Before dispatching a service contractor, perform the following tests:

**Mechanical**

1. **Is the thermocouple connection on the gas valve tight?**
   - Yes
   - No
     - Tighten thermocouple connection (hand tight + ¼ turn) with a 3/8 wrench

2. **Is the thermocouple imbedded in the pilot flame?**
   - Yes
   - No
     - Adjust thermocouple so the tip is embedded in the pilot flame

3. **Is the flue way clean and free of debris?**
   - Yes
   - No
     - Remove flue baffle and check flue way. Re-hang baffle.

4. **Is the Energy Cut-Off (ECO) tripped?**
   - Yes
   - No
     - The energy cut off device provides a safety shut off to the gas supply in case of exceedingly hot water temperatures in the heater. The gas control incorporates a single use energy cutoff. If the ECO activates, the entire gas control valve must be replaced. If you can get PILOT or MAIN BURNER – even for a couple of seconds, then the ECO if good. Otherwise, proceed to the next step.
Pilot Outage Troubleshooting

Is the thermocouple working properly?

No

Verify thermocouple is creating at least 10 milivolts by using a thermocouple adapter (Robertshaw part number 10-038).

-or-

With the pilot flame lit, turn OFF the gas supply and start to count seconds (one-one thousand, two-one thousand). Count for a full twenty (20) seconds. The pilot flame should be out.

Listen carefully for a small clicking noise at the gas inlet side of the valve. If you count for the full twenty (20) seconds and do not hear a click then the thermocouple is fine.

If you hear a click within the twenty (20) seconds then the thermocouple and or gas valve is bad. Replace both the thermocouple and gas valve.

Yes

Is the gas valve working properly?

No

There is no ‘field test’ for the gas valve. It either works or is doesn’t. If all the other tests have passed so far, then there is a possibility the gas valve is the problem. Continue with the Fuel, Fresh Air and Environmental tests. If they all pass, then replace the gas valve.

Yes

Is the pilot orifice clean and free of debris?

No

Remove and clean pilot orifice and pilot hood

Yes

Is the Thermal Release Device intact (FVIR models only)?

No

Check TRD by physically removing the burner assembly and checking for TRD. This will require a new gasket to be installed if the TRD is OK. If the TRD is tripped, then replace water heater. Attempt to determine cause of TRD trip.

Yes

There appears to be nothing wrong with the mechanical aspects of the heater. Continue with FUEL, FRESH COMBUSTION AIR, and ENVIRONMENTAL sections of this document.
Fuel
Many things about the fuel can be ruled out by asking if the unit ever worked OK. If it has been installed for more than a few weeks, has been working just fine, and the pilot outage is just now starting, then chances are the fuel related issues are not the problem. Just to be sure, go thru the checklist.

1. Is the gas supply turned on?
   - No: Verify gas supply is turned ON at the gas supply shut off

2. Is the proper fuel being used?
   - No: Verify fuel type used with rating plate on tank

3. Is the inlet gas pressure within range?
   - No: Verify gas pressure at the inlet side. This is not a YES or NO question. You must get a pressure reading.
     - Natural is _____ inches water column
     - Propane is _____ inches water column
Fresh Combustion Air
Many things about the fresh combustion air can be ruled out by asking if the unit ever worked OK. If it has been installed for more than a few weeks, has been working just fine, and the pilot outage is just now starting, then chances are the fresh combustion air related issues are not the problem. Just to be sure, go thru the checklist. Venting will not cause pilot outage on a regular gas water heater. It may cause pilot outage on a direct vent water heater. See the Direct Vent section about venting.

Environmental
Where and how the unit is installed is critical to its safe and proper operation. Check the following.

- **Is there a venting down draft that will blow out the pilot?**
  - Yes: Check for any drafts down and thru the vent that could blow out the pilot light. Look for a fan (like a ceiling fan) in the same room that could potentially cause a down draft. You can check the drafting effect of the venting with a smoke stick or a mirror. Place the mirror close to the draft diverter. If the mirror fogs up, then there is spillage. If the smoke blows away from the heater and not up the vent, then there is spillage. Spillage indicates improper drafting and venting.
  - No

- **Is there a draft at the base of the heater that will blow out the pilot?**
  - Yes: Check for any drafts at the bottom of the heater that could cause the pilot to blow out. These could be an open door or underneath a door frame. If the inner and outer doors are not installed properly, the draft could blow out the pilot. *(This does not apply to the FVIR Guardian units.)*
  - No

- **Is the unit installed in a garage?**
  - Yes: If the unit is installed in a garage, then check for drafts, inner and outer combustion chamber doors installed and anything around the base of the heater that could restrict fresh air to the heater.
  - No

- **Is the unit installed in an attic?**
  - Yes: If the unit is installed in an attic, then the time of year may be a factor. Attic installations in the summer are prone to pilot outage because of the excessive heat in the attic. Check the temperature of the attic space next to the water heater. If the temp is more than 120 degrees, then attempt to introduce more fresh air to the water heater. Attic fans, soffit vents and special fresh air intakes to the water heater may help. This problem usually will go away once the weather cools.
  - No
Pilot Outage Troubleshooting

Venting (Direct Vent Water Heaters Only)

Venting may cause pilot outage on a direct vent (DV) water heater. A DV has a balanced fresh air inlet and combustion gas outlet system by design. If either of these two systems are not working correctly, you may get a pilot outage situation.

You may also get some nuisance pilot outage if the wind is blowing directly into the DV vent on the outside of the home. This will also cause a pressure imbalance inside the vent system and may cause the pilot to go out.

If the unit is installed in closet or other confined space, then the water heater may not have enough air (in volume) to operate. A ‘confined space’ is defined as having less than 50 cubic feet of space per 1,000 BTUH. A closet that is 3’ x 3’ x 8’ has only 72 cubic feet of space. That means that a 40,000 BTU gas water heater needs a room of at least 400 cubic feet. (That is a room that is 7’ x 7’ x 8’.)

If the unit is installed in a small closet, then more air volume is needed.

By now, the only probable cause of the pilot outage is the gas valve. If pilot outage is constant, then replace the gas valve. If pilot outage is erratic, then start over in the troubleshooting tree.

Do not send out a service contractor without Supervisor approval.