

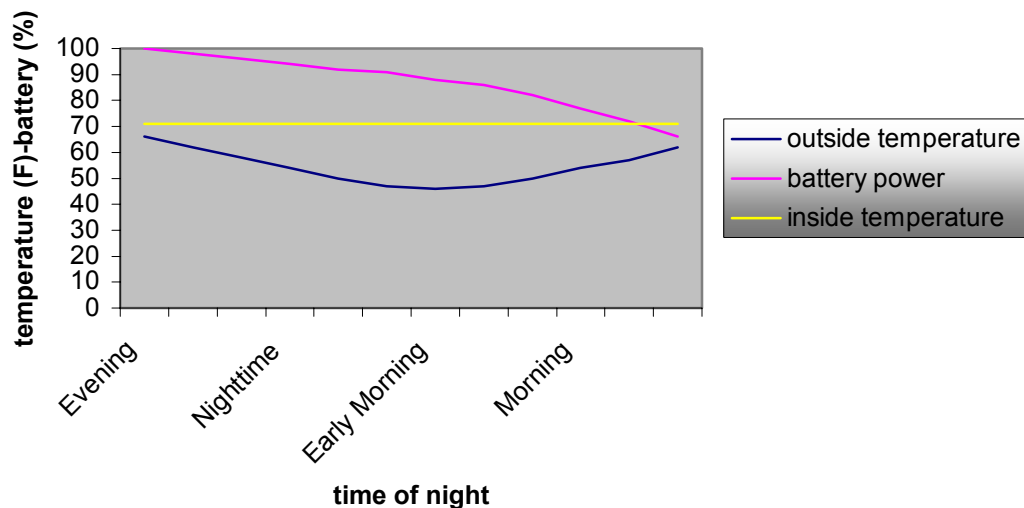
What Does the Camper-Thermostat Do?

Executive Summary

The two biggest problems we encountered with the stock Camper thermostat were that it tended to “short cycle”, and that it would set off the LP Gas Alarm. The first was a constant problem, and the second, while occasional, was a really a nuisance. On closer examination, it became clear that the reason the furnace was turning on and off was because of the thermostat. A household thermostat is shipped with the Camper. Now, a normal house is well insulated, so even if the temperature outside changes quickly, the indoor temperature holds about even. This is not so for a Camper. The instant the furnace turns off, the temperature immediately starts to drop. Then, the furnace comes right back on again. Since the furnace is located right under the bed, this can really serve to disturb one’s sleep.

Now, another real nuisance occurs when the battery runs out sometime during the night. There is an “LP Gas Detector” located near the floor just in front of the refrigerator. This is an important piece of safety equipment, since LP gas is poisonous and a leak could result in great danger. The LP Gas Detector is located low and out of the way since LP gas is heavier than air, and in the event of a leak would sink to the floor first. If gas is detected, a loud alarm is sounded. The LP Gas Detector is powered by the marine battery located under the bed. If the battery runs low, the alarm chirps (just as a smoke alarm does when its battery runs down). This is the same battery that powers the fan and the ignition in the furnace. So, running the furnace can set off the LP Gas Detector’s chirping!

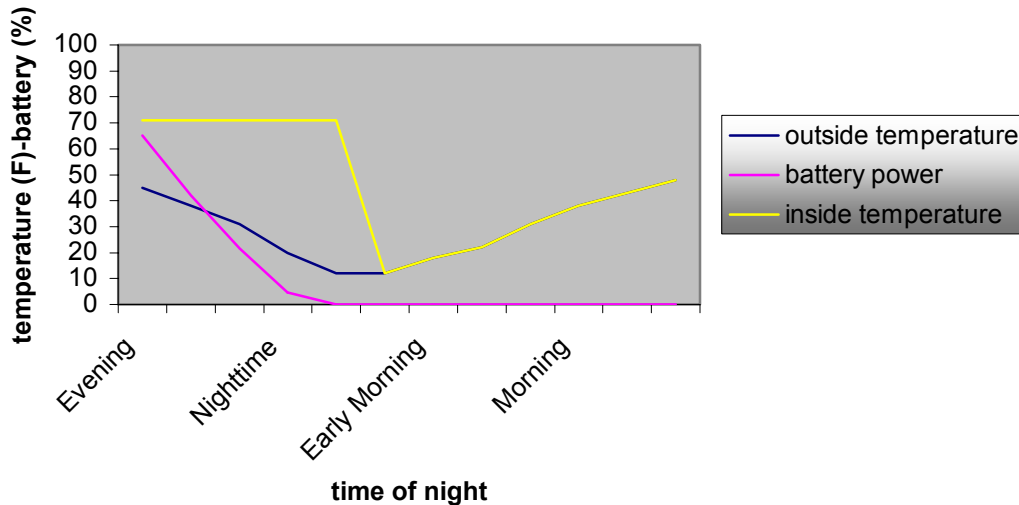
A Good Night's Sleep



Good Night, Sleep Tight, and Don't let the Bedbugs Bite

The chart above shows some things which may affect a warm night's sleep in a Camper. Outside temperature is important. In this example, it doesn't get too cold out, and the battery is fully charged, so there are few problems. The Camper-Thermostat follows a routine of heating the cabin with at least ten minutes off at a time, and at least five minutes on when it does turn on. This minimizes sleep disturbances from the sound of the heat turning on and off, since the furnace is right under the bottom bunk.

A Cold Night, with A Low Battery, "Normal" Mode



"Houston, we have a problem."

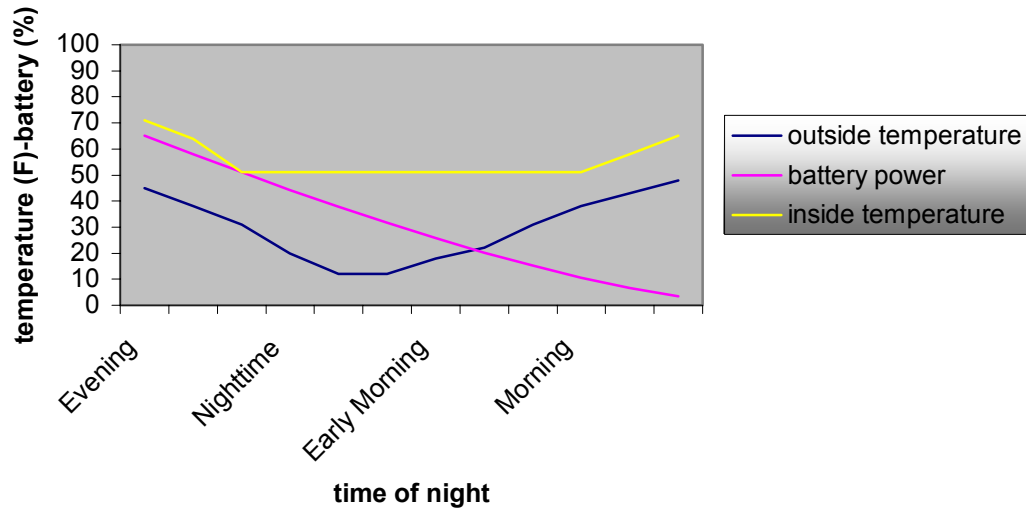
Of course, few evenings in the great outdoors are so temperate! It may get cold and warm outside often and quickly, and since the Camper is not perfectly insulated, the furnace might again be inclined to short-cycle (click on and off). This is especially true if a window is cracked, or the pop-top is open. Once again, though, the Camper-Thermostat applies its time based minimums to furnace operation, and the cabin stays quiet and warm.

A power failure can happen to any Camper if the refrigerator is left on the "battery" setting too long, if other appliances are run off the battery, or if the battery is not in good condition. So, the Camper-Thermostat is automatically set to stop running the furnace *before* the LP Gas Detector low power alarm, so that we are not woken up by that darned alarm!

The Camper-Thermostat has an additional feature intended to improve sleepy time on nights like the one described above. The computer can detect a dying battery before it happens, and automatically lower the set temperature. This will save power. Since the computer knows how long it has been turned on, it can save a little extra power

to blast away eight hours after the furnace was first started. Then, before the alarm goes off, the thermostat will once again power down the furnace.

A Cold Night, with A Low Battery, and "Budget" Setting



By the way, there is a button on the LP Gas Detector to reset the alarm, but it just goes off again after a few minutes anyway. Running the Camper a while to charge the battery should stop the noise. If this happens often, without any appliances running, check the water level in the battery. If the water level is Ok, before you buy a new thermostat, replace the battery!