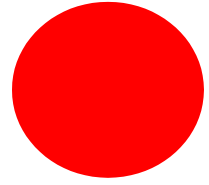




# Cascade Aqua-Aire®



## Standard & Swivel Lift Spas, Optional Reservoir

### Parts Breakdown & Assemblies

### Right, Left, and End Tub Access Door Systems



X= Color, L- Left, W= Wide, T= Swivel Lift

TUBS: 360010-X, 360010-XL, 360010-XW,  
362010-X, 362010-XL,  
360010-XWT, and 360010-XWTL

RESERVOIRS: 370000-XW and 370000-XWL

360748 Revision "I" 5/1/2017

Penner Patient Care

101 Grant Street

Aurora, NE 68818

For Service Please Call:  
1-800-732-0717 or 1-866-736-6377

Visit Our Web Site: <http://pennerbathingspas.com/>

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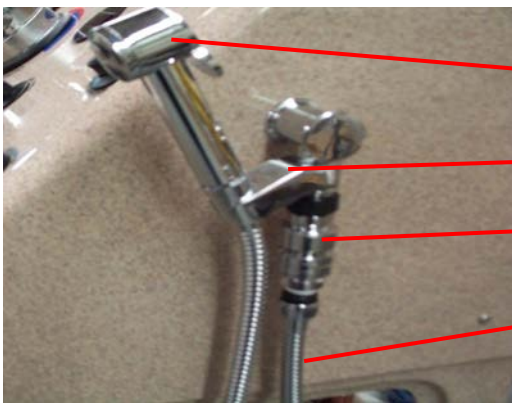
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## Deck Controls Front & Side



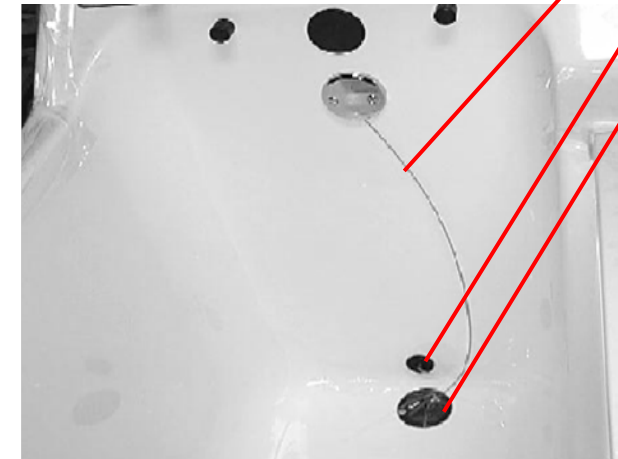
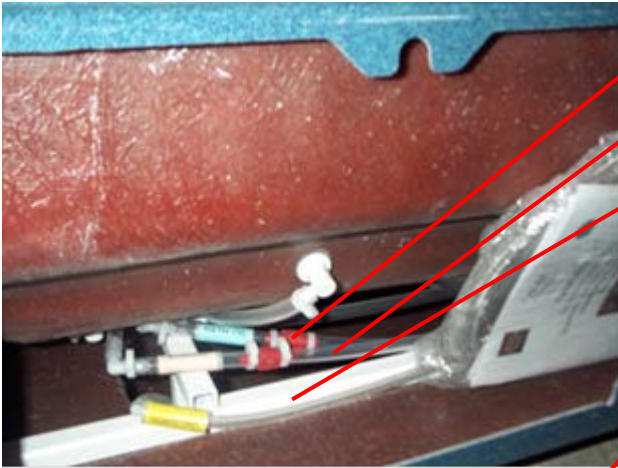
- 350535M-SER – Thermometer (2 ea)
- 350495 - Air Transmitter – Black (5 ea)
- 350200 - Dispenser Pump - Complete (2 ea)
- \*350201- "O" Ring for Dispenser pump
- \*350204 - Spring-Dispenser Pump Replacement
- \*350210 - Nut, Pump Mount (White))
- \*350215 - Cap, Dispenser Pump
- \* = All included in 350200
- 350151 – Replacement Cartridge-(Not shown)
- 350220 - Dispenser Spout - Oil & Soap (2 ea)
- 350217 - Cap - Sporocide Dispenser Pump  
The other parts are the same as 350200
- 350172 – Escutcheon, Chrome
- 360340 - Spigot – Black
- Tub Identification Markings And Ratings

## Shower Sprayer



- 140106CHT -Hand Shower W/Positive Trigger
- 140104 - Swivel Chrome Elbow
- 1404785 -Shower Backflow Preventer
- 350190CH - Shower Hose 69"

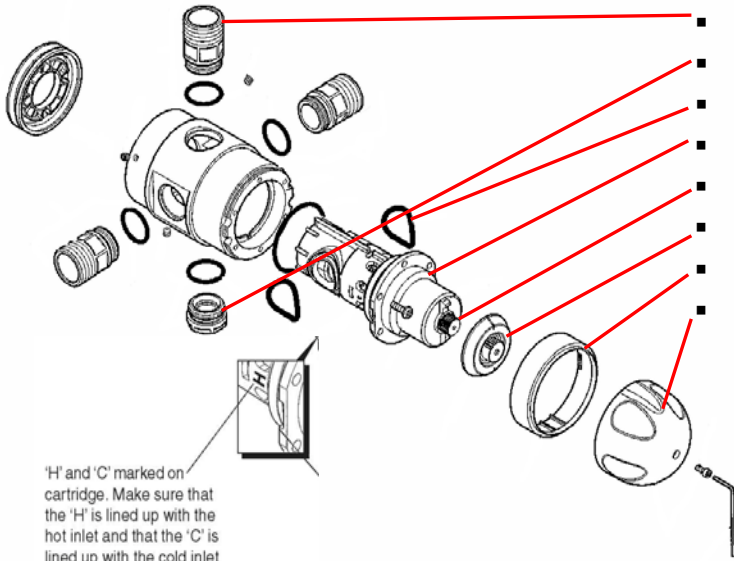
## Liquid Connections and Inside Tub



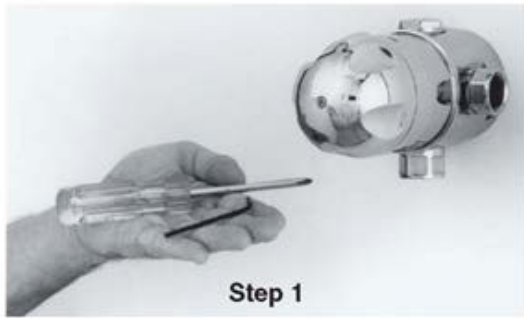
- 350235 - Check Valves
- 350276 – Clear Tubing 3/8" ID
- 140261 - Hose 1/4" Id Clear
- 140489 - Foot Strainer (Clear) On End of Disinfectant Hose  
(Not Shown)
- 350177 - Drain Plug & Cable Replacement Kit
- 360630 - Adapter - Temp Probe
- Base Shoe Basket (See Page 12)

# Rada 320 Mixing Valve Service Component Breakdown & Removal

## 350150 – Complete Mixing Valve – Rada 320



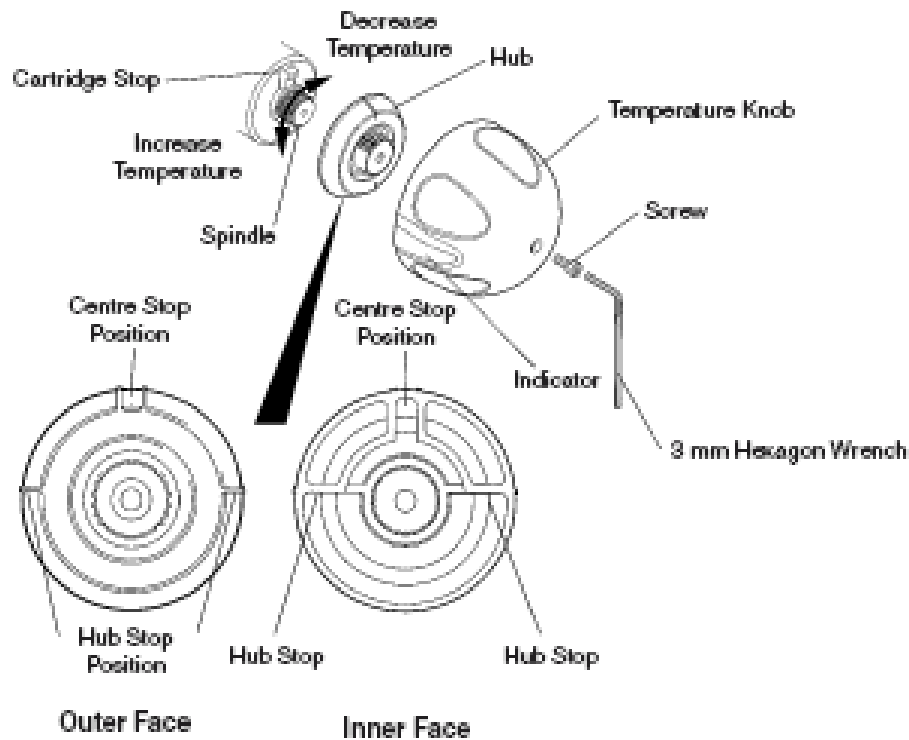
- 350157 - Inlet/Outlet Adapter, 3/4 Female Three Ea.
- 350163 - Cap (with O-ring)
- 350158 - Seal Pack (includes all O-rings)
- 350151 - Cartridge – with O-rings Rada 320
- Temperature Spindle
- 350154 - Hub
- 350152 - Temperature indicating ring
- 350162 - Knob Pack (Knob, screw, and wrench)
- 350159 – Screw Pack (includes all screws)



The Rada 320 Mixing Unit features a single "sealed for life" disposable internal cartridge. With an allen key (3 mm) to remove the handle retaining screw and a phillips head screwdriver to remove the 6 cartridge retaining screws, the entire mixing unit can be serviced and/or replaced in approximately 10 minutes.

Note: All seals are pre-lubricated. If further lubrication is required, use only silicone based lubricants on this product. Do not use petroleum based lubricants.

## Rada 320 - Mixing Valve Adjustment



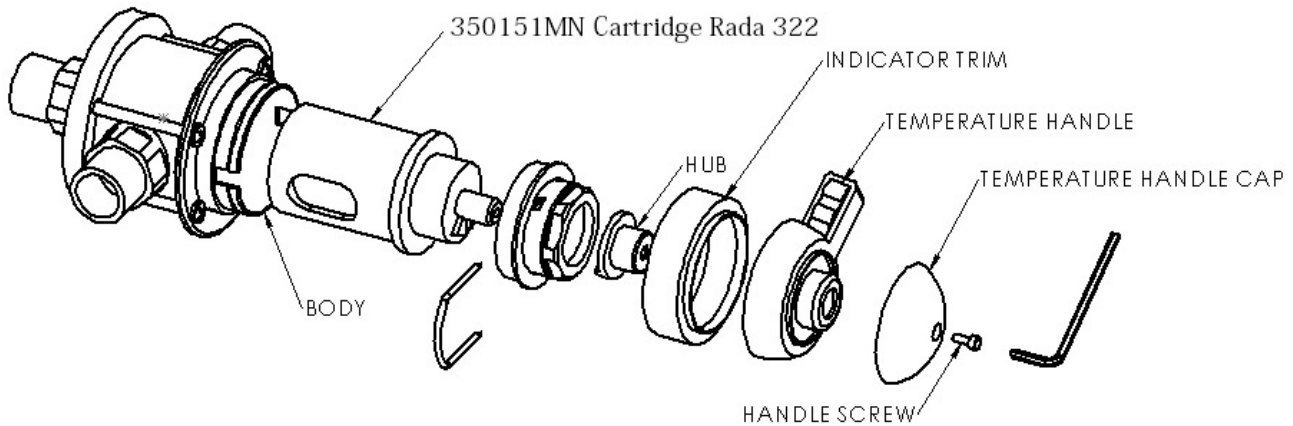
1. Remove the temperature knob screw using a 3 mm hexagonal wrench. Remove the temperature knob.
2. Pull off the black polymer hub assembly which may inadvertently remain attached to the inside of the temperature control handle. This is a “push fit” and can be “levered” out using a thin blade screwdriver or pliers.
3. Rotate the spindle until required maximum blend temperature is obtained at outlet point (clockwise = decrease temperature, counterclockwise = increase temperature).

**When resistance is felt do not use force to turn any further, as this can damage the internal parts.**

4. Once the desired maximum blend temperature is achieved, re-fit the hub without disturbing the spindle: Position the hub so that the hub stop comes up against the cartridge stop preventing any further rotation in a counterclockwise direction. Check that blend temperature has not altered.
5. Refit the temperature knob. Make sure that the indicator points to 9 o'clock.



## Rada 222 - Mixing Valve Parts



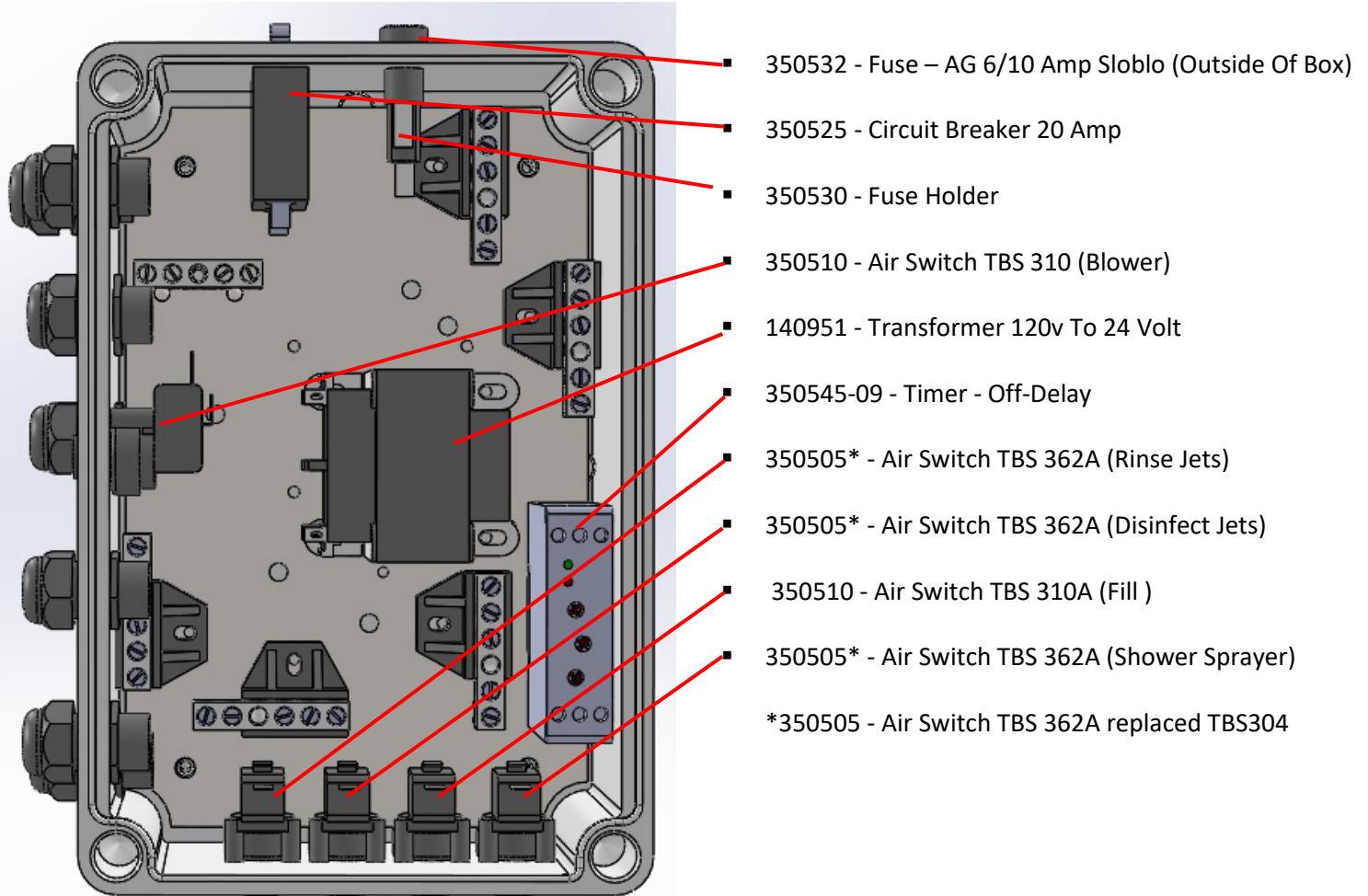
## Rada 222 Mixing Valve Adjustment

1. Check that an adequate supply of hot water is available at the hot inlet of the mixing valve.
2. Temperatures should always be checked using a thermometer with proven accuracy.
3. Remove the handle screw, temperature handle cap, temperature handle, and indicator trim using a 3 mm hexagonal key.
4. Pull off the hub.
5. Using the temperature hub, rotate the spindle until the required maximum blend temperature is obtained at the discharge point (rotate clockwise to decrease temperature).

**If resistance is felt do not use force to turn any further, as this can damage the internal parts.**

6. Once the desired maximum blend temperature has been achieved, refit the hub so that the lug is against the side of the stop on the cartridge face, thus preventing counter clockwise rotation past the maximum temperature stop.
7. Check that blend temperature has not altered.
8. Refit the indicator trim, handle, and cap. Then secure with the handle screw using a 3 mm hexagonal key.

## Electrical Box for All Standard Cascades



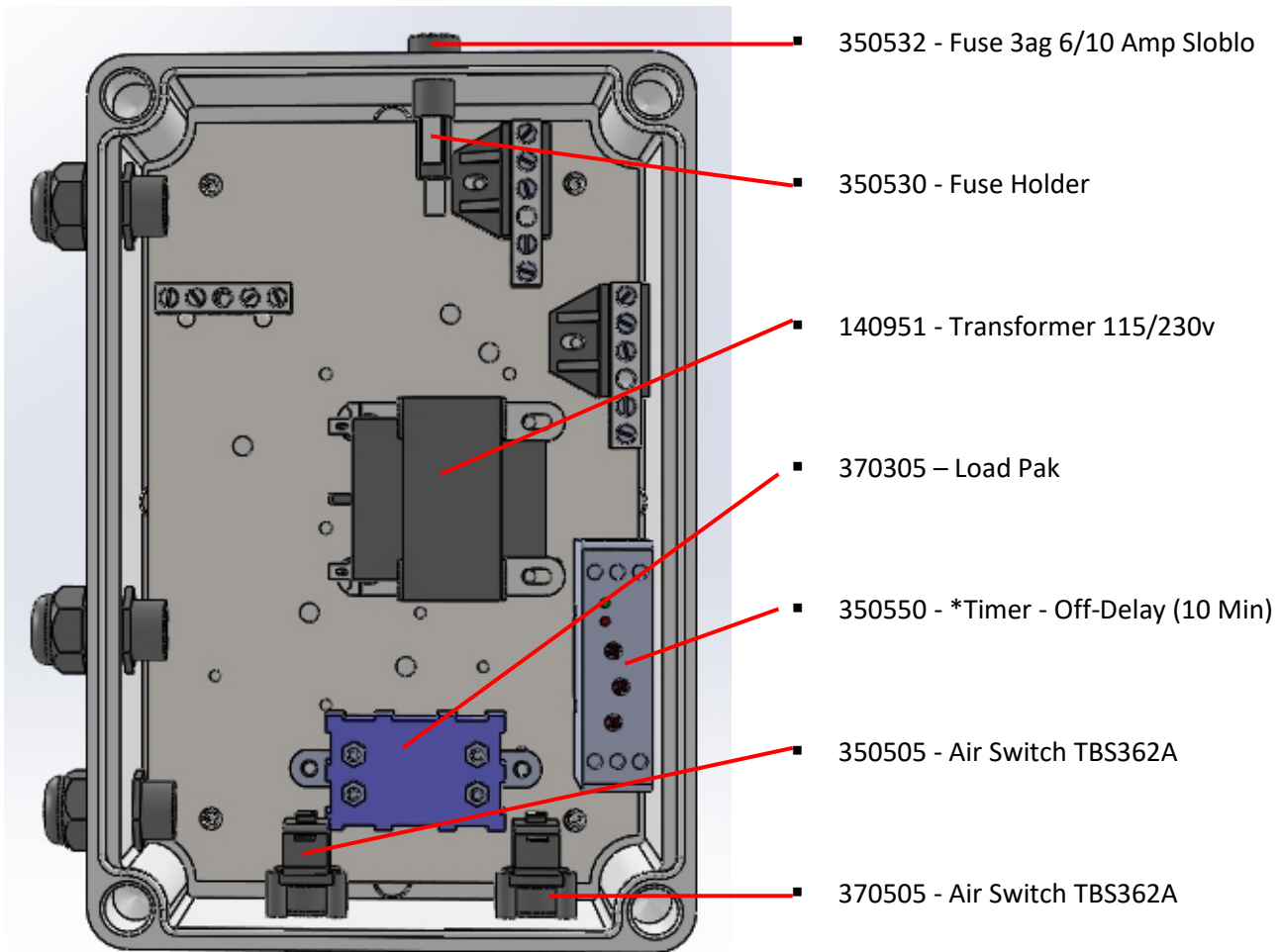
**NOTE: A spare fuse is taped inside the Lid in case it is needed.**

### Timer Adjustments Explanation

There are three Timers located in the lower right hand corner of the Electrical Kit (shown above). They are adjusted by setting the timer sector and value. An example is the **Time Sector** setting of 100S = 100 seconds and with the **Time Value** set at 5, the timer is now set for 50 seconds. Another example is the **Time Sector** setting of 1000S = 1000 seconds and with the **Time Value** set at 5, the timer is now set for 500 seconds.



## Cascade Reservoir Electrical Kit



TBS362A replaced TBS304A

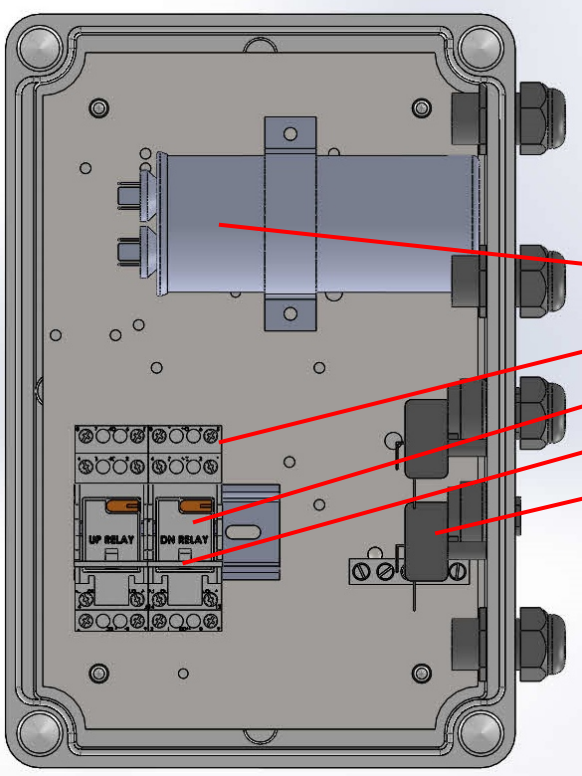
**NOTE: A spare fuse is taped inside the Lid in case it is needed.**

## Timer Adjustments Explanation

There are three Timers located in the lower right hand corner of the Electrical Kit (shown above). They are adjusted by setting the timer sector and value. An example is the **Time Sector** setting of 100S = 100 seconds and with the **Time Value** set at 5, the timer is now set for 50 seconds. Another example is the **Time Sector** setting of 1000S = 1000 seconds and with the **Time Value** set at 5, the timer is now set for 500 seconds.

## Swivel Lift Electrical Kit

**NOTE:** The kit shown is as it is mounted in a right hand tub. In a left hand tub it is upside down but same kit.



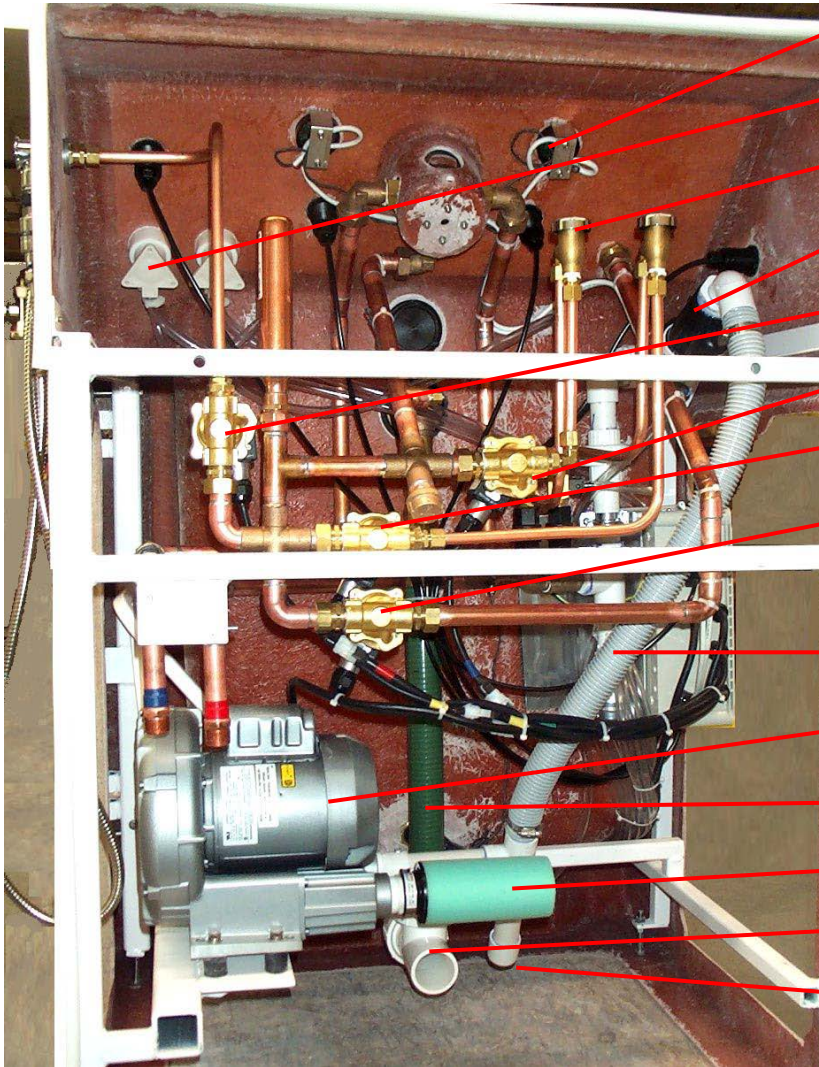
- 340115 - Capacitor - Post Tub Actuator
- 390530-09 - Base Blade Socket - 2ea
- 390540-09 - Relay for Actuator - 2ea
- 390545-09 - Retainer Clips - 2 ea
- \*350505 - Air Switch TBS362A - 2ea

\*350505 - Air Switch TBS362A replaced TBS304

Note: The Actuator System Schematic is inside the Electrical Kit Lid.

Note: This view is up side down for left hand tubs.

## Cascade Plumbing View



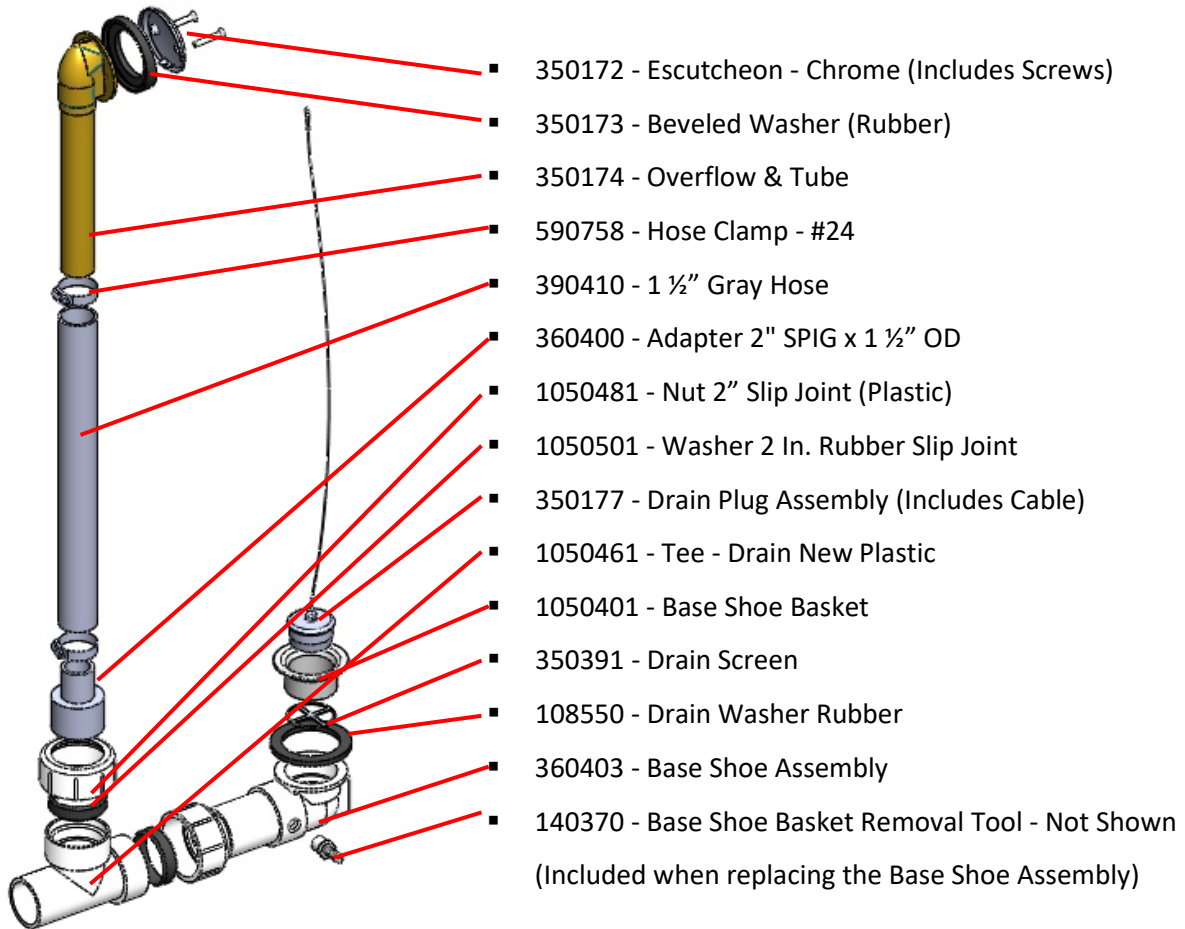
- 350535M-SER - Thermometer -Replacement
- 350200 - Dispenser Complete
- 144105 - Vacuum Breaker Watts 288A-3/8
- 360628 - Check Valve 1 1/2" Black, Assembly
- 140124 - Solenoid Valve - (Shower)
- 140124 - Solenoid Valve (Rinse)
- 140124 - Solenoid Valve - (Disinfectant)
- 140124 - Solenoid Valve (Fill)
- 1401308 – All Solenoid Repair Kit
- 390409 - Hose Vac 1-1/4 Id
- 350602 - Air Blower
- 360187 - Green Pipe 1 1/2" ID Flex 16"
- 350601 - Air Filter
- 360403 - Drain Shoe Assembly (including Tool)
- 3601761- Water Trap Assembly
- 140474 - Black Check Valve 1/2"
- 350315 - Screen Complete 1/2" 40 Mesh
- 350316 – Internal Screen only Replacement
- 350185 - Inlet Hose Assembly -36".

### SOLENOID IDENTIFICATION COLORS

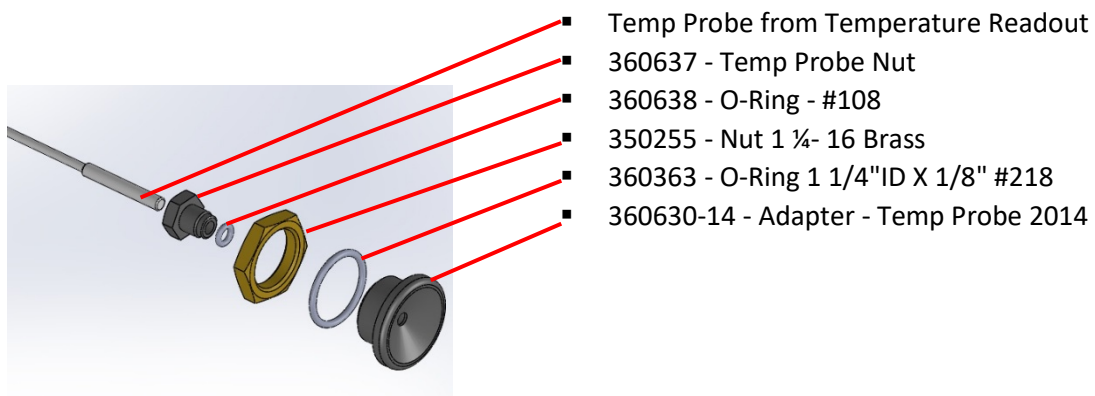
TUB SHOWER RED
TUB FILL GREEN
TUB DISINFECT YELLOW
TUB RINSE BLUE



## Cascade Tub Drain Assembly



## Tub Temperature Probe Assembly

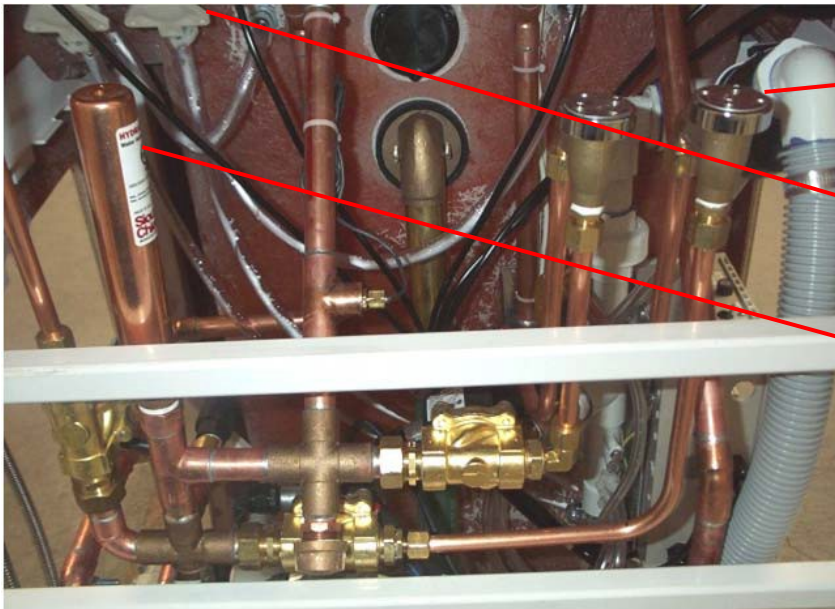




## Cascade Plumbing View

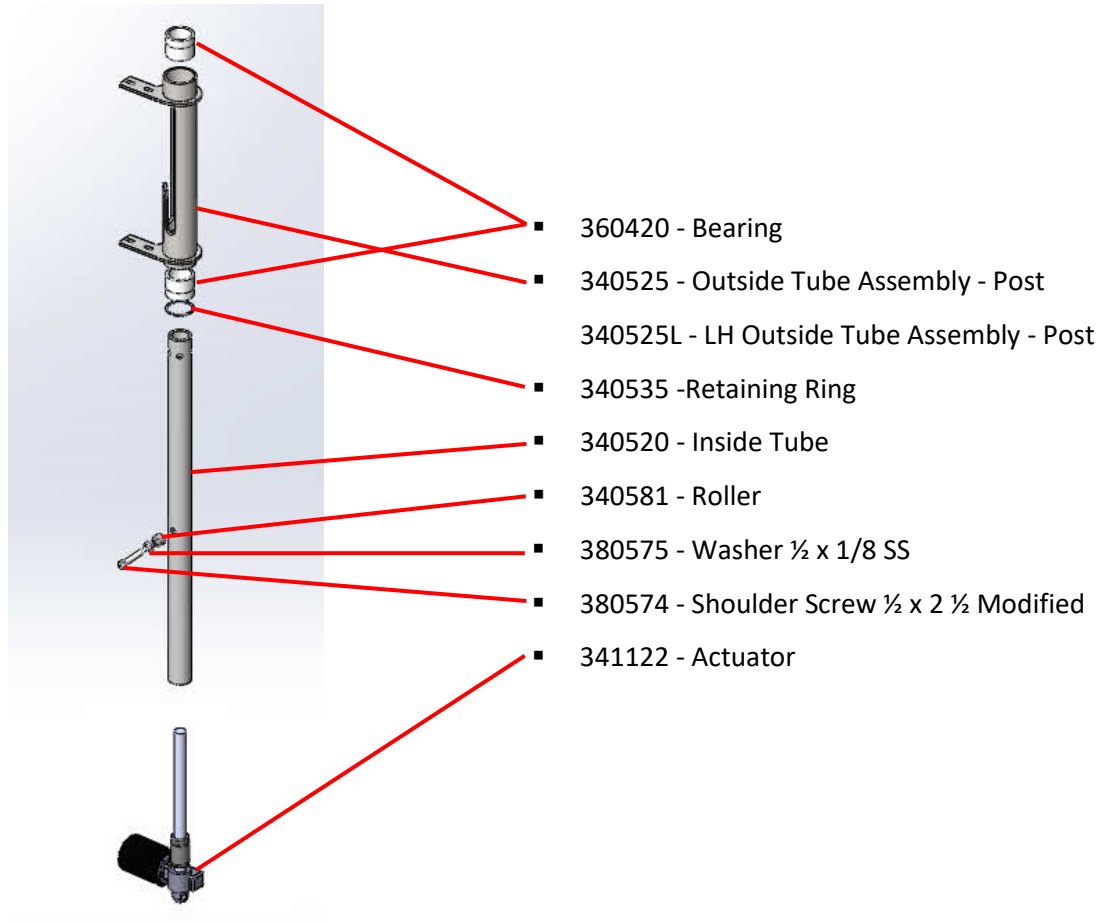


- 360628 - Check Valve 1 1/2" Black Service Replacement Assembly Only
- 040955 - Tubing 1/8" Air Line
- 1404804 - Injector – Dema
- 140474 - Check Valve-1/2 FxF – Plastic

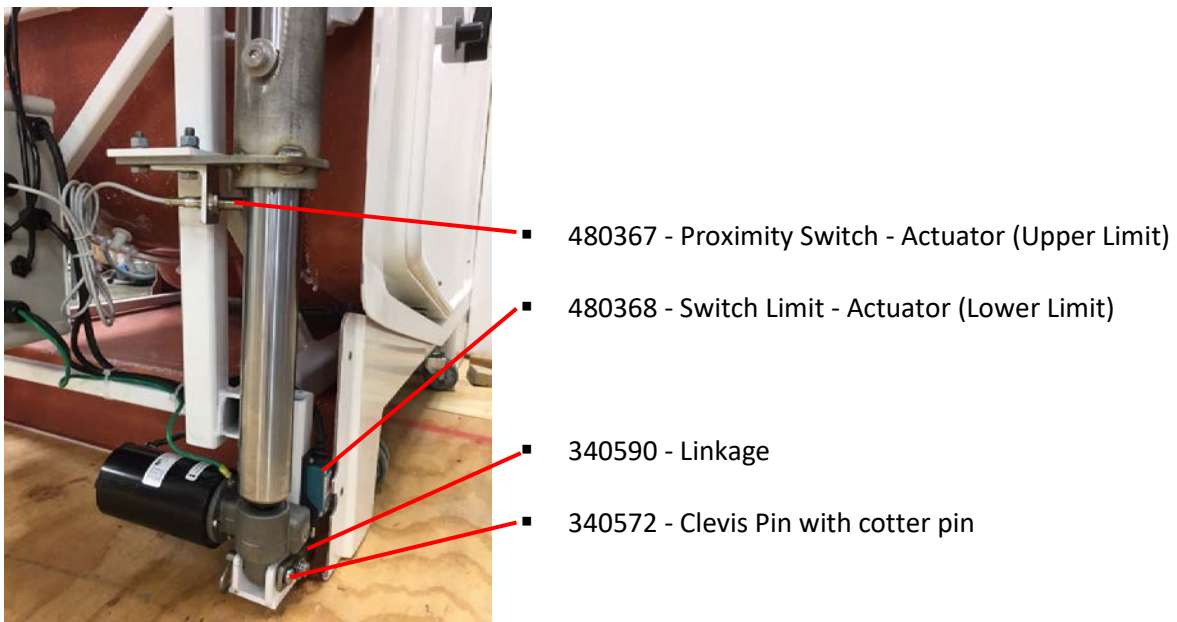


- 144105 - Vacuum Breaker Watts 288A-3/8
- 144110 - Service Kit for Vacuum Breaker
- 350200 - Dispenser Pump
- 350444 - Hydra-Rester

## Cascade Tub with Swivel Lift



## Swivel Lift Actuator Limit Switch Parts





## Cascade Tub with Swivel Lift



- 481160-2 - Arm Rest R/H Brown
- 481160-1 - Arm Rest R/H Blue
- 481161-1 - Arm Rest L/H Blue
- 481161-2 - Arm Rest L/H Brown
- 481161-3 - Arm Rest L/H Grey
  
- 481150-2 - Chair Comp Brown W/O Hole
- 481150-3 - Chair Comp Grey W/O Hole
- 481150-1 - Chair Comp Blue W/O Hole
- 481151-1 - Chair Comp Blue W/Hole
- 481151-2 - Chair Comp Brown W/Hole
- 481151-3 - Chair Comp Grey W/Hole



- 390640 Screw 1/4-20 X 1/2 PH TR HD SS
- 3411068 -Scale PSC48 Display Only Service Replacement
- 360820 - Cover, Lift Scale Arm,
- 360830 - Cover, No Scale Lift Arm
- 350495 - Air Transmitter - Raised Black (2 ea)

## Penner Manufacturing, Inc. Swivel Lift Scale Calibration Procedure

It is very important that you use an absolute 25 LB. Weight. If not used, you will have variations in your patient weighing.

Follow the calibration procedures included in any Penner Patient Transfer Safe Operation Manual.

Requirements: Calibrated 25 LB. weight.



1. To enter the calibration mode, first press and hold the "ON/ZERO" pad. While holding the "ON/ZERO" pad, press and hold the "LB/KG" pad. After approximately 3 (three) seconds the message on the display will change from "ZERO" TO "CAL". Release both pads at this time and the display will show the "CAL 0" message.
2. Make sure the chair is empty and not in contact with any part of the tub. Allow the lift to stabilize completely. (Not vibrating or moving at all and no fans blowing on it.) Press the "ON / ZERO" pad once again. The indicator will count down from -8- to -0-. When finished, the indicator will show the "C 25" message.
3. Place a 25 LB. calibrated weight on the chair, allow it to stabilize again\* and press the "ON / ZERO" pad once again, The indicator will again count down from -8- to -0- as before and show "25".
4. The indicator then automatically returns to the normal weighing mode. Calibration is now complete.

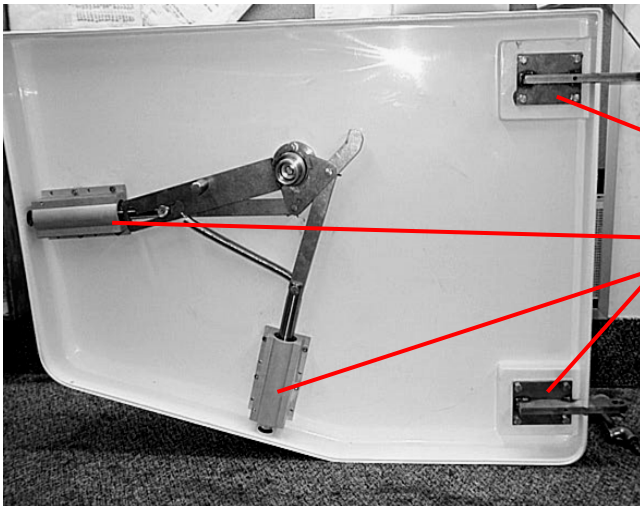
\*Failure to stabilize the unit may cause the scale to display an inaccurate weight or not permit calibration.

## Water Door Seal

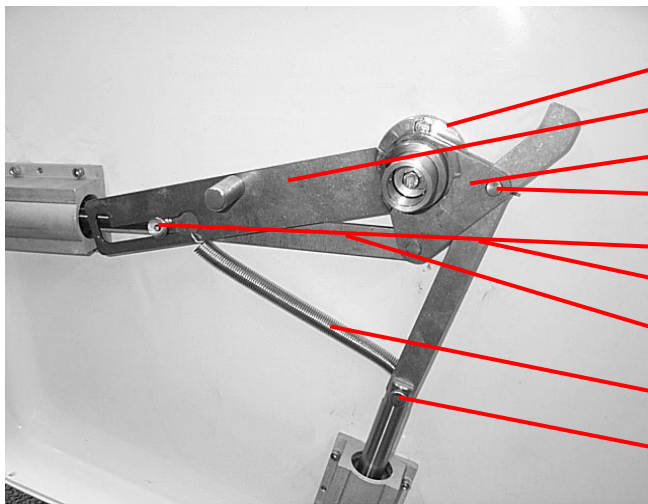


- 360125K - Door Seal Replacement Kit
- Includes everything needed to replace the door seal. It works for either the end opening or the side opening water doors.  
(An End Opening Door is shown at the Left.)

## Side Opening Water Door Internal Parts



- 360335 - Hinge Assembly (2 ea)
- 360101 - Bearing, Linear Modified



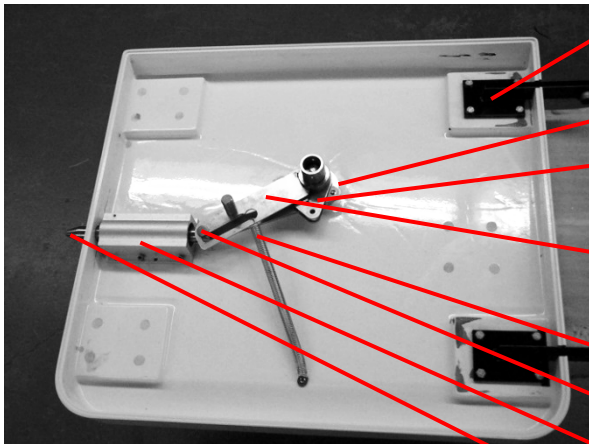
- 360280 - Door Lock Spindle
- 360315 - Secondary Lock Assembly
- 360320 - Hub Assembly
- 360425 - Clevis Pin - 3/8 X 1" (2ea)
- 360310 - Pin - 2nd Lock
- 360331 - Linkage - Off-Set
- 360326 - Linkage – Straight
- 360435 - Spring
- 360430 - Clevis Pin - 1/2 X 1 1/4" SS

## Door Lock Handle (Side and End Opening)



- 360720-12 - Label - Leave Door Open
- 360440 - Roll Pin - 1/4 X 1 3/4" SS
- 360297 - Handle Cast Complete
- 360309 - Secondary Lock Knob

## End Opening Door Internal Parts

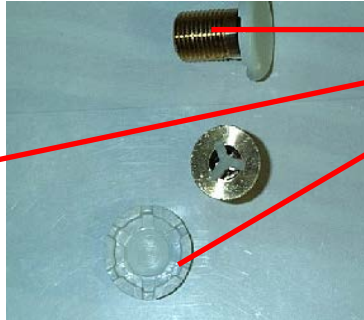


- 360335E - Hinge Assembly (RH Hinge) (2 ea)
- 360335EL - Hinge Assembly (LH Hinge)
- 360280 - Door Lock Spindle
- 360320E - Hub Assembly-EO (RH)
- 360320EL - Hub assembly EO (LH)
- 360315E - Secondary Lock Assembly-EO
- 360315E - Secondary Lock Assembly-EO LH
- 360435 - Spring
- 360310 - Pin - Secondary Lock
- 360101 - Bearing, Linear Modified
- 360302 - Door Lock Bolt - Short



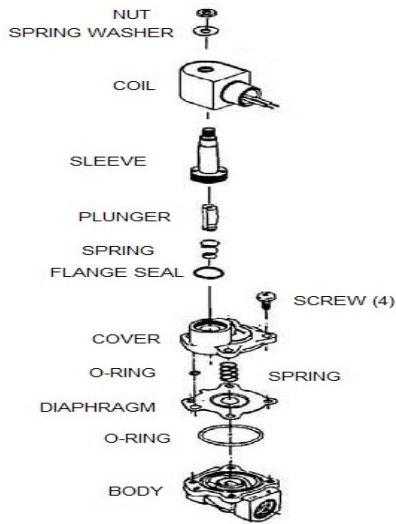
- 360336E - Hinge Assembly - Tub EO
- 360276 - Hinge Spacer
- 360250 - Lock Bushing

## Cascade Aqua-Air Air Jet Assembly

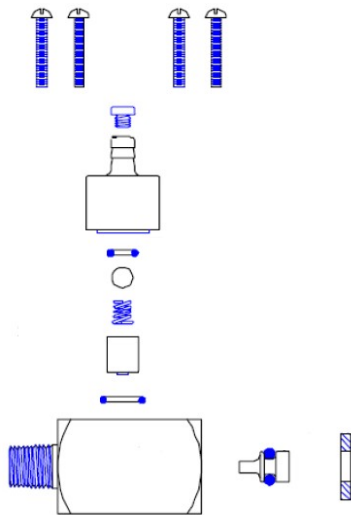


- 350135 - Jet - Brass
- 350134 - Kit - Internal Jet Replacement
- 360646 - Replacement Cap - White 360644 - Replacement Cap - Black (not shown)

## Break Down Of Solenoid Valve with Coil



## Orientation of Components in Injector



DEMA  
INJECTOR



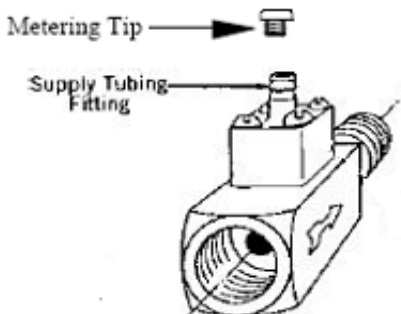


## Checking for the Correct Dilution of Disinfectant Solution

1. Check to see if a container of disinfectant has been installed. Assure that the disinfectant tube is inserted into the container and connected to the Injector with black metering tip. See the drawing of the square injector (204C) below for location of the metering tip.
2. Visually check if disinfectant is in the hose all the way to the injector. If not, the disinfectant can be brought to the injector pushing the disinfect button on the tub until disinfectant fills the hose all the way to the injector.
3. With the drain open, push the fill button on the tub to check the water temperature. Adjust the temperature control to read 60 degrees to 65 degrees (F). When the temperature remains in the above range, turn off the fill button.
4. Allow the water to drain from the tub.
5. Close the tub drain, push and hold the disinfect button long enough to bring the disinfectant mixture into the tub then release the disinfect button.
6. To test the solution in the foot-well of the tub with the Dilution Check Kit, order (140481). A dispenser of test paper (part number 219201) is included in this kit.
7. Tear off a strip of test paper from the dispenser and immerse in the solution for at least (10) seconds. Compare the color that the test paper turns with the chart on the dispenser. If the test paper matches the green in the range of 600-800, the disinfecting solution is the correct strength.
8. If the color of the test paper matches a color on the dispenser chart in the 800-1000 range, install the next smaller metering tip. See metering tip chart for color reference. The injector is furnished with a metering tip installed. The Metering tips listed below are included in the Dilution check kit, (Part number 140481).
9. If the color of the test paper matches a color on the dispenser chart in the 0-400 range, install a metering of the next larger size and re-test.

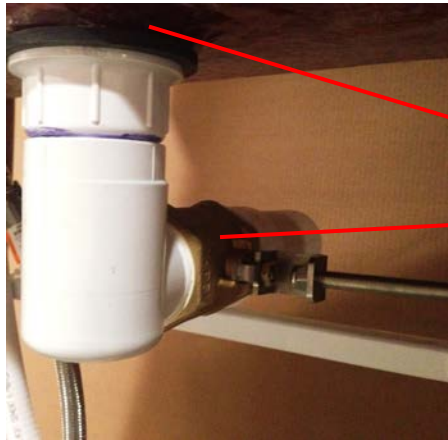
### METERING TIP CHART APPLICABLE TO THE AQUA-AIR JET DISINFECTATION INJECTOR

<u>Color</u>	<u>Part Number</u>	<u>Metering Tip Size</u>	<u>Solution Strength</u>
Black	1404824	Large	Preferred Strength
Blue	1404822	Medium	Less Strength

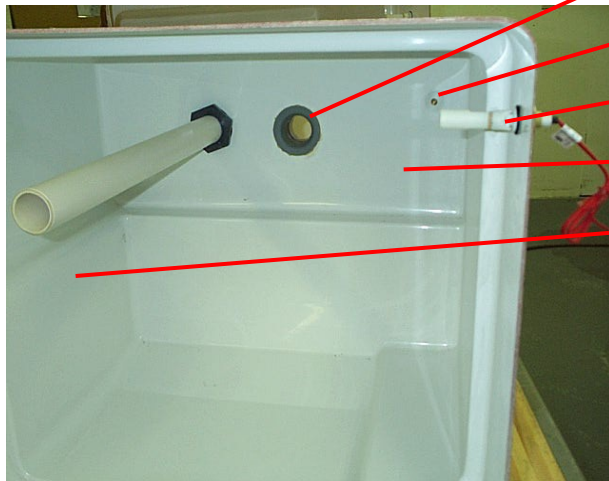




## Cascade Reservoir

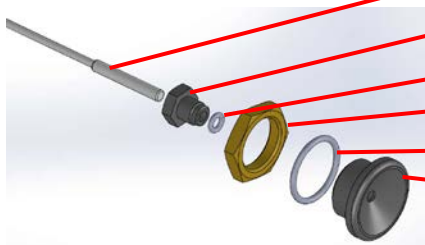


- 370430 - Gasket 2 3/8" ID
- 370412 - Valve Ball 2" Brass



- 1050401 - Base Shoe Basket (Brass)
- Temp Probe Adapter - See below
- 370300 - Float Switch
- 370871 - Reservoir Tank
- Overflow pipe

**Note: Reservoir Temp Probe adapter changed  
As shown below on 08/25/2014**



- Temp Probe from Temperature Readout
- 360637 - Temp Probe Nut
- 360638 - O-Ring - #108
- 350255 - Nut 1 1/4-16 Brass
- 360363 - O-Ring 1 1/4" ID x 1/8" #218
- 360630-14 - Adapter - Temp Probe 2014

## Cascade Reservoir Cont'd



- 350535M-SER Thermometer Display  
Can be ordered either F° or C° (Has to be routed back to the electrical kit when replaced)
- 370325 - Handle - Reservoir Lever
- 350470 – Air Transmitter Flush (2 ea)
- 370306 - Reservoir Installation Kit.  
(It is Boxed & Inside the Back of the Reservoir).  
Components:
- 360305 - Reservoir Outlet Fitting
- 350104- -Gasket Buna 2-1/4 X 3 X 1/8
- 655400 - Nut 3/8-16 Hex Pltd (2 ea.)
- 140518 - Washer 3/8 Flat (4 ea.)
- Reservoir connector pipe assembly
- 370435 - Coupling, 2" PVC Flex
- 370380 - Screw 3/8-16 X 3 3/4" Grade 5 Zinc (2 Ea.)

## Cascade Installation Kit & Doors



- 350185 - Hose Assembly-36" (2 Ea)  
(Fiber Washer Comes With Hose)
- 350650 - Label- Warranty Registration
- 360748 - Label- Manual Cascade Air And Reservoir  
Parts & Assembly
- 360745 - Cascade Installation Manual
- 360750 - Cascade Operation Manual
- 390301 - Nipple-3/4" Close Brass Modified
- 140625 - 5/16 X 2 Floor Anchor (2 ea)
- 400212 - Belt, Cascade 78"
- 350889 - Key - Penner Door Lock (3 Sets)

### Miscellaneous Access Door Parts:

- 350895 - Door Lock (One on each Access Door)
- 1400191 - Bracket - Tub Door Spring (2 On Each Door)
- 140018 - Rivet - 3/16 Removable (4 On Each Door)

Your Penner Distributor and his personnel are trained to provide in-service instruction and maintenance information on your Cascade Bath System. If you have any questions about the operation or maintenance of your Cascade Bath System, please contact your Penner Distributor. For your nearest Penner distributor, contact:

**Penner Patient Care, Inc.**

at

1-866-736-6377

OR

1-800-732-0717