Industry guidance for the checking of case seals and the general integrity of room-sealed fan assisted positive pressure gas appliances

Historically, fanned draught room-sealed boilers were of the positive pressure type (See Figure 1, which shows the differences between positive and negative pressure appliances).

For a positive pressure appliance, it is essential to ensure that the combustion chamber casing is firmly secured to the boiler, as the manufacturer intended, with the correct seal in a good condition.

If this is not achieved, there is a real risk that products of combustion may escape into the room and due to the poor combustion that is likely to occur, high levels of carbon monoxide (CO) could be produced creating a dangerous environment. A list of these types of appliances is given in the Table 1.

Regulation 26(9) of the Gas Safety (Installation and Use) Regulations (GSIUR) requires an examination of the effectiveness of any flue following work on a gas appliance.

A test method to help ensure that case seals of positive pressure gas appliances comply with the requirements of the GSIUR, has been developed by the Industry and is described below.

Step 1

Before the case is put back on the appliance the following checks should be carried out:

- are any water leaks evident?
- is the backplate or case corroded?
- where corrosion is evident, is it likely to affect the integrity of the case, backplate, or seal?

  Note: The extent of the corrosion should be carefully checked with a sharp instrument e.g. a screwdriver. If the instrument does not perforate the corroded area, this should be deemed acceptable, but the gas user should be advised of the problem and potential consequences if a repair is not made.
- are the combustion chamber insulation linings intact?
- is the backplate or the case distorted or damaged? Pay particular attention to the area where the case and seal meet. This may have been caused by explosive ignition of the main burner
- is the case sealing material intact and in good condition? (e.g. pliable, free from discolouration, trapped debris, etc.). Will it continue to form an adequate seal between the case and the backplate?
- is anything trapped or likely to be trapped when the case is put back on (e.g. wires, thermocouple capillaries, tubes, etc.)?
- are other gaskets and seals intact?
- is the pilot inspection glass undamaged?
- are the case fastenings and fixings (including fixing lugs) in good condition? (e.g. screws/nuts stripped)
- are there any signs of discolouration on or around the appliance, which may have been caused by leaks of products of combustion from the appliance?

Rectify any defects identified in Step 1 as necessary and proceed to Step 2.

Note: Where defects are identified they should be classified using the following criteria in accordance with the current CORGI Gas Industry Unsafe Situations Procedure.

Where there are inappropriate or missing case fittings or defective seals, which cannot be remedied, but there is no evidence of leakage, the appliance should be classified as At Risk (AR). If there is evidence of actual leakage, then the appliance should be deemed Immediately Dangerous (ID). Where suitable replacement seals are no longer available the appliance should be classed as ID and regarded as obsolete.

Step 2

When the case has been put on the appliance the following checks should be carried out:

- is the case fitted correctly?
- is a “mark” visible showing that the case had previously been fitted closer to the backplate?
- are all the case screws adequately tightened?
- is a bright area visible on the screw thread of any of the case securing screws, indicating that the screw was previously secured more tightly?
- is anything trapped and showing through the case seal?

Rectify any defects identified in Step 2 as necessary. Proceed to Step 3.

Step 3 – Operate/light the appliance

Ensure that the main burner remains lit (i.e. set the appliance and room thermostats to their highest settings).

Check for possible leakage; initially this can be done by running your hands around the boiler casing and backplate.

Then check for possible leakage etc. as in Step 4 where practicable.

Step 4 – Check for possible leakage of combustion products from the appliance

Where joints have been disturbed, check with leak detection fluid to confirm that there are no gas escapes. Check for possible leakage of combustion products from the appliance using a taper, an ordinary match, or similar. (A taper can be used to get into less accessible locations).

> *Note: Whilst smoke tubes and smoke matches can be used, the results may require further interpretation and these methods are currently being validated.*

Light the taper/match and allow the flame to establish. Position the flame very close to the case seal or any possible leakage point (e.g. back panel). The flame will be blown quite easily by the draught caused by a leak. Move the taper around the entire seal, using fresh tapers as required.

To investigate the seal at the bottom of the case – hold the lit taper between the bottom of the case and the appliance control panel. Does the flame flicker slowly or is it disturbed by leakage flowing from the case? Try the taper in several positions.

> *Attention: DO NOT confuse natural convection with leakage. DO NOT look for a gas escape with this method.*

Rectify any defects as necessary and re-check. If still unsure seek expert advice.

> *Note: When using this method, be careful not to set fire to surrounding fixtures/furnishings.*Table 1 contains a list of room-sealed fan assisted positive pressure gas appliances. This list is not exhaustive, but may be used as guidance to appliances that are believed to operate under positive pressure.

Warning – 'Immediately Dangerous' installations

It is essential that in ALL cases where spillage is identified, the appliance is made safe. In the case of a new installation when the fault cannot be rectified, it is the responsibility of the gas operative to disconnect and seal the appliance from the gas supply immediately and label the appliance accordingly.

With existing installations, the gas operative should seek permission from the gas user to seal the supply. If permission is refused, the appliance should be turned off and in both instances the current CORGI Gas Industry Unsafe Situations Procedure adhered to.

Figure 1. Positive/Negative fanned flued room-sealed gas appliances.

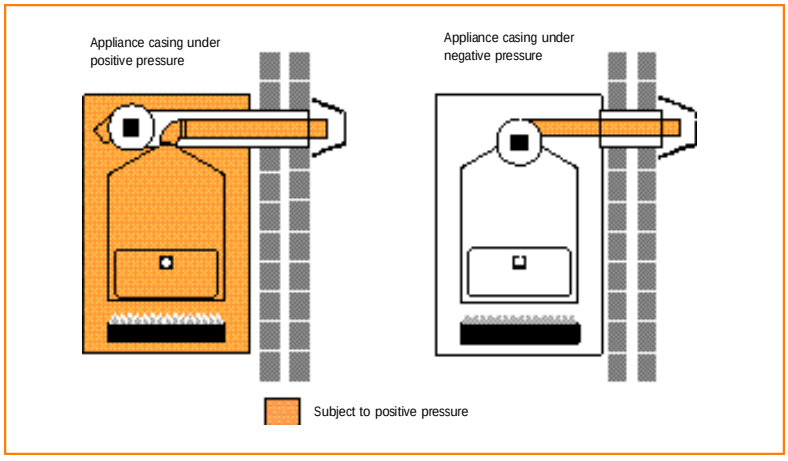

Table 1. Room-sealed fan assisted positive pressure gas appliances.

Manufacturer and model	Manufacturer and model	Manufacturer and model
Alde International (UK) Ltd	Halstead Heating & Engineering Ltd	Stelrad Group Ltd
Alde 2927 Slimline	Halstead 45F*	Ideal Elan 2 40F*
	Halstead 55F*	Ideal Elan 2 50F*
Brassware Sales Ltd	Halstead 65F*	Ideal Elan 2 60F*
Ferrolli 76 FF*	Wickes 45F*	Ideal Elan 2 80F*
Ferrolli 77 FF*	Wickes 65F*	Ideal Excel 30F*
	Barlo Balmoral 45F*	Ideal Excel 40F*
Crosslee (JLB) (Pyrocraft)	Barlo Balmoral 55F*	Ideal Excel 50F*
AWB 23. 09 WT Combi	Barlo Balmoral 65F*	Ideal Excel 60F*
Crosslee (Trisave Boilers Ltd)		Ideal Sprint 80F*
Trisave Turbo T45*	Harvey Habridge Ltd	Ideal W2000 30F*
Trisave Turbo T60*	Impala MK 11	Ideal W2000 40F*
Trisave Turbo 30*	Impala MK 11 Ridgeseal	Ideal W2000 50F*
Trisave Turbo 22*	Impala Super 2 (HF)	Ideal W2000 60F*
	Impala Super 2 (VF)	
Glow Worm Ltd		Worcester Bosch
Economy 30F*	Potterton Myson Ltd	Heatslave 9.24 RSF*
Economy 40F*	Myson (Thorn) Olympic 20/35F ‡	Worcester 9.24 Electronic RSF*
Economy 50F*	Myson (Thorn) Olympic 38/50F ‡	Worcester 9.24 Electronic RSF 'S'*
Glow Worm Fuelsaver 35F*	Myson (Thorn) Apollo Fanfare 15/30	
Glow Worm Fuelsaver 45F*	Myson (Thorn) Apollo Fanfare 30/50	
Glow Worm Fuelsaver 55F*	Supaheat 50/15 with 'A' control	
Glow Worm Fuelsaver 65F*	Supaheat GC 50/15	
Glow Worm Fuelsaver 80F*	Netaheat MK 1 10/16	
Glow Worm Fuelsaver 100F*	Netaheat MK 1 16/22 BF	
	Netaheat MK 11 10/16 BF	
Glynwed Domestic & Heating Appliances Ltd	Netaheat MK 11 16/22 BF	
AGA A50	Netaheat MK 11F 10-16 BF	
AGA A50 A	Netaheat MK 11F 16-22 BF	
AGA A50 NG	Netaheat Electronic 6/10	
AGA A50 SS	Netaheat Electronic 10/16	
AGA A50 ANG	Netaheat Electronic 16/22	
AGA A60	Netaheat Electronic 10/16e	
AGA A60 NG	Netaheat Electronic 16/22e	
AGA A75 NG	Netaheat Profile 30e	
Hi-light P50	Netaheat Profile 40e	
Hi-light P50A SC	Netaheat Profile 50e	
Hi-light P50S	Netaheat Profile 60e	
Hi-light P50SS	Netaheat Profile 80e	
Hi-light P50S/A	Netaheat Profile 100e	
Hi-light P50S/A GLC		
Hi-light P50S/A SC		
Hi-light P50/A		
Hi-light P70		
Hi-light P70S		
Hi-light P70SS		

‡ A safety enhancement kit has been designed for these appliances and is available from Potterton Myson Ltd.

** Boilers where spares relevant to case seal problems are still available, based on information provided by manufacturers.*