

SERVICE SUPPLEMENT

Reporter



The Aqua-Hot Reporter

Introduction:

The Aqua-Hot Reporter is a new generation of command and control module which manages all functions of the Aqua-Hot from start-up to shutdown. The Reporter is used across the 400, 450, 600, and 675 units. The previously used electronic control board has been retired on new units in favor of the Reporter.

There are two series of Reporters presently in use; Reporter 1.0 and Reporter 2.0. Reporter 1.0 was launched November 30, 2018, and Reporter 2.0 was launched for 400 series units on September 18, 2019, and it later launched on 600 Series units on October 2, 2019.

The launch of Reporter 2.0 allowed an opportunity to improve upon the 1.0 design where ever it was deemed necessary. The Reporter 2.0 features the following design improvements:

- Over-Temperature Fault Functionality
- Precise fluid coolant temperature display
- Boost Pumps are now powered directly by the Reporter
- 600D/675D Owners may now select a pump for fluid stir

Functionality:

The Reporter was designed with a touch-screen interface to simplify and standardize unit use and troubleshooting. Screen navigation and access is now standardized across the Aqua-Hot 400 Series (D02/P02 and newer,) 450 Series Diesel (DE5 and newer,) and 600 Series (D04 and newer.)

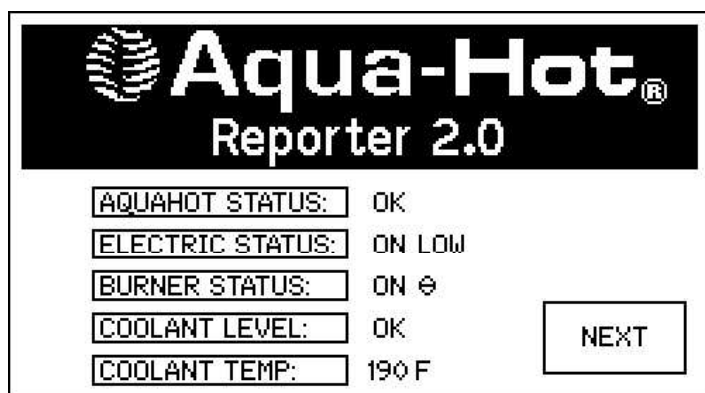
The Reporter also contains fault logging functionality, troubleshooting tools, and testing functions. Each of these functions will be explained in-detail later in this supplement.

Screens

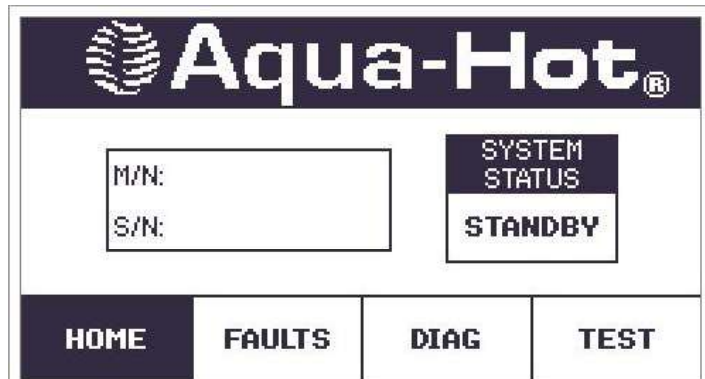
Introduction:

The Aqua-Hot Reporter has a graphical user interface that brings increased clarity and functionality to the operation and troubleshooting of the Aqua-Hot. These screens will be shown in-context with the section to which it corresponds.

You will be displayed with the first screen upon waking the Reporter. This is called the home screen.



After tapping next, you will be presented with the serial number screen. All navigation of the Reporter GUI will originate from this screen.

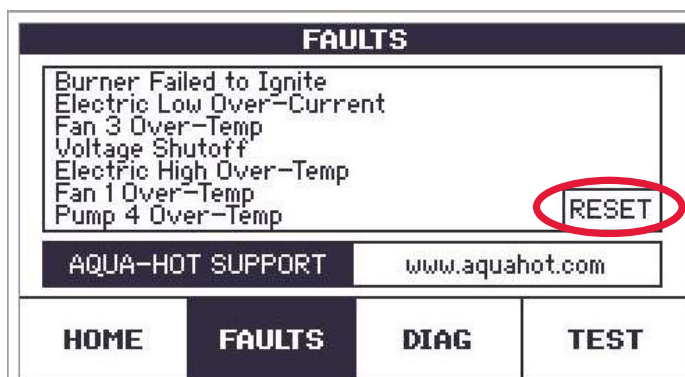


Fault-Status and Fault Log

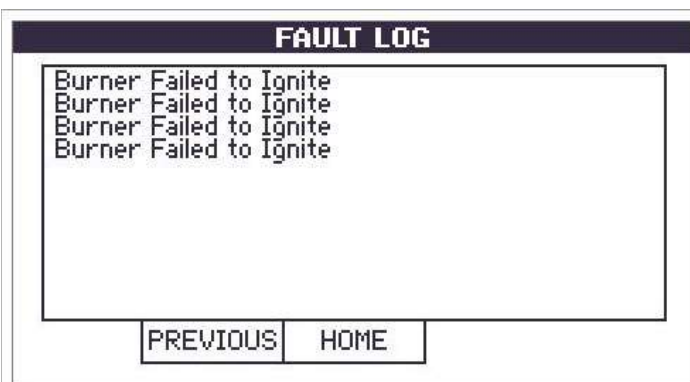
Introduction:

The faults page will display certain faults which may impede the functionality of an Aqua-Hot, and should be the first stop any technician makes when beginning to diagnose an Aqua-Hot heater equipped with a Reporter.

These faults will display, newest to oldest, top to bottom until the Reporter has been reset. Reset the Reporter by pressing and holding "RESET" in the bottom right of this window for at least 6 seconds. When using the "RESET" button, the Reporter will prompt the user to affirm the reset before it is executed. Alternatively, power-cycling the Reporter will also serve as reset.



The Fault Log contrasts slightly from the Faults screen in that it does not automatically clear on system reset. This feature was implemented on Reporter 1.0 firmware 1v11, and Reporter 2.0 firmware 2v7. Earlier firmware revisions will not allow fault log clearance under any circumstance. Keep this information in mind, as the Fault Log may contain historic faults which have already been addressed and are not related to a present issue.



NOTE: Please note that the Reporter can only detect faults within the Aqua-Hot itself and cannot provide diagnostic information to any coach-side utilities or components.

Fault Codes

The Reporter will generate specific fault codes relevant to certain failures within the Aqua-Hot. This will assist in diagnosis and repair of most problems which arise within the Aqua-Hot.

System Voltage:

A system voltage fault code will display when the Reporter exceeds, or drops below its supply voltage operating range of 11V DC to 16V DC. The Reporter will deactivate all components of the Aqua-Hot as a safety mechanism.

This fault code indicates a problem with the coach-side power supply to the Aqua-Hot. Remedy the issue within the coach power system before proceeding.

Low Voltage:

A low-voltage fault is displayed when the Reporter supply voltage is between 11.1V DC and 11.8V DC. During a low-voltage fault, the Reporter will continue to operate until the voltage drops to or below 11.0V DC.

A Low-Voltage fault, and a System Voltage Fault are NOT the same fault.

Repair this issue by diagnosing and repairing the coach-side 12V DC power supply system.

Low Level Cutoff (LLCO):

A low level cutoff fault indicates that the level of antifreeze and water heating fluid within the Aqua-Hot has dropped below the safety threshold. The Reporter will not allow the Aqua-Hot to operate until the fluid level has been returned to an acceptable threshold.

Add antifreeze and water heating solution to the Aqua-Hot in order to remedy this issue.

Over-Current

An over-current fault will occur if any component (such as a fan or a pump) is drawing too much current. If the over-current fault occurs, the Reporter will disable the over-current output channel (fan/pump/etc). For example, if pump 2 presents an over-current condition which triggers an over-current response by the Reporter, pump 2 will be deactivated. The Reporter must be power-cycled (remove power

and reapply it) in order to restore functionality to the over-current channel.

Remedy this issue by inspecting, and if necessary, replacing the component which is causing the over-current condition.

Overheat

With the release of the Reporter 2.0, the control thermostat was replaced with an Engine Temperature Sensor (ETS). This allows for more granular control over the internal tank temperature of the Aqua-Hot.

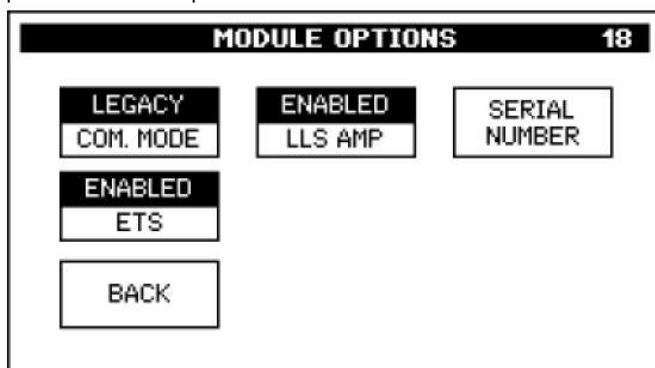
An overheat condition will occur if the internal tank temperature exceeds 210 °F. At this point, the Reporter will deactivate all components of the Aqua-Hot and it will not allow the unit to restart until the Reporter has been power-cycled.

Remedy this issue by addressing the cause of the heater overheat, and then power-cycling the Reporter.

System Options

Introduction:

Reporter 2.0 units are equipped with user-serviceable settings which will be changed ONLY in the event that a Reporter 1.0 is replaced with a Reporter 2.0.



If these settings are applied incorrectly, it will only negatively impact heater performance. DO NOT change these settings unless directed to do so by Aqua-Hot or a trained technician.

COM. MODE:

The COM. MODE setting affects the communication mode of the RVC network. On certain coaches the COM. MODE must be set

to legacy due to the manufacturer's use of legacy PGNs.

Contact your coach manufacturer to determine if this setting must be changed when upgrading your Reporter.

ETS:

The ETS must be set to ENABLED only if the heater utilizes an ETS module. If the unit uses a control thermostat, this must be set to DISABLED. Units with serial numbers newer than those listed below employ the ETS.

LLS AMP

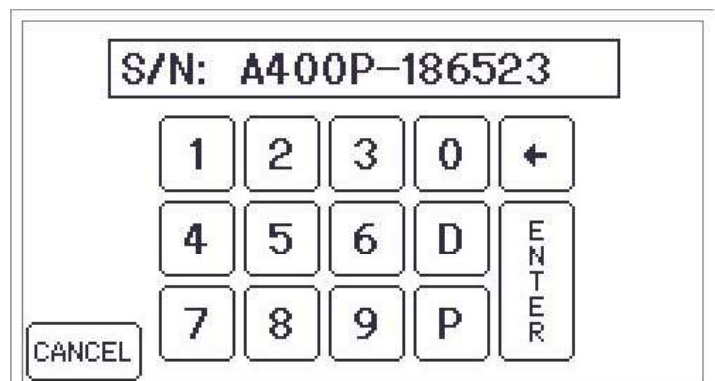
The LLS AMP setting must be enabled on all heaters which serial numbers are less than those listed below.

Model	Serial Number
400D	A400D-195434
450D	A450D-196049
600D	A600D-195034
675D	A675D-195019

Serial Number

The serial number setting will display the serial number entry field. The serial number will need to be set if the Reporter that shipped with the unit needs to be replaced.

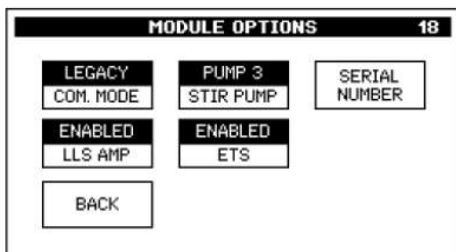
Enter the serial number which is found on the unit identification label which is affixed to the top of the heater cabinet.



Stir Pump (600D and 675D only)

The 600D and 675D have the option to change the stir pump for the unit to either pump 2 or pump 3.

Check with the coach manufacturer if it is not immediately clear which pump should be the stir pump.



Testing Functionality

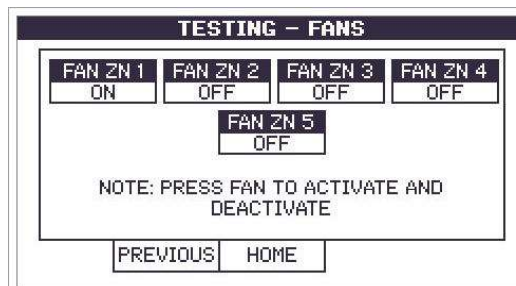
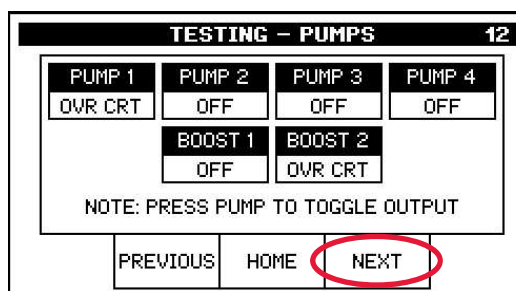
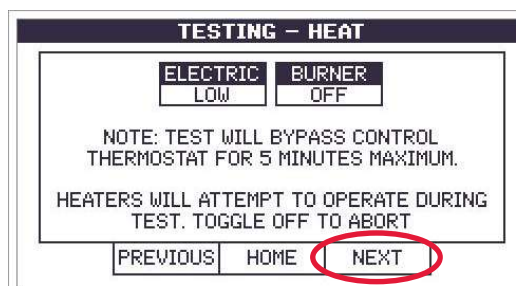
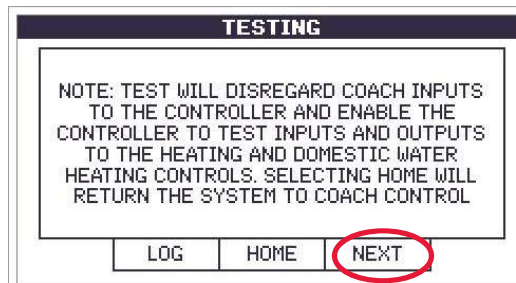
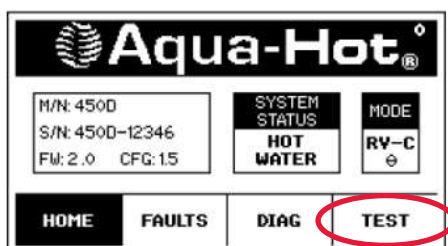
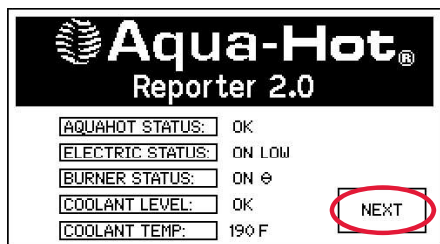
Introduction:

The Reporter brings with it a large amount of testing functionality which was not previously available, or was much more difficult to utilize. This functionality is organized into three sub-categories: Fans, Pumps, and Heating Sub-systems. A detailed description for each is included below.

Fans:

It is possible to independently activate the fans of the heating zones using the Reporter. This will allow you to verify communication between the fans and the Reporter. When activated via the testing screen, the fans will remain active for five minutes before shutting down.

Follow the prompts below to activate the zone fans.



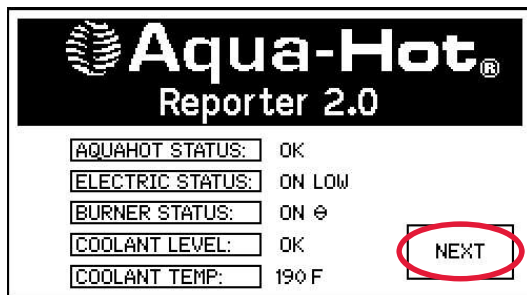
Once you reach the screen entitled "TESTING - FANS," it is possible to activate the fans in use at each zone independently to verify their functionality, and their communication with the Aqua-Hot.

Tap each zone fan (FAN ZN 1, FAN ZN 2, etc) in order to activate that zone. The number of zone fans will vary depending on the unit installed in the coach. These fans will run for five minutes before shutting down.

Pumps:

Pumps can also be independently activated to accomplish such things as diagnosis, repair, and zone purging. These pumps will activate for a maximum of five minutes before shutting down. This method may be used to test pumps for over-current conditions.

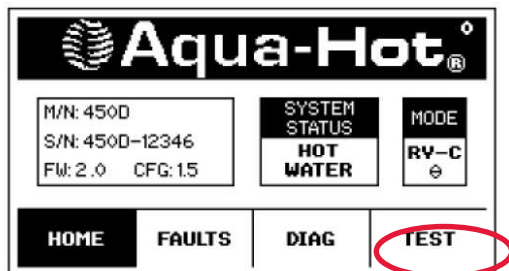
Follow the prompts below to independently activate the zone pumps.



Aqua-Hot® Reporter 2.0

AQUAHOT STATUS:	OK
ELECTRIC STATUS:	ON LOW
BURNER STATUS:	ON ⊕
COOLANT LEVEL:	OK
COOLANT TEMP:	190 F

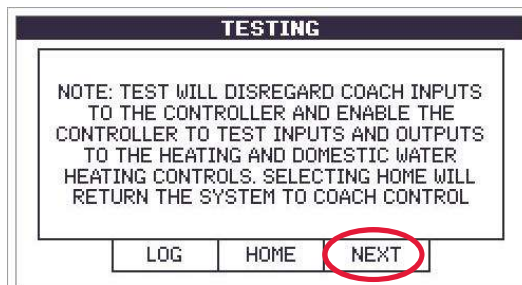
NEXT



Aqua-Hot®

M/N: 450D S/N: 450D-12346 FW: 2.0 CFG: 1.5	SYSTEM STATUS HOT WATER	MODE RV-C ⊕
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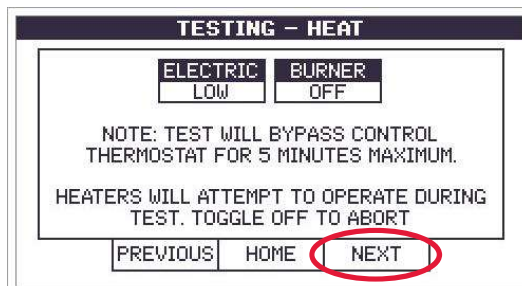
HOME **FAULTS** **DIAG** **TEST**



TESTING

NOTE: TEST WILL DISREGARD COACH INPUTS TO THE CONTROLLER AND ENABLE THE CONTROLLER TO TEST INPUTS AND OUTPUTS TO THE HEATING AND DOMESTIC WATER HEATING CONTROLS. SELECTING HOME WILL RETURN THE SYSTEM TO COACH CONTROL

LOG **HOME** **NEXT**

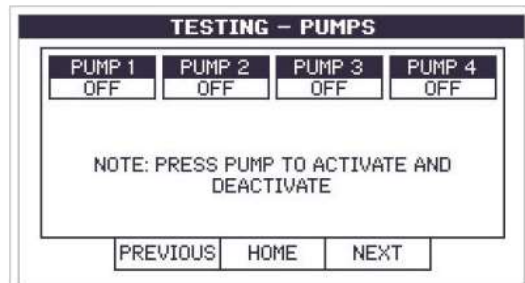


TESTING - HEAT

ELECTRIC LOW	BURNER OFF
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NOTE: TEST WILL BYPASS CONTROL THERMOSTAT FOR 5 MINUTES MAXIMUM.
HEATERS WILL ATTEMPT TO OPERATE DURING TEST. TOGGLE OFF TO ABORT

PREVIOUS **HOME** **NEXT**



TESTING - PUMPS

PUMP 1 OFF	PUMP 2 OFF	PUMP 3 OFF	PUMP 4 OFF
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NOTE: PRESS PUMP TO ACTIVATE AND DEACTIVATE

PREVIOUS **HOME** **NEXT**

Once you reach the screen entitled “TESTING - PUMPS,” it is possible to activate the fans in use at each zone independently to verify their functionality, and their communication with the Aqua-Hot.

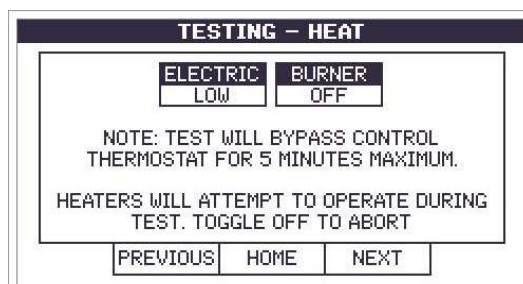
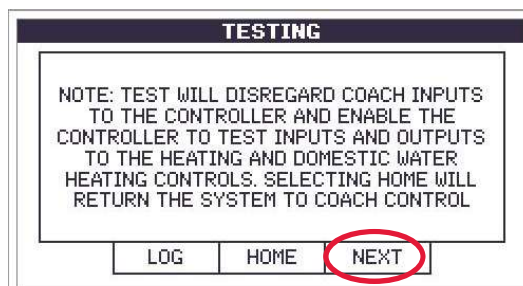
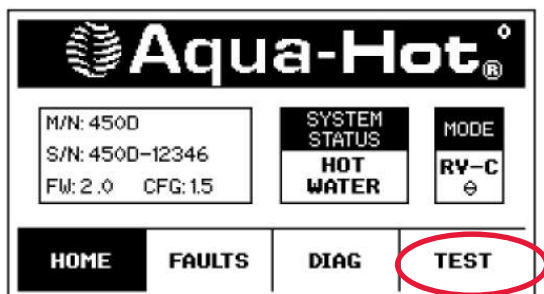
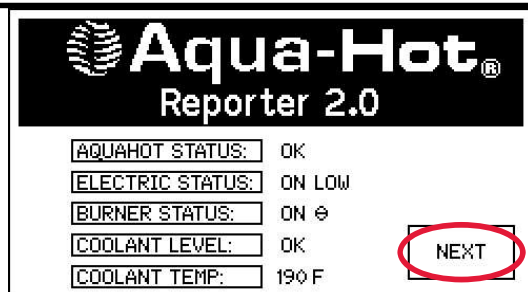
Tap each zone fan (PUMP 1, PUMP2, etc.) in order to activate that zone. The number of pumps will vary depending on the unit installed in the coach. These fans will run for five minutes before shutting down.

Boost pump functionality and implementation for Reporter 1.0 units is dependent upon the coach manufacturer. As such, it may or may not be possible to activate the boost pump via the method described above. Contact your coach manufacturer if you need help activating your boost pump.

The Reporter 2.0 changed this functionality slightly by allowing boost pumps to be independently activated from this screen.

Heating Sub-Systems:

The heating sub-systems (burner and electric) can be activated regardless of unit temperature, coach thermostat status, or ETS reading.



Activating the heating sub-systems near the operating temperature could trigger an overheat condition, further complicating troubleshooting and diagnosis of the Aqua-Hot.

The heating sub-systems tests should be used after service has been performed to the burner or AC electrical sub-systems, or if the coach connectivity is suspected of fault or failure.

The heating sub-systems will activate for a maximum of five minutes to verify functionality. These test elements are NOT a substitute for normal functionality. Attempting to use them as such could result in damage to the Aqua-Hot, coach, and could result in personal injury.

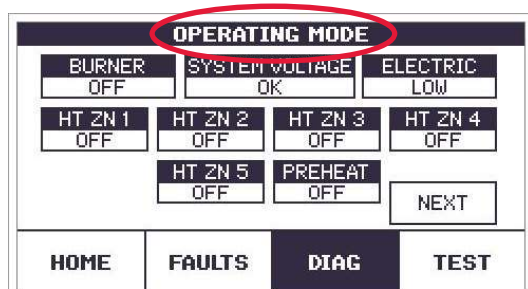
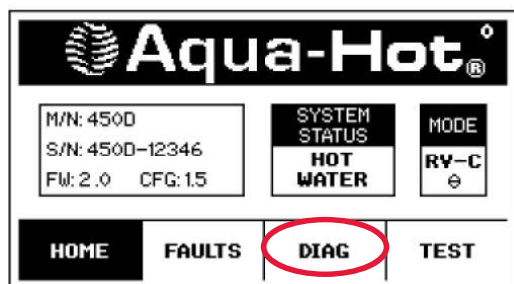
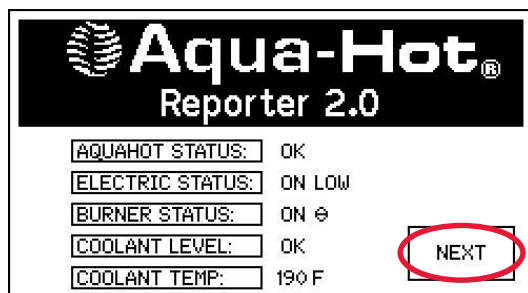


Diagnostic Information

Introduction:

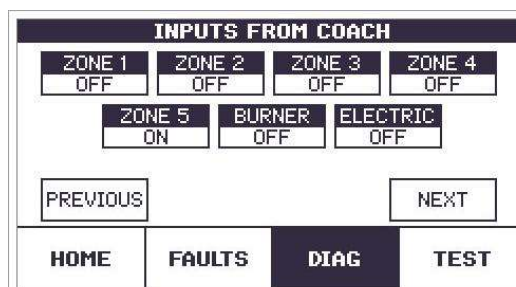
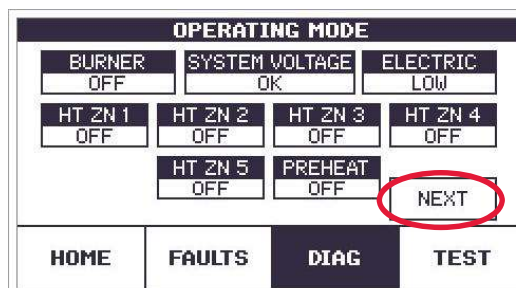
The Reporter brings with it detailed information pertaining to coach-side and Aqua-Hot side input/output (I/O) signals.

Follow the directions below to access the Aqua-Hot and Coach I/O sections of the Reporter.



Immediately after tapping “DIAG,” the “OPERATING MODE” section will appear. This is intended as an at-a-glance view into the Diagnostic information. This will tell you if any zones are requesting heat, the system voltage status, burner status, and if applicable the engine preheat status.

Note that the example above shows “ELECTRIC - LOW” and “PREHEAT - OFF.” These features are not present on all units, and the OPERATING MODE screen may display differently depending on the unit that is being worked on.



INPUTS FROM COACH

Tapping next on the OPERATING MODE screen will move you to the INPUTS FROM COACH screen. The INPUTS FROM COACH screen will display the signals that the Aqua-Hot is receiving from the coach.

In the example above, we see that Zones 1-5, burner, and electric are all displaying “OFF.” This indicates that the zone thermostats within the coach are NOT requesting heat, and the burner and electric are both switched off, or not requested for use by the on-board RVC or multi-plex system. If the switches within the coach are moved to the ON position, or if the RVC or multi-plex system sets the burner and electric element to ON, the ELECTRIC and BURNER elements on this page will change to “ON.” Likewise, if the zone thermostats are set to their highest setting (to trigger a request for heat,) the corresponding Zone on the screen will change to ON.

This screen can be used to verify communication between the coach and the Reporter. Detailed instructions herein are below.

1. Inside the coach, set both the electric and burner switches to the ON position
2. Set all interior thermostats to their maximum setting..
3. Navigate to the “INPUTS FROM COACH” screen in the “DIAG” section of the Reporter.
4. At this stage, all of these elements should display “ON”.
5. If any of these elements do not display “ON”, it indicates that there is a communication failure between that element (zone thermostat or switch) and the Aqua-Hot.

INPUTS FROM COACH			
ZONE 1 OFF	ZONE 2 OFF	ZONE 3 OFF	ZONE 4 OFF
ZONE 5 ON		BURNER OFF	ELECTRIC OFF
PREVIOUS		NEXT	
HOME	FAULTS	DIAG	TEST

OUTPUTS TO COACH 3			
FAN ZN 1 OFF	FAN ZN 2 ON	FAN ZN 3 OFF	FAN ZN 4 OFF
FAN ZN 5 OFF	BURN IND. OFF	BOOST 1 OFF	BOOST 2 OVR CRT
PREVIOUS		LOW TEMP SENSE INTERIOR HEAT	NEXT
HOME	FAULTS	DIAG	TEST

OUTPUTS TO COACH 3			
FAN ZN 1 OFF	FAN ZN 2 ON	FAN ZN 3 OFF	FAN ZN 4 OFF
FAN ZN 5 OFF	BURN IND. OFF	BOOST 1 OFF	BOOST 2 OVR CRT
PREVIOUS		LOW TEMP SENSE INTERIOR HEAT	NEXT
HOME	FAULTS	DIAG	TEST

OUTPUTS TO AQUA-HOT			
ELECTRIC LOW	BURNER OFF	PUMP 1 OFF	PUMP 2 OFF
		PUMP 3 OFF	PUMP 4 OFF
PREVIOUS		NEXT	
HOME	FAULTS	DIAG	TEST

OUTPUTS TO COACH

Tapping next from the INPUTS FROM COACH screen will direct you to the OUTPUTS TO COACH screen. The OUTPUTS TO COACH will show any output signals which are being sent to the coach.

In the example above we see that the Zone Fans, Burner Indicator Light, Boost Pumps 1 and 2, and the Low Temp Sense elements are all present.

- The “FAN ZN #” elements indicate whether or not the Reporter is supplying power to the zone fans. In the example above, we see that FAN ZN 2 is ON, therefore, Zone 2 is requesting heat, and the Reporter is supplying power to the fans in that zone to deliver is.
- “BURN IND” indicates the current status of the burner indicator light. When the burner is on and operating, this should indicate ON. If the burner is on and the unit is up to operating temperature, this light will go out as part of normal operation.
- “BOOST #” indicates the current status of the boost pumps that have been wired into the Reporter. We can see that in this example, BOOST 1 is off, but BOOST 2 is displaying “OVR CRT”, meaning that the pump is attempting to draw too much current through the Reporter.
- “LOW TEMP SENSE” indicates the current reading of the Low-Temperature Cutoff Thermostat (LTCT). The Aqua-Hot 400 series heaters are a hot-water priority system, meaning that when the boiler tank needs heat, it will prioritize heating hot water over interior heat. This element will indicate either INTERIOR HEAT or HOT WATER. This element will NOT be present on 600D and 675D units.

OUTPUTS TO AQUA-HOT

Tap NEXT on the OUTPUTS TO COACH page to access OUTPUTS TO AQUA-HOT. Present on this page are going to be the BURNER, ELECTRIC, and PUMP #. The number of pumps shown on this screen will vary depending on the Aqua-Hot that is installed in the coach.

- BURNER will display either ON, OFF, or FAULT depending on the need for heat. This indicates that the Reporter is requesting the burner be active or inactive based upon the heating needs. If this indicates FAULT, the burner has faulted and will require maintenance. No diagnostic information beyond that will be available from the Reporter.
- ELECTRIC will indicate ON or OFF for 400 Series heaters, and will indicate LOW or HIGH for 600 series units. 600 series heaters differ from the 400 series in that it is possible to set the electric to HIGH or LOW to change the heating output provided to the boiler tank. 400 series heaters lack this functionality and are able to only turn the electric heat on or off. Please note that the Reporter is not able to detect faults within the AC electric heating system.
- PUMP # indicates that the Reporter is providing power to operate the fluid circulation pumps within the heater. The number of pumps shown on this screen will vary depending on what kind of heater is installed in the coach. These elements will display either OFF, ON or “OVR CRT”. “OVR CRT” indicates that there may be a problem with the corresponding pump - the pump is drawing too much power.

OUTPUTS TO AQUA-HOT			
ELECTRIC LOW	BURNER OFF	PUMP 1 OFF	PUMP 2 OFF
	PUMP 3 OFF	PUMP 4 OFF	
PREVIOUS		NEXT	
HOME	FAULTS	DIAG	TEST

INPUTS FROM AQUA-HOT			
BURNER STATUS OFF	LOW LEVEL SENSOR TANK FULL	LOW TEMP SENSOR INTERIOR HEAT	COOLANT TEMP 190 F
PREVIOUS			
HOME	FAULTS	DIAG	TEST

INPUTS FROM AQUA-HOT

Starting at the OUTPUTS TO AQUA-HOT screen, tap NEXT to proceed to the INPUTS FROM AQUA-HOT screen.

The elements shown on this screen indicate the current operational readings from the components within the Aqua-Hot. This screen will be most useful when attempting to diagnose problems with components inside the Aqua-Hot.

- **BURNER STATUS** will indicate the current operational status of the burner within the Aqua-Hot. This element will display one of the following elements at any given time; ON, OFF, STANDBY, or FAULT. ON and OFF are self-explanatory. STANDBY will occur when the heater has reached operational temperature, and the burner has been shut off due to no longer needing heat input. FAULT will display if the burner faults out for any reason. There will be no diagnostic information provided from the Reporter about this fault.
- **LOW LEVEL SENSOR** will indicate the current fill level of the Aqua-Hot. It will display either TANK FULL or ADD FLUID. If the screen displays ADD FLUID, antifreeze and water heating solution will need to be added to the boiler tank of the Aqua-Hot according to the service manual of your unit.
- **LOW-TEMP SENSE** indicates that the components within the Aqua-Hot required to provide either hot water, or interior heat are activated as necessary. When the LOW TEMP SENSOR element displays INTERIOR HEAT, the Aqua-Hot is working to supply interior heat to the coach. If the LOW TEMP SENSOR element displays HOT WATER, that means that the unit stir pump is active and is working to produce continuous hot water.

- **COOLANT TEMP** or **CONTROL THERM** indicates the current operating temperature of the Aqua-Hot.

On units with a control thermostat, this element will display CONTROL THERM, with its status being either HEATING or AT TEMP. The control thermostats were phased out with the introduction of the Engine Temperature Sensor (ETS.) The example shown below will display when a Control Thermostat is in use.

INPUTS FROM AQUA-HOT			
BURNER STATUS OFF	LOW LEVEL SENSOR TANK FULL	LOW TEMP SENSOR INTERIOR HEAT	CONTROL THERM AT TEMP
PREVIOUS			
HOME	FAULTS	DIAG	TEST

Units equipped with an ETS will display COOLANT TEMP, and with the actual coolant temperature displayed as the status. The ETS contrasts from the control thermostat in that the control thermostat served as a switch, which opened or closed depending on the temperature of the tank. The ETS is instead a thermistor, which measures the tank temperature precisely, while the Reporter handles the switching on and off of components as the tank heats. The example below is indicative of a unit with an ETS module.

INPUTS FROM AQUA-HOT			
BURNER STATUS OFF	LOW LEVEL SENSOR TANK FULL	LOW TEMP SENSOR INTERIOR HEAT	COOLANT TEMP 190 F
PREVIOUS			
HOME	FAULTS	DIAG	TEST

RVC Network Connectivity

The Reporter was designed to interface with the coach-side RVC network to aid in the Aqua-Hot's integration into the on-board RVC network.

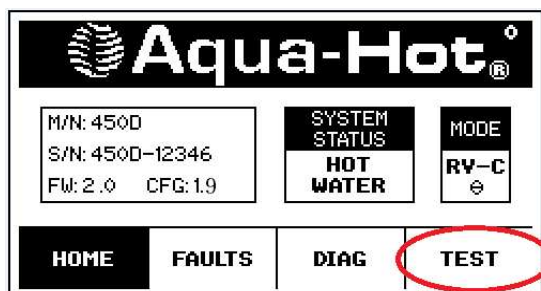
There is an indicator light on the back of the Reporter which shows the current status of the Reporter's connection to the RVC network. This will be useful when diagnosing potential problems with the coach-side RVC network.

LED Activity		Status
		Solid Green Reporter is connected to network and communicating properly
		OFF Reporter has no power, or has failed completely
		Solid Red Reporter has gone offline and is not connected to network
		Flashing Green (4/second) Reporter is attempting to make an initial connection to the network
		Flashing Green (1/second) The Reporter is online, but it has not received a valid network message for at least 5 seconds
		Alternating Red and Orange Reporter has gone offline and is attempting to re-connect (within 30 seconds)
		Alternating Green and Orange Reporter is currently online but has gone offline 2 or more times.

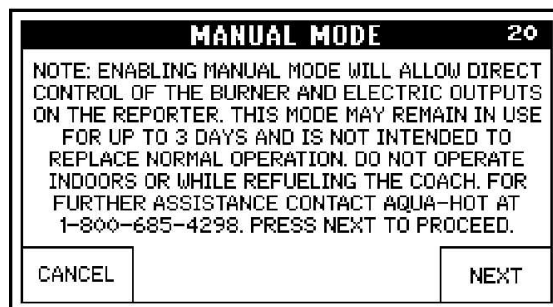
Manual Mode

The 2.0 Reporters with CFG 1.9 and greater come with a Manual Mode in case the general coach RVC network fails. It will allow for limited operation while the larger network/module problem is addressed.

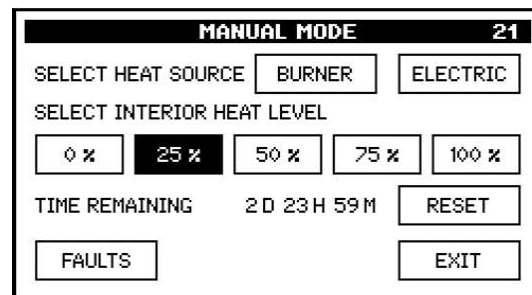
This mode can be accessed under the test page of the Aqua-Hot Reporter (see below).



Once the test page is open, select the MANUAL MODE and select "NEXT". Manual Mode will continue to run for up to 3 days without any user intervention. Pressing the reset button at any time while enabled will reset the timer, and run for an additional 3 days.



All heating zones are linked together and can be run at 25%, 50%, 75%, and 100% (as shown below). The burner and electric can be enabled or disabled. For all levels, there is a 10 minute duty cycle period that will allow Cozy fans to be on for the specified percentage of 10 minutes. Example, 25% would be on for 2.5 minutes, and then off for 7.5 minutes. It always starts with the on-cycle, then shuts off for the remainder of the 10 minute period.



NOTE: On the 600/675 units, electric can be operated in low or high modes.

If the system power is cycled, the Manual Mode will be disabled and must be manually reactivated. Leaving the manual mode page will also disable manual mode and restore normal operation. Leaving manual mode should be done once the system failure has been resolved and normal operation can resume.

NOTE: If using the rocker switches, burner & electric switches must be toggled on/off after leaving Manual Mode.

Please call the Technical Service Department if you encounter any difficulties while performing this procedure. 1 (800)-685-4298 from 7am-4pm MST Monday through Friday.

SERVICE SUPPLEMENT

Reporter



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Visit us online at www.aquahot.com
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