

Finding and Fixing Leaks

Where did all that water go? Could we have splashed all that water out of the tub?

These are all common thoughts that can run through your mind when you open up the hot tub cover and notice that the water level has dropped.

Manufacturers diligently water tests each spa before shipping to ensure that no leaks exist.

Spas can develop leaks as the result of a defect, routine wear and tear, carelessness, accidents, animals or the effects of wintertime damage.

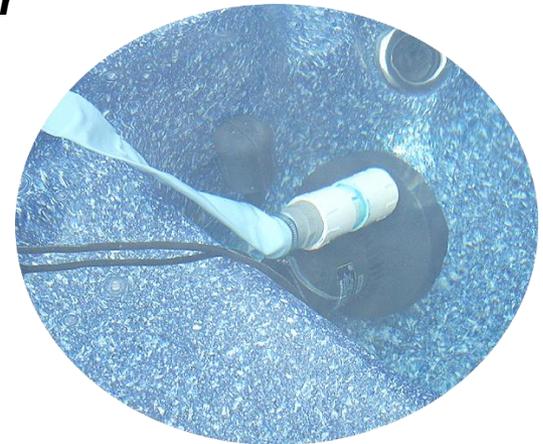


Finding & Fixing leaks **Tools**

The following is recommended as a minimum for onsite troubleshooting and leak repair:

Screw Driver Bit Set
Hand Screw Driver Set
Small Hacksaw
Water Proof PVC Glue
Clear PVC Primer
Flex pipe Assorted
Assorted PVC Fittings
Cell Phone
Pacific Service Manual
Holding Tank (500 gal)
Submersible pump
Fix a leak
Shop Vac

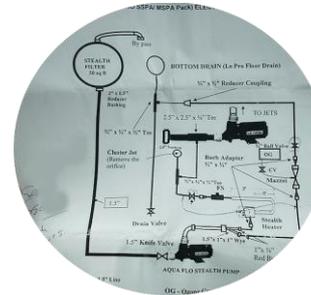
1 ¼" Drain hose
Head Band LED Light
Teflon Tape
Silicone
Any needed parts as per troubleshooting.
O-Rings Assorted
Silicone Lubricant
Channel Locks x2
Cordless Drill
Wire brush for drill or wire pad
Heat Gun
Camera



Finding & Fixing leaks **The Process**

The troubleshooting process is a combination of standard procedures and creativity, however there is a basic strategy to follow when beginning the process:

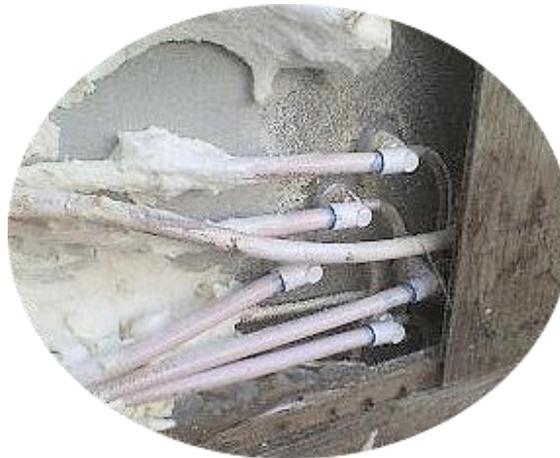
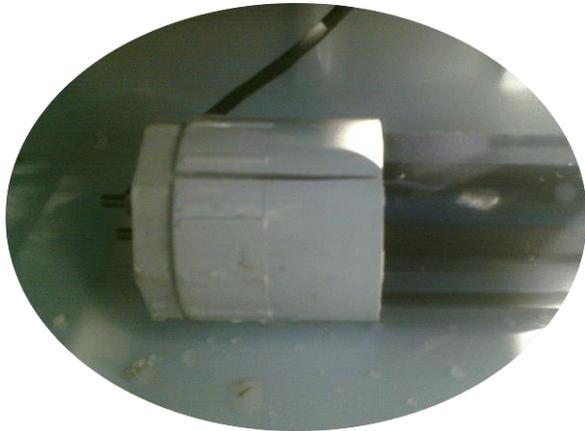
- A) Get as much information as possible before going on site (and while on site).
- B) Eliminate the obvious causes of the problem.
- C) Isolate the problem to a specific component or components
- D) Bring replacement parts for all potentially affected components to the repair site.
- E) Make only one change at a time.
- F) Reassess after each change.



Finding & Fixing leaks

The Process

1. Confirm the existence of the leak.
2. Find the location of the leak / Assessing needed plumbing / electrical components needed for the repair.
3. Repair the leak.
4. Re-test the spa for leaks.
5. Re-foam the spa.



Finding & Fixing leaks **Confirming the Leak**

The drop test consists of measuring the water loss in the spa in two separate 24 hour periods.

This is done by placing masking tape at the water line, allowing the spa to run normally for 24 hours having engaged the pumps on high speed for two 20 minute cycles with no one entering the spa.

The water drop is measured by measuring the distance in between the tape and the water line the next day.

The second test is done in the same manner except that the breaker is off and there is no power to the spa.



Finding & Fixing leaks

Finding The Leak

Components associated with spa leaking:

Pump Wet End Seals / Unions

Heater Assembly Manifold

Slice/Knife and Gate Valves

Plumbing Tubing

Jet Bodies / Air Controls / Drains

Acrylic Spa Shell

Finding & Fixing leaks

Spas leak from a limited number of places; the equipment, the jets and fittings, the piping or the spa shell itself.

Once the drop test has been performed, you should try to narrow down where you think the leak is coming from.

If the drop test revealed a significant amount of water loss when the pumps are running, it can be a sign that the leak is on the discharge side of the plumbing.

Finding The Leak



Finding & Fixing leaks

If the water loss is minimal when the pumps are running it can be a sign that the leak is from the suction side of the plumbing.

Another method for locating leaks is to let the water drop (with spa not running) and then observe the water level of the spa when the level ceases to drop. If the water stops dropping at a jet for example, that jet is the likely leak source.

Finding The Leak

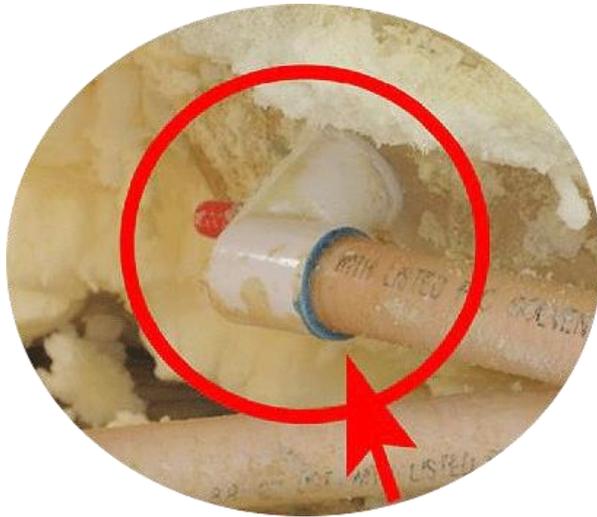


Finding & Fixing leaks

Finding The Leak

Walk around the outside of the spa to see if you can observe any obvious water on the floor, deck, cement or grass near the spa. If you can, try to follow the water back to the spa and determine what area it is coming from.

Unfortunately, just because you see the water on the back-right-side, this does not necessarily mean that this is where the leak is, but it may help.



If you cannot see an obvious amount of water outside the tub, the next place to check is the equipment compartment.

This is where most leaks occur.

Finding & Fixing leaks

Leaks in spas can seem hard to find, but it's not difficult if you know where to start.

Look for water under your pump first, as a common cause of leaks are bad pump seals.

Also check around your heater, pressure switch and all interior plumbing, unions, and connections.



Finding The Leak



A small dripping leak out of a fitting in the equipment compartment can account for a 2" - 12" a day leak.

Finding & Fixing leaks

If you can see the leak by the equipment, try to determine exactly where it is coming from and why. Dry off all suspect fittings and/or equipment with a paper towel.

Turn on the spa and see if you can see water seepage or drips. Then decide how best to repair the leak.

A loose fitting can be tightened. A small seepage can be siliconed. But a cracked pump housing or a split or corroded heater will require a component replacement.

Finding The Leak

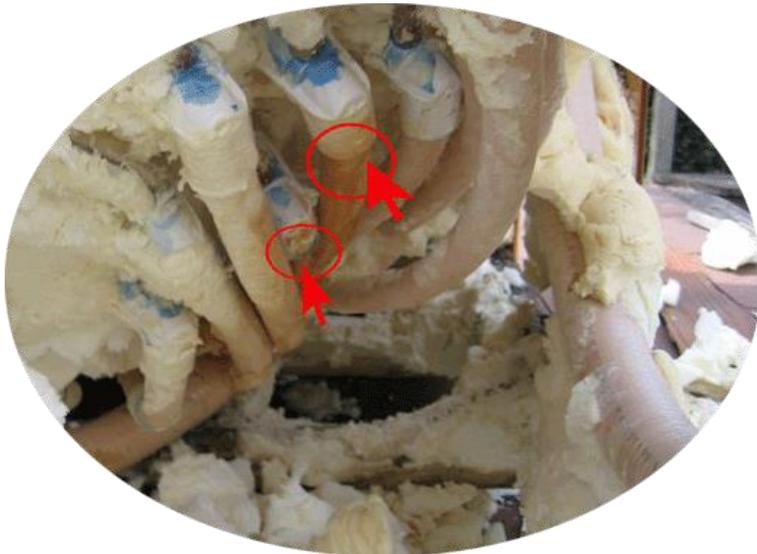


Finding & Fixing leaks

If your leak does not appear to be in the equipment area, either you have an internal plumbing leak or the spa shell is cracked.

Spa shells rarely crack. If your shell is cracked, you can drain the spa and see where the crack is.

Finding The Leak



Assuming that it is not your spa shell, that only leaves one place; your jets or jet piping.

Finding & Fixing leaks

Finding The Leak

If there is no visible sign of a leak outside of the spa, all outside panels will have to be removed so that access can be obtained to the foam and plumbing.

Push your hand in through the foam at intermittent intervals to see whether you encounter wet foam. Once wet foam is found, completely remove the wet foam and expose the area.



Once the area is exposed the spa must be filled so that the drip or leak can be visually confirmed.

Finding & Fixing leaks

If you are still unable to find the wet foam the leak may be coming from under the spa and the spa will need to be raised so that you can access the foam and plumbing under the spa.

When raising the spa ensure that the platform will maintain the weight of the filled spa.

Finding The Leak



If you are still unable to find the leak and have confirmed that a leak exists and have excluded the potential of an equipment leak, all the foam will have to be removed to completely expose the plumbing, after which the leak will be visibly exposed.

Finding & Fixing leaks

More often, a vessel leak can be traced to a bad jet or other shell fitting. Jet bodies have a flexible gasket which is tightened against the underside surface of the spa shell. These gaskets can sometimes shrink or decompose over time, resulting in water loss.



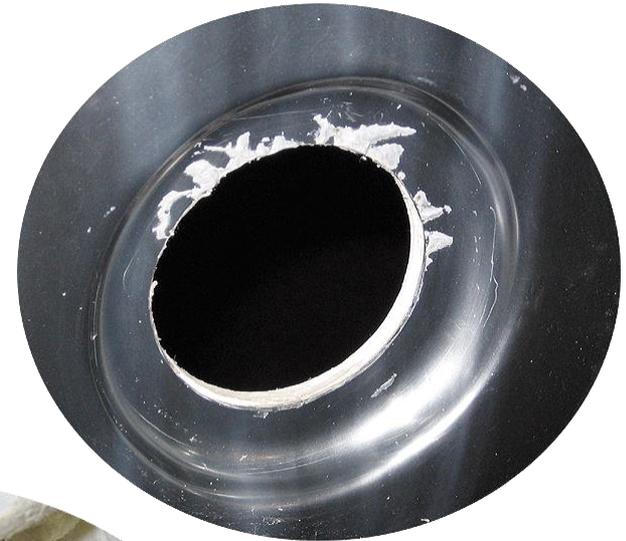
Fixing The Leak



Finding & Fixing leaks

Fixing The Leak

Make sure the area is clean and smooth before installing a new component. After installing and tightening a new jet body or other component, apply a generous layer of silicone sealant around the gasket perimeter and fiberglass under the shell as an added measure of future leak protection.



Finding & Fixing leaks

There are;

PVC to PVC Glues

ABS to ABS Glues

PVC to ABS Glues

Each will work under different ambient temperatures and humidity levels.

Pacific uses the 795 PVC glue which is a medium body blue glue that does not require a primer and can be used indoors as well as outdoors.

PVC Glue



Finding & Fixing leaks PVC Glue

PVC cements come in Regular (sometimes called light), Medium, and Heavy bodies. This refers primarily to the mixture of solvents and resins, and is clearly visible in the thickness of the product.

There are several types of PVC solvent cement, the majority are highly flammable.

Depending on the piping & what type of glue you want to use, some are slow setting some set very quickly. The choice of the glue will depend on the ambient temperature and humidity factor.



Finding & Fixing leaks PVC Glue

USE OF PRIMERS: A primer helps clean the PVC, and the solvents in it pre-soften the plastic prior to the application of the cement.

Using a primer will make a better joint than one made with a pvc cement only.

When using a primer, do not allow it to dry, but apply the cement directly on top of the wet primer.



Most manufacturers use primer alone to glue air lines as this will fuse the plastic to the PVC

USAGE GUIDELINES: Per quart, anticipate the following number of joints can be made. 1/2"=300, 3/4"=200, 1"=125, 1 1/2"=90, 2"=60, 3"=40, 4"=30, 6"=10

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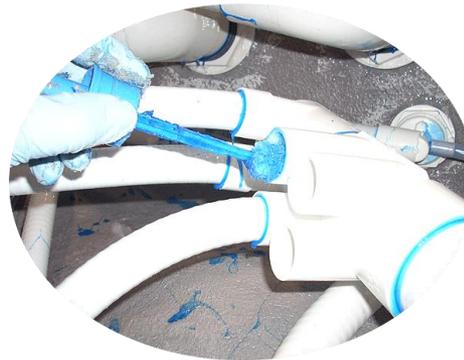
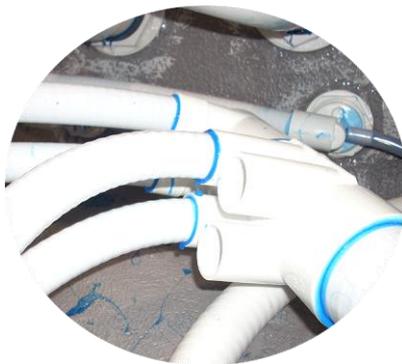
PVC Glue

Gluing Pipe

Plastic pipe joints are connected with glue that actually melts the pieces together.

To glue PVC pipe, check that any cut ends are fairly straight. Remove any burrs with a knife or emery cloth and clean both pieces with a rag.

Apply a cleaning chemical (primer) that prepares the plastic. Apply PVC glue to both the pipe and fitting.



Finding & Fixing leaks

PVC Glue

Gluing Pipe

Push the joints together with a twisting motion to spread the glue. Hold the joints together for a few seconds so they won't push apart while the fast-drying glue sets.



Finding & Fixing leaks Re-test

Repeat the drop test. Again, this will consist of measuring the water loss in the spa in two separate 24 hour periods.

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Foam Finish

Foam Fill Options

- Truck
- Cans
- Kits
- Boxes of foam

