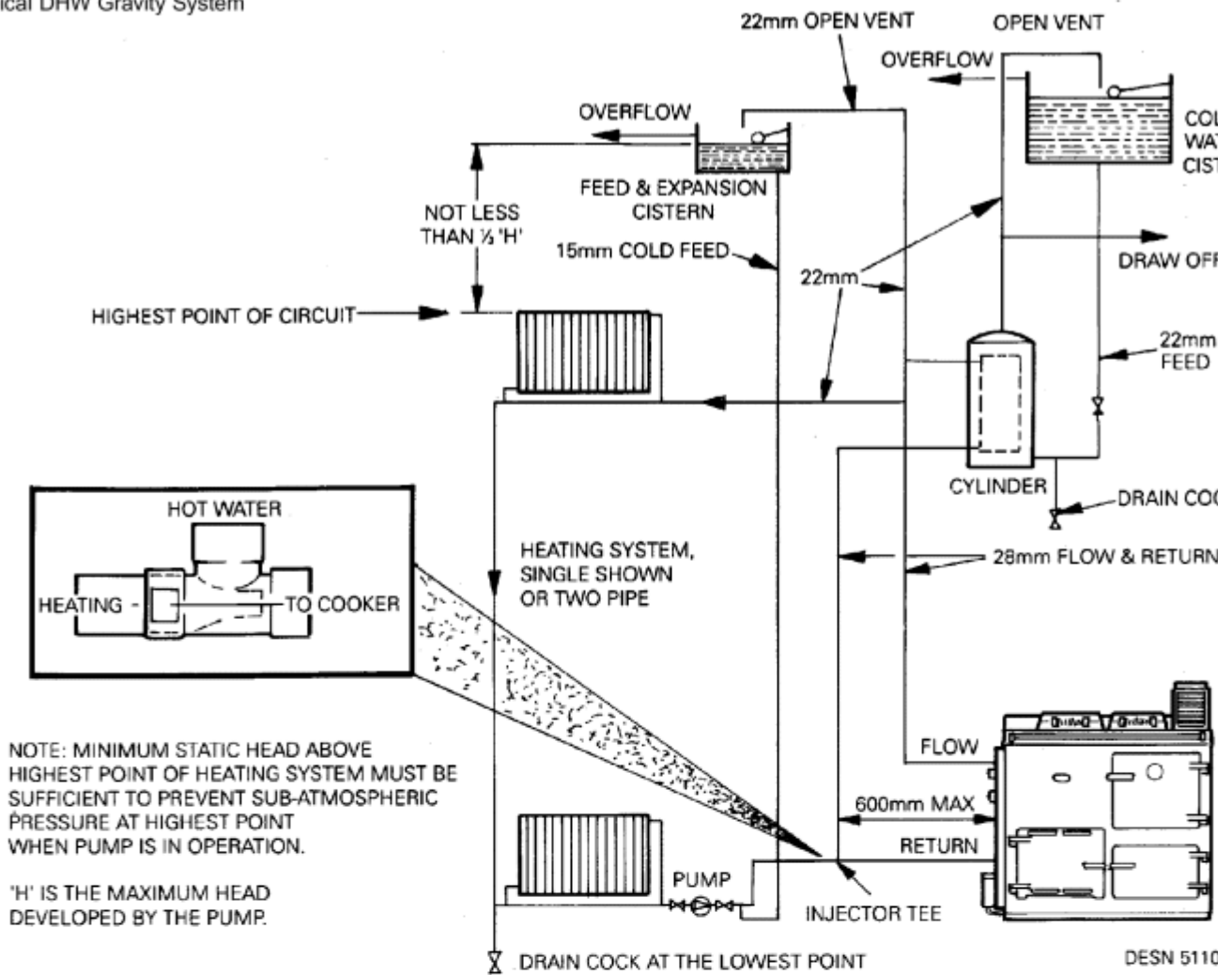


Fig.3 - Pressure Loss Curve



Typical DHW Gravity System



**IMPORTANT: UNDER NO CIRCUMSTANCES SHOULD THE GRAVITY SYSTEM BE ISOLATED WHEN HEATING AND CYLINDER MOTORISED VALVES ARE CLOSED ON PUMPED PART OF CIRCUIT.**

Fig. 4 - Typical Pumped System DESN 511019

## **ELECTRICAL SUPPLY**

Wiring external to the appliance must be installed in accordance with current National Wiring Regulations and any local regulations which apply. The appliance is supplied for 220/240 Volt ~ 50Hz and a fuse rating of 5 amps.

The method of connection to the mains supply should facilitate complete electrical isolation of the appliance, by the use of a fused double pole switch having a contact separation of at least 3mm serving only the appliance. The point of connection to the mains should be readily accessible and adjacent to the appliance. The installation should be protected by a 30mA Residual Current Circuit Breaker (RCCB).

The minimum requirement for the power cable is that it should be a 3 core PVC sheathed flexible cord (85°C min) at least 0.75mm<sup>2</sup> (24 x 0.2mm) to the relevant standard.

## **WARNING THIS APPLIANCE MUST BE EARTHED**

In the event of an electrical fault after installation of the appliance, preliminary electrical system checks must be carried out i.e. earth continuity, short circuit, polarity and resistance to earth.

For wiring instructions see [wiring diagram](#).

**NOTE: WHEN WIRING THE INSTALLATION IT MUST BE REMEMBERED THAT THE PUMP MUST BE ON WHILE THE BOILER BURNER OPERATES.**

The wiring of the pump is dependant on its position relative to the appliance. Where it is close to the appliance then it can be wired directly into the terminals on the control panel, marked PUMP.

Details of the wiring of the appliance and system are given in figures 6 and 7.

**UNDER NO CIRCUMSTANCES SHOULD THE APPLIANCE HAVE MORE THAN ONE POWER SOURCE. ALL POWER TO THE APPLIANCE MUST GO THROUGH ONE SINGLE 5 AMP FUSED ISOLATOR SWITCH.**

## **INSTALLATION OF APPLIANCE**

### **General**

The appliance is floor-mounted and the space in which the appliance is to be fitted must have the following minimum dimensions:-

**Between wall and L.H. side of appliance**  
300mm

**Between wall and R.H. side of appliance**  
Zero

**Above the raised insulating cover handle**  
60mm

In addition, adequate clearance must be available at the front of the appliance to enable it to be operated and serviced.

The appliance is delivered in a fully assembled condition with the exception of the following items which are supplied separately packed and require assembly:-

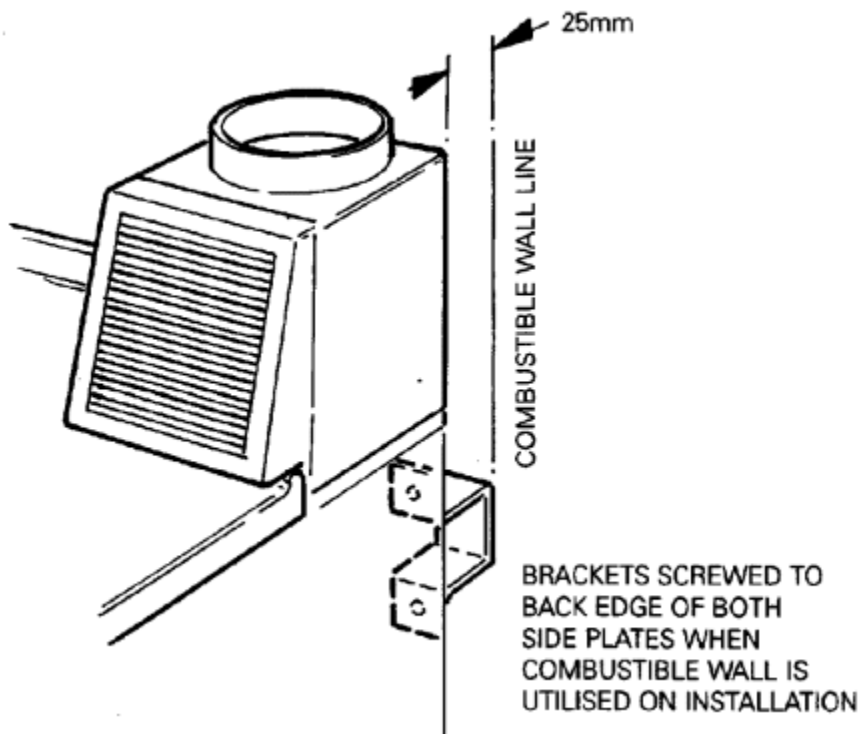
The appliance rear distance bracket.

The cooker handrail

Appliance rear distance bracket: If the rear wall is of combustible material, there must be an air gap of 25mm between the wall and the rear of the cooker. Fit the rear distance brackets as shown in Fig. 5. Whenever possible it is recommended that the skirting board is removed for the width of the appliance to enable the rear edge of the appliance top plate to make contact with the vertical wall and avoid a rear gap. (Combustible wall excepted).

Where the cooker is to stand in a recess or against a wall which is to be tiled, **IN NO CIRCUMSTANCES SHOULD THE TILES OVERLAP THE TOP PLATE.**

The handrail brackets are held on the front ends of the cooker top-plate casting. Remove the travel nuts and replace with the handrail brackets ensuring the fibre protecting washers are in position. Insert the handrail with fitted endcaps into the brackets, positioning them correctly, and tighten the locating bolts (Fig. 5).



DESN 511072

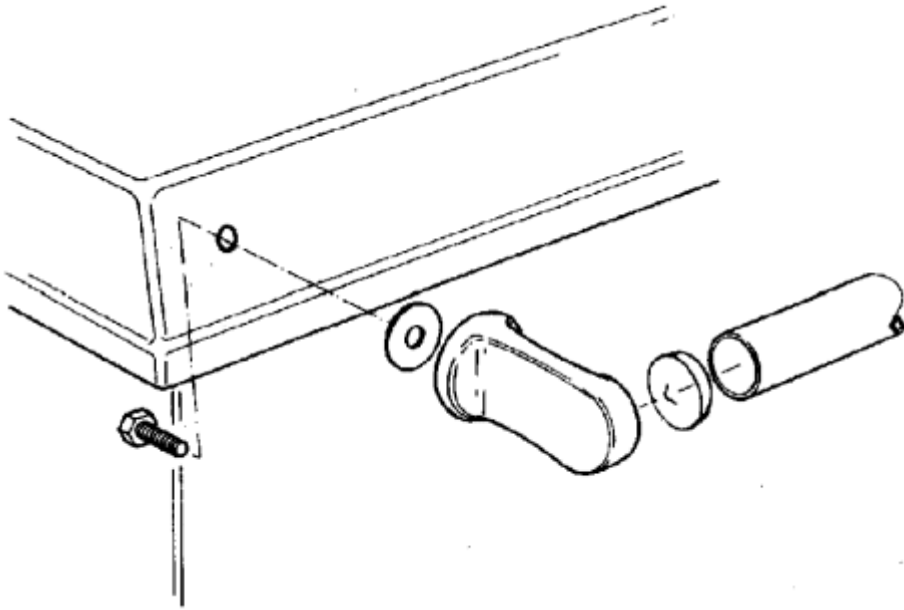


Fig. 5 DESN 510454 A

For System Wiring Diagram See below.

**UNDER NO CIRCUMSTANCES SHOULD THE APPLIANCE HAVE TWO SEPARATE POWER SOURCES. ALL POWER MUST GO THROUGH ONE SINGLE 5A FUSED ISOLATOR SWITCH.**

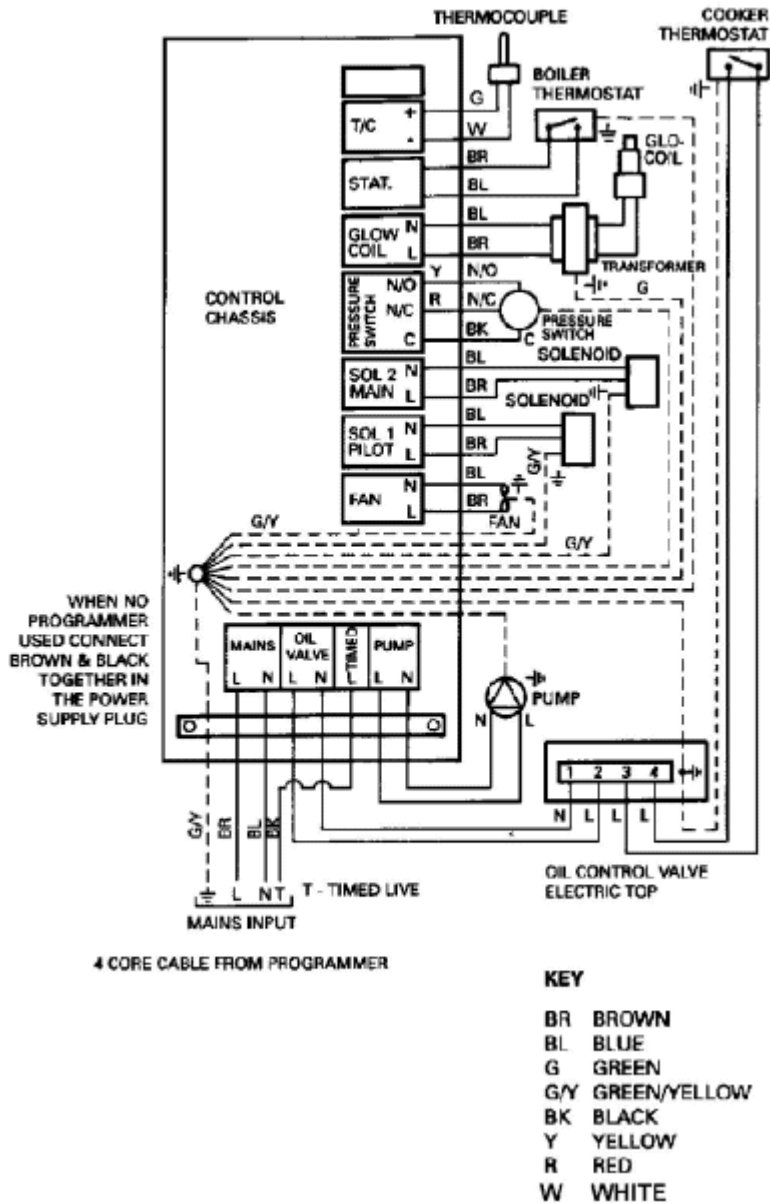


Fig.6

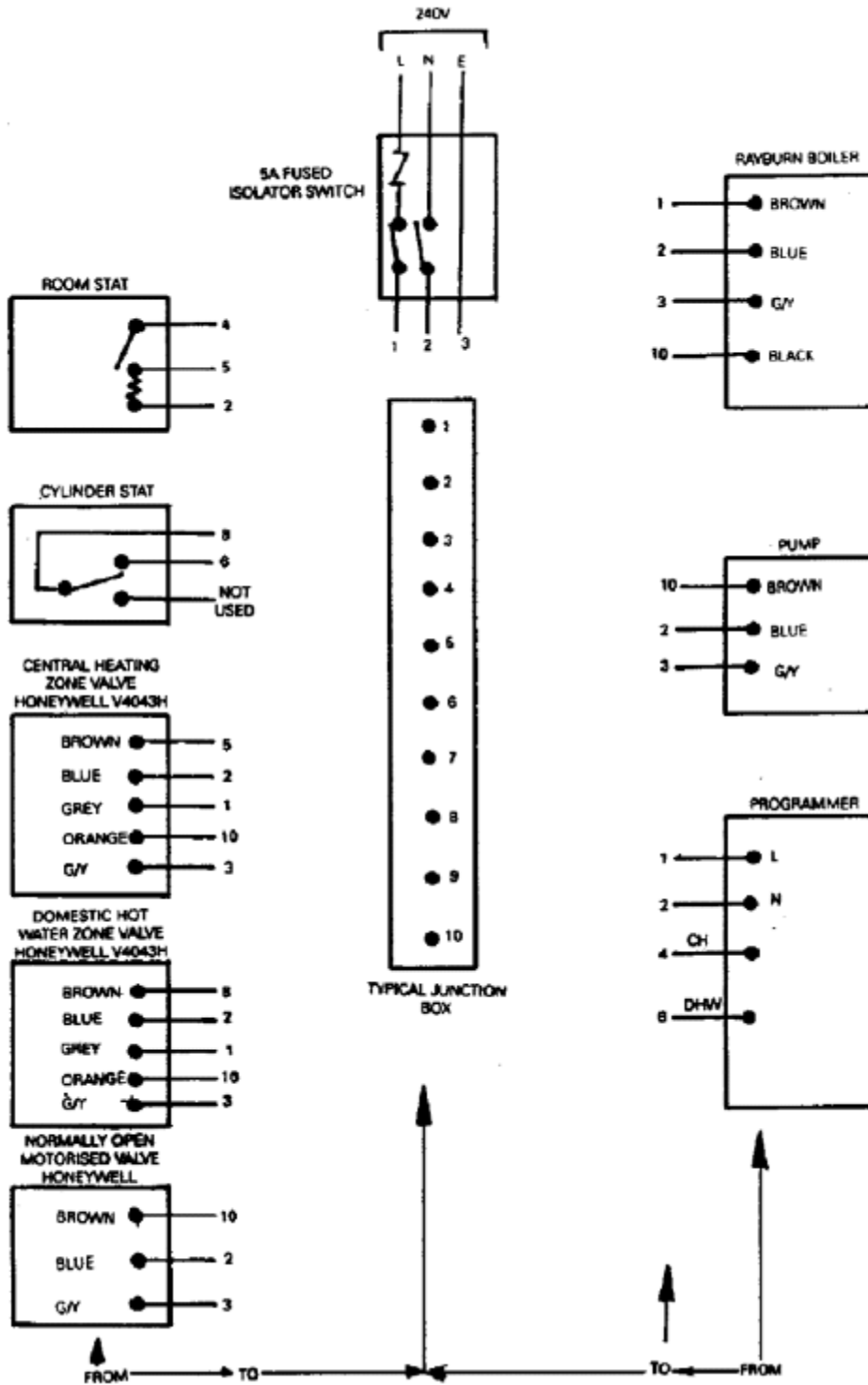


Fig.7 Wiring Diagram for the 368K on a Fully Pumped System

## OIL CONTROL VALVE INSTALLATION

1. Fit and lightly secure oil control valve support bracket to cooker LH side panel. See [Fig.8](#).
2. Using a spirit level, check that the horizontal face of the support bracket is level in all directions, then tighten and secure bracket fixing screws.

3. Fit and align boiler burner feed, minus the solenoids to the oil control valve outlet.
4. Mount oil control valve on support bracket and adjust its height (via locknuts) so that the "OIL LINE" mark on the LH side of the oil control valve body, measures a vertical height of 182mm from the valve body "mark" to the floor.
5. Refit solenoids.

**NOTE:** IF THE APPLIANCE IS MOUNTED ON A PLINTH, ADD THE HEIGHT OF THE PLINTH TO THE DIMENSION GIVEN. CHECK USING A SPIRIT LEVEL, THAT THE TOP OF THE VALVE IS LEVEL IN ALL DIRECTIONS.

DO NOT FIT TEMPO-MAT AT THIS POINT

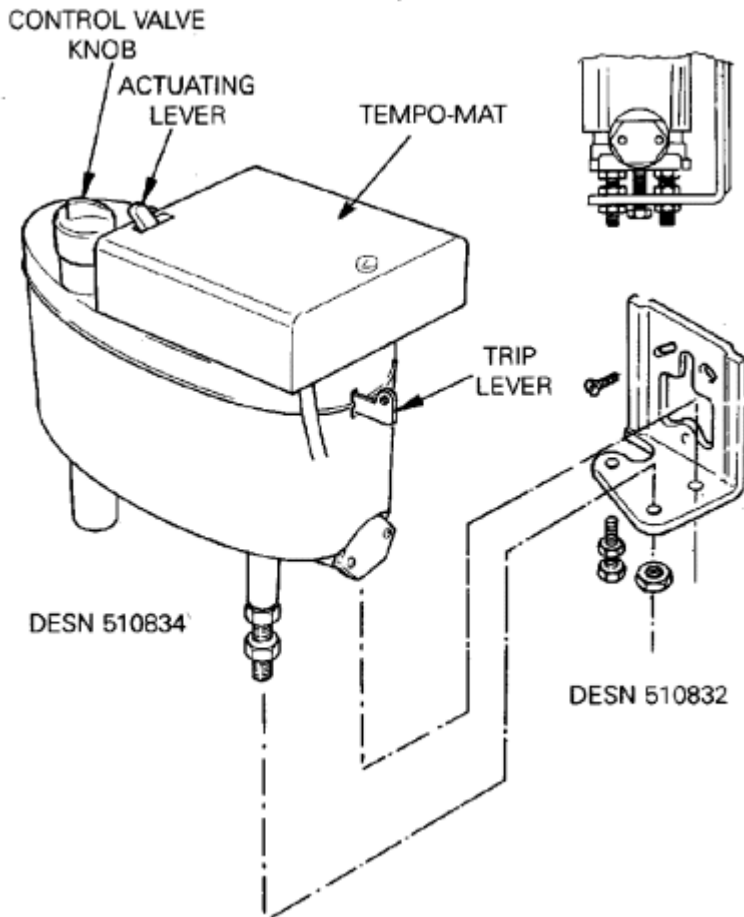


Fig.8

## BURNER INSTALLATION

Although the boiler burner has been approximately set, it will be necessary to check the levelling of the burner and the oil depth within it. The cooker burner must also be checked for being level in ALL directions and oil depth.

This is necessary to ENSURE a boiler burner pot oil depth of 15-17mm, and a cooker burner oil depth of 6mm.

### Boiler Burner

1. Open the outer burner door **E**, and remove. Lift off, the cooker burner door **F**. Remove knobs and electrical

- cover panel on L.H. side. See [fig.13](#).
2. (i) Unscrew the pinch screw locating the Flame sensor and withdraw it from the burner front plate. See [fig.11](#).  
(ii) Detach the electrical connections to the glo-coil. See [fig.11](#).
  3. Slacken off bolts on tie bar retaining the boiler burner, and remove tie bar.
  4. Holding the strap handle on the front of the burner withdraw horizontally until clear of the appliance. See [fig.13](#).
  5. (i) Lift out top Vee baffle.  
(ii) Remove the two end baffles and inter stage baffles from within the boiler burner.  
(iii) Check that the wick on the glo-coil is attached to the glo-coil bracket and that the free end is well down and in contact with the pot reservoir.

WICK MUST NOT TOUCH COIL - 2-3mm CLEARANCE.

## CHECKING THE BOILER BURNER OIL LEVEL

(iv) Check that burner base plate in combustion chamber is level. Remove hot plate. Remove boiler cover plate. Remove the two front centre bricks from the boiler heating exchanger.

(v) In order to check level of burner it is recommended that a flat plate of metal approximately 135mm x 250mm is placed on the top of the pot and a right angle spirit level laid on this.

(vi) Insert the boiler burner (minus any baffles) ensuring it is fully engaged.

(vii) Fit tie bar - Holding down burner front tighten tie bar bolts.

(viii) Viewing from above check level of burner. If not level then remove boiler burner again and adjust the burner base plate accordingly. Then re-check the levelling as before.

(ix) Connect the main oil feed pipe between the oil control valve and the appliance.

**NOTE:** IN ALL CASES, BOTH OIL PIPES MUST RISE CONTINUOUSLY FROM THE LOWEST POINT AVOIDING PIPE KINKS. ON INITIAL COMMISSIONING AIR MAY HAVE TO PURGED FROM BOTH PIPES TO OBTAIN OIL FLOW.

(x) Connect oil supply pipe from tank to inlet of Oil Control Valve. - open all oil valves to allow oil into the control valve.

(xi) Depress trip lever **D** on the front of the oil control valve **P** (See [Fig.13](#)).

(xii) Connect MAIN burner solenoid to 13A plug and extension lead - switch on power to solenoid.

This will allow oil to flow to the burner without activating the main controller.

(xiii) Wait about 10-15 minutes until the depth of oil within the burner settles. Lower a dip stick through the hot plate aperture, until it seats onto the burner base at its centre. Remove the dip stick and measure the depth of oil which must register 15-17mm depth.

### To Correct Oil Depth

For small adjustments (1-2mm) - adjust oil control valve height - for adjustments greater than this it may be necessary to adjust the height of the burner base plate. Should this be necessary then switch off the solenoid - disconnect the pipe work and remove the burner - release the locking bolts on the base plate and turn the slotted setting screws to the required position, re-check levelling of base plate, - replace burner and pipe work - switch on



solenoid and re-check oil depth.

WHEN CORRECT ENSURE THE VALVE IS LEVEL IN ALL DIRECTIONS AND SECURE - INCLUDING THE REAR SUPPORT SCREW. THIS MUST BE FITTED AND SUPPORTING THE REAR OF THE VALVE. OTHERWISE OIL RATES CAN CHANGE OVER A PERIOD OF TIME.

(xiv) Switch **OFF** mains power supply to solenoid. (xv) Disconnect the main inlet oil feed and the pilot feed at the front of the burner. Collect the oil spill over into a receptacle, then proceed to withdraw the boiler burner as previously indicated.

(xvi) Replace the two interstage baffles, the end baffles, and the top VEE baffle. ENSURING THE CORRECT LOCATION OF EACH BAFFLE.

(xvii) Re-insert the boiler burner into the combustion chamber ensuring it is fully engaged, refit the tie bar and secure with the tie bolts - DO NOT ALLOW THE BURNER FRONT TO LIFT AS IT IS TIGHTENED UP.

(xviii) Re-connect the main and pilot oil feed pipes as previously described.

(xix) Re-connect electrical cables to glo-coil terminals, ensuring that the shakeproof washer is fitted under the Glo-Plug Locking Nut. - Insert Flame Sensor into burner front plate and secure.

Adjust fire bricks so that there is a gap between them in the centre.

(xx) Replace boiler front fire bricks, boiler cover plate and hot plate assembly. Ensure boiler cover plate is down correctly, that the front screw is secure and that the rope gasket is sealing.

(xxi) Check oil flow rate to main burner. - This should be 38 - 40 cc/min as measured by the DRIP FEED METHOD. FOR SETTING THE OIL RATES SEE [SECTION ON SETTING THE OIL CONTROL VALVE](#).

## SETTING UP THE COOKER BURNER

The cooker burner comes packed in its own carton.

1. Screw the carbon leg assembly into the base using an oil resistant sealant. The carbon leg must be positioned in line with the length of the burner base. The end which the carbon leg faces when tightly screwed in place is the front of the burner, where the burner support bar is located. The support bar must be screwed into location using a counter sunk screw before the final tightening of the carbon leg.
2. Screw the levelling screws into the support bar.
3. Screw the adjustment leg into the rear of the burner. Check that the height of the levelling screw in the adjustment leg is 39mm from the top of the lock nut to the base of the screw (Fig. 9).
4. Open outer burner door and lift/remove R.H. cooker inner burner door.
5. Place burner base into combustion chamber and check base is level in all directions. (ENSURE THAT THE LEGS OF THE BASE ARE ENGAGED IN THE ROUND RECESSES PROVIDED). There are three - two at the front and one at the rear. It is essential this is done or any adjustment on height or level of the burner WILL BE WRONG.
6. Connect oil supply pipe and turn cooker control knob to No.6 this will allow oil into the burner base. Allow approximately 15-20 minutes for the oil level to stabilise. - then test oil depth this should settle to a depth of 6mm.
7. To correct oil depth, slacken the nuts securing the threaded support legs and adjust leg height to suit. Re-check that the burner is level in all directions.
8. With the burner level and a constant oil depth of 6mm tighten the locking nuts on the oil burner levelling screws. IMPORTANT: THE COOKER BURNER BASE MUST BE LEVEL IN ALL DIRECTIONS AND THE OIL DEPTH STABLE AT 6MM. Switch off oil, drain and disconnect.

Remove cooker burner base

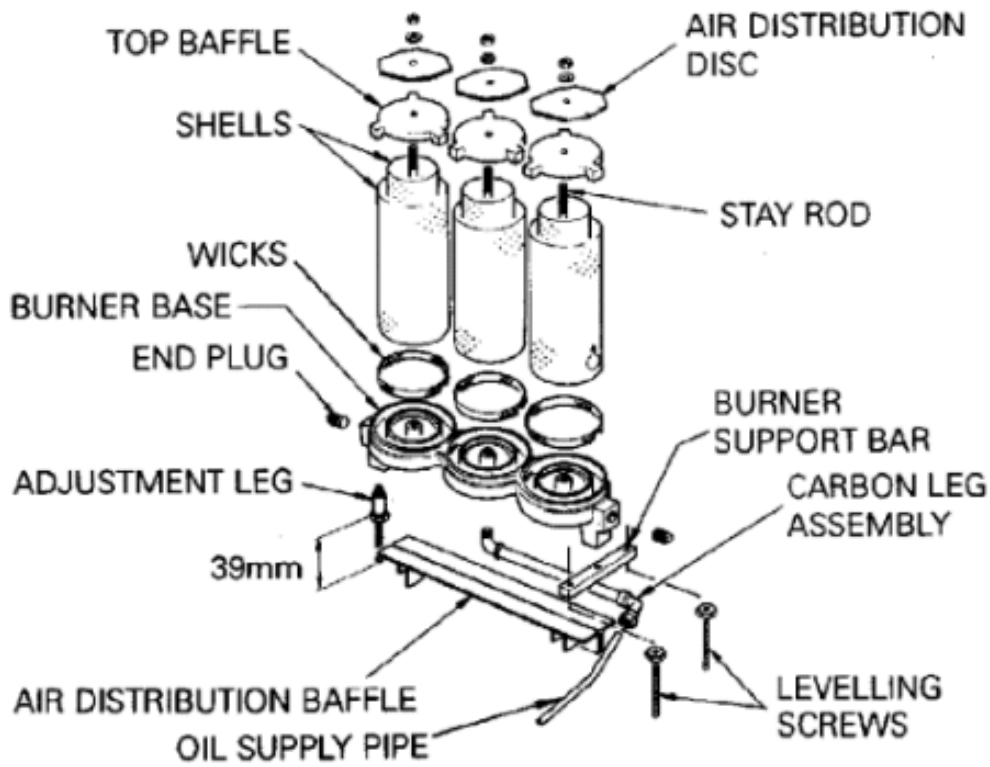
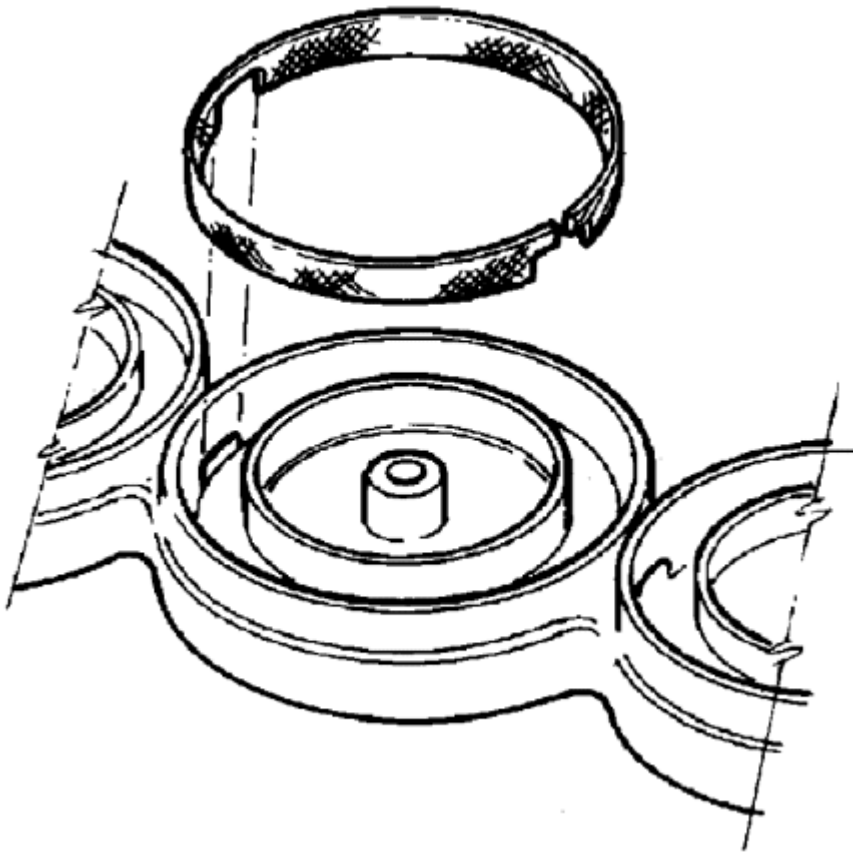


Fig.9 Cooker Burner Assembly DESN 510835 A



DESN 510918

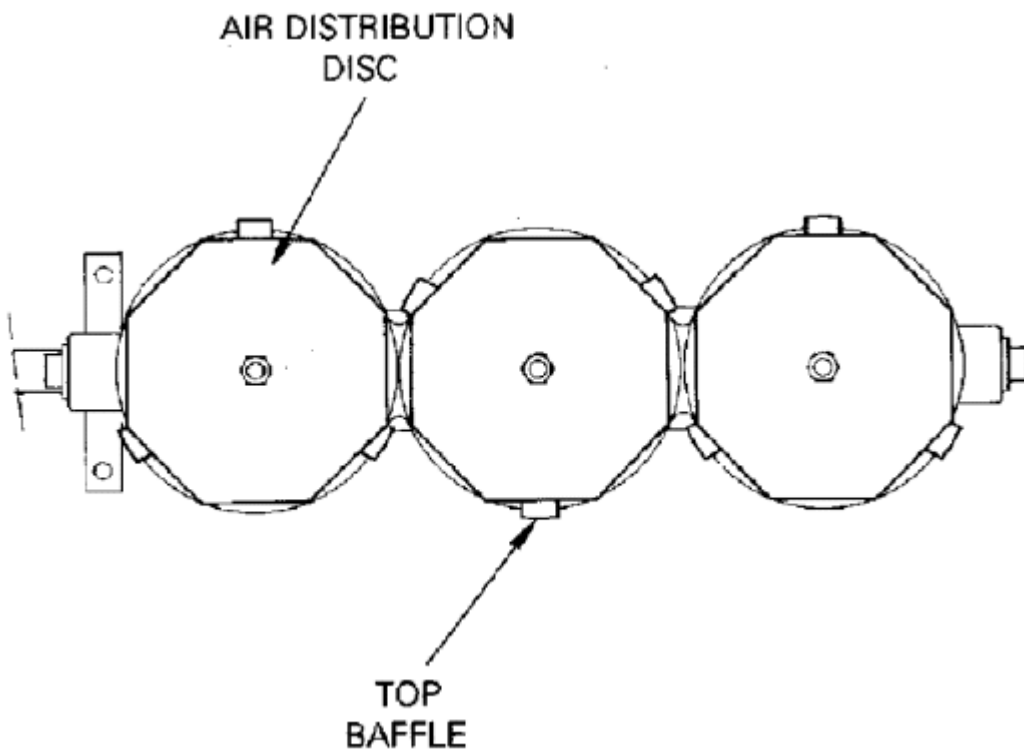


Fig.10 DESN 510919

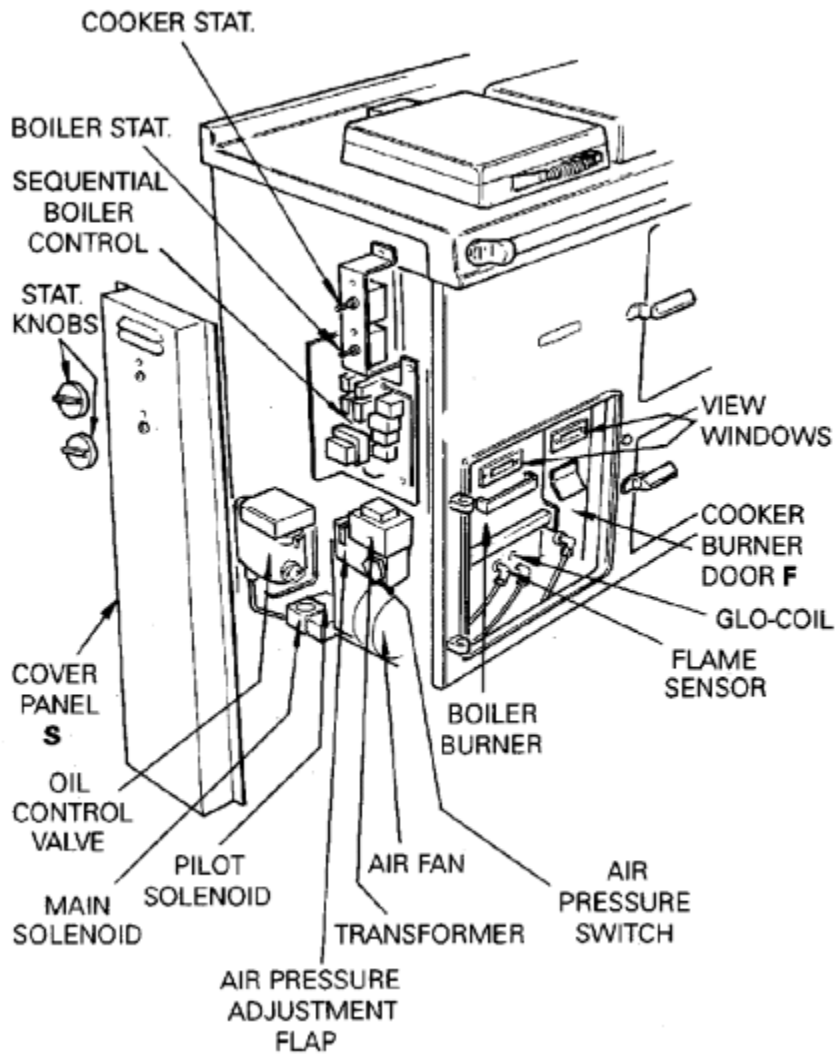


Fig.11 DESN 510388

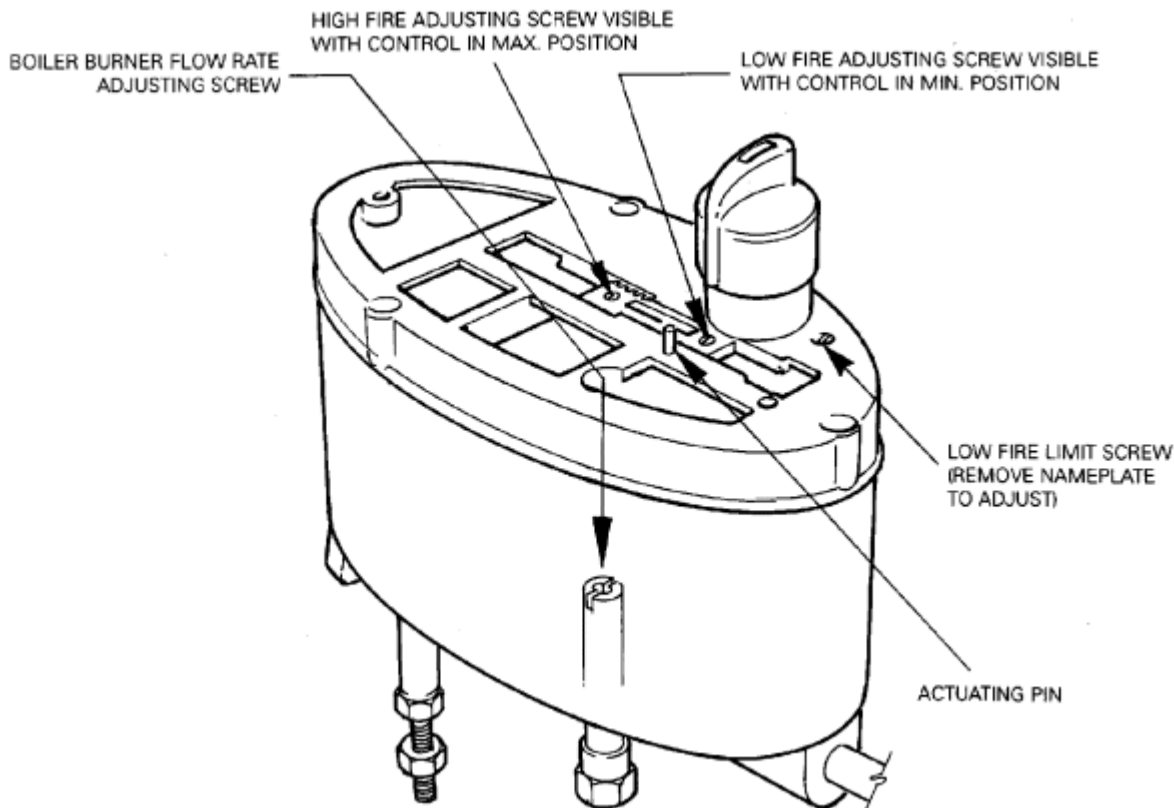


Fig.12 DESN 511324

9. Fit the burner shells on to the burner base and locate check that the joint between the oil burner base and shells, is near airtight, otherwise, unacceptable air gaps may cause "burner light-back", with ignited fuel occurring below the oil burner base. Remove the shells, place wicks in oil burner wick line up with oil feed channel in the burner base (Fig.10), and fit stainless steel stay rods into burner base. Refit burner shells ensuring correct fit and location. (The burner shell with the lighting port must be fitted at the front facing forward (Fig. 9). Place the baffles on top of shells and fit air distribution disks on top of them, making sure the orientation of both baffles and disk are as shown in Fig. 10. When orientations is correct fasten assembly down using nut and washers. Do not over tighten.
10. Place the air distribution baffle into the slot in the base of the burner combustion chamber. Place Burner Assembly into combustion chamber, locating the legs into the recesses. Reconnect the cooker oil supply pipe to carbon leg elbow and tighten.

## SETTING OF OIL CONTROL VALVE

### General

1. As directed earlier the support bracket when fitted to the appliance must be level in all directions, and rigid.
2. Fit the support pins to the valve and set the height. The correct height of this valve is 182mm from the base of the appliance to the oil level mark on the valve body. See [Fig.13](#).
3. **NOTE:** IF THE APPLIANCE IS MOUNTED ON A PLINTH, ADD THE HEIGHT OF THE PLINTH TO THE DIMENSION GIVEN. SCREW IN THE REAR SUPPORT PIN SO THAT THE VALVE IS RIGIDLY SUPPORTED. CHECK THAT THE VALVE IS NOW LEVEL IN ALL DIRECTIONS.
4. Do not fit TEMPO-MAT **B** at this point.

NOW CARRY OUT THE SETTING OF THE CONTROL IN THE CORRECT ORDER WHEN COMMISSIONING

## THE APPLIANCE.

Start with the boiler burner - the reason for this is that it can be run to warm the flue before lighting the cooker burner - thus eliminating excessive fumes into the room.

### Boiler Burner

SEE [FIG. 12](#)

1. Connect oil pipe work and solenoids between the oil control valve and the boiler burner.
2. Ensure that both pipes rise steadily without kinks from the lowest point.
3. Disconnect main burner oil feed and fit adaptor for measuring oil rates by the DRIP FEED METHOD.
4. Put tray under adaptor outlet.
5. Turn **ON** separate power supply to main solenoid.
6. Allow oil to flow for about 10 min before taking the rate. The reason for this is to allow the flow from the valve to stabilise as there is an initial surge.
7. Take oil rate this should be 38-40cc min. If the setting is wrong then adjust it accordingly by
  8. i. Remove the plastic dust cover from the valve cover plate.
  - ii. Using a flat blade screwdriver, turn the adjusting screw anti-clockwise to increase the oil flow rate until a flow rate of 38-40 cc/minute is obtained.

If the rate is wrong and adjustment is required then allow 2-3 minutes between resetting and taking the next rate. Failure to do so will result in inaccurate oil rates.

9. Switch **OFF** power to main solenoid and disconnect.
  - i. Connect cable to pilot solenoid.
10. Reconnect the main oil feed to the burner and disconnect the pilot feed pipe.
11. Fit adaptor to pilot pipe to check pilot feed. Set height to level of pilot inlet pipe.
12. Switch **ON** power to pilot solenoid via separate feed.
13. THERE MAY BE TENDENCY FOR THE PILOT FEED TO AIR LOCK SO BLEED THIS PIPE FREE OF AIR AS IT MAY AFFECT THE PILOT IGNITION.
14. After 4 min check oil rate it should be a minimum of 20cc min. If this is not obtained then there is still air in the pipe work And must be cleared.
15. If correct then switch **OFF** power to solenoid and reconnect pilot feed pipe.
16. Connect both solenoids to control panel in correct order.
17. The boiler burner can now be operated. At this point set the burner air control to maximum.

This will need to be adjusted as the unit warms up and finally set with the cooker burner on high.

### Cooker Burner

SEE [FIG. 12](#)

After checking the burner is level and that the oil is the correct depth in the burner disconnect the oil feed pipe to the burner and attach adaptor for measuring oil rates by the DRIP FEED METHOD.

To make adjustments to the control it is necessary to remove the electric top if fitted, and the name plate to expose the adjusting screws. Do not remove the pre-punched knockouts in the name plate.

### ACTUATING PIN ADJUSTMENT (IF ELECTRIC TOP IS FITTED).

1. Turn the regulating knob to the LOW fire position.

2. Press lightly on the actuating pin and check to see if it is possible to move the pin up and down.
3. The limit screw should be adjusted so that the movement is just eliminated.

CAUTION: Do not over adjust the limit screw as excessive low fire flow rates will occur when the electric head is de-activated.

### **ADJUSTING THE HIGH FIRE FLOW RATES - 13cc/min to 13.5cc/min**

1. turn the regulating knob to the high fire position to expose the adjustment screw.
2. NOTE: ALLOW 7 MINUTES FOR THE FLOW TO STABILISE BEFORE TAKING THE RATE. IF THE RATE IS INCORRECT THEN ALLOW 2 MINUTES BETWEEN RESETTING AND THE NEXT RATE.
3. Rotate the adjusting screw anti-clockwise, to increase and clockwise to decrease the flow rates.

NOTE: The adjusting screw is highly sensitive and should only be adjusted in small increments.

### **ADJUSTING THE LOW FIRE RATES - 4.75cc/min but no lower than 4.5cc/min**

1. Turn the regulating knob to low fire position to expose the low fire adjustment screw.
2. NOTE: ALLOW 7 MINUTES FOR THE FLOW TO STABILISE BEFORE TAKING THE RATE. IF THE RATE IS INCORRECT THEN ALLOW 2 MINUTES BETWEEN RESETTING AND THE NEXT RATE.
3. Rotate the adjusting screw anti-clockwise, to increase and clockwise to decrease the flow rates.
4. After adjustment it may be necessary to re-adjust the low fire limit screw. Check the actuating pin for movement.
5. Refit name plate and electric top if applicable.

## **COMMISSIONING AND TESTING**

### **ELECTRICAL INSTALLATION**

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

### **WATER CIRCULATION 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 air locks cleared. Vent all heat emitters and check for water soundness.

### **LIGHTING THE BOILER BURNER**

SEE [FIG. 13](#)

Check that:-

1. The boiler system is full of water and all valves are fully open.
2. Any room thermostat is **ON**.
3. Any programmer or time switch is set at continuous heating.
4. Ensure the electricity supply is **ON**, that the pump is running.
5. Lighting Sequence

(i) Set the boiler thermostat knob **H** to a thermostat setting of 80°C (180°F) whereupon the airfan unit will become operative, the ignition glo-coil **K** will start to heat up.

(ii) After 1 minute, the pilot oil solenoid will energise and allow pilot oil supply to the boiler burner. Entry and rate of pilot oil flow is dependant on a small static head of oil from the constant level oil valve.

Reduction or loss of this head, will result in pilot oil starvation e.g. low constant oil valve location or conversant, high burner pot location.

(iii) The pilot oil supply will ignite within 30 seconds of oil flow, and be recognised by the thermocouple, which switched the pilot solenoid and glo-coil **OFF**, and switches the main oil flow solenoid **ON**. The boiler will fire and run.

(iv) The activated boiler thermostat isolates power from the main oil solenoid, to interrupt the oil supply, but the fan remains energised on an overrun period time of about 5 minutes, depending on the length of **ON** time boiler cycle. This enables all the oil in the burner to be burned and also the cooling of the flame sensor, which then isolates power from the fan, ready for the next cycle call. With the call for hot water, the boiler thermostat reactivates, and the complete cycle starts again.

(v) Allow the boiler burner to operate for 2 to 3 cycles, then during a boiler **ON** period, proceed with the following checks.

## CHECKING THE BOILER BURNER FAN PRESSURE

1. Connect pressure gauge to nipple **N**. Initial cold start should indicate a cold pressure reading of 3.1mm w.g. (0.125in w.g.) which on hot cycling, should rise to a stable 4.1mm w.g. (0.165in w.g.).
2. Adjust excess air pressure via air pressure adjustment flap on top of air duct at the L.H. side of cooker. (See [fig.11](#).) No adjustment of the air pressure switch is needed.
3. If pressure is low, remove plastic sensor tubes from Fan Scroll and Fan Duct, and connect a differential pressure gauge across the nipples. This reading should register between 9-11mm water gauge with duct fully open. This should confirm whether the fan performance is adequate. If the fan performance is not confirmed, there must be a windbox air leak. Investigate by removal of the boiler burner assembly for examination of the underside gasket seal.

**IMPORTANT:** BEFORE COMMENCING, ISOLATE THE ELECTRICITY SUPPLY (SWITCH **OFF** AND REMOVE PLUG) THEN TURN **OFF** THE OIL SUPPLY AT THE ISOLATING VALVE NEAR TO THE APPLIANCE.

4. Disconnect pressure gauge and replace plug nipple.

## BOILER BURNER LOCKOUT

Fail-safe protection has been built into the Sequential Control so that in the event of any deviation from the timing programme, or component malfunction, a lock-out condition occurs, with the display of lamp **L**.

Interruption of the Sequential Control power with the exception of the continuous running fan.

To cancel the lock-out condition, turn the boiler thermostat knob from **ON** to **OFF**, then back to **ON**. The cycle will then re-commence.

### WAIT 3 MINUTES BEFORE TURNING THE THERMOSTAT KNOB ON.

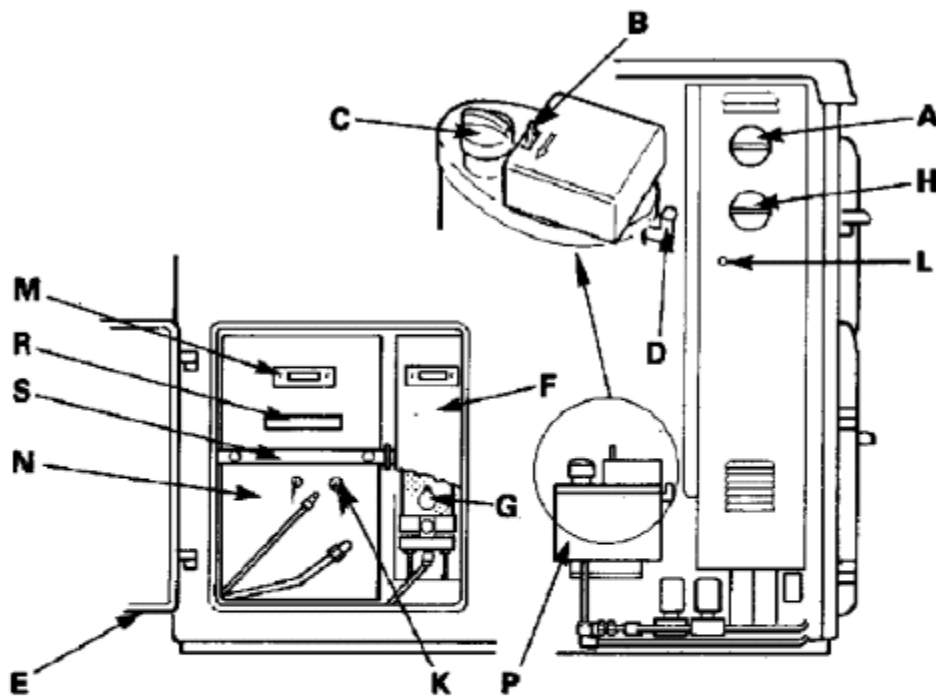
Continued lock-out indicates a malfunction that requires qualified inspection - See [Fault Finding Chart](#).



## BOILER CONTROL CHECK

Check that:-

1. The boiler system is full of water and all valves are fully open.
2. Any room thermostat is **ON**.
3. Any programmer or time switch is set at continuous heating.
4. Ensure the electricity supply is **ON**, that the pump is running and the boiler thermostat set at 80°C(180°F).
5. Allow the heating system to warm up then set the pump adjuster to maintain a boiler "flow and return" temperature differential of 10°-14°C (18°-25°F). Checks must be made by the installer to see that this differential is obtained after the boiler "Flow" temperature is stabilised.  
The system should be balanced by regulating the water flow rate through individual heat emitters to ensure a satisfactory water temperature at each emitter. A system balance must also be made, so that the minimum flow required through the boiler is achieved when supplying D.H.W. only.



- |                                   |                               |
|-----------------------------------|-------------------------------|
| <b>A</b> COOKER THERMOSTAT KNOB   | <b>K</b> GLOW COIL            |
| <b>B</b> ACTUATING LEVER          | <b>L</b> LOCK OUT LIGHT       |
| <b>C</b> OIL CONTROL VALVE KNOB   | <b>M</b> VIEWING WINDOWS      |
| <b>D</b> TRIP LEVER               | <b>N</b> PRESSURE TEST NIPPLE |
| <b>E</b> OUTER BURNER DOOR        | <b>P</b> OIL CONTROL VALVE    |
| <b>F</b> INNER COOKER BURNER DOOR | <b>R</b> BOILER BURNER HANDLE |
| <b>G</b> LIGHTING COVER           | <b>S</b> BOILER STRAP         |
| <b>H</b> BOILER THERMOSTAT KNOB   |                               |

Fig.13 DESN 510836 A

6. When the water system reaches working temperature, check that the boiler thermostat operates satisfactorily. Check that any room temperature controls and programmer or time switch are fully operative.
7. Examine the system for water soundness. The system should then be turned off and rapidly drained while

still hot.

The water system should again be filled and cleared of all air locks.

It is recommended that a corrosion inhibitor is added to protect the heat exchanger and pipe work.

## LIGHTING THE COOKER BURNER

1. Depress the trip lever **D** on the front of the oil control valve and turn the cooker oil control knob **C** to No.6 setting.
2. **NOTE:** THE ACTUATING LEVER **B** ON THE ELECTRIC TOP MOUNTED ON THE OIL CONTROL VALVE TOP, PERMITS MANUAL CONTROL TO OBTAIN MAXIMUM OIL FLOW RATES IN THE EVENT OF POWER FAILURE AND DEPRIVATION OF THERMOSTAT USE. ENGAGE THE ACTUATING LEVER **B** BY PUSHING TO THE LEFT AND ENGAGING IN THE NOTCH OF THE COVER. THIS ALLOWS THE ACTUATING PLUNGER BUTTON TO EXTEND UPWARD AND GIVE HIGH FIRE OIL RATE.

### USE ACTUATING LEVER WITH POWER FAILURE ONLY.

3. Switch power **ON** and set oven thermostat knob **A** to maximum.
4. With the outer door **E** open, remove/lift out the cooker burner door **F**.
5. After allowing 15 minutes for oil to settle in the cooker burner base, open the lighting cover **G** on front of burner shells to expose a lighting port. Fig. 13.
6. Light the front wick through the lighting port and close the lighting cover.
7. Replace cooker burner door **F** and outer door **E**.
8. The cooker burner will gradually increase its oil rate, yet under the control of the oven thermostat, taking 2<sup>1</sup>/<sub>2</sub> hours to attain 200°C (400°F) from cold.

## Appliance and Flue Pipe Draught

### (i) Flue Pipe Draught

The draught must be measured in the flue pipe above the flue chamber, and must not exceed 6mm w.g. (0.24in w.g.) at any time.

Should excessive draughts occur, an additional flue stabiliser should be fitted on the flue pipe between the top of the flue chamber and the kitchen ceiling, for controlling the excessive draught down to 6mm w.g.

### (iii) Appliance Draught

The draught in the boiler and cooker flues should be collectively checked, and for optimum performance, draught measurements with respect to Flue Pipe Draughts, should be as indicated in Fig.14.

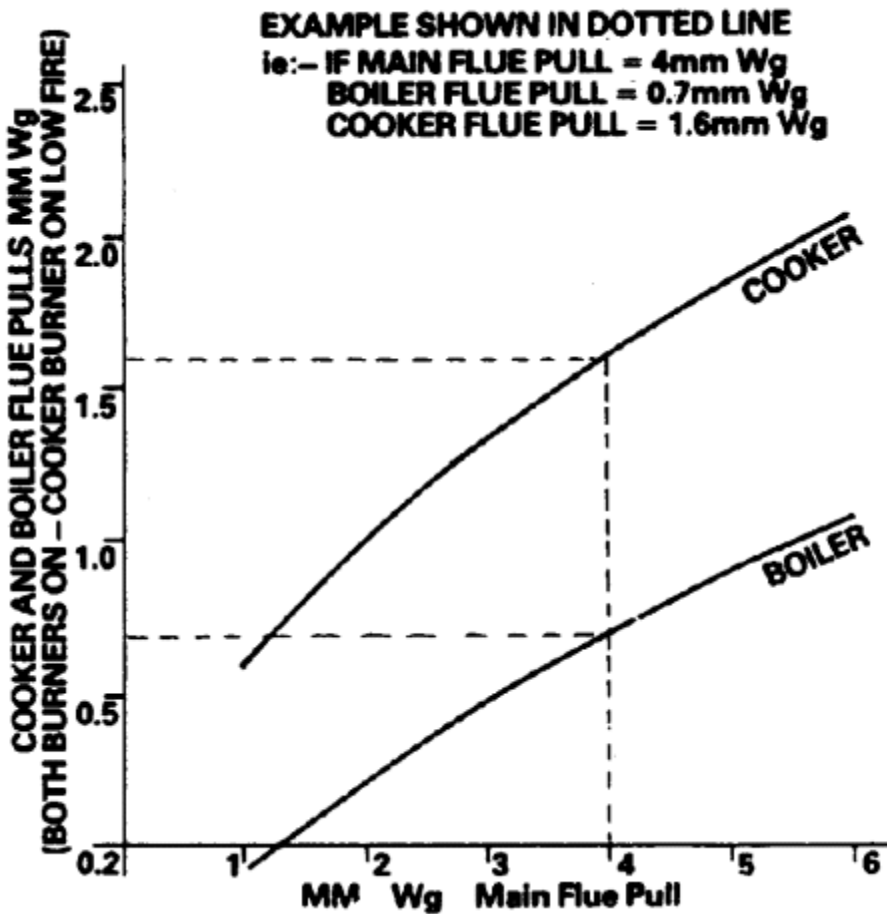


Fig.14 Flue Draught Setting Curves

## SERVICING INSTRUCTIONS

### Twice Yearly Servicing

It is important that service cleaning is carried out at least twice yearly by a competent service engineer, and it is recommended that a contract be made with a registered heating installer. With normal use, a boiler/cooker half yearly flueway clean and burner service should be carried out immediately at the commencement and end of the heating season. An additional flueway clean half-way through the heating season may be necessary in some cases.

The householder should be advised to turn **OFF** both cooker and boiler control knobs **A** and **H** and the oil control valve knob **C** to **OFF** (Fig.15) the night preceding the day of service, so that the appliance will have cooled down by the following morning, in readiness for servicing. Before commencing any servicing, isolate the electricity supply (switch **OFF** and remove plug) then turn **OFF** the oil supply at the isolating valve near to the appliance.

### Standard Half Yearly Service Schedule

- a. Remove and clean Flue Draught Stabiliser.
- b. Service clean of complete boiler heat exchanger over flueways, oven and hotplate flueways together with boiler firebricks.
- c. Service clean of complete cooker and boiler oil burner.

- d. Detailed examination of glo-coil and clean.
- e. Remove and clean boiler burner fan.

**NOTE:** DEPENDING ON USAGE, GLO-COILS MAY DETERIORATE (HEAT OXIDING) AND REQUIRE REPLACEMENT AT THE END OF RESPECTIVE HEATING SEASON.

### **Standard Yearly Service Schedule**

- a. Remove and clean Flue Draught Stabiliser unit and check that it moves freely.
- b. Service maintenance check of cooker and boiler thermostat.
- c. Service maintenance check of boiler combustion fan unit, air pressure switch and oil solenoid.
- d. Service maintenance check of boiler flame sensor, oil valve and its electric top.
- e. Check on cooker and boiler oil flow rates - Section "**Post Servicing Checks**"

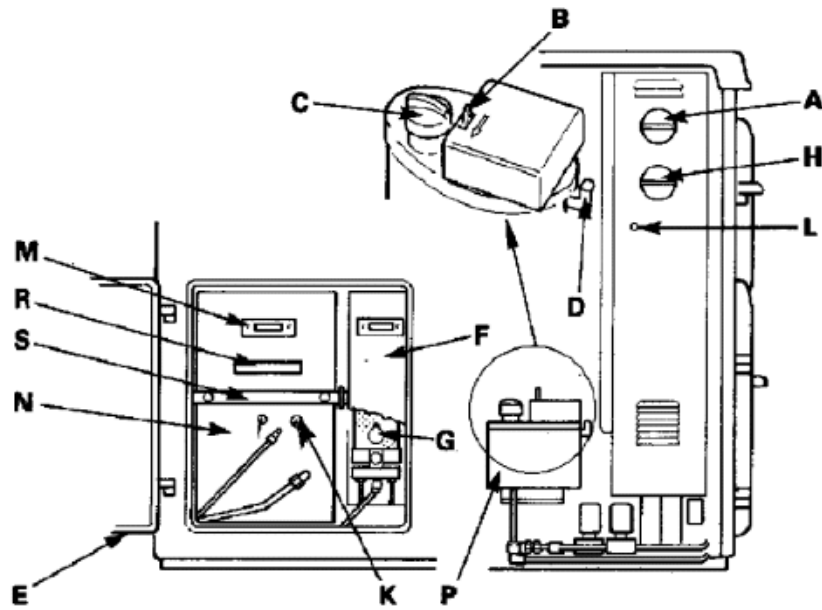
### **To Obtain Servicing Access**

To obtain servicing access to boiler heat exchanger, oven and hotplate flueways, boiler firebricks and both oil burners, proceed as follows:

- a. Lift out the hotplate via lifting tools - See [Fig.17](#).
- b. Lift out boiler combustion separator baffle and remove boiler flueway firebricks - See [Fig.18](#).
- c. Open outer burner door **E** - See [Fig.15](#).
- d. Lift off cooker burner door **F** - See [Fig.15](#).

### **To Remove Cooker and Boiler Burners - See [Fig.15](#).**

- a. Ensure isolation of the electrical supply (switch **OFF** or remove plug).



- |                                   |                               |
|-----------------------------------|-------------------------------|
| <b>A</b> COOKER THERMOSTAT KNOB   | <b>K</b> GLOW COIL            |
| <b>B</b> ACTUATING LEVER          | <b>L</b> LOCK OUT LIGHT       |
| <b>C</b> OIL CONTROL VALVE KNOB   | <b>M</b> VIEWING WINDOWS      |
| <b>D</b> TRIP LEVER               | <b>N</b> PRESSURE TEST NIPPLE |
| <b>E</b> OUTER BURNER DOOR        | <b>P</b> OIL CONTROL VALVE    |
| <b>F</b> INNER COOKER BURNER DOOR | <b>R</b> BOILER BURNER HANDLE |
| <b>G</b> LIGHTING COVER           | <b>S</b> BOILER STRAP         |
| <b>H</b> BOILER THERMOSTAT KNOB   |                               |

Fig.15 DESN 510836 A

b. Ensure that the oil line isolating valve, near to the appliance is turned **OFF** and the trip lever on the appliance **D** is lifted up.

c. Set boiler and cooker oil control valve knob **C** to **OFF**.

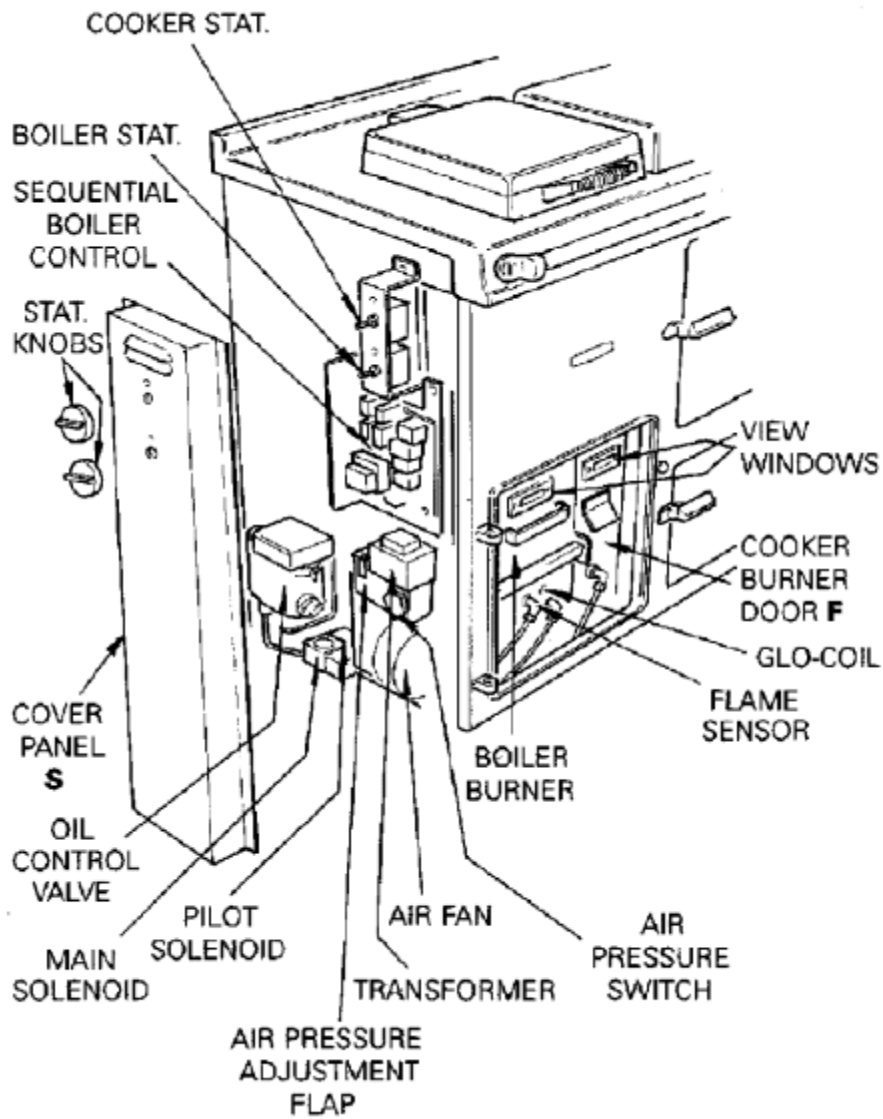


Fig.16 DESN 510388 A

## d. To Remove Cooker Burner

(i) Break the cooker oil feed pipe at inlet joint (Fig. 19) taking care to collect Kerosene residue from burner oil pipe when inlet joint is separated.

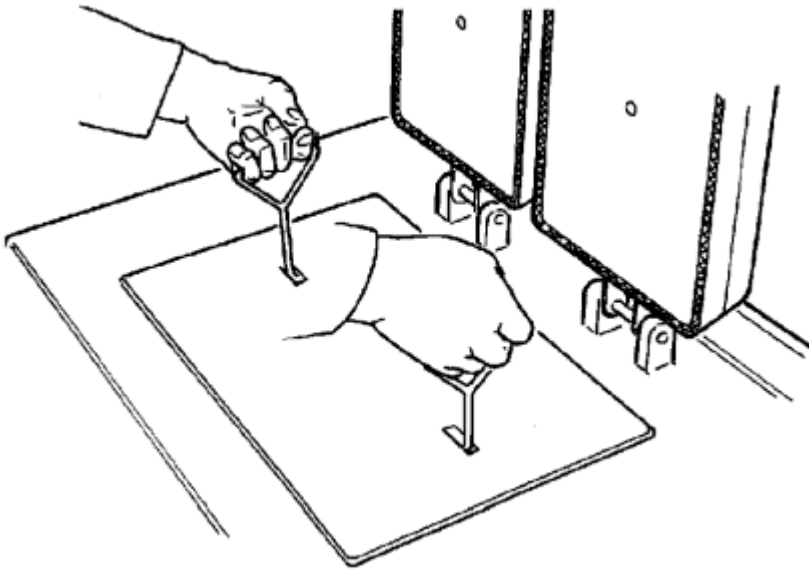


Fig.17 Removal of Hot Plate DESN 510145 A

(ii) Carefully lift complete oil burner assembly (See [Fig.19](#)) out of combustion chamber, and stand on servicing surface.

**e. To Remove Boiler Burner - See [Fig.15](#).**

(i) Slacken off boiler strap retaining bolts and remove boiler strap **S**.

(ii) Disconnect electric ignition glo-coil at terminal connections on boiler burner front, then push the connecting leads backwards to provide burner withdrawal access.

(iii) Remove flame sensor via location on boiler burner front.

(iv) Break the boiler pilot and main oil feed pipes at burner pot inlet joints, taking care to collect Kerosene residue from burner oil pipe when the inlet joints are separated. Push pipework down.

(v) Place hand on boiler burner handle **R** and carefully, but forcefully, draw burner assembly forward from cooker, and lift out onto servicing area.

**To Clean Cooker Burner - See [Fig.19](#)**

(i) Disconnect the oil supply pipe from the carbon leg assembly and lift the burner assembly out of the burner chamber.

(ii) Undo top nuts and remove air distribution disks and top heat baffles, brush these parts clean, free of soot etc.

(iii) Remove burner shells and check that any heat deformation is minimal, the assembly is free of heat oxidised surfaces, and is interlocked together. Remove any internal/external surface deposits with soft brush.

(iv) Remove the wicks from oil burner base.

If the wicks are badly charred or heat hardened, prepare replacements

(v) Carefully remove any carbon deposit on machined surfaces of oil burner base which provide seating for burner shells.

Remove end plugs from burner base and scrape/brush the internal core until free of deposit. Then refit the plugs using an oil resistant sealant.

**DO NOT MARK OR DAMAGE MACHINED SURFACE.**

Scrape and remove carbon deposit from burner base wick grooves.

(vi) Detach burner oil feed pipe from burner base elbow and scrape/brush the internal core of the burner base elbow until it is free of deposit.

Use pipe cleaner to brush open end of oil feed pipe free of deposit, then reconnect to burner base, using an oil resistant sealant.

Re-assemble Cooker Burner

**NOTE: ENSURE ELBOW AT OPPOSITE END OF THE CARBON LEG ASSEMBLY IS ORIENTATED CORRECTLY TO THE BURNER BASE ELBOW, AND THE CARBON LEG SLOPES UPWARDS OR LEVEL TO BURNER BASE ELBOW.**

(vii) Place the burner base into the burner chamber, locating the legs into the recesses and check the base sits level, adjust if necessary but note; the oil depth will need to be checked and set if burner height is adjusted.

(viii) Remove burner base and follow assembly instructions in the section "setting up the cooker burner."

(ix) Place the burner assembly into the combustion chamber, locating support legs in recess of the combustion chamber base.

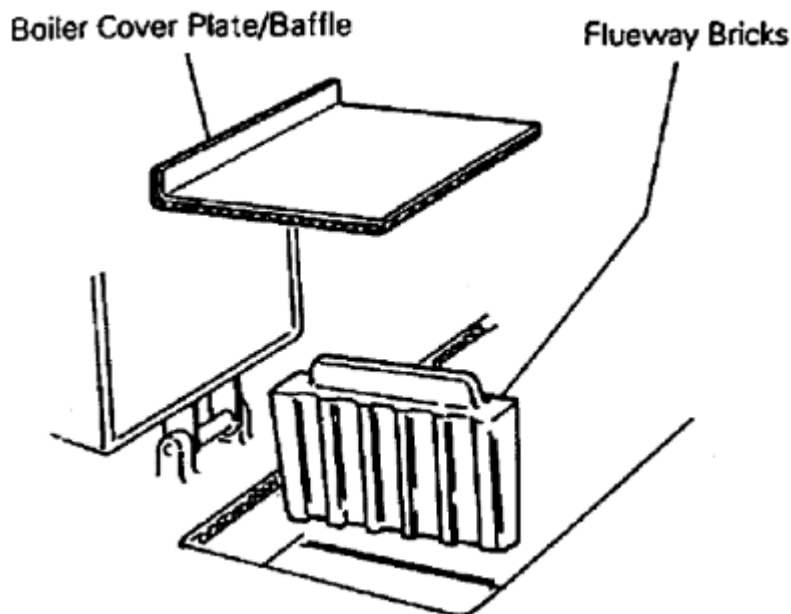


Fig.18



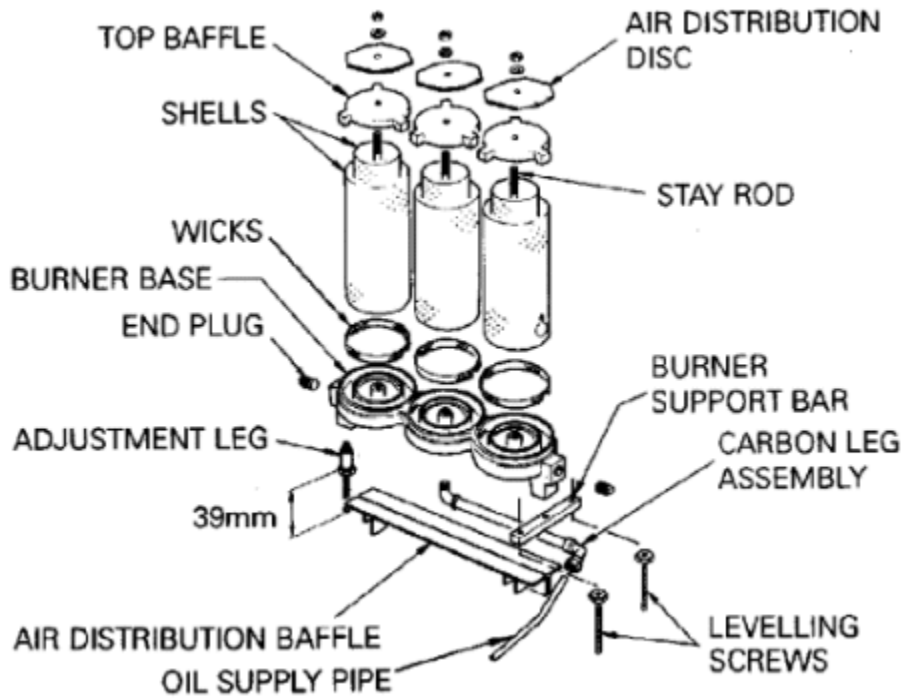


Fig.19 - Cooker Burner Assembly DESN 510835 A

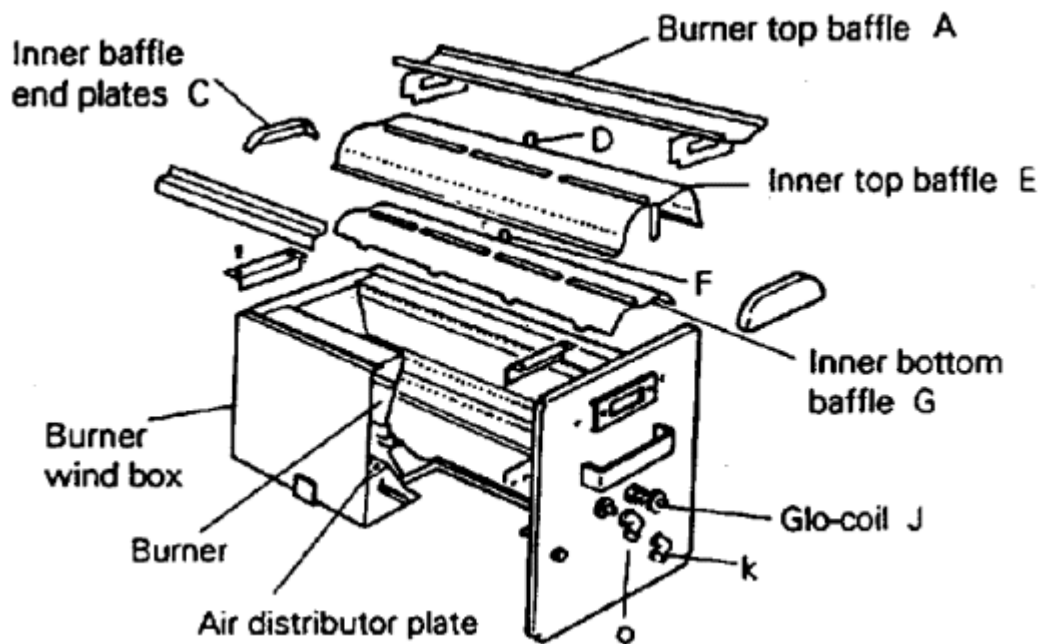


Fig.20 Boiler Burner

Re-connect the cooker oil feed pipe to carbon leg elbow and tighten.

The cooker burner is now ready for re-lighting.

**To Clean the Boiler Burner - See [Fig.20](#)**

- (i) Remove the top burner baffle **A** and brush clean both surfaces free of soot, etc.
- (ii) Lift and remove front and back interstage end sealing plates **C**.
- (iii) Holding the finger grip **D** of the now exposed top interstage burner baffle **E** tilt it slightly and lift out clear of burner.

Brush clean both surfaces free of soot.

- (iv) Holding the finger grip **F** of the bottom internal burner baffle **G** tilt it and lift out clear of burner.

Brush clean both surfaces free of soot.

(v) Temporarily plug the main and pilot oil inlet hole in the burner base bottom and brush/scrape the internal faces of oil burner and then tip the debris out of the burner. Withdraw glo-coil igniter **J**, brush and lightly clean. Examine coil for deterioration by heat oxidisation, and if in doubt, replace igniter.

(vi) Remove plug from oil inlet holes, then clean each end section of the oil feed pipes **K** and **O** with a pipe cleaner, tipping the debris via the inlet end. (Ensure hole is clear).

(vii) With the glo-coil igniter surface clean, check and ensure that the ignition wick is touching the oil burner base at the front. Replace if worn. Wick must not touch glo-coil. **THIS IS IMPORTANT.**

(vii) Replace all interstage baffles and other baffle plates, etc., in a reverse order of dis-assembly.

(ix) Lift the complete oil burner assembly into the boiler chamber and push inwards on the reverse manner of withdrawal.

Before replacing the fire bricks, check that the boiler burner is level.

Reconnect the oil feed pipe and electrically reconnect the flame sensor and ignition glo-coil igniter in reverse order of dis-assembly. Replace boiler strap and secure tightly with retaining bolts.

The boiler burner is now ready for re-lighting.

**NOTE: ENSURE BOTH PILOT AND MAIN FEED PIPES RISE CONTINUALLY FROM THE LOWEST POINT TO AVOID AIR LOCKING PROBLEMS.**

### **To Clean the Boiler Heat Exchanger and Cooker Flueways - See [Figs.22 and 23](#)**

- (i) Remove the cooker and boiler burners.
- (ii) Place a layer of paper on the boiler and cooker combustion chamber base area to collect debris when brushing commences.
- (iii) Use the rake and brush to ensure that the flueway above the oven top is clear and any deposit is removed - See [Fig.22](#).
- (iv) Lift top plate enamelled cover panel (behind the L.H. insulating cover) and remove. Remove sealing plate - See [Fig.23](#).

Insert flexible rake through exposed top plate aperture, directing it towards the flue chamber. Clean the boiler outlet flueway, by scraping the deposits towards the boiler heat exchanger and vigorously brush if necessary. Additional access can be obtained via the front of the flue chamber by removal of the flue chamber door, unscrewing the four screws securing the flue stabiliser its sealing plate.

(v) Thoroughly brush boiler heat exchanger cross firebrick ducts and cooker flueways from the top and bottom of the heat exchanger until free of debris - See [Fig.22](#)

(vi) Brush and clean in between hotplate ribs on underside. Examine soft rope seal located on underside of hotplate baffle plate and replace if worn or frayed.

(vii) Examine soft rope seal located around hotplate aperture in top plate.

Replace if frayed or damaged.

(viii) Remove layer of paper in combustion chamber base with fallen debris.

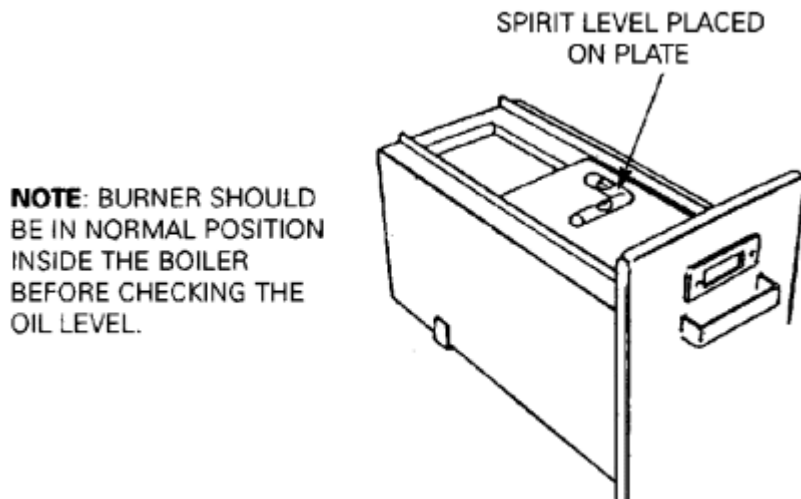


Fig.21 Burner oil level checking method

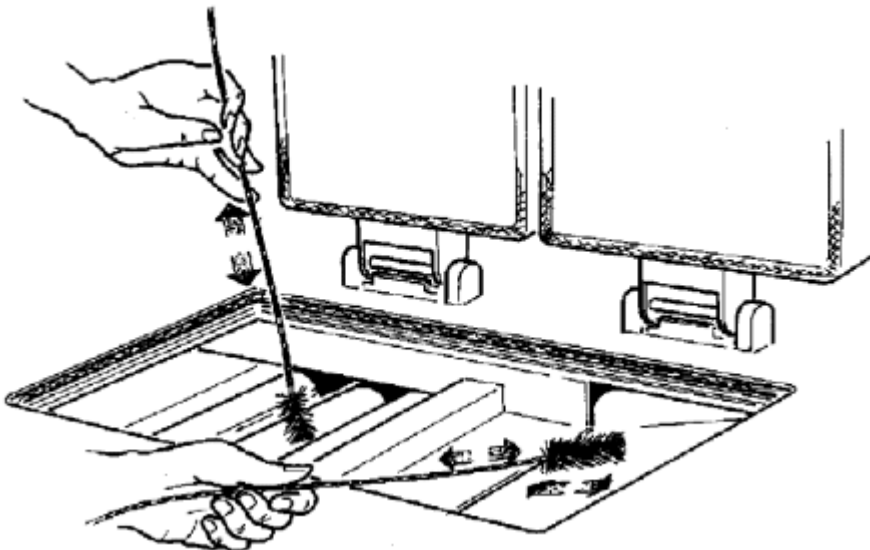


Fig.22 DESN511020

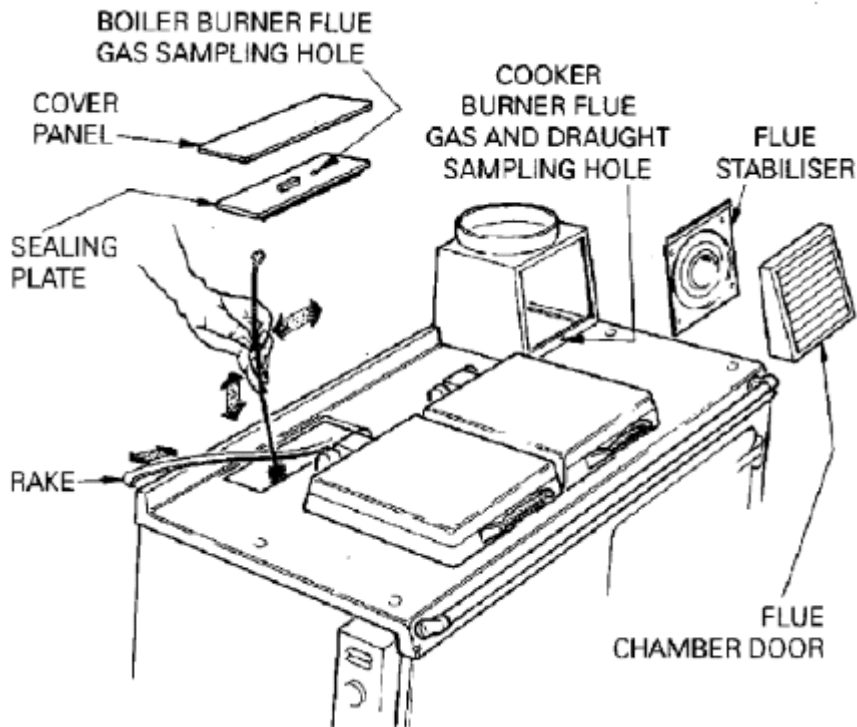


Fig.23 DESN511021 A

(ix) Replace boiler flueway firebricks in reverse manner of withdrawal, then locate boiler combustion separator baffle in original position.

(x) Replace hotplate ensuring the underside ribs lie over the combustion chamber, and that it seals to the top plate.

(xi) Replace both oil burners and remake all connections, etc., in the reverse manner of dismantling as described under Section - **"TO REMOVE COOKER AND BOILER BURNERS"**

#### **To Remove Cooker Thermostat - See [Fig.24](#)**

- a. Isolate the electricity supply (switch **OFF** and remove plug).
- b. Pull off the two thermostat knobs. Remove four screws securing control panel cover to L.H. side plate and remove cover.
- c. Disconnect two electrical leads thermostat body and earth terminal. See [Fig.28](#) for connections.
- d. Remove two securing screws holding thermostat body mounting plate. Unscrew thermostat spindle locknut to detach cooker thermostat from mounting bracket.
- e. Open top oven door and using a screwdriver, remove two fixing screws securing inner L.H. side to expose the located thermostat phial - See [Fig.24](#).
- f. Unclip thermostat phial from L.H. side of roasting oven and reset phial to face across the oven width instead of facing in depth.

Withdraw thermostat phial and capillary tube clear of oven and cooker front plate until it is fully exposed at L.H. side of appliance.

g. Fit replacement thermostat and assemble in reverse order of dismantling. Electrical leads to be reconnected as previously - See [Fig.28](#) for connections.

#### **To Remove Boiler Thermostat - See [Fig.24](#)**

- a. Isolate the electricity supply (switch **OFF** and remove plug).
- b. Pull off the two thermostat knobs. Remove four screws securing control panel cover to L.H. side plate and remove cover.
- c. Remove split pin from boiler thermostat pocket.
- d. Remove and withdraw boiler thermostat phial from boiler phial pocket.
- e. Disconnect two electrical leads from thermostat body and earth terminal. See [Fig.14](#) for connections.
- f. Unscrew thermostat spindle locknut to detach boiler thermostat from mounting plate.
- g. Fit replacement thermostat and assemble in reverse order of dismantling. Electrical leads to be reconnected as previously. See [Fig.28](#) for connections.

#### **To Remove Oven Temperature Indicator**

- a. Open roasting oven door fully and remove four screws securing inner lining panel to outer door.
- b. Remove inner lining panel and slagwool insulation.
- c. Unscrew two hexagon nuts securing indicator to outer door and remove indicator.
- d. Fit replacement indicator in reverse order of dismantling.

#### **To Remove Main or Pilot Oil Solenoid - See [Fig.25](#)**

- a. Isolate the electricity supply (switch **OFF** and remove plug), remove the side cover panel via its fixing screws. See [Fig.16](#).
- b. Detach solenoid cable connection from terminal block.
- c. Isolate oil supply by turning **OFF** isolating valve on inlet to oil control valve. (Operate trip).
- d. Place a small tray receptacle on floor beneath the oil solenoid. Break inlet/outlet connections of main or pilot oil solenoid at points **A** and **B** or **C** and **D** and allow surplus oil to run into tray receptacle.
- e. Remove inlet/outlet connection fittings from main or pilot solenoid, clean threaded ends and re-coat with oil sealant. Refit to new solenoid.
- f. Re-assemble in reverse of dis-assembly and reconnect electrical cable leads to terminal block.

The main oil solenoid valve is now ready for use.

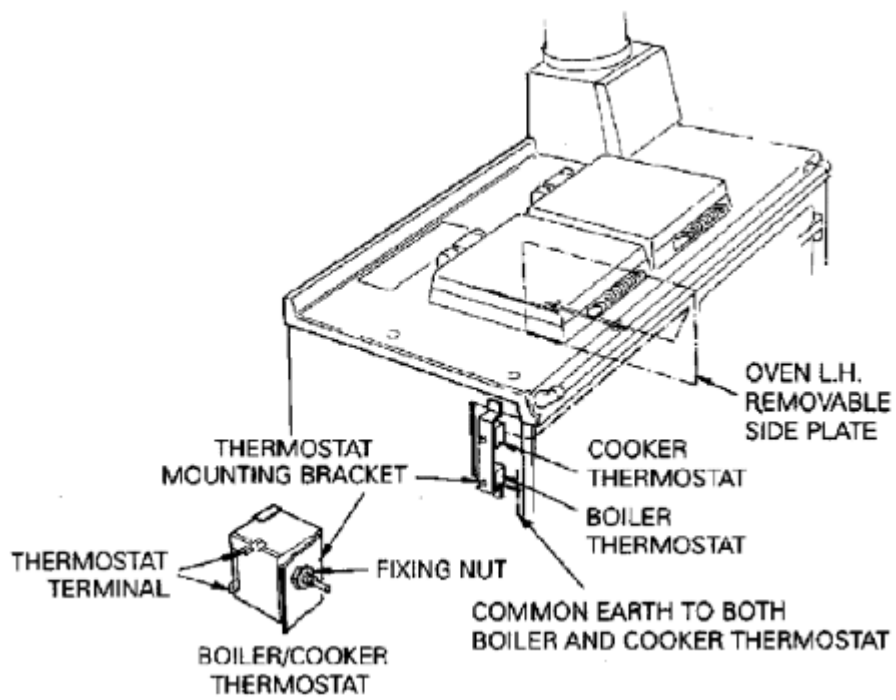


Fig.24 DESN 511022

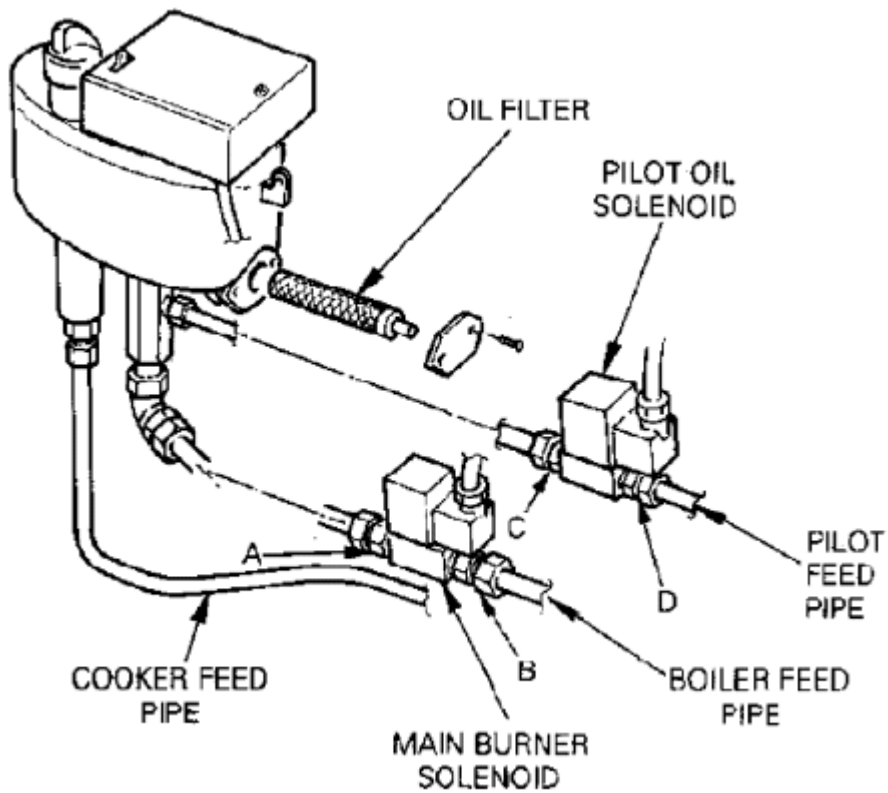


Fig.25 DESN 511323

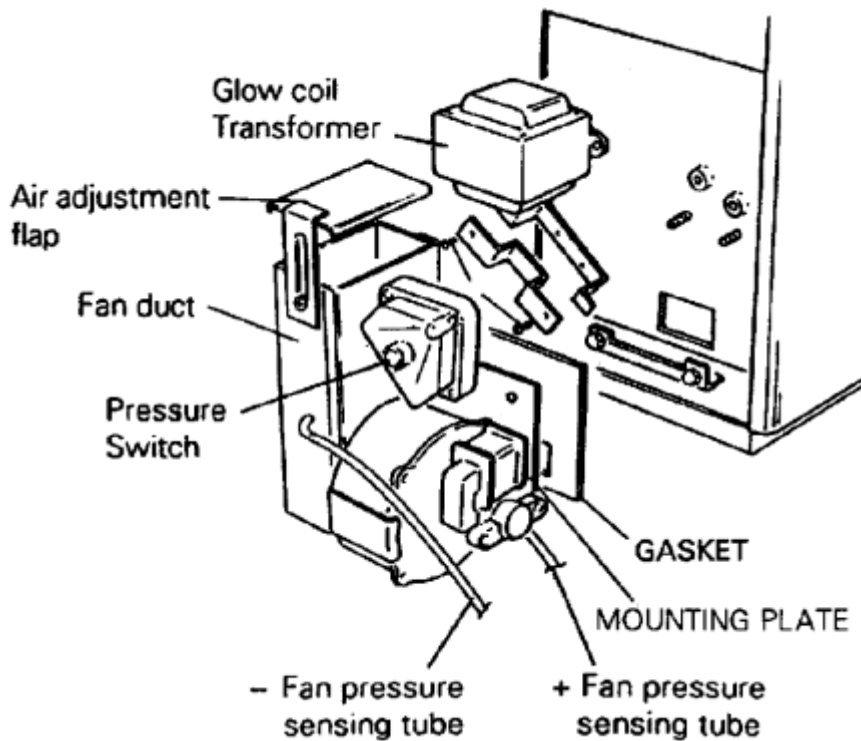


Fig.26

**To Remove Airfan - See [Fig.26](#)**

- Isolate the electricity supply (switch **OFF** and remove plug), remove the side cover panel via its fixing screws. Disconnect oil lines at burner inlets and depress downwards for fan access. Remove cable lead connected to terminal block position '**FAN**' on sequential control box - See [Fig.28](#).
- Using box spanner, slacken and remove two top nuts and also slacken two bottom locknuts and screws securing mounting plate to boiler side.
- Detach air pressure plastic tubes from air pressure switch. + and -.
- Tilt and lift complete fan assembly away from appliance.
- Remove the two screws securing the fan assembly to the mounting plate.

**CHECK THE GASKET SEAL IS INTACT AND REPLACE IF NECESSARY.**

- Re-assemble in reverse order of dis-assembly and reconnect electrical terminals.

The airfan is now ready for use.

**To Remove Air Pressure Switch - See [Fig.26](#).**

- Isolate the electricity supply (switch **OFF** and remove plug), remove the side cover panel via its fixing screws. See [Fig.16](#).
- Detach and remove two plastic tubes from pressure switch. + and -.

- c. Remove three sleeved electrical terminations from micro-switch noting order of connection.
- d. Remove two fixing screws securing pressure switch to strap.

**NOTE:** CHECK BOTH PLASTIC TUBES ARE INTACT/AIRTIGHT AND REPLACE IF NECESSARY.

Replace switch assembly in reverse manner of disassembly and remake electrical terminations.

Although the air pressure switch is now ready for use, adjustments must be made to the switch for pressure activation as follows:

- i) Connect air pressure gauge to windbox nipple.
- ii) Switch **ON**, and initial cold start should indicate a cold pressure reading of 3.1mm w.g. (0.125w.g.) which on hot cycling should rise to a stable 4.1mm w.g. (0.165in w.g.). With duct fully open 9-11mm w.g. across fan.
- iii) Adjust excess air pressure via air pressure adjustment flap on top of air duct, adjacent to fan.

**To Remove Thermocouple Flame Sensor -See [Fig.16](#)**

- a. Isolate the electrical supply (switch **OFF** and remove plug) remove the side cover panel via its fixing screws. See [Fig.16](#).
- b. Open outer burner door.
- c. Slacken off pinch screw securing flame sensor to location by bush.
- d. Withdraw flame sensor from location bush and detach cable leads at terminal block. (Clean hole).
- e. Refit flame sensor and re-assemble in reverse manner of dis-assembly, and remake cable terminations.

The flame sensor is now ready for use.



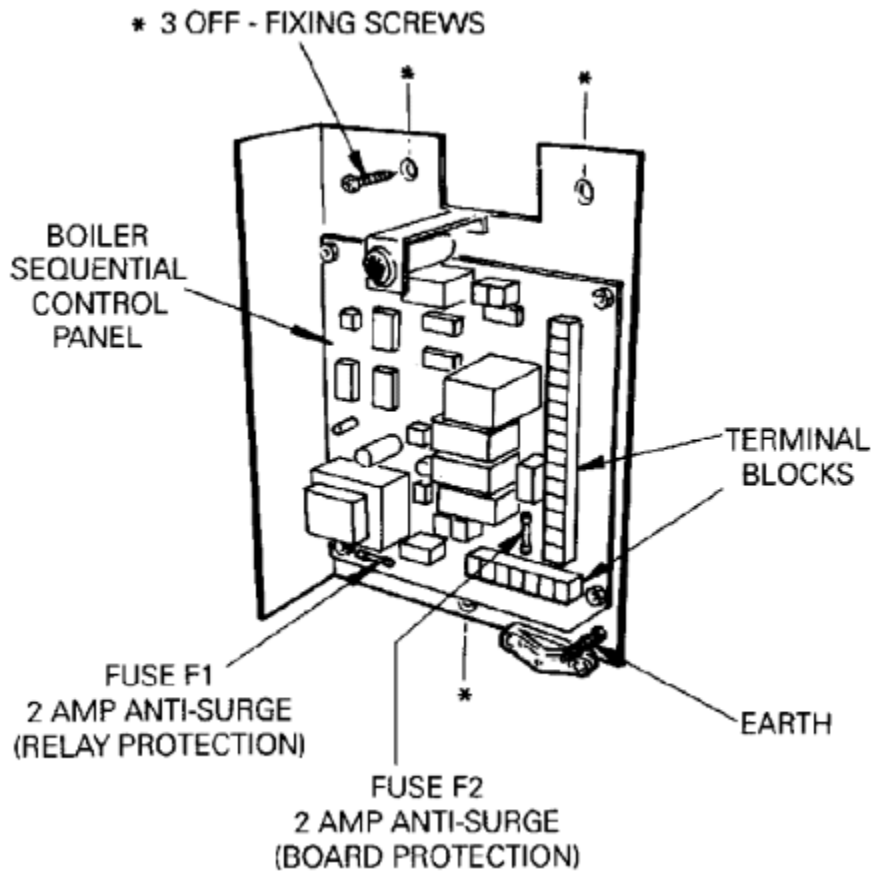


Fig.27 DESN 510389

**To Remove Ignition Transformer - See [Fig 26](#).**

- a. Isolate the electricity supply (switch **OFF** and remove plug), remove the side cover panel via its fixing screws.
- b. Open outer burner door.
- c. Remove glo-coil cable locking nut and detach both cable leads from glo-coil termination spindle.
- d. Detach transformer primary cable leads from terminal block with earth lead.
- e. Remove transformer securing screws and withdraw transformer.
- f. Replace transformer in reverse manner of dis-assembly and remake electrical connections.

**To Remove Glo-Coil Igniter - See [Fig 16](#).**

- a. Isolate the electrical supply (switch **OFF** and remove plug).
- b. Open outer burner door.
- c. Remove glo-coil cable locking nut and detach both cable leads from glo-coil termination spindle.
- d. Using a spanner on hexagon skirt of glo-coil body, slacken and withdraw glo-coil.

e. Replace with new glo-coil in reverse manner of disassembly and remake electrical connections.

**To Remove Sequential Control Panel - See [Fig 27](#).**

a. Isolate the electrical supply (switch **OFF** and remove plug).

b. Pull and remove two thermostat knobs - [Fig.15 or 16](#).

c. Remove side cover panel via its four fixing screws -Fig.16.

d. Remove the cable clamp straps via fixing screws.

e. Disconnect all electrical connections on terminal blocks and the nuts on earth posts.

f. Slacken the two top screws and one bottom screw securing the control panel to the L.H. side plate.

g. Fit replacement control box in reverse order of dismantling, ensuring that all the cable connections are fitted to their respective terminal strip positions.

Finish re-assembly of appliance.

## COOKER OPERATING SEQUENCE

With the oil valve trip lever depressed **ON**, the knob in the oil control valve set No.6, oil will flow to the cooker burner. It is intended that the cooker burner be operated on a 'high-low' oil rate basis, with idling oven temperatures obtained by a thermostat knob setting of '**LOW**' (oven temperature 135°C approx.), without the use of electrical power.

Setting the thermostat knob from **LOW TO MAX** will cause the thermostat to switch electrical power **ON-OFF** automatically and vary the oil rate to provide a selected oven temperature, thermostatically controlled.

See Users Instructions for details of thermostat knob settings and oven temperatures.

## ELECTRICAL POWER FAILURE

Despite the loss of electrical power, high oven cooking temperatures can still be obtained, but oven temperature control must be manual only.

**Method:** Holding the actuating lever on the top of the oil control valve, push it to left and engage it in the notch of the cover.

Ensure the knob on the oil control valve is set at No.6 setting to obtain maximum oil rate and adjust later to suit temperature requirements.

Electrical thermostat control will not be possible until the actuating lever is dis-engaged and the oil control valve knob is returned to No.6 setting.

## COOKER ELECTRICAL FAULTS

Because the control system is basically simple, only two electrical malfunctions are likely to occur, namely:-

1. Oven thermostat malfunctions and must be replaced.
2. Oil control valve electric top, bi-metal heater element fails. The complete electric top must be replaced.

## BOILER OPERATING SEQUENCE

The operation of the boiler burner is under the overall control of an electronic sequential control box, whose function is to provide the following service:-

1. A purpose-made orderly timing sequence of electrical signals, to various electrical controls, to enable the boiler to cycle upon boiler thermostat demand.
2. To recognise an electrical control malfunction or condition, and prevent the timing sequence continuing, by causing a lock-out condition. With the oil valve trip lever depressed **ON**, oil will exit from the oil control valve as far as the de-energised main and pilot solenoid valves only.

**NOTE:** WHERE THERE IS A LIKELIHOOD OF AIRLOCKING SUCH AS INITIAL COMMISSIONING OR REPLACEMENT OF CONTROLS, PREPURGE THE PILOT AND MAIN OIL FEED PIPES OF AIR BY BREAKING THE PIPE JOINTS AT THE BOILER BURNER FRONT

## LIGHTING SEQUENCE

1. To start the boiler sequence cycle, set the boiler thermostat knob to 80°C. The glo-coil ignition and airfan become energised with switch-on.
2. After 1 minute of energisation, the pilot solenoid valve opens, and admits a pilot supply of oil into the pilot reservoir at the front of the boiler burner.
3. The pilot oil supply becomes ignited within 30 seconds of entry, and this pilot fire then progressively heats an adjacent thermocouple until a temperature of about 300°C is attained by the thermocouple after about 1 minute of flame.
4. This temperature confirmed, the thermocouple switches the main oil solenoid ON to admit oil at full rate, which then cross lights from the pilot flame.
5. At the same time, power is isolated from the glo-coil and pilot solenoid valve, resulting in a pilot oil shut-off condition.
6. The burner continues to run at main oil rate, under control of the boiler thermostat until satisfied.
7. **NOTE:** IF FOR ANY REASON, ONE OF THE FUNCTIONS ARE NOT CARRIED OUT IN POINTS 1-4, A LOCK-OUT CONDITION WILL OCCUR AT THE END OF THE TIMING SEQUENCE, OR, THE SEQUENCE WILL NOT COMMENCE.
8. With boiler thermostat interruption, power is isolated from the main oil solenoid valve, but the fan remains energised on an overrun, to burn all the oil in the burner and cool the thermocouple down in temperature, taking about 5-6 minutes.

With reduction in temperature of the thermocouple, the fan becomes de-energised, and power is isolated, until the boiler thermostat calls for heat. With thermostat call, the sequence re-commences.

## POST SERVICE CHECKS

Confirmation of oil rates and combustion must be made as a final check.

These can be carried out using the Drip Feed Method.

## COOKER

1. Confirm the cooker burner base is level in all directions.
2. Confirm the static oil depth in the cooker burner base is 6mm after a 15-20 minute period.
3. Check low fire oil rate - 4.75cc/min on low.
4. Check high fire rate - 13.0-13.5cc/min.

5. Assemble burner and light.
6. After 30 minutes on high fire, sample the flue products in the flue chamber for a Smoke Test which should indicate a Baccarach Smoke No.0-1.
7. Leave the cooker thermostat knob set to **MAX**.

## BOILER

1. Check main burner oil rate - 38-40cc/min.
2. Check pilot burner oil rate - 20cc/min minimum.
3. Connect oil supply pipes.
4. Connect manometer tube to test point nipple.
5. Switch ON power supply and set boiler thermostat knob to 80°C, whereupon the glo-coil igniter and airfan will become energised.
6. Confirm the initial cold windbox air pressure of 3.1mm w.g. (0.125in w.g.) which on hot cycling, should rise to a stable 4.1mm w.g. (0.165in w.g.).
7. **NOTE:** LOW PRESSURE INDICATES A LEAKING GASKET SEAL BELOW THE WINDBOX OR AROUND ITS FRONT DOOR.
8. Adjust excess air pressure via air pressure adjustment flap on top of air duct at L.H. side of appliance, disconnect manometer and re-plug the test nipple.
9. Allow the boiler burner to operate for 2-3 cycles, then during a boiler **ON** period, sample the flue products within the boiler flue chamber where a Baccarach Smoke No.0-1 should be confirmed.
10. Combustion Analyser

Using the Combustion Analyser in the boiler flue duct sampling hole, the following readings should be achieved:

CO<sup>2</sup> 9 - 9.5%

CO PPM 15-20

O<sub>2</sub> 8 - 9%

For System Wiring Diagram See Page below.

UNDER NO CIRCUMSTANCES SHOULD THE APPLIANCE HAVE TWO SEPARATE POWER SOURCES. ALL POWER MUST GO THROUGH ONE SINGLE 5A FUSED ISOLATOR SWITCH.

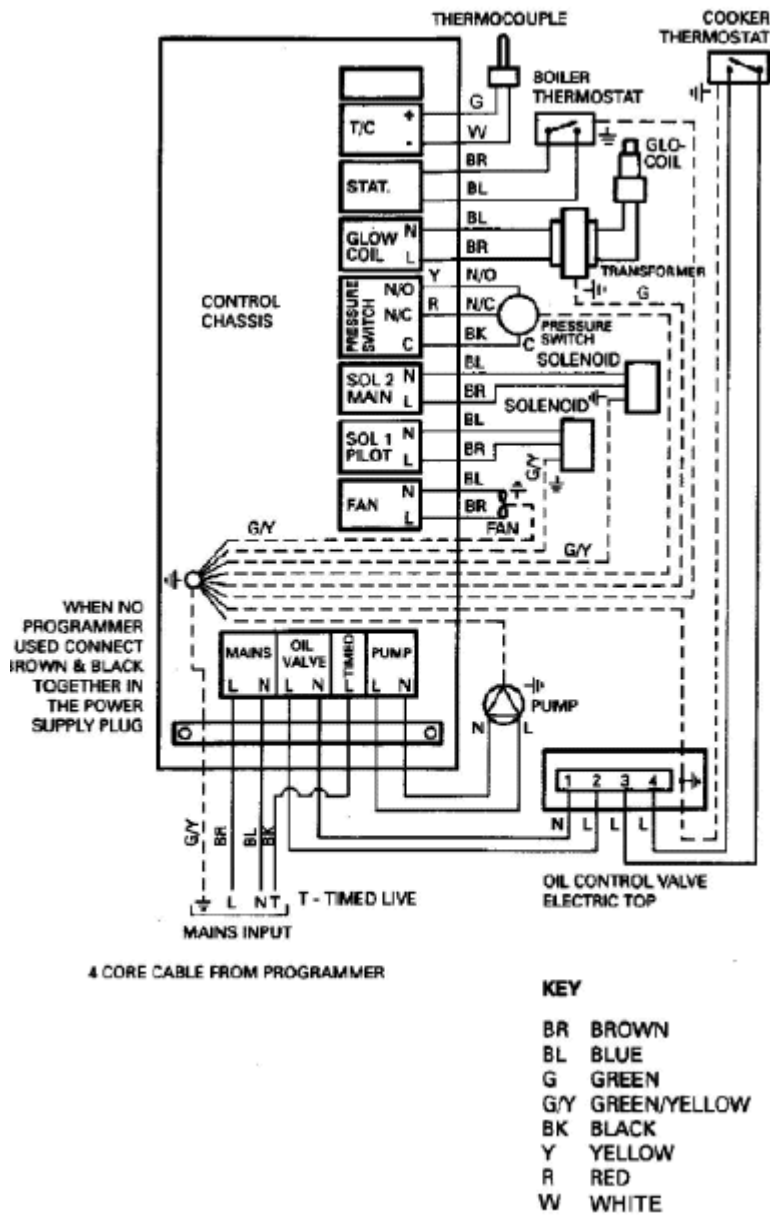


Fig.28

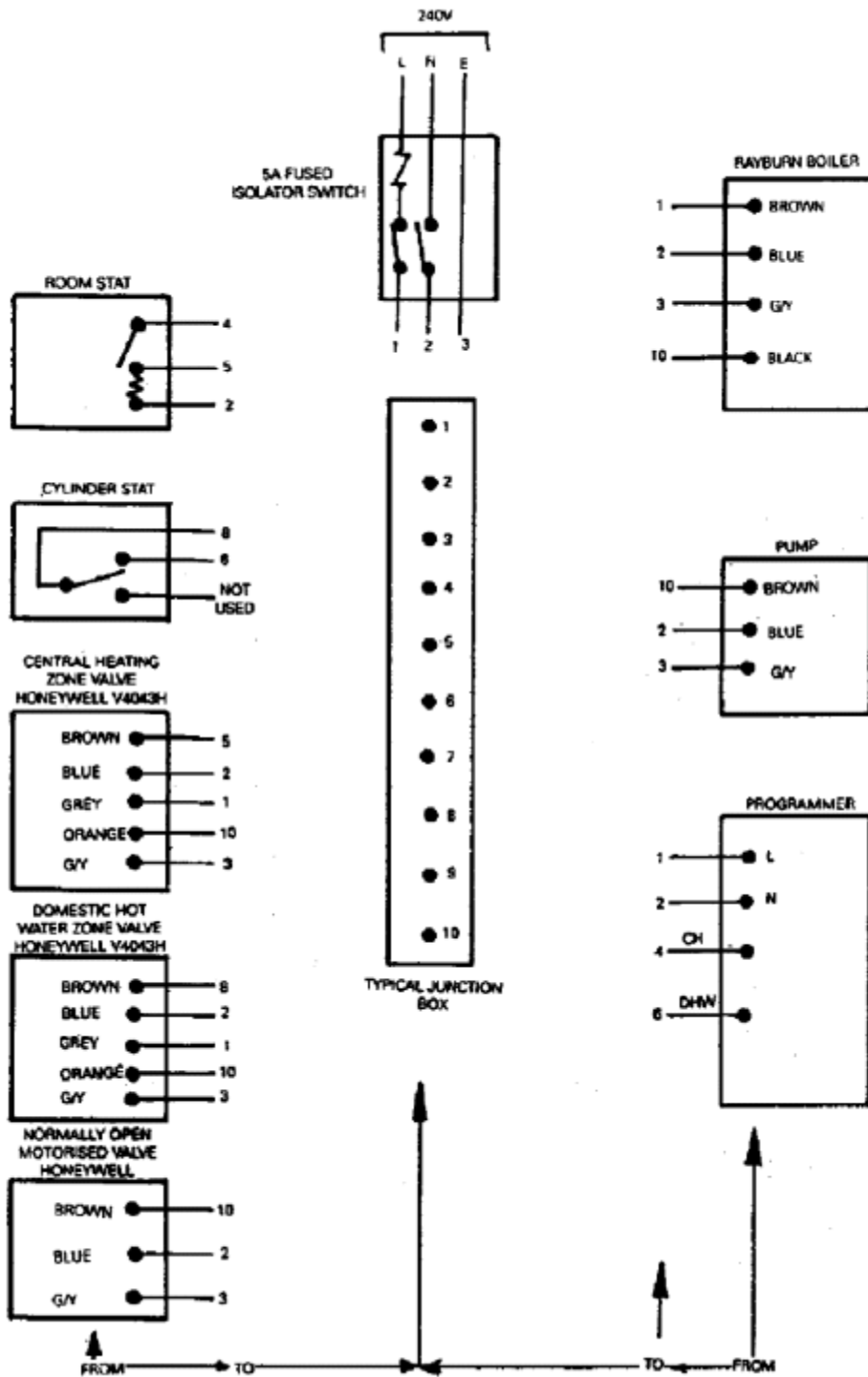



Fig.29 Wiring Diagram for the 368K on a Fully Pumped System

| FAULT FINDING      |                   |                                     |
|--------------------|-------------------|-------------------------------------|
| BOILER BURNER      |                   |                                     |
| SYMPTOMS           | CAUSE             | REMEDY                              |
| SWITCH ON          |                   |                                     |
| - nothing happens. | No power to unit. | Check mains supply, time clock, ext |

|   |  |  |
|---|--|--|
|   |  | thermostat.  |
| No output from PCB  | Fuse (F2) failure.<br><br>Boiler thermostat off.<br>Faulty thermostat.<br>Fuse (F1) failure.   | Check for wiring failure to PCB, repl<br>If fuse fails replace PCB.<br>Switch on.<br>Replace thermostat.<br>Check for component failure e.g. gl<br>and replace fuse.   |
| <b>FAN NOT RUNNING</b>  | Fault with air pressure.<br><br>PCB fault.<br>Fan unit fault.  | Check pressure has not been tamp<br>Sensing tube positioned correctly, c<br>pressure switch.<br>No power to fan, change PCB.<br>Change fan.  |
| <b>FAN ONLY</b>   |  |  |
| - Fan and glo-plug energised/No pilot/Lock out/Glo-plug De-energised/Fan continues running. |    | Pilot solenoid failure.<br>PCB fault.<br>Pressure switch not operating.  |
| -Fan, glo-plug, pilot solenoid Energised/Pilot flame/No main solenoid.                      |  | Thermocouple fault.<br>Main solenoid fault.<br>PCB fault.  |
| -Solenoid and glo-plug de-energised/ Fan runs on/Lock outlight.                             |  | PCB fault.   |
| <b>FAN and GLO-PLUG on CONTINUOUSLY</b>   |  |  |
| - Fan and glo-plug on/pilot solenoid does not open.   | PCB fault.   | Replace PCB.   |
| <b>PILOT BURNER DOES NOT LIGHT</b>  |  |  |
| - Glo-plug energised/power to pilot but does not open.                                      | Pilot solenoid fault.<br>Pressure switch fault.<br><br>Air lock in pilot oil feed pipe.<br><br>Glo-plug not working.<br><br>Transformer fault.<br>Wick displaced.<br>Glo-coil touching wick<br>Long timer fault.<br>Short timer fault. | Replace solenoid.<br>Check setting of pressure switch.<br>Replace pressure switch.<br>Check oil pipe rises steadily over wl<br>length.<br>Check Volts to Glo-plug(Approx 1.5<br>contacts on Glo-plug terminals.<br>Replace if required.<br>Check Volts In/out. Replace if requi<br>Check wick in burner replace if requ<br>Adjust wick to be 2-3mm clear of gl<br>Replace PCB.<br>Replace PCB. |
| <b>PILOT FLAME ONLY</b>   |  |  |

|   |   |   |
|---|---|---|
| - Lack of oil to main burner                  | Air lock in oil feed pipe.<br>No power to main solenoid.<br>Main solenoid fault.                                | Remove air lock/ensure gradual rise work<br>Replace PCB.<br>Replace main solenoid.  |
| <b>LOW AIR PRESSURE FROM FAN</b>              | Air adjustment cover on fan duct set wrongly.<br>Wind box leak.<br>Fan speed too low                            | Reset air adjustment cover on fan d<br>Replace gasket.<br>Replace fan unit.   |
| <b>NO FLAME SENSING</b>                       |   |   |
| - Goes to lockout                             | Thermocouple fault.<br>PCB fault.   | Replace thermocouple.<br>Replace PCB.   |
| <b>BURNER WILL NOT LIGHT.</b>                 | Check wicks in position.<br>Lack of oil to burner.  | Fit wicks.<br>Check oil valve switched on.<br>Check oil valve trip is down.<br>Check oil feed pipe gradient ensure rise.  |
| <b>NO HIGH FIRE.</b>                          | Control valve setting wrong.<br>Sticking control valve pin.   | Check control valve knob is set at n<br>Replace control valve top.  |
| <b>SOOTY FLAME-LOW FIRE.</b>                  | Poor fitting burner shells.<br><br>Low fire oil rate incorrect.   | Check set of shells seating properly<br>Replace set of shells.<br>Check burner base, replace if neces<br>Reset oil rate.  |
| <b>SOOTY FLAME-HIGH FIRE.</b>                 | Oil rate to high.<br>Down Draughts.<br><br>Poor fitting burner shells.  | Re-adjust high fire oil rate.<br>Check flue for down draughts and e<br>them.<br>Check set of shells seating properly<br>Replace set of shells.<br>Check burner base, replace if neces |
| <b>CONTINUOUS LOW FIRE.</b>                   | Power failure.<br><br>Cooker thermostat fault.<br>Oil valve electric top fault.<br>Oil valve control pin stuck. | Check mains supply: if power cut us<br>control.<br>Replace cooker thermostat.<br>Replace electric top.<br>Free using manual control lever.  |
| <b>CONTINUOUS HIGH FIRE.</b>                  | On manual over ride.<br><br>Cooker thermostat fault.<br>Oil valve electric top fault.                           | Return manual over ride lever to lov<br>Replace cooker thermostat.<br>Replace electric top.   |
| <b>ABNORMALLY LOW OVER NIGHT TEMPERATURE.</b> | Oil starvation.<br>Air lock in oil feed pipe.<br><br>Air lock in burner feed pipe.                              | Check oil supply.<br>Check oil feed pipe rises over whole<br>Check burner feed pipe gradient an<br>cleanliness.   |



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**For further advice or information contact  
your local distributor/stockist**

With AgaRayburn's policy of continuous product improvement, the Company reserves the right to change specifications and make modifications to the appliances described and illustrated at any time.



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