

No: TB116
June 12, 2007

Flameguard® Pilot Outage Checklist

NOTE: All tests on this bulletin must only be performed by a certified gas technician.

Service requires trade knowledge in the areas of plumbing, electricity, venting, air supply and gas supply. If you lack these skills or have difficulty understanding these instructions, you should not proceed. Enlist the help of a qualified service technician. Examples of qualified service technicians include those trained in the plumbing and heating industry, local gas utility personnel or an authorized service person.

All FVIR water heaters

Since the introduction of FVIR (Flammable Vapour Ignition Resistant) water heaters, in 2004, there has been an increase in the incidence rate of pilot outage across all brands. In most cases these outages can be attributed to one of the factors listed here. By performing the recommended checks and procedures, you can eliminate most call backs.

1.) Thermocouple out of position or faulty:

It's possible during shipping, installation or servicing that the thermocouple can get out of position.

The thermocouple must be in the correct position in order to provide adequate voltage to keep the pilot burning. Follow these steps to ensure positioning and operation.

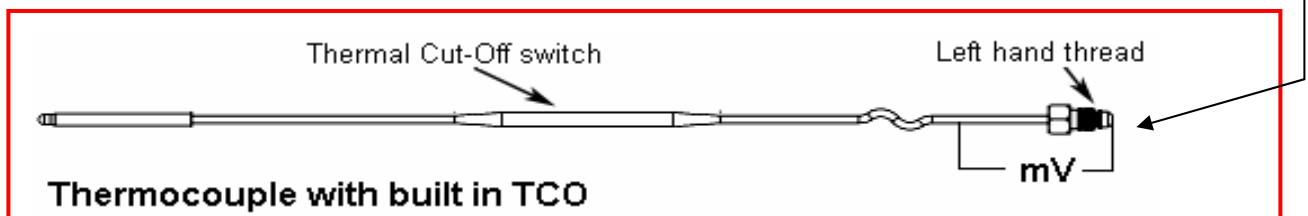
Checks:

- Verify that the thermocouple is inserted completely and that it is inserted approximately ¼" past the pilot head.
- Using the test procedure below, test the open circuit of the thermocouple for acceptable reading which should be approximately 20-30 millivolts

Open Circuit Test:

An open circuit test determines the full voltage output from a thermocouple. The range for a single thermocouple should be approximately 20-30 millivolts. The millivolt meter should be set for the lower scale (e.g...0-50 M.V.) One lead is attached to the thermocouple's tip, the other to the thermocouple sheath. In order for the pilot to remain lit, you will have to depress and hold the pilot button for the duration of this test.

Notes: Water heaters manufactured prior to March 2006 (will have a left hand threaded thermocouple)



- On natural gas water heaters manufactured prior to March 2006 (units with a left hand threaded thermocouple), GSW recommends that, if the thermocouple needs to be changed, the complete manifold door assembly should be replaced with the newer version that has the externally mounted TCO switches and standard right hand threaded thermocouple.
 - Reduce service time.
 - Ensures a more accurate positioning of the TCO switch.
 - Enhanced resettable TCO switch.
- Consult attached chart #1 for correct kit information and part number.

Chart #1

MANIFOLD KIT ASSEMBLIES FOR PRODUCT MANUFACTURED PRIOR TO MARCH 2006						
Old SKU	Old Models	Capacity , USG	Style	Input Rate, Btu/hr	TCO colour code	Kit p/n
B3071, B3072, B3075	G630S30FV-02, JW30S30FV-02	30	Short	30,000	Violet	58988
B3070	G630S27FV-04	30	Short	27,000 Hi Alt		
B4095, B4098, B4099	G640T40FV-02, G940T40FV-02, JW40T40FV-02	40	Tall	40,000	Blue	58989
B4096, B4299, B4298	G640T36FV-04, JW40T36FV-04, G940T36FV-04	40	Tall	36,000 Hi Alt	Green	58990
B4170, B4171, B4173, B4178, B4179, B4273, B4172	G640S38FV-02, JW40S38FV-02, G940S38FV-02, G940S34FV-04, JW40S34FV-04, G640S34FV-04, G940S34FV-04, G1240S34FV-04	40	Short	38,000	Orange	58992
B4175, B4174, B4179, B4210, B4220, B4222	JW40S34FV-04, G640S34FV-04, G940S34FV-04, G1240S34FV-04	40	Short	34,000 Hi Alt	Violet	58991
B4169	G640S31FV-06	40	Short	31,500 Hi Alt		
B5106, B5199, B5201	G950T40FV-02, G650T40FV-02, JW50T40FV-02	50	Tall	40,000	Orange	58992
B5203, B5200, B5205	JW50T36FV-04, G650T36FV-04, G950T36FV-04	50	Tall	36,000 Hi Alt		
B5301, B5302, B5310, B5303, B5308, B5320	G650S40FV-02, JW50S40FV-02, G950S40FV-02, JW50S36FV-04, G650S36FV-04, G950S36FV-04, G1250S36FV-04	50	Short	40,000	Orange	58994
B5305, B5304, B5309, B5311, B5313, B5312	JW50S36FV-04, G650S36FV-04, G950S36FV-04, G1250S36FV-04	50	Short	36,000 Hi Alt	Violet	58993

NOTE: Technicians must re-use existing orifice & burner head.

2.) Air Supply issues:

To meet FVIR requirements these units have a sealed combustion chamber. On the under side of the water heater is a specially designed “Flame Arrestor” plate. This plate is the only air intake on the Flame Guard water heater. Several factors relating to air supply can affect the ability of the water heater to sustain a pilot.

a. Negative Draft

Other appliances that draw combustion air (such as furnaces and clothes dryers), within the same space, combined with airtight homes, can create a negative draft condition.



Checks:

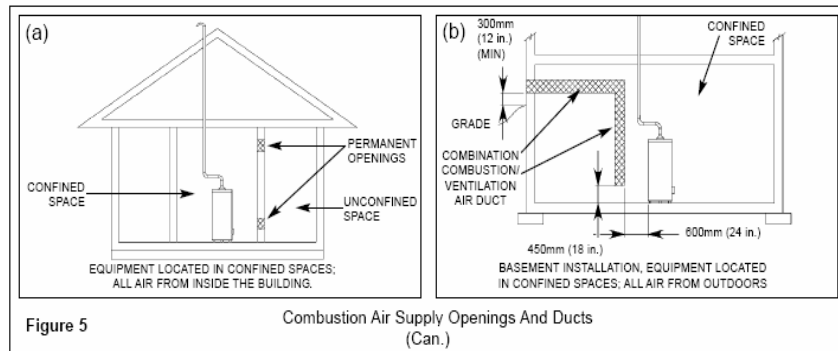
- Test for spillage at the draft hood of the water heater **while all appliances are in operation** using a candle or match flame to judge flame direction.
- Visually inspect the chimney to insure that it has been properly sized and installed as per the CAN/CSA-B149.1-05

b. Insufficient Combustion Air Supply

Insufficient air supply to the combustion chamber can cause pilot outage.

Checks:

- Make sure that all air requirements are met per the Installation & Operation manual, including 2 permanent openings in a confined space.



- In order for the heater to have enough primary air drawn into the combustion chamber to sustain combustion, the arrestor plate must be kept clean. Under normal conditions, the action of the burner igniting will remove dust and lint from the arrestor plate, however, if the heater is installed in an area having a high dust and/or lint content, the flame arrestor should be visually inspected periodically for accumulation of dust, lint and other debris and cleaned as required.

How to Clean a Blocked Arrestor Plate:

- Use a vacuum cleaner to remove all loose debris in the flame arrestor.
- If necessary, a soft bristle brush can be used to dislodge any remaining debris.
- Repeat step 1 as necessary.

Note: On 30 and 40 gallon products to avoid future build up of dust or lint after cleaning the arrestor plate you may install a **“Flame Guard Filter Accessory”** P/N 6910610 This part limits, the debris buildup in problematic areas but is not a requirement.



3.) Condensation issues:

All water heaters produce condensation on start-up, some more than others, depending on the incoming water temperature, ambient temperature of the room, relative humidity and usage patterns. Although the unit is designed to allow for condensation, if the condensation volume is unusually high, it could cause pilot outages.

Checks:

- Verify that the connections to the water heater are not leaking
- Verify that the water heater is not undersized. An undersized heater will mean constant lower water temperature in the tank, at times, which can lead to higher condensation levels.
- If condensation is a frequent occurrence, a burner equipped with a drain hole is available (Part #86622). This burner redirects condensation falling from the flue tube.

Drip hole in burner



4.) Tripped TCO Switch (only on water heaters manufactured after March 2006)

- Check the resistance of this switch with an ohmmeter on a low scale. This is a normally closed switch (NC) with no measurable resistance.
- In situations where the "Flame Arrestor" becomes obstructed or insufficient fresh air contributes to the over heating of the ambient air in the room the resettable side of the switch will open.
- Measurable resistance through the switch may also cause the gas valve to close due to the fact that the TCO switch is in series with the thermocouple.
- The non-resettable side of the TCO switch should never open other than as the result of a flammable vapour event or faulty switch.

▪ Checks:

- Follow the steps above "**How to clean a blocked arrestor plate**" and then reset the TCO switch.
- Ensure sufficient fresh air intake for the room, (verify with the Installation and operation manual or your local gas code on "confined spaces").
- Verify that the connections (Quick connects) to the TCO are on tight & firmly inserted.
- If the water heater has experienced a flammable vapor event, the water heater must be inspected by a licensed gas fitter to verify that the heater did not sustain damage. If damaged the entire heater must be replaced.

