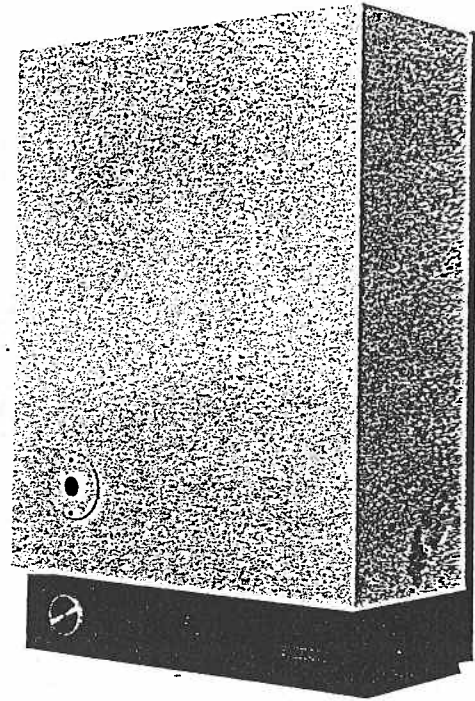


SPACE-SAVER 45-60B

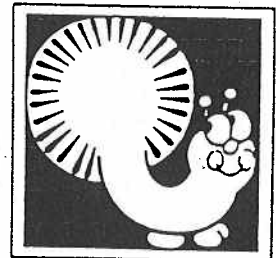
BALANCED FLUE
BOILER



G.C. No
41 315 64

INSTALLATION AND SERVICE INSTRUCTIONS

Glow-worm



VENTILATION REQUIREMENTS

Central heating units or boilers installed in Compartments.

The compartment, whether modified or specially built, should meet the following requirements:

- Have a half hour fire resistance from internal fire and the inside lining or finishing should be non-combustible or a class 1 finish.
The door must have at least the fire resistance of the compartment walls.
- For good acoustic insulation, should preferably be built of brick or clinker block plastered on at least one side and supplied with a well-fitting door.
- Be of sufficient size to permit access for inspection and servicing of the boiler and compartments. It should not be made larger than necessary in order to avoid the use of the compartment as a storage cupboard. The makers' recommendations regarding minimum requirements should always be obtained and observed.
- Be fitted with a door of sufficient size to permit the boiler to be withdrawn from the compartment.
- Be fitted with permanent openings for air for compartment ventilation as shown in the table.

Position of Opening	Air from Room	Air direct from outside
High and Low level	9.0cm ² per kW input (2in ² per 5,000 Btu/h input)	4.5cm ² per kW input (1in ² per 5,000 Btu/h input)

The figures quoted refer to the minimum acceptable free area when grilles are fitted to the openings. The high level and low level openings must communicate with the same room or space or must both be to outside air.

Where ventilation air to a compartment is taken from a room, then the room must be fitted with ventilation openings equivalent to those into the compartment.

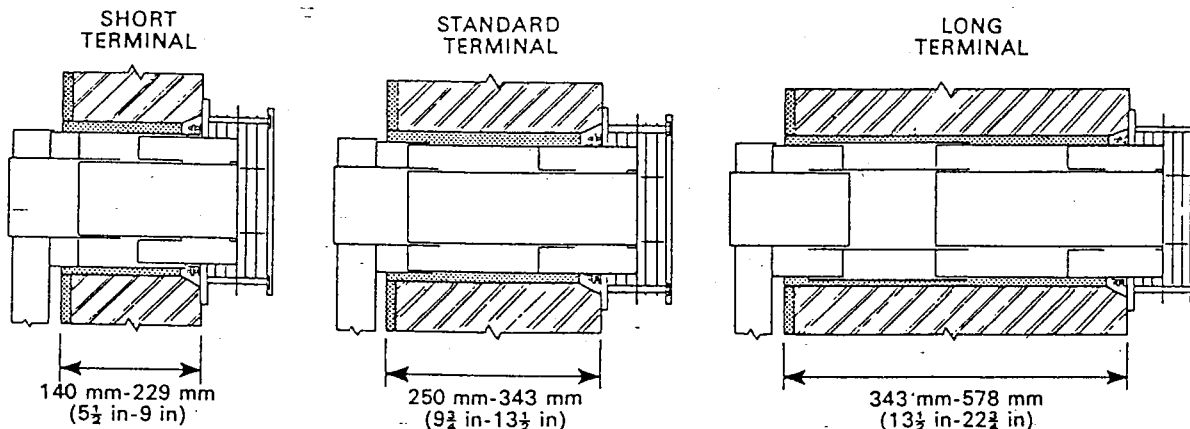
INSTALLATION

The following procedure should be adopted :

- Check that the balanced flue duct supplied is suitable for the wall thickness through which it has to pass, see diagram 1. Standard supplied suits 250mm-343mm, (9 $\frac{1}{2}$ in - 13 $\frac{1}{2}$ in). Short to suit 140mm - 229mm (5 $\frac{1}{2}$ in - 9in) and Long to suit 343mm - 578mm (13 $\frac{1}{2}$ in - 22 $\frac{1}{2}$ in) wall available to special order. *The site selected must allow a minimum of 100mm (4in), clearance for servicing, at each side of the boiler casing.*
- Mark out and cut a hole through the wall where the boiler is to be installed to the dimensions shown in diagram 2.
- Remove the boiler from its carton and place it face down on the floor. Unscrew the primary air duct from the boiler. Take the four fibre spacers supplied, peel off the protective waxed paper and fix round the securing holes in the flange of the primary air duct.
 - Where Rawlbolts are being used, mark out the four holes for the bolts securing the primary air duct to the wall, see diagram 2. Drill the holes for the D.20 Rawlbolts provided, with a $\frac{1}{32}$ inch diameter drill, the maximum diameter of the holes must not exceed $\frac{5}{8}$ inch. Dismantle the Rawlbolts and place into the holes drilled in the wall. Position the duct into the hole in the wall, offer the washers and nuts on to the bolts and tighten.
 - When FEBOLTS are used place the primary air duct in position, the balanced flue duct protruding into the prepared hole in the wall. Drill the four lower holes of 10mm diameter in the wall, using the duct as a template. (Upper two holes not used, see diagram 6). Secure the duct to the wall by passing the four F.10.B Febolts provided through the holes in the duct into the wall without dismantling the bolt, until the washer is hard against the duct. Full expansion will be achieved by turning the bolt nut 4 to 5 times. See diagram 2. In the event of the bolt spinning in the hole, remove the bolt and pre-expand, then replace.

Make sure the duct is firm and secure. Make a good cement seal around the flue duct inside the hole in the wall. Diagram 1.

DIAGRAM 1

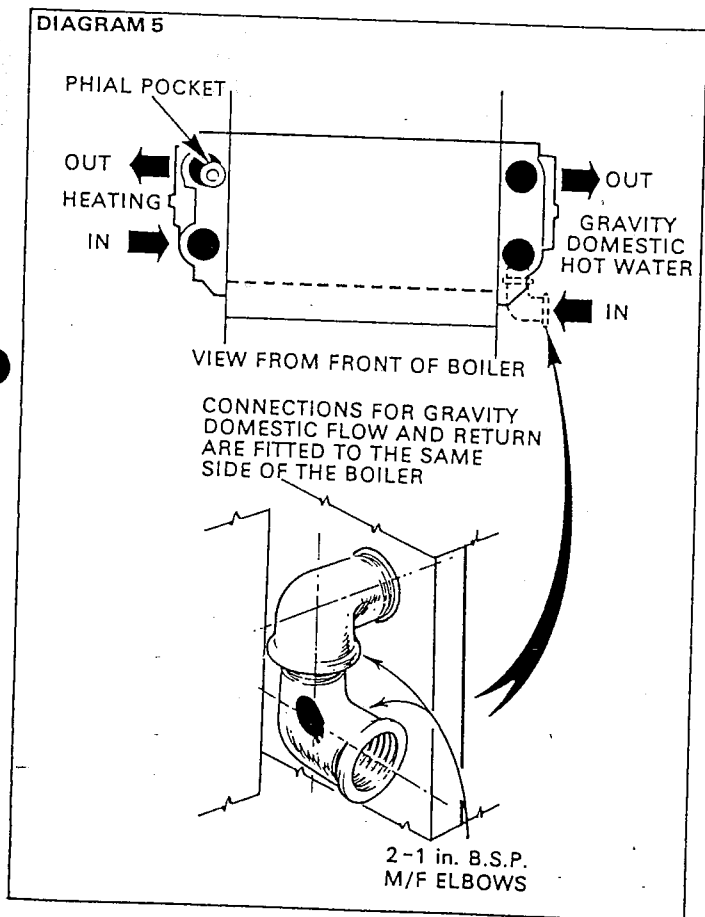
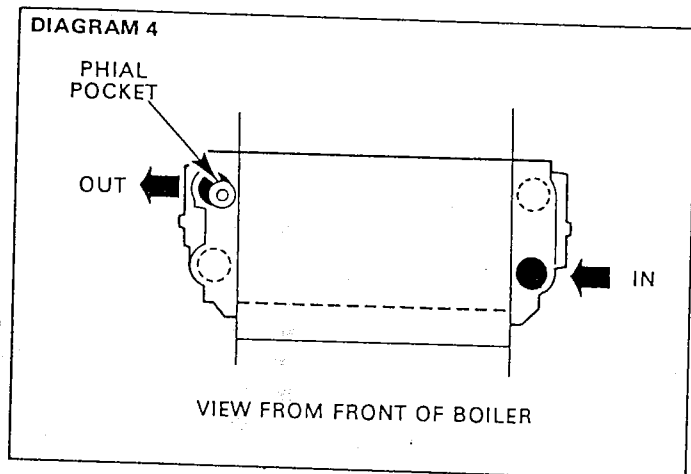


5. WATER CONNECTIONS

Pumped heating and hot water

Where single flow and return is taken from the boiler, the thermostat phial pocket must be on the same side as the flow connection is made (See diagram 4). It is important that all connections are made as illustrated in diagram 4. The connections may be fitted on opposite side to that shown, but always in the same relative positions, including the thermostat phial pocket. Fit the thermostat bulb and lock up.

Make sure that there is clearance between the capillary and the front of the boiler.



Gravity domestic hot water.

It is important that the scheme illustrated in diagram 5 is adopted when the gravity domestic hot water connections are being prepared. The domestic return pipe must be on the same side as the domestic flow. It must be fitted with two 1 inch M/F elbows, as illustrated diagram 5. The heating flow and return pipes are taken from the other side of the boiler.

The thermostat phial pocket must be fitted in the heating flow side of the boiler.

The domestic flow and return pipes must be 28mm diameter and must rise immediately on leaving the boiler.

If the boiler is fitted at high level, the following considerations should be observed to obtain maximum circulating head in the domestic system.

- Maximum vertical height between boiler and cylinder, e.g. can the cylinder be lifted from floor level?
- The horizontal run should be made above ceiling level.
- There should be maximum inclination on the horizontal pipe runs.
- If the cylinder has not been lifted above floor level, long horizontal pipe runs will reduce circulation and under these conditions the inclined horizontal pipes should not exceed 2.4m (8ft.) in length.

Where the boiler is fitted at low level with the cylinder on the first floor, a greater circulating head will be available and the horizontal runs can, therefore, be increased.

If the above conditions cannot be accommodated, it is suggested that pumped primaries be employed.

For all systems the cylinder should be indirect (NOT SELF PRIMING TYPE).

Screw the 1 inch BSP elbows into the water connection tappings at the rear of the boiler through the holes in the back panel, ensure that good sound connections are made.

passing the left hand end behind the pilot burner. Next, locate the hole in the R.H. burner end plate over the injector, then lower the L.H. end of the burner so that the pin on the bottom of the burner enters the hole in the pilot bracket.

Check that the electrode is correctly positioned, see diagram 7, if not it must be removed to adjust. See par. 6 under "Replacement of Parts" for the removal and re-fitting.

Re-fit front protection plate.

INSTALLATION REMINDERS

SAFETY VALVE

Where a safety valve is fitted it should be adjacent to the boiler on the flow pipe. It should not be possible to isolate the safety valve from the boiler by means of any intermediate cock.

DRAIN-OFF COCK

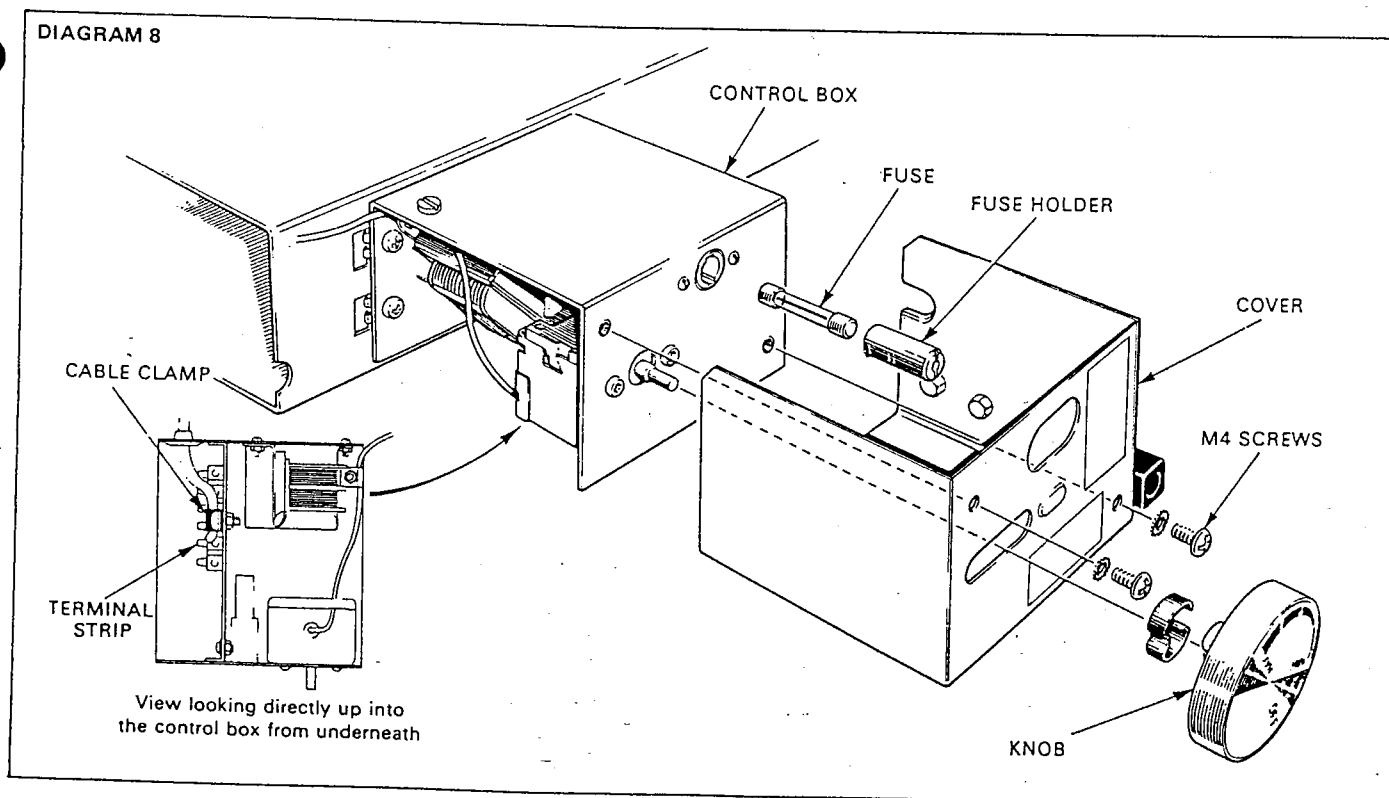
A drain-off cock must be fitted to the lowest part of the system for complete drainage for subsequent servicing.

7. WIRING INSTRUCTIONS FOR CONTROL BOX M8718

THE INSTALLER IS REQUESTED TO ADVISE THE USER OF THE CONTROLS SCHEME USED WITH THIS APPLIANCE AND TO GIVE GUIDANCE ON THE OPERATION OF THE CONTROLS.

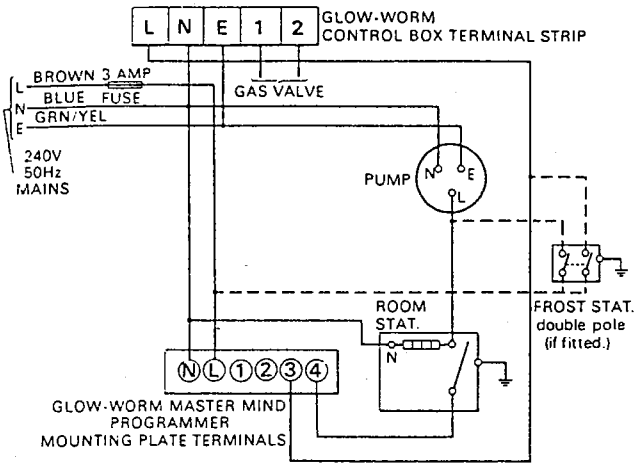
Under no circumstance should a fuse of greater value than 500mA (BSS. 2950A) be fitted in the control box. Up-rating of this fuse could cause damage to the transformer.

- (a) Remove the boiler thermostat control knob by pulling from its spindle, (See diagram 8), and disconnect the lead from the spark generator.
- (b) Remove the two M4 Pozidriv pan hd. screws and shakeproof washers securing the cover to the control box and remove the cover.
- (c) Bring the power supply cable into the control box through one of the grommets in its rear surface. Slacken off the screw holding the power supply cable clip, pass the power supply cable through the clip and connect the three wires to the appropriate terminals in the terminal strip, (See diagram 9) Tighten the screw holding the power supply cable clip.
- (d) Replace the control box cover and screws, then push the boiler thermostat control knob on to its spindle. Re-connect the ignition lead to the spark generator.



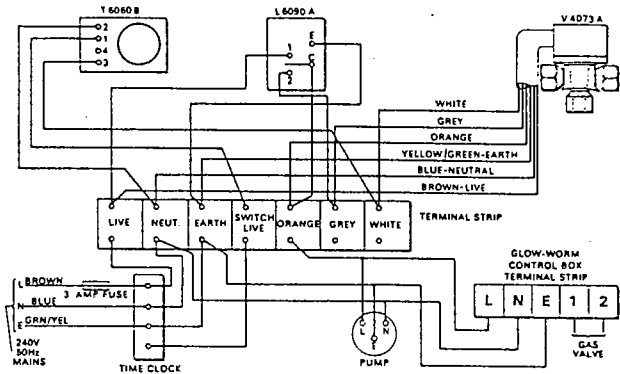
SCHEME 1 (Diagram 10)

Gravity hot water, pumped central heating (ten position programmer).



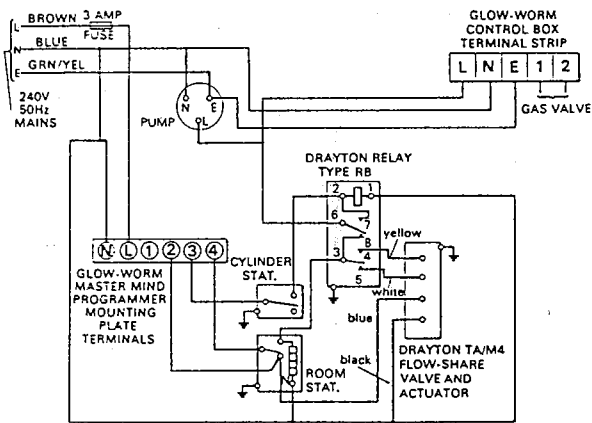
SCHEME 2 (Diagram 11)

Wiring diagram for fitting the Honeywell Sundial Plan Y. NOTE:— The piping arrangement and the installation of the controls should be in accordance with the Honeywell instructions.



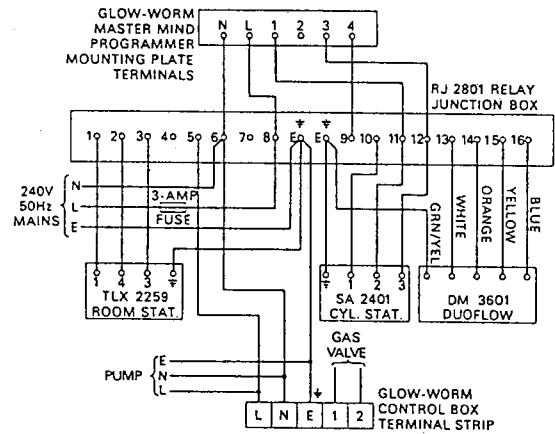
SCHEME 3 (Diagram 12)

Domestic hot water and central heating, both pumped, using a Drayton flow-share valve.



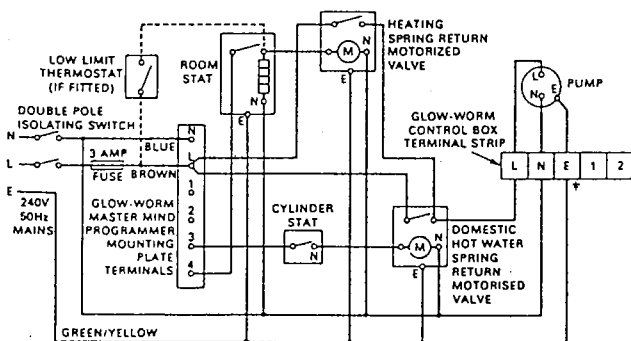
SCHEME 4 (Diagram 13)

Wiring diagram for fitting the Satchwell Duoflow system, using the sixteen position programmer.



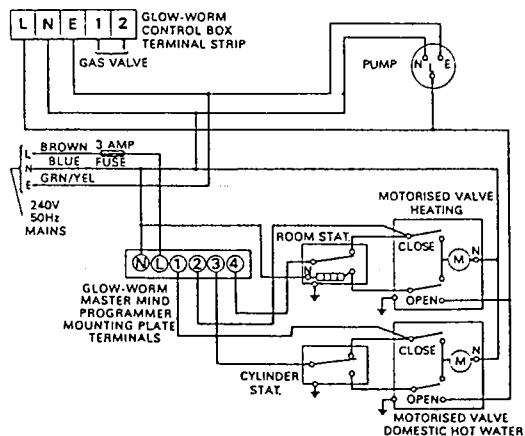
SCHEME 5 (Diagram 14)

Independent control of domestic hot water and central heating, both pumped, using two spring return motorised valves (sixteen position programmer). See diagram 16.



SCHEME 6 (Diagram 15)

Independent control of domestic hot water and central heating, both pumped, using two fully motorised valves (sixteen position programmer). See diagram 16.



INITIAL LIGHTING AND ADJUSTMENT

CAUTION: The following procedure should be carried out by a qualified gas service engineer. The pipes and fittings to the gas control and burner and to some extent the gas pipe to the appliance will contain an appreciable amount of air. It is, therefore, necessary to purge the air from the pipes before the appliance can operate normally.

Identify the boiler controls with relevant details on diagram 19.

LIGHTING PROCEDURE

- Check that the service tap 'C' is closed, that is, the indicator line is across the line of the pipe. See diagram 6A. See that the gas valve 'A' is in the 'OFF' position ('OFF' opposite red arrow).
- See that mains electricity supply is switched 'OFF'
- Set the thermostat knob 'B' to the 'OFF' position.
- Remove the gas pressure test nipple screw 'E' and connect a suitable pressure gauge.
- Open service tap 'C' using a $\frac{5}{16}$ " BSW open ended spanner and set the gas valve control knob 'A' until 'PILOT' setting is opposite the red arrow.
- Depress gas valve control knob 'A' fully, also depress the spark igniter button 'G' and release. A single spark should ignite the pilot burner. At this stage air may be present in the gas pipes and this operation may need to be repeated until all the air has been expelled. When the pilot burner lights keep control knob 'A' fully pushed in for approx. 20 seconds to heat the thermocouple. If the pilot burner fails to light or stay alight wait **THREE MINUTES** then repeat exactly the above sequence.

The pilot gas rate can be adjusted if necessary as follows: Remove pilot adjustment cover screw 'K' from gas control and adjust the grub screw beneath it until the pilot burner flame envelopes 10-13mm ($\frac{3}{8}$ - $\frac{1}{2}$ in) of the thermocouple tip and ignites the main burner smoothly.

Turn anticlockwise to increase pilot flame. Replace cover.

- If gas control is turned 'OFF' (knob 'A' a safety lock prevents knob 'A' from being turned on again until the thermocouple has cooled to prevent attempted re-light in an unsafe condition. No attempt should be made to force knob 'A' back to pilot position until the three minutes have elapsed.
- Make sure that the burner pilot is alight and stable, and then turn gas valve knob 'A' to 'ON' and switch electricity supply 'ON'. Set clock or programmer to an 'ON' position. Set the thermostat knob 'B' between 'MIN' and 'MAX' (approx. 82°C, 180°F) opposite the marker on the control box and the main burner will light at once.
- Set gas pressure with water gauge (See page 2 for setting pressure).
To do this: Remove pressure regulator adjustment cover screw 'F', adjust internal grub screw to the required pressure. Turn clockwise to increase pressure. Replace cover screw.
- Turn the gas valve control knob 'A' to the 'OFF' position, remove pressure gauge and re-fit pressure test nipple screw 'E'.

CONTROLS

The service gas tap upstream of the gas valve providing overriding control of the gas supply to the boiler.

The gas valve performs four main duties. Those of three position gas cock; a thermomagnetic flame failure device; an electric operator and a gas pressure governor.

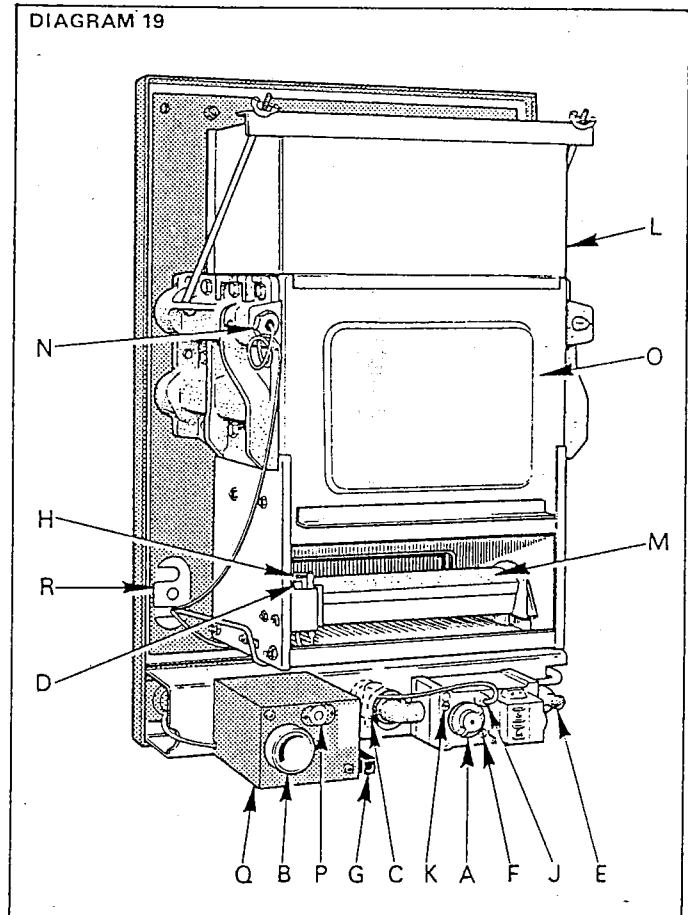
The three position gas cock allows pilot supply only, alternatively pilot and main burner supply and an 'OFF' position, incorporating 'Safety Lock', giving overriding control of the gas supply to the boiler.

The thermomagnetic flame failure device provides for a complete shut off of all gas to the appliance in the event of the lighting pilot flame becoming extinguished.

The electric operator allows for the main burner to be controlled by a signal from the electric clock and from the boiler thermostat. This control operates on 24 volts.

The gas pressure governor regulates the gas supply pressure to the burner ensuring constant rated output. Also provided on the gas control is a regulating screw to control the pilot flame size.

DIAGRAM 19



Key

A.	Gas valve control knob	K.	Pilot adjustment
B.	Thermostat control knob	L.	Flue collector
C.	Service gas tap	M.	Main burner
D.	Pilot burner	N.	Thermostat phial & pocket
E.	Pressure test nipple	O.	Front insulation tray
F.	Governor adjustment	P.	500mA fuse
G.	Spark igniter button	Q.	Electrical control box
H.	Electrode	R.	Sealing Plates
J.	Thermocouple union		

MAINTENANCE

Servicing must be carried out by a qualified gas service engineer and where appropriate a qualified electrician.

SERVICING IN GENERAL

Before commencing servicing, turn off the gas supply at the main service tap and switch off the electricity supply.

1. BOILER FLUEWAYS

Regular cleaning of the boiler flue passages is necessary for efficient operation, also inspection and examination of the burner and controls is essential.

- a. Remove the control cover slide by pulling forward and disengaging it from the bracket under the front outer casing and the two channels at the rear. Unscrew the four wing nuts behind the boiler back panel and remove complete with four plain washers. This will enable the outer casing to be removed.
- b. Remove the front protection plate, (See diagram 6), by lifting slightly and then withdrawing.
- c. Remove the burner by taking the left hand end backwards, to disengage it from the injector, then withdrawing the right hand end forward.
- d. Place a sheet of paper below the combustion chamber and over the controls to catch the flue debris.
- e. Remove the flue collector by unscrewing the two ¼ inch BSW wing nuts which retain the securing angle. The angle can then be lifted from the tie rods and the flue collector removed.
- f. Remove the front and rear insulation trays by lifting upwards, taking care not to damage the fibre insulation inside them.
- g. The boiler flueways and fins should now be cleaned thoroughly with a suitable stiff brush.

IMPORTANT

When replacing the insulation trays, ensure that the fibre insulation faces inwards towards the boiler body, also ensure that the asbestos seal at the rear of the flue collector is in position and intact and makes a good seal.

2. BURNER

With the burner removed as above, it may be cleaned as follows:

Clean all dust and lint from inside the burner with a vacuum cleaner. Also use the vacuum cleaner to remove any dust etc. from the outside of the burner top.

3. INJECTOR

While the burner is removed, the injector can be seen at the R.H. side of the combustion chamber. The injector can be unscrewed by means of a spanner and replaced as necessary. When replacing, use jointing compound on the thread to ensure gas soundness.

NOTES TO THE SERVICE ENGINEER ON THE REPLACEMENT OF PARTS

Before removing or replacing any parts, make sure that the gas supply is turned off and the electricity supply is switched off.

1. Gas Valve

Remove the control cover slide, and front protection plate as described in Maintenance Instructions, Boiler Flueways 1a. and b.

Make sure the gas tap 'C' is in the 'OFF' position. Disconnect the pilot gas supply pipe at the gas valve.

Release the gland plate on the boiler back panel and ease the pilot supply pipe away from the valve. Disconnect the thermocouple union 'J' at the gas valve. Disconnect the orange electrical leads to the valve.

Unscrew the sleeve nut connection at the gas valve outlet elbow and disconnect. Support the gas valve and unscrew the union nut at the gas tap 'C'.

Access to the union nut is through the slots above and below the union gas tap. (If the boiler is fitted at low level it may be necessary to remove the burner to gain access to the gas tap, see servicing note 1c.)

Remove the gas valve by pulling forward.

When fitting the elbows into the replacement gas valve, use a little jointing compound on the threads to ensure a gas-tight seal. Remove the Taptite screws and spacers from the base of the old valve and fit to the replacement. Re-assemble in the reverse order to that described, do not tighten thermocouple union 'J' more than one quarter turn beyond finger tight.

It will be found necessary to purge the system of air after this operation and re-lighting should be done in accordance with the initial lighting procedure.

2. Injector

For the replacement of the injector, refer to Notes 1a, b and c, 2a and b, and 3 in "Maintenance".

3. Burner

Refer to Note 1a, b and c in "Maintenance" for removal and replace in reverse order.

4. Pilot Burner

Remove the main burner as in Notes 1a, b and c under "Maintenance".

Remove the front pilot shield by unscrewing the two hex. hd. screws and nuts securing it to the combustion chamber side and pilot bracket. (See diagram 7) Pull out the clip holding the thermocouple into the pilot burner and pull the thermocouple downwards out of the pilot burner. Disconnect the lead from the electrode and remove the hex. nut from the stud securing the electrode to the pilot bracket then remove the electrode. The pilot burner can now be removed by disconnecting the ¼ inch union at the base of the burner using two spanners, one on the union nut and the other on the hexagon immediately above the union nut and thread. Release the cheese head screw, washer and nut securing it to the pilot bracket.

LIST OF REPLACEMENT PARTS

Key No.	G.C. Part No.	Description	Makers Part No.
51	393 597	Spark electrode, Kigass D6164	K8948
52	351 858	Ignition lead, Kigass E5289	K7336
53	387 907	Spark generator, Kigass D5037	K6587
53	393 563	Spark generator, Vernitron Variant 66108) Alternatives .	K6587
65	392 581	½ inch BSP gas valve, Maclaren UK48/RBB01	K6466
68	351 978	Injector, Natural gas	K8277
76	393 172	Burner, Aeromatic 7/51994	K8312
78	391 535	Single pilot burner, Natural gas, Maclaren 26T0166 TL016	K8356
82	390 930	Thermocouple, Maclaren 2500M-48	K5509
83	390 983	Clip-thermocouple	K3580
85	351 992	Electrical control box	M8718
92	382 339	Thermostat, Ranco C26-P0617	K8717
92	392 729	Thermostat, Diamond H Controls 34 TH1) Alternatives	K8717
93	351 828	Control knob-thermostat	M7191
94	396 216	Clip-control knob	K4158
95	351 230	Fuse, 500mA (BS 2950A)	K4644

If replacement parts are required, apply to your local supplier. Please quote the name of the appliance, Space-Saver 45-60B and preferably its serial number, which can be found on the data badge positioned on the controls panel, visible when the controls cover is removed.

Because of our constant endeavour for improvement, details may vary slightly from those shown in this booklet.

