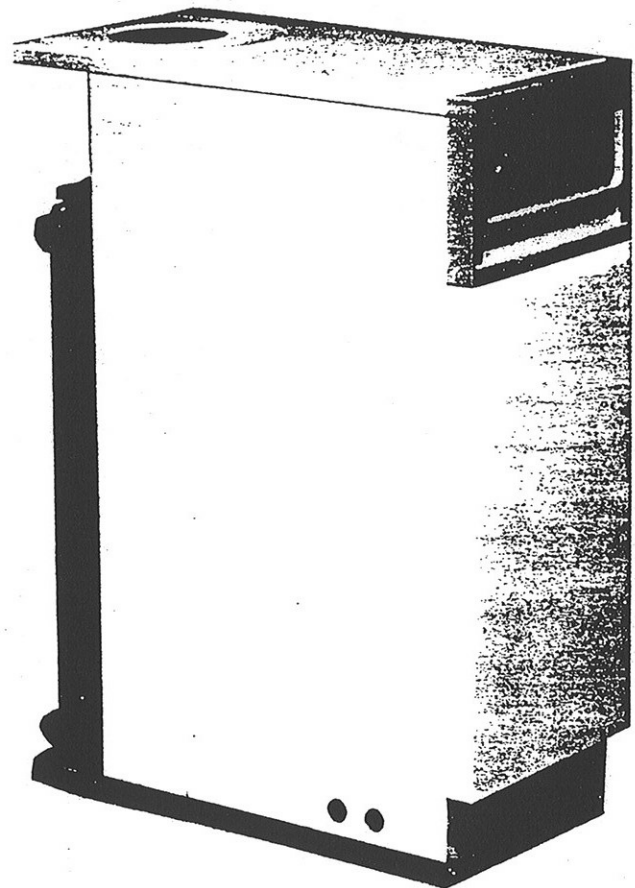


Installation and Servicing Instructions

**Velaire Vitesse 40/50, 50/60, 60/80, 80/100 balanced flue/
conventional flue/boiler house
oil boiler.**



READ THESE INSTRUCTIONS THOROUGHLY BEFORE WORKING ON THE BOILER.

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1. INTRODUCTION

The Velaire Vitesse 40/50, 50/60, 60/80 and 80/100 models are horizontally fired, automatic pressure jet boilers. Cased models can be installed with a conventional flue, a low level balanced flue, a high level balanced flue, or a vertical balanced flue (except as shown in Section 3 below). As supplied all boilers are suitable for use with kerosene (class C2, 28 second viscosity). Balanced flue boilers can only be used with kerosene, and the burners are fitted with a post purge unit. Conventional flue and boiler house models can be converted for use on gas oil (class D, 35 second viscosity) see burner information sheet for details.

These boilers are designed for use with an open central heating system, and/or an indirect hot water cylinder. They must not be connected to a direct cylinder.

They are supplied with a standard control panel. However an optional programmer kit is available which fits into the fascia panel. Some models are available to special order with the gas oil conversion or programmer ready fitted.

2. GENERAL REQUIREMENTS

The installation of the appliance must be in accordance with: Building Regulations, Building Standards (Scotland) Regulations, current I.E.E. Regulations and Model and Local Water Undertaking by-laws.

Detailed recommendations are contained in the following British Standards: BS4543 Part 3 1990, BS5410 Part 1 1977, BS5449 1990.

It is in your interest and that of safety that this appliance is installed by a competent person.

3. DELIVERY

The appliance is delivered as follows:

Cased models i.e. conventional flue, balanced flue,

- (1). The boiler with casings, standard control panel and burner fitted, suitable for either a conventional flue, or a balanced flue as ordered.
- (2). Additional deluxe control panel kit as required.
- (3). Additional flue kits for a balanced flue as required.
 - A. Low level, flue length 225 to 400 mm (9 ins to 16 ins), can also be used at high level with kit D.
 - B. Low level, flue length 400 to 750 mm (16 ins to 30 ins), can also be used at high level with kit D.
 - C. Horizontal extension piece, 350 mm (14 ins) long, for use with A or B, maximum 2 pieces, low level only.
 - D. High level extension piece, for use with A or B.
 - E. Vertical.

NOTE: Balanced flue model of Vitesse 40/50 can only be used with kits A or B. It cannot be used with kits C, D or E.

Boiler House

- (1). The boiler.
- (2). The burner and control box.
- (3). Casing kit as required.

4. TECHNICAL DATA

Model: Rating:		40/50		50/60		60/80			80/100		
		Min.	Max.	Min.	Max.	Min.	Mid.	Max.	Min.	Mid.	Max.
Heat input	kW	14.65	18.32	18.32	21.98	21.98	25.64	29.31	29.31	32.97	36.64
	Btu/h	50,000	62,500	62,500	75,000	75,000	87,500	100,000	100,000	112,500	125,000
Heat output	kW	11.72	14.65	14.65	17.58	17.58	20.52	23.45	23.45	26.38	29.31
	Btu/h	40,000	50,000	50,000	60,000	60,000	70,000	80,000	80,000	90,000	100,000
Burner Information		SEE ADDITIONAL SHEET FOR INFORMATION									
Weight, cased boiler (excluding flue)	kg	78		78		101			110		
	lb	171		171		222			243		
Water content	litres	13		13		17			21		
	pints	23		23		29			36		
Water connections		4 x 1" BSP									
Conventional flue models		Minimum flue draught 12.5N/m ² (0.05 in w.g.) Maximum flue draught 30N/m ² (0.12 in w.g.)									
Maximum smoke number		1 (Bacharach)									
Electricity supply		240V~50Hz fused at 3A (150W burner only, excludes circulating pump)									
Oil supply pipe connection		1/4" BSP									
Maximum water static head		30.5m (100ft)									
Minimum water static head		0.9m (3ft)									
Maximum boiler thermostat setting		82°C (180°F)									

Dimensions (see Fig. 1)

Model	40/50		50/60		60/80		80/100	
	mm	in	mm	in	mm	in	mm	in
BOILER								
A. Height	850	33½	850	33½	850	33½	850	33½
B. Width	300	11⅞	300	11⅞	450	17¾	450	17¾
C. Depth	600	23⅝	600	23⅝	600	23⅝	600	23⅝
D. Width across water connections	304	12	304	12	454	17⅞	454	17⅞
E. Distance between water connections	569	22⅜	569	22⅜	569	22⅜	569	22⅜
F. Height of bottom water connection above floor	81	3¼	81	3¼	81	3¼	81	3¼
G. Distance of water connections from wall	55	2⅞	55	2⅞	55	2⅞	55	2⅞
CONVENTIONAL FLUE								
H. Flue diameter (nominal)	100	4	100	4	100	4	125	5
I. Distance of flue centre from wall	100	4	100	4	100	4	110	4⅜
H ₁ Flue diameter (optional alternative, nominal)	125	5	125	5	125	5	-	-
I ₁ Distance of flue centre from wall (optional alternative)	110	4⅜	110	4⅜	110	4⅜	-	-
LOW LEVEL BALANCED FLUE								
J. Flue section (square)	152	6	152	6	152	6	152	6
K. Height of flue centre above floor	752	29⅝	752	29⅝	752	29⅝	752	29⅝
L. Maximum flue length	750	29½	1450	57⅞	1450	57⅞	1450	57⅞
M. Depth of terminal guard	260	10¼	260	10¼	260	10¼	260	10¼
N. Height of terminal guard	410	16⅞	410	16⅞	410	16⅞	410	16⅞
P. Width of terminal guard	470	18½	470	18½	470	18½	470	18½
HIGH LEVEL BALANCED FLUE								
J. Flue section (square)	-	-	152	6	152	6	152	6
Q. Height of flue centre above floor (fixed)	-	-	2000	78¾	2000	78¾	2000	78¾
L. Maximum horizontal flue length	-	-	750	29½	750	29½	750	29½
VERTICAL BALANCED FLUE								
R. Flue diameter	-	-	176	7	176	7	176	7
S. Maximum roof height	-	-	3600	141¾	3600	141¾	3600	141¾
BOILER HOUSE								
T. Height - cased boiler	732	28⅞	732	28⅞	732	28⅞	732	28⅞
U. Height - uncased boiler	690	27⅞	690	27⅞	690	27⅞	690	27⅞
V. Depth of base plate	564	22¼	564	22¼	564	22¼	564	22¼

5. AIR SUPPLY

There must be adequate air for combustion and, if the boiler is installed in a confined space, additional air for ventilation. Data shown is taken from BS5410 Part 1.

Conventional Flue and Boiler House

Combustion air is drawn from the room in which the boiler is installed, which must have a permanent air vent to the outside air or to an adjacent room which itself has a permanent air vent to the outside air. The minimum free area of any such air vent is as follows: (Consideration may be given to adventitious air, e.g. around windows and doors).

Model	40/50		50/60		60/80		80/100	
	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²	in ²
Free area	81	13	97	15	130	20	162	25

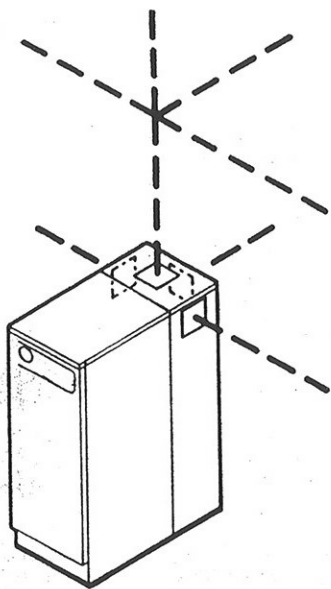
Balanced Flue

Combustion air is drawn from outside through the terminal head.

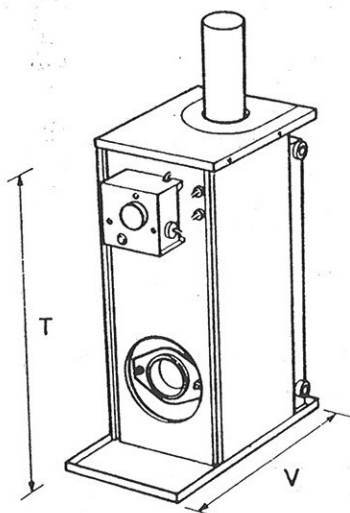
All types of Flue

If the boiler is installed in a confined space, permanent air vents are required for ventilation IN ADDITION to those above, one at high level and one at low level, either both through the same wall to outside air, or both to the same adjacent room. The minimum free area of each of these additional air vents is as follows:

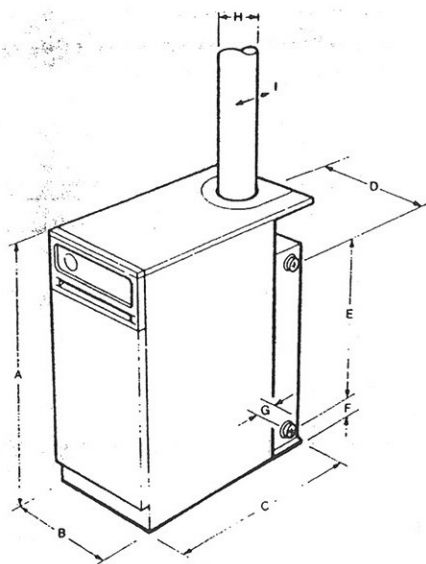
Model	40/50		50/60		60/80		80/100	
	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²	in ²
Vents to outside	81	13	97	15	130	20	162	25
Vents to room	162	25	194	30	260	40	324	50



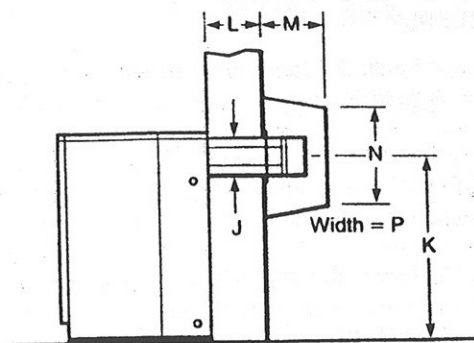
BALANCED FLUE OPTIONS



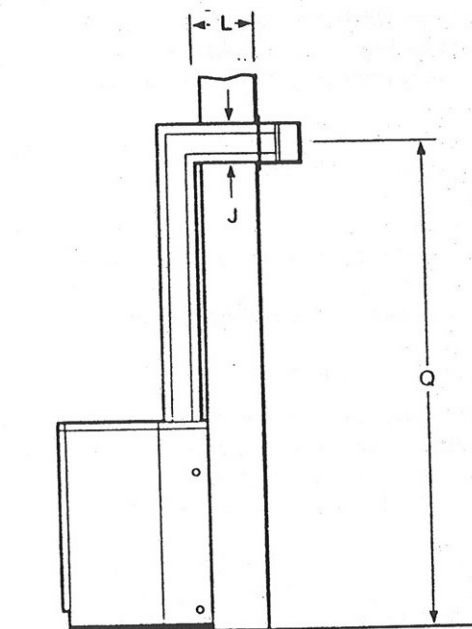
BOILER HOUSE



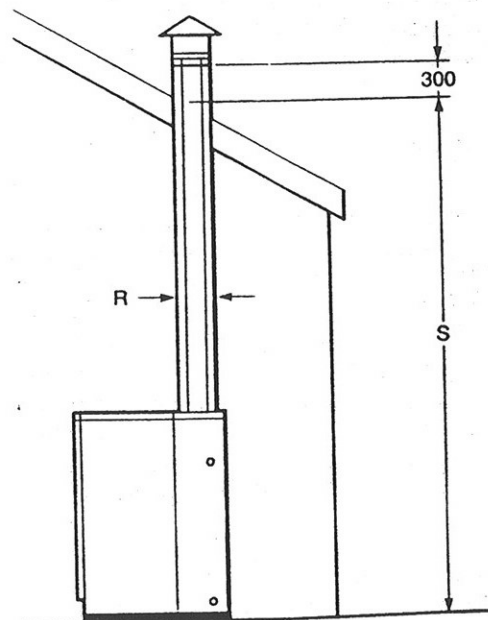
CONVENTIONAL FLUE



LOW LEVEL BALANCED FLUE



HIGH LEVEL BALANCED FLUE



VERTICAL BALANCED FLUE

Figure 1. Dimensions

6. OIL SUPPLY

Oil Storage Tank. Galvanised tanks must not be used.

The oil storage tank must be constructed to BS799 Part 5, 1987 and incorporate the following features.

1. An oil level gauge (not glass type).
2. A capacity of at least 2500 litre (550 gall) to give economy and reasonable time periods between oil deliveries.
3. A vent pipe with a waterproof return bend or suitable cap, and of diameter not less than the filling pipe diameter.
4. A sludge valve.
5. An outlet valve at the opposite end to the sludge valve.
6. A slope of 1 in 50 ($\frac{1}{4}$ " per foot length) towards the sludge valve.
7. Painted outside but unpainted inside.

Some types of plastic tank are also suitable. The positioning of the tank should take filling, maintenance and protection from fire into account, recommendations are given in BS5410 Part 1 1977.

Fire Valve

A remote sensing fire valve must be installed. A suitable type is available from the Landon Kingsway division of Potterton Myson (part no. 860E, complete with 8m of operating cable and pulleys). The fire valve sensor must be adjacent to the boiler, it can be installed within the casing of cased boilers, but away from the boiler shell. Combined fire and stop valves are also available (part no. 818EM), however they must only be used in addition to the remote sensing valve.

Oil Filter

A metal bowl filter with replaceable micronic filter element must be fitted in the oil supply pipe.

Oil Supply Pipe

Galvanised pipe must not be used. The pipe should have an internal diameter of at least 8 mm, though diameters greater than 10 mm are not recommended for systems where the oil tank is below the burner, as this can cause air locks on start up. High points in the pipe should be avoided as they can cause air locks. A shut off valve must be installed immediately before the boiler.

7. ELECTRICITY SUPPLY

Warning: This appliance must be earthed.

All electrical wiring must be carried out by a qualified electrician and be wired in accordance with current I.E.E. regulations and any local regulations that may apply.

The supply to the boiler should be 240V ~ 50Hz and fused at 3A. The rating of the boiler is approximately 150W.

IT MUST BE POSSIBLE TO COMPLETELY ISOLATE THE BOILER AND ALL ASSOCIATED CONTROLS FROM MAINS ELECTRICITY. THE COMPLETE ELECTRICAL SYSTEM MUST BE POWERED FROM A SINGLE POINT, WHICH SERVES THE HEATING SYSTEM ONLY. THIS POINT CAN BE CONNECTED USING A FUSED THREE PIN PLUG AND SHUTTERED SOCKET, BOTH COMPLYING WITH THE REQUIREMENTS OF BS1363. ALTERNATIVELY, A FUSED DOUBLE POLE SWITCH WITH A CONTACT SEPARATION OF AT LEAST 3mm ON BOTH POLES MAY BE USED.

All external cables used must be rated to take at least 3A i.e. at least 0.75 mm² (24/0.2 mm) to BS 6500 1990 Table 16.

On cased models a 7-way terminal block is provided for connecting the mains inlet cable and external controls to the control box. For all balanced flue models and for conventional flue models with internal programmer, the electricity supply to the terminal block **MUST** be a permanent live, unswitched by external controls, for the post purge unit and/or the programmer to function.

On boiler house models, a 6-way terminal block is provided for connecting the mains inlet cable and external controls to the control box.

8. BOILER LOCATION

The boiler does not require a special hearth. The floor surface must be firm and level, non combustible and non absorbent. The boiler base plate provides the necessary protection to BS5410 Part 1.

The following minimum clearances are required for access and servicing.

Front of boiler	610 mm (24 in)
Side of boiler	6 mm ($\frac{1}{4}$ in)
Top of boiler	450 mm (18 in)
Boiler house side clearance	100 mm (4 in) (to allow removal of top casing fixing screws).

If it is desired to install the boiler under a worktop, a portion of the worktop should be removable to give the required clearance. Ensure that the kicking strip can be removed after installation.

When installing a boiler with a balanced flue the terminal must be at least 600 mm (2 ft) away from any opening window, door, air brick and internal or external corner, and at least 300 mm (1 ft) away from any gutter, eaves and soil pipe. The vertical balanced flue must extend at least 300 mm (1 ft) above roof level, excluding the terminal (see Figure 1).

9. FLUE SYSTEM

Conventional Flue and Boiler House

The flue must be of sufficient height to provide a draught of at least 12.5N/m^2 (0.05 in wg) as measured at the boiler outlet. An insulated flue terminating in a down draught free area i.e. above the roofline of a one or two storey building will usually provide the necessary draught. A draught stabiliser should be unnecessary unless extreme conditions, above 30N/m^2 (0.12 in wg) prevail. The cross sectional area of the flue at any point must not be less than that of the flue connection on the boiler.

Precautions are needed against excessive cooling of flue gases and if a suitable internal flue is available it should be used. If an existing brick chimney is used it must be lined with a liner suitable for fuel oils. The annular space must be sealed at top and bottom and may be loosely filled with insulating material.

An independent external flue must be of double wall construction or effectively insulated and waterproofed. The first 1.8m (6ft) of flue above the boiler must not be of asbestos. Aluminium must not be used for any part of the flue. A sealed cleaning door must be provided. The flue should rise as directly as possible, and use 135° bends only.

A minimum clearance of 25 mm (1 in) or as required by local regulations must be maintained between the flue pipe and any combustible material, and in any case the temperature of such combustible material must not exceed 100°C .

Balanced Flue

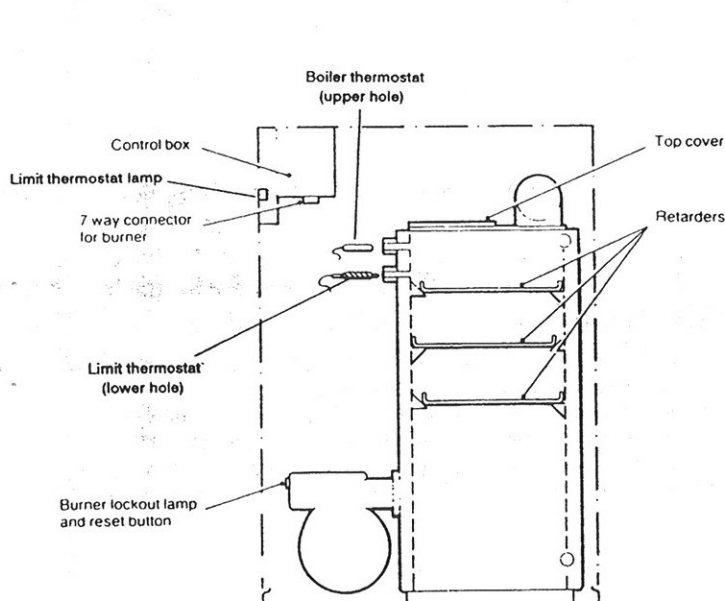
All flue components are supplied in the appropriate kit. If the terminal is less than 2m above a balcony, above ground or above a flat roof to which people have access, then the terminal guard must be fitted. The terminal guard should be screwed to the wall so that it is at least 50 mm from all parts of the terminal.

10. WATER SYSTEM

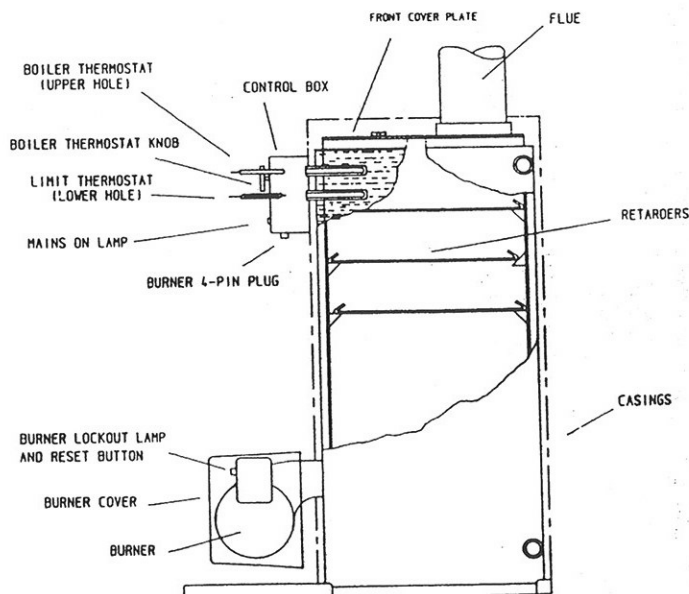
Two flow connections (at the top of boiler) and two return connections (at the base of the boiler) are provided, one pair for the central heating system and one pair for the gravity feed hot water primary system. The connections for each system should be diagonally opposite. Blank off all unused water connections. A hot water cylinder must be of the indirect type. Fit one or more drain cocks to enable the system to be fully drained. The water system should be thoroughly flushed with cold water to remove swarf or residues, before fitting the pump.

11. INSTALLATION PROCEDURE

The following instructions (frames 1 to 14) apply to all conventional and balanced flue models although the 40/50 version is illustrated throughout, boiler house models are covered after frame 14.



Conventional and balanced flue models.

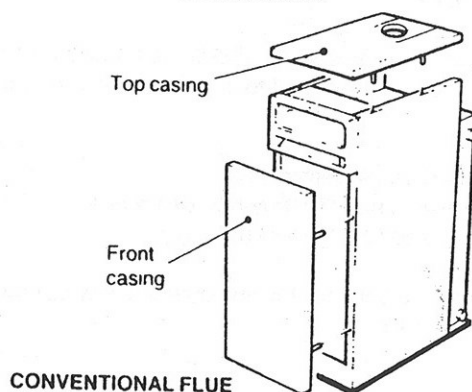


Boiler House model.

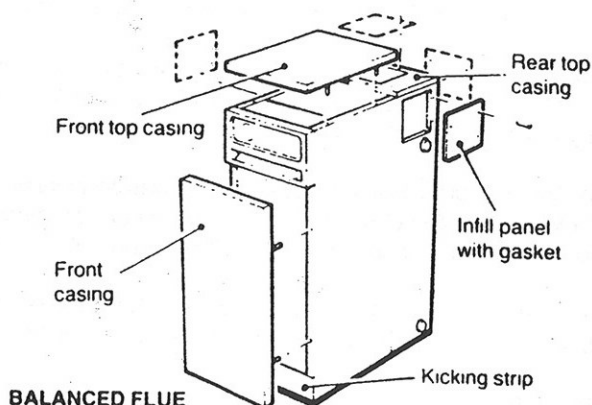
Figure 2. Boiler Components

1 UNPACK AND PREPARE THE BOILER

1. C.F. models - Pull off the top casing (4 studs).
2. B.F. models - Pull off the front top casing (4 studs) and rear top casing (2 studs).
3. Remove appropriate infill panel (4 screws) if necessary and transfer to the opening not required.
4. Blank off unused water connections.



CONVENTIONAL FLUE



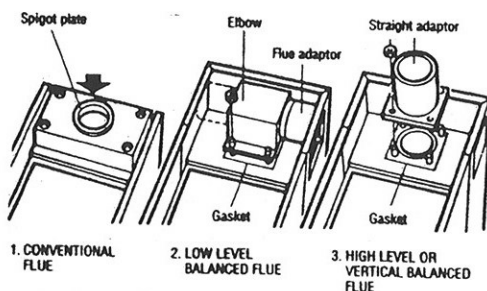
BALANCED FLUE

2 POSITION THE SPIGOT

1. For conventional flue, use the flue spigot plate provided.
2. For low level balanced flue, fit elbow and gasket supplied with the flue kit and secure with 4 nuts and washers. For side exit fit appropriate flue adaptor, short for 40/50 and 50/60 models, long for 60/80 and 80/100 models. Insulate the adaptor with the ceramic fibre blanket supplied in the flue kit.
3. For high level or vertical balanced flue, fit the straight adaptor and gasket supplied with the flue kit and secure with 4 nuts and washers. Insulate the adaptor with the ceramic fibre blanket supplied.
4. B.F. models - Check the main piece of ceramic fibre blanket insulation is correctly fitted to the top of the boiler shell, without obstructing the air inlet duct.

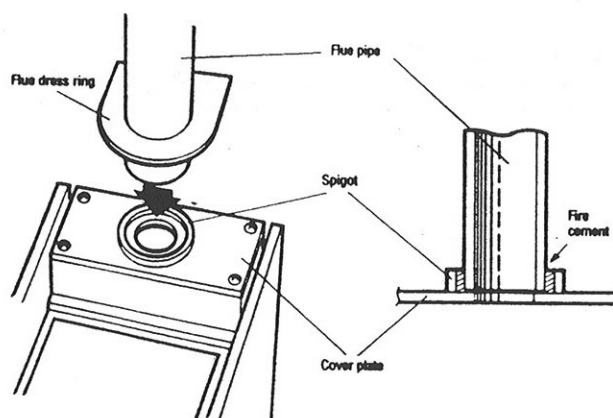
Refit rear top casing

Proceed through frames 3 to 9 according to which type of flue is being fitted.



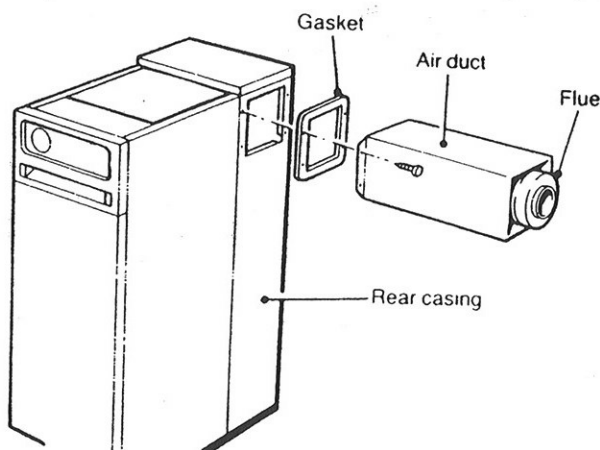
3 FITTING A CONVENTIONAL FLUE

1. Refer to dimensions given in section 4 and prepare the boiler as described in frame 1.
2. Fit the flue dress ring around the flue.
3. Seat the flue pipe in the spigot plate provided and seal the joint with fire cement.



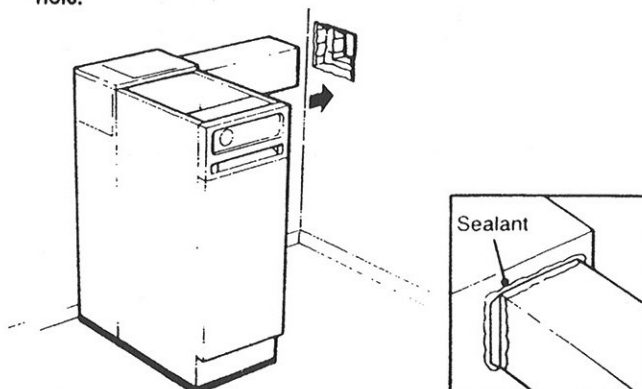
4 FITTING A LOW LEVEL BALANCED FLUE (1) - all kits A, B or C.

1. Apply gasket to flange on air duct, to seal between the flange and the rear casing.
2. Push the flue onto the elbow and secure the air duct to the casing with 4 screws.



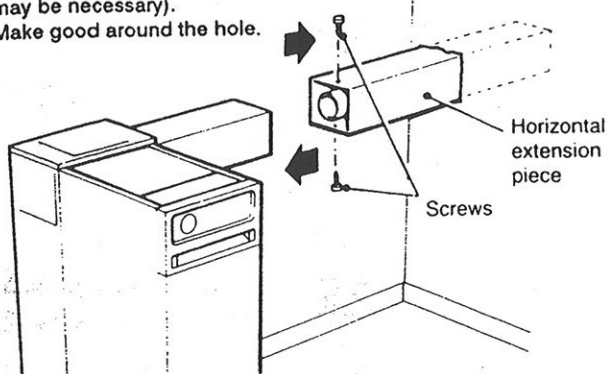
5 FITTING A LOW LEVEL BALANCED FLUE (2) - boiler adjacent to wall, kits A or B.

1. Having decided on the position of the boiler, cut a hole in the wall according to dimensions given in Section 4.
2. Apply suitable sealant i.e. Silicone or Cement around air duct, to seal around hole. Alternatively make good around hole after installation, if access is possible.
3. Push boiler against the wall with the air duct/flue passing into the hole.



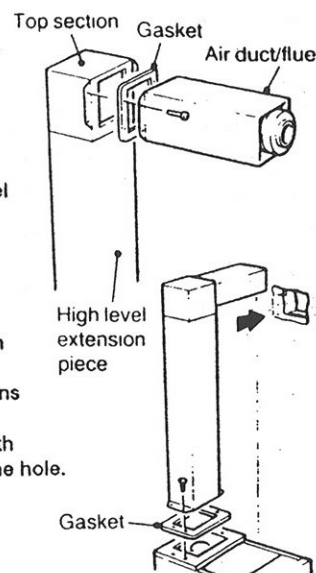
6 FITTING A LOW LEVEL BALANCED FLUE (3) - extended flue kit C.

1. If the boiler is to stand part way along the wall, either one or two horizontal extension pieces are required.
2. Secure air duct/flue as described in frame 3.
3. Cut a hole in the wall according to dimensions given in Section 4.
4. Feed the extension(s) into the hole, then position the boiler and draw the extension(s) fully onto the flue.
5. Ensure the extension pieces are horizontal, drill holes and fix together with 2 screws (some form of additional support bracket may be necessary).
6. Make good around the hole.



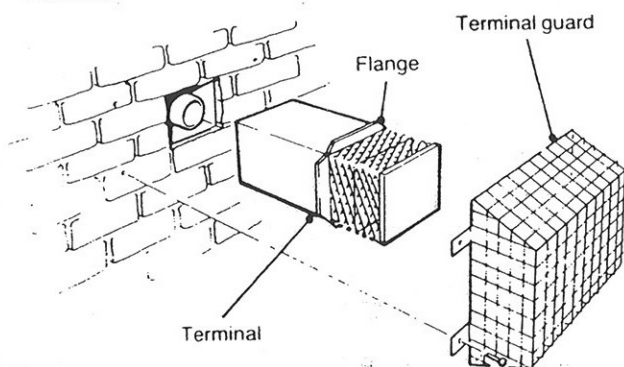
7 FITTING A HIGH LEVEL BALANCED FLUE

1. Position the top section of the high level extension piece so the opening is in the correct direction.
2. Apply gaskets to flanges on air duct and high level extension piece.
3. Secure air duct/flue to high level extension piece as shown (4 screws).
4. Fit high level extension piece onto spigot and secure to the boiler case (4 screws).
5. Having decided on the position of the boiler, cut a hole in the wall according to the dimensions given in Section 4.
6. Push boiler against the wall with the air duct/flue passing into the hole.
7. Make good around the hole.



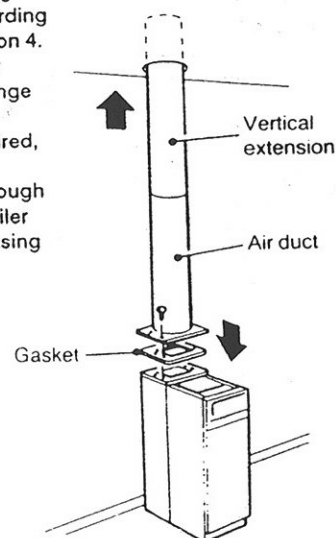
8 FIT THE FLUE TERMINAL AND GUARD (LOW AND HIGH LEVEL)

1. Apply a layer of suitable sealant i.e. Silicone or Cement around edge of hole.
2. From outside, slide the terminal over the flue and push the outer casing fully home, so the flange seals on the sealant. The V shaped baffle at the end of the terminal must be vertical.
3. For a low level flue, fasten the guard squarely to the wall over the terminal. A high level flue does not need a guard unless the terminal can be easily reached (e.g. from an outhouse or wall beneath).



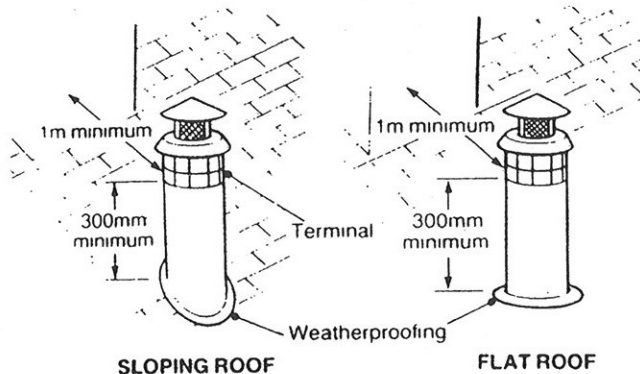
9 FITTING A VERTICAL BALANCED FLUE

1. Having decided on the position of the boiler, cut a hole through the ceiling and the roof according to dimensions given in Section 4.
2. Apply gasket to flange on air duct, to seal between the flange and the rear top casing.
3. Fit vertical extension, if required, to air duct/flue.
4. Feed the air duct/flue up through the hole, then fit onto the boiler with spigot and secure to casing with 4 screws.



10 FITTING THE VERTICAL BALANCED FLUE TERMINAL

1. The flue system is designed to use standard 176mm (7 ins) roof fixing and sealing components (not supplied). Ensure a weatherproof joint is made.
2. The air duct/flue should extend at least 300mm above roof level, and be at least 1m from any overlooking wall, chimney etc.
3. Slide the terminal over the air duct/flue and push firmly home.



11 CHECK THE BURNER NOZZLE AND THE RETARDERS

Burner Nozzle (refer to burner information sheet)

1. The burner is supplied preset to the pressure and with the nozzle shown. Check whether this nozzle is correct for the required rating - if not, obtain the appropriate nozzle, and change as described.

Retarders (refer to Fig. 2)

1. Remove the top cover from the boiler shell (2 wing nuts).
2. Check that all retarders are correctly positioned.
3. Replace the top cover and fully tighten the wing nuts.

12 CONNECTING THE OIL SUPPLY AND WATER SUPPLY

Oil Supply

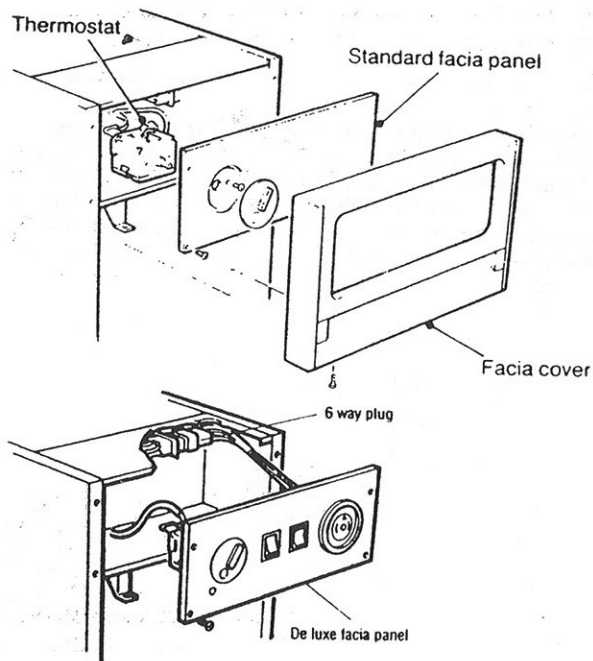
1. To ease future servicing, connect the oil supply to the burner by way of the flexible pipe provided. If a two pipe system is to be used, it will be necessary to obtain a second flexible pipe.
2. Feed rigid copper pipe (minimum 8mm - not supplied) through the rearmost of the two holes at the base of the side panel, RH or LH as required. Cut the diaphragm grommet provided to accommodate, so maintaining room seal.
3. It may be convenient to mount the filter and stop valve inside the casing, but ensure that the filter is not directly above the burner control box, to prevent oil spillage entering the box when changing the filter.

Water Supply

1. Connect the water supply with reference to Section 10.

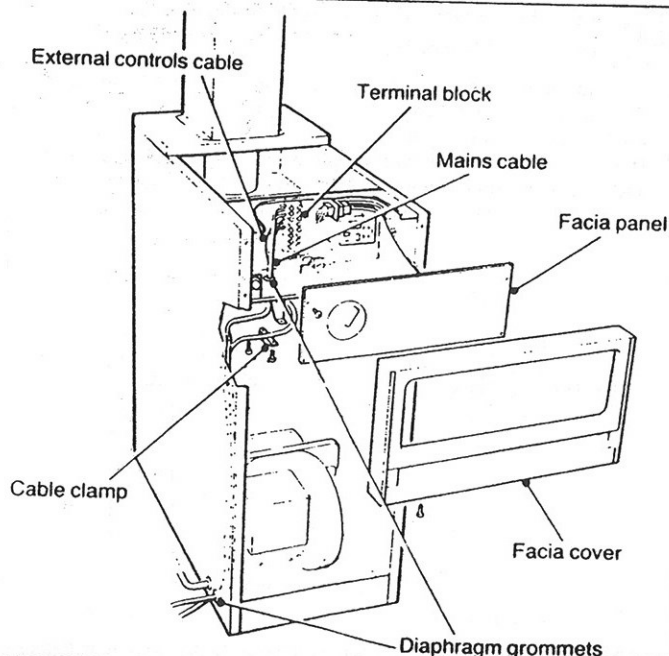
13 FITTING THE DE LUXE FACIA PANEL (IF REQUIRED)

1. Remove 2 or 3 screws beneath control box and lift off the fascia cover.
2. Release the standard fascia panel (4 screws) and carefully pull forward.
3. Push off the thermostat knob from behind using a screwdriver through the spaces provided in the fascia panel.
4. Unscrew 2 front mounting screws and remove the thermostat body. Discard panel.
5. Fit thermostat to the de luxe panel with capillary uppermost. Press on the knob.
6. Connect the 6-way plug to the socket inside the control box with purple lead forward.
7. Proceed to frame 14, steps 3 to 6.



14 CONNECTING THE ELECTRICITY SUPPLY

1. Remove 2 or 3 screws beneath control box and lift off the fascia cover.
2. Release the fascia panel (4 screws) and carefully pull forward.
3. Feed mains cable and external controls cable through the forward hole at base of side panel (RH or LH as required) and through hole into the control box, cutting the two diaphragm grommets to accommodate and so maintain room seal.
4. Connect mains cable to the terminal block:
 - Brown (Live) to L (Permanent Live for all B.F. and for C.F with internal programmer)
 - Blue (Neutral) to N;
 - Green/yellow (Earth to) \perp
5. Connect external controls cable to the terminal block see wiring diagram Section 15 for details.
6. Secure mains cable and, if applicable, the external controls cable in the cable clamp provided (2 screws) and ensure that the cables do not touch the boiler shell.
7. Replace the fascia panel and cover.
8. Replace front top cover.



The following instructions apply only to boiler house models.

1. Position the boiler in accordance with Section 8. Fit outer casing (if required), according to instructions supplied with casing pack, apart from top casing panel. Detach part of the label showing fuel type from boiler shell, before fitting, and re-attach to outside of front casing.
2. Connect the water system, see Section 10.
3. Connect the flue system, see Section 9. Seal the connection between the flue pipe and the boiler spigot with fire cement.
4. Fit the boiler control box:
Remove the thermostat knob by pulling off.
Remove the control box lid (two screws).
Screw the control box base to the bracket on the front of the boiler shell, using the screws provided in the bracket.
Connect the electricity supply to the terminal block, see Section 7 and the wiring diagrams in Section 15, and burner information manual. Secure mains cable in the cable clamp provided (two screws). Ensure that the cable(s) do not touch the boiler shell.
Fit the control box lid and thermostat knob.
5. Carefully uncoil the thermostat capillaries, and fit the thermostat phials into their pockets in the top right corner of the boiler shell, noting the correct location shown in Figure 2. Retain the phials using the "R" clips provided.
6. The burner is supplied preset to the pressure and with the nozzle shown in the burner information sheet. Check whether the nozzle is correct for the required rating. If not, obtain the appropriate nozzle and change, then fit to boiler shell, as described in burner instructions. Connect the burner cable to the control box, using the four pin Bulgin plug.
7. Connect oil supply, see Section 6.
8. Remove the top cover from the boiler shell (two wing nuts), and check that all the retarders are correctly positioned, see Figure 2, (components diagram). Replace the top cover, and fully tighten the wing nuts.

12. COMMISSIONING

Refer to the burner information sheet supplied for location of items mentioned in the following procedures.

1. Temporarily disconnect the oil pipe from the burner, run off oil into a container to purge the fuel pipe of air or foreign matter. Reconnect the oil pipe and check for leaks, rectify if necessary. Purge air from the oil pump from the position indicated. Purging is unnecessary on a two pipe system, as air is automatically vented as the burner is started.
2. Check the burner information sheet to see if oil pump bypass plug is required for a two pipe oil supply system.
3. Connect a pressure gauge to the pressure gauge connection on the burner.
4. Check that the water system is full and vented. Check for leaks and rectify if necessary.
5. Check all external controls are set to call for heat. Set the boiler thermostat to maximum setting, and set the programmer (if fitted) to call for heat. Switch on the electricity supply. The burner fan should start immediately and the burner should light within approximately 20 seconds. If the flame is not established within this time the burner will go to lockout and the "RESET" light on the burner will be lit. WAIT FOR THREE MINUTES to allow unburnt vapour to disperse, then press the reset button on the burner to restart the burner. If lockout again occurs, consult fault finding guide.

NOTE: When the electricity supply is connected to a balanced flue boiler, the post purge unit will run the burner fan for approximately 2 minutes even if all controls are set to off, though the burner will not light. The burner fan will also continue to run for 2 minutes after the burner has been shut down by external controls, boiler thermostat or a lockout condition on the burner control box, to clear fumes from the boiler.

6. When the burner has lit, adjust the pump pressure to give the required output using the pressure regulator. Turn off the boiler, remove the pressure gauge from the connection and refit the plug.
7. COMBUSTION TESTS MUST BE DONE WITH THE OUTER CASING FITTED ON BALANCED FLUE MODELS. Refit front top casing and front casing. Let the boiler run for 20 minutes, then check the CO₂ level, flue gas temperature and smoke number, inserting the test probe into the test point on the left hand side of the boiler shell top for conventional flue models, at the base of the vertical balanced flue or the flue terminal for low or high level balanced flues. Compare with the figures shown in the burner information sheet, and if necessary adjust the air damper. The correct position is that which gives a CO₂ reading in the range 9% to 12.5%, but normally 1% less than that which has a smoke reading of 1.
After adjustment, replace the front casing before rechecking the combustion.
8. When fully heated, re-examine the water system for leaks and rectify if necessary. Turn off the boiler, drain the water system whilst hot, refill and vent the system.

NOTE: The boiler is fitted with a limit thermostat to switch off the burner should the boiler overheat. The limit thermostat is of a self-resetting type and the boiler will restart automatically as soon as the system cools. Ensure that the boiler is not cycling on the limit thermostat alone, for cased models by checking that the limit thermostat light on the control panel does not light as the boiler cycles, for boiler house models by turning the boiler thermostat to setting 1, the burner should now switch off at a lower water temperature.

13. HANDING OVER THE INSTALLATION

Hand all instructions to the user or purchaser for retention, demonstrate and explain the safe and efficient operation of the boiler. Advise the user or purchaser that for continued safe and efficient operation it is important that servicing is carried out at least once a year.

14. ANNUAL SERVICING

Servicing should be carried out once or twice a year, depending on the amount of use i.e. winter use only, or winter and summer use.

WARNING: Always turn off the oil supply at the storage tank outlet and switch off and disconnect the electricity supply to the boiler before commencing servicing.

Preparation (see Fig. 3)

Cased Models:

Pull off the front top casing (balanced flue models) or top casing (conventional flue models) and front casing (4 studs each). Remove the kicking strip (4 screws).

Boiler house models:

Remove top casing panel if fitted, (4 screws on sides). Remove burner outer cover (if fitted). Remove the top cover from the boiler shell by removing two wing nuts. Remove the retarders from inside the boiler shell. To remove centre retarder from 40/50, 50/60 or 60/80 models, lift rear of retarder towards top rear of boiler, allow front of retarder to drop off its support and lift out. Separate the 7-way connector for the burner, from the control box, (4 pin Bulgin plug on boiler house models). Remove the burner, (see burner information sheet), check the flue is positioned correctly, and there are no obstructions in the air ducts.

Boiler Servicing

Clean the flue. Clean the retarders and all internal surfaces of the boiler with a brush and scraper, remove all debris from inside the boiler. Remove the filter bowl from the filter in the oil pipe and renew the element (ensure oil spillage does not enter burner control box). Open the sludge valve on the storage tank to remove the sludge.

Burner Servicing

See burner information sheet.

Reassembly

Replace the burner in the boiler securing as appropriate. Replace the 7-way connector (or 4 pin plug) for the burner under the control box. Replace the retarders in the boiler (see Fig 2). Replace the top cover on the boiler shell and fully tighten the two wing nuts. For balanced flue models check the ceramic fibre blanket insulation is correctly located on the top of the boiler shell, without blocking the air inlet. Turn on the oil supply and bleed air from the oil pump.

Final Checks

Turn on the electricity supply and check that the burner lights when required.

Check the pump pressure is correct for the required output. Refit the front and front top casings, for balanced flue models replace any damaged sealing tape around casings. Following the instructions given in Section 12.7, check the CO₂ level, flue gas temperature and smoke number, and adjust the air damper if necessary.

Reset the timer (if fitted) to the correct time.

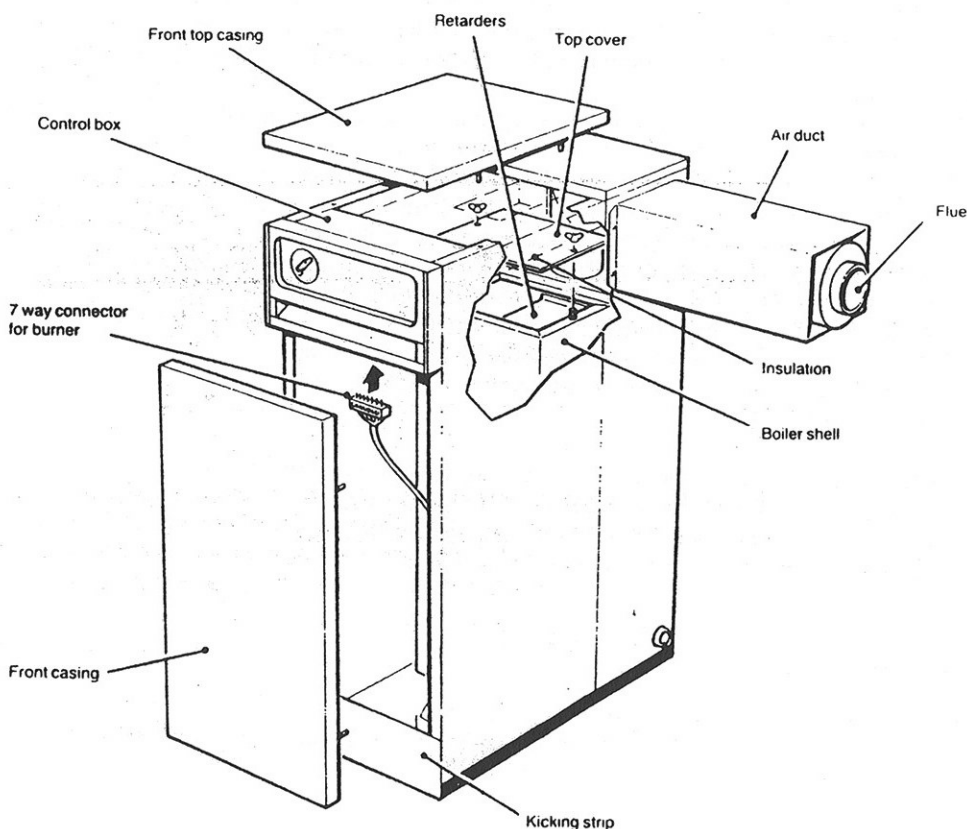
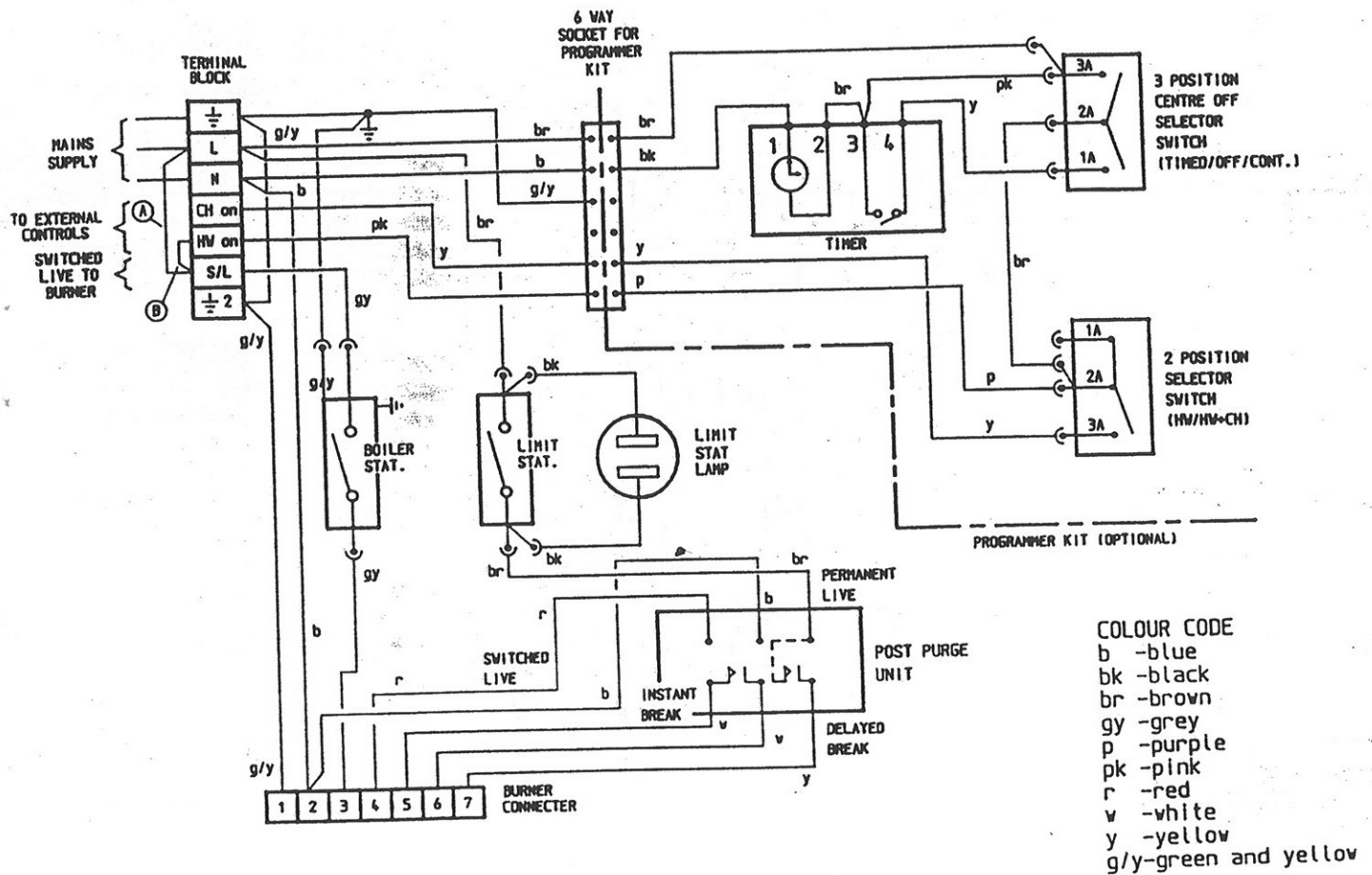


Figure 3. Boiler Servicing

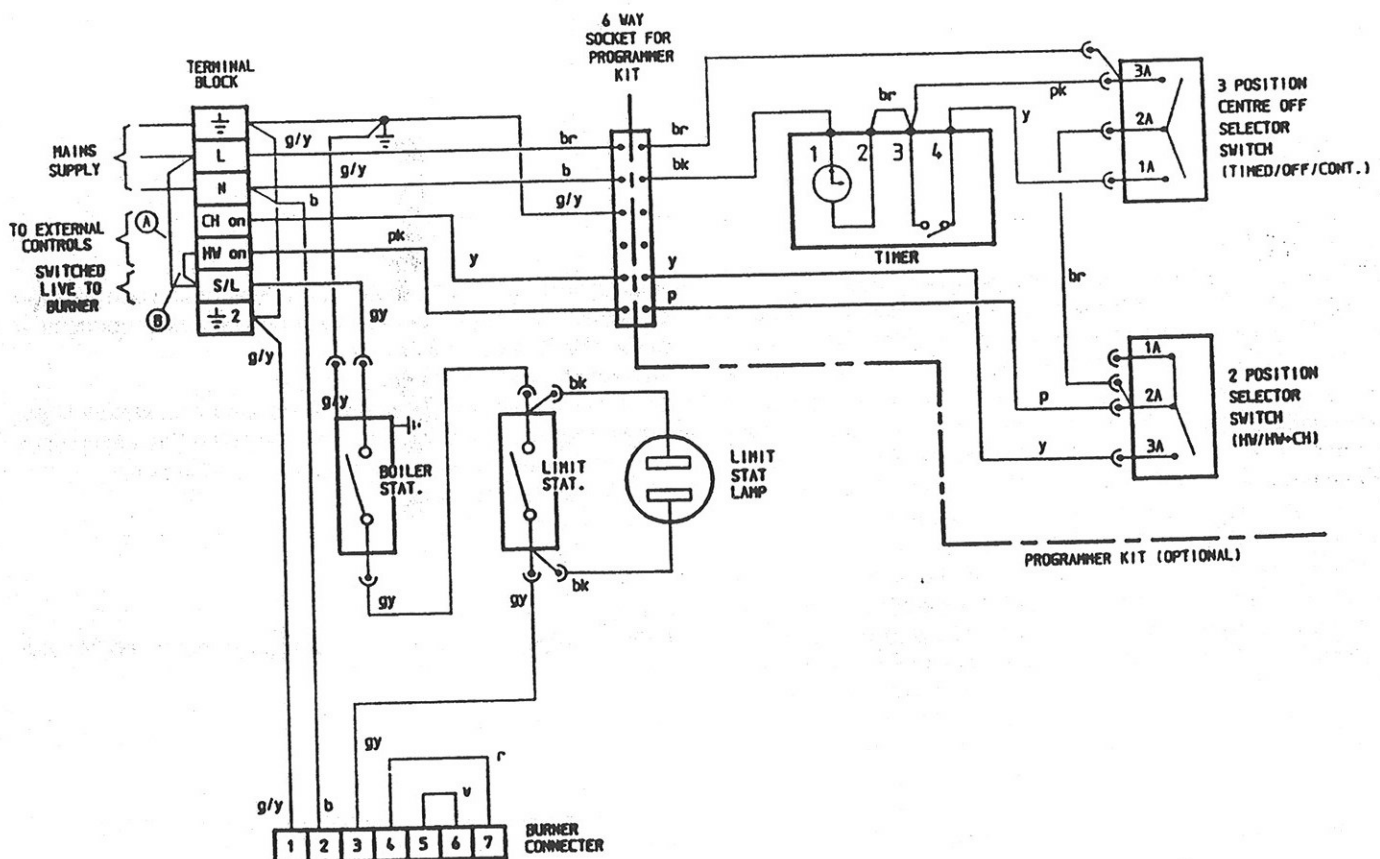
15. WIRING DIAGRAM

Boiler control box (the matching burner wiring is shown in the burner information sheet)

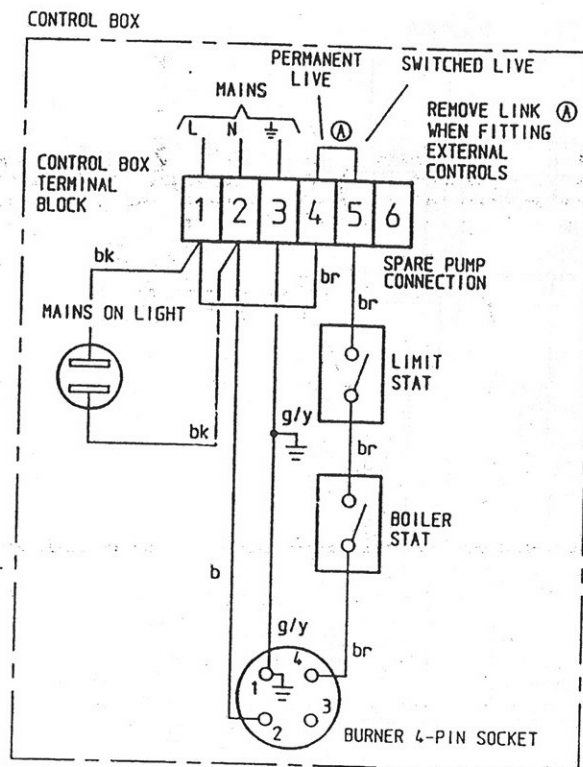
a) Balanced flue boilers, with post purge



b) Conventional flue boilers, no post purge



c) Boiler House Models



COLOUR CODE
b -blue
bk -black
br -brown
g/y-green and yellow

NOTES: BALANCED FLUE BOILERS

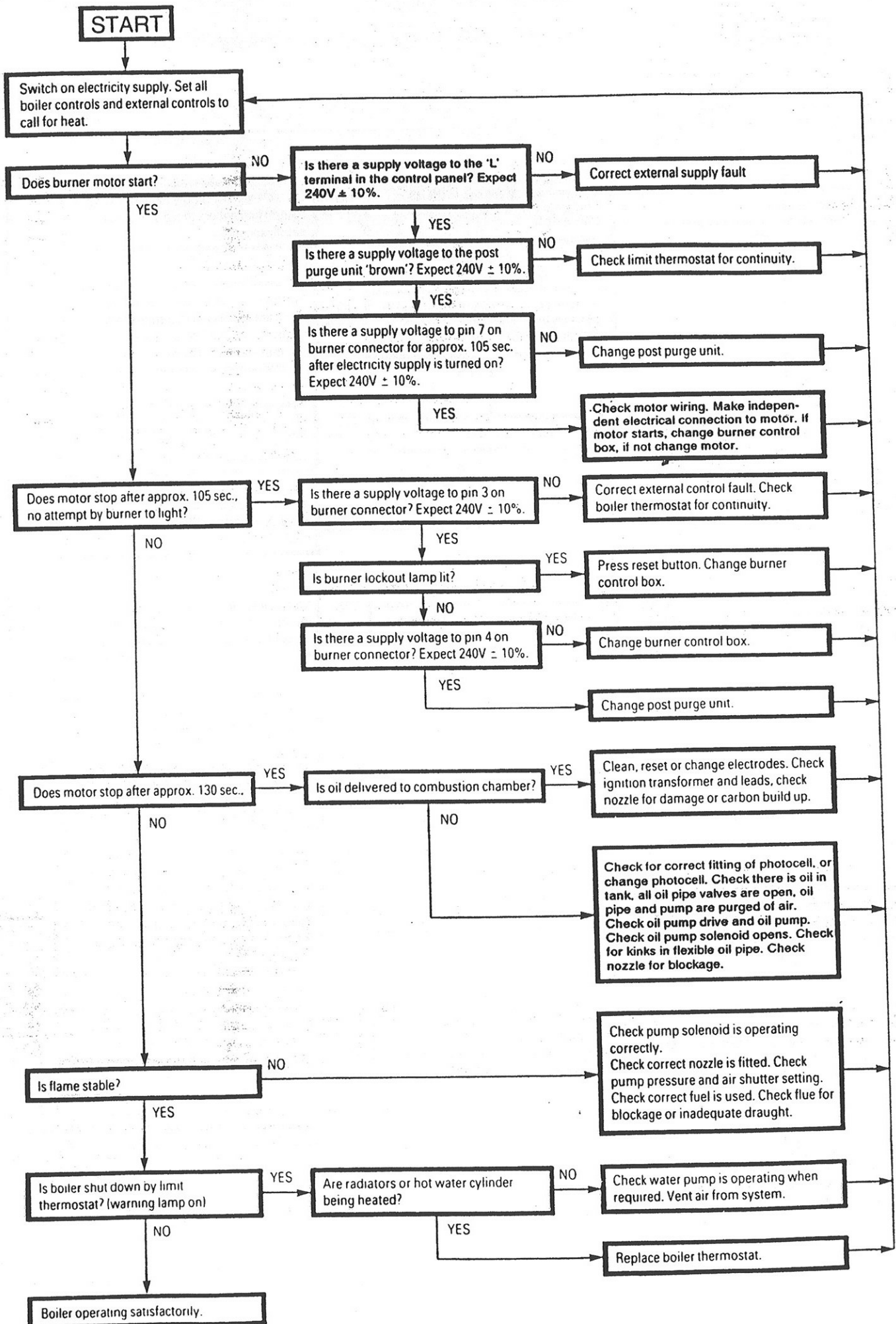
- (i) 'External controls' refer to room thermostat, cylinder thermostat, external timer/programmer, motorised valves or any combination of these, which control the electrical supply to the boiler 'switched live.' Any such combination simply ends in a wire or connection which becomes live when the boiler is required to fire, this point is connected to 'switched live. S/L'
- (ii) A link is factory fitted on the terminal block, so that the boiler will fire without any additional connections being necessary. The link is fitted in position (A) when an internal programmer is not factory fitted, and in position (B) when a programmer is factory fitted. However, the boiler may be fitted to a variety of heating systems each requiring differing wiring arrangements, and hence in many cases the link will be removed. The connection point for the circulating pump varies between the heating system types. When fitting ANY external controls remove link, whether it is in position (A) or position (B). If an internal programmer is fitted on site then:
 - (a) move link from (A) to (B) if there are no external controls.
 - (b) remove link (A) if external controls are fitted.
- (iii) For external programmer or controls, the live supply can be taken from 'L.'
- (iv) For internal programmer kit 'C.H. ON' is live to room thermostat, 'H.W. ON' is live to cylinder thermostat, then to motorised valve(s) (if fitted) and circulating pump, details varying between various systems.
- (v) Switched live from external controls goes to 'S/L' to turn on burner.

NOTES: CONVENTIONAL FLUE /BOILER HOUSE BOILERS

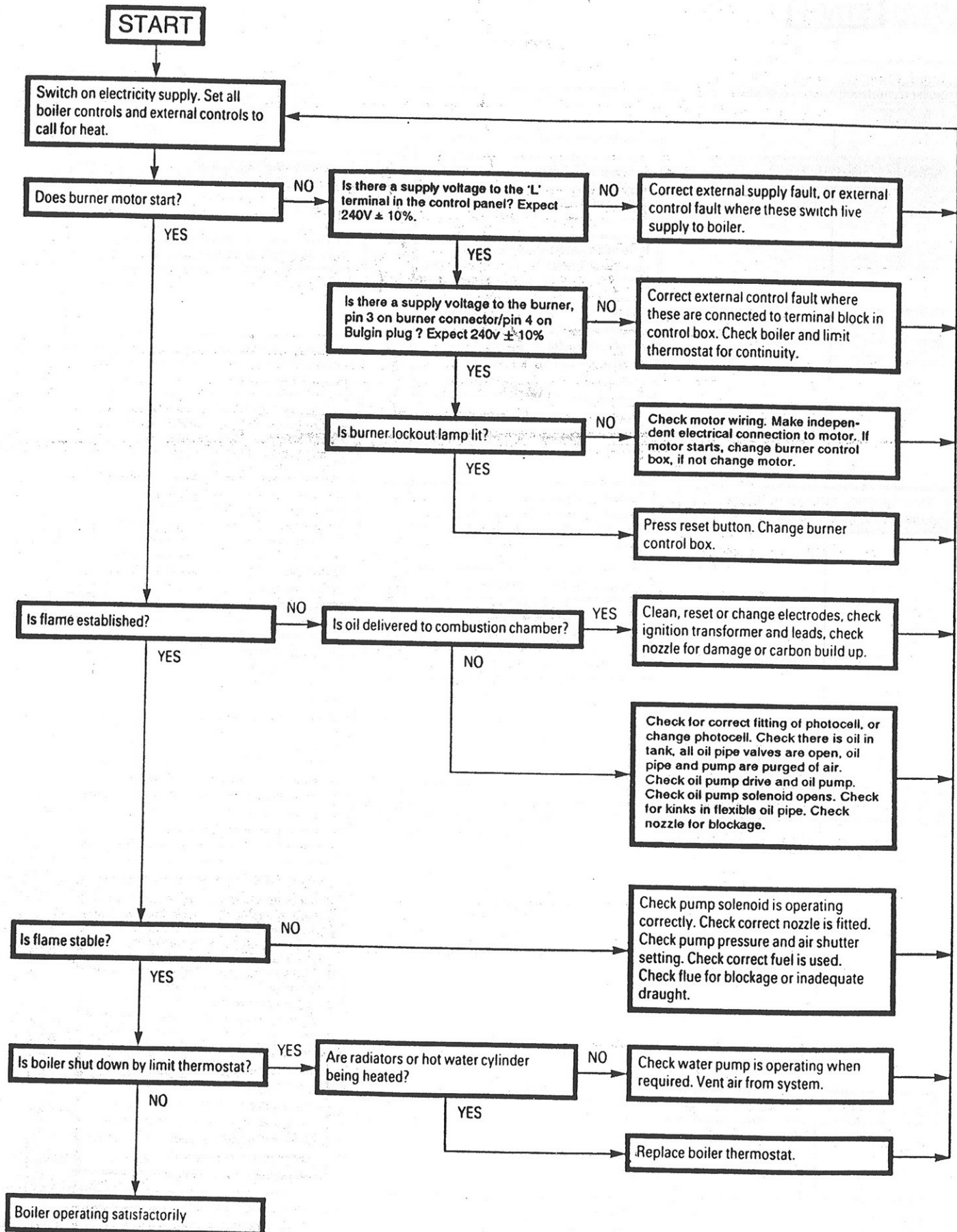
- (i) If an internal programmer is fitted, the mains supply must be a permanent live. See notes for balanced flue above.
- (ii) if an internal programmer is not fitted, it is acceptable to have the mains supply switched by external controls, leaving link (A) in position. In this case the boiler is connected as 'BASIC BOILER' on control manufacturers instructions.

16. FAULT FINDING GUIDE

a) Balanced flue boilers, with post purge



b) Conventional Flue and Boiler House Models



17. PARTS LIST

Model	40/50	50/60	60/80	80/100
Front casing	25/0063/03	25/0063/03	25/0063/04	25/0063/04
Side casing - left	25/0048/03	25/0048/03	25/0048/03	25/0048/03
Side casing - right	25/0048/04	25/0048/04	25/0048/04	25/0048/04
Top casing	25/0060/03	25/0060/03	25/0060/04	25/0060/04
Flue dress ring 4 in.	25/0097/01	25/0097/01	25/0097/01	-
Flue dress ring 5 in.	25/0097/02	25/0097/02	25/0097/02	25/0097/02
Front casing	25/0053/03	25/0053/03	25/0053/04	25/0053/04
Side casing - left	25/0052/04	25/0052/04	25/0052/04	25/0052/04
Side casing - right	25/0052/03	25/0052/03	25/0052/03	25/0052/03
Top casing	25/0054/03	25/0054/03	25/0054/04	25/0054/04
Flue dress ring 4 in.	25/0097/05	25/0097/05	25/0097/05	-
Flue dress ring 5 in.	25/0097/06	25/0097/06	25/0097/06	25/0097/06
Front casing	25/0063/01	25/0063/01	25/0063/02	25/0063/02
Side casing - left	25/0048/01	25/0048/01	25/0048/01	25/0048/01
Side casing - right	25/0048/02	25/0048/02	25/0048/02	25/0048/02
Front top casing	25/0060/01	25/0060/01	25/0060/02	25/0060/02
Rear top casing	25/0057/01	25/0057/01	25/0057/02	25/0057/02
Retarder, cased model	25/0116/01	25/0116/01	25/0116/02	25/0025/03
Retarder, boiler house model	25/0025/01	25/0025/01	25/0025/02	25/0025/03
Boiler thermostat Ranco C26, cased models	25/0093/02	25/0093/02	25/0093/02	25/0093/02
Boiler thermostat Ranco C26, boiler house	2200/8471	2200/8471	2200/8471	2200/8471
Limit thermostat	1100/8986	1100/8986	1100/8986	1100/8986
Post purge unit	25/0093/01	25/0093/01	25/0093/01	25/0093/01
Burner assembly, cased model	25/0055/07	25/0055/01	25/0055/02	25/0055/03
Burner assembly, boiler house model	25/0055/08	25/0055/04	25/0055/05	25/0055/06

Technical advice:

POTTERTON MYSON TECHNICAL HELPLINE

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Registered Office:

Myson House, Railway Terrace

Rugby, Warwickshire CV21 3JH

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