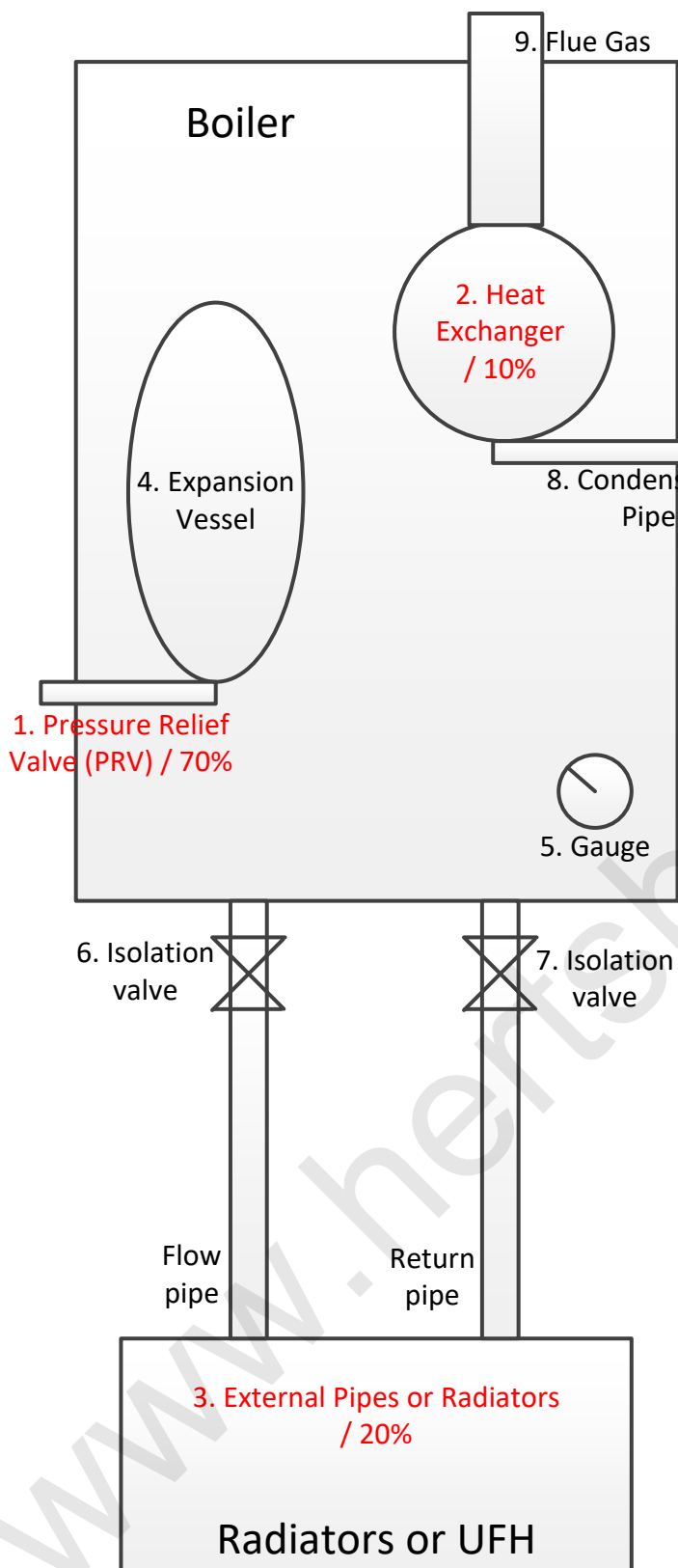


# Pressure Loss Diagnosis



**What is a leaking?** It is acceptable for customers to top up their heating systems by a couple of times per year. If a system requires a regular top up, say once in a few days, it has a leaking.

On a sealed heating system, water loss can happen at one of the following three parts:

- |   |       |
|---|-------|
| 1. Boiler Pressure Relief Valve - PRV (1) | / 70% |
| 2. Boiler Heat Exchanger (2)              | / 10% |
| 3. External radiators or pipes (3)        | / 20% |

The above possibility percentage figures are based on existing systems. For new boiler installs, it is unlikely any new boiler has an internal leaking inside the boiler.

## Diagnosis Strategy

**First visit** at £70 with 70% success rate

Boiler hydraulic service to deal with expansion vessel (4) and pressure relief valve (PRV, 1). Also a visual check for any leaking inside the boiler, and particularly unusual discharge on condensation pipe (8) and flue gas (9).

For a regular heat only boiler, the expansion vessel and PRV are at outside the boiler.

After the first visit the system is likely to lose bit more pressure for air to get out through AAV, but normally (70%) will settle down after a few days with another top up. If the pressure continues to drop and if it is a combi or system boiler then

**Second visit** at £70 to do an isolation test

Top up the pressure to 2.0 to 2.5 bar at the gauge (5), close boiler isolation valves (6 & 7). Both sides are now at the same pressure.

A combi boiler will not work for heating for two days but still work for hot water. A system boiler will not work at all for two days, then

**Third visit** at £70 to check which side is losing pressure after two days.

**A.** If it is boiler side with lower pressure, then boiler heat exchanger (2) is having a pin hole or crack, the leaking water is going away either by condensate discharge pipe, or with flue gas as water vapour. A new heat exchanger is required, it will be an expensive repair, but unlikely < 10%.

Or **B.** If it is a leaking on external pipes or radiators, a leaking detection specialist is required to find out where is leaking, 20% possibility. Such a leaking will normally in a concealed location, and at the downstairs.

# Frequently Asked Questions on Boiler / System Pressure Loss

## **Q1. What is the recommended boiler system pressure?**

A1. It should be between 1.0 to 1.5 bar when system is cold, ie, the heating hasn't been on for a while. Once heating is on, the pressure will increase bit more to 2.0 or even 2.5 bar, but it shouldn't be to near 3.0 bar.

## **Q2. How often should I top up my boiler or system pressure?**

A2. If it is a couple of times per year, the frequency is acceptable. There isn't 100% no leaking system, more or less the system pressure will lose.

## **Q3. Who has the responsibility to top up the system pressure, by a plumber, or a landlord, or tenants?**

A3. It is the responsibility of the occupants, so it should be done by tenants if it is a rented property.

## **Q4. What is the most cause on system pressure loss?**

A4. It is a PRV (pressure relief valve) let by or blowing off, caused by a flat expansion vessel. An expansion vessel is needed to be checked with pressure reading and need to top up every two or three years. Unfortunately in this country, more than 80% existing expansion vessels are more or less depleted.

## **Q5. Is there any danger if a system is losing pressure on a regular basis?**

A5. No. All boilers should shut off if there isn't enough water in the system.

## **Q6. Is there any harm to a boiler if a system is losing pressure on a regular basis?**

A6. Unlikely. As a frequent adding to the system water, only inhibitor chemical will be diluted.

## **Q7. Do you have a 100% success rate on isolation tests?**

A7. Not 100% success rate. Occasionally a leak is only occurring when water temperature is hot. By doing an isolation test, a combi boiler can still run on hot water mode (being hot), but for system boilers, they are all off during the test period.

## **Q8. I can't see any leaking or dump sign in my house, is it still possible to have a pipe leaking?**

A8. Should you have a leaking at an exposed location, you would have found it out already. If a leaking is happening in a hidden place, eg, under floor boards or behind a wall, it will take time to show any dump sign to the floor at above or to a nearby wall.

Yes, if there is no leaking at the boiler, then the only possible leaking will be at an external pipe for sure.

Again this also needs an isolation test to confirm.

## **Q9. Who do you recommend to do an external pipe leak detection?**

A8. IGM (Ian Minall) in Harpenden 01582 831120 / 07749 202609, is a leaking detection specialist on external pipes. They are expensive and charged by hours and method not by outcomes.

# PRV – Pressure Relief Valve



Water discharging at PRV terminal

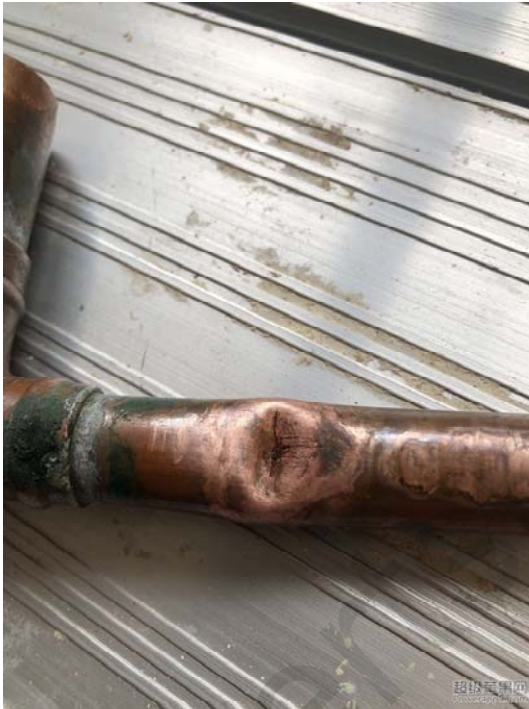


No water discharging at PRV terminal

# Pipe Leaking Cases



Nail punctured leaking



Corroded leaking 1



Corroded leaking 2

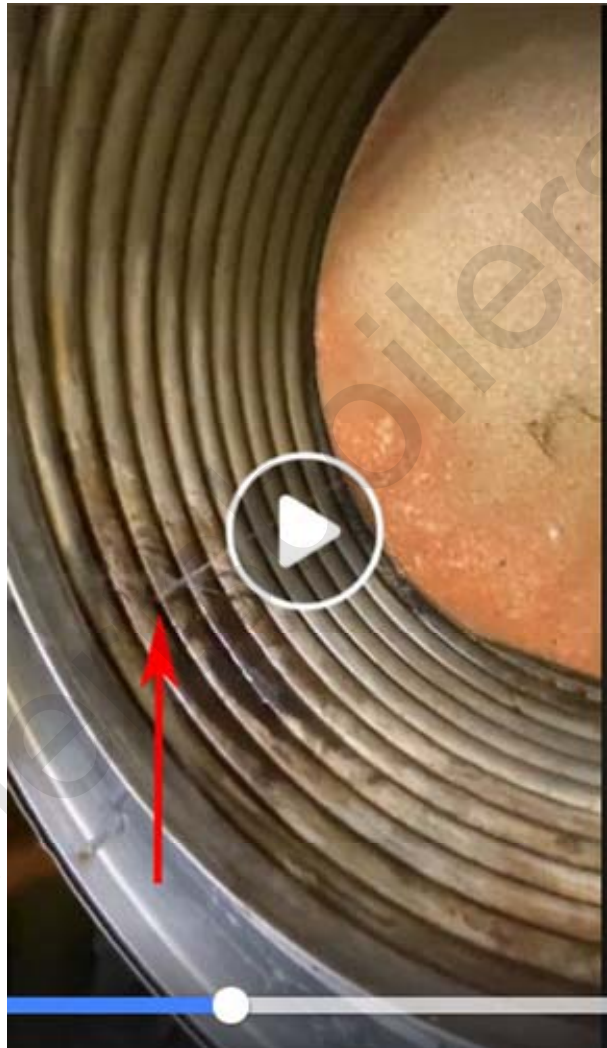
# Boiler Heat Exchangers



Aluminium – used by Worcester and Ideal



Stainless steel (Giannoni) – used by Vaillant and Baxi



A pin hole at a main heat exchanger