

Intermittent Blockage of the Cap Tube – Diagnosis and Repair

If you have been experiencing intermittent problems whereby the compressor runs but no cooling takes place, there is a possibility that you have a small piece of debris in the system that is intermittently blocking the entrance to the capillary tube (cap tube). The classic symptom of this condition is that the temperature in the box starts rising, but the compressor continues to run. Turning off and restoring power to the system after a short rest may restore the system to normal running again, but some time in the future the problem will likely return, although this could be minutes, hours, days, weeks, months or even years later. Quite often this condition appears after a rough or boisterous passage. If the problem happens repeatedly, with cooling ceasing after a few minutes run time, then it is probably moisture in the system that is freezing, causing the blockage.

The cap tube looks like a piece of wire, but in fact is a small tube with a micro-bore down the center, and this separates the high and low pressure sides of the system. Any small piece of debris (usually introduced during installation) that finds its way to the end of the cap tube can block it, and so no refrigerant flows even though the compressor is running. Turn the system off, and the pressures equalize which releases the debris and unblocks the end of the cap tube. It's just a matter of luck as to where the offending piece of junk sits in the rest period, and whether or not it causes a blockage on the next cycle. With the boat at rest in a marina, etc., the problem may not surface again until you encounter some heavy weather, and then the debris is disturbed from its resting place to cause havoc and mayhem again. Very frustrating!

So what is the remedy? If the blockage is caused by moisture freezing at the cap tube, then evacuating the system with a vacuum pump may do the trick, but if it's debris that's causing the blockage, evacuating the system may simply relocate it, not remove it. This may prove to be all that is required, but the only true cure is to either add a cap-tube filter (if access allows), or replace the evaporator and install a filter-drier in the liquid line. The filter-drier will stop any more debris getting to the end of the cap tube (the cap tube is integral with the tubing attached to the evaporator). But there is one trick well worth trying. You will need to locate the section of tubing that incorporates the end of the cap tube and orientate that section vertically in the hope that the debris has enough mass to be trapped somewhere and cannot get to the end of the cap tube. The cap tube is run inside the suction tube, and if you follow the tubing back from the evaporator for approx. 9ft you will come across a section where the cap tube exits from inside the suction line. It then takes a few turns around the suction line before disappearing inside a slightly larger tube and then on to a coupling, and it is this area we want to focus on. Once the cap tube enters the slightly larger tube it extends inside it for a few inches, maybe three or four, (it depends on who fabricated it) and so it is this section that needs to be fashioned so that it is vertical. Either way up should work, but I suggest you try first with the cap tube entering from the top, and if that doesn't work try the other way up. A few sharp taps on the tubing with a screwdriver handle when vertical will help to settle the debris. If neither method is successful then there is no alternative but to add a cap-tube filter (a job for a technician), or replace the evaporator and add a filter/drier.

