COOLANT THERMOSTAT/HEATER FAILURE
Information Sheet

On any thermostatically controlled coolant heating system which relies on circulation by means of convection, it is necessary to ensure that the installation is such that there is a sufficient flow across the element/s to transfer the heat from the heater unit to the engine without 'stressing' the heater or thermostat.

In an ideal installation, the flow of the cooler water entering the heater will be sufficient to ensure that the mean temperature within the heater is cool enough to allow the control thermostat to remain switched off, the heat output from the heater equalling the heat loss from the engine. If, as an example, the temperature of the coolant entering the heater were to be 40°C and the temperature leaving the heater were to be 60°C, then the mean temperature would be 50°C, the temperature at which we set the heater thermostat.

If the flow through the heater is reduced for any reason (see below) the mean temperature will increase internally and the thermostat will switch off. On cooling, the thermostat will switch on, and the cycle repeats. Whereas it is normal for the thermostat to occasionally switch, any undue 'cycling' will cause stress and therefore premature thermostat failure, and of course reduces the amount of heat available to be transferred to the engine. You will note that where there is a flow reduction the top of the heater will become unduly hot, as the hot water is not passing fast enough from the heater to the engine, whilst the bottom of the heater remains relatively cool. This increase in upper heater temperature may cause heat stress in the element/s and their eventual failure.

It can be seen that if the flow through a heater is reduced then the coolant entering the heater will tend to be at a slightly lower temperature but the coolant leaving the heater will be at a considerably higher temperature. Tests undertaken on deliberately poor installations have shown that with a standard thermostat setting of 50°C, a somewhat lowered flow can produce an upper heater temperature of even above 100°C, which can cause element coil discolouration, damage and premature heater failure.

It should also be noted that the direct mounting on to an engine of any heater with integral thermostat may in some cases cause vibration damage to the heater unit or more likely the thermostat. The heater should be mounted off a solidly mounted support member or the floor to avoid this potential problem.

Possible causes for element/thermostat failure include: -

1) Air-lock within system caused by either using an incorrect connection or by looping of the hose. Usually top (hot) hose from heater.

2) Blockage in hose or at an engine connection point (usually at bottom hose connection or a sludge trap where there is a dip in the hose allowing deposits to locate).

3) Incorrect top connection being used, with little or no 'head' of water above that connection, or the 'cold feed' connection has been taken from a point ABOVE the 'hot return' connection.

4) The fitting used to connect heater to engine has too small a bore hole, thereby restricting flow.

5) Vibration damage due to heater being directly mounted to engine.

As with any installation, if you are unsure, please contact us. We are happy to discuss any application and recommend alternatives where needed. Please also feel free to take pictures of your installation and e-mail to us for comment (technical@preheat.co.uk). We stock a large range of alternative fittings if needed and can make special fittings usually on same-day despatch basis.

Please see overleaf for examples of flow restriction

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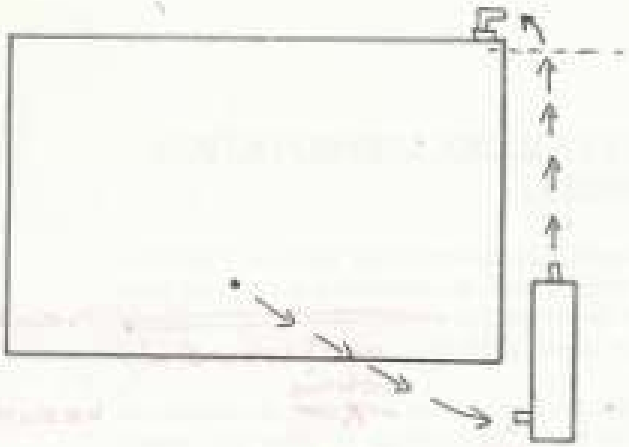
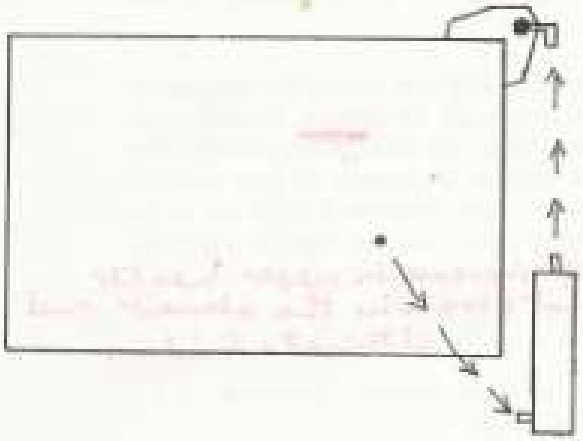
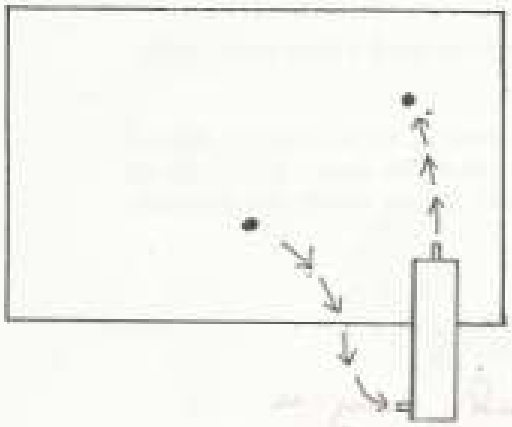


AIR-LOCK IN HOSE AND FITTING, PREVENTING HOT WATER FROM RISING AND REDUCING WATER FLOW



INCORRECT CONNECTION POINT. HOT WATER UNABLE TO RISE FROM CONNECTION POINT, REDUCING WATER FLOW



AN EXAMPLE OF CORRECT INSTALLATION. NO DIPS OR LOOPS IN HOSE. THERE IS A HEAD OF WATER IN THE BLOCK ABOVE THE TOP CONNECTION TO ALLOW HOT WATER TO RISE WITHIN ENGINE

AS ALWAYS, IF IN ANY DOUBT, PLEASE CONTACT US. WE ARE HERE TO ASSIST YOU

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