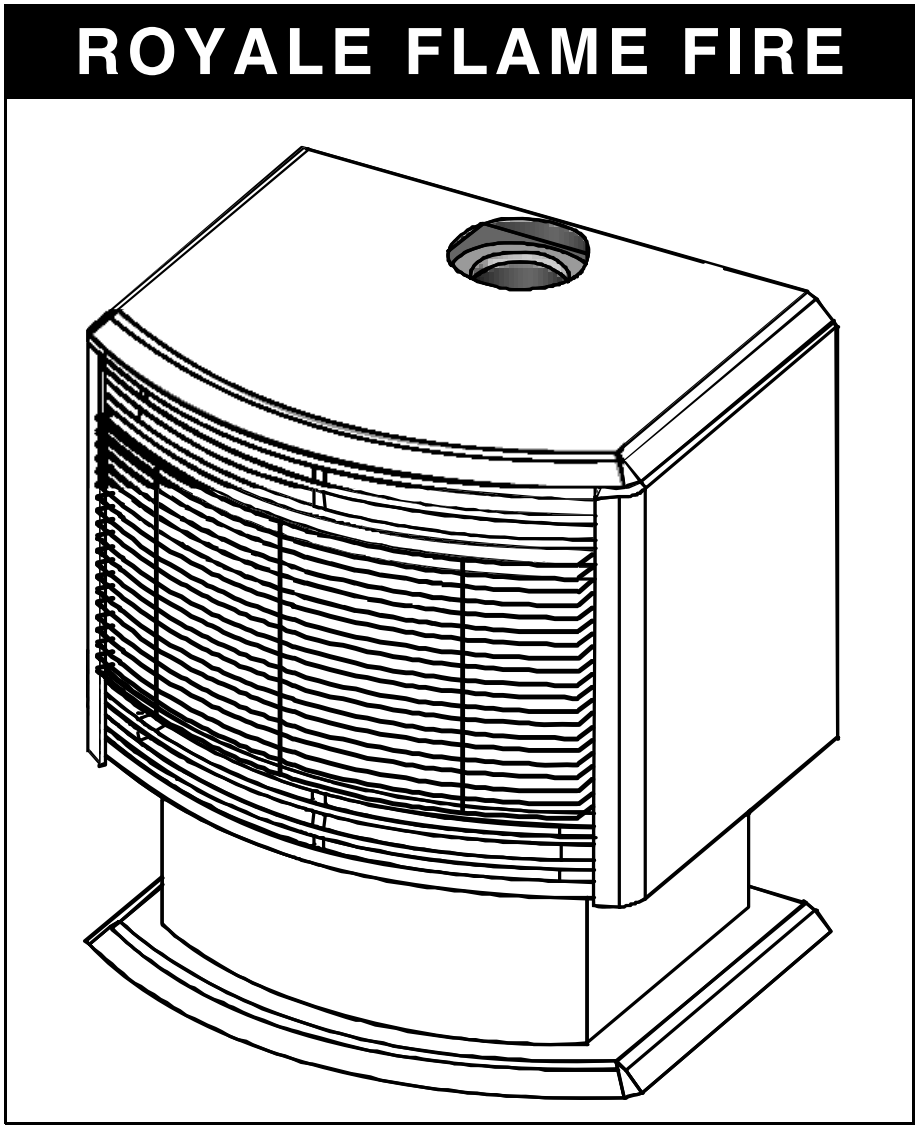
Rinnai

SERVICE MANUAL

FS35R ROYALE

ROYALE FLAME FIRE

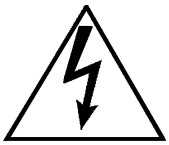


The Australian Gas Association	All Rinnai products are certified by the Australian Gas Association as compliant to relevant Australian Standards.
Certified System Quality ISO 9001 SAI GLOBAL	Rinnai Australia Head Office is certified as complying with ISO 9001 by SAI Global.
TELARC REGISTERED SUPPLIER Quality Endorsed Company ISO 9001 Reg 415	Rinnai New Zealand has been certified to ISO 9001 Quality Assurance by Telarc.
N10378	All Rinnai products carry the “C Tick” symbol. This signifies compliance with the Electromagnetic Compatibility (EMC) requirements of the Australian Communications Authority (ACA) which aim to minimise electromagnetic interference. Rinnai Australia Supplier Code N10378.

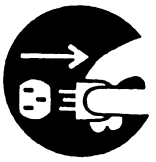
Produced by Technical Services Department
2012 - Issue 2

Key to Warning Symbols

Failure to comply with the following instructions may result in serious personal injuiry or damage to the appliance.



Be careful of possible electric shock. Wiring inside this appliance may potentially be at 240 Volts.



Remove the plug from the source when carrying out any of the following activities.

Read Fault Diagnosis and Wiring Diagram carefully to avoid incorrect wiring

Do not disassemble. Parts within cannot be exchanged or diagnosed faulty.

Please follow instructions carefully to ensure safe and appropriate service.
After completing the service and confirming that there no gas leaks or incorrect wiring, test operation of unit according to the Customer Operating Instructions. After confirming normal operation, explain what was serviced to the customer and operation principles if necessary.

This manual has been compiled by Rinnai Australia Engineering & Technical Department. While many individuals have contributed to this publication, it will be successful only if you - the reader and customer - find it useful. We would like to extend an invitation to users of this manual to make contact with us, as your feedback and suggestions are valuable resources for us to include as improvements. Rinnai are constantly working toward supplying improved appliances as well as information, and specifications may be subject to alteration at any time.

Glossary of Terms and Symbols

This glossary of terms and symbols is provided to assist you in understanding some of the language used throughout this manual.

dB(A)	-	sound pressure level in decibels, “A” range
DC	-	direct current
AC	-	alternating current
Hz	-	Hertz
IC	-	integrated circuit
kcal/h	-	kilocalorie per hour
kPa	-	kilopascals
LED	-	light emitting diode
mA	-	milliamps
MJ/h	-	megajoule per hour
mm	-	millimetres
OHS	-	overheat switch
PCB	-	printed circuit board
CPU	-	central processing unit
POT	-	potentiometer
rpm	-	revolutions per minute
SV	-	solenoid valve
ø	-	diameter
$\Delta^\circ C$	-	temperature rise above ambient
POV	-	modulating valve
TH	-	thermistor

Table of Contents

1. Introduction

Background

Royale Free Standing Flame Gas Fire range incorporates an improved three (3) flame burner setting modulating control system to provide comfortable heating and flame ambience. Other features of these appliances are improved operation, dual timers, installation and maintenance features.

Features

- Burner 1 - Igniton / Low
- Burner 2 - Medium
- Burner 3 - High
- Independent flame settings
- Child lock
- Fuzzy logic
- Independent flame selection button
- All operation and temperature control is with easy-to-use push buttons.
- If a problem occurs and service is required, an error code message appears on the LED display to lead the service technician to the cuase of the problem.
- Information about any previous faults is stored in the PCB and can be recalled during servicing.

About the Free Standing Royale

The inner body work is formed 0.8 mm aluminised steel sheet, which forms a box to which the components, heat exchangers, burners (3) and blower are incorporated. The whole assembly is covered by an outer metal case, which is constructed from 1.6 mm cold roll steel sheet.

The heat exchanger is composed of two sub-heat exchangers sets. The lower set is constructed on 0.8 mm aluminised steel. The upper set is constructed 0.8 mm stainless steel. The heat exchanger is connected to the flue by an intermediary draft diverter. The comustion air is drawn from the room atmosphere through the combustion chamber. Combustion by-products in the combustion chamber are drawn out into the 100 mm flue spigot which is connected via the flue system to the outside atmosphere.

The flue system is connected with stainless steel pipe. Masonry chimney installation applications a (100 mm) flexli-liner is required. Ignition by a continuous spark in conjunction with an electrically operated solenoid monitored and control by the PCB. Gas passes through the inlet fitting, then via a gas regulator connection to the solenoid valves and delivered to the injectors for combustion.

2. Specifications

Model Name		FS 35R		
Name of appliance		Royale Freestanding - Flame Fire		
Description		Radius Front Freestanding model		
Flue Outlet size	(mm)	100		
Flue Type		Conventional Top Flue Exit		
Electrical Consumption				
Dimensions Case	(mm)	**Height:**	**Width:**	**Depth:**
		755	650	560
Weight	Kg	64		
Heating Output	MJ/h	High: 7.1	Low: 3.3	
Burners	Input - MJ/h	Flame Burner	Ember Burner	Heat Burner
		16	7	10
Noise level	dB (A)	High: 43	Low: 37	
			NG	**LPG**
Gas Input	(MJ/h)	High:	35	35
		Low:	16	16
Pilot Injectors		NG - 0.45	LP - 0.30	
Connections	Electrical	AC240V 50Hz		
	Gas	1/2” BSP male flare to barrel union		
Room Temperature control		3 push button		
Warm air discharge		Top front louvres		
Control panel	High	35		
	Medium	24		
	Low	16		
	Switch	3 Burner button control		
Glass	mm	Large one piece Radius (600 x 320)		
Fan		Tangential, 2 speed power rating 28 Watts		
Flue Terminal		43 x 245 rear discharge		
Gas Control		Push Button combination control valve		
Ignition System		Continuous spark Electronic ignition		
Logs		Ceramic		
Operation	Operation method	Manual Push button control valve		
	Ignition	Electric Spark ignition		
Remote control		No		
Safety features		Dress Guard		
		Cool to touch cabinet		
		Flame failure - thermocouple / Magnetic cartridge		
		Overheat Protection / Thermal Switch		

3. Combustion Specification

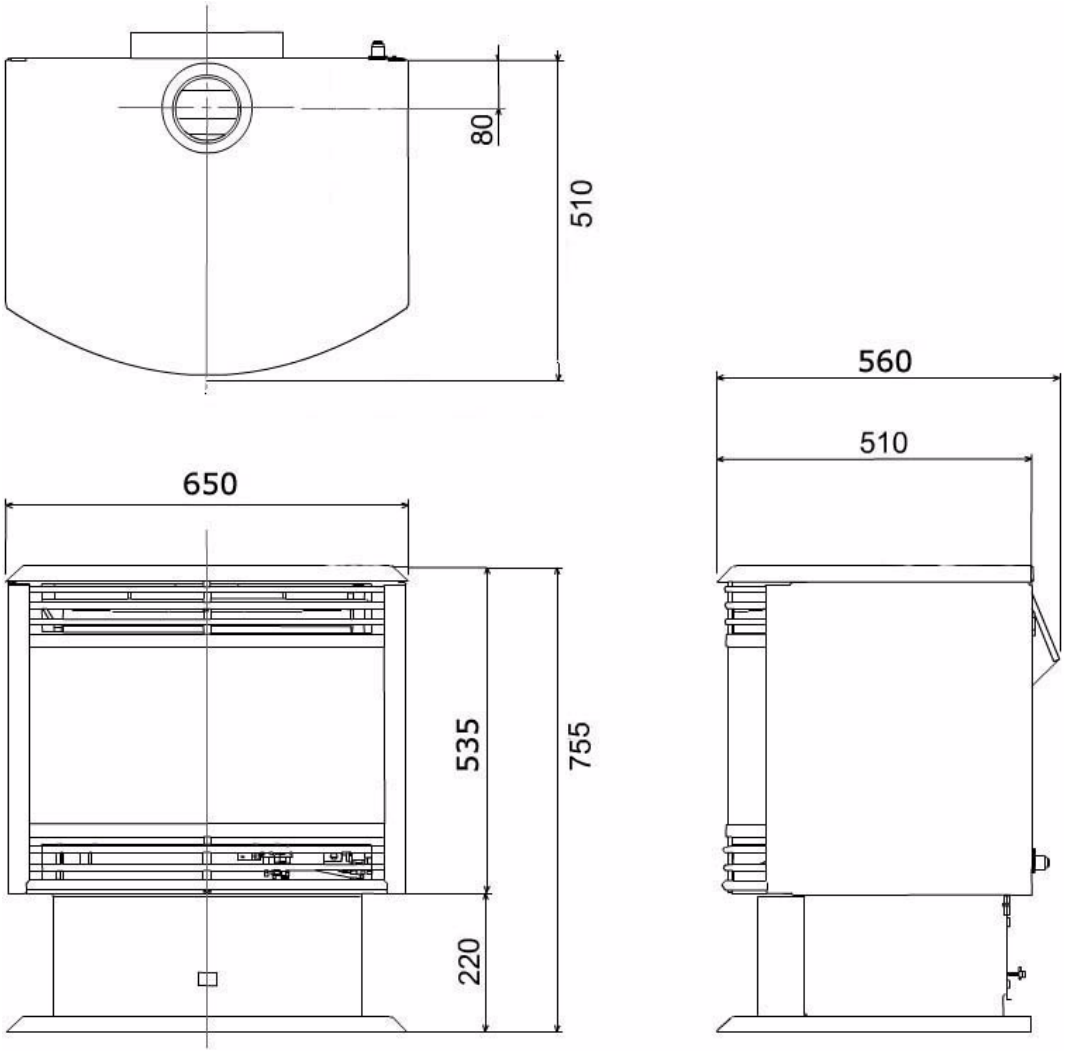
Basic Combustion Specifications

Rinnai Model Reference		FS35 Flame Fire Freestanding Royale	
Gas Type		**NG**	**LPG / (Propane)**
Gas Input (MJ/h)	High	35	35
	Low	16	16
Test Pressure (kPa)		0.95	2.4
Injector Size dia. (mm)	Pilot Injector	0.45	0.3
	Front Bnr Injector	200 M	95 S
	Middle Bnr Injector	440 M	170 M
	Rear Burner Injector	280 S	120 S
Bypass Orifice			
Aeration Sleeve		(7258) 17 mm	
Burner Marking			
Burner Type	Surface Combustion		
Solenoid Valve	Direct single seated valve type		
Log-set locating pin position		Rear position	Front position

M = Bray multi port injector
S = Bray single port injector

4. Dimensions

Note: All dimensions are in millimetres

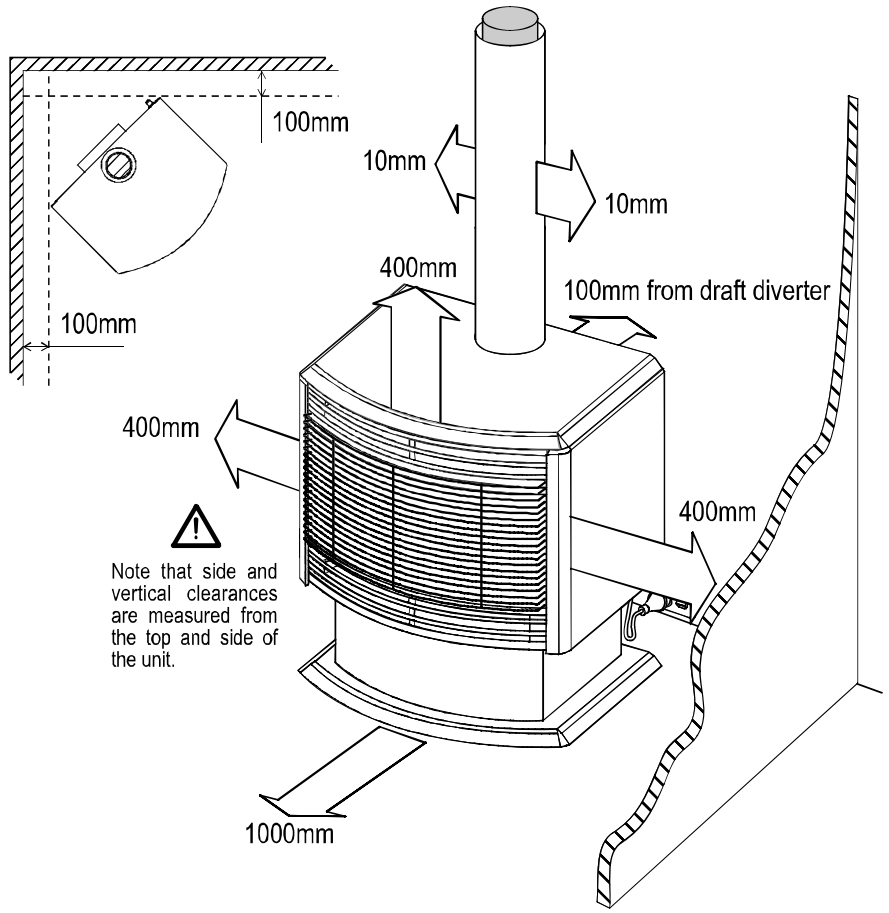


5. Installation

When positioning the heater, the main points governing the location are:

1. Flueing
2. Warm air distribution.
3. Adequate air supply.

4. The heater must not be installed where curtains or other combustible materials could come into contact with it. In some cases, curtains may need restraining. See below for minimum clearances required.



5. This heater is not designed to be built into bookcases or shelves or any any combustible opening.

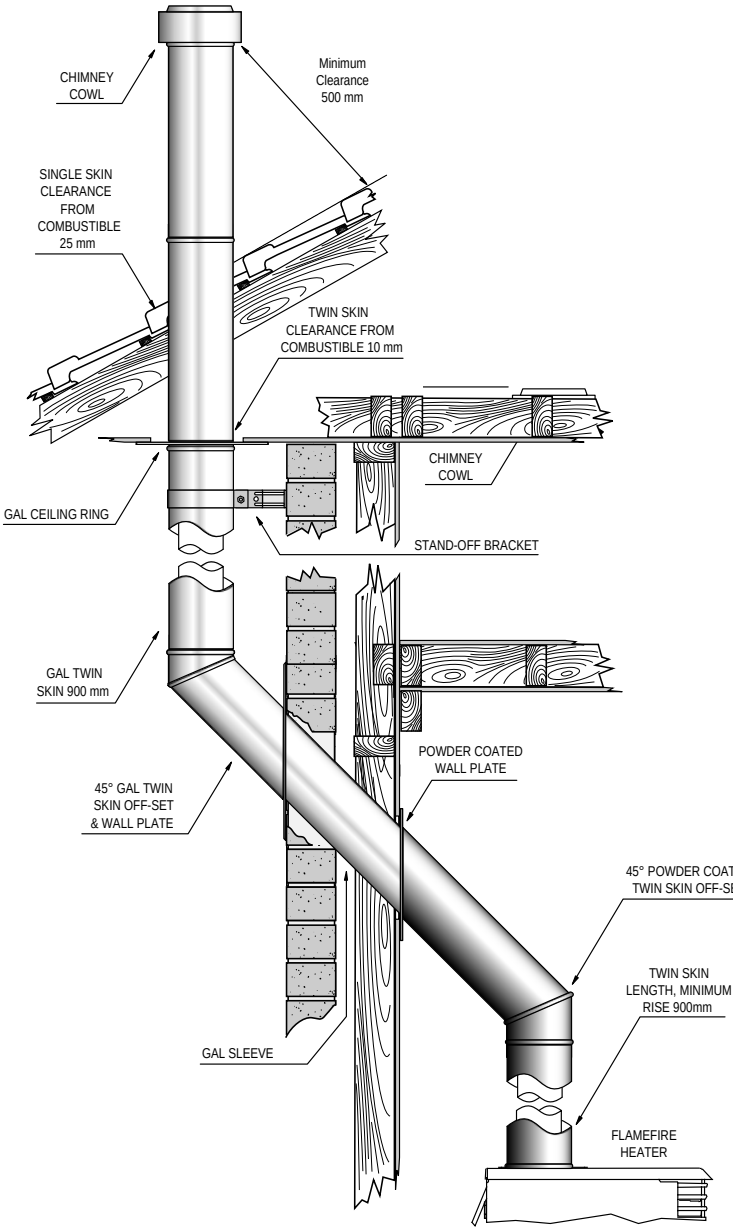
6. Check that room ventilation complies with local regulations.

7. 5.2.11 Electrical requirements
   A *gas appliance* connected to the electricity supply shall have a suitable means of electrical isolation which is adjacent to the *appliance* location and is *accessible* with the *appliance* installed.
   The means of isolation is to be -
   (a) a plug to a switched general purpose outlet;
   (b) a double-pole isolating switch; or
   (c) a plug to a fixed socket outlet.

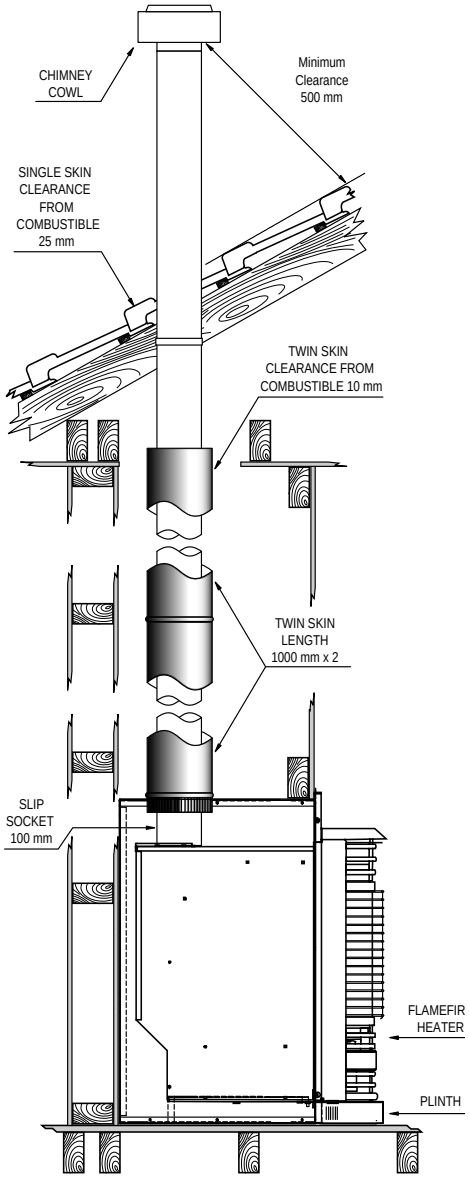
8. An approved Rinnai Flue system must be used.

6. Flueing

Order Code: FLFKIT03



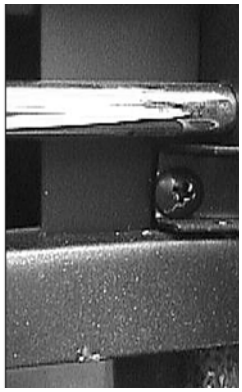
Order Code: FLFKIT02



1. This heater requires a minimum 3 m flue.
2. Position the heater.
3. Suspend a plumbline from the ceiling to the centre of the flue socket.
4. Mark the centre of the flue in the ceiling.
5. Mark a small hole in the ceiling and double check that the flue system will be at least 25mm clear of combustion materials.
6. Cut the hole for the flue.
7. Fit the ceiling plate, flue and decorative cover.
8. Refer to Flueing Brochure for 2-Storey installations.

7. Log Installation

1. **The log set is packed inside the heater and the packaging must be removed prior to installing as follows:**



- Open both side panels.
- Remove fasteners on both sides of the top glass retainer.
- Lift retainer away from heater.
- Loosen screws on bottom glass retainer.
- Carefully lift glass out of bottom channel.
- Carefully remove log packaging.

The log set is supplied in one piece with two holes underneath for location onto the pins inside the heater.

2. **Place the log set into the heater ensuring that the locating pins enter the two locating holes on the bottom face of the logset.**

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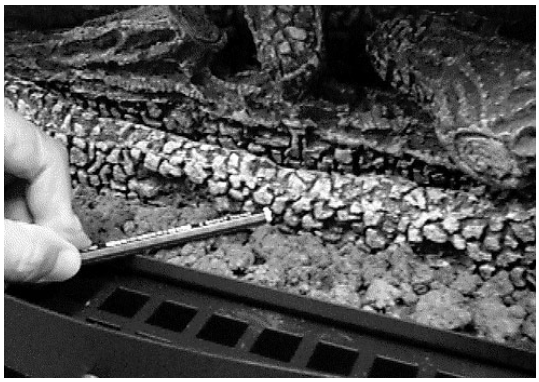
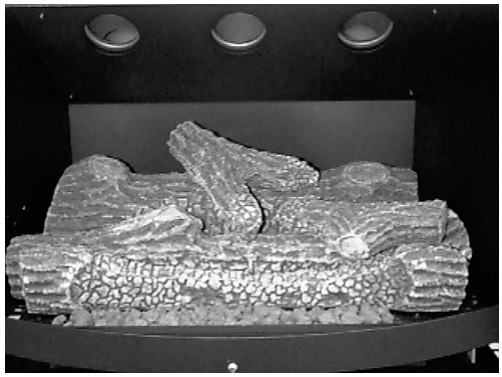
3. **Gently place loose ember bed material in front of the Front Log. Do not pour as dust particles from the plastic bag may block the burner ports.**

Level it with a pencil or screw driver and remove excess material. Note: The ember bed material must be placed **after** the logs are fitted. If the logs are to be removed for any reason, the ember bed material must be removed first and replaced after the logs are refitted. Any material that prevents the logs sitting flat on the burner top can upset the burning pattern and performance of the heater.



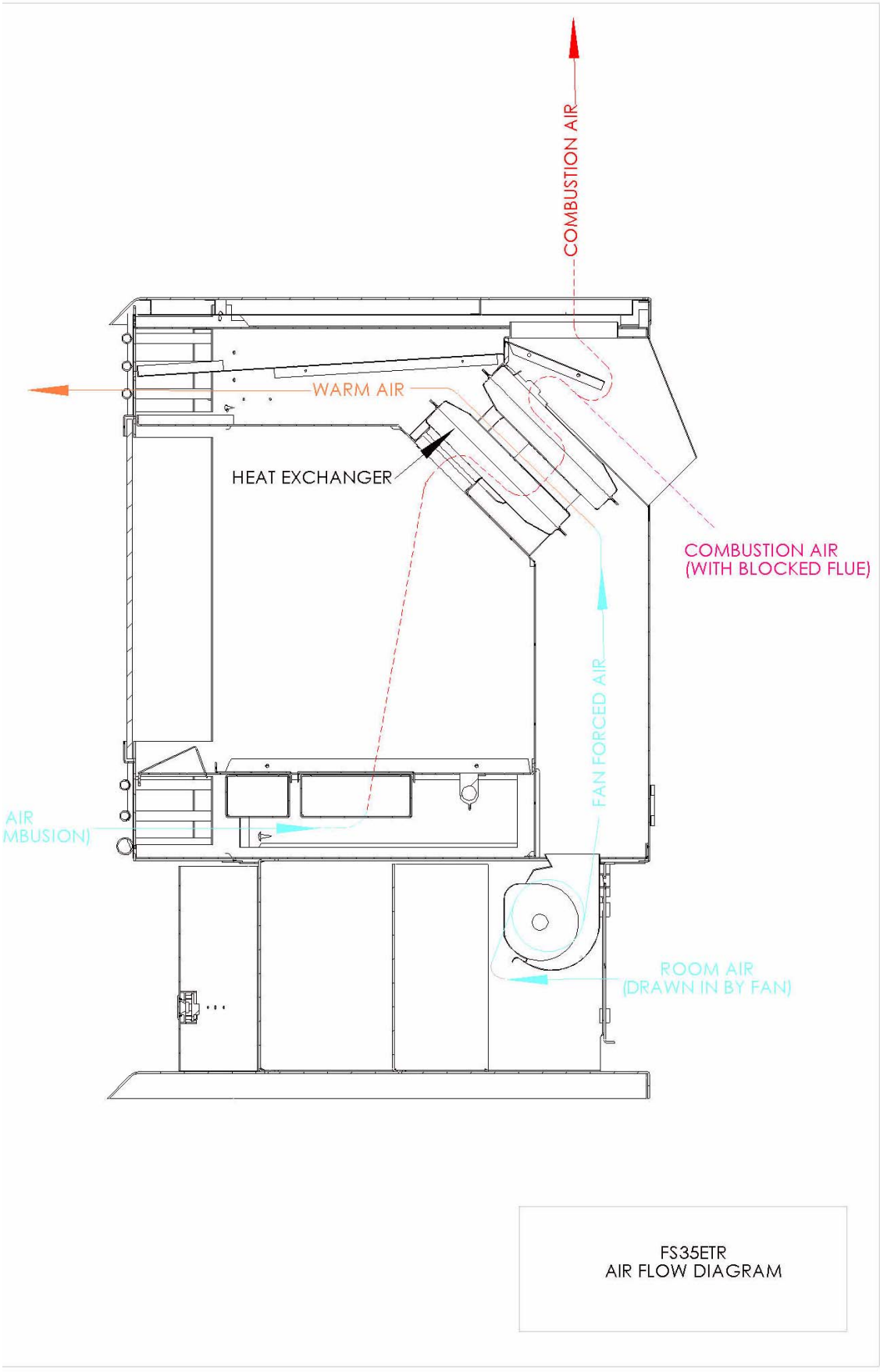


4.

- Replace glass and top glass retainer, tighten bottom glass retainer screws.
- Note: Fit glass so that the join/gap in the glass seal is at the bottom.
- Take care not to damage seals.
- Reinstall side panels.

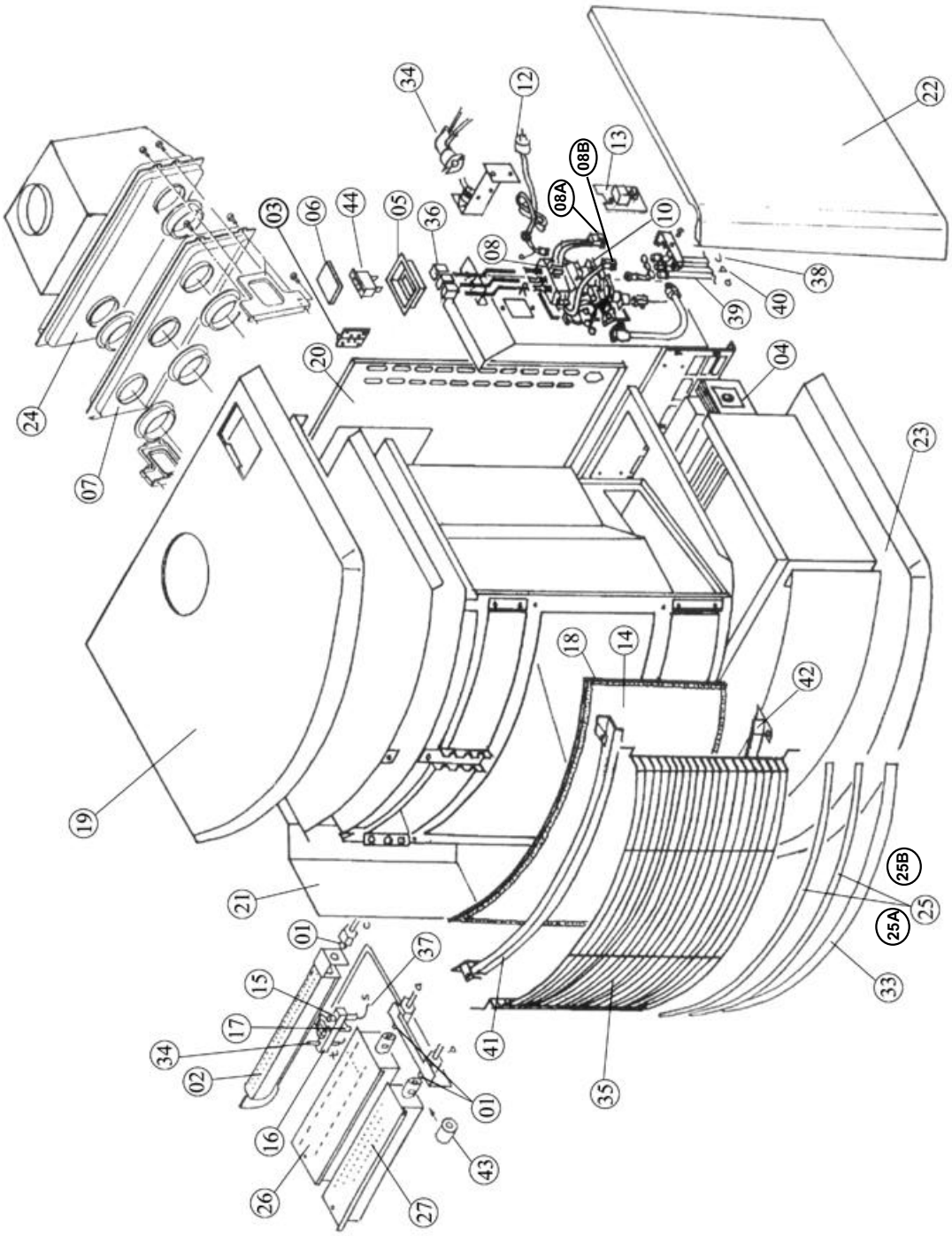
Note: When first lighting the heater, the logs need to be burnt in, which may take approximately 2 hours. The flame colour may change after the initial burning in period.

8. Schematic Diagram



9. Cut - Away Diagram

Freestanding Flamefire



10. Operation Principles

(refer to customer installation manual - section ‘Customer Information - Operation’ - page 4)

11. Fault Finding Procedure

SERVICE

Rinnai recommend that this appliance be serviced every 2 years.
If the power supply cord, gas supply hose or any other component of the heater is damaged, they must be replaced by Rinnai or a suitably qualified person.
Any service or repair work should only be carried out by an authorized person.
Rinnai Australia has service and spare parts departments.

Fault Finding Procedure

If you are unsure about the way your heater is operating, contact Rinnai Australia, or your local agent.

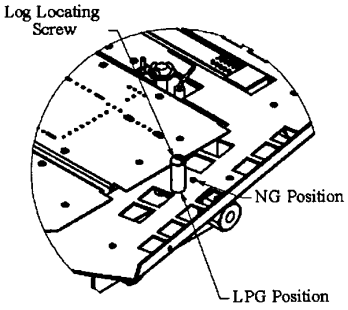
12. Gas Pressure Setting Procedure

Conversion Method

Warning- Ensure power cord is disconnected from power point (240V potential) and isolate gas supply

1. Remove the dress guard.
2. Open side panels by removing the securing screws and/or breaking the magnetic joint.
3. Remove the protector shield from the right hand side of the unit.
4. Remove the top glass retainer, held in place, 2 screws.
5. Gently lift the glass out of the bottom retaining channel, taking care not to damage the glass seal.
6. Replace small gas label on gas inlet.
7. Replace large gas label on back of appliance.
8. Fit the supplied Data Plate label over the top half of the existing Data Plate on the appliance.
9. Record serial number on Heater Gas Conversion Record sheet (F9) **(For Workshop Use Only)**
10. Complete details on conversion sticker, place sticker inside front panel **(For Workshop Use Only)**
11. Remove log set. **NOTE: Log-sets pre 2001 are in three (3) pieces**
12. Remove granules and place in a bag or container.
13. Remove the middle burner, 1 screw on left side.
14. Remove front burner, 1 screw on left side.
15. Remove rear burner, 2 screws.
16. Remove middle, rear and front burner Propane injectors.
17. Fit Natural injectors to the injector blocks. Take care to get injectors in the right order.
18. Remove large screw nut from the bottom of the pilot burner.
19. Remove Propane pilot injector and Pilot spring from within pilot burner.
20. Place pilot spring over the Natural pilot and replace pilot injector. **DO NOT Overtighten**
21. Move log locating screw from forward hole position to rear hole position (see notes)
22. Fit Aeration sleeve 17mm to middle burner and refit middle burner.
23. Refit the rear and front burners.
24. Refit log set. Ensure logs mounting holes are positioned over locating screws correctly.
25. Replace the granules, ensuring that the granules are level with the top of the front retainer.
26. Replace the Top glass retainer.
27. Replace the dress guard.
28. Connect appliance to gas and electricity
29. Set incoming pressure to 0.95 kPa
30. Test for gas escapes
31. Close the side panel and secure with the bottom screw.
32. Disconnect appliance from services **(For Workshop Use Only)**
33. Replace labels on carton with 4 large gas type labels **(For Workshop Use Only)**
34. Attach barcode labels over existing labels **(For Workshop Use Only)**
35. Repack the appliance **(For Workshop Use Only)**
36. Complete conversion records by signing test confirmation **(For Workshop Use Only)**

Notes



13. Dismantling for Servicing

NOTE: *Before proceeding with dismantling, be sure to follow the CAUTION instructions before each explanation.*

e.g.- Isolate gas supply
- Disconnect electrical supply from wall socket

ITEM **PAGE**

Unless otherwise stated, re-assembly is the reverse of dismantling.

CAUTION

240 Volt exposure. Isolate the electrical supply to the appliance and reconfirm with the neon screwdriver or multimeter.

1) Glass Panel Removal

Open the side panels, they are hinged for easy access.

Access can now be obtained to the two top glass trim retaining screws.

Remove the top glass retaining trim, held in place by two screws.

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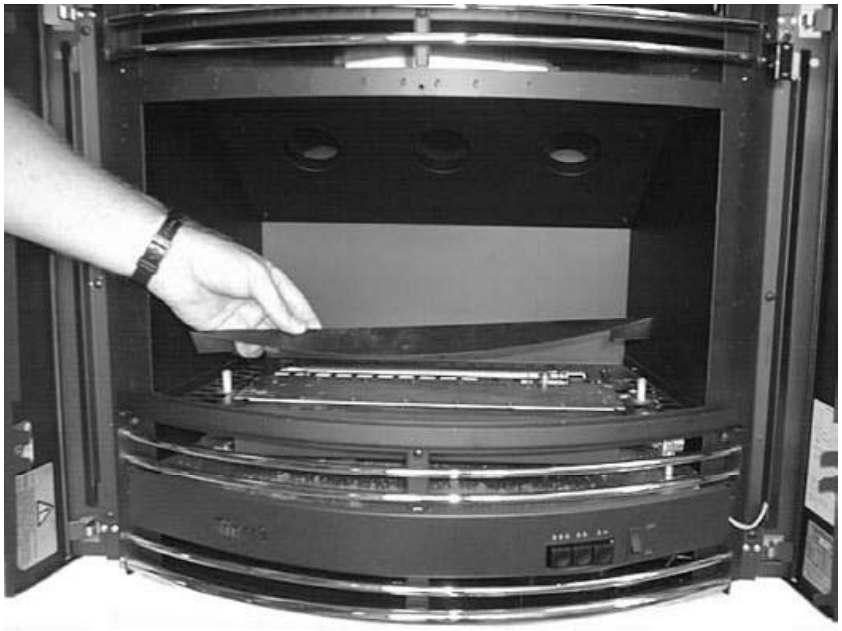
Gently lift the retaining trim away from the glass.

Carefully lift the glass out of the bottom retaining channel, taking care not to damage the glass seal.

2) Removal of Air guide trim and Log Sets

Remove the air guide trim by lifting out of its position



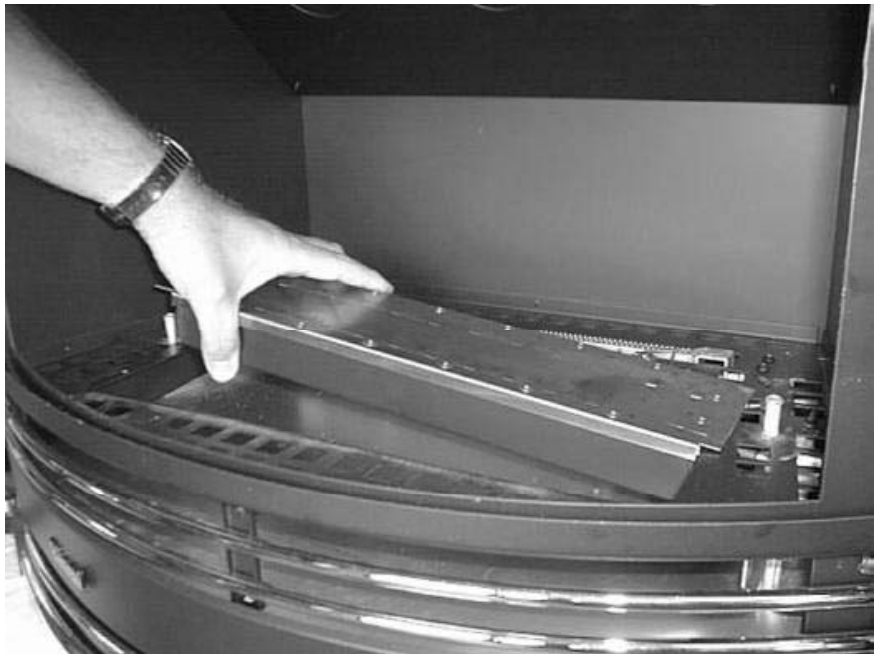
Lift the log set out of the combustion chamber and place aside.

If the logset is fitted in its final position, (heater has been used), remove all the logs carefully after they have cooled. Remove all the ember bed material from the front burner and place in a container for replacement when the heater is reassembled.

3) Burner Removal

With the glass panel and log set removed access is now available to the burners, injectors, pilot holder and thermocouple.

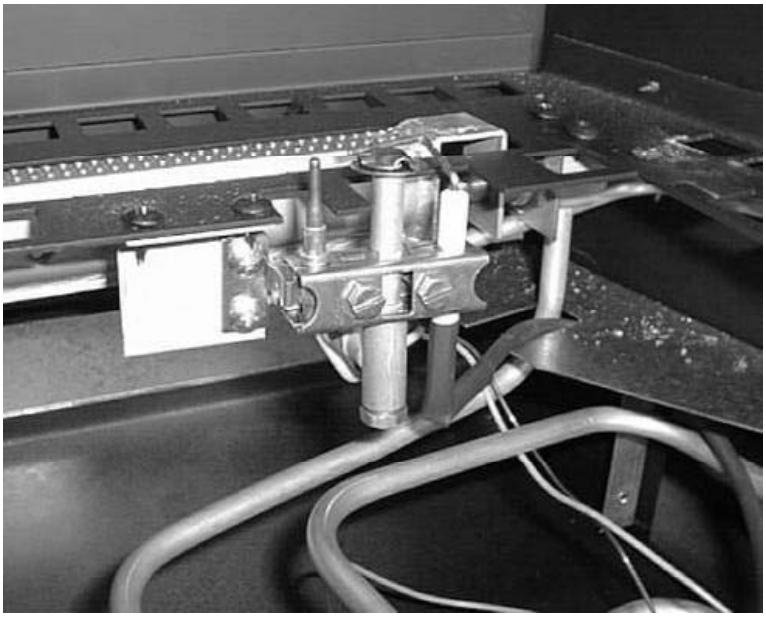
The ember bed burner (front) and the flame burner (centre) are each held in place by a screw on the left-hand side. To remove the burner - remove this screw and lift the burner out of the combustion chamber.



The rear heat burner is removed by unscrewing and removing the two retaining screws and drawing the burner to the left-hand side under the combustion chamber.

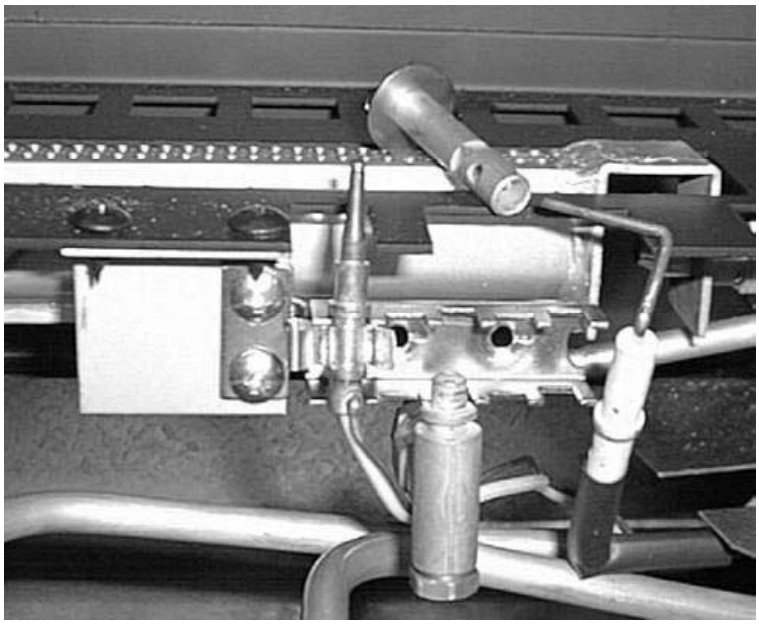
4) Pilot Assembly

With the flame burner removed, access is available to the pilot burner assembly.



To remove the assembly, remove the two 3/8ths securing screws holding the assembly to the pilot bracket.

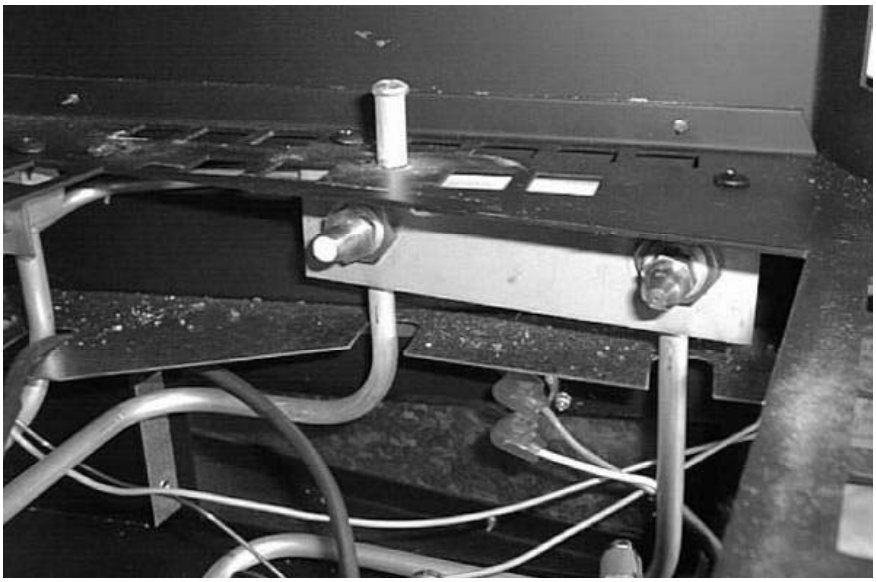
Access to the pilot, ignition electrode and thermocouple can be gained by removing the two hexagonal bolts on the pilot assembly.



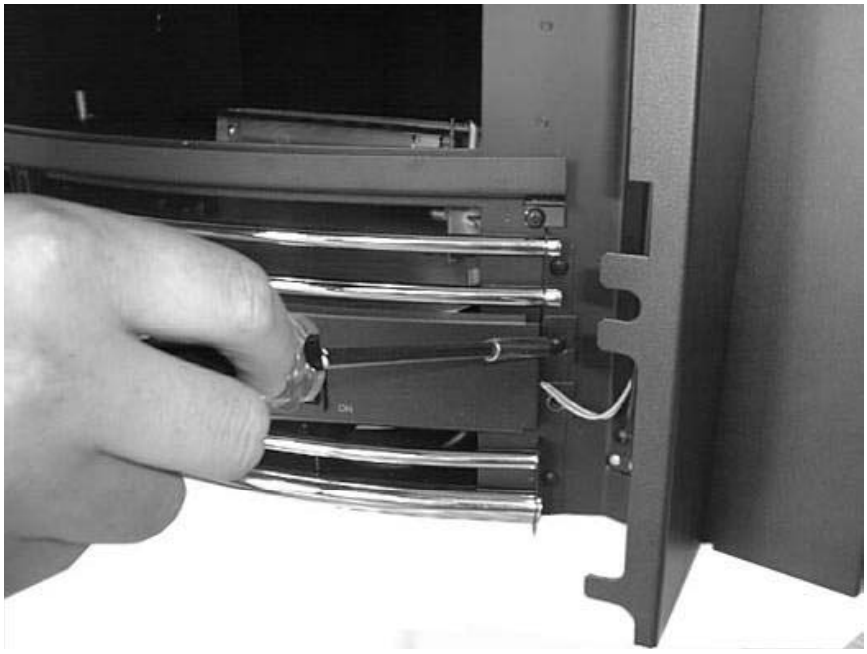
5) Injector access, Gas Control and Ignition Assembly

Access to the injectors is available after the burner assembly has been removed.

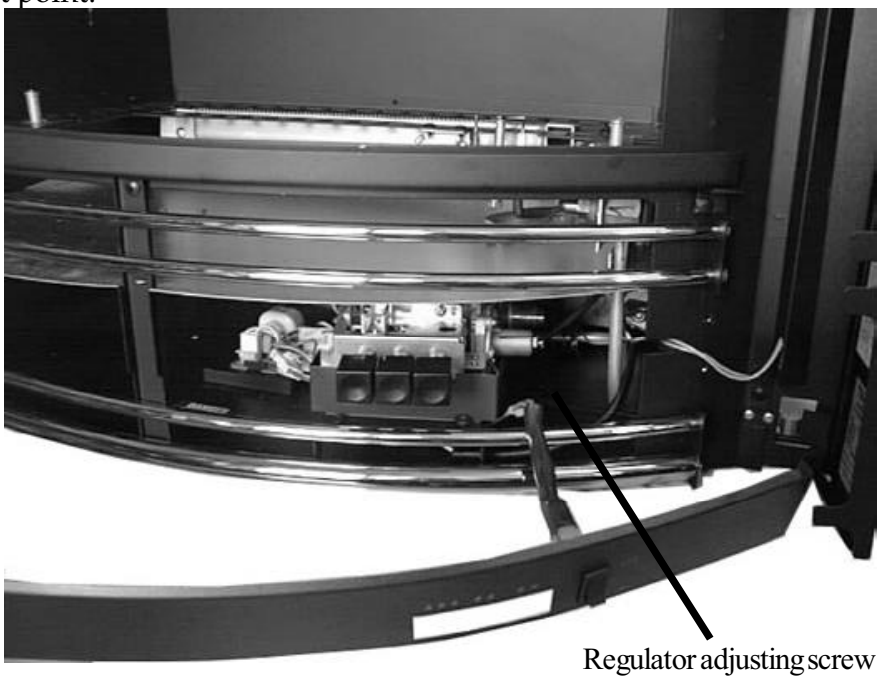
To remove the pilot burner assembly, undo the pilot gas supply union on the right-hand side; undo the pilot holder retaining screws and gently lift the pilot away from the assembly.

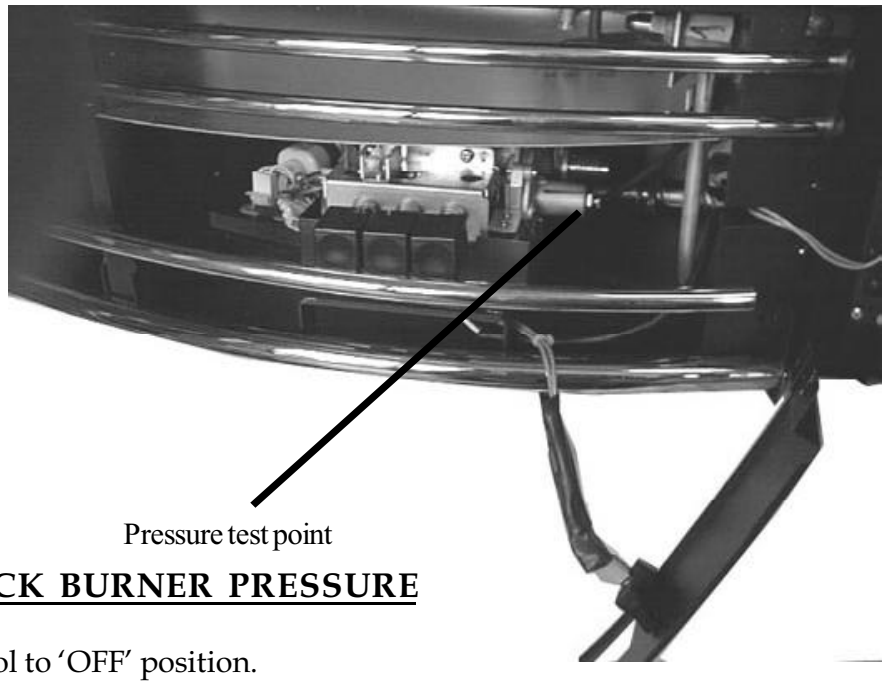


Access to the gas control can be gained by loosening the 3/8th screws on the front panel and lifting the front panel clear. Care needs to be taken as the fan switch and leads are connected to the front panel. Carefully remove the brass trims, they are held in place by tension



Note: The regulator can now be adjusted with the fan dividing panel in place. Removal of the front panel and trims gives access to the regulator adjusting screw and the pressure test point.





TO CHECK BURNER PRESSURE

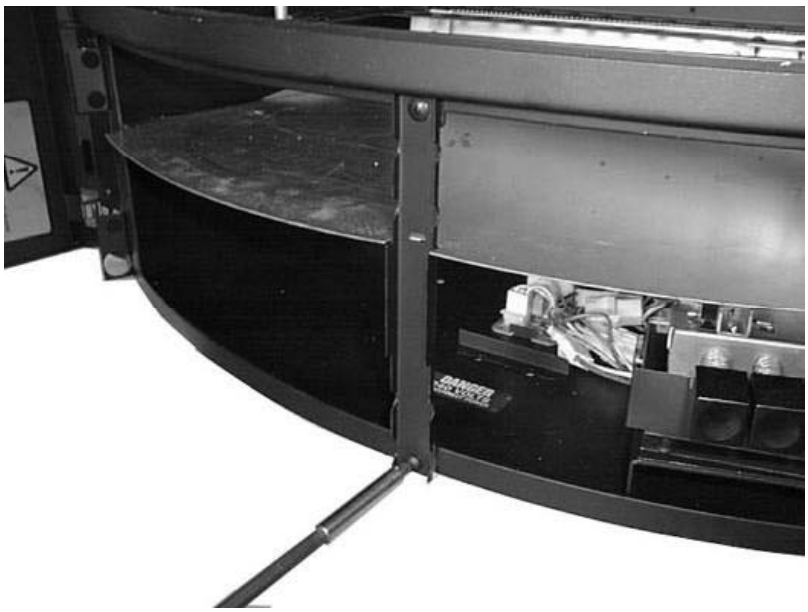
Push control to 'OFF' position.
Test point is on the right hand side of the gas valve.

Remove test point screw, the test point is on the right hand side of the gas valve. attach manometer to test point, light heater, adjust to high, and check pressure.
The regulator has been factory pre-set; before making any adjustments to the appliance regulator, check the supply pressure. Correct pressures are shown on the data plate.
If adjustments are necessary, regulator is situated on the right hand side of the gas control.
THE PILOT CANNOT BE ADJUSTED.

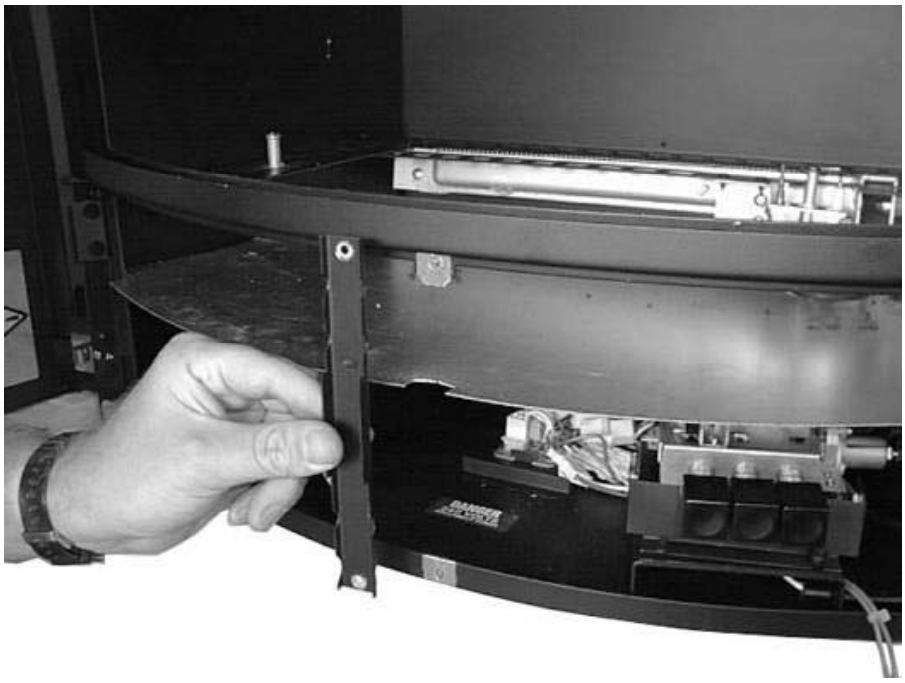
- After checking pressure, turn the unit off, remove manometer and replace test point screw.
- Turn the heater on and off a few times to check ignition.
- When you are satisfied that the heater is working correctly, re-assemble panels.
- The flames should be approximately 10 cm long on the central burner with yellow tips but with no sooting.
- The aeration is factory preset and cannot be adjusted.
- If you are unable to get the unit to operate correctly, contact your agent of Rinnai for advice.
- It may take approximately 20 minutes for the logs to achieve their final flame pattern and glow.

6) Ignition Assembly

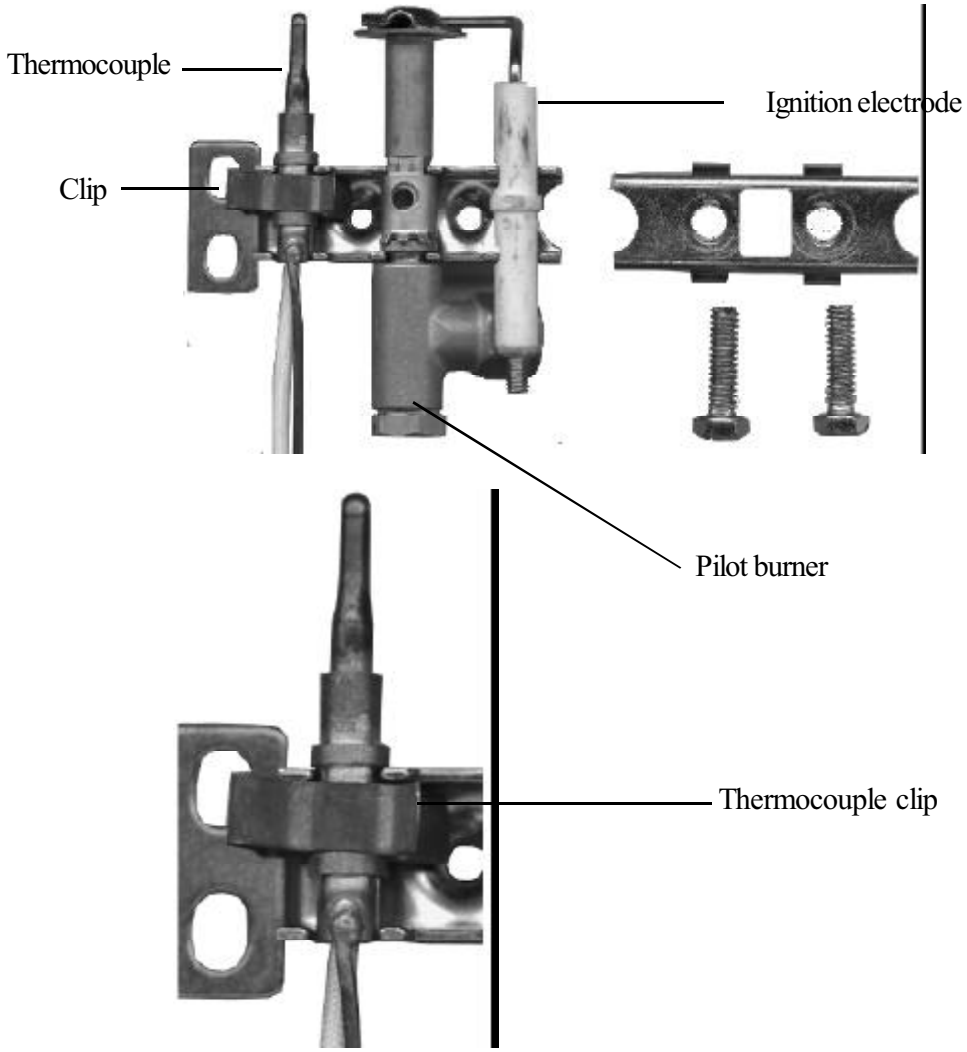
The ignition assembly is a non-serviceable part and should be replaced as an assembly. Access can be gained once the front panel, louvre trims, centre support and the fan dividing panel have been removed. Remove the single screw holding the printed circuit board assembly to the bracket. Remove the earth screw and unplug the high-voltage ignition lead together with the main power lead to the circuit board. The circuit board can now be removed.
Replacement is the reversal of the above procedure.



Support removal



Open the side panels. Remove the front panel glass and burners as described previously. Undo the two screws on the front of the piot bracket assembly and remove the thermocouple together with thermocouple clip from the pilot holder assembly.



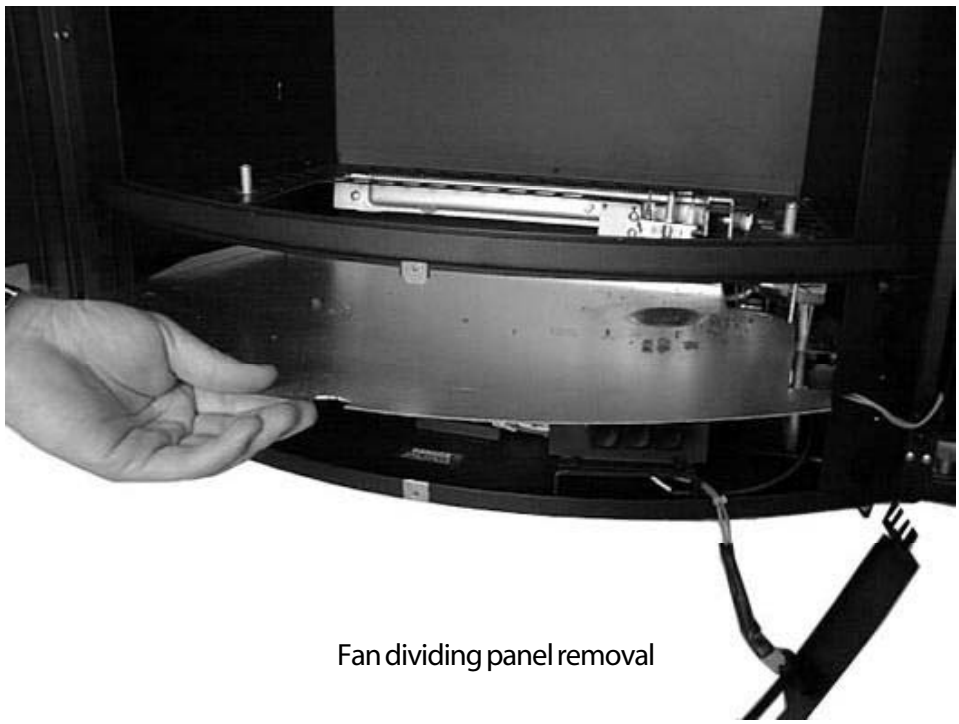
Note: The thermocouple clip acts as a spacer. It is important it is reassembled in the correct position as shown.

Remove the front panel,the louvre trims, the centre support and the fan dividing panel. Access can now be gained to the gas control and thermocouple plug.Unclip the themocouple plug and remove the thermocouple earth tag. Remove the cover over the yellow wire going to the overheat switch and dissconnect the switch. Withdraw the thermocouple assembly and replace.

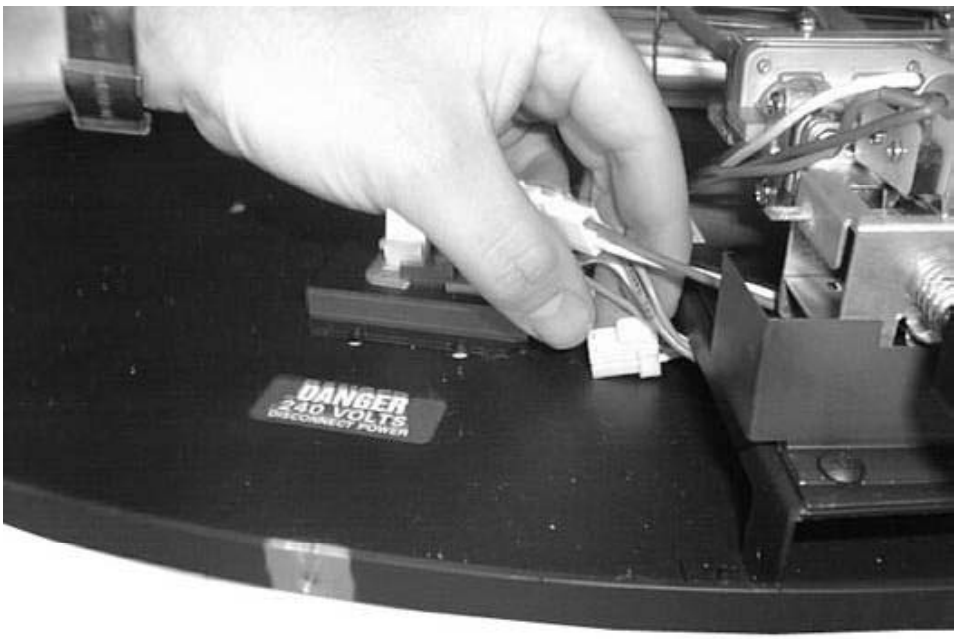
Replacement of the thermocouple is the reverse of the above procedure.

7) Fan Removal

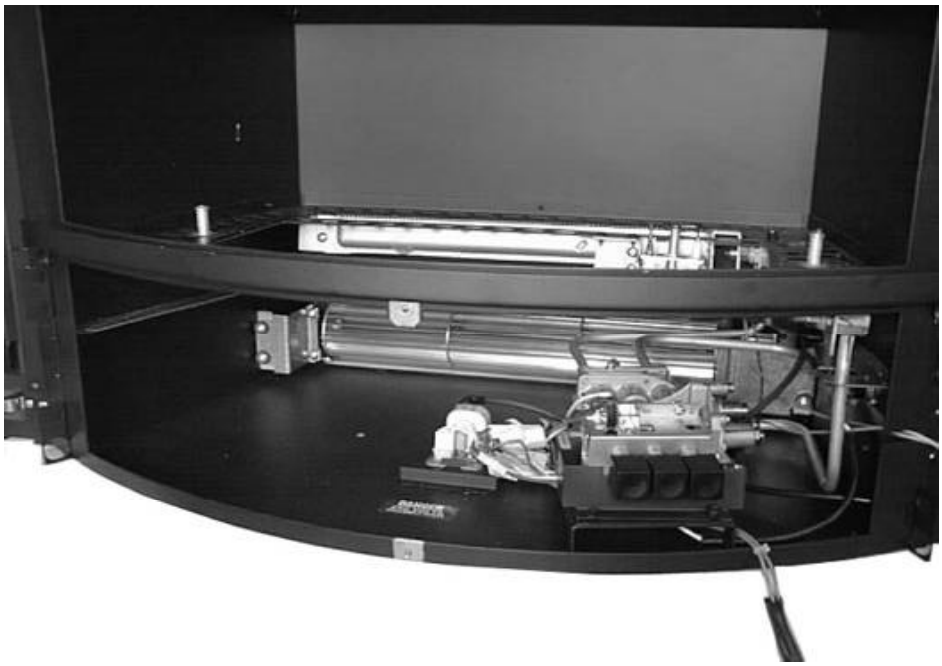
Turn off the power.
Remove the front panel.
Remove the louvre trims.
Remove the centre support
Remove the fan dividing panel.



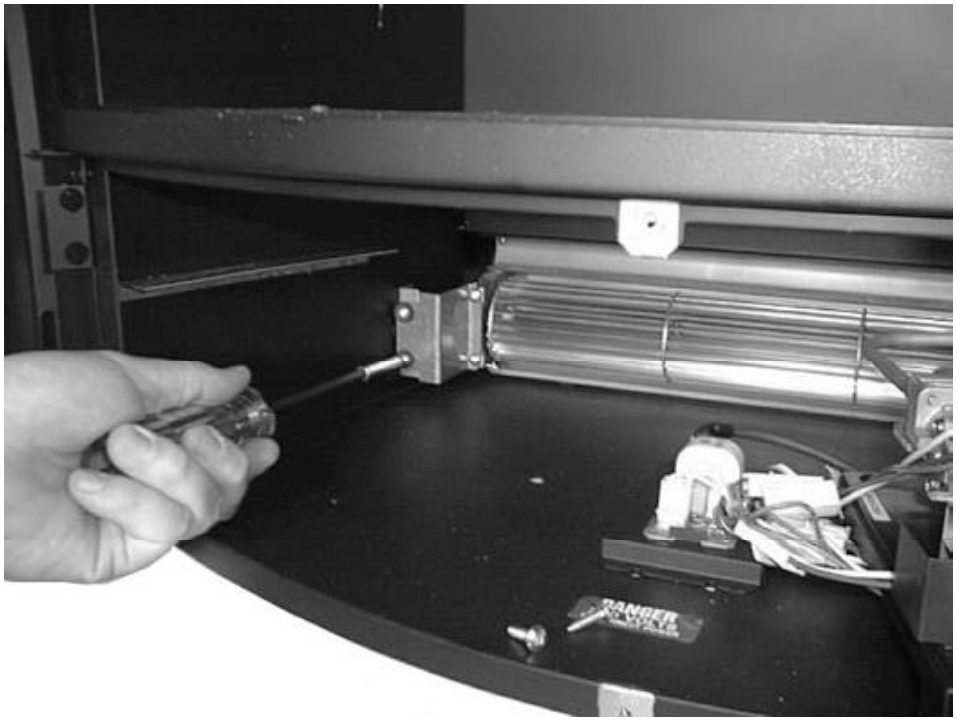
Fan dividing panel removal

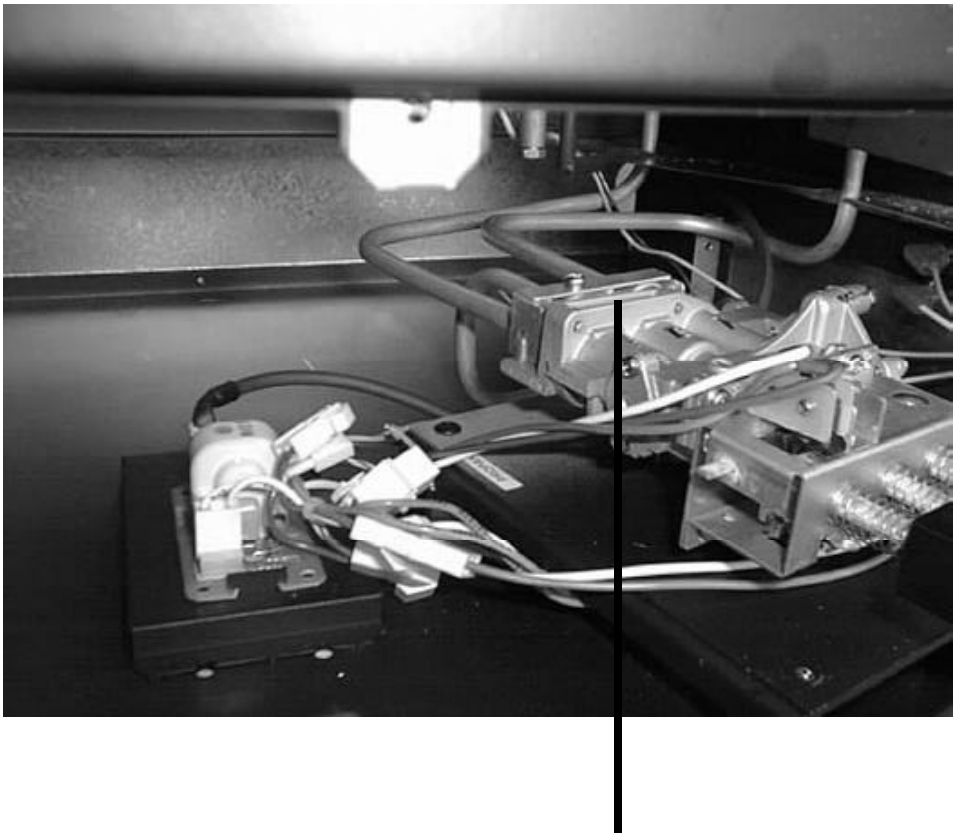


- Unplug the fan connection on the right hand side

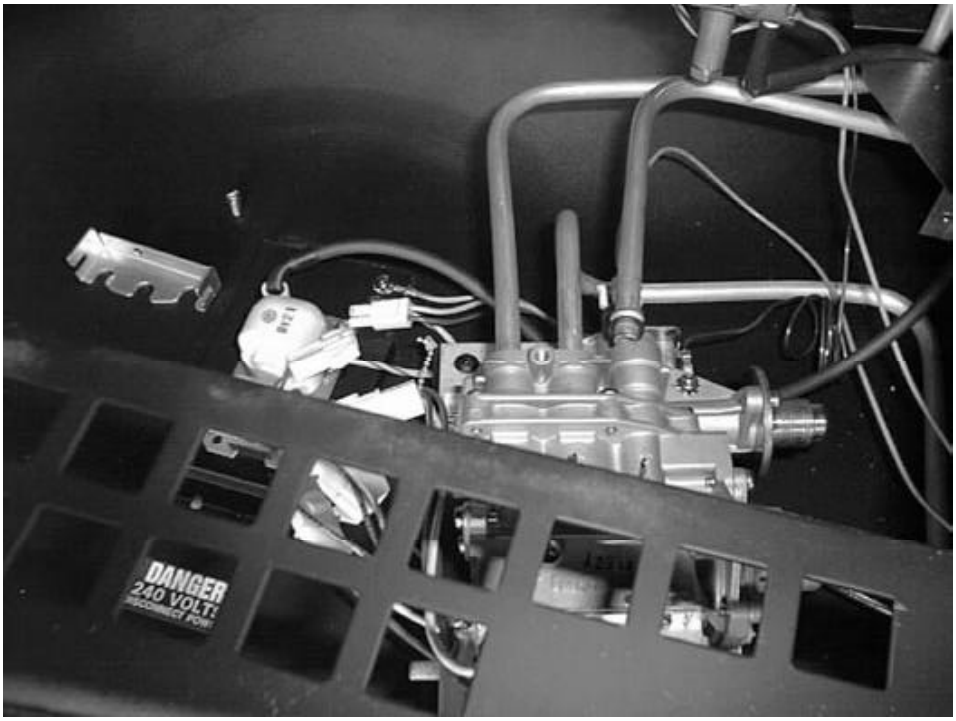


- Remove the 4 retaining screws
- Secure the fan bracket to the heater housing, 2 per side

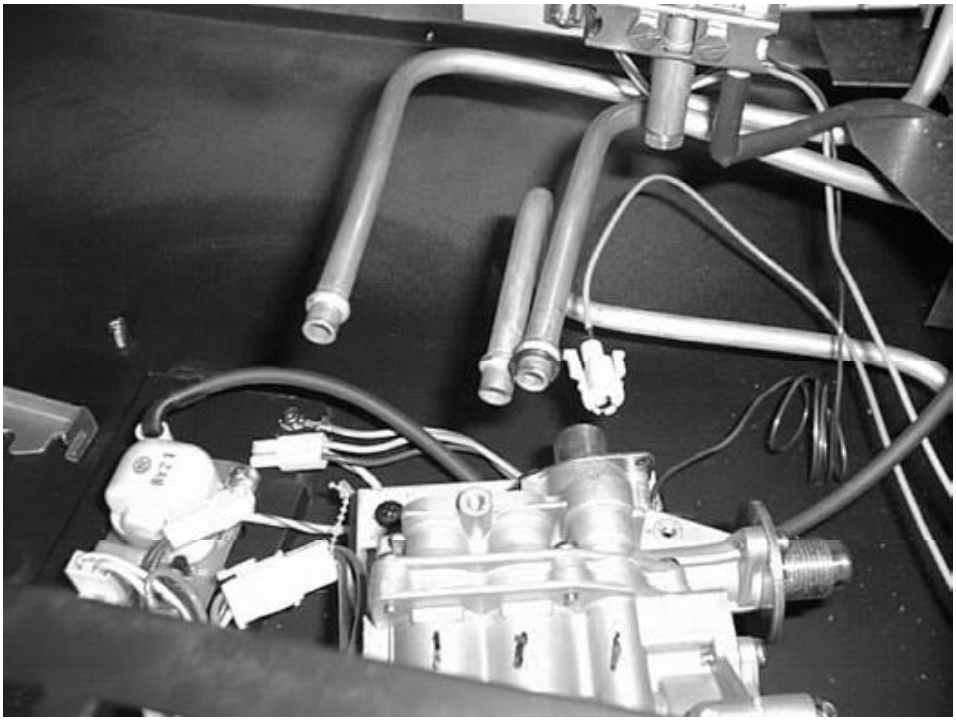




Remove the clip securing the gas supply tubes.

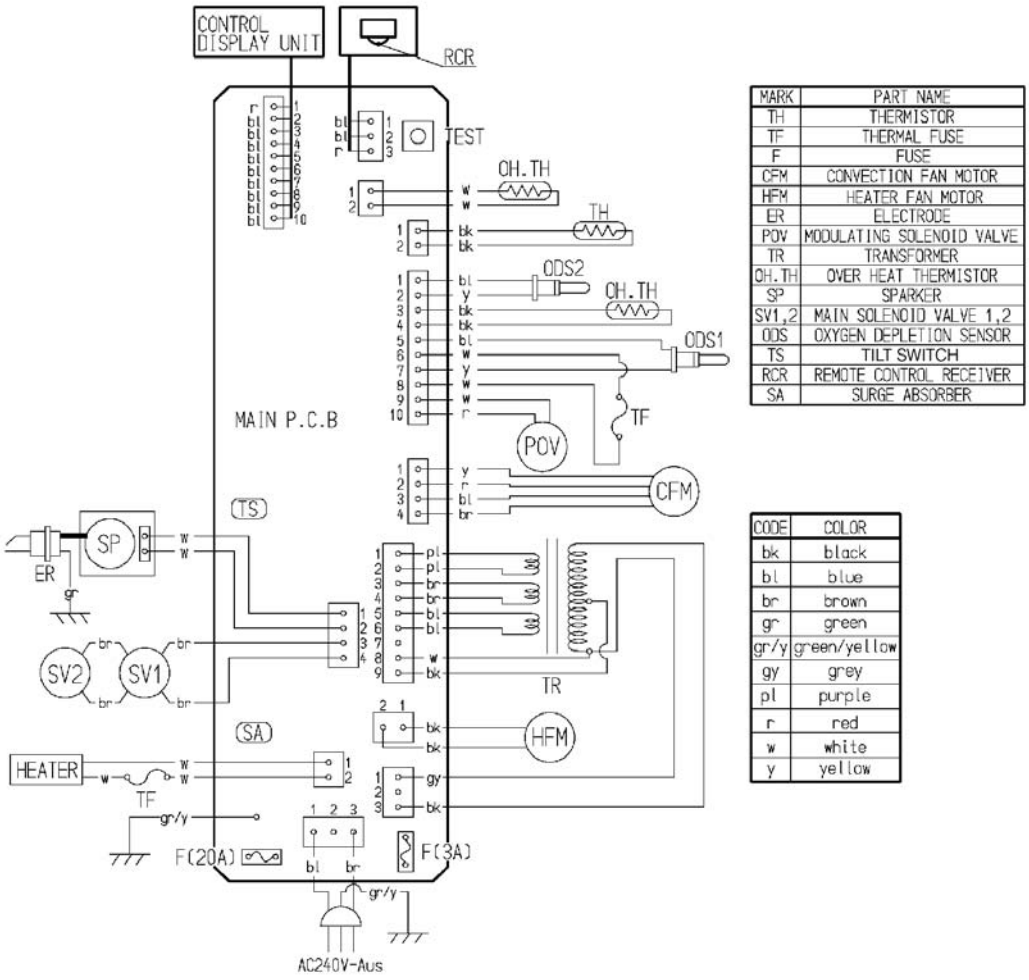


Gently remove the gas supply tubes.



Gas supply tubes removed and thermocouple plug unclipped.

14. Wiring Diagram

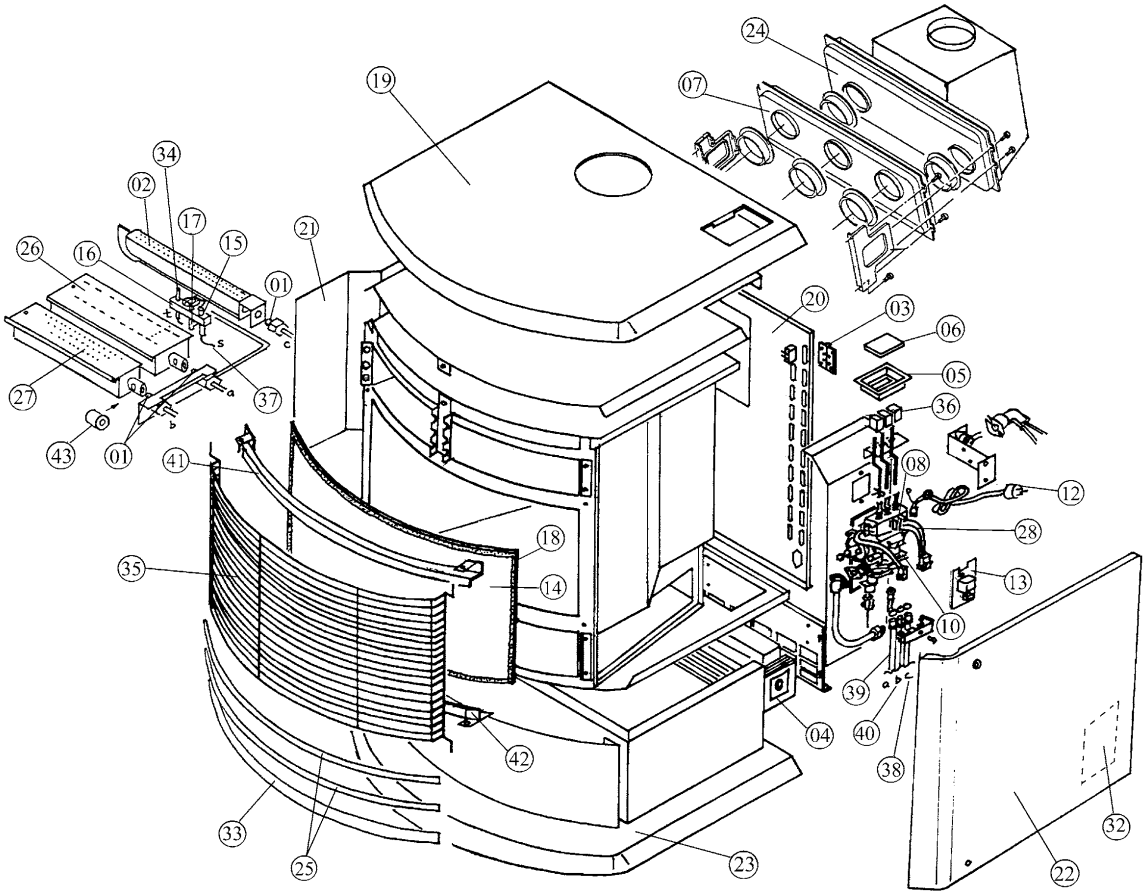


MARK	PART NAME
TH	THERMISTOR
TF	THERMAL FUSE
F	FUSE
CFM	CONVECTION FAN MOTOR
HFM	HEATER FAN MOTOR
ER	ELECTRODE
POV	MODULATING SOLENOID VALVE
TR	TRANSFORMER
OH.TH	OVER HEAT THERMISTOR
SP	SPARKER
SV1,2	MAIN SOLENOID VALVE 1,2
ODS	OXYGEN DEPLETION SENSOR
TS	TILT SWITCH
RCR	REMOTE CONTROL RECEIVER
SA	SURGE ABSORBER

CODE	COLOR
bk	black
bl	blue
br	brown
gr	green
gr/y	green/yellow
gy	grey
pl	purple
r	red
w	white
y	yellow

If the supply cord is damaged or requires replacing, it must be replaced by the manufacturer or the manufacturer's agent or similarly qualified person in order to avoid a hazard. The supply cord must only be replaced with a genuine Rinnai spare part. Part No. 90182065.

15. Exploded Diagrams



16. Parts List

Effective Date: 02/08/12
Supercedes: 18/04/12
Version 4

FS35R - Freestanding Royale

No.	Part Name	RA Part No.	Qty
001	Injector NG Bray 170 middle	90183864	1
001	Injector NG Bray 440 middle	90183989	1
001	Injector LP/NG Bray 0.80 front	90182270	1
001	Injector NG 1.45 rear	90183997	1
001	Injector NG 0.90 rear	90186503	1
001	Injector NG Bray 200 front	90183856	1
002	Rear Burner	90182000	1
003	Side Panel Hinge		1
004	Fan (Serial No. 98) Rotate motor mounting	90183831	1
004	Fan (Serial No. 99.01 to 01.03)	90183831	1
004	Fan (Serial No. 01.04 to current)	90187733	1
005	Control Box Black	90183906	1
006	Control Box Lid Black	90183914	1
006	Control Box Lid (Silver Metallic)		1
006	Control Label	90183922	1
007	Front Heat Exchanger		1
008	Gas Control	90147638	1
008A	Switch Fan changeover	90150590	1
008B	Switch Spark & Head	90150608	1
010	Control Valve	90147638	1
012	Power Cord	90182065	1
013	Sparker	90169384	1
014	Glass	90182070	1
015	Electrode	90182285	1
016	Pilot Burner c/w NG Pilot Injector	90182290	1
017	Pilot Injector NG 0.45	90186453	1
017	Pilot Injector LPG 0.30	90186495	1
018	Glass Seal	90182072	1
019	Top Panel Matt Black	90184060	1
019	Top Panel Matt Black, Satin Black use (v)	90189531	1
020	Rear Panel Matt Black, Satin Black use (v)	90182110	1
020	Rear Panel - FS3502 (Satin Black)		1
021	Panel Side LH FS35 (1999)	90184078	1
021	Panel Side LH FS35 (2002)	90189374	1
021	Side Panel LH		1
021	Panel Side LH Painted FS (Silver Metallic)		1

Effective Date: 02/08/12
Supercedes: 18/04/12
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No.	Part Name	RA Part No.	Qty
022	Panel Side RH FS35 (1999)	90184086	1
022	Panel Side RH FS35 (Satin Black)	90189382	1
022	Panel Side RH Painted FS (Silver Metallic)		1
022	Base Panel	90182125	1
022	Panel Base FS35 FS02 (Satin Black)	90189515	1
022	Base Panel FS (Silver Metallic)		1
024	Rear Heat Exchanger		1
025A	Louvre (Top)	90196999	1
025B	Louvre (Bottom)	90197195	1
025	Louvre Tube 9.5 (5 of) (Silver)		1
025	Louvre Tube 9.5 (5 of) (Black Nickle)		1
025	Louvre Tube 9.5 (5 of) (Silver Metallic)		1
026	Main burner LPG	90183872	1
026	Main burner NG	90182150	1
026	Front burner	90182155	1
027	Louvre tube 15.9 (1 of) (Silver)		1
033	Louvre tube 15.9 (1 of) Gold	90182132	1
033	Louvre tube 15.9 (1 of) (Black Nickle)	90189499	1
033	Louvre tube 15.9 (1 of) (Silver Metallic)		1
033	Thermocouple clip (2000)		1
034	Thermocouple	90182190	5
	Fan Delay Switch	90143058	1
035	Dressguard (Australia only)	90182122	1
036	Control button	90182200	1
037	Sparker lead	90169385	1
038	Gas Supply Tube C rear	90182212	1
039	Gas Supply Tube A middle	90182210	1
040	Gas Suply tube B front	90182211	1
041	Glass retaining bracket top - Black	90182262	1
042	Glass retaining bracket bottom - Black	90182288	1
042	Glass retaining bracket bottom - (Silver Metallic)		1
043	Aeration sleeve (NG only)	90183880	1
044	Fan Switch (rocker)	90184029	1
141*	Shield Burner ALL	90185505	1
-	Cord Holder		1
-	Granules	90183971	1
-	Pillar front (Use RNZ P/Nos. 7020 & 7022 for complete pedestal)		1

Effective Date: 02/08/12
Supercedes: 18/04/12
Version 4

No.	Part Name	RA Part No.	Qty
-	Main Log		1
-	Fan Switch	90169368	1
-	Log Locating Sleeve	90186479	1
-	Pillar (Use RNZ P/Nos. 7021 & 7022 for complete pedestal)		1
-	Fan switch lead		1
-	Control rod snap pin		1
-	Gas tube retainer		1
-	Inlet elbow	90182049	1
-	Fan mounting grommet		1
-	Rear Log		1
-	Wiring Diagram		1
-	Conversion Kit to NG		1
-	Flare Nut 1/2"		1
-	Inlet Tube		1
-	Control Rod	90183898	1
-	Twig LH		1
	Conversion kit to LPG		1
-	Side Panel Magnet	90184003	1
-	Log set c/w granules	90182180	1
-	Wiring Harness	90182170	1
-	Fan mounting sleeve		1
-	Twig RH		1

* = Not listed on exploded diagrams

Notes

SERVICE CONTACT POINTS

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Fax: (03) 9271 6622

Internet: www.rinnai.com.au E-mail: enquiry@rinnai.com.au

National Help Line

Sales & Service
Tel: 1300 555 545* Fax: 1300 555 665*

Cost of a local call Higher from mobile or public phones.

Rinnai has a Service and Spare Parts network with personnel who are fully trained and equipped to give the best service on your Rinnai appliance. If your appliance requires service, please call our Helpline. Rinnai recommends that this appliance be serviced every 2 years.

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