Operation

CONSUMER SAFETY WARNING!

- Use with LP gas only.
- Shut off all gas appliances and pilot lights when refueling.
- Turn gas OFF at the LP tank when vehicle is in motion. This disables all gas appliances and pilot lights. Gas appliances must never be operated while vehicle is in motion.
- LP tanks must be filled by a qualified gas supplier only.
- Should overheating occur, turn gas OFF at the LP tank and turn the operating switch to the OFF position.

A: Understanding How the Girard Tankless Water System Works

In a conventional installation the Girard Tankless Water Heater is connected to:

1. The RV's cold water system deriving its water input from a pressurized (45 psi or greater) source such as a shore connection or an RV water pump connected to the RV's fresh water storage tank. NOTE - A steady water flow (no pulsating) will ensure a consistent temperature and performance.

2. The RV's hot water system (i.e. faucets and shower).

3. The RV's LP Gas system capable of supplying its rated BTU requirement. The Girard Products model GSWH-2 introduces a new generation of smart tankless water heater designed specifically for Recreation Vehicles (RV). Its configuration and size are consistent with the tank based RV water heaters currently in use and is designed for OEM's and after- market use by the RV industry.

4. The RV's 12VDC electrical power.

The Water Heater's microprocessor based controller (Control Module) receives from electronic sensors the data it needs to decide each step of the Model GSWH-2 operation.

1. Display on the User Control Panel (UCP) each phase of the Water Heater's operation and receive from the user the operation parameters desired:
   - ON/OFF to activate
   - Desired outlet temperature

2. Verify that all components are in working order and that it is safe to start the unit upon sensing the minimum amount of water flow required (.7 Ga/min)

3. Verify that the blower is operating and supplies the air flow needed to maintain clean combustion.

4. Open the gas control and light the burner according to the procedure required by the safety standard.

5. Adjust the gas flow to reach and maintain the desire temperature set by the user

6. Continue operation as long as:
   - The water flow is above the minimum required
   - The presence of flame is verified
   - No unsafe condition develops

7. Provide the user with a visual indication of the operating conditions turning on the appropriate icon and displaying the current outlet temperature:
   - Fan icon on: Blower operating
   - Flame icon on: Burner is lit and flamed is detected
   - Shower Head on: Water is flowing

8. The button marked “C/F” determines if the temperature is displayed in °F or °C degrees

9. Whenever the “UP” or “Down” are pressed the display shows the set temperature.

10. If an unsafe condition is encountered and the unit shuts off, the display will show an Error Code corresponding to the actual condition that caused the unsafe condition.

See **Troubleshooting** section for a list of all error codes.

B. Water Control Valve Flow Optimization (optional)

The Water Control Valve of the GSWH-2 provides good control of the outlet temperature within a wide range of inlet water temperatures as are normally encountered in Recreational Vehicles. The unit is shipped with the Water Control Valve set at fully open/maximum flow. If desired, the operating flow can be manually adjusted. It is located on the rear of the water heater.

In case of operation with extreme cold inlet water temperatures (approximately less than 45°(F) the performance of the Water Control Valve can be optimized by adjusting the flow as shown in Figure 8 below.

NOTE - This also can be accomplished by adjusting the hot water flow at the faucet.

Figure 8

C: Operating Procedures

The Model GSWH-2 can be operated from the User Control Panel (Figure 9) which includes the Power ON/OFF switch.

Figure 9

The model GSWH-2 can be operated in two different ways:

1. Operate like a Tank Water Heater. The user turns on the hot water and add cold water to achieve the desired Hot water temperature.
2. Select the desired temperature by adjusting temperature setting up (^) or down (v). The UCP settings are from 95° (F) to 124° (F). The unit will maintain the set temperature.

   Note – The recommended and Factory setting is 115° (F) or 46° (C).

For normal operation:

1. Turn on the power. The panel will light and will display the current temperature at the inlet of the unit.
2. Press a temperature selection arrow (up or down) to see the current set temperature.
3. Adjust the set temperature to your preference.
4. Turn on the faucet.

WARNING!

It is dangerous to operate a Tankless Water Heater unattended. This may occur accidentally if a sufficient leak develops in the water system or if a faucet is left open. For this reason The GSWH-2 will automatically turn off after operating for 20 minutes and displays Error “En” on the Display.

D: Winter Use

Winterization

Freezing of the water heater and its plumbing components will result in severe damage not covered by warranty. For this reason it is advisable to follow the recommendations below if the unit is to be stored in a freezing environment or for long periods of time. At the start of the winter season or before traveling to a location where freezing conditions are likely, the unit must be winterized. The very small amount of water present in the heat exchanger DOES NOT require the installation of a bypass kit. Winterization can be accomplished using one of the two common methods of winterization used for RV water systems:

- Compressed Air method: Drain all water from the system opening one tap at a time and using compressed air to purge all remaining water.

- Anti-freeze method: Follow the recommendations of the Recreational Vehicle manufacturer and fill the system with a non-toxic anti-freeze. Make sure that the anti-freeze flows from each tap to complete the process.

Antifreeze Device

If you wish to operate the water heater in potentially freezing conditions the model GSWH-2 has a built in thermostat that will start the burner whenever the temperature of the Heat Exchanger falls below 38ºF and will automatically shut off when it senses a temperature in excess of 58 º F

IMPORTANT NOTICE

To allow the Antifreeze Device to operate you must have sufficient LP Gas in the tank and 12VDC power available and you must leave the unit powered with the ON / OFF switch in the ON position at all times that freezing may occur. It will not protect the entire RV's plumbing system. The RV must be designed for winter use/freezing conditions.

E: Replacement Parts: Components

#	Description	Photo	Qty
1	Shell Top		1
2	Proportional Valve (Gas Valve)		1
3	Valve Bracket		1
4	Power switch & Fuse holder Assy		1
5	External Fuse10A		1
6	Controller Bracket		1
7	Air Pressure Switch		1
8	Control Box (Microprocessor)		1
9	User Control Panel (UPC) Remote Cont.		1
10	Water Pipe Screw Cover		1
11	O-Ring		1
12	Inlet-Valve Gas Train		1
13	Valve-Burner Gas Train		1
14	Igniter		1
15	Burner		1
16	Shell Bottom		1

#	Description	Photo	Qty
17	Pressure Relief Valve Direction Tube		1
18	Pressure Relief Valve		1
19	Water Pipe Assembly		1
20	Flow Switch Inlet		1
21	Filter Screen Inlet		1
22	Dust Cap: Inlet/Outlet		1
23	Flow Switch Inlet Knob		1
24	Water Flow Sensor		1
25	Rubber Gasket		1
26	Temperature Probe for Water Inlet		1
27	Inlet Thermostat (Antifreeze)		1
28	Temperature Probe for Water Outlet		1
29	Heater Exchanger		1
30	(ECO) T-Switch		1
31	Strain Relief		1
32	Blow Motor Assembly		1

E: Replacement Parts: Door Kit

#	Description	Photo	Qty
1	2GWHD Door Kit (White) New install/Sub 6 gal		1
2	2GHWDB Door Kit (Black) New install/Sub 6 gal		1
3	2GWDA6 Door Kit (White) Atwood 6 gal		1
4	2GWHDAS10 Door Kit (White) Sub/Atwood 10 gal		1
5	2GWD Door Only (White)		1
6	2GWHDB Door Only (Black)		1
7	2GWHD Flange Only		1
8	2GWHDA6 Door Only (White)		1

#	Description	Photo	Qty
9	2GWHDA6 Flange Only		1
10	2GWHDAS10 Door Only (White)		1
11	2GWHDAS10 Flange Only		1
12	Door Hinge		1
13a	Vent Silicone Ring (White)		1
13b	Vent Silicone Ring (Black)		1
14a	Door Latch Lock (White)		1
14b	Door Latch Lock (Black)		1
15	Door Latch Spring		1

F: Troubleshooting

If a failure were to occur in the GSWH-2 it will be detected by the Controller Module and the specific cause will be indicated by the Error Code on the User Control Panel display.

E0: Water Outlet Temperature Probe failure.
An open circuit or short circuit condition is detected: This could be due to an internal failure in the Temperature Probe or to a faulty connection (Wires)

E1: Ignition failure or accidental flame off during ignition.
If the established flame signal is lost while the burner is operating, the control will respond within 0.8 seconds, the gas valve is de-energized and a new inter-purge and ignition routine will begin. If the burner does not light, the control will de-energize the gas valve and will make two more attempts to relight the burner. If the burner does not relight after the three trials the control will go into LOCKOUT and the unit will need to be turned off before it can operate again. This could occur for a number of reasons. The most common are:

- Lack of Gas in the tank
- Faulty Igniter
- Faulty Igniter connections
- Improper distance between the Igniter and the Burner
- Accumulated dirt or obstruction between
- Igniter and Burner
- Low Gas Inlet pressure

E2: Flame sensing interrupted during normal operation. Buzzer will sound.
Possible causes are the same as indicated by Error E1 if any of these conditions occur during normal operation. A lock out will occur also in these conditions.

E3: ECO open before ignition or during normal operation.
This occurs if the ECO thermostat opens. Under normal circumstances this is due to the Temperature of the water at the Outlet exceeds 175 F. The cause must be identified and removed before restarting the unit.

E4: Water Inlet Temperature Probe probe failure.
An open circuit or short circuit condition is detected: This could be due to an internal failure in the Temperature Probe or to a faulty connection (Wires)

E5: Blower motor failure.
No motor signal was detected before ignition or during normal operation. This could be also caused by a wiring fault in the motor connections.

E6: Over Temperature.
Outlet Water Temperature has exceeded 140°F (60°C) for 3 sec.

E7: Linear valve failure:
The Controller Module detects an open circuit in the Linear Valve control circuit before ignition or during normal operation indicating a faulty Valve.

E8: Air pressure switch:
Air pressure switch not detected for 7 sec. before ignition or is cut-off for 2 sec. during normal operation. This failure may be caused by a faulty motor or a blockage in the air supply or in the exhaust system.

E9: Flame sensor:
Flame is sensed before ignition. Buzzer will sound. This is displayed when a short is detected in the flame sensor.

En: System Timer:
Water Heater ran longer than 20 min.

Functional Diagram of the Water Heater

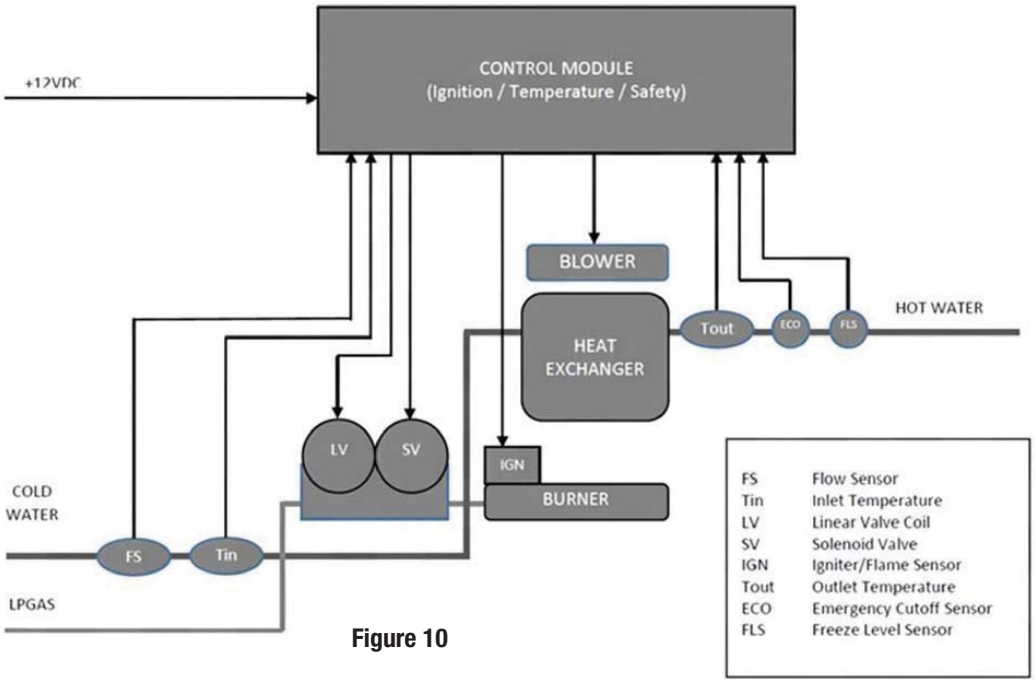


Figure 10

Wiring Diagram of the Electrical Connections within the Unit

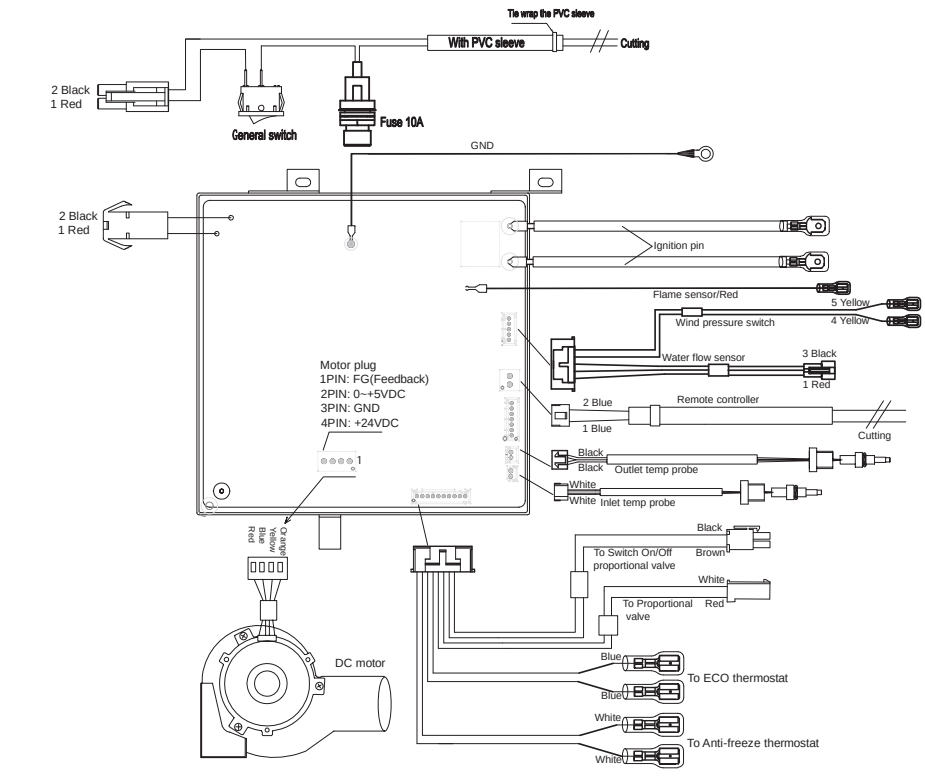
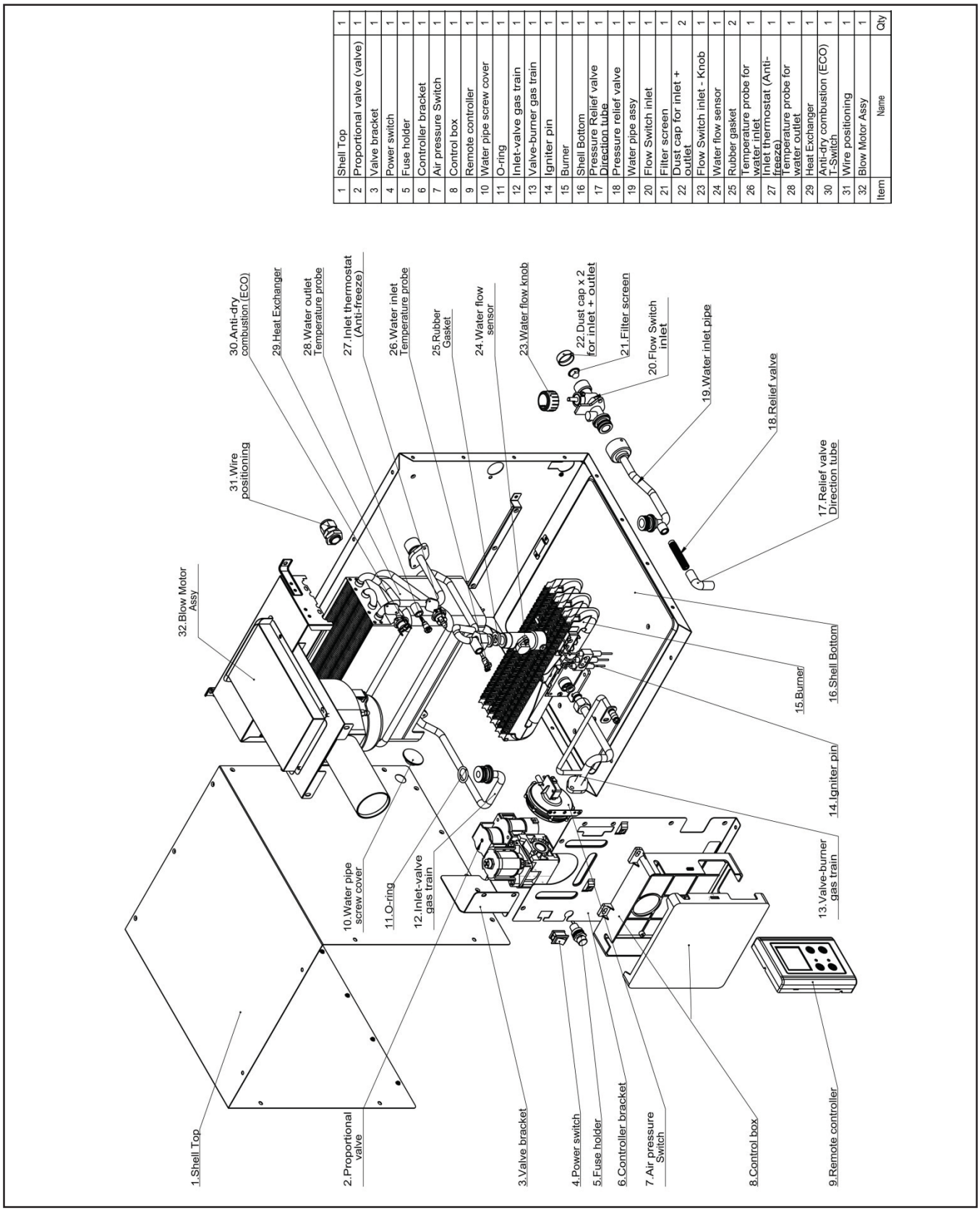


Figure 11

Exploded view of all of Components



Item	Name	Qty
1	Shell Top	1
2	Proportional valve (valve)	1
3	Valve bracket	1
4	Power switch	1
5	Fuse holder	1
6	Controller bracket	1
7	Air pressure Switch	1
8	Control box	1
9	Remote controller	1
10	Water pipe screw cover	1
11	O-ring	1
12	Inlet-valve gas train	1
13	Valve-burner gas train	1
14	Igniter pin	1
15	Burner	1
16	Shell Bottom	1
17	Pressure Relief valve Direction tube	1
18	Pressure relief valve	1
19	Water pipe assy	1
20	Flow Switch inlet	1
21	Filter screen	1
22	Dust cap for inlet + outlet	2
23	Flow Switch inlet - Knob	1
24	Water flow sensor	1
25	Rubber gasket	2
26	Temperature probe for water inlet	1
27	Inlet thermostat (Anti-freeze)	1
28	Temperature probe for water outlet	1
29	Heat Exchanger	1
30	Anti-dry combustion (ECO) T-Switch	1
31	Wire positioning	1
32	Blow Motor Assy	1

Figure 12

Control Module and its Connections

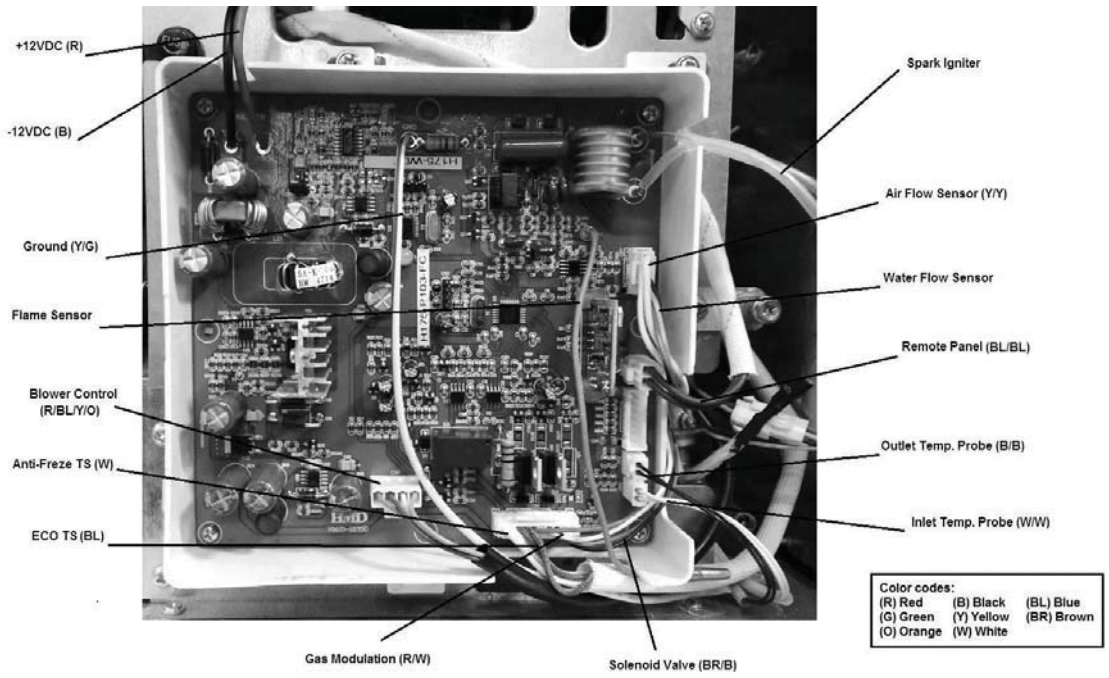


Figure 13

MAINTENANCE

CAUTION

Label all wires prior to disconnection when servicing controls.
Wiring errors can cause improper and dangerous operation.
Verify proper operation after servicing

We recommend that the GSWH-2 water heater be inspected monthly by the user and at least once a year by a Girard Products LLC recommended service technician.

Before an inspection, make sure that the Electrical Power, LP Gas and Water systems are turned on. Purge air out of ALL hot and cold water lines. **Verify that there are no combustible materials, gasoline or other flammable vapors and liquids in proximity of the unit.**

A routine inspection must include the following items:

1. Inspect the integrity of the sealing (caulking or tape) between the side wall and the door of the water heater and ensure that the unit is solidly mounted to the vehicle.

2. Verify that the air inlet openings (louvers) are completely open and clear of any debris including mud, leaves, twigs, insects etc. Remove all obstructions to allow full air flow.

3. Insects, including mud wasps and spiders, can build nests in the Exhaust Tube Outlet which will affect the performance of the unit. Inspect the Flue Outlet Tube to make sure that It is unobstructed and that the screen is clean. **If debris or insects are present, clean and vacuum to remove any remaining debris. The use of any type of aftermarket screen to cover the vent is not permitted and will void the warranty.**

4. Open the door and verify that no debris or extraneous combustible materials are present anywhere (especially in the area of the burner and the gas controls); remove any item present and wipe clean the bottom of the housing.

5. Inspect the interior surface of the housing for any cracks or corroded areas that could allow penetration of gases into or out of the interior of the vehicle. Check especially around the Hot Water, Cold Water, Gas and electrical connections.

6. There is a filter screen on the Water Heater inlet water line connection, unscrew the water line connection from water inlet and check the screen to ensure no debris.

7. Check that all wire connections are firmly in place and there are no signs of chafing or cracks on the insulation. Verify that the spark ignition cable between the Control Board and the igniter is securely in place and not shorted to any metal component.

8. Check relief valve to ensure it has not been leaking (no water residue).

9. Turn ON the power to the water heater and open a hot water faucet to inspect the flame of the burner. The flame should be of the normal bluish appearance that indicates proper combustion. This can be accomplished by opening the water heater door and observing the flames by looking at the burner under the edge of the heat exchanger.

10. If unit overheats (limits) often and the relief valve discharges periodically contact your service center.

SERVICE

Your Girard Tankless Water Heater is manufactured to the highest standards and is designed to provide years of trouble free use but in the event you require service please follow the steps outlined below. Remember as an owner, you are required to provide proof of purchase date through a Bill of Sale or other appropriate record.

1. For warranty/service information contact a Girard Products Water Heater Service Center, call the Girard Products Technical Support Department at 949-259-4024 or visit our website at www.greenrvproducts.com for a local recommended service center.

2. If the Girard water heater was installed by the OEM it may be under their warranty, follow the steps suggested by the manufacturer of your RV or contact Girard Products.

3. Call the service center, describe your problem and make an appointment if necessary. **SERVICE CALLS TO CUSTOMER LOCATION ARE THE RESPONSIBILITY OF THE OWNER.**

4. **GIRARD PRODUCTS WILL NOT PAY THE SERVICE CENTER FOR WARRANTY REPAIRS WITHOUT PRIOR APPROVAL.**

5. Provide the Service Center with purchase documentation for your Girard Water Heater.

The Girard Products GSWH-2 Water Heater is designed for use in recreation vehicles for the purpose of heating water as stated in the “rating plate” attached to the water heater. Any other use, unless authorized in writing by the Girard Products Engineering Department, voids the warranty.

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