STANDARD TROUBLESHOOTING APPROACH

S.T.A. MANUAL

2003 Jacuzzi Spa Division

Mass Merchant Spas

JACUZZI®

SPA DIVISION

Table of Contents

Pg.

1.0 Standard Troubleshooting Approach (S.T.A.)

1.1 Why a Standard Troubleshooting Approach?

Service prices are basically set by local industry and geographic region. Stiff competition in the service industry has made it difficult to raise the price of a service contract; or charge more for time and materials than the competitive shop down the street. If your service business is to be profitable you must control the overall **cost of service.** The total cost of service is made up of many individual cost factors, but three in particular are more important than the rest combined:

1. Time of Repair- How long it takes to find and fix a problem.
2. Time Between Failures- How often you are called to repair any one particular hot tub? How many times are you called back to fix the same problem on the same hot tub?
3. Parts Usage- Except in rare circumstances, only one part fails. How many parts do you replace before you find the bad one?

The Jacuzzi Spa Division STA Manual has been designed to help you control the overall cost of service by focusing on the three important aspects of your job outlined above. The STA will help you fix your customer's hot tub quickly, fix it well, and use fewer parts.

1.2 How to use the STA

The STA was developed by the Jacuzzi Spa Division Technical Support Department and is designed to be the communications link between you and your customers. If you call for help on any symptom covered in this book, you will be told to do what the STA recommends, therefore, you will save time by calling technical support after you have done what the STA tell you to do.

1.3 Professional Customer Service

Doing your job in a way that keeps cost of service low and profit margin high, also it creates customer satisfaction. That's being a professional!

1.4 Before Leaving the Shop

Phone the customer(s), personally if possible, and ask what problem(s) should be corrected. This may not tell you what work must be done or what part(s) must be replaced, but it will tell you what must be fixed after you arrive.

1.5 Fixing the Hot Tub

Use the STA to see how Jacuzzi Spa Divisions Technical Support Department would approach the customer's complaint. Try to fix the problem following the STA. Use your experience and other information to help you answer any "Whys" or "Hows". The STA is designed to keep unnecessary part replacement to a minimum. Least expensive, most likely, and easily changed parts are always swapped first. Some parts, like control panels and temperature sensors do not require complete installation to be temporary swapped out for testing purposes. You should carry such spares as "Tools".

1.6 Before Calling Technical Support

Make sure you have followed the STA. Have the STA manual near the telephone. Technical support can help you best if the STA manual becomes the communications tools for the phone call.

1.0 Standard Troubleshooting Approach (S.T.A.)

1.7 Before Leaving the Customer

If this is a warranty repair, the serial number information will be needed when your office fills out the "Returned Goods/ Labor Tag. In any case, it will help you spot trouble before it happens. Pumps burn up if voltage at the hot tub is too low. Circuit breakers trip if heaters and motors draw too much current (Amps). Wires overheat and connections burn if wire size is too small or push-on connectors are loose. **Call backs cause cost of service to increase!**

1.8 Satisfying the Customer

Most customers do not care what work you have done or what parts you have replaced, but they always care whether or not their problem goes away. When you are done, show them that their problem is gone. If they ask how you did it, take a few minutes to explain. Show them the bad part(s) and explain or show why it is bad.

Develop the habit of examining the hot tub's you service. Compliment customers on the things they are doing right. Tell them how their care and attention can stop trouble before it starts.
Mention if you noticed any adverse conditions, especially if the hot tub is under warranty or contract, that could lead to failure. Can the customer correct the problem? Would they like you to correct it? Can you recommend someone? Would they like an estimate?

2.0 Electro Static Discharge (E.S.D.)

2.1 ESD - What is it? What does it do?

Static electricity is always being generated around us, even at those times of the year when we no longer get zapped after walking across a rug and touching something.

Like all state-of-the-art circuit boards, the hot tub's circuit board can be damaged by unnoticed static electricity. Damaged is the key word. Sometimes a board which has been subjected to ESD will fail immediately upon being put back into service. Usually a board will operate for a few days, or months, then fail.

If the hot tub runs only a few days, the customer thinks you provided poor service.
If the hot tub runs only a few months, the customer thinks the circuit board is a low quality product.
If the customer loses use of the hot tub. **You lose money** because you must go back to make it right.
Jacuzzi Spa Division loses its reputation for quality.

2.2 Avoiding ESD Damage

We can't prevent static charges from building up within us as we go about our jobs, so we must do three things to protect circuit boards from getting zapped:

1. Never transport or ship circuit boards- **Good boards or bad boards**- except in static protective bags.
2. Never remove the board from the static protective bag unless you are ready to install it in the hot tub.
3. After removing the bad board from the hot tub, A) lay it on the ground, B) remove the replacement board from the static protective bag, C) lay the replacement board on the ground, D) place the bad board in the bag from which you removed the replacement board.

2.3 What About Wrist Straps and Special Mats?

The purpose of these devices is to keep the technician, the work surface, and the circuit board at the same electrical potential, and to drain into ground any static charges which might build up. Proper use of the wrist strap and special matt guarantees maximum protection against ESD damage.

2.4 Must Wear Wrist Straps and Mats be Used When Replacing A Circuit Board?

No, if you keep the spare board in the protective bag during transport and you observe a few simple techniques during replacement.

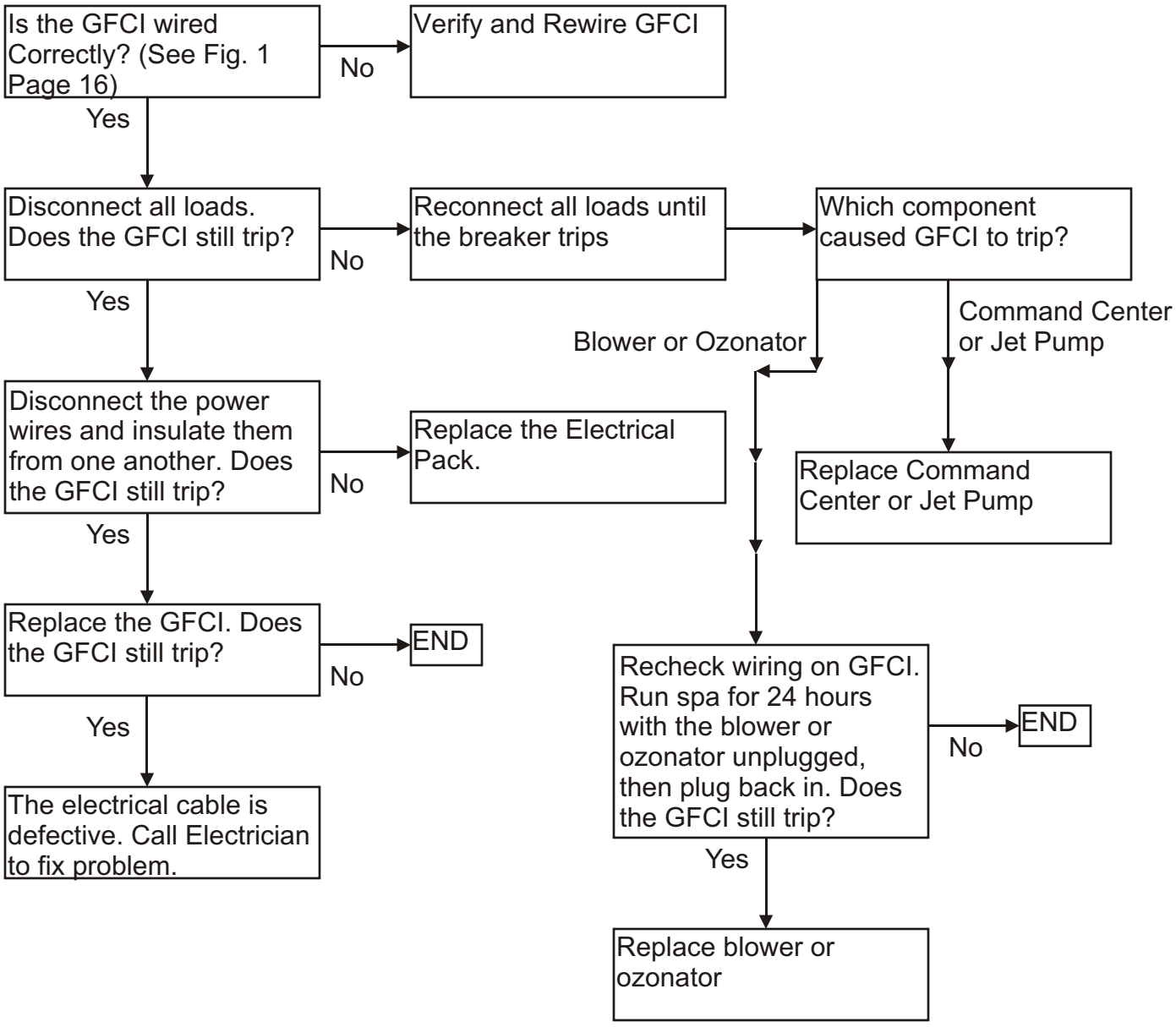
The possibility of ESD damage to the circuit board during replacement will be minimal because of the hot tub's design and the way you normally work on it. Touching the grounding lug will drain all built-up static charges from your body much like a wrist strap would. Laying the bad board on the ground will tend to keep it neutral. Touching a finger to the grounding lug immediately before removing the good board from the bag will drain any charges built up by the rustling of your clothes. Laying the good board on the ground after removing it from the bag will tend to keep it neutral. Another quick touch of the grounding lug before will allow it to be transported safely. Another quick touch of the grounding lug before picking up the good board will agin drain any charges built up by the rustling of your clothes. In the process of installing the replacement board, you and the board will be grounded to the load box or grounding lug, draining off charges you may build up during installation.

3.0 General Troubleshooting

3.1 Chemical or Water Quality Problem

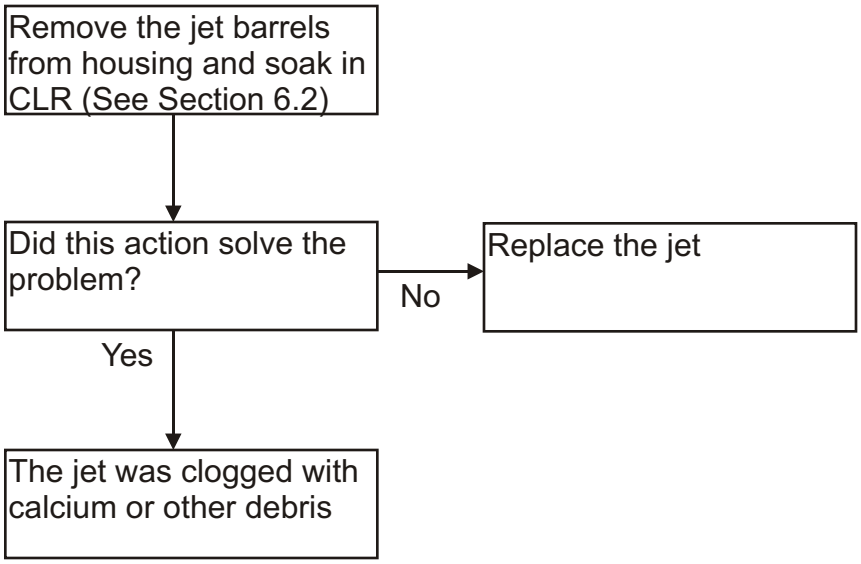
Go to Section **5.0 Chemical Issues.**

3.2 Spa Tripping the GFCI Breaker

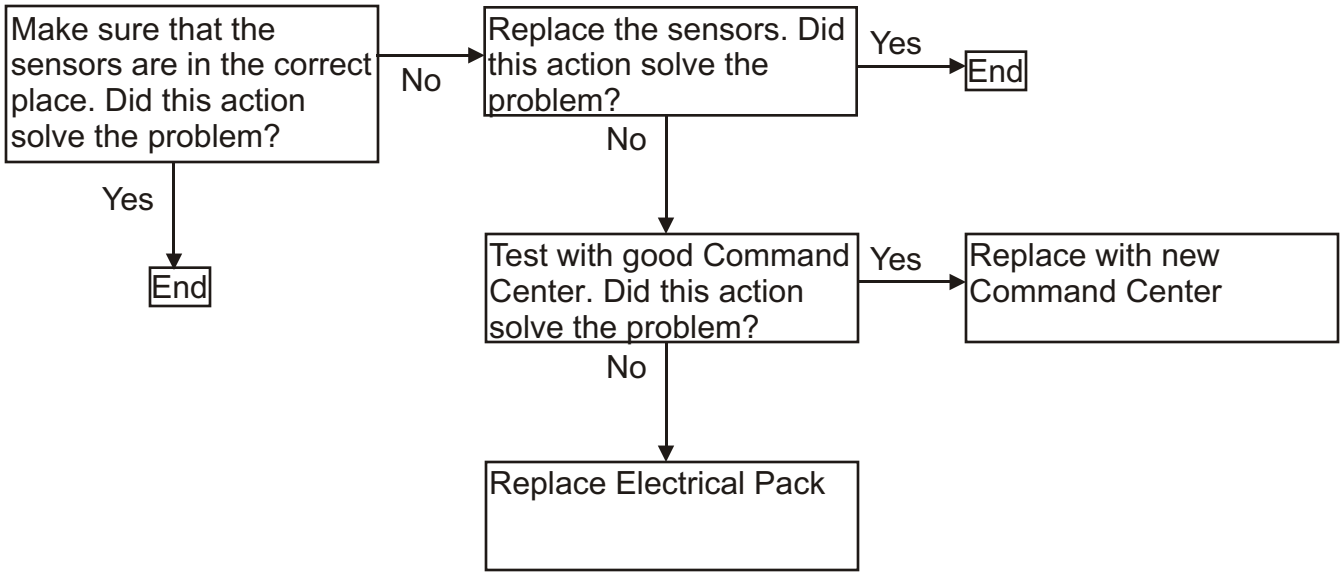


3.0 General Troubleshooting

3.3 Jets Won't Rotate (High Speed)



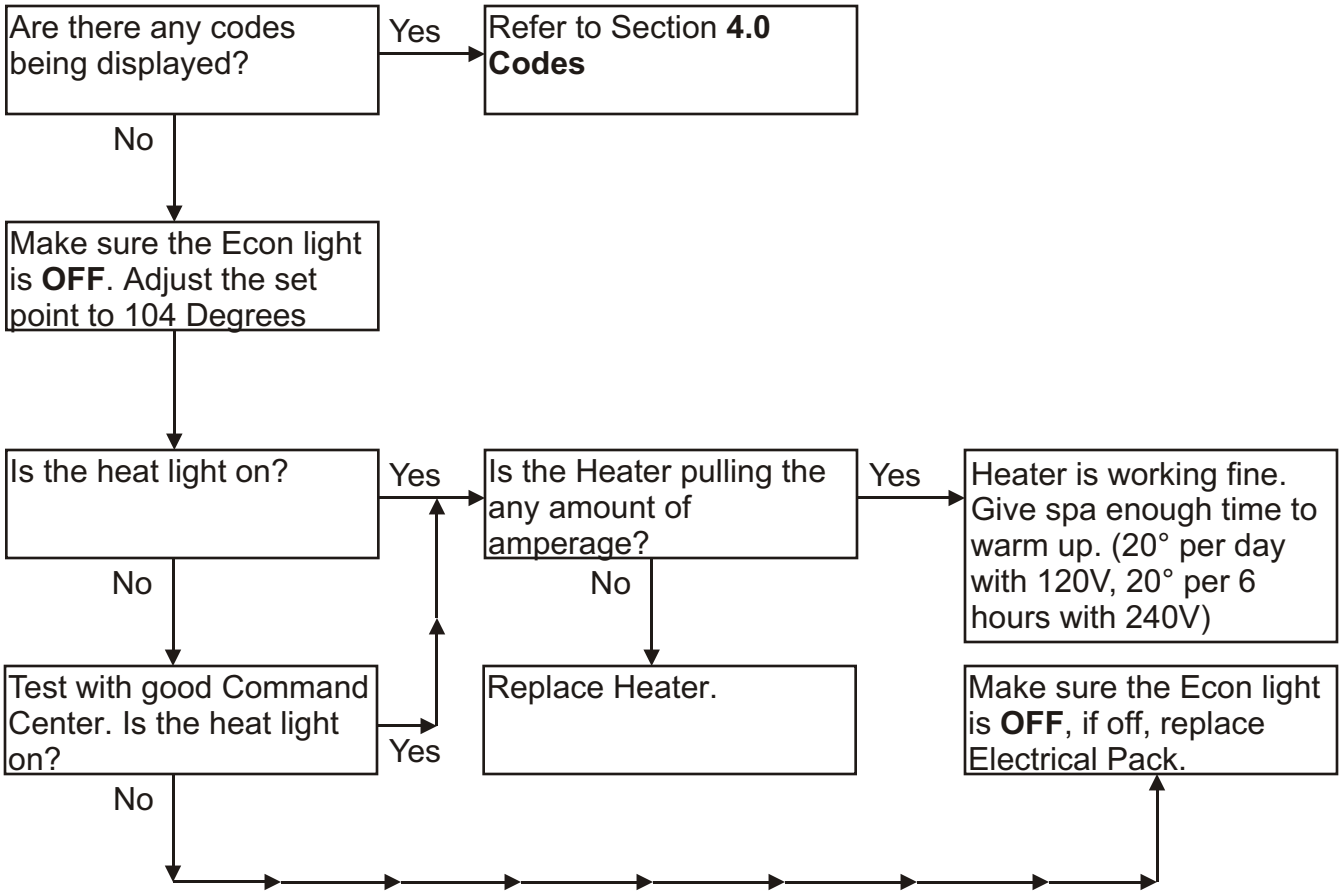
3.4 Spa isn't Displaying the Proper Temperature*



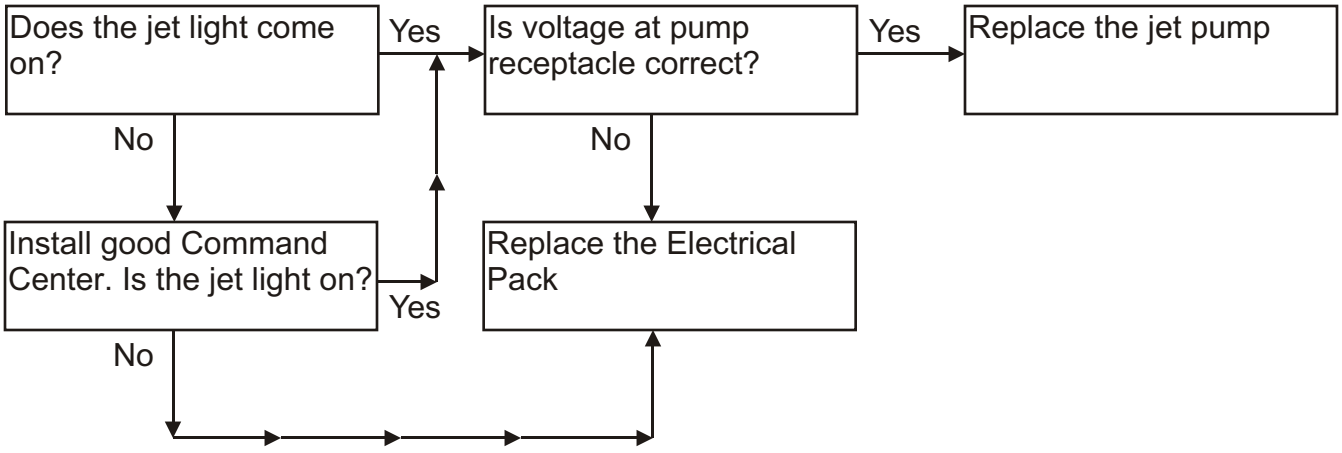
* Verify with second thermometer, medical thermometer works best for this purpose

3.0 General Troubleshooting

3.5 Spa Water not Heating

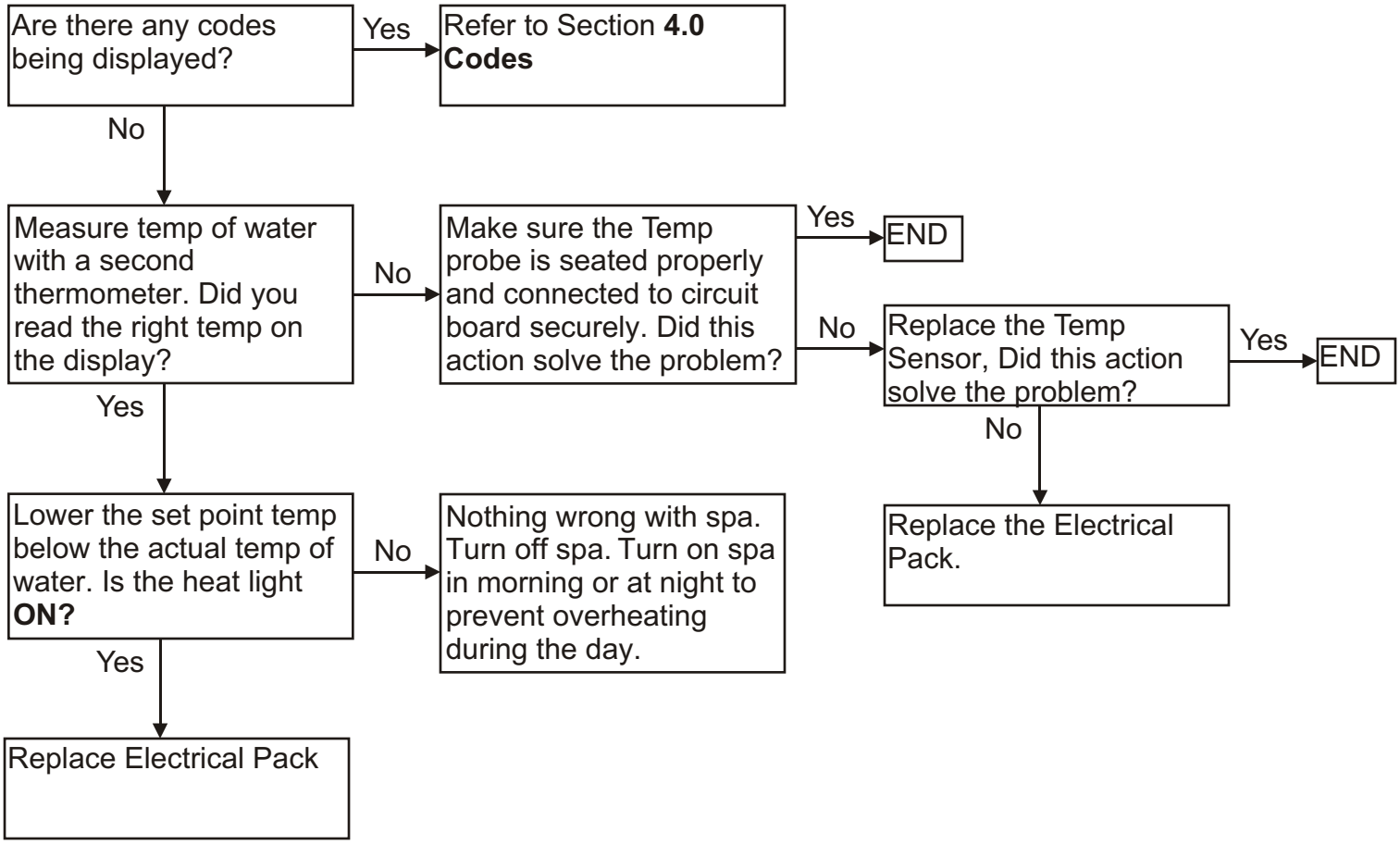


3.6 Jet Pump Not Running



3.0 General Troubleshooting

3.7 Spa is Overheating



3.0 General Troubleshooting

3.8 Nothing on the Spa Works (Display is Blank)

Reset GFCI. Is there incoming voltage at Terminal block? (Refer to drawing below)

Yes → Check 30 amp fuse. Replace if bad. Is display still blank?

No → END

Yes → Check ¾ amp fuse. Replace if bad.Do you measure 10-15Vac between the two yellow transformer wires?

No → Recheck incoming voltage. If okay, replace Transformer.

Yes → Is display still blank?

No → END

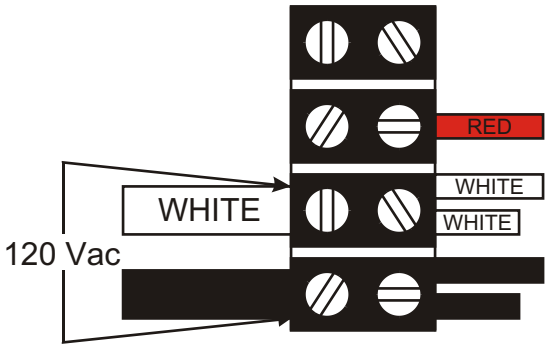
Yes → Does the motor(s) come on?

No → Recheck incoming voltage. Replace Electrical Pack.

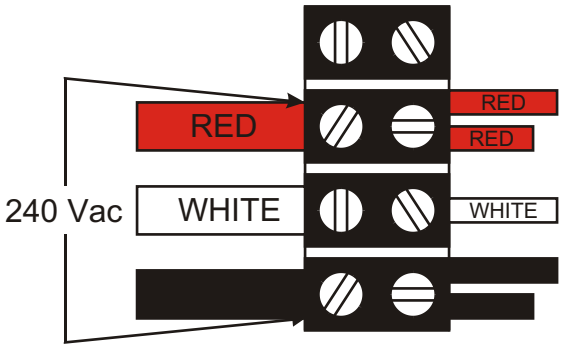
Yes → Check connection from Electrical Pack to Command Center, if okay replace Command Center.

No → There is a problem in the electrical wiring. Have the wiring checked by a local electrician.

120 Volts Application

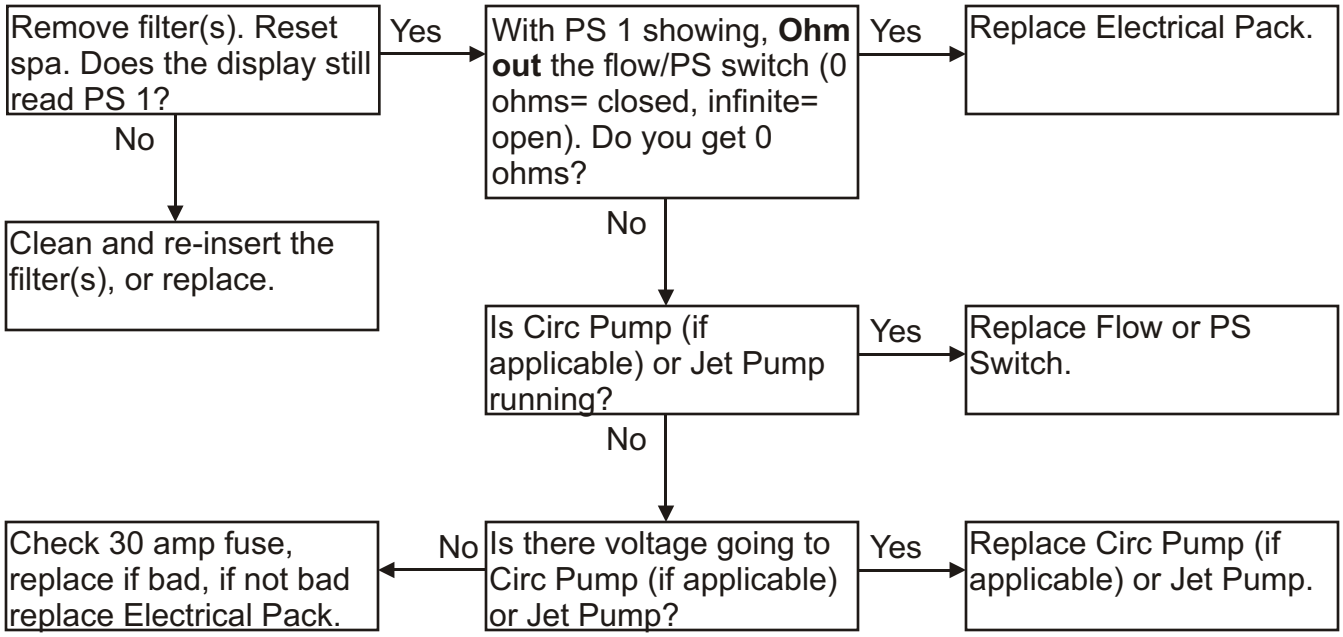


240 Volts Application

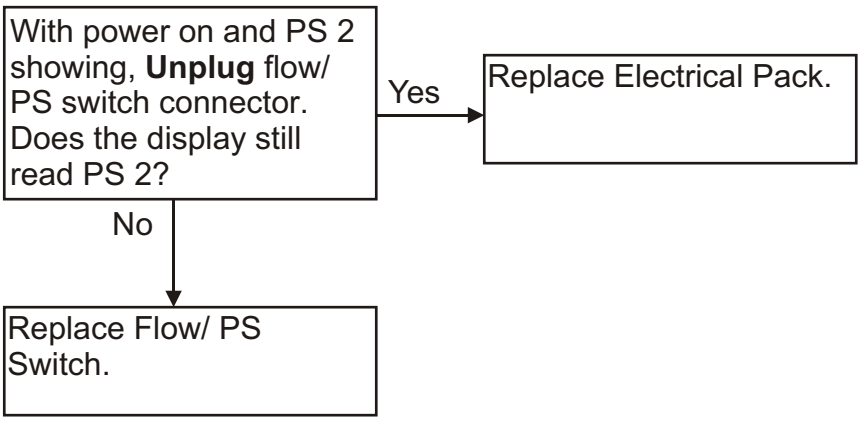


4.0 Codes

4.1 PS 1 (Flow Switch/ Pressure Switch (PS Switch) is Open When Motor is On)



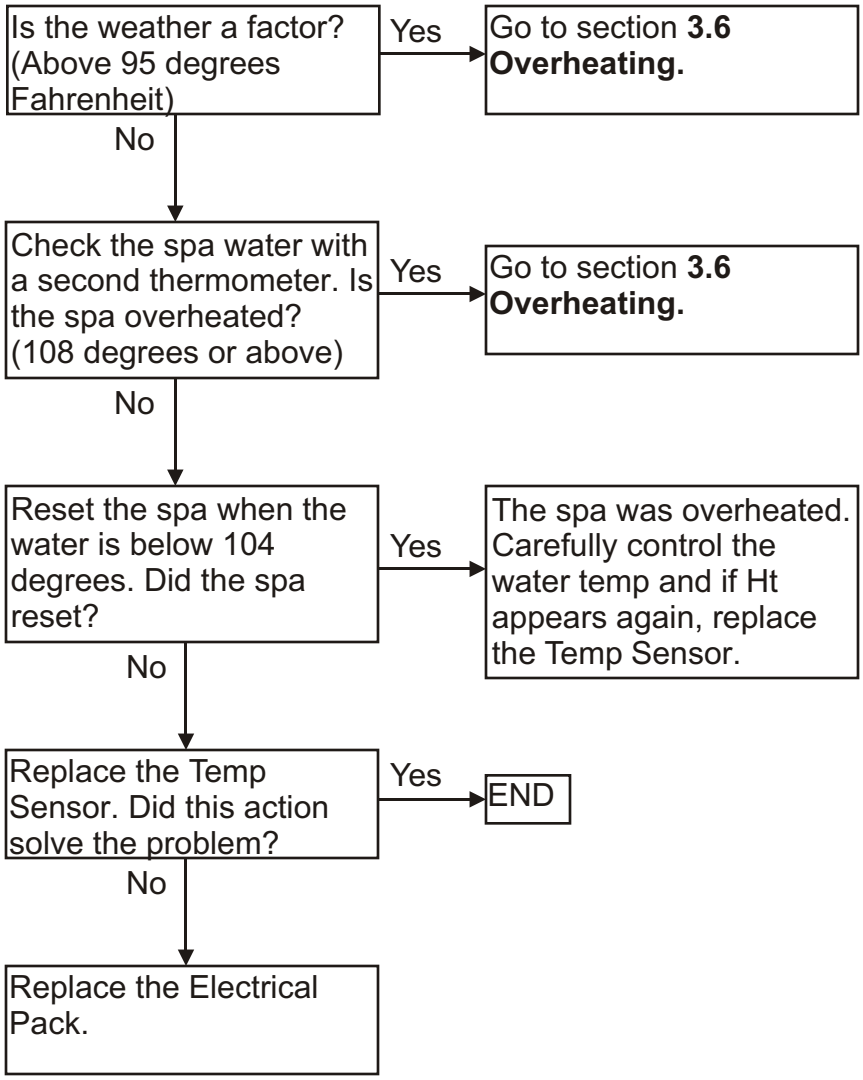
4.2 PS 2 (Flow Switch/ Pressure Switch (PS Switch) is Closed When Motor is Off)



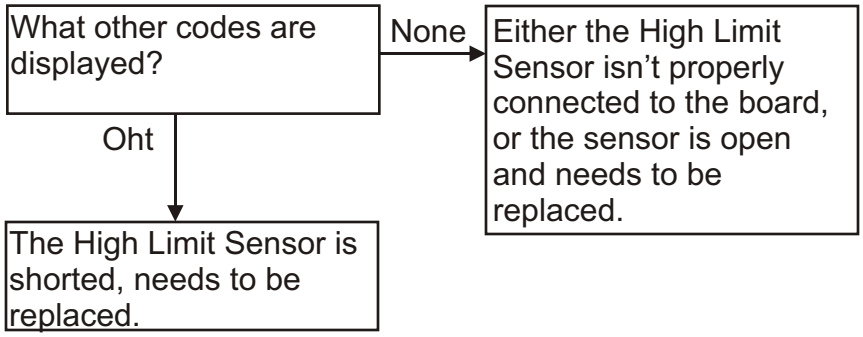
***** If Ps1 and Ps2 have been displayed longer than 5 minutes the spa will have to be turned off and turned back on, to reset the code..

4.0 Codes

4.3 Ht (Temp Sensor)

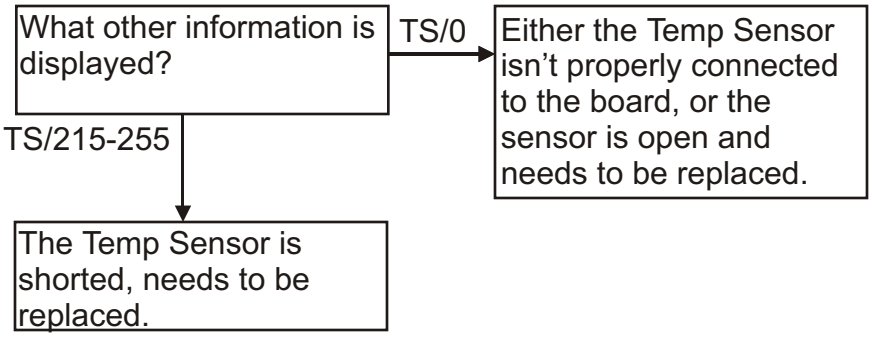


4.4 HtS (High Limit Sensor)

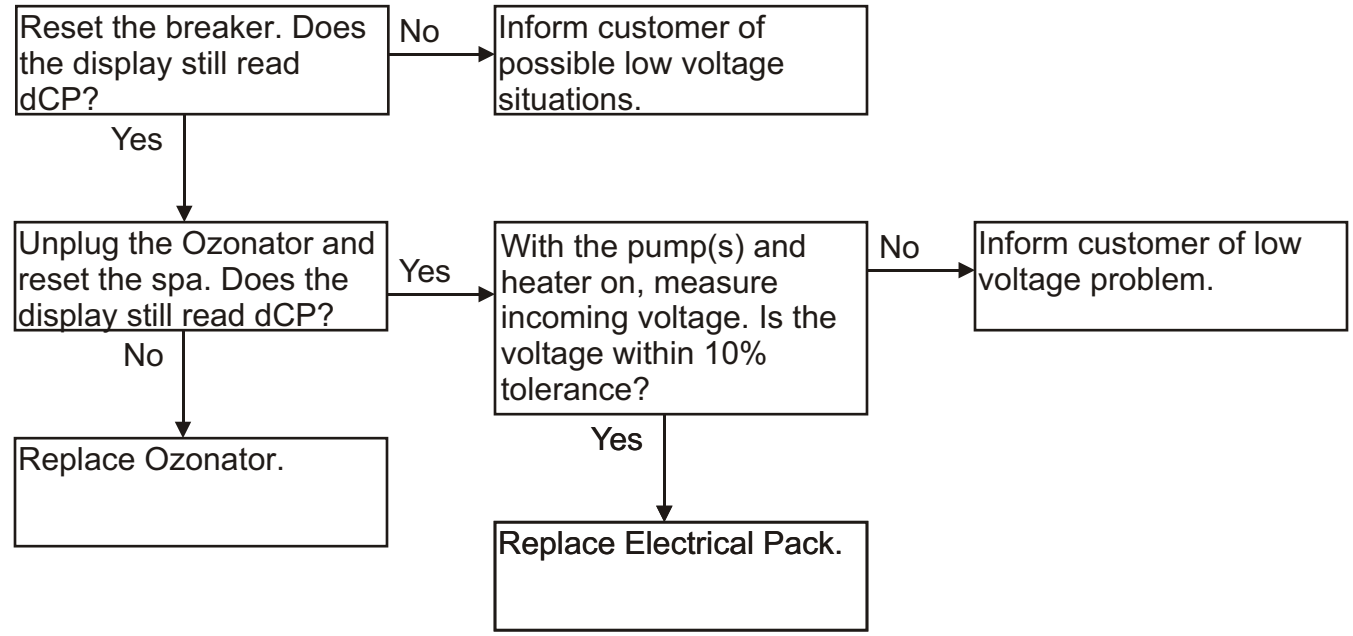


4.0 Codes

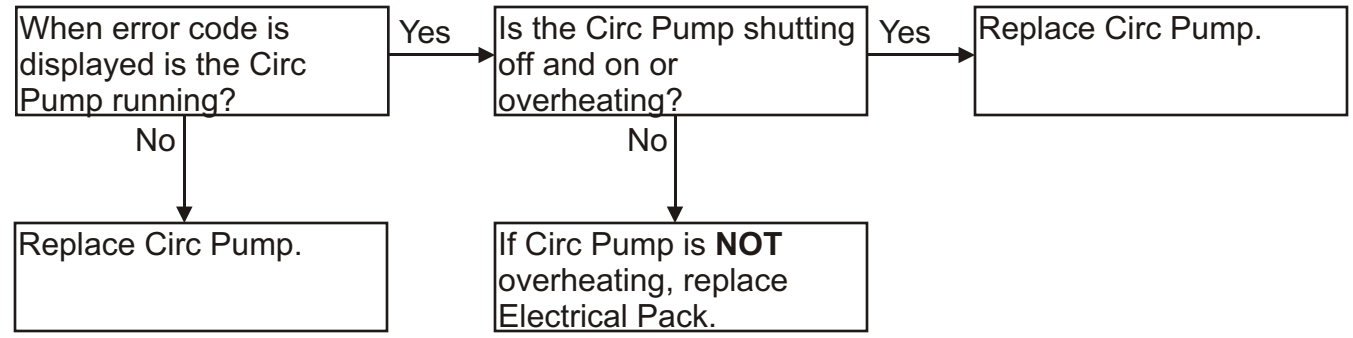
4.5 tS (Temp Sensor)



4.6 dCP (DC Power Voltage)

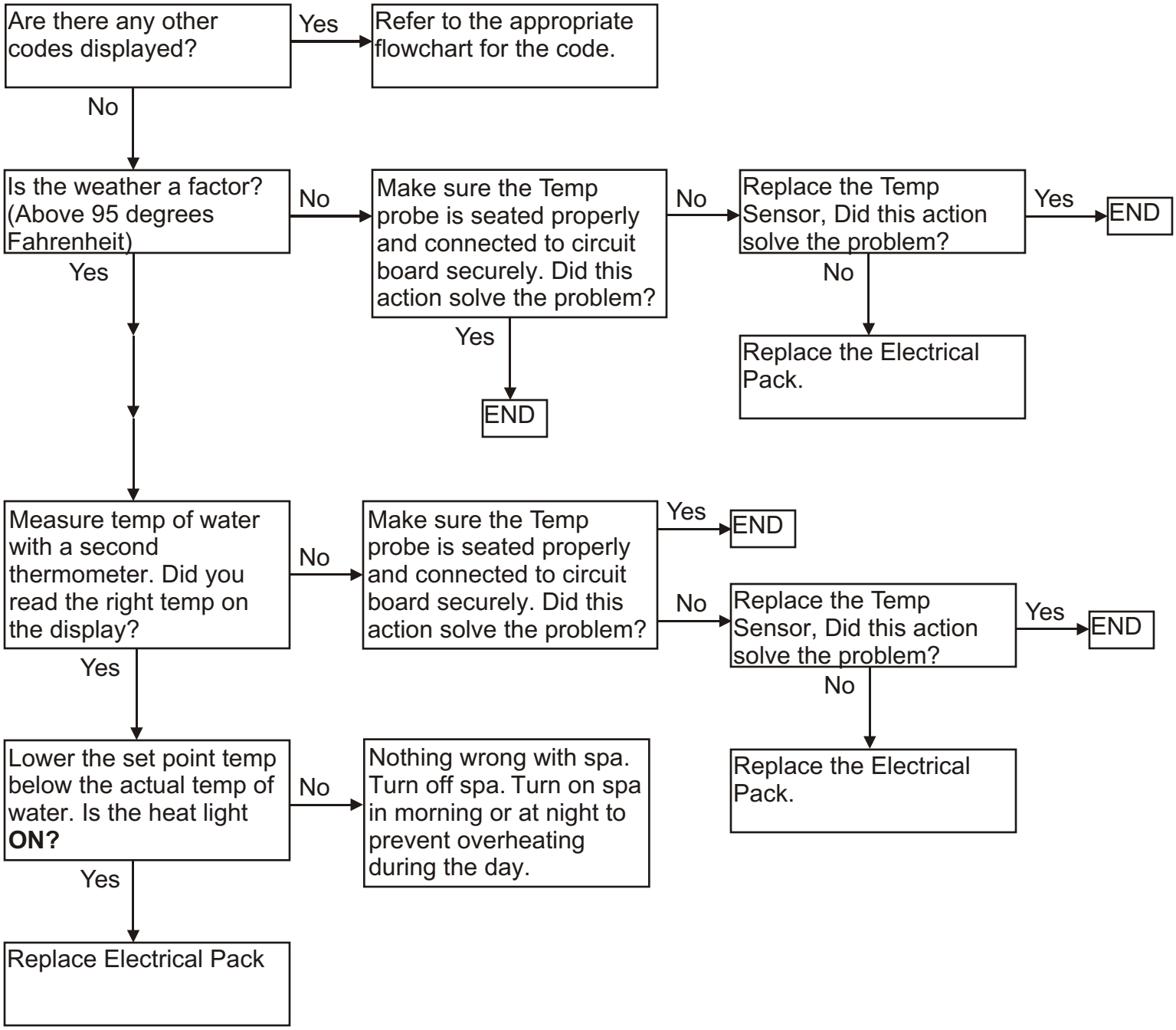


4.7 Flo (Circ Pump not pulling amperage)



4.0 Codes

4.8 Oht (Overheat)



4.9 “81” (Water Clean Out Cycle)

Spa has not been used in a 48 hour period. Motors will come on for 5 - 10 minutes to cycle water to plumbing. No action is necessary.

4.10 “127” (Water Clean Out Cycle)

High Speed Jet Button was pushed when spa was in the Water Clean Out Cycle. No action is necessary.

5.0 Chemical Issues

5.1 Bromine:
Bromine is a derivative of chlorine, which are both derivatives of salt. Bromine was developed for spas because spa temperatures are higher than pools, and because Bromine has buffers to protect the acrylic. Bromine levels in spas should be maintained as follows:

A) 5 ppm (parts per million) on spas without an Ozonator.
B) 2-2 ½ ppm on spas with an Ozonator.
C) With a mineral purifier, 2-2 ½ without Ozonator, less than 1 ppm with an Ozonator.

5.2 Chlorine:
Use Sodium Diachlor only. Add 1 teaspoon every other day without “Frog”. Note: **DO NOT** use Chlorine tablets, any trichlor, Calcium Hypochlorite, bleach (liquid Chlorine). Trichlor and bleach can ruin the acrylic finish. Calcium Hypochlorite will cause flakes or crystals in the spa.

5.3 Peroxide:
Known as Baqua Spa. Follow directions from its manufacture. It is what people who are too sensitive to Chlorine, or Bromine use. It can be used but not recommended by us.

5.4 Mineral Purifiers:
Known as the “Frog”, “Natures II”, etc. Install purifier into cartridge filter. Usually lasts 4 months. Sanitation rate: without Ozonator 2-2 ½ ppm, with Ozonator under 1 ppm. (Follow manufacturers directions) NOTE: ALL SPAS NEED TO BE SHOCKED ONCE EVERY TWO MONTHS WITH EITHER A CHLORINATED OR NON-CHLORINATED SHOCK. CHECK LOCAL SPA/ POOL SUPPLY DEALERS FOR DETAILS.

5.5 pH:
pH levels should be checked once a week, pH levels should be maintained between 7.2 and 7.8. If the pH level is over 7.8, the water is alkaline, and if the pH level is below 7.2 the water is acidic. If the water is alkaline, you need to add pH down. If the water is acidic, you need to add pH up or baking soda. Note: if pH levels are high or low, it will burn off the Bromine or Chlorine very quickly. Make sure to adjust the pH levels before putting sanitizer into water.

5.6 Alkalinity:
Total water alkalinity should be 80-120 ppm. The alkalinity in the spa usually will adjust to the pH in 1-2 days. If it is still low, you will need to add total-up from your local pool supply dealer.

5.7 Calcium in Water:
If you get calcium scale deposits in your spa, the best way to get rid of it is to add a gallon of white distilled vinegar to the spa. Once added, run all pumps and blowers (if applicable) for about an hour. Turn the spa off, and let the vinegar set overnight. Then next day, drain and refill the spa. If calcium is in the tap water after you fill, add 1 tablespoon of vinegar per day for 1 week.

5.8 Scum Lines:
All spas will develop scum lines around the water line. This is a natural occurrence that happens when you shock the spa. The sanitizer breaks down the minerals in the water. These minerals will attach to the sides of the acrylic walls. If you wipe the sides two hours after shocking the spa with a handy wipe, the scum line will come off very easily. The longer you wait, the harder it gets.

5.0 Chemical Issues

5.9 Suds:
Suds are caused by soap left on the skin or clothes, or a spa that is about to grow algae. You can decrease the amount of suds by rinsing off before entering the spa and using the same swimming suit each time. If you have suds, you can either use 1 tablespoon of white distilled vinegar per day until it goes away, or use a defoamer (check local spa supply dealer). The benefit to using vinegar is that it will not leave an oily residue like a defoamer, however it will take longer for the suds to disappear.

5.10 Odor:
Usually caused from low Bromine or Chlorine level. Check levels and adjust (shock). If the level was good, drain and refill the spa.

5.11 Black Spots:
Black spots on cover and in spa. This condition is usually caused by algae or mold growth from low sanitizer.

5.12 Cloudy Water:
Usually caused by either the water being too old, a polymer based product is being used with an Ozonator (refer to what not to use with an Ozonator), or the water is developing an algae problem. Shock the spa, if there is no response in 24 hours, drain and refill.

5.13 Jelled Water:
Spa has an Ozonator and a polymer based product was used. Add one gallon of white distilled vinegar, set stand overnight, drain and refill. Refer to what **not** to put in a spa with an Ozonator.

5.14 What not to use with an Ozonator:
The products you should stay away from if you have an Ozonator are clarifiers, “Perfect pH”, de-foamers (use Vinegar), and any other polymer based product. Polymer based products based products are products that coagulate things together.

5.15 Rashes:
Rashes on your skin are usually caused by either an allergic reaction to the chemicals in the water, or a bacteria infection. If it is an allergic reaction, this is usually caused by a high sanitizer level. Try checking the level and adjust if too high by draining some water, and adding more water back in. If this does not work, try changing to different sanitizer. If it is a bacteria infection, see your dermatologist. Afterwards try shocking the spa and bring to proper level. If these suggestions do not work,

5.16 General Care:
All Spas:
Need to be shocked at least once every two months. Either a non-chlorine shock, or a chlorinated shock. (See bottle for dosage).
FILTERS NEED TO BE CLEANED EVERY 2 WEEKS. (Soak filters in 1 part bleach and 1 part water for 24 hours).
Spa needs to be drained and refilled every three months. Spas have a smaller volume of water, and hotter temperatures. (Having 2-4 people in a spa is equivalent to having 30-40 people in a pool.)

6.0 Miscellaneous

6.1 My Electric Bill is Higher Than Expected

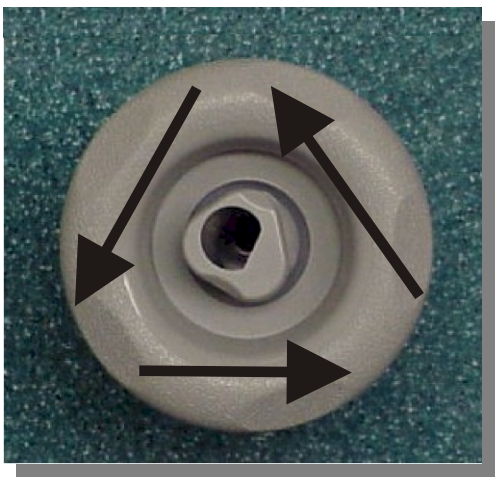
The figures in our brochure are calculated with a National Average Cost of 8 cents/ kWh. Your utility company may charge more. Also remember, if you don't keep your spa covered when not in use, your heater has to operate longer to keep the spa water hot. If your spa is on a deck and the bottom isn't sealed, then the wind can remove heat from the spa causing the heater to operate longer. If you are still unsure, you can request a free home energy audit from most utility providers.

Important Information about our test:
The outside ambient temperature during the test period was 70 Degrees.
The spa thermostat was set to maintain 100 degrees.
Average heat loss per day with cover on = 3 to 6 degrees.
Average heat recovery time = 1 degree every 12 to 15 minutes.
Average total heat time per day = 36 to 90 minutes.
Heat loss during use = 2 to 3 degrees in 20 minutes.

6.2 How to Replace the Jets

Luxury Jets

1. Locate the clip on the jet. (Look at picture)
2. Pull the clip, with your fingernail or screwdriver, towards the center of the jet.
3. While rotating the jet back and fort, pull it out of the spa.
4. To install the new luxury jet in your Gatsby spa, insert the jet into the body and snap into place.

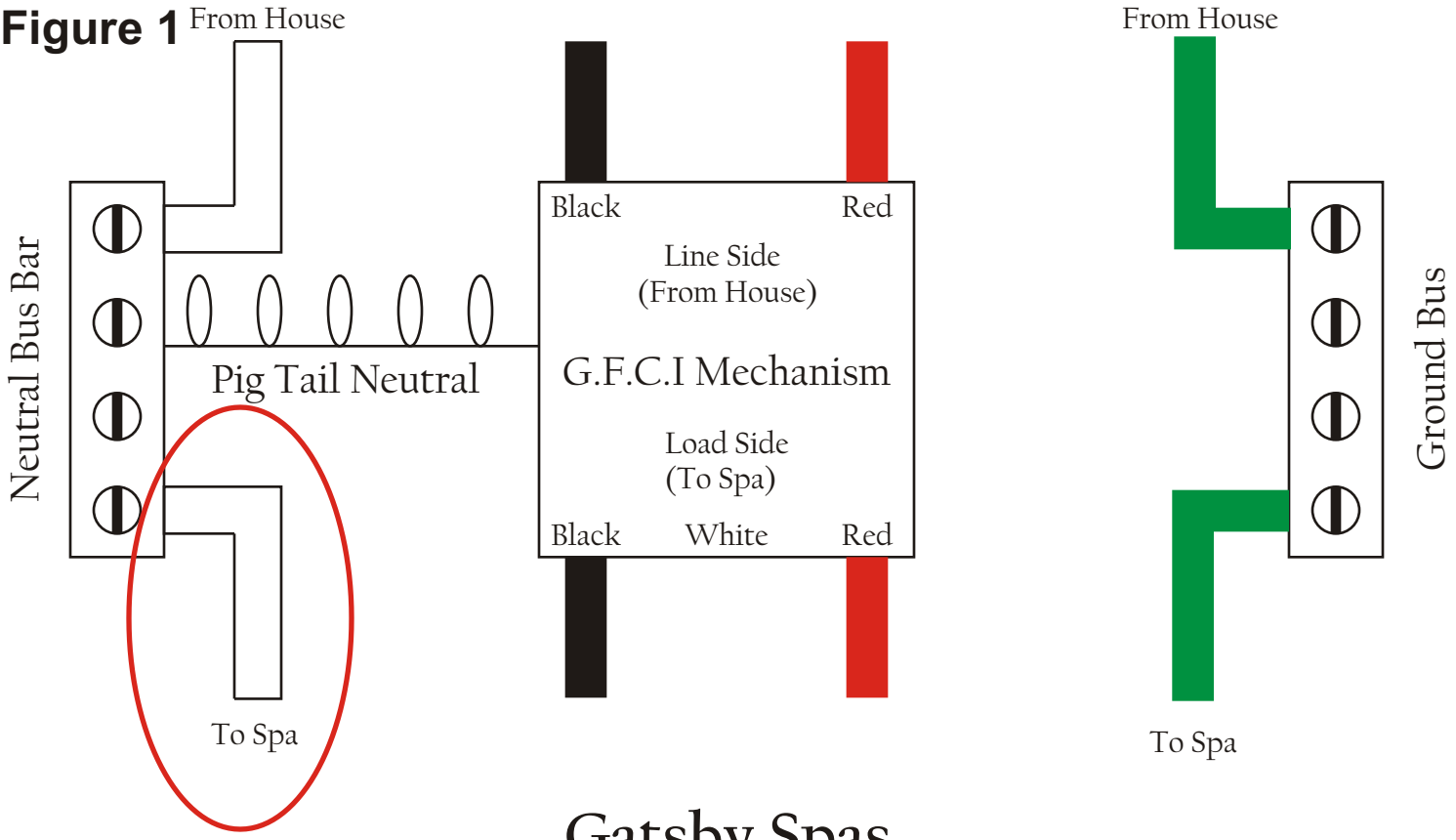


Micro Jets

1. Rotate the jet counterclockwise until it stops
2. Force the jet to rotate 1/8 turn more.
3. Pull the jet out of the spa.
4. To install a new rotating micro jet in your spa, insert the jet into the body and rotate it clockwise until it snaps into place.

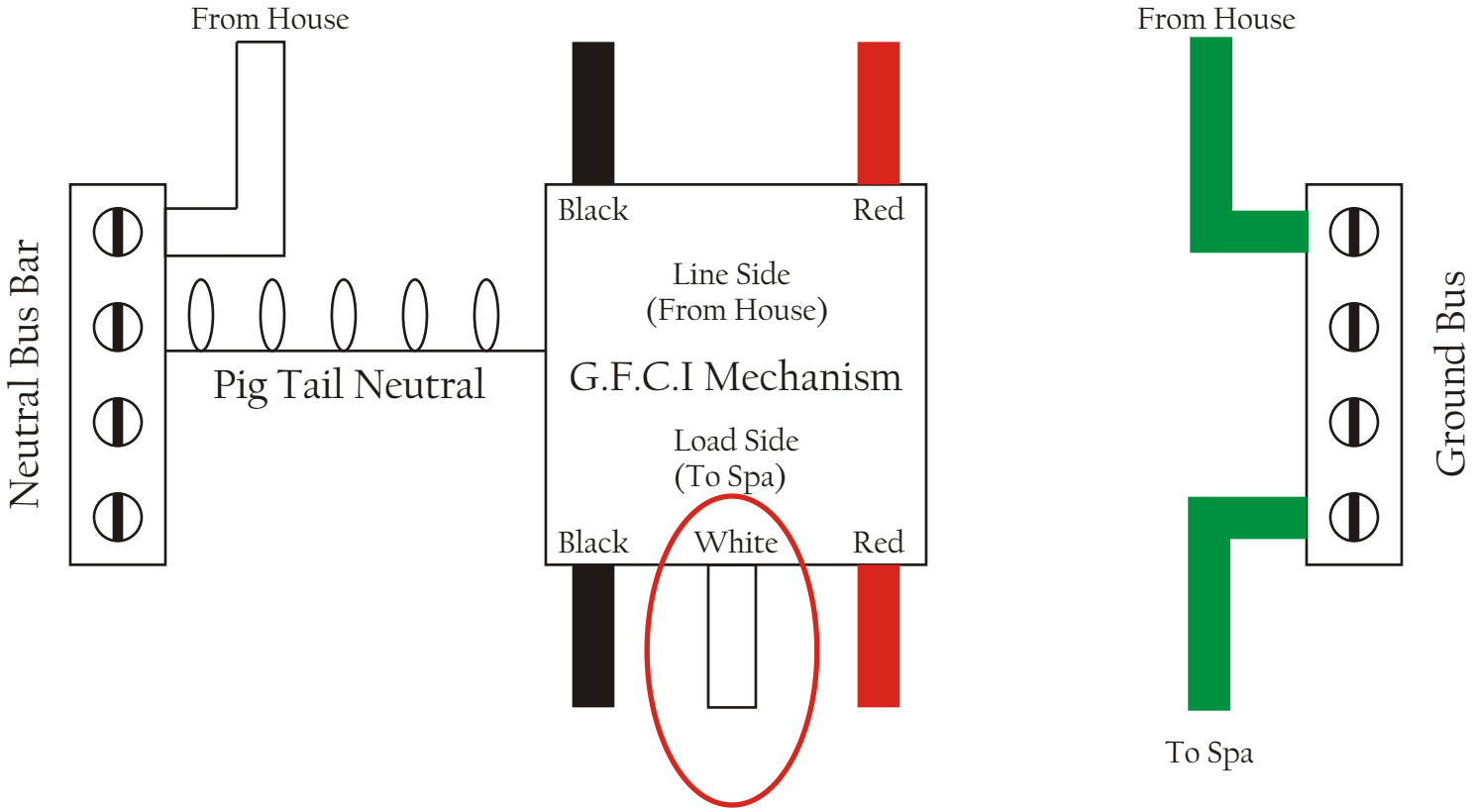
Incorrect Wiring of G.F.C.I

Figure 1



Gatsby Spas

Correct Wiring of G.F.C.I



JACUZZI®
SPA DIVISION

14525 Monte Vista Ave Chino, CA 91710
Phone # 1-866-245-3387 Fax # 909-393-1583