Solar hot water heater
The following refers to a Dux SunPro ™ Gas boosted solar Hot water with a Resol DeltaSol ® bs controller. The hot water system is a open system with the water used being directly heated by the solar panels. The general principles should apply to other units also.

Solar Hot water heaters need to be tested to see if the solar heating is working. Try feeling around the water pipe connection to feel for heat. Turn off the gas to the booster heater on a hot day and run some water to see if is hot. My system has instantaneous gas heater to heat the water on cloudy days but it appeared to work all the time. The fault was due to the solar pump and controller. To fix it see below.

Fair Warning

The author assumes no responsible for errors and omissions. Neither is any liability assumed for damages resulting from information contained in this article. Use of the information is at your own risk and no liability is accepted.

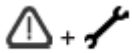
I cannot guarantee your skill and knowledge in using the information

Repairing electrical appliances can be dangerous and the risk of electric shock is always present. It can be fatal! Read the section on "A1 Electric Shock" in Australian Washing Machine Repairs. Improper repairs can make the appliance dangerous and can cause a fatal electric shock to the operator. Also incorrect replacement of parts can trip the safety switch/circuit breakers, damage the replacement part or other parts.

Always turn off and pull out the plug before removing any covers or touching any electrical components!

If you do not have the skills and knowledge to repair the appliance, do not do it, get an experienced qualified person. This information is a guide for someone with experience in electrical repairs.

Testing the Controller
Resol DeltaSol ® bs controller
The manual for the controller can be down loaded from the manufacture web site (not the hot water system manufacture). Google "Resol DeltaSol". (I can email a copy if you have trouble)


Sensor Fault

The LED should be green for correct operation, a red LED for a fault condition.

The controller has a screen and 3 buttons. Left: backwards, Centre: Set and Right: forwards. These buttons move backwards or forwards through the displays.
COL is the collector temperature., press the forwards button and it then displays the collector temperature (TST) If -88.8 is displayed then the sensor is short circuit, 888.8 the sensor is opened circuit. The resistance of the sensor is about 1000 Ω to 1400 Ω depending on the temperature. The sensor are small metal cylinder with a pair of wires. The sensor can be removed from the terminal block for resistance. S1 is for the collector sensor and S2 is the tank sensor. A warning triangle plus a spanner indicates a sensor problem.

Testing the pump
The pump is a shaded pole motor (AWMR: F8,E5) similar in construction to sync pump (AWMR:

F9,) in washing machine with the bush bearing running in the water. The magnetism from the field travel through the stainless steel sleeve.
Unplug before starting! Disconnect the pump from the controller and power up using "suicide leads" (AWMR:B2.4.2). The pump should use about 0.2-0.3A. (Measure with an inline ammeter or clamp meter (AWMR: appendixA1). Put your ear next to the pump and you should hear it running. On a sunny day the pipe back from the collector to the tank should get hot. Also the collector temperature on the controller should drop in temperature. Note if any air locks are present then the pump may not pump. There is a bleed valve at the outlet in the collector. Caution: the water may be very hot!

Cleaning or replacing the pump.

The pipe from the bottom of the tank goes through a ball valve (operated by a blade screw driver), and then to the pump and then to the bottom of the solar collector. The hot water then travels from the top of the solar collect back to the top of the tank. Cover the solar collectors to prevent them overheating when there is no water in them. Close the ball valve to prevent draining the tank. Remove any power to the pump! Undo the brass ring and the pump will come apart. If the pump is to be replaced undo the pipe to the pump housing. Refitting is the reverse. You need to bleed the air out of the system as describe in the manual supplied by the manufacture. Bleed the air at the top of the collector and run water through a hot water tap.

My Problem.

The sensor in the tank failed, the pump not operating for a long time the the pump bearings corroded up causing the pump not to rotate. These pumps are not very powerful!

Suggested Modification

The controller cannot be seen with the covers on. I suggest the a window or door be cut into the cover to gain access to the controller.

References

Article by Lindsay Alford

AWMR: Australian Washing Machine Repairs by Lindsay Alford, see washfix.com.au
AWMR:: F8 refers to section F8 in my book.

More picture will be added soon.