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TIPS FROM TECHNICAL SERVICE

HELPFUL HINTS FROM THE TECHNICAL SERVICE DEPARTMENT - COMBINED EXPERTISE OF OVER 100 YEARS

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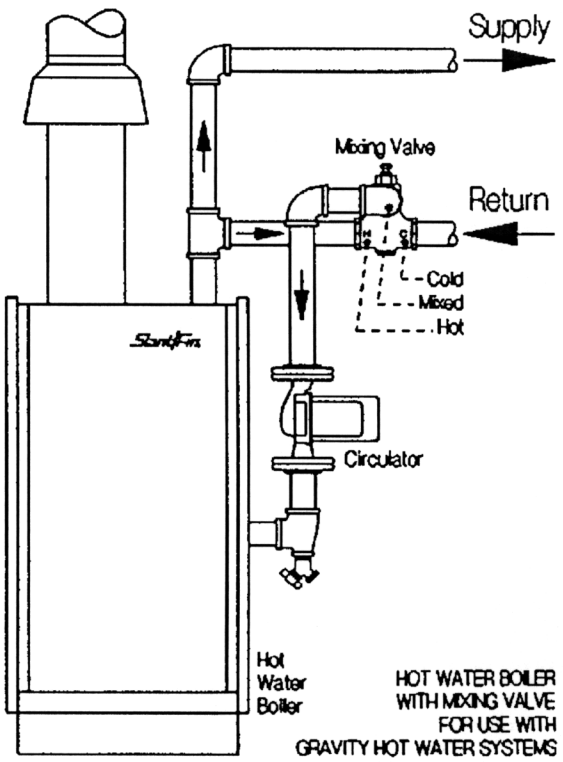
UPGRADING A GRAVITY HOT WATER HEATING SYSTEM

When an older, gravity heating system is upgraded with a new, high efficiency boiler, the large pipe sizes involved lead to two problems:

- The large volume of the system requires a long time to heat up to working temperatures. There may be long periods when condensation is occurring in the firebox because of low return water temperatures.

- The low resistance to flow of the piping system tends to overload the circulator pump, making a larger pump selection necessary.

A mixing valve can solve both problems at the same time. In the piping shown here, the mixing valve forces the boiler up to a minimum return water temperature as quickly as possible on a cold start, plus it provides back pressure to the pump to throttle its flow rate.



HOT WATER BOILER WITH MIXING VALVE FOR USE WITH GRAVITY HOT WATER SYSTEMS

To select a valve, start by considering a size that matches the pipe size of the boiler return connection. This may be larger than necessary, but the extra parts and labor to reduce and expand pipe sizes could well offset the extra price of the valve. As far as the boiler is concerned, the higher the flow, the better.

Match the flow resistance of the valve with the performance curve for the boiler circulator. In most residential installations, the typical cartridge circulator with a 1¼" or 1½" tempering valve will result in a system flow rate in the range of 12 to 18 gallons per minute. This is usually more than adequate for the heating system, and still low enough to avoid noisy pump operation and motor overheating. Set the valve adjustment for between 110° and 125°F.

From a cold start, the boiler will circulate water from its supply directly to its return, until the boiler approaches the set point of the valve. The valve then begins to open its "cold" port, drawing return water from the system. This controls the temperature entering the boiler at the valve set point until the system return temperature rises above the set point. Now the valve is wide open between the "cold" and "mixed" ports, the "hot" port is closed, and the system is circulating normally, as if the valve were not there. Only it's flow resistance remains in the system, preventing the pump from overloading.