

Supplementary service note for Kenlowe engine pre-heaters up to 2002 model inclusive.

The enclosed sheets explain how to dismantle, clean out and re-prime the combined heater and pump model. Service parts are limited and care should be exercised to retain 'O' rings for re-use where possible. Thermostats for heaters produced with a separate control in the heater head, which is retained by a spring clip, are available if required.

You may wish to try and clear any stubborn air or sediment build-up that is affecting pump operation prior to dismantling - it is not uncommon on units not run periodically in the Summer for silt to build up in the pump, which will affect operation at the start of the new season. However, when attempting to re-prime you will find it beneficial (with the aid of extra hands) to give the appliance body a sharp knock with a wooden mallet to try and dislodge any sediment build-up, running the engine and blipping the throttle will help purge the pump using the power of the engine's water pump. In short, if the priming procedure is done concurrently the shock to the body and blipping the throttle all at the same time, you stand the best chance of freeing the pump and avoiding stripdown. Remember when priming that you need to push the bleed hose fully home and secure the jubilee clip before turning the engine off.

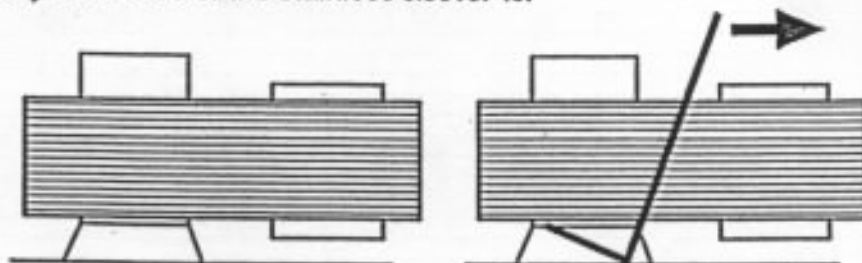
The shaded pole magnetic field of the assembly's pump cannot burn out even if it is not currently working, so restoring pump operation can ultimately be a matter of freeing the pump from sediment build-up or foreign matter that has settled in exactly the wrong place !

During peak season service opportunities at the factory are limited and potentially expensive and we therefore recommend that you carry out the procedures outlined above and in the enclosed rather than return the appliance to us.

## Kenlowe Hotstart engine preheating service/repair/update

To adapt original heater element to new Jan.1999 heater element or to provide heater or pump in field service or repair

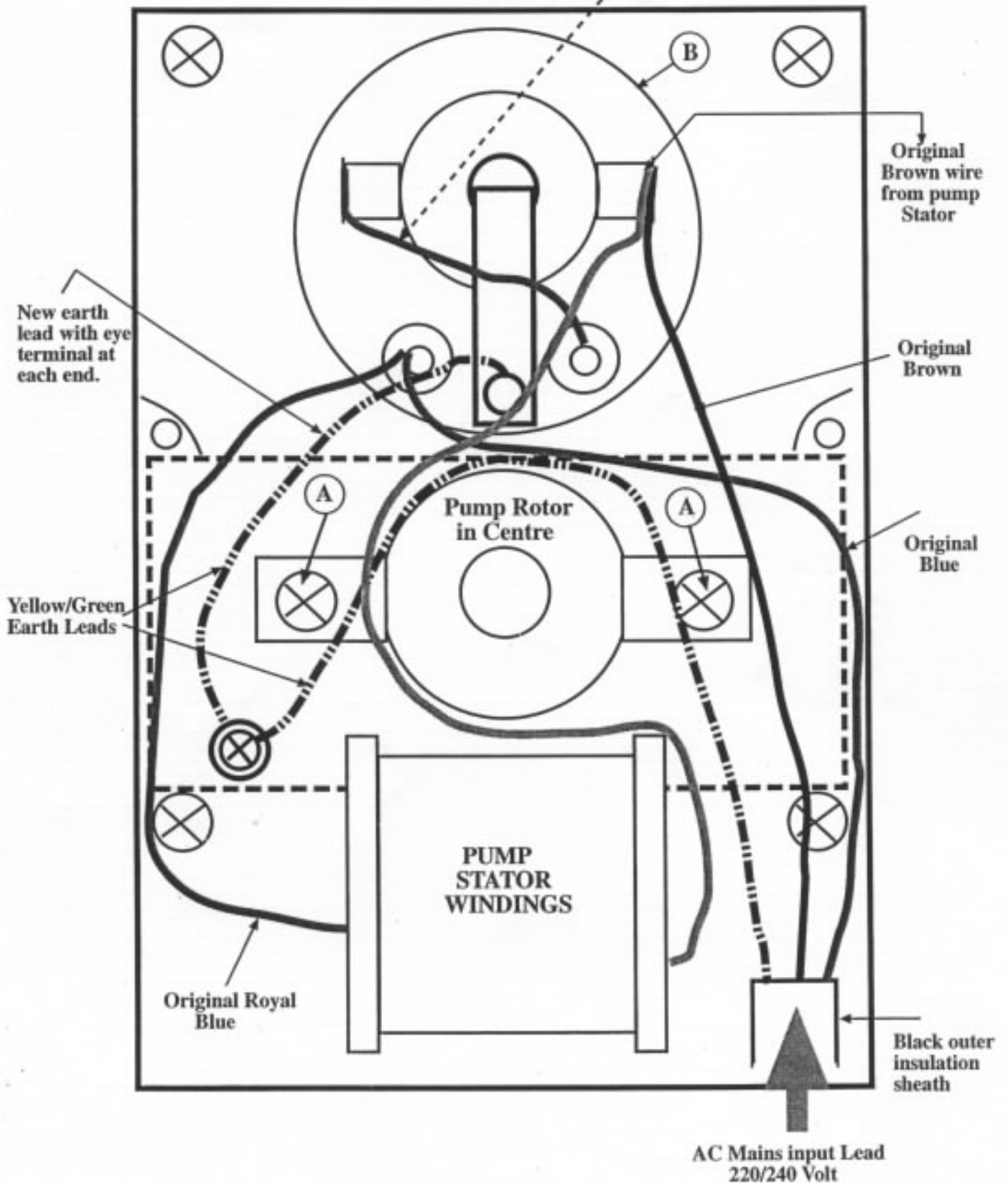
1. Remove brown insulated back plate.
2. Remove central gold circlip from pump rotor centre chamber and lift top plastic retaining ring away after unscrewing the two retaining lug screws 'A' in the diagram over leaf.
3. Disconnect wiring from old heater.
4. Pull pump stator laminations vertically up off the thin wall stainless steel central core - avoid distorting the stainless steel tube by not using off centre leverage! Two right angle strips of metal help to exert upward lift centrally either side of the stainless sleeve. i.e.



5. Release the 4 Phillips head screws that hold the front 'wet' section casting to the back 'dry' section casting so that you can separate the two halves of the appliance.
6. Using an appropriate socket undo the black plastic nut holding the heater element in place marked 'B' in diagram over leaf.
7. Reassemble the new heater using new 'O' ring and the new slightly thinner black plastic nut supplied with service pack - tighten fully.
8. Check pump rotor shaft rotates freely - if not pull the impeller off the shaft and turn the shaft with mole grips or similar - if sediment has built up inside the stainless steel central chamber pull the black plastic rear bearing housing out of the stainless steel sleeve - it seals with an 'O' ring so pull out using some effort whilst pushing the spindle down on the bench to help ease the back bearing out of the stainless steel sleeve! (Do not hammer the shaft!) Clean out the rotor chamber and replace front bearing if you have the ability to remove the old bearing. *Bear in mind that you should only consider removing the inner rotor if you are happy to reassemble the new black plastic rear bearing housing into the stainless steel sleeve which is moulded into the main appliance casting! (You have to be sure of a watertight fit for the 'O' ring inside the sleeve and you have to be able to pass the pump stator laminations back over the stainless steel sleeve).*
9. Spray WD40 onto the shims at each end of the rotor laminations around the shaft before reassembling in reverse order the rotor into the central chamber, ensure you have 1-2 mm shaft end float on reassembly. *(Use 2 X 50 thou shims on long end of shaft and 1 X 15 thou on the short end).*
10. Fit the sensor in the brass head recess and hold in place with the spring blade by threading a brass nut part way down the thread and securing with the silver nylock nut *(See note 11 first)*.
11. Using the new green/yellow earth lead with an eye terminal at each end - place one end under the nylock nut on the 4mm stud as diagram and connect the black linking wire between one leg of the element electrode and one side of the new temperature control switch as the diagram.
12. Prime the appliance before using the 'Hotstart' electrically - this equipment has a recirculatory pump not a pressure pump, so that coolant can pass unhindered through it when not in use! (Recirculatory pumps need to be manually primed - they will not self prime like a pressure pump) priming is necessary each time the system is drained i.e. during initial or recommissioning/installation or during any system drain down or opening such as unrelated service by a garage when replacing antifreeze, hoses, engine thermostat etc!

# 1999 Appliance Circuit Diagram

A New Black Wire is Provided to Adapt the Old Circuit to New Temperature Sensor - Links Sensor With New Heater Element Terminal



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## Kenlowe Hotstart Priming/Filling and Commissioning Guide

Please read all these instructions before using your appliance.

**This is not a self priming pump it is a re-circulating pump and needs manual priming.**

Manual priming also needs to be done after any cooling system work i.e. if hoses, antifreeze, engine thermostat replaced - radiator or engine involved in a full/partial drain down or if coolant is more than 18 months old and has any evidence of sediment build up - drain and refill with fresh coolant. This equipment deserves fresh new coolant - the cost will be re-paid with many many years of trouble free service - *it does not have the power in the pump to circulate sludge or gritty substances which can block the pump chamber or bearings!*

Remember to run periodically throughout the year even in the summer just as you would a central heating pump to keep it free of sediment build up which will settle in the pump and stop it working when you next need it!!

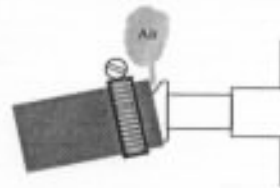
Mount the appliance as low as possible - try and avoid a position that is higher than the cylinder head or the radiator top hose as this will mean more effort is needed to prime the pump before you first use it! (i.e. you would have to either fit a small bleed screw into the highest point of the hose run or prime the appliance whilst suspending it low down hanging on the hoses before lifting to its prepared mounting point!)

Antifreeze must be used with the largely aluminium Hotstart for the same reason that it is essential for your aluminium engine, antifreeze contains an inhibitor which stops corrosion! This must be at least 33% of your coolant, (some engine manufacturers recommend 50%).

### Priming.

Fill engine with water and antifreeze as normal, run the engine with radiator cap off, blip the throttle and top up with more coolant to replace any air that escapes. Allow sufficient time for the coolant to cycle the engine and heating system so that any air in the system has the chance to escape. Replace radiator cap and with the engine still running but before the coolant is too hot, prime the Hotstart by slackening the top hose clip on the outlet pipe nearest the appliance cable.

Pull the hose far enough back to crack it open so that any air that is stuck in our cast chamber is released!



*Allow for the coolant to cycle the engine and the heater completely before assuming that all the air has escaped! Then push the hose on and tighten the Jubilee clip before turning the engine off! If you are in any doubt that you have not got all the air out, repeat the procedure. Owners installing the appliance may wish to run the vehicle normally for one day before checking the coolant level and re-priming the appliance! (Monitor car interior heater performance provides a constant level of heat output before using the appliance from the mains - on older cars fitted with a valve or tap ensure it is open or the heater in the on position before using the 220V Hotstart!) A brief period of reduced heat air is indicative of air going round!*

Stay with the appliance during the first period of use to monitor that the appliance is heating and pumping continuously and therefore the priming of the pump has been effective! *If the heater clicks out after around 1 minute and the heat has not travelled all the way down the outlet hose into the the engine the priming has been unsuccessful and you should avoid a repeated dry boil by going back through the whole engine and appliance priming procedure as already outlined.*

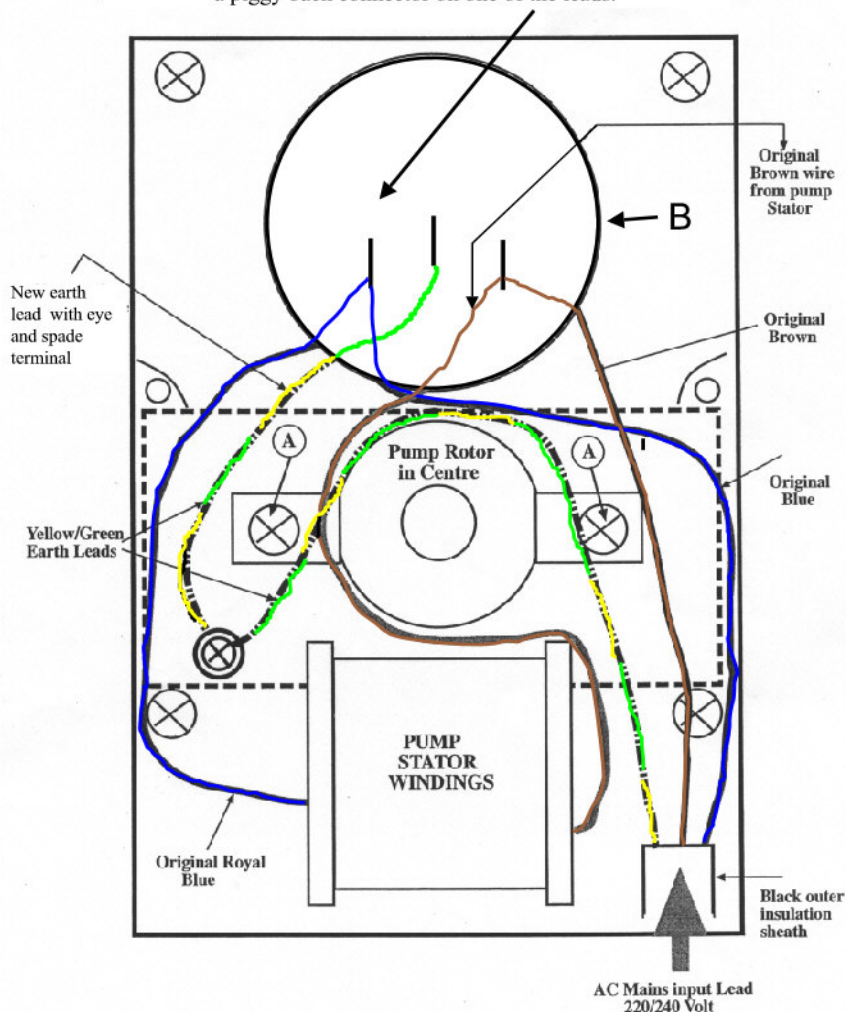
If you are in any doubt as to if the pump is running or the heater is heating, check the following.

The pump sounds like a turbine or submarine especially if you put the butt of a screwdriver in your ear and the blade on the appliance body! *(The pump should run all the time the electric is connected even if the heater has switched off!)* Obviously you know by the appliance body temperature if the heater is working or not but you may need to stay with the vehicle on the first cycle to ensure the system and the priming is effective - temperature will only build up if continuous heat is put in. (If the pump is not fully primed the heat can become very hot in the chamber before it can be efficiently distributed which causes the safety sensor to cut out the heater with the result that heater cycles on and off which means the temperature fails to build up! Similarly you should establish the time it takes for the equipment to heat your particular engine and switch it on before your required departure accordingly. *This ensures that you depart at the top of heating cycle instead of the bottom!*



## HOTSTART COMBINED HEATER/THERMOSTAT

Where two leads attach to a terminal use a piggy back connector on one of the leads.



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