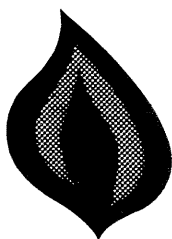


installation and servicing instructions

LENNOX **G11/G11R series** **air heaters**



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PART TWO

SERVICE INSTRUCTIONS

1. GENERAL

The Lennox G11 and G11R Series heaters are open flued fanned circulation ducted air heaters and are intended to be floor mounted.

There are five downflow types, denoted by the letter 'R' in the unit designation and six upflow models. Heater inputs are in the range of 14.5 kW (49,500 Btu/h) to 5½.8 kW (173,250 Btu/h) as detailed in 'Technical Data'.

See Figure 1 for unit dimensions.

The heaters must be fitted to a natural draught flue system.

LENNOX warm air heaters are designed for independent installation or as part of TOTAL COMFORT SYSTEMS or as part of a FUELMASTER PLUS heat pump system. These systems include auxiliary equipment such as DX cooling coil, compressor, electronic air cleaner and automatic humidification. Full instructions for installation and use are provided with all LENNOX auxiliary equipment.

2. PACKING DETAIL

Each LENNOX warm air heater is supplied in two packages as follows:-

PACK 1	-	Warm air heater
PACK 2	-	Flue adaptor Gas isolating valve Primary air filter ('R') models Room thermostat (if ordered) User's Instructions Installer's Instructions Filter frame assembly Filter

3. TECHNICAL DATA FOR HEATERS EQUIPPED TO BURN NATURAL GAS.
ELECTRICAL SUPPLY 240 V. AC. 50 HZ. SINGLE PHASE.

Model Number	G11R-55 G11-55	G11-82	G11R-82	G11-110	G11R-110	G11-137	G11R-137	G11-165	G11R-165	G11-200
Heat Input Kw Btu/h	14.5 49500	21.7 74250	21.7 74250	29.0 99000	29.0 99000	36.2 123750	36.2 123750	43.5 148500	43.5 148500	50.8 173250
Heat Output Kw Btu/h	11 37400	16.7 57200	17 57900	22.3 76250	22.5 76800	27.9 95500	27.7 94650	33.9 115700	33.5 114350	39.6 135150
Gas Connection	RC. 1/2 1/2" BSP	RC. 1/2 1/2" BSP	RC. 1/2 1/2" BSP	RC. 1/2 1/2" BS"	RC. 1/2 1/2" BSP	RC. 1/2 1/2" BSP	RC. 1/2 1/2" BSP	RC. 3/4 3/4" BSP	RC. 3/4 3/4" BSP	RC. 3/4 3/4" BSP
Nominal Flue 5125 mm ins	100 4	125 5	125 5	125 5	125 5	150 6	150 6	150 6	150 6	175 7
Blower Type	Q2	Q2	Q2	Q3	Q3	Q3	Q3	Q5	Q5	1/2hp, 3/4hp, 1 hp.
Weight (Basic Unit) kg	G11R-55 73 kg 161 lbs	77	83	90	98	108	123	140	137	150
lbs.	G11-55 63 kg 139 lbs	139	139	198	215	238	251	308	301	330
External electrical fuse rating - amp.					13					
Natural Gas Injector Marking					"N"					
Natural Gas Injector mm ins					2.58 0.1015					
Burner pressure mbar ins					6.2 2.5					

4. INSTALLATION REQUIREMENTS

4.1. General information

The installation of the air heater must be in accordance with the relevant requirements of the Gas Safety Regulations, Building Regulations and the I.E.E. Regulations.

It should be in accordance also with any relevant requirements of the local gas region and local authority and the relevant recommendations of the following British Standard Codes of Practice.

- CP 331. Installation of pipes and meters for town gas. Part 3. Low pressure installation pipes.
- BS 5864. Installation of gas fired ducted air heaters of rated input not exceeding 60 kW (2nd family gases).
- BS 5440. Flues and air supply for gas appliances of rated input not exceeding 60 kW (1st and 2nd family gases).
 - Part 1 Flues
 - Part 2 Air supply
- CP 3 Ch IV Precautions against fire
 - Part 1 Flats and maisonettes
 - Part 2 Shops and departmental stores
 - Part 3 Office buildings

4.2. Location

The location chosen for the air heater must permit 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 air heater.

The air heater must not be installed in a room containing a bath or shower. In addition, it is recommended that the heater should not be fitted in a bedroom.

A compartment used to enclose the air heater must be designed and constructed specifically for this purpose. An existing cupboard or compartment may be used provided that it is modified for the purpose. Details of essential features of cupboard/compartment design are given in BS.5864. These details must be complied with, except that the permanent air vents required (for combustion, flue dilution and cooling purposes) in the cupboard/compartment at high and low level must

have a minimum effective area as detailed in 'Air Supply' (below).

If an airing cupboard is used to enclose the air heater the above recommendations for a cupboard/compartments must be implemented. In addition, the airing space in the cupboard must be separated from the space housing the heater (including the draught diverter) by a perforated non-combustible partition, the major dimensions for each perforation not being greater than 13 mm (1/2 inch). Expanded metal grille or wire mesh is suitable material. Both high and low level air vents must be in that portion of the cupboard housing the heater. If the flue pipe or any ducting or pipework from the air heater passes through the airing space in the cupboard there must be a close fit between the perforated partition and that which passes through it. In addition, that part of the flue pipe passing through the airing space must be protected by a guard, such as wire mesh, that forms an annular space around the flue pipe of not less than 25mm (1 inch).

4.3. GAS SUPPLY

Service Pipes

The local gas region should be consulted at the installation planning stage in order to establish the availability of an adequate supply of gas.

An existing service pipe must not be used without prior consultation with the local Gas Region.

Meters

A gas meter is connected to the service pipe by the local Gas Region.

An existing meter should be checked by the Gas Region, to ensure that the meter is adequate to deal with the rate of gas supply required.

Installation Pipes

Installation pipes should be fitted in accordance with CP 331:3.

Pipework from the meter to the air heater must be of adequate size. Do not use pipes of a smaller size than the inlet gas connection on the heater.

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

4.4 Flue System

Detailed recommendations for flueing are given in BS 5440:1. The following notes are intended to give general guidance.

The size of the flue serving the air heater must not be less than the size of the flue spigot of the air heater.

Fit the flue adaptor to the top of the heater cabinet with the two screws provided. Fit a split flue socket immediately above the heater to facilitate servicing and maintenance.

Flue pipes and fittings should be constructed from one of the following materials:

- (a) Asbestos cement
- (b) Aluminium or stainless steel.

If double walled flue pipe is used it should be of a type acceptable to British Gas.

If a chimney is to be used it preferable should be one that is composed of or lined with a non-porous acid resistant material. (Chimneys lined with salt glazed earthenware pipes are acceptable if the pipes comply with BS 65 & 540:1). A flue pipe constructed from one of the materials above, should form the initial connection to lined chimneys.

Where a chimney is to be used which is not composed of or lined with a non-porous acid resistant material it should be lined with a stainless steel flexible flue liner or any other liner that is of a type acceptable to British Gas. The internal diameter of the liner must not be less than the size of the flue spigot of the air heater and the number of joints must be kept to a minimum. If the flue liner is not to be connected directly to the air heater draught diverter, a flue pipe which is constructed from one of the materials above should form the connection between the draught diverter and flue liner.

Before connecting the air heater to, or inserting a liner into, a flue that has been previously used, the flue must be thoroughly swept clean of any soot and loose material. If a register plate, restrictor plate, damper, etc. is fitted in the flue it must be removed before connecting the air heater to, or inserting a liner into, the flue.

The flue should terminate in accordance with the relevant recommendations given in BS 5440:1, Table 4.

A terminal of a type that has been tested and found satisfactory by British Gas should be fitted at the flue outlet.

The point of termination must not be within 600mm (2 ft) of an openable window, air vent or any other ventilation opening.

4.5. Air supply

Detailed recommendations for air supply are given in BS 5440:2. The following notes are intended to give general guidance.

Room or internal space air supply

If the air heater is to be installed in a room or internal space, the room or internal space must have a permanent air vent. This vent must be either direct to outside air or to an adjacent room or internal space which must itself have a permanent air vent of at least the same size direct to outside air.

The minimum effective area of the permanent air vent(s) is specified below and is related to the maximum rated heat input of the air heater.

4.5 cm² per kW in excess of 7 kW.
(1 in² per 5000 Btu/h in excess of 25,000 Btu/h)

Cupboard or compartment air supply

If the air heater is to be installed in a cupboard or compartment permanent air vents are required (for combustion, flue dilution and cooling purposes (in the cupboard or compartment at high and low level). These air vents may either communicate with a room or internal space or be direct to outside air.

The minimum effective areas of the permanent air vents required in the cupboard or compartment are specified below and are related to the maximum heat input of the air heater.

POSITION OF AIR VENTS	AIR VENT AREAS	
	Air from room or internal space.	Air direct from outside
High level	9cm ² per kW (2 in ² per 5000 Btu/h	4.5cm ² per kW 1 in ² per 5000
Low level	18cm ² per kW (4 in ² per 5000 Btu/h	9cm ² per kW (2 in ² per 5000 Btu/h

Both air vents must communicate with the same room or internal space or both be on the same wall to outside air.

Extract fan

If an extract ventilation fan is fitted in the same room as the heater, or the room from which the heater draws its air, or the compartment in which the heater is fitted, then additional room ventilation must be provided to ensure that when all doors and windows are closed tight and the extract fan is running, it does not affect the correct operation of the heater flue or burner.

In hairdressing salons, ventilating air must not be drawn from rooms or areas in which aerosol sprays are being used. The propellants used in aerosols can cause corrosive damage to the heating unit.

4.6. Air distribution system

Detailed recommendations for the air distribution system are given in BS 5864.

The following notes are of particular importance.

All delivery and return air ducts, including jointing and any insulation or lining must be constructed entirely of materials which will not contribute to a fire, are of adequate strength and dimensionally stable up to an internal air temperature of 120°C (248°F). Where inter-joist spaces are used as duct routes they should be suitably lined with a fire-resisting material.

It is essential that a full and unobstructed return-air path to the heater from all heated rooms be provided, with the exception of kitchens, bathrooms and W.C.'s.

IN ORDER TO AVOID INTERFERENCE WITH THE OPERATION OF THE FLUE BY THE AIR-CIRCULATION FAN, THE RETURN AIR GRILLE(S) MUST BE CONNECTED TO THE RETURN AIR INLET OF THE AIR HEATER BY MEANS OF DUCTING.

The return air path should be provided as follows (see also Notes below):

- (a) by means of separate ducts from each heated room or,
- (b) via a common return-air duct situated in a collection area (e.g. a hall), used in conjunction with openings in the doors or walls separating the heated rooms from the collection area,
- (c) by a combination of above two methods.

The undercutting of doors for the purpose of providing a return-air path is not acceptable.

Openings must have minimum effective areas of 88 cm² per kW (1 in² per 250 Btu/h) of designed heat input to the rooms they serve.

NOTE:

The installation of a warm air heating system must be in strict accordance with any fire regulations or insurance company's requirements appertaining to the area in which the system is installed. In addition, where a warm air heating system is installed in a flat or maisonette (in a block over two storeys), a shop or departmental store or an office building, any relevant recommendations of CP 3: Ch IV appertaining to such buildings, with respect to the installation maintaining the integrity of any fire escape route, must be complied with.

4.7. Electrical supply

Wiring external to the air heater must be installed in accordance with the I.E.E. Regulations and any local regulations which apply. The air heater is supplied for 240 volts, 50 Hz, the external fuse rating is 13 amps for all models.

The method of connection to the mains electricity supply should facilitate complete electrical isolation of the air heater, preferably by the use of a switched shuttered socket-outlet in conjunction with a fused three-pin plug both complying with the requirements of BS 1363.

Alternatively, a fused double-pole switch spur-box serving only the heater may be used.

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

5. FITTING HEATER

- 5.1. The air heater is floor mounted and the space in which the heater is to be fitted must have the following clearance to adjacent walls:

No filter side	-	25mm (1 in)
Filter side upflow units	-	100mm (4 in)
Filter side reverser flow units	-	
G11R-55/82		413mm (16.1/4 in)
G11R-110		540mm (21.1/4 in)
G11R-137		667mm (26.1/4 in)
G11R-165		794mm (31.1/4 in)
Back	-	25mm (1 in)
Front	-	50mm (2 in)

In addition a minimum clearance of 600mm (24 in) must be provided at the front of the heater to enable the heater to be serviced. Where a flue passes through a partition, the temperature of

of combustible material in the vicinity of the flue should not exceed 65°C (150°F). In the case of a gas appliance flue pipe this will be achieved if there is a clearance of 25mm (1 in) between the pipe and any such material.

5.2. FITTING THE HEATER

G11 Upflow series

Cut out return air opening.

The return air can be brought in either side of the unit.

Bottom return air entry cannot be used.

Scribe lines are provided on each side showing outline for return air opening. Remove screw retaining blower access door, remove door and cut out desired opening.

Fit filter frame assembly (provided in Pack 2) to side of unit. See Figure 7.

Locate and levelling the unit.

Levelling holes are provided in the corners of the base for levelling the unit. Install levelling bolts provided in levelling bolt package as shown in Figure 4A.

CAUTION

BE SURE THAT THE PLASTIC NUTS ARE INSTALLED AS SHOWN AND TIGHTENED DOWN SNUG BEFORE SETTING UNIT.

Set the unit in desired location keeping in mind gas supply connection, electrical supply, flue connections and sufficient clearance for installing and servicing unit and access for user to withdraw filter for cleaning.

Install return air plenum

Install return air plenum and secure to filter frame assembly previously fitted to the return air opening. Secure with sheet metal screw or rivets.

Install warm air plenum

NOTE:

THE FOLLOWING ARE SUGGESTED PROCEDURES THAT SHOULD BE FOLLOWED WHEN INSTALLING THE WARM AIR PLENUM.

Sealing strips of asbestos or fibreglass may be used. In all cases, the plenum should be secured to the heater or evaporator coil cabinet with sheet metal screws. In closet installations, it may be impossible to install sheet metal screws from the outside. If this is the case, install screws from the inside. Cut an access panel in plenum if necessary.

Install conventional plenum as illustrated in Figure 4B. Secure to heater top with sheet metal screws.

N.B. FOR COOLING OR FUTURE COOLING

Install cooling plenum according to the instructions furnished with the evaporator coil or the empty cabinet for cabinet coil.

Gll Reverse flow series

FITTING THE UNIT

Unit can be installed in three ways: on non-combustible flooring, on combustible flooring using an additive base or a reverse flow cooling cabinet.

SET UNIT AS FOLLOWS

A. Installation of non-combustible flooring

1. Cut floor opening keeping in mind the clearances, supply connections, electrical supply, flue connections and sufficient installation and servicing clearances, and access for user to withdraw filter for cleaning.

See Table 1 for correct flow opening size.

2. Flange warm air plenum and lower into opening.
3. Set unit over plenum.
4. Check to see that an adequate seal is made.

TABLE 1

NON COMBUSTIBLE FLOOR				
UNIT SERIES	Front to rear		Side to side	
	in	mm	in	mm
55 & 82	20.1/2	520	14.1/4	311
110	20.1/2	520	17.1/4	438
137	20.1/2	520	22.1/4	565
165	20.1/2	520	27.1/4	692

NOTE:

FLOOR OPENING DIMENSIONS LISTED AT 1/4" (6mm) LARGER THAN UNIT OPENINGS.

B. Installation of combustible flooring

1. When unit is installed on a combustible floor an additive base (ordered extra) must be installed between the heater and floor.

See Table 2 for opening size to cut in floor.

TABLE 2

ADDITIVE BASE FLOOR OPENING				
UNIT SERIES	Front to rear		Side to side	
	in	mm	in	mm
55 & 82	22.7/8	581	14.5/8	371
110	22.7/8	581	19.5/8	498
137	22.7/8	581	24.5/8	625
165	22.7/8	581	29.5/8	752

NOTE:

FLOOR OPENING DIMENSIONS LISTED ARE 1/4" (6 mm) LARGER THAN UNIT OPENINGS.

2. After opening is cut, set additive base into opening.

3. Check fibreglass strips on additive base to make sure they are properly glued and positioned.
4. Lower supply air plenum into additive base until plenum flanges seal against fibreglass strips.
5. Set unit on additive base so unit flanges drop into plenum. Refer to Figure 5A.

NOTE:

BE CAREFUL NOT TO DAMAGE FIBREGLASS STIPS. CHECK FOR TIGHT SEAL.

C. Installation of cooling cabinet

1. Refer to reverse flow coil installation instructions for correctly sized opening in floor and installation of cabinet.
2. When cooling cabinet is in place, install heater so flanges drop inside cabinet opening.

Install return air plenum

The following steps should be taken when installing plenum:

1. Fit filter frame assembly to return air opening on top of heater. (Refer to Figure 7)
2. Bottom edge of plenum should be flanged with a hemmed edge. (See Figure 5B).
3. Sealing strips of asbestos or fibreglass may be used.
4. In all cases the plenum should be secured to top flanges of heater with sheet metal screws.
5. In closet installation it may be impossible to install sheet metal screws from outside. If this is the case, make plenum with removable front and install screws from the inside. See Figure 5C.

Connect duct work

Install supply and return ductwork as desired.

5.3. Return air ducts

There are specific requirements for return air ducting, particularly in relation to a conventionally flued appliance.

The principal ones listed below:-

- (a) A permanent return air duct must provide a continuous path from the grille to the heater.
- (b) It is not advisable to collect return air from the room in which the heater is fitted. In no circumstances should this be done if it is a small room.
- (c) Return air must not be taken from kitchens, bathrooms, W.C.'s, or from a position adjacent to the unit.

IT IS EXTREMELY IMPORTANT THAT THE CORRECT SIZE RETURN AIR GRILLE(S) AND DUCTING ARE USED AND THAT A POSITIVE RETURN AIR CONNECTION IS MADE.

5.4. (a) Primary air filter

'R' units only. Fit primary air filter over burners and manifold and secure with two springs provided. See Figure 15.

(b) Gas connection

Gas entry may be made through either side of the heater cabinet. The entry to the gas control valve (see diagram) is at its left-hand side.

Fit the isolating gas valve (supplied in separate pack) outside the cabinet with the union connection downstream from the metered gas supply to facilitate servicing and maintenance.

5.5. Electric connections

The heater control circuit is shown in the wiring diagram (see Technical Data).

Tie the plastic cable entry glands into the piercings on the side of the heater cabinet. The compression gland should be used for the mains inlet. Mains input cable must not be less than 0.75mm². The terminal block is situated in the electrical control box and is visible when the control box cover has been removed.

ALL G11 and G11R HEATERS MUST BE EARTHED.

Supply and install a separate fused double pole switch or unswitched plug and socket outlet near the heater so that power can be disconnected during servicing. Fuse rating is 13 amps. Install and connect the 24 volt room thermostat (supplied if ordered in separate pack).

Thermostat locations to be avoided as listed below:-

- (a) On heater compartment walls
- (b) On external walls in cold spots, or above concealed warm air ducts.
- (c) Areas where radiant heat will affect the thermostat.
- (d) In the warm air stream from diffusers and registers.

After thermostat is installed and wired, set adjustable heat anticipation in the thermostat according to the amperage rating label affixed to heater, usually 0.50 amps.

5.6. Air distribution system

It is important that proper materials and installation methods are employed for the warm air distribution system.

Comprehensive details to enable you to specify a system conforming to the best standards of the industry are given in the Gas Fired Warm Air Manual, prepared by the Warm Air Group of SBGI. (Obtainable from Ernest Benn Limited, 25 New Street Square, London EC4A 3JA).

PLEASE READ THIS PUBLICATION CAREFULLY

5.7. Flue

The flue outlet from this heater is situated at the top, front of the heater cabinet.

Fit the adaptor piece (supplied separately) to the flue outlet. Screw to top of cabinet with two self-tapping screws provided. You will need to drill 2 x 2mm (1/8" dia) holes to take the screws. Make the external flue to the outlet of the adaptor piece. Ensure that a split flue socket is installed adjacent to the heater and that the flue pipe assembly is self-supporting.

Refer to Technical Data for correct flue size.

6. COMMISSIONING AND TESTING

6.1.1. Electrical installation

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

6.2. Gas installation

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

6.3. Air distribution

The system should be checked to ensure that the installation work has been carried out in accordance with the design requirements. Particular attention should be given to the correct arrangement of delivery ducts and registers, return air ducts and grilles and general adequacy of return air paths.

6.4. CHECKS BEFORE LIGHTING THE AIR HEATER

The following preliminary checks should be made before lighting the air heater:-

- (a) Ensure that the ELECTRICITY supply to the heater is switched off.
- (b) Check that all warm air delivery outlets are open.
- (c) Check that the room thermostat is set to 'ON' and the heater thermostat is set to 'OFF'.
- (d) Check that the clock control (if fitted) is set to an 'ON' period.
- (e) G11-220V only - check fan belt for tension and alignment (see Figures 6a, b, c, d & e)

Check the fan wheel moves freely. The fan bearings are self-adjusting and require no adjustment. Check the collars on the fan belt and adjust the motor so that the belt tension provides approximately 3/4" play. Check that the fan pulley and motor pulley are aligned.

(f) MULTI SPEED DIRECT DRIVE UNITS

Wire motor to higher or lower speed according to unit wiring diagram.

- (g) Check that the air filter is correctly positioned.

NOTE:

FAN and LIMIT controls are factory set as follows:-

Fan 'Off'	50°C.
Differential	15°C.
Limit	70°C.

- (h) Refer to Section 8 for commissioning and testing procedure.

7. HOW TO LIGHT YOUR HEATER

WARNING:

If the pilot light is extinguished either intentionally or unintentionally no attempt should be made to relight the gas until at least three minutes have elapsed.

- 7.1. Switch the electricity supply OFF.
- 7.2. Set the room thermostat to its lowest, or OFF, position.
- 7.3. Ensure that the gas supply to the heater is ON.
- 7.4. Remove the front panels to the heater by lifting the door panels upwards free of the retaining flanges (upper panel only on G11 units, both panels, top one first, on G11R units). See Figures 2A and 2B.
- 7.5. The gas valve with its white control knob will be seen in the gas supply pipe in the front compartment of the heater.

Ref Figure 3.
- 7.6. Lift the lighting access flap in the burner shield.
Ref Figure 8.
- 7.7. Turn gas control knob anti-clockwise to the pilot position Ref Figure 14.
- 7.8. Push in the gas control knob and keep fully pushed in. At the same time apply a lighted match or taper to the pilot burner. See Figure 8.
- 7.9. Once the pilot light is alight, keep the knob pushed in for at least 60 seconds before releasing. The pilot should remain alight after the knob is released. If the pilot does not stay alight, push the knob down and turn clockwise to the OFF position, wait at least three minutes and then repeat from Step 7.7.
- 7.10. With the pilot flame established, close the lighting access flap in the burner shield.
- 7.11. Turn the gas control knob to the ON position.
- 7.12. Set the room thermostat to the required setting.
- 7.13. Switch the electricity supply ON.

The heater will now light provided that the room temperature is below the thermostat setting.

(N.B. Any programmer or time clock control, if fitted must be ON).

- 7.14. When proper operation of the burner has been established, replace the front door panels.

THESE INSTRUCTIONS ALSO APPEAR IN THE USER INSTRUCTIONS.

8. ADJUSTMENTS, TESTING AND COMMISSIONING HEATER

After gas has been established at the main burner the following points must be inspected.

- 8.1. Test for gas soundness. Do not use naked flame for gas leak test.
- 8.2. Check that pilot flame envelopes the thermocouple tip, adjust pilot gas glow on gas valve if necessary.
- 8.3. TURN OFF gas supply to burner, connect gas pressure gauge to pressure test point on gas valve. (See Diagrams 3 and 4).
- 8.4. Refire burner and check gas burner pressure. Adjust if necessary. SEE TECHNICAL DATA FOR CORRECT GAS PRESSURE. Pressure should be rechecked after Five minutes. Turn off gas to burner. Disconnect pressure gauge and refit test point cap.
- 8.5. When under full operation check there is no spillage of products of combustion from the draught diverter vent aperture. (Ref. BS 5440. Part I).
- 8.6. Check that the flames are burning quietly, with no yellow topping, and evenly on all burners. (No lift off).
- 8.7. Check the operation of the flame failure device. The main gas to the burner must stop within 30 seconds of pilot extinction.
- 8.8. Check operation of room thermostat. Recheck heat anticipation setting and adjust to correct setting. (See Section 5.5 Electrical connections).
- 8.9. Fan speed must be set in accordance with system design and also to achieve correct temperature rise through the heater. Place a thermometer in the return air grille and another thermometer in the nearest supply air register. Temperature rise will differ according to system air flow design. An easy way of calculating correct temperature rise is as follows:-

Btu/h output of heater =

1.08 x Design air flow

See Technical data for Btuh output of heater.
See system design for design air flow.

- 8.10. To adjust temperature rise adjust fan speed as follows:-

G11-52 to G11-165 and all G11R units

Refer to wiring diagrams (Figures 9, 10, 11 & 12).

LBWD-1571, LBWD.1572, LBWD-1573, LBWD-1574 or appropriate wiring connections to either increase or decrease fan speed.

G11-200

Fan speed is by an adjustable pulley on the fan motor.

- 8.11. Loosen nut on the fan motor frame and push motor up to relieve belt tension (see Figure 6b). Remove belt as shown in Figure 6c. Then loosen Allen screw on outer boss of motor pulley. See Figure 6d, and open adjustable pulley to decrease speed or close pulley to increase speed. (Refer to Figure 6e). Re-tighten Allen screw making sure screw tightens on to the flat of pulley boss and not on to the threads of pulley. Refit fan belt and adjust tension to give 3/4" play. (Refer to Figure 6A).

- 8.12. After any fan speed adjustment motor amperage must be taken to ensure motor is not running in excess to maximum amperage stated on motor rating plate. A clip on ammeter is suggested for this purpose and should be clipped around motor voltage supply lead. All fan access panels must be in place when these readings are taken. Motor amperages should be recorded on commissioning sheet for future reference - particularly warranty claims.

8.13. Fan thermostat adjustment

Fan thermostat should always be site adjusted to give correct fan off temperature. Factory settings listed in 6.4 are not operational settings. With heater in full operation hold centre of dial, push differential and fan off level to low setting. Turn room thermostat to low temperature setting, i.e. below actual room temperature to extinguish burners when temperature of leaving air from diffusers drops to required level, (usually 40°C for low side wall systems and 32°C for floor or ceiling diffusion systems). Return to fan control, hold centre dial and push fan off lever slowly to a higher setting until the fan stops. The differential lever should be set at approximately 15°C higher than fan off lever. If fan cycles when burners are off increase differential.

9. TO TURN HEATER OFF

- 9.1. For short periods, set the room thermostat to OFF, or its lowest setting.
- 9.2. For long periods, set the room thermostat to OFF, or its lowest setting, remove the front panel(s) of the heater, turn the gas control knob to the pilot position, push down and continue turning to OFF position. Wait until the fan stops running then you can turn the electricity power OFF at the supply switch. To relight the heater, follow instructions "How to light your heater" from the beginning.

USER'S INSTRUCTIONS

Hand the USER'S INSTRUCTIONS TO THE USER for retention and instruct in the safe operation of the air heating system.

Bring to the attention of the user the labels on the air heater, carrying instructions for lighting and the safe use of the heater.

Advise the user of the need to clean, and replace correctly, the air filter at least every month.

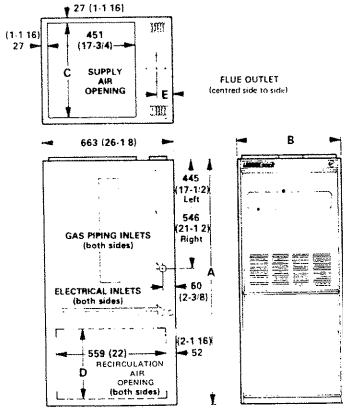
Finally, advise the user that, for continued efficient and safe operation of the heater, it is important that adequate servicing is carried out at least once per year by the local gas region or by a Lennox Authorised Service Agency.

N O T E

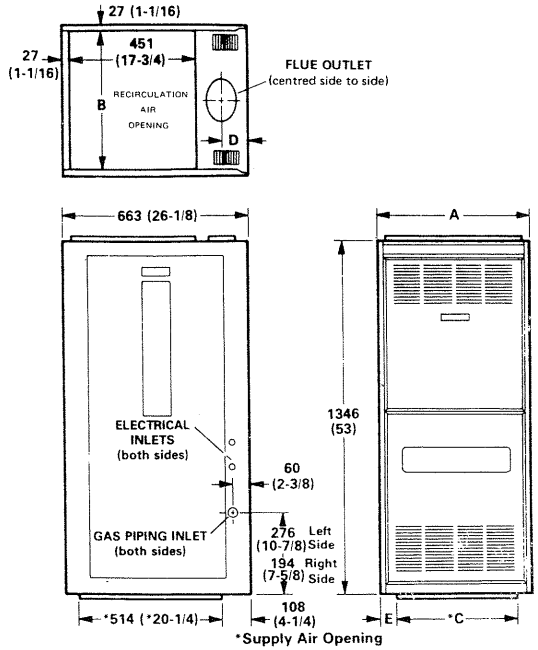
DO NOT LEAVE INSTRUCTIONS AND SERVICING INSTRUCTIONS WITH THE USER.

DIMENSIONS — mm (inches)

G11 SERIES



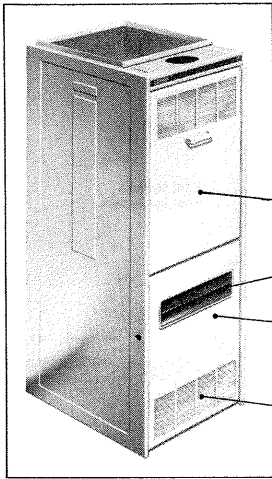
G11R SERIES



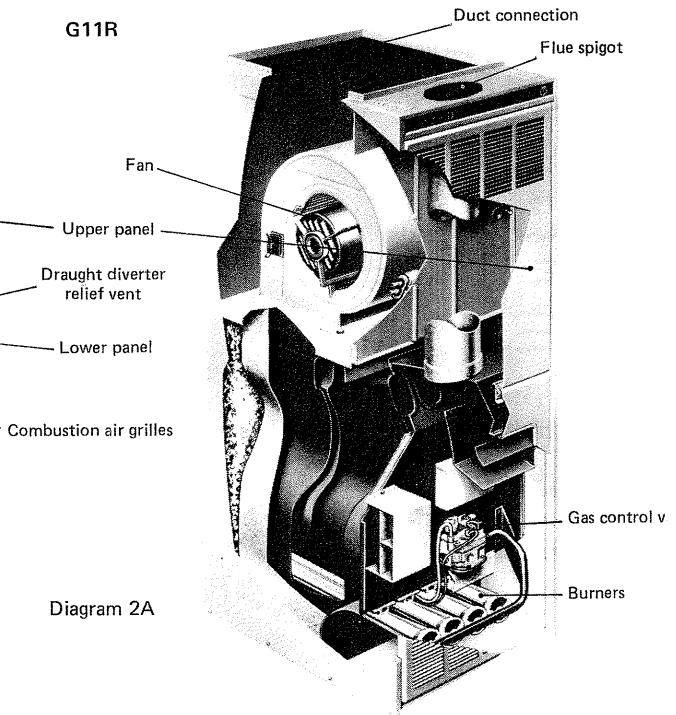
Model Number	G11-55 & G11-82		G11-110		G11-137		G11-165		G11-200	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
A	1245	49	1245	49	1346	53	1346	53	1346	53
B	413	16-1/4	540	21-1/4	667	26-1/4	794	31-1/4	794	31 1/4
C	359	14-1/8	486	19-1/8	613	24-1/8	740	29-1/8	740	29 1/8
D	356	14	356	14	457	18	457	18	457	18
E	79	3-1/8	79	3-1/8	86	3-3/8	86	3-3/8	86	3 3/8

Model Number	G11R-55 & G11R-82		G11R-110V		G11R-137		G11R-165V	
	mm	in.	mm	in.	mm	in.	mm	in.
A	1245	49	1245	49	1346	53	1346	53
B	413	16-1/4	540	21-1/4	667	26-1/4	794	31-1/4
C	359	14-1/8	486	19-1/8	613	24-1/8	740	29-1/8
D	356	14	356	14	457	18	457	18
E	79	3-1/8	79	3-1/8	86	3-3/8	86	3-3/8

Fig 1



G11R

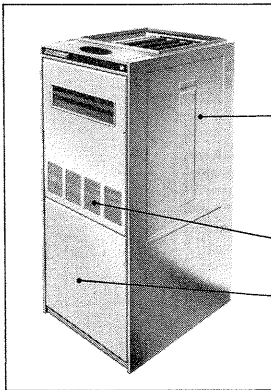


For access

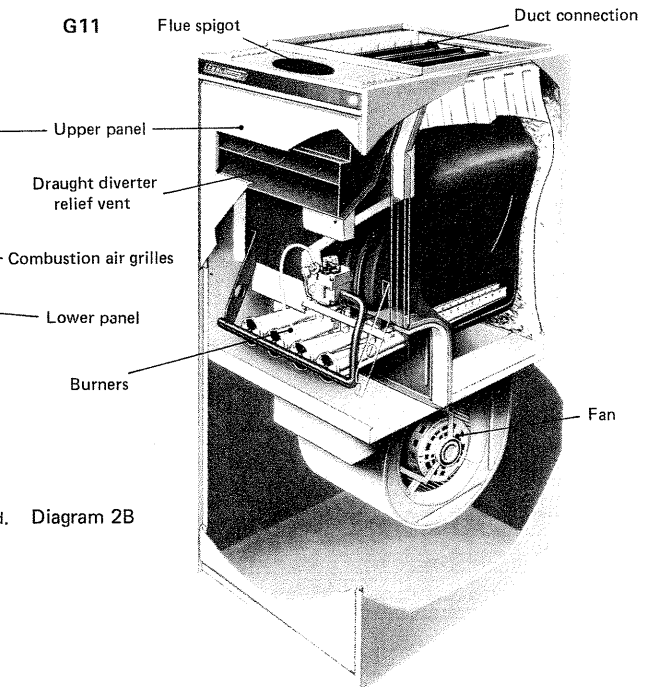
- 1) Lift upper panel up to remove.
- 2) Then lift lower panel upwards.

Diagram 2A

Fig 2a



G11



For access

- 1) Lift upper panel up to remove.
- 2) Lower panel should not be removed.

Diagram 2B

Fig 2b

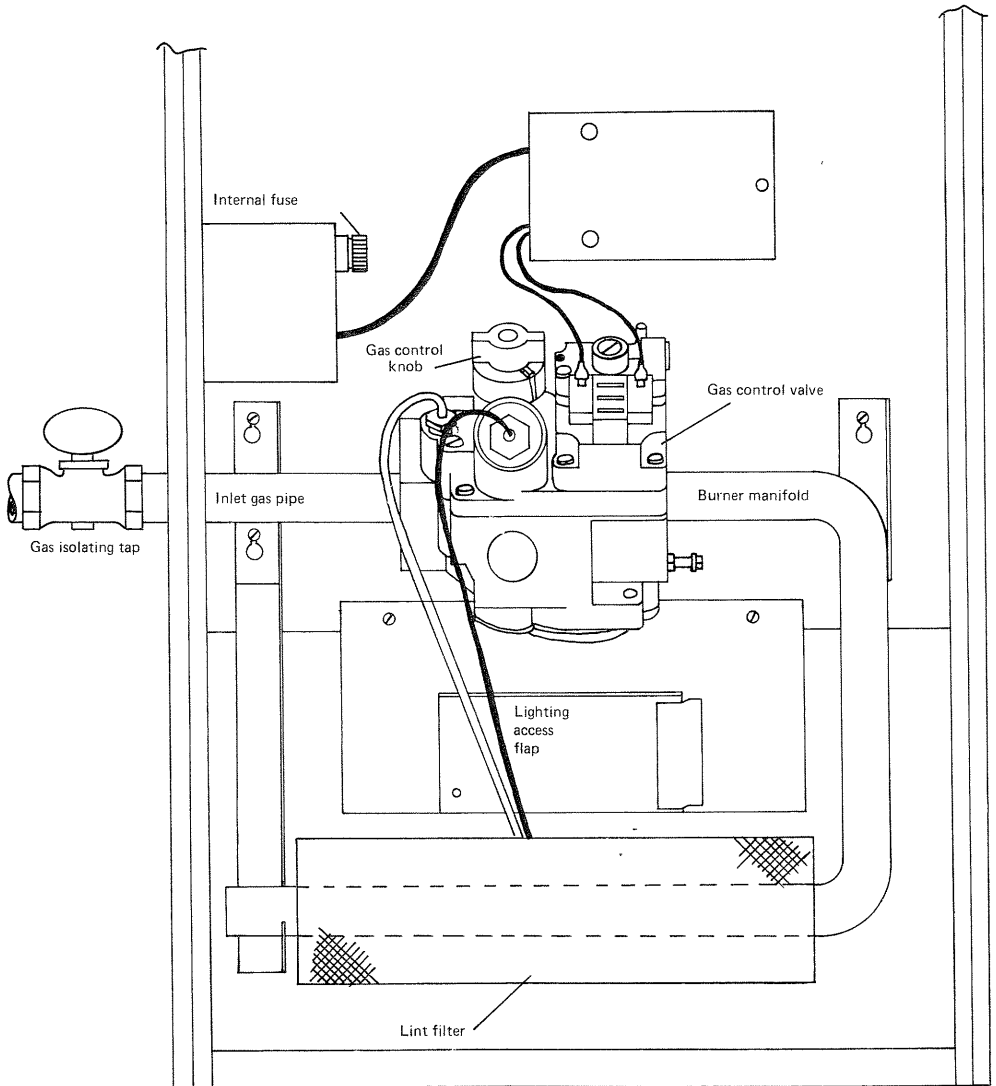


Fig 3 G11R series

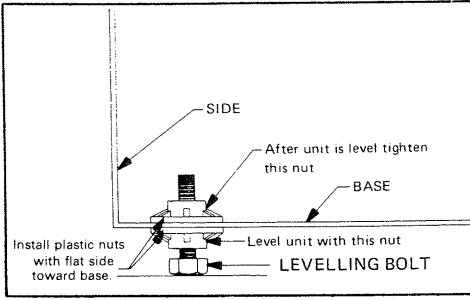


Fig. 4A

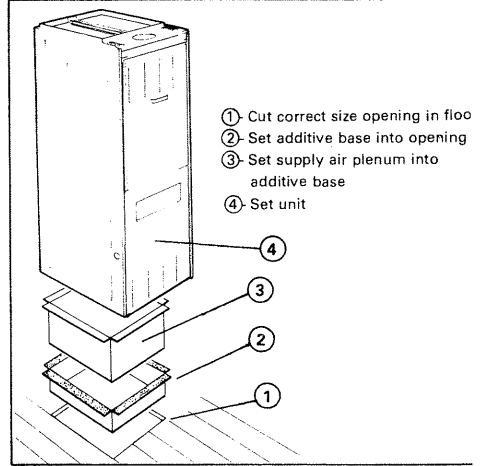


Fig. 5

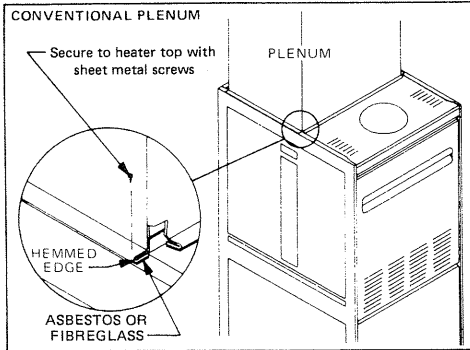


Fig. 4B

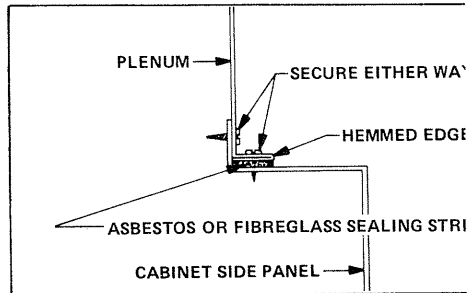


Fig. 6

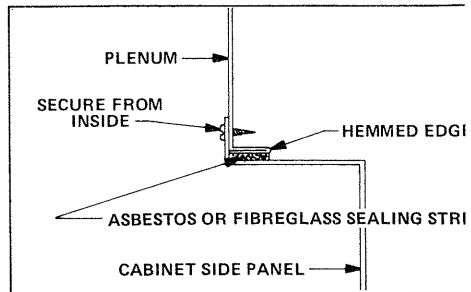
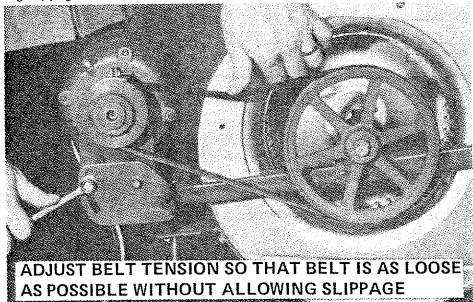


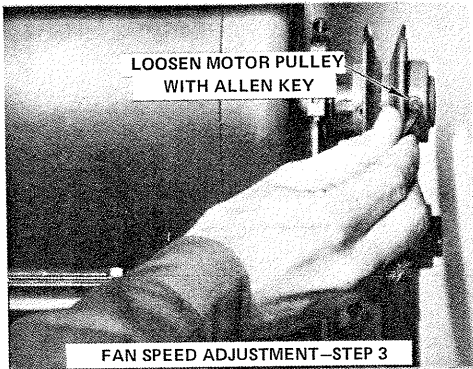
Fig. 7

Belt adjustment
Adjust belt tension so that belt is as loose as possible without allowing slippage.



ADJUST BELT TENSION SO THAT BELT IS AS LOOSE AS POSSIBLE WITHOUT ALLOWING SLIPPAGE

(a)

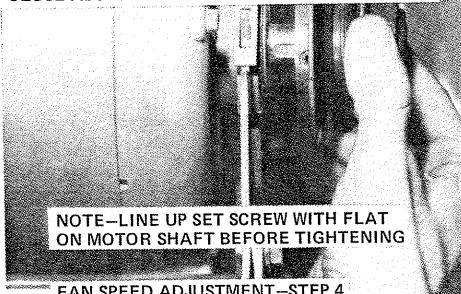


LOOSEN MOTOR PULLEY WITH ALLEN KEY

FAN SPEED ADJUSTMENT—STEP 3

(d)

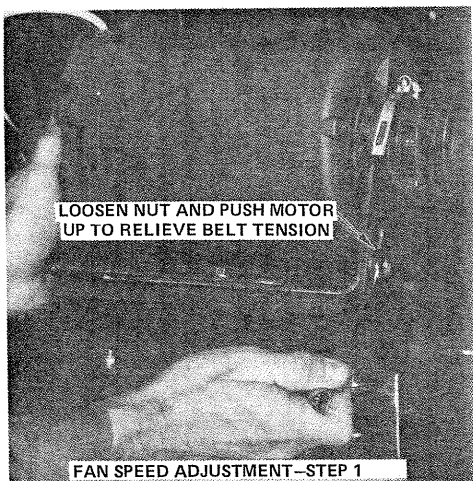
**OPEN ADJUSTABLE PULLEY TO DECREASE SPEED
CLOSE ADJUSTABLE PULLEY TO INCREASE SPEED**



NOTE—LINE UP SET SCREW WITH FLAT ON MOTOR SHAFT BEFORE TIGHTENING

FAN SPEED ADJUSTMENT—STEP 4

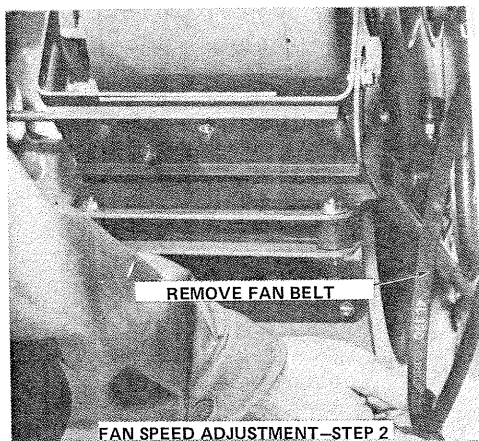
(e)



LOOSEN NUT AND PUSH MOTOR UP TO RELIEVE BELT TENSION

FAN SPEED ADJUSTMENT—STEP 1

(b)



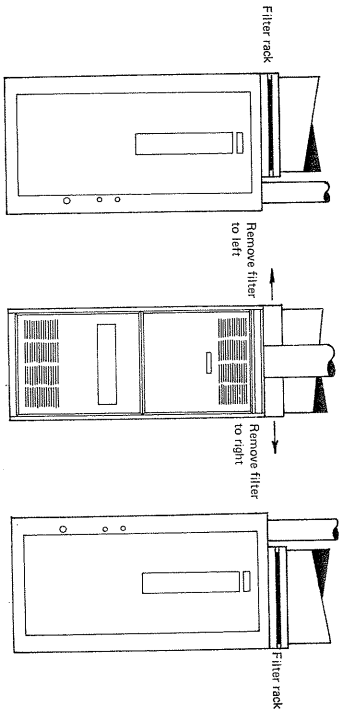
REMOVE FAN BELT

FAN SPEED ADJUSTMENT—STEP 2

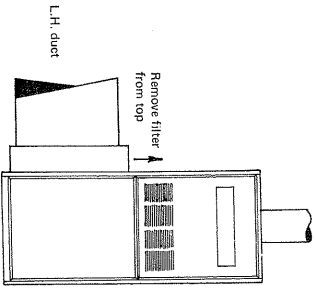
(c)

Fig. 6

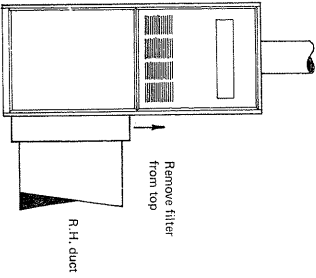
FILTER RACK POSITIONS



G11R series



Units without base plenum



G11 series

Fig 7

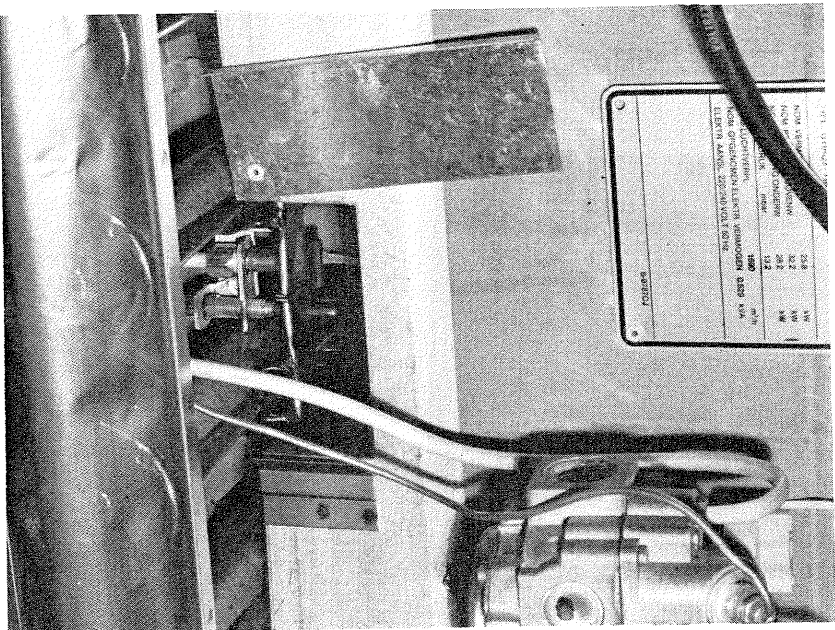
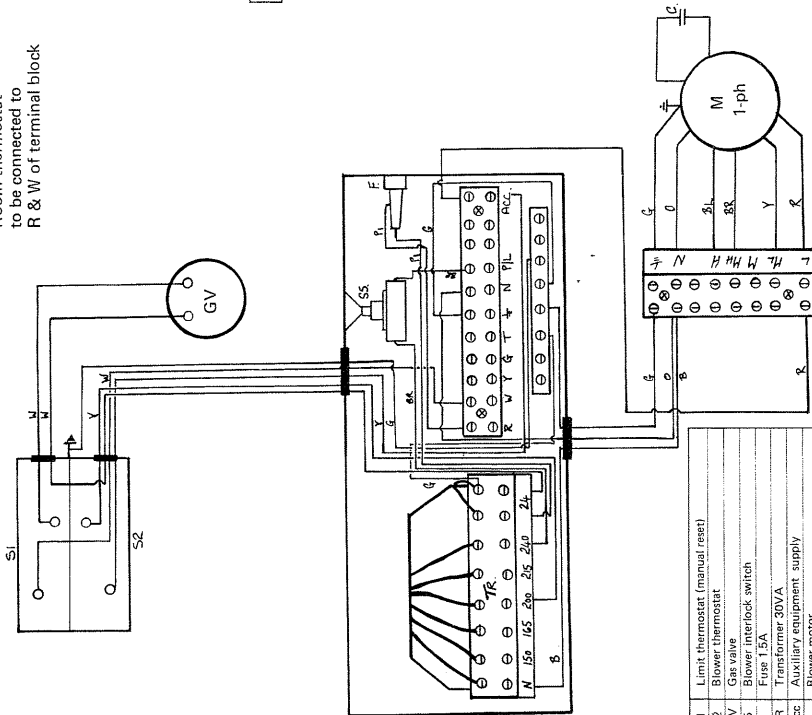


Fig 8

Room thermostat
to be connected to
R & W of terminal block

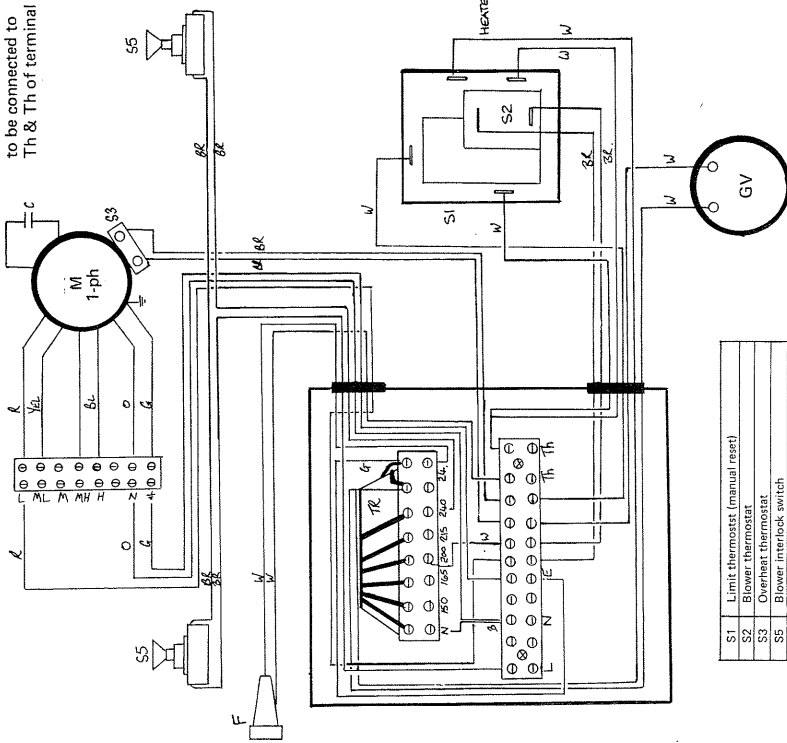


S1	Limit thermostat (manual reset)
S2	Blower thermostat
GV	Gas valve
S5	Blower interlock switch
F	Fuse 1.5A
TR	Transformer 30VA
Acc	Auxiliary equipment, supply
M	Blower motor
L	Coil
ML	Medium low
MH	Medium high
H	High
C	Capacitor

Colour code	Motor speed
B	Low
BR	Medium low
O	Medium high
PI	High
R	
Y	
YL	
YR	

Fig 9 Wiring diagram – LBWD-1571 for G11-55

Room thermostat
to be connected to
Th & Th of terminal



S1	Limit thermostat (manual reset)
S2	Blower thermostat
S3	Overheat thermostat
S5	Blower interlock switch
F	Fuse 1.5A
GV	Gas Valve
M	Blower motor
L	Coil
ML	Medium low
MH	Medium high
H	High
TR	Transformer 30VA
C	Capacitor

Colour	Motor speed
R	Low
Y	Medium low
B	Medium high
BL	High

BR	Colour Code
BR	Brown
G	Green
O	Orange
W	White
BL	Black
B	Blue

Fig 10 Wiring diagram – LBWD-1572 for G11R-55

Room thermostat to be connected to R & W of terminal block

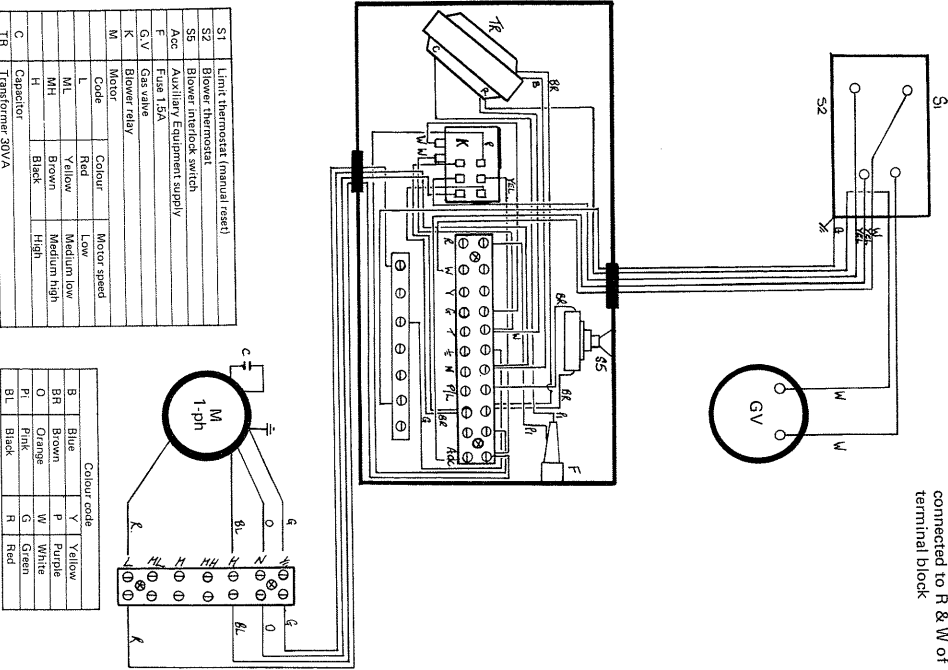


Fig 11 Wiring diagram - LBWD-1573 for G11-82/110/137/165

Room thermostat to be connected to R & W of terminal block

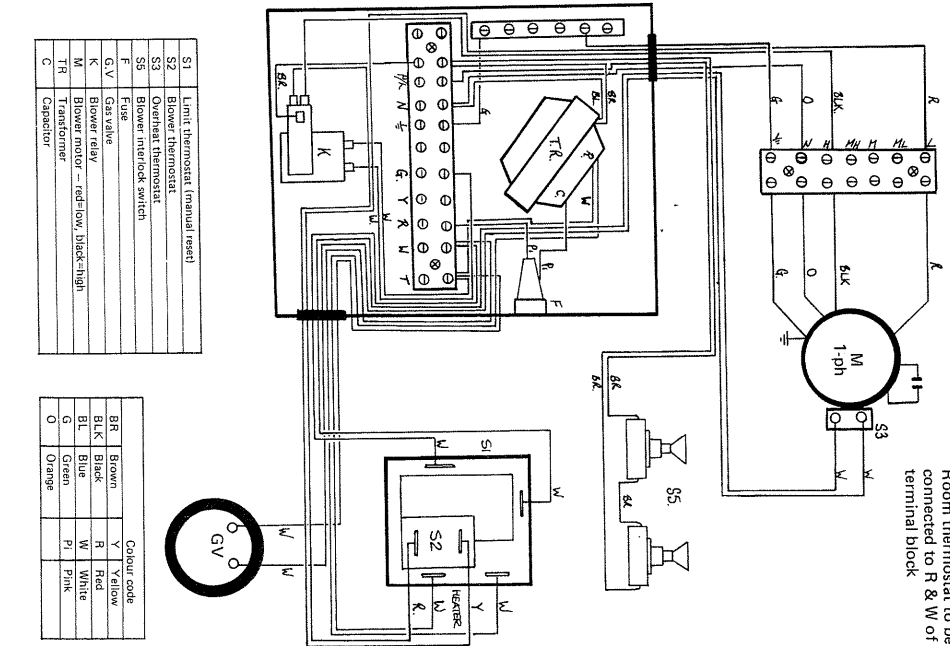
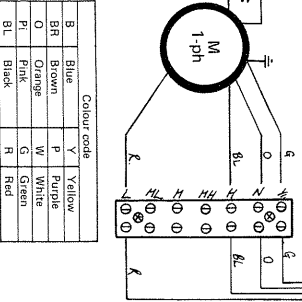


Fig 12 Wiring diagram - LBWD-1574 for G11R-82/110/137/165

S1	Limit thermostat (manual reset)
S2	Blower thermostat
S3	Blower interlock switch
Ac	Auxiliary Equipment supply
F	Fuse 1.5A
G.V	Gas valve
K	Blower relay
M	Motor
L	Low
ML	Yellow
MH	Brown
H	High
C	Capacitor
TR	Transformer 30VA



S1	Limit thermostat (manual reset)
S2	Blower thermostat
S3	Blower interlock switch
Ac	Auxiliary Equipment supply
F	Fuse
G.V	Gas valve
K	Blower relay
M	Blower motor - red-low, black-high
TR	Transformer
C	Capacitor

BR	Brown	Y	Yellow
BLK	Black	R	Red
BL	Blue	W	White
G	Green	PI	Pink
O	Orange		

Room thermostat to be connected to R & W of terminal block

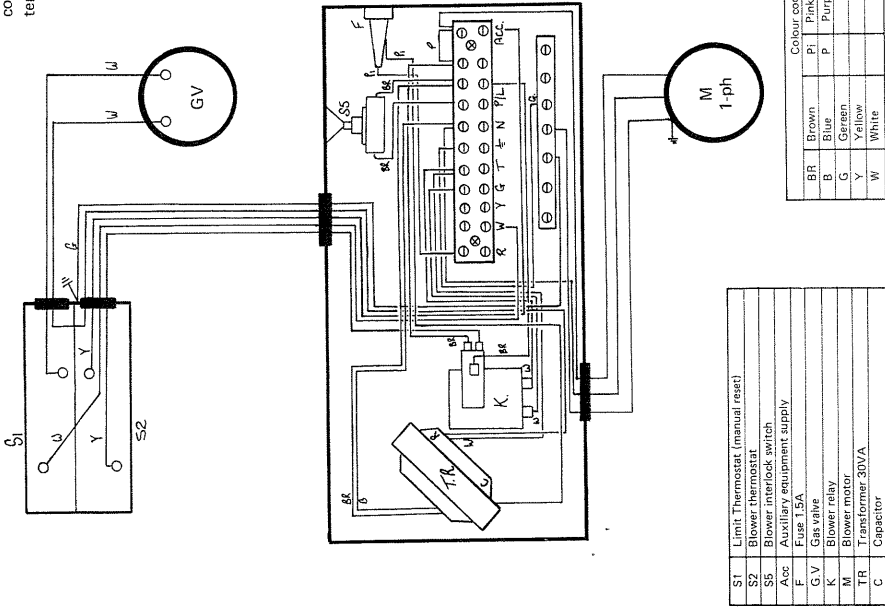


Fig 13 Wiring diagram -- LBWD-1575 for G11-200

PART TWO

INDEX FOR SERVICING INSTRUCTIONS

1. PREPARATION
2. REMOVING AIR HEATER BURNER
3. PILOT
4. THERMOCOUPLE
5. FAN/LIMIT CONTROL
6. FAN ASSEMBLY
7. ADJUSTING BELT TENSION (G11-200 ONLY)
8. TRANSFORMER
9. HEAT EXCHANGER CLEANING
10. FILTERS
11. STARTING THE HEATER

APPENDICES

- (A) SHORT SPARES LIST

THE FOLLOWING NOTES ARE DESCRIBING THE DISCONNECTION OF COMPONENTS FOR THE PURPOSE OF REPLACEMENT AND MAINTENANCE. REFITTING SHOULD BE CARRIED OUT IN REVERSE ORDER.

1. PREPARATION

First switch off electricity and the gas supply to the air heater at the mains isolator and gas isolator valve adjacent to unit. Remove the front top panel by pushing upwards 1/2 inch and then pulling outwards. Remove bottom in similar manner, on G11 series first pull plunger of micro switch upwards to release catch. Micro switch is located under gas manifold, remove bottom access panel securing screw then remove bottom panel as previously described.

2. REMOVING AIR HEATER BURNER

- (A) Disconnect pilot supply tube and thermocouple at gas valve.
- (B) Disconnect two wires to gas valve.
- (C) Undo union nut of gas isolating valve.
- (D) Remove primary air filter "R" models only.
- (E) Loosen four screws securing manifold, do not remove completely.
- (F) Slip manifold upwards and lift over securing screws.
- (G) Burners can now be removed. External cleaning of burners can be done with wire brush. Internal cleaning is done with soft flue-type brush. Brush burners off and shake out dust. Vacuum clean burners if required after brushing.

3. PILOT

Disconnect pilot supply tube from burner, remove pilot injector and clean by blowing through reverse way. Brush dust off pilot burner with soft brush.

4. THERMOCOUPLE

Disconnect thermocouple from pilot burner. Examine for damage, particularly distortion. If thermocouple is distorted - renew.

5. FAN/LIMIT CONTROL

Remove the control cover secured by one screw. Remove four wires noting which connection they came from. Remove two screws securing control to vest panel. Brush probe of control with soft brush. Refer to commissioning section in part one of this manual for correct setting procedures.

6. FAN ASSEMBLY

"R" MODELS

Remove internal flue pipe. Pull plunger of micro switches to release. Undo securing screws on access panels to fan compartment and remove panels. Unscrew wire from terminal block mounted on fan assembly, noting position removed from. Remove two wires from limit control on fan assembly. Remove securing nuts from flange of assembly. Lift assembly over studs and remove.

Clean fan blades with soft brush.

Vacuum if required.

Care must be taken not to damage blades or move balancing weights during removal, cleaning or reassembly. Damage will cause unbalance of fan.

"G11" MODELS

Follow same procedure as for "R" models except for removing flue, access panels and limit control. Check tightness of blower wheel on motor shaft.

7. ADJUSTING BELT TENSION G11-200V ONLY

Motor is equipped with adjustable pulley. See commissioning instructions in part one of this manual for correct setting procedure.

For adjusting belt tension slacken hexagonal head bolt which passes through quadrant shaped slotted hole on motor frame and pull motor outwards until belt tension is correct. Tighten nut securely. Correct tension is 3/4 in (19mm) play in centre of longest side.

8. TRANSFORMER

On G11 units the transformer is located in the control box in fan compartment. On G11R units the transformer is located in the control box situated on the left hand side of the unit below the draught diverter. Remove screws securing the control box cover, disconnect wires from transformer, remove screw securing transformer. The 24 volt circuit of the control system is protected by a 1.5 amp fuse located on the side of the control box.

9. HEAT EXCHANGER CLEANING

To clean heat exchanger first remove gas valve, manifold, and burners as described previously.

On G11 units remove flue from unit and remove top cap from unit. Remove four draught diverter retaining screws and remove draught diverter.

The flue ways are now exposed and may be brushed clean.

9. Continued...

Brush clams from bottom of heat exchanger and vacuum if necessary.

To remove heat exchanger follow dismantling instructions given above for burner removal and heat exchanger cleaning. Disconnect wires from fan/limit control noting position removed from.

Remove vest panel/heat exchanger retaining screws and withdraw heat exchanger through front of unit.

10. FILTERS

Washable filters are fitted external to unit cabinet.

GllR unit filters slide out side-ways. Gll unit filters slide out upwards. Wash expanded metal filters in mild detergent solution and rinse out. Shake dry and replace.

11. STARTING THE HEATER

Refer to lighting instructions in part one of these instructions for correct lighting and operating instructions.

G11 AND G11R SHORT SPARES LIST

G11-55	Gas valve	87A6301
	Thermocouple	P-8-9304
	Motor	P-8-8370
	Capacitor	81A3801
	Fan/Limit control	85A2901
	Transformer	55C3301
	Door interlock switch	41C4201
G11-82	Gas valve	87A6301
	Thermocouple	P-8-9304
	Motor Q3	P-8-8609
	Motor Q2	P-8-8370
	Capacitor	81A3801
	Fan/limit control	85A2901
	Transformer	55C3301
	Door interlock switch	41C4201
G11-110	Gas valve	87A6301
	Thermocouple	P-8-9304
	Motor	P-8-8609
	Capacitor	81A3801
	Fan/limit control	85A2901
	Transformer	55C3301
	Door interlock switch	41C4201
G11-137	Gas valve	87A6301
	Thermocouple	P-8-9304
	Motor	P-8-8609
	Capacitor	81A3801
	Fan/limit control	85A2901
	Transformer	55C3301
	Door interlock switch	41C4201

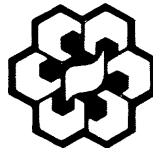
G11 AND G11R SHORT SPARES LIST (CONT'D)

G11-165	Gas valve	87A6301
	Thermocouple	P-8-9304
	Motor	P-8-8711
	Capacitor	81A3901
	Fan/limit control	85A2901
	Transformer	55C3301
	Door interlock switch	41C4201
G11-200	Gas valve	87A6401
	Thermocouple	23C6701
	Motor 1/2 h.p.	P-8-60197
	Motor 3/4 h.p.	P-8-65272
	Motor 1 h.p.	P-8-60164
	Fan belt 1/2 h.p.	P-8-60099
	Fan belt 3/4 or 1 h.p.	P-8-119
	Fan limit control	85A2901
	Transformer	55C3301
	Door interlock switch	41C4201
	Blower shaft	P-5-203
	Blower bearings	P-5-91
G11R-55	Gas valve	P-8-9817
	Thermocouple	P-8-9371
	Motor	P-8-10637
	Capacitor	P-8-1379
	Fan/limit control	52C7301
	Transformer	11B1101
	Door interlock switch	41C4201
	Overheat stat	P-8-5132
G11R-82	Gas valve	P-8-9817
	Thermocouple	P-8-9371
	Motor	P-8-8609
	Capacitor	P-8-1379
	Fan/limit control	P-8-10851
	Transformer	11B1101
	Door interlock switch	41C4201
	Overheat stat	P-8-5132

G11R AND G11R SHORT SPARES LIST (CONT'D)

G11R-110	Gas valve	P-8-9817
	Thermocouple	P-8-9371
	Motor	P-8-8609
	Capacitor	P-8-1379
	Fan/limit control	P-8-10851
	Transformer	11B1101
	Door interlock switch	41C4201
	Overheat stat	P-8-10852
G11R-137	Gas valve	P-8-9817
	Thermocouple	P-8-9371
	Motor	P-8-8609
	Capacitor	P-8-1379
	Fan/limit control	P-8-10851
	Transformer	11B1101
	Door interlock switch	41C4201
	Overheat stat	P-8-10852
G11R-165	Gas valve	P-8-9518
	Thermocouple	P-8-9371
	Motor	P-8-8711
	Capacitor	P-8-1947
	Fan/limit control	35C8401
	Transformer	11B1101
	Door interlock switch	41C4201
	Overheat stat	P-8-5132
	Transformer fuse for all models	58C6801

It is recommended that this appliance be installed only by a competent gas installer or heating engineer, Lennox approved installer, British Gas and their associated agents, or CORGI members.



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