

INSTALLATION & INSTRUCTION MANUAL

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INSTALLATION REQUIREMENTS

110v - Escape, Super Escape, Haven

- The spa comes with 12' GFCI protected cord that must be plugged directly into the outlet. The spa operates best if it is the only thing on that line. Do Not use an extension cord to operate your spa.
- A dedicated line may be used as well, a 20amp breaker is recommended. The spa can run on a 15amp breaker depending on the strength of the line. Tuff Spas is not responsible for any existing outlets or any lines that have been installed by an electrician that will not operate your spa.

<u>220v – Deluxe Haven & Super Haven</u>

- 50 amp Breaker
- GFCI
- 4 wire: Neutral, Ground and (2) Hot
- #8 wire up to 75', #6 wire for anything over 75'
- For 110v to 220v conversions follow the instructions listed in this manual. (You must remove a jumper wire for this conversion)
- Tuff Spas must be Hard Wired, you may not use a 220v plug.
- 220v lines must be installed by a licensed electrician. Tuff
 Spas will not warranty any part of the spa due to improperly
 installed electrical runs. Tuff Spas is not responsible for any
 existing outlets or any lines that have been installed by an
 electrician that will not operate your spa.

Ground Preparation

- Tuff Spas is not responsible for any ground preparation.
- Customer needs a complete solid foundation for the spa. As level as possible.
- NO SAND
- We recommend you use: Concrete, Pavers or Brick.

IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS

When using this electrical equipment, basic safety precautions should always be followed, including the following:

- A green colored terminal marked G, GR, Ground, Grounding, or the "G" symbol is located inside the supply terminal box or equipment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electrical supply service panel with a continuous copper wire equivalent in size to the circuit conductors supplying this equipment.
- Bus Bar marked "Bonding Lugs" is provided on the external surface of the supply terminal box or compartment. To reduce the risk of electrical shock, connect the local common bonding grid in the area of the hot tub or spa to these terminals with an insulated or bare copper conductor not smaller than #6 AWG.
- All field-installed metal components such as rails, ladders, drains, or other similar hardware within 3 meters of the hot tub should be bonded to the equipment grounding bus with copper conductors not smaller than #6 AWG.

DO NOT OPERATE THE EQUIPMENT WHEN THERE IS LITTLE OR NO WATER IN THE SPA OR HOT TUB.

SAVE THESE INSTRUCTIONS!!!

POTENTIAL RISKS OF PERSONAL INJURY
OR HEALTH HAZARDS MAY BE
ASSOCIATED WITH USE OF EQUIPMENT,
PLEASE READ AND FOLLOW ALL
WARNINGS CAREFULLY.

SAFTEY WARNINGS...

- Children should not use spa or hot tub without adult supervision.
- Do not use spa or hot tub unless all suction guards are installed to prevent body and hair entrapment.
- People using medications and/or having an adverse medical history should consult a Physician before using a spa or hot tub.
- To avoid injury, exercise care when entering or exiting the spa or hot tub.
- DO NOT use drugs or alcohol before or during the use of the spa or hot tub to avoid unconsciousness and possible drowning.
- Pregnant or possibly pregnant women should consult a Physician before using a spa or hot tub.
- Water temperature in excess of 104 degrees Fahrenheit may be injurious to you health.
- Before entering the spa or hot tub measure the water temperature with an accurate thermometer.
- DO NOT use a spa or hot tub immediately following strenuous exercise.
- Prolonged immersion in a spa or hot tub may be injurious to your health.
 See Page 6 for detailed description and precautions for Hyperthermia.
- DO NOT permit electronic appliances (such as a lights, telephones, radios, or televisions), within 5 feet of the spa or hot tub, unless your spa or hot tub is built by the manufacturer to include such features.

CAUTION:

DO NOT OPERATE THE EQUIPMENT WHEN THERE IS LITTLE OR NO WATER IN THE SPA OR HOT TUB.

PROLONGED IMMERSION IN HOT WATER MAY INDUCE HYPERTHERMIA READ THE FOLLOWING SYMPTOMS:

The causes, symptoms, and effects of hyperthermia may be described as follows. Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above 37 degrees Celsius the normal body temperature. The symptoms of hyperthermia include drowsiness, lethargy, and an increase in the internal temperature of the body. The effects of hyperthermia include:

- a) Unawareness of impending hazard
- b) Failure to perceive heat
- c) Failure to recognize the need to exit spa
- d) Physical inability to exit spa
- e) Fetal damage in pregnant women
- f) Unconsciousness and danger of drowning

WARNING...THE USE OF ALCOHOL OR DRUGS CAN GREATLY INCREASE THE RISK OF FATAL HYPERTHERMIA IN HOT TUBS AND SPAS.

WIRE DIAGRAM

220-VOLT SYSTEMS

220-VOLT, 40 AMP, 60Hz, 4 WIRE

2 HOT #8 AWG

1 NEUTRAL #8 AWG

1 GROUND #8 AWG

#8 BONDING REQUIRED.

PER DIAGRAM BELOW: Ground (green) in "G", Neutral (white) in "N", Hot (black) in L2 AND L1.

110-VOLT SYSTEMS

110-VOLT, 20 AMP, 60 Hz, 3 WIRE

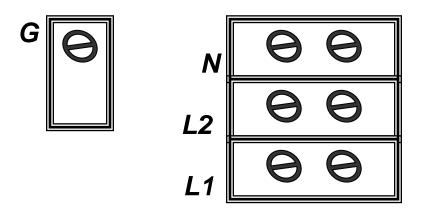
1 HOT #12 AWG

1 NEUTRAL #12 AWG

1 GROUND #12 AWG

#8 BONDING REQUIRED.

PER DIAGRAM BELOW: Ground (green) in "G", Neutral (white) in "N", Hot (black) in L2.



Please note: All domestic units except Haven Super, Haven Deluxe and Rock Spa are shipped 110-Volt. To convert to 220-Volt, remove white jumper from neutral to L-1 and re-program topside. See 220-Volt conversion sheet for re-programming directions.

WARNING-The following information is provided for hooking up electrical supply to the spa. A qualified electrician must perform this work. Failure to have this done can result in termination of all warranty coverage and may result in an unsafe spa.

110V TO 220V CONVERSION INSTRUCTIONS

Changing from 120 volt to 240 volt systems:

- Remove the G.F.C.I. and Cord
- Remove the white jumper wire between neutral and terminal 23 located in the circuit board
- Connect a 240 volt 4 wire 40 amp circuit to terminal block
- Change to HC (High Current at topside)

To change from Lo-current 120 volt to High-current system:

Press and hold temp up & light buttons simultaneously for 5 seconds. "R 21" will appear, release and press "heat up" button until HC or LC appears, use "jets" button to change from LC to HC, now push "heat up" buttons 3 times, this will save the change.

INTRODUCTION

The TUFF SPA you have purchased is one of the very best available and incorporates features designed to assure long, reliable use if properly installed, operated and maintained. This model is certified for your safety and protection. The Spa Pack must be installed in accordance to the instructions specified in this manual, otherwise the warranty is void.

Check for shipping damage before unpacking. Tuff Spas is not responsible for damage to the unit sustained during shipment. If damage is evident before unpacking, contact the freight carrier regarding shipping damage claims.

CAUTION

It is strongly suggested that you read this entire manual first before any installation has begun so that you are entirely familiar with the requirements that are absolutely necessary to accomplish a safe and reliable installation.

GENERAL INSTALLATION INSTRUCTIONS

This Spa Pack manual shows all of the options available, your particular model may not have all options shown.

DANGER – RISK OF ELECTRIC SHOCK

Do Not permit any electric appliance such as a lights, telephone, radio or television, within five feet of the spa, hot tub or pool. Never operate any electrical appliances from inside the water or while wet.

The electrical supply to this product must include a suitably rated switch or circuit breaker to open all un-grounded supply conductors to comply with Local Electric Codes. The disconnecting means must be readily accessible to the tub or pool occupant but installed at least five feet (1.5 meters) from the water.

All wiring connections should be made using copper conductors only.

Under no circumstances shall an extension cord be used, use of an extension cord will void the warranty and may cause damage to the electrical components.

It is necessary to use **only a dedicated circuit** to supply power. A dedicated circuit is one where no other electrical appliances are connected to the same circuit. If a dedicated service is not available, or there is a question whether the circuit serves other appliances, it is the responsibility and obligation of the owner/user to have one installed by a qualified electrician.

CAUTION

An earth grounding wire must be attached to the heater housing and to any other piece of equipment in the system, such as the pump. The grounding connector should be at least the same size or larger than the wire size supplying the power.

READ AND FOLLOW ALL INSTRUCTIONS!!

DESCRIPTION AND USE OF CONTROLS

ELECTRONIC THERMOSTAT

The electronic thermostat works through a processor and an "in water" temperature sensor, sometimes referred to as a thermo-probe. The temperature is adjusted by depressing the heat key on the topside control. There is an LED that displays the actual water temperature as well as the desired "set point". See details in the start up and operation section of this manual.

HIGH TEMPERATURE RESET SWITCH

If the temperature of the water reaches 118F, the system will shut down and can only be reset by depressing the heat key on the topside control panel. The water temperature must be less than 112F to be manually reset.

HEATER INDICATOR LIGHT

This red pilot light, located on the topside control, will blink when the heater is on this light and will shutoff when set temperature is attained. The heater assembly described in this manual consists of one electric heating element mounted within a stainless steel manifold or vessel whose ends are fitted with unions for connection to the water input and output plumbing system. In addition, there is a water-pressure switch threaded into the body.

PRESSURE SWITCH

The switch is pre set and cannot be adjusted.

TEMPERATURE SENSOR

The temperature sensor must be located where it will not be affected by ambient air. It is recommended that the sensor be located in an insulated dry well or a wet compression fitting in the side wall or foot well of the spa. If there is doubt of the accuracy of the temperature readout after the sensor is installed, you can test the sensor by placing it directly in the spa and measure it against another accurate digital temperature thermometer. This will show whether the problem exists in the sensor or the application.

START UP PRECAUTIONS

Before performing the operations of this section, make sure you TURN OFF ALL ELECTRICAL POWER TO THE UNIT and read these instructions and the uses for the heater as previously described in this manual.

- 1. Make sure the spa is filled with water. DO NOT OPERATE THIS SYSTEM WITH LITTLE OR NO WATER IN THE SPA.
- 2. Plug in each piece of the peripheral equipment, (pump, blower, light, etc.) into the appropriate receptacle. All plug/receptacles are uniquely polarized; therefore you cannot insert a plug into the wrong receptacle.
- 3. Review the Start up and Operation section of this manual.
- 4. Turn on the power to the unit and test the ground fault circuit interrupter, (GFCI).
- 5. If a particular function does not seem to be working properly, first go back and re-read the DESCRIPTION AND USE OF CONTROLS section as well as Start up and Operation section. If further problems persist, refer to the trouble-shooting section of this manual.

Start-Up and Operation*

Note: If the starting water temperature is below 55F, the unit will run on high speed until 55F is reached only then will the low speed pump operate.

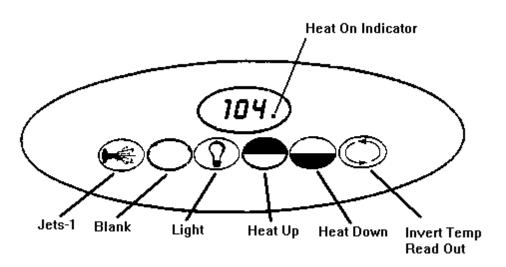
- Power up system and "pur" will appear for 30 seconds while your system is in purge mode and then normal operation will assume.
- The unit will now display the temperature of the spa water; the low speed pumps will be running in filter mode. The unit is set up to run for 2 hours twice a day when delivered. Filtering mode can be adjusted as follows.
 - 1. Push and hold Blank space & Heat down buttons
 - 2. After 5 seconds C2 will appear on the display indicating to run for 2 hours twice a day
 - **3.** Continue holding down the **Blank space & Heat down** keys to change. (C3 will run the unit for 3 hours twice a day, C4 will run the unit for 4 hours twice a day, etc...)
- Press the **Blank Space & Light** keys to toggle from Celsius to Fahrenheit temperature read out.
- Press the **Heat Up** key and hold to adjust temperature higher. Press the **Heat Down** key and hold to adjust the temperature lower. The minimum set point is 70F or 21C.
- A red **LED** will flash at the topside control when the heater is on.
- Press **Jet1** key to activate Pump 1, **High & Low**.
- The pumps in will run in **HI** for 30 minutes at which time the system will automatically return to automatic mode.
- Press Light key to active light ON & OFF.
- Press HEAT UP key and PUMP key simultaneously to activate temperature LOC and do the same to de-activate.
- If the tub temperature reaches 112F the control will flash the temperature, and the unit will shutoff until the temperature drops below 112F.
- If the heater body temperature reaches 112F, the control will flash and the system will shut down until the temperature drops below 112F.
- There is a third level of protection via hi-limit relay that will trip at 118F. If this occurs "HL" will flash on the digital display, and will not turn back on until the temperature drops below 112F. The hi-limit can be manually reset by pressing the heat key of the control pad or re-booting the system. If this "trips" repeatedly, call your Tuff Spa dealer for service.

Notice: If a two-speed pump is supplied that filters on low speed, be aware that if the temperature creeps 2 degrees over the set point, it will shut off and turn back on when the temperature drops below the set point.

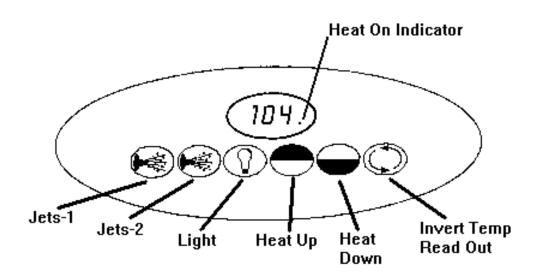
This Page does not apply to the Standard Escape

Top-Side Button Guide

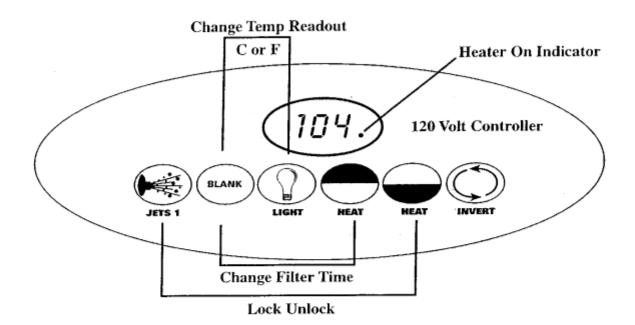
Single Pump

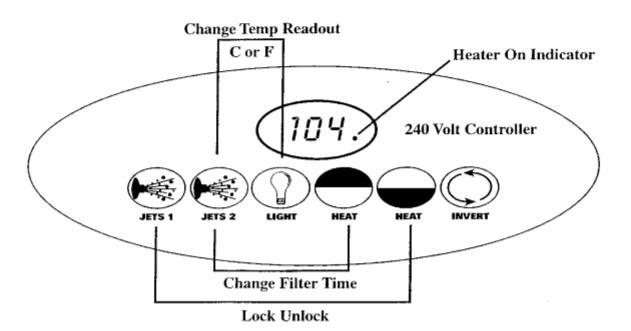


Two Pump



Programming Directions





OPERATING INSTRUCTIONS - ESCAPE

Spa Activator Control Panel

The Standard Escape operates on a Push Button Air Control located on the top rim of the spa. The thermostat/temperature control is located inside the front access panel on the spa.

Jet Pump

Jet pump is 2 speed. This pump filters and heats the spa and operates all the jets listed below:

6- Mini Directional Jets

Jet Operations

The Escape is operated by push button air control. Depress the button once to turn jets on and activate the heater. Depress the button a second time for high speed. You depress the button a second time to shut the spa off. All jets can be shut on or off by turning the outer ring of the jet.

Air Controls

The Escape has one air control. This control feeds air to all jets.

MAINTENANCE

It is recommended that your cartridge be cleaned every 3 to 6 weeks, or as needed. Replace when necessary. A professional technician should service Your Tuff SpasTM spa at least once a year. Contact your Tuff SpasTM dealer for details.

CLEANING THE FILTER

- 1) Turn off pump (and timer if used).
- 2) Turn ring of floating skimmer counter-clock wise and set the ring aside.
- 3) Lift out basket and weir, set aside.
- 4) Lift the filter straight up and out of canister.

CLEANING THE CARTRIDGE

- 1) Hold the cartridge in an upright position. Spray downward into the pleats of the fabric with a garden hose to flush away debris.
- 2) After hosing off the cartridge, soak in water and a suitable filter cleaner. Soak for 2 to 4 hours to remove body oils that become impregnated in the cartridge fabric during filtration. Rinse thoroughly before placing back into the filter housing.

- To replace a burned-out bulb, open the cabinet door to locate to spa light housing attached to the spa. Remove the lamp socket from the back of the light assembly. Gently turn and pull at the same time.
- 2) Remove the bulb from the lamp socket, and replace with a GE-912 bulb available from your local dealer. Return the lamp socket back into the light assembly, and close the cabinet door.

OPERATING INSTRUCTIONS - SUPER ESCAPE

Spa Activator Control Panel

The buttons located on the topside of the spa offer you convenient "on/off" switches for the pump and light. Tap the buttons once to activate (there is a two second delay) and a second time to deactivate. Heat up & Heat down buttons are there to change your desired temperature. The Invert button is for changing the direction of your digital display, so you can read your display from either inside or outside the spa.

Jet Pump

Jet pump has 2 speeds. The low speed of the pump filters and heats. The hi-speed of the pump activates all the following jets:

6-Euro Jets 4-Mini Dir

3-Mini Roto 1-Cyclone Super Jet

1-Whirlpool Jet 2- Neck Jets

Jet Operations

This spa is equipped with (1) Diverter Valve (Lg. Handle) on the rim of the spa to turn Jet Stations on and off. Also, each individual jet can shut on or off by turning the outer ring of the jet.

Air Controls

The Super Haven has (2) Air Controls (Sm. Handles), located on the rim of the spa. To operate, simply turn knob counterclockwise inducing air into the jets.

MAINTENANCE

It is recommended that your cartridge be cleaned every 3 to 6 weeks, or as needed. Replace when necessary. A professional technician should service Your Tuff SpasTM spa at least once a year. Contact your Tuff SpasTM dealer for details.

CLEANING THE FILTER

- 1) Turn off pump (and timer if used).
- 2) Turn ring of floating skimmer counter-clock wise and set the ring aside.
- 3) Lift out basket and weir, set aside.
- 4) Lift the filter straight up and out of canister.

CLEANING THE CARTRIDGE

- 1) Hold the cartridge in an upright position. Spray downward into the pleats of the fabric with a garden hose to flush away debris.
- 2) After hosing off the cartridge, soak in water and a suitable filter cleaner. Soak for 2 to 4 hours to remove body oils that become impregnated in the cartridge fabric during filtration. Rinse thoroughly before placing back into the filter housing.

- 1) To replace a burned-out bulb, open the cabinet door to locate to spa light housing attached to the spa. Remove the lamp socket from the back of the light assembly. Gently turn and pull at the same time.
- 2) Remove the bulb from the lamp socket, and replace with a GE-912 bulb available from your local dealer. Return the lamp socket back into the light assembly, and close the cabinet door.

OPERATING INSTRUCTIONS - HAVEN/HAVEN DELUXE*

Spa Activator Control Panel

The buttons located on the topside of the spa offer you convenient "on/off" switches for the pump and light. Tap the buttons once to activate (there is a two second delay) and a second time to deactivate. Heat up & Heat down buttons are there to change your desired temperature. The Invert button is for changing the direction of your digital display, so you can read your display from either inside or outside the spa.

Jet Pump

Jet pump has 2 speeds. The low speed of the pump filters and heats. The hi-speed of the pump activates all the following jets:

4-Mini Roto1-Mini Dir2-Neck Jets1-Foot Jet1- Large Roto1-Cyclone Dir2-Large Dir1-Cyclone Roto1-Diverter Jet1-Stealth Massage

*Haven Deluxe is same as The Haven but operates on 220v only and has a 4.8hp pump, with 4 additional jets and one Whirlpool Jet.

Jet Operations

This spa is equipped with (1) Diverter Valve (Lg. Handle) on the rim of the spa to turn Jet Stations on and off. Also, each individual jet can shut on or off by turning the outer ring of the jet.

Air Controls

The Super Haven has (2) Air Controls (Sm. Handles), located on the topside of the spa. To operate, simply turn knob counterclockwise inducing air into the jets.

MAINTENANCE

It is recommended that your cartridge be cleaned every 3 to 6 weeks, or as needed. Replace when necessary. A professional technician should service Your Tuff SpasTM spa at least once a year. Contact your Tuff SpasTM dealer for details.

CLEANING THE FILTER

- 1) Turn off pump (and timer if used).
- 2) Lift skimmer face straight up and out.
- 3) Slide skimmer basket out.
- 4) Turn filter counterclockwise and pull up and out.

CLEANING THE CARTRIDGE

- 1) Hold the cartridge in an upright position. Spray downward into the pleats of the fabric with a garden hose to flush away debris.
- 2) After hosing off the cartridge, soak in water and a suitable filter cleaner. Soak for 2 to 4 hours to remove body oils that become impregnated in the cartridge fabric during filtration. Rinse thoroughly before placing back into the filter housing.

- To replace a burned-out bulb, open the cabinet door to locate to spa light housing attached to the spa. Remove the lamp socket from the back of the light assembly. Gently turn and pull at the same time.
- 2) Remove the bulb from the lamp socket, and replace with a GE-912 bulb available from your local dealer. Return the lamp socket back into the light assembly, and close the cabinet door.

OPERATING INSTRUCTIONS - SUPER HAVEN

Spa Activator Control Panel

The buttons located on the topside of the spa offer you convenient "on/off" switches for the pump and light. Tap the buttons once to activate (there is a two second delay) and a second time to deactivate. Heat up & Heat down buttons are there to change your desired temperature. The Invert button is for changing the direction of your digital display, so you can read your display from either inside or outside the spa.

Jet Pumps (2)

 1^{st} Jet pump has 2 speeds and the 2^{nd} jet pump is 1 speed. The low speed of the pump filters and heats. Both pumps in hi-speed activates all the following jets:

7-Mini Roto
2-Neck Jets
2-Foot Jet
3-Cyclone Super Dir
1-Whirlpool Jet
1-Diverter Jet
2-Cyclone Roto
1-Stealth Massage

Jet Operations

This spa is equipped with (1) Diverter Valve (Lg. Handle) on the rim of the spa to turn Jet Stations on and off. Also, each individual jet can shut on or off by turning the outer ring of the jet.

Air Controls

The Super Haven has (2) Air Controls (Sm. Handles), located on the rim of the spa. To operate, simply turn knob counterclockwise inducing air into the jets.

MAINTENANCE

It is recommended that your cartridge be cleaned every 3 to 6 weeks, or as needed. Replace when necessary. A professional technician should service Your Tuff SpasTM spa at least once a year. Contact your Tuff SpasTM dealer for details.

CLEANING THE FILTER

- 1) Turn off pump (and timer if used).
- 2) Lift skimmer face straight up and out.
- 3) Slide skimmer basket out.
- 4) Turn filter counterclockwise and pull up and out.

CLEANING THE CARTRIDGE

- 1) Hold the cartridge in an upright position. Spray downward into the pleats of the fabric with a garden hose to flush away debris.
- 2) After hosing off the cartridge, soak in water and a suitable filter cleaner. Soak for 2 to 4 hours to remove body oils that become impregnated in the cartridge fabric during filtration. Rinse thoroughly before placing back into the filter housing.

- 1) To replace a burned-out bulb, open the cabinet door to locate to spa light housing attached to the spa. Remove the lamp socket from the back of the light assembly. Gently turn and pull at the same time.
- 2) Remove the bulb from the lamp socket, and replace with a GE-912 bulb available from your local dealer. Return the lamp socket back into the light assembly, and close the cabinet door.

OPERATING INSTRUCTIONS – ROCK SPA

Spa Activator Control Panel

The buttons located on the topside of the spa offer you convenient "on/off" switches for the pump and light. Tap the buttons once to activate (there is a two second delay) and a second time to deactivate. Heat up & Heat down buttons are there to change your desired temperature. The Invert button is for changing the direction of your digital display, so you can read your display from either inside or outside the spa.

Jet Pumps (2)

1st Jet pump has 2 speeds and the 2nd jet pump is 1 speed. The low speed of the Jet pump One filters and heats the spa. Both pumps in hi-speed activates all the following jets based on the position of the Diverter Valves, explained in the next section below:

Jet Pump One
Mode 1Wall Whirlpool Jet
Mode 2Wall Jets

Jet Pump Two
Mode 1Foot Whirlpool & Foot Jets
Mode 2Hot Seat Jets (Captain Chair)

Jet Operations

This spa is equipped with (2) Diverter Valve (Lg. Handle) on the rim of the spa to turn Jet Stations on and off, one for each Jet Pump. These activate the Modes listed above. Also, each individual jet can shut on or off by turning the outer ring of the jet.

Air Controls

The Super Haven has Air Controls (Sm. Handles), located on the rim of the spa. To operate, simply turn knob counterclockwise inducing air into the jets.

MAINTENANCE

It is recommended that your cartridge be cleaned every 3 to 6 weeks, or as needed. Replace when necessary. A professional technician should service Your Tuff SpasTM spa at least once a year. Contact your Tuff SpasTM dealer for details.

CLEANING THE FILTER

- 5) Turn off pump (and timer if used).
- 6) Lift skimmer face straight up and out.
- 7) Slide skimmer basket out.
- 8) Turn filter counterclockwise and pull up and out.

CLEANING THE CARTRIDGE

- 3) Hold the cartridge in an upright position. Spray downward into the pleats of the fabric with a garden hose to flush away debris.
- 4) After hosing off the cartridge, soak in water and a suitable filter cleaner. Soak for 2 to 4 hours to remove body oils that become impregnated in the cartridge fabric during filtration. Rinse thoroughly before placing back into the filter housing.

- 3) To replace a burned-out bulb, open the cabinet door to locate to spa light housing attached to the spa. Remove the lamp socket from the back of the light assembly. Gently turn and pull at the same time.
- 4) Remove the bulb from the lamp socket, and replace with a GE-912 bulb available from your local dealer. Return the lamp socket back into the light assembly, and close the cabinet door.

TROUBLE-SHOOTING GUIDE

For any problems with your Tuff Spas please do the following items first.

- -Check all breakers, plugs (inside and outside the spa) & wiring to assure all connections are clean and tight.
- -RESET ALL BREAKERS, UNPLUG OR DISCONNECT THE SPA AND RETRY

No display at topside-check the connection to main board, make sure it clean at J8.

- -Test a new topside control
- -Check for 120v primary power going to the transformer and for 12v secondary power out of the transformer to J6 and J7 on the board before replacing the transformer. Replace board if there is 12v to J6 and J7.

Display flashes "th1 / 39" on system start up

- -Check the temperature sensing probe connection to main board. Make sure it is clean at J2.
- -Try a new temperature-sensing probe.

Display flashes "th2 / current temperature" on start up

- Check that the temperature sensing probe is connected to the main board and is clean at location I1.
- -Try a new temperature-sensing probe.

Display flashes "th2 / 39" on start up

-This indicates that **both thermisters** are detecting tub water temperature of less than 39F /4C or they are both disconnected. Pumps and blowers will run in this condition.

Display flashes "OH" (Overheat)

-This indicates that the **spa** water temperature is above 112F. The system should be shut down in this state and will re-start automatically when the water cools below 112F.

Display flashes "hot" (Overheat)

-This indicates that the **heater body** temperature is above 112F. The system should be shut down in this state and will re-start automatically when the water cools below 112F.

Display flashes "HL" (High limit)

-This indicates that either the heater or the spa has reached **118F** or higher. The system will not re-start automatically. To re-start the system, the water temperature must be below 112F and the heater key at the topside control must be pressed.

Display flashes "FLO" (Flow)

- This indicates that there is a water flow problem or defective pressure switch.
- Make sure filters are clean
- Check that service valves are open
- -Check for blockage of flow

Display Flashes "FLC"

-This indicates that the pressure switch is stuck in the closed position and needs to be replaced.

Erratic operation on the Topside control panel

- Check for proper connection at J8, and re-start the system.
- Check for debris inside the topside control housing.
- Check cable connection at the topside control; remove, clean, and then re-connect.
- Try a new topside control.
- Replace the main board.

Spa Not Heating

- Check the topside control for "HL". This indicates that the system has over heated. Make sure the temperature has dropped below 112F and press the heat key to reset.
- Check that the temperature set point is higher than actual tub temperature.
- Check for flashing LED at topside control panel to indicate heat demand.
- Check to see of the pilot light on the equipment panel is lit. This indicates if power is getting to the heater element. If the light is on and there is still no heat, the element should be checked for continuity. If the element is open, it needs to be replaced.
- If the pilot light still does not turn on, then the pressure switch may need to be replaced. The pressure switch is located on the heater body and has a small wheel on it. The wheel should be turned counterclockwise to allow the heater to run on less water flow / pressure.
- The pressure switch is a protection switch that is meant to turn the heater off if the pump fails to operate or if there is not enough pump pressure. You can test the pressure switch by unplugging the circulation pump to see if the heater shuts off. It should operate again when the pump is plugged back in. The heater should not be allowed to operate under static (gravitational) pressure when the pump is not on as it will cause an instant overheat.

Overheat

- If the water is too hot and high limit has tripped, the water must be allowed to drop below 112F before it will reset. Reset by pressing the heat key on the topside control panel.
- The circulation of the water may be to low, allowing the heater body to overheat. Be sure that all valves are fully open to allow maximum water flow over the heater element.
- The friction and radiant heat from the pump motor can cause an extremely high ambient temperature around the spa and the equipment causing an overheat condition. If this condition is suspect, try running the spa with the equipment door off to see if it still overheats.

Pump(s), Blower or Light does not shut off

- Try a new topside control
- Replace the main board

Circulation pump does not work

- Check the fuse and power connections.

Light does not work

- Press light key on the topside control panel
- Check the light bulb and replace as needed. The instructions are included as a separate sheet with you startup instructions packet.
- -Check 12V out to light at J4 & J5

Ground Fault Interrupter Trips (GFCI)

- Check to see if it trips only when the heater is on, if so, check the element by removing the power to the element terminal and turn the heat back on. If it only faults when the element is connected, the element has a ground fault and must be replaced.
- This can be done with the pump(s), blower, Ozonator, or any other peripheral equipment as a process of elimination to see where the fault may be.
- Be sure that the neutral on the GFCI has been wired properly in the main panel.

Improper Temperature Measurement

- Remove temperature sensor from it's current location and submerge directly into the spa / hot tub water. Compare it with an accurate digital thermometer. This will tell you if it is the sensor or the application. (See temperature sensor in the "Description and Use of Controls" sections of this manual.)

MAINTENANCE AND CARE

The maintenance and care of your new Tuff Spa is simple and easy to carry out. If performed regularly, problems will be minimal. It is important that the following procedures be read thoroughly and carried out on a regular basis for best long-term overall performance of your spa.

The filtering cycle of your spa should be operated AT LEAST eight hours or more a day whether or not the water is heated, to remove impurities from and to prevent deposition of contaminants in your spa. The filtering system works automatically during the heating cycle of the spa water and during the time the filtration timer is on (low speed pump on) or when the high-speed pump is on.

Keep the spa covered when not in use to reduce the loss of heat and to keep leaves, dirt and debris from settling in the water.

Maintaining the spa's proper water chemical balance is essential to the comfort and safety of the user. Water chemistry varies constantly and is directly affected by evaporation and the use of cleaning and maintenance chemicals, which will change water chemistry when added. If your water chemistry deviates from prescribed pH level (7.2 to 7.8), the condition and operation of your spa and it's equipment may be adversely affected by deposits on spa walls, filter, **electric heating element** (or gas heating internal manifold) and piping.

Since the water capacity of your spa IS FAR LESS THAN THAT OF A SWIMMING POOL, THE CHEMICAL REACTION CAUSED BY THE PRESENCE OF ONE OR MORE PERSONS IN THE SPA IS MORE RAPID AND PRONOUNCED – IN OTHER WORDS, IT IS MUCH MORE DIFFICULT TO MAINTAIN THE PROPER PH BALANCE IN A SPA THAN A SWIMMING POOL. For these reasons, it is important to **frequently** check the chlorine/bromine level; pH level and total alkalinity of the water then add the prescribed chemicals as necessary to maintain the proper chemical balances. Contact a local pool and spa professional in your area to assist you in learning about proper water chemistry on your new Tuff Spa if you are unfamiliar with the terms listed in this section. Failure to maintain a PROPER BALANCE OF CHEMICALS IN YOUR SPA WILL RESULT IN AN EARLY, PREMATURE FAILURE OF YOUR SPA PARTS INCLUDING, BUT NOT LIMITED TO, PIPING, JET COMPONENTS, FILTER COMPONENTS, AND CERTAIN ELECTRICAL COMPONENTS IN THE HEATER MODULE BOX, AND THUS VOIDING YOUR WARRANTY.

ESSENTIAL CHEMICALS AND THEIR USE

Caution:

The following information on chemical use for spa maintenance is provided strictly as a guide for the spa owner and may or may not be appropriate to maintain your spa correctly and may, under certain conditions, be harmful to your spa and/or persons using the spa. Always check with your spa dealer to determine which chemicals and/or procedures they recommend to maintain your spa correctly.

Tuff Spas does hereby claim no responsibility or liability for the use of and quantities of the chemicals listed below:

Concentrated chlorine or bromine granules - The minimum chlorine/bromine level in the spa should be at least 2.0 PPM (Parts Per Million). Chlorine level should be tested frequently and the chemical added to maintain a safe level in excess of 2.0PPM. Liquid chlorine is not recommended.

Organic Polymers are used in various forms. These chemicals clear up cloudy or dirty water appearance and prevent calcium deposits on the inside spa finish, plumbing and heating equipment. Use as recommended by the manufacturer.

Metal Protector or Remove "Metal Gon" or it's equivalent is a chemical that will prevent iron in the spa water from staining the spa finish. This chemical is added to the spa water when the spa is filled for the first time or when re-filled. Use as directed.

Silicone Emulsion (Anti-Foam) quickly and effectively disperses foam and is completely compatible with the other chemicals listed. Use as required. If foaming persists, it may indicate the water needs to be changed.

It is important to keep the water in your spa clean. Your spa water should be drained and refilled periodically depending upon the frequency of usage and other conditions that may affect water usability. Typically 60 to 90 days is a satisfactory interval under normal spa usage conditions. If a spa is used heavily, with several people, this interval between cleanings should be less. This is the logical time to

clean the spa surface with a spa cover cleaner or an equivalent. At this time the filter cartridge should be taken out and soaked in a filter cleaner, (as described on your "Operating Instructions" sheet). Once again, Contact a local pool and spa professional in your area to assist you in learning about proper water chemistry and cleaning of your new Tuff Spa if you are unfamiliar with the terms listed in the section.

IMPORTANT!!

When adding chemicals to you spa water be sure to add in the center of the water surface **with the pump on** high speed. Never add chemical directly into the skimmer and make sure the water is heated, thus chemicals added to cold water will change how the chemicals work.

Store all chemicals in a cool, dry place, out of reach of children and pets.

Danger-Risk of electric shock!!

Install at least five feet from all metal surfaces. A spa may be installed within five feet of a metal surface if, with accordance with the Local Electrical Codes, each metal surface is permanently connected by a No. 8AWG (8.4) solid copper connector attached to the control box that is provided for this purpose.

GROUND FAULT CIRCUIT INTERRUPTER INFORMATION AND TESTING

What the GFCI does for you:

The GFCI helps protects you against hazardous electrical shock that may be caused if your body becomes a path through which electricity travels to reach ground. This could happen when you touch an appliance that is "live" through a faulty mechanism, damp or worn insulation on the power cord, etc. You don't even have to be on the ground yourself. You could be touching plumbing or other material that leads to the ground. When using a GFCI devise you may still feel a shock, but the GFCI is designed to cut off power quickly enough so that a normal healthy adult will not experience serious electrical injury.

Warning: GFCI's will not protect against:

- (1) Line-to-line shocks (of the type received when touching metal inserted into the slots of a receptacle).
- (2) Current overloads or line-to-neutral short circuit. THE FUSE OR CIRCUIT BREAKER AT THE DISTRIBUTION BOX OR PANEL MUST PROVIDE SUCH OVER-CURRENT PROTECTION!

Caution! If the GFCI trips on it's own accord, this indicates a possible ground fault condition, which is potentially hazardous. Carry out the test procedure outlined below to ensure that your GFCI is operating properly. If the GFCI does not reset, this indicates a ground fault still exists, and must be corrected. Have a qualified electrician investigate the ground fault condition and correct the defect at once.

TEST THE GFCI UNIT BEFORE EACH USE! -AT LEAST ONCE PER MONTH. DO NOT BYPASS THE GFCI TO USE POTENTIALLY FAULTY EQUIPMENT.

1. Turn your equipment ON to the lowest setting. Push the test button. This should result in the motor or lamp going OFF. (**Note:** Be sure you are turning off all applicable motors. Some spas come with blower motors, jet motors, and heater motors).

Caution! If the motor keeps running or lamp remains lit, DO NOT USE YOUR EQUIPMENT. UNPLUG EQUIPMENT OR TURN OFF POWER AT THE CIRCUIT BREAKER OR FUSE AND CONSULT A CERTIFIED ELECTRICIAN.

2. If the GFCI test okay, restore power by pushing the reset button. The motors or lamps should turn on again. If the GFCI fails to reset properly, DO NOT USE YOU EQUIPMENT. UNPLUG EQUIPMENT OR TURN OFF POWER AT THE CIRCUIT BREAKER OR FUSE AND CONSULT A CERTIFIED ELECTRICIAN.



Built for Relaxation. Built for a Lifetime.

TO ALL ORIGINAL PURCHASERS OF THIS PRODUCT LIFETIME

Tuff Spas™ warrants the spa shell/skirting against water loss and structural integrity due to defects in the spa for the lifetime of the original purchaser. For original purchaser only, warranty is non-transferable.

5- YEAR WARRANTY

Tuff Spas™ warrants the interior and exterior surface of the spa against cracking or delaminating for 5 years from date of purchase. For original purchaser only, warranty is non-transferable.

2- YEAR PARTS WARRANTY

The Original Manufacturers provide limited warranties on the pump, "topside" controls, heater, master control center, and fittings. See terms and conditions in separate documents.

PERFORMANCE OF WARRANTY

Tuff SpasTM shall repair or replace (at our option) warranted product if it fails or becomes defective during the warranty period. To obtain service in the event of a defect covered by this Warranty, contact your Tuff SpasTM dealer or Tuff SpasTM as soon as possible and take appropriate precautions to prevent further damage to your spa. Tuff SpasTM or a designated service technician will correct the defect subject to the terms in this warranty. In the event that a replacement is necessary, costs for the removal of the defective spa, shipping costs for the replacement or repaired spa, and delivery and installation of the replacement or repaired spa will be the responsibility of the spa owner.

EXCEPTIONS TO WARRANTY

- Any damage caused by negligent misuse, improper installation, improper water chemistry, and/or failure to follow instructions in the Owners Manual.
- Filter elements, underwater light bulbs, ozone bulbs, pillows, spa covers, stereos and all stereo components.

This warranty is void if the spa has been subject to any alteration, misuse, or abuse. Alteration shall include any component or plumbing change, electrical conversion, or the addition of any sanitation or water purification device or heating system, which contributes to a component or unit failure or unsafe operating system. Misuse and abuse shall include use of the spa in an application for which it is not designed. Specifically: damage caused by clogged or dirty cartridges, damage to the spa surface caused by harsh chemicals or chemical misuse, and damage to the spa surface caused by improper pH balance or other improper water chemistry maintenance, and damage to the spa surface caused by leaving the spa uncovered by spa cover, without water, and in direct sunlight.

Tuff Spas™ shall not be liable for injury to any person or any claim for damage however it shall arise. All consequential expenses including loss of use, transportation charges arising out of alleged deficiency of spa are specifically excluded. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. Some states do not allow the exclusion of consequential damages, so the above limitation may not apply to you.

Tuff Spas™ 7112 West Frier Drive Glendale, AZ 85303					
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7112 W. Frier			Warranty Registration: Mail this in with a		
Glendale, AZ 85303				copy of your invoice.	
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