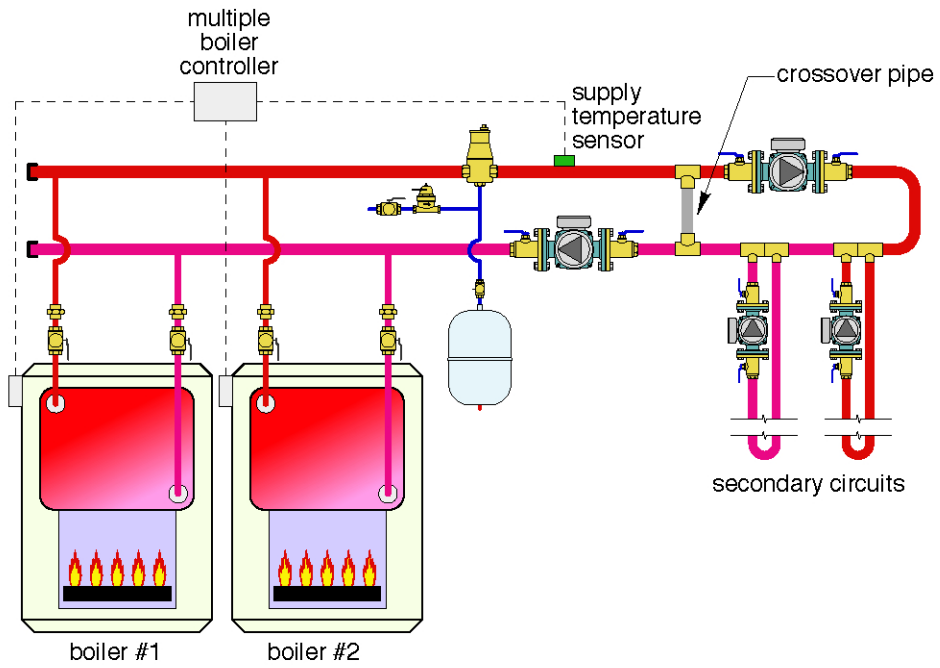
The Glitch & The Fix, May 2016


## The Glitch

A multiple boiler system has been configured to supply two loads as shown below.

There are several piping errors in this proposed design. Can you spot at least five of them?

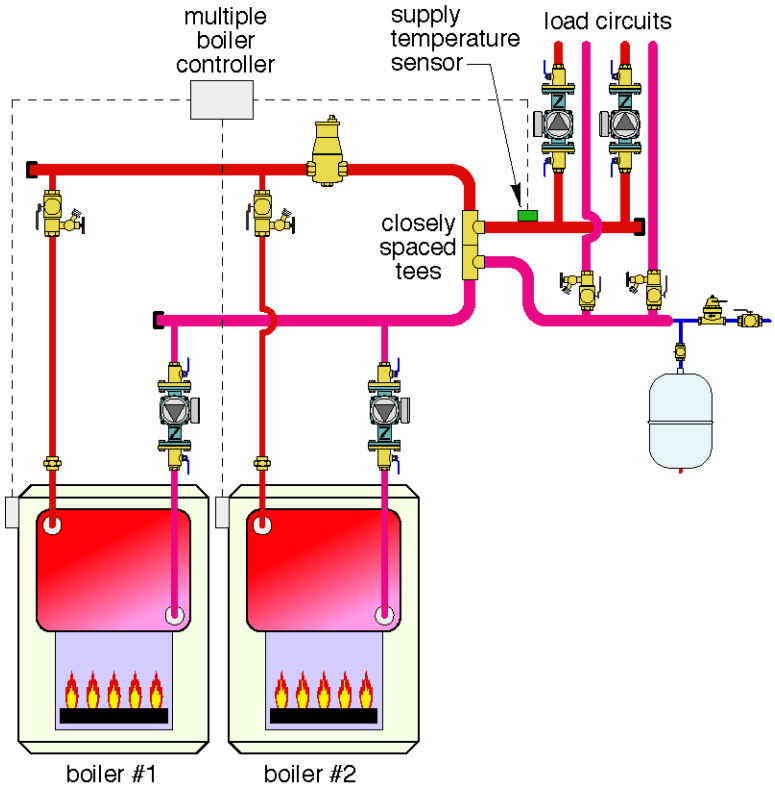


**The Fix**

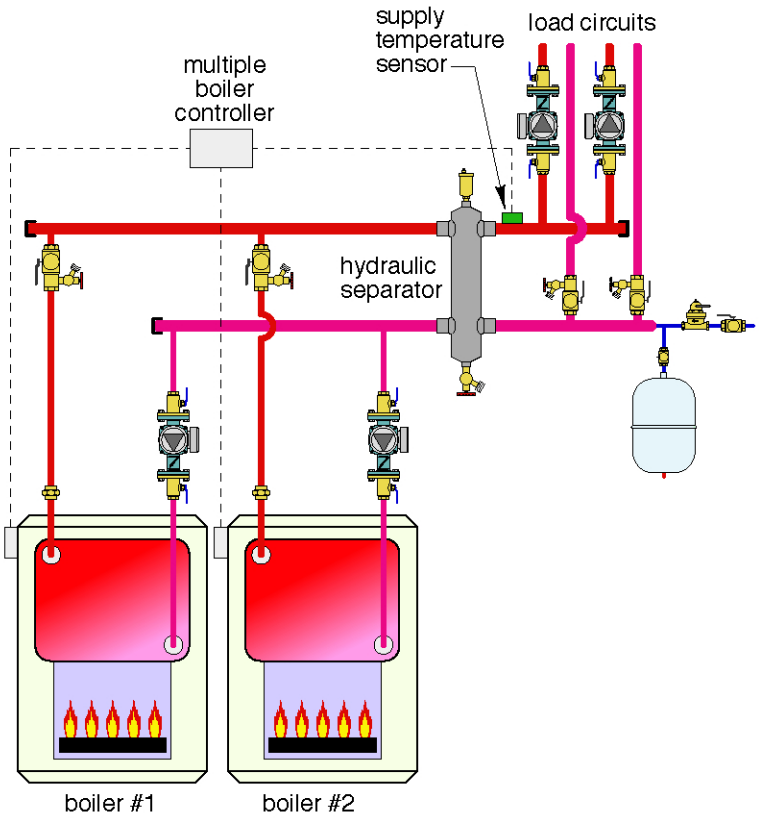
I've shown two solutions. The first uses a pair of closely spaced tees to provide hydraulic separation between the boiler circulators and the load circulators. The other uses a hydraulic separator. Both are viable, and both provide the same supply water temperature to each load circuit, which would not be the case with the original system piping.

I prefer the solution using the hydraulic separator since that component not only replaces the closely spaced tees, it also replaces the high-efficiency air separator and provides dirt separation.

**Fix Figure 1: Using closely spaced tees**



**Fix Figure 2: Using hydraulic separator**




Here's a summary of the other corrections:

1. Every boiler in a multiple boiler system should have its own circulator that only operates when that boiler is operating. The original schematic allows flow through all boilers regardless of which are firing.

2. It may seem simple to be sure the unions are installed between the boiler and the isolating valves, but I've seen it otherwise.

3. Always install the supply sensor for the staging controller on the distribution system-side of the hydraulic separation point (e.g., downstream of the closely spaced tees or downstream of the hydraulic separator).

4. Every secondary circuit should be equipped with purging valves to allow efficient filling and flushing.

5. Always locate secondary circulators so they pump into their associated circuit. With this arrangement, the primary loop becomes the pressure reference point and the pressure within the secondary circuit increases when the circulator is on.