

# Boiler

# Fault Finder

Top Tips and Tricks  
for the Professional  
Boiler and Heating Engineer

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## Top Tips and Tricks for the Professional Boiler and Heating Engineer

It sometimes pays to test the **air pressure hoses** with (LDF) Leak detection fluid, when encountering ignition problems. (Hoses may be split or have loose connections).

Where the **air pressure switch** is difficult to access (which is most common), test at the end of the wiring harness (at the p.c.b. end), which will also test the integrity of the C, NC and NO wiring also.

When the **automatic air vent on the boiler** shows signs of severe leakage through the threaded bleed cap, it is not always a fault with the air vent itself, despite the fact of sludge being present within the system water.

- Check the pressure charge at the expansion vessel, as the air vent is a much weaker component than most under pressure and releases the build up which the vessel should be taking up, but can't due to a loss in air.
- Always isolate boiler at flow and return valves and depressurise via the **pump** vent cap (using an absorbent towel or similar), never the **pressure relief valve** as this may encounter debris on the seat and then drip constantly. Better still, utilise the drain off valve connected to the hydraulic block (where fitted).
- Pre-charge vessel as shown on data badge (typically between 0.5 – 1.0 bar) and re-pressurise boiler via filling loop.
- Open isolation valves (these may start to leak) and monitor pressure gauge and air vent.
- Should water maintain leaking from air vent, then a direct replacement is necessary, however, should the pressure gauge remain under 2.5 bar (when hot) with no leaks, then the air vent is ok.

**Always run a hot water demand when a central heating fault exists**, as this will then eliminate several components from being defective. (Fan, **pump**, flame detection electrodes, **gas valve**, **thermistors** and hot water side of p.c.b. – all being ok). Faults can only then rest with (**diverter valve** being seized/sticking, faulty primary **flow switch** and/or **micro switch**, faulty primary **thermistor** or p.c.b). The same process applies for a hot water fault!

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When an internal expansion vessel is beyond repair (the diaphragm has perished as water is entering the pre charge section and the pressure gauge climbs up to 3 bar and discharges water via blow off pipe), install a remote vessel on the return pipe as close to the boiler as possible.

***Remember** – it may be the case that the existing vessel is not adequately sized due to the customer extending the size of their heating system over the years! Always oversize the remotely fitted vessel if not sure and purge the system water from the abrasive particulates (iron oxide), by way of flushing with good quality chemical cleanser and inhibitor. (Heavy corrosion build up may have been the reason why the rubber diaphragm perished).*

Always **photograph and manually log** / record the boiler gas council (GC) number and serial number when working on boilers which needs attention to parts – if possible. (Manufacturers have the right to change their internal component design at time of mass production, without you even knowing). This will be hassle when the wrong part turns up, leaving you the embarrassment, but more importantly, your customer without a working boiler for longer periods – not good for promoting your professional and reliable services.

**NEVER PRE-EMPT THE PART NUMBER IN THE SHORTS PARTS LIST SECTION OF THE INSTALLATION & SERVICING MANUAL WILL BE CORRECT!**

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- During winter months (especially frosty conditions), should the boiler ignite but remain sparking and then the burner goes out almost suddenly, the condensation pipe maybe blocked from an ice plug forming. (The ionisation / flame detection electrode maybe linked to the condense trap via a linked wire which when exposed to water, will short out the connection and behave like the electrode is not sensing the presence of a flame – hence the repetitive ignition pattern).
- When sparking occurs but no ignition takes place (flow [switches](#), [air pressure switch](#), [thermistors](#), fan, [diverter valve](#), high limit cut out stat and [pump](#) – all being ok). The fault can only then rest with the [gas valve](#) or p.c.b).
- When replacing dry pocket [thermistors](#) or high limit [cut out thermostats](#), always use heat conductive paste between the interconnecting surfaces to ensure good thermal conductivity.
- When boiler is not functioning on either hot water or central heating but the power is shown to be on, always check to see if the manual overheat cut out stat has been activated (open circuit). These can be seen on top of boiler casing, below the boiler casing or within the boiler clamped onto pipes, where the button will be raised and you will be able to press down to reset (closed circuit). Do not ignore this problem – further investigation needed (see [boiler shuts down](#) within [fault finding section](#)).

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- When encountering stiff moving fan impellers / seized rotors, WD 40 is not a permanent solution to the problem, and it must be pointed out that WD 40 is designed to degrease (clean) and not lubricate.
- When measuring in low voltage DC with [multimeter](#) on components such as [modureg gas valves](#) and [multi speed fans](#), but with no steady reading present, then the transformer on the [printed circuit board](#) may be faulty.
- When boiler is intermittently firing up and extinguishing with the radiators getting hot, (with no hot tap running or the central heating timer activated), it maybe the domestic hot water tap [micro switch is stuck](#) in the NC position and not necessarily a [faulty diverter valve](#).  
When the [diverter valve](#) is in its rest position, it leaves the central heating port open, and when the domestic hot water [micro switch](#) is stuck in the NC position (calling for a demand), the boiler thinks a hot water draw off has occurred, but due to the pressure differential [flow switch](#) (attached on top of the [diverter valve](#)) not actually moving the spindle / diverter assembly within, the boiler fires up and heats the radiator circuit due to the open port in its rest position.

Should there be continuity between C and NC (with no hot water demand), then the [micro switch](#) needs replacing.

# Boiler Fault Finder

"Boiler Fault Finder is aimed at Professional Heating Engineers and results from from years of experience as a professional service and repair engineer, demonstrating technical expertise within the industry – the GOTO to fix Boiler Faults"

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