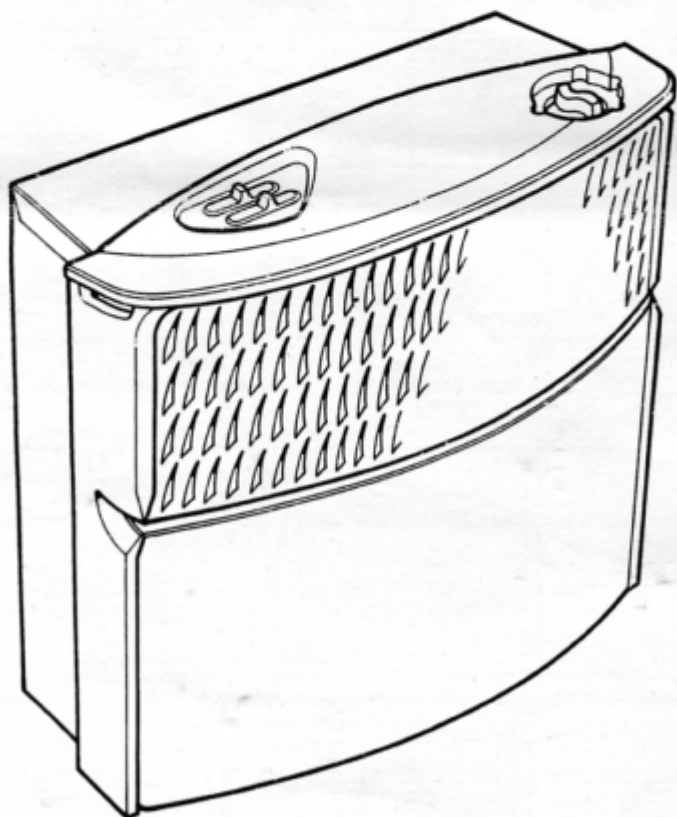


CARVER

INSTALLATION AND USER INSTRUCTIONS

FOR THE
2000 SPACE HEATER RANGE



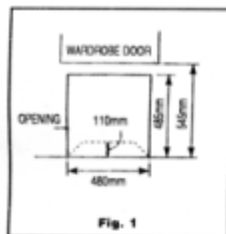


Fig. 1

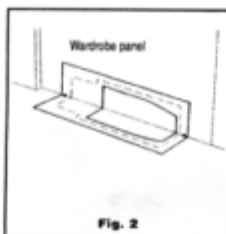


Fig. 2

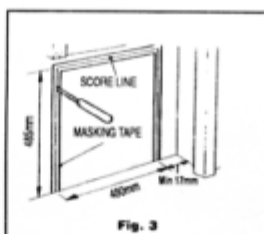


Fig. 3

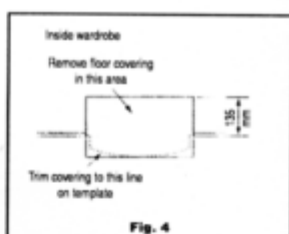


Fig. 4

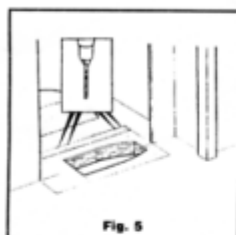


Fig. 5



Fig. 6

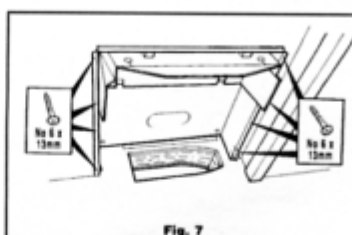


Fig. 7

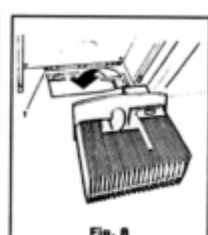


Fig. 8

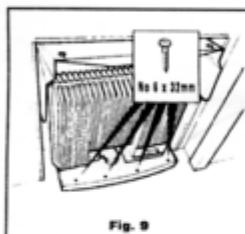


Fig. 9

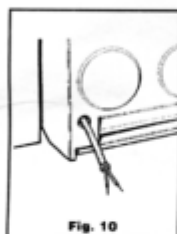


Fig. 10

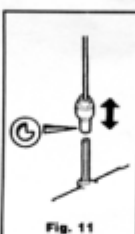


Fig. 11

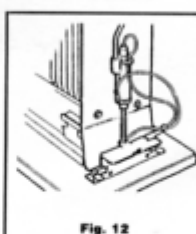


Fig. 12



Fig. 13

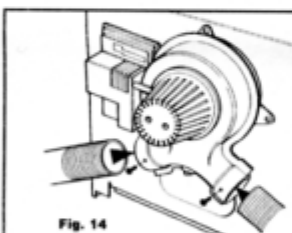


Fig. 14

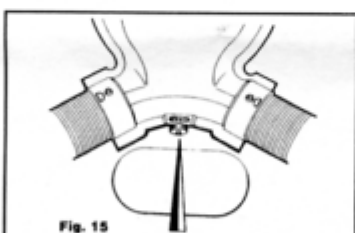


Fig. 15

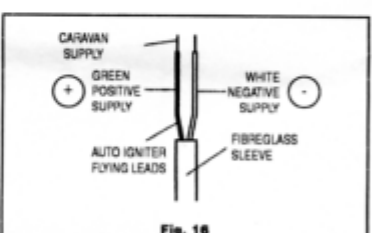


Fig. 16

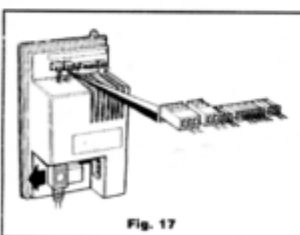


Fig. 17

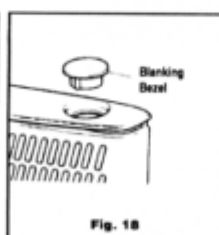


Fig. 18



Fig. 19

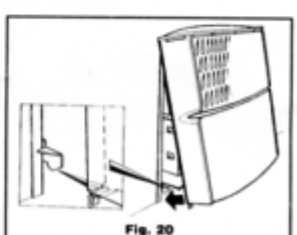


Fig. 20

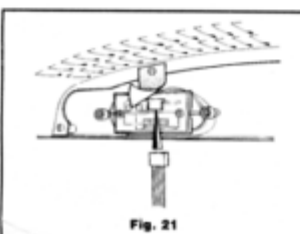


Fig. 21

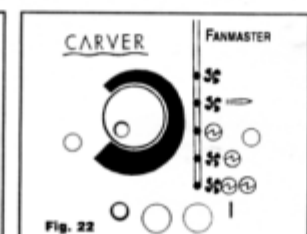


Fig. 22

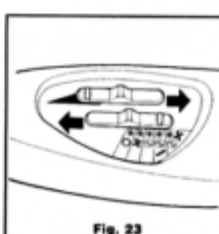


Fig. 23



Fig. 24

INSTALLATION INSTRUCTIONS

- 2000 SPACE HEATER RANGE

The following installations instructions cover the following heaters

- i. 2000P (Right hand installation build)
- ii. 2000A (Right hand installation build)
- iii. 2000 FANMASTER (Right hand installation build)
- iv. 2000P (Left or right hand installation build)
- v. 2000A (Left or right hand installation build)
- vi. 2000 FANMASTER (Left or right hand installation build)

1 WARNINGS AND INFORMATION

IF THIS HEATER IS FITTED TO A MOTOR VEHICLE, A LABEL MUST BE PLACED ADJACENT TO THE APPLIANCE STATING "SWITCH OFF WHILE VEHICLE IS BEING REFUELLED".

- 1.1 These heaters must be installed by a competent person in accordance with the regulations in force, and these fitting instructions.
- 1.2 In addition, on "Fanmaster" models, the heaters must be installed by a competent electrician working to the relevant regulations in force, when installing the 230v connection to the heater.
- 1.3 The Carver 2000 heater range is approved to the relevant sections of B.S. 5258; pt. 13 and are manufactured to ISO 9002 1987, and are approved to the Gas Appliance Directive 90/396/EEC.
- 1.4 The gas supply to the heater must be from an approved regulator of adequate capacity. In **NO** circumstances should industrial and adjustable regulator be used on caravan applications.
- 1.5 Always ensure the underfloor air intake and flue outlet are positioned so it cannot be blocked by mud or snow. A minimum of three sides of the vehicle **MUST** be open at all times. This is to allow for the products of combustion to be dispersed from the heater.
- 1.6 There **MUST NOT** be a mantelpiece or shelving sited above the heater.
- 1.7 Curtains **MUST NOT** hang within 150mm of the sides of the heater or within 300mm above the top of the outlet grille.
- 1.8 Adjacent furniture or upholstery must be clear by at least 5mm on either side of the heater.
- 1.9 The heater does not contain any asbestos or asbestos related products.
- 1.10 The regulator must be protected from the effects of severe weather.
- 1.11 It is of the utmost importance that the ducting for combustion air supply and for products of combustion is installed in accordance with these installation instructions.
- 1.12 As this product has an underfloor flue, any ventilation hole in the same floor channel or within 1 metre of the flue must be blocked off and relocated outside the area if necessary.
- 1.13 The data label is located on the heater structure, behind the front case.
- 1.15 Aerosols and other flammable materials **MUST NOT** be stored in compartments behind or adjacent to the heater.
- 1.16 These heaters are **NOT** suitable for use while the vehicle is in motion.

2 THE HEATER KIT

2.1 "A" and "P" models

1 heater assembly	4 screws No.8 x 32mm (black)
1 front case assembly	4 screws No. 8 x 19mm (silver)
1 control rod assembly	8 woodscrews No. 6 x 12mm (silver)
1 set of literature in polythene bag	1 floorplate clamp strip
1 12v loom (optional - "A" models)	1 installation box assembly
1 Gas connection olive	1 Gas connection nut.

The "Fanmaster" kit (In addition to the above parts)

1 Preassembled installation box, directly replacing the installation box above. This assembly incorporates:

Electric elements (2 off)	Air distribution fan
Control box Integral wiring loom	
1 230v supply cable	2 No. 6 x 6mm screws
1 Wall switch	
1 Wall switch loom	For optional "Left Hand" build variants only

3 CHOOSING THE POSITION FOR THE HEATER

The heater is normally fitted into the panel below the wardrobe door or cupboard. Before commencing any fitting, ensure that the appliance will fit into the desired position (see fig 1). The main installation box will be recessed into the panel of the wardrobe by 110mm, on "A" and "P" models; 245mm in the case of the "FANMASTER" MODELS

4 FITTING THE HEATER

4.1 **TURN OFF** the gas supply at the cylinder.

4.2 If possible, lift away the floor covering from the front of the panel or wall into which heater is to be fitted. If this is not possible, the template will have to be positioned on top of the floor covering.

4.3 Fold the template upwards along the arrows marked "Wall cut-out front face "RH" and place into position as shown in fig.2 with the rectangular cut-out to the right.

4.4 If an obstruction is evident, the heater must be repositioned in another area of the vehicle.

4.5 When satisfactory, mark the hole to take the installation box. This will require a hole to be cut in the panel 485mm high (from the floor, below floor covering) x 480mm wide (Fig 1). It is recommended that the panel surface is protected by masking tape. Score the line to be cut with a sharp knife, to stop the veneer lifting (see fig 3). If the panel is of the hollow type, then the void must be filled locally along the opening with wood.

4.6 Trim the floor covering from the inside the wardrobe or panel to a depth of 135mm from the front (see fig 4). If the floor covering is not wanted behind the installation box remove as required. Also trim the floor covering in front of the panel or to the lines on the template.

4.7 Open the template making sure that the arrows remain in their relative positions. Mark and cut the floor hole at A, B, C and D on the template. Remove some of the the installation and insert a timber liner to seal off the caravan floor installation. The liner must be secured using a suitable adhesive or screws and their size must be such that all holes marked on the template fall with in their inserts.

4.8 Position the installation box / heater into the opening ensuring that the bottom edge is on the floor. Secure the installation box to the panel with the eight wood screws provided (Fig 8).

4.9 Lower the heater into the floor hole and position centrally in the installation box width, ensuring that the rear of the floorplate is pushed fully home under the clamp strip tongues (Fig 8). Secure along the front of the floorplate, with the four woodscrews (Fig 9). Tighten the rear clampstrip screws. **IMPORTANT:** The heater **MUST NOT** be positioned on top of any carpet or soft trim, as an air tight room seal is essential for this product.

4.10 Connect the control rod assembly to the stem of the gas valve (see fig. 11), and push securely together.

4.11 On 2000P models, connect the H/T ignition lead to the piezo igniter end, and the earth lead to the tab (Fig 12).

4.12 On 2000 FANMASTER, ensure that the green and white 12v leads, from the rear control box, are routed through the hole in the rear lower right hand corner of the installation box and connect to the igniter box.

4.13 On 2000A models, pass the leads from the igniter box through the hole in the rear of the installation box, ready for connection the caravan supply.

5 DUCTING AND DUCT LAYOUTS

- 5.1 The Fanmaster is a major component on the Carver Blown Air Central Heating system. The Carver Central Heating Kit (Part No. 102145) is available for use on all Fanmaster models
- 5.2 Each of the twin outlets on the Fanmaster accepts Carver flexible ducting to give a warm air supply to both ends of the caravan. Each duct run can supply 2 or 3 outlets. Its recommended that at least one outlet is of the permanently open type to prevent the over temperature safety tripping of the heating elements.
- 5.3 Detailed duct installation information is available from Carver on layouts.

CONNECTION OF THE DUCTS

- 5.4 Push the ends of the duct firmly into the Fanmaster ports up to the stops. Secure each in place with a No.6 self tapping screw through the fan port sides (Fig 14).
- 5.5 In some cases installation care must be taken in routing the duct into the ports to avoid kinks. It may be easier to fit the ducts before securing to the Fanmaster.
- 5.6 At the bottom of the fan body, between the duct outlets, is an air diverter (Fig 15) This can be preset on installation to give a balanced flow of air down each duct run. Pull the button down and slide left or right to set. Ensure the button returns and locks into one of the teeth in the fan body.

6 CONNECTION TO THE GAS SUPPLY

- 6.1 Ensure that the gas supply is turned **OFF** at the cylinder.

Connect the 8mm-diameter caravan gas feed pipe to the heater gas valve in the caravan, using the nut and olive provided. When tightening the valve connection, two spanners **MUST** be used: one to tighten the nut and other, for steadying purposes, on the flat surfaces of the valve itself.

The gas pipes or valve **MUST NOT** be placed under any strain while fitting to the heater.

For heater servicing purposes an approved isolating valve, mounted in an accessible position, is recommended. After connecting, turn on the gas at the cylinder and check the system up to the appliance gas valve for leaks, using an approved leak testing method.

7 CONNECTION TO THE 12V DC SUPPLY

- 7.1 Disconnect and isolate the caravan battery and ensure that the caravan circuitry is not connected to any mains supply.
- 7.2 Connect the 12v loom to the power connector on the electronics housing.
The wires are coloured in accordance with the following code:
Green = positive (+)
White = negative (-)
- 7.3 Connect the wires into the caravan 12v circuit.

WARNING:
CORRECT POLARITY MUST BE OBSERVED WHEN CONNECTING TO THE CARAVAN SUPPLY 12V CIRCUIT, OR ELECTRONIC COMPONENTS MAY BE DAMAGED (see fig 20).

IMPORTANT:
A FUSE OF 5 AMP MAXIMUM RATING, MUST PROTECT THE VEHICLE SUPPLY TO THE IGNITION UNIT, OR THE REAR CONTROL BOX (FANMASTER BUILD).

- 7.4 When satisfactory, reconnect the caravan battery, again observing the correct polarity.

8. CONNECTING THE 230V SUPPLY

- 8.1 Disconnecting the vehicle from any external 230v supply, and turn off the gas cylinders.
- Ensure sufficient cable is used to avoid straining. Ensure all cables are fully secured to the heater control box (Fig 17).
- 8.2 Connect the mains supply cable (PVC sheathed, 3 core, brown, blue, green/yellow) into the rear control box side, with the moulded on right angled plug lead supplied. This lead is of 1.5mm square conductor cross section, 600v grade to BS 6004. This marked as:-
- | | | |
|-----|---------|--------------|
| 'E' | EARTH | Green/Yellow |
| 'N' | NEUTRAL | Blue |
| 'L' | LIVE | Brown |
- 8.3 To supply mains current to the Fanmaster by means of fixed wiring. Lead the mains cable from the Fanmaster to an accessible double pole switched outlet with contact separation of at least 3mm on each pole fused at 10A which is supplied from the output of the MCB which serves the 13A socket.
- 8.4 Before connection check the Fanmaster and its cable for earth continuity and insulation resistance. After connection check the earth impedance
- 8.5 Clip the cable to the caravan structure so that they cannot be disturbed or strained by items dropping behind the heater. Ensure sufficient cable is used to avoid straining. Ensure all cables are fully secured to the heater control box (Fig 17).

9 FINAL ASSEMBLY (non-fan variants)

- 9.1 For Left Hand variants, the blanking bezel should be fitted in the opposite end of the top shelf to which the gas control knob will lie. Press firmly into position (Fig 18). On both Left Hand and Right Hand build only variants, locate the heater case over the top edge of the installation box and the control knob. Press in the bottom of the case to locate on to the installation box (see figs 19 & 20)

For the 2000 FAN MASTER (Right Hand Installation build only)

Connect the loom from the rear control box to the connector on the front case PCB (Fig 21). It would be useful at this stage. to check to operation of both the fan variable speed controller and the igniter. Slide the switch through the range for the fan speeds, ensuring the 12v supply is on. Press the control knob down and turn anticlockwise, a constant 'ticking' will be heard.

- 9.2 For the 2000 FANMASTER (Left Hand Installation variant)

Select the position for the wall switch. Connect the loom from the rear control box, to the wall switch PCB. The loom must be routed carefully to avoid sharp edges and hot surfaces. Secure to the vehicle structure. NOTE: no thermostat is fitted in the remote wallswitch variant, so its position is not critical to heater performance.

Select the wallswitch template and position against the wall. Using masking tape as before, cut the central hole (if a back box is not to be used, and drill at the points required. Screw the switch in place, and connect the wiring loom to the rear.

10 TESTING THE HEATER

GAS

Ensure the gas is turned on at the cylinder and that the vehicle's 12v supply is correctly connected and switched on.

Turn the control knob anti-clockwise to the "F" position and press down. On piezo ignition models, this may be repeated several times until the burner lights as air is purged from the pipework. On 12v "Auto" models, the spark will automatically continue until the burner lights. On Piezo models "P", check through the windows on the lower half of the front case, that the burner is alight. On "Auto" models ("A"), on "FANMASTER" models, a light will come on in the control knob when the burner lights. Hold the control knob down for a further 20 seconds while the flame failure protection device operates, release the control knob and the pilot will remain alight.

Test the "full flame" function by now turning the control knob further clockwise to the desired position.

If the burner does not remain alight, repeat the operation from the beginning of this section. The light in the control knob, if applicable, will go out if the burner is extinguished, for any reason. The function of this light does differ from that of earlier models.

ALWAYS WAIT THREE MINUTES BEFORE ATTEMPTING TO RELIGHT THE HEATER.

To turn off, return the control knob to the "●" position

11.1 TESTING THE HEATER-FANMASTER MODELS WITH TOP SHELF SLIDE CONTROL (Fig 21)

POSITION 1	Off
POSITION 2	Manual fan speed - Temp. control selects speed for cool air distribution.
POSITION 3	1kw electric convector heating, no fan. Temperature control selects desired room temperature.
POSITION 4	1kw electric fan heating, fan remains slow.
POSITION 5	2kw electric fan heating. Fan automatically adjusts speed to suit.

11.2 FANMASTER MODELS WITH OPTIONAL WALLSWITCH CONTROL (Fig 22)

POSITION 1	Manual fan control - fan only and speed variable by control knob.
POSITION 2	Automatic fan control. Speed varies automatically with temperature.
POSITION 3	1kw electric convector heating, no fan.
POSITION 4	1kw electric fan heating, fan remains slow.
POSITION 5	2kw electric fan heating. Fan automatically adjusts speed to suit.

TECHNICAL SPECIFICATIONS

2000 FANMASTER

HEAT INPUT	Max. 1.86kW
HEAT OUTPUT	Max. 1.64kW
HEATING ELEMENT SUPPLY	230v A.C., 8A, 1830W Fused 10A.
FAN & CONTROL SUPPLY	12v D.C. 2.2A Max. 25W. Fused 5A.
AIR DELIVERY	190m ³ /h Max.
SAFETY FEATURES	Thermistors sensing warm air temperature. Over temperature shut down thermostat.
APPROVALS	Fanmaster: EN 60335 pt. 1/2/30 1993
GAS CONSUMPTION (Butane)	Max. 13g/h
EFFICIENCY	Net 92% Gross 85%
GAS SUPPLY REQUIRED	Butane 28mb, Propane 37mb
GAS FEED PIPE	8mm O.D. (Minimum 6mm)
APPROXIMATE WEIGHT	14Kg
DIMENSIONS	Height 512mm Width 518mm Depth 330mm

2000A

HEAT INPUT	Max 1.86kW
HEAT OUTPUT	Max 1.64kW
IGNITOR SUPPLY	12V D.C. Fused 5A
SAFETY FEATURES	Flame Failure protection device on gas control
APPROVALS	B.S. 5258 pt. 13 1986
GAS CONSUMPTION (Butane)	Max. 136g/h
EFFICIENCY	Net 92% Gross 85%
GAS SUPPLY REQUIRED	Butane 28mb, Propane 37mb.
GAS FEED PIPE	8mm O.D. (Minimum 6mm)
APPROXIMATE WEIGHT	11Kg
DIMENSIONS	Height 512mm Width 518mm Depth 195mm

2000 P

HEAT INPUT	Max 1.86kW
HEAT OUTPUT	Max 1.64kW
IGNITION	Piezo
SAFETY FEATURES	Flame Failure protection device on gas control
APPROVALS	B.S. 5258 pt. 13 1986
GAS CONSUMPTION (Butane)	Max 136g/h
EFFICIENCY	Net 92% Gross 85%
GAS SUPPLY REQUIRED	Butane 28mb, Propane 37mb.
GAS FEED PIPE	8mm O.D. (Minimum 6mm)
APPROXIMATE WEIGHT	11Kg
DIMENSIONS	Height 512mm Width 518mm Depth 195mm

USER INSTRUCTIONS:

2000 SPACE HEATER RANGE

IN THE EVENT OF A GAS LEAK, IMMEDIATELY TURN OFF ALL APPLIANCES AND THE GAS SUPPLY AT THE CYLINDER. CONTACT YOUR NEAREST APPROVED SERVICE AGENT WITHOUT DELAY.

1.0 PLEASE READ THESE CAUTIONS BEFORE USING THE HEATER.

- 1.1 The gas supply to the heater must be from an approved pressure regulator of adequate capacity. Under **NO** circumstances should an industrial or adjustable regulator be used on caravans.
- 1.2 The heater **MUST NOT** be operated while refuelling or when the vehicle is in a confined space such as a garage. The heater **MUST NOT** be used if the flue has been damaged. The heater must **NOT** be used while the vehicle is in motion.
- 1.3 The products of combustion pass through the vehicle floor and requires unrestricted air entry beneath the vehicle into which it is fitted.
- 1.4 A minimum of 3 sides of the vehicle **MUST** be exposed at all times. This is to allow for dispersal of the underfloor combustion products. If there is a possibility of the sides becoming blocked by snow or mud, then the heater **MUST NOT** be used. Every effort must be made to clear obstructions before use.
- 1.5 There **MUST NOT** be a mantelpiece or shelving sited above the heater.
- 1.6 Curtains **MUST NOT** hang within 150mm of the sides of the heater, or within 300mm about the top of the appliance.
- 1.7 **DO NOT** place furniture or upholstery closer than 5mm to the sides of the heater.
- 1.8 Where children, the elderly or the infirm are present, we recommend that a guard be fitted around the heater when in use.
- 1.9 Always wait three minutes before attempting to relight the heater after switching off or the heater going to fail safe shut down.
- 1.10 **DO NOT** obstruct the gap at the bottom of the heater or the outlet grille slots.
- 1.11 This heater does not contain any asbestos or asbestos related products.
- 1.12 Aerosols and highly inflammable materials **MUST NOT** be stored in compartments behind or adjacent to the heater.
- 1.13 These heaters must be switched off and the gas supply turned off while the vehicle is in motion.
- 1.14 When the heater is first used, it is recommended that you open a window or door and turn the temperature setting to maximum for one hour. This will allow any odours when first using the appliance to escape. **NOTE:** If odours persist, contact your local dealer.

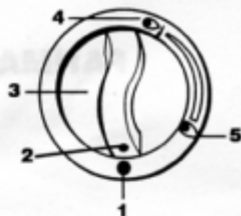
2.0 SERVICING

- 2.1 In order to ensure that your heater continues to operate effectively, you will need to arrange for it to be serviced at least once a year by a competent and trained service engineer. By law no one is permitted to deal with the installation and servicing of gas appliances unless they have proven competence. Contact your nearest authorised caravan dealer if service or repair is required.

3.0 TO LIGHT AND ADJUST THE HEATER - OPERATION ON GAS ONLY

(Right hand installation shown)

- 1 OFF
- 2 INDICATOR LIGHT
- 3 GAS CONTROL KNOB
- 4 LOW/IGNITION
- 5 HIGH



3.1 BEFORE LIGHTING THE HEATER

Ensure the gas is turned on at the cylinder

3.2 LIGHTING THE HEATER

2000P and 2000FANMASTER (Piezo Ignition)

- 3.2.1 Press the control knob down and turn to the "f" position, and then press firmly downwards. A click will be heard as the igniter operates, to light the heater. If a gas cylinder has been replaced, it may require several operations of the igniter to light the flame. Observe through the viewing windows on the lower half of the front case, that the burner lights.

2000A, 2000 FANMASTER (12v "Auto" Ignition)

- 3.2.2 As above, turn to the "f" position and press firmly down. A continuous ticking will be heard, as the spark generator is actuated. An indicator light, built into the control knob will light up when the flame is lit.
- 3.2.3 Continue to hold the knob down for 20 seconds and release. The flame supervision device will now have been actuated. The knob can now be released and adjusted to the desired setting as marked on the heater top panel.
- 3.2.4 If the burner is extinguished for any reason, or fails to remain alight, the heater will shut down to a safe condition. In the case of the 12v "Auto" ignition models (2000A and 2000 Fanmaster with this ignition device), the continuous ticking of the spark generator will be heard until turned off.
- 3.2.5 To turn off the heater at any time, turn the knob to the "O" position.

- 3.2.6 Wait for at least three minutes, after shut down, before attempting to relight these heaters.

3.3 ELECTRIC HEATING-FANMASTER MODELS ONLY.

CAUTIONS





- 3.3.1 Read the operating instructions before using the Fanmaster
- 3.3.2 Read the operating instructions for the Carver gas heater before using it in conjunction with the Fanmaster.
- 3.3.3 One or more duct outlets must be open whilst the Fanmaster is in use.
- 3.3.4 The 230v external supply to the vehicle must be isolated whilst the caravan or motorhome is in transit.

3.4 GENERAL DESCRIPTION






- 3.5 The Fanmaster is an automatically controlled fan designed to distribute warm air around the caravan.
- 3.6 All of the functions of the Fanmaster are controlled independently of the gas control - by front case slide switches on 2000 FANMASTER when 'Right Hand Only' build is specified (Fig 23), or by wallswitch control if the front case style is specified for left hand installation (Fig 22).
- 3.7 The air is heated either by the Fanmaster's own electric element or by the Carver gas fired heater. Both the Carver gas heater and the Fanmaster can be used at the same time providing the fan is in operation.
- 3.8 The built in elements are automatically or manually switchable between 0, 1kw, and 2kw and require a 230v AC mains supply drawing a maximum of 8 amps at 2kw. The fan requires a 12v DC supply and will take 1.5A at maximum speed.
- 3.9 When using electric heating the caravan temperature is regulated by the thermostat mounted at the top of the installation box but when using the gas heating the temperature is controlled by the gas heater thermostat. The night setting is a 1kw convector heater setting. In the summer the fan may be operated without any heat input to distribute cool air.
- 3.10 The Fanmaster has an air deflector allowing the majority of air to be directed down one fan outlet. For example down the longest ducting run. This may have been preset on installation.
- 3.11 The duct outlets are generally of the butterfly type and may be opened or closed by twisting the disc in its housing. Directing of flow can also be achieved in this way. One outlet on each leg of the duct layout must be kept open.

FANMASTER CONTROLLER OPERATIONS

FANMASTER CONTROLLER OPERATIONS - SLIDE SWITCH ON TOP SHELF

POSITION	OPERATION (without gas)	OPERATION (with gas)
0	Off	Heater gas convection
	Manual fan speed - Temperature slider or wall switch knob governs the fan speed. For cool air distribution.	Blown hot air distribution manual speed control.
	1kw electric convector heating, no fan. Temperature slider or wall switch knob selects desired room temperature.	Position only for 1kw electric heating, not used for gas heating.
	1kw electric fan heating, fan remains slow.	Gas heating slow speed fan only.
	2kw electric fan heating. Fan automatically adjusts speed to suit.	Gas heating, maximum ¾ full speed fan, reducing automatically to low speed with heater thermostat operation.

FANMASTER CONTROLLER OPERATIONS - WALLSWITCH CONTROL

POSITION	OPERATION (without gas)	OPERATION (with gas)
0	Off	Heater gas convection
	Manual fan speed - Temperature slider or wall switch knob governs the fan speed. For cool air distribution.	Blown hot air distribution manual speed control.
	Automatic fan speed - temperature of heater governs fan speed	Blown hot air distribution with automatic fan speed control
	1kw electric convector heating, no fan. Temperature slider or wall switch knob selects desired room temperature.	Position only for 1kw electric heating, not used for gas heating.
	1kw electric fan heating, fan remains slow.	Gas heating slow speed fan only.
	2kw electric fan heating. Fan automatically adjusts speed to suit.	Gas heating, maximum ¾ full speed fan, reducing automatically to low speed with heater thermostat operation.

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