

## **WARNING**

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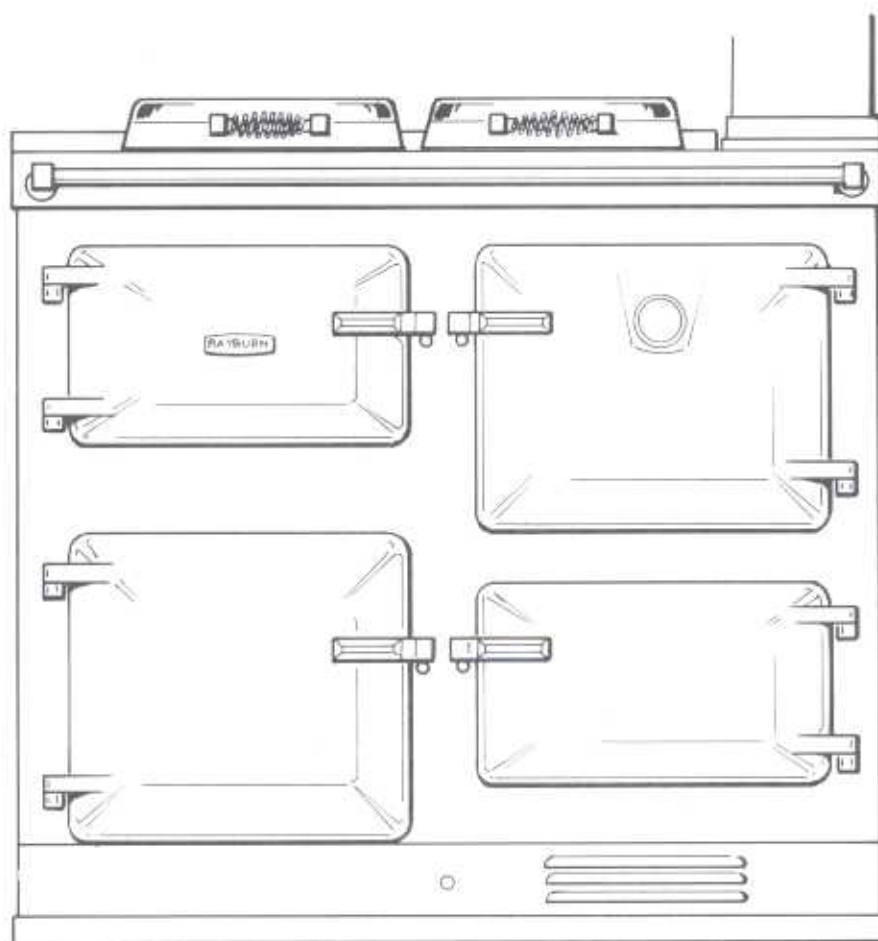


Home on the Range.

# Installation Instructions

400K

For use in GB and IE



DESN 511420

PLEASE READ THESE INSTRUCTIONS BEFORE INSTALLING THIS APPLIANCE

WP 9/96 EINS 511387

## 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.

## Health & Safety

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**

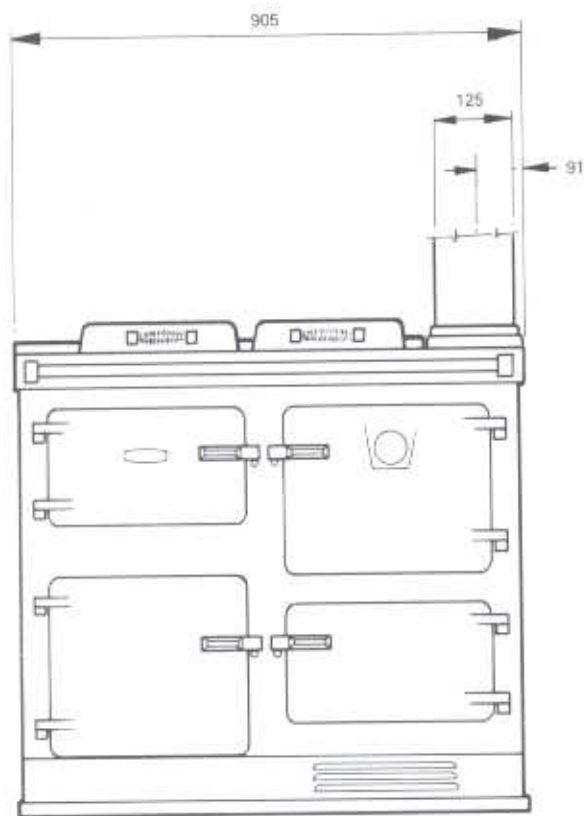
Exercise caution - if these are still in liquid form use face mask and disposable gloves.

### **Glass Yarn, Mineral Wool, Insulation Pads, Ceramic Fibre**

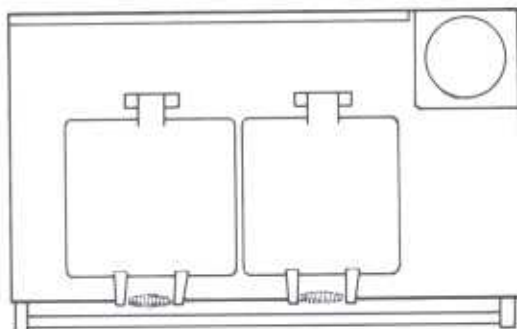
May be harmful if inhaled. May be irritating to skin, eyes, nose and throat. When handling avoid contact with skin or eyes. Use disposable gloves, face-masks and eye protection. After handling wash hands and other exposed parts. When disposing of the product, reduce dust with water spray, ensure that parts are securely wrapped.

### **Kerosene & Gas Oil fuels (mineral oils)**

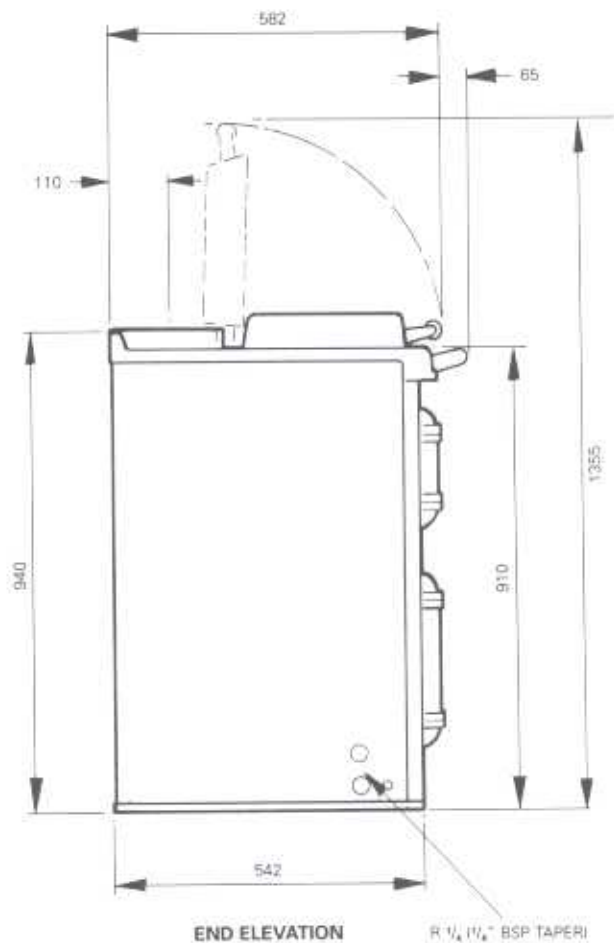
1. The effect of mineral oils on the skin vary according to the duration of exposure.
2. The lighter fractions also remove the protective grease normally present on the surface of the skin. This renders the skin dry, liable to crack and more prone to damage caused by cuts and abrasions.
3. 'Oil acne' is recognised by the presence of skin rashes. The arms are most often affected, but may occur where there is contact with oil or oily clothing.
  - Seek medical attention for any rash.
  - Avoid skin contact with mineral oil or clothing contaminated with mineral oil.
4. Inhalation of mineral oil vapours must be avoided. Never fire the burner in the open as unburnt oil vapours are likely to occur.
5. Use a suitable barrier cream which will give protection against mineral oil, lanolin based hand creams are usually very effective.
6. Never syphon mineral oils by use of the mouth. If accidentally swallowed, call a doctor, do not induce vomiting.



FRONT ELEVATION



PLAN



END ELEVATION

DIMENSIONS IN MM

DESN 511423

## TECHNICAL DATA

|                   |                           |
|-------------------|---------------------------|
| Oil Inlet         | R1/4 (1/4" BSP Taper Ext) |
| Electrical Supply | 230V ~ 50Hz 3 amp Fused   |
| Flue Outlet       | 125mm                     |
| CO <sub>2</sub> % | - COOKER 11.0             |

Fuel - Kerosene Class C2 complying with BS2869 part 2

Weight of Appliance - 345KG

### BURNER

|                        |                 |
|------------------------|-----------------|
| BURNER NOZZLE (US g/h) | 0.40 @ 80° H LE |
| OIL PRESSURE Bar (psi) | 7.6 (110)       |
| OIL BURNING RATE cc/m  | 24              |
| HEAT INPUT kW          | 14.6            |

## Site requirements

### INTRODUCTION

The Rayburn is a floor standing cooker, fired by a pressure jet oil burner.

#### IMPORTANT

- ☐ **This appliance must only be used with Kerosene Class C2 Complying with BS2869 Part 2**
- ☐ **A Fire Valve MUST be fitted in the oil supply line.**
- ☐ **The supplied in line filter MUST be fitted.**

### REGULATIONS

This appliance must be commissioned by a competent engineer such as an OFTEC approved or a commissioning engineer as shown on the Rayburn list.

The installation of the appliance must be in accordance with the relevant requirements of the current Building Regulations BS7671 (formerly IEE Wiring Regulations). It should also be in accordance with the relevant British Standard Codes of Practice.

**BS 5410** Installation of oil fired appliances for space heating and hot water purposes Part 1 Boilers of rate output not exceeding 45kW.

The control of Pollution (Oil) Regulations.

### LOCATION

**Appliance Hearth.** The surface temperature of the floor below the appliance does not exceed 100°C. The constructional hearth described in current Building Regulations does not apply. However this appliance must be installed on a solid floor or base of incombustible material which is capable of supporting the total weight.

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

The space in which the appliance is to be fitted must have the following minimum dimensions.

- Between wall and LH side of appliance - 3mm
- Between wall and RH side of appliance - 10mm
- 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. Flue pipes and fittings must not be closer than 25mm to combustible materials and where passing through a combustible partition such as ceiling or roof, must be enclosed in a non-combustible sleeve providing an air space of at least 25mm.

Spaces around flue pipes passing through walls or floors should be sealed against the passage of smoke and flame.

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 PIPE LINE

SEE FIG. 1 & 2

The oil supply connection between the storage tank and the oil pipe should be run in copper or steel pipe with a minimum diameter of 10mm. Galvanised pipes and fittings should not be used. Annealed copper pipe is preferred with flare type manipulative fittings. Capillary fittings with soft solder should not be used. Steel pipes should be joined using taper threads.

All pipe work and fittings must be completely air tight. Only oil resistant compounds and PTFE tape should be used when making joints. Pipe work must be protected against damage whether fitted above or below ground.

The size and arrangement of pipe work will depend upon the distance and height of the oil storage tank in relation to the oil pump inlet.

**The oil line from the storage tank to the appliance must be fitted with a remote acting fire valve operating at 150°F, fitted with an appropriate length of capillary to enable the valve body to be located externally at the point where the oil line enters the building. The heat sensing phial of the fire valve MUST be fitted to the clips, located behind the terminal strip**

The 5-10 micron oil filter supplied with the appliance must be fitted on the oil pipe line and stop valve must be fitted, as close to the cooker as possible in an accessible position.

A flexible pipe connection, approximately 740 mm long, is supplied to fit between the oil supply pipe and the oil pump for ease of burner removal.

## OIL STORAGE

The minimum recommended oil tank size is 1400 litres. Mild Steel Tanks should be to BS 799 Part 5 and plastic tanks to OFTEC standard OFS T100.

HOWEVER in the interests of economical deliveries the oil tank should be of 3000 litres (600 gallons) capacity.

When positioning the tank, due consideration should be given to appropriate access for fuel delivery vehicles.

Positioning should comply with the requirements of BS5410 Pt 1 and OFTEC Technical Book 3.

The tank should be complete with the following:

1. Sludge Lock (steel tanks)
2. Outlet Valve
3. Contents Indicator
4. Hinged Fill and Vent Cover  
(these may be separate)

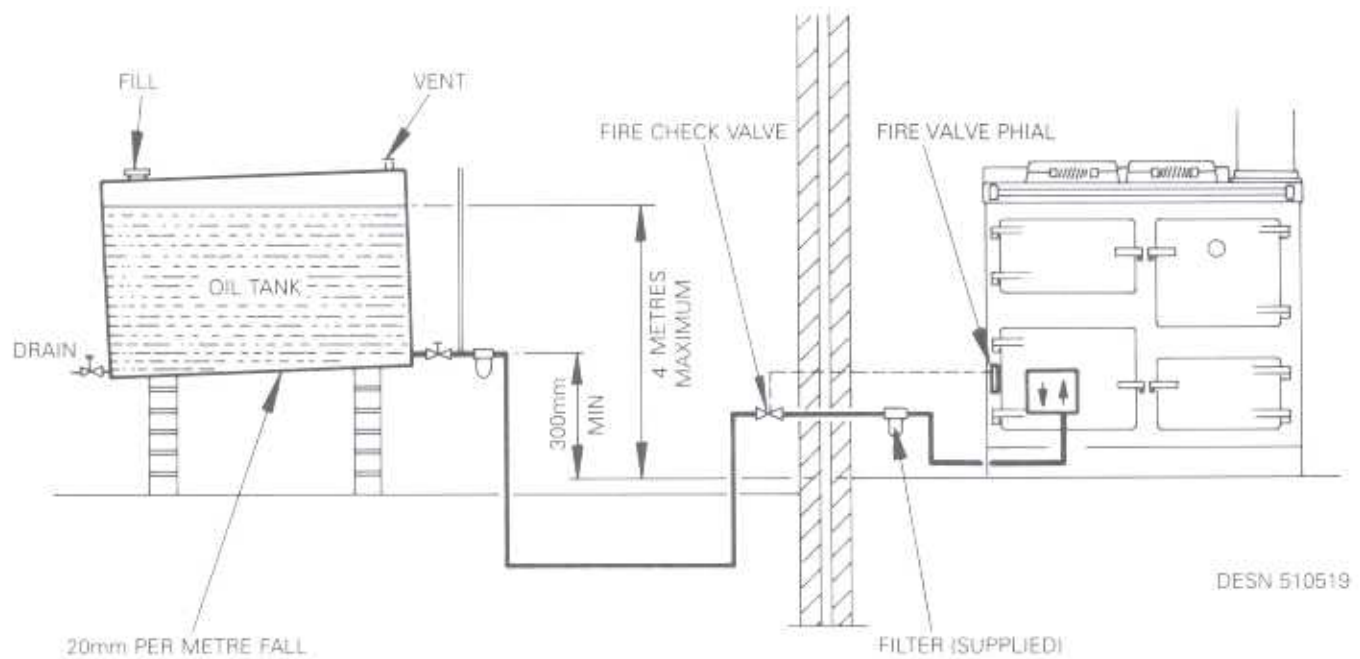
They should be either capped to prevent entry of water or fitted with return bends.

**Steel Tanks** - should be mounted on suitable supports. If of masonry, a damp proof membrane should be positioned between the tank and its supports to prevent the steel from rusting when in direct contact with water. Steel Tanks should slope 20mm for each 1m run from the oil outlet towards the sludge cock (opposite end).

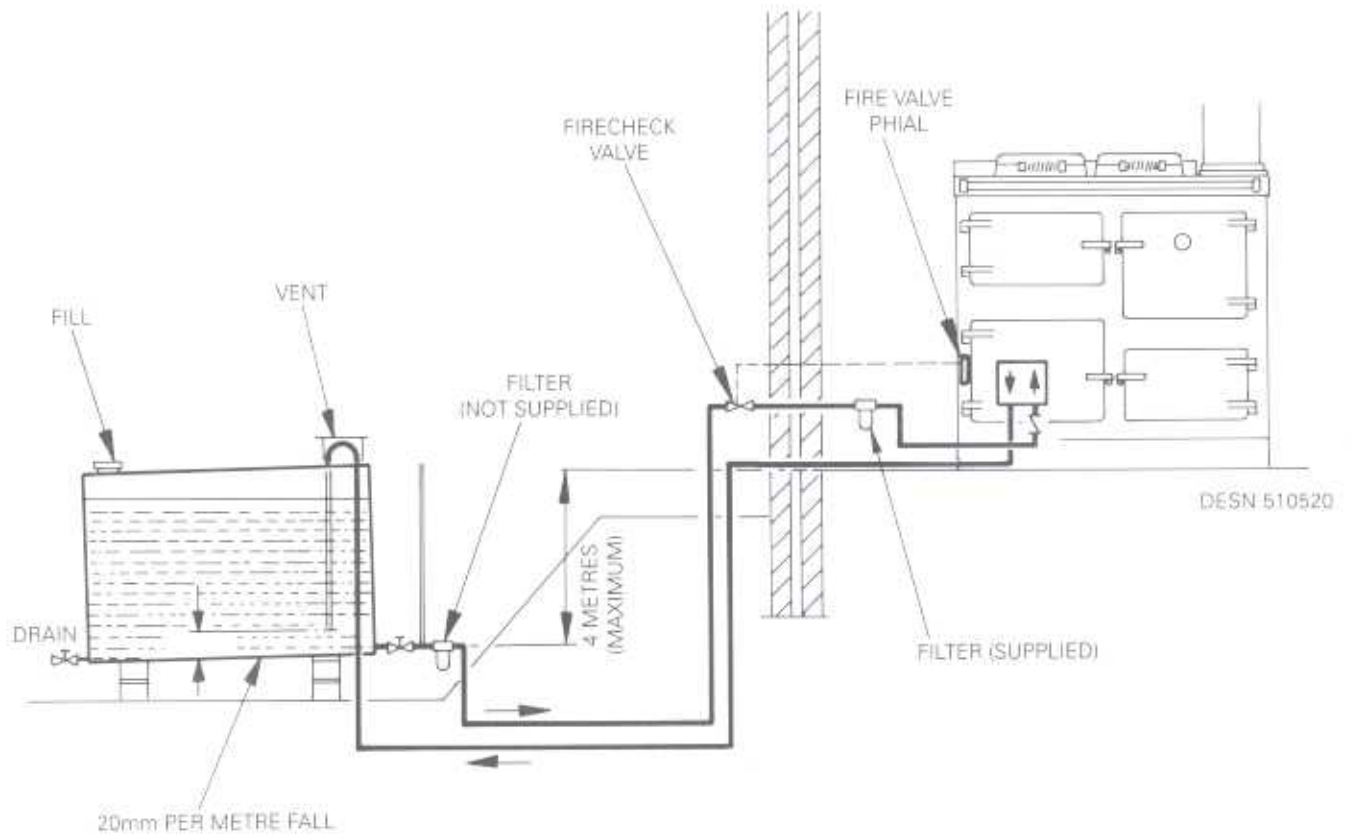
**Plastic Oil Tanks** - UV Stabilized, plastic tanks are a modern alternative to steel. These green tanks are protected against sunlight and do not need to stand on piers. They do however need to be supported over their entire base area. Ideally 50mm smooth faced garden slabs bedded onto sand or a smooth concrete base.

The single tapped outlet makes them more suited to single pipe gravity feed or where suction lift is necessary a single pipe feed with deaerator is ideally suitable.

## Site requirements



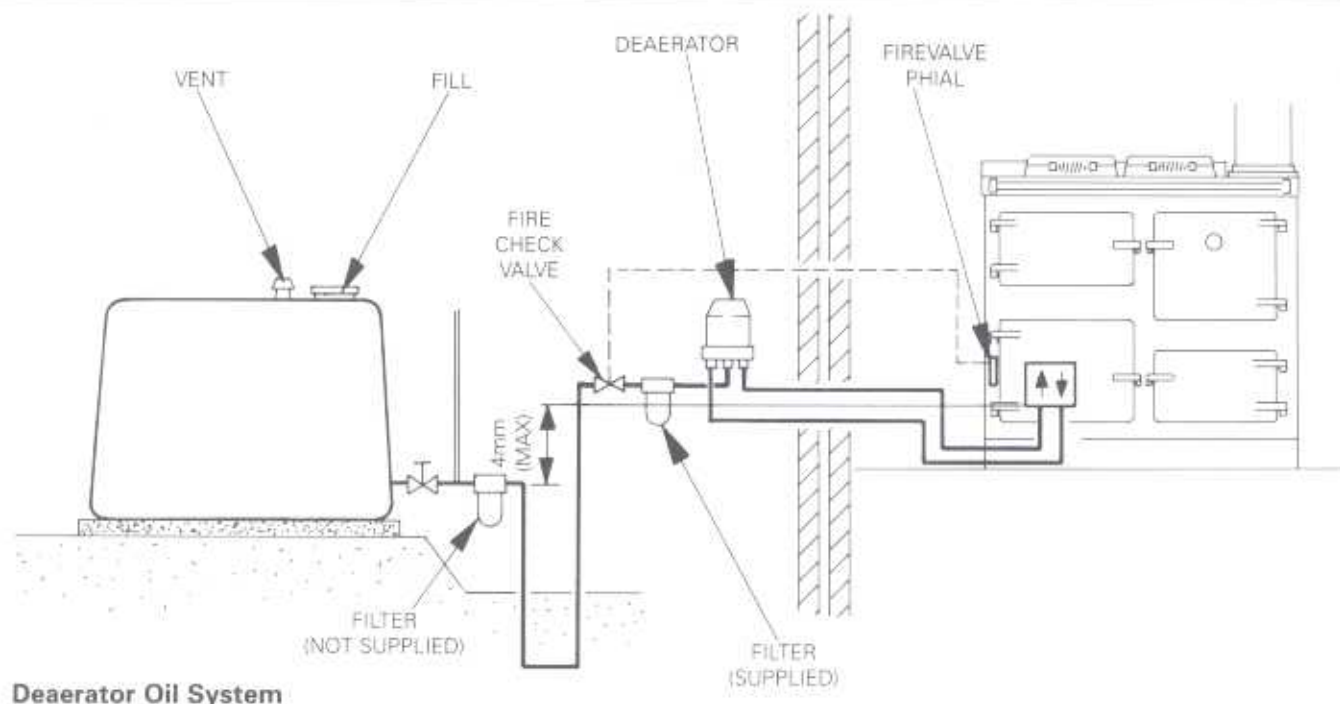
### Single Pipe oil system



### Two Pipe oil system

|                         | H METRES | 0   | -3.0 | -3.5 | -4.0 |
|-------------------------|----------|-----|------|------|------|
| MAXIMUM LENGTH (METRES) | 10mm OD  | 100 | 100  | 88   | 40   |

FIG. 1



**Deaerator Oil System**

FIG. 2

DESN 511459

## ONE & TWO PIPE SYSTEMS

SEE FIG. 3

The cooker as delivered is ready to be used on a one pipe system. To convert to a two pipe system follow the instructions in the **SERVICING MANUAL**,

Sections:-

BURNER ACCESS, steps 1 to 3,

BURNER REMOVAL, steps 1 to 5

PUMP FILTER REPLACEMENT steps 1 & 2

1. Remove middle screw
2. Remove horseshoe washer
3. Replace screw
4. Re-assemble in reverse order

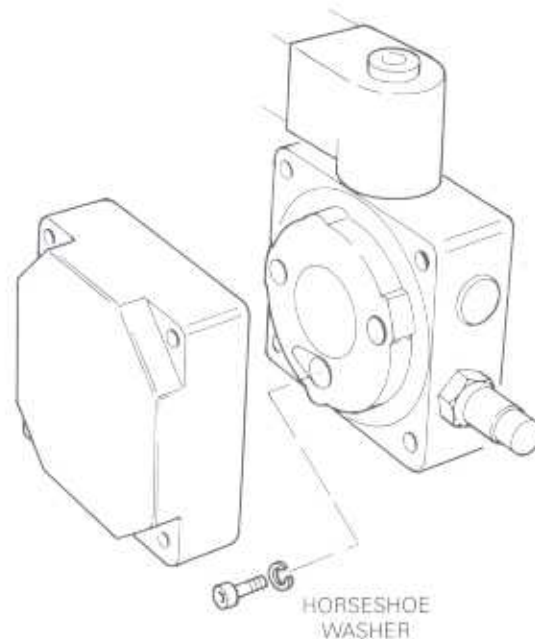


FIG. 3

DESN 511449

## Site requirements

### FLUE SYSTEM

SEE FIG. 4

The flue system must be installed to the regulations in force.

#### Information

Maximum flue gas temperature 260°C

The appliance requires a minimum chimney draught of 1.0mm WG (0.04" WG) with both burners on.

Maximum chimney draught 3.7mm (0.15" WG). Draughts in excess of this will require a draught stabilizer fitted either in the chimney or flue pipe and in the same compartment.

Detailed recommendations for flueing are given in the current issue of the Building Regulations.

Due to the range in flue gas temperatures a brick chimney should be fitted with a suitable multi fuel stainless steel flexible liner. Where it is necessary to avoid condensation, such as an exposed end gable insulation; such as vermiculite, should be back filled and the full length of the brickwork.

Factory built chimney must comply with the latest edition of the Building Regulations and BS 4543: Part 3.

The cross-sectional area of the flue serving the appliance must not be less than the equivalent area of 125mm diameter flue pipe, and be at least 4.5m high.

The flue pipe must not be less than 125mm internal diameter. Flue pipes and fittings between the appliance and the chimney should be constructed from one of the following materials:

- Stainless Steel to BS 1449: Part 2
- Cast Iron to BS 41
- Mild Steel, acid resistant vitreous lined to BS 1344: Part 2.

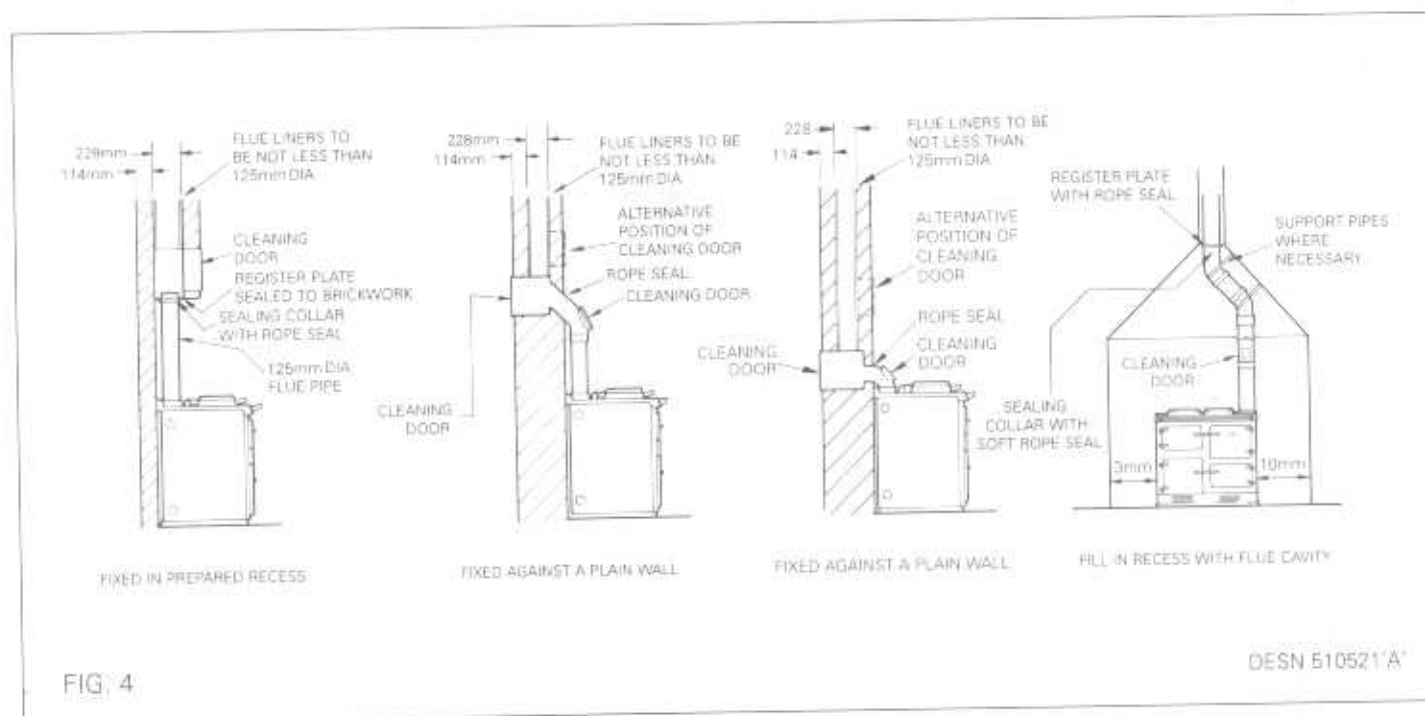
**NOTE: TO ACHIEVE THE OPTIMUM OPERATIONAL SOUND LEVELS FROM THE APPLIANCE IT IS RECOMMENDED THAT CAST IRON FLUE PIPE IS USED WHERE POSSIBLE.**

#### Chimney Termination

All chimneys should terminate at least 600mm above the roof level in accordance with current Building Regulations and statutory requirements, as outlined in BS 5410: Part 1, BS 6461: Part 1 and BS 7566 Parts 1 to 4.

#### 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.



OESN 510521'A

## AIR SUPPLY

The appliance can only be installed in a room which meets the ventilation regulations in force. But, in any event the room must have a permanent vent of minimum free air area, see below.

| MODEL | MIN. AIR REQUIREMENT |
|-------|----------------------|
| 400K  | 61 cm <sup>2</sup>   |

**IMPORTANT: THE LOUVRED AIR INTAKE AT THE BOTTOM FRONT OF THIS APPLIANCE MUST BE KEPT CLEAR OF ANY OBSTRUCTIONS**

## AIR SUPPLY

Detailed recommendations for air supply are given in the Building Regulations, and in BS 5410: Part 1. The following notes are intended to give general guidance.

1. Combustion and ventilation air supply to oil fired appliance has to comply with the Building Regulations and with BS 5410: Part 1. The air supply requirement for oil fired appliances is 550mm<sup>2</sup> per kW of maximum rated output above 5kW. These requirements are illustrated in OFTEC Technical Book No.3.

2. The combustion air supply to open flued appliances should normally be provided at high level into a room where it will not cause discomfort by creating a cold draught across the floor.

3. If combustion air is supplied through an under floor duct the grilles at each end should be positioned in the vertical plane to reduce the risk of blockage. Ducts should be sized so as to reduce resistance to air flow.

4. The ventilation requirement for kitchens in Part F of the Building Regulations is for mechanical extract at the rate of 60 litres per second or 30 litres per second if the fan is incorporated in a cooker hood. The amount can be reduced if the spillage of flue gases might be caused by the outflow of air from the room.

Background ventilation is also required, either by producing a constant mechanical extract rate of one air change per hour or by having ventilation openings of not less than 4000mm<sup>2</sup>.

5. Extract fan should be positioned as far away from the open flue as possible and should have a sufficient dedicated air supply. To undertake a test the oil fired appliance should be set in operation and the doors and windows of the room containing it should be closed. The extract fan should then be run at its maximum setting. The oil fired heating appliance should be observed to operate satisfactorily both before and after the fan is switched on.

6. It is preferable for the air supply for an extract fan to be located where it can serve the fan without the air stream passing close to the oil fired appliance.

7. Oil fired appliances must not draw combustion air from a garage.

## Site requirements

### 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 230 Volt – 50Hz and a fuse rating of 3 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 diagrams.

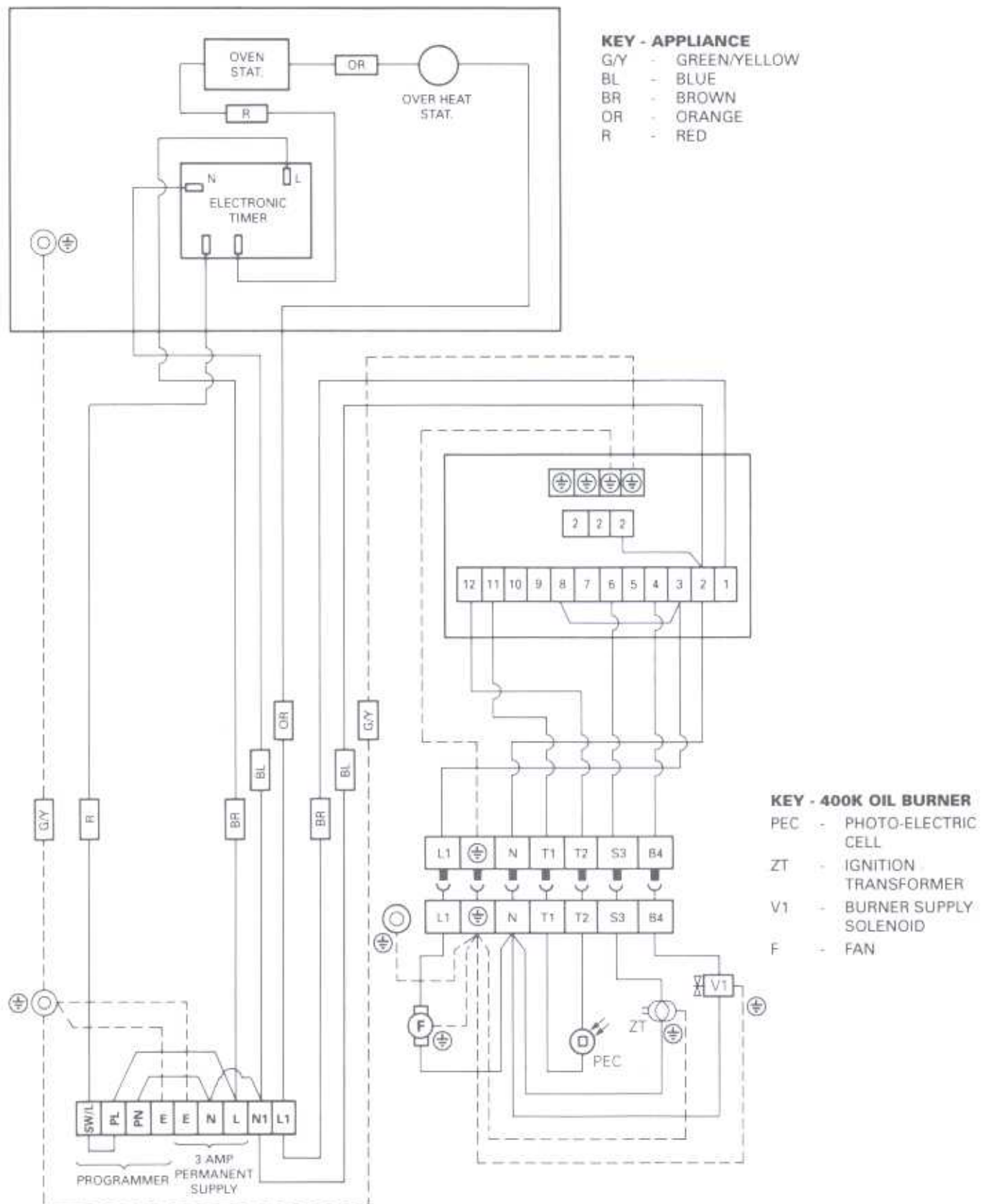


FIG. 5

## Installation requirements

### CLEARANCES

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

Between wall and LH side of appliance - 3mm

Between wall and RH side of appliance - 10mm

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.

### PRELIMINARY INSTALLATION

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.

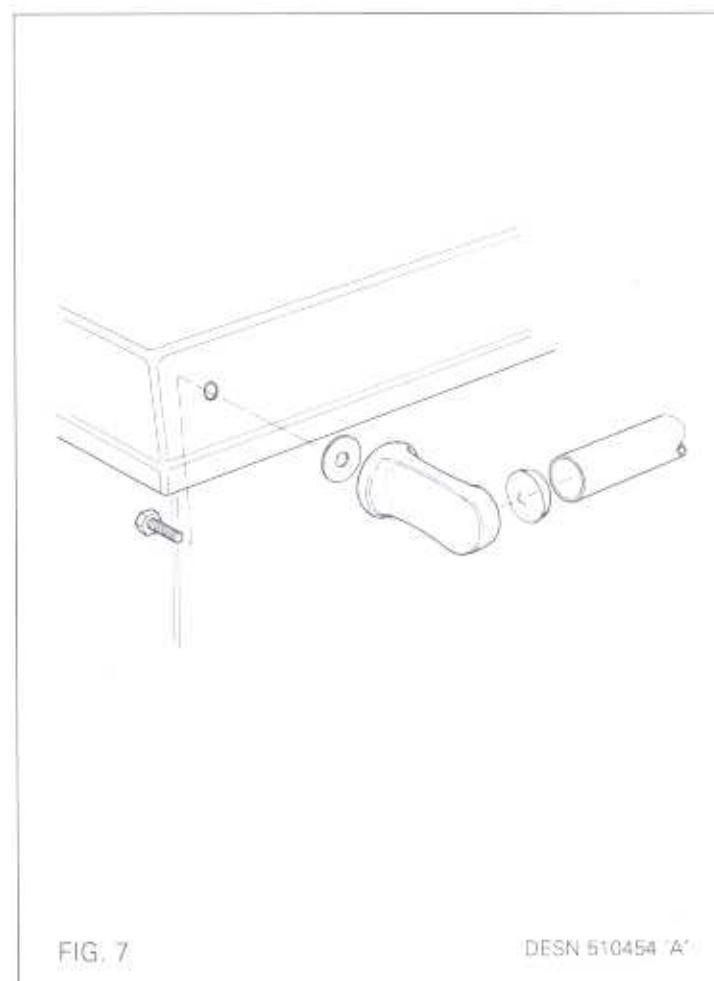
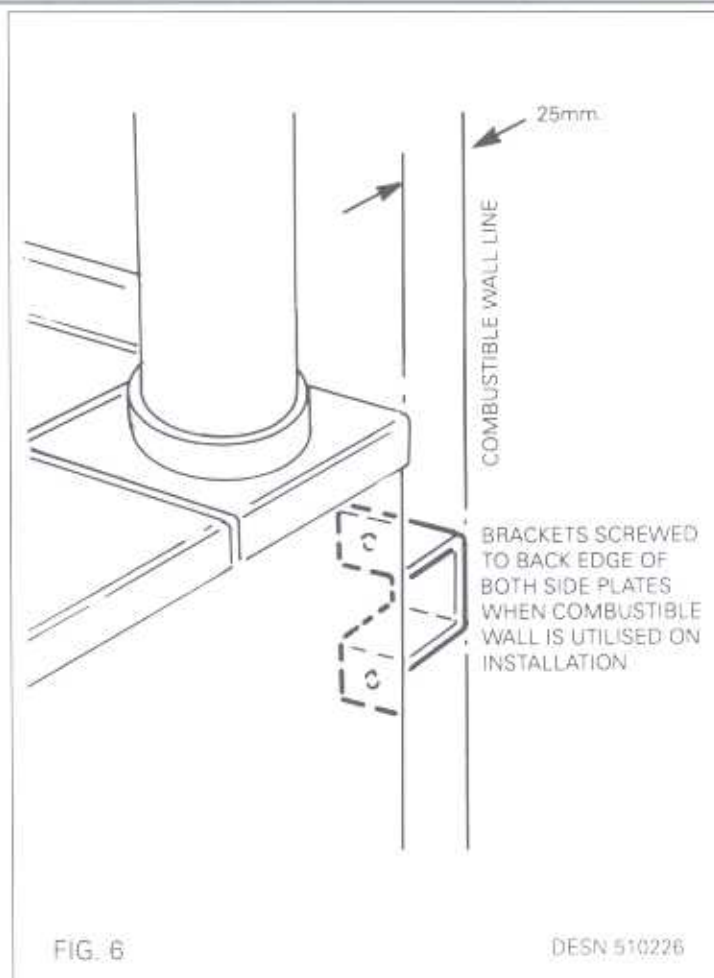
The cooker handrail.

The oil filter and the flexible oil feed pipe.

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. 6. 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 edges 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 end caps into the brackets, positioning them correctly, and tighten the locating bolts (Fig. 7).



### SITE LOCATION

1. Check that the hearth is level, then remove the appliance from its transit wooden pallet, and position it with its back against the wall and in its intended position for flue connection.
2. Locate and fit flue pipe into socket of flue pipe adaptor, seal joint with fire cement.
3. Connect and terminate the flue system in accordance with the regulations in force.

## Commissioning Instructions

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

During Initial usage of operation of the cooker, smoke/smell may 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.

## BURNER ACCESS

- SEE FIG. 8

1. Open the burner access door.
2. Remove (5) inner panel securing screws and remove panel.
3. Remove the (3) plinth securing screws and remove plinth.

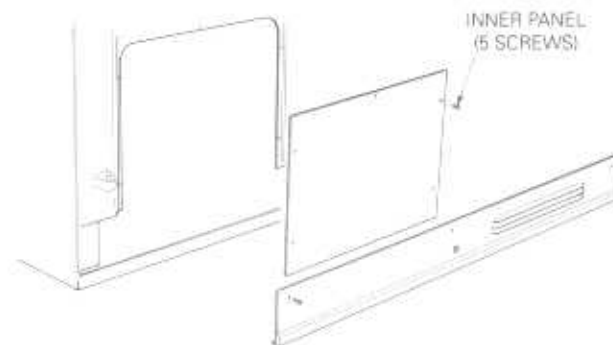


FIG. 8

DESN 511424

## ELECTRICAL CONNECTION

- SEE FIG. 9

1. Make electrical connections to terminal strip as wiring diagram (See Fig. 11)

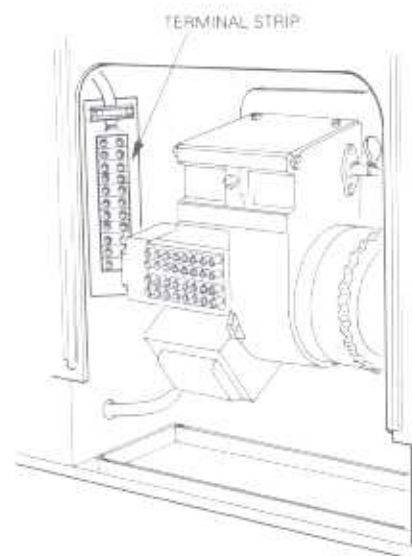


FIG. 9

DESN 511425

## OIL PUMP CONNECTION

- SEE FIG 10

1. Bring the sensing phial of the fire valve through the grommet in the left hand side panel and locate in the clips provided at rear of terminal bracket.
2. Connect the flexible hose to the outlet pipe from the oil filter. DO NOT pass the flexible oil hose through the side panel casing. If necessary use 10mm O/D copper tube between the hose and oil filter.
3. Before connecting the flexible oil pipe to the pump inlet, open the stop valve slowly and run off some of the oil into a receptacle to establish an air free supply to the pump. Make the connection onto the pump oil tight and leave valve open.

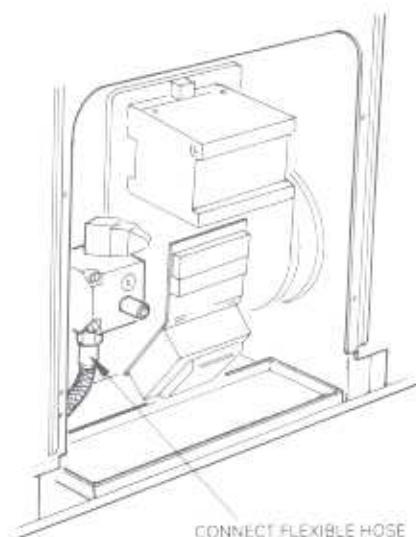


FIG. 10

DESN 511426

TERMINAL STRIP CONNECTIONS

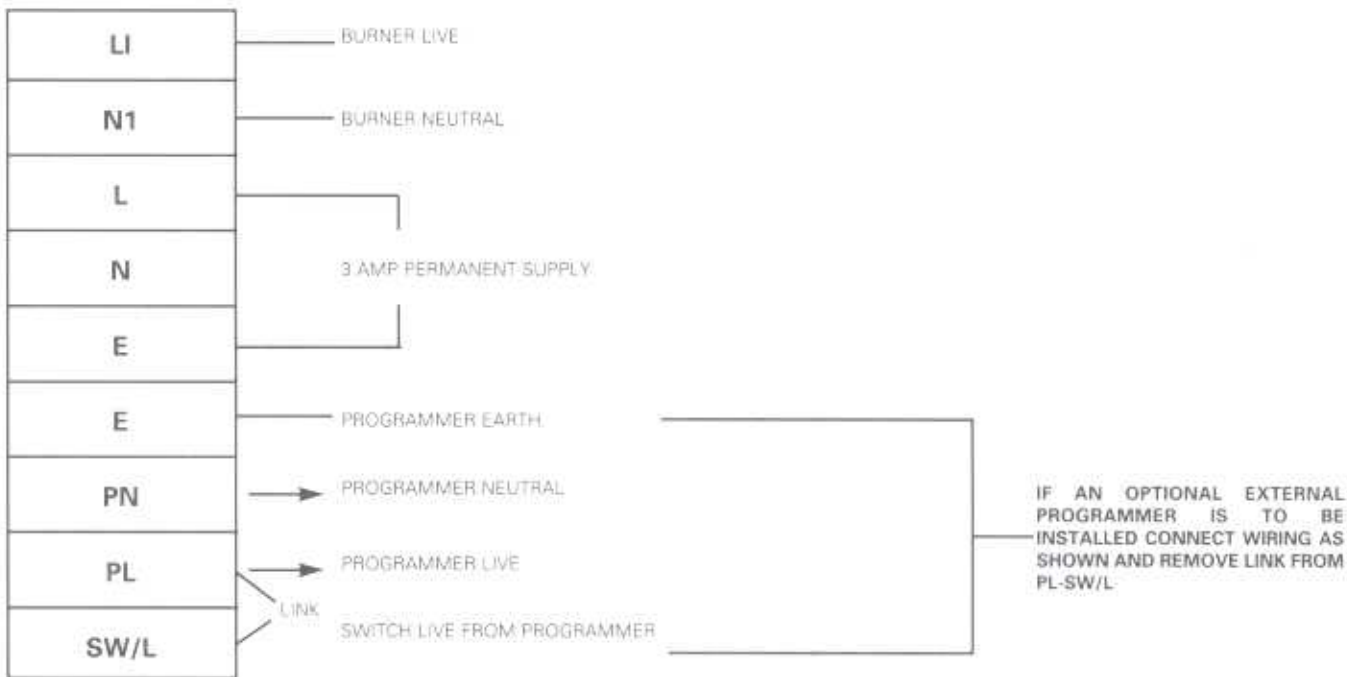


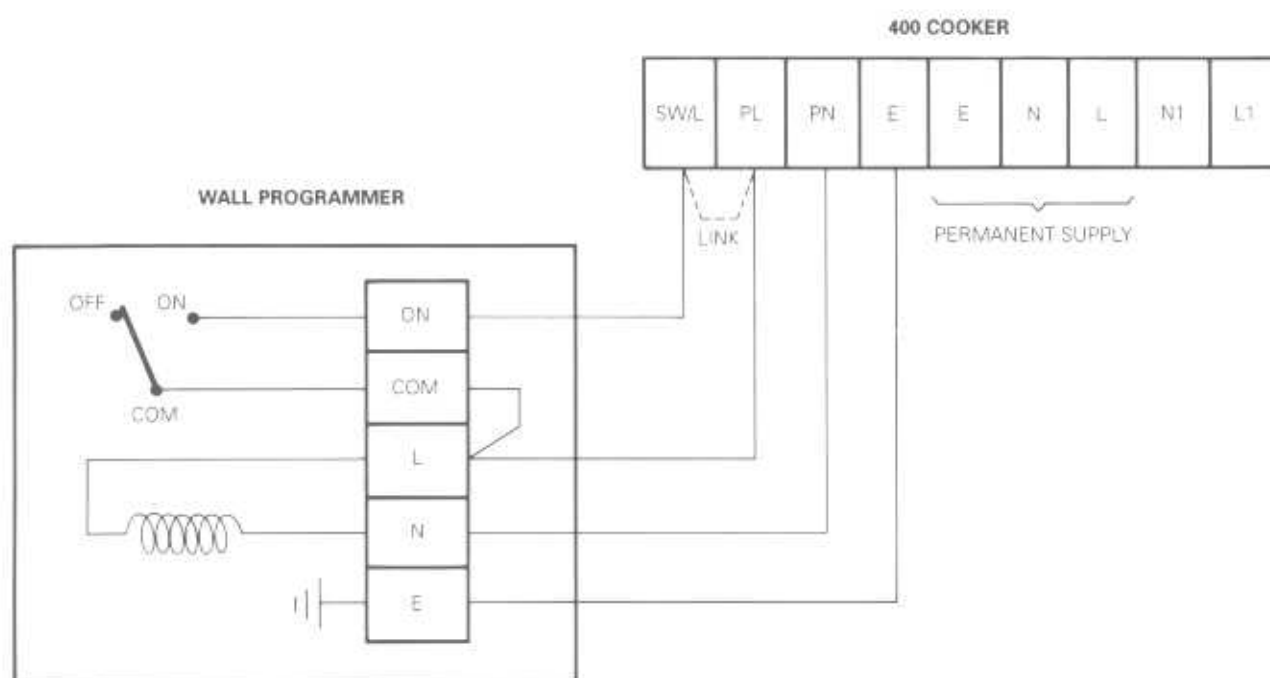
FIG. 11

## Commissioning Instructions

### USING A SINGLE CHANNEL OPTIONAL PROGRAMMER IN CONJUNCTION WITH THE RAYBURN 400 COOKER ONLY:

1. Always use the same isolating switch for both the cooker and programmer. Ideally: always use the supply connections on the appliance.
2. Before carrying out any maintenance work on either the programmer or the cooker ensure the supply is isolated.

#### PROGRAMMER WIRING



**NOTE:** LINK BETWEEN PL & SW/L IS REMOVED WHEN A WALL PROGRAMMER IS USED

FIG. 12

ALL WIRING TO THE IEE REGULATION BY A QUALIFIED ENGINEER

#### USERS INSTRUCTIONS GUIDE PROGRAMMER AND TIMER COMBINATION

1. The "Time of Day" alarm and 'Minute Minder' functions can all be used without effecting the external programmer timings.
2. When using Auto Cook Function on the internal timer ensure the external wall programmer is in the continuous 'ON' mode.
3. When using the external wall programmer; ensure it is set correctly i.e. timed. The internal cooker timer should be in Manual Mode.
4. Please read in conjunction with the instructions supplied with your external programmer.

## ELECTRICAL CHECK

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

## FIT PRESSURE GAUGE

- SEE FIG. 13

Remove the bleed screw from the manifold and fit an oil pressure gauge with R1/8 connection to check the pump output pressure.

### Switch on the Electricity

Set the cooker oven timer to manual and boiler burner turn the thermostat to maximum. The burner should run on pre-purge for 7 to 15 seconds, with the ignition spark energised. The oil solenoid valve should then open allowing the burner to fire.

Until all the air from the oil pump is flushed out there may be some flame instability resulting in the burner locking out.

This will be shown by the burner stopping and the illumination of the signal light in the reset button of the control box (see Fig. 14). In this event, **wait at least one minute**, then press the re-set button to restart.

## VENT OIL PUMP

- SEE FIG. 13

Whilst the burner is running, vent air from the pump by slackening the pressure gauge connection sufficient to allow air to bleed out. When bubble free oil seeps out retighten.

## ADJUST OIL PRESSURE

- SEE FIG. 13

After 15 minutes

Whilst the burner is running check the oil pressure on the pressure gauge. Wait for 30 seconds after ignition, for the burner to establish full firing rate.

If the pressure gauge is not indicating the correct reading then adjust the pressure by turning the pressure regulator clockwise to increase or anti-clockwise to decrease the pressure until the pressure gauge reads 7.6 bar (110 lb/in<sup>2</sup>).

Switch off the burner, remove the pressure gauge and refit the bleed screw.

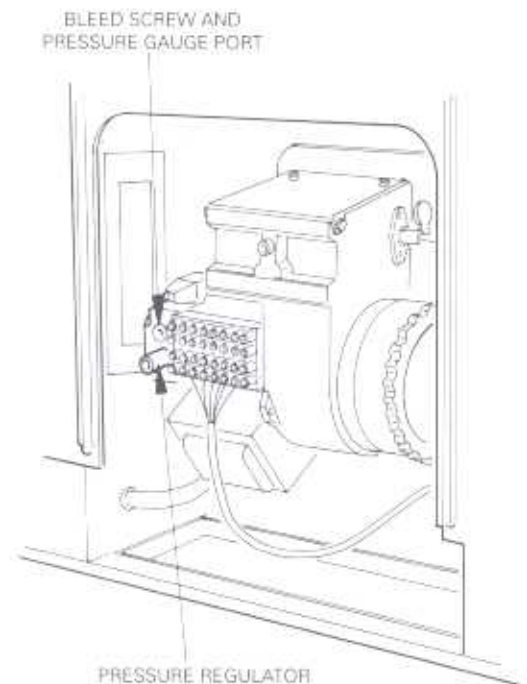


FIG. 13

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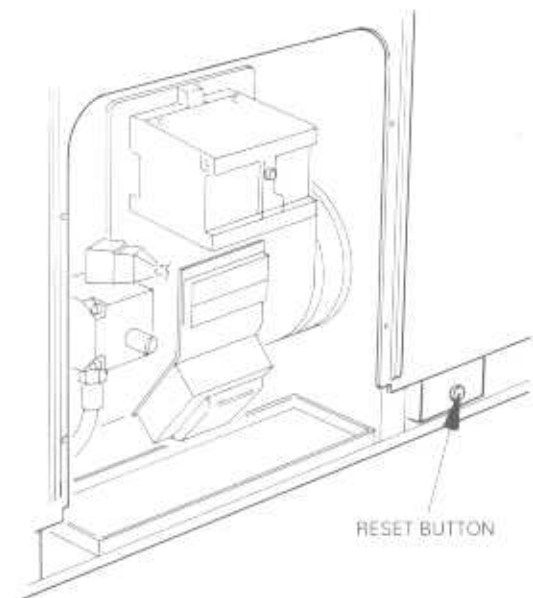


FIG. 14

DESN 511428

## Commissioning Instructions

### SET COMBUSTION AIR

- SEE FIG. 15 & 16

The air control of the burner is factory pre-set, however small adjustments may be necessary to suit the site conditions.

**IMPORTANT:** Ensure that the bottom louvred plinth is in place during combustion setting procedures and the outer door is closed.

Turn burner on.

After 15 minutes lift up the R.H. insulating cover and remove the counter sunk screw and insert the sensing end of a portable indicator to check the CO<sub>2</sub> (Carbon Dioxide) level. Adjust the burner air intake until a reading of 11.0 CO<sub>2</sub> is recorded on the indicator.

#### Check Smoke

Remove the CO<sub>2</sub> sampling tube and using the same hole for flue sampling insert the sensing end of a Baccarach Smoke Pump and check that the smoke does not exceed No. 2 on the scale. Replace the countersunk screw.

**NOTE:** Ensure that the Hotplate is fitted correctly as this forms part of the cooker combustion circuit.

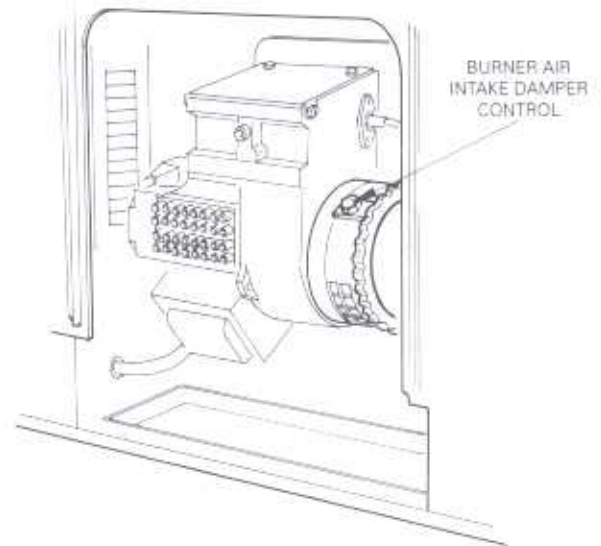


FIG. 15

DESN 511429

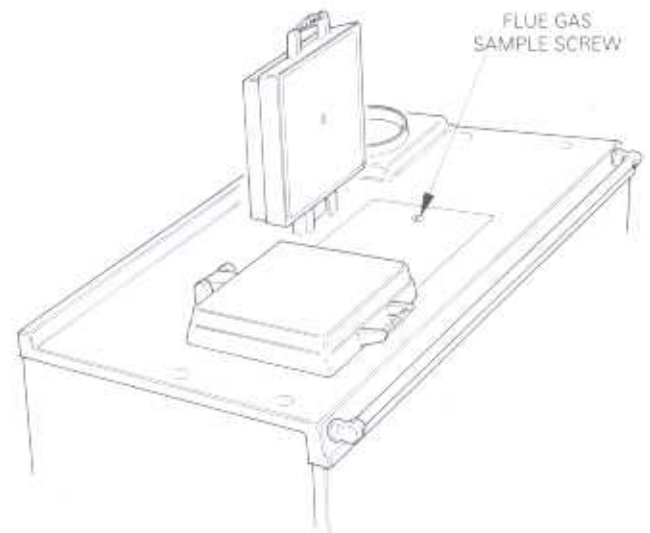


FIG. 16

DESN 511430

### ANCILLARY CONTROLS CHECK

Before leaving the site, check that the operation of cooker timer and thermostat are capable of controlling the burner correctly. Check the operation of burner control box.

In the event of a flame failure the control box should cut off the oil supply by closing the solenoid valve. The reset buttons will then be illuminated.

**WAIT 1 MINUTE BEFORE RESETTNG THE CONTROL BOX.**

### INSTRUCT THE USER

1. Advise the User that, for continued efficient and safe operation of the appliance, it is important that adequate servicing is carried out at regular 12 monthly intervals.
2. Hand the Operating Instructions to the User and demonstrate the correct operation of the appliance and system controls.
3. Leave the Installation and Servicing Instructions with the User.