Otterbine Service Manual

Concept 3 Aerating Fountains

Table of Contents

ADDITIONAL RESOURCES

- Physical Installation Instructions
  » Refer to Concept 3 Owners Manual
- Troubleshooting, Diagnostic Forms & Supply Lists
  » Refer to Warranty & Reference Service Manual

Otterbine® Barebo, Inc.
3840 Main Road East
Emmaus, PA 18049 U.S.A.
PH: 610-965-6018
Fax: 610-965-6050

Email: service@otterbine.com
Web: www.otterbine.com

Made in the U.S.A.

This manual and more can be found online through Otterbine's Distributor Extranet.

To Register: www.otterbine.com/register
To Login: www.otterbine.com/login

Power Unit | Disassembly

The Power Unit will need to be removed from the float in order to perform the following procedures.

NOTE: Prior to dissassembly complete the Power Unit Diagnostics 10-step process as it will aid you in identifying problems.

Complete disassembly of the Power Unit involves three primary steps.

1. Remove Float and Pumping Chamber/Standoff Strainer (*See "Exploded Views & Parts Lists"*)
2. Disassembly of the Seal Hub
3. Disassembly of the Power Unit

Power Unit Disassembly | Seal Hubs:

There are currently three hub assemblies found on Concept 3 Motor Units, (See Fig. 1a). Depending on the year of manufacture, determine the one for the unit and proceed to the appropriate section for disassembly instructions. **Power Unit Disassembly continues at Step F.**

Metal Seal Hub
(Units after March 2010)

Open Seal Hub
(Units 2007-March 2010)

Closed Seal Hub
(Units before 2007)

Fig. 1a | *Seal Hub Assemblies*

Metal Seal Hub Disassembly (Units after March 2010)

Refer to Exploded View Illustrations found in the next section for additional assistance.

A. Remove 2 oil plugs from the motor base plate, and drain the oil.

B. Remove the Can Ring, using a Phillips screwdriver remove the 4 S/S self-tapping screws and remove can ring. (See Fig. 2a)

C. Remove the motor/motor base plate from the S/S housing by reinstalling one of the oil plugs and installing an air fitting into the other oil plug opening. Slowly apply air pressure to a "maximum of 5PSI". Wrap a rag around the motor base plate assembly to catch any excess oil that may escape when the motor/motor base plate assembly pops out. (See Fig. 3a) Set the motor/motor base plate assembly on the motor stand (See Fig. 5a).

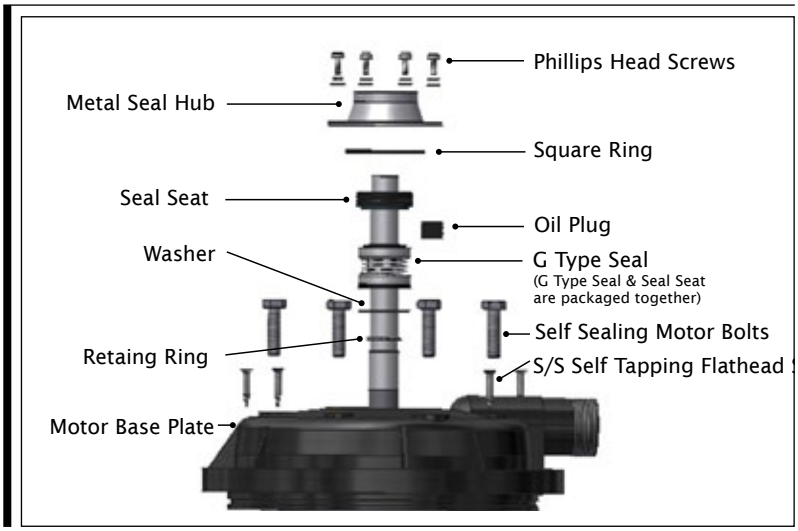


Fig. 2a | *Metal Seal Hub Assembly Exploded View*

! WARNING: DO NOT PRY ON MOTOR BASE PLATE ASSEMBLY IN ORDER TO REMOVE, DAMAGE TO SEAL WILL OCCUR.

Perform the next two steps only if the motor base plate is to be removed from the motor or if the rotary seal requires replacement.

D. Remove the metal seal hub (See Fig. 2a). Using a Phillips screwdriver remove the 4 screws and pull the seal hub off the motor shaft.

E. Remove the G-Type seal and washer. Use snap ring pliers to remove retaining ring.

NOTE: Rotary seals, self-sealing bolts, and O-rings are not reusable after they are removed.

(Proceed to Step F)

Fig. 3a | *When removing motor base plate with air pressure, wrap a rag around the assembly to catch excess oil.*

Open Seal Hub Disassembly (Units 2007-March 2010)

Refer to Exploded View Illustrations found in the next section for additional assistance.

A. Remove 2 oil plugs, from the motor base plate, and then drain the oil.

B. Remove the Can Ring, using a Phillips screwdriver remove the 4 S/S self-tapping screws. Remove Can Ring. (See Fig. 4a)

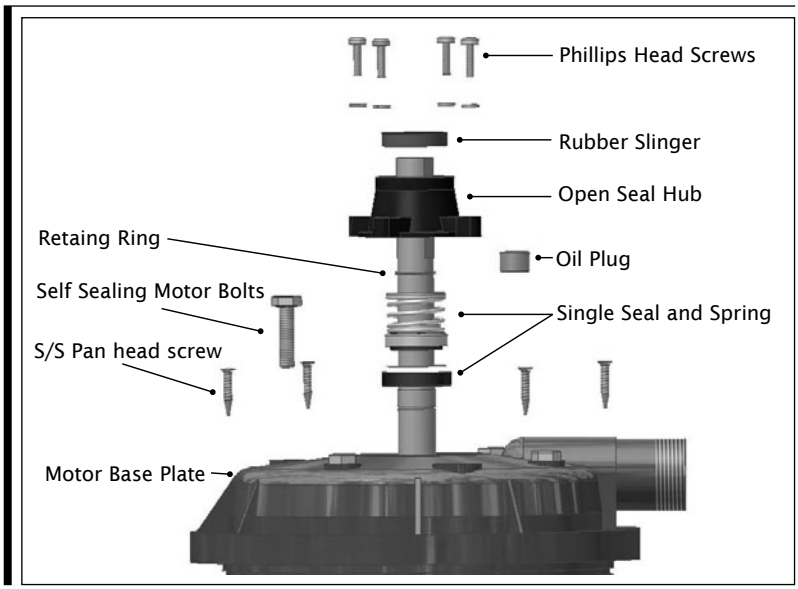


Fig. 4a | *Open Seal Hub Assembly Exploded View*

C. Remove the motor/motor base plate from the S/S housing by reinstalling one of the oil plugs and installing an air fitting into the other oil plug opening. Slowly apply air pressure to a "maximum of 5PSI". Wrap a rag around the motor base plate assembly to catch any excess oil that may escape when the motor/ motor base plate assembly pops out. (See Fig. 3a) Set the motor/ motor base plate assembly on the motor stand. (See Fig. 5a)

Fig. 5a | *Concept 3 Motor/Motor Base Plate Assembly on Stand*

! WARNING: DO NOT PRY ON MOTOR BASE PLATE ASSEMBLY IN ORDER TO REMOVE, DAMAGE TO SEAL WILL OCCUR.

Perform the next two steps only if the motor base plate is to be removed from the motor or if the rotary seal requires replacement.

D. Remove the open seal hub (See Fig. 4a). Using a Phillips screwdriver remove the 4 screws and pull the seal hub off the motor shaft. Remove rubber slinger.

E. Use snap ring pliers to remove retaining ring. Remove seal spring and rotary portion of seal.

NOTE: *Rotary seals, self-sealing bolts, and O-rings are not reusable after they are removed.*

(Proceed to Step F)

Closed Seal Hub Disassembly (Units Prior to 2007)

Refer to exploded view illustrations found in the next section for additional assistance.

A. Remove the seal hub oil plug and drain the oil, from the seal hub cavity.

B. Remove 2 oil plugs from the motor base plate, and then drain the oil.

C. Remove the Can Ring using a Phillips screwdriver remove the 4 S/S self-tapping screws and remove Can Ring.

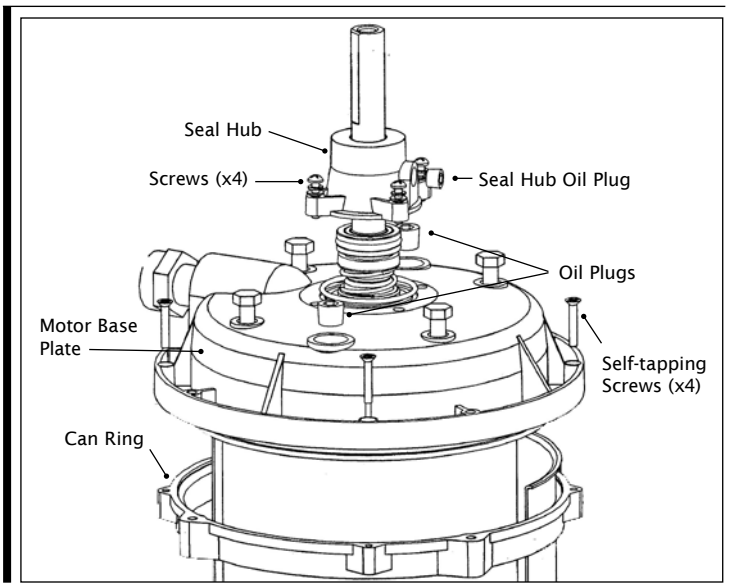


Fig. 6a | *Closed Seal Hub Assembly Exploded View*

D. Remove the motor/motor base plate from the S/S housing by reinstalling one of the oil plugs and installing an air fitting into the other oil plug opening. Slowly apply air pressure to a "maximum of 5PSI". Wrap a rag around the motor base plate assembly to catch any excess oil that may escape when the motor/motor base plate assembly pops out. (See Fig. 3a) Set the motor/motor base plate assembly on the motor stand. (See Fig. 5a)

! WARNING: DO NOT PRY ON MOTOR BASE PLATE ASSEMBLY IN ORDER TO REMOVE, DAMAGE TO SEAL WILL OCCUR.

Perform the next step only if the motor base plate is to be removed from the motor or if the rotary seal requires replacement.

E. Remove the seal hub (See Fig. 6a). Using a Phillips screwdriver remove the 4 screws and pull the seal hub off the motor shaft. Remove double rotary seal assembly.

NOTE: *Rotary seals, self-sealing bolts, and O-rings are not reusable after they are removed.*

(Proceed to Step F)

Power Unit Disassembly | Power Unit

Disassembly of the Power Unit involves five main areas, depending on results from diagnostics and other testing, some steps may be omitted.

F. Perform a visual inspection of the motor and motor base plate assembly. Note any abnormalities. (Examples: blown capacitor, cracked motor end bell, motor wired improperly, water damage.) Spin the motor shaft by hand, are the bearings noisy, do they drag?

   a) Should bearings have failed disassemble the motor and check for rotor strike.

G. Motor: If motor failed the Megger/Hi Pot testing procedure during the Power Unit Diagnostics, it is necessary at this time to perform further testing to rule out a conductive bulkhead wire assembly versus a shorted motor. (Disconnect all bulkhead wires from the motor and also remove the capacitor/start switch from the motor and retest both assemblies).

NOTE: *It is possible to reuse a motor in which some water was present in the oil. Be absolutely sure that all moisture is out of the motor before reuse. Bearings need to be inspected and may also need to be changed.*

Should water contamination be present, the unit should be disassembled. Separate the motor's rotor from the stator and wash both in mineral spirits (a parts washer is ideal for this type of cleaning). Allow the motor to dry overnight before retesting. (See Fig. 7a)

Fig. 7a | *If water was presenent in oil, you might be able to reuse motor. Seperate motor rotor and stator and wash both in mineral spirits; allow to dry overnight before retesting.*

H. Capacitor and Start Switch testing: Determine HP of unit and proceed. (See Fig. 8a)
Refer to Motor Capacitor/Start Switch wiring diagrams and specifications found in the Appendix.

IMPORTANT: The start switch will vary per HP/Model; do not mix.

   a) If it is determined that these components have failed; replace them at this time.

      - Always replace the capacitor and the start switch as a pair, never one without the other.

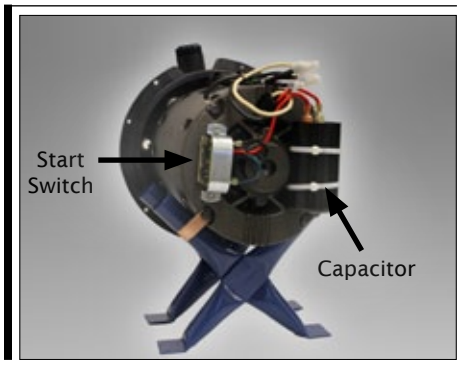


Fig. 8a | *Concept 3 Start Switcch and Capacitor*

<u>1HP & 2HP Single Phase Motors</u>
1HP & 2HP single phase motors will contain both a capacitor & start switch.

To check the start switch:

   a) Remove start switch from motor. (See Fig. 8a)

   b) Check for visual damage, faulty connector solder joints, burn marks.

c) Check resistance between pins 1 and 3, verify short circuit (continuity). (See Fig. 9a)

d) Check resistance between pins 1 and 2, verify open circuit.

e) Verify the number on the label of the start switch, make sure it is the correct one.

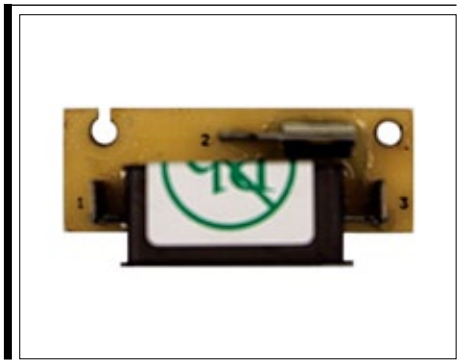


Fig. 9a | *Start switch removed from motor. Pins 1, 2 and 3 are visible.*

To check the capacitor:

a) Remove capacitor from motor.

b) Inspect capacitor for cracks/defects.

c) Inspect capacitor's integrated pressure relief component. A hole in the center of the relief component represents a failed condition. (See Fig. 10a)

d) Test the cap with Digital Capacitor Tester. (See Fig. 11a)

e) After components are attached, the power unit can now be re-assembled without disturbing the rotary seals. Proceed to the **Power Unit Assembly/Final Assembly & Testing**.

- Always make sure capacitors fit tight against the end bell. Snug ty-raps, if defective replace. (P/N: BP2874*10)

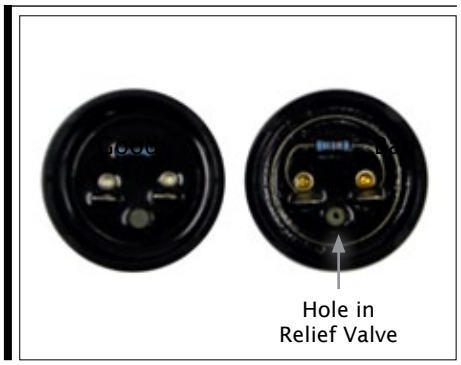


Fig. 10a | *Capacitors, hole in relief valve means it's bad and needs to be replaced.*

3HP & 5HP Single Phase Motors

3HP & 5HP single phase units may have one or two capacitors, no start switch is required. The capacitor serves as a start and run component. (Capacitance varies between dual and single setups, do not mix.) If a failure has been determined; replace it at this time.

Fig. 11a | *Digital Capacitor Tester*

To check the capacitor:

a) Remove capacitor from motor.

b) Inspect capacitor for cracks/defects.

c) Test the cap/caps with Digital Capacitor Tester. (See Fig. 11a)

- Always replace dual capacitors as a pair, even if one tests well.

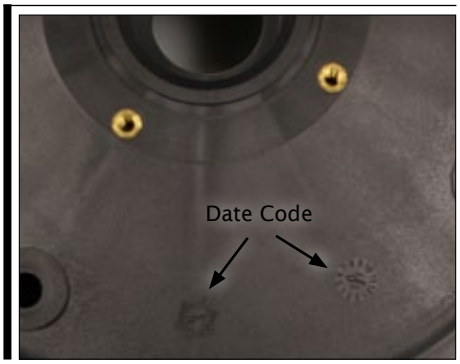


Fig. 12a | *Date code located on top of Motor Base Plate.*

d) After components are attached, the power unit can now be re-assembled without disturbing the rotary seals. Proceed to **Power Unit Assembly/Final Assembly & Testing**.

I. Motor Base Plate Removal
If motor base plate's date code is prior to April 12, 2006 or if it has no date, replace motor base plate assembly. (See Fig. 12a)

a) Disconnect all bulkhead wires from the motor. Using Channel Lock Pliers de-crimp the crimp connectors and separate motor lead wires from bulkhead wires. Remove ground wire from motor. (See Fig. 13a)

b) Remove the 4 motor mount bolts (self sealing hex bolts) and pull the motor base plate assembly away from the motor.

c) *Closed and Open Hub Seal models only:* Remove seal seat from the motor base plate assembly.

d) Inspect the motor base plate for abnormalities. (Inspect seal seat counter bore for wear marks/cracks.)

e) If there are any defects, do not reuse.

f) For proper O-ring replacement requirements determine the age of the motor base plate by the date stamp, (see Fig. 12a) for greater detail reference Technical Bulletin #101.

NOTE: Rotary seals, self-sealing bolts, and O-rings are not reusable after they are removed.

J. Bulkhead Removal/Replacement
If bulkhead assembly is ok, omit this step.

a) Remove old bulkhead insert by pushing the inner lip of the insert through the bulkhead opening or by cutting away part of the lip. (See Fig. 14a)

b) Using needle nose pliers grab one of the pins and pull the insert out. (See Fig. 15a)

c) Thoroughly clean the motor base plate. Use a de-greaser that will not leave a residue behind.

d) Installing New Bulkhead. Place a bead of Hylomar Sealant (P/N: 48-0012) liberally with a 3 to 3.5mm (1/8") coating around the circumference and along the entire length of the neck of the bulkhead. This is

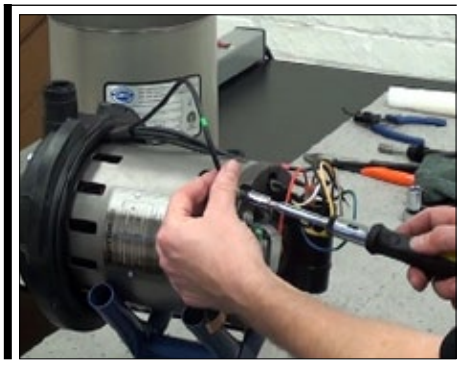


Fig. 13a | *Disconnect bulkhead wires from motor.*

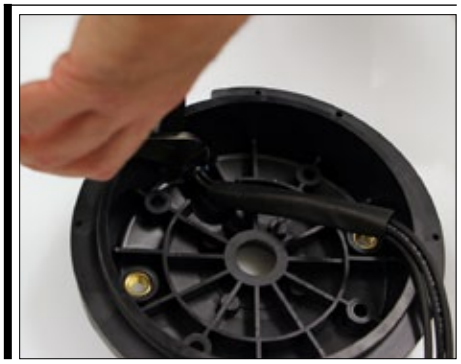


Fig. 14a | *Remove old bulkhead insert. Cut away part of lip if necessary.*

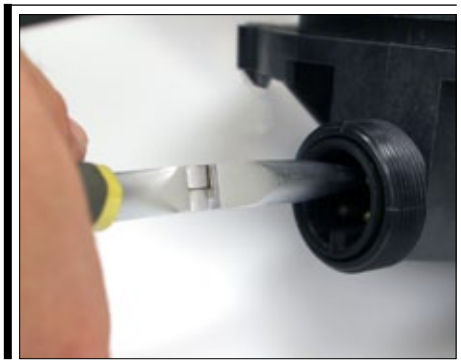


Fig. 15a | *Use needle nose pliers to grab pin and remove insert.*

Fig. 16a | *Use Bulkhead Inserter tool to install new bulkhead insert.*

the narrowest portion where the conductors enter the molded head.

e) Allow the sealant to cure for a minimum of 10 minutes before pressing into the motor base plate.

f) Install the new bulkhead insert into the MBP using the Bulkhead Inserter Assembly tool (P/N: SS-C300). There will be a popping sound when the bulkhead is seated properly (See Fig. 16a). There should also be sealant evenly dispersed around the exposed portion of the bulkhead on the inside of the base plate.

K. Bearing Removal/Replacement

If the motor is being replaced, omit this step.

- If any water was found in the unit, you may need to replace the bearings.
- Before changing bearings, verify there was no rotor strike against the stator. If rotor strike is found, do not reuse motor, this can alter the motor's performance.

Replacement bearing part numbers (same for all C3 motors):
Top bearing P/N: 36-0009 | Bottom Bearing P/N: 36-0010

a) Using a 5/16 inch nut driver remove the 4 motor bolts in the bottom of the motor. Remove the motor end bells. (Use Dead Blow Hammer, and rotate tap from side to side.)

TIP: Mark end bells for easy reinstallation.

b) Separate the motor's rotor from the stator.

c) Using a bearing puller, remove damaged bearings from rotor. (See Fig 17a)

d) Tap the new bearings in place using the Bearing Driver tool. (P/N: SS-C230) (See Fig. 18a)

! WARNING: NEVER TAP ON THE OUTER RACE OF THE BEARING, DAMAGE WILL RESULT.

NOTE: The Top Bearing (P/N: 36-0009) has a key. When installing bearing make sure key faces away from the rotor. (The top bearing also has a washer next to it on the shaft, re-use the washer when replacing bearings.)

When installing the top end bell make sure key on the top bearing is aligned with the slot in the end bell. (Also inspect the wavy washer which resides in the end bell for damage.)

Fig. 17a | *Use bearing puller to remove damaged bearings.*

Fig. 18a | *Tap new bearings into place with the Bearing Driver tool.*

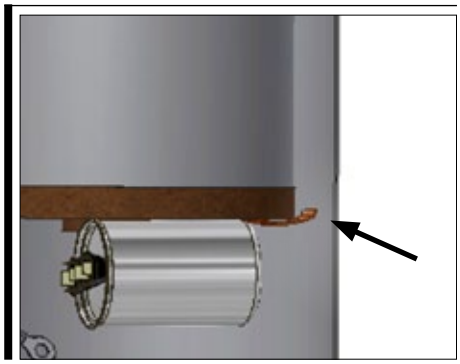


Fig. 19a | *Ground clip should bend toward the top of the motor.*

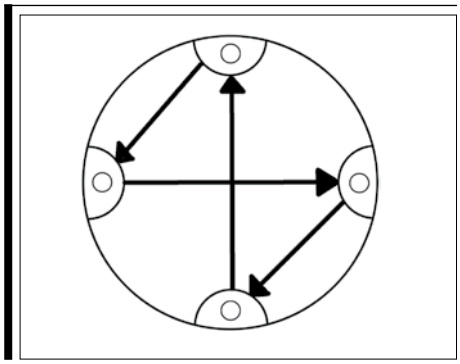


Fig. 20a | *Tighten motor bolts in a cross pattern.*

e) Check condition of S/S housing's Ground Clip (P/N: 47-0002) which is attached to a motor bolt, replace if damaged.
   - Ground Clip should bend towards the top of the motor. (See Fig. 19a)

f) Line up the end bell with the 4 motor bolts and start to thread by hand

g) Using the Torque Wrench (P/N: SS-C340) tighten the motor bolts to 30in-lbs (3.2 N-m). Insure ground clip is at a ninety degree (90°) angle to make proper contact with housing. Re-check each bolt to insure they are torqued to 30in-lbs (3.2 N-m)
   - The motor bolts must be tightened evenly in a cross pattern. (See Fig. 20a)

Metal Seal Hub
(Units after March 2010)

Open Seal Hub
(Units 2007-March 2010)

Closed Seal Hub
(Units before 2007)

***Fig. 1b** | Seal Hub Assemblies*

Power Unit | Assembly

Complete assembly of the Power Unit involves three primary steps.

1. Power Unit
2. Seal Hub
3. Float and Pumping Chamber/Standoff Strainer
   Instructions are found in the next section "Exploded Views & Parts Lists".

Power Unit Assembly | Seal Hubs:

There are currently three hub assemblies found on Concept 3 Motor Units, (See Fig. 1b). Depending on the year of manufacture, determine the one for the unit and proceed to the appropriate section for assembly instructions.

Metal Seal Hub Assembly
(Units after March 2010)

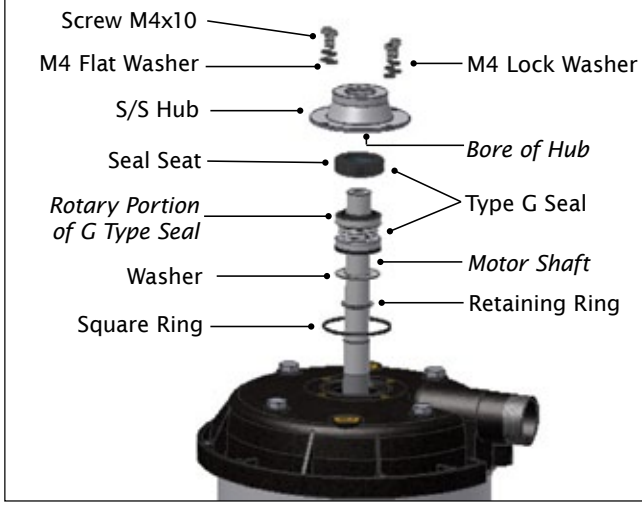
Refer to Exploded View Illustrations found in the next section for additional assistance.

A. Place the motor onto the motor stand. (P/N: SS-C290)

B. Clean motor shaft with denatured alcohol.

C. Install Retaining Ring (P/N 46-0002) onto motor shaft. Be sure ring is locked in to groove. (See Fig. 2b)

TIP: Retaining rings have a smooth rounded edge on one side



***Exploded view** | C3 Metal Seal Hub*

and a sharper edge on the other. Determine the sharper side by running your finger tip over the edge. Install the retaining ring on the motor shaft with the smooth side facing the rotary seal. This allows the sharp edge to dig into the groove once pressure is encountered. (See Fig. 3b)

D. Install O-ring onto the motor base plate.
   - Never reuse old O-rings. (Reference Technical Bulletin #101)

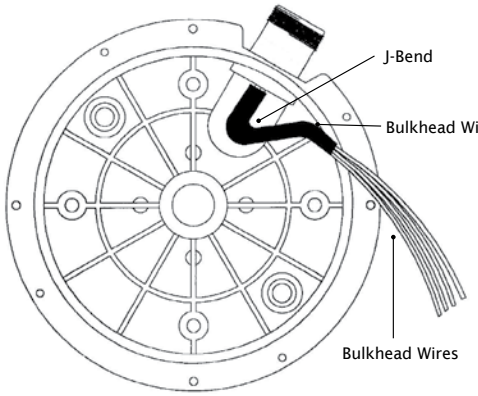
E. Install the motor base plate onto the motor. (Refer to Fig. 4b for Motor Base Plate/Bulkhead Preparation.)
   a) Put a dab of blue lock tight on the threads of the four (4) Self Sealing Hex Bolts. (P/N: 22-0020)
   b) Thread into the motor. (Do not cross thread into the end bell.)
   c) With a 13mm socket tighten to 6-8ft lbs. (8-11 N-m), or until the Red O-ring on the Self Sealing Hex Bolt begins to bulge, however do not tear into the O-ring.

   NOTE: *After installing the seal hub assemblies, the motor/ motor base plate assembly will be drawn into the S/S housing with vacuum.*

F. Wire the bulkhead to the motor.
   a) Install bulkhead ground wire to motor. (See Fig. 5b) Pull the motor bolt

Fig. 2b | *Install retaining ring to motor shaft so it locks into groove.*

Fig. 3b | *Retaining rings have a smooth rounded edge on one side, sharp on the other.*



C3 Motor Vent Fin Removal - Removal of an end bells's vent fin allows additional space for routing the bulkhead wiring, making motor base plate installation easier and alleviating the potential for damage during installation. (After performing the normal J-bend techinique, the bulkhead wire bundle is installed in this gap.) This improves overall quality of the assembly. (Refer to Technical Bulletin #102B.)

Fig. 4b (19b, 28b) | *C3 Motor Base Plate Bulkhead Installation Be sure to keep wires from being pinched by the motor.*

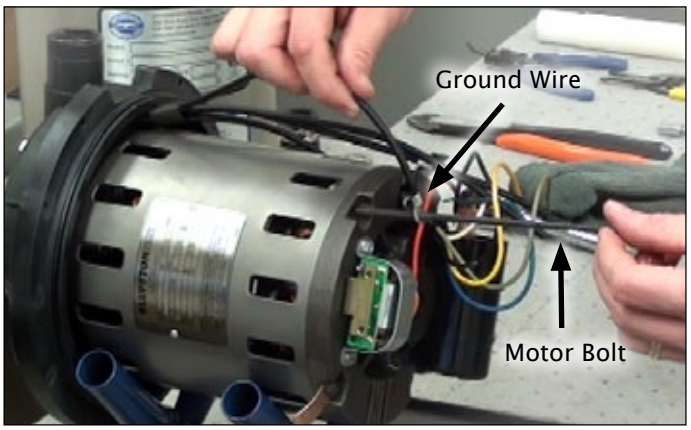


Fig. 5b | *Install bulkhead ground wire to motor under the motor bolt located to the left of motor lead wire assembly. Tighten the motor bolts using torque wrench in a cross pattern.*

located to the left of the motor lead wire assembly and slip the ground lug of the bulkhead over it and reinstall.

b) Using the Torque Wrench (P/N SS-C340) and a cross patten formation, tighten the motor bolts to 30in-lbs (3.2 N-m). Insure ground clip is a ninety degree (90) angle to make proper contact with housing. (See Fig. 19a) Re-check each bolt to insure they are torqued to 30in-lbs (3.2 N-m).

c) Using the Motor Wiring Diagrams found in the Appendix, make all wiring connections for subsequent HP and voltage.

d) Secure all bulkhead/motor wire connections with Crimp Connectors.

- Do not use Twist-On Wire Connectors, they will eventually twist off with the presence of oil and vibration. (See Fig. 6b)

e) Strap the wires down using two ty-raps. (P/N: 46-0106) (See Fig. 7b)

G. Perform the following motor tests to verify correct wiring and motor operation.

a) Perform Megger and Hi Pot testing. Reference Unit Analysis Using a Meghomn Meter ("Megger") found online through Distributor Extranet. (See Fig. 8b)

b) Take a resistance reading across the motor windings at bulkhead pins.

NOTE: Correct Resistance readings can be found in the Appendix.

c) Bump start the motor to verify wiring and operation. (See Fig. 9b)

TIP: Otterbine Service Panels work great for testing. Call for pricing.

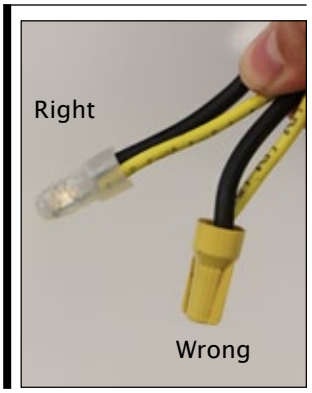


Fig. 6b | *Crimp Connectors used to secure wiring.*

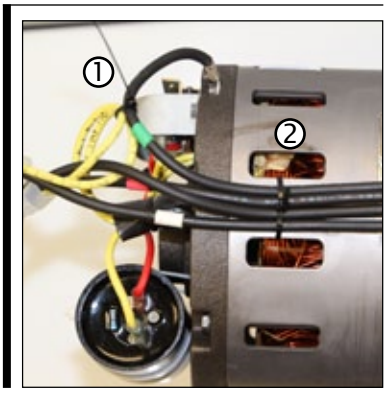


Fig. 7b | *Strap wires down using two ty-raps.*

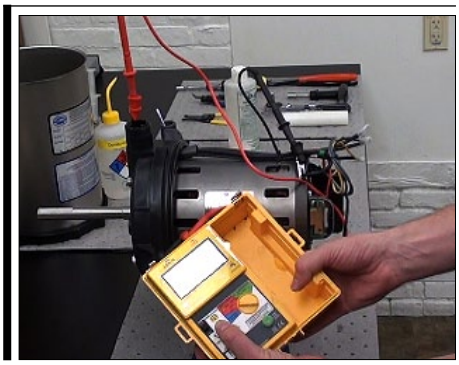


Fig. 8b | *Megger and Hi-Pot tests will verify correct wiring and operation. (Megger test shown)*

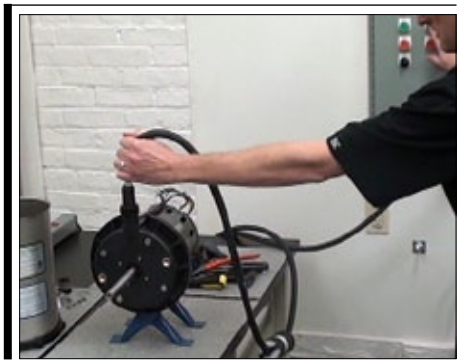


Fig. 9b | *Bump start the motor to verify wiring and operation.*

Fig. 10b | *Wipe seal lubricant around the top of the S/S housing to help with seating the motor/motor base plate assembly.*

H. Install motor/motor base plate into S/S housing (P/N: 47-0001).

a) Wipe clean the S/S housing. Be sure to remove any oil deposits, and dirt.

TIP: Use Putty Knife to scrape off debris around rim of S/S housing.

b) Wipe a generous amount of Seal Lubricant around the top of the S/S housing to ease seating of the motor base plate into the S/S housing. (See Fig. 10b)

NOTE: *Make sure the S/S housing's Ground Clip (P/N: 47-0002) is properly installed to the motor prior to placement into the S/S housing. Ground Clip should bend towards the top of the motor. (See Fig. 19a)*

c) Lower the motor/motor base plate assembly into the S/S housing. Be sure it is even/square on the housing.

NOTE: *After installing the seal hub assemblies, the motor/motor base plate assembly will be drawn into the S/S housing with vacuum.*

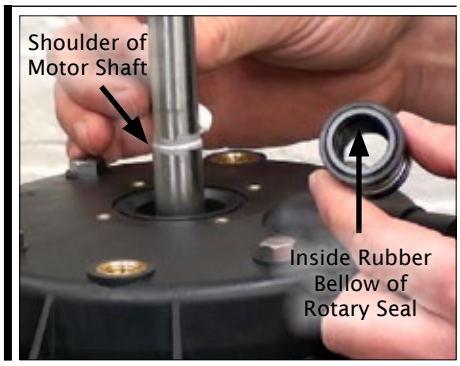


Fig. 11b | *Apply seal lubricant around the shoulder of the motor shaft, and inside rubber bellow of the rotary portion of the seal.*

Fig. 12b | *When seal reaches shoulder of shaft, place thumb tips on outer edge*

I. Clean motor shaft with denatured alcohol.

J. Slide S/S washer (P/N 28-0004), down motor shaft, and rest it on retaining ring.

K. Apply seal lubricant (P/N: 48-0003) with a cotton swab around the shoulder, or high portion, of the motor shaft and the inside rubber bellow of the rotary portion of the seal. (See Fig. 11b)

L. With rubber side of seal towards motor base plate, install seal onto motor shaft. When seal reaches shoulder of shaft, place thumb tips on outer edge of seal and push downward until the seal is seated against washer. (See Fig. 12b)

Fig. 13b | *Clean inside of S/S Hub (P/N 42-0052 with denatured alcohol)*

M. Clean face of seal (Graphite infused silicon/carbide), with denatured alcohol.

- **Dirt will create a leak path** - Both the graphite infused silicon/carbon face of the rotary and seal seat must be free of dirt/fingerprints/any abnormalities. If contaminates are present, clean surfaces using denatured alcohol and cotton swab.

N. Clean inside of S/S Hub (P/N 42-0052), with denatured alcohol. (See Fig. 13b)

O. Apply Seal Lubricant to outside surface of rubber seal seat cup using cotton swab and insert into bore of hub, with seal surface facing out. Push into place with Seal Seat Driver, (P/N SS-10). Clean any excess lubricant off of seal face with denatured alcohol. (See Fig. 14b)

P. Place Square Ring (P/N 49-0013), into groove of motor base plate. (See Fig. 15b)

Q. Apply two drops of Otterbine oil onto face of rotary portion of the seal. (See Fig. 16b)

R. Carefully place Metal Hub with seal seat installed, over motor shaft and onto rotary seal head.

S. Place split lock washers (P/N 28-0015), onto four screws (P/N 24-0018), followed by flat washers (P/N 28-0014).

T. Insert screws with washers in place, into holes of hub, and tighten evenly into inserts on motor base plate. Torque to 15in-lbs (1.7 N-m).

Proceed to **Power Unit Assembly | Final Assembly & Testing**

Fig. 14b | *Insert into bore of hub with seal surface facing out, push into place with Seal Seat Drive (P/N SS-10)*

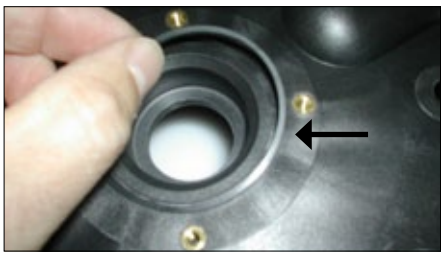


Fig. 15b | *Place square ring into groove of motor base plate.*

Fig. 16b | *Apply two drops of Otterbnie oil onto the face of the seal seat.*

Open Seal Hub Assembly
(Units between 2007 - March 2010)

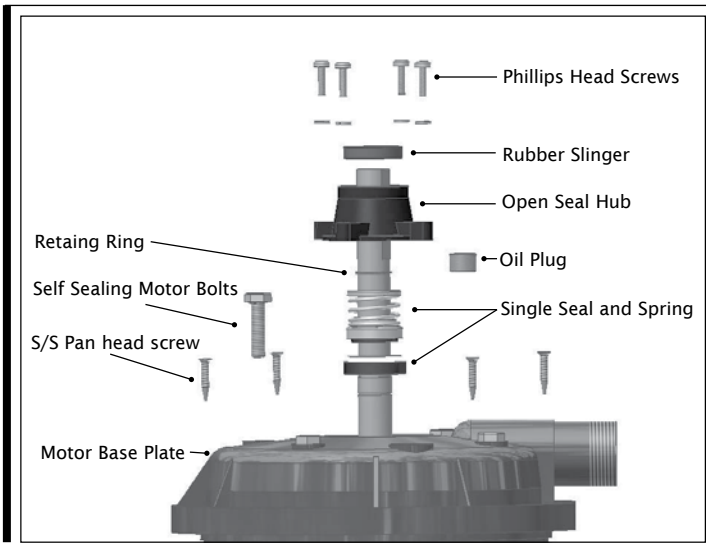
Refer to Exploded View Illustrations found in the next section for additional assistance.

NOTE: *To upgrade to Otterbine's current seal configuration (G-Type, Metal Seal Hub,) contact Otterbine Service for instruction.*

A. Place the motor onto motor stand (P/N: SS-C290).

B. Before starting, clean the seal seat counter bore of the motor base plate and the shaft of the motor with denatured alcohol using a clean cloth.

C. Apply Seal Lubricant (P/N: 48-0003) to the outer rubber surface of the Silicon Carbide Seal Seat (P/N: 49-0041) using a cotton swab. (See Fig. 17b)



Exploded view | *C3 Open Seal Hub*

D. With the motor base plate on a flat surface, use the Seal Seat Driver (P/N: SS-10) to install the seat into the motor base plate counter bore with the smooth shiny surface facing up. (See Fig. 18b)

- Visually verify that seat is sitting squarely into the counter bore.

E. Install O-ring onto the motor base plate.

- Never reuse old O-rings. (Reference Technical Bulletin #101)

F. Install the motor base plate onto the motor. (Refer to Fig. 19b for Motor Base Plate/Bulkhead Preparation)

a) Put a dab of blue lock tight on the threads of the four Self Sealing Hex Bolts (P/N: 22-0020)

b) Thread into the motor. (Do not cross thread into the end bell)

c) With a 13mm socket tighten to 6-8ft lbs. (8-11 N-m), or until the Red O-ring on the Self Sealing Hex Bolt begins to bulge, however do not tear into the O-ring.

G. Wire the bulkhead to the motor.

a) Install bulkhead ground wire to motor. Pull the motor bolt located to the left of the motor lead wire assembly and slip the ground lug of the bulkhead over it and reinstall. (See Fig. 5b)

b) Using the Torque Wrench (P/N SS-C340) and a cross patten formation, tighten the motor bolts to 30in-lbs (3.2 N-m). Insure ground clip is a ninety degree (90) angle to make proper contact with housing. Re-check each bolt to insure they are torqued to 30in-lbs (3.2 N-m). (See Fig. 20b)

c) Using the Motor Wiring Diagrams found in the

Fig. 17b | Apply seal lubricant to the outer rubber surface of the Silicon Carbide Seal Seat.

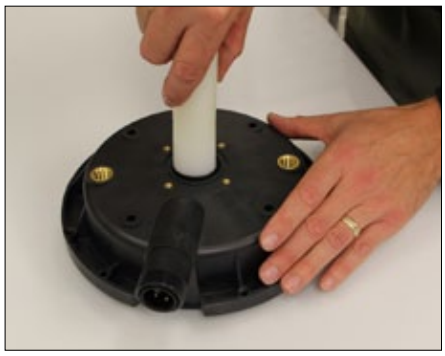
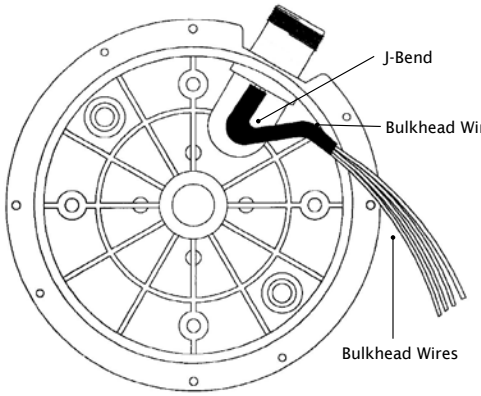


Fig. 18b | On a flat surface, use the Seal Seat Driver tool (wide end) to install the seat into the motor base plate counter bore with the smooth shiny surface facing up.



C3 Motor Vent Fin Removal - Removal of an end bells's vent fin allows additional space for routing the bulkhead wiring, making motor base plate installation easier and alleviating the potential for damage during installation. (After performing the normal J-bend techinique, the bulkhead wire bundle is installed in this gap.) This improves overall quality of the assembly. (Refer to Technical Bulletin #102B.)

Fig. 19b (4b, 28b) | C3 Motor Base Plate Bulkhead Installation
Be sure to keep wires from being pinched by the motor.

Appendix, make all wiring connections for subsequent HP and voltage.

d) Secure all bulkhead/motor wire connections with Crimp Connectors. (See Fig. 6b)

- Do not use Twist-On Wire Connectors, they will eventually twist off with the presence of oil and vibration.

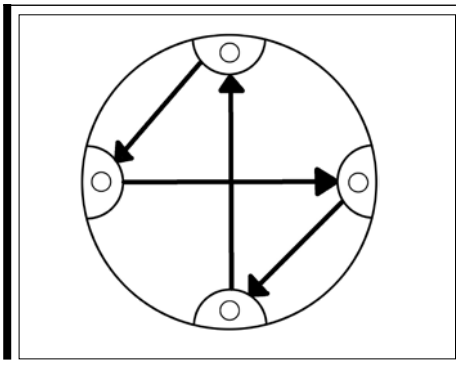


Fig. 20b | *Tighten motor bolts in a cross pattern.*

H. Perform the following motor tests to verify correct wiring and motor operation.

a) Perform Megger and Hi Pot testing. Reference Unit Analysis Using a Meghomn Meter ("Megger") found online through Otterbine's Distributor Extranet.

b) Take a resistance reading across the motor windings at bulkhead pins.

NOTE: *Correct Resistance readings can be found in the Appendix.*

c) Bump start the motor to verify wiring and operation.

TIP: Otterbine Service Panels work great for testing. Call for pricing.

I. Install motor/motor base plate assembly into S/S housing (P/N: 47-0001).

a) Wipe clean the S/S housing. Be sure to remove any oil deposits, and dirt.

TIP: Use Putty Knife to scrape off debris around rim of S/S housing.

b) Wipe a generous amount of Seal Lubricant around the top of the S/S housing to ease seating of the motor base plate into the S/S housing. (See Fig. 10b)

NOTE: *Make sure the S/S housing's Ground Clip (P/N: 47-0002) is properly installed to the motor prior to placement into the S/S housing. Ground Clip should bend towards the top of the motor.*

c) Lower the motor/motor base plate assembly into the S/S housing. Be sure the motor/motor base plate assembly is even/square on the housing. (See Fig. 21b)

NOTE: *During Final Assembly & Testing the motor/motor base plate assembly will be drawn into the S/S housing with vacuum.*

Fig. 21b | *Lower motor/motor base plate assembly into S/S housing and be sure it is even/square on the housing.*

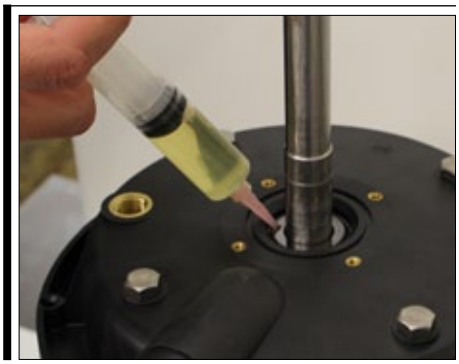


Fig. 22b | *Apply two drops of Otterbine oil onto the face of the seal seat.*

J. Clean motor shaft with denatured alcohol.

K. Use denatured alcohol to clean the smooth shiny seal surface of the seal seat installed in the motor base plate with a clean cotton swab and then apply two drops of Otterbine Aerator Oil onto face of the seat. (See Fig. 22b)

- **Dirt will create a leak path:** Both the silicon/carbon face of the rotary and seal seat must be free of dirt/fingerprints/any abnormalities. If contaminates are present, clean surfaces with denatured alcohol and cotton swab.

L. Apply Seal Lubricant (P/N: 48-0003) to the inside rubber bellows of the rotary seal using a cotton swab. Keep the silicon/carbide surface clean. (See Fig. 23b)

M. To avoid damage to the inside rubber bellow of rotary portion of seal, as it is installed onto the motor shaft wrap a 3" x 2.5" (7.6cm x 6.35cm) piece of Mylar film around the shaft covering the area around the retaining ring groove. (See Fig. 24b)

NOTE: *Damage to the seal bellows will occur at point of contact with retaining ring groove without Mylar film protection, (this will create a leak path.)*

N. Place the rotary seal and spring over the motor shaft mating the silicon carbide seal surface against the seal seat in the motor base plate. Compress the Seal Spring by pressing down on the spring with one hand and using a 45˚ angled Retaining Ring Pliers to install the retaining ring (P/N: 46-0002) around the shaft below the retaining ring groove. Slowly release pressure on the spring sliding the retaining ring up the shaft until it is fully seated in the groove. (See Fig. 25b)

TIP: Retaining rings have a smooth rounded edge on one side and a sharper edge on the other. Determine the sharper side by running your finger tip over the edge. Install the retaining ring on the motor shaft with the smooth side facing the rotary seal. This allows the sharp edge to dig into the groove once pressure is encountered.

NOTE: *Reference Technical Bulletin #104, for information regarding the C3 Seal Spring Change.*

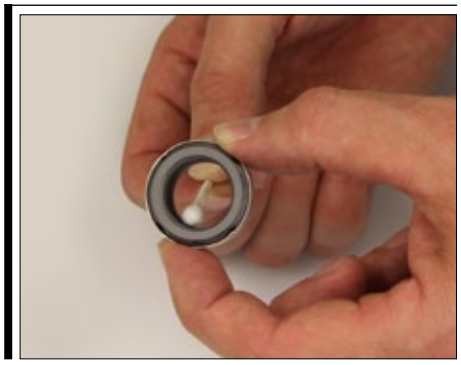


Fig. 23b | *Apply seal lubricant to inside of rotary portion of the seal with cotton swab.*

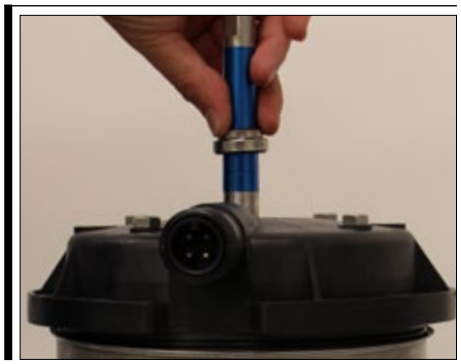


Fig. 24b | *When installing the rotary seal, wrap Mylar film around motor shaft covering the area around the retaining ring groove to avoid damaging seal.*

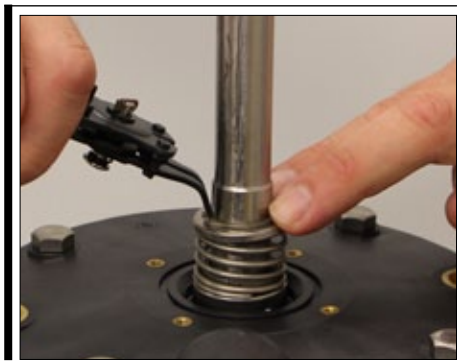


Fig. 25b | *Compress seal spring with one hand while using 45˚ angled retaining ring pliers to install the retaining ring.*

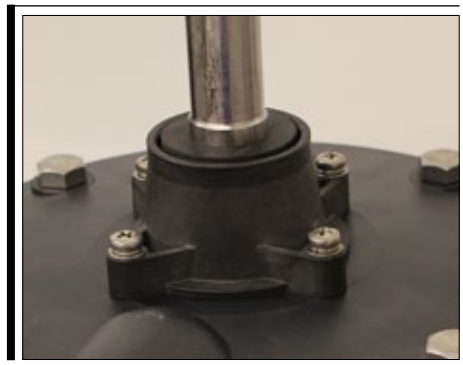


Fig. 26b | *Rubber slinger disc is flush to the top of the hub when installed*

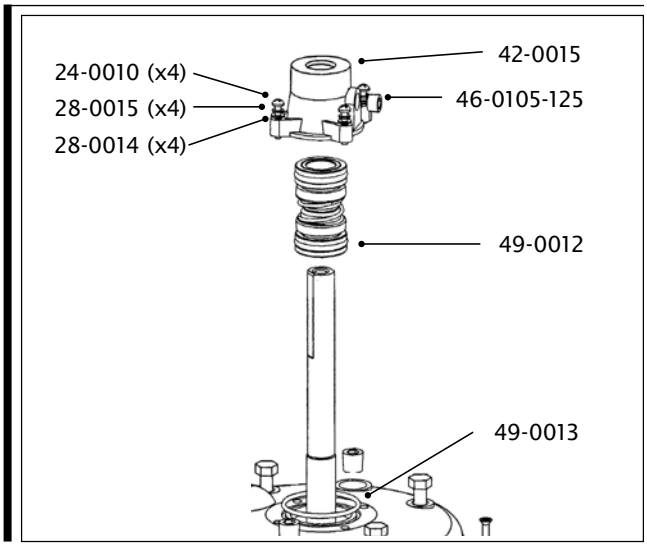
O. Slide the Rubber Slinger Disc (P/N: 47-0020) onto the shaft and seat it against the top of the seal. Place the Open Seal Hub (P/N: 42-0051) over the motor shaft against the motor base plate. The slinger should be flush to the top of the hub and centered in the seal hub without touching it. Fasten the hub using four Philips head screws (P/N: 24-0010). If adjustment is necessary, loosen the hub screws, center the hub and re-tighten the screws. (See Fig. 26b)

Proceed to **Power Unit Assembly | Final Assembly & Testing**

Closed Seal Hub Assembly (Units prior to 2007)

Refer to exploded view illustrations found in the next section for additional assistance.

NOTE: *To upgrade to Otterbine's current seal configuration (G-Type, Metal Seal Hub,) contact Otterbine Service for instruction.*



Exploded view | *C3 Closed Seal Hub*

A. Place the motor onto the motor stand (P/N: SS-C290)

B. Clean motor shaft with denatured alcohol.

C. Install ceramic seal into motor base plate.

a) Install the ceramic seat into the motor base plate using the larger diameter side of the Seal Seat Driver (P/N: SS-10)

b) Install with smooth side up (against the tool surface).

c) Use Seal Lubricant (P/N: 48-0003) on the O-ring of the seal.

d) With Seal Seat Driver, push the seat firmly into the counter bore on top of the motor base plate. (See Fig. 27b)

- Visually verify that seat is sitting squarely into the counter bore.

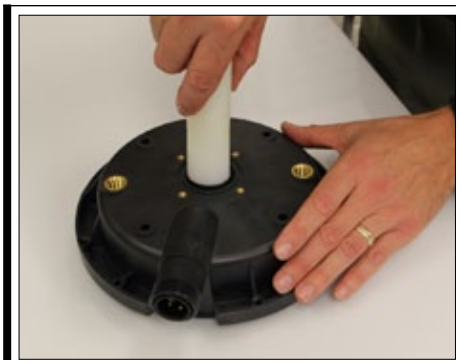


Fig. 27b | *On a flat surface, use the Seal Seat Driver tool (wide end) to install the seat into the motor base plate counter bore with the smooth shiny surface facing up.*

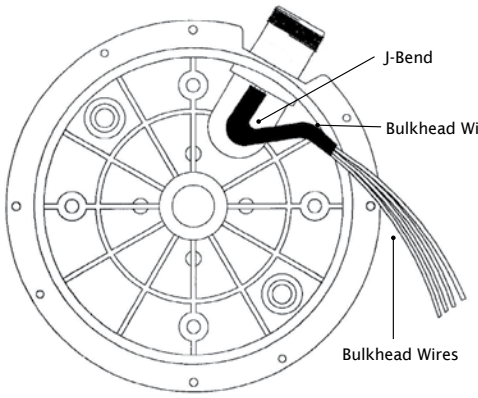
D. Wipe ceramic seal clean with denatured alcohol and a soft cotton swab.

- **Dirt will create leak path:** Both the carbon face and ceramic face of the seals must be free of dirt/fingerprints/any abnormalities. If contaminates are present, clean surfaces with denatured alcohol and cotton swab. (Dirt will create a leak path)

E. Install O-ring onto the motor base plate.
   - Never reuse old O-rings (Reference Technical Bulletin #101)

F. Install the motor base plate onto the motor. (Refer to Fig. 28b for Motor Base Plate /Bulkhead Preparation)
   a) Put a dab of blue lock tight on the threads of the four Self Sealing Hex Bolts (P/N: 22-0020)
   b) Thread into the motor. (Do not cross thread into the end bell)
   c) With a 13mm socket tighten to 6-8ft lbs. (8-11 N-m), or until the Red O-ring on the Self Sealing Hex Bolt begins to bulge, however do not tear into the O-ring.

G. Wire the bulkhead to the motor.
   a) Install bulkhead ground wire to motor. Pull the motor bolt located to the left of the motor lead wire assembly and slip the ground lug of the bulkhead over it and reinstall. (See Fig. 29b)
   b) Using the Torque Wrench (P/N SS-C340) and a cross patten formation, tighten the motor bolts to 30in-lbs (3.2 N-m). Insure ground clip is a ninety degree (90) angle to make proper contact with housing. Re-check each bolt to insure they are torqued to 30in-lbs (3.2 N-m). (See Fig. 20b)



C3 Motor Vent Fin Removal - Removal of an end bells's vent fin allows additional space for routing the bulkhead wiring, making motor base plate installation easier and alleviating the potential for damage during installation. (After performing the normal J-bend techinique, the bulkhead wire bundle is installed in this gap.) This improves overall quality of the assembly. (Refer to Technical Bulletin #102B.)

Fig. 28b (19b, 4b) | *C3 Motor Base Plate Bulkhead Installation Be sure to keep wires from being pinched by the motor.*

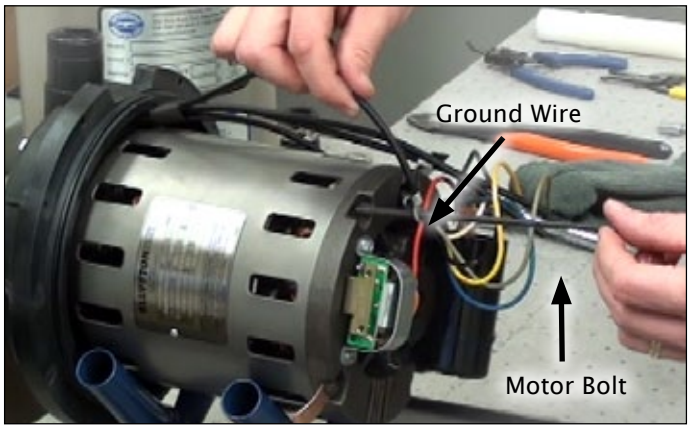


Fig. 29b | *Install bulkhead ground wire to motor under the motor bolt located to the left of motor lead wire assembly. Tighten the motor bolts using torque wrench in a cross pattern.*

Fig. 30b | *When trimming bulkhead wires be sure to trim away from the top of the motor so the scrap doesn't fall in the windings.*

c) Using the Motor Wiring Diagrams found in the Appendix, make all wiring connections for subsequent HP and voltage. (See Fig. 30b)

d) Secure all bulkhead/motor wire connections with Crimp Connectors.

- Do not use Twist-On Wire Connectors, they will eventually twist off with the presence of oil and vibration. (See Fig. 6b)

H. Perform the following motor tests to verify correct wiring and motor operation.

a) Perform Megger and Hi Pot testing. Reference Unit Analysis Using a Meghomn Meter ("Megger") found online through Otterbine's Distributor Extranet.

b) Take a resistance reading across the motor windings at bulkhead pins.

NOTE: Correct Resistance readings can be found in the Appendix.

c) Bump start the motor to verify wiring and operation. (See Fig. 31b)

TIP: Otterbine Service Panels work great for testing. Call for pricing.

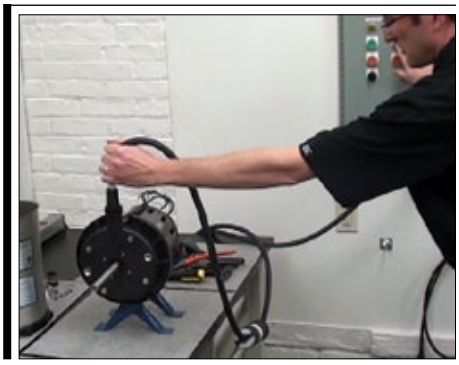


Fig. 31b | *Bump start the motor to verify wiring and operation.*

Fig. 32b | *Wipe clean the S/S housing before installing motor/motor base plate assembly.*

I. Install motor/motor base plate assembly into S/S housing (P/N: 47-0001).

a) Wipe clean the S/S housing. Be sure to remove any oil deposits, and dirt. (See Fig. 32b)

TIP: Use Putty Knife to scrape off debris around rim of S/S housing

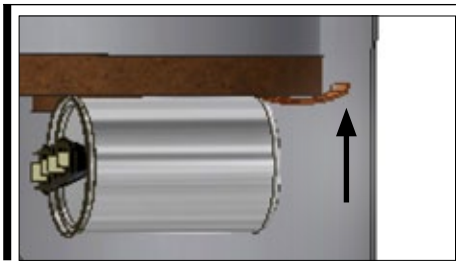


Fig. 33b | *Be sure ground clip is facing up and at a 90 degree angle from motor when installing motor into housing.*

b) Wipe a generous amount of Seal Lubricant around the top of the S/S housing to ease seating of the motor base plate into the S/S housing. (See Fig 10b)

NOTES: *Make sure the S/S housing's Ground Clip (P/N: 47-0002) is properly installed to the motor prior to placement into the S/S housing. Ground Clip should bend towards the top of the motor. (See Fig. 33b)*

c) Lower the motor/ motor base plate assembly into the S/S housing. Be sure the motor/ motor base plate assembly is even/square on the housing. (See Fig. 21b)

NOTE: *After installing the seal hub assemblies, the motor/MBP assembly will be drawn into the S/S housing with vacuum.*

J. Clean motor shaft with denatured alcohol. (See Fig 34b)

Fig. 34b | *Clean motor shaft with denatured alcohol.*

K. Install seal assembly and seal hub onto motor base plate.
   a) Install the ceramic seat into the seal hub using the larger diameter side of the Seal Seat Driver. (P/N: SS-10)
   b) Install with smooth side up (against the tool surface).
   c) Use Seal Lubricant (P/N: 48-0003) on the O-ring of the seal.
   d) With Seal Seat Diver, push the seat firmly into the top of the seal hub.
      - Visually verify that seat is sitting squarely into the counter bore.

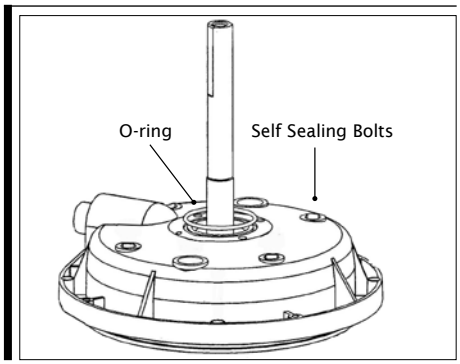


Fig. 35b | *Place O-Ring on top of motor base plate.*

L. Wipe ceramic seal clean with denatured alcohol and a soft cotton swab.

M. Place O-ring onto top of motor base plate. (See Fig. 35b)

N. Place two drops of Otterbine oil on the surface of the two ceramic seals.

O. Install Double Rotary Seals and Spring
   a) Prior to assembly clean the Double Rotary Seal surfaces with denatured alcohol and a soft cotton swab.
      - **Dirt will create a leak path:** Both the double rotary and seal seats must be free of dirt/fingerprints/any abnormalities. If contaminates are present, clean surfaces with denatured alcohol and cotton swab.
   b) Apply Seal Lubricant (P/N: 48-0003) with a cotton swab around the high portion of the motor shaft and the inside of the rotary seal bellows. (See Fig. 11b)
   c) Push on the first rotary seal with the shiny side facing down the shaft towards the ceramic seal seat.
   d) Use the C2 Motor Base Plate Tool (P/N: SS-C350) and press on downward until seal is seated up against the ceramic seal seat.
   e) Slide the Seal Spring down the shaft followed by the second Rotary Seal this time with the shiny side facing up.
   f) Again using the C2 Motor Base Plate Tool (P/N: SS-C350) press fit the seal up against the spring.

P. Set the seal hub on top of the double rotary seal.

Q. Push the seal hub down against the motor base plate. Center the ceramic seal around the shaft and hand tighten the four Pan Head Phillips Screws evenly in a cross pattern.

NOTE: *Always use extreme caution during this procedure. The screws must be tightened evenly in a cross pattern (Fig. 20b). If the bolts are tightened in a manner that cocks the seal hub, the ceramic seat will hit the motor shaft consequently causing it to chip and or break!!*

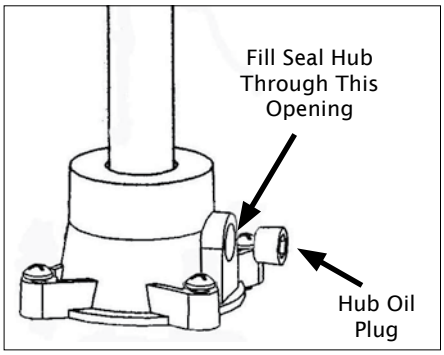


Fig. 36b | *Fill Seal Hub (while power unit is upright) with Otterbine oil until the oil is in the bottom of the threads (Approximately 12cc).*

R. Fill the seal hub (while power unit is upright) with Otterbine oil until the oil is at the bottom of the threads (12cc). Place Teflon tape or TFE Pipe Thread Sealant around the hub oil plug (P/N: 46-0105-125) and insert it into the seal hub. (See Fig. 36b)

!WARNING: DO NOT OVER TIGHTEN, OR YOU MAY DAMAGE SEAL HUB.

Proceed to **Power Unit Assembly | Final Assembly & Testing**

Power Unit Assembly | Final Assembly & Testing

Refer to Exploded View Illustrations found in the next section for additional assistance.

A. Motor Base Plate /Bulkhead Preparation: Draw the motor/ motor base plate assembly into the S/S housing using vacuum.

a) Be sure the motor/ motor base plate assembly is even/ square on the housing.

- Use Compressor capable of reaching 20 in. Hg of vacuum.

b) Insert an air fitting into one of the oil plug openings. Install an oil plug in the other opening.

c) Apply 20 in. Hg of Vacuum, you will hear a pop sound when the assembly is seated. (See Fig. 35b)

- Clamp off Vacuum for 5 minutes, verifying no drop in Vacuum. This is a check to insure that the rotary seal is seated correctly and there are no leaks present within the entire assembly.

d) Insert the Self Tapping Screws (P/N: 24-0014) into the motor base plate at the proper locations. Lift the Can Ring (P/N: 42-0020) to them and start to thread them by hand. (See Fig. 36b)

e) Tighten screws.

Fig. 35b | *Draw motor base plate assembly into S/S housing using 20 in. Hg of Vacuum.*

Fig. 36b | *Insert self tapping screws into motor base plate and lift can ring. Thread by hand and tighten screws.*

B. Vacuum/Pressure Procedures: Should a drop in vacuum occur, perform the following pressure test procedure to pin point the leak.

a) Re-configure the compressor for pressure.

CAUTION: *Vacuum/Pressure Compressor – The air supply must have an adjustable regulator. The C3 unit must only be tested at a maximum of 5 PSI. Damage/ physical harm may occur if a C3 unit is tested at a pressure greater than 5 PSI!*

b) Insert an air fitting into one of the oil plug openings. Install an oil plug in the other opening.

c) Apply air pressure - **DO NOT USE ANY MORE THAN 5 PSI.**

d) Use a soapy water solution or water dunk tank to check for leaks. Locate the source of the leak and take corrective actions to resolve.

TIP: Water Dunk Tank works well for leakage testing (See Fig. 37b)

e) Once it is determined that there are no leaks, remove the air fitting and oil plug.

C. Bump start the motor to make sure it works.

TIP: Otterbine Service Panels work great for motor testing purposes. (Call for Pricing.)

Fig. 37b | *Water dunk tank works well for testing leakage, you can also use a soapy water solution.*

Fig. 38b | *Check for continuity between S/S housing and ground pin on bulkhead to confirm that S/S housing and ground clip are touching.*

Fig. 40b | **Motor Resistance & No Load Ampere Specifications for Concept 3**

Motor Rating	Resistance	No Load Ampere @ 60Hz
1 HP 115V 1Ph	.6 - 1.2 ohms	10.0 - 13.1 amps
1 HP 230V 1Ph	1.6 - 2.4 ohms	5.1 - 6.7 amps
2 HP 230V 1Ph	1.2 - 2.0 ohms	6.0 - 8.0 amps
3 HP 230V 1Ph	1.0 - 2.5 ohms	4.5 - 6.9 amps
3 HP 230V 3Ph	1.2 - 1.7 ohms	3.0 - 4.0 amps
3 HP 460V 3Ph	5.5 - 5.9 ohms	1.5 - 2.0 amps
5 HP 230V 1Ph	.6 - 1.8 ohms	13.0 - 15.0 amps
5 HP 230V 3Ph	1.0 - 1.6 ohms	4.8 - 6.0 amps
5 HP 460V 3Ph	3.6 - 4.1 ohms	2.4 - 2.9 amps
5 HP 575V 3Ph	5.6 ohms	1.2 - 1.8 amps

Fig. 40b| *All figures are approximate.*

Fig. 39b | *(Top) Pour Otterbine oil into one of the oil plug openings on the power unit using a funnel. (Bottom) Fill until oil level is between the lines of the C3 Oil Dipstick.*

D. Oil Process

a) Check for continuity between the S/S housing and the ground pin on the bulkhead. This is to confirm that the S/S housing and Ground Clip are making contact. (See Fig. 38b)

b) Pour the new Otterbine Oil into one of the oil plug openings on the power unit using a funnel. With the unit *standing upright on a flat surface*, fill until the oil level is between the lines on the C3 Oil Dipstick. **DO NOT OVERFILL.** (See Fig. 39b)

- This is as full as the unit needs to be, **DO NOT TIP UNIT** or add any additional oil. C3 Dipsticks are provided with all C3 Maintenance Kits (P/N: 12-0077)

Fig. 41b | *Place dielectric compound or silicone grease in the bulkhead connector to prevent water penetration which will lead to nuisance tripping.*

c) Place Teflon tape or TFE Pipe Thread Sealer around the oil plugs and insert them in the openings. Torque the oil plugs to 100-120in-lbs (11.3-13.6N-m).

E. **Final Electrical Tests:** Connect power to the motor. Verify No-Load amperage draw is correct per table in Fig. 40b. **DO NOT RUN UNIT** for more than 5 seconds, damage will occur.

a) Place Dielectric Compound or Silicone Grease (P/N: 48-0001) in the bulkhead connector to prevent water penetration which can lead to nuisance tripping. (See Fig. 41b)

This completes the unit assembly; for details related to the pumping chamber assemblies reference the chamber's exploded view illustrations.

Routine Maintenance Quick Guide

Otterbine's C3 product line of Aerating Fountains require periodic maintenance. When a unit is properly cared for, it will provide years of trouble free service.

C3 Maintenance Schedule

Once a Year:

1) The aerator should be disconnected from the power source and physically inspected along with the underwater cable for any cuts, cracks or breaks.

2) Inspect and clean the pumping chamber components and screen.

3) Check ground points on the Power Unit. Check for continuity between the S/S housing and the ground pin on the bulkhead. This is to confirm that the S/S housing

The C3 Maintenance Kit (P/N: 12-0077) contains all consumable supplies to perform an oil change.

Quantity discounts are offered on any combination of Maintenance Kits, (Concept 3, Concept 2, and AFL.) Discount is applied after your distributor discount.

- 10% on 10 or more
- 14% on 20 or more
- 17% on 50 or more

Ground Clip is making contact and therefore is properly grounded. (See Fig. 38b)

4) Apply fresh Dielectric Compound or Silicone Grease (P/N: 48-0001) in the bulkhead connector. This will prevent water penetration which will lead to electrolysis and nuisance tripping. (See Fig. 41b)

5) Test controls inside the Otterbine Power Control Center (Breaker/GFCI/Contactor/Thermal Overload/Timers).

Concept 3 Maintenance Kit (P/N 12-0077) Includes:

Qty	Description	P/N
2	Otterbine Aerator Oil (1 Gallon)	667-002-008
2	Silicone Dielectric Compound (single use pack)	927-000
1	Instructions	75-0075
1	C3 Oil Dipstick	97-0004

<u>After Every Three Running Seasons</u>

1) An oil change is recommended to keep the unit running smoothly. Otterbine oil is recommended for this oil change. Reference C3 Maintenance Kit (P/N: 12-0077).

Oil Change:

A. Remove the float and pump chamber from the power unit.

B. Remove the 2 oil plugs with a 1/4 inch Allen wrench. Drain used oil out of the power unit. The condition of the oil will provide important information on the running condition of the unit. Therefore, when draining oil use a clean bucket and note the condition of the used oil; some items to look for include but are not limited to: (Fig. 1c)

- **Dark, foul smell like sulfur:** Possible burnt winding, unit developed extreme internal heat.
- **Milky:** Water present in oil.
- **Dark, molasses like in color:** Blown capacitor.

DO NOT REUSE OIL! Dispose of the drained oil in accordance with local EPA regulations.

NOTE: *It is possible to reuse a motor in which some water was present in the oil. Be absolutely sure that all moisture is out of the motor before reuse. Bearings should be inspected and may need to be changed.*

Should water contamination be present, the unit should be disassembled. Separate the motor's rotor from the stator and wash both in mineral spirits (a parts washer is ideal for this type of cleaning). Allow the motor to dry overnight before retesting.

Fig. 1c *| [Top] Remove oil plugs and drain oil, note condition of oil. [Bottom] Condition of oil: (a) Clean Oil (b) Milky Oil (c) Dark Oil*

Fig. 2c *| [Top] Pour Otterbine oil into one of the oil plug openings on the power unit using a funnel. [Bottom] Fill until oil level is between the lines of the C3 Oil Dipstick.*

C. Pour the new Otterbine Oil into one of the oil plug openings on the power unit using a funnel. With the unit standing upright on a flat surface, fill until the oil level is between the lines on the C3 Oil Dipstick. **DO NOT OVERFILL** (See Fig. 2c)

NOTE: *This is as full as the unit needs to be.* ***DO NOT TIP UNIT*** *or add any additional oil. C3 Dipsticks are provided with all C3 Maintenance Kits (P/N: 12-0077) or individually (P/N: 97-0004).*

D. Place Teflon tape or TFE Pipe Thread Sealer around the oil plugs and insert them in the openings. Torque the oil plugs to 100-120in-lbs (11.3-13.6N-m).

E. Connect power to the motor. Verify No-Load amperage draw is correct per table in Fig. 40b. **DO NOT RUN UNIT** for more than 5 seconds, damage will occur.

Zinc Anodes:

(Used on aeration systems placed in brackish waters.)

Zinc Anodes are considered a sacrificial metal and work well to protect other metals within a brackish water environment.

However they need to be maintained and will require periodic replacement, C3 Zinc Anode Kits can be purchased with P/N 12-0122.

Concept 3 Zinc Anode Kit (P/N 12-0122) Includes:

Qty	Description	P/N
4	S/S Lock Nut, 1/4-20	C2-112
4	Flat Washer, 1/4", S/S	927-000
4	Hex Bolt, 1/4-20 x 1.5" S/S	24-0016
1	Band Clamp	46-0129
4	Zinc, Machined	41-0001
4	Mounting Bracket	40-0001
1	Instructions	75-0042

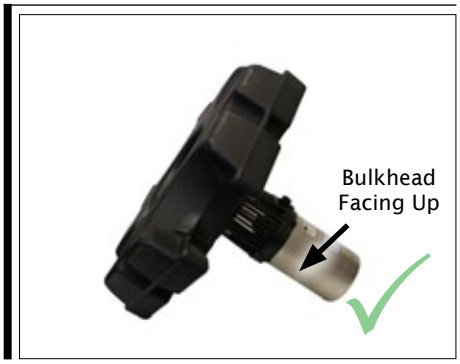
Storage and Winterization:

Storage:

The unit/float should never be stored in an upside down position (float down), this could create oil leakage. For proper storage stand the unit/float upright or tilted on its side with the bulkhead connection facing up.

Proper Storage for Concept 3 Units

RIGHT | Stand unit upright.



RIGHT | Unit stored on side with bulkhead connection facing up.

WRONG: Never store a unit upside down.

Winterization:

Damaged caused to the motor and pump chamber due to freezing will not be covered under warranty.

The following units can stay in the water; however they should be run a minimum of 12hrs a day, preferably 24hrs a day to avoid freezing in and damaging the motor/pump. (*If you experience severe weather for prolong periods we suggest that you remove and store the unit.)*

Units that Can Run During Winter

These units can remain in water during the winter:

Aerating Fountains: Aeration Line

Chamber Type (Open Throat)

- Sunburst
- Gemini
- Saturn

NOTE: *If the power is shut down and the unit freezes in, it must not be run until the ice clears, otherwise severe motor damage may occur.*

Pigtail Protectors

Pigtail Protectors are available to protect plugs on units with quick disconnects, where units are removed and cables are left in the water.

Please refer to the following items numbers:

- P/N 178-017 (C2 & C3 units: 1 to 5HP)
- P/N GP1225 (Small Light Cables with Quick Disconnect feature)

Units to be Removed in Winter

If you live in freezing climates, Otterbine recommends that you winterize and take the following units out of the water in the winter:

Aerating Fountains: Decorative Line

Chamber Type (Decorative)

- Rocket
- Phoenix
- Tri-Star
- Constellation
- Comet
- Genesis
- Equinox
- Omega

NOTE: *These models are especially prone to freezing in. If an aerator becomes frozen-in there is a possibility of motor and pump chamber damage.*

Replacing Cable:

Pigtails | Splice Kits | Cable Assemblies

When replacing cable, cable assemblies, pigtails and quick disconnects refer to the following. Instructions for splicing will come with individual splice kits when ordered.

Replacement Pigtails:

For Otterbine replacement pigtails reference the following item numbers:

- P/N: 35-0010 (Pigtail C3/C2 Heavy Duty)
- P/N: 35-0011 (Pigtail C3 5HP/1Ph ONLY)
- P/N: 35-0012 (CE Pigtail C3/C2 12/4 HARM)

Splice Kits:

A splice kit is required to complete the connection when performed in the field or service center:

- P/N: 614-017
  (Splice Kit Large 1" Max ALL 12/10/8)
- P/N: 614-016
  (Splice Kit Small 5/8 Max) – Used for Lights

Cable Assemblies:

Cable Assemblies come with a cable strain relief, pigtail, factory vulcanized splice and 50ft/15m of raw cable, (additional cable can be added at time of order to accomodate longer runs.) *(See Cable Assembly Chart)*

Cable Assembly Chart

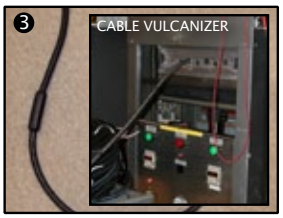
CABLE ASSEMBLY

=

PIGTAIL (3ft/.9m long)

+

VULCANIZED SPLICE



+

RAW CABLE (50ft/15m)

Cable Assembly comes with ❶ cable strain relief, ❷ pigtail, ❸ factory vulcanized splice, and ❹ 50ft/15m of raw cable. (Additional cable can be added at time of order to accommodate longer runs.)

SPLICE KIT

Used when field splices are needed.

EXAMPLE: Adding lengths of cable to existing cable runs, or replacing pigtails.

Contact Otterbine Inside Sales with any additional questions.

ORDER: CABLE ASSEMBLY
When replacing cable runs, or need at least 50ft/15m of cable and a replacement pigtail.

ORDER: SPLICE KIT AND RAW CABLE
When adding additional cable to an existing cable run in the field.

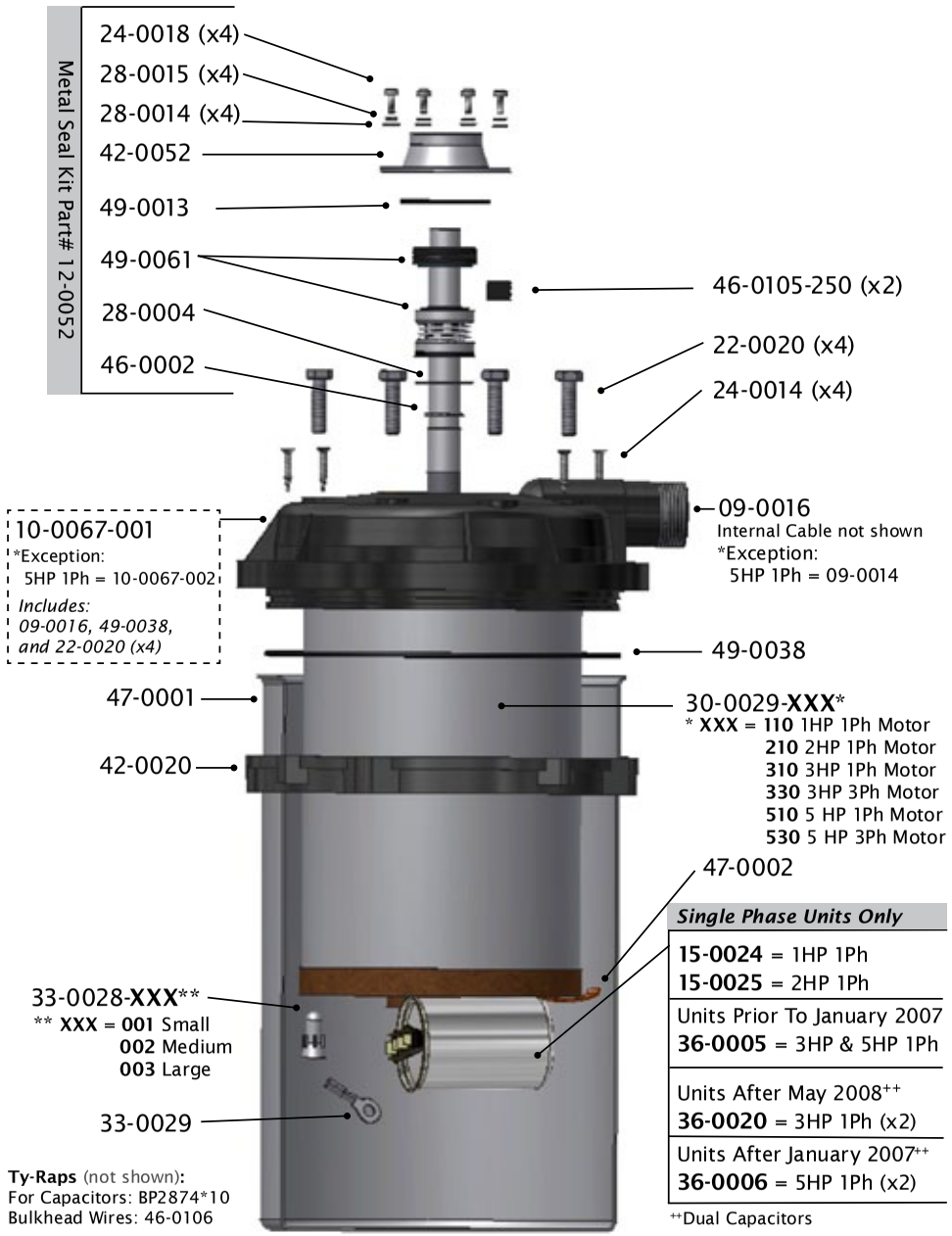
ORDER: PIGTAIL AND SPLICE KIT
When replacing a Pigtail in the field.

Exploded Views & Part Lists

The following pages contain exploded view illustrations of Concept 3 components and assemblies, including:

- C3 Power Unit
  - Metal Seal Hub
  - Open Seal Hub
  - Closed Seal Hub
  - C3 Power Unit Parts List/Chart
- C3 Impeller Configurations & Color Codes
- Pumping Chambers
  - Open Throat (Aeration Line)
    - Sunburst
    - Gemini
    - Saturn
    - Open Throat Parts Comparison Chart
  - *(Pumping Chambers Cont.)*
  - Decorative (Decorative Line)
    - Phoenix
    - TriStar
    - Rocket
    - Constellation
    - Comet
    - Genesis
    - Equinox
    - Omega
    - Decorative Chamber Parts Comparison

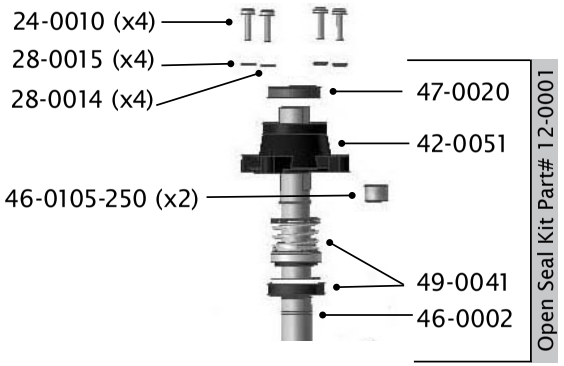
C3 POWER UNIT



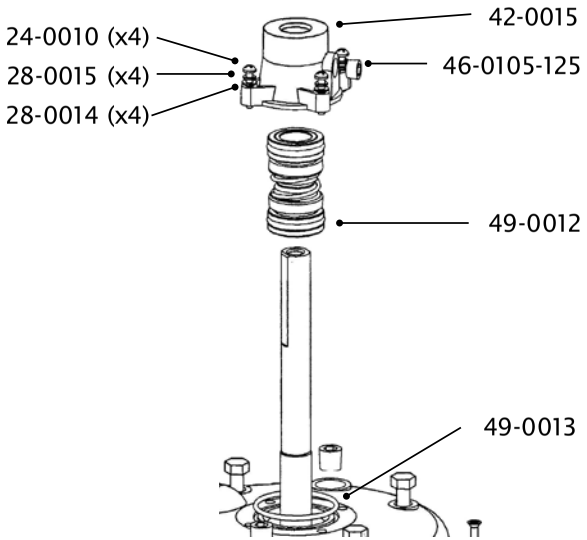
Can be purchased as complete power unit which includes standoff strainer (P/N 10-0061) - not shown.

METAL SEAL HUB +
(Units After March 2010)

OPEN SEAL HUB +
(Units 2007 - March 2010)



CLOSED SEAL HUB +
(Units Prior 2007)



+ Seal Hubs Vary by Year Manufactured

Parts List | Concept 3 Power Unit

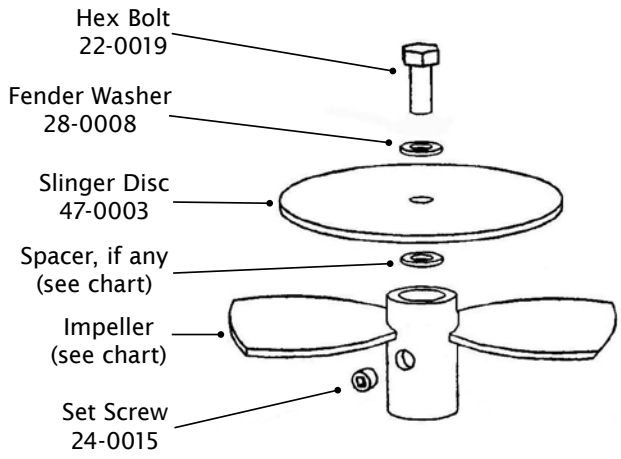
P/N	Description	Quantity
09-0014	Bulkhead Connector Assembly 5HP/1Ph ONLY (3 Pin)	1
09-0016	Bulkhead Connector Assembly (4 Pin)	1
10-00067-001	Motor Base Plate Assembly (4 Pin)	1
10-00067-002	Motor Base Plate Assembly 5HP/1Ph ONLY (3 Pin)	1
10-0061	Standoff Strain Relief (not shown)	1
15-0024	Capacitor/Start Switch, 1HP/1Ph	1
15-0025	Capacitor/Start Switch, 2HP/1Ph	1
36-0005	Capacitor, 3HP/1Ph & 5HP/1Ph (units prior Jan 2007)	1
36-0020	Capacitor, 3HP/1Ph (units after May 2008)	2
36-0006	Capacitor, 5HP/1Ph (units after Jan 2007)	2
22-0020	M8 x 30 Self Sealing Hex Bolt	4
24-0010	M4x6 Panhead Phillips Screw	4
24-0014	#8x1" Self Tapping Flathead Screw	4
24-0018	M4x10 Panhead Phillips Screw	4
26-0006	M5 Nylon Locknut 316S/S	4
28-0004	Washer Flat 18-8SS "G" SEAL	1
28-0014	M4 Flat Washer S/S	4
28-0015	M4 Split Lock Washer S/S	4
30-0029-110	1 HP 1Ph Motor	1
30-0029-210	2 HP 1Ph Motor	1
30-0029-310	3 HP 1Ph Motor	1
30-0029-330	3 HP 3Ph Motor	1
30-0029-510	5HP 1Ph Motor	1
30-0029-530	5 HP 3Ph Motor	1
30-0029-535	5 HP 575V 3Ph Motor	1
33-0028-001	Crimp Connector, Small	*
33-0028-002	Crimp Connector, Medium	*
33-0028-003	Crimp Connector, Large	*
33-0029	Ring Connector, 12-10awg	1
42-0020	Can Ring	1
42-0052	Metal Seal Hub (Units After March 2010)	1
42-0051	Open Seal Hub (Units 2007 - March 2010)	1
42-0015	Closed Seal Hub (Units prior 2007)	1
46-0002	Retaining/Snap Ring	1
46-0105-125	1/8" NPT S/S Plug	1

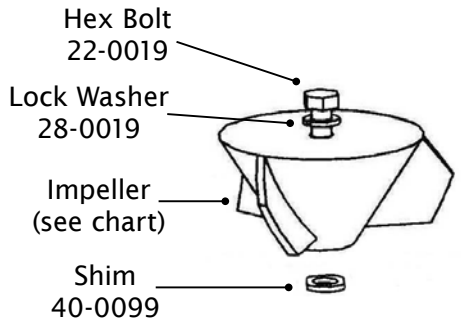
Concept 3 Power Unit (continued)

P/N	Description	Quantity
46-0105-250	1/4" NPT S/S Plug	2
46-0106	Ty-Rap (Small - Bulkhead wires)	2
47-0001	S/S Motor Housing	1
47-0002	Ground Clip	1
47-0020	Rubber Slinger Seal	1
49-0013	O-Ring Seal Hub	1
49-0038	O-Ring Motor Base Plate	1
49-0061	G-Type Seal (Units After March 2010)	1
49-0041	Single Rotary Seal (Units 2007 - March 2010)	1
49-0012	Double Rotary Seal (Units prior 2007)	1
BP2874*10	Ty-Rap (Capacitors)	2 to 4

* Quantity and size of crimp connector dependent on HP and voltage of Power Unit

Impeller Configurations and Color Codes





(use as needed to position impeller properly in pump chamber)

Aeration Spray Patterns
(Sunburst, Gemini, Saturn)

Rating	Spacer P/N (if any)	Impeller P/N	Impeller Color
1HP 60Hz	n/a	50-0012-001	White
2HP 60Hz/1HP 50Hz	n/a	50-0012-002	Red
3HP 60Hz/2HP 50Hz	28-0008	50-0012-003	Blue
5HP 60Hz/3HP 50Hz	40-0107	50-0012-005	Yellow
5HP 50Hz	40-0107	50-0012-055	Black

Note: Saturn spray pattern consists of only an impeller. (Hex bolt, fender washer, slinger disc and spacer are not used.)

Decorative Spray Patterns
(Comet, Constellation, Equinox, Genesis, Omega, Phoenix, Rocket, TriStar)

Rating	Impeller P/N	Impeller Color
1HP 60Hz	50-0010-001	White
2HP 60Hz/1HP 50Hz	50-0010-002	Red
3HP 60Hz/2HP 50Hz	50-0010-003	Blue
5HP 60Hz/3HP 50Hz/5HP 50Hz	50-0010-005	Yellow

Sunburst Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Slide the Impeller onto the motor shaft so the top of the hub is even with the top of the shaft. Tighten the set screw onto one of the flats on the shaft.

C. Mount the Slinger Disc to the shaft using (1) M8x20 S/S Hex Bolt and (1) M8 S/S Fender Washer. An Impeller Spacer is only used with 3HP 60Hz/2HP 50 Hz, 5HP 60Hz, 3HP 50Hz and 5HP 50Hz units (P/N 28-0008 or 40-0107). Tighten the bolt to 35 ft. lbs. (47 N-m).

NOTE: *Put a dab of removable thread locker (Loctite 242 – medium strength) on the threads of the impeller hex bolt before assembly.*

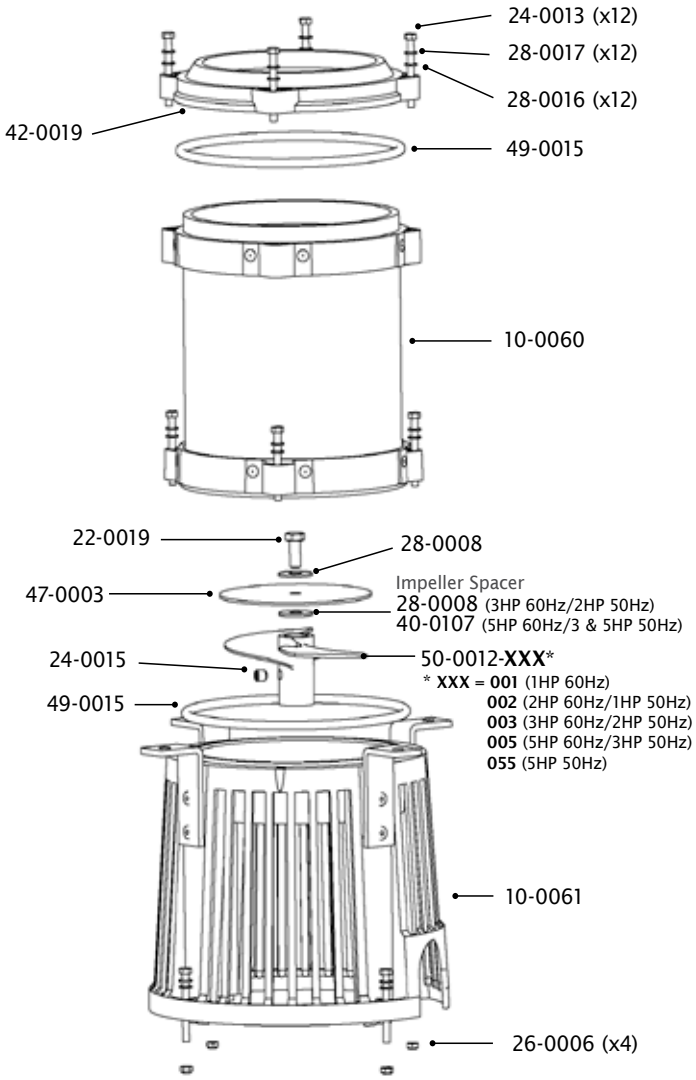
D. Place O-ring in the groove on the top of the Standoff Strainer Assembly.

NOTE: *Never reuse old O-rings.*

E. Mount the Throat Assembly to the Standoff Strainer Assembly using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.

F. Place O-ring on the top of the Throat Assembly.

G. Mount the Sunburst Ring to the Throat Assembly using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.



Qty	Description	P/N
1	Throat Assembly	10-0060
1	Standoff Strainer Assembly	10-0061
1	M8 x 20 S/S Hex Bolt	22-0019
12	M5 x 50 S/S Hex Screw	24-0013
1	M8 x 8 S/S Set Screw	24-0015
1	M8 (5/16") S/S Fender Washer Impeller Spacer 3HP 60Hz/2HP 50Hz ONLY	28-0008
12	M5 S/S Flat Washer	28-0016
12	M5 S/S Split Lock Washer	28-0017
1	Impeller Spacer 5HP 60Hz/3HP 50Hz/5HP 50Hz	40-0107
1	Sunburst Ring	42-0019
1	Slinger Disc	47-0003
2	O-Ring Throat/Pattern	49-0015
1	SNB Impeller 1HP 60Hz	50-0012-001
1	SNB Impeller 2HP 60Hz/1HP 50Hz	50-0012-002
1	SNB Impeller 3HP 60Hz/2HP 50Hz	50-0012-003
1	SNB Impeller 5HP 60Hz/3HP 50Hz	50-0012-005
1	SNB Impeller 5HP 50Hz	50-0012-055

Gemini Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Slide the Impeller onto the motor shaft so the top of the hub is even with the top of the shaft. Tighten the set screw onto one of the flats on the shaft.

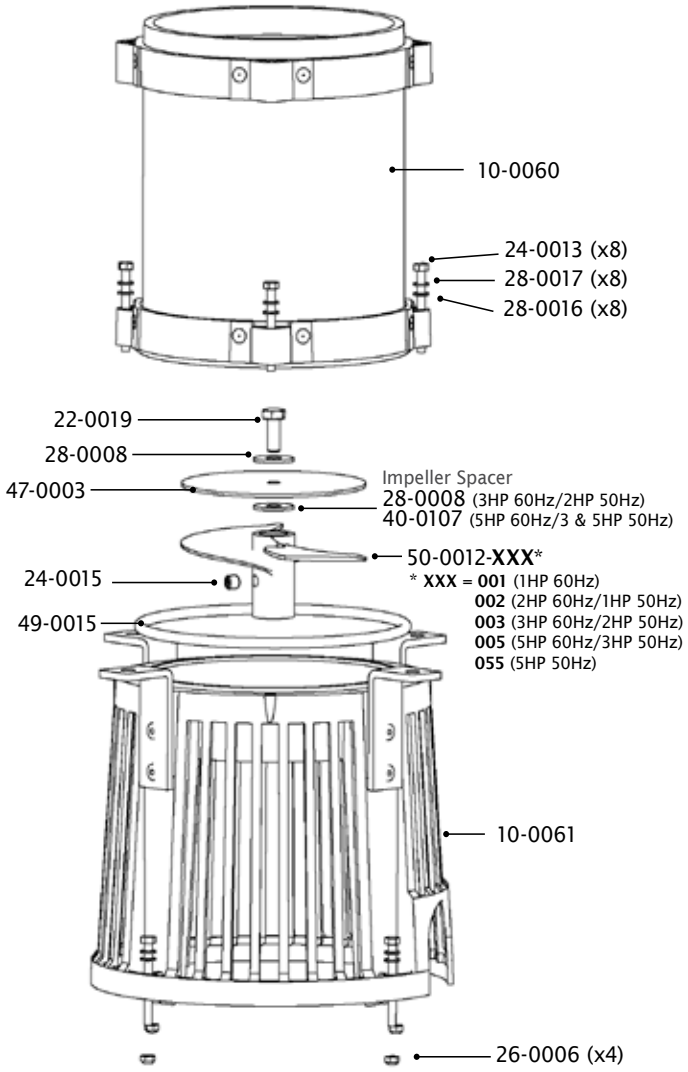
C. Mount the Slinger Disc to the shaft using (1) M8x20 S/S Hex Bolt and (1) M8 S/S Fender Washer. An Impeller Spacer is only used with 3HP 60Hz/2HP 50 Hz, 5HP 60Hz, 3HP 50Hz and 5HP 50Hz units (P/N 28-0008 or 40-0107). Tighten the bolt to 35 ft. lbs. (47 N-m).

NOTE: *Put a dab of removable thread locker (Loctite 242 – medium strength) on the threads of the impeller hex bolt before assembly.*

D. Place O-ring in the groove on the top of the Standoff Strainer Assembly.

NOTE: *Never reuse old O-rings.*

E. Mount the Throat Assembly to the Standoff Strainer Assembly using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.



Qty	Description	P/N
1	Throat Assembly	10-0060
1	Standoff Strainer Assembly	10-0061
1	M8 x 20 S/S Hex Bolt	22-0019
8	M5 x 50 S/S Hex Screw	24-0013
1	M8 x 8 S/S Set Screw	24-0015
1	M8 (5/16") S/S Fender Washer Impeller Spacer 3HP 60Hz/2HP 50Hz ONLY	28-0008
8	M5 S/S Flat Washer	28-0016
8	M5 S/S Split Lock Washer	28-0017
1	Impeller Spacer 5HP 60Hz/3HP 50Hz/5HP 50Hz	40-0107
1	Slinger Disc	47-0003
1	O-Ring Throat/Pattern	49-0015
1	SNB Impeller 1HP 60Hz	50-0012-001
1	SNB Impeller 2HP 60Hz/1HP 50Hz	50-0012-002
1	SNB Impeller 3HP 60Hz/2HP 50Hz	50-0012-003
1	SNB Impeller 5HP 60Hz/3HP 50Hz	50-0012-005
1	SNB Impeller 5HP 50Hz	50-0012-055

Saturn Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Slide the Impeller onto the motor shaft so the top of the hub is even with the top of the shaft. Tighten the set screw onto one of the flats on the shaft.

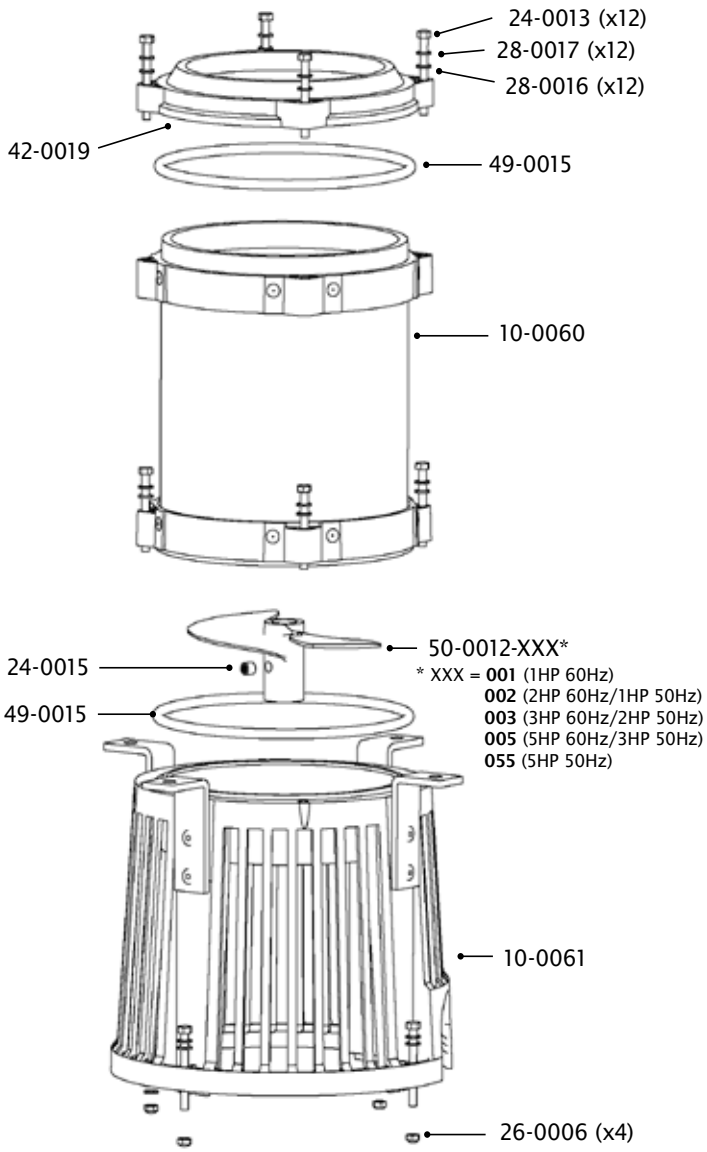
C. Place O-ring in the groove on the top of the Standoff Strainer Assembly.

NOTE: *Never reuse old O-rings.*

D. Mount the Throat Assembly to the Standoff Strainer Assembly using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.

E. Place O-ring on the top of the Throat Assembly.

F. Mount the Sunburst Ring to the Throat Assembly using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.



Qty	Description	P/N
1	Throat Assembly	10-0060
1	Standoff Strainer Assembly	10-0061
12	M5 x 50 S/S Hex Screw	24-0013
1	M8 x 8 S/S Set Screw	24-0015
12	M5 S/S Flat Washer	28-0016
12	M5 S/S Split Lock Washer	28-0017
1	Sunburst Ring	42-0019
2	O-Ring Throat/Pattern	49-0015
1	SNB Impeller 1HP 60Hz	50-0012-001
1	SNB Impeller 2HP 60Hz/1HP 50Hz	50-0012-002
1	SNB Impeller 3HP 60Hz/2HP 50Hz	50-0012-003
1	SNB Impeller 5HP 60Hz/3HP 50Hz	50-0012-005
1	SNB Impeller 5HP 50Hz	50-0012-055

Parts List | Open Throat Pump Chambers

(Sunburst, Gemini, Saturn)

P/N	Description	Qty per Sunburst Chamber	Qty per Gemini Chamber	Qty per Saturn Chamber
10-0060	Throat Assembly	1	1	1
10-0061	Standoff Strainer Assembly	1	1	1
22-0019	M8 x 20 S/S Hex Bolt	1	1	0
24-0013	M5 x 50 S/S Hex Screw	12	8	12
24-0015	M8 x 8 S/S Set Screw	1	1	1
28-0008	M8 (5/16") S/S Fender Washer	1	1	0
28-0008	Impeller Spacer **3HP 60Hz/2HP 50Hz ONLY**	1	1	0
28-0016	M5 S/S Flat Washer	12	8	12
28-0017	M5 S/S Split Lock Washer	12	8	12
40-0107	Impeller Spacer **5HP 60Hz/3HP 50Hz/5HP 50Hz**	1	1	0
42-0019	Sunburst Ring	1	0	1
47-0003	Slinger Disc	1	1	0
49-0015	O-Ring Throat/Pattern	2	1	2
50-0012-001	SNB Impeller 1HP 60Hz	1	1	1
50-0012-002	SNB Impeller 2HP 60Hz/1HP 50Hz	1	1	1
50-0012-003	SNB Impeller 3HP 60Hz/2HP 50Hz	1	1	1
50-0012-005	SNB Impeller 5HP 60Hz/3HP 50Hz	1	1	1
50-0012-055	SNB Impeller 5HP 50Hz	1	1	1

Phoenix Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Place the Lower Pump Chamber Assembly into the Standoff Strainer Assembly. Slide the Impeller onto the motor shaft. If the Impeller rubs against the inside wall of the Lower Pump Chamber Assembly place 1, 2 or 3 Shims (P/N 40-0099) as necessary onto the shaft to raise the Impeller so it no longer rubs. Secure using (1) M8x20 S/S Hex Bolt and (1) M8 S/S Split Lock Washer. Tighten the bolt.

NOTE: *Single phase units can take up to two shim spacers. Three phase units should only take one shim spacer.*

C. Place O-ring in the groove of the Lower Pump Chamber.

NOTE: *Never reuse old O-rings.*

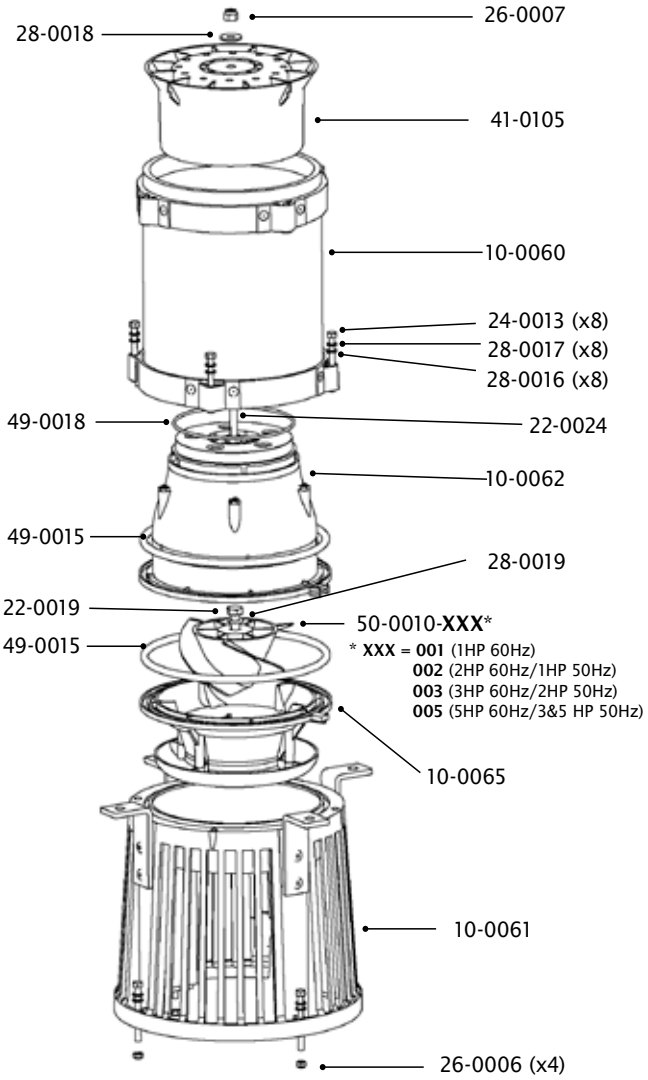
D. Place the Phoenix/Tri-Star Flow Diverter Assembly, P/N 10-0062, onto the Lower Pump Chamber Assembly so the tabs on each part align.

NOTE: *Tabs must align for pump to function properly.*

E. Place the Throat Assembly onto the Upper Pump Chamber and secure using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-rings.

F. Place O-ring on the top of the Flow Diverter Assembly.

G. Slide the Phoenix Diffuser onto the Carriage Bolt so that it is seated on the Flow Diverter Assembly and secure using a M8 S/S Flat Washer and a M8 S/S Nylon Locknut. Tighten the locknut just enough so the diffuser will not spin. Do not overtighten, may cause damage to carriage bolt.



Qty	Description	P/N
1	Throat Assembly	10-0060
1	Standoff Strainer Assembly	10-0061
1	PHX/TRI Flow Diverter Assembly	10-0062
1	Lower Pump Chamber Assembly	10-0065
1	M8 x 20 S/S Hex Bolt	22-0019
8	M5 x 50 S/S Hex Bolt	24-0013
4	M5 Nylon Locknuts (mounted to power unit)	26-0006
1	M8 S/S Nylon Locknut	26-0007
8	M5 S/S Flat Washer	28-0016
8	M5 S/S Split Lock Washer	28-0017
1	M8 (5/16") S/S Flat Washer	28-0018
1	M8 (5/16") S/S Split Lock Washer	28-0019
2 or 3	Decorative Impeller Shim (not shown)	40-0099
1	Phoenix Diffuser	41-0105
2	O-Ring Throat/Pattern C3	49-0015
1	O-Ring C3 PHX/TRI/CON	49-0018
1	Decorative Impeller, 1HP 60Hz	50-0010-001
1	Decorative Impeller, 2HP 60Hz/1HP 50Hz	50-0010-002
1	Decorative Impeller, 3HP 60Hz/2HP 50Hz	50-0010-003
1	Decorative Impeller, 5HP 60Hz/3&5HP 50Hz	50-0010-005

Tri-Star Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Place the Lower Pump Chamber Assembly into the Standoff Strainer Assembly.

C. Slide the Impeller onto the motor shaft. If the Impeller rubs against the inside wall of the Lower Pump Chamber Assembly place 1, 2 or 3 Shims (P/N 40-0099) as necessary onto the shaft to raise the Impeller so it no longer rubs. Secure using (1) M8x20 S/S Hex Bolt and (1) M8 S/S Split Lock Washer. Tighten the bolt.

NOTE: *Single phase units can take up to two shim spacers. Three phase units should only take one shim spacer.*

D. Place O-ring in the groove of the Lower Pump Chamber.

NOTE: *Never reuse old O-rings.*

E. Place the Phoenix/Tri-Star Flow Diverter Assembly, onto the Lower Pump Chamber Assembly so the tabs on each part align.

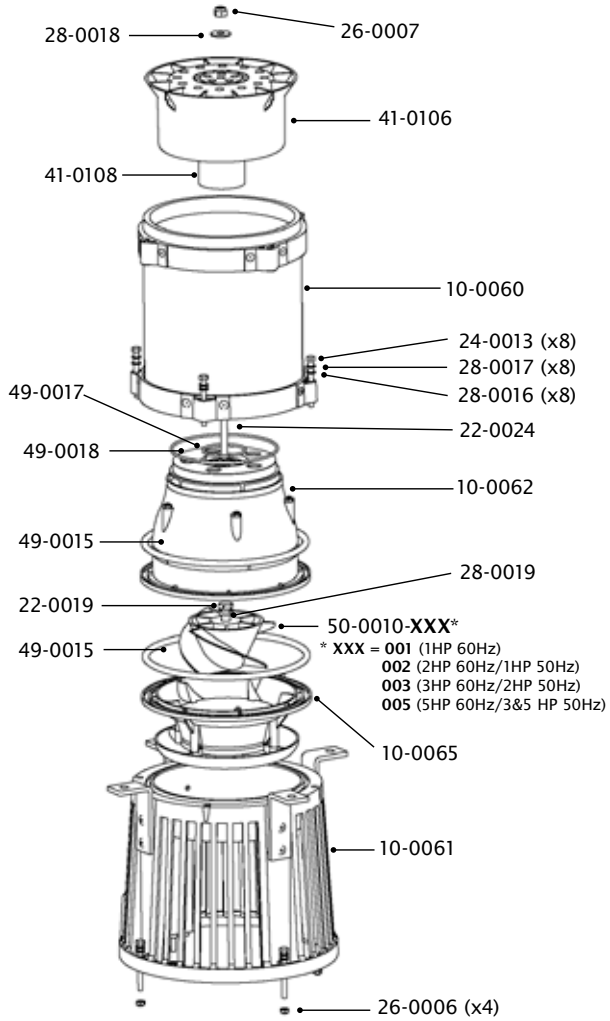
NOTE: *Tabs must align for pump to function properly.*

F. Place the Throat Assembly onto the Upper Pump Chamber and secure using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-rings.

G. Place O-ring on top and inside of the Flow Diverter.

H. Place the Tri-Star Diffuser Pipe in the Flow Diverter Assembly so it rests on the O-Ring.

I. Slide the Tri-Star Diffuser onto the Carriage Bolt so that it is seated on the Flow Diverter Assembly/Tri-Star Diffuser Pipe and secure using a M8 S/S Flat Washer and a M8 S/S Nylon Locknut. Tighten the locknut just enough so the diffuser will not spin. Do not overtighten, may cause damage to carriage bolt.



Qty	Description	P/N
1	Throat Assembly	10-0060
1	Standoff Strainer Assembly	10-0061
1	PHX/TRI Flow Diverter Assembly	10-0062
1	Lower Pump Chamber Assembly	10-0065
1	M8 x 20 S/S Hex Bolt	22-0019
8	M5 x 50 S/S Hex Bolt	24-0013
4	M5 Nylon Locknuts (mounted to power unit)	26-0006
1	M8 S/S Nylon Locknut	26-0007
8	M5 S/S Flat Washer	28-0016
8	M5 S/S Split Lock Washer	28-0017
1	M8 (5/16") S/S Flat Washer	28-0018
1	M8 (5/16") S/S Split Lock Washer	28-0019
2 or 3	Decorative Impeller Shim (not shown)	40-0099
1	TriStar Diffuser	41-0106
1	TriStar Diffuser Pipe	41-0108
2	O-Ring Throat/Pattern C3	49-0015
1	O-Ring TriStar	49-0017
1	O-Ring C3 PHX/TRI/CON	49-0018
1	Decorative Impeller, 1HP 60Hz	50-0010-001
1	Decorative Impeller, 2HP 60Hz/1HP 50Hz	50-0010-002
1	Decorative Impeller, 3HP 60Hz/2HP 50Hz	50-0010-003
1	Decorative Impeller, 5HP 60Hz/3&5HP 50Hz	50-0010-005

Rocket Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Place the Lower Pump Chamber Assembly into the Standoff Strainer Assembly.

C. Slide the Impeller onto the motor shaft. If the Impeller rubs against the inside wall of the Lower Pump Chamber Assembly place 1, 2 or 3 Shims (P/N 40-0099) as necessary onto the shaft to raise the Impeller so it no longer rubs. Secure using (1) M8x20 S/S Hex Bolt and (1) M8 S/S Split Lock Washer. Tighten the bolt.

NOTE: *Single phase units can take up to two shim spacers. Three phase units should only take one shim spacer.*

D. Place O-ring in the groove of the Lower Pump Chamber.

NOTE: *Never reuse old O-rings.*

E. Place the Upper Pump Chamber onto the Lower Pump Chamber Assembly so the tabs on each part align.

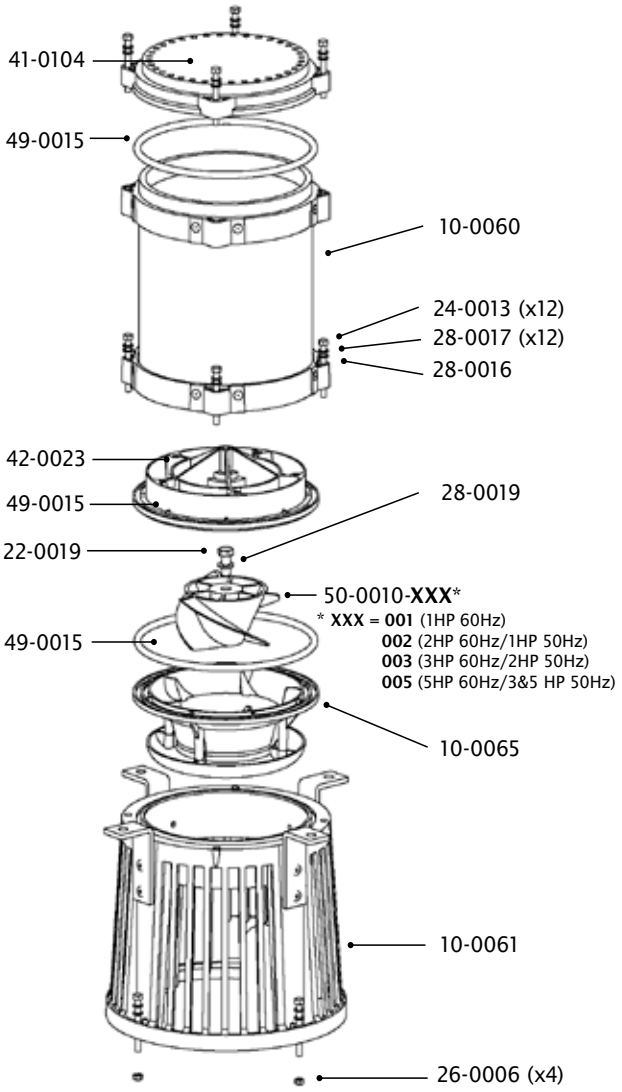
NOTE: *Tabs must align for pump to function properly.*

F. Place O-ring in the groove of the Upper Pump Chamber.

G. Place the Throat Assembly onto the Upper Pump Chamber and secure using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-rings.

H. Place O-ring on the top of the Throat Assembly.

I. Mount the Rocket Diffuser to the Throat Assembly using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.



Qty	Description	P/N
1	Throat Assembly	10-0060
1	Standoff Strainer Assembly	10-0061
1	Lower Pump Chamber Assembly	10-0065
1	M8 x 20 S/S Hex Bolt	22-0019
12	M5 x 50 S/S Hex Bolt	24-0013
4	M5 Nylon Locknuts (mounted to power unit)	26-0006
12	M5 S/S Flat Washer	28-0016
12	M5 S/S Split Lock Washer	28-0017
1	M8 (5/16") S/S Split Lock Washer	28-0019
2 or 3	Decorative Impeller Shim (not shown)	40-0099
1	Rocket Diffuser	41-0104
1	Upper Pump Chamber	42-0023
3	O-Ring Throat/Pattern C3	49-0015
1	Decorative Impeller, 1HP 60Hz	50-0010-001
1	Decorative Impeller, 2HP 60Hz/1HP 50Hz	50-0010-002
1	Decorative Impeller, 3HP 60Hz/2HP 50Hz	50-0010-003
1	Decorative Impeller, 5HP 60Hz/3&5HP 50Hz	50-0010-005

Constellation Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Place the Lower Pump Chamber Assembly into the Standoff Strainer Assembly.

C. Slide the Impeller onto the motor shaft. If the Impeller rubs against the inside wall of the Lower Pump Chamber Assembly place 1, 2 or 3 Shims (P/N 40-0099) as necessary onto the shaft to raise the Impeller so it no longer rubs. Secure using (1) M8x20 S/S Hex Bolt and (1) M8 S/S Split Lock Washer. Tighten the bolt.

NOTE: *Single phase units can take up to two shim spacers. Three phase units should only take one shim spacer.*

D. Place O-ring in the groove of the Lower Pump Chamber.

NOTE: *Never reuse old O-rings.*

E. Place the Constellation Flow Diverter Assembly onto the Lower Pump Chamber Assembly so the tabs on each part align.

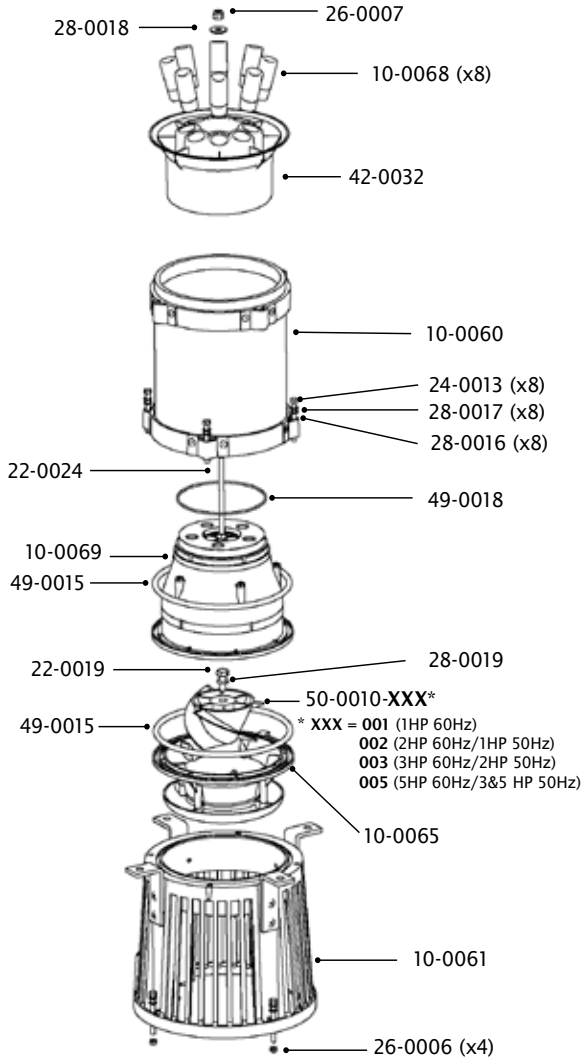
NOTE: *Tabs must align for pump to function properly.*

F. Place O-ring in the groove of the Upper Pump Chamber.

G. Place the Throat Assembly onto the Upper Pump Chamber and secure using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-rings.

H. Place O-ring on top of the Flow Diverter Assembly.

I. Slide the Constellation Diffuser onto the Carriage Bolt so that it is seated on the Flow Diverter Assembly and secure using a M8 S/S Flat Washer and a M8 S/S Nylon Locknut. Tighten the locknut so the four legs on the Diffuser are just touching the top of the Throat Assembly. Do not over tighten, may cause damage.



Qty	Description	P/N
1	Throat Assembly	10-0060
1	Standoff Strainer Assembly	10-0061
1	Lower Pump Chamber Assembly	10-0065
8	Constellation/Genesis Nozzle	10-0068
1	Constellation Flow Diverter Assembly	10-0069
1	M8 x 20 S/S Hex Bolt	22-0019
8	M5 x 50 S/S Hex Bolt	24-0013
4	M5 Nylon Locknuts (mounted to power unit)	26-0006
1	M8 S/S Nylon Locknut	26-0007
8	M5 S/S Flat Washer	28-0016
8	M5 S/S Split Lock Washer	28-0017
1	M8 (5/16") S/S Flat Washer	28-0018
1	M8 (5/16") S/S Split Lock Washer	28-0019
2 or 3	Decorative Impeller Shim (not shown)	40-0099
1	Constellation Diffuser	42-0032
2	O-Ring Throat/Pattern C3	49-0015
1	O-Ring C3 PHX/TRI/CON	49-0018
1	Decorative Impeller, 1HP 60Hz	50-0010-001
1	Decorative Impeller, 2HP 60Hz/1HP 50Hz	50-0010-002
1	Decorative Impeller, 3HP 60Hz/2HP 50Hz	50-0010-003
1	Decorative Impeller, 5HP 60Hz/3&5HP 50Hz	50-0010-005

Comet Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Place the Lower Pump Chamber Assembly into the Standoff Strainer Assembly.

C. Slide the Impeller onto the motor shaft. If the Impeller rubs against the inside wall of the Lower Pump Chamber Assembly place 1, 2 or 3 Shims (P/N 40-0099) as necessary onto the shaft to raise the Impeller so it no longer rubs. Secure using (1) M8x20 S/S Hex Bolt and (1) M8 S/S Split Lock Washer. Tighten the bolt.

NOTE: *Single phase units can take up to two shim spacers. Three phase units should only take one shim spacer.*

D. Place O-ring in the groove of the Lower Pump Chamber.

NOTE: *Never reuse old O-rings.*

E. Place the Upper Pump Chamber onto the Lower Pump Chamber Assembly so the tabs on each part align.

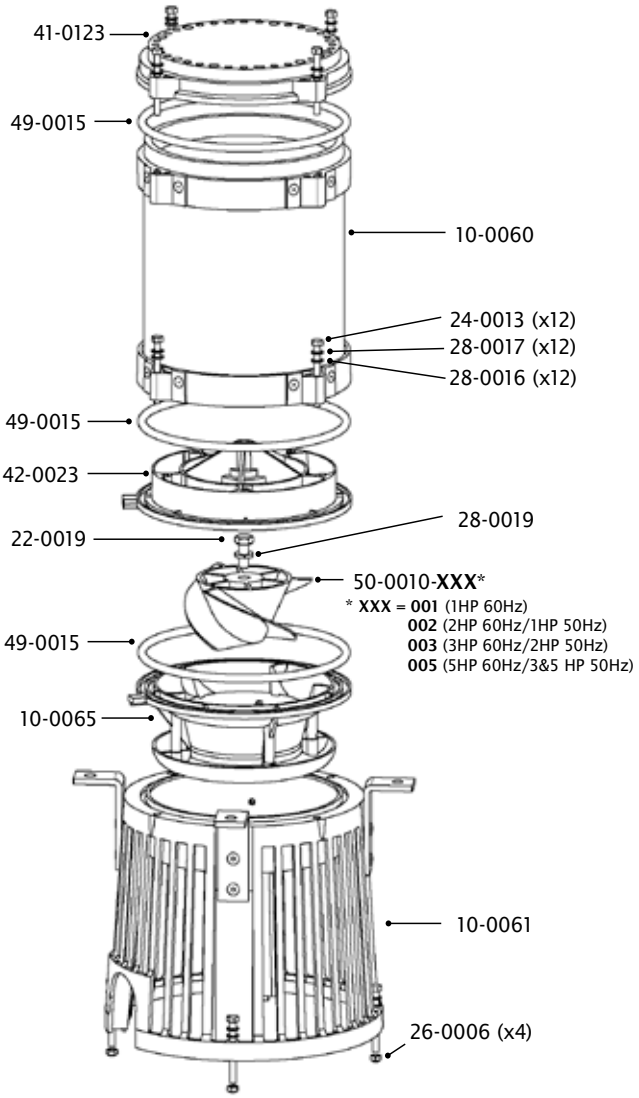
NOTE: *Tabs must align for pump to function properly.*

F. Place O-ring in the groove of the Upper Pump Chamber.

G. Place the Throat Assembly onto the Upper Pump Chamber and secure using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-rings.

H. Place O-ring on the top of the Throat Assembly.

I. Mount the Comet Diffuser to the Throat Assembly using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers and (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.



Qty	Description	P/N
1	Throat Assembly	10-0060
1	Standoff Strainer Assembly	10-0061
1	Lower Pump Chamber Assembly	10-0065
1	M8 x 20 S/S Hex Bolt	22-0019
12	M5 x 50 S/S Hex Bolt	24-0013
4	M5 Nylon Locknuts (mounted to power unit)	26-0006
12	M5 S/S Flat Washer	28-0016
12	M5 S/S Split Lock Washer	28-0017
1	M8 (5/16") S/S Split Lock Washer	28-0019
2 or 3	Decorative Impeller Shim (not shown)	40-0099
1	Upper Pump Chamber	42-0023
1	Comet Diffuser	41-0123
3	O-Ring Throat/Pattern C3	49-0015
1	Decorative Impeller, 1HP 60Hz	50-0010-001
1	Decorative Impeller, 2HP 60Hz/1HP 50Hz	50-0010-002
1	Decorative Impeller, 3HP 60Hz/2HP 50Hz	50-0010-003
1	Decorative Impeller, 5HP 60Hz/3&5HP 50Hz	50-0010-005

Genesis Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Place the Lower Pump Chamber Assembly into the Standoff Strainer Assembly.

C. Slide the Impeller onto the motor shaft. If the Impeller rubs against the inside wall of the Lower Pump Chamber Assembly place 1, 2 or 3 Shims (P/N 40-0099) as necessary onto the shaft to raise the Impeller so it no longer rubs. Secure using (1) M8x20 S/S Hex Bolt and (1) M8 S/S Split Lock Washer. Tighten the bolt.

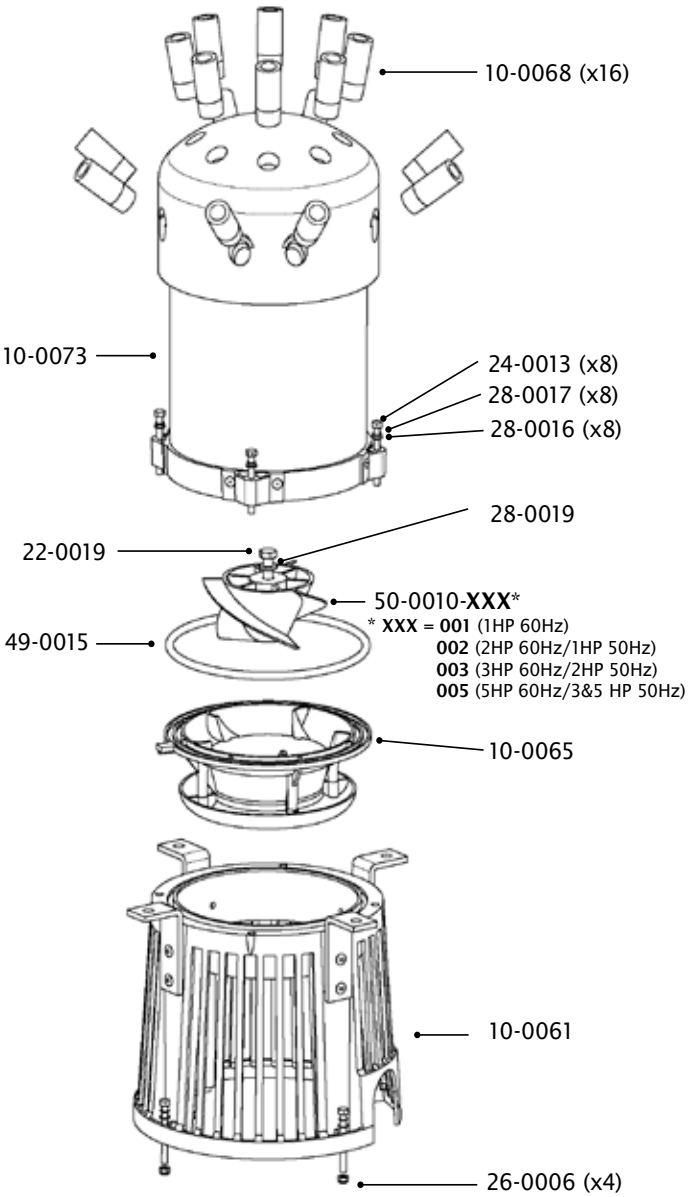
NOTE: *Single phase units can take up to two shim spacers. Three phase units should only take one shim spacer.*

D. Place O-ring in the groove of the Lower Pump Chamber Assembly.

NOTE: *Never reuse old O-rings.*

E. Place the Genesis Throat Assembly onto the Lower Pump Chamber Assembly and secure using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.

NOTE: *The Float must be mounted before the Genesis Throat Assembly is installed.*



Qty	Description	P/N
1	Standoff Strainer Assembly	10-0061
1	Lower Pump Chamber Assembly	10-0065
16	Constellation/Genesis Nozzle	10-0068
1	Genesis Throat Assembly	10-0073
1	M8 x 20 S/S Hex Bolt	22-0019
8	M5 x 50 S/S Hex Bolt	24-0013
4	M5 Nylon Locknuts (mounted to power unit)	26-0006
8	M5 S/S Flat Washer	28-0016
8	M5 S/S Split Lock Washer	28-0017
1	M8 (5/16") S/S Split Lock Washer	28-0019
2 or 3	Decorative Impeller Shim (not shown)	40-0099
1	O-Ring Throat/Pattern C3	49-0015
1	Decorative Impeller, 1HP 60Hz	50-0010-001
1	Decorative Impeller, 2HP 60Hz/1HP 50Hz	50-0010-002
1	Decorative Impeller, 3HP 60Hz/2HP 50Hz	50-0010-003
1	Decorative Impeller, 5HP 60Hz/3&5HP 50Hz	50-0010-005

Equinox Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (6) M5x50 S/S Hex Screws, (7) M5 S/S Split Lock Washers, (8) M5 S/S Flat Washers and (15) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Place the Lower Pump Chamber Assembly into the Standoff Strainer Assembly.

C. Place a shim (P/N 40-0099) on the top of the motor shaft prior to installing the impeller onto the motor shaft. If the Impeller rubs against the inside wall of the Lower Pump Chamber Assembly add another shim (do not use more than four (4) shims). Secure impeller using (9) M8x20 S/S Hex Bolt and (10) M8 S/S Split Lock Washer. Tighten the bolt.

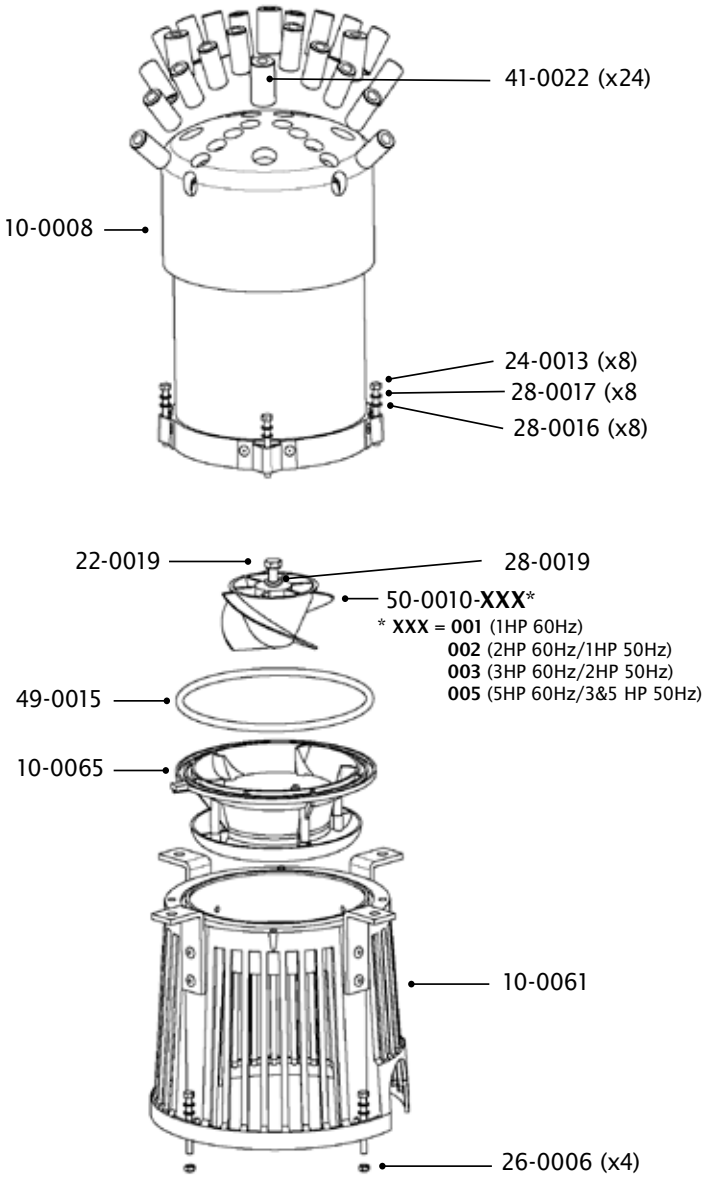
NOTE: *Single phase units can take up to two shim spacers. Three phase units should only take one shim spacer.*

D. Place O-ring in the groove of the Lower Pump Chamber Assembly.

NOTE: *Never reuse old O-rings.*

E. Place the Equinox Throat Assembly onto the Lower Pump Chamber Assembly and secure using (6) M5x50 S/S Hex Screws, (7) M5 S/S Split Lock Washers and (8) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.

NOTE: *The Float must be mounted before the Equinox Throat Assembly is installed.*



Qty	Description	P/N
1	Throat Assembly Equinox C3	10-0008
1	Standoff Strainer Assembly	10-0061
1	Lower Pump Chamber Assembly	10-0065
1	M8 x 20 S/S Hex Bolt	22-0019
8	M5 x 50 S/S Hex Bolt	24-0013
4	M5 Nylon Locknuts (mounted to power unit)	26-0006
8	M5 S/S Flat Washer	28-0016
8	M5 S/S Split Lock Washer	28-0017
1	M8 (5/16") S/S Split Lock Washer	28-0019
1 to 4	Decorative Impeller Shim (not shown)	40-0099
24	Nozzle 3/8NPTx1.5" C3 Equinox	41-0022
1	O-Ring Throat/Pattern C3	49-0015
1	Decorative Impeller, 1HP 60Hz	50-0010-001
1	Decorative Impeller, 2HP 60Hz/1HP 50Hz	50-0010-002
1	Decorative Impeller, 3HP 60Hz/2HP 50Hz	50-0010-003
1	Decorative Impeller, 5HP 60Hz/3&5HP 50Hz	50-0010-005

Omega Pump Chamber Assembly

A. Mount Standoff Strainer Assembly to the power unit using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers and (4) M5 S/S Hex Nylon Locknuts. Tighten the screws evenly.

NOTE: *Standoff Strainer Assembly (P/N 10-0061) is not part of the Pump Chamber Assembly.*

B. Place the Lower Pump Chamber Assembly into the Standoff Strainer Assembly.

C. Place a shim (P/N 40-0099) on the top of the motor shaft prior to installing the impeller onto the motor shaft. If the Impeller rubs against the inside wall of the Lower Pump Chamber Assembly add another shim (do not use more than four (4) shims). Secure the impeller using (1) M8x20 S/S Hex Bolt and (1) M8 S/S Split Lock Washer. Tighten the bolt.

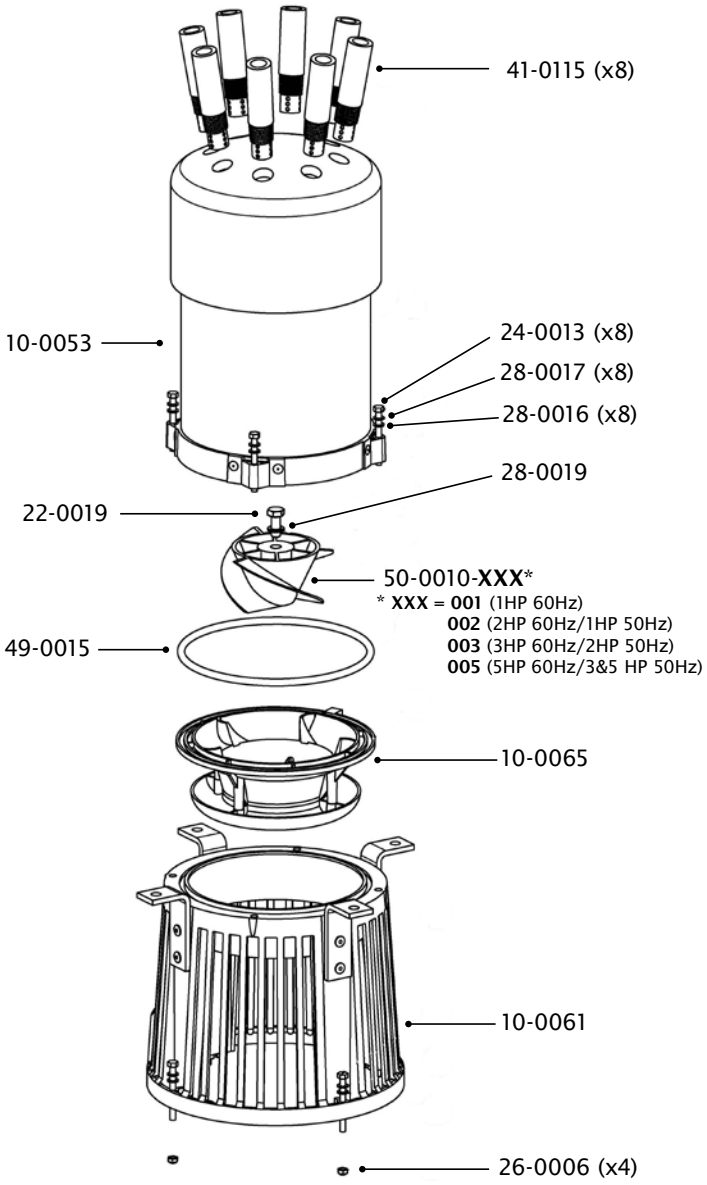
D. Place O-ring in the groove of the Lower Pump Chamber Assembly.

NOTE: *Never reuse old O-rings.*

E. Place the Omega Throat Assembly onto the Lower Pump Chamber Assembly and secure using (4) M5x50 S/S Hex Screws, (4) M5 S/S Split Lock Washers, (4) M5 S/S Flat Washers. Tighten the screws evenly in order to properly compress the O-ring.

NOTE: *The Float must be mounted before the Omega Throat Assembly is installed.*

F. If replacing nozzles on the Omega throat assembly place Teflon tape on the threads of the nozzle and DO NOT OVERTIGHTEN, THE THROAT MAY BE DAMAGED.



Qty	Description	P/N
1	Standoff Strainer Assembly	10-0061
1	Lower Pump Chamber Assembly	10-0065
1	Omega Throat Assembly	10-0053
1	M8 x 20 S/S Hex Bolt	22-0019
8	M5 x 50 S/S Hex Bolt	24-0013
4	M5 Nylon Locknuts (mounted to power unit)	26-0006
8	M5 S/S Flat Washer	28-0016
8	M5 S/S Split Lock Washer	28-0017
1	M8 (5/16") S/S Split Lock Washer	28-0019
1 to 3	Decorative Impeller Shim (not shown)	40-0099
8	Omega Nozzle	41-0115
1	O-Ring Throat/Pattern C3	49-0015
1	Decorative Impeller, 1HP 60Hz	50-0010-001
1	Decorative Impeller, 2HP 60Hz/1HP 50Hz	50-0010-002
1	Decorative Impeller, 3HP 60Hz/2HP 50Hz	50-0010-003
1	Decorative Impeller, 5HP 60Hz/3&5HP 50Hz	50-0010-005

Parts List | Decorative Pump Chambers

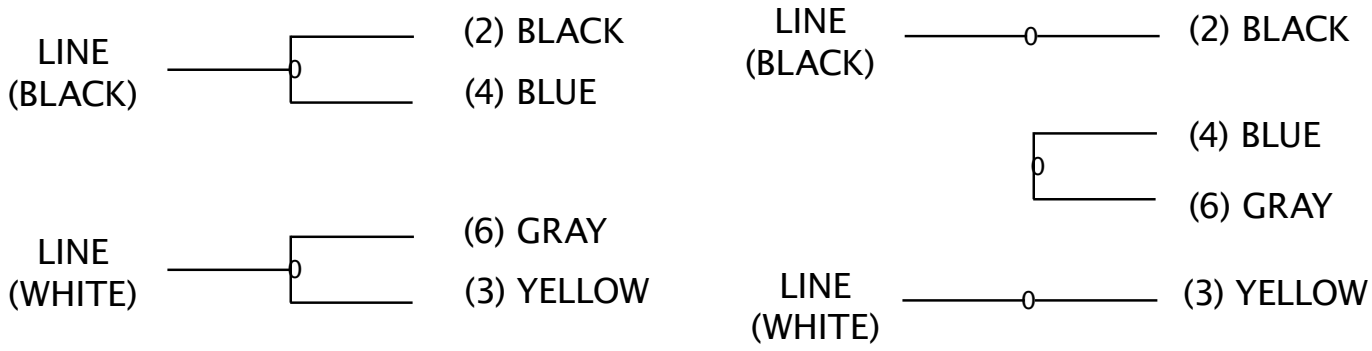
(Phoenix, TriStar, Rocket, Constellation, Comet, Genesis, Equinox, Omega)

P/N	Description	Qty per Phoenix Chamber	Qty per TriStar Chamber	Qty per Rocket Chamber	Qty per Constellation Chamber	Qty per Comet Chamber	Qty per Genesis Chamber	Qty per Equinox Chamber	Qty per Omega Chamber
10-0008	Throat Assembly Equinox C3	0	0	0	0	0	0	1	0
10-0053	Throat Assembly Omega	0	0	0	0	0	0	0	1
10-0060	Throat Assembly	1	1	1	1	1	0	0	0
10-0061	Standoff Strainer Assembly	1	1	1	1	1	1	1	1
10-0062	PHX/TRI Flow Diverter Assembly	1	1	0	0	0	0	0	0
10-0065	Lower Pump Chamber Assembly	1	1	1	1	1	1	1	1
10-0068	Constellation/Genesis Nozzle	0	0	0	8	0	16	0	0
10-0069	Constellation Flow Diverter Assembly	0	0	0	1	0	0	0	0
10-0073	Genesis Throat Assembly	0	0	0	0	0	1	0	0
22-0019	M8 x 20 S/S Hex Bolt	1	1	1	1	1	1	1	1
24-0013	M5 x 50 S/S Hex Bolt	8	8	12	8	12	8	8	8
26-0006	M5 Nylon Locknuts (mounted to power unit)	4	4	4	4	4	4	4	4
26-0007	M8 S/S Nylon Locknut	1	1	0	1	0	0	0	0
28-0016	M5 S/S Flat Washer	8	8	12	8	12	8	8	8
28-0017	M5 S/S Split Lock Washer	8	8	12	8	12	8	8	8
28-0018	M8 (5/16") S/S Flat Washer	1	1	0	1	0	0	0	0
28-0019	M8 (5/16") S/S Split Lock Washer	1	1	1	1	1	1	1	1
40-0099	Decorative Impeller Shim (not shown)	2 or 3	2 or 3	2 or 3	2 or 3	2 or 3	2 or 3	1 to 4	1 to 4
41-0022	Nozzle 3/8NPTx1.5" C3 Equinox	0	0	0	0	0	0	20	0
41-0104	Rocket Diffuser	0	0	1	0	0	0	0	0
41-0105	Phoenix Diffuser	1	0	0	0	0	0	0	0
41-0106	TriStar Diffuser	0	1	0	0	0	0	0	0
41-0108	TriStar Diffuser Pipe	0	1	0	0	0	0	0	0
41-0115	Omega Nozzle	0	0	0	0	0	0	0	8
42-0023	Upper Pump Chamber	0	0	1	0	1	0	0	0
42-0032	Constellation Diffuser	0	0	0	1	0	0	0	0
42-0123	Comet Diffuser	0	0	0	0	1	0	0	0
49-0015	O-Ring Throat/Pattern	2	2	3	2	3	1	1	1
49-0017	O-Ring TriStar	0	1	0	0	0	0	0	0
49-0018	O-Ring C3 PHX/TRI/CON	1	1	0	1	0	0	0	0
50-0010-001	Decorative Impeller, 1HP 60Hz	1	1	1	1	1	1	1	1
50-0010-002	Decorative Impeller, 2HP 60Hz/1HP 50Hz	1	1	1	1	1	1	1	1
50-0010-003	Decorative Impeller, 3HP 60Hz/2HP 50Hz	1	1	1	1	1	1	1	1
50-0010-005	Decorative Impeller, 5HP 60Hz/3&5HP 50Hz	1	1	1	1	1	1	1	1

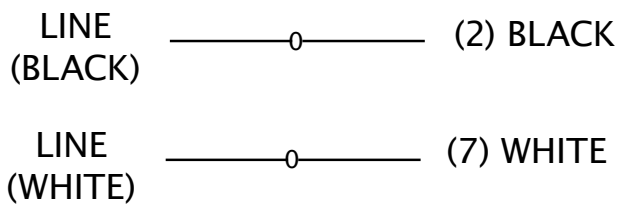
Motor Wiring Diagrams

(Franklin/Bluffton Motors Only)

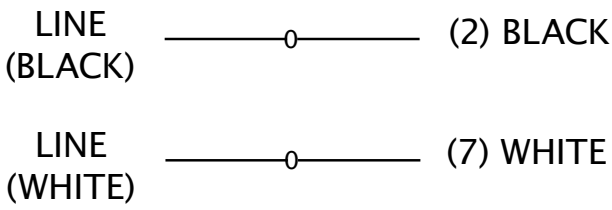
115V 1HP (1PHASE) 208/220/230



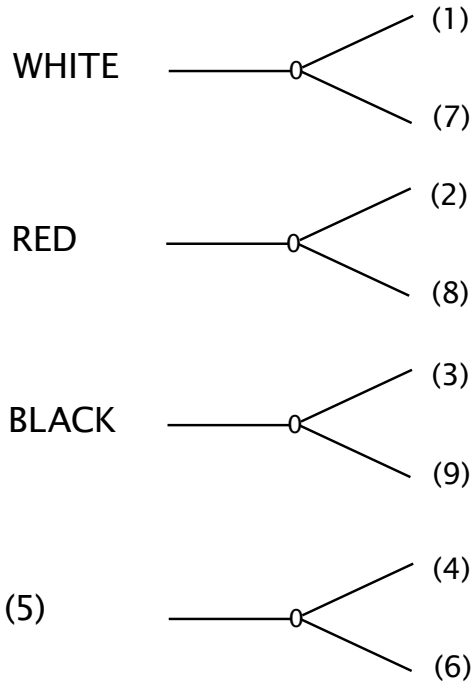
2HP (1PHASE) 208/220/230



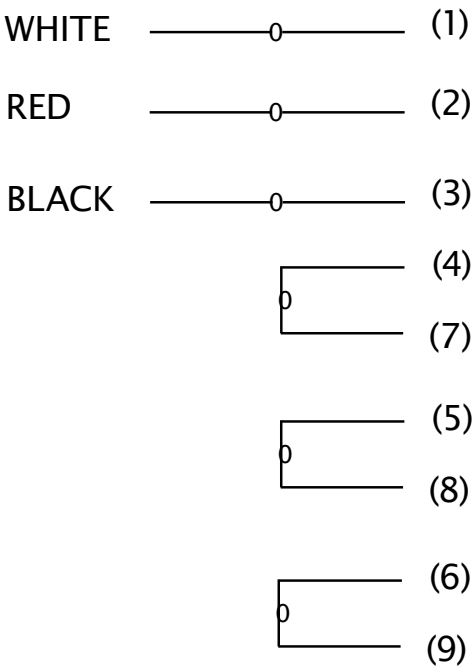
3HP and 5HP (1PHASE) 208/220/230



3HP and 5HP (3PHASE) 208/220/230



3HP and 5HP (3PHASE) 380/415/460



Motor Start Switch & Capacitor Ratings*

Description	Otterbine P/N	Start Switch Franklin P/N	Capacitor Rating
C3 1HP 1Ph Capacitor/Start Switch Kit	15-0024	294626902 or 294626904	189-227 MFD, 125 VAC 50/60Hz
C3 2HP 1Ph Capacitor/Start Switch Kit	15-0025	294616906	250-300 MFD, 125 VAC 50/60Hz
C3 3HP & 5HP 1Ph Capacitor (Single Cap)	36-0005	n/a	65 MFD, 370 VAC 50/60Hz (variance 10%)
5HP 1Ph Capacitors (New Motors)** (Dual Caps) - Motors After January 2007	36-0006 (Order 2 each)	n/a	40 MFD, 440 VAC 50/60Hz (variance 10%)
3HP 1Ph Capacitors (New Motors)** (Dual Caps) - Motors After May 2008	36-0020 (Order 2 each)	n/a	30 MFD, 440 VAC 50/60Hz (variance 6%)

** If you replace an Otterbine capacitor with a non-approved capacitor - **Motor Warranty Will Be Void***
*** Cap Boots - Dual Capacitors: P/N 149-001*10*

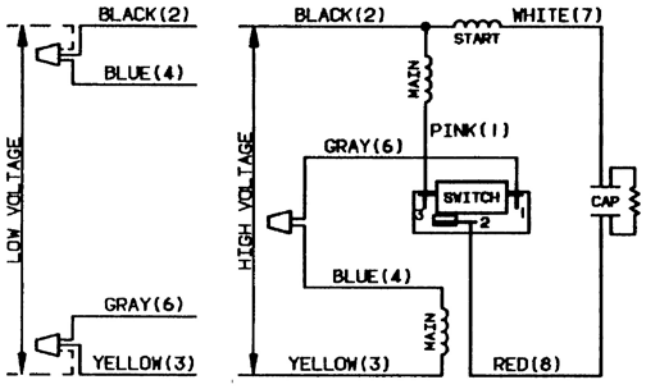
Motor Resistance & No Load Ampere Specifications for Concept 3

Motor Rating	Resistance	No Load Ampere @ 60Hz
1 HP 115V 1Ph	.6 - 1.2 ohms	10.0 - 13.1 amps
1 HP 230V 1Ph	1.6 - 2.4 ohms	5.1 - 6.7 amps
2 HP 230V 1Ph	1.2 - 2.0 ohms	6.0 - 8.0 amps
3 HP 230V 1Ph	1.0 - 2.5 ohms	4.5 - 6.9 amps
3 HP 230V 3Ph	1.2 - 1.7 ohms	3.0 - 4.0 amps
3 HP 460V 3Ph	5.5 - 5.9 ohms	1.5 - 2.0 amps
5 HP 230V 1Ph	.6 - 1.8 ohms	13.0 - 15.0 amps
5 HP 230V 3Ph	1.0 - 1.6 ohms	4.8 - 6.0 amps
5 HP 460V 3Ph	3.6 - 4.1 ohms	2.4 - 2.9 amps
5 HP 575V 3Ph	5.6 ohms	1.2 - 1.8 amps

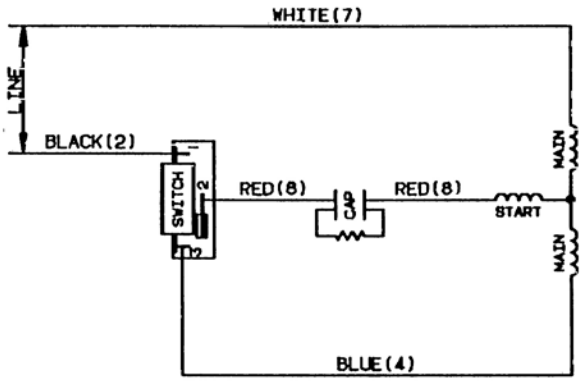
NOTE: All figures are approximate.

Motor Capacitor/Start Switch Wiring Diagrams

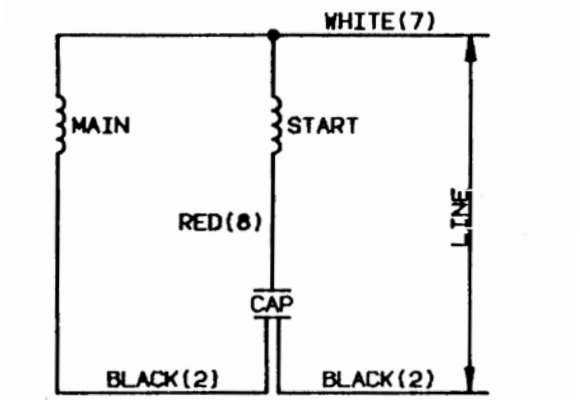
1HP Single Phase (115V & 230V)



2HP Single Phase (230V)



3HP & 5HP Single Phase (230V)



Capacitor Wiring Diagrams | 3HP & 5HP 230V 1 Phase*

*Same wiring schematic for both 3HP & 5HP motors, variance will occur with the wiring color.

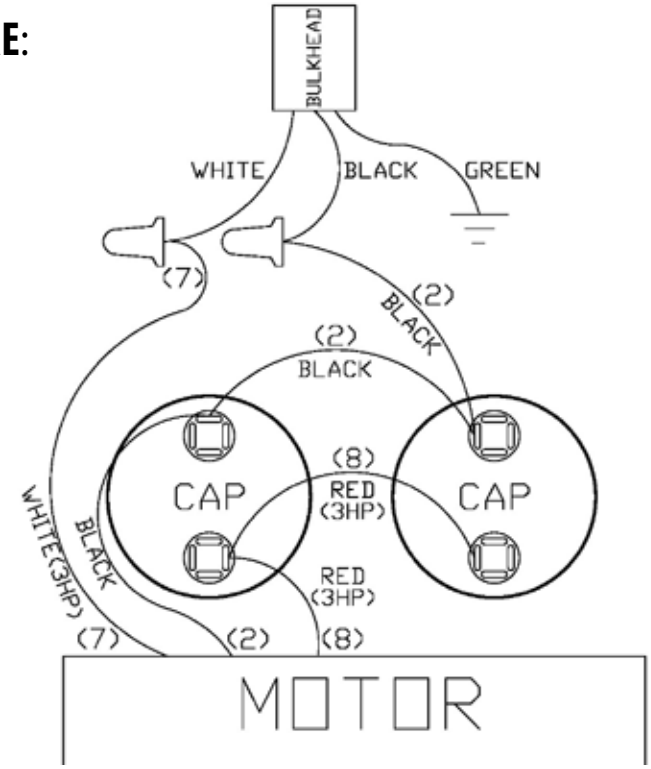
- **3HP Motors:** White, black and red wires used with numbered metal tags.
- **5HP Motors:** All wires will be black with numbered metal tags.

For Units with Serial Numbers **BEFORE**:

- 3HP/1Ph: D3-0908-10895 **(September 2008)**
- 5HP/1Ph: J3-0608-10577 **(August 2008)**

3HP 230V 1Ph Capacitor (30uf/440V)**:**
P/N 36-0020 (x2)

5HP 230V 1Ph Capacitor (40uf/440V)**:**
P/N 36-0006 (x2)

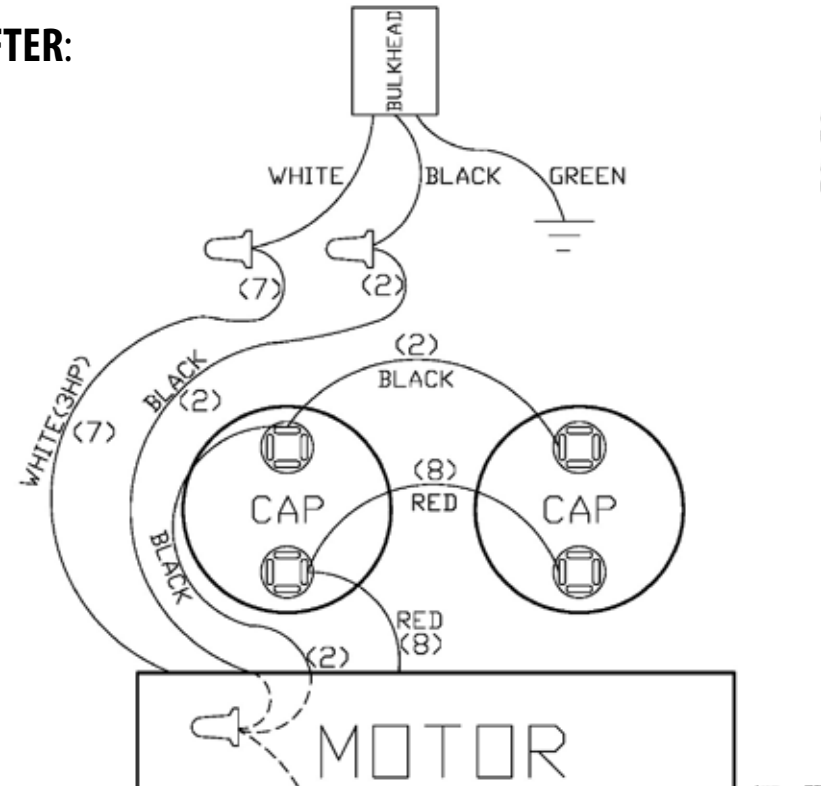


For Units with Serial Numbers **AFTER**:

- 3HP/1Ph: D3-0908-10895 **(September 2008)**
- 5HP/1Ph: J3-0608-10577 **(August 2008)**

3HP 230V 1Ph Capacitor (30uf/440V)**:**
P/N 36-0020 (x2)

5HP 230V 1Ph Capacitor (40uf/440V)**:**
P/N 36-0006 (x2)

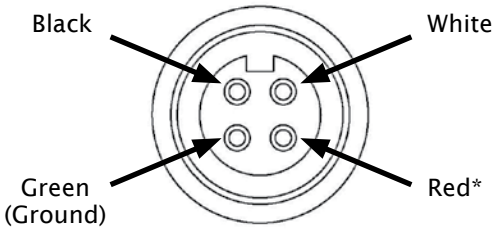


Connector Configurations
(for Concept 3 Aerating Fountains 1HP-5HP)

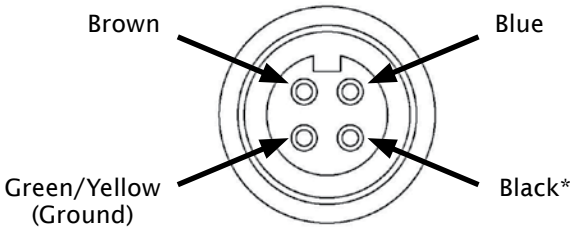
Pigtail (Female Connector at End of Power Cord)

Layout & Color Codes

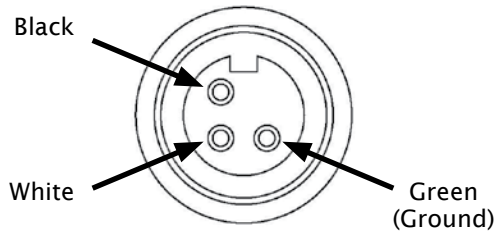
Standard 4 Pin Pigtail (P/N 35-0010)
*Not used with Single Phase

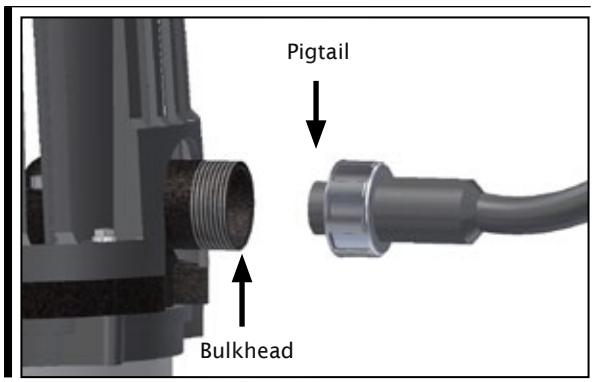


CE (European) 4 Pin Pigtail (P/N 35-0012)
*Not used with Single Phase



Standard 3 Pin Pigtail (P/N 35-0011)
(Used on 5HP 1Ph C3 Units ONLY)





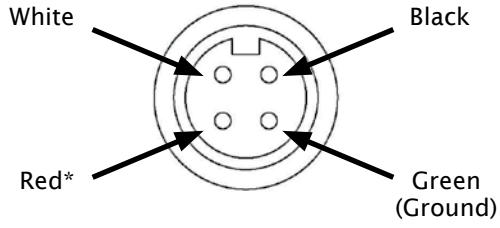
Concept 3 | *Bulkhead & Pigtail*

Bulkhead (Male Connector in Motor Base Plate of Unit)

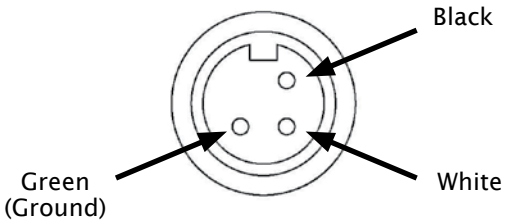
NOTE: When Motor Base Plate Assemblies are purchased, the bulkhead connector is included and will come installed.

Layout & Color Codes

Standard 4 Pin Bulkhead (P/N 09-0016)
*Not used with Single Phase



Standard 3 Pin Bulkhead (P/N 09-0014)
(Used on 5HP 1Ph C3 Units ONLY)



Concept 3 Technical Specifications - 60Hz

Model	HP	Electrical Rating	Motor RPM	Amps	Spray Height (ft)	Spray Diameter (ft)	Pumping Rate* (GPM)	Induced Circ. Rate (GPM)	Min. Operating Depth (in)
Sunburst	1	115V 1Ph 60Hz	3450	14	4	15	530	5300	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	4	15	530	5300	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	7	24	640	6400	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	10	30	775	7750	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	10	30	775	7750	30
	3	460V 3Ph 60Hz	3450	4.3	10	30	775	7750	30
	5	230V 1Ph 60Hz	3450	23	11	40	1100	11000	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	11	40	1100	11000	30
	5	460V 3Ph 60Hz	3450	7.2	11	40	1100	11000	30
	5	575V 3Ph 60Hz	3450	5.5	11	40	1100	11000	30
Gemini	1	115V 1Ph 60Hz	3450	14	5	10	555	5550	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	5	10	555	5550	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	9	16	665	6650	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	12	24	800	8000	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	12	24	800	8000	30
	3	460V 3Ph 60Hz	3450	4.3	12	24	800	8000	30
	5	230V 1Ph 60Hz	3450	23	15	34	1125	11250	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	15	34	1125	11250	30
	5	460V 3Ph 60Hz	3450	7.2	15	34	1125	11250	30
	5	575V 3Ph 60Hz	3450	5.5	15	34	1125	11250	30
Rocket	1	115V 1Ph 60Hz	3450	14	11-13	5	110	1100	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	11-13	5	110	1100	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	17-19	5	155	1550	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	20-22	8	200	2000	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	20-22	8	200	2000	30
	3	460V 3Ph 60Hz	3450	4.3	20-22	8	200	2000	30
	5	230V 1Ph 60Hz	3450	23	23-25	8	290	2900	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	23-25	8	290	2900	30
	5	460V 3Ph 60Hz	3450	7.2	23-25	8	290	29000	30
	5	575V 3Ph 60Hz	3450	5.5	23-25	8	290	29000	30
Saturn	1	115V 1Ph 60Hz	3450	14	1.5	7	400	4000	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	1.5	7	400	4000	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	3	11	480	4800	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	4.5	20	580	5800	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	4.5	20	580	5800	30
	3	460V 3Ph 60Hz	3450	4.3	4.5	20	580	5800	30
	5	230V 1Ph 60Hz	3450	23	5	24	825	8250	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	5	24	825	8250	30
	5	460V 3Ph 60Hz	3450	7.2	5	24	825	8250	30
	5	575V 3Ph 60Hz	3450	5.5	5	24	825	8250	30

Concept 3 Technical Specifications - 60Hz (cont)

Model	HP	Electrical Rating	Motor RPM	Amps	Spray Height (ft)			Spray Diameter (ft)			Pumping Rate* (GPM)	Induced Circ. Rate (GPM)	Min. Operating Depth (in)
Comet	1	115V 1Ph 60Hz	3450	14	9-11			5			130	1300	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	9-11			5			130	1300	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	16-18			5			185	1850	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	19-21			8			240	2400	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	19-21			8			240	2400	30
	3	460V 3Ph 60Hz	3450	4.3	19-21			8			240	2400	30
	5	230V 1Ph 60Hz	3450	23	21-23			8			325	3250	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	21-23			8			325	3250	30
	5	460V 3Ph 60Hz	3450	7.2	21-23			8			325	3250	30
	5	575V 3Ph 60Hz	3450	5.5	21-23			8			325	3250	30
Equinox	1	115V 1Ph 60Hz	3450	15	10			35			150	1500	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	10			35			150	1500	30
	2	208-230V 1Ph 60Hz	3450	12.7-11.4	13			40			210	2100	30
	3	208-230V 1Ph 60Hz	3450	13.5-12	15			58			275	2750	30
	3	208-230V 3Ph 60Hz	3450	8.7-7.6	15			58			275	2750	30
	3	460V 3Ph 60Hz	3450	4.1	15			58			275	2750	30
	5	230V 1Ph 60Hz	3450	20	20			72			400	4000	30
	5	208-230V 3Ph 60Hz	3450	13.1-11.4	20			72			400	4000	30
	5	460V 3Ph 60Hz	3450	6	20			72			400	4000	30
	5	575V 3Ph 60Hz	3450	5	20			72			400	4000	30
Omega	1	115V 1Ph 60Hz	3450	15.5	8			10			150	1500	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	8			10			150	1500	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	11			16			210	2100	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	15			21			275	2750	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	15			21			275	2750	30
	3	460V 3Ph 60Hz	3450	4.3	15			21			275	2750	30
	5	230V 1Ph 60Hz	3450	23	18			22			400	4000	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	18			22			400	4000	30
	5	460V 3Ph 60Hz	3450	7.2	18			22			400	4000	30
	5	575V 3Ph 60Hz	3450	5.5	18			22			400	4000	30
					Lower		Upper	Lower		Upper			
Phoenix	1	115V 1Ph 60Hz	3450	14	4		8	14		2	150	1500	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	4		8	14		2	150	1500	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	6		11	20		2	210	2100	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	9		15	28		3	275	2750	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	9		15	28		3	275	2750	30
	3	460V 3Ph 60Hz	3450	4.3	9		15	28		3	275	2750	30
	5	230V 1Ph 60Hz	3450	23	10		18	34		3	400	4000	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	10		18	34		3	400	4000	30
	5	460V 3Ph 60Hz	3450	7.2	10		18	34		3	400	4000	30
	5	575V 3Ph 60Hz	3450	5.5	10		18	34		3	400	4000	30

Concept 3 Technical Specifications - 60Hz (cont)

Model	HP	Electrical Rating	Motor RPM	Amps	Spray Height (ft)			Spray Diameter (ft)			Pumping Rate* (GPM)	Induced Circ. Rate (GPM)	Min. Operating Depth (in)
					Lower		Upper	Lower		Upper			
Constellation	1	115V 1Ph 60Hz	3450	14	2		4	18		9	150	1500	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	2		4	18		9	150	1500	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	2		6	28		14	210	2100	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	3		9	35		17	275	2750	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	3		9	35		17	275	2750	30
	3	460V 3Ph 60Hz	3450	4.3	3		9	35		17	275	2750	30
	5	230V 1Ph 60Hz	3450	23	3		10	36		18	400	4000	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	3		10	36		18	400	4000	30
	5	460V 3Ph 60Hz	3450	7.2	3		10	36		18	400	4000	30
	5	575V 3Ph 60Hz	3450	5.5	3		10	36		18	400	4000	30
					Lower		Upper	Lower		Upper			
Genesis	1	115V 1Ph 60Hz	3450	14	3		6	24		8	150	1500	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	3		6	24		8	150	1500	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	5		10	32		11	210	2100	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	6		15	50		20	275	2750	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	6		15	50		20	275	2750	30
	3	460V 3Ph 60Hz	3450	4.3	6		15	50		20	275	2750	30
	5	230V 1Ph 60Hz	3450	23	7		18	62		24	400	4000	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	7		18	62		24	400	4000	30
	5	460V 3Ph 60Hz	3450	7.2	7		18	62		24	400	4000	30
	5	575V 3Ph 60Hz	3450	5.5	7		18	62		24	400	4000	30
					Lower	Middle	Upper	Lower	Middle	Upper			
TriStar	1	115V 1Ph 60Hz	3450	14	3	5	8	13	9	2	150	1500	30
	1	208-230V 1Ph 60Hz	3450	8.3-7.5	3	5	8	13	9	2	150	1500	30
	2	208-230V 1Ph 60Hz	3450	13.7-12.4	4	7	12	17	10	2	210	2100	30
	3	208-230V 1Ph 60Hz	3450	15.5-14	7	11	16	23	13	3	275	2750	30
	3	208-230V 3Ph 60Hz	3450	9.7-8.6	7	11	16	23	13	3	275	2750	30
	3	460V 3Ph 60Hz	3450	4.3	7	11	16	23	13	3	275	2750	30
	5	230V 1Ph 60Hz	3450	23	8	13	19	27	15	3	400	4000	30
	5	208-230V 3Ph 60Hz	3450	15.1-13.4	8	13	19	27	15	3	400	4000	30
	5	460V 3Ph 60Hz	3450	7.2	8	13	19	27	15	3	400	4000	30
	5	575V 3Ph 60Hz	3450	5.5	8	13	19	27	15	3	400	4000	30

*Pumping rates may vary due to voltage, elevation, and relative humidity.

LEGEND:

HP - Horsepower
V - Voltage
Ph - Phase
Hz - Hertz
RPM - Revolutions per Minute
GPM - Gallons per Minute
m3/hr - Cubic Meters per Hour
cm - Centimeters

Concept 3 Technical Specifications - 50Hz

Model	HP	Electrical Rating	Motor RPM	Amps	Spray Height (m)	Spray Diameter (m)	Pumping Rate* (m^3/hr)	Induced Circ. Rate (m^3/hr)	Min. Operating Depth (cm)
Sunburst	1	220/240V 1Ph 50Hz	2875	8.3	1.2	5	114.4	1144	75
	2	220/240V 1Ph 50Hz	2875	12.6	2	7.3	138.1	1381	75
	3	220/240V 1Ph 50Hz	2875	13.5	2.9	8.6	167.2	1672	75
	3	380/415V 3Ph 50Hz	2875	4	2.9	8.6	167.2	1672	75
	3	380V 3Ph 60Hz	3350	4.6	2.9	8.6	167.2	1672	75
	5	380/415V 3Ph 50Hz	2875	7	3.2	11.6	237.3	2373	75
	5	380V 3Ph 60Hz	3350	7.6	3.2	11.6	237.3	2373	75
Gemini	1	220/240V 1Ph 50Hz	2875	8.3	2	4	119.7	1197	75
	2	220/240V 1Ph 50Hz	2875	12.6	2.6	4.7	143.5	1435	75
	3	220/240V 1Ph 50Hz	2875	13.5	3.5	6.9	172.6	1726	75
	3	380/415V 3Ph 50Hz	2875	4	3.5	6.9	172.6	1726	75
	3	380V 3Ph 60Hz	3350	4.6	3.5	6.9	172.6	1726	75
	5	380/415V 3Ph 50Hz	2875	7	4.4	9.5	242.7	2427	75
	5	380V 3Ph 60Hz	3350	7.6	4.4	9.5	242.7	2427	75
Rocket	1	220/240V 1Ph 50Hz	2875	8.3	3.8-4.4	1.5	23.7	237	75
	2	220/240V 1Ph 50Hz	2875	12.6	4.9-5.5	1.5	33.4	334	75
	3	220/240V 1Ph 50Hz	2875	13.5	5.6-6.2	2.4	43.2	432	75
	3	380/415V 3Ph 50Hz	2875	4	5.6-6.2	2.4	43.2	432	75
	3	380V 3Ph 60Hz	3350	4.6	5.8-6.4	2.4	43.2	432	75
	5	380/415V 3Ph 50Hz	2875	4	5.6-6.2	2.4	43.2	432	75
	5	380V 3Ph 60Hz	3350	7.6	5.8-6.4	2.4	43.2	432	75
Saturn	1	220/240V 1Ph 50Hz	2875	6.2	0.5	2.1	86.3	863	75
	2	220/240V 1Ph 50Hz	2875	10.8	0.9	3.3	103.6	1036	75
	3	220/240V 1Ph 50Hz	2875	11.6	1.4	6.1	125.1	1251	75
	3	380/415V 3Ph 50Hz	2875	3.4	1.4	6.1	125.1	1251	75
	3	380V 3Ph 60Hz	3350	4.6	1.4	6.1	125.1	1251	75
	5	380/415V 3Ph 50Hz	2875	6	1.5	7	178	1780	75
	5	380V 3Ph 60Hz	3350	7.6	1.5	7.3	178	1780	75
Comet	1	220/240V 1Ph 50Hz	2875	8.3	2.8-3.4	1.5	28	280	75
	2	220/240V 1Ph 50Hz	2875	12.6	4.4-5	1.5	39.9	399	75
	3	220/240V 1Ph 50Hz	2875	13.5	5.2-6.8	2.4	51.8	518	75
	3	380/415V 3Ph 50Hz	2875	4	5.2-6.8	2.4	51.8	518	75
	3	380V 3Ph 60Hz	3350	4.6	5.8-6.4	2.4	51.8	518	75
	5	380/415V 3Ph 50Hz	2875	4	5.2-6.8	2.4	51.8	518	75
	5	380V 3Ph 60Hz	3350	7.6	5.8-6.4	2.4	51.8	518	75
Equinox	1	220/240V 1Ph 50Hz	2875	8.5	3.00	10.50	32.4	324	75
	2	220/240V 1Ph 50Hz	2875	10.5	4.00	12.00	45.3	453	75
	3	220/240V 1Ph 50Hz	2875	11	4.50	17.00	59.3	593	75
	3	380/415V 3Ph 50Hz	2875	3.5	4.50	17.00	59.3	593	75
	3	380V 3Ph 60Hz	3350	4.1	4.50	17.00	59.3	593	75
	5	380/415V 3Ph 50Hz	2875	3.8	5.25	18.25	59.3	593	75
	5	380V 3Ph 60Hz	3350	7.5	5.25	18.25	59.3	593	75

Concept 3 Technical Specifications - 50Hz (cont)

Model	HP	Electrical Rating	Motor RPM	Amps	Spray Height (m)			Spray Diameter (m)			Pumping Rate * (m^3/hr)	Induced Circ. Rate (m^3/hr)	Min. Operating Depth (cm)
Omega	1	220/240V 1Ph 50Hz	2875	8.5	2.7			3.0			32.4	324	75
	2	220/240V 1Ph 50Hz	2875	12	3.1			4.1			45.3	453	75
	3	220/240V 1Ph 50Hz	2875	13.5	3.5			5.0			59.3	593	75
	3	380/415V 3Ph 50Hz	2875	4	3.5			5.0			59.3	593	75
	3	380V 3Ph 60Hz	3350	4.1	4.5			6.4			59.3	593	75
	5	380/415V 3Ph 50Hz	2875	3.8	3.5			5.0			59.3	593	75
	5	380V 3Ph 60Hz	3350	7.5	5.5			6.5			59.3	593	75
					Lower		Upper	Lower		Upper			
Phoenix	1	220/240V 1Ph 50Hz	2875	8.3	1.2		3	5.5		0.6	32.4	324	75
	2	220/240V 1Ph 50Hz	2875	12.6	1.8		4	6.4		0.6	45.3	453	75
	3	220/240V 1Ph 50Hz	2875	13.5	2		4.2	7.2		0.9	59.3	593	75
	3	380/415V 3Ph 50Hz	2875	4	2		4.2	7.2		0.9	59.3	593	75
	3	380V 3Ph 60Hz	3350	4.6	2.6		4.4	8.1		0.9	59.3	593	75
	5	380/415V 3Ph 50Hz	2875	4	2		4.2	7.2		0.9	59.3	593	75
	5	380V 3Ph 60Hz	3350	7.6	2.6		4.4	8.1		0.9	59.3	593	75
Constellation	1	220/240V 1Ph 50Hz	2875	8.3	0.6		1.2	5.4		2.7	32.4	324	75
	2	220/240V 1Ph 50Hz	2875	12.6	0.6		1.8	7.6		3.7	45.3	453	75
	3	220/240V 1Ph 50Hz	2875	13.5	0.9		2.4	9.6		4.6	59.3	593	75
	3	380/415V 3Ph 50Hz	2875	4	0.9		2.4	9.6		4.6	59.3	593	75
	3	380V 3Ph 60Hz	3350	4.6	0.9		2.7	10.6		5.2	59.3	593	75
	5	380/415V 3Ph 50Hz	2875	4	0.9		2.4	9.6		4.6	59.3	593	75
	5	380V 3Ph 60Hz	3350	7.6	0.9		2.7	10.6		5.2	59.3	593	75
Genesis	1	220/240V 1Ph 50Hz	2875	8.3	1.2		2.1	7.6		3	32.4	324	75
	2	220/240V 1Ph 50Hz	2875	12.6	1.5		3.4	10.7		4	45.3	453	75
	3	220/240V 1Ph 50Hz	2875	13.5	1.7		4.2	13.7		5	59.3	593	75
	3	380/415V 3Ph 50Hz	2875	4	1.7		4.2	13.7		5	59.3	593	75
	3	380V 3Ph 60Hz	3350	4.6	1.7		4.4	14.4		5.8	59.3	593	75
	5	380/415V 3Ph 50Hz	2875	4	1.7		4.2	13.7		5	59.3	593	75
	5	380V 3Ph 60Hz	3350	7.6	1.7		4.4	14.4		5.8	59.3	593	75
					Lower	Middle	Upper	Lower	Middle	Upper			
TriStar	1	220/240V 1Ph 50Hz	2875	8.3	0.9	1.8	3	4	2.7	0.6	32.4	324	75
	2	220/240V 1Ph 50Hz	2875	12.6	1.2	2.4	4	5.2	3	0.6	45.3	453	75
	3	220/240V 1Ph 50Hz	2875	13.5	2	3.2	4.6	6.1	3.8	0.9	59.3	593	75
	3	380/415V 3Ph 50Hz	2875	4	2	3.2	4.6	6.1	3.8	0.9	59.3	593	75
	3	380V 3Ph 60Hz	3350	4.6	2	3.2	4.7	6.7	3.8	0.9	59.3	593	75
	5	380/415V 3Ph 50Hz	2875	4	2	3.2	4.6	6.1	3.8	0.9	59.3	593	75
	5	380V 3Ph 60Hz	3350	7.6	2	3.2	4.7	6.7	3.8	0.9	59.3	593	75

*Pumping rates may vary due to voltage, elevation, and relative humidity.

LEGEND:

HP - Horsepower **Ph** - Phase **RPM** - Revolutions per Minute **m3/hr** - Cubic Meters per Hour
V - Voltage **Hz** - Hertz **GPM** - Gallons per Minute **cm** - Centimeters

TIPS:

Humming Noise:

Have you ever experienced a C3 Unit that has a good spray pattern, but HUMS loudly?

PROBLEM: The Float could be mounted too tight to the Unit, which would cause the strainer to bow inward.

SOLUTION: Turn the power off, bring the Aerating Fountain to shore and loosen the float's mounting hardware. Rule of Thumb: Tighten mounting hardware until its snug. Do not over tighten, as it may cause damage to the float and/or pump chamber.

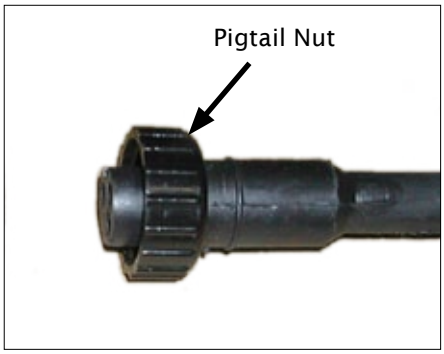


Fig. 1d | *C3 Pigtail Nut, P/N 178-015*

Crushed or Damaged Pigtail Nuts

Have you encountered a pigtail nut connection that was accidentally crushed or damaged?

Fear not for Otterbine has a solution! Replacement pigtail nuts (part# 178-015) are available and are a cheaper alternative then splicing on a new pigtail. (See Fig. 1d)

Fig. 2d | *Example of game cart.*

Easy Way to Transport Otterbine C3 Aerating Fountains

Struggling to transport that aerator?

Look to invest in a "Game Cart" - often used in hunting to transport deer and other game, the cart has a load capacity of 550lbs (250kg), folds down to a compact 44in (1m) length, and its sturdy construction is good for everyday use. Available at Cabela's and other retail outlets. (See Fig. 2d)

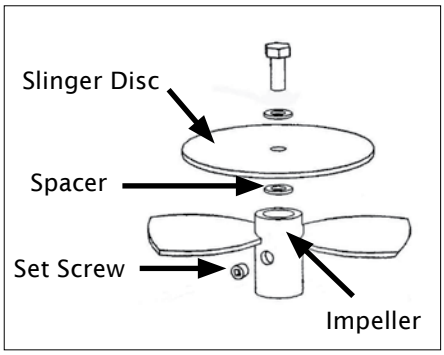


Fig. 3d | *Example of impeller assembly.*

Pattern Cavitation

Sudden formation and collapse of pattern?

PROBLEM: The spray pattern appears less than normal however suddenly cavitates. This sequence will continue. Also if you were to check the amp draw it would be lower than normal.

SOLUTION: Check impeller assembly. Make sure that the proper spacer is between the impeller and slinger disc. Also make sure that the impeller is properly secured to the motor shaft and finally that no debris is present, especially between the impeller and slinger disc. (See Fig. 3d)

Water Works with Otterbine®

Otterbine® Barebo, Inc.
3840 Main Road East
Emmaus, PA 18049 U.S.A.
Ph: 610-965-6018 or 1-800-AER8TER (237-8837)
Fax: 610-965-6050
Email: service@otterbine.com

Made in the U.S.A.

For our most current product specifications
and owners manuals, please visit us online at
WWW.OTTERBINE.COM