

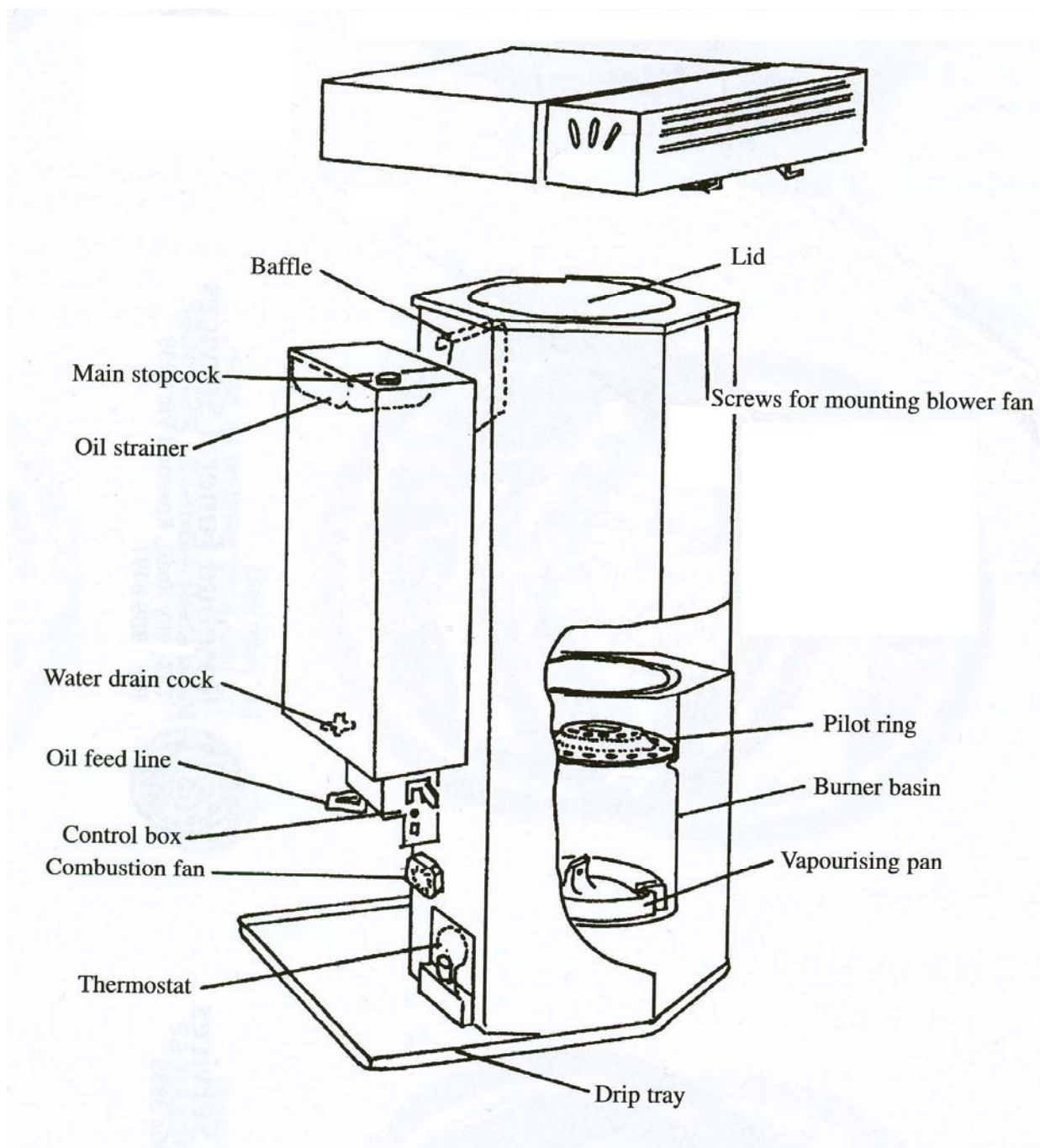
Waste Oil Heater

INSTALLATION AND OPERATING **INSTRUCTIONS**

(including helpful maintenance suggestions)

This manual was NOT written by a deskbound technician. It is in "plain English" and easy to follow.

Please don't file it with all your other owner's manuals and "only read it when all else fails".



Please read it right through before even commencing installation. Take advantage of our experience and you'll get the best out of your Kroll Kozy.

INTRODUCTION

Thank you for choosing a Kroll Heater. Your new Kroll Kozy waste oil heater is guaranteed to function properly and safely if you install, operate and maintain it, according to this "plain English" manual.

Please take the trouble to read it right through, before even commencing installation.

Even though it's mostly common sense, you may pick up some little tip that avoids frustration and inconvenience further down the track.

INSTALLATION

Space Heating Principles

The principle of space heating is that you "fill" your building with a body of warm air. As your Kroll blower fan "pulls" the heat off the furnace and pushes it out, the hot air naturally wants to rise. So whilst there is some extra warmth if you're standing say 3 or 4 metres in front of the blower fan, most of the heat is rising by then.

As it builds up under the roof, the warmth gradually reaches back to floor level.

In high roofed buildings, a slow turning ceiling fan which pushes the warm air downwards can make a tremendous difference.

Most Industrial buildings are not perfectly sealed, and your Kroll can cope with this. But, if you have large ventilators sucking the air out or an open ridge in the roof, then the heat will easily escape as quickly as it's generated. If you want to get the best from your heater, then you'll need to reduce this unchecked heat loss.

Choose A Safe Location

Because of the radiant heat given off from the sides and front of your KOZY, it must not be located within one metre of combustible material, such as wooden wall studs. At the rear of the heater, there is considerably less radiant heat, so 500mm clearance is adequate. However, you will need access to the back to fill the tank, and for routine maintenance from time to time, so this will need to be taken into consideration.

Certainly, highly flammable material such as petrol, thinners, paint, cardboard boxes and packing material must not be stored within 3 metres of the heater.

If you are using your KOZY without the blower fan, then the radiant heat output is higher and ALL the above clearances should be doubled, to be on the safe side.

Assembly

Remove these parts from inside the heater: Oil tank, pilot ring, baffle, lifting rod, and vapourising pans. In the tank you will find the oil strainer, a universal "pick up" tool, the oil feed line, a masonry drill, the aluminum cup, and attached to this manual, the fibre washer that goes between the oil feed line and the pump (plus a spare)

The heater must be on a level surface. The bottom of the heater gets hot enough to scorch a wooden floor, so you must place the drip tray on a pad of bricks, or similar, in such a case.

Sit the heater in the drip pan, so the wide end of the pan is under the oil tank, or what we might call the back of the heater. Hang the stainless steel baffle inside the heater, on the lip above the flue outlet. Hang the tank into the slits on the rear panel. (At the bottom it should rest against the small ledge, not sit on it). Screw the pear fitting at the lower end of the oil feed line onto the oil inlet pipe, and the upper end, using the fibre washer, to the pump outlet under the control box. Plug the five pin terminal into the socket at the back of the control box. Make sure the water drain cock is closed and that the aluminium cup is sitting freely in its seat. When you press it down and up, you should hear the "click-clack" of the microswitch underneath it.

Fitting The Flue

The heater must be connected to a 150mm (6") diameter stainless steel flue, of at least four metres in height. It is important, because it creates a draught which allows the heater to burn properly, enabling smokeless combustion.

The flue consists of a T-piece (which traps any condensation or rainwater that comes down the flue), some straight sections and a cowled "Chinaman's hat" on top. The top of the flue should be in free air. The *cowled* hat ensures that the draught is less affected by strong winds. The top of the flue should extend at least one metre through the roof. If it's near the ridge, half a metre will do.

Fitting The Blower Fan

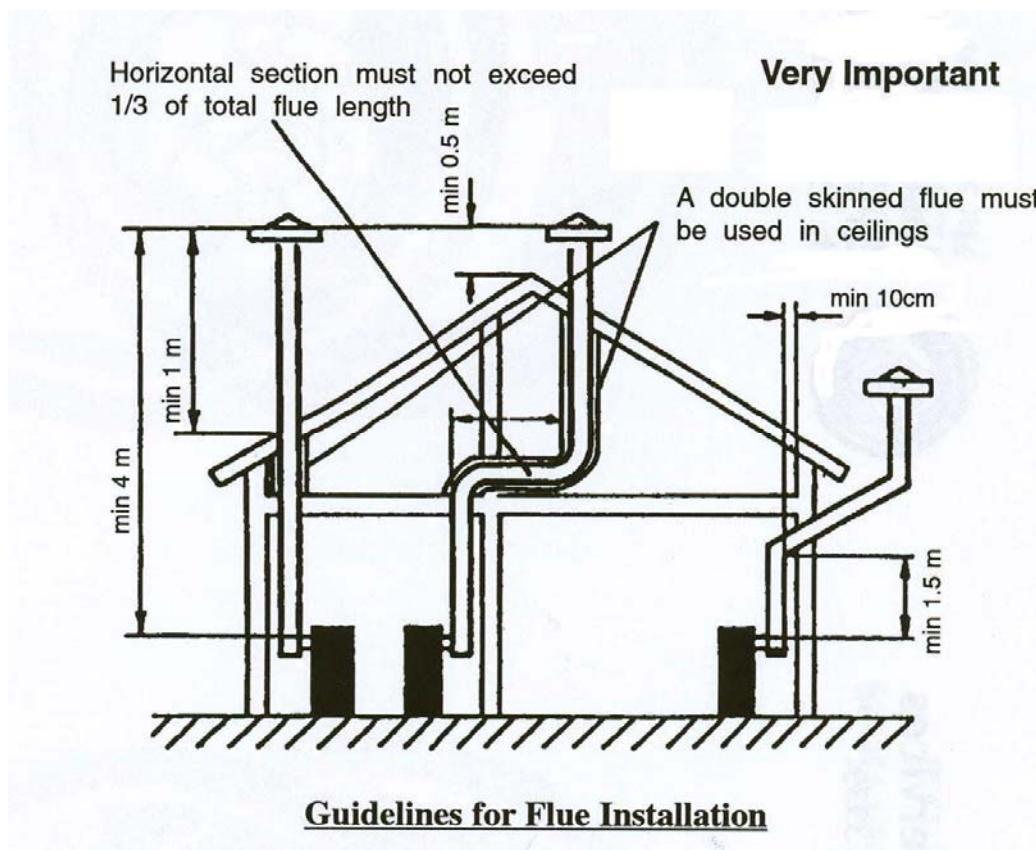
Fit the blower fan in the position as shown on the cover of this manual, using the two phillips head screws which are already in place.

Plug the three pin terminal in, above the five pin terminal. It's quite OK for the red heat resistant lead to hang down outside the heat shield and we recommend securing it to the shield with a couple of wire ties, to prevent snagging.

If you wish to run your heater without the fan, simply unplug it - but you must leave the hinged cover open to prevent overheating damage. In fact, we recommend that you leave this hinged cover open every time you light the heater and only close it once the blower fan starts. This will prevent the fan motor from overheating, if for some reason the fan fails to start in time. Note that the "D" handle on the lid is not actually a handle, but a support for the lid when it is hinged open.

When installing the flue, it is preferable to maintain a good upwards slope, but if you must have a horizontal section, it must not exceed one third of the total flue length.

Because your Kroll is not a temperamental heater, you can bend these guidelines a bit, but it's best to adhere to them where possible. If in doubt, consult your dealer.



If the length of your flue is more than 5 or 6 metres, it's possible that the draught will be too high. This means too much heat may be "sucked" out of your KOZY, and lost up the flue.

This can be easily fixed by fitting a simple draught control device. Contact your Kroll agent for details.

We recommend that the overlap on the flue section connections is such that any moisture from condensation running down the inside of the flue does not leak to the outside, because it will cause unsightly streaks. If the appearance doesn't bother you, suit yourself. Air-tight flue connections are not critical. For joins outside the roof - use silastic to stop water entering the flue at the joint. The heat and upwards movement of the flue gas means the pressure in the flue is slightly lower than the pressure outside, so flue gas doesn't leak out. But you shouldn't have big gaps, or the air will be drawn in and affect your draught.

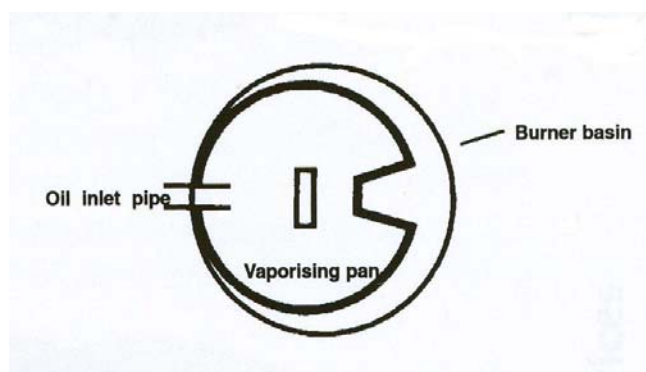
The flue gets very hot. If you're going through a ceiling, you must use a double skinned flue for that section. *If your flue is likely to be touched by the general public (kids in particular), we strongly advise a heat shield. In fact, we recommend it for almost all installations.*

For a good, simple weatherproof seal where the flue goes through the roof, we recommend a DEKTITE DFS 160-220 RE "rubber" roof collar. We recommend the SILICONE RED dektite, rather than the black one, as it has a better heat and UV resistance.

You should strap or secure your flue to support the vertical weight, so it's not being supported by the heater. Not only does this take the load off the outlet spigot (which could otherwise eventually distort), but it enables you to take your heater away in Summer and just leave all or part of the flue hanging there, if you wish.

OPERATING PROCEDURE

- 1 Plug it in (240V).
- 2 Using the lifting rod, lower a clean vaporising pan into the burner basin, past the oil inlet pipe. Rotate it 180° and place as shown in diagram.



- 3 Make sure that the water drain cock is closed, put oil in the tank (always through the strainer) and open the main fuelcock at least 2 or 3 full turns. Keep in mind that really thin oil can seep through the gear pump even if it's not running, so make sure that you close the fuelcock when you switch the heater off.
- 4 Pour 1/3 of a litre of starting fluid into the pan. Use a suitable container, and reach down into the heater so it doesn't splash over the side of the pan. For starting fuel, you can use straight kerosene, diesel or heating oil or, any one of these, mixed with waste oil also works well. Make up a batch of it, so you do not have to do it everyday.
- 5 Using the half circle on the lifting rod, seat the pilot ring on the indented ledge in the burner basin. (*If you picture it as a plate, it goes upside down*)
- 6 The pump must be set on low for starting. To ensure proper engagement,

you may need to reach under the control box housing and turn the pump/motor connection a little, until you feel the lever drop into place.

- 7 Put a small piece of rag (about 100mm x 100mm) in the jaws of the pick-up tool, dip it in the pan, light it, and drop it back into the pan. You will get a little bit of smoke from this, but not for long.
- 8 Place the cast iron lid on top.
- 9 Switch the on/off switch to ON. (This switch is opposite to the "norm". It's OFF when the orange coloured O is visible.) All that happens at this stage is that the small black combustion fan will start.
- 10 After about 10 minutes, the starting fuel will generate enough heat for the

- b) The stopcock is not usually used as a metering device. It is usually fully open or fully closed. However, you can restrict the flow by finding a partial opening point where the pump is delivering about 2 litres an hour. Use LOW only.
- 12 Run on the LOW setting for 20 minutes before turning off. To turn the heater off, put the switch in the OFF position and close the main stopcock. After about 15 minutes, the flame will go out and the heater will gradually cool down. When it does, the thermostat which switched the blower fan on, will switch it off.

WARNING

Please make quite sure that ALL MEMBERS are aware of the

DANGER OF EXPLOSION

if they try to re-light the heater while it is still hot, or even warm.

This situation usually arises when the heater has gone out unexpectedly, or failed to start for some reason.

IT IS PERMITTED TO HAVE A BEHEATING COOL DOWN BEFORE REHEATING

If you pour some starting fluid into a warm pan, it will start to vapourise (ie. Turn to gas) immediately, and you will have an explosion when you attempt to light it, it's no different to leaving the gas on in your kitchen oven for 10 minutes, and then trying to light it.

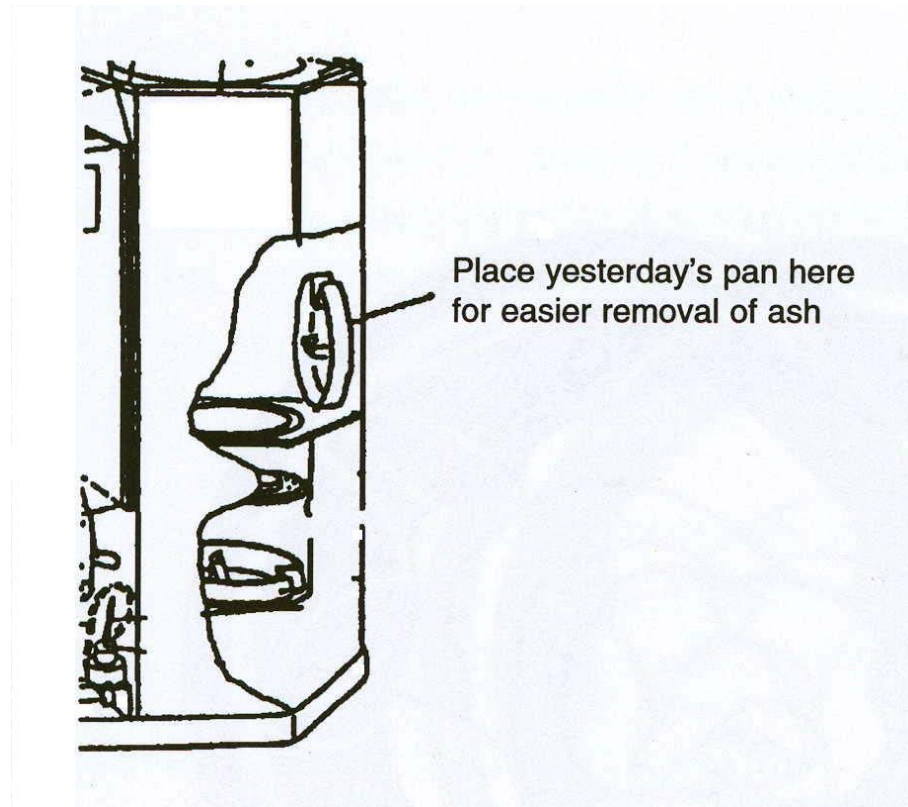
CLEANING AND MAINTENANCE

When you burn waste oil in your kroll, there is no smoke or fumes, but you will get an accumulation of ash in the vapourising pan. The amount of ash you get depends upon how "dirty" your waste oil is - eg. Very thick, black oil from old diesel engines leaves lots of ash. Used transmission oil leaves very little.

On a typical day, before starting your heater, you will take out "yesterday's pan"

and put in the clean one. At some convenient time, you can clean yesterday's pan, ready for tomorrow.

If you are finding some of the ash is difficult to remove, you can, after scraping out the "easy" stuff, place yesterday's pan back in the heater, on its side, on the ledge. The heat turns that stubborn carbon into a whitish powder which is easy to remove.



The principal of operation of your KOZY is that waste oil trickles onto the very hot cast iron pan and vapourises.

If there is a thick layer of ash and solid carbon covering most of the surface, then the oil will not vapourise properly and you will get incomplete combustion, wet oil, smoke and a mess inside your burner basin.

So, it's important that you clean the pans properly.

You also need to work out how much ash accumulates in the pan each day. If the pan is too full and there is a bit of wet oil present, you may need to switch it off earlier each day and/or run it on LOW only.

If the *burner basin* needs to be cleaned, because of excessive build up in the bottom and on the wall, the best way is to take it out of the heater. This is not a difficult task if you follow these steps.

1. Unplug the power at the power point and disconnect the five pin terminal.
2. Remove the oil feed line, taking care not to lose the fibre washer.
3. Remove the aluminium overflow cup.
4. Remove the pan it sits in, but place it aside carefully, because it is still attached to the combustion fan.
5. Remove the oil inlet pipe and gasket, which is held to the back of the burner basin by two 6mm nuts (10mm socket required).
6. Remove the three phillips or hex head screws around the rim of the burner basin, and lift it straight up. It's possible that the three screws (two on the rim, and one on the small rectangular plate), have deteriorated in the heat, and you may have to drill them out.

When refitting the burner basin it is very important that it is screwed down again and seals fairly well around the rim.

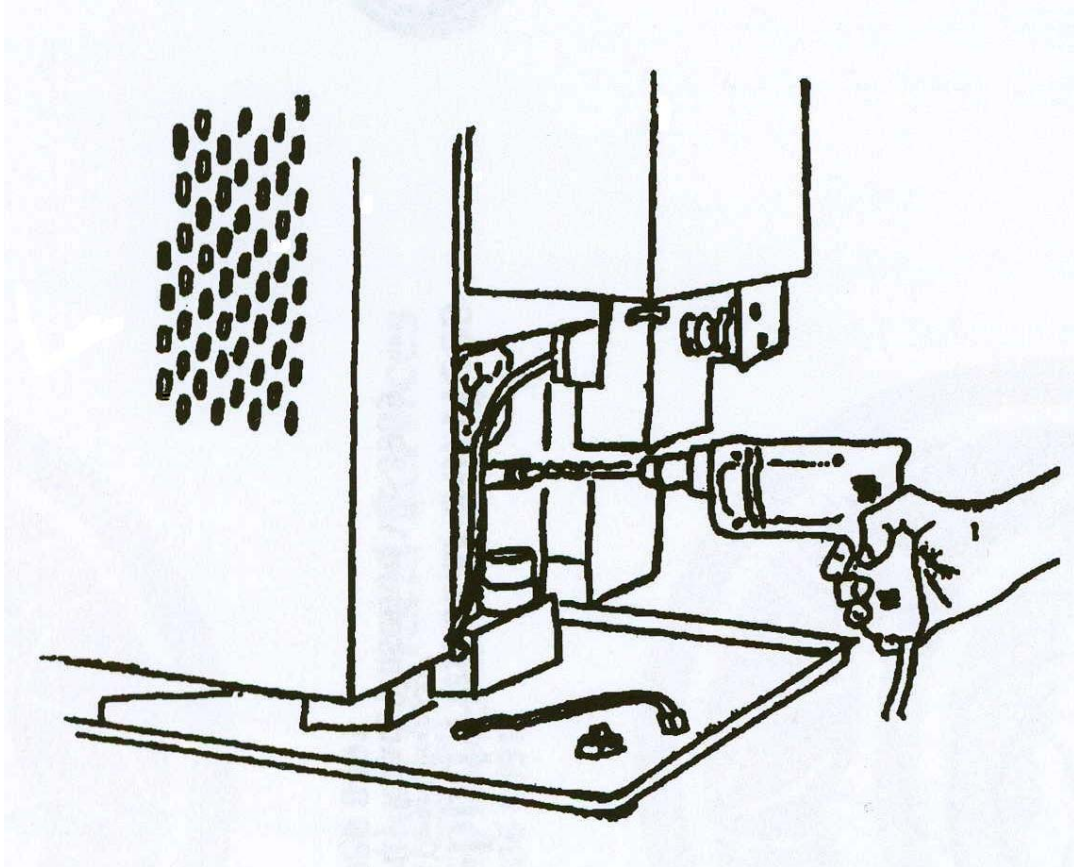
The combustion air that is being induced into the cavity around the burner basin *must* go through the holes in the burner basin to ensure good combustion. If this combustion air can find an easier path around the rim, your KOZY will not burn cleanly.

This "major" cleaning of the burner basin should not be necessary more than once or twice each winter.

Also, depending on your waste oil, you may need to ream out the oil inlet pipe using the masonry drill supplied. Carbon will build up inside, starting with the hot end, eventually blocking it completely. To reduce this build up, each time you're taking out the pan, poke the end of the lifting rod into the pipe, and jiggle it around a bit.

Once or twice each Winter, it will probably be necessary to remove the big nut, and run the masonry drill through from the outside.

You should also poke a stiff piece of wire through the overflow pipe occasionally, to make sure it's not blocked.



Sludge Build-Up In Tank

Depending upon the quality of your oil, you may get a gradual build-up of sludge in the bottom of your Kroll's oil tank. We recommend that at the end of the season, you run the tank empty, remove it from it's mount, and flush out the sludge with a bit of kerosene. Leave it empty over Summer.

Inspect Pans Regularly

The cast iron vaporising pans should last 2 or 3 Winters depending on usage. Harsh treatment or dropping them can shorten their life. DO NOT USE CRACKED OR BADLY DISTORTED PANS.

A FEW TIPS ON OIL QUALITY

Your Kroll Kozy will burn just about any kind of oil, but the better it is, the less maintenance you have to do on your heater.

The best waste oil is transmission oil. The worst is from diesel engines that do a lot of work between oil changes. Oil from diesels is OK if it's been changed regularly, but if it's very, very dirty, then it will leave a lot of ash. But even the worst oil can be used, if it's mixed with better waste oil, or say 10 to 1 with new diesel fuel or heating oil. Alternatively, if it's allowed to settle for 6 weeks or so, the top half becomes quite good and it gets progressively worse as you go down. So we suggest storing your waste oil over Summer, so it settles, and then discarding the last 10% or so, of each drum. This gets rid of excessive water also.

Your Kroll is fairly tolerant of a bit of water in the oil, but it's best to check and drain it off through the water drain cock, on a regular basis.

It also pays to check both the fans for build up of dirt and lint on the blades, and clean them if necessary.

REMOTE OIL SUPPLY

Waste oil makes a terrible mess if you spill it. It's like black paint. So, please take some trouble to set up an organized supply procedure to the heater. We can suggest:

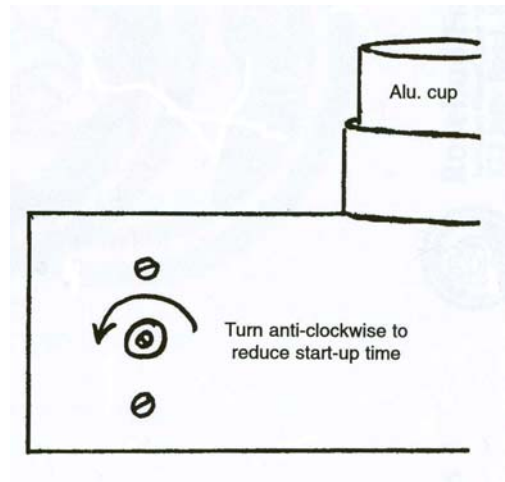
- a) A 205 or 60 litre drum, with a pump and hose, near the heater
- b) A watering can.
- c) A remote tank with a manual or automatically switched electric pump.
- d) A remote tank with a gravity supply "top-up" system.

PROBLEMS and PROBABLE CAUSES

#1 H - .

The overflow cup may have some oil in it, causing it to press down on the micro switch. Oil can accumulate gradually in the cup from "splashing" inside the furnace, or if spillage occurs down the back of the heater while filling the tank.

- a) Heater not switched on at PowerPoint, or at the ON/OFF switch.
- b) Not enough starting mixture.
- c) Faulty thermostat. This is most unusual, but it can happen. It may only need adjusting. If the thermostat does not switch on after 10 minutes (and you are sure that everything else is correct), it may need a minor adjustment. Remove the rubber plug (between the 2 screw heads) in the overflow assembly housing (near aluminium cup). With a small screwdriver, turn the thermostat adjusting screw, very cautiously, anti-clockwise, to reduce the start-up time, (ie, the time elapsed from when a good flame is established in your starting fluid, to when the thermostat switches on.)



It won't need much adjustment. It is very important that the start-up time is not less than 8 minutes.

#2 H - .

- a) Main stopcock still closed.
- b) Too much water in the bottom of the oil tank.
- c) Tank Empty.
- d) High/low selector not engaged properly. You can check if the pump is turning by feeling under the control box with your finger, after the thermostat has started the motor.
- e) Grit in pump. This happens quite rarely, because anything that will go through the tank strainer will go through the pump. But if a bit of oil slops in over the side of the strainer, it's possible some grit can jam the pump. Usually your attention is drawn to this because it makes a graunching noise. Sometimes you can free it up by switching it off, then turning the pump back and forth by hand.

Alternatively, it's very simple to remove and clean the pump. First, turn off the main stopcock. Then unscrew the oil feed line, undo the two bolts holding the pump to the control box, and pull down on the pump, to draw it out of the oil tank spigot. Remove the four screws in the pump, and both gears will

come out for easy cleaning. Depending on what you find, it might be best to clean out your oil tank and start again. Take care, when refitting the pump, that the pin and the slot on the coupling discs are lined up.

- d) Blocked oil inlet pipe. See the "Cleaning and maintenance". If you suspect that this is the problem, take care when unscrewing the oil feed line, because it may contain hot oil under slight pressure.

#3 H .

- a) Tank Empty.
- b) Oil in overflow cup- See 1(a).
- c) Grit in pump - See 2(a)
- d) Too much water in oil. Uneven burning and a hissing sound are signs of water.

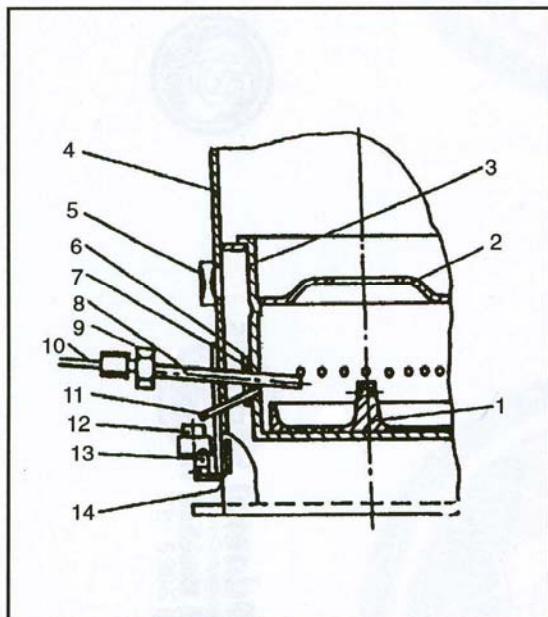
#4 O and/or the ash in the pan is wet and tar-like instead of dry and crusty.

This indicates *incomplete* combustion, which can be caused by:

- a) Insufficient draught. Is the flue in good condition and breathing freely? Very strong winds can sometimes cause a down draught. A special anti-down draught hat may be required in extreme cases
- b) Combustion fan faulty. Is it spinning normally? Does it need cleaning? It's surprising how lint and dirt can build up. Remove fan for thorough cleaning.
- c) Non-combustible waste oil. It's rare but some modern synthetic oils, don't burn well. A good test is to drain the tank and try again with a "known" batch of waste oil.
- d) Crack in pan. Inspect closely. Even a very fine crack will open up at high temperatures. Cracked or damaged pans *must not be* used.
- e) Holes in burner basin blocked preventing adequate flow of combustion air.
- f) Split or "burned away" burner basin, allowing excessive and uneven combustion air.

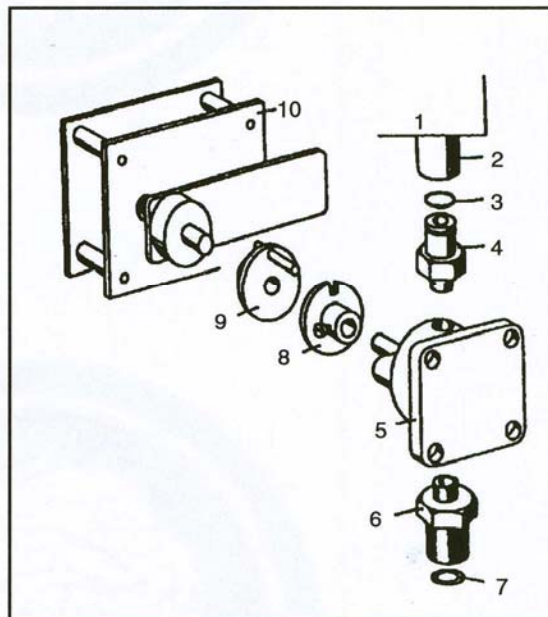
Too much ash in pan. It's simply overflowing. See MAINTENANCE. You may need to reduce the running time between swapping pans and/or run only on LOW.

Some contaminants in waste oil can cause the ash to "froth-up" where the oil hits the pan. This ash can spill over the edge, even though the pan is not full. To overcome this, put a bit of steel or some suitable packing of about 3mm thickness, under the pan so it's sloping away slightly from the inlet pipe.



Oil inlet pipe with overflow cup

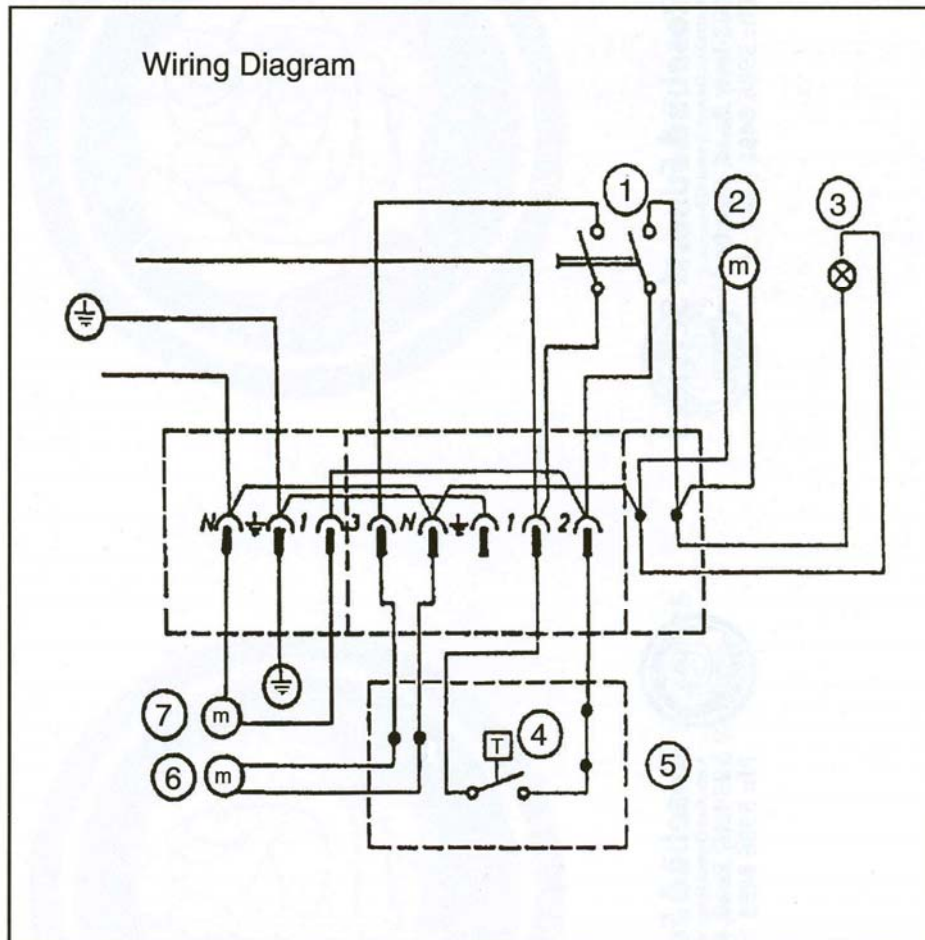
- 1 Vapourising pan
- 2 Pilot Ring
- 3 Burner Basin
- 4 Combustion Chamber
- 5 Combustion Fan
- 6 Oil inlet pipe mounting flange
- 7 Gasket for inlet pipe flange
- 8 Oil inlet pipe
- 9 "Big nut"
- 10 Oil feed line
- 11 Overflow pipe
- 12 Aluminium overflow cup
- 13 Microswitch
- 14 Thermostat



Motor with gear pump

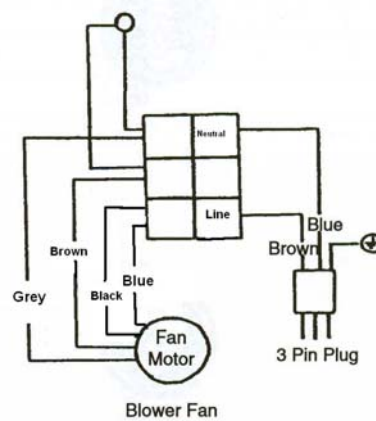
- 1 Oil tank
- 2 Oil tank spigot and stopcock
- 3 O-ring
- 4 Upper adaptor
- 5 Pump
- 6 Lower adaptor
- 7 Fibre washer
- 8 Drive coupling disk with slot
- 9 Drive coupling disk with pin
- 10 Motor and HIGH/LOW selector

Wiring Diagram



- 1 ON/OFF Switch
- 2 Pump Motor
- 3 Indicator light
- 4 Thermostat
- 5 Microswitch
- 6 Combustion air fan
- 7 Blower fan

Capacitor 2 u F



Kroll HEATERS AUSTRALIA

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