Preparing holiday homes for winter

John Rowley of Morco Products updates previous guidance, explaining the sources of frost damage and how to minimise it

One of the most frustrating aspects of caravan holiday home ownership is the risk of frost damage to the plumbing or heating system during the winter months. This problem has become more prevalent as many parks open longer and caravan owners take winter holidays.

Historically most parks would shut for the winter and all holiday homes would be drained down in October and reconnected in March, hence avoiding the worst of the frost risk. If an owner is planning to use their home during the winter, they will have to take action to avoid frost damage on each occasion and the cost and inconvenience of this can limit their enjoyment.

Parks can play a key role in managing customers' expectations and advising on the options for a range of different use profiles. There are a number of common approaches (some of which offer little or no protection). But first we need to look at the two main causes of frost damage:

1. freezing water within the home in applicances, pipes, taps or TMV2 valves
2. water pressure increases within the entire system caused by water freezing outside the home.

The classic reason is mains water trapped inside boilers and mixer taps (or even inside fridges with ice makers!) being exposed to freezing temperatures for a period of time. The volume of water expands by 9% when it turns to ice, with enough force to destroy cast iron car cylinder blocks, so a brass tap or copper heat exchanger have no chance.

Our understanding of how freezing water damages holiday homes has broadened to include damage caused by water pressure.

During the last winter, we also had many examples of boilers and mixer taps being damaged overnight even though the owners/customers were staying in the home with the central heating on.

This phenomenon has been known to Morco for some years, but the lack of a really cold winter meant we didn't see the theory in action with our current range of GB combi boilers. What actually happens is that the home, including the boiler cupboard, remains warm due to the central heating. Obviously no damage due to ice formation can occur in these circumstances.

However, nearly all holiday homes have the hot and cold water pipes hung underneath the home. These pipes are lagged in line with the NCC standards, but they will only protect the water within the pipes from freezing for a period of time in cold conditions. While the caravan owners are sleeping in a lovely warm bed with the combi boiler circulating the antifreeze/water mix in the sealed heating circuit around the radiators, the mains water inside the hot and cold pipes under the home is turning to ice. This has the effect of compressing the water that is still unfrozen. This water may be in the pipes under the van, inside the boiler, in the pipes inside the home and in the shower mixers or mixer taps. As the ice continues to form, the pressure increases due to water expanding by 9% when it turns to ice.

Combi boilers are usually specified to cope with mains water pressures up to 10bar; TMV2 shower mixers will generally be in trouble at pressures below 10bar. The hot and cold water pipes under the typical holiday home have a capacity of 3.6 litres. As ice forms, that volume increases to 3.925 litres and, as water is pretty much incompressible, this extra 0.325 litres needs to go somewhere.

Depending on where the water turns to ice in the pipe, it may push apart a pipe fitting under the van or it may blow O-ring seals out of the boiler heat exchanger or cause irreparable internal damage to shower mixer valves.