Why Your Boiler Keeps Losing Pressure and What to Check

Why does boiler pressure drop and what can you do about it?

A boiler that keeps losing pressure is a common and frustrating problem for many homeowners. The immediate answer is that your central heating system is a closed, pressurised loop. When the pressure gauge shows a reading below 1 bar when the system is cold, water is escaping somewhere. The most likely causes are a small leak in a radiator valve, a pipe joint, or a fault inside the boiler itself, such as a failing pressure relief valve or a split in the expansion vessel. Before you call for professional help, there are several simple checks you can carry out safely.

How a pressurised system works

Your boiler heats water and circulates it through radiators and pipework. The system is pressurised to stop water from boiling at high temperatures and to push it around the circuit efficiently. When the system is cold (after several hours of non-use), the pressure gauge should read between 1 and 1.5 bar. When the boiler fires up, the water expands, and the pressure naturally rises, typically to around 2 bar. A healthy system holds this pressure steady when the boiler is off.

If you notice the needle dropping below 1 bar when the system is cold, or if your boiler cuts out with a low-pressure fault code, you have a leak. The challenge is finding where the water is going. It could be a visible drip, a hidden weep inside a wall or floor, or a fault inside the boiler that vents water away. The checks below will help you narrow it down.

Check the radiators and pipework

Start with the most obvious places. Walk around every radiator in the house. Look for small puddles or damp patches on the floor beneath the valves. Feel along the pipe connections at the bottom of each radiator; if they feel wet or show a trace of corrosion, that joint may be weeping. Also check the bleed valve at the top of each radiator. A slow leak from a bleed valve is not common, but it does happen. If you find a damp joint, gently tighten the nut with a radiator spanner or an adjustable wrench. Do not overtighten, as this can crack the fitting. If the drip stops, you have found the problem.

View the location on Google Maps

Next, inspect any visible pipework in the loft, under floorboards (where you can see them), and in cupboards that house the boiler or hot water cylinder. Look for green or white crusty

deposits on copper pipes; these are signs of a slow leak that has been present for a while. Feel along the pipes for moisture. A tiny leak can lose enough pressure over a day or two to cause the boiler to cut out. If you find a leak that you cannot fix by tightening a joint, you will need a heating engineer to repair it.

Inspect the pressure relief valve

The pressure relief valve (PRV) is a safety device that opens automatically if the system pressure rises too high, usually above 3 bar. It is normally located on the pipework near the boiler. If the valve has failed or is stuck slightly open, it will drip water, often into a tundish (a small plastic funnel) or directly onto the floor. Look for a small copper pipe that exits through the wall to the outside; if it is wet or has a steady drip, the PRV is leaking. This is not a DIY fix, because the valve is part of the safety system. A Gas Safe engineer should replace it.

Check the expansion vessel

Inside most modern boilers is a small tank called the expansion vessel. It contains a rubber diaphragm with air on one side and system water on the other. As the water heats and expands, the air compresses to absorb the extra volume, keeping the pressure stable. If the diaphragm ruptures or the air charge is lost, the vessel cannot do its job. The water expands straight into the system, the pressure spikes, the PRV opens, and water is lost. When the system cools, the pressure drops below 1 bar. This is a very common cause of pressure loss that is not due to a visible leak. Diagnosing a faulty expansion vessel requires checking the Schrader valve and the air pressure, which is a job for a qualified heating engineer. If you suspect this is the issue, call a professional.

Look at the condensate pipe

Condensing boilers produce acidic water vapour as a by-product of burning gas. This condensate drains away through a plastic pipe, usually to an outside drain. If the condensate pipe is blocked, water can back up and leak from the boiler casing. This is not a pressure loss caused by a leak in the heating circuit, but it can look like one. Check the end of the pipe outside to see if it is blocked with debris or frost. If you can safely clear the blockage (the pipe is not pressurised and does not contain hot water), do so. If the pipe runs through a cold area and freezes, you may need to thaw it carefully with warm water. Never use boiling water or a naked flame.

When to repressurise the system

If you have checked for visible leaks and found none, you can temporarily repressurise the system to keep the heating working while you arrange a proper investigation. Most boilers have

a filling loop: a flexible hose with a valve at each end, or a lever that connects the mains water supply to the heating circuit. With the boiler off and the system cold, slowly open the valves until the pressure gauge reads about 1.5 bar. Then close both valves fully. Turn the boiler back on and watch the pressure over the next few days. If it drops again, you have a problem that needs professional diagnosis. Never leave the filling loop valves open; mains pressure can overpressurise the system and cause a boiler failure or a burst pipe.

What causes a hidden leak

Sometimes the leak is inside a wall, under a concrete floor, or in a part of the pipework you cannot see. The signs of a hidden leak include a persistent drop in pressure that happens even when the heating is off, damp patches on walls or ceilings near pipe runs, and a musty smell in the room. If you suspect a hidden leak, the only reliable way to find it is with a thermal imaging camera or a moisture meter, which a heating engineer can use. In some cases, the leak may be so tiny that it seals itself temporarily as the water evaporates, but the pressure loss will return.

Can a faulty heat exchanger cause pressure loss?

Yes. The heat exchanger is the part that transfers heat from the burner to the water. If it develops a pinhole leak, water can escape from the heating circuit into the condensate drain, or into the boiler casing. This is a more serious fault because it mixes heating water with combustion gases, and it can damage the boiler beyond repair. A heat exchanger failure usually causes frequent pressure loss, and the boiler may also produce unusual noises or a smell of overheated metal. This is not a DIY repair; a Gas Safe engineer must inspect and replace the heat exchanger if necessary.

What about the thermostat and heating controls?

Faulty thermostats or heating controls do not directly cause pressure loss. However, they can make the problem worse. For example, if the room thermostat is not working, the boiler may run for too long, causing the pressure to rise too high and trigger the PRV. If the programmer is set to run the heating when no one is at home, the system may cycle unnecessarily, which can accelerate wear on the expansion vessel and other components. If you have pressure loss that seems to come and go, check that your heating controls are set correctly and that the thermostat is reading the room temperature accurately. A simple change in settings may reduce the number of pressure cycles and help you confirm whether the leak is still there.

When to call a professional

If you have checked radiators, pipework, the PRV, and the condensate pipe, and you still see the pressure dropping, it is time to call a Gas Safe registered engineer. Working on gas boilers and

pressurised heating systems is dangerous and requires specialist knowledge and equipment. A qualified engineer can test the expansion vessel, inspect the heat exchanger, check the pressure relief valve, and use diagnostic tools to find hidden leaks. They can also repressurise the system safely and advise on whether a repair or a replacement is more cost-effective.

For homeowners in Berkshire and nearby Surrey areas, Carswells Construction provides professional plumbing, heating, and boiler services. Their Gas Safe registered engineer can diagnose pressure loss issues and carry out any necessary repairs. If your boiler keeps losing pressure, it is worth having it checked properly rather than repeatedly topping it up. A persistent leak can waste energy, damage the boiler, and lead to higher bills.

Preventing future pressure loss

Once the leak is fixed, you can take a few steps to reduce the risk of it happening again. Have your boiler serviced annually by a Gas Safe engineer. During a service, the engineer checks the expansion vessel pressure, inspects the PRV, and looks for signs of corrosion or wear. They will also check the system pressure and repressurise it if needed. Keep an eye on the pressure gauge yourself. If you notice it dropping slowly over a week, investigate before it becomes a problem. Bleed your radiators once a year to remove trapped air, which can cause pressure fluctuations. And if you hear gurgling sounds from the radiators or boiler, that is often a sign of air in the system, which can also affect pressure.

Final checks to make

Before you call an engineer, make a note of the boiler make and model, and the fault code if one is displayed on the control panel. This helps the engineer bring the right parts and speeds up the diagnosis. Also, check whether the pressure loss happens only when the heating is on, or also when it is off. If it only happens during heating cycles, it points to an expansion vessel or PRV problem. If it happens all the time, there is likely a leak in the pipework. If you have a system with a hot water tank, check the tank and its pipe connections for leaks as well.

For professional help with boiler pressure issues and other heating problems, contact **Carswells Construction** at Tregenna, Hicks Ln, Blackwater, Camberley GU17 0DG, UK, or call +44 7809 473255.

Carswells Construction is also on Instagram.