PUBLICATION JA23

SfB (56)

UDC 697·3

Installation and Maintenance Instructions

MODELS JGD35C-BF-SE
and
MODELS JGD42C-BF-SE

DOWNFLOW

WARM AIR HEATERS

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J & S WARM AIR

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Johnson & Starley Ltd.
Installation and Maintenance Instructions for Models JGD35C-BF-SE and JGD42C-BF-SE Downflow Warm Air Heaters

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DESCRIPTION OF HEATER

The Johnson & Starley JGD35 and JGD42 gas fired warm air heaters supply heat by burning gas through 'Bray' jets. The gas supply is controlled by a Honeywell gas control which operates under the instructions given by a room thermostat. The variable speed circulating fan which forces the warm air through ducts to the rooms to be heated is controlled by a Honeywell fan control. In addition, a Honeywell safety limit control is fitted. These controls are combined in one unit which has a fan auto/manual switch. In summer the circulating air fan can be switched on without heating for the continued circulation of the air in the building. A full description of the various instruments in the control system is given later in these instructions. The heater is supplied completely pre-wired and factory tested. It weighs 147 lbs.

DESIGN CONSIDERATIONS

The heater has been developed to operate against external static resistances within the range detailed in Publication No. JA31 and systems complying with good warm air design and installation practice. Johnson & Starley publish a Perimeter Systems Installation Manual, Publication No. JA10, and a Design Manual, Publication No. JA13/1 from which much useful information can be obtained.

GENERAL INSTALLATION INSTRUCTIONS

1. **Heater Location.** If possible, the heater should be located centrally to ensure :

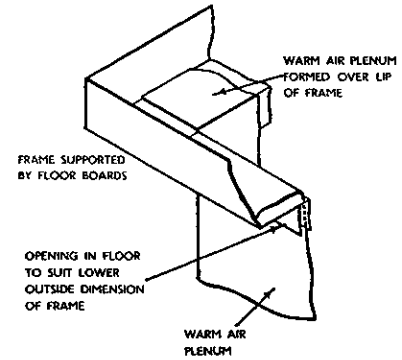
(i) a compact and economic duct design

(ii) sensible flue arrangements, and

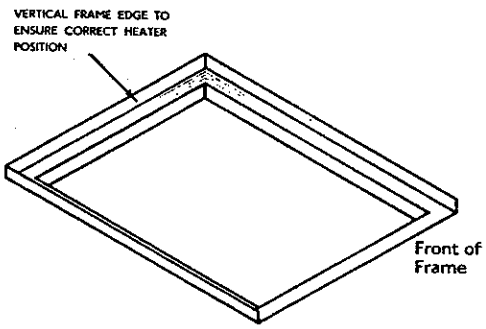
(iii) ease of installation and servicing.

All preparatory installation and building work should be finished before the heater is placed in position. See para's 2, 3, 4, 5, 6, and 7.

INSULATING FRAME



Section of Insulating Frame fitted to a Warm Air Plenum in Suspended Floor



Insulating Frame for JGD 35/42 Heater

FIG. 1

The heater will normally be set on :

(a) a base duct positioned above floor level on which the heater is bolted (supplying short duct runs to outlets adjacent to the heater cupboard).

or (b) a warm air plenum fitted below floor level in either a solid floor or suspended wood floor (supplying longer duct runs). When in a solid floor the heater can be set directly on to the plenum. If in a suspended floor, an insulating metal frame which fits into the floor with flanges to locate the plenum and heater correctly, must be used. (See FIG. 1). Base Ducts, Warm Air Plenums and Insulating Frames are available from Johnson & Starley Ltd.

2. **Heater Compartment.** Building and fire precaution regulations and local bye-laws should be adhered to. The minimum recommended clearances around the heater should be as follows :—

(a) Rendered brickwork or similar—back and sides—1″.

(b) Other materials such as fire resistant hardboard, etc.—back and sides—1″.

It is recommended that the compartment door be lined internally with asbestos sheet and also be large enough to permit removal of the heater. A minimum of 18″ in front of the compartment is required for servicing purposes.

3. **Ventilation.** The heater compartment **must** be ventilated. Recommendations are :

(a) **Conventional flue installation.** A grille at low level for combustion air and ventilation of 1 sq. in. free area for every 1000 Btu/h output of the heater, and one at high level for ventilation of 1 sq. in. free area for every 2000 Btu/h output of the heater.

NOTE. If an extract ventilation fan is fitted in the same room (*e.g.*, a kitchen) as the heater compartment, additional room ventilation will be required to ensure that when doors are closed and the extract fan is running, it does not affect operation of the heater flue.

(b) **Balanced flue or SE-Duct installation.** A grille at high level for ventilation of 1 sq. in. free area for every 2000 Btu/h output of the heater.

4. **Return Air**

(a) **Conventional flue installation.** The return air to the heater **must** be ducted and not drawn from the heater compartment. The return air duct or plenum should connect directly to the heater return air opening. A vibration isolating flexible connection is desirable. The return air grille(s) connected directly to the return air duct system should have a total free area such as to ensure that the air velocity through them does not exceed 400 ft/min. at full fan output. (*i.e.*, a total free area of 175 sq. ins.)

(b) **Balanced flue and SE-Duct installation.** An unobstructed return air path to the heater return air opening of minimum free area 200 sq. ins. should be provided. Air velocity through the return air grille(s) should not exceed 400 ft/min. The heater compartment ventilation grille free area, may be added to the return air grille free area in the form of one grille suitable for both purposes.

It is essential that rooms (except kitchen and bathroom) not connected directly to the return air system should be provided with an adequate return air path to the heater such as relief grilles or undercutting doors. Do not take more air from a room or area than is being introduced into it. Grilles at high level should be fitted with the louvres directed upwards.

5. **Warm Air Ducts.** The ducts and pipes should be assembled to the installation drawing. Ensure all joints are mechanically strong and sealed with at least 2″ overlap of suitable adhesive 2″ wide tape. Duct pipe and fittings should be wrapped with 2″ of suitable insulation. Underfloor installations also require externally wrapping with 500 guage P.V.C. sheeting to pretect the insulation from moisture and water. Ducts in solid floors require protection from crushing. (See Publication J.A.10). Clean out all ducts and pipes before fitting the registers and/or diffusers. Registers should be fitted with the louvre blades directed downwards.

6. **Gas Supply.** The gas connection should be ½" B.S.P. Entry to the heater is on the R.H. side 12" from the bottom of heater. The gas meter capacity should be sufficient for the heater and other demands. The maximum gas rate of the heater are :

JGD35—91 cu.ft./hr. of 500 C.V. gas.

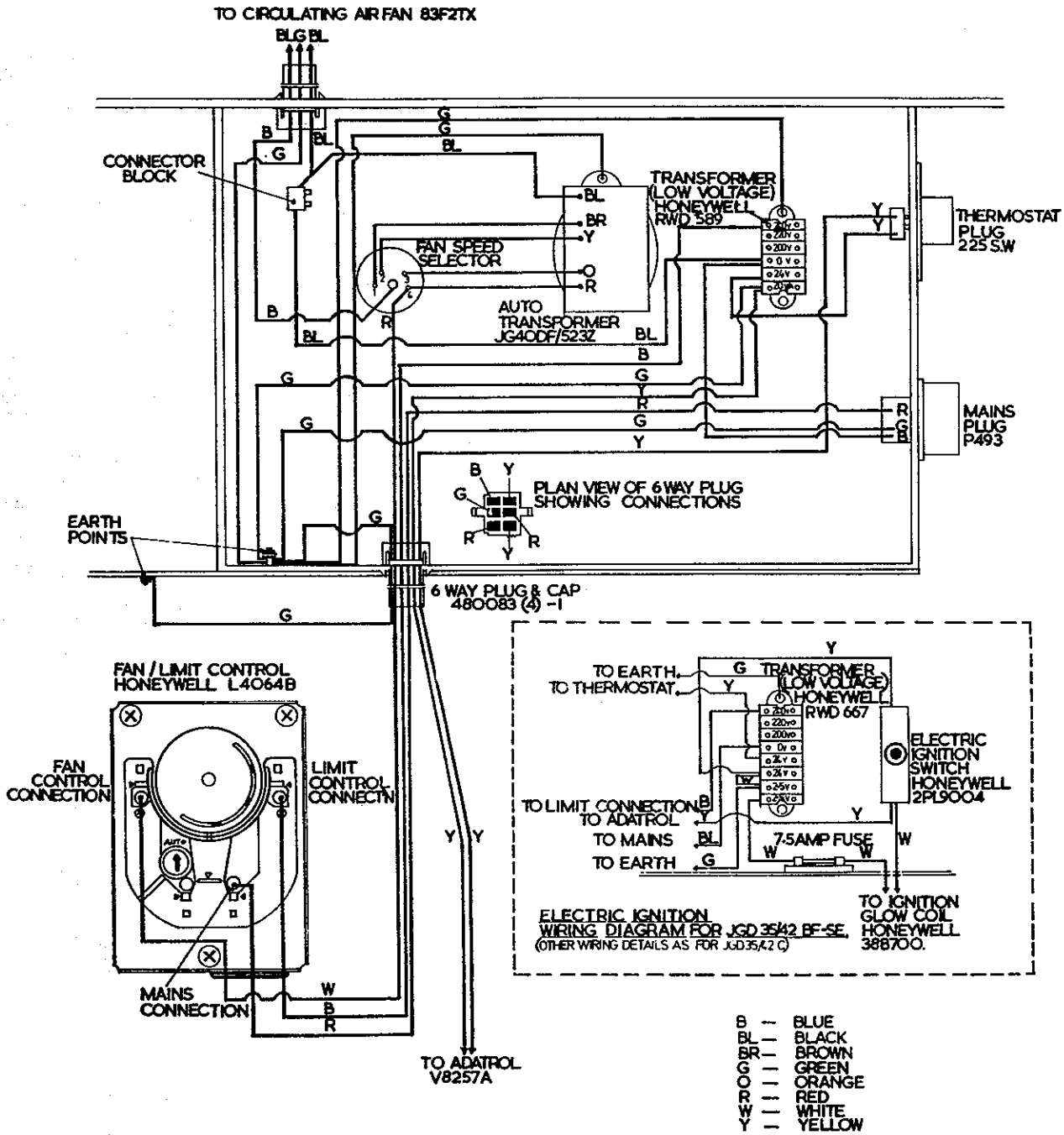
JGD42—110 cu.ft./hr. of 500 C.V. gas.

Installation of gas pipes should comply with local Gas Board requirements and Building Regulations.

7. **Electrical Connections**

(a) **Mains Supply.** The mains power supply connection is to the lower of the two sockets on R.H. side of heater cabinet. An isolating switched socket outlet, 230/250 volts, A.C., fuse rating 5 amps, should be provided near to the heater at this point. Colour coding is : Red for line ; Black for neutral ; Green for earth. The earth connection is essential. All external wiring to the heater should comply with I.E.E. Regulations. (See FIG. 2)

HEATER WIRING DIAGRAM

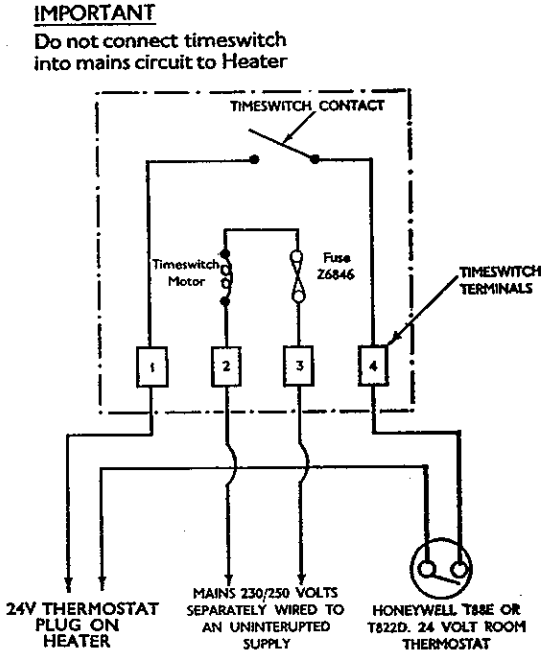


WIRING DIAGRAM FOR JGD 35/42 C.

FIG. 2

(b) **Time Switch.** A Vennerette Mk.II, 4 tappet or similar is recommended. It is important that wiring should comply with FIG. 3.

TIME SWITCH WIRING



Wiring of Timeswitch into Low Voltage Room Thermostat Circuit of JGD 35/42 C-BF-SE

(Detail illustrates Vennerette Mk11 Timeswitch Connections)

FIG. 3

(c) **Thermostat.** Twin P.V.C. insulated flex is suitable for wiring to the 24 volt thermostat position. Heater connection is to the upper white 2-pin socket on the R.H. side which supplies 24 volts external to the heater. Terminate the wiring near to the heater at this point. The slide resistance pointer inside the thermostat should be set to .4 amps.

8. **Thermostat Location.** It is **important** to locate the thermostat (supplied with heater) where it will respond to the average level of room temperature. It should be on an **inside** wall at a height of about 5'0". It is **not** advisable to mount the thermostat :—

(a) In hot spots above concealed ducts or in the warm air stream from a diffuser/register.

(b) In cold spots, in draughts, on outside walls, on walls with unheated space on the other side, or on the heater compartment walls.

(c) In places which are screened from normal circulation of air in the room.

(d) In the living room if a coal fire or other source of heating is habitually used in addition to the warm air system.

FLUEING INSTRUCTIONS

It is important when placing the heater in position for connection to any of the three types of flue to make sure that :

(a) when set on a base duct it is bolted down securely and set firmly on the neoprene sealing gasket so that no leakage or air will occur between the two units or :

(b) when set on an insulating frame (plenum below floor level) that the vertical edge of the frame is not damaged and the heater is seated firmly to prevent air leakage as noted in (a).

A. CONVENTIONAL FLUE-MODEL, JGD35/42C

(i) Fit the combination flue box and draught diverter over the top spigot at the back of the heater with its long spigot upwards. Place the flue adaptor in position.

(ii) Fit the heater flue bracket over the adaptor and secure to the heater cabinet with nuts and bolts provided. Tighten bracket to ensure firmness.

To facilitate fitting the flue bracket, open heater door and pull filter forward.

(iii) With the notice "TOP" uppermost, fit the combustion air inlet baffle to the bottom spigot at the back of the heater.

(iv) Carefully lift the heater into the heater compartment and bolt it squarely on the base duct (bolts supplied with heater), or set it on the insulating frame (for suspended floors) or sunken warm air plenum (for solid floors).

(v) Complete the flue connection, using a split clip, to the heater flue adaptor with 4" i/d light duty asbestos pipe. The flue should conform to B.S.C.P. 331. 104. Flue installations should comply with Gas Board requirements and Building Regulations.

NOTE. The flue pipe must be taken to the wall of the compartment and supported by brackets to relieve its weight from the heater.

B. BALANCED FLUE—MODEL JGD35/42BF

The terminal is suitable for walls up to 14" thick. The flue installation should comply with Gas Board requirements and Building Regulations.

(i) Prepare a finished opening in the wall to the dimensions and position shown in FIG. 4.

(ii) Fix two Eye Rawlbolts—Type AE-3/16" (supplied with terminal) securely into the wall at positions 'A'—'A.' The flue terminal box is a standard length of 14", hence for an 11" cavity wall prepare two asbestos backed wooden distance pieces about 3" thick and the same width as the connecting box to fit between the wall and the back of the connecting box in the positions shown.

CONNECTION DETAILS FOR BALANCED FLUE APPLICATION

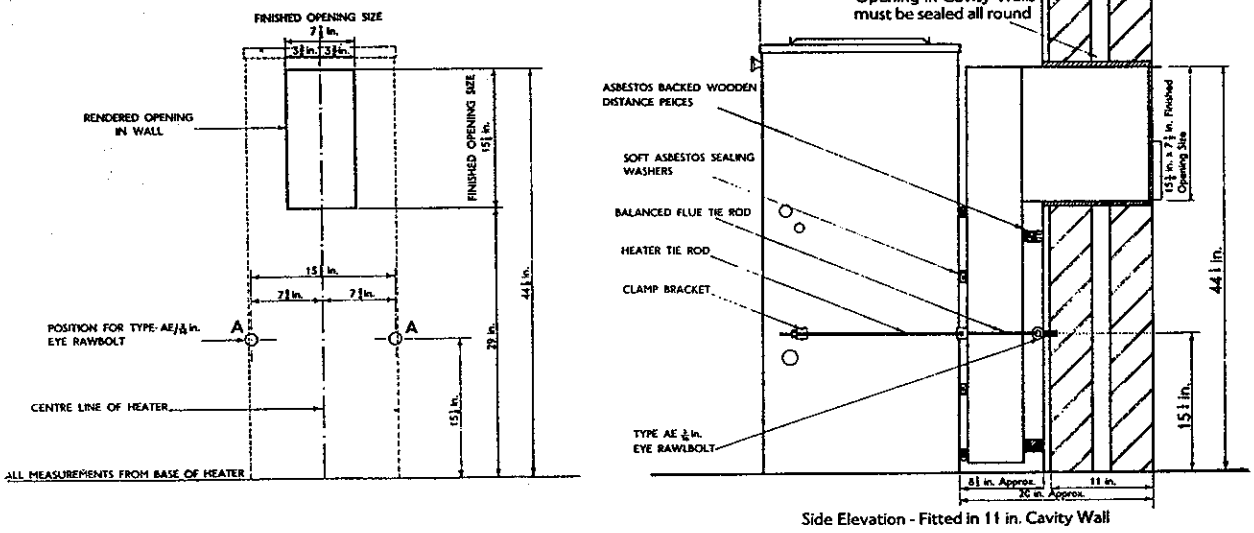


FIG. 4

For other types of wall, distance pieces of appropriate thickness should be used.

(iii) Position the flue terminal box in the wall opening and fit the distance pieces as shown. Fit the cast terminal grille to the flue terminal box making sure that it is level with the outside surface of the wall. Do not overtighten the holding screws. Insert the threaded end of the short pair of tie-rods through the connecting box clamp bar and engage the hook ends into the Rawlbolt eye. Start the tie-rod nuts and carefully tighten each side so that the asbestos strips and wood distance pieces are held firmly. Check that the connecting box is parallel to the wall.

(iv) Insert the clamp brackets through the slots in the side of the heater cabinet. Fit the soft asbestos sealing washers on both spigots at the back of the heater and carefully lift the heater into the compartment as detailed in A—(iv) on page 4 so that the spigots enter the sockets in the connecting box.

(v) Insert the threaded end of the long tie rods through the clamp brackets and place the hook ends in the slots on the connecting box clamp bar.

Start the tie-rod nuts and **carefully tighten each side so that the asbestos washers compress evenly to form an effective seal between the back of the heater and the Balanced Flue connecting box.**

CONNECTION DETAILS FOR SE-DUCT APPLICATION

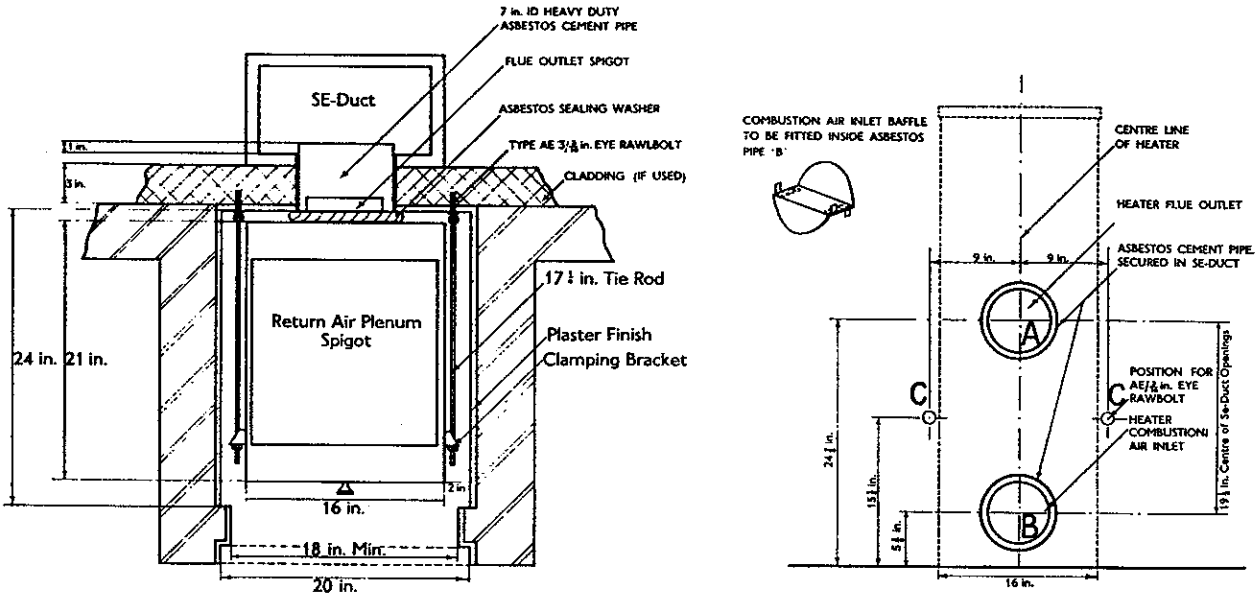


FIG. 5

C. SE-DUCT—MODEL JGD35/42SE

It will be difficult to fit the heater to the SE-Duct unless, at the design stage, the measurements from the bottom of the heater to the SE-Duct entries 'A' & 'B'—See FIG. 5—have been adhered to.

(i) Cement a piece of 7" inside diameter heavy duty asbestos cement pipe, maximum length 6", into each hole in the SE-Duct at 'A' and 'B'. The outer ends of these pipes to be flush with the outer surface of the SE-Duct cladding. The inner end of the lower pipe (at 'B') to be flush with the inner surface of the SE-Duct and the end of the upper pipe (at 'A') to project 1" into the SE-Duct.

(ii) Fit the heater combustion air inlet baffle securely inside the lower pipe (at 'B') allowing approximately ½" clear inside the pipe for entry of the heater combustion air inlet spigot.

(iii) Fix two Eye Rawlbolts—Type AE-3/16" (supplied with heater) securely into the SE-duct cladding at positions 'C'-'C'.

(iv) Insert the clamp brackets through the slots in the sides of the heater cabinet. Fit the threaded end of the tie-rods through the brackets and start the nuts just on to the thread.

(v) Fit the soft asbestos sealing washers on both spigots at the back of the heater, bolt it securely to the base duct with the bolts provided and carefully lift on to the concrete plinth and slide into the compartment so that the spigots enter the asbestos cement pipes.

(vi) Hook each tie rod into the Rawlbolt Eye and **carefully tighten each side so that the asbestos washers compress evenly to form an effective seal between the back of the heater and the SE-Duct.**

COMMISSIONING THE HEATER

The following check and test procedure is recommended :

(a) **Fan Control.** This is part of the Honeywell L4064B Combination Fan and Limit Control which is located just above the Gas Control. The control has a pull off cover. Check that indicator pointer settings, which are factory preset, are :

Fan ON—130°F
Fan OFF—100°F
} on the dial scale of the control.

This gives a differential of 30°F between Fan ON and Fan OFF.

The minimum differential obtainable is 15°F.

Hold the dial scale when setting the indicator pointers.

The above settings may require on-site adjustment depending on the type of warm air outlets connected to the system, *i.e.*, low level sidewall registers or floor diffusers and/or to prevent 'after cycling' when the heater shuts down on thermostat switch off.

(b) **Limit Control.** The indicator pointer of this section of the control is factory preset to 160°F on the dial scale of the control. It will not normally require adjustment, but should be checked for correct setting. The Limit Control resets automatically after operation when the temperature of the discharge air falls through 25°F.

NOTE. The Auto/Manual switch must be set to Auto when commissioning the heater.

(c) **Heating System.** Check that all Warm Air registers/diffusers are fully open in living areas and half open in other rooms and Return Air grilles free from obstruction.

(d) **Gas Rate and Pressure.** Turn on gas and electricity to the heater. Bleed the gas supply pipe of air. Temporarily set room thermostat to its highest setting and light the heater according to the instructions inside the heater door. If necessary, adjust the pilot burner so that the flame completely envelopes the end of the thermocouple. (See leaflet attached to Gas Control). It should be noted that the circulating air fan operates a short time after the main

burner has lit ; *i.e.,* when sufficient heat is available in the heat exchanger—and shuts down a short time after the main burner goes out ; *i.e.,* when all useful heat is dispersed from the heat exchanger.

When the heater has been running for about 20 minutes, check the gas rate at the supply meter is to that given on the heater name plate and if necessary, adjust the Gas Control governor regulating screw accordingly (see leaflet attached to Gas Control). A pressure guage should also be attached to the gas pressure test point on the burner manifold to check that the burner bar pressure is not less than the value given below. The heater name plate also gives the gas group for which the heater has been set at the factory, and Serial Number.

JET AND PRESSURE TABLE

GAS GROUP	G3	G4	G5	G6
JGD35 Jet Size	2	2¼	2½	2½
Pressure in. W.G.	1.0	1.0	1.2	1.4
JGD42 Jet Size	2	2¼	2½	2½
Pressure in. W.G.	1.2	1.2	1.4	1.7

	Input Btu/h	Output Btu/h	Gas Rate cu.ft./h.
JGD35	47,000	35,000	91
JGD42	56,000	42,000	110

All jets are Bray Type 266—Cross-lighting jets Size No. 1. The burner has 24 main and 5 cross-lighting jets.

FRONT VIEW OF HEATER

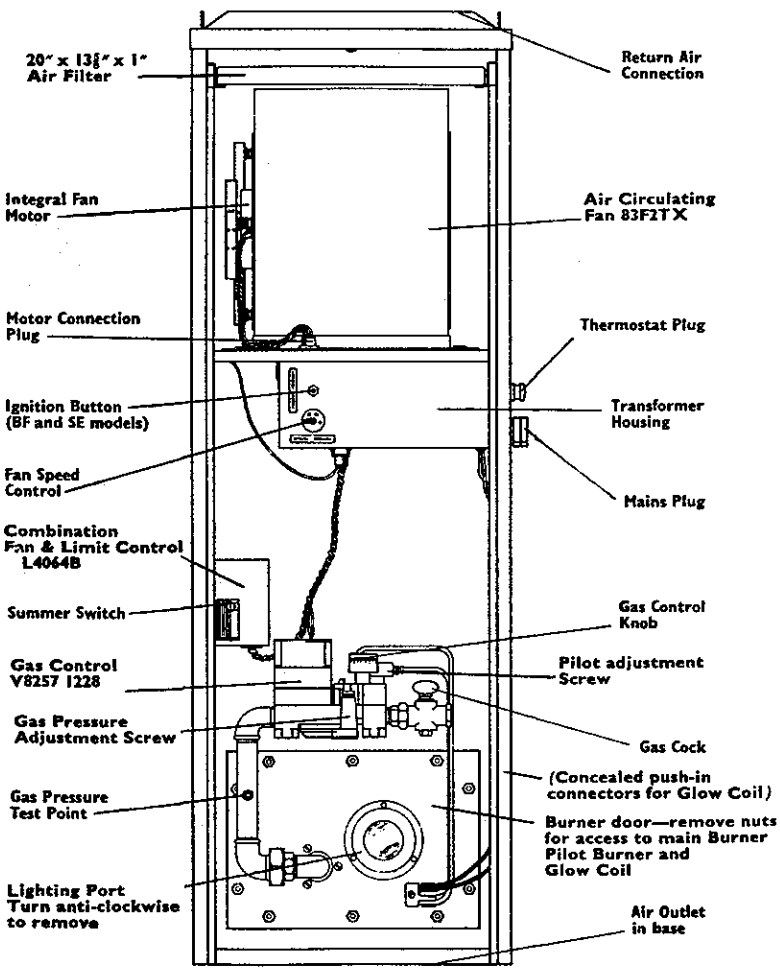


FIG. 6

(e) **Fan Speed Adjustment and Temperature Rise.** Adjust the circulating air fan speed by means of the selector plug on the front of the transformer housing—FIG 6, so that the temperature difference between the warm air at the diffuser nearest to the heater and the return air entering the heater is to the temperature rise figure used in the system design calculations—say 90°F. Temperature readings can be taken with a 0—240°F. thermometer suspended in the register/diffuser and one in the return air grille. Fan adjustment gives more air flow (smaller temperature rise) as the selector plug is moved from position 1 progressingly to position 4.

Adjustments should then be made to each register/diffuser damper to obtain the calculated C.F.M. for each room according to design data, and damper positioning screws set accordingly. The temperature rise across the heater should then be re-checked, re-adjusted if necessary and final adjustments made to each register/diffuser damper.

DESCRIPTION AND OPERATIONAL DETAILS OF CONTROL EQUIPMENT

A. PRIMARY CONTROLS

1. Honeywell V8257A1228 Gas Control (24 volts)

This control incorporates a safe lighting 2-position gas cock ; a thermo-electric flame failure valve for complete shut off in case of pilot flame failure ; pilot filter ; pressure tapping and plug ; silent quick-acting electric oil filled operator valve ; and adjustable gas governor. (Honeywell Data Specification Sheet 70-7238-HB).

All adjustments to the control can be made from the top.

For servicing, **either :** The complete control can be withdrawn and replaced ;
or : The defective part of the control can be replaced.

More detailed information about the parts of the Gas Control are as follows :

(a) **2-Position Gas Cock and Flame Failure Device (Pilotstat)**

When the Gas Cock knob on the Pilotstat section is turned to the 'Pilot' position (in which no gas can flow in the main gas valve) it can be depressed to allow a flow of gas through the pilot gas filter to the pilot burner gas outlet. When the pilot flame is established, power is generated by the thermocouple which energises an electromagnet in the pilotstat and holds the valve open (delay approximately 30 seconds). The knob may then be released and the pilot should remain alight.

The cock can now be moved to the 'ON' position by turning the knob through 90° anti-clockwise. (The knob cannot be turned to the 'ON' position as long as it is depressed). This allows gas to flow through the built-in gas governor to the heater burner when the oil filled operator is energised by the room thermostat contacts making. Should the pilot flame become extinguished the electro-magnet in the pilotstat is de-energised thereby interrupting the gas supply to the main valve **and** the pilot.

NOTE. Later models of the Honeywell V8257 Gas Control incorporate two modifications in the Pilotstat section ; An 'OFF' position is provided and a built-in safety latch added ; The function of the safety latch is: if at any time the Gas Control knob is turned to the 'OFF' position, the safety latch will lock the knob in this position until the pilot has been out for 1-2 minutes.

(b) **Pilot Flame Adjustment.** Alongside the knob of the gas cock will be found a turret with a cap screw. If this screw is removed, a small adjusting screw will be found which restricts the gas flow to the pilot when turned clockwise. It may be necessary to adjust this when commissioning the heater so that the thermocouple tip is completely covered by the pilot flame. The Q.315A pilot burner fitted only consumes between ½ and 1 cu.ft./hr. of gas regardless of inlet gas pressure.

(c) **Gas Governor.** This is installed between the flame failure section and the operator valve to ensure satisfactory light-up. It is positioned on the underside of the unit and can be removed or replaced by undoing four Phillips screws. The adjustment of the spring loaded governor is by means of a screw which is found on removal of the cap screw at the side of the Gas Control. Replacement governors can be ordered separately under part No. V.5102A.1056.

(d) **Main Gas Valve.** The oil filled operator valve functions as follows :

When 24 volts is applied to the terminals a solenoid is energised and attracts the armature of the valve causing it to open and gas flows to the heater burner. The valve is quick acting. It is positioned on top of the Gas Control and can be removed by undoing four Phillips screws. Replacement operators can be ordered separately under Part No. V8254A1023.

2. Pilot Burner Assembly.

(i) **Honeywell Q315A.1142 Pilot Burner.** This is mounted directly on to the main burner bar in a carefully predetermined position to ensure that as long as the pilot flame is of adequate size to hold the flame failure system energised, a reliable, quite light-up will be obtained. At the gas entry to the pilot will be found a metering orifice assembly which should never require adjustment but **may** become blocked. No aeration adjustment is required. Great care must be taken when cleaning this orifice that it is not damaged or enlarged.
(Honeywell Instruction Sheet 95-2683-HB).

(ii) **Honeywell Q309A.1236 Thermocouple.** This fits up the middle of the pilot flame and is located in the correct position and held by a nut at the base. The connection from the thermocouple to the flame failure valve on the Gas Control should be made by tightening the nut finger tight then another ¼ turn. It is essential that this contact is clean.

B. SECONDARY CONTROLS

The secondary control system consists of :

(i) a Low voltage transformer to supply the 24 and 2.5 volt circuits.

(ii) an Auto-transformer with selector plug for fan speed control.

(iii) a Combination fan and limit control.

Details are as follows :

1. **Honeywell RWD 589 Transformer.** This is a 20 VA 24 volt transformer. The primary winding is tapped for 200, 220 and 240 volt supplies. It is located in the transformer housing just below the fan compartment diaphragm. (Model JGD35/42C only).

2. **Honeywell RWD667 Transformer.** This is a 20 VA, 24 volt transformer with an additional 2.5 volt secondary winding for automatic pilot ignition. (Models JGD35/42BF and JGD35/42SE).

3. **J. & S. Auto Transformer with Selector Panel—JG40DF/523Z.**

This has 4 tappings connected to a selector panel on the front of the transformer housing. Fan speed is increased by moving the selector plug from position 1 progressively to position 4 on the selector panel.

Tapping voltages are :

No. 1—160 Volts. No. 2—175 Volts.

No. 3—195 Volts. No. 4—240 Volts.

For access to the above transformers, pull out upper and lower Amp-lok plugs and remove three nuts securing transformer housing to fan compartment diaphragm.

4. **Honeywell L4064B Combination Fan & Limit Control.**

The fan section of this control ensures that air is not circulated from the heater unless its temperature is sufficient and that air is circulated whenever there is heat to be distributed. (See page 4 (a) for details of fan control temperature setting).

The limit section of the control is a safety device which ensures that the burner is turned off if :

(a) the air discharge temperature exceeds 200°F. because of restriction of the circulating air flow such as can be caused by—a clogged filter—obstructed return air grilles or ducts and

(b) the fan motor stops causing a high temperature in the fan chamber. (See page 4 (b) for details of limit control setting).

The Auto/Manual fan switch which is set to Auto during the heating season can be turned to Manual in the off season to re-circulate air in the building. The fan will run until the switch is turned back to the Auto position.

5. **Honeywell 388700C Glow Coil.** This is a 2.5 volt pilot ignition glow coil mounted on the Q315 pilot burner. The lead wires are glass fibre insulated. (Models JGD35/42BF and JGD35/42SE).

6. **Honeywell 2PL9004 Ignition Push Button.** This is a snap acting push button switch with Single Pole Double Throw action which operates the glow coil. It is positioned above the fan speed selector on the front of the transformer housing. (Models JGD35/42 BF and JGD35/42BF).

7. **Air Circulating Fan—83F2TX.** (Airflow Deloppments).

This is a double entry centrifugal fan with an integral motor which has a two stage rubber anti-vibration mounting. Fan performance details are given in Publication No. JA31/1. Motor details are : Type Redmond A06. 875 RPM, 240 volts 1.19 amps. A.C. single phase. The motor bearings are permanently lubricated. The fan has a slide-in mounting for easy withdrawal. Electrical connection is by Amp-lok push-in plug to the transformer housing.

SERVICING INSTRUCTIONS

SWITCH OFF ELECTRICITY, REMOVE PLUG AND TURN OFF HEATER GAS COCK BEFORE SERVICING

An annual service in the off-season is recommended and should cover the following :

(a) Main burner removal for jet, pilot burner, thermocouple and glow coil inspection.

(b) Combustion chamber cleaning.

(c) Flueways cleaning.

(d) Motor and fan inspection.

(e) Automatic controls inspection and testing.

(f) Air filter cleaning.

For Access to :

Main Burner, Pilot Burner and Glow Coil
Disconnect heater gas cock union, gas control 24 volt leads, glow coil (if used) push-in connectors. Remove ten nuts from combustion chamber door and carefully withdraw main burner and gas control.

Gas Control.
Disconnect unions on either side of control, thermocouple lead, pilot gas supply and gas control 24 volt leads.

Fan and Fan Motor.
Pull out Amp-lok plug on fan compartment diaphragm and withdraw the fan and motor assembly from runners taking special care not to touch the fan rotor.

FAULT FINDING

Symptom	Possible Cause	Action to Rectify
Pilot will not light or pilot flame too short.	1. Gas supply interrupted.	Check cocks.
	2. Pilot regulator screw blocked.	Open regulator screw fully and, if gas is still not reaching pilot, disconnect pilot filter and replace filter. Clear pilot jet orifice carefully with soft copper fuse wire, disconnect, tap smartly and blow through.
	3. Pilot filter blocked.	
	4. Dirt in pilot jet.	
	5. Glowcoil faulty or not operating (BF & SE models). Ignition push button or wiring faulty.	Disconnect plug-in leads and check Glowcoil with test meter. If faulty, replace. Check ignition circuit wiring and push button operation. Check 7.5 amp glass fuse.
Main burner not alight.	1. Thermocouple insufficiently heated. Pilot flame too short.	Increase pilot flame by turning adjustment screw on gas control anti-clockwise. The pilot flame should burn with a steady blue flame and should be about level with the top of the thermocouple.
	2. Thermocouple connection contact on gas control dirty or loose.	Remove connection nut and carefully clean contact. Re-tighten nut finger tight plus quarter turn.
	3. Thermocouple faulty.	Replace thermocouple (Honeywell Q309)
	4. Pilotstat thermo-electric valve faulty.	Replace with new part. (Honeywell. C5278A).
Main burner not alight, pilot and thermocouple operating correctly.	1. Controls not calling for heat.	Check room thermostat setting, over-ride switch on clock and clock setting. Allow a few seconds for gas control operator valve to open.
	2. Electrical failure or blown fuse.	Check electrical supply by test meter or switching fan control to Manual. (Fan should run). Inspect fuses external to heater.
	3. Loose wire or disconnection on thermostat, limit control, gas control or transformers.	Check connection points carefully. Ensure socket and plug connections on heater securely made.
	4. Transformer open circuit.	Check with test meter or carefully feel if transformer is warm.
	5. Automatic operator (24 volt) of gas control faulty.	Replace with new part. (Honeywell V8254A).
	6. Limit control permanently open. Normal condition is closed.	Check by looping out of circuit. Allow a few seconds for gas control operator valve to open. Replace if faulty (Honeywell L4064B). Check cause of limit control operation, such as clogged air filter, registers/diffusers shut and return air restricted.
Main burner lights and goes out and then relights.	1. Limit control operating (opening) and resetting (closing) caused by clogged filter, registers/diffusers closed, or restricted return air.	Check air filter, remove and rinse clean. Open registers and diffusers as necessary. Remove restriction in return air path.
	2. Fan failing to operate, fan control faulty.	Check fan control by switching to Manual. If fan does not operate, loop across fan control ; failing this check fan motor and fan electrical circuits.
Main burner remains alight, but fan stops and starts excessively.	1. Burner bar pressure low causing low gas input to heater.	Adjust gas control governor to obtain correct pressure. Check consumption at gas meter.
	2. Fan speed too fast causing low temperature rise across heater.	Adjust fan speed by means of speed selector to obtain correct temperature rise (approx. 90°F).
Fan operates intermittently after main burner shuts down on thermostat switch off.	1. Fan 'ON' and Fan 'OFF' settings incorrect.	Decrease fan 'ON' setting and adjust fan 'OFF' setting to prevent "after cycling" of fan when room thermostat is satisfied, *i.e.*, Heater shuts down.

FAULT FINDING

Symptom	Possible Cause	Action to Rectify
Contunuous low temperature air flow at diffusers or registers after main burner shuts down on thermostat switch off.	1. Fan control Auto/Manual switch at Manual after summer use.	Turn switch to Auto.
	2. Fan 'OFF' setting too low.	Adjust setting to approx. 100°F. 'OFF.'
	3. Fan control permanently closed.	Switch off heater and check control with test meter. Replace if faulty.
Noisy operation.	1. Gas pressure too high or low.	Check pressure and gas consumption at meter.
	2. Motor mounting loose.	Inspect and tighten.
	3. Motor bearing failing.	Turn off gas supply. Switch fan control to Manual and check. Replace faulty assembly if necessary.
Room temperatures too high or low.	1. Incorrect siting of room thermostat.	Check suitability of thermostat position. Refer to Page 3 of this manual. Re-site thermostat.
	2. Insufficient return air.	Improve return air arrangements.
	3. Cold air leaking into building from outside.	Weatherstrip doors and windows and check roof insulation.
	4. Ducts not lagged.	If accessible, lag ducts efficiently.
Heater and fan shuts off directly time switch goes to 'OFF.'	1. Time switch wired into electric supply to heater.	Re-wire time switch contacts into thermostat wiring. Re-wire electric mains to time switch from separate circuit. See page 3, wiring diagram.
Heater switches on and off outside normal on/off periods.	1. Time switch tappets slipping or mechanism faulty.	Check tappets for slackness and correct position. If mechanism faulty, change time switch.

Short List—Spare Parts for for Models JGD 35C-BF-SE and JGD 42C-BF-SE Downflow Warm Air Heaters

G.C. Number	Maker's Part No.	Description	Qty.
—	83F2TX	Air Circulating Fan with Amplok Cap and earth wire. (Airflow Developments Ltd.)	1
—	JG40DF/157Z	Polyurethane Washable Filter, 20″ × 13⅝″ × 1″	1
—	JG40DF/153Y	Filter Frame, 20″ × 13⅝ × 1″	1
—	JG40DF/523Z	Auto Transformer with selector panel	1
—	—	Selector Plug (2-pin polarized) for above	1
22.95.53	RWD589	Honeywell Transformer 20 V.A. 24 volt (JGD35/42C only)	1
—	L4064B	Honeywell Combined Fan and Limit Control	1
—	V8257A1228	Honeywell Gas Control	1
22.95.02	JG25DF/60Z	Lighting Port Cover	1
22.95.03	Q315A1142	Honeywell Pilot Burner Assembly	1
—	266/1	Bray Gas Jet (Cross Lighting)	5
—	266/2	Bray Gas Jet for Gas Groups 3	24
39.94.88	266/2½	Bray Gas Jet for Gas Groups 4, 5 and 6	24
—	P493	Bulgin Mains Plug	1
38.50.30	225S.W.	Contactum Thermostat Plug	1
39.00.15	Q309A1236	Honeywell Thermocouple	1
—	JG40/DF111Y	Insulating Lining (Burner Door)	1
	Following Items for JGD35/42BF and JGD35/42SE only		
—	RWD667	Honeywell Transformer 20 V.A. 24 volt and 2.5 volt (Replaces RWD589)	1
—	388700C	Honeywell Glow Coil	1
—	2PL9004	Honeywell Micro-switch	1
—	—	Glass Fuse 7.5 amp. Rating 1¼″ long. (Radio Spares Ltd.)	1