Service Manual
International Edition

July 2007

Component Explanation & Diagnosis

TIGER RIVER COMPONENT EXPLANATION AND DIAGNOSIS

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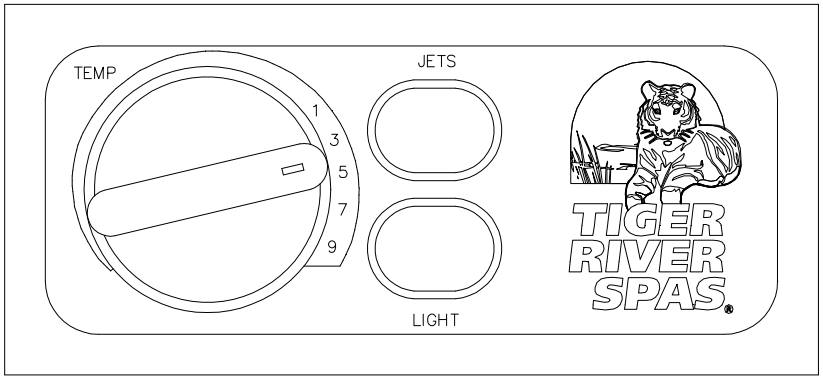
SECTION I: EXPLANATION

PART 1: CONTROL PANEL

CONTROL PANEL (1997)

The 1997 control panel allows the spa user to regulate the light, jets, and water temperature. The 1997 control panel consists of the panel assembly, electronic thermostat, control circuit board, jets button, light button, control thermostat dial, and a 7-pin ribbon cable that connects the electronic thermostat to the control circuit board. The control panel is connected to the control box via a ribbon cable. If the ribbon cable is disconnected or damaged, the control panel and spa functions will not work properly.



CONTROLS

Jets Button – activates and deactivates the jet pump.
Light Button – activates and deactivates the spa light.
Temperature Dial – raises and lower the thermostat setting (the maximum temperature setting is 107.5° F / 42° C; the lowest temperature setting is 50° F / 10° C).

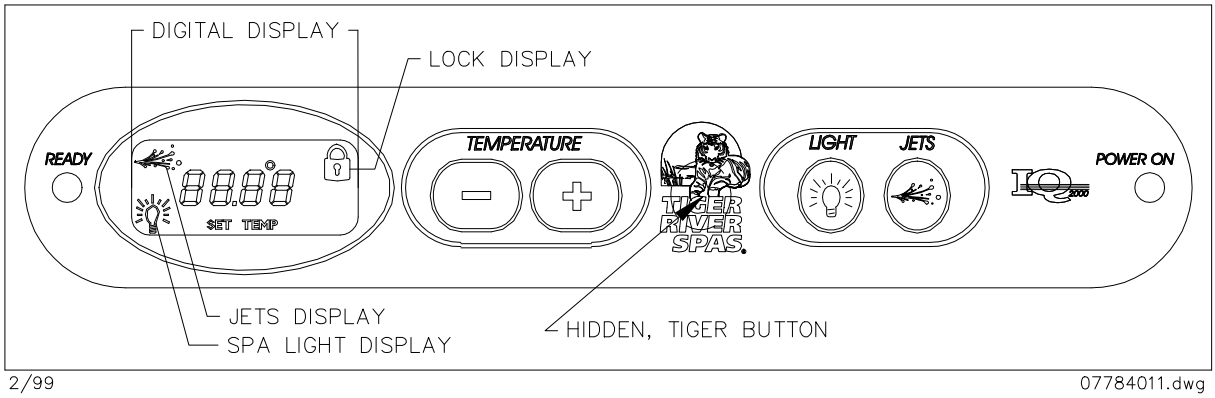
ELECTRONIC CONTROL THERMOSTAT

The electronic control thermostat is located behind the temperature dial and allows the spa user to select the temperature of the spa water that the heater will maintain. The control thermostat compares the water temperature in the heater to the current temperature setting to determine when the heater will be switched on. If the actual water temperature is below the set temperature (±2° F / ± 1° C), the control thermostat will activate the heater. Conversely, the control thermostat will not activate the heater if the actual water temperature is equal to or above the set temperature (±2° F / ± 1° C). Voltage will only be allowed to pass on to the heater if three conditions are met:

1. The water temperature in the heater must be below the control thermostat's temperature setting.
2. The high limit must not be tripped.
3. The control panel and thermistors (see ***Thermistors*** located ***in Part 3: Electrical Sub-Components***) must be properly connected to the control box main circuit board.

CONTROL PANEL (IQ 2000)

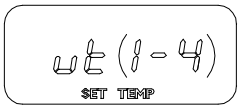
The IQ 2000 control panel allows the spa user to regulate and view the status of the spa functions. Spa functions that are regulated by the control panel include the temperature control, light, jets, spa lock, and temperature lock. The control panel also displays the status of the light, jets, set temperature, spa lock, temperature lock, power indicator, ready indicator, and spa high limit. The IQ 2000 control panel face consists of three interconnected items: the digital display, the control buttons, and two indicator lights. The control panel is connected to the control box via a ribbon cable. If the ribbon cable is disconnected or damaged, the control panel and spa functions will not work properly.



CONTROL BUTTONS

Jets Button – activates and deactivates the jet pump.
Light Button – activates and deactivates the spa light.
Temperature Plus (+) Button – raises the set temperature on degree at a time (the maximum temperature setting is 104° F / 40° C; higher temperatures may be reached but are indicated with a code:

- **UT 1** = 105° F/ 40.5° C
- **UT 2** = 106° F / 41° C
- **UT 3** = 106.5° F / 41.5° C
- **UT 4** = 107.5° F / 42° C).



Temperature Minus (–) Button – lowers the set temperature on degree at a time (the lowest temperature setting is 80° F / 26.5° C).
Hidden, Tiger Button (located underneath the *Tiger River Spas* logo) – activates and deactivates the spa lock and temperature lock. (see ***Features*** below).

FEATURES

Spa Lock – disables the control panel – none of the spa functions can be accessed. To activate or deactivate the spa lock, press the *Hidden, Tiger* button and the *Temperature Minus (–)* button at the same time and hold for 5 seconds.
Temperature Lock – disables the set temperature function – the set temperature cannot be changed. To activate or deactivate the spa lock, press the *Hidden, Tiger* button and *the Temperature Plus (+)* button at the same time and hold for 5 seconds.

INDICATORS/DISPLAYS

Power Indicator (RED) – lit when control panel is receiving power; blinking when the high limit has tripped or if there is a high limit thermistor malfunction (see ***Thermistors*** located in ***Part 3: Electrical Sub Components*** for more information).

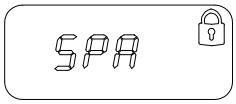
Ready Indicator (GREEN) – lit when the actual temperature of the spa water is within ±2° F / 1±° C of the temperature setting; blinking when there is a control thermistor and/or control panel malfunction (see ***Thermistor Verification*** located in ***Part 2: Control Box*** for more information about thermistor malfunctions).

Jets Display – visible when the jets are on.

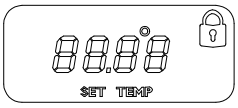
Light Display – visible when the light is on.

Set Temperature Display – visible for 30 seconds after a temperature button is pressed.

Spa Lock Display – visible for 30 seconds after a temperature button is pressed when the spa lock is activated.



Temperature Lock Display – visible for 30 seconds after a temperature button is pressed when the temperature lock is activated.



CONTROL THERMOSTAT

The control thermostat has been integrated into the control panel circuit board, and allows the spa user to select the temperature of the spa water that the heater will maintain. The control thermostat compares the water temperature in the heater to the current temperature setting to determine when the heater will be switched on. If the actual water temperature is below the set temperature (±2° F / ± 1° C), the control thermostat will activate the heater. Conversely, the control thermostat will not activate the heater if the actual water temperature is equal to or above the set temperature (±2° F / ± 1° C).

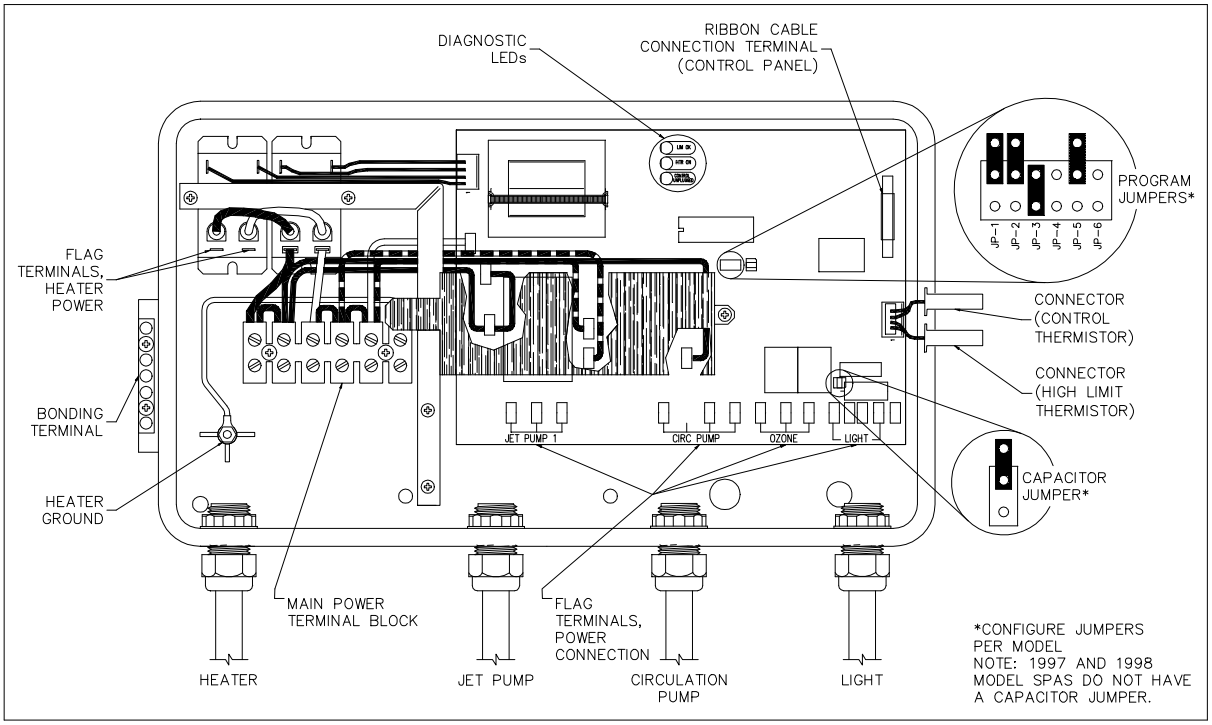
Voltage will only be allowed to pass on to the heater if three conditions are met:

1. The water temperature in the heater must be below the control thermostat's temperature setting.
2. The high limit must not be tripped.
3. The control panel and thermistors must be properly connected to the control box main circuit board.

PART 2: CONTROL BOX

CONTROL BOX (IQ 2000)

The "brain" of the control system is the control box. The control box contains the primary control circuitry, which receives and processes signals from the control panel and regulates the spa functions. In addition, the control box receives source voltage from the main power line and routes the appropriate load or output voltage to each electrical component (jet pump, circulation pump, ozonator, spa light, heater, and control panel). The control box assembly contains no serviceable components, so the entire box must be replaced if a failure occurs.



The following items are pictured above, in the control box illustration.

- **Diagnostic LEDs** – convey the status of three circuits: high limit, heater, and control.
- **Ribbon Cable Connection Terminal (Control Panel)** – seats the control panel's ribbon cable.
- **Program Jumpers** – control the spa functions and settings (see *Jumper Configuration*).
- **Capacitor Jumper** – regulates the spa light capacitor (see *Jumper Configuration*).
- **Connector (Control Thermistor)** – receives the control thermistor connection wire.
- **Connector (High Limit Thermistor)** – receives the high limit thermistor connection wire.
- **Flag Terminals, Power Connection** – supply power to the spa light, circulation pump, jet pump, and ozonator.
- **Main Power Terminal Block** – receives the main power line and passes source voltage on to the circuit board and heater relays.
- **Heater Ground** – attaches to the ground wire from the heater.
- **Bonding Terminal** – connects all of the solid copper bonding wires to the main ground line.
- **Flag Terminals, Heater Power**– supplies power to the heater.

CONTROL BOX FUNCTIONS AND FEATURES

Actuation Time Delay
This feature prevents the control panel buttons from switching components on and off more than once per second.

Automatic Time-out
If the spa light or jet pump is left on by the spa user, the automatic time-out feature will turn the jet pump off after 2 hours, and will turn the spa light off after 6 hours.

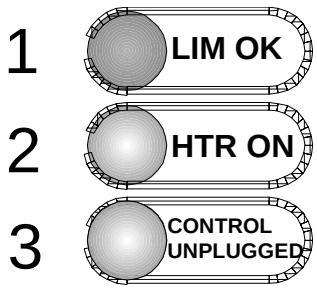
Continuous filtration
The circulation pump is turned on whenever power is supplied to the spa. This provides continuous 24-hour filtration.

Default Settings
Whenever power is disconnected from the spa, the control box circuit board will revert to its default settings, which are: spa light OFF and jet pump OFF (the circulation pump is always ON). After power is disconnected from the spa, always wait 1 minute before reconnecting power. If power is prematurely reconnected to the spa, disconnect power to the spa, wait 1 minute, then reconnect power to the spa. Whenever power is supplied to the spa:

- All of the control panel LEDs should light up momentarily, this verifies that all of the indicator lights and LEDs in the digital display are operative.
  NOTE: There are no control panel LEDs on 1997 model spas.
- The spa light and jet pump should not activate by themselves.
- The last temperature setting selected by the spa user will be restored.

Diagnostic LEDs
There are three diagnostic LEDs, which are located on the main circuit board in the control box, and provide a quick and easy way to determine the status of the spa. (On the 1997 IQ 2000 control box, there may be a fourth diagnostic LED that is red and says FLOW, please disregard this LED. The FLOW LED is not used. It will always be on, and should not be considered when troubleshooting the spa. The flow LED does NOT determine if the spa has proper flow).

1. **LIM OK LED –** The green LIM OK LED indicates the status of the high limit circuit.
   - A lit LED indicates the high limit circuit is functioning properly.
     An unlit LED indicates a problem with the high
   - limit circuit.



2. **HTR ON LED** – The red HTR ON indicates the status of the heater circuit.
   - A lit LED indicates the control circuit is supplying DC voltage to the coil of the heater relay. If the heater relay is not defective and the interlock relay is closed, AC voltage will be supplied to the heater, and the heater will be on. If the interlock relay is open, or if the relay or wiring is bad, the HTR ON LED will be on, but no AC voltage will be supplied to the heater, the heater will be off.
   - An unlit LED indicates that no DC voltage is being supplied to the heater relay.
3. **CONTROL UNPLUGGED LED** – The red CONTROL UNPLUGGED LED indicates whether the Control Panel Assembly is plugged into the Control Box Assembly.
   - A lit LED indicates the control panel is not communicating with the control box – usually caused by disconnected or damaged ribbon cable.
   - An unlit LED indicates the control panel is properly connected to the control box.

Thermistor Verification

The control circuitry verifies the condition of the thermistors. Power to the spa light, jet pump, and heater will be disconnected if the control circuitry detects a high limit thermistor discrepancy. Power to the heater will be disconnected if the control circuitry detects a control thermistor discrepancy. There are three common discrepancies that will cause the control circuitry to disconnect power to the heater and/or the spa light and jet pump:

1. If a thermistor circuit is open (thermistor unplugged).
2. If a thermistor circuit is shorted (damaged thermistor wires – bare wires are touching each other).
3. If the spa water temperature is near or below freezing (32° F / 0° C) – this appears to be an open circuit to the control circuitry. (See ***Thermistors*** located in ***Part 3: Electrical Sub-Components***).

In addition, power will be disconnected from the spa light, jet pump, and heater if the spa water temperature exceeds the high limit value (118° F / 48° C). To reset a spa after the control circuitry has disconnected power to the heater and/or spa light and jet pump, you must disconnect power to the entire spa for a minimum of 1 minute, correct the failure or discrepancy, and then reconnect power to the spa.

HIGH LIMIT THERMOSTAT

The high limit thermostat is part of the control box circuitry, and is designed to prevent the spa water from overheating. The high limit thermostat compares the water temperature in the heater to the high limit value (118° F ±2° F / 48° C), which cannot be set or adjusted by the spa user. If the high limit value is exceeded, the high limit will trip. When the high limit trips the spa light, jet pump, and heater cannot be switched on until the spa water temperature cool down below the high limit value, and the high limit thermostat is reset by disconnecting power to the spa for 1 minute then reconnecting power to the spa.

NOTE: The control thermostat circuitry is located in the control panel (for information about the control thermostat see ***Part 1: Control Panel***).

PART 3: ELECTRICAL SUB-COMPONENTS

Bonding Terminal

The bonding terminal is located on the exterior of the control box, and is connected to two sources of ground: the ground wire on the main power line, and a solid copper ground wire. Safety standard dictates that the heater, along with any components not permanently connected or "hard wired" to the control box must be attached to the bonding terminal with a minimum 8.4 mm^2 solid copper wire. Components that are plugged into a control box receptacle are not considered "hard wired" (permanently connected), and therefore must be attached to the bonding terminal. Also, all metal structures permanently placed within five feet of the spa (metal ladders, metal water pipes, metal enclosures of electrical equipment, metal equipment, etc.) must be attached to the bonding terminal as well. If the spa is located on a reinforced concrete pad, the reinforcement steel should also be bonded to the bonding terminal (please refer to the *Owner's Manual* for more details).

Circuit Breaker

A circuit breaker, located in a sub-panel, is a switch that will not tolerate electrical current greater than its rating. Like the GFCI (see below), the breaker interrupts the flow of electrical current when tripped. However, the difference in the operating principle between the breaker and GFCI is that the GFCI is primarily designed to protect the spa user from current leakage, and the circuit breaker is implemented to protect the electrical equipment from overloads. GFCI devices do nothing in over-current (current draw that exceeds the tolerance of the circuit) situations that do not result in any current leaking to ground. On the other hand, there may be a flow of current in the system, which does not exceed the circuit breaker rating (so it will not trip), but the GFCI will react if there is sufficient current leakage to ground.

GFCI

A GFCI (Ground Fault Circuit Interrupter) is a protective device that is sensitive to small amounts of electric current flowing to ground. A ground fault greater than 5 mA (milliamps), $\pm$ 1 mA, will cause the GFCI to trip, which disconnects power to the spa until the ground fault is corrected and the GFCI is reset. The GFCI is designed to protect the spa user from electrical shocks (as well as the spa's circuitry from overloads and shorts). Without a GFCI device installed on a spa, a significant ground fault could be fatal and would likely burn the weakest (smallest) link in the circuitry (i.e. a wire, circuit board trace, or terminal block connection). However, the GFCI will not protect anyone who comes in contact with the hot and neutral wires, and the GFCI offers no protection from voltage introduced from an exterior source (radio, hair dryer, etc.). When the GFCI trips, it normally indicates current leakage to ground caused by faulty insulation, wet wiring, or wet equipment connected to the circuit.

GFCI devices always have a test button and may be reset after they have tripped. The test button trips the GFCI when pressed, which disconnects power to the spa. When the GFCI is reset, the circuit will be completed unless a ground fault of 5 mA or more is detected then the GFCI will trip as soon as the GFCI is reset.

NOTE: Spa owners should test the GFCI before each use of the spa by performing the ***GFCI Test*** described in the testing section of this manual).

Grounding Lug

The grounding lug is a terminal located on the exterior of spa components (i.e. the heater, jet pump, ozonator, etc.) that is intended to receive a ground wire that is connected to the bonding terminal. However, only heaters and any components not permanently connected to the main circuit board (see *Bonding Terminal*) are required to be attached to the bonding terminal.

Terminal Block

The terminal block receives the source voltage from the main power line, and delivers voltage to the control circuitry in the control box. Improperly wiring or jumping the terminal block may permanently damage the control box components.

Thermistors

A thermistor is an electronic temperature-sensing device that consists of three main parts: electrical wires, a connector, and a temperature-sensing probe. The thermistor's resistance or ohmic value corresponds with its temperature. When the thermistor's temperature changes the ohmic value also changes. The thermistor's connector plugs directly into a circuit board that is able to determine the water temperature based on the thermistor's resistance. The control circuitry uses the control thermistor to determine the actual temperature of the spa water, and compares this value to the temperature setting of the control thermostat to regulate the heater. The control circuitry uses the high limit thermistor to determine whether the high limit value has been exceeded. If the high limit value is exceeded, the high limit will trip.

Thermistor Cold Weather Startup – If the spa water temperature is near freezing or below, the high limit may trip. To reset the high limit there are two things that you can do:

1. Disconnect power to the spa. Raise the temperature of the thermistors by warming them with a hair dryer while they are still connected to the heater. Then reconnect power to the spa.
2. Disconnect power to the spa, disconnect the thermistors from the control box, and then connect a thermistor test tool to the control box. Reconnect power to the spa, set the thermistor test tool so that the heater switches on, and wait a couple of minutes for the heater to warm the thermistors. When the water temperature is well above freezing, disconnect power to the spa, reconnect the thermistors to the control box, and then reconnect power to the spa.

NOTE: Every time power is disconnected from the spa, power should not be reconnected for, at least, 1 minute. If power is prematurely reconnected to the spa, disconnect power, wait 1 minute, and then reconnect power.

PART 4: MAJOR ELECTRICAL COMPONENTS

Circulation Pump

The circulation pump consists of two main parts: an electric motor and a wet end. The electric motor spins the impeller. The wet end contains the impeller, which is the mechanism that moves the spa water through the jet pump. Water is supplied to the circulation pump via the suction lines that are connected to the filter compartment and secondary/safety suction fitting. Water is discharged from the circulation pump via the pressure lines that are connected to the drain/heater return assembly.

Heater

For the purposes of discussion, the heater may be split into five basic sections: the heater body, the heating element, the heat-exchange chamber, the heater inlet, and the heater outlet. The heating element is the device that produces heat. The heater inlet supplies water to the heat-exchange chamber, which is where the heat (generated by the heater element) is transferred to the spa water. The heater outlet is where the heated spa water re-enters the plumbing lines. The heated water reenters the bathing area of the spa through the drain/heater return. All spa control systems implement some form of a safeguard that disconnects power to the heater when situations arise that could cause the heating element to overheat, such as restricted water flow to or through the heater.

No Fault 1500 Heater – The No Fault 1500 Heater body houses the control and high limit thermistors, but what makes the No Fault 1500 heater unique are two distinguishing features. First, the spa water never comes in direct contact with the heating element because stainless steel heat-exchange chambers protect the heating element from direct exposure to the spa water. Second, when the heater exceeds tolerable temperatures, power to the heater is disconnected by the thermal cut-off, which may be reset when the heater cools down.

Jet Pump

The jet pump consists of two main parts: an electric motor and a wet end. The electric motor turns a drive shaft, which spins an impeller. The wet end assembly (volute and volute cover) contains the impeller, which is the mechanism that moves the spa water through the jet pump. Water is supplied to the jet pump via the suction lines that are connected to the filter compartment and secondary/safety suction fitting. Water is discharged from the jet pump via the pressure lines that are connected to the jet nozzles.

Shroud, Jet Pump Motor – The jet pump motor shroud is attached to the rear of the jet pump and promotes air circulation around the motor. The shroud vents warm air away from the jet pump motor and out of the equipment compartment to safeguard the unit and other components from the heat that's generated by the jet pump motor.

Spa Light

Spas are equipped with a light to enhance nighttime use. The spa light illuminates the entire bathing area and is located in the equipment compartment behind the light lens, which is sealed to the spa shell. The spa light may be activated and deactivated from the control panel. The light assembly or harness consists of the light socket, ballast/transformer, heat shield, and wires that connect to the control box.

PART 5: JETS AND PLUMBING

Air Control Valve

The air valve, located on the bar-top or at the jet, controls the amount of air that is allowed to mix with water at the jets. This allows the spa user to control the water pressure at the jets. When the air valve is closed no air is mixed with water and the water pressure at the jets is minimal. Opening the air valve increases the amount of air that is mixed with water, and increases the water pressure.

Check Valves

Check valves are used to regulate the direction of flow through the air, pressure, and suction lines. Flow is permitted to travel through a check valve in only one direction. Air Check valves are placed at the intake end of the jet and ozone air lines to prevent back flow from entering the equipment compartment. Water check valves are placed throughout the pressure and suction lines, and are primarily used in conjunction with the diverter valve to route water flow to various groups of jets.

Tiger River spas have addition water check valves placed at the circulation pump and jet pump outlets to prevent the pumps from drawing water through each other and the heater return assembly and jet nozzles. The additional water check valves are required because the jet pump and circulation pump use the same filter and share parts of the suction lines.

Diverter Valve

The diverter valve controls which jets are activated when the jet pump is turned on. Groups of jets activated by the diverter valve are called *jet systems*. The number of jet systems that can be activated by the diverter valve is determined by the type of spa and hence the type of diverter valve implemented in the spa. Fundamentally there are only two types of diverter valves: 2-position and 4-position. Both types of diverter valves consist of three primary components: the diverter body, the diverter core, and the diverter lever. The diverter body is permanently attached to the plumbing lines and houses the diverter core; the diverter core regulates the water flow through the diverter body; and the diverter lever is used to rotate the diverter core, which changes the water flow through the diverter body and activates specific jet systems (refer to the *Owner's Manual* for specific information about jet systems).

Drain/Heater Return System

- **Floor Drain/Heater Return –** The floor drain/heater return is located on the floor or wall of the foot well and permits the spa water to be completely emptied with little or no bailing. The floor drain/heater return also serves as the outlet where the heated water produced by the heater reenters the bathing area of the spa.
- **Drain/Heater Return Fitting –** The drain/heater return fitting prevents debris from entering the spa's draining system.
- **Drain Valves –** The drain valves are located beneath the equipment compartment, and are connected to the bleed lines and floor drain/heater return. The drain valves allows the spa to be emptied with little or no bailing.

Filter

The filter prevents debris from entering the plumbing lines, cleans the spa water, and is the primary inlet for water entering the plumbing system.
NOTE: Clogged or dirty filters are the primary cause of low flow conditions.

Jets

There are four basic parts to a jet: the face, the nozzle, the front wall fitting, and the rear wall fitting or body. The face provides an aesthetic finish to the exterior of the jet, but provides some functionality by retaining the nozzle in certain jets. The nozzle is the outlet, which constrains and directs the water propelled by the jet pump. The front wall fitting seals the opening where the jet connects to the spa shell, and retains the nozzle in certain jets. Finally, the rear wall fitting or body houses the front wall fitting, and is where the air is mixed into the water before it enters the tub. The amount of air mixed into the water determines the amount of pressure produced at the jet.

Safety/Secondary Suction System

- **Safety/Secondary Suction Fitting –** The safety/secondary suction fitting, located on the wall of the foot well (usually in front of the filter compartment), prevents foreign objects from entering the plumbing line through the safety suction valve.
- **Safety/Secondary Suction Filter Screen –** The safety/secondary suction filter screen prevents minute debris from entering the plumbing line through the suction fitting.
- **Safety/Secondary Suction Valve –** The safety/secondary suction valve is a safety device that provides an alternate route for water to be drawn into the plumbing lines should the primary route through the filter compartment become obstructed.

50 HZ

SECTION II: DIAGNOSIS

TIGER RIVER COMPONENT EXPLANATION AND DIAGNOSIS

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SECTION II: DIAGNOSIS

DIAGNOSIS

TIGER RIVER (50 Hz)

The center column (Diagnosis) is arranged so that the most likely cause of the malfunction is listed first, so the corrective actions should be performed in order from top to bottom until the problem is solved.

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION
ENTIRE SPA INOPERATIVE The control panel does not activate any of the spa functions or components.	The spa lock may be activated (spas with the IQ 2000 control panel ONLY).	Deactivate the spa lock – refer to ***Control Buttons*** under ***Control Panel (IQ 2000)*** in the Explanation section of this manual.
	The electrical connections in the control box may be bad and/or the jumpers may not be properly configured	Check the electrical connections and program jumpers.
	The spa high limit may have tripped.	Disconnect power to the spa, wait 1 minute then reconnect power to the spa. Refer to ***High Limit/Thermal Cut-Off Tripping*** to Diagnose the cause of the problem.
	The control box may not be receiving the proper source voltage.	Check the GFCI. If the GFCI has tripped, perform the ***Ground Fault Test***.
		If the GFCI has not tripped, Perform the ***Source Voltage Test***.
	The control panel may be damaged or defective.	Perform the ***Control Panel Test***.
	The spa light, heater, and/or jet pump may not be receiving the proper output voltage.	Perform the ***Output Voltage Test*** for the spa light, heater, and jet pump.

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION
SPA LIGHT INOPERATIVE The spa light cannot be operated with the control panel.	The spa lock may be activated (spas with the IQ 2000 control panel ONLY).	Deactivate the spa lock – refer to ***Control Buttons*** under ***Control Panel (IQ 2000)*** in the Explanation section of this manual.
	The electrical connections in the control box may be bad and/or the jumpers may not be properly configured.	Check the electrical connections and program jumpers.
	The light bulb may be burned out.	Check the light bulb, and replace it if necessary.
	The control panel may be damaged or defective.	Perform the ***Control Panel Test***.
	If the spa light will not turn **ON**, the spa light may not be receiving the proper output voltage at the control box.	Perform the ***Output Voltage Test, Spa light***.
	If the spa light cannot be turned **OFF** from the control panel, and the control panel is not defective then the control box is defective.	
JET PUMP INOPERATIVE The jet pump cannot be operated with the control panel.	The spa lock may be activated (spas with the IQ 2000 control panel ONLY).	Deactivate the spa lock – refer to ***Control Buttons*** under ***Control Panel (IQ 2000)*** in the Explanation section of this manual.
	The electrical connections in the control box may be bad and/or the jumpers may not be properly configured.	Check the electrical connections and program jumpers.
	The control panel may be damaged or defective.	Perform the ***Control Panel Test***.

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION
Jet pump inoperative continued.		
	If the jet pump will not turn **ON**, the jet pump may not be receiving the proper output voltage at the control box.	Perform the ***Output Voltage Test, Jet Pump***.
	If the jet pump cannot be turned **OFF** from the control panel, and the control panel is not defective then the control box is defective.	
Circulation PUMP INOPERATIVE The circulation pump does not turn on when the spa is supplied power.	The electrical connections in the control box may be bad and/or the jumpers may not be properly configured.	Check the electrical connections and program jumpers.
	The circulation pump may not be receiving the proper output voltage at the control box.	Perform the ***Output Voltage Test, Jet Pump***.
HEATER INOPERATIVE The heater cannot be operated with the control panel and/or the spa water will not heat.	The jet pump may be turned on. Since power cannot be supplied to the jet pump and heater simultaneously, whenever the jet pump is turned on the heater will switch off.	Turn the jet pump off.
	The temperature lock or spa lock may be activated (spas with the IQ 2000 control panel ONLY).	Deactivate the temperature lock or spa lock – refer to ***Control Buttons*** under ***Control Panel (IQ 2000)*** in the Explanation section of this manual.
	The set point may not be more than 1° C above the current water temperature.	Raise the temperature setting more than 1° C above the current water temperature.

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION
Heater Inoperative continued.		
	The thermal cut-off may have tripped.	Reset the heater thermal cut-off by pressing the thermal cut-off reset button located on top of the heater. Refer to ***High Limit/Thermal Cut-Off Tripping*** to diagnose the cause of the problem.
	The electrical connections in the control box may be bad and/or the jumpers may not be properly configured.	Check the electrical connections and program jumpers.
	The control panel may be defective (and/or electronic control thermostat – 1997 model spas only).	Perform the ***Control Panel Test***. Perform the ***Thermostat Test, Control (1997 Model Spas ONLY)***.
	The thermistors may be unplugged or defective.	Check the thermistor connections, and Perform the ***Thermistor Test*** for each thermistor if necessary.
	The heater may not be receiving the proper output voltage at the control box.	Perform the ***Output Voltage Test, Heater***.
	If the heater cannot be turned **OFF**, even though the set point is more than 1° C below the current water temperature, and the control thermistor is not defective then the control box is defective.	

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION
READY INDICATOR BLINKING *(1997 model spas do not have a ready indictor).*	The control thermistor may be disconnected.	Reconnect the control thermistor.
	The control may perceive the control thermistor as an open circuit, if the spa water temperature is near freezing or below.	Perform the procedure for thermistor cold weather startup (see ***Thermistors*** located in Section I, ***Part 3: Electrical Sub-Components***).
	The control thermistor may be damaged or defective.	Perform the ***Thermistor Test.***
GFCI TRIPPING	The electrical connections in the control box may be bad and/or the jumpers may not be properly configured.	Check the electrical connections and program jumpers.
	There may be a leak in the equipment compartment and/or excessive moisture on any of the electrical components	Check for a leak in the equipment compartment and/or excessive moisture on any of the electrical components, and repair the leak and/or dry the equipment compartment and electrical components.
	There may be a ground fault.	Perform the ***Ground Fault Test***.
HIGH LIMIT/THERMAL CUT-OFF TRIPPING Immediately after the high-limit or thermal cut-off trips, it must be determined whether it was just the heater that overheated, the entire spa, or neither.		
If the spa water temperature is equal to or below the temperature setting only the heater overheated.	Flow may be restricted.	Perform the ***Flow Test, Circulation Pump*** (restricted flow is usually the result of dirty or clogged filters).

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION
High limit tripping continued. If the water temperature is above the maximum temperature setting (42° C) the entire spa overheated.	The control and/or high limit thermistors may be defective.	Perform the ***Thermistor Test*** on each thermistor.
	The jet pump and/or heater may not be able to be switched OFF, due to a defective control box.	Verify that the heater and jet pump function normally (refer to the ***Heater Inoperative*** and ***Jet Pump Inoperative*** sections).
If neither the heater, nor the entire spa overheated.	The high limit thermistor may be disconnected.	Reconnect the high limit thermistor.
	The high limit may perceive the high limit thermistor as an open circuit, if the spa water temperature is near freezing or below.	Perform the procedure for thermistor cold weather startup (see ***Thermistors*** in the Explanation section).
	The high limit thermistor may be damaged or defective.	Perform the ***Thermistor Test.***
JET PUMP LEAKING There are two places where the source of the leak may be located, the wet end and the plumbing unions.		
Wet End	Damaged volute and/or loose or damaged volute cover.	Tighten volute cover and/or replace volute and/or volute cover.*
	Loose or damaged freeze drain plug and/or o-ring.	Tighten or replace the freeze drain plug and/or o-ring.*
	Damaged volute o-ring.	Replace the volute o-ring.*
	Damaged shaft seal.	Replace the shaft seal.*
Plumbing union, Inlet or Outlet	Damaged volute and/or volute cover.	Replace volute and/or volute cover.*
	Loose or damaged compression fittings.	Tighten or replace the compression fittings.

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION
Jet pump leaking continued.		
	Damaged compression fitting o-ring.	Replace the o-ring.

*Replace the entire pump if servicing its components is prohibited by the warranty, or if replacement components are not available.

CIRCULATION PUMP LEAKING There are two places where the source of the leak may be located, the wet end and the plumbing connections.		
Wet End	Damaged volute and/or loose or damaged lock ring.	Tighten volute cover and/or replace volute and/or lock ring.*
	Damaged volute o-ring.	Replace the volute o-ring.*
	Damaged motor housing.	Replace the motor housing.*
Plumbing Inlet or Outlet	Damaged volute.	Replace volute.*
	Loose or damaged vinyl tubing.	Reinstall or replace the vinyl tubing.

*Replace the entire pump if servicing its components is prohibited by the warranty, or if replacement components are not available.

HEATER LEAKING There are three places where the source of the leak may be located, the heater body, thermistors, or the plumbing connections.		
Heater Body	Damaged heater body.	Replace the heater.
Thermistors	Loose or damaged thermistor or heater body	Tighten the thermistor or replace the damaged component.

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION
Heater leaking continued. **Plumbing Inlet or Outlet**	Damaged heater body.	Replace the heater.
	Loose or damaged vinyl tubing.	Reinstall or replace the vinyl tubing attached to the heater.
FLOW RESTRICTED, JET PUMP The jet pump is weak or sporadic, and/or no air is mixing at the jets.	The filter may be dirty or clogged.	Check the filter and clean or replace it if necessary.
	The air control valve(s) may be closed.	Open the air control valve(s).
	The jet pump may not be receiving the proper voltage.	Perform the ***Output Voltage Test, Jet Pump***.
	There may be a leak in one of plumbing lines, or the jet pump may be leaking.	Repair any leaks (refer to the ***Jet Pump Leaking*** section of this manual).
	One of the air or plumbing lines may be obstructed.	Inspect the check valves and/or remove any obstructions from the air or plumbing lines.
	The jet pump may be defective.	Listen for unusual noise originating from the jet pump, check wet end for excessive chemical deposits or buildup, and perform the ***Flow Test, Jet Pump***.
FLOW RESTRICTED, CIRCULATION PUMP The circulation pump is weak or sporadic.	The filter may be dirty or clogged.	Check the filters and clean or replace them if necessary.
	Circulation pump may not be properly primed	Perform the ***Flow Test, Circulation Pump***.

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION
Flow restricted, circulation pump continued.		
	The circulation pump may not be receiving the proper voltage.	Perform the ***Output Voltage Test, Circulation Pump***.
	There may be a leak in one of plumbing lines, or the circulation pump or heater may be leaking.	Repair any leaks (refer to the ***Circulation Pump Leaking*** or ***Heater Leaking*** sections of this manual).
	One of the plumbing lines may be obstructed.	Remove any obstructions from the plumbing lines and/or heater return screen (back flushed the plumbing lines if necessary).
	The circulation pump may be defective.	Listen for unusual noise originating from the pump, and check wet end for excessive chemical deposits or buildup.

PROBLEM	DIAGNOSIS	CORRECTIVE ACTION

50 HZ

SECTION III: TESTS

TIGER RIVER COMPONENT EXPLANATION AND DIAGNOSIS

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SECTION III: TESTS

TESTS

TIGER RIVER (50 Hz)

SOURCE VOLTAGE TEST

1. Verify that there is 240(±10%) VAC between the neutral and hot wires in the sub panel. If there is not 216 to 264 VAC between the neutral and hot wires on the input side of each breaker, call an electrician. If a breaker is closed and there is not 240(±10%) between the neutral and hot wire on the output side of the breaker, then the breaker is defective.
2. Check the GFCI test buttons, and reset each breaker. Perform the ***Ground Fault Test*** if the GFCI a breaker test button is tripped.
   NOTE: Every time power is disconnected from the spa (even when resetting a breaker), power should not be reconnected for at least 1 minute.
3. Measure the voltage on the main power terminal block between the hot wire and the neutral wire. There should be 240 ± 10% VAC present at the terminal block. If the terminal block is not receiving from 216 to 264 VAC between the neutral wire and the hot wire, then there is a problem with the wiring somewhere "up stream" or before terminal block. Inspect for damaged wiring or components and check the terminal block, main power cord, etc. for loose wiring.

GFCI TEST

1. Press the GFCI(s') test button(s). The GFCI should trip.
   NOTE: Every time power is disconnected from the spa (even when testing a GFCI), power should not be reconnected for at least 1 minute.
2. Reset the GFCI device. (If there is a ground fault, the GFCI will trip – perform the ***Ground Fault Test***). The GFCI is defective if the test button fails to disconnect power, or if resetting the GFCI fails to restore power (provided there is proper source voltage, the GFCI is properly wired, and if there is not a ground fault).

GROUND FAULT TEST

NOTE: *Every time power is disconnected from the spa, power should not be reconnected for, at least, 1 minute. If power is prematurely reconnected to the spa, disconnect power, wait 1 minute, and then reconnect power.*

DANGER! RISK OF ELECTRICAL SHOCK – The spa's ground will be interrupted and the test meter will be placed in series with the spa's ground when performing this test.

1. Shut down power to the entire spa (including the GFCI device(s) and main power cord.
2. Verify that the program jumpers and electrical connections are properly configured.
3. Disconnect all of the 8.4 mm^2 solid copper wires attached to the bonding terminal, and disconnect any additional ground or bonding wires to eliminate all paths to ground but the main power source ground wire.
   DANGER! RISK OF ELECTRICAL SHOCK – Disconnecting the ground wires eliminates alternate paths to ground, use extreme caution when testing.
4. Disconnect the heater's hot and neutral wires from the relay, and disconnect the heater's ground wire from the heater ground terminal in the control box.

Ground fault test continued

5. Disconnect the jet pump hot, neutral, and ground wires from the flag terminals.
6. Disconnect the circulation pump hot, neutral, and ground wires from the flag terminals.
7. Disconnect the ozonator hot, neutral, and ground wires from the flag terminals if an ozonator is installed.
8. Disconnect the spa light hot, neutral, and ground wires from the flag terminals.

Main Power Cord

9. Disconnect power to the main power cord.
   DANGER – The power cord must NOT be receiving any voltage when performing this part of the test.
10. Disconnect the main power cord hot, ground, and neutral wires form the main power terminal block in the control box.
11. Test for continuity between the main power cord hot and ground wires. If there is any continuity at all, there is a ground fault, and the power cord is defective.
12. Test for continuity between the main power cord neutral and ground wires. If there is any continuity at all, there is a ground fault, and the power cord is defective.

Control Box

13. Reconnect the main hot and neutral wires to the terminal block, and connect the test meter's leads to the ground wire and the terminal block.
14. Reconnect power to the spa. If the GFCI trips and there is no ground fault in the power cord or GFCI device, the control box is defective and must be replaced before this test can be completed. If the GFCI does not trip, write down how much current is leaking to ground, and label this value 'control box.' The control box is defective if the amount of current it is leaking to ground is equal to or greater than .5 mA.

Spa Light Assembly/Harness

15. Disconnect power to the spa.
16. Reconnect the spa light hot and neutral wires, and connect the test meter's leads to the spa light ground wire and the flag terminal where the spa light ground wire was previously attached.
17. Reconnect power to the spa and switch the spa light on. If the GFCI trips, the spa light is defective. If the GFCI does not trip, write down how much current is leaking to ground, and label this value 'spa light.' The spa light is defective if the amount of current it is leaking to ground is equal to or greater than .5 mA.
18. Disconnect power to the spa, disconnect the spa light hot and neutral wires, then disconnect the test meter from the ground wire and the flag terminal.

Jet Pump

19. Reconnect the jet pump hot and neutral wires, and connect the test meter's leads to the jet pump ground wire and the flag terminal where the jet pump ground wire was previously attached.
20. Reconnect power to the spa and switch the jet pump on. If the GFCI trips, the jet pump is defective. If the GFCI does not trip, write down how much current is leaking to ground, and label this value 'jet pump.' The jet pump is defective if the amount of current it is leaking to ground is equal to or greater than .5 mA.
21. Disconnect power to the spa, disconnect the jet pump hot and neutral wires, then disconnect the test meter from the ground wire and the flag terminal.

Ground fault test continued

Circulation Pump

22. Reconnect the circulation pump hot and neutral wires, and connect the test meter's leads to the circulation pump ground wire and the flag terminal where the circulation pump ground wire was previously attached.
23. Reconnect power to the spa and switch the circulation pump on. If the GFCI trips, the circulation pump is defective and must be replaced before this test can be completed. If the GFCI does not trip, write down how much current is leaking to ground, and label this value 'circ. pump.' The circulation pump is defective if the amount of current leaking to ground is equal to or greater than .5 mA.
24. Disconnect power to the spa and the test meter from the ground wire and the flag terminal.
25. Reconnect the circulation pump ground wire to the flag terminal where it was previously attached.

Ozonator (Optional Part)

26. Reconnect the ozonator hot and neutral wires, and connect the test meter's leads to the ozonator ground wire and the flag terminal where the ozonator ground wire was previously attached.
27. Reconnect power to the spa. If the GFCI trips, the ozonator is defective provided the circulation pump is not leaking more than .5 mA of current to ground. If the GFCI does not trip, write down how much current is leaking to ground, and label this value 'ozonator.' The ozonator is defective if the amount of current it is leaking to ground is equal to or greater than .5 mA.
28. Disconnect power to the spa, disconnect the ozonator hot and neutral wires, then disconnect the test meter from the ground wire and the flag terminal.

Heater

29. Reconnect the heater hot and neutral wires and connect the test meter's leads to the heater ground wire and the heater ground terminal on the terminal block.
30. Reconnect power to the spa, raise the temperature setting to the highest setting, verify that the temperature setting is at least 1° C above the actual water temperature (the heater should switch on). If the GFCI trips, the heater is defective provided the circulation pump is not leaking more than .5 mA of current to ground. If the GFCI does not trip, write down how much current is leaking to ground, and label this value 'heater.' The heater is defective if the value of current it is leaking to ground is equal to or greater than .5 mA.
31. Disconnect power to the spa, disconnect the test meter from the heater ground wire and the heater ground terminal, and reconnect the heater ground wire to the heater ground terminal in the control box.
32. Reconnect the hot, neutral, and ground wires of the spa light, jet pump, and ozonator. Then reconnect all of the 8.4 mm^2 solid copper wires that were previously attached to the bonding terminal, and any other wires that you disconnected.

OUTPUT VOLTAGE TEST, SPA LIGHT

1. Disconnect power to the spa for 1 minute to restore the default setting – spa light OFF.
2. Reconnect power to the spa and check the main power terminal block for 240±10% VAC (216 VAC to 264 VAC) to see if the spa is receiving the proper source voltage. If the terminal block is not receive the proper source voltage, perform the ***Source Voltage Test***, correct the failure, and restart this test.
3. Before you switch the spa light on, measure the voltage in the control box between the spa light hot and neutral flag terminals. The spa light flag terminals should not supply any output voltage. If any voltage is supplied, the control box is defective.
4. Press the ***Light*** button and measure the voltage in the control box between the spa light hot and neutral flag terminals. The spa light flag terminals should supply 240±10% VAC (216 VAC to 264 VAC) output voltage. If the flag terminals did not supply 240±10% VAC when the voltage was measured, perform the control panel test to determine whether or not the control panel is defective. If the control panel is not defective, then the control box is defective.
5. Measure the voltage in the light socket of the light harness if the flag terminals did supply 240±10% VAC (216 VAC to 264 VAC). The light socket should also supply 240±10% VAC output voltage. If the light socket did not supply 240±10% VAC when the voltage was measured, the light harness is defective.

OUTPUT VOLTAGE TEST, OZONATOR

1. Connect power to the spa and check the main power terminal block for 240±10% VAC (216 VAC to 264 VAC) to see if the spa is receiving the proper source voltage. If the terminal block is not receive the proper source voltage, perform the ***Source Voltage Test***, correct the failure, and restart this test.
2. Measure the voltage in the control between the ozonator hot and neutral flag terminals. The ozonator flag terminals should supply 240±10% VAC (216 VAC to 264 VAC) output voltage. If the flag terminals did not supply 240±10% VAC, the control box is defective.

OUTPUT VOLTAGE TEST, CIRCULATION PUMP

1. Connect power to the spa and check the main power terminal block for 240±10% VAC (216 VAC to 264 VAC) to see if the spa is receiving the proper source voltage. If the terminal block is not receive the proper source voltage, perform the ***Source Voltage Test***, correct the failure, and restart this test.
2. Measure the voltage in the control between the circulation pump hot and neutral flag terminals. The circulation pump flag terminals should supply 240±10% VAC (216 VAC to 264 VAC) output voltage. If the flag terminals did not supply 240±10% VAC, the control box is defective.

OUTPUT VOLTAGE TEST, JET PUMP

1. Disconnect power to the spa for 1 minute to restore the default setting – jet pump off.
2. Reconnect power to the spa and check the main power terminal block for 240±10% VAC (216 VAC to 264 VAC) to see if the spa is receiving the proper source voltage. If the terminal block is not receive the proper source voltage, perform the ***Source Voltage Test***, correct the failure, and restart this test.
3. Before you switch the jet pump on, measure the voltage in the control box between the jet pump hot and neutral flag terminals. The jet pump flag terminals should not supply any output voltage. If any voltage is supplied the control box is defective.
4. Press the ***Jets*** button and measure the voltage in the control between the jet pump hot and neutral flag terminals. The jet pump flag terminals should supply 240±10% VAC (216 VAC to 264 VAC) output voltage. If the flag terminals did not supply 240±10% VAC when the jet pump was switched on, perform the control panel test to determine whether or not the control panel is defective. If the control panel is not defective, then the control box is defective.

OUTPUT VOLTAGE TEST, HEATER

1. Check the main power terminal block for 240±10% VAC (216 VAC to 264 VAC) to see if the spa is receiving the proper source voltage. If the terminal block is not receive the proper source voltage, perform the ***Source Voltage Test***, correct the failure, and restart this test.
2. Turn the heater off. Lower the temperature setting to the minimum setting, and verify that the temperature setting is at least 1° C below the actual water temperature.
3. Measure the voltage in the control box between the heater hot and neutral flag terminals on the heater relay. The heater flag terminals should not supply any output voltage. If any voltage is supplied the control box is defective provided that the thermostat did not switch the heater on.
4. Turn the heater on. Raise the temperature setting to the maximum setting, and verify that the temperature setting is at least 1° C above the actual water temperature.
5. Measure the voltage in the control box between the heater hot and neutral flag terminals on the heater relay. The heater flag terminals should supply 240±10% VAC (216 VAC to 264 VAC) output voltage. If the heater flag terminals do not supply 240±10% VAC, refer to ***Heater Inoperative*** in the Diagnosis section of this manual. (If you have completed the ***Heater Inoperative*** corrective actions and the heater is still not receiving the proper output voltage, then the control box is defective).

CONTROL PANEL TEST **(1997 Model spas ONLY)**

1. Verify that the control panel's ribbon cable is properly connected to the circuit board.
2. Try to access the spa light, jets, and temperature setting from the control panel and note which components, and/or buttons do not function.
   a) The ***Light*** button should switch the spa light on and off.
   b) The ***Jets*** button should switch the jet pump on and off.
   c) The temperature dial should switch the heater off when turned all the way to the left if the water temperature is warmer than 10±1° Celsius. The temperature dial should switch the heater on when turned all the way to the right if the water temperature is cooler than 41.5±1° Celsius.

Control panel test (1997 model spas ONLY) continued

3. Disconnect the control panel's ribbon cable and connect a spare control panel that you know works properly.
4. Repeat step 2 with the spare control panel installed, then review the following:

- If the jet pump, heater, or spa light switch on when the spa is powered on and cannot be turned off with the spare control panel, the control box is defective.
- If the spare control panel is fully functional and the suspect control panel is not, then the suspect control panel is defective.
- If the spare control panel responds exactly the same as the suspect control panel, then the control box and/or spa component(s) are defective. Refer to the Diagnosis section of this manual for each component that is inoperative.
- If the spare control panel is not fully functional, but more operational than the suspect control panel, then the suspect control panel is defective in conjunction with the control box and/or spa component(s). Refer to the Diagnosis section of this manual for each component that is inoperative.

THERMOSTAT TEST, CONTROL (1997 Model spas ONLY)

If necessary, refer to the electrical schematics when performing this test. This test must be performed with power supplied to the spa, and all of the electrical wires must be properly connected.

1. On the electronic control thermostat test for continuity between the yellow (thermistor low) and orange (thermistor high) wires. You are reading the ohmic value of the control thermistor, so the value you read on your test meter should correspond with the ***Thermistor Temperature vs. Resistance Graph***. Continue to step 3 if the correct ohmic value is present at the electronic thermostat.
2. Refer to the electrical schematics and continue testing between the yellow and orange wires at the 7-pin ribbon cable where it connects to the control head main circuit board. If you detect the correct resistance where the 7-pin ribbon cable connects to the control head main circuit board, but not at the electronic control thermostat, then the 7-pin ribbon cable is defective. Perform the ***Thermistor Test*** if there isn't any continuity at all, or if the ohmic value does not correspond with the ***Thermistor Temperature vs. Resistance Graph***. If there isn't any continuity at all, or if the ohmic value does not correspond with the ***Thermistor Temperature vs. Resistance Graph***, but the control thermistor is not defective, perform the ***Thermostat Test, Sub 2*** located at the end of this test.
3. On the electronic control thermostat test for 12 VDC between the white (common) and black (hot) wires. Continue to step 5 if the correct voltage is present at the electronic thermostat.
4. Refer to the electrical schematics and continue testing between the white and black wires at the 7-pin ribbon cable where it connects to the control head main circuit board. If you detect the correct voltage where the 7-pin ribbon cable connects to the control head main circuit board, but not at the electronic control thermostat, then the 7-pin ribbon cable is defective. Perform ***Thermostat Test, Sub 2*** located at the end of this test if you do not read the correct voltage where the 7-pin ribbon cable connects to the control head main circuit board.
5. On the electronic control thermostat test for 5 VDC between the white (common) and red (hot) wires. Continue to step 7 if the correct voltage is present at the electronic thermostat.

Thermostat test, Control (1997 model spa ONLY) continued

6. Refer to the electrical schematics and continue testing between the white and black wires at the 7-pin ribbon cable where it connects to the control head main circuit board. If you detect the correct voltage where the 7-pin ribbon cable connects to the control head main circuit board, but not at the electronic control thermostat, then the 7-pin ribbon cable is defective. Perform ***Thermostat Test, Sub 2*** located at the end of this test if you do not read the correct voltage where the 7-pin ribbon cable connects to the control head main circuit board.
7. Turn the temperature dial all the way down (to the left), and verify that the water temperature is warmer than 10±1° C, and test for 0 VDC between the brown (coil driver input) and blue (coil driver output) wires. If you detect any voltage, the electronic control thermostat is defective.
8. Turn the temperature dial all the way up (to the right), and verify that the water temperature is cooler than 41.5±1° C, and test for 12—18 VDC between the brown (coil driver input) and blue (coil driver output) wires. If you do not detect 12—18 VDC at the electronic control thermostat, then the electronic control thermostat is defective. It is safe to assume the electronic control thermostat is operating normally if you detect:
    - 0 VDC between the light-blue and the brown wire when the temperature dial is all the way to the left and the water temperature is warmer than 10±1° Celsius.
    - 12—18 VDC between the light-blue and the brown wire when the temperature dial is all the way to the right and the water temperature is cooler than 41.5±1° Celsius.
9. Refer to the electrical schematics and continue testing between the brown and blue wires at the 7-pin ribbon cable where it connects to the control head main circuit board. If you detect the correct voltage at the electronic control thermostat, but not where the 7-pin ribbon cable connects to the control head main circuit board, then the 7-pin ribbon cable is defective.

Thermostat Test, Sub 2

Disconnect the control panel's ribbon cable and connect a spare control panel that you know works properly. Repeat the test with the spare control panel installed. If the same results are produced with the spare control panel, the control box is defective. If the spare control panels produces the correct test results, the suspect control panel is defective.

CONTROL PANEL TEST (IQ 2000 Control Panels)

1. Verify that the control panel's ribbon cable is properly connected to the circuit board.
2. Try to access the spa light, jet pump, and set temperature from the control panel and note which components, buttons, and/or control panel LEDs do not function.
    a) The ***Light*** button should switch the spa light and its display indicator on and off.
    b) The ***Jets*** button should switch the jet pump and its display indicator on and off.
    c) The temperature setting has a range from 26° C to UT4 (42° C). The ***Temp –*** button should lower the temperature setting one degree at a time. The heater should turn off when the set point is ± 1° C below the actual water temperature.

Control panel test (IQ 2000 control panels) continued

d) The ***Temp +*** button should raise the temperature setting one degree at a time. The heater should turn on when the temperature setting is ±1° C above the actual water temperature displayed on the control panel.

e) The ***Hidden, Tiger*** button behind the *Tiger River Spas* logo and the ***Temperature Plus (+)*** button should activate and deactivate the temperature lock when pressed at the same time and held for 5 seconds. When the temperature lock is activated, the temperature buttons should be disabled and the temperature lock display should be lit for 30 seconds after a temperature button is pressed.

f) The ***Hidden, Tiger*** button behind the *Tiger River Spas* logo and the ***Temperature Minus (–)*** button should activate and deactivate the spa lock when pressed at the same time and held for 5 seconds. When the spa lock is activated, all of the control panel buttons should be disabled and the spa lock display should be lit for 30 seconds after a button is pressed.

3. Disconnect the control panel's ribbon cable and connect a spare control panel that you know works properly.
4. Repeat step 2 with the spare control panel installed, then review the following:

- If the jet pump, heater, or spa light switch on when the spa is powered on and cannot be turned off with the spare control panel, the control box is defective.
- If the spare control panel is fully functional and the suspect control panel is not, then the suspect control panel is defective.
- If the spare control panel responds exactly the same as the suspect control panel, then the control box and/or spa component(s) are defective. Refer to the Diagnosis section of this manual for each component that is inoperative.
- If the spare control panel is not fully functional, but more operational than the suspect control panel, then the suspect control panel is defective in conjunction with the control box and/or spa component(s). Refer to the Diagnosis section of this manual for each component that is inoperative.

THERMISTOR TEST

1. Verify that the program jumpers are properly configured.
2. Turn the heater off by lowering the set temperature to the minimum setting, and verifying that the set temperature is at least 1° C below the actual water temperature.
3. Check the temperature of the spa water with a thermometer.
4. Disconnect the thermistor from the control circuit board.
5. Use the ***Thermistor Temperature vs. Resistance Graph*** to verify that the ohmic value of the thermistor coincides with the temperature of the water.

- If ohmic value and water temperature do not coincide with the values on the graft, the thermistor is defective.

FLOW TEST, JET PUMP

1. There must be enough water in the spa to cover the filter completely.
2. Open the air valve(s) all the way.
3. Turn the jet pump on. Refer to the **Jet Pump Inoperative** section of this manual if the jet pump cannot be turned on.
4. Feel the water pressure in front of each of the jets. The water pressure should feel the same from each of the jets.

- If only one of the jets feels week, its air valve may be in the closed position, or there may be an obstruction behind the jet nozzle. Switch the jet to the open position, or turn the jet pump off, remove the jet nozzle and check for an obstruction.
- If all of the jets feel weak, probably the filter is dirty or clogged. Turn the jet pump off, remove the filter from the filter compartment, and clean or replace it, depending on how dirty it is. Also, clean or replace the secondary suction intake screen if it is dirty or clogged. To verify that the filter is responsible for the restricted flow remove the filter from the filter compartment, turn the jets back on, and feel the water pressure from one of the jets (the water pressure should increase significantly when the dirty or clogged filter is removed).
  WARNING: Debris is free to enter the plumbing system when the filters are removed, be sure that the spa is clean or this could make the problem worse.
- If all of jets feel sporadic the jet pump may not be receiving the proper output voltage. Perform the ***Output Voltage Test, Jet Pump***.
- If all of the jets feel week or sporadic and/or the pump is making an unusual noise the jet pump may be defective.

FLOW TEST, CIRCULATION PUMP

The circulation pump flow test requires the heater flow test tool.

1. There must be enough water in the spa to cover the filter completely.
2. Refer to the **Circulation Pump Inoperative** section of this manual if the circulation pump is not operating.
3. Remove the screen on the heater return assembly.
4. Insert the bottom of the flow test tool in the heater return, and use a one gallon jug to catch the water flowing out of the flow test tool. The gallon jug should be filled by the circulation pump in 20 seconds; otherwise, the circulation pump is not performing properly.

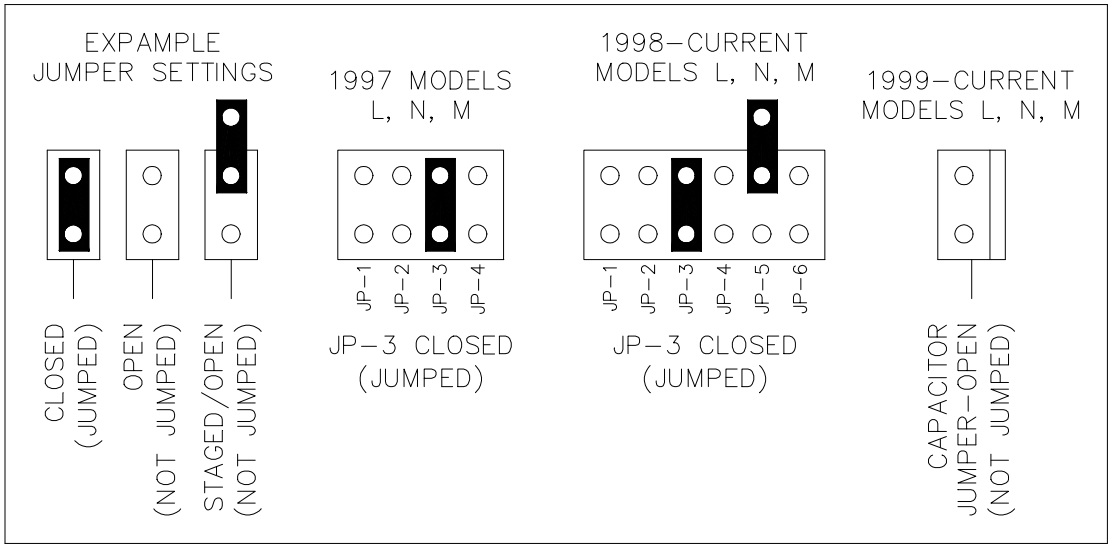
- If the circulation pump is not performing properly, most likely the filter is dirty or clogged. Disconnect power to the spa, remove the filter from the filter compartment, and clean or replace it, depending on how dirty it is. To verify that the filter is responsible for the restricted flow repeat the flow test after the filter has been cleaned or replaced.
- If the circulation pump is not performing properly, the circulation pump may not be receiving the proper output voltage. Perform the ***Output Voltage Test, Circulation Pump***.
- If the circulation pump is not performing properly, the circulation pump may need to be primed (especially if the water level was too low or if the spa was drained recently). To prime the circulation pump, remove the filter and standpipe. Turn a garden hose on full, insert the nozzle into the opening in the floor of the filter compartment, and cup you hands around the hose where it feeds into the opening in the floor of the filter compartment.
  WARNING – Debris is free to enter the plumbing system when the filter is removed, be sure that the spa is clean or this could cause problems.

50 HZ

APPENDIX:
JUMPER CONFIGURATION

THERMISTOR TEMP. VS RESISTANCE GRAPH

JUMPER CONFIGURATION
TIGER RIVER (50 Hz) 1997—CURRENT



WARNING – Improper jumper positioning may cause permanent damage to the spa.

Capacitor Jumper

1999—Current SIBERIAN (L), SUMATRAN (N), BENGAL (M)

- The capacitor jumper regulates the spa light capacitor on the control box main circuit board, and must NOT be jumper for the spa light function properly. **Open**: DO NOT jump the Capacitor Jumper.

Program Jumpers (P-4)

1998—Current SIBERIAN (L), SUMATRAN (N), BENGAL (M)

I. Jumper # 1 (**JP 1**) – Controls the spa settings. **Open**: JP-1 must NOT be jumped for the spa to function properly.
II. Jumper # 2 (**JP 2**) – Controls the spa settings. **Open**: JP-2 must NOT be jumped for the spa to function properly.
III. Jumper # 3 (**JP 3**) – Controls the spa settings. **Closed**: JP-3 must be jumped for the spa to function properly.
IV. Jumper # 4 (**JP 4**) – Developmental. **Open**: Never jump JP-4.
V. Jumper # 5 (**JP 5**) – Controls the temperature designation.
   a) **Open**: Sets the control panel to display the temperature setting in Celsius.
   b) **Closed**: Sets the control panel to display the temperature setting in Fahrenheit.
VI. Jumper # 6 (**JP 6**) – Developmental. **Open**: Never jump JP-6.

Program Jumpers (P-4)

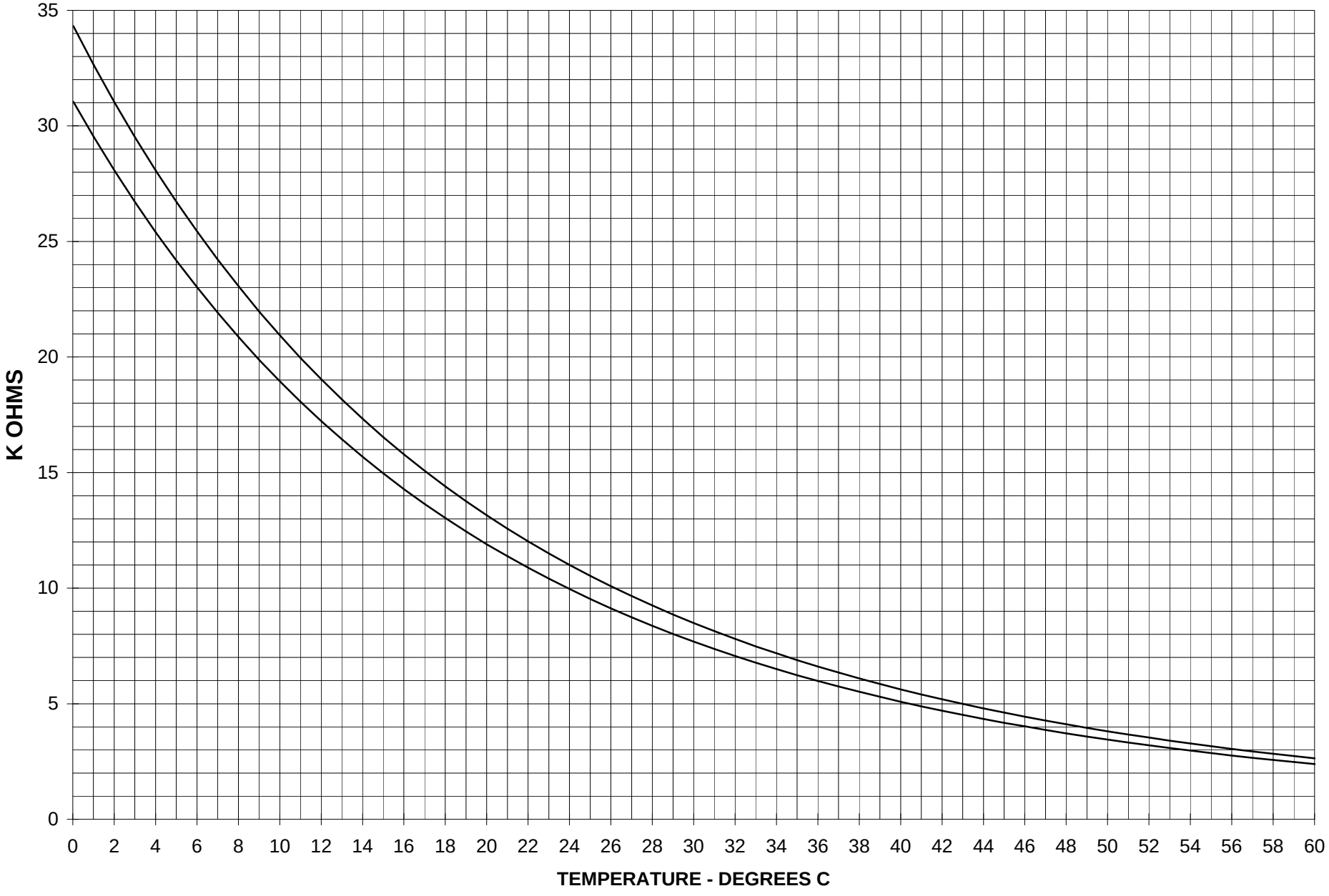
1997 SIBERIAN (L), SUMATRAN (N), BENGAL (M)

I. Jumper # 1 (**JP 1**) – Controls the spa settings. **Open**: JP-1 must NOT be jumped for the spa to function properly.
II. Jumper # 2 (**JP 2**) – Controls the spa settings. **Open**: JP-2 must NOT be jumped for the spa to function properly.
III. Jumper # 3 (**JP 3**) – Controls the spa settings. **Closed**: JP-3 must be jumped for the spa to function properly.
IV. Jumper # 4 (**JP 4**) – Developmental. **Open**: Never jump JP-4.

THERMISTOR TEMPERATURE VS RESISTANCE GRAPH
TIGER RIVER (50 Hz)

The control thermistor graph shows what the resistance of the control or high limit thermistor should be based on the spa's water temperature. To check the calibration of a control or high limit thermistor, unplug it from the control box and test for K Ohms between the two terminal located on the thermistor's connector. If the value of the thermistor's resistance and the spa's water temperature (±1° C) do not intersect in between the two curved lines on the graph, the thermistor is defective.

THERMISTOR RESISTANCE VS TEMPERATURE
TIGER RIVER (50 Hz)



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Exploded Illustrations

TIGER RIVER 50 Hz SPAS
EXPLODED ILLUSTRATIONS
TABLE OF CONTENTS

Filter Compartment

Surface

Accessories

Section I:

Control Box Components

50 Hz Exploded Illustrations

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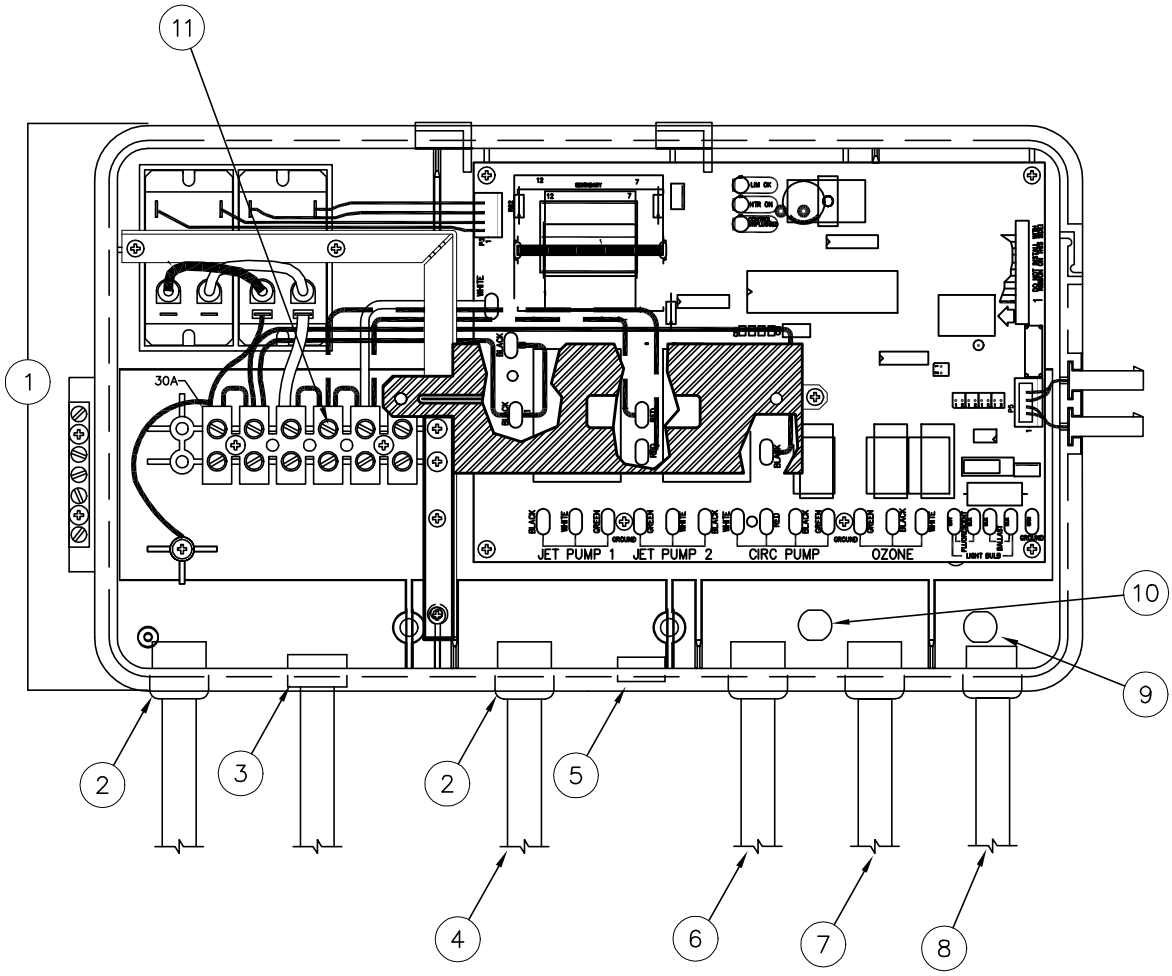
IQ 2000 CONTROL BOX

1997 – 2000



3/01

TIGER RIVER (50 Hz)

0772401C.dwg

FOR INTERNAL USE ONLY:
TR(E)

IQ 2000 CONTROL BOX

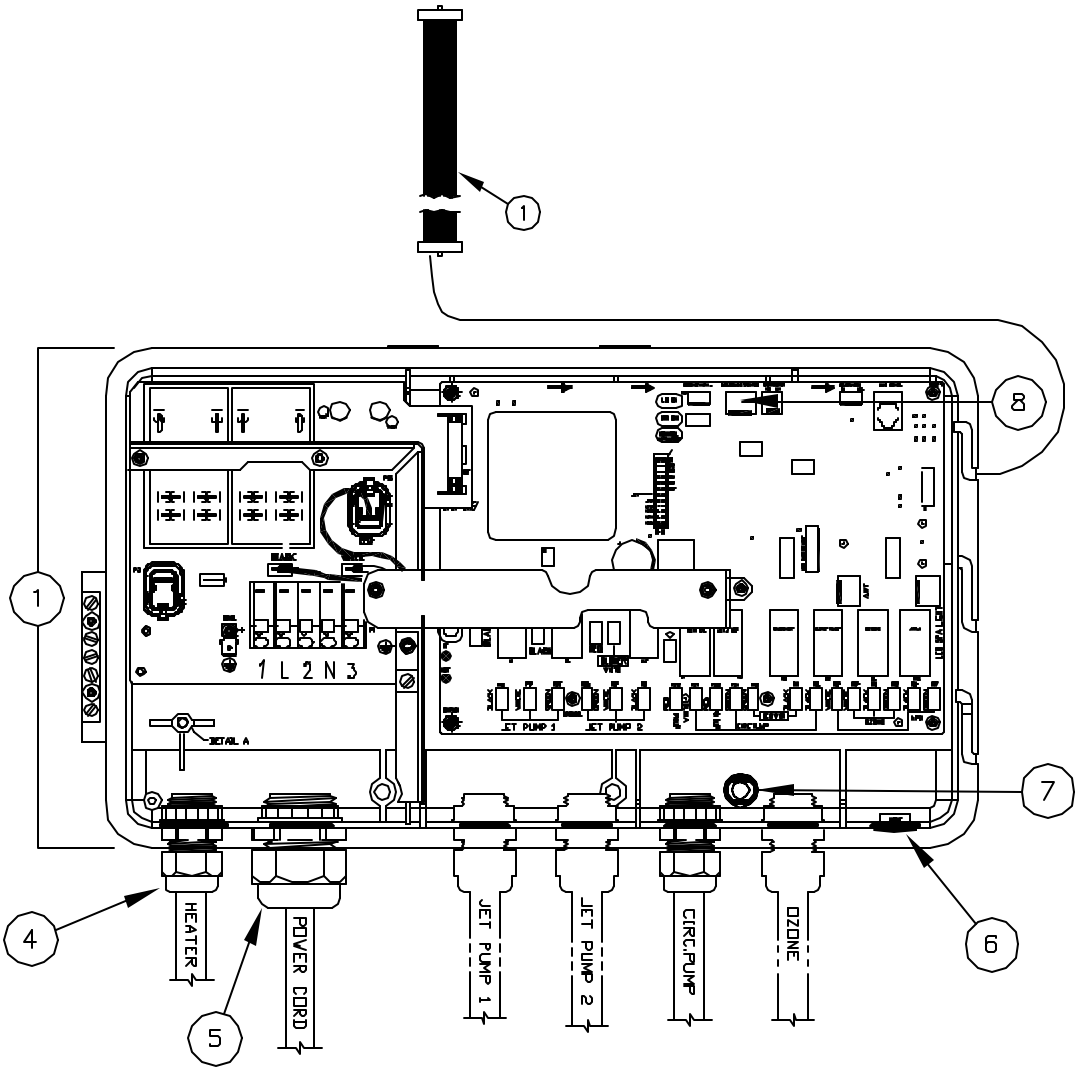
1997 – 2000

ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1a	IQ–2000, Export Control Box 97	ALL 171001 – 479999	71386
1b	IQ–2000, Export Control Box 98	ALL 181001 – 4B9999	71489
2	Kit, Strain Relief, #3231	ALL 171001 – 4B9999	71614
3	Kit, Strain Relief, #3460	ALL 171001 – 4B9999	71613
4	Cord, 14/3 XP Jet Pump	ALL 171001 – 4B9999	71416
5	Plug, Hole 0.875"	ALL 171001 – 4B9999	36043
6	Cord, Circ Pump Replacement	ALL 171001 – 4B9999	71434
7	Cord, Ozone Replacement	ALL 171001 – 4B9999	37093
8	Cord, Light Replacement	ALL 171001 – 4B9999	36031
9	Transformer, Light	ALL 171001 – 4B9999	37354
10	Fuseholder	ALL 171001 – 4B9999	37061
11	Screw, Terminal Block	ALL 171001 – 4B9999	71529
*	Screw, IQ2000 Cover	ALL 171001 – 4B9999	36676
*	Screw, Mounting Bracket	ALL 171001 – 4B9999	36898
*	CBA Mounting Bracket	ALL 171001 – 4B9999	36018
*	Cable Assy, Panel Interface	ALL 171001 – 479999	34931
*	Cable Assy, Panel Interface	ALL 181001 – 4B9999	71755
*	Fuse 606 – 1A, Export	ALL 171001 – 4B9999	37062

* Non–illustrated part

IQ2020 CONTROL BOX, PUG

2001 – Current



5/04 TIGER RIVER (50 HZ) 1030801A.dwg

FOR INTERNAL USE ONLY:
HSSE, TRE

IQ2020 CONTROL BOX PUG

2001 – CURRENT

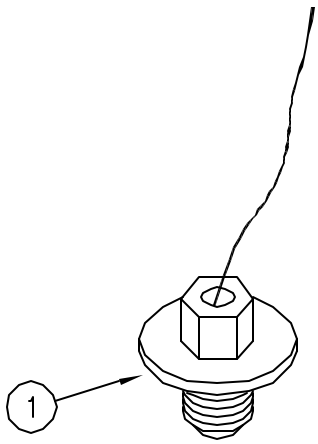
ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	Kit, IQ Ribbon Cable, '01	ALL 1C1001 – Current	72065
2	IQ2020, Control Box, Export	ALL 1C1001 – Current	73224
3	Strain Relief 10/3	ALL 1C1001 – Current	36022
4	Clamp, Romex 3/4"	ALL 1C1001 – Current	30105
5	Cord, 14/3 XP Jet Pump	ALL 1C1001 – Current	71416
6	PLUG, HOLE 0.875"	ALL 1C1001 – Current	36043
7	CORD, CIRC PUMP, REPLACEMENT	ALL 1C1001 – Current	71434
8	Strain Relief, 3/8" 7K-2	ALL 1C1001 – Current	30098
9	Fuseholder	ALL 1C1001 – Current	37061
10	Jumper, Pressure Switch Bypass	ALL 1C1001 – 4D9999	72768**
*	Screw Receptacle For Control Panel	ALL 1C1001 – Current	34481
*	CBA Mounting Bracket	ALL 1C1001 – Current	36018
*	Screw, Mounting Bracket	ALL 1C1001 – Current	36898
*	Program Jumper	ALL 1C1001 – Current	36021
*	Power Jumper, 2-Pin, IQ2020	ALL 1C1001 – Current	39192
*	Power Jumper, 3-Pin, IQ2020	ALL 1C1001 – Current	39193
*	Screw, IQ2020 Cover	ALL 1C1001 – Current	36676
*	Thermistor Assy, Control (IC)	See Thermistor Page	39530
*	Thermistor Assy, Hi-Limit (IC)	See Thermistor Page	39525

* Non-Illustrated Part

** Pressure Switch Bypass Jumper (PN 72768) is required for all spa models containing a heater without a pressure switch.

THERMISTOR

EXTERNALLY CONNECTED



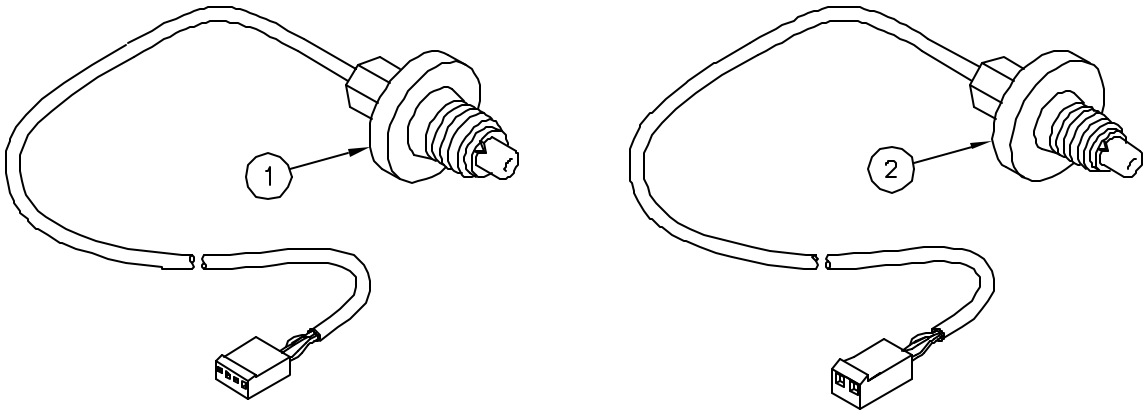
ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1A	Thermistor Assy, Control	See Below Matrix	38415
1B	Thermistor Assy, Hi-Limit	See Below Matrix	38416
*	O-Ring, Control Thermistor	ALL 181001-Current	34878
*	O-Ring, Hi-Limit Thermistor	ALL 181001-Current	34879

* Non-illustrated part

**Used in the following serial numbers: P/N 38415 - Control Thermistor P/N 38416 - Hi Limit Thermistor
EXPORT
LE181001 - LE2D1059
ME181001 - ME2D1066
NE181001 - NE2D1034

THERMISTOR

INTERNALLY CONNECTED



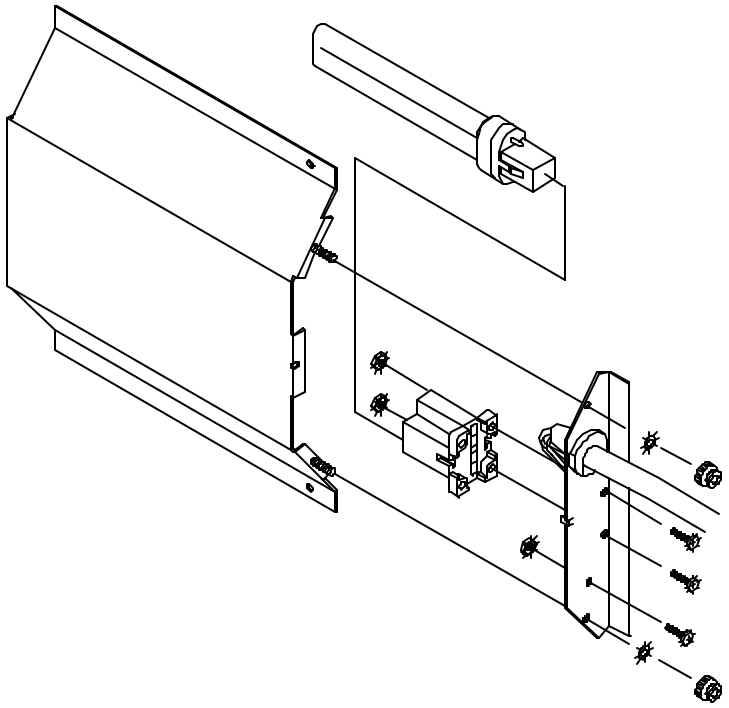
ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1a	Thermistor Assy, Control	See Below Matrix	39530**
1b	Thermistor Assy, Hi-Limit	See Below Matrix	39525**
*	O-Ring, Control Thermistor	L, M, N 181001-Current	34878
*	O-Ring, Hi-Limit Thermistor	L, M, N 181001-Current	34879

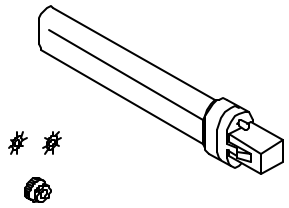
* Non-Illustrated part

**Used in the following serial numbers: P/N 39530 - Control Thermistor P/N 39525 - Hi Limit Thermistor
EXPORT
LE2D1060 - 4F9999
ME2D1067 - CURRENT
NE2D1035 - CURRENT
CPNE 1E1001 - 4E9999
CHPE 1F1001 - CURRENT

LAMP ASSEMBLY, PRE – 2001

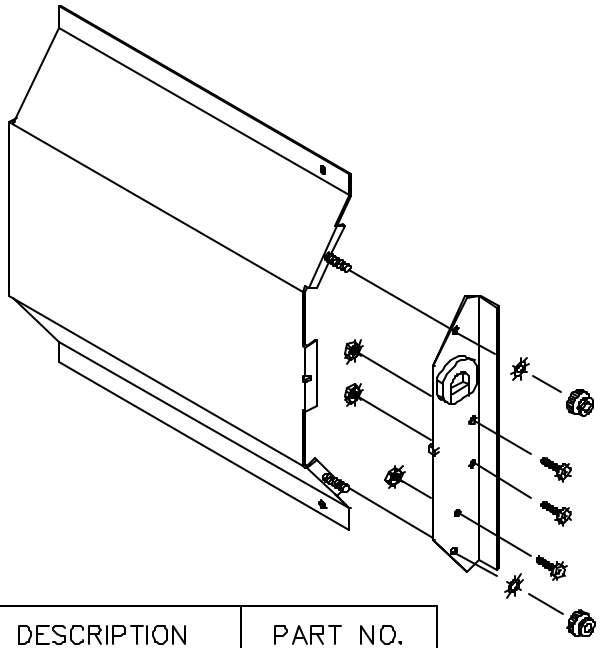
COMPLETE ASSEMBLY





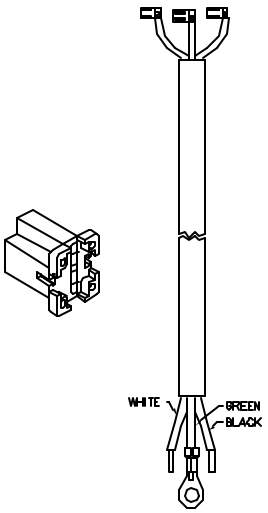
DESCRIPTION	PART NO.
BULB REPLACEMENT KIT 9 WATT WHITE BULB	71800
BULB REPLACEMENT KIT 9 WATT BLUE BULB	71802
*9 WATT BLUE "BULB ONLY"	37171
*9 WATT WHITE "BULB ONLY"	33328

*USE WITH ONE–PIECE HOUSING ONLY



DESCRIPTION	PART NO.
LAMP HOUSING KIT	71809

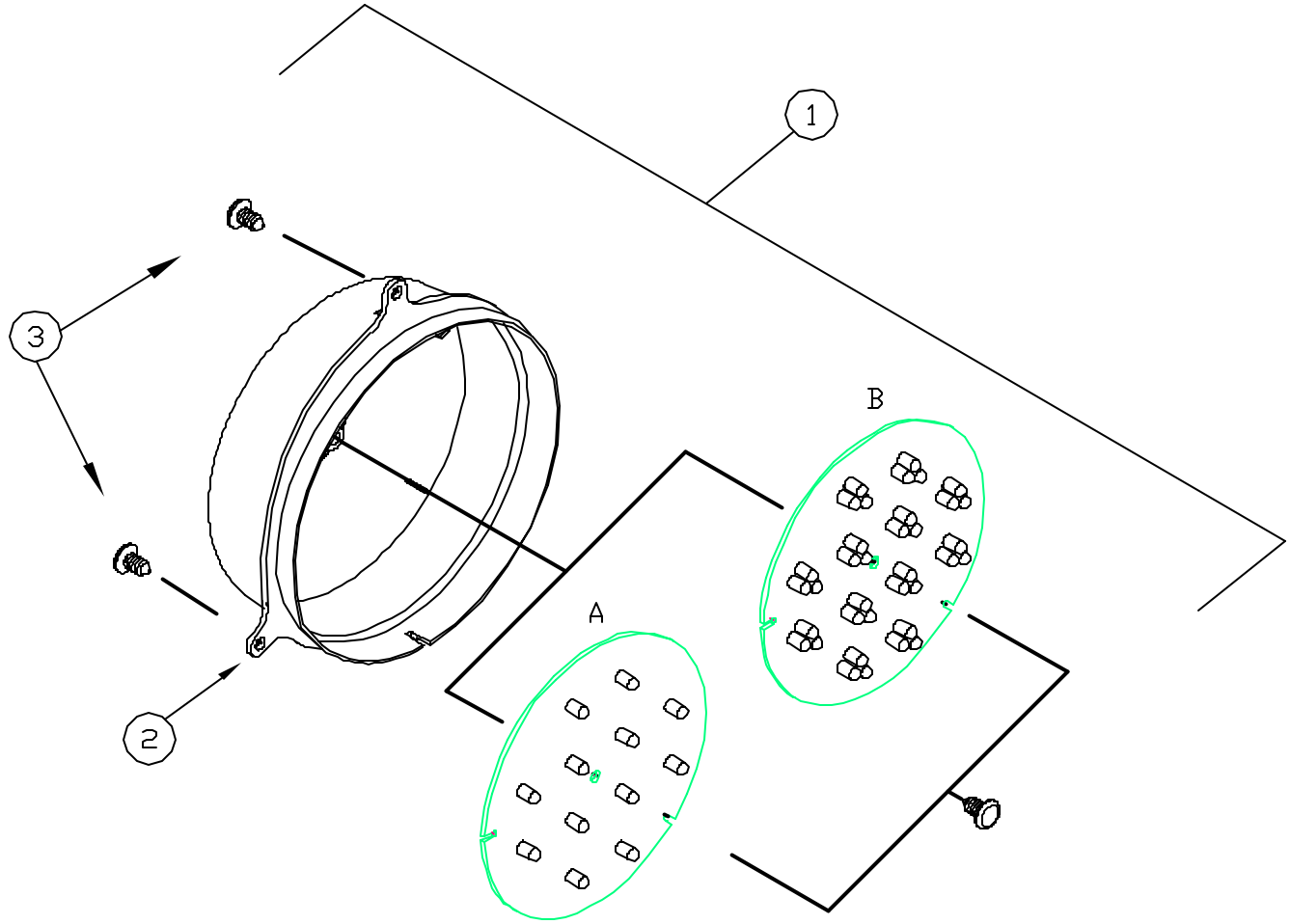
CORD ASSEMBLY



DESCRIPTION	PART NO.
CORDSET KIT	71814

LED LIGHT ASSEMBLY

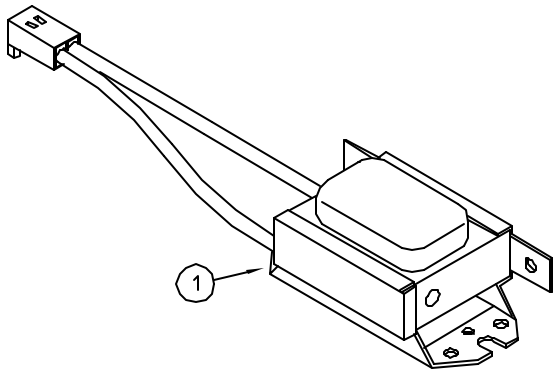
2001 – CURRENT



ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1A	LED Light Assembly, Blue	All 1C1001–Current	72016
1B	LED Light Assembly, Multicolor	All 1C1001–Current	72642*
2	Housing, LED Light	All 1C1001–Current	38859
3	Fastener (Quantity 4)	All 1C1001–Current	72017

* After Market Upgrade

CONTROL BOX COMPONENTS



ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	Ballast Assy	LE,ME,NE 171001-4B9999	37354

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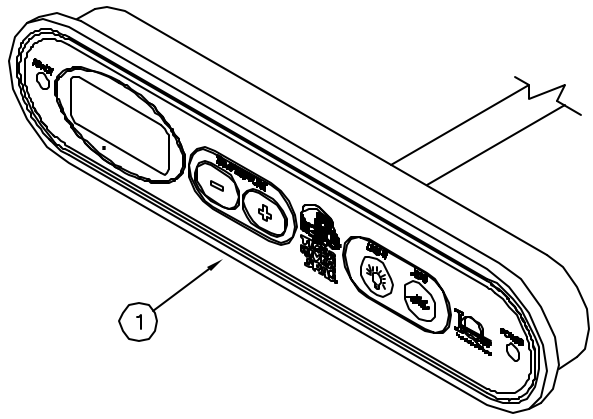
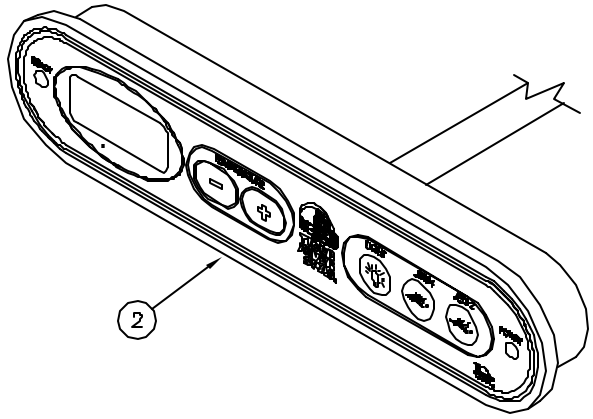
CONTROL PANEL

1998 – 2003



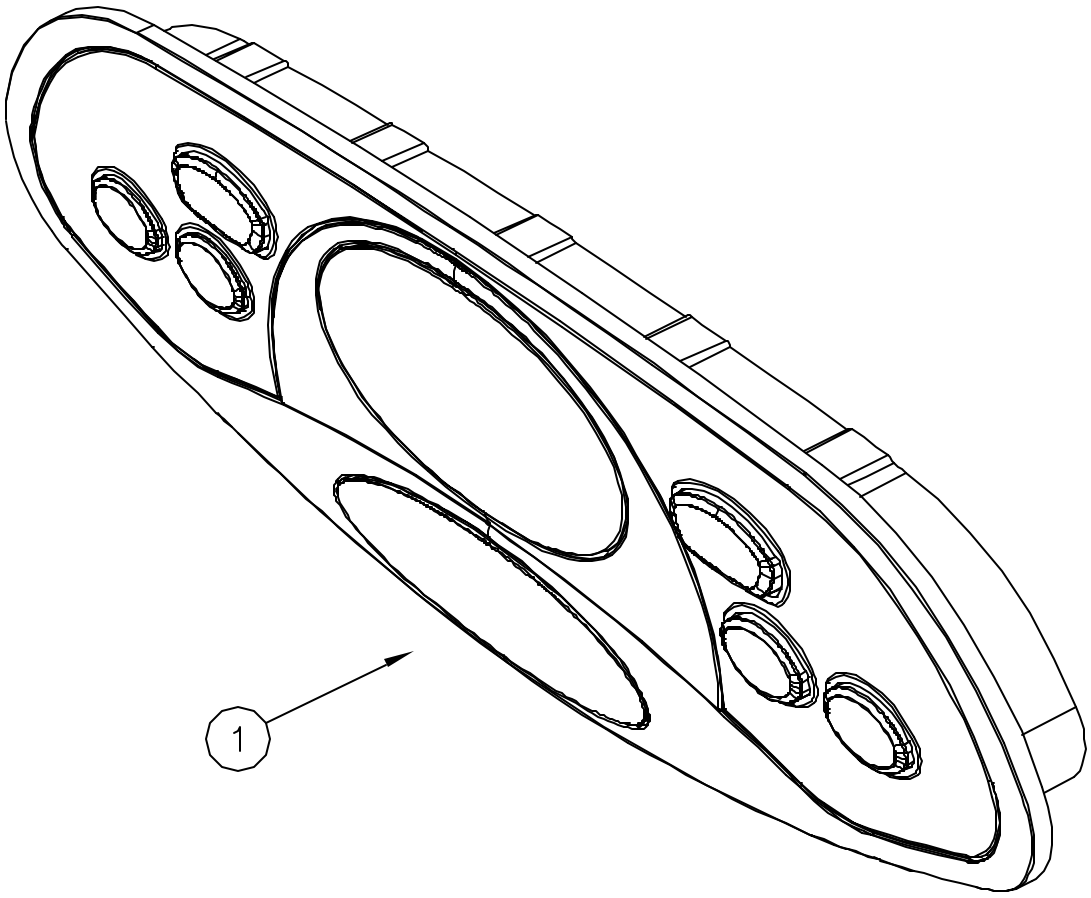


ITEM	DESCRIPTION	SERIAL NUMBER	P/N
1A	1 Jet Pump Control Panel	LE,ME,NE 1B1001 – 4A9999 ME,NE 1B10D1 – 4B9999	71502
1B	1 Jet Pump Control Panel	ME,NE 1C1001 – 4E9999 CPNE 1E1001 – 4E9999	72018
2A	2 Jet Pump Control Panel	LE 1B1001 – 4B9999	71836
2B	2 Jet Pump Control Panel	LE 1C1001 – 4E9999	72019
*	Gasket, Control Panel TR	LE,ME,NE 1B1001 – 489999 LE,ME,NE 1A1001 – 4E9999	37233

* Non-Illustrated part

CONTROL PANEL

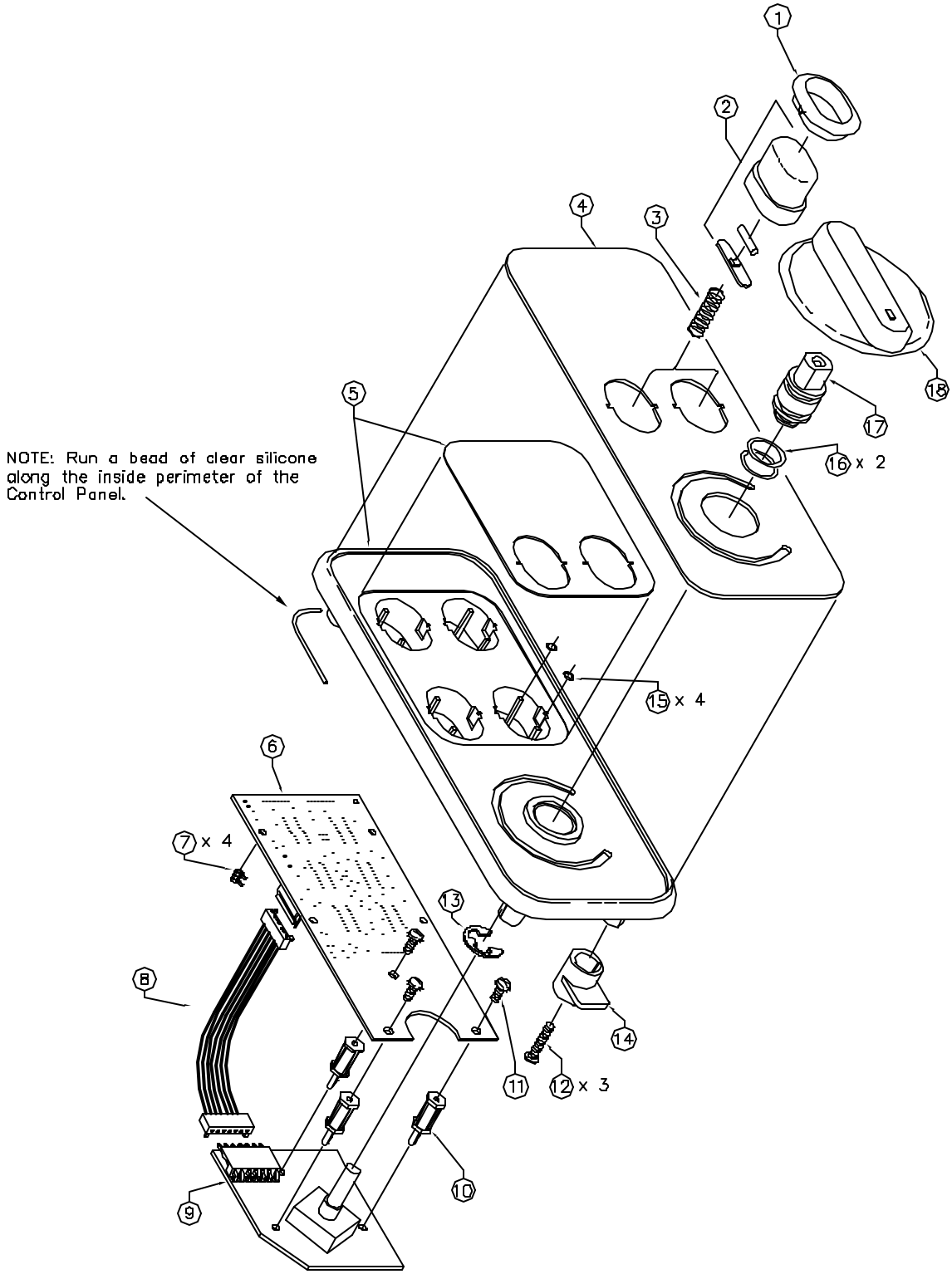
2004 – Current



ITEM	DESCRIPTION	SERIAL NUMBER	P/N
1	JET PUMP CONROL PANEL	ALL MODELS 1F1001 – CURRENT	73228

CONTROL PANEL ASSEMBLY

1997



5/02

TIGER RIVER (50 Hz)

0377001B.dwg

FOR INTERNAL USE ONLY:
TR, TR(E)

CONTROL PANEL ASSEMBLY

1997

ITEM	DESCRIPTION	SERIAL NUMBER	P/N
1	Bezel, New Style	171001 – 479999	33859
2	Push Button w/Magnet	171001 – 479999	71081
3	Spring	171001 – 479999	33934
4A	Label, Tiger River	171001 – 469999	35103
4B	Label, Control Panel, T/R 97	171001 – 479999	36751
5	Control Panel	171001 – 479999	35106
6	PWA, Panel, T/R 97	171001 – 479999	71345
7	Retaining Ring	171001 – 479999	300859
8	Harness Assy, Reg/Switch, T/R	171001 – 479999	35079
9	Thermostat, Electronic	171001 – 479999	71340
10	Standoff, PCB–5/8	171001 – 479999	35087
11	Screw, 6–32 x 1/4	171001 – 479999	30331
12	Screw, B x 6 x 3/4	171001 – 479999	34009
13	Ring	171001 – 479999	34006
14	Clamp	171001 – 479999	33863
15	O–Ring, Control Panel	171001 – 479999	33275
16	O–Ring, T/R T–Stat Adapter	171001 – 479999	34007
17	Adapter, Knob	171001 – 479999	35099
18	Thermostat Knob, New Style	171001 – 479999	35101
*	Cable Assy Panel Interface	171001 – 479999	34931
*	Silicone, Dow 732 CLR, 3oz	171001 – 479999	71525

* NON ILLUSTRATED PART

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TIGER RIVER SPAS®

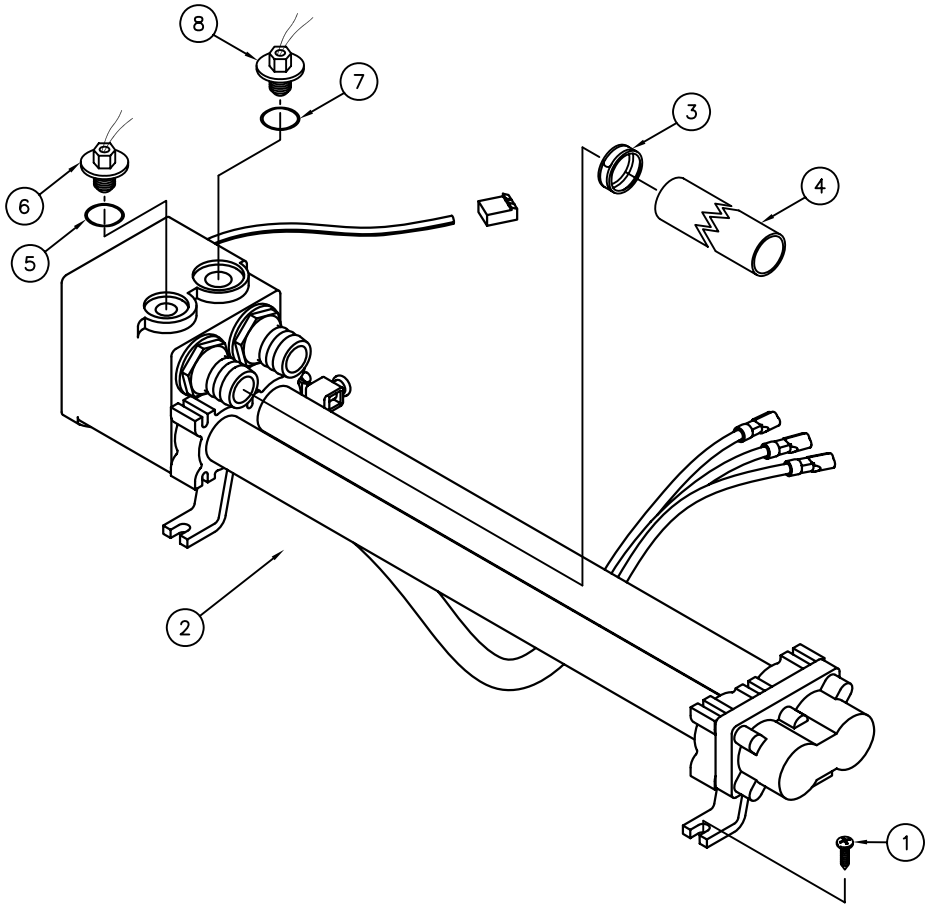
Section II:

Electrical Components

50 Hz Exploded Illustrations

NO FAULT HEATER

3RD QTR 2005 – CURRENT



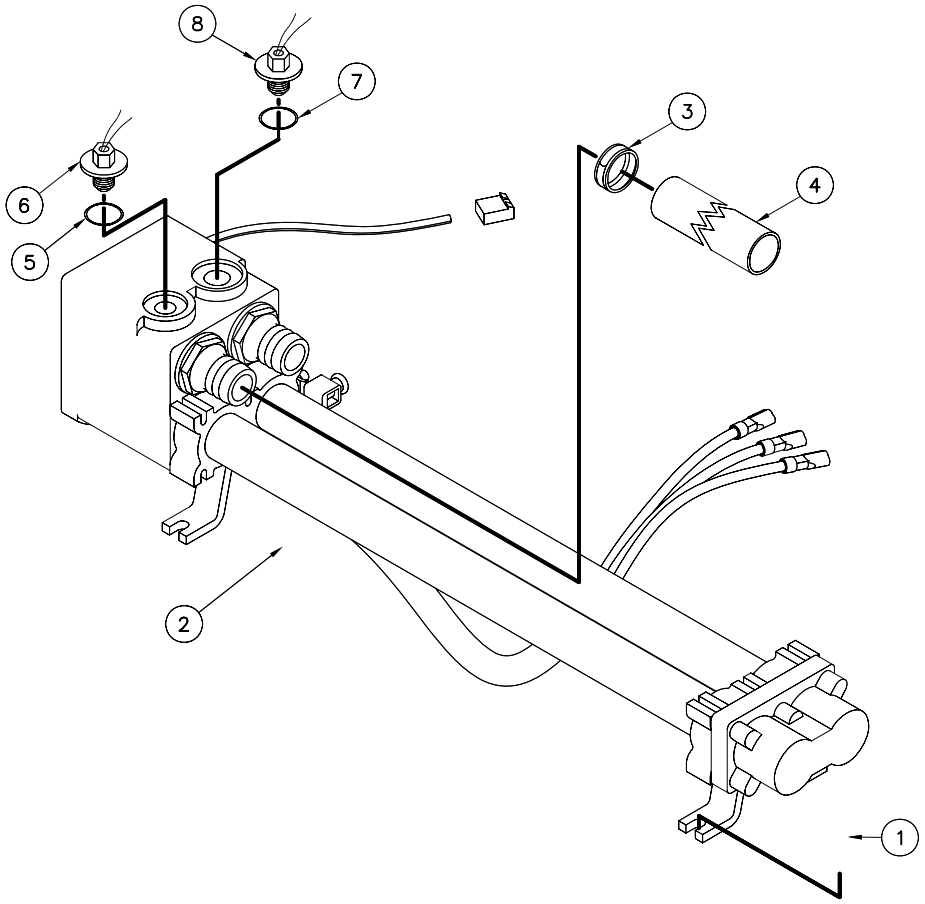
ITEM	DESCRIPTION	SERIAL NUMBERS USED:	PART NO.
1	SCREW,#10 x 1/2 PLP TRHD SMS SS	ALL 3G1001 – CURRENT	35162
2	HEATER ASSY, TITANIUM, HSS	ALL 3G1001 – CURRENT	72796
2a	PDR HEATER ASSY, TITANIUM, HSS	ALL 3G1001 – CURRENT	73792*
3	CLAMP, SPRING, 3/4"	ALL 3G1001 – CURRENT	300601
4	TUBING, VINYL, 3/4"	ALL 3G1001 – CURRENT	70315
5	O–RING, HI–LIMIT THERMISTOR	ALL 3G1001 – CURRENT	34879**
6	THERMISTOR ASSY, HI–LIMIT	ALL 3G1001 – CURRENT	39525**
7	O–RING, CONTROL THERMISTOR	ALL 3G1001 – CURRENT	34878**
8	THERMISTOR ASSY, CONTROL	ALL 3G1001 – CURRENT	39530**

* IF USED AS REPLACEMENT ON 1H1001 – CURRENT MODELS, A FLOW STATUS JUMPER (P/N 72768) MUST ALSO BE INSTALLED ON CONNECTOR P34.

** SEE THERMISTOR PAGE FOR EXACT SERIAL NUMBER TRACKING INFORMATION

NO FAULT HEATER

1998 – 2ND QTR 2005



ITEM	DESCRIPTION	SERIAL NUMBERS	PART NO.
1	SCREW,#10 x 1/2 PLP TRHD SMS SS	ALL 181001 – 2G9999	35162
2	HEATER ASSY, PDR	ALL 181001 – 2G9999	73792
3	CLAMP, SPRING, 3/4"	ALL 181001 – 2G9999	300601
4	TUBING, VINYL, 3/4"	ALL 181001 – 2G9999	70315
5	O–RING, HI–LIMIT THERMISTOR	ALL 181001 – 2G9999	34879**
6A	THERMISTOR ASSY, HI–LIMIT*	ALL 181001 – 1D9999	38416**
6B	THERMISTOR ASSY, HI–LIMIT	ALL 2D1001 – 2G9999	39525**
7	O–RING, CONTROL THERMISTOR	ALL 181001 – 2G9999	34879**
8A	THERMISTOR ASSY, CONTROL*	ALL 181001 – 1D9999	38415**
8B	THERMISTOR ASSY, CONTROL	ALL 2D1001 – 2G9999	39530**

* USED IN FACTORY–INSTALLED HEATERS ONLY

** FOR EXACT SERIAL TRACKING INFORMATION, SEE THERMISTOR PAGE

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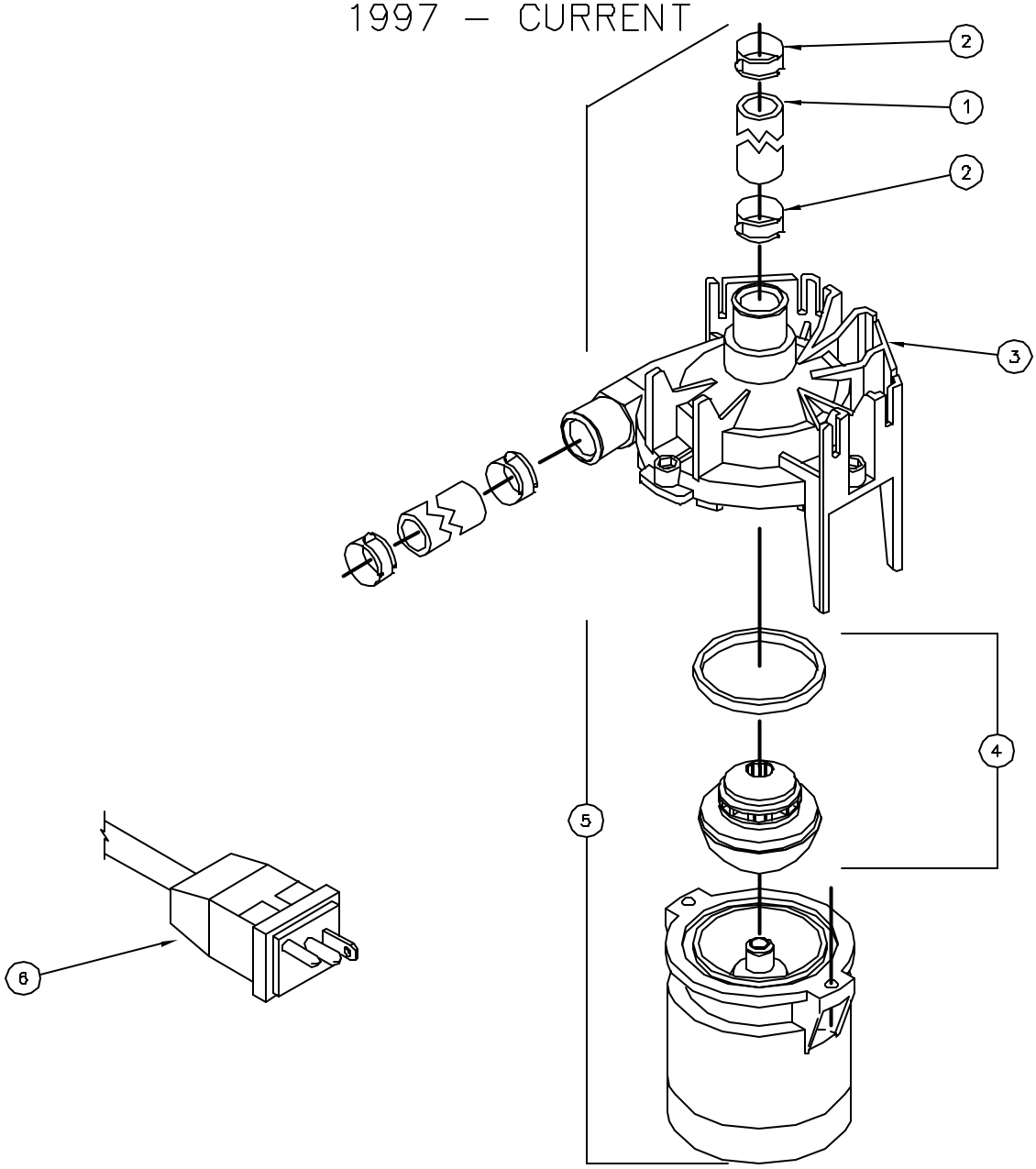
CIRCULATING PUMP ASSEMBLY, SILENTFLO 5000

1997 – CURRENT



ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	Vinyl Tubing 3/4"		70315
2	Clamp 3/4"		300601
3	Volute, Silent Flo		70832
4A	Impellor, Silent Flo	171001 – 479999	71032
4B	Impellor, Silent Flo	181001 – CURRENT	71493
5	Pump, Silent Flo 5000 1SP		73589
6	Cordset, 1SP		31829
*	Screw, 10–24 x 1/2" SS		30347

* NON–Illustrated Part.

03/05

TIGER RIVER (50 Hz)

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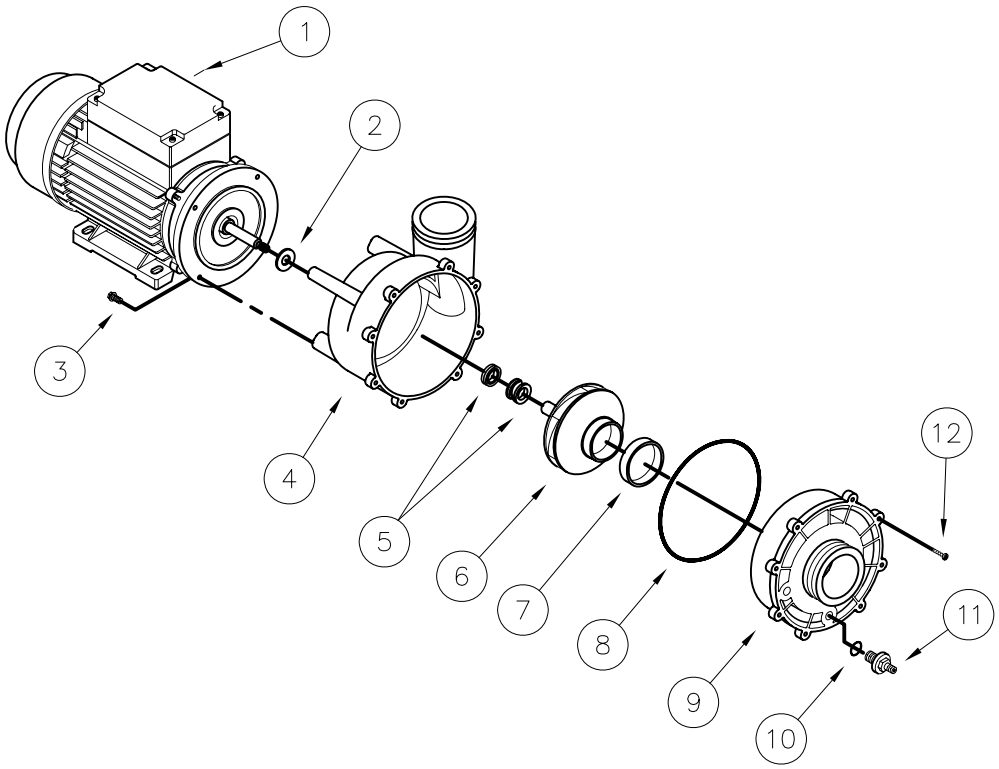
FOR INTERNAL USE ONLY:
HSS(E), TR(E)

JET PUMP, 50 Hz

1997 – CURRENT



ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	Motor, 50 Hz	ALL 171001 – Current	**
2	Slinger, Water 1/2" Shaft	ALL 171001 – Current	71551
3	Screw, #10–32 x 1/2", SHWH	ALL 171001 – Current	71556
4	Volute, 50 Htz	ALL 171001 – Current	71552
5	Kit, Shaft Seal Assy	ALL 171001 – Current	71447
6	Impeller, 3.0 HP, 50 Htz	ALL 171001 – Current	71553
7	Wear Ring, XP	ALL 171001 – Current	71409
8	O–Ring, Volute, 50 Htz	ALL 171001 – Current	71554
9	Cover, Suction, 50 Htz	ALL 171001 – Current	71696
10	O–Ring, Drain Nipple XP	ALL 171001 – Current	71412
11	Drain Fitting	ALL 171001 – Current	33732
12	Screw, MACH, 8x32x5/8	ALL 171001 – Current	71413
*	Washer FLT 5/16 x 3/4 SS	ALL 171001 – Current	30413
*	Screw, 1/4–20x1–1/2 SHC SS	ALL 171001 – Current	38798
*	Screw, 1/4–20x1–3/4 SHC SS	ALL 171001 – Current	38797
*	Cord, 14/3 XP PUMP	ALL 171001 – Current	71416
*	Cord, 14/4 XP PUMP	L 1F1001 – 4F9999	71416
*	Pump, 2.0 HP Complete	NE 171001 – Current CHPE 1F1001 – Current CPNE, L 171001 – 4E9999 ME 171001 – 4F9999	71838
*	Pump, 2.5 HP 2 SPD Complete	L 1F1001 – 4F9999 MME 3H1001 – Current	73028
*	Pump, 2.5 HP Complete	MME 1G1001 – 2H9999 L 1F1001 – 4F9999	71972

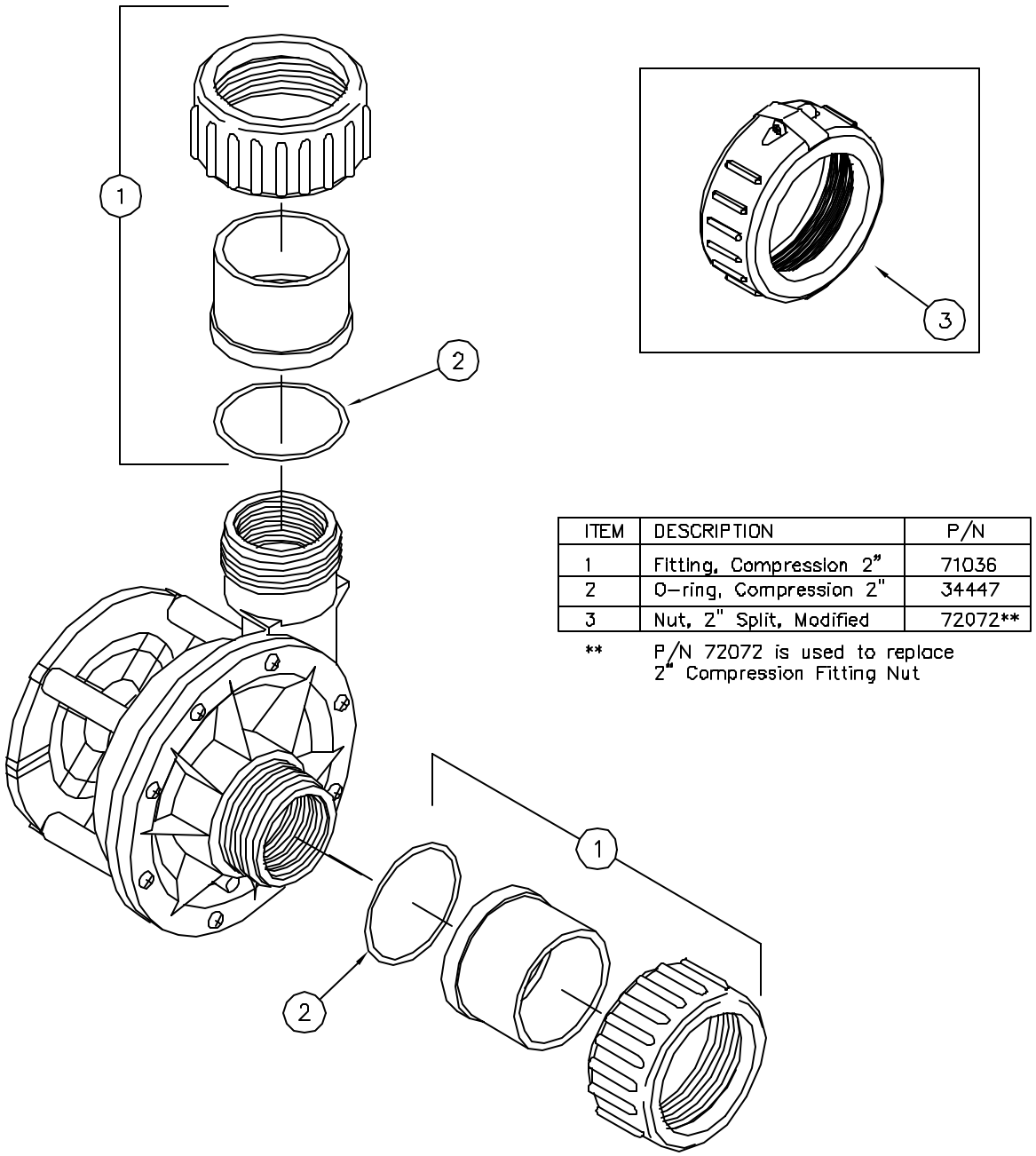
* Non–Illustrated Part
** Order Pump Complete

Section III:

Jets & Plumbing

50 Hz Exploded Illustrations

JET PUMP UNIONS



ITEM	DESCRIPTION	P/N
1	Fitting, Compression 2"	71036
2	O-ring, Compression 2"	34447
3	Nut, 2" Split, Modified	72072**

** P/N 72072 is used to replace 2" Compression Fitting Nut

09-02

TIGER RIVER (50 Hz)

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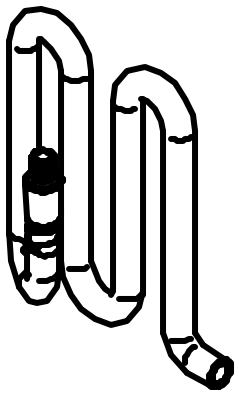
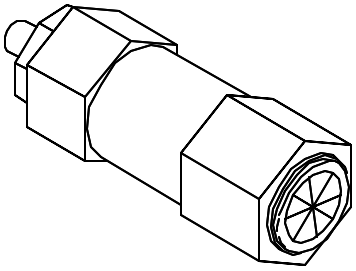
FOR INTERNAL USE ONLY:
TR(E), CAL(E)

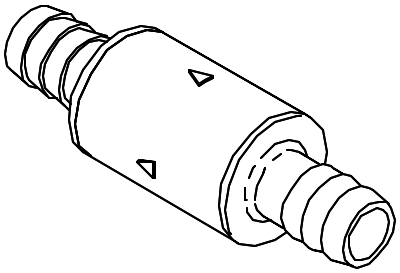
CHECK VALVES



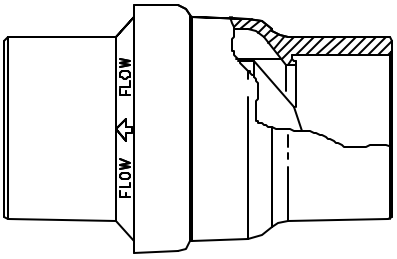
HARTFORD LOOP ASSEMBLY
2001 TO CURR: P/N 72701



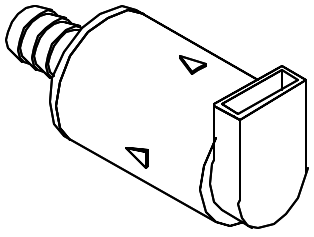
SAFETY SUCTION
ASSEMBLY, PRE 2000
USE MODIFIED WEIR KIT P/N 71944



CHECK VALVE, WATER –
CIRCULATING PUMP
P/N 35233



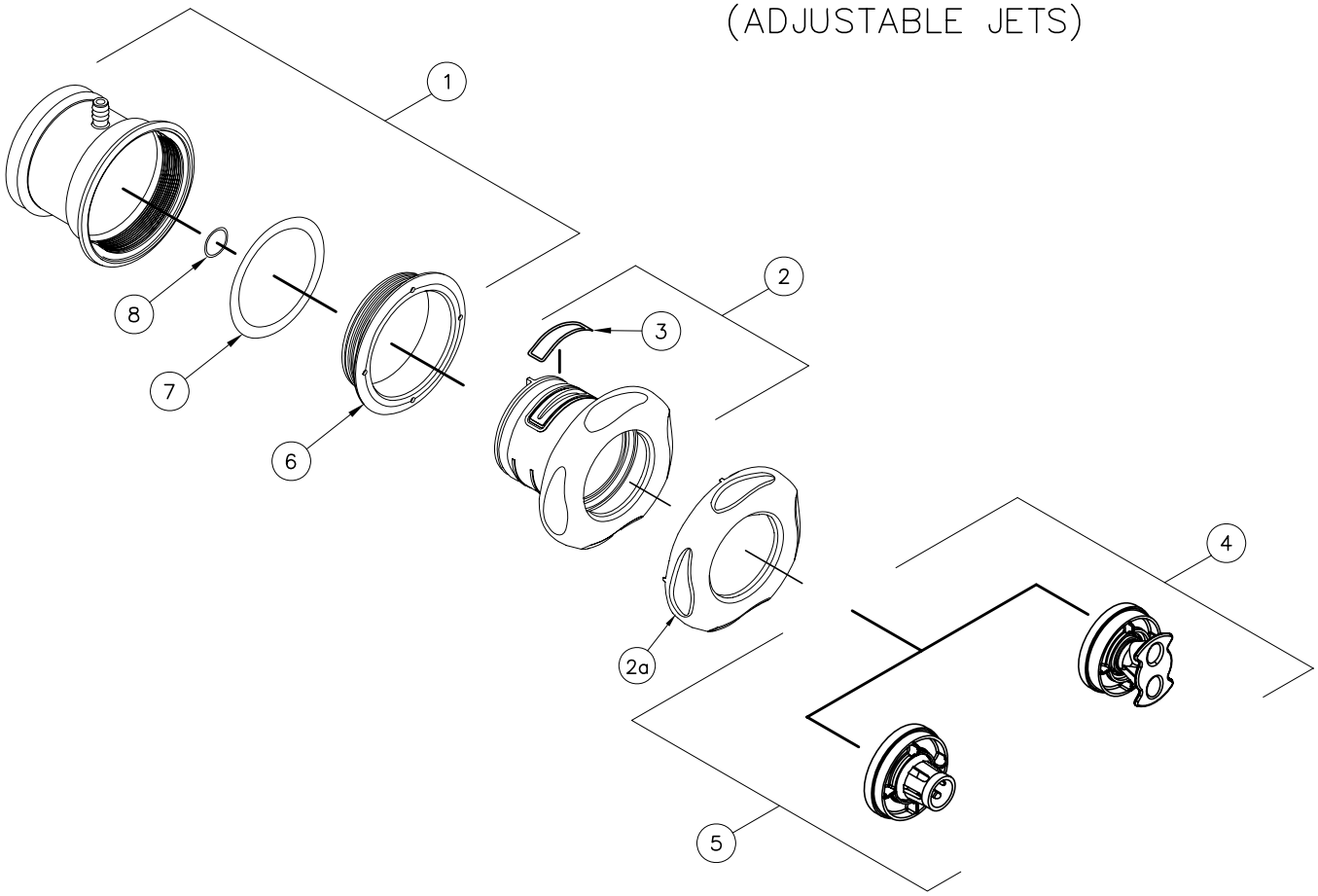
CHECK VALVE WATER
WITHOUT SPRING P/N 71980
CHECK VALVE WATER
WITH SPRING P/N 71981



CHECK VALVE, AIR
Pre 2001: P/N 70289

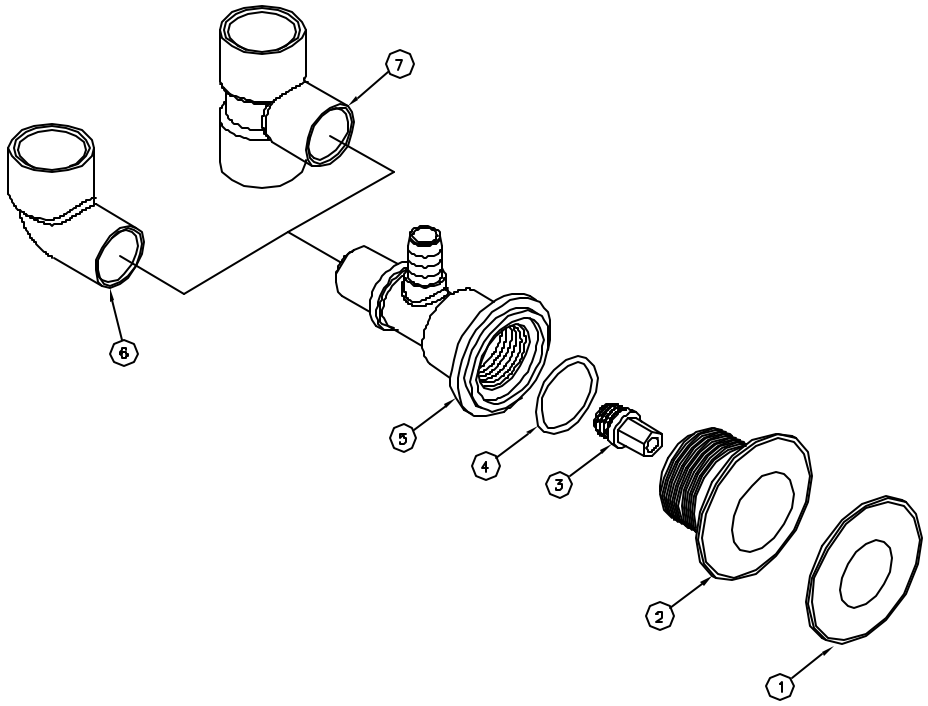
HYDROMASSAGE JETS, 1998 – CURRENT

(ADJUSTABLE JETS)



ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	Kit, Wallfitting, Adj Rotary Jet	ALL	71361
2	Adj Rotary Jet Face, TR Gray	ALL 181001 – 4H9999	71365
2a	Adj Rotary Jet Face w/ Escutcheon, C. Gray	ALL 1J1001 – Current	73900
3	Gasket, Adj Rotary Jet	ALL	36534
4	Kit, Rotary Jet Gray	ALL 181001 – Current	71690
5	Kit, Directional Jet Gray	ALL 181001 – Current	71692
6	Wallfitting Front, Adj Jet	ALL	35977
7	O–Ring, Front Wallfitting Adj Jet	ALL	35988
8	O–Ring, Adj Jet (small)	ALL	35986

PRECISION JETS



ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	Face, Minijet, Grey	LE, ME, NE 171001 – 2E9999	37495
2	Wallfitting, Front, Grey, Minijet	LE, ME, NE 171001 – 2E9999	36174
3	Orifice, Minijet, White	LE, ME, NE 171001 – 2E9999	36100
4	O–Ring, Minijet, White	LE, ME, NE 171001 – 2E9999	37112
5	Wallfitting, Rear, Minijet	LE, ME, NE 171001 – 2E9999	36057
6	Ell, Minijet	LE, ME, NE 171001 – 2E9999	36159
7	Tee, Minijet	LE, ME, NE 171001 – 2E9999	36160

* PRECISION JET REMOVAL TOOL (PN 72618) IS REQUIRED TO SERVICE THE WALLFITTING

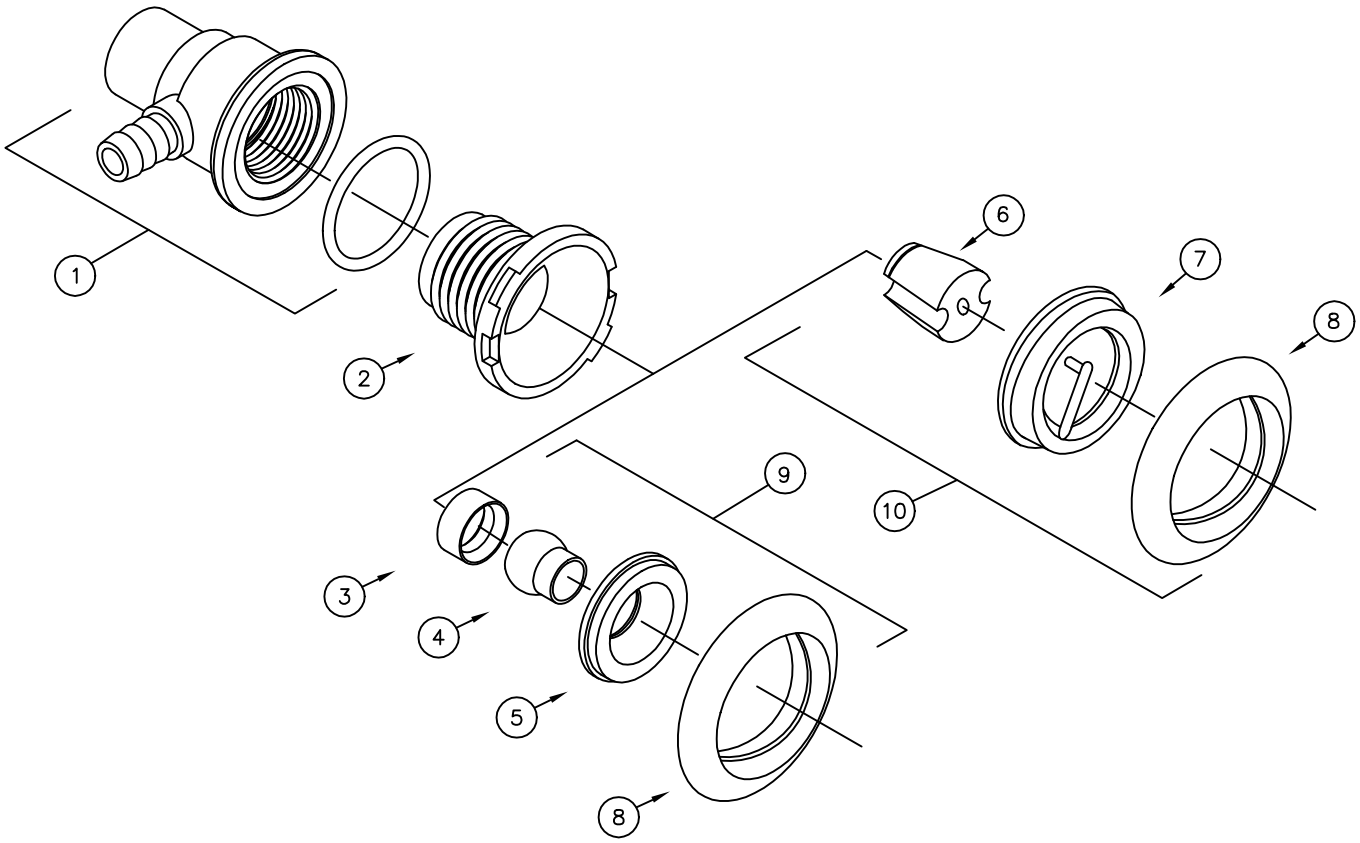
12/03 TIGER RIVER (50 HZ) 0655501N.dwg

FOR INTERNAL USE ONLY:
HSS, TR, HSS(E), TR(E), HS, HS(E), SOL, SOL(E)

PRECISION JETS

(MINI–JET ASSEMBLY)

2003 THIRD QUARTER TO 2005

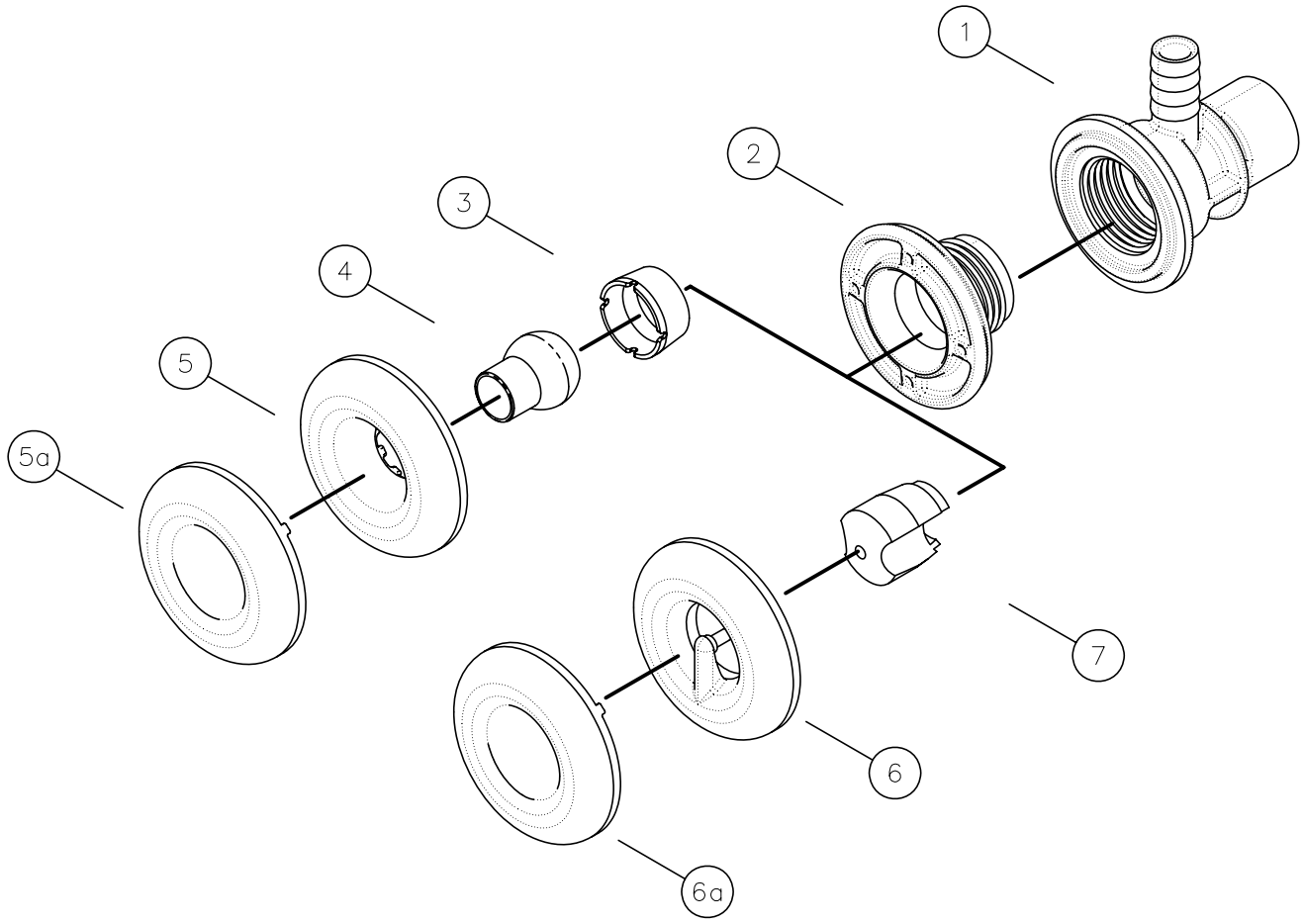


ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	KIT, MINI JET BODY	ALL 3E1001 – 4G9999	72981
2	KIT, WALL FITTING, MINI JET C.GRY	ALL 3E1001 – 4G9999	72983
3	KIT, RING SEAT, MINI JET	ALL 3E1001 – 4G9999	72984
4	KIT, EYEBALL, MINI JET C.GRY	ALL 3E1001 – 4G9999	72985
5	KIT, EYE RETAIN, MINI JET C.GRY	ALL 3E1001 – 4G9999	72986
6	KIT, ROTARY, MINI JET C.GRY	ALL 3E1001 – 4G9999	73273
7	KIT, ROTARY RETAIN, MINI JET C.GRY	ALL 3E1001 – 4G9999	73274
8	KIT, FACE, MINI JET C.GRY	ALL 3E1001 – 4G9999	72987
9	KIT, DIRECT, MINI JET ASSY C.GRY	ALL 3E1001 – 4G9999	73290
10	KIT, ROTARY, MINI JET ASSY C.GRY	ALL 3E1001 – 4G9999	73289
*	C.GRY = COOL GRAY		

PRECISION JETS

(Mini Jet Assembly)

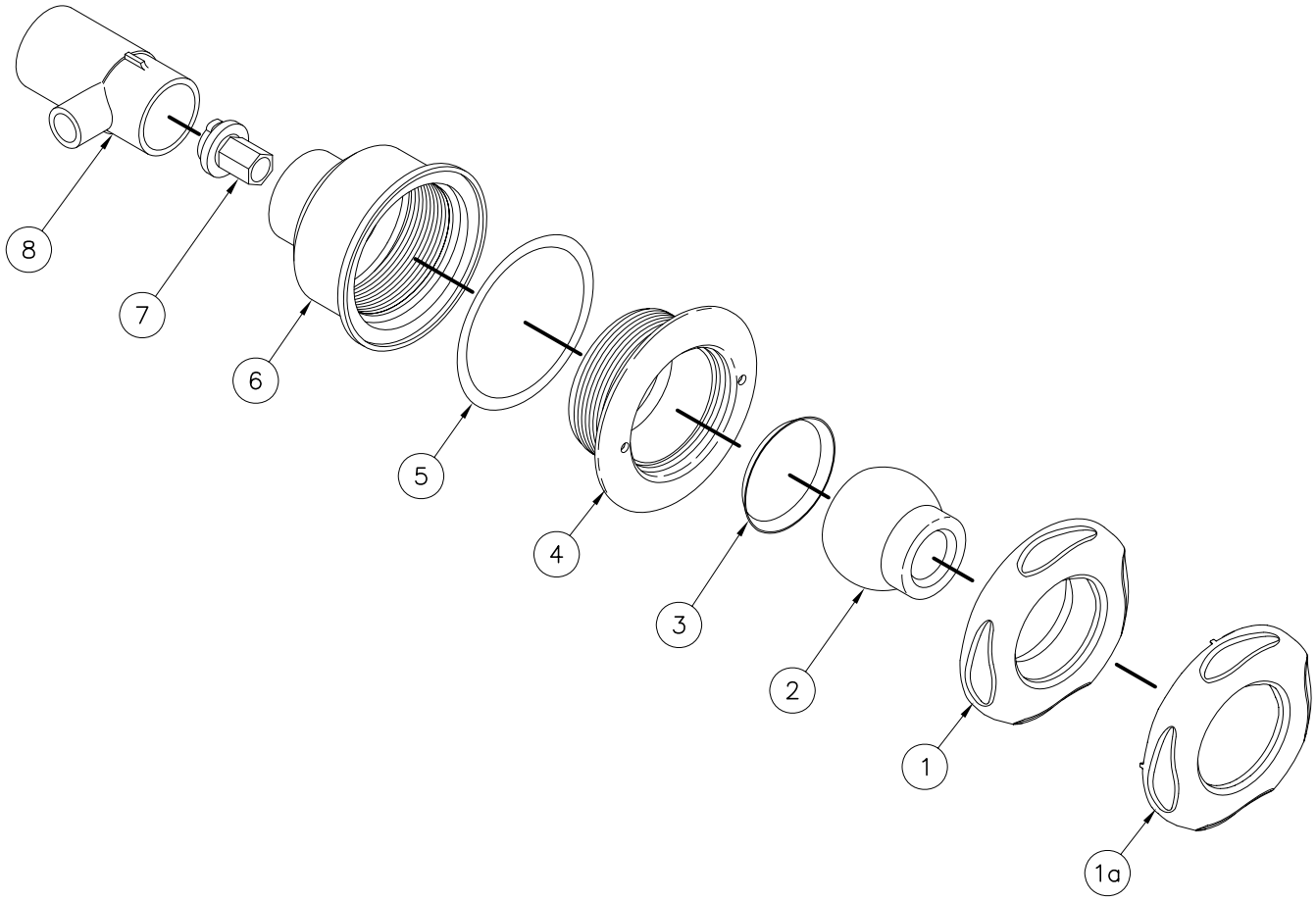
2006 – CURRENT



ITEM	DESCRIPTION	SERIAL NO. USED	P/N
1	KIT, JET BODY 250 Dia '06 (White)	ALL 1H1001 – CURRENT	73848
2	KIT, WLLFTG, '06	ALL 1H1001 – CURRENT	73842
3	KIT, MINIJET EYEBALL SEAT	ALL 1H1001 – CURRENT	73913
4	KIT, MINIJET EYEBALL	ALL 1H1001 – CURRENT	73910
5	KIT, MINIJET FACE	ALL 1H1001 – 4H9999	73840
5a	KIT, MINIJET FACE W/ ESCUTCHEON, C. GRY	ALL 1J1001 – CURRENT	73898
6	KIT, MINIJET SPINNER FACE	ALL 1H1001 – 4H9999	73846
6a	KIT, MINIJET SPINNER FACE W/ ESCUTCHEON, C. GRY	ALL 1J1001 – CURRENT	73914
7	KIT, MINIJET SPINNER BODY	ALL 1H1001 – CURRENT	73917

JET, WATKINS – JETSTREAM, FIXED

1997 – CURRENT



ITEM	DESCRIPTION	SERIAL NO. USED	P/N
1	Face, Bezel, Jetstream, Gray	See Note	36763
1a	Face w/ Escutcheon, Jetstream, C. Gray	ALL 1J1001 – Current	73901
2	Eyeball Insert Assy, Gray	See Note	72725
3	Eyeball Seal Ring	See Note	32470
4	Wallfitting, Front	See Note	31987
5	O Ring	See Note	10437
6	Wallfitting, Rear	See Note	71126
7	Orifice	See Note	32397
8	Venturi Tee	See Note	32395

Note: This Jetstream was used in the following serial numbers:

ME, NE – 171001 – CURRENT
MME 1G1001 – CURRENT
LE 171001 – 4F9999
CHPE – 1F1001 – CURRENT
CPNE – 1E1001 – 4E9999

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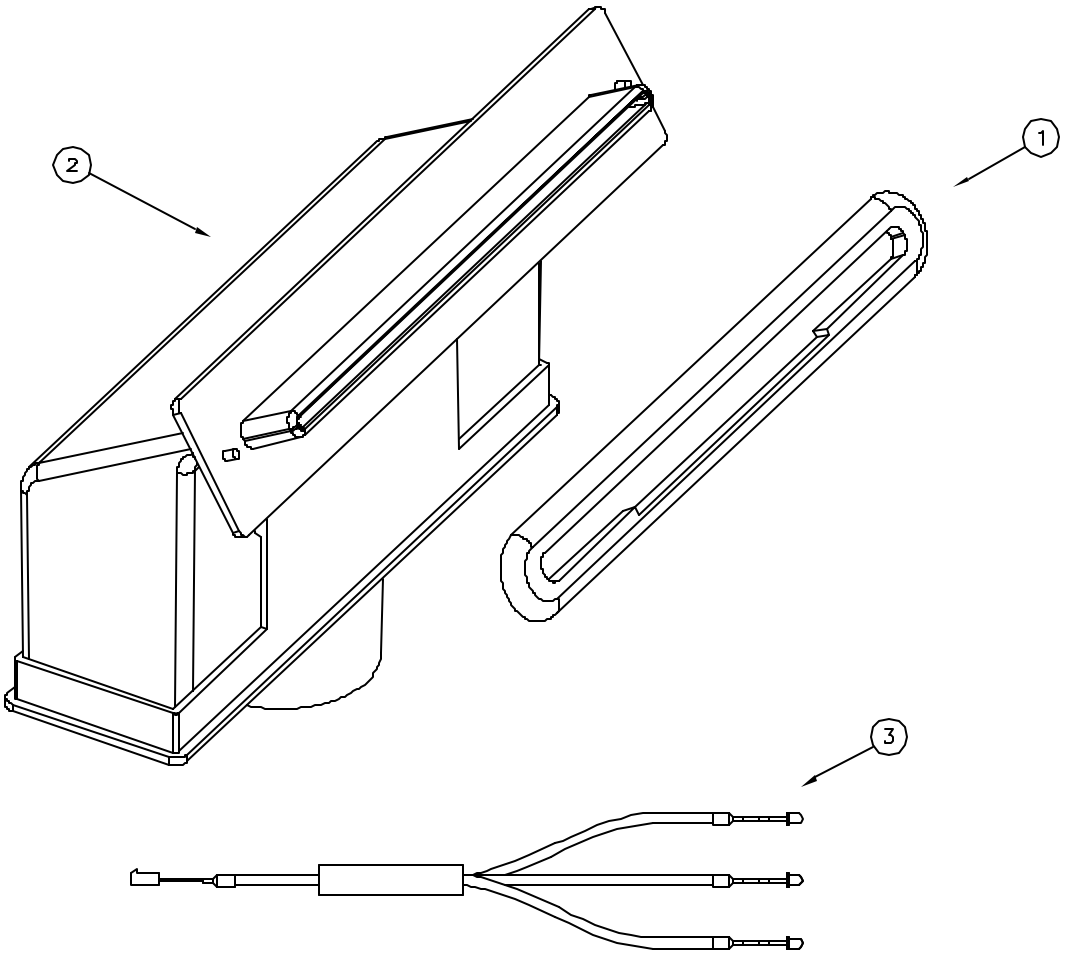
AMUR WATER FEATURE

(BARTOP WATERFALL)

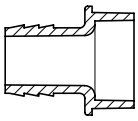
2004 – CURRENT



ITEM	DESCRIPTION	P/N
1	KIT, BEZEL, WATERFALL C.GRY	73315
2	KIT, BODY, WATERFALL	73317
3	KIT, LED HARNESS	73400

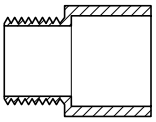
PLUMBING FITTINGS

BARBED ADAPTER (Slip x Barbed)



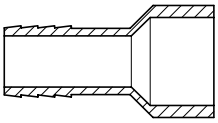
PART No.	SIZE
31218	1/2 x 1/2
31391	3/4 x 1/2
31417	3/4 x 3/4

MALE ADAPTER (Mipt x Slip)



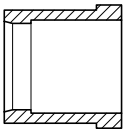
PART No.	SIZE
30671	1/2
32881	3/4
30672	1–1/2

BUSHING (Spig x Slip)



PART No.	SIZE
31556	1/4 x 1/4
31486	3/4 x 3/4

REDUCER BUSHING (Spig x Slip)



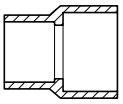
ALL BUSHINGS ARE FLUSH STYLE

PART No.	SIZE
30675	3/4 x 1/2
30676	1 x 1/2
30677	1 x 3/4
30678	1–1/4 x 3/4
31485	1–1/4 x 1
30679	1–1/2 x 1/2
30680	1–1/2 x 3/4
30681	1–1/2 x 1
30682	1–1/2 x 1–1/4
30683	2 x 1/2
30684	2 x 3/4
30685	2 x 1
31288	2 x 1–1/2

VINYL TUBING (IN 3' LENGTHS)

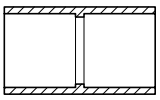
PART No.	SIZE	PART No.	SIZE
70318	1/4	70315	3/4
70317	3/8	70314	1
70316	1/2		

REDUCER COUPLING (Slip x Slip)



PART No.	SIZE
30666	3/4 x 1/2
30667	1 x 3/4

COUPLING (Slip x Slip)



PART No.	SIZE
30660	1/2
30661	3/4
30662	1
30663	1–1/4
30664	1–1/2
30665	2

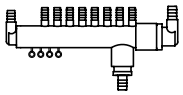
SPRING CLAMPS

PART No.	TYPE
31134	1/4
31228	1/2
300055	3/4

ADHESIVES

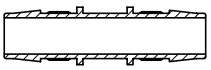
PART No.	TYPE
10080	PERMALITE

AIR MANIFOLD, 10–PORT



PART No.
72032

COUPLING (Barb x Barb)



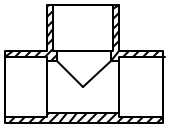
P/N	SIZE:
70382	1/4
70383	1/2
70384	3/4

HOSE FLEXIBLE (IN 3' LENGTHS)

PART No.	SIZE	PART No.	SIZE
70313	1/2	70310	1–1/4
70312	3/4	70309	1–1/2
70311	1	70308	2

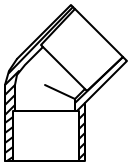
PLUMBING FITTINGS

TEE (Slip x Slip x Slip)



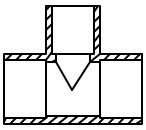
PART No.	SIZE
30626	1/2
30627	1
30628	1-1/2

45° ELL (Slip x Slip)



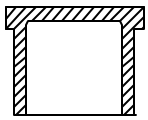
PART No.	SIZE
30655	1/2
30656	3/4
30657	1
30658	1-1/4
30659	1-1/2
32467	2

REDUCING TEE (Slip x Slip x Slip)



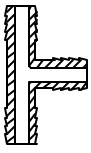
PART No.	SIZE
30629	3/4 x 3/4 x 1
30630	1 x 3/4 x 3/4
30631	1 x 1 x 1/2
30632	1 x 1 x 3/4
30633	1 x 1 x 1-1/4
30634	1 x 1 x 1-1/2
30635	1-1/2 x 1-1/2 x 1/2
30636	1-1/2 x 1-1/2 x 3/4
31574	1-1/2 x 1-1/2 x 1
30637	2 x 2 x 1/2
30638	2 x 2 x 1
30639	2 x 2 x 1-1/2
35076	1-1/2 x 1-1/2 x 2

PLUG (Spig)



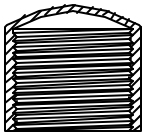
PART No.	SIZE
30696	1/2
30697	3/4
30698	1
30699	1-1/2

TEE (Barb x Barb x Barb)



PART No.	SIZE
31193	1/4 x 1/4 x 1/4
30611	1/2 x 1/2 x 1/4
31487	1/2 x 1/2 x 1/2

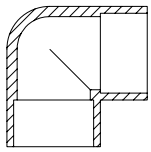
CAP (Fipt)



PART No.	SIZE
30693	1-1/2

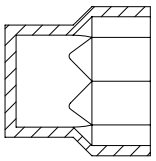
PLUMBING FITTINGS

90° ELL (Slip x Slip)



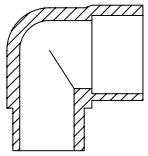
PART NO.	SIZE
30641	3/8
30642	1/2
30643	3/4
30644	1
30645	1–1/2
31932	2

Manifold (6–Port)



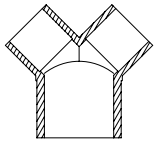
PART NO.	SIZE
38087	1–1/2 X 1/2
30696	1/2 Plug

90° STREET ELL (Spig x Slip)



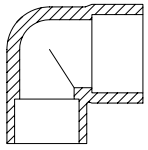
PART NO.	SIZE
30649	1/2
30650	3/4
30651	1
30652	1–1/2

WYE (Spig x Slip x Slip)



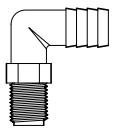
PART NO.	SIZE:
34459	1–1/2 x 1 x 1

90° REDUCER ELL (Slip x Slip)



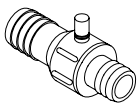
PART NO.	SIZE
31401	2 x 1–1/2
33021	1–1/4 x 1
300843	3/4 x 1/2

ADAPTER, BARBED ELL



PART NO.	SIZE
39438	1/2

BLEEDLINE COUPLING ASSY



PART NO.
72726

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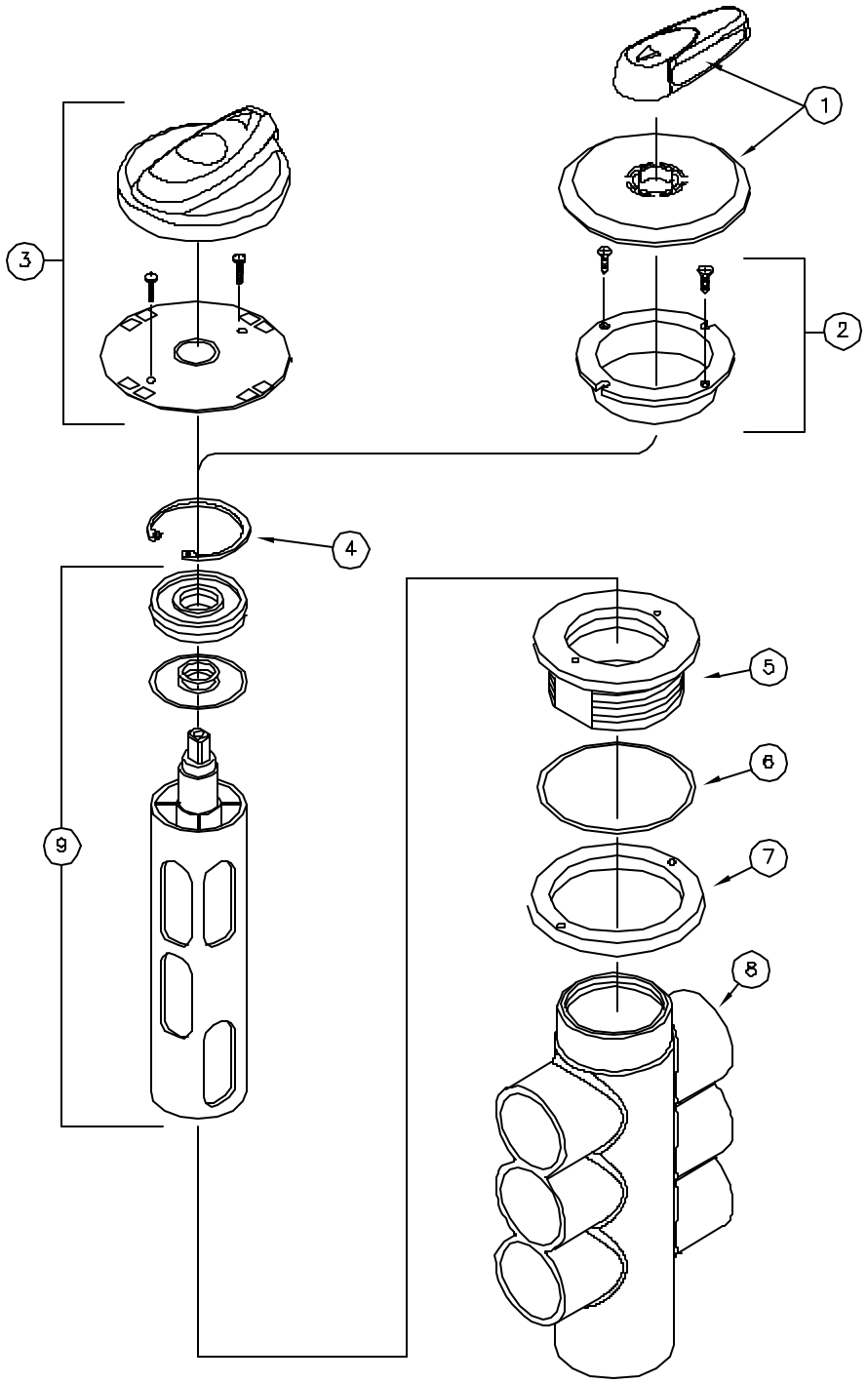
4–POSITION DIVERTER VALVE ASSY

1998 – 2003



04/04

TIGER RIVER (50 Hz)

0712101G.dwg

FOR INTERNAL USE ONLY:
HSS, TR, HSS(E), TR(E)

4-POSITION DIVERTER VALVE ASSY

1998 - 2003

ITEM	DESCRIPTION	P/N
1	Kit, Lever Bezel, grey	71608
2	Kit, Diverter Retrofit	71799
3	Bezel, Lever, Screw	*
4	Snap Ring	34350
5	Collar	34308
6	O-Ring (238) (or Silicone Adhesive RTV)	34319
7	Nut	34309
8	Body	37297
9	Valve Kit	71495
**	Snap Ring Tool	70825

* NOTE: Replace the 1998 style lever and bezel (Item 3) with the 1999 style. Order Item 1 which contains both the 1999 style bezel and lever. Also order the diverter retrofit kit (Item 2).
** Non-Illustrated Part.

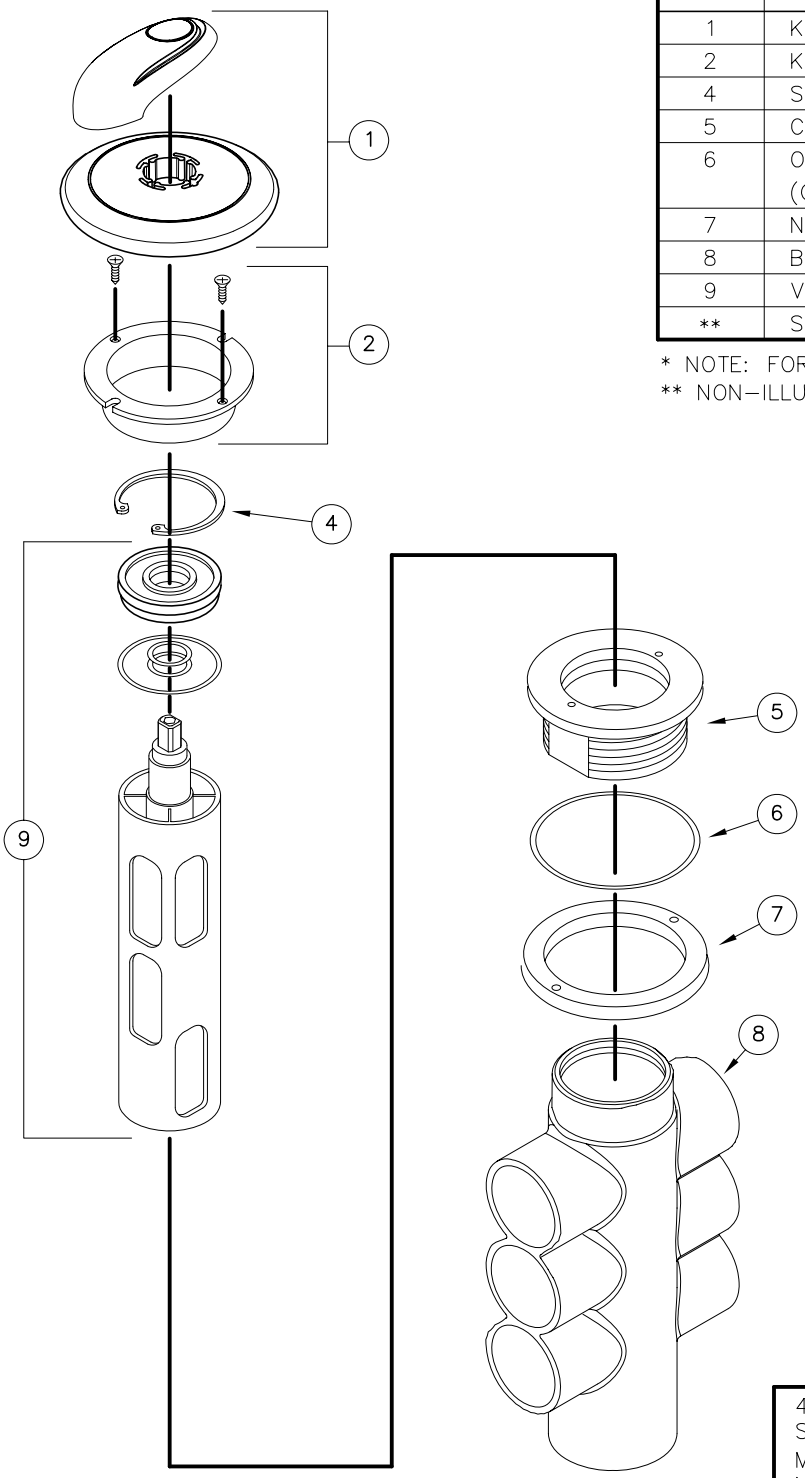
This 4 position diverter valve is used on spas with the following serial numbers;
LE 181001 - 489999
LE 1A1001 - 4A9999
ME 181001 - 489999
ME 1A1001 - 4E9999

4–POSITION DIVERTER VALVE ASSEMBLY

2004 – CURRENT

ITEM	DESCRIPTION	P/N
1	KIT, LEVER BEZEL, C.GRY	73363
2	KIT, DIVERTER RETROFIT	71799*
4	SNAP RING	34350
5	COLLAR	34308
6	O–RING (238) (OR SILICONE ADHESIVE RTV)	34319
7	NUT	34309
8	BODY	37297
9	VALVE KIT	71495
**	SNAP RING TOOL	70825

* NOTE: FOR 2003 AND EARLIER SPAS.
** NON–ILLUSTRATED PART



4 POSITION DIVERTER VALVE IS USED ON SPAS WITH THE FOLLOWING SERIAL NUMBERS:
ME 1F1001 – CURRENT
MME 1G1001 – 2H9999

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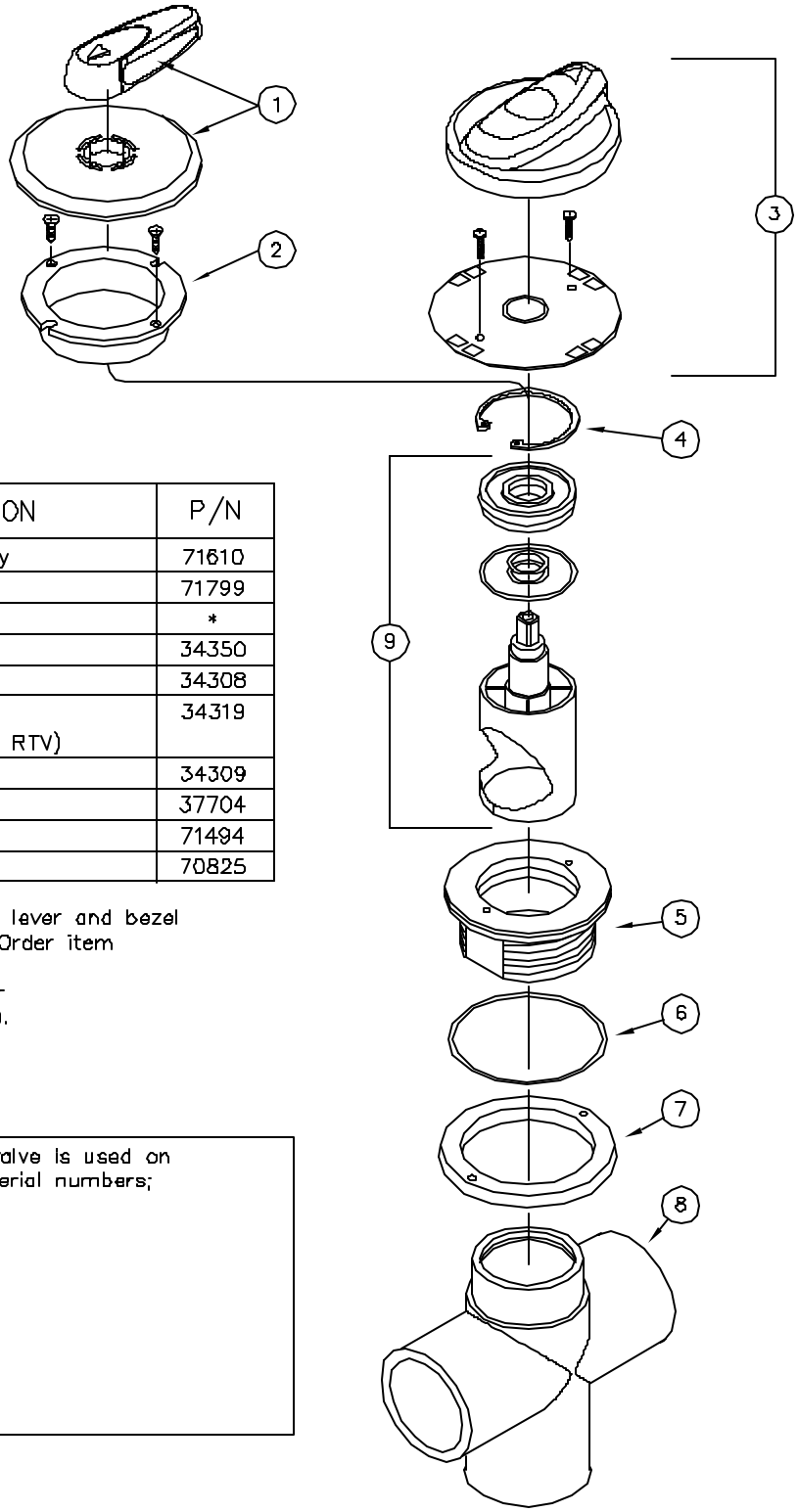
2–POSITION DIVERTER VALVE ASSY

1998 – 2003



ITEM	DESCRIPTION	P/N
1B	Kit, Lever Bezel, grey	71610
2	Kit, Diverter Retrofit	71799
3	Lever and Bezel	*
4	Snap Ring	34350
5	Collar	34308
6	O–Ring (238) (or Silicone Adhesive RTV)	34319
7	Nut	34309
8	Body	37704
9	Valve Kit	71494
**	Snap Ring Tool	70825

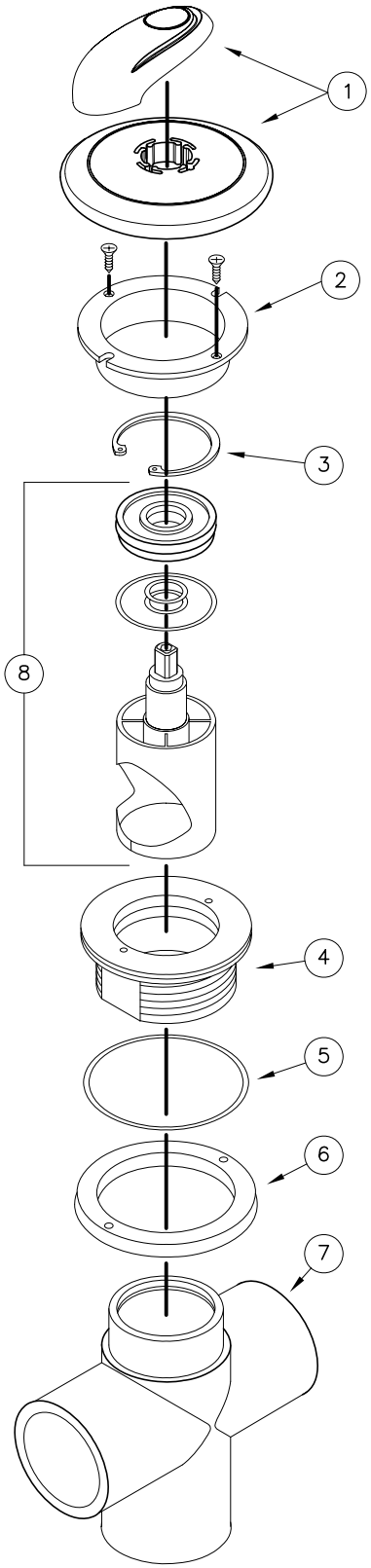
* NOTE: Replace the 1998 style lever and bezel (item 3) with the 1999 style. Order item 1 which contains both the 1999 style bezel and lever. Also order the diverter retrofit kit (item 2).
** Non–Illustrated Part.

This 2 position diverter valve is used on spas with the following serial numbers;

NE 181001 – 489999
NE 1A1001 – 4E9999
LE 1B1001 – 4E9999
CPNE 1E1001 – 4E9999

2–POSITION DIVERTER VALVE ASSEMBLY

2004 – CURRENT



ITEM	DESCRIPTION	P/N
1	KIT, LEVER BEZEL, C.GRY	73360
2	KIT, DIVERTER RETROFIT	71799*
3	SNAP RING	34350
4	COLLAR	34308
5	O–RING (238) (OR SILICONE ADHESIVE RTV)	34319
6	NUT	34309
7	BODY	37704
8	VALVE KIT	71494
**	SNAP RING TOOL	70825

* NOTE: FOR 2003 AND EARLIER SPAS ONLY.

** NON–ILLUSTRATED PART

2 POSITION DIVERTER VALVE IS USED ON SPAS WITH THE FOLLOWING SERIAL NUMBERS:

CHPE, NE 1F1001 – CURRENT
LE 1F1001 – 4F9999
ME 3H1001 – CURRENT

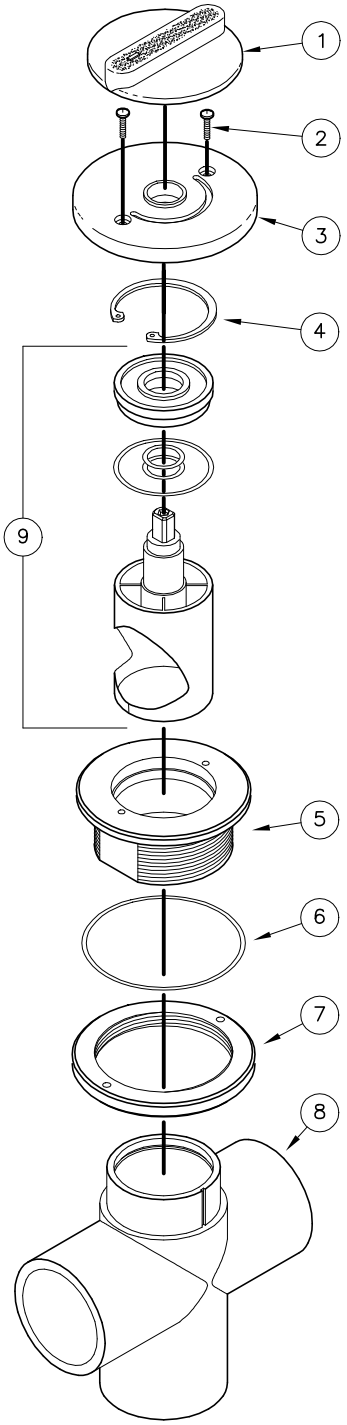
DIVERTER VALVE ASSEMBLY

1994 – 1997

ITEM	DESCRIPTION	P/N
1	Knob 2" Diverter TR	35104*
2	Screw	33850
3	Bezel 2" Diverter TR	35105
4	Snap Ring	34350
5	Collar	34308
6	O–Ring (238) (or Silicone Adhesive RTV)	34319
7	Nut	34309
8	Body	37704
9	Valve Kit	70849
**	Snap Ring Tool	70825

* SERVICE NOTE: When replacing a knob, (P/N 35104), on a 1994 Model Spa, (Serial Numbers 141001 to 449999), the bezel, (P/N 35105), must also be replaced.

** Non–Illustrated Part.



THIS DIVERTER WAS USED IN THE FOLLOWING SERIAL NUMBERS:

LX 171001 – 479999
MX 171001 – 479999
MX 171001 – 449999

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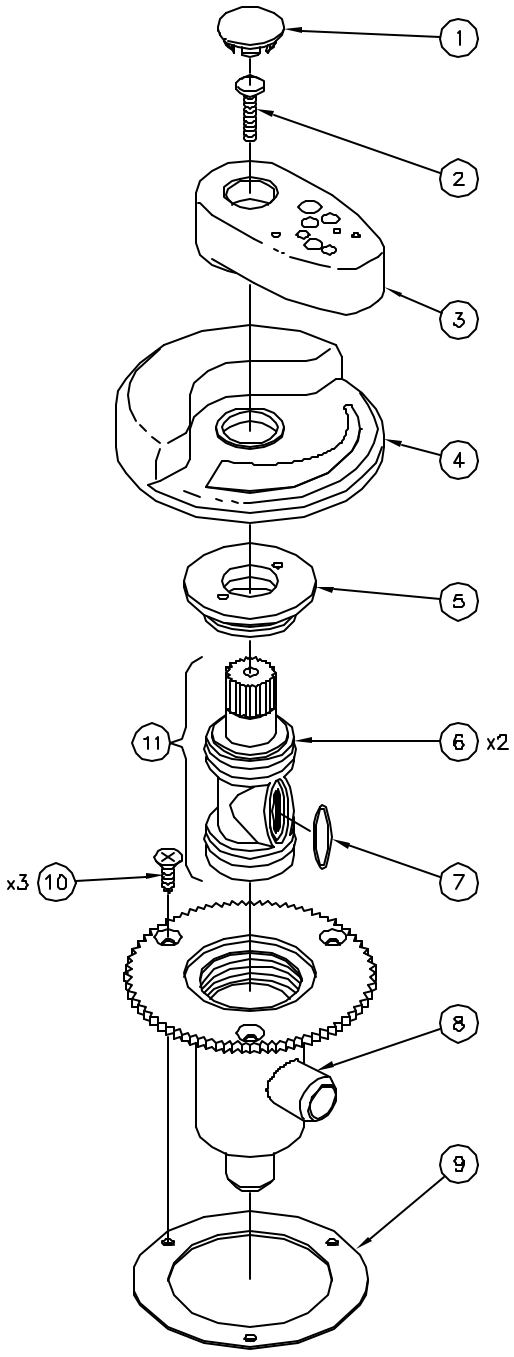
AIR CONTROL VALVE

1998 – 2003



ITEM	DESCRIPTION	PART NO.
1	CAP, DARK GREY, QUARITE 1998	37499
2	SCREW	33850
3	LEVER, AIRVALVE, GREY	36209
4	BEZEL, AIRVALVE, GREY	36505
5	STOPPER	33836
6	O-RING	33832
7	O-RING	33831
8	BODY	33838
9	GASKET	33830
10	SCREW	34173
11	PISTON W/O-RINGS	70442
**	SPANNER WRENCH	50554

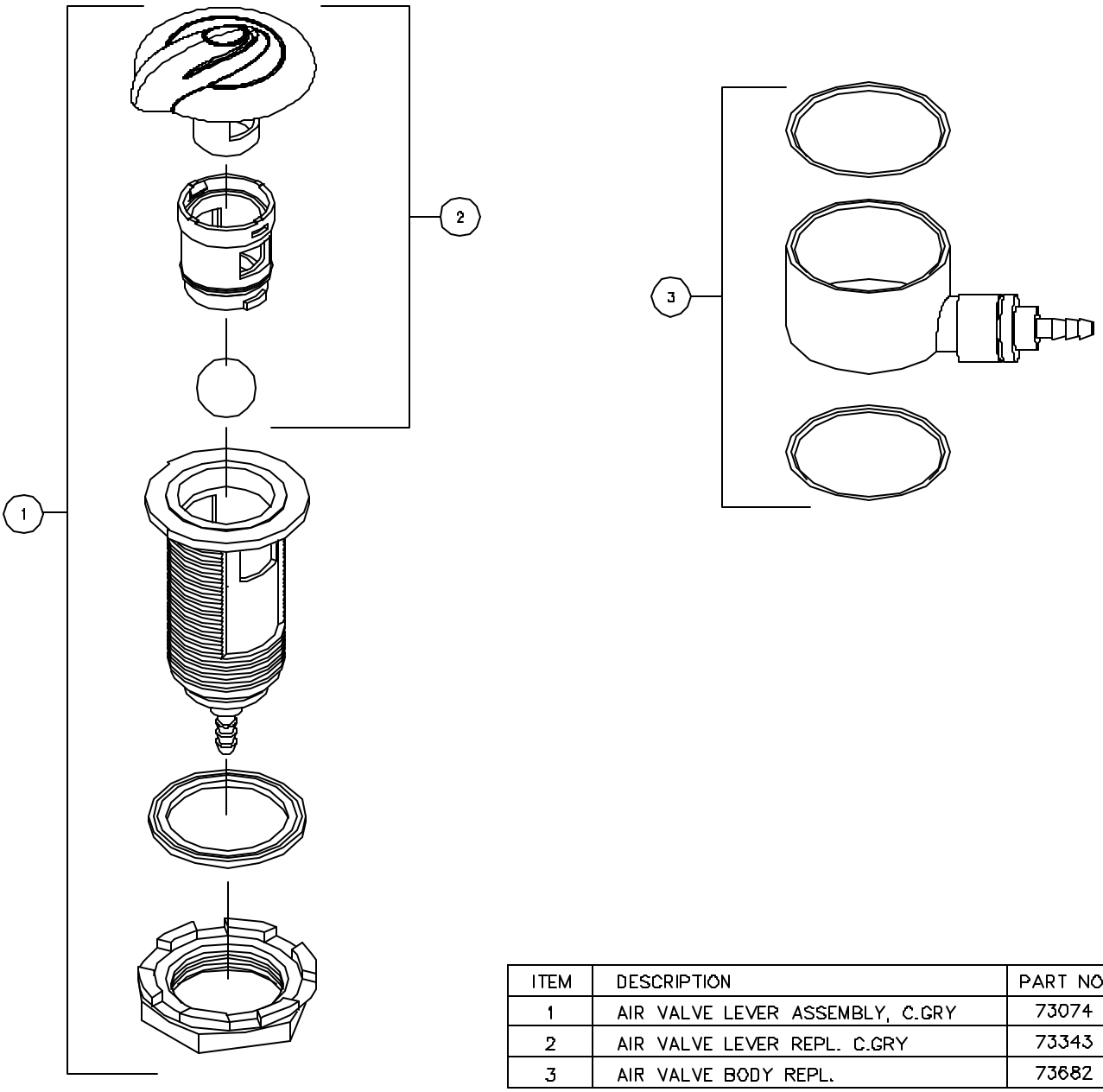
** THIS IS A SPECIAL SPANNER TOOL REQUIRED TO REMOVE THE STOPPER.

* THIS AIR CONTROL VALVE WAS USED WITH THE FOLLOWING SERIAL NUMBERS:

LE 1A1001 – 4E9999
ME 1A1001 – 4E9999
NE 1A1001 – 4E9999
CPNE 1E1001 – 4E9999

AIR CONTROL VALVE

2004 – 2005

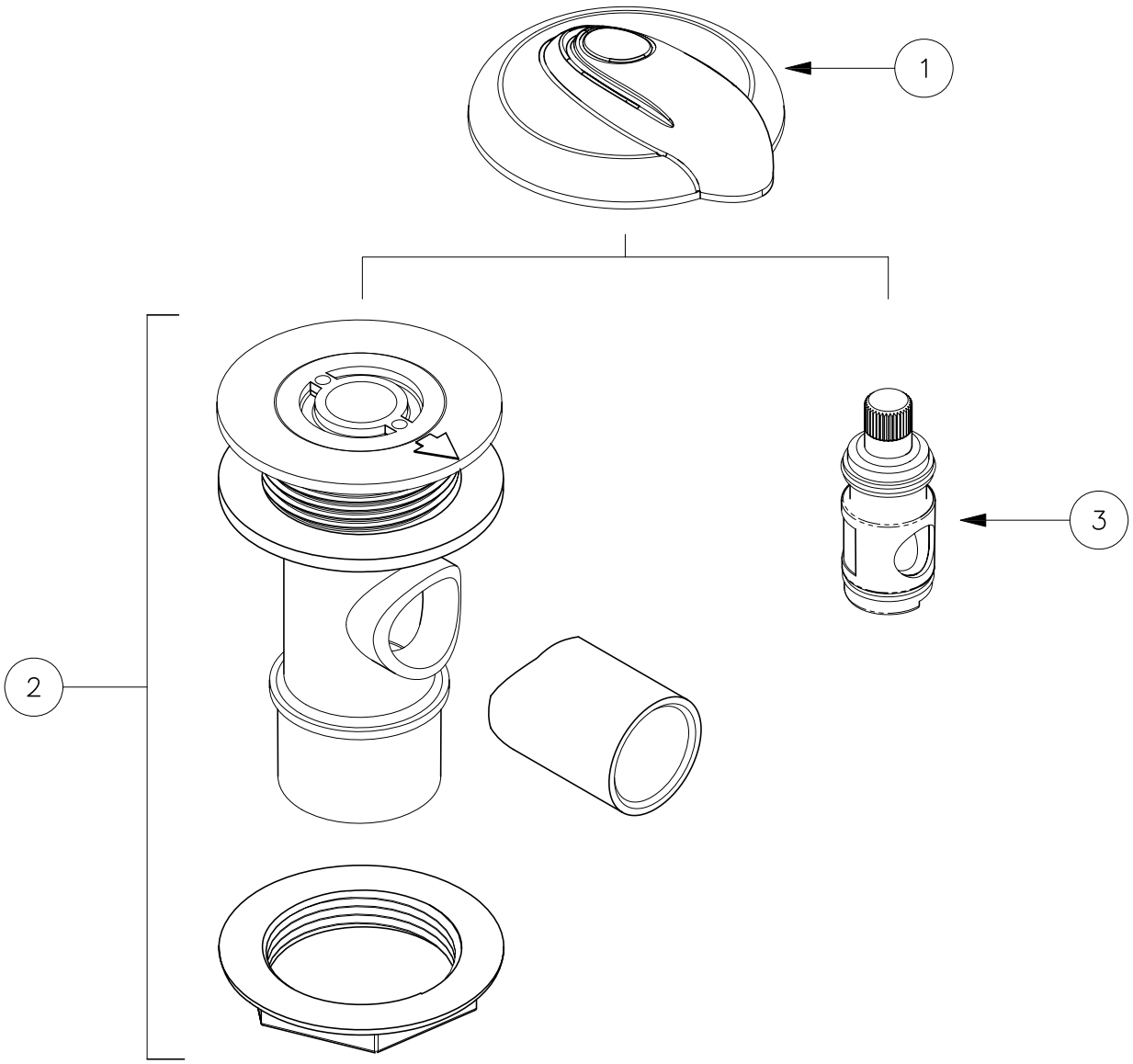


ITEM	DESCRIPTION	PART NO.
1	AIR VALVE LEVER ASSEMBLY, C.GRY	73074
2	AIR VALVE LEVER REPL. C.GRY	73343
3	AIR VALVE BODY REPL.	73682

Used in the following serial numbers:
CHPE1F1001 – 3G1024
ME1F1001 – 3G1047
NE1F1001 – 3G1055

AIR CONTROL VALVE

2006 – CURR



ITEM	DESCRIPTION	P/N
1a	KIT, AIR CONTROL LEVER, CG	73804
1b	KIT, AIR CONTROL LEVER, WG	73997
2	KIT, AIR CONTROL VALVE	73919
3	KIT, AIR CONTROL PISTON	73916

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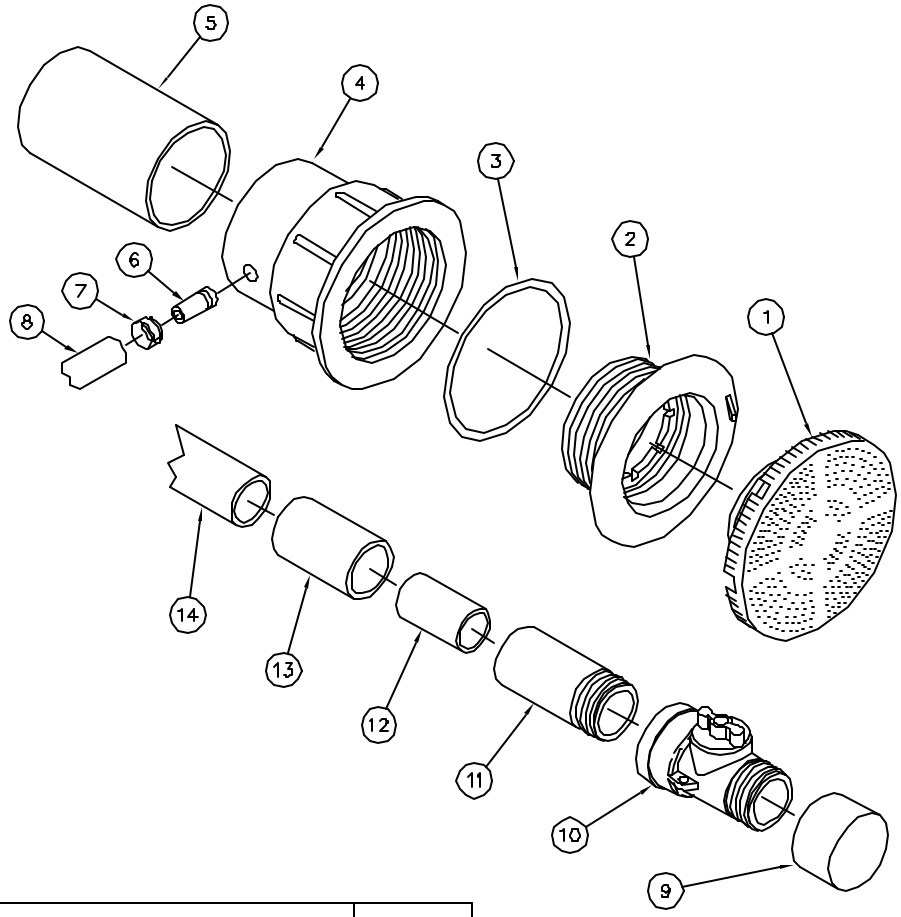
DRAIN ASSEMBLY

2001 – 2003, 2004 – CURRENT



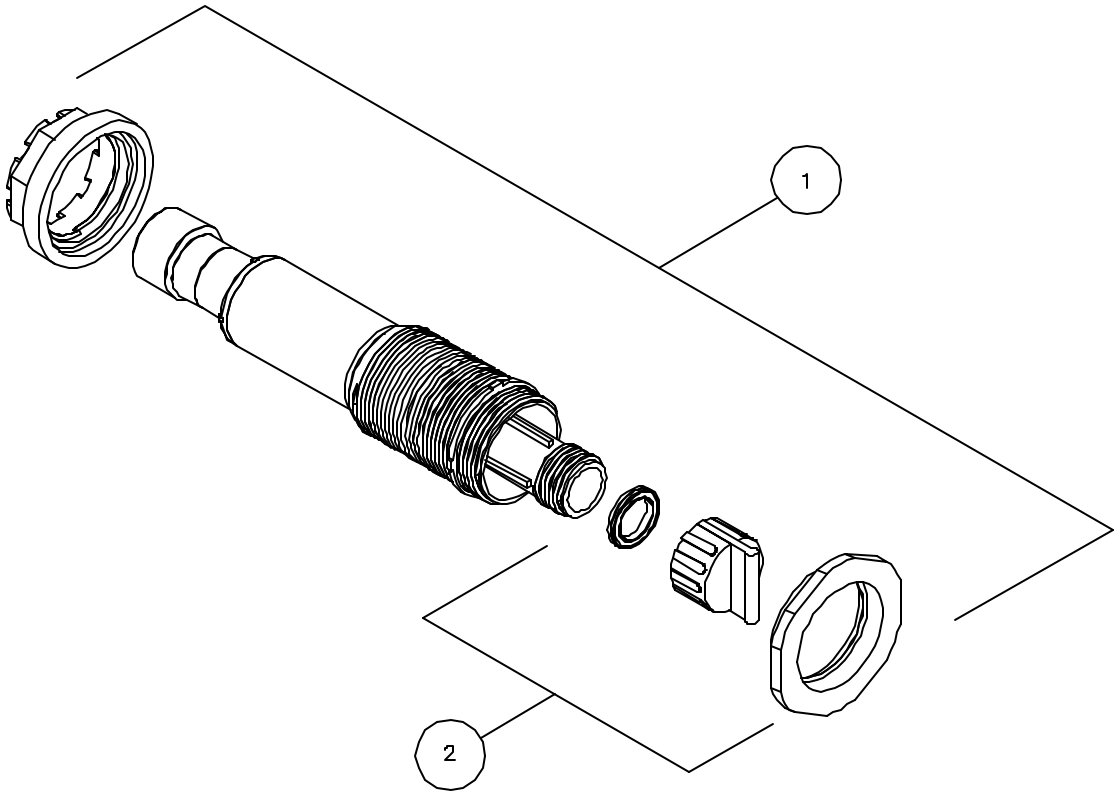
ITEM	DESCRIPTION	P/N
1	Screen	33727
2	Wallfitting, Front	33728
3	O-Ring	30482
4	Wallfitting, Rear	33729
5	Tubing, PVC Flex Pipe 1 – 1/2"	70309
6	Bleedline Nipple	30598
7	Clamp, 1/4"	31134
8	Tubing, Vinyl 1/4"	70318
9	Cap	30700
10	Drain Valve	30592
11	Drain Adapter	30703
12	Adapter, 3/4"	70346
13	Coupler, 3/4"	30661
14	Tubing, PVC Flex 3/4"	70312
*	Safety Suction Filter Screen	35463

* Non-Illustrated Part

Use parts 9–14 according to following matrix
All models 2001 – 2003
CHPE4F1005 – CURRENT
ME4F1044 – CURRENT
NE4F1043 – CURRENT

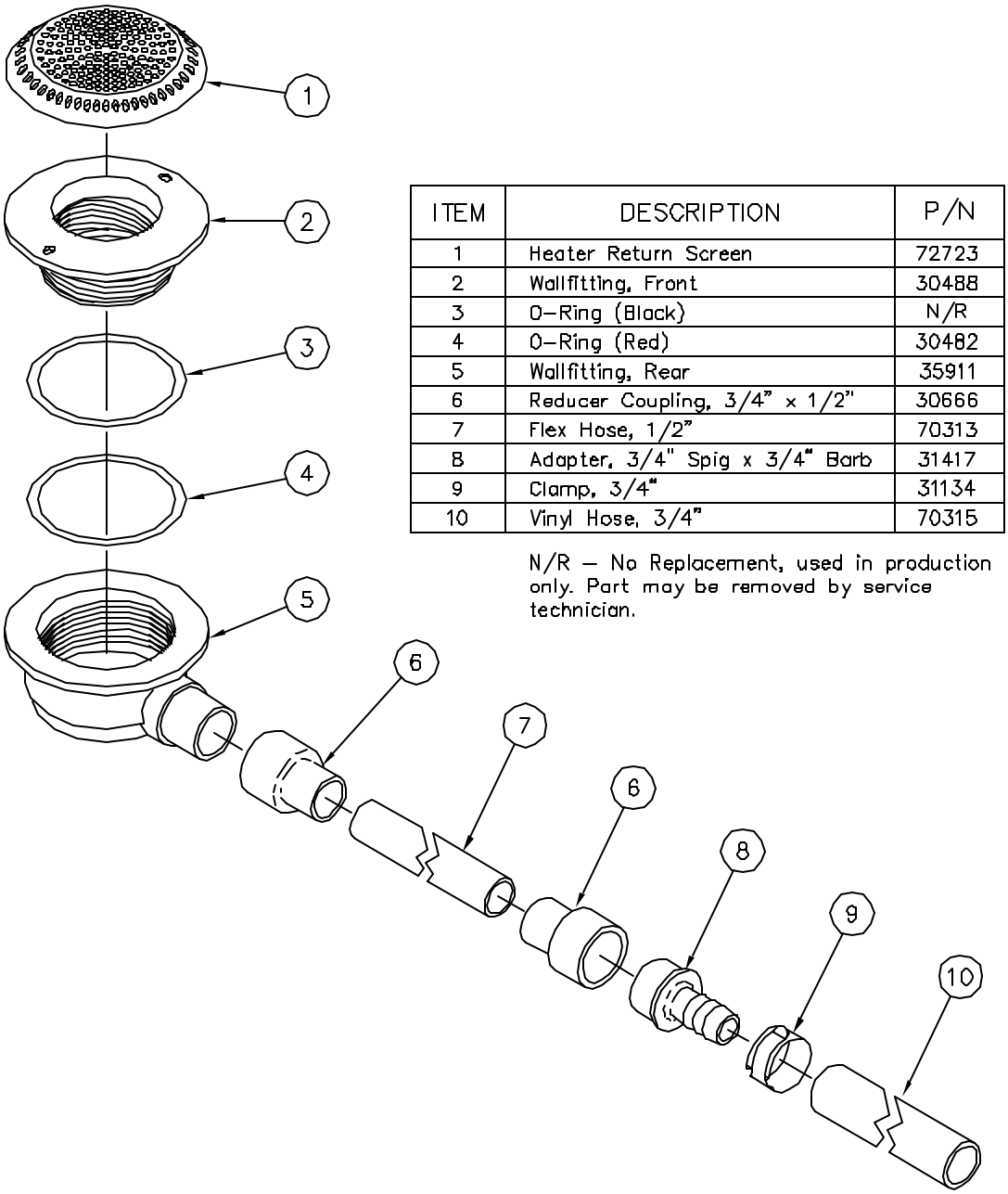
DRAIN ASSEMBLY

2004



ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	KIT, DRAIN VALVE ASSEMBLY	ALL 1F1001 – CHPE4F1004 – ME4F1043 – NE4F1042	73299
2	KIT, CAP, DRAIN VALVE ASSEMBLY	ALL 1F1001 – CHPE4F1004 – ME4F1043 – NE4F1042	73298

HEATER RETURN ASSEMBLY

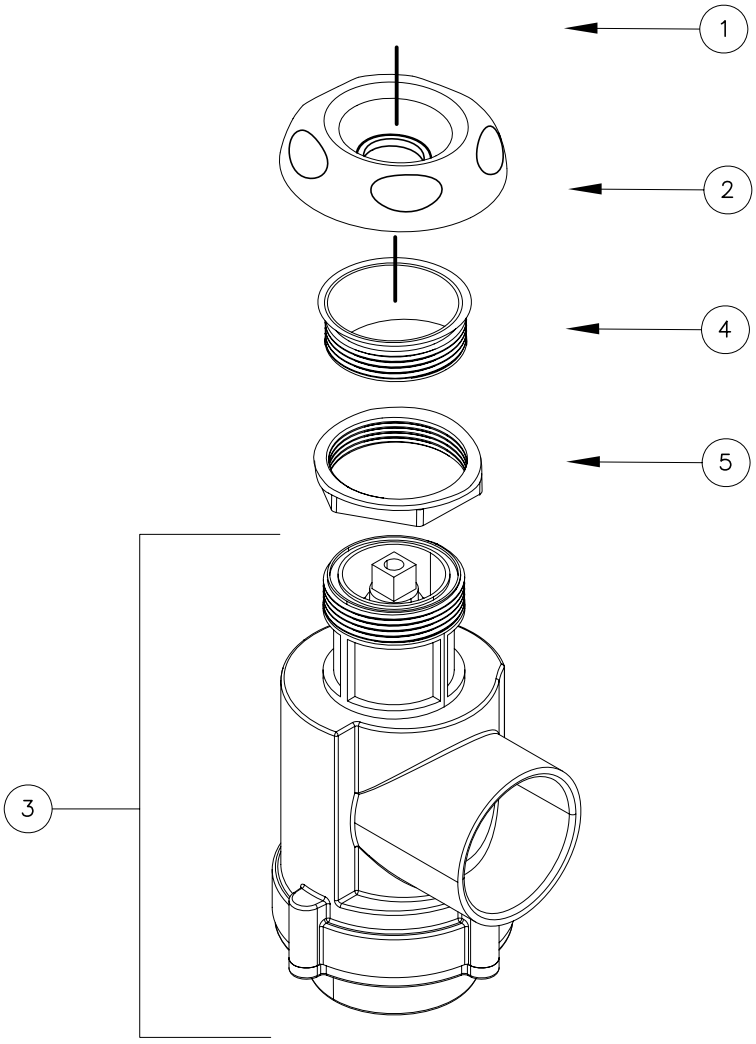


ITEM	DESCRIPTION	P/N
1	Heater Return Screen	72723
2	Wallfitting, Front	30488
3	O-Ring (Black)	N/R
4	O-Ring (Red)	30482
5	Wallfitting, Rear	35911
6	Reducer Coupling, 3/4" x 1/2"	30666
7	Flex Hose, 1/2"	70313
8	Adapter, 3/4" Spig x 3/4" Barb	31417
9	Clamp, 3/4"	31134
10	Vinyl Hose, 3/4"	70315

N/R – No Replacement, used in production only. Part may be removed by service technician.

WATER FEATURE ON/OFF VALVE

2004 – CURRENT



THIS VALVE IS USED IN SPAS WITH THE BARTOP WATER FEATURE

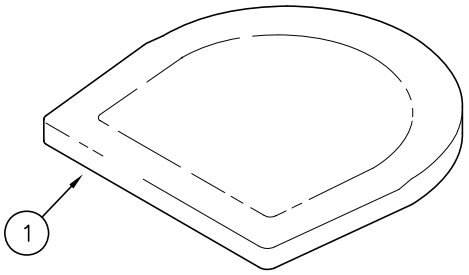
ITEM	DESCRIPTION	PART NO.
1A	KIT, ON/ OFF VALVE HANDLE C.GRY	73316
1B	KIT, ON/ OFF VALVE HANDLE W.GRY	73327
2A	KIT, BEZEL, ON/ OFF VALVE C.GRY	73352
2B	KIT, BEZEL, ON/ OFF VALVE W.GRY	73353
3	KIT, ON/ OFF VALVE 1.5	73350
4A	KIT, ON/ OFF COLLAR C.GRY	73626
4B	KIT, ON/ OFF COLLAR W.GRY	73627
5	KIT, NUT, ON/ OFF VALVE	74149
*	KIT, O'RING ON/OFF VALVE	73483
*	KIT, O'RING 10 PACK	73484

Section IV:

Filter Compartment

50 Hz Exploded Illustrations

FILTER LIDS

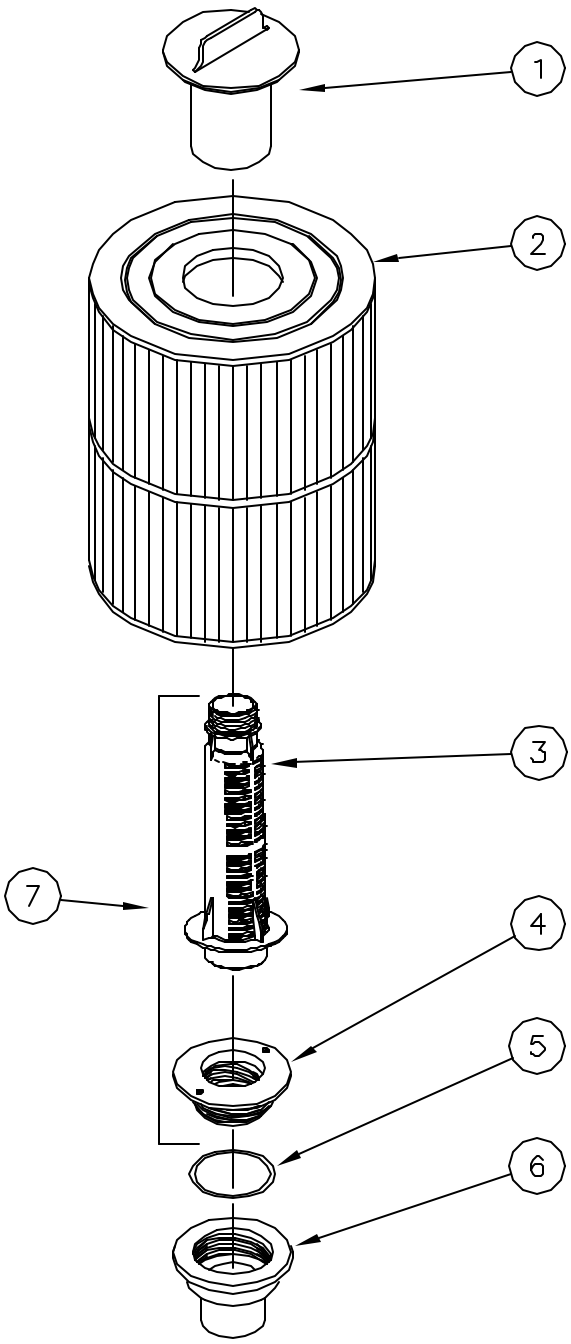


ITEM	DESCRIPTION	SERIAL NUMBERS	PART NO.
1A	FILTER LID, JADE 98	LE, NE 181001 – 4A1002 ME 181001 – 4A1009	71917
1B	FILTER LID, SAHARA 98	LE 181001 – 4A9999 ME 181001 – 4C9999 NE 181001 –1D1004	71640
1C	FILTER LID, BLUE 99	LE 1A1001 – 4A9999 ME, NE 1A1001 – 1C1002	71639
1D	FILTER LID, BLUE 01	ME 1C1003 – 4C9999 NE 1C1003 – CURRENT	72059
1E	FILTER LID, TEAL	LE 4A1003 – 4A9999 ME 4A1010 – 4C9999 NE 4A1003 – 4D9999	71638
1F	FILTER LID, JADE 02	ME 1D1001 – 4D9999	72449
1G	FILTER LID, JADE 03	ME 1E1001 – CURRENT CPNE 1E1001 – 4E9999 CHPE 1F1001 – CURRENT	72783
1H	FILTER LID, BLUE 02	ME 1D1001 – CURRENT CPNE 1E1001 – 4E9999 CHPE 1F1001 – CURRENT	72450
1J	FILTER LID, SAND 02	LE, NE 181001 – 4A1002 CPNE 1E1001 – 4E9999 CHPE 1F1001 – CURRENT	72451
1K	FILTER LID, SILVER PEARL	ME, MME, CHPE 1G1001 – CURRENT	73548
*	FILTER LID, JADE 03	NE 1E1001 – CURRENT	72784
*	FILTER LID, SAND 02	NE 1D1005 – CURRENT	72559
*	FILTER LID, SILVER PEARL	NE 1G1001 – CURRENT	73549
*	FILTER LID, JADE 00	LE 1B1001 – 4D9999	71878
*	FILTER LID, JADE 03	LE 1E1001 – 4F9999	72782
*	FILTER LID, BLUE 00	LE 1B1001 – 4B9999	71877
*	FILTER LID, BLUE 01	LE 1C1001 – 4F9999	72058
*	FILTER LID, SAND 00	LE 1B1001 – 1D1016	72876
*	FILTER LID, SAND 02	LE 1D1017 – 4F9999	72558
*	FILTER LID, AZURITE	ME, CHPE 1H10001 – CURRENT	73824
*	FILTER LID, AZURITE	NE 1H10001 – CURRENT	73825
*	FILTER LID, STERLING WHITE MARBLE 07	NE 1J1001 – CURRENT	74146
*	FILTER LID, OCEAN WAVE 07	NE 1J1001 – CURRENT	74145
*	FILTER LID, STERLING WHITE MARBLE, 07	ME, CHPE 1J10001 – CURRENT	74144
*	FILTER LID, OCEAN WAVE 07	ME, CHPE 1J10001 – CURRENT	74143

* NON–ILLUSTRATED FILTER LID

FILTER COMPARTMENT ASSEMBLY

TOP LOADING



ITEM	DESCRIPTION	SERIAL NO.	PART NO.
1	Cap, Standpipe, 3-/12" (grey)	ALL	36513
2	Filter Cartridge 65 sq. feet	ALL	71827
3	Standpipe, Ag+ TR	ALL	36531
4	Wallfitting, Front-WMC	ALL	30491
5	O-Ring, red Wallfitting Front	ALL	30482
6	Kit, Rear Wallfitting	ALL	71452
*	Kit, Floating Weir	ALL	71944

* NOTE: Non Illustrated Part.

TIGER RIVER SPAS®

Section V:

Surface

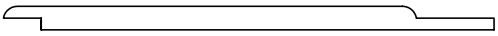
50 Hz Exploded Illustrations

SUREWOOD

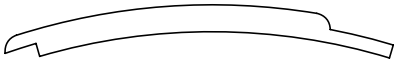
SLAT FOOTPRINTS

⇧ 2001 – CURRENT ⇧

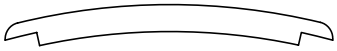
RW: P/N 72036
CG: P/N 73574



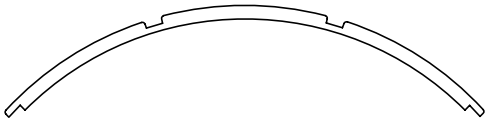
RW: P/N 72038
CG: P/N 73575



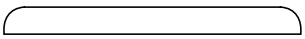
RW: P/N 72039
CG: P/N 73576



RW: P/N 74054
CG: P/N 74055



RW: P/N 72037
CG: P/N 73577



P/N 73788 – Glue Gun Applicator

P/N 73789 – Adhesive Kit (DP601 NS)

* RW = RED SUREWOOD
CG = COASTAL GRAY SUREWOOD

NOTE: Surewood slats CANNOT be used to replace Redwood slats.

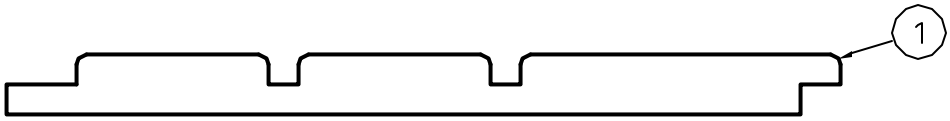
SUREWOOD USAGE TABLE, 2001 – CURRENT

QUANTITIES REFLECT NUMBER OF BOARDS REQUIRED FOR REPLACEMENT OF ENTIRE SECTION

SPA MODEL	RED SUREWOOD	72036	72037	72038	72039	74054
	COASTAL GRAY	73574	73577	73575	73576	74055
	SERIAL NUMBERS	VERTICAL & HORIZONTAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
		QTY.	QTY.	QTY.	QTY.	QTY.
Siberian						
Corners	LE 1C1001 – 4F9999			2	1	
Front	LE 1C1001 – 4F9999	6	2			
Sides	LE 1C1001 – 4F9999	6	2			
Door	LE 1C1001 – 4F9999	6	2			
Back	LE 1C1001 – 4F9999	6	2			
Bengal	Same for the MME					
Corners	ME 1H1001 – Current					1
Corners	ME 1C1001 – 4G9999			2	1	
Front	ME 1C1001 – Current	5	2			
Sides	ME 1C1001 – Current	5	2			
Door	ME 1C1001 – Current	5	2			
Back	ME 1C1001 – Current	5	2			
Sumatran						
Corners	NE 1C1001 – 4G9999			2	1	
Front	NE 1C1001 – Current	5	2			
Sides	NE 1C1001 – Current	5	2			
Door	NE 1C1001 – Current	5	2			
Back	NE 1C1001 – Current	5	2			
Caspian						
Corners	CHPE 1H1001 – Current					1
Corners	CHPE, CPNE 1C1001 – 4G9999			2	1	
Front	CHPE, CPNE 1C1001 – Current	5	2			
Sides	CHPE, CPNE 1C1001 – Current	5	2			
Door	CHPE, CPNE 1C1001 – Current	5	2			
Back	CHPE, CPNE 1C1001 – Current	5	2			

REDWOOD SLATS

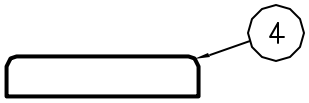
MODELS LE, ME, NE 1998 – 2000



P/N 70338
CUT IN 40–inch LENGTHS
SCALE: 1 = 1

P/N 70880
CUT IN 32–inch LENGTHS
SCALE: 1 = 1

P/N 70340
CUT IN 32–inch LENGTHS
SCALE: 1 = 1



P/N 70339
CUT IN 32–inch LENGTHS
SCALE: 1 = 1

REDWOOD SLATS; MODELS LE, ME, NE

ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	Slat, Redwood Detail #1 – LE, ME, NE	LE, ME, NE 181001 – 4B9999	70338
2	Wood Tiger River Detail Corner	LE, ME, NE 181001 – 4B9999	70880
3	Slat, Redwood Detail #2 – LE, ME, NE	LE, ME, NE 181001 – 4B9999	70340
4	Slat, Redwood Detail #3 – LE, ME, NE	LE, ME, NE 181001 – 4B9999	70339

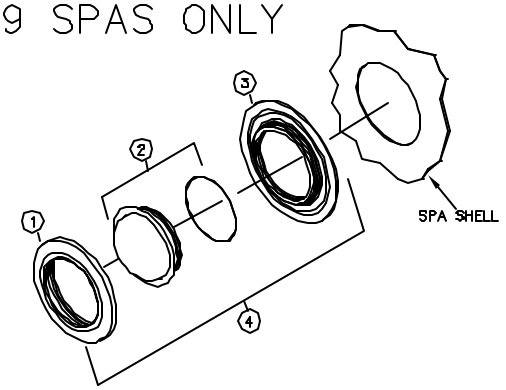
EVERWOOD DOORS

1998 – CURRENT

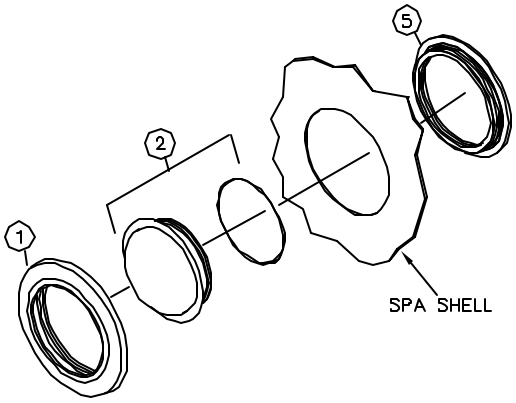
MODEL / DESCRIPTION	SERIAL NO. USED	PART NO.
SIBERIAN/ KYBER		
DOOR REPLACEMENT, L '98 – '99	LE 181001 – 4A9999	W71523
DOOR REPLACEMENT, L '00	LE 1B1001 – 1B1437	W71929
DOOR REPLACEMENT, L '00	LE 1B1438 – 4B9999	W71957
DOOR REPLACEMENT, L '01 (FRONT)	LE 1C1001 – 4F9999	W72041
REMOVABLE ACCESS DOOR, L '01 (BACK/ SIDE)	L 1C1001 – 4F9999	W72042
BENGAL/ MANORA		
DOOR REPLACEMENT, M '97 – '00	ME 1B1001 – 1B1702	W71423
DOOR REPLACEMENT, M'00	ME 1B1703 – 4B9999	W71958
DOOR REPLACEMENT, M'01 (FRONT)	ME/ MME 1C1001 – CURRENT	W72040
REMOVABLE ACCESS DOOR, M'01 (SIDE)	ME/ MME 1C1001 – CURRENT	W72043
REMOVABLE ACCESS DOOR, M'01 (BACK)	ME/ MME 1C1001 – CURRENT	W72044
DOOR REPL., COASTAL GREY M'05 (FRONT)	ME/ MME 1C1001 – CURRENT	W73633
REMOV. DOOR, COASTAL GREY M'05 (SIDE)	ME/ MME 1G1001 – CURRENT	W73632
REMOV. DOOR, COASTAL GREY, M'05 (BACK)	ME/ MME 1G1001 – CURRENT	W73631
SUMATRAN/ TONDI (N & P)		
DOOR REPLACEMENT, N '98 – '00	NE 181001 – 1B1342	W71523
DOOR REPLACEMENT, N '00	NE 1B1343 – 4B9999	W71959
DOOR REPLACEMENT, N '01 (FRONT)	NE 1C1001 – CURRENT	W72040
REMOVABLE ACCESS DOOR, N (BACK/SIDE)	NE 1C1001 – CURRENT	W72043
DOOR REPL. COASTAL GREY, N '05 (FRONT)	NE 1G1001 – CURRENT	W73633
REMOV. DOOR COASTAL GREY, N'05 (BACK/SIDE)	NE 1G1001 – CURRENT	W73632
CASPIAN (CPN & CHP)		
DOOR REPLACEMENT, CPN '03	CPNE, CHPE 1E1001 – CURRENT	W73016
REMOV. ACCESS DOOR, CPN '03 (BACK/SIDE)	CPNE, CHPE 1E1001 – CURRENT	W73013
DOOR REPL. COASTAL GREY, CHP '05	CHPE 1G1001 – CURRENT	W73630
REMOV. DOOR, COASTAL GREY, CHP '05 (BACK/SIDE)	CHPE 1G1001 – CURRENT	W73629

LIGHT LENS

1998 – 1999 SPAS ONLY



2000 – CURRENT SPAS

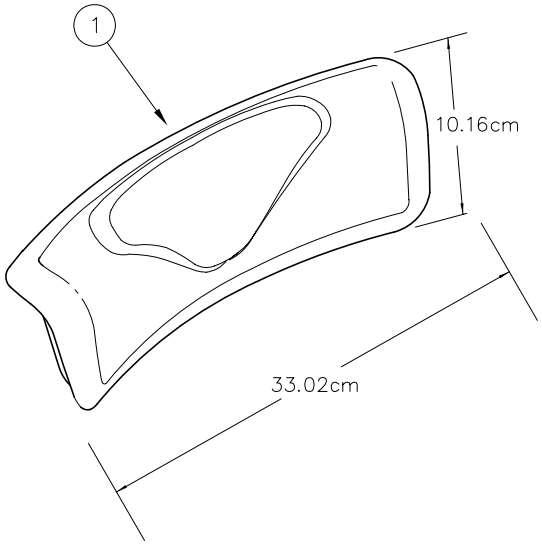


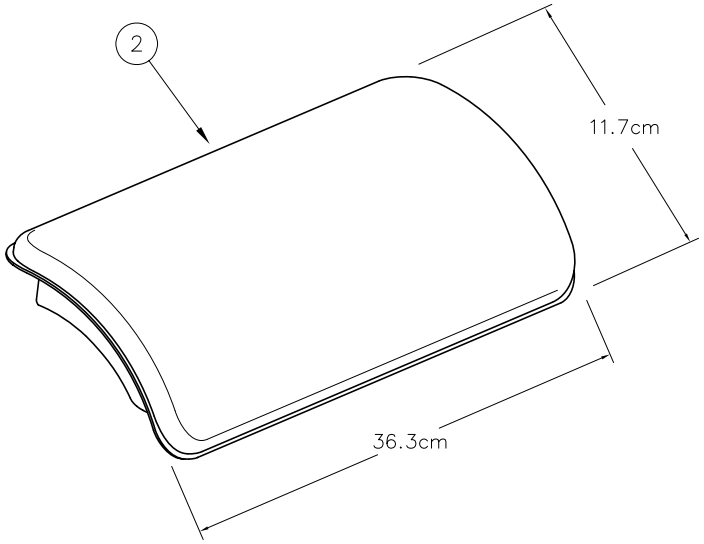
ITEM	DESCRIPTION	P/N
1	LIGHT BEZEL, GRAY	71926
2	LENS ONLY REPLACEMENT KIT	71830
3	WALLFITTING ASSY, GRAY (1992–1999)	71924
4	LIGHT LENS RETROFIT KIT, 1992–1999 (GRAY)	71831**
5	WALLFITTING (2000 – CURRENT)	71925
*	DEVCON REPAIR KIT	72961
*	GRIP STYLE GLOVE	71945

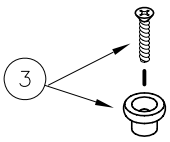
* NON–ILLUSTRATED PART
** DEVCON REPAIR KIT (PN 72961) IS ALSO REQUIRED FOR LIGHT LENS RETROFIT

NOTE: A's ARE USED ON SPAS WITH WHITE ENDURAL SHELLS, B's ARE USED ON QUARTITE PLUS SHELLS

PILLOWS







ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	Kit, Pillow Gray, TR	ALL 181001 – Current	72578
2	Pillow, Grey, Rear Mounted	ALL 171001 – 479999	71982
3	Kit, Retainer/Screw, Rear Mounted	ALL 171001 – Current	71242

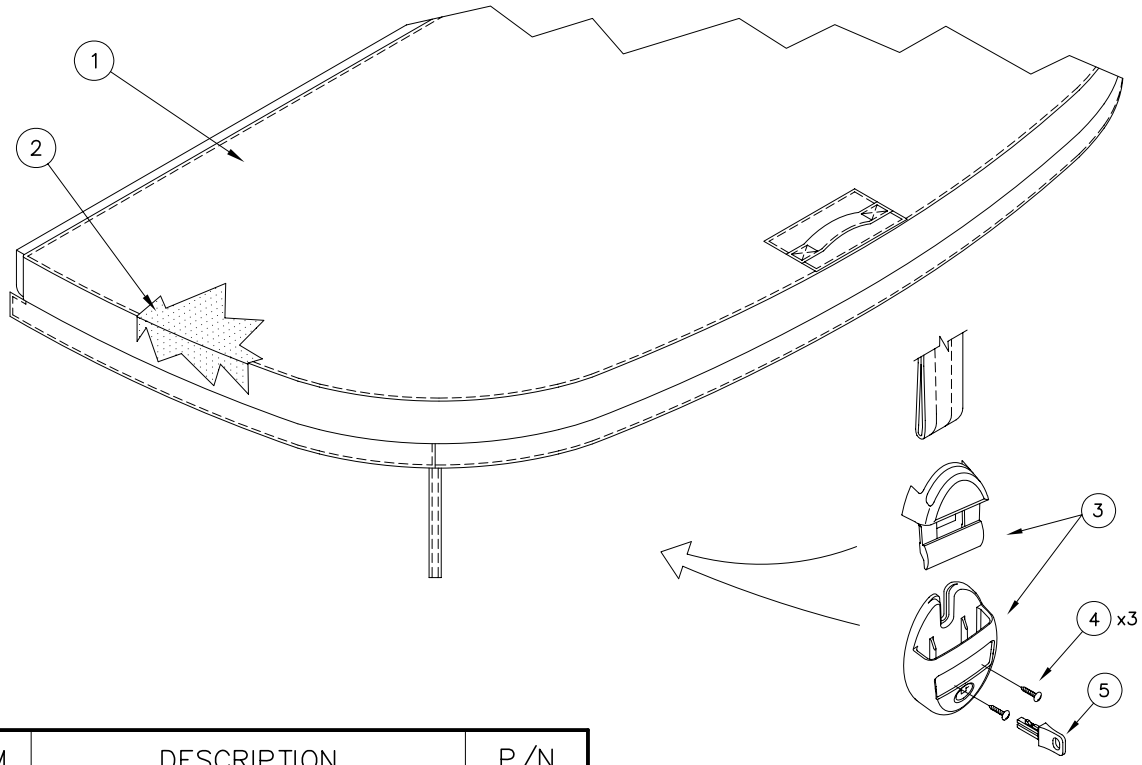
Note: All measurements are approximate
Drawing is not to scale

Section VI:

Accessories

50 Hz Exploded Illustrations

VINYL COVER ASSEMBLY

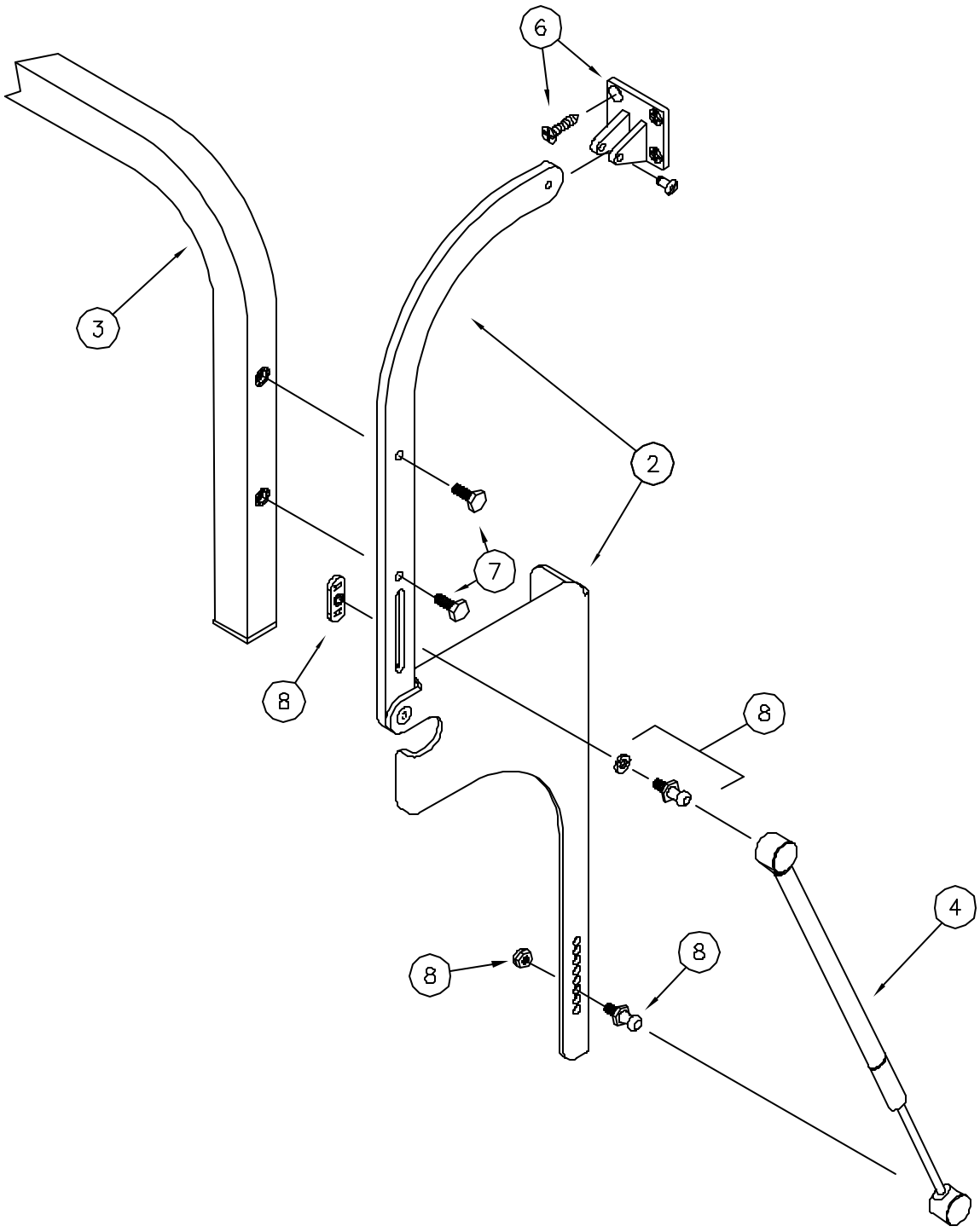


ITEM	DESCRIPTION	P/N
1A	Encasement – SIBERIAN/KHYBER	
	Rust, 1997 to 1999	36349
	Rust, 2000 to Current	38562
	Ash, 1997 to 1999	36365
	Ash, 2000 to Current	38588
	Green, 1997 to 1999	37968
	Green, 2000 to Current	38591
1B	Encasement – BENGAL/MANORA	
	Rust, 1997 to Current	36350
	Gray, 1997 to Current	36366
	Green, 1997 to Current	37970
1C	Encasement – SUMATRAN/TONDI	
	Rust, 97	33560
	Rust, 1998 to Current	37502
	Gray, 1997	36376
	Gray, 1998 to Current	37503
	Green, 1997	38052
	Green, 1998 to Current	37972
1D	Encasement – CASPIAN	
	Gray, 2003 to Current	300277
	Rust, 2003 to Current	300276
	Green, 2003 to Current	300285

ITEM	DESCRIPTION	P/N
2	Core, Foam	
	LE, 2.0 LB 2000 to Current	71919
	LE, 2.0 LB 1997 to 1999	71682
	ME, 2.0 LB 1997 to Current	71683
	NE, 1.5 LB 1998 to Current	71685
	NE, 1.5 LB 1997	71675
	CPNE, 2.0 LB 2003 to Current	72732
3	Coverlock, Black, QTY 4	71515
4	Screw	30334
5	Key	31402
*	Drain Grommet	70301

* Non-Illustrated Part

COVER CRADLE KIT F



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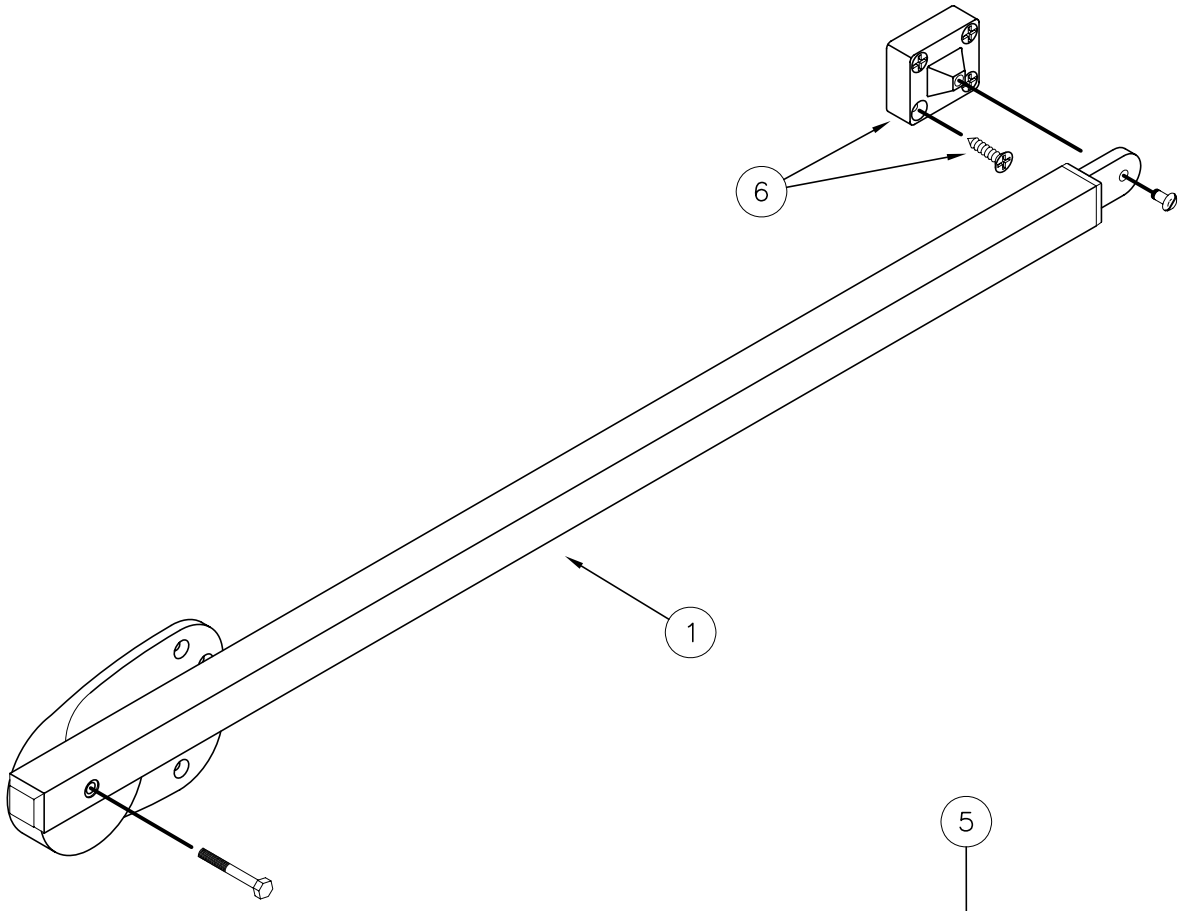
1D/02

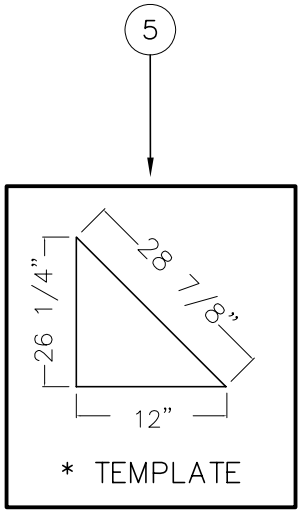
TIGER RIVER (50 Hz)

09299018.dwg

FOR INTERNAL USE ONLY:
HSS, TR, HSS(E), TR(E)

COVER CRADLE KIT F





COVER CRADLE KIT F

ITEM	DESCRIPTION	P/N
1	Side Arm Assembly	72573
2a	Pivot Assembly (Right)	72570
2b	Pivot Assembly (Left)	72571
3	Crosslink Assembly	72572
4	Gas Spring, 40 lb.	71095
5	Template, Cardboard, 54 degree	Use inserted drawing
6	Cover Cradle Hardware Bag #1	72574
7	Cover Cradle Hardware Bag #2	72575
*	Cover Cradle Hardware Bag #3 Use only on Spas with Removable Panels	72576
8	Cover Cradle Hardware Bag #4	72591

* Non Illustrated Part

Hardware Bag #1 (PN 72574):

2 – 4 Hole Side Hinges (11/16" base)
2 – 4 Hole Rear Hinges
8 – #10 x 1" Flat Head Screw
8 – #10 x 1–1/2" Flat Head Screw

Hardware Bag #2 (PN 72575):

4 – 1/4–20 x 3/4" Hex Bolt
8 – #10 x 1–1/2" Flat Head Screws
12 – #10 x 1–1/2" Pan Head Screws

Hardware Bag #3 (PN 72576):

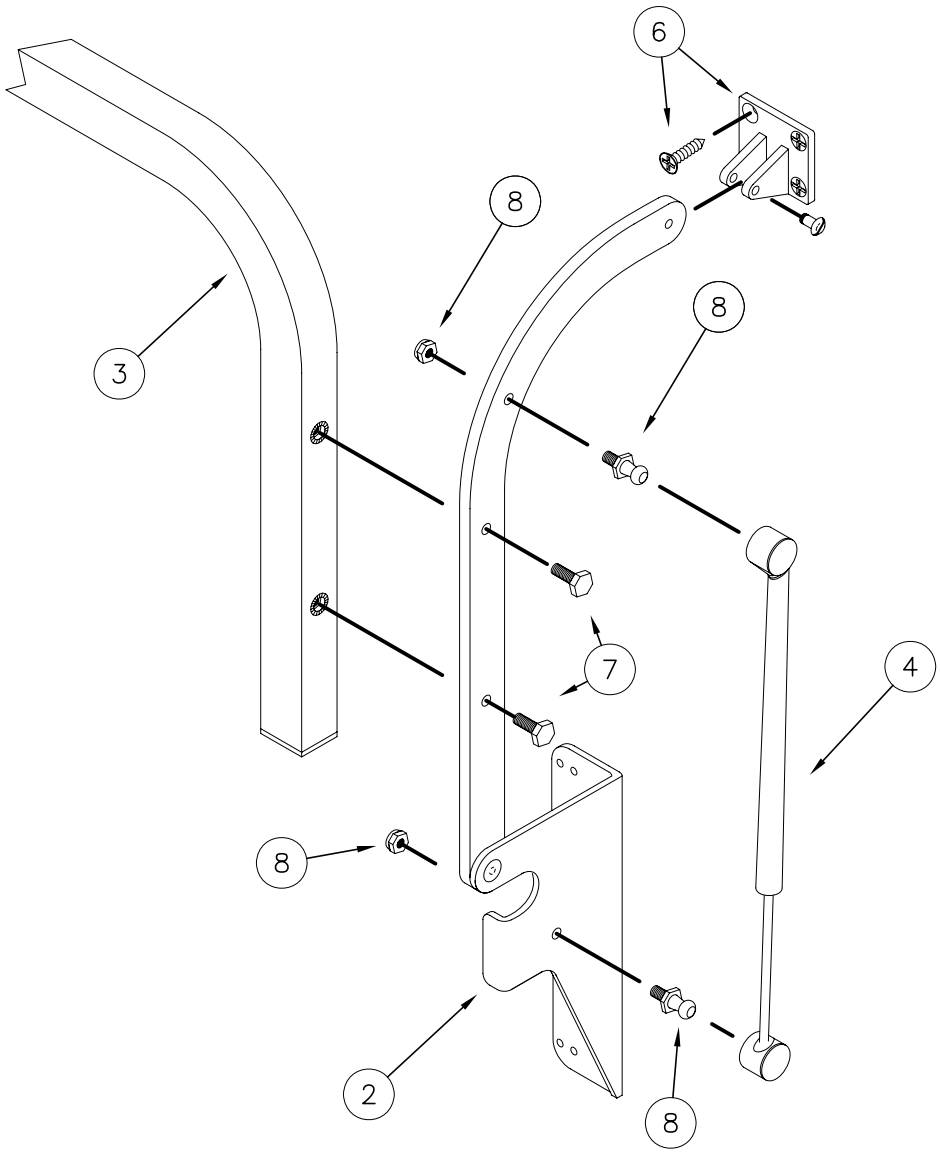
Use on Spas with Removable Panels Only

8 – #10 x 2" Flat Head Screws
12 – #10 x 2" Pan Head Screws

Hardware Bag #4 (PN 72591):

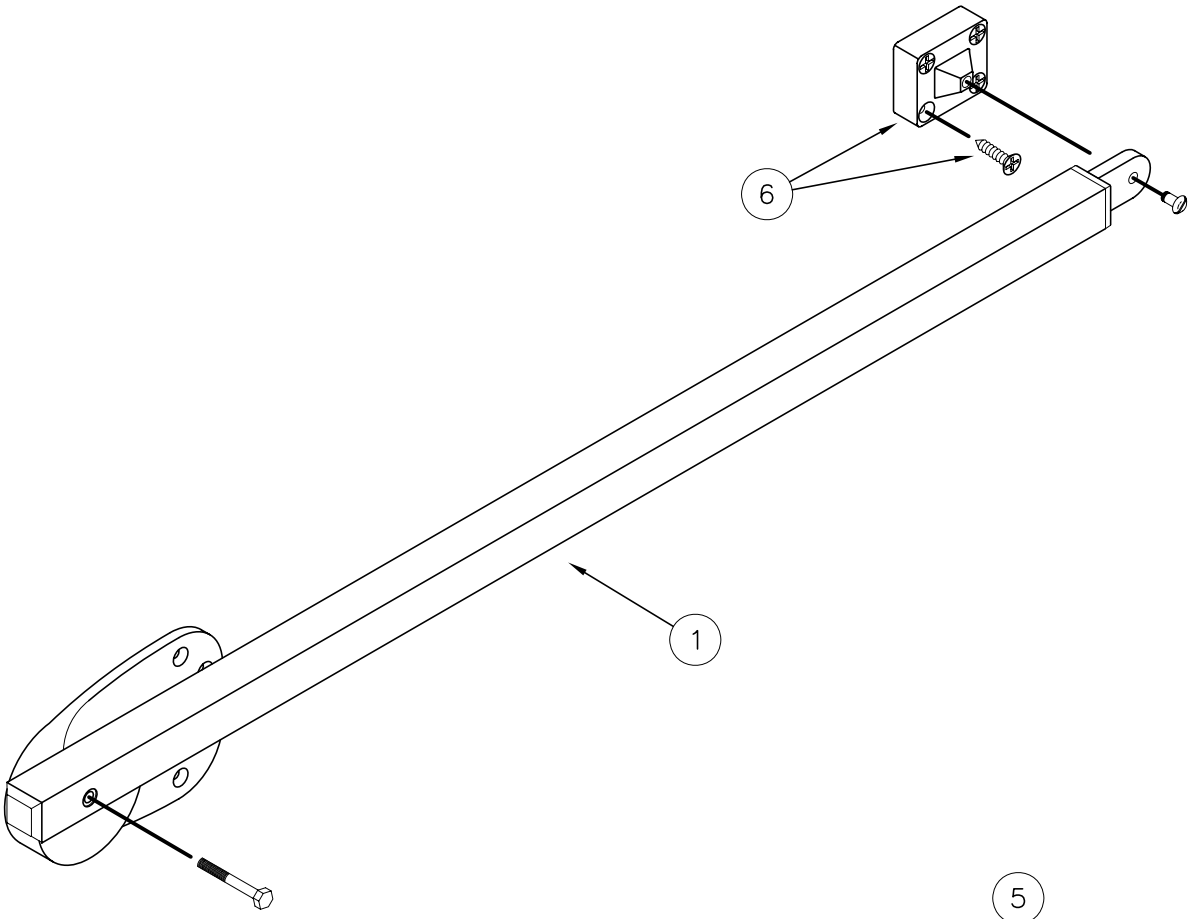
4 – Ball Studs, 1/4"
2 – Split Lock Washer, 1/4"
2 – Slot Nut, 1/4"
2 – Nut, 1/4"

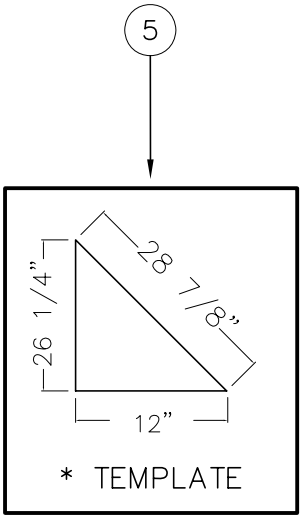
COVER CRADLE II



09/06 TIGER RIVER (50 Hz) 0947101C.dwg

COVER CRADLE II





COVER CRADLE II

ITEM	DESCRIPTION	P/N
1	Side Arm Assembly	72573
2a	Pivot Assembly (Right)	72713
2b	Pivot Assembly (Left)	72712
3	Crosslink Assembly	72572
4	Gas Spring – 60 lb.	74034
5	Template, Cardboard, 54 degree	Use inserted drawing
6	Cover Cradle II Hardware Bag #1	72574
7	Cover Cradle II Hardware Bag #2	72714
*	Cover Cradle II Hardware Bag #3 Use only on Spas with Removable Panels	72715
8	Cover Cradle II Hardware Bag #4	72716
**	Cover Cradle II Complete Assembly	72690

* Non Illustrated Part

Hardware Bag #1 (PN 72574):

2 – 4 Hole Side Hinges (11/16" base)
2 – 4 Hole Rear Hinges
8 – #10 x 1" Flat Head Screw
8 – #10 x 1–1/2" Flat Head Screw

Hardware Bag #2 (PN 72714):

4 – 1/4–20 x 3/4" Hex Bolt
8 – #10 x 1–1/2" Flat Head Screws
14 – #10 x 1–1/2" Pan Head Screws

Hardware Bag #3 (PN 72715):

Use on Spas with Removable Panels Only

8 – #10 x 2" Flat Head Screws
14 – #10 x 2" Pan Head Screws

Hardware Bag #4 (PN 72716):

1 – Ball Stud, 1/4"
1 – 1/4" 20 Thin Lock Nut
1 – Ball Stud, 5/16"
1 – 5/16" 18 Nylock Nut

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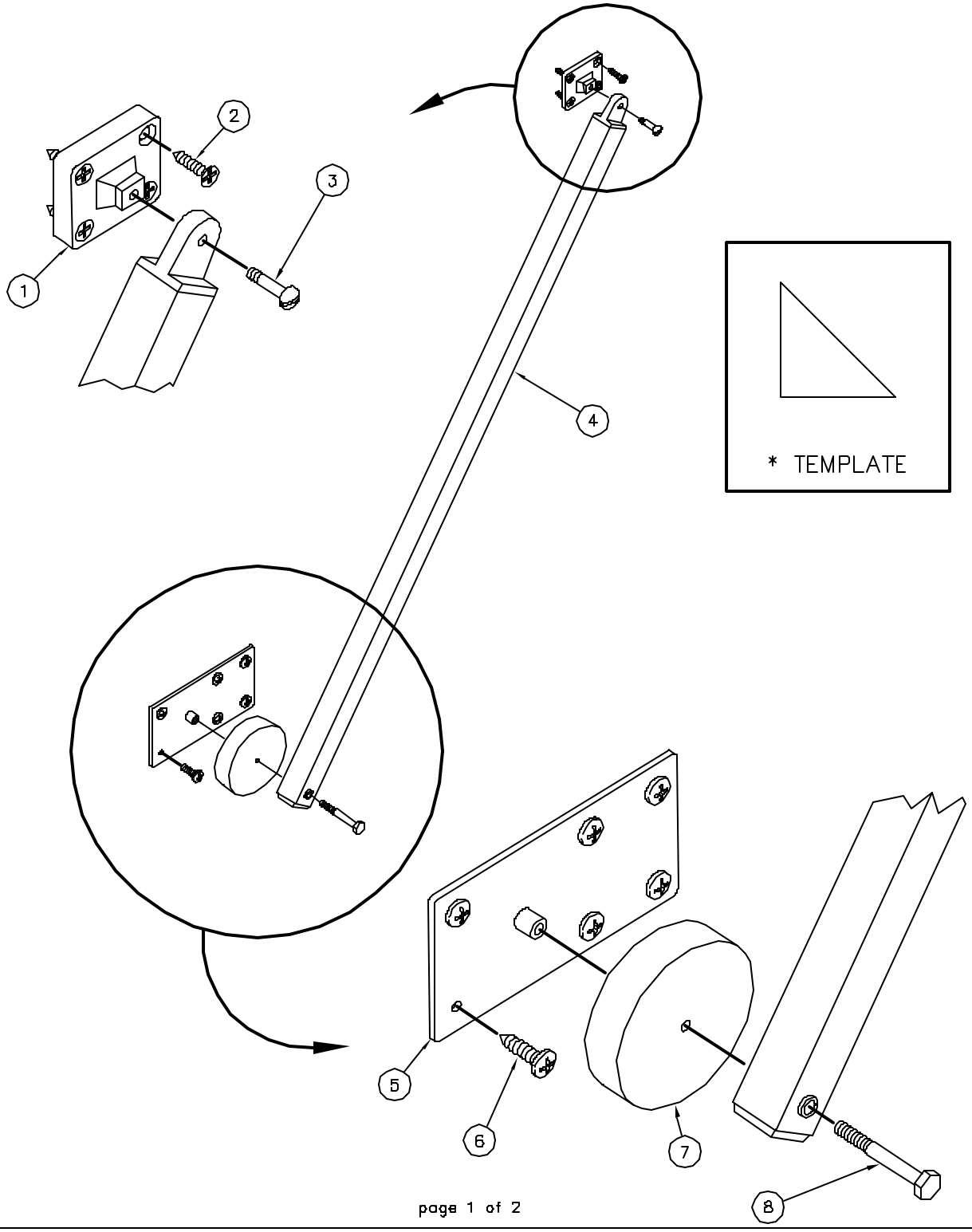
COVER CRADLE EXPLODED DETAIL #1

Kit A – E



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4/02

TIGER RIVER (50 Hz)

0471012B.dwg

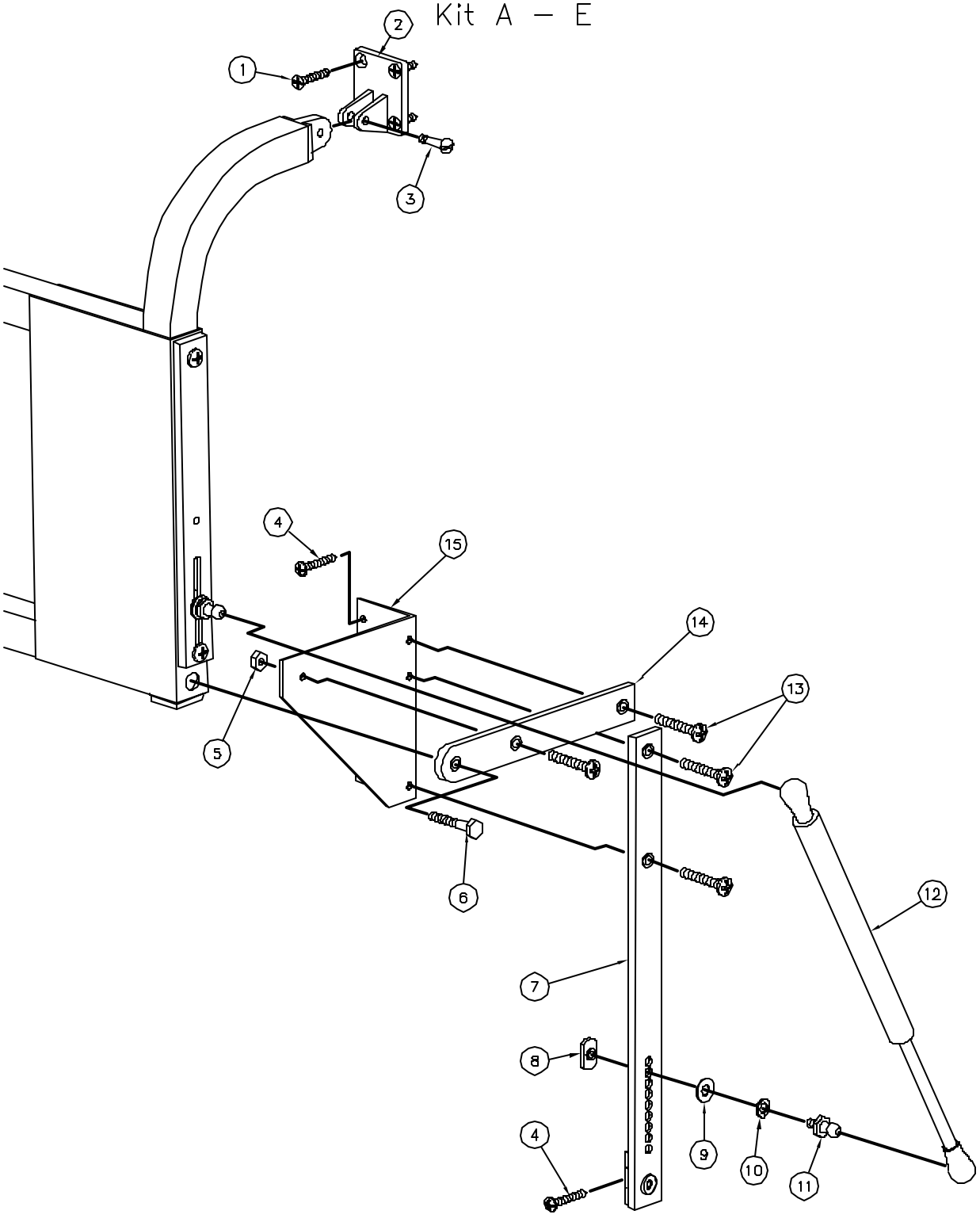
FOR INTERNAL USE ONLY:
HSS, TR, HSS(E), TR(E)

COVER CRADLE EXPLODED DETAIL #1

Kit A – E

ITEM	DESCRIPTION	WHERE USED	PART NO.
1	Side Hinge, Thick w/Screw, 11/16" Base	ALL	72452
2	Screw, #10 x 1–1/2" Flat Head Phillips	ALL	71110
3	Screw, 1/4"–20 Hinge Side	ALL	71215
4	Sidearm	ALL	71096
5	Bracket, Side 6–1/4"	LE, ME MODELS ONLY	71102
6	Screw, #10 x 1–1/2" Pan Head Phillips	ALL	71111
7	Wheel, Pivot	ALL	71101
8	Bolt, 1–1/4"–20 x 2 Hex Head	ALL	71218

COVER CRADLE EXPLODED DETAIL #2



5/02

TIGER RIVER (50 Hz)

0471013B.dwg

FOR INTERNAL USE ONLY:
HSS, TR, HSS(E), TR(E)

COVER CRADLE EXPLODED DETAIL #2

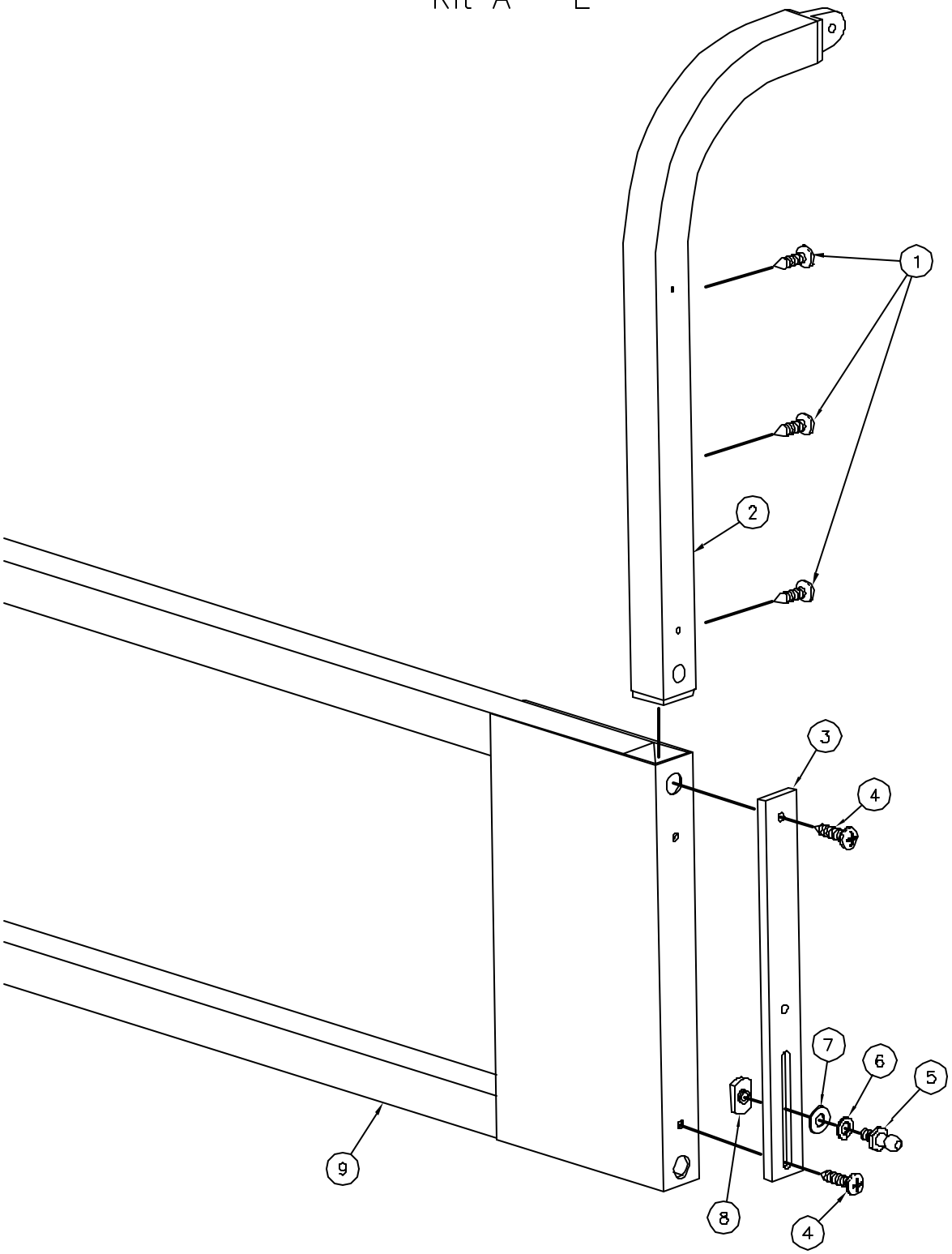
Kit A – E

ITEM	DESCRIPTION	WHERE USED	PART NO.
1	SCREW, #10 x 1-1/2", FLAT HEAD PHILLIPS	ALL	71110
2	HINGE, REAR WITH SCREW	ALL	71092
3	SCREW, 1/4-20, HINGE REAR	ALL	71216
4	SCREW, #10 x 1-1/2", PAN HEAD PHILLIPS	ALL	71111
5	NUT, 1/4-20 HEX HEAD	ALL	71219
6	BOLT, 1/4-20 x 1", HEX HEAD	ALL	71217
7	BAR, GAS SPRING, LOWER	ALL	71091
8	NUT, SLOT 1/4"	ALL	71220
9	WASHER, 1/4" FLAT	ALL	71113
10	WASHER, 1/4" SPLIT LOCK	ALL	71114
11	STUD, BALL 1/4"	ALL	71107
12	SPRING, GAS	ALL	71095
13	SCREW, 1/4-20 x 3/4 PH PLP MS	ALL	71112
14	PIVOT BAR, WITH BEARING	ALL	71085
15A	BRACKET, BASE 90°, LEFT	ALL	71086
15B	BRACKET, BASE 90°, RIGHT	ALL	71087
*	SHIM, WOOD TIGER RIVER	LE, ME	71094

* NON-ILLUSTRATED PART

COVER CRADLE EXPLODED DETAIL #3

Kit A – E



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5/02

TIGER RIVER (50 Hz)

0471014B.dwg

FOR INTERNAL USE ONLY:
HSS, TR, HSS(E), TR(E)

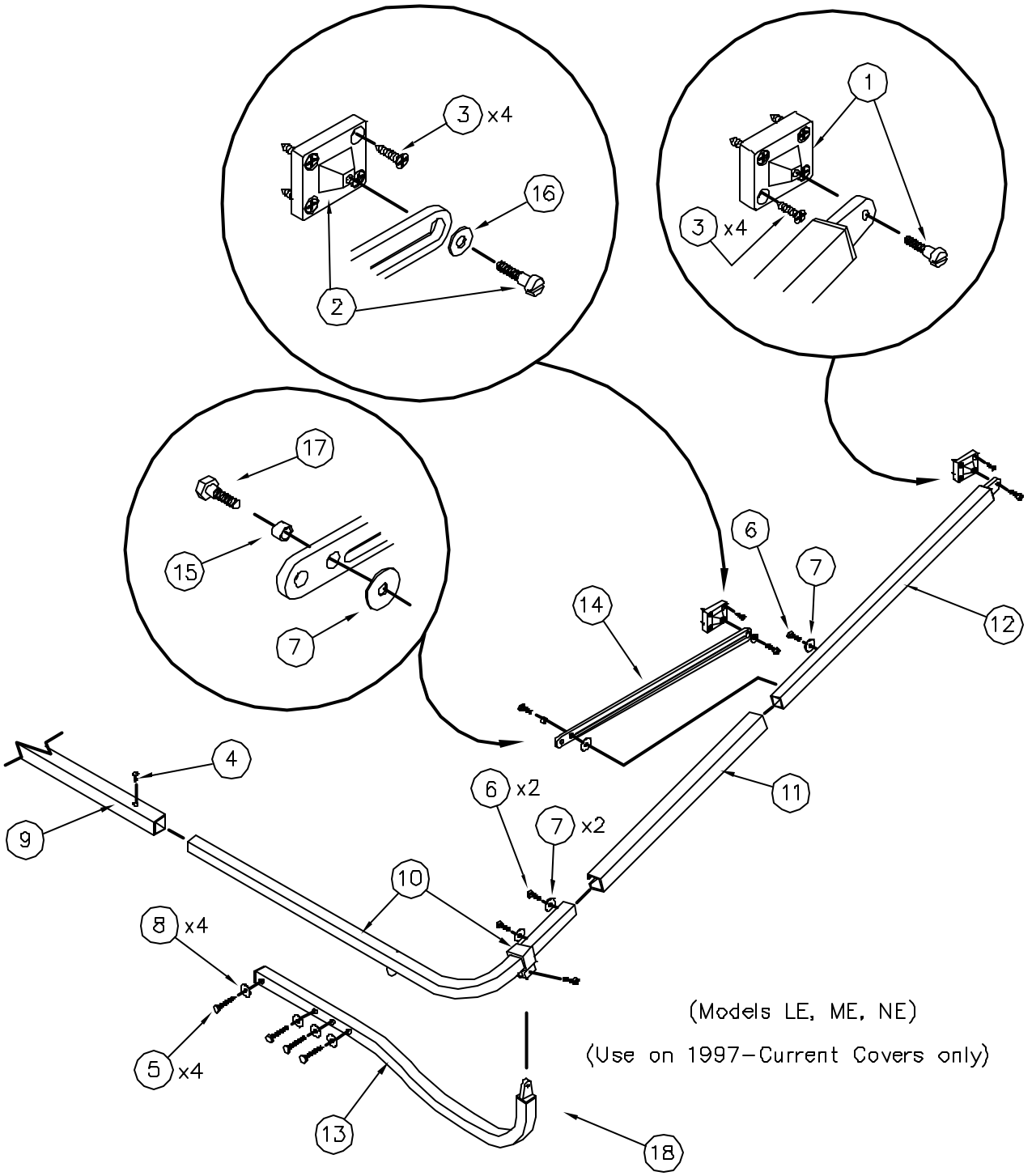
COVER CRADLE EXPLODED DETAIL #3

Kit A – E

ITEM	DESCRIPTION	WHERE USED	PART NO.
1	SCREW, #10 x 1/2" PAN HEAD, PHILLIPS	ALL	71109
2A	BACKARM, CURVED LEFT	ALL	71083
2B	BACKARM CURVED RIGHT	ALL	71084
3	BAR, GAS SPRING, UPPER	ALL	71090
4	SCREW, #10 x 3/4" PAN HEAD, PHILLIPS	ALL	71108
5	STUD, BALL 1/4"	ALL	71107
6	WASHER, 1/4" SPLIT LOCK	ALL	71114
7	WASHER, 1/4" FLAT	ALL	71113
8	NUT, SLOT 1/4"	ALL	71220
9	BACK PANEL	ALL	71082

GLIDERITE RETRACTABLE COVER SYSTEM

(ONLY THE RIGHT SIDE IS SHOWN)



10/04

TIGER RIVER (50 Hz)

D7B2101E.dwg

FOR INTERNAL USE ONLY:
HSS, TR, HSS(E), TR(E)

GLIDERITE RETRACTABLE COVER SYSTEM

ITEM	DESCRIPTION	PART NO.
*1	Side Hinge, Thick w/Screw, 11/16" Base	72452
*2	Side Hinge, Thin w/Screw, 7/16" Base	72525
3	Screw, 10 x 1 1/2" FH PHIL TAP	71110
4	Screw, 10 x 1/2" PH PHIL TAP	71109
5	Bolt, Lag 1/4" x 2 1/2" HX	71742
6	Bolt, 1/4" – 20 x 5/8" HX	71743
7	Washer, 1/4" x 1" SS	71744
8	Washer, 1/4" x 5/8" SS	71113
***9	Tube, 1 1/4" x 1 1/4" x 48"	71745
10A	Tube Assy, 1" x 1" Corner, Left w/Pivot Collar & Screw	71746
10B	Tube Assy, 1" x 1" Corner, Right w/Pivot Collar & Screw	71774
*11	Tube, Slot 1 1/4" x 1 1/4" x 21"	71747
*12	Sidearm Assy, 1" x 1"	71749
13A	Tube Assy, 1" x 1" Base, Left	71748
13B	Tube Assy, 1" x 1" Base, Right	71775
**14	Slide Lock Bar	71750
**15	Bearing	71751
16	Washer 1/4" Plastic	71752
17	Bolt, 1/4 – 20 x 1," HX (w/Yellow Locking Threads)	71217
18	Jaw Slide, Pivot Collar w/ Screen	71776

* Used on both sides
** Used on one side only
*** Used in center only

10/04

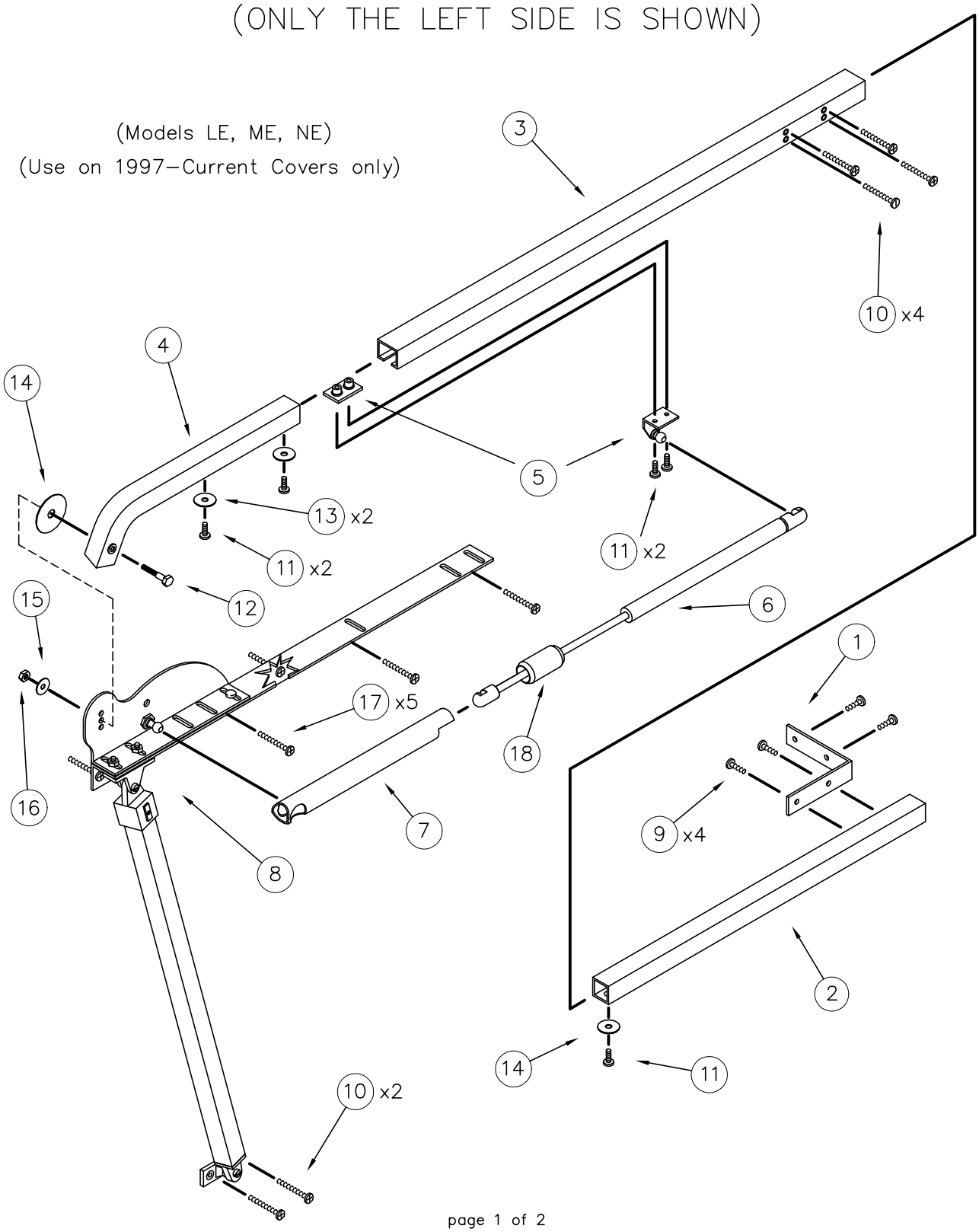
TIGER RIVER (50 Hz)

07B21D2D.dwg

FOR INTERNAL USE ONLY:
HSS, TR, HSS(E), TR(E)

UPRITE COVER SYSTEM

(ONLY THE LEFT SIDE IS SHOWN)



9/00

TIGER RIVER (50 Hz)

0792801C.dwg

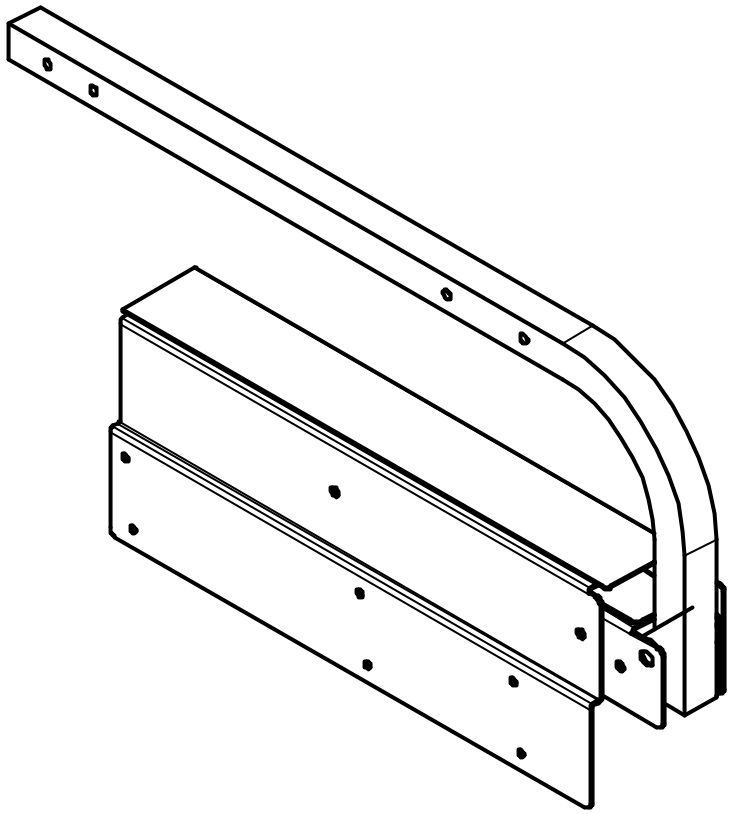
FOR INTERNAL USE ONLY:
HSS, HSS(E), TR, TR(E)

UPRITE COVER SYSTEM

ITEM	DESCRIPTION	PART NO.
1	ANGLE BRACKET	71793
2A	TUBE, EXTENSION, LEFT	71787
2B	TUBE, EXTENSION, RIGHT	71788
3A	CHANNEL, LEFT	73413
3B	CHANNEL, RIGHT	73414
4A	TUBE, PIVOT, LEFT (FOR UPRITE MODELS AFTER SERIAL # TB-3F1001)	73415
4B	TUBE, PIVOT, RIGHT (FOR UPRITE MODELS AFTER SERIAL # TB-3F1001)	73416
4C	TUBE, PIVOT (FOR UPRITE MODELS BEFORE SERIAL # TB-3F1001)	71786
5	BALL STUD BRACKET & NUT PLATE	71983
6	GAS SPRING	71794
7	GAS SPRING LOCK	71795
8A	SIDE BRACKET ASSY, LEFT	71789
8B	SIDE BRACKET ASSY, RIGHT	71790
9	SCREW, #10 x 1/2," PH PHIL TAP	71109
10	SCREW, #10 x 1 1/2" FH PHIL TAP	71110
11	BOLT, 1/4" - 20 x 5/8" HX	71743
12	BOLT, 1/4 - 20 x 1-3/4" HX	71116
13	WASHER, 1/4" x 1" SS	71744
14	WASHER, 2" PLASTIC	71801
15	WASHER, 1/4" x 5/8" SS	71113
16	NUT, NYLOCK 1/4" - 20	71236
17	SCREW, #10 x 1-1/2" PH PHIL	71111
18	SURE - LOCK SLEEVE	71994
*	DECK HINGE	71803
*	UPRITE SIDE ASSEMBLY, LEFT (FOR UPRITE MODELS AFTER SERIAL # TB-3F1001)	73411
*	UPRITE SIDE ASSEMBLY, RIGHT (FOR UPRITE MODELS AFTER SERIAL # TB-3F1001)	73412

* NON ILLUSTRATED PART

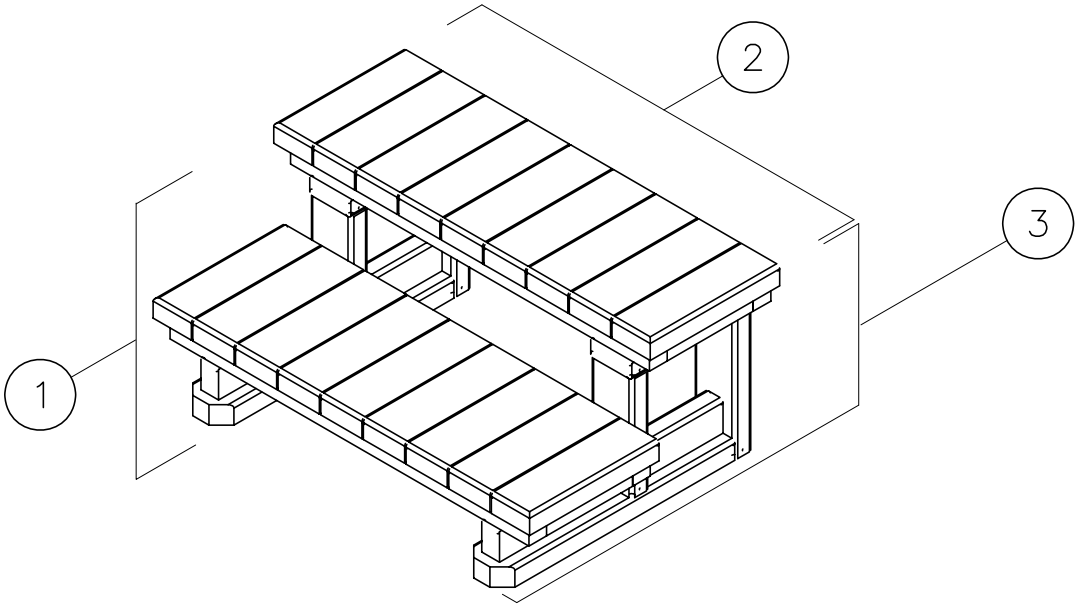
LIFT 'N GLIDE COVER LIFTER



DESCRIPTION	P/N
LIFT 'N GLIDE COVER LIFTER	73071
KIT, HINGE, RIGHT LIFT 'N GLIDE	73164
KIT, HINGE, LEFT LIFT 'N GLIDE	73165
KIT, HARDWARE BAG, LIFT 'N GLIDE	73166

STEP

OVERALL STEP DIMENSIONS: L–32" x W–21 1/4" x H–14 3/4"



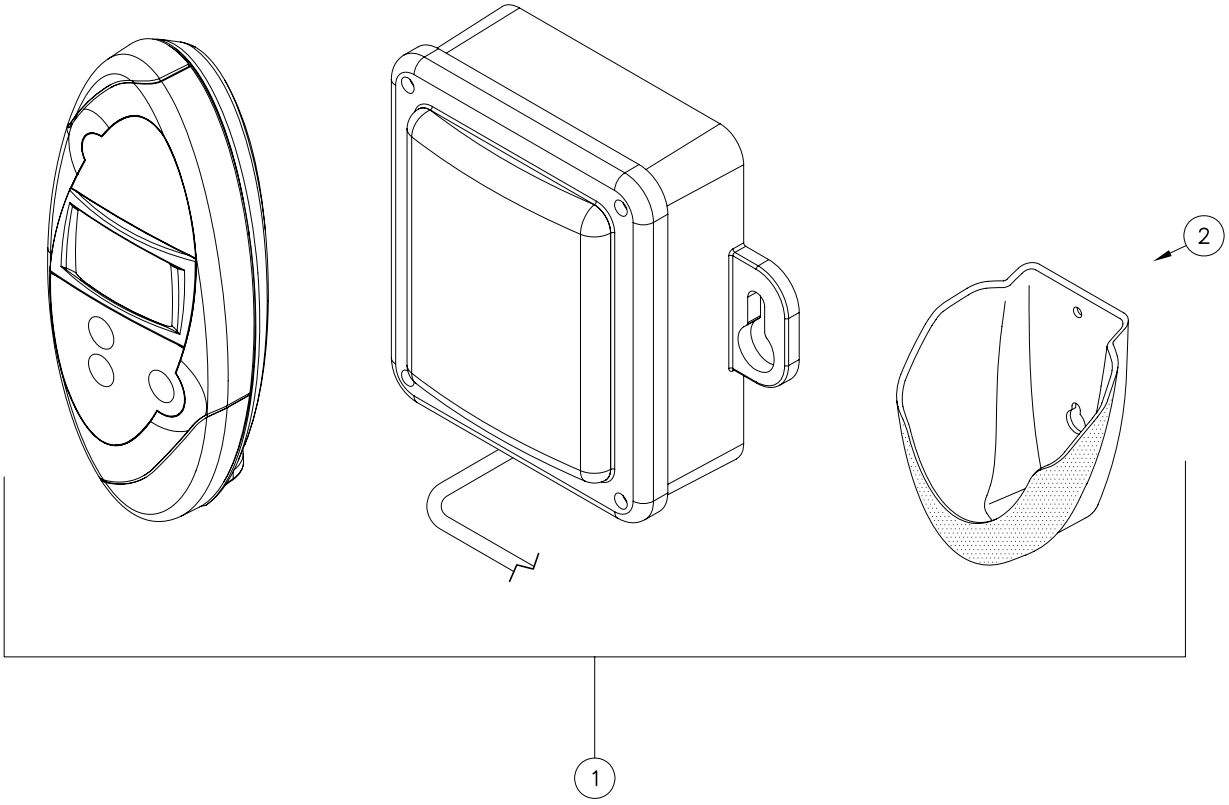
ITEM	DESCRIPTION	P/N
1a	Complete 32" Redwood Stained Step	39463**
1b	Complete 32" Unstained Step	72312
1c	Complete 32" '06 Gray Stained Step	73777
2	32" Piano–Style Tread – Unstained	72308
3	Step Support Assy, Unstained	72307
*	Stain, Surewood, Pre–2002	72318
*	Stain, Redwood, 2002 – Current	72552
*	Stain, '05 Gray, 2005 – Current	73832

* Non–Illustrated Part

** When ordering the Complete Surewood Step for a Pre–2002 Spa Model, it is necessary to order the Unstained Step Assy (PN 72312) and Pre–2002 Surewood Stain (PN 72318).

IQ 2020 remote control

2004 – CURRENT



ITEM	DESCRIPTION	SERIAL NO. USED	PART NO.
1	KIT, ASSEMBLY, IQ2020 remote control	ALL MODELS 1F1001 – CURRENT	73069
2	KIT, BRACKET, IQ2020 remote control	ALL MODELS 1F1001 – CURRENT	73159
*	BATTERY PLUG, IQ2020 remote control	ALL MODELS 1F1001 – CURRENT	73739
*	SCREW, 10x 1/2 STAINLESS STEEL	ALL MODELS 1F1001 – CURRENT	30360

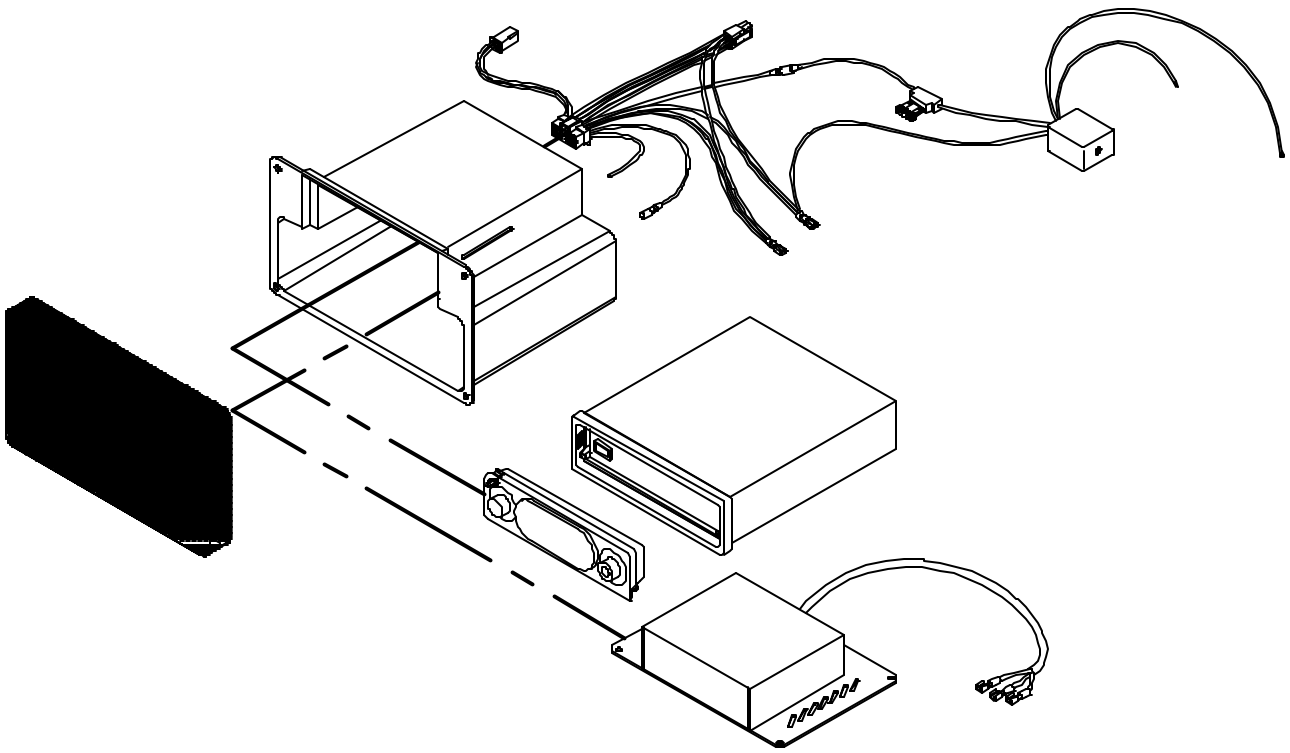
* NON ILLUSTRATED PARTS

NOTE: THE IQ2020 REMOTE CONTROL AND MODULE IS NOT AVAILABLE SEPARATELY.

NOTE: SPAS THAT REQUIRE MORE THAN ONE CONNECTION TO THE 'COMMUNICATION' PORT OF THE IQ2020 CONTROL BOX WILL REQUIRE THE I2C COMMUNICATION HUB P/N 72742

HYDROPULSE SOUND SYSTEM

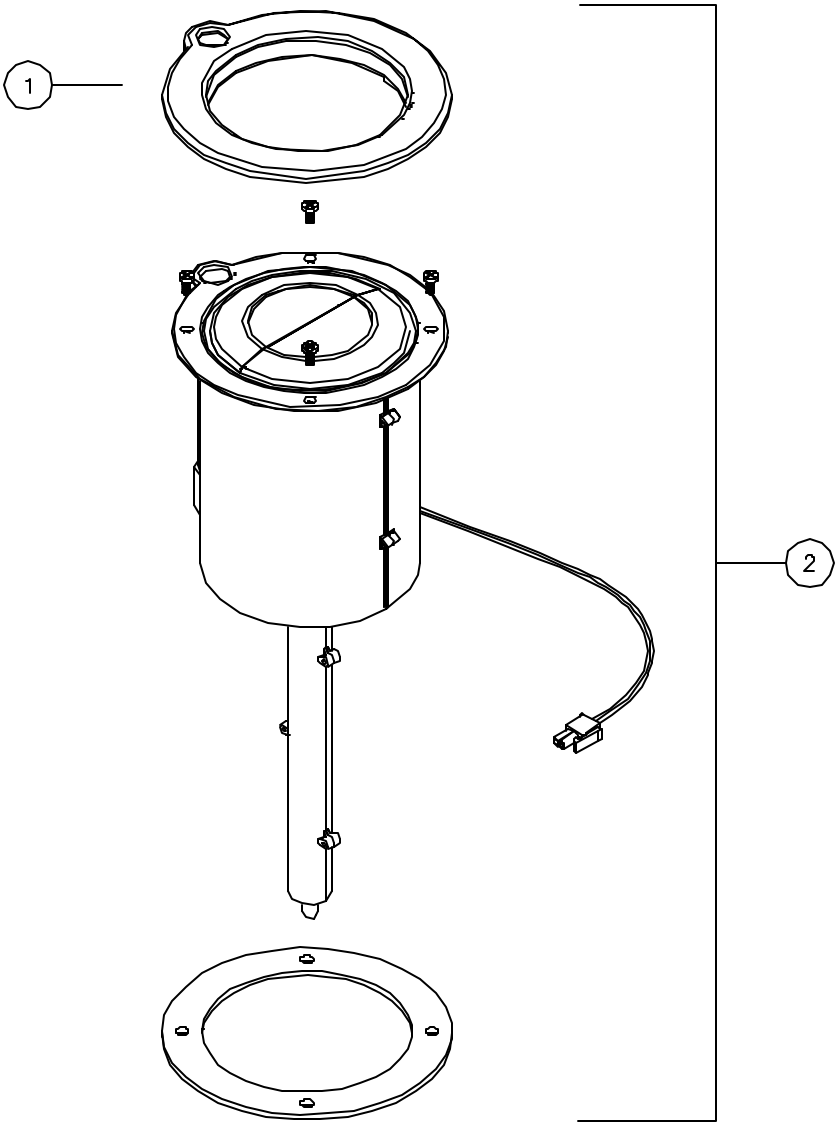
STEREO/POWER SUPPLY/DRY DOCK
2003 CPNE



DESCRIPTION	P/N
KIT, STERO POWER SUPPLY DRY DOCK	72770

HYDROPULSE MUSIC SYSTEM

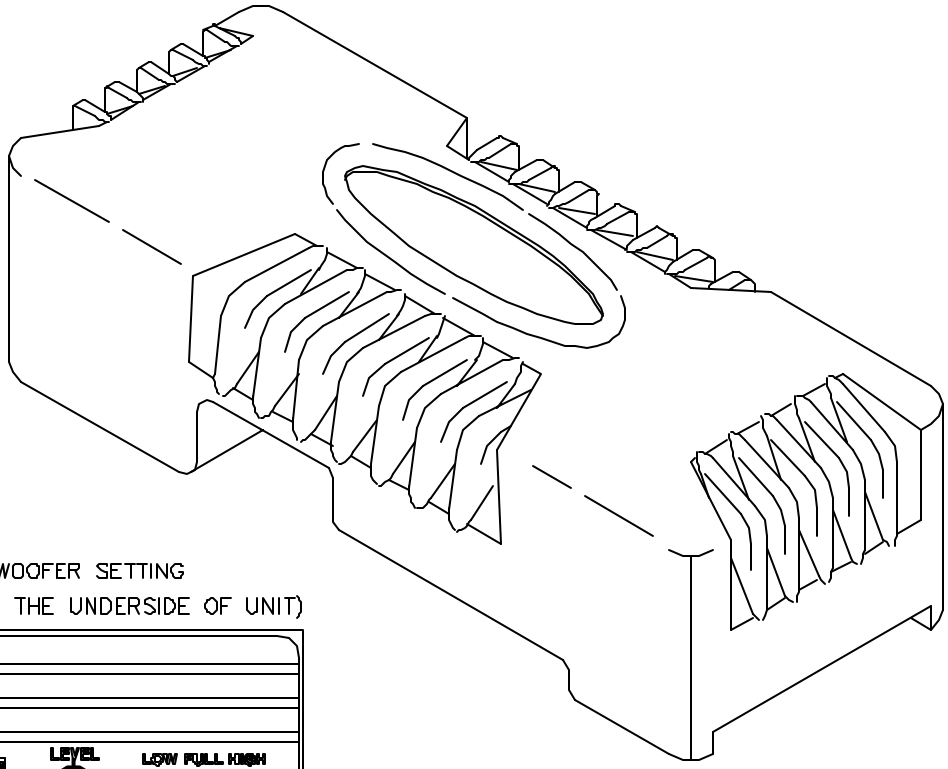
SPEAKER
2003 CPNE



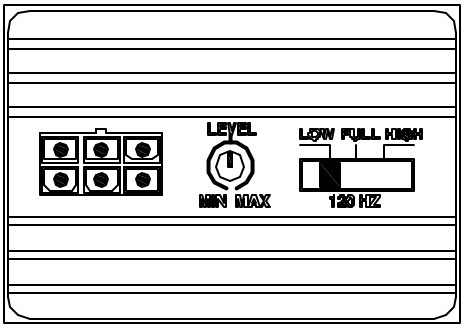
ITEM	DESCRIPTION	P/N
1	KIT, STEREO SPEAKER BEZEL	72790
2A	KIT, POPUP SPKR, CASPIAN	72792
2B	KIT, POPUP IR SPKR, CASPIAN	72791

HYDROPULSE MUSIC SYSTEM

SUBWOOFER
2003 CPNE



SUBWOOFER SETTING
(LOCATED ON THE UNDERSIDE OF UNIT)



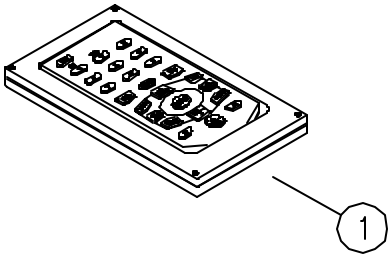
SET LEVEL TO "12 O'CLOCK" POSITION
SET 120 HZ (EQ) SLIDE SWITCH TO THE "LOW" POSITION

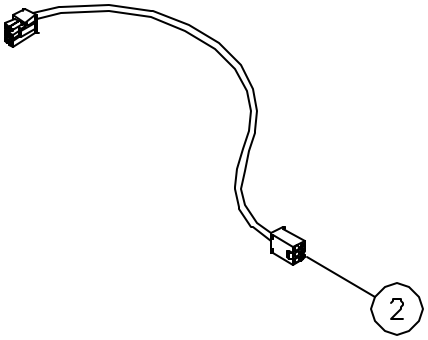
DESCRIPTION	P/N
SUBWOOFER	72788

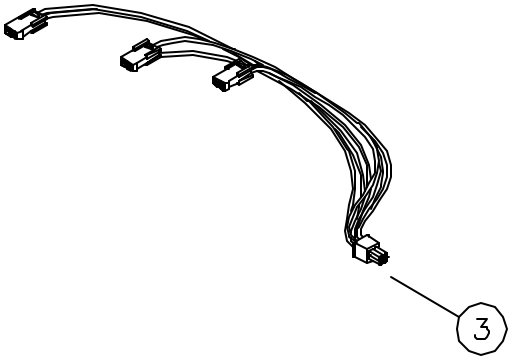
HYDROPULSE MUSIC SYSTEM

REMOTE CONTROL AND CABLE ASSEMBLIES

2003 CPNE

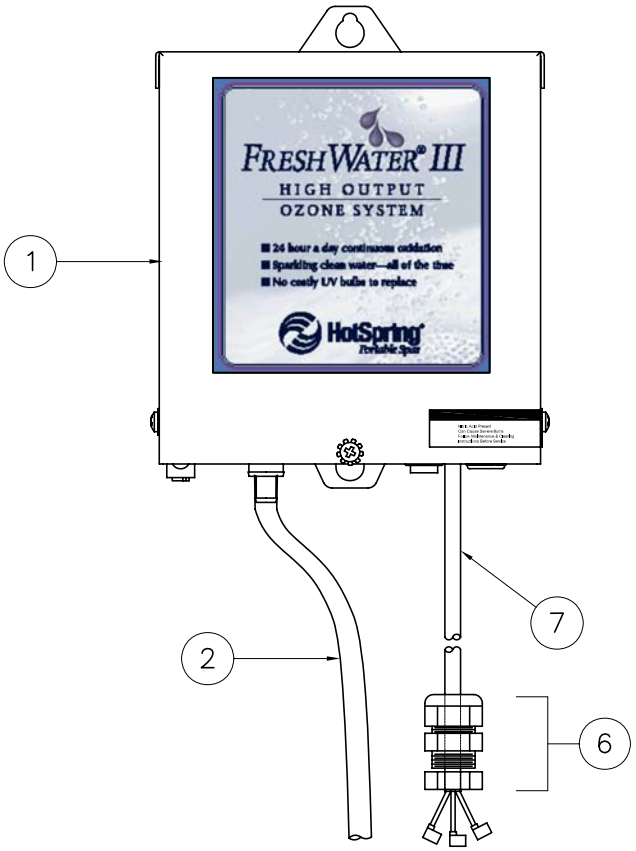


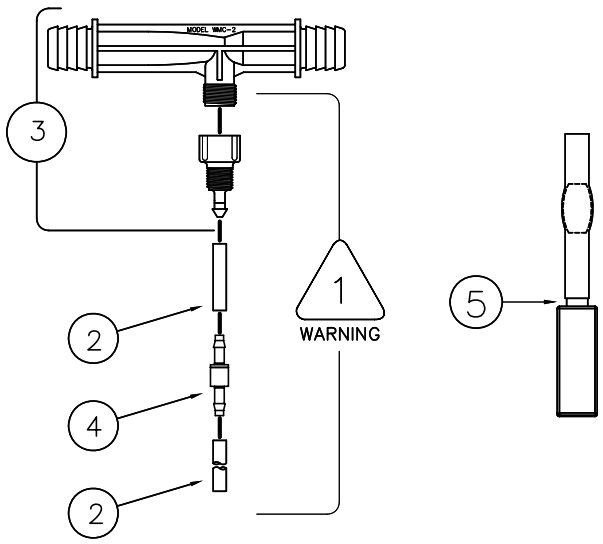




ITEM	DESCRIPTION	P/N
1	KIT, REMOTE WATERPROOF	72787
2	KIT, SUBWOOFER CABLE ASSEMBLY	72789
3	KIT, SPEAKER CABLE ASSEMBLY	72878

FRESHWATER III





1 WARNING – NITRIC ACID ACCUMULATION. RISK OF CHEMICAL BURNS: WEAR PROTECTIVE GLOVES

CORROSIVE

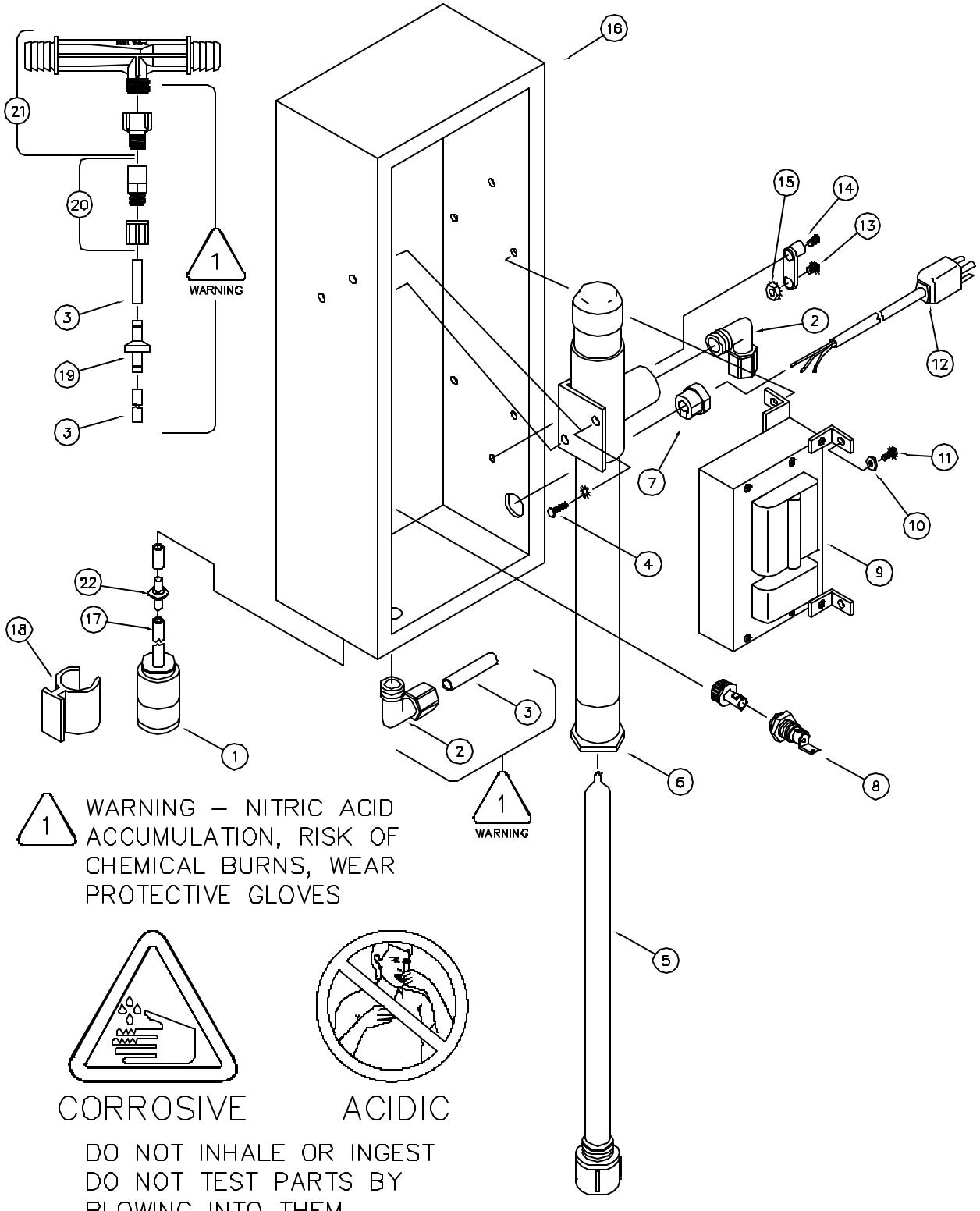
ACIDIC

DO NOT INHALE OR INGEST
DO NOT TEST PARTS BY BLOWING INTO THEM

ITEM	DESCRIPTION	P/N
1	FreshWater III (Complete Assembly)	72603
2	Tubing, Ozone Chemical	72228
3	Injector, Black	74078
4	Ozone Check Valve	1044101
5	Kit, Flow Restrictor	72699
6	Kit, Strain Relief	71614
7	Power Cord	**
*	Fuse, Ozone GDB – 2/10A	72464
*	Ozone Intake Assembly	72230

* Non–Illustrated part from FreshWater III (Revision A–E).
** Order Complete Assembly

FRESH WATER II



1 WARNING – NITRIC ACID ACCUMULATION, RISK OF CHEMICAL BURNS, WEAR PROTECTIVE GLOVES

CORROSIVE

ACIDIC

DO NOT INHALE OR INGEST
DO NOT TEST PARTS BY BLOWING INTO THEM

4/00

TIGER RIVER (50 Hz)

0338501C.dwg

FOR INTERNAL USE ONLY:
HSS, TR, HSS(E), TR(E)

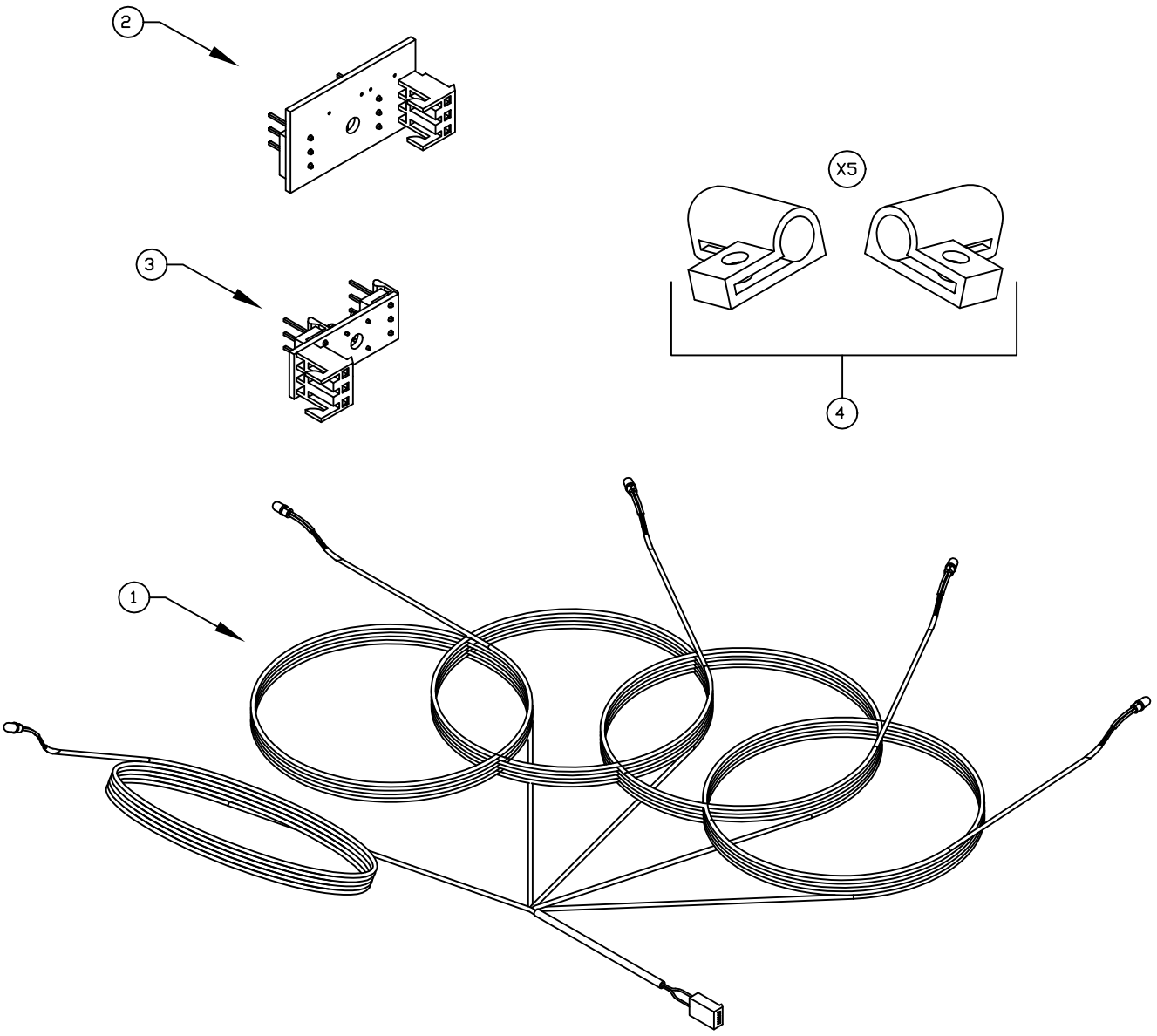
FRESHWATER II

ITEM	DESCRIPTION	PART NO.
1	Filter, Air Freshwater II	35199
2	Adapter, Male Ell 1/4" x 1/4"	34696
3	Tubing, Kynar 1/4" FWII	70939
4	Screw, 6-32 x 3/8"	33972
5	Cell, Ozone FW II	71056
6	Chamber, Ozone FW II	71055
7	Strain Relief Bushing	30098
8	Fuse Holder	34506
9	Transformer Assy, 230V/50Hz (Export)	71291
10	Kepnut, 10-24 SS	33144
11	Screw, 8-32 x 3/8" SS	33974
12A	Cordset, 18/3 Export Ozone FWII	35525
12B	Cordset, 1997 Export Ozone FWII	71439
13	Screw, 10-24 x 1/2" SS	33975
14	Lug, Grounding	30120
15	Kepnut, 10-24 SS	34018
16	Ozone Enclosure Box, FW II	34754
17	Tubing, Silicone-Ozone	70328
18	Clip, Mounting Check Valve	36586
19	Check Valve, Tubing 3/16" PVDF	34658
20	Female Adapter	34695
21	Injector, Ozone WMC-2 BLACK	71075
22	Flow Restrictor Valve Assy	72721
*	Fuse	35196
**	Screw, 8-32 x 3/8"	33366

* Non-Illustrated Part

* Used to secure two Ozone Exclosure(P/N 34754) pieces together.

CLARION LIGHT ASSEMBLY



ITEM	DESCRIPTION	PART NO.
1	LED LIGHT HARNESS	73162
2	IQ2020 ADAPTER BOARD (PRE-2004 CONTROL BOXES)	73257
3	IQ2020 ADAPTER BOARD (2004 TO CURRENT CONTROL BOXES)	73161
4	LEFT AND RIGHT CLIPS (5 EACH)	73256
*	COMPLETE ASSEMBLY	73160

MISCELLANEOUS SERVICE PARTS

TOOLS	
DESCRIPTION	PART No.
Spanner Wrench	10057
Flow Test Tool, 1995 – Current	71066
Miter Box + Saw	70094
Thermometer	10066
Spring Clamp Pliers	50051
Hose Clamping Pliers	50306
Snap Ring Tool	70825
Spanner Wrench 3.6" Dia	71703
Pliers, Strain Relief #42	50494
Pliers, Strain Relief #30	50663
Air Valve Spanner	50554
Meter Lead, Needle Black	71129
Meter Lead, Needle Red	71131
Meter, Electrical Usage, 240V	70357
Meter, Electrical Usage, 115V	10069
Thermistor Test Tool	70924
Hand Reamer Tool	72284
Red Devil Scraper	50017

STAIN	
DESCRIPTION	PART No.
Quart, Redwood Pre – 1999	71514
Quart, Redwood 1999 – 2000	71704
Pint, Surewood 2001 – Current	72306

MISCELLANEOUS SERVICE PARTS

SILICONE	
DESCRIPTION	PART No.
Tube	31397

FOAM AND INSULATION	
DESCRIPTION	PART No.
Foam, Spray – 2 lbs., 1Cu. FT	70293
Foam, Spray – 2 lbs., 8.75 Cu. FT	70869
Foam, Pour – 60 lbs	70869
Insulation, Fiberglass 3' x 65" x 2"	70268

SURFACE REPAIR	
DESCRIPTION	PART No.
Crack Repair Kit	70998
Tiger River Bartop Crack Repair	72619

LOANER TOOLS	
DESCRIPTION	PART No.
Fluke Recordning Meter	71130
Solar Distress Repair Kit	71307

SERVICE DOCUMENTS	
DESCRIPTION	PART No.
Warranty Service Claims (Pack of 50)	60091
Service Manual	61299
Parts Price List (All Lines)	60763