



Investigation of pressure loss in the LTHW heating circuit

Calder Vale Community Centre

RK-2026-0446

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[Sample report](#)

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Acknowledgements

The author thanks the site manager and the client's facilities team for arranging access and providing the documents listed in this report.

Summary

The parish council asked us to find the cause of repeated low-pressure lockouts on the community centre's two gas-fired boilers. The sealed LTHW system was pressure tested, the expansion vessel and pressurisation unit were checked and the pipework in the plant room and ceiling voids was inspected. The system loses about 0.35 bar in 24 hours and has taken in 41 litres of make-up water in a week. The loss is attributable to a weeping compression joint below the low-loss header and a failed diaphragm in the expansion vessel, which together explain the lockouts; no evidence of a concealed leak in the floor was found. We recommend replacing the joint and the expansion vessel, re-dosing the inhibitor and fitting a water meter on the filling loop so that any further loss is seen early.

1 Introduction

1.1 Terms of reference

We were instructed by the clerk to the parish council on 16 March 2026 to investigate the cause of the pressure loss and to recommend remedial work. The investigation was limited to non-destructive methods; floor finishes were not lifted.

1.2 Scope

The report covers the sealed LTHW circuit, the pressurisation unit, the expansion vessel and the visible pipework. It does not cover the domestic hot water system, the gas installation or the boiler combustion settings.

1.3 Background

The centre was built in 2004 with two 70 kW condensing boilers serving radiators and fan convectors through a low-loss header. The pressurisation unit was replaced in 2019. Lockouts have occurred every two to three days since December 2025.

2 Method

The system was filled to 1.0 bar cold and isolated from the pressurisation unit; the pressure was logged with a calibrated test gauge over 24 hours on two separate days. A water meter was fitted on the filling loop for seven days. The expansion vessel pre-charge was checked with the system side depressurised. All accessible pipework, valves and automatic air vents were inspected and the ceiling voids were viewed with a borescope at six locations. Readings were taken to BSRIA BG 29/2021 guidance.

Equipment and settings

Equipment	Calibrated test pressure gauge 0 to 4 bar; water meter; borescope; infrared thermometer	Serial / asset number	Calibrated test pressure gauge 0 to 4 bar; water meter; borescope; infrared thermometer
Calibration date	14 Jan 2026	Software / version	Calibrated test pressure gauge 0 to 4 bar; water meter; borescope; infrared thermometer

This report records a non-destructive visual inspection carried out from the positions, and under the conditions, described in the methodology section. No parts of the building or asset were opened up, lifted, moved or tested unless the report says so. Concealed, covered, inaccessible or obstructed areas have not been inspected and we cannot confirm that they are free from defects. Observations describe the condition on the day of inspection only.

3 Findings

3.1 Observations

The cold pressure was 0.6 bar on arrival. The isolated system lost 0.35 bar over 24 hours on both test days. The expansion vessel pre-charge was 0.2 bar against a nominal 1.0 bar and water was present at the air valve, indicating a failed diaphragm. A compression joint on the 28 mm return below the low-loss header was weeping, with scale and corrosion deposits on the floor beneath. The automatic air vents were passing air. No damp or staining was found in the ceiling voids or at the floor-mounted fan convectors.



Figure 3.1 — *Figure 1: weeping compression joint below the low-loss header*

Table 3.1 — *Table of measured values (calculated totals)*

Item	Parameter	Value	Unit	Note
1	System pressure, cold (boiler gauge)	0.60	bar	Below the 1.0 bar design fill pressure
2	Pressure loss over 24 hours (test gauge)	0.35	bar	Repeated on two days
3	Make-up water volume over 7 days	41.00	litres	From the meter on the filling loop
Total		#CIRC!		Calculated

3.2 Analysis

The measured loss (table 1) is consistent with a small continuous leak; the make-up volume of 41 litres per week equates to about 6 litres per day, matching the weeping joint. The failed expansion vessel means that normal thermal expansion now discharges through the pressure relief valve during each heating cycle, which accounts for the larger pressure swings reported by the caretaker and for the lockouts occurring after the boilers cool.

4 Conclusions

The pressure loss has two causes: a weeping compression joint below the low-loss header and a failed expansion vessel diaphragm. Neither is serious in itself, but together they cause the boilers to lock out on low pressure. There is no evidence of a concealed leak in the floor or ceiling voids.

5 Recommendations

R1: remake the weeping joint with a new olive and re-dose the system with inhibitor (heating contractor, within two weeks). R2: replace the expansion vessel with a 50-litre vessel pre-charged to 1.0 bar (within two weeks). R3: fit a permanent water meter on the filling loop and log it weekly (caretaker, within one month). R4: if make-up exceeds 5 litres per month after the repairs, carry out a tracer-gas test of the underfloor pipework.

Table 5.1 — *Schedule of recommendations*

Ref	Recommendation	Priority	Owner	By when
R1	Remake the weeping joint below the low-loss header and re-dose inhibitor	High	Heating contractor	2026-04-21
R2	Replace the expansion vessel (50 litres, 1.0 bar pre-charge)	High	Heating contractor	2026-04-21

References

[1] BS 7913:2013 Guide to the conservation of historic buildings. [2] BRE Digest 251, Assessment of damage in low-rise buildings. [3] RICS Home survey standard (2019). [4] Manufacturer's installation and maintenance literature for the products named in this report.

Appendix A — Supporting information

Instrument calibration certificates, site photographs not reproduced in the body of the report and the field notes are held on file and can be supplied on request.

Declaration

I confirm that the work described was carried out as stated and that this report presents my findings and professional opinion.

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