

**Playing it Safe**

with Pools and Spas

# Playing it Safe with Pools and Spas

Pools and spas are fun for everyone. Knowing and following safety guidelines will help everyone enjoy their leisure hours safely. This brochure presents basic information on the main hazards associated with the mechanical equipment used with a pool or spa:

1. Pump suction (from the main circulating pump);
2. Compressed air trapped in the filter system;
3. Fire, explosion, or asphyxiation from a gas-fired pool heater;
4. Electricity.

Please read this brochure, and make a habit of practicing basic safety in the use, and care of pool and spa equipment. Also, **read your equipment owner's manuals carefully**. Keep them handy and refer to them for detailed maintenance instructions and safety information. Contact your pool professional, or dealer if you need advice or to replace a lost manual. If your Pentair Water Pool and Spa owner's manuals get lost, damaged, or wet, call us at 1-800-831-7133 for a replacement.

Please take time to review these guidelines, and keep safety in mind at all times in, and around pools and spas. Taking the time periodically to inspect your equipment will result in many hours of carefree relaxation.

**Safe and Happy Swimming!**

*This brochure is provided through the courtesy of Pentair Water Pool and Spa™, in the interest of promoting swimming pool safety.*





# Routine Maintenance Tasks

Routine maintenance helps keep your pool and spa system operating safely and efficiently. Follow a regular check-off procedure for the safety-related items listed on Pages 8 and 9, and have your pool professional perform the following tasks regularly:

- Make sure that each suction outlet has a cover that is installed correctly, screwed down, unbroken, and certified for that application.
- Make sure that all skimmer covers are in place, screw-fastened and unbroken.
- Make sure that the filter pressure gauge is in good working condition, and that the filter pressure is within the operating range specified in your filter owner's manual.
- Make sure that the pump and filter O-rings are sealing properly, and in good condition.
- Bleed off accumulated air from the system, as described in your owner's manual.
- Empty the skimmer baskets and the pump strainer basket of debris.
- Remove any debris or obstructions from the main drain cover.
- Remove obstructions and combustibles from around the pump motor air vents and heater top vents.
- Make sure that all chemicals are properly stored (away from equipment).
- Make sure that the heater is functioning properly.
- Make sure that there is no gas smell around the heater.
- Make sure that all grounding and bonding wires are connected, and in good condition.
- Make sure that all wiring connections are tight and clean, and that all wiring and electrical equipment are in good condition.

# Glossary

**A moment, please!** If you are new to pools and spas, please take a moment to use this glossary and the picture on the opposite page to get acquainted with some of the technical terms and equipment names used in this brochure. Use the pictures of typical equipment in this brochure to help you identify all of the equipment in your installation. Remember, though, that your equipment may not look exactly like the typical examples we have shown here.

**1 – Air Release Valve:** The valve on top of a filter or separation tank which allows you to manually release the air out of the system. This reduces the risk of a filter or separation tank explosion.

**2 – Chlorinator:** A device to automatically feed small quantities of chlorine into the pool to help keep the water disinfected (as part of the chemical treatment of the water). Some pool systems use bromine compounds instead of chlorine compounds. Never mix the two – the combination may explode.

**3 – Filter:** A device to clean pool water by filtering out dirt, oils, etc. Filters may use diatomaceous earth (DE), cartridges with a fine-mesh element, or a sand bed as the filtering agent.

**4 – Grates and Anti-Vortex Covers:** Protective covers for the main drains. Each main drain must have a cover that is IAPMO\* certified to be of anti-entrapment and anti-hair-entanglement design, and ASME rated for the flow that it must handle. It must be correctly installed with screws. Operating a pool without proper covers on the main drains is extremely dangerous.

**5 – Heater:** A device to automatically heat pool or spa water to the desired temperature and maintain it there. A heater typically has automatic thermostat controls, and may be controlled by a time clock.

**6 – Light Niche:** The recess in the side of the pool to take an underwater light.

**7 – Main Circulating Pump:** The pump which moves water from the pool and pumps it back to the pool through the filter, heater, chlorinator, etc. When the pump is working properly, there will be a strong suction at the suction outlet (see #10). Anything sealing off the suction outlet (on a system with only one suction outlet) will be held there by pressure of the water trying to flow into the pump.

**8 – Main Drain:** The fitting on the bottom of the pool which leads to the main circulating pump's inlet pipe. All pools and spas should have

more than one main drain (except some above-ground pools which use the skimmer as a suction outlet). Since there can be a strong suction pull at the main drain, for swimmer protection it must be equipped with a correctly installed, anti-entrapment and anti-hair-entanglement certified cover, fastened with screws.

**9 – Skimmer:** A box set into the edge of the pool with mouth open to the pool, just at water level. It connects to the main circulating pump suction pipe. It channels both water to the pump and skims leaves, debris, etc., off the pool surface. A removable deck cover allows for cleaning.

**10 – Suction Outlet:** Any fitting that allows water to go back from the pool to the main circulating pump (in other words, any pool fitting on the end of the pump's suction line).

**Bonding:** Connecting together all the metal items (ladders, diving platforms, pumps, etc.) around a pool or spa with a heavy wire (the "bonding wire"), so that there can be no difference in voltage between them. This helps prevent electrical shocks from pool equipment.

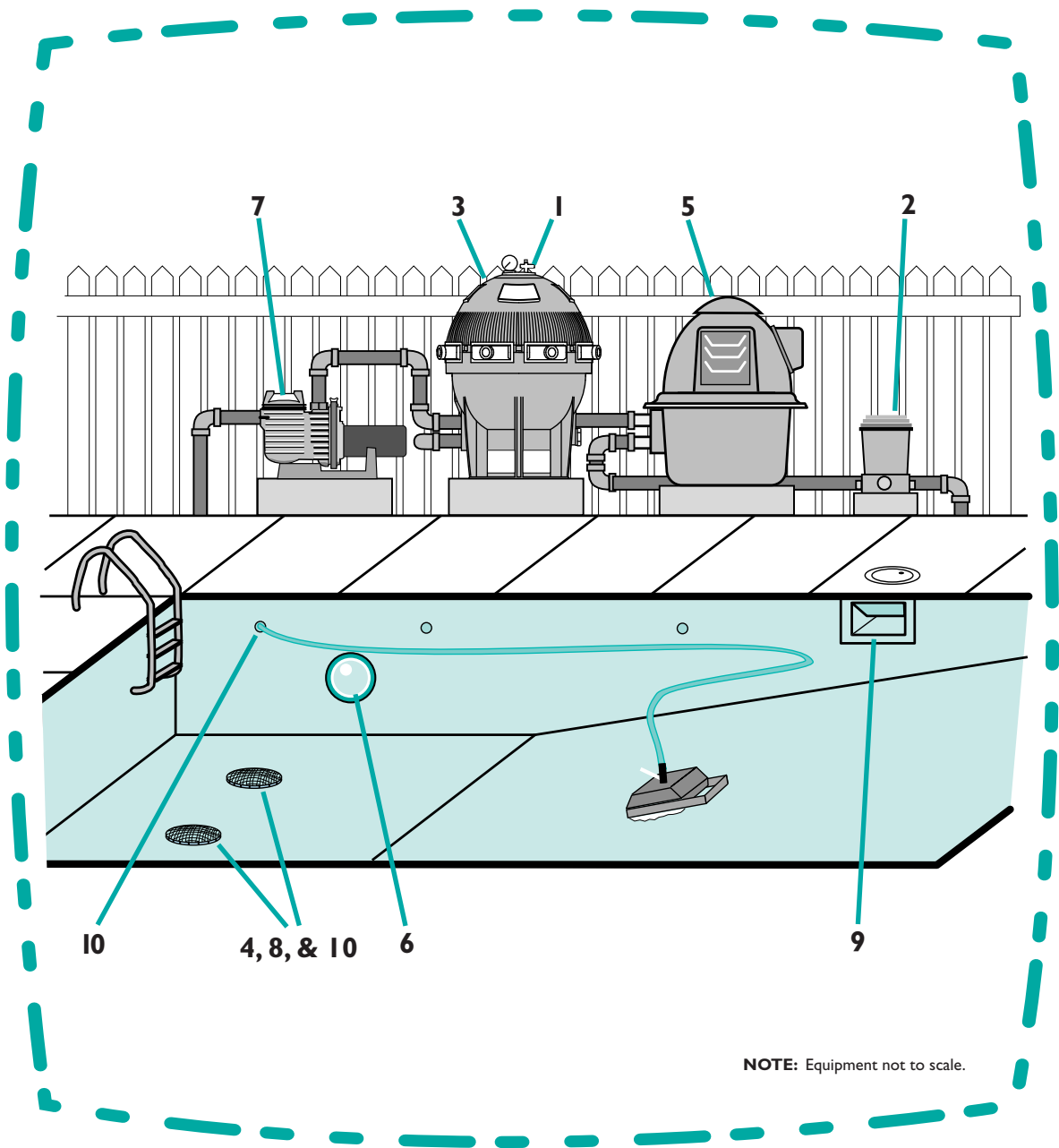
**Ground Fault Circuit Interrupter (GFCI):** A device to interrupt the power supply to a piece of equipment when it senses very small electrical leaks to the ground or to the pool water. It will cut off power in dangerous circumstances which might not cause a circuit breaker to trip or a fuse to blow.

**Grounding:** Connecting each piece of electrical equipment around the pool to a "ground wire" which is connected to the electrical system ground at the circuit breaker box. Grounding your equipment helps ensure that the circuit breaker will trip and cut off power in the event of a short circuit or damage to insulation.

**Owner's Manual:** A reference book for individual items of equipment, including instructions for installation, operation and repair. It usually includes a list of available repair parts.

**Separation Tank:** A tank used with a DE filter during the backwash cycle of the filter. It collects backwashed DE and debris, allowing the water to return to the pool.

\* International Association of Plumbing and Mechanical Officials



**NOTE:** Equipment not to scale.



Copy the safety  
check-list and  
use it regularly 

# Routine Equipment Safety Check List:

- Is there a complete, readable Owner's Manual kept handy for each piece of equipment?
- Are Skimmer Deck Covers NSF Certified, and all Suction Fittings and Main Drain Outlet Covers IAPMO certified as anti-entrapment and anti-hair-entanglement?
- Are Skimmer Deck Covers and Main Drain Outlet Covers in place and screwed down?
- Are Skimmer Deck Covers and Main Drain Outlet Covers deteriorated, cracked, or weathered? If so, replace them. (On outdoor pools, all Plastic Skimmer or Drain Covers should be replaced every 3-4 years, especially in the "Sun Belt.")
- Are Skimmer Baskets clean and in place?
- Are Filter Tank Clamps and Bolts in place, in good physical condition (no signs of rust, corrosion, or damage), and correctly tightened? (Don't try to adjust or replace clamps while the filter is under pressure. Replace any clamps or bolts that show deterioration - even ones made of stainless steel).
- Are the Pump and Filter Tank O-Rings sealing properly?
- Are Filter Tank Pressure Gauge and Air Release Valve in place and working?
- Is Pool Heater area clear of leaves, flammable material, and debris?
- Are Heater, Vent Pipe, and Gas Line in good physical condition?
- Is the entire Pool area free of any smell of gas?
- Is all visible Electrical Equipment and Wiring (including pool lights and niches) in good physical condition?
- Do Ground Fault Circuit Interrupters (GFCIs) test OK? (Most GFCIs have a "test" button; see the instructions with the GFCI.)
- Are Motors, Equipment Rooms, etc., clear of leaves, debris, and combustibles?

# I. Pump Suction

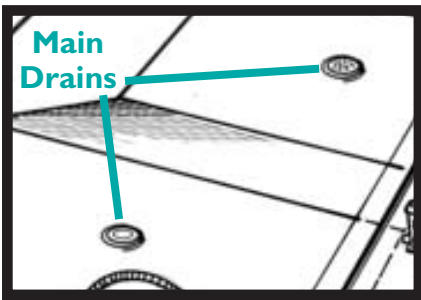
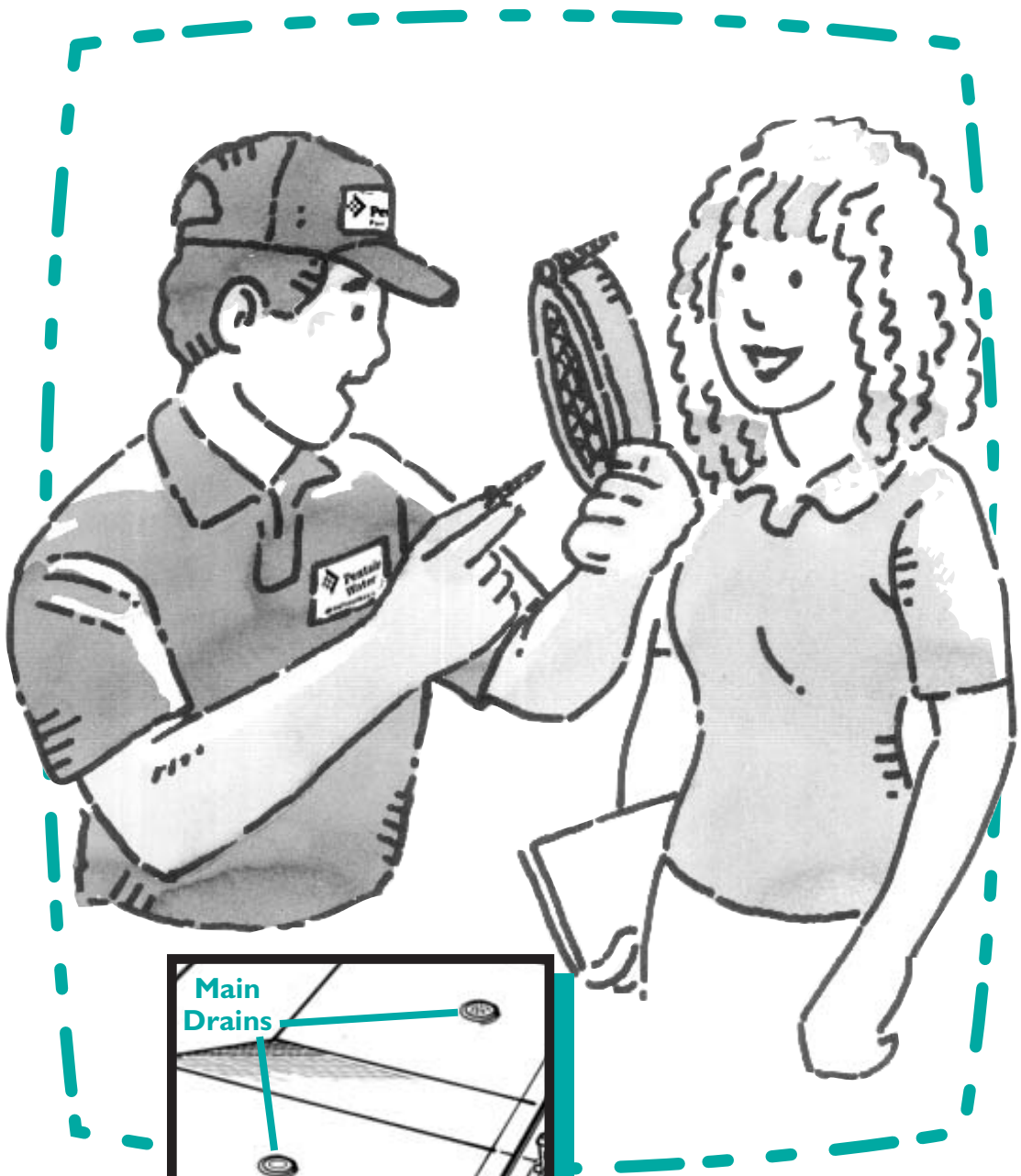
(from the main circulating pump)

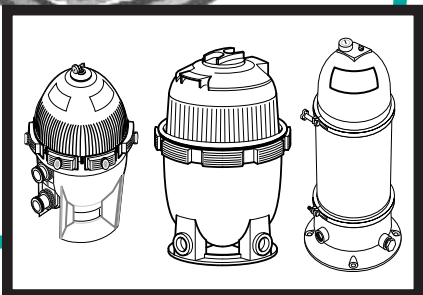
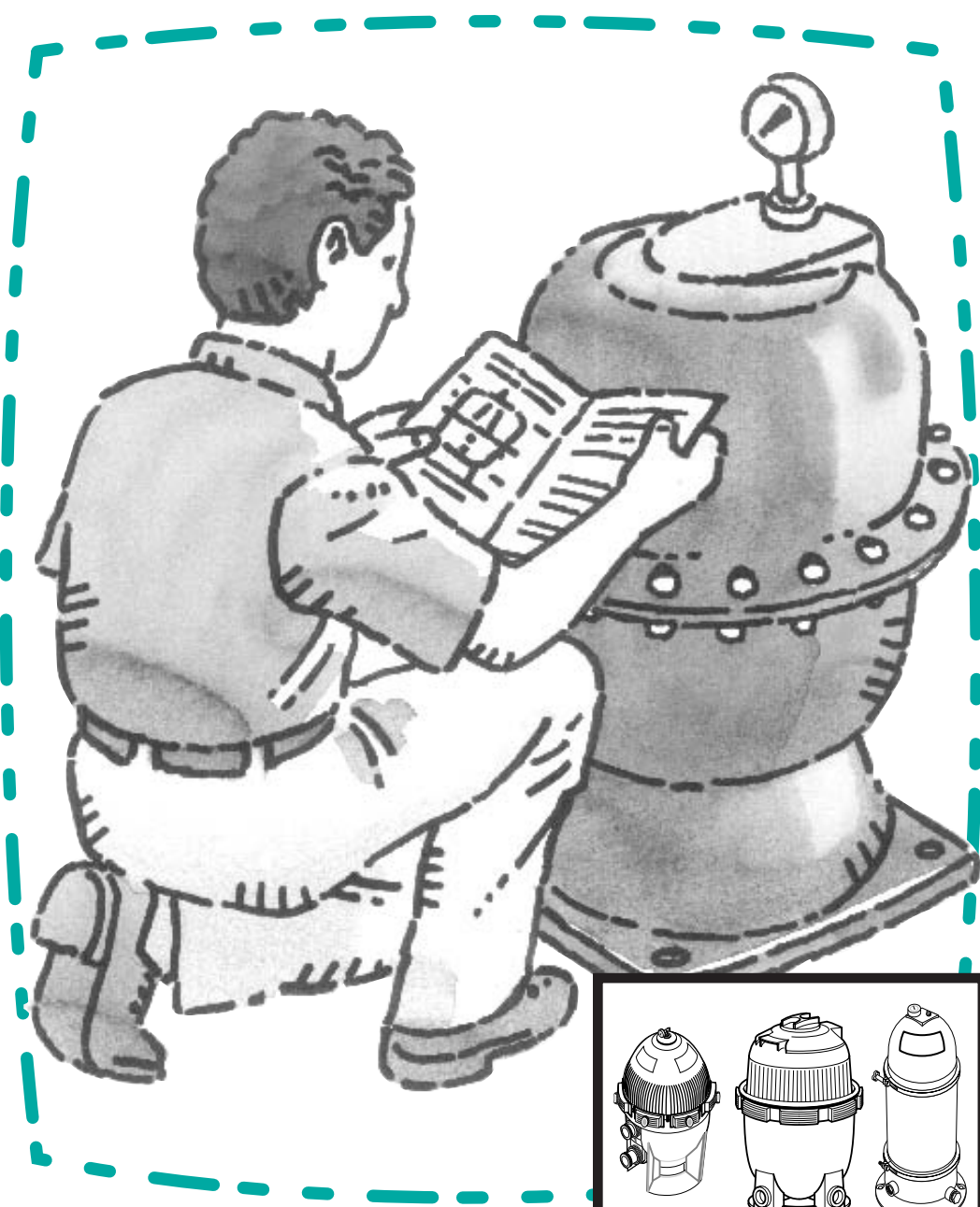
Your pool or spa's main circulating pump pulls in water by means of a strong vacuum through the main drain. The vacuum is so strong that anyone lying on an 8" diameter main drain, while the pump is running, could be held down on the drain by a force of up to *seven hundred pounds* (that's right, 700 pounds). This is enough force to trap adults or children underwater, or even to eviscerate them.

**Stay off the main drain!**

Have your pool professional examine your pool or spa for the following points:

- A. There must be at least two suction outlets from the pool to the main circulating pump. Each outlet must have a cover fastened down with screws. Either one of these outlets should be able to supply the pump by itself without exceeding the flow rating of its cover. (Many above-ground pools use the skimmer as the suction outlet, and have no main drain; these pools don't require a second suction outlet.) Read the pump owner's manual for flow requirements for your installation.
- B. All suction outlet covers (for instance, grates, anti-vortex covers, etc.) must be designed so that they won't trap body parts or hair, and must be certified by a nationally recognized testing laboratory. Plastic deck and drain covers may deteriorate, and crack or break from exposure to sunlight or weather. Routinely replace them every 3-4 years.
- C. An emergency shut-off switch for the pool circulation pump and the spa jet pump should be in an easily accessible, obvious place near the pool or spa. Bathers should know where it is, and how to use it. Use the switch in case of emergency.
- D. Many pool cleaners, and all pool vacuums, use the pump suction to clean the pool. Because of the strength of the suction and the possibility of entrapment underwater, keep everyone out of the pool during cleaning or vacuuming. Read the cleaner or vacuum owner's manual for safe operating information. Never play with the pool cleaner, the vacuum, or their hoses – they are not toys.





## 2. Compressed Air Trapped in the System

Water under pressure doesn't present much of a hazard. But the piping and filtering systems on pools, and spas can trap, and hold large bubbles of air until they build up enough explosive potential to blow the tops off of filters, strainers, and separation tanks. The owner's manual for your filter, separation tank, and pump will tell you how to safely bleed the air out of your filter system. For safety's sake, review the following points:

- A. *Read the owner's manual carefully* to learn how to operate your filter system safely. **Never** try to adjust, or service your pool, or spa filter unless you have read the owner's manual and understand how to release all pressure from the system (*shut off the power and release the pressure first*).
- B. When starting up the system after a period of non-use (for instance, after a winter shut-down), *read the start-up instructions in the owner's manuals* for the equipment involved to purge all the air from the system before it builds up to dangerous pressures.
- C. Never connect your pool or spa filter system to a household water system – the pool equipment is designed to run at much lower pressures, and may split or burst if subjected to household water system pressures.
- D. To avoid a dangerous pressure buildup in the filter, make sure that any shutoff valves downstream of the filter remain open during system operation.
- E. The pool skimmer may be sucking air (“vortexing”) as well as water. This can pull a large amount of air into the filter system, and should be corrected by raising the pool water level, reducing the flow of water through the skimmer, or both.
- F. Vacuums and cleaners can also suck air for brief periods of time. Before you use a vacuum, submerge the hose completely, and let it fill with water before connecting it to the pump suction outlet. This will minimize the amount of air taken into the system.

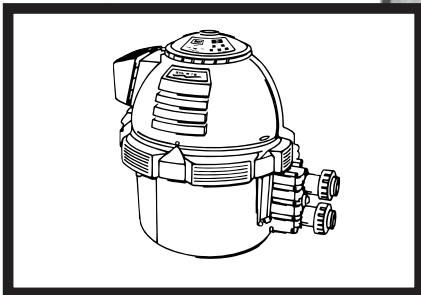
# 3. Fire, Explosion, or Asphyxiation from a Gas-fired Pool Heater

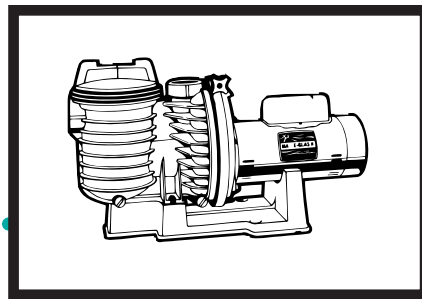
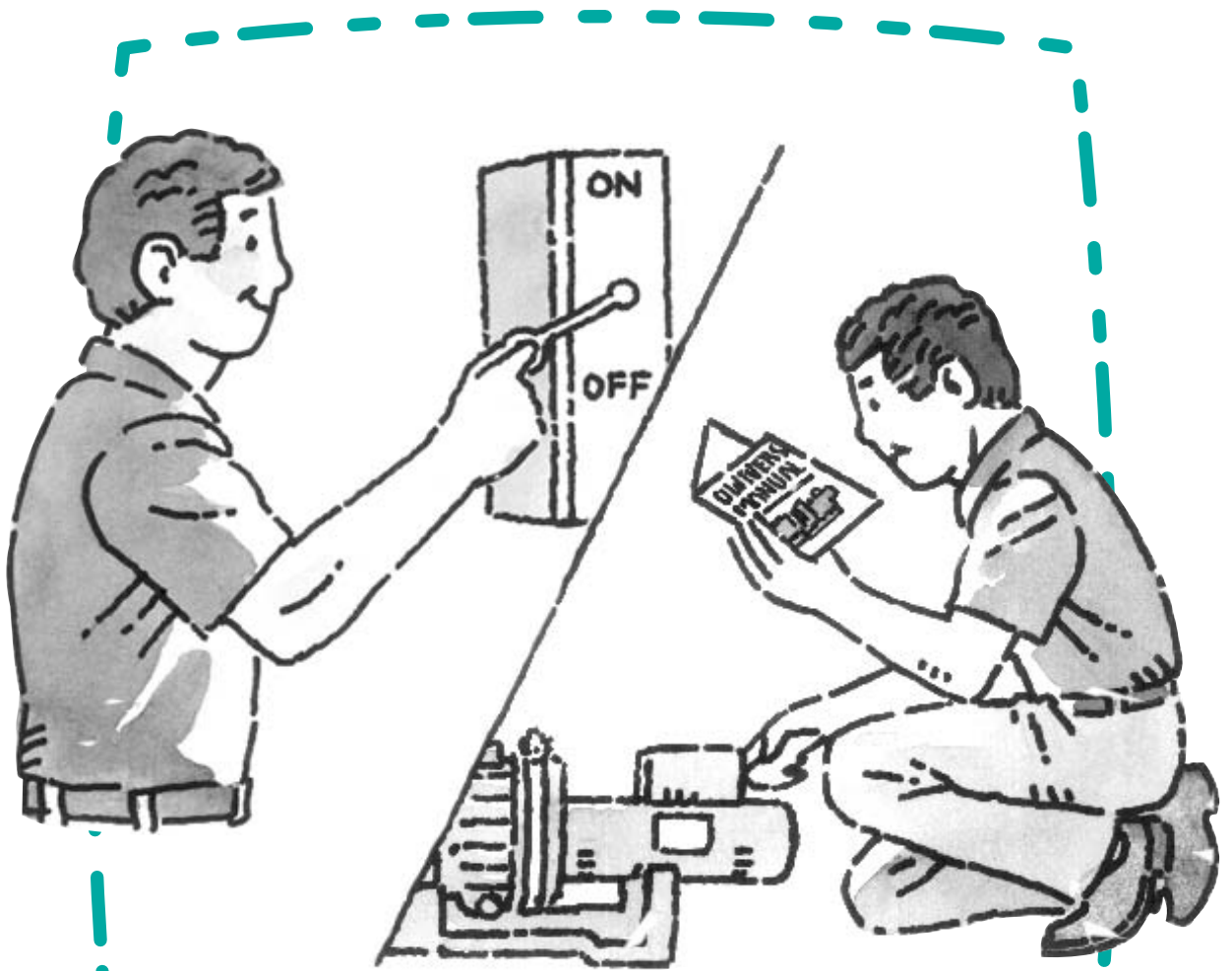
LP gas (Propane) and natural gas are safe fuels as long as they are used correctly. Read your heater owner's manual carefully, and remember that gas heaters require a trained technician for service and repair. Remember, gas is *highly flammable*, and that LP gas is heavier than air – it will collect in low spots.

If you suspect a gas leak or smell gas, immediately clear the area, and call the gas company from a telephone that is *away from the area of the suspected leak*. If you suspect a problem with your heater, don't take chances by trying to fix it yourself – *call your heater professional or the local gas company*. Have your heater professional verify these points about your installation:

Make sure that there is no leakage of exhaust gases into any building. This is especially important if the heater is installed indoors. Improper venting, damaged or rusted-out venting can cause serious injuries, illness, or death from carbon monoxide poisoning.

- A. Your installation should comply with the requirements of local and national codes.
- B. The heater exhaust vents should be located away from windows, air conditioners, or roof overhangs, so the exhaust gases (which are poisonous) will not enter any buildings in the area. Check with your local building inspector for regulations concerning the location of the heater exhaust relative to buildings.
- C. If your heater is located indoors, review the venting information in the heater owner's manual. Make certain that all vent pipes, air intakes, gas line installations, etc., meet all local and national code requirements.





# 4. Electricity

Mixing electricity and water is always hazardous. In a pool or spa situation, underwater lights, deck lights, the motor on the circulating pump, or any other accessory requiring electricity may pose a safety threat to people in the water if the wiring is incorrect or faulty. Read the owner's manual for each piece of equipment to get information on electrical requirements. To make sure your pool or spa is electrically safe, ask your pool builder or professional service person to verify these points:

- A. **Ground Fault Circuit Interrupters (GFCIs):** The power supply circuit for each piece of electrical equipment should include a GFCI for protection against tiny – but dangerous – leaks of electricity to ground ('ground faults'). If these tiny ground faults travel through the human body, they can damage the nerves controlling the heart, and cause cardiac arrest (heart failure). A GFCI will sense ground faults and disconnect the power supply. This protects you from a dangerous, and possibly fatal electrical shock.
- B. **Codes:** All electrical equipment and wiring should comply with the requirements of local and national codes.
- C. **Grounding and Bonding:** All electrical equipment must be grounded. All metal objects (ladders, diving platforms, etc.) must be electrically bonded together.
- D. **Extension Cords:** Never use extension cords around a pool or spa or to supply power to pool or spa equipment. If they get wet, it's an invitation to a shock – possibly a fatal shock.
- E. **Utility Pump:** A utility pump to drain the pool must always be plugged into a GFCI-protected outlet. Because of the danger of electrical leakage from a utility pump to the pool water, never enter the water when a utility pump is running, and never put an aluminum vacuum handle (or any similar object which could conduct electricity) into the pool.

# 5. Spas and Hot Tubs

- A. A spa should always have dual suction outlets to prevent entrapment (see Page 10, “Pump Suction”). All tub suction fittings should be certified to meet the current ASME/ANSI Standards that apply.
- B. Keep the water temperature in your spa below 104°F (40°C). Age or health conditions (especially pregnancy) may require a lower temperature; consult a physician for more information. If you’re not sure, start at a lower temperature and gradually increase it, but don’t go above 104°F (40°C). Keep an accurate thermometer in the spa; check the temperature *before* getting in.
- C. If you are using alcohol or drugs (including medications), don’t use the spa or hot tub. The combination of hot water and either alcohol or drugs (or both) can cause dizziness, falling, unconsciousness, or a heart attack.
- D. A long bath in hot water may cause hyperthermia (too much heat in the body) which can be fatal. Some symptoms of hyperthermia are:
  - Nausea
  - Dizziness
  - Fainting

If these symptoms appear while you are in the spa, **GET OUT AT ONCE!**

Cool the body quickly with cold towels or a cool shower. Call a doctor if the symptoms do not go away.

- E. Running the spa pump overnight with the spa covered can heat the water to extremely high temperatures from the friction of the water flowing through the pump and piping system. This can scald you and may cause spa shell failure. Turn off the jets whenever the spa is not in use.
- F. Never alter the electrical cord or plug on the spa system. In particular, *never* cut off a 20-amp plug and replace it with a 15-amp plug. Check the spa’s dataplate to be sure that the system’s electrical requirements do not overload the supply circuit’s capacity.
- G. Do not use an extension cord to connect a spa system to an existing electrical outlet. A spa system must operate from a GFCI protected circuit or outlet, which is dedicated to that spa only. If in doubt, consult a licensed electrician.

# 6. Pool/Spa Chemical Storage and Use

- A. Store water test kits in a cool, dry place, out of the reach of children. Follow the kit manufacturer's safety instructions – test reagents contain dilute acids and caustics that may cause chemical burns or skin irritation. If you get any of the test chemicals on your skin or in your eyes, flush the exposed area with water. Get medical help for chemicals in the eyes.
- B. Store pool chemicals away from the pool/spa environment. Sanitizing chemicals (liquid or dry), and acid solutions that are stored in enclosed areas without sufficient ventilation give off fumes (even from closed containers) that may cause corrosion and deterioration of electrical terminals, wiring, and metal components. Deterioration of electrical components may create shock hazards, or cause the equipment to fail.
- C. Read all chemical usage safety instructions, and be familiar with emergency procedures, so that in the event of a chemical spill or accident, you will be able to act quickly. Put on protective clothing and eyewear before handling chemicals. Do not breathe concentrated chemical fumes.
- D. Never mix chlorine or bromine with acids. Never mix chlorine with bromine. Always dilute chemicals by *adding the chemical to the water*. **Never add water to the chemicals.**
- E. Never pour undiluted chemicals into the skimmer deck opening or into the pool. Dilute the chemicals before adding them to the pool water, and then distribute the solution around the perimeter of the pool.
- F. Always be sure that no swimmers are in the pool when you are chemically treating the pool water.

# In Conclusion...

We hope you enjoy the relaxation of your pool and spa. Remember that these safety tips – and a good knowledge of your equipment (**read your owner's manuals!**) – can enhance the fun of a swimming pool or the warm, relaxing effects of a spa. Your enjoyment will be increased by knowing that your equipment is well-maintained and safe.

While the suggestions outlined in this brochure will make pool and spa use safer and more enjoyable, Pentair Water Pool and Spa cannot guarantee that accidents will not happen.

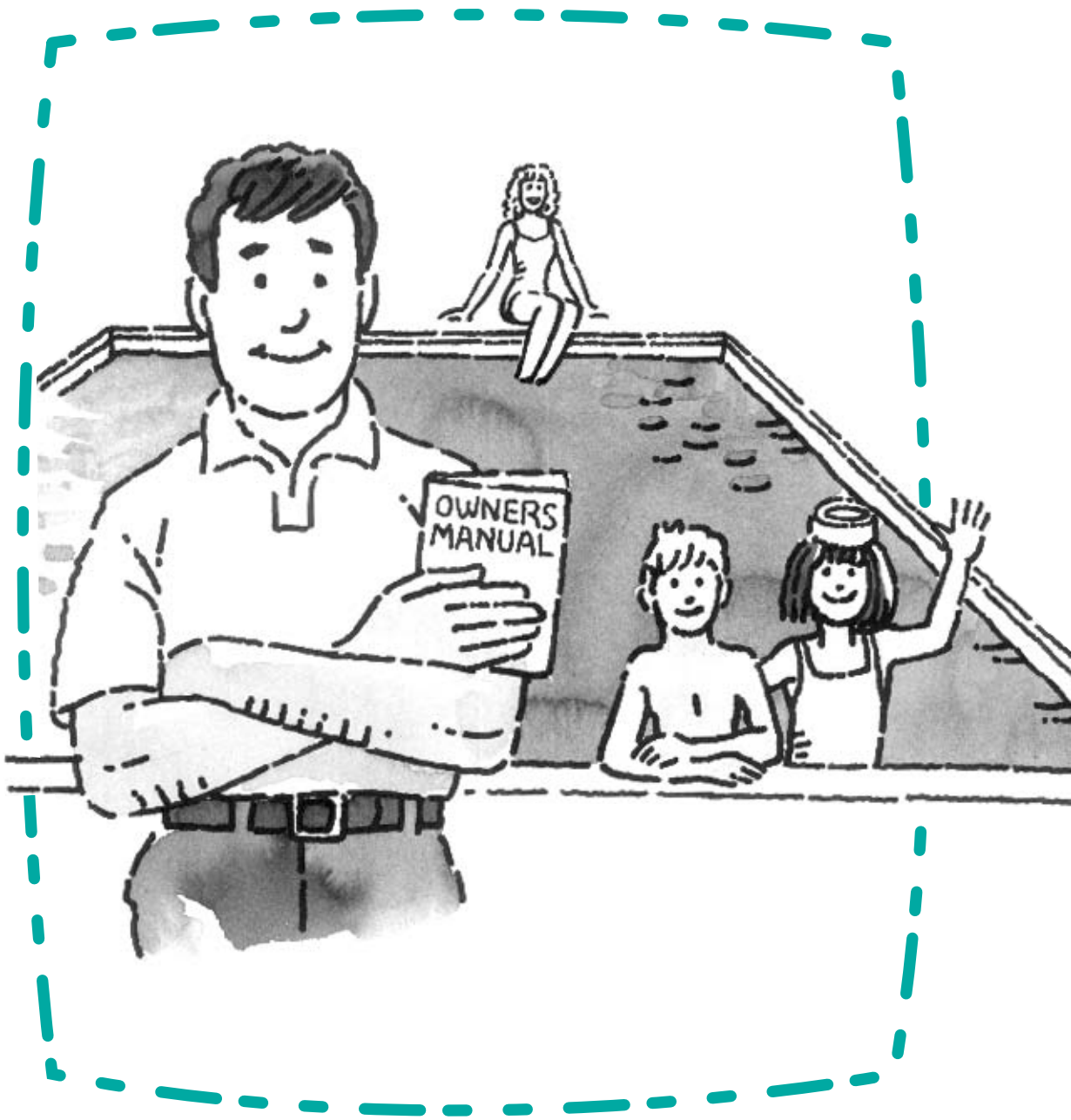
The precautions outlined in this brochure cover only the basics. This brochure is not intended to replace instructions you receive from your owner's manuals or pool professional.

By using common sense, taking proper safety precautions and having your pool professional do regular maintenance and safety inspections, your pool and spa mechanical equipment should provide safe and trouble-free enjoyment for years to come.

At Pentair Water Pool and Spa, we wish you the best in swimming enjoyment and spa relaxation, and thank you for playing it safe!

If you have questions about pool or spa safety, or if you would like more information about our company and its products, call 1-800-831-7133 or visit our website at [www.pentairpool.com](http://www.pentairpool.com).

Please be careful, and remember – ***always play it safe!***





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