

The Glitch & The Fix — September 2009

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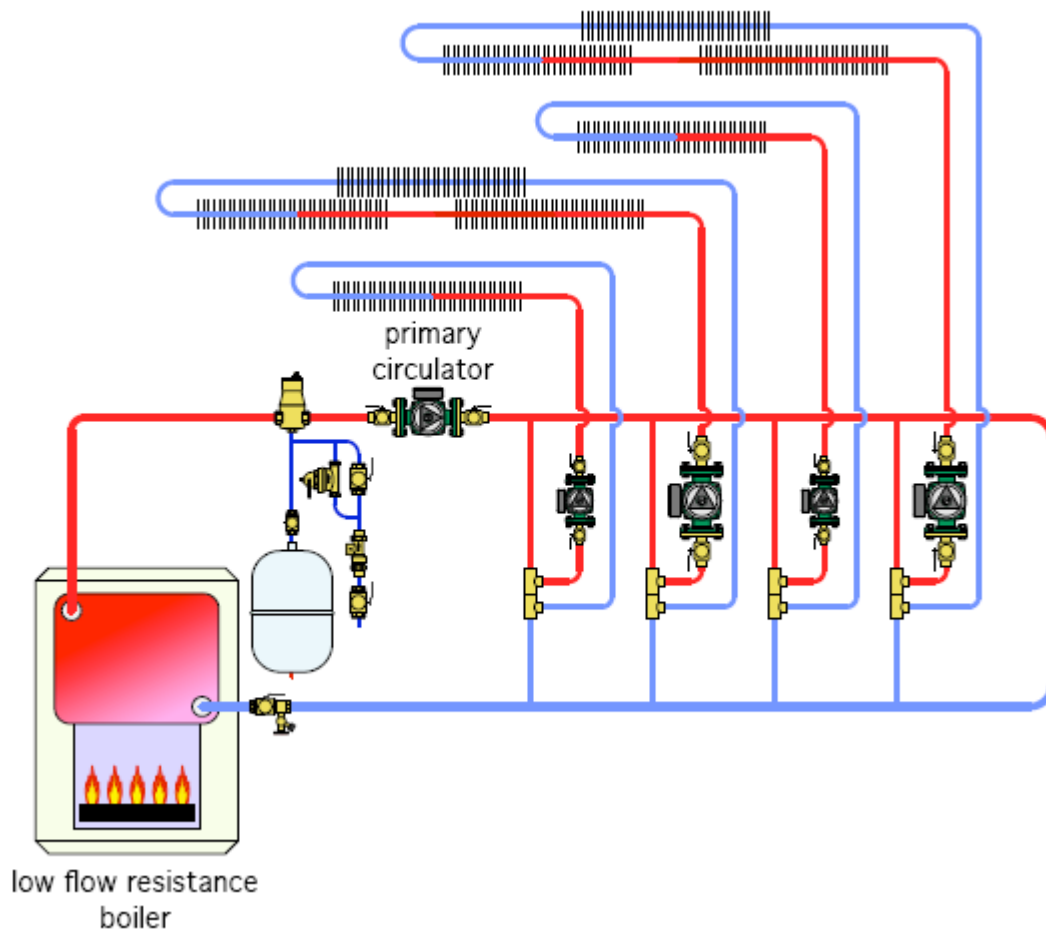
Over-Looped

The Glitch

Overview: An installer decides to use a parallel primary loop because he wants hydraulic separation between several simultaneously operating circulators of different size. He also wants the same supply water temperature to each load.

He pipes up the system as shown. It takes him half a day to get the air out of the system at start-up. Once it's in operation, some of the circulators are experiencing overheating issues. There's also heat getting into zones when that heat is not needed.

Exercise: Can you spot the details that are causing these glitches?

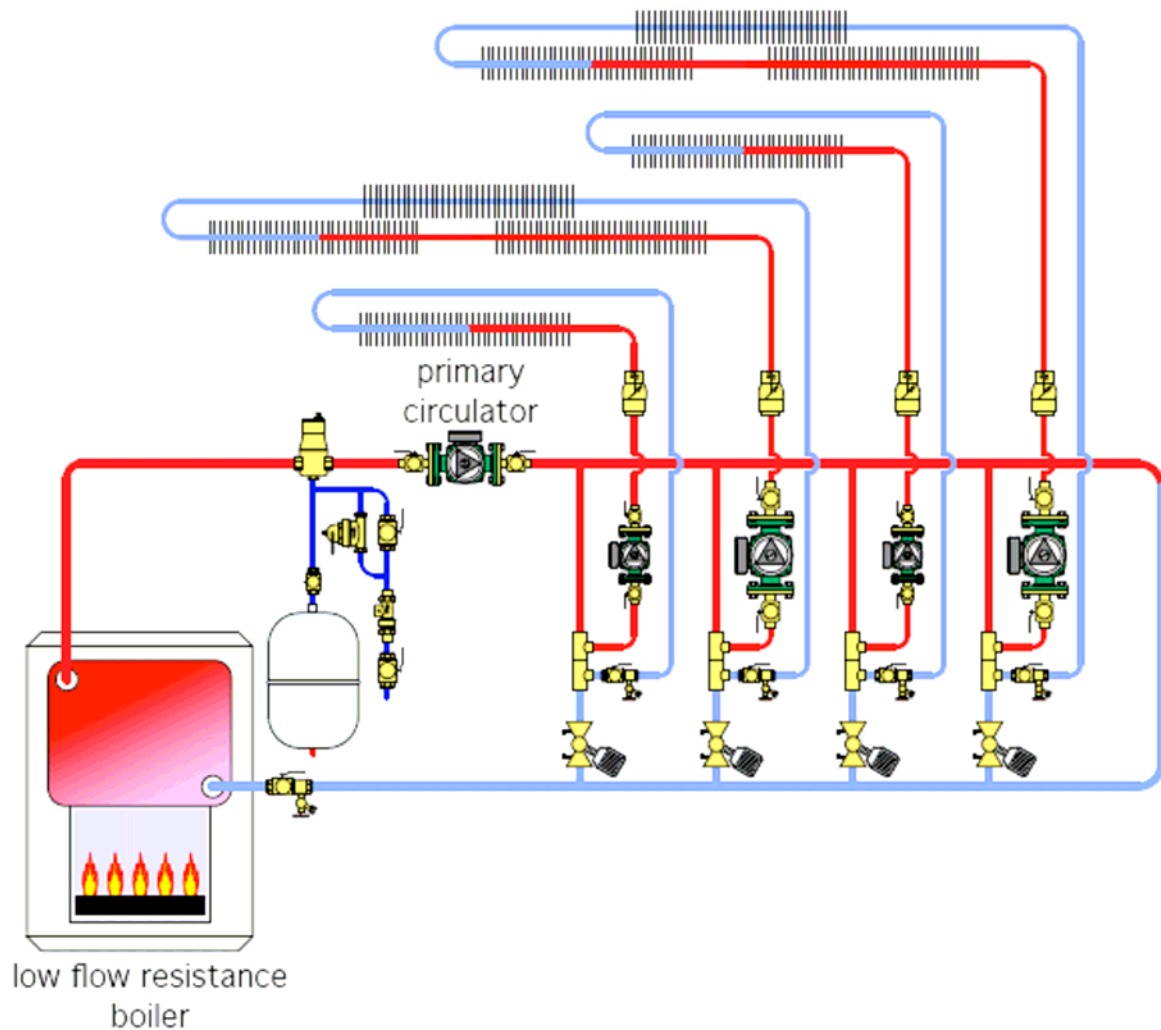


The Fix

The parallel primary loop should not have the extra riser at the far right (e.g. the one with no connected load). Its presence allows much of the primary flow to bypass the normal risers (which have slightly high flow resistance).

The solution is shown in Figure 1. Notice that check valves have been added to each secondary circuit to prevent off-cycle heat migration. Balancing valves have been added to each crossover to adjust flows in proportion to the load served by each secondary circuit. Purging valves have also been added to the return side of each secondary circuit to make air removal quick and easy.

FIGURE 1



Another option is shown in Figure 2: Eliminate the parallel primary loop all together and use a set of low-flow resistance headers (sized for maximum flow velocity of 2 feet per second). This effectively eliminates pump interaction and provides the same water temperature to each load circuit without the complications and extra hardware needed for a parallel primary loop system.

FIGURE 2

