J15-22/MAF & J15-22R/MAF
J25-32 Mk II/MAF & J25-32R Mk II/MAF
Warm Air Heaters with MODAIRFLOW Control

(56·53)
UDC 697 3

Installation & Maintenance Instructions

Publication JA 218

J15-22/MAF & J15-22R/MAF

The J15-22/MAF is a Gas-Fired Warm Air Heater fitted with MODAIRFLOW Electronic Control for open flue application. Output is adjustable between 4.4 kW – 6.5 kW (15.8 MJ/h, 15,000 Btu/h – 23.2 MJ/h, 22,000 Btu/h). It has internal provision for the optional fitting of a Johnson & Starley JANUS 3 Water Heater.

Water heaters may be provided factory-fitted by Johnson & Starley Ltd. or fitted on-site.

To fit a water heater on site:- Obtain from Johnson & Starley Ltd. a JANUS 3 Water Heater and KK32 Fittings Kit.

J15-22/MAF/JAN denotes an Air Heater with JANUS 3 water heater and KK32 Fittings Kit factory fitted.

The J15-22R is similar to J15-22 but with a built-in rising air supply duct at rear of cabinet.

J25-32 & J25-32R Series

In order to rationalise the J25-32 series air heater, the designations have been altered to J25-32 MK II and J25-32R MK II.

The J25-32 MK II is a Gas-Fired Warm Air Heater fitted with MODAIRFLOW Electronic Control for open flue application. Output is adjustable between 7.3 kW – 9.4 kW (26.4 MJ/h, 25,000 Btu/h – 33.8 MJ/h, 32,000 Btu/h). It has internal provision for the optional fitting of a Johnson & Starley JANUS 3 Water Heater.

Water heaters may be provided factory-fitted by Johnson & Starley Ltd. or fitted on site.

To fit a water heater on site:- Obtain from Johnson & Starley Ltd. a JANUS 3 Water Heater and KK32 Fittings Kit.

J25-32 MK II/MAF/JAN denotes an Air Heater with JANUS 3 water heater and KK32 Fittings Kit factory fitted.

The J25-32R MK II is similar to J25-32 MK II but with a built-in rising air supply duct at rear of cabinet.

CORGI

For safety, use a competent installer to install this appliance. CORGI (The Confederation for the Registration of Gas Installers) requires its registered installer to work to satisfactory standards.

MAF

Johnson & Starley Ltd

1. COMPONENTS CHECK. N.B. Check that Gas Group on heater data plate is as required.

1. Air Filter.
2. Air Circulating Fan.
3. Plug for Thermista-stat.
4. I.5A Fuse.
5. Time Control (clock).
6. Balancing Knob.
7. Overheat Limit Switch.
8. Fan Override Switch.
9. Combination Gas Control.
10. Pressure Test Point.
11. Multi-gas Burner.
12. Safety Pilot Burner.
13. Union Gas Cock ½" B.S.P. Female (supplied loose).
14. Gas connection.
15. Draught Diverter.
16. Draught Deflector plates.
17. Heater Data Plate.
18. Air Flow Sensor.
19. Fan Speed Regulator.
20. Electronic Panel Cover.
21. Electronic Panel.
22. Thermista-stat (supplied seperately).

KK32 WATER HEATER FITTINGS KIT

50. Water 'flow' Elbow and pipe (not provided).
51. Flue Pipe.
52. Flue cap and connection.
53. Main gas tap for Water Heater.
54. Gas feed pipe to Water Heater.
55. Water Heater mounting bracket.
56. Water 'return' elbow and pipe (not provided).

JANUS 3 WATER HEATER

A. 'Flow' connection — ¾" B.S.P. Female.
B. Thermostat Phial.
C. 'Return' connection — ¾" B.S.P. Female.
D. Water Heater Body.
E. Burner and Controls.
F. Water Temperature Control Knob.
G. Start Button.
H. Off Button.
J. Gas Connection.
K. Pilot Burner.

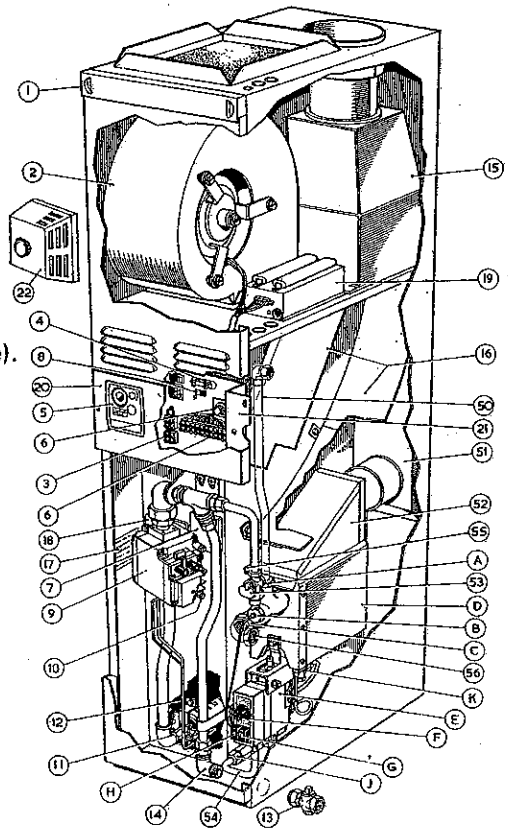


Fig. 1

2. WARM AIR INSTALLATION REQUIREMENTS

Installation should be in accordance with:—

Building Regulations
British Standard Code of Practice CP 332 Part 4.
Institute of Electrical Engineers Regulations.
British Standard Code of Practice CP 337 : 1963 (Flues for Gas Appliances)
British Gas Material and Installation Spec: Latest Edition.

a) Ventilation of Heater Compartment

		Ventilation from inside building	Ventilation direct from outside building
Low Level Grille	free area	277 cm^2 (43 in^2)	139 cm^2 (21.5 in^2)
High Level Grille	free area	139 cm^2 (21.5 in^2)	71 cm^2 (11 in^2)

b) Ventilation of Building

A purpose designed ventilation opening must be provided in an outside wall. This opening must be either:

(i) Into the room containing the heater, or
(ii) Into an adjacent room which has a purpose designed opening into the room containing the heater.

Openings must have minimum effective areas of 71 cm^2 (11 in^2).

c) Return Air

Return Air Grille/s must be connected to the return air opening of the air heater by duct/s. Each heated room with the exception of Kitchens, Bathrooms and W.C.s, must have either a return air grille or purpose made relief opening communicating with a collection area served by a return air grille. Openings must have minimum areas of 25 cm^2 per MJ/h (1 in^2 per 250 Btu/h) of designed heat input to the rooms they serve.

3. PREPARATION

a) Flues. A single 4 in. lightweight asbestos or suitable twin wall flue is required.

b) Electrical Connections.

(i) MAINS. The heater is supplied complete with mains cable (P.V.C. sheathed, high temp. resistant, 3 core, 5A, 0.75mm^2) connected to the terminal strip and can leave the heater from either side or the top. This cable, suitable for 240V, 50 Hz, single phase supply, must be protected by a 3A fuse and the earth wire connected. A double pole switch or fused spur box should be used or, a 3 pin plug into an unswitched socket outlet.

(ii) THERMISTA-STAT. Should be positioned on an internal wall approximately 1.5m (5ft) from the floor away from direct sunlight, draughts and local warmth. A two pin plug is provided behind the electronic panel cover. This plug must be connected to the thermista-stat and polarity of these wires must be observed, i.e. + side on electronic panel to + side on thermista-stat.

c) Gas Supply.

The gas connection should be in ½" B.S.P. pipe or larger dependant upon length of pipe run from the meter. The gas pipe may enter the heater from either side or through the floor of the cabinet. A ½" B.S.P. Union Gas Tap is supplied for external fitting. The leg of the internal tee not used must remain plugged. *Installation should conform to British Gas requirements and Building Regulations.*

d) Heater Installation Clearances — from Combustible Materials

Sides and Back — 3mm (1/8 in.) minimum.

Front — 75mm (3 in.) minimum

Note: When gas and water connections are made at the side a clearance of 77mm (3 in.) is required.

Servicing access required to the front of the heater is 457mm (18 in.). It is recommended that the access door to the heater cupboard be large enough to permit heater removal.

e) Installation on Suspended Floors:

Combustible floors must be insulated from the heater.
When a base duct is used, the base duct provides sufficient insulation and no insulation is needed underneath the base duct.
When an underfloor warm air plenum is used, insulation can be provided by using a J & S Base Tray BT32 (J15-22 and J25-32) or BT32R (J15-22R and J25-32R). See Figs. 2 and 3.

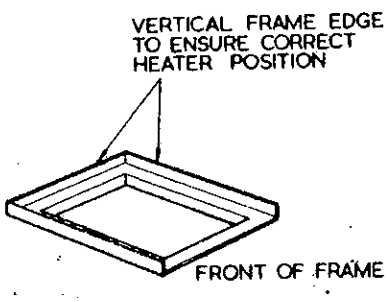


Fig. 2

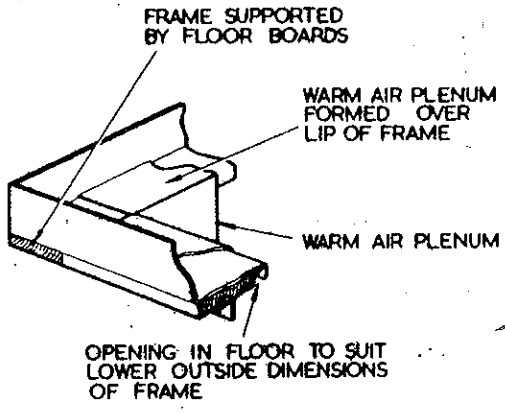


Fig. 3

4. AIR HEATER FIXING

Note: If side return air is used, fit before fixing heater.

(a) FOR SLOT FIX (TS32) or TOP CLOSURE (TC32 or TC32R) INSTALLATIONS refer to the fitting instructions provided in the relevant kits.
(b) REMOVE APPROPRIATE KNOCK-OUT DISCS required for gas, water flow and return entries.
(c) POSITION HEATER ON BASE DUCT OR PLENUM – Ensure no air leakage can occur.
(d) J15-22R or J25-32R MK II only – fix rising duct.
(e) CONNECT FLUE – using split clip. Note:- If Top Closure Kit is used, extension skirt should be positioned before connecting flue.
(f) CONNECT RETURN AIR DUCT.
(g) MAKE GAS CONNECTION – Fit union gas tap provided.
(h) ELECTRICAL CONNECTIONS
  (i) Remove electrical panel cover.
  (ii) Mains lead may leave heater and themista-stat wires may enter, either through grommet in heater top or at either side of electrical panel cover. Position leads. Remove appropriate plastic knock-outs from inside of electrical panel cover.
  (iii) Connect plug to mains lead – fuse 3 amp.
  (iv) Connect thermista-stat wires to plug provided observing correct polarity, i.e. + side on electronic panel connection to + side on thermista-stat.
  (v) If a summer switch is required, fit switch in a suitable position external to heater and connect wires to terminals 4 and 12 as shown in wiring diagram.

5. COMMISSIONING

(a) Check that WARM AIR DELIVERY OUTLETS are open.
(b) Check LIMIT control is correctly set at 200°F.
(c) Fit GAS PRESSURE GAUGE to test point.
(d) Turn on GAS supply and bleed off air.
(e) Light PILOT BURNER.
(f) Adjust pilot flame if necessary so that it just envelopes thermocouple tip, To adjust flame, remove screw cap from adjustment point (see Fig. 7) and turn screw clockwise to decrease, anti-clockwise to increase flame.
(g) Switch on ELECTRICITY.
(h) Turn Thermist-stat to MAXIMUM setting and ensure Time Control is at an ON period.
(j) Balance Warm Air System:
  i) Set Fan Override Switch to CONTINUOUS.
  ii) Turn Balancing Knob to a number corresponding to the fan curve selected from Fig. 5. Fan should run at selected speed.
  iii) Adjust burner bar pressure to output required:- J15-22 see Fig. 4; J25-32 MK II see Fig. 6. Heaters are factory set to pressure giving maximum output at gas group specified. To adjust pressure, remove cover from adjustment point (see Fig. 7) and turn screw *clockwise to increase, anti-clockwise to decrease pressure.*
  iv) Check velocities to design figures and adjust fan speed if necessary by the BALANCING KNOB.
  Note: if the system includes ceiling diffusers, it is important that the velocities of air through these (except in very small rooms e.g. bathrooms etc.) is at least 300 ft/m. To achieve this, it may be necessary to blank-off part of the outlet face.
  v) Check temperature rise (85°-100°F) across heater and adjust fan speed if necessary.
(k) Turn Fan Override Switch to AUTO.
(l) CHECK THAT FLUE OPERATES EFFECTIVELY with heating system on, all doors closed and extractor fan/s if fitted, running.

J15-22 Series		kW	MJ/h	Btu/h	kW	MJ/h	Btu/h	kW	MJ/h	Btu/h
INPUT		5.9	21.1	20,000	7.3	26.4	25,000	8.3	29.8	28,000
OUTPUT		4.4	15.8	15,000	5.6	20.0	19,000	6.5	23.2	22,000
GAS RATE (1000 cv)		0.55 m^3/h	(19.57 ft^3/h)		0.69 m^3/h	(24.3 ft^3/h)		0.78 m^3/h	(27.7 ft^3/h)	
GAS	INJECTOR dia. mm.	BURNER BAR GAS PRESSURES (measured hot)								
NATURAL	2.46	5.5mbar	2.2 in. wg		9.1mbar	3.6 in. wg		12.2mbar	4.9 in. wg	
PROPANE	1.50	Lower rates not available						35.0	14.0	

Fig. 4

FAN PERFORMANCE

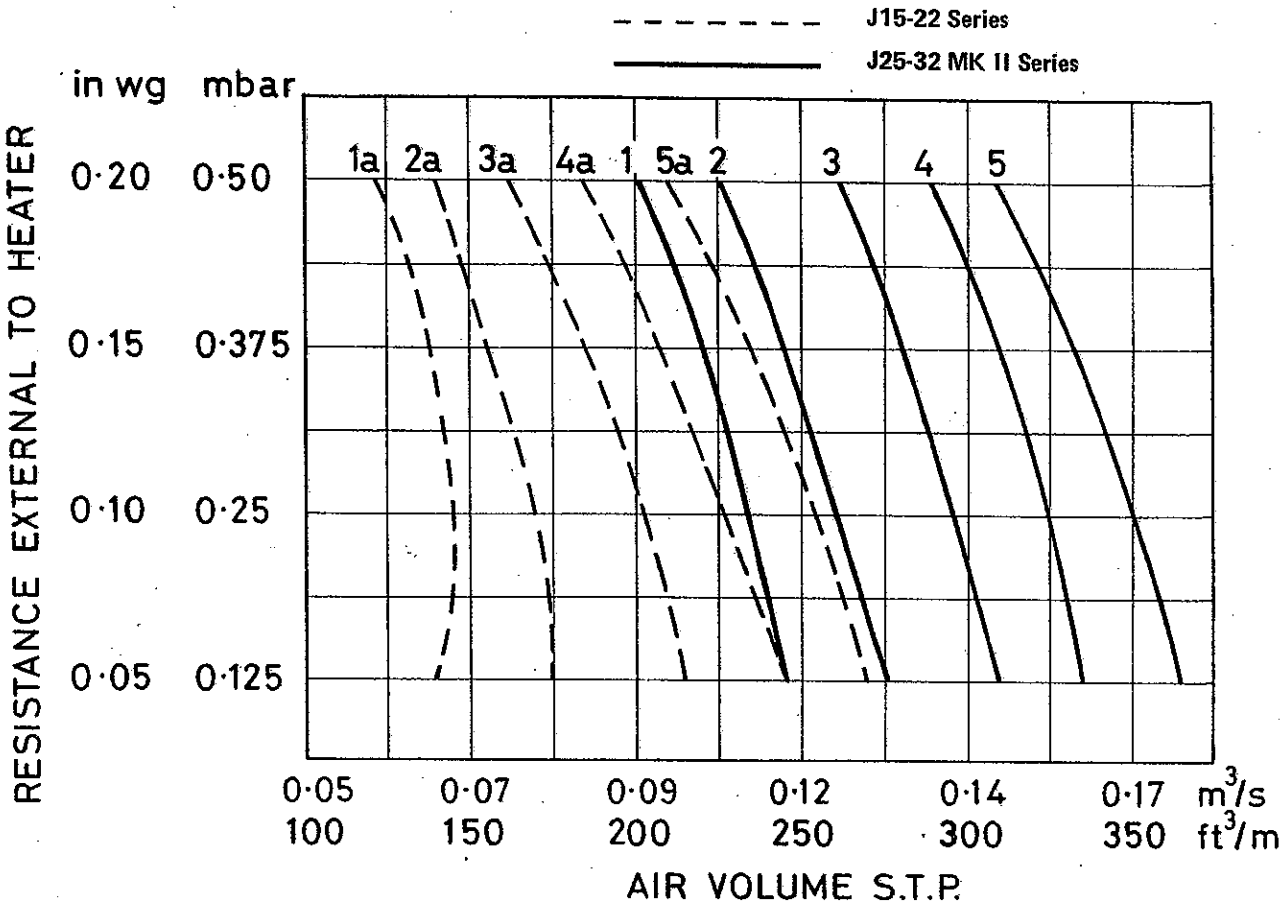


Fig. 5

J25-32 MK II Series		kW	MJ/h	Btu/h	kW	MJ/h	Btu/h	kW	MJ/h	Btu/h
INPUT		10.15	36.4	34,500	11.6	41.7	39,500	12.7	45.6	43,200
OUTPUT		7.3	26.4	25,000	8.5	30.6	29,000	9.4	33.8	32,000
GAS RATE (500 cv)		1.95 m^3/h	(69 ft^3/h)		2.24 m^3/h	(79 ft^3/h)		2.43 m^3/h	(86 ft^3/h)	
GAS RATE (1000 cv)		0.98 m^3/h	(34.5 ft^3/h)		1.12 m^3/h	(39.5 ft^3/h)		1.22 m^3/h	(43 ft^3/h)	
GAS	INJECTOR dia. mm.	BURNER BAR GAS PRESSURES (measured hot)								
G4	5.07	2.8 mbar	1.1 in wg		3.8 mbar	1.5 in wg		4.6 mbar	1.8 in wg	
G5	5.07	3.6	1.4		4.6	1.8		5.6	2.2	
G6	5.37	2.8	1.1		3.8	1.5		4.6	1.8	
NATURAL	2.89	8.3	3.3		11.0	4.4		13.5	5.4	
PROPANE	1.90	Lower rates not available						35.0	14.0	

Fig. 6

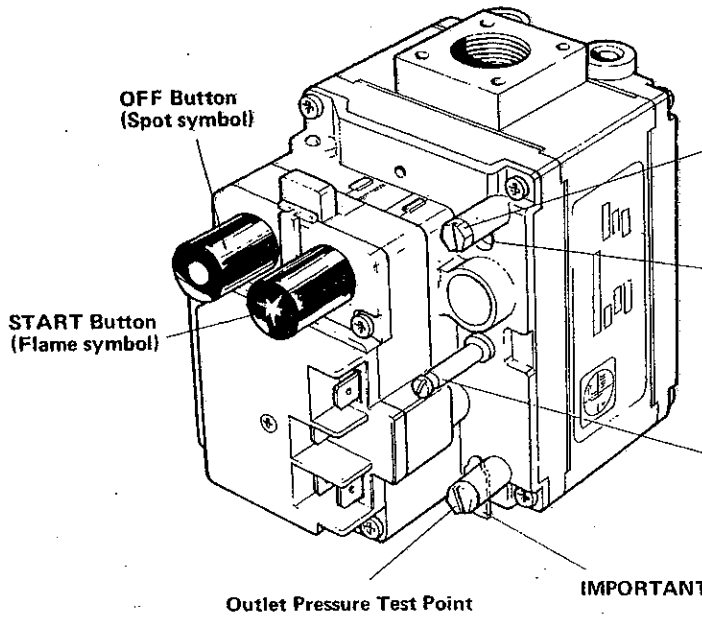


Fig. 7

6. MAINTENANCE (Recommended Annually)

SWITCH OFF ELECTRICITY, REMOVE MAINS PLUG AND TURN OFF HEATER GAS TAP

(a) Main Burner Cleaning — with Burner Assembly removed

Release split pins at rear of burner bar and remove end cap. Brush lightly both inside and out. *Under no circumstances should burner holes be enlarged or distorted, or brushed strongly.*

(b) Injector Cleaning — (Main Injector and Pilot Burner Injector)

Remove injector and clean carefully avoiding damage to orifice in each case. When injector replacement is a preferred alternative to cleaning, ensure that replacement injectors are of the correct orifice size.

(c) Thermocouple

Ensure that thermocouple connection to Gas Control is tight (finger tight + quarter turn).

(d) Fan and Fan Motor Cleaning

Remove fan and fan motor. Remove all dust, etc., from both fan impeller and fan motor. *Great care must be taken whilst cleaning both items that the fan balance is not disturbed.*

(e) Gas Pressure Check

Attach a gas pressure gauge to gas pressure test point on Gas Control, light heater and check pressure and confirm by gas rate check at meter.

(f) Gas Control 'fail-safe' Operation Check

Reduce flame of pilot burner by turning screw clockwise at pilot flame adjusting point until it extinguishes. Check that main burner extinguishes i.e., gas control 'fails safe'.

(g) Pilot Flame Check

Pilot flame should just surround thermocouple probe.

(h) Automatic Controls Inspection

Lighting the heater and allowing to run for a short time checks these controls.

For access to Electronic Panel, Time Control and 1.5A Fuse, remove Electronic Panel Cover.

For access to Air Circulating Fan and Fan Speed Regulator, remove Electronic Panel Cover, Air Filter and Fan Chamber Door.

(j) Time Control Removal

i) Loosen fixing screw in botton of time Control casing, withdraw casing and disconnect leads.
ii) Release mounting screw (situated centrally on the rear top face of the mechanism), lift slightly and withdraw mechanism.
iii) Position replacement mechanism onto the lugs of the mounting plate and lock by a downward movement. Tighten mounting screw, remake electrical connections and replace casing.

(k) Electronic Panel Removal

i) Disconnect 3 way, 6 way and Thermista-stat plugs.
ii) Disconnect all leads from terminal block.
iii) Remove Time Control together with its mounting plate from Electronic Panel.
iv) Loosen four retaining screws and lift off panel.

(l) Fan Speed Regulator Removal

i) Disconnect 3 way and 6 way plugs from Electronic Panel.
ii) Release harness from cable clip.
iii) Disconnect fan plug from Fan Speed Regulator.
iv) Remove nut and bolt fixing.

Note: It is important that harness is retained in cable clip when replacing.

(m) Air Circulating Fan Removal

i) Disconnect plug from Fan Speed Regulator and remove fan retaining plate.
ii) Withdraw fan assembly, handling with care.

Note: It is important that lead is retained in cable clip when replacing fan assembly.

(n) Heat Exchanger Access

Note: Should access to the heat exchanger be necessary, proceed as follows:—

i) Remove burner bar assembly.
ii) Remove Electrical Panel Cover, Air Filter and Fan Chamber Door.
iii) Remove access panel from bulkhead.
iv) Remove cover plate from front of heat exchanger together with gasket.
v) Withdraw internal baffle (J15-22 heaters only) from top of heat exchanger. Heat exchanger can now be brushed through and inspected.

IMPORTANT: Replace baffle (J15-22 heaters only) by sliding under retaining straps and push fully home.
Refit cover plate complete with gasket.

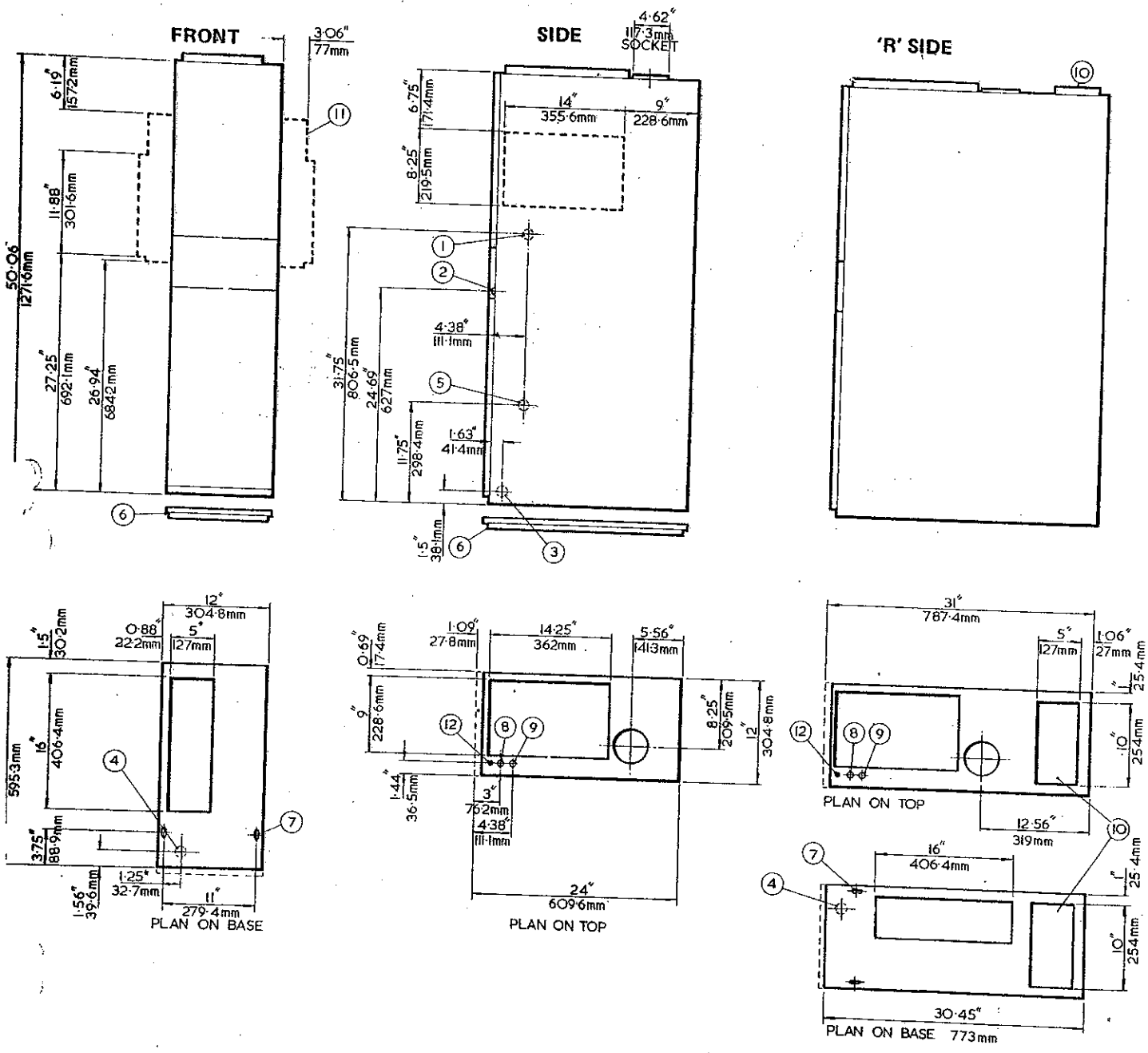
7. FAULT FINDING

Note: i) When purging or checking gas supplies, ensure there is adequate ventilation to the room or cupboard and all naked lights are extinguished.
ii) Before commencing fault finding, turn Thermista-stat to maximum setting, turn mains supply on and check that Time Control is at an ON position.
iii) Care must be taken during replacement and handling of electronic assemblies, viz. Electronic Panel, Fan Speed Regulator, Air Flow Sensor, Thermista-stat. It is not practical to rectify any faults in these assemblies except in the factory and any attempt to do so may render any guarantee or factory replacement arrangement void.

Symptom		*Possible Cause*	*Remedy*
(a)	Pilot will not light.	i) No gas supply to heater.	Break gas cock union and listen for escape.
		ii) Gas supply not purged.	Break gas cock union until gas is detected.
		iii) Pilot orifice restricted.	Clear pilot orifice carefully or replace injector.
(b)	Pilot lights but goes out on releasing START button.	i) Connection between thermo-couple and gas control not secure.	Check connection is secure.
		ii) Pilot flame too small.	Adjust.
		iii) Faulty thermocouple.	Replace thermocouple.
		iv) Faulty power unit on gas control.	Replace power unit.
(c)	Pilot lights but goes out after normal operation.	As stated above for (b).	As stated above for (b).
(d)	Main burner not lighting (Pilot alight, 24V across gas control).	i) Pressure regulator set too low.	Screw down and adjust to required pressure.
		ii) Gas control operator faulty.	Replace operator.

(e)	Main burner not lighting (Pilot alight, NO 24V across gas control).	i) Fault in mains supply.	Check supply.
		ii) Internal 1.5A fuse blown.	Replace fuse.
		iii) Replacement fuse blows due to fault in gas control operator.	Disconnect wires to gas control and if fuse remains intact, replace operator and check connections.
		iv) Replacement fuse blows due to fault in Electronic Panel.	Replace Electronic Panel.
		v) Fault in external wiring to Thermista-stat:	
		a) Break in circuit.	Check for continuity by shorting wires at Thermista-stat. Main burner should light.
		b) Reversed polarity.	Check for correct polarity by reversing connections at Thermista-stat terminal block.
		vi) Faulty Thermista-stat.	Replace Thermista-stat.
		vii) Faulty Limit Control.	Short across control and replace if necessary.
		viii) Faulty Electronic Panel.	Replace Electronic Panel.
(f)	Main burner lights but fan fails to operate when override switch is set to continuous.	i) Poor electrical connections on fan circuit.	Check connections, especially plug and socket contacts. It is important that the 6 way plug and cap is making good contact
		ii) Faulty fan assembly.	Replace fan assembly.
		iii) Faulty panels.	Replace Electronic Panel and Fan Speed Regulator — ONE at a time.
(g)	Main burner lights but fan fails to run when override switch is set to AUTO from CONTINUOUS.	i) Faulty panels.	Replace Electronic Panel and Fan Speed Regulator — ONE at a time.
		ii) Faulty Air Flow Sensor.	Short across Air Flow Sensor. If Fan runs, replace sensor.
(h)	Main burner remains ON with controls set to OFF.	i) Faulty Thermista-stat.	Replace Thermista-stat.
		ii) Short to earth in external wire to Thermista-stat.	Check and rectify. Note: return wire from Thermista-stat is connected to earth within heater.
(j)	Insufficient heating.	i) Heater gas rate low.	Check and adjust gas rate accordingly.
		ii) Limit control operation due to:	
		a) Temperature rise set too high.	Adjust fan speed and/or gas rate accordingly.
		b) Air filter or return-air path restricted.	Check filter for cleanliness and return-air path for obstruction.
		c) Excessive number of outlets closed.	Open additional outlets.
		d) Limit Control out of calibration.	Replace Limit Control.
		iii) Incorrect siting of Thermista-stat.	Reposition.
		iv) Thermista-stat out of calibration.	Replace Thermista-stat.
		v) Insufficient return-air relief.	Check for relief and where no provision has been made, fit grilles to area/s where no positive return-air collection is made.
		vi) Substandard installation e.g. Poor insulation, faulty duct connections or damaged ductwork.	Check velocities and underfloor heat losses.
(k)	Heater operates outside required periods (applicable only when equipped with a Time Control).	i) Time Control motor running slowly.	Replace Time Control.
		ii) Time Control tappets slipping.	Replace Time Control.
		iii) Time Control tappets not set in correct sequence.	Refer to Time Control operating instructions and set tappets accordingly.

8. DIMENSIONS & DATA



1. Knock-out for 'Flow' connection (both sides)
2. Knock-out for electrical connection (both sides)
3. Knock-out for Gas Connection (both sides)
4. Knock-out for Bottom Gas Connection
5. Knock-out for 'Return' connection (both sides)
6. BT 32 Base Tray (extra)
7. Slots for base duct fixing bolts 25/32" x 9/32" (9.97 x 7.1 mm)
8. Aperture for top return connection, dia 0.92" (23mm) with plug.
9. Aperture for top flow connection, dia 0.92" (23mm) with plug.
10. Rising duct
11. Optional side return air fitting (SR 32)
12. Grommet for top electrical connection

Fig. 8

9. WIRING DIAGRAM

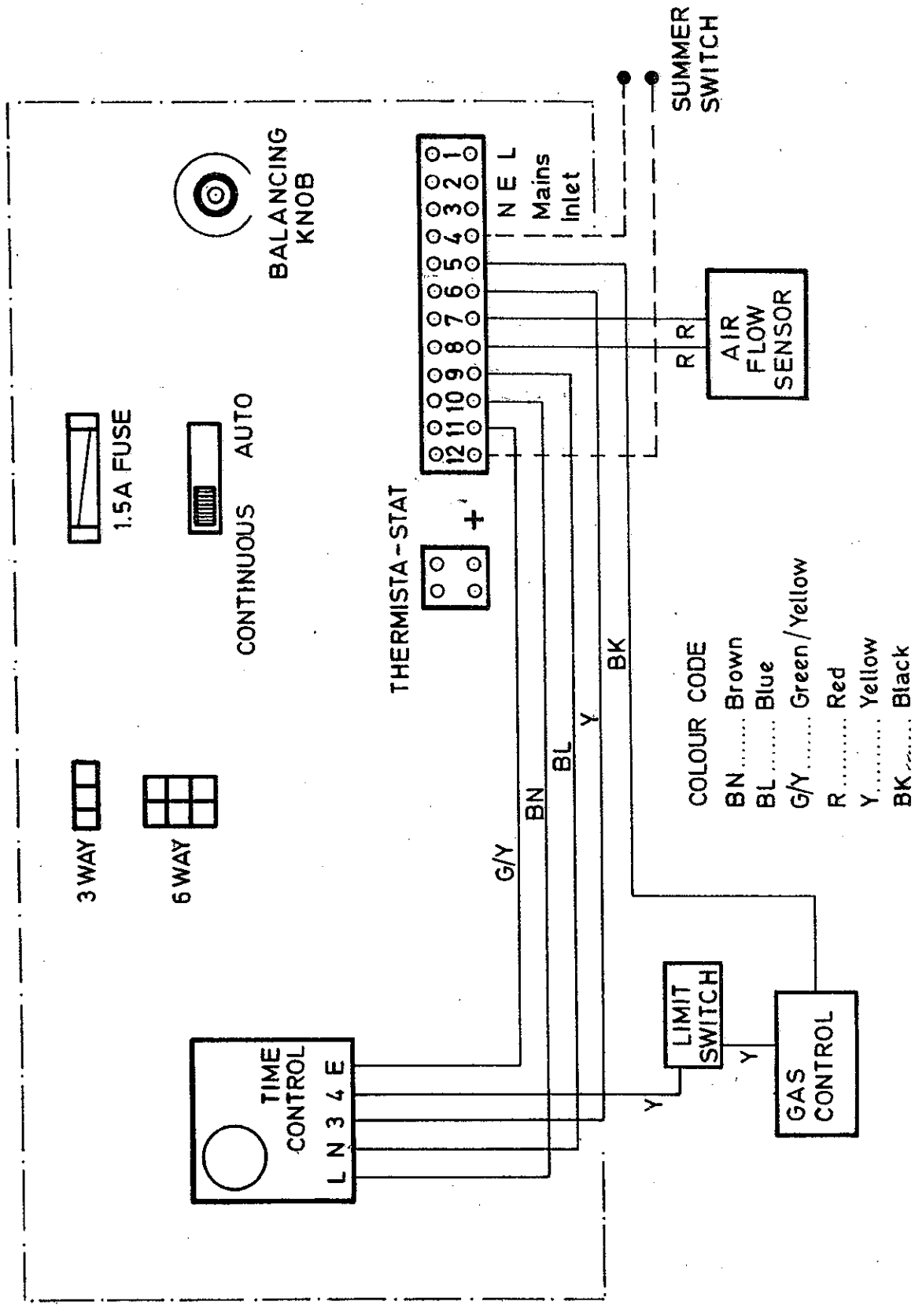


Fig. 9

10. SHORT LIST OF SPARE PARTS FOR J15/22/MAF SERIES WARM AIR HEATERS

G.C. Number	Makers' Number	Description	Qty.
389 272	BOS 1369	Torin Corporation Ltd. Air Circulating Fan with integral motor. Amp-lok cap and earth wire Ref. 2979 : DSN 816-400 : 35W motor T.O.P.	1
389 271	S.0086	Replacement Motor Kit with mounting brackets — Torin type spec. 2985	1
230 147	J25-32/182Y	Filter Tray Assembly.	1*
242 266	BOS 1370/2	Electrical Cover Plate.	1
230 177	BOS 467/2	Time Control Cover.	1*
393 123	BOS 1243	Electronic Panel less Time Control.	1*
385 102	BOS 105	Honeywell Limit Control — L4069C 1066.	1*
230 496	BOS 1245	Air Flow Sensor.	1*
392 676	BOS 1282	S.I.T. Gas Control — ½" B.S.P. — 0810028.	1*
391 522	BOS 1281/1	S.I.T. Pilot Burner Assembly — 0158011.	1*
391 523	BOS 1283	S.I.T. Thermocouple — 0200179 — 1000 mm long.	1*
230 494	BOS 1237	Fuse 1.5A, 1¼" long.	1*
	BOS 1235/2	Thermista-stat Plug.	1*
396 068	BOS 310	Horstmann Time Control — type 'Emerald' 423/J&S4W.	1*
242 262	J15-22/851Y	Burner Arm Assembly.	1
398 360	BOS 1204/4	Main Injector — 2.46 mm dia.	1
230 497	BOS 1246	Wiring Harness.	1*
230 495	BOS 1244	Fan Speed Regulator.	1*
230 034	BOS 305/1	Union Washer.	1*
386 475	BOS 1242	Thermist-stat.	1*
	ADDITIONAL SPARES FOR PROPANE GAS HEATERS		
	BOS 1196	Main Injector — 1.5 mm	1
	BOS 1285	Pilot Burner Injector — S.I.T. 1.177.046.	1*
	J25-32/901X	Burner Arm — Akramatic	1*

11. SHORT LIST OF SPARE PARTS FOR J25-32/MAF SERIES WARM AIR HEATERS

G.C. Number	Makers' Number	Description	Qty.
399 167	S.0006	Torin Corporation Ltd. Blower with integral motor, Amp-lok connection and earth wire plus universal retaining plate. Ref. E6147. DSA 816-500	1
388 967	S.0007	Replacement Motor Kit with mounting brackets — Torin type U52011 1/10 hp.	1
230 147	J25-32/182Y	Filter Tray Assembly.	1*
230 176	BOS 467/1	Electrical Cover Plate.	1
230 177	BOS 467/2	Time Control Cover.	1*
393 123	BOS 1243	Electronic Panel less Time Control.	1*
385 102	BOS 105	Honeywell Limit Control — L4069C 1066.	1*
230 496	BOS 1245	Air Flow Sensor	1*
392 676	BOS 1282	S.I.T. Gas Control — ½" B.S.P. — 0810028.	1*
391 522	BOS 1282/1	S.I.T. Pilot Burner Assembly — 0158011.	1*
391 523	BOS 1283	S.I.T. Thermocouple — 0200179 — 1000 mm long	1*
230 494	BOS 1237	Fuse 1.5A, 1¼" long.	1*
	BOS 1235/2	Thermista-stat Plug.	1*
396 068	BOS 310	Horstmann Time Control — type 'Emerald' 423/J&S4W.	1*
230 484	J25-32/851Y	Burner Arm Assembly.	1
398 280	BOS 1204/1	Main Injector — 2.89 mm dia.	1
230 497	BOS 1246	Wiring Harness.	1*
230 495	BOS 1244	Fan Speed Regulator.	1*
230 034	BOS 305/1	Union Washer.	1*
386 475	BOS 1242	Thermista-stat.	1*
	ADDITIONAL SPARES FOR TOWNS GAS HEATERS		
398 356	BOS 1204/2	Main Injector — Groups 4 & 5 — 5.07 mm dia.	1
398 359	BOS 1204/3	Main Injector — Group 6 — 5.37 mm dia.	1
	BOS 1284	Pilot Burner Injector — S.I.T. 1.177.048.	1
	ADDITIONAL SPARES FOR PROPANE GAS HEATERS		
	BOS 1196	Main Injector — 1.9 mm dia.	1
	BOS 1285	Pilot Burner Injector — S.I.T. 1.177.046.	1*
	J25-32/901X	Burner Arm — Akramatic.	1*

Note: Items marked * are common to both J15-22 and J25-32 Air Heaters.

Johnson & Starley Ltd

Rothersthorpe Crescent, Northampton
NN4 9JF
Telephone: 62881/6

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