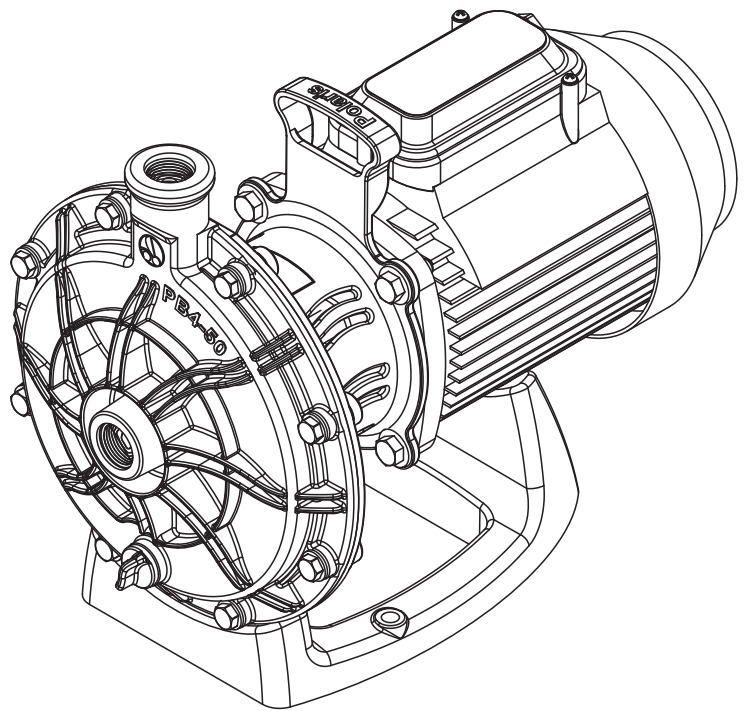


Polaris® PB4-50



Booster Pump Installation and Operation Manual

WARNING

If these instructions are not followed exactly, a fire or explosion may result, causing property damage, personal injury, or death.

FOR YOUR SAFETY - This product must be installed and serviced by a contractor who is licensed and qualified in pool equipment by the jurisdiction in which the product will be installed where such state or local requirements exist. In the event no such state or local requirement exists, the maintainer must be a professional with sufficient experience in pool equipment installation and maintenance so that all of the instructions in this manual can be followed exactly. Improper installation and/or operation can create dangerous electrical hazards, which can cause high voltages to run through the electrical system. Before installing this product, read and follow all warning notices and instructions that accompany this product. Failure to follow warning notices and instructions may result in property damage, personal injury, or death. Improper installation and/or operation will void the warranty.



ATTENTION INSTALLER: This manual contains important information about the installation, operation and safe use of this product. This information should be given to the owner/operator of this equipment.

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EQUIPMENT INFORMATION RECORD

DATE OF INSTALLATION _____

INSTALLER INFORMATION _____

INITIAL PRESSURE GAUGE READING (WITH CLEAN FILTER) _____

NOTES: _____

Section 1. IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS

1.1 Safety Instructions

All electrical work must be performed by a licensed electrician and conform to all national, state, and local codes. When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

WARNING

To reduce the risk of injury, do not permit children to use this product.

- Young children and infirm persons should not be left unsupervised in the vicinity of the pump.
- Young children should be supervised to ensure they do not play with the pump.

WARNING

To reduce the risk of property damage or injury, do not attempt to change the backwash (multiport, slide, or full flow) valve position with the pump running.

WARNING

Zodiac® pumps are powered by a high voltage electric motor and must be installed by a licensed or certified electrician or a qualified swimming pool service technician.

WARNING

Failure to comply with the following warnings can result in permanent injury, electrocution or drowning.

PREVENT ELECTRICAL SHOCK

To reduce risk of electrical shock:

- Connect pump to receptacle protected by a Residual Current Device (RCD) having a rated residual operating current not exceeding 30mA.
- Be sure to follow all applicable local and national electrical and installation codes.
- The booster pump is for fixed installations only and to be used in conjunction with swimming pool equipment. The pump is to be installed in accordance with the relevant requirements of the Australian wiring rules AS/NZS 3000. Also refer to the installation instructions relating to the swimming pool equipment for which the pump will be an integral part. The pump is to be supplied through a Residual Current Device (RCD) with a rated residual operating current of 30mA.
- If the supply cord is damaged, it must hbe replaced by the manufacturer, its service agent or a similarly qualified person in order to avoid a hazard.

WARNING

Incorrectly installed equipment may fail, causing severe injury or property damage.

WARNING

- Do not connect the system to an unregulated city water system or other external source of pressurized water producing pressures greater than 240 kPa (35 PSI).
- Trapped air in system can cause the filter lid to be blown off, which can result in death, serious personal injury, or property damage. Be sure all air is out of the system before operating.

WARNING

Maximum head - 30M

⚠ WARNING

To minimize the risk of severe injury or death the filter and/or pump should not be subjected to the piping system pressurization test.

Local codes may require the pool piping system to be subjected to a pressure test. These requirements are generally not intended to apply to the pool equipment such as filters or pumps.

Zodiac® pool equipment is pressure tested at the factory.

However, if the WARNING cannot be followed and pressure testing of the piping system must include the filter and/or pump, **BE SURE TO COMPLY WITH THE FOLLOWING SAFETY INSTRUCTIONS:**

- Check all clamps, bolts, lids, lock rings and system accessories to ensure they are properly installed and secured before testing.
- **RELEASE ALL AIR** in the system before testing.
- Water pressure for test must **NOT EXCEED 240 kPa (35 PSI)**.
- Water temperature for test must **NOT EXCEED 38°C (100°F)**.
- Limit test to 24 hours. After test, visually check system to be sure it is ready for operation.

Notice: These parameters apply to Zodiac equipment only. For non-Zodiac equipment, consult equipment manufacturer.

⚠ WARNING

Also refer to the installation instructions relating to the swimming pool equipment for which the pump will be an integral part.

⚠ WARNING

Chemical spills and fumes can weaken pool/spa equipment. Corrosion can cause filters and other equipment to fail, resulting in severe injury or property damage. Do not store pool chemicals near your equipment.

CAUTION

Do not start pump dry! Running the pump dry for any length of time will cause severe damage and will void the warranty.

CAUTION

This pump is for use with permanently installed pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it may be readily disassembled for storage and reassembled to its original integrity.

CAUTION

Do not install within an outdoor enclosure or beneath the skirt of a hot tub or portable spa. The pump requires adequate ventilation to maintain air temperature at less than the maximum ambient temperature rating listed on the motor rating plate.

SAVE THESE INSTRUCTIONS

1.2 Pool Pump Suction Entrapment Prevention Guidelines

WARNING

Pump suction is hazardous and can trap and drown or disembowel bathers. Do not use or operate swimming pools, spa, or hot tubs if a suction outlet cover is missing, broken, or loose. The following guidelines provide information for pump installation that minimizes the risk of injury to users of pools, spas, and hot tubs:

Entrapment Protection - The pump suction system must provide protection against the hazards of suction entrapment.

Suction Outlet Covers - All suction outlets must have correctly installed, screw-fastened covers in place. All suction outlet (drain) covers must be maintained. Drain covers must be listed/certified to the latest version of ANSI/ASME A112.19.8. They must be replaced if cracked, broken, or missing.

Number of Suction Outlets Per Pump - Provide at least two (2) hydraulically-balanced main drains, with covers, as suction outlets for each circulating pump suction line. The centers of the main drains (suction outlets) on any one (1) suction line must be at least one (1) meter apart, center to center. See Figure 1 on page 7.

The system **must** be built to include at least two (2) suction outlets (drains) connected to the pump whenever the pump is running. However, if two (2) main drains run into a single suction line, the single suction line may be equipped with a valve that will shut off both main drains from the pump. The system shall be constructed such that it shall not allow for separate or independent shutoff or isolation of each drain. See Figure 1 on page 7.

More than one (1) pump can be connected to a single suction line as long as the requirements above are met.

Water Velocity - The maximum water velocity through the suction fitting or cover for any suction outlet must be 0.5 m (1.5 ft.) per second unless the outlet complies with the latest version of ANSI/ASME A112.19.8, the standard for Suction Fittings For Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs. In any case, do not exceed the suction fitting's maximum designed flow rate.

If 100% of the pump's flow comes from the main drain system, the maximum water velocity in the pump suction hydraulic system must be 2 m (6 ft.) per second or less, even if one (1) main drain (suction outlet) is completely blocked. The flow through the remaining main drain(s) must comply with the latest version of ANSI/ASME A112.19.8, the standard for Suction Fittings For Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs.

Testing and Certification - Suction outlet covers must have been tested by a nationally recognized testing laboratory and found to comply with the latest version of ANSI/ASME A112.19.8, the standard for Suction Fittings For Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs.

Fittings - Fittings restrict flow; for best efficiency use fewest possible fittings (but at least two (2) suction outlets).

Avoid fittings which could cause an air trap.

Pool cleaner suction fittings must conform to applicable International Association of Plumbing and Mechanical Officials (IAPMO) standards.

Section 2. General Description

2.1 Introduction

This manual contains information for the proper installation, operation and maintenance of the Polaris PB4-50 pump. Procedures in this manual must be followed exactly. To obtain additional copies of this manual contact the technical service department at +1.800.688.552. For address information, see the back cover of this manual.

2.2 General Specifications

The general specifications for the Polaris PB4-50 booster pump are as follows:

Control unit voltage:	240 VAC, 50 Hz
Supply voltage amps:	6.6 V DC, max.
Installed load:	1500W max
Cable length:	2 m
Weight:	14 kg.
IP Rating:	24

DOUBLE INSULATED

The Polaris PB4-50 booster pump is a double-insulated product. A double-insulated electrical appliance is one which has been designed in such a way that it does not require a safety connection to ground. The basic requirement for double-insulation is that no single failure can result in dangerous voltage becoming exposed so that it might cause an electric shock and that this is achieved without relying on an earthed (grounded) metal casing. This is achieved by having two (2) layers of insulating material surrounding live parts or by using reinforced insulation.

Therefore, devices having double-insulated construction, such as the Polaris PB4-50 booster pump, do not utilize a grounded (three-prong) cord/plug.

2.3 Description

The Polaris PB4-50 booster pump, supplies high pressure water to the Polaris pool cleaner to optimize cleaner efficiency. The pump is not self-priming and should only be used when the pool filtration pump is on.

CAUTION

Running the booster pump without a filtration pump will damage the booster pump. Improper operation of the booster pump will void the warranty.

2.4 Preparation

1. Upon receipt of the pump, check the carton for damage. Open the carton and check the pump for concealed damage, such as cracks, dents or a bent base. If damage is found, contact the shipper or distributor where you purchased the pump.
2. Inspect the contents of the carton and verify that all the parts are included. See Section 7.1, Replacement Parts List.

Section 3. Installation

3.1 Electrical Installation

3.1.1 Information

The electrical hook-up of the pump should be performed by a licensed professional.

The motor comes wired for 240 volt installation. Plug the two (2) meter supply lead into an electrical outlet near the pool equipment. If the specially prepared supply cord is damaged, please call the technical service department at +1.800.688.552. for advice.

A separate time clock (in addition to the filtration system time clock) is recommended to control the On/Off functions of the booster pump. The MV3 timer/power separator (W90012) provides year round protection and enhanced control of your pool equipment. The MV3 timer/power separator will ensure your booster pump is utilised only when it is required to run, prolonging the life of your equipment.

If a time clock is used, set it to turn on the pump at least one half hour after the pool filtration pump is turned on, and turn off the pump at least one half hour before the filtration pump shuts off. Periodically check the time clock settings to make sure they are properly synchronized.

3.2 Electrical

3.2.1 Electrical Wiring

1. A separate time clock (in addition to the filtration system time clock) is recommended to control the On/Off functions of the booster pump. A manual switch can also be used.
2. If a time clock is used, set it to turn the pump on at least a half an hour after the pool filtration pump is turned on, and turn the pump off at least half an hour before the filtration pump shuts off. Periodically check the time clock settings to make sure they are properly synchronized.

3.3 Plumbing

CAUTION

Be careful not to overtighten any pipe fitting on the inlet or outlet of the booster pump. Overtightening can cause the housing to crack.

3.3.1 Requirements

The Polaris Booster Pump requires a dedicated return line. Plumb the booster pump into the system so that it always receives flow from the filtration pump.

To ensure proper function of the pump and the cleaner, refer to Figure 1 and adhere to the following guidelines for specific equipment.

1. Plumb the dedicated line upstream of all air inducing equipment.
2. If a heater is installed on the system, tap the inlet for the booster pump into the return line **downstream** and at least one (1) meter from the heater discharge. See Figure 1. **Do not tap the booster pump inlet into the 1 meter section of heat sink pipe that comes directly out of the heater.**
3. Some solar heating systems utilize the entire water flow when the panels are being purged of air. If the pump is installed in a non-flow pipe during solar panel purges, install an automatic override to shut off the pump.
4. Plumb the booster pump inlet higher, upstream and as far away as possible from a chlorinator.

3.3.2 Pipe Sizing

CAUTION

Zodiac does not recommend poly pipe because it has clamps that can fail. Non reinforced flexible PVC piping is not recommended as it can be damaged by expansion and movement caused by the surge of pump pressure. Zodiac is not responsible for damages caused by the use of these materials.

1. Use rigid PVC pipe with a minimum diameter of 20 mm (¾ in.), 40 mm (1 ½ in.) is recommended) for the dedicated return line. Non reinforced flexible PVC piping is

not recommended as it can be damaged by expansion and movement caused by the surge of pump pressure. Refer to Figures 2 and 3.

2. The booster pump inlet connection line should be at least 20 mm (¾ in.) pipe. **The Softube quick connect is designed to work with the Polaris reinforced hose (part #W4230009) only.**

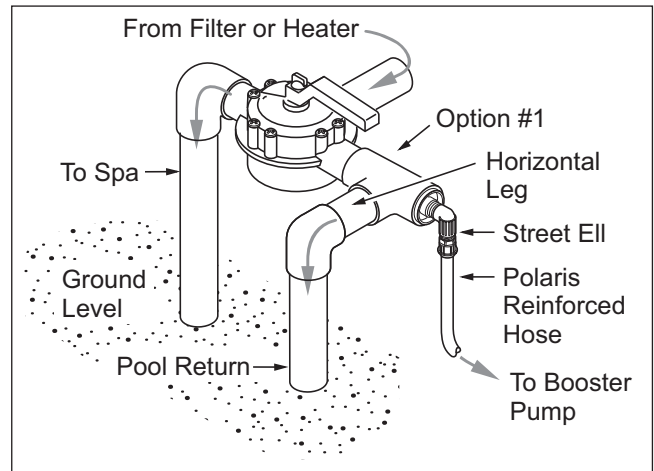


Figure 2. Preferred Plumbing Configuration.

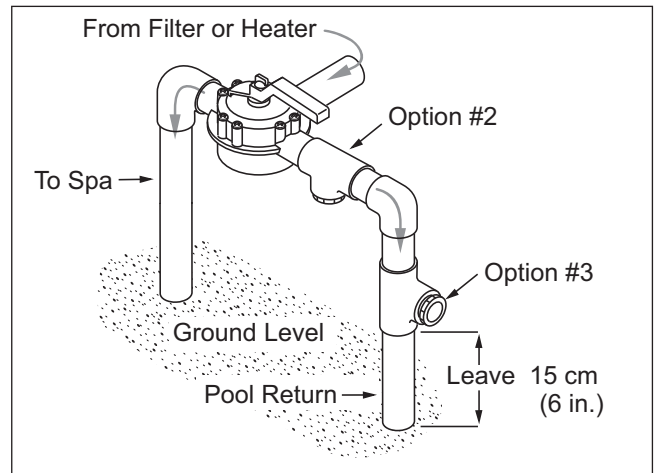


Figure 3. Alternate Plumbing Configuration.

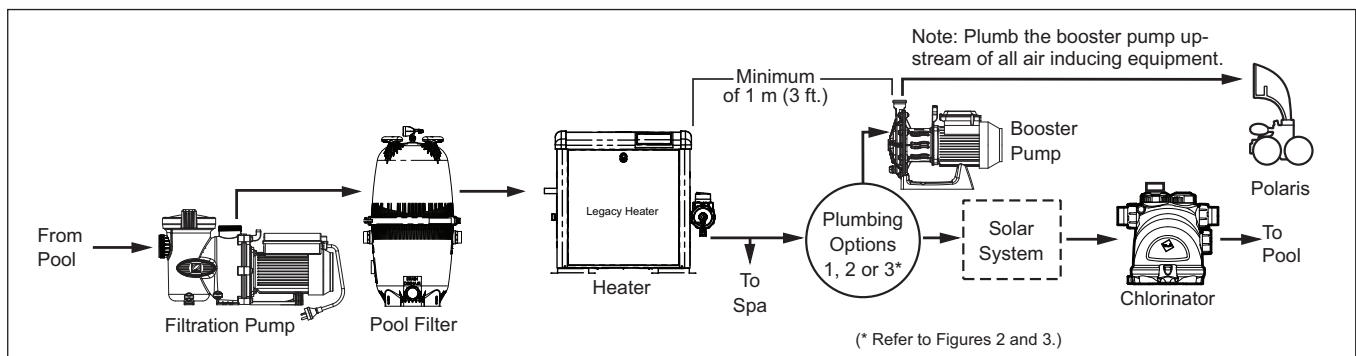


Figure 1. Typical Equipment Layout

3. **Do not tap into the top of a horizontal line.**
4. Use 90° street ells to minimize bends and loops in the Polaris reinforced hose.

3.3.3 Pump Location

1. Zodiac Group Australia Pty Ltd recommends installing the pump within 0.3 m (1 ft.) above the water level. The pump should not be elevated more than a few feet above the water level of the pool.
2. If the pump is located below water level, isolation valves must be installed on both the suction and return lines to prevent back flow of pool water during any routine or required servicing.

▲ WARNING

Some Safety Vacuum Release System (SVRS) devices are not compatible with installation of check valves. If the pool has an SVRS device, be sure to confirm that it will continue to safely operate when any check valves are installed.

3. The pump and other circulation equipment must be located more than 1.5 m (5 ft.) from the water. Choose a location that will minimize turns in the piping.
4. The pump must be placed on a solid foundation that will not vibrate. To further reduce the possibility of vibration noise, bolt the pump to the foundation.

NOTE Zodiac Group Australia Pty Ltd recommends bolting the pump directly to the foundation.

5. The pump foundation must have adequate drainage to prevent the motor from getting wet. The pump needs to be protected from the rain and sun.
6. Proper ventilation is required for the pump to operate normally. All motors generate heat that must be removed by providing proper ventilation.
7. Provide access for future service by leaving a clear area around the pump. Allow plenty of space above the pump for servicing.
8. If the equipment is under cover, provide adequate lighting.

3.3.4 Install the Pump

1. Mount the pump using two (2) concrete expansion anchors to ensure stability.
2. If rotation (or removal) of volute is necessary:
 - a. Remove volute and o-ring.
 - b. Thoroughly clean and dry o-ring and sealing surfaces.
 - c. Reinstall the o-ring on volute.
 - d. Orient the volute properly and reattach.

3. Slide the quick connect retainer ring over the Softube quick connect threads. Install quick connects onto pump discharge and supply ports using teflon tape.
4. Measure and cut reinforced hose ensuring cut is clean, with no more than a 30° off straight edge. Avoid unnecessary loops or bends in the hose.
5. Push the hose onto the quick connect until it is flush against the hose barb base. See Figure 4
6. Holding the hose in place, pull and twist the sleeve on the quick connect over the hose as far as possible. Snap the clip into place. See Figure 5.

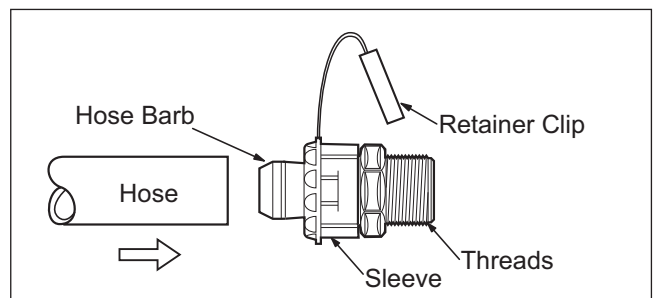


Figure 4. Install the Hose onto the Quick Disconnect.

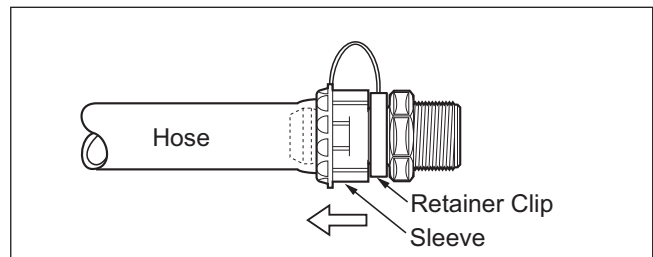


Figure 5. Install the Retainer Clip.

3.3.5 Installation Recommendations

1. If the pump is located below water level, isolation valves must be installed on both sides of the pump to prevent back flow of pool water during any routine or required servicing.
2. To help prevent difficulty in priming, install the suction pipe without high points (above inlet of pump - inverted "U"s in plumbing), which can trap air.
3. The piping must be well supported and not forced together where constant stress will be experienced.
4. Always use properly sized valves. Zodiac® Jandy™ diverter valves and Zodiac Jandy ball valves typically have the best flow capabilities.
5. Use the fewest fittings possible. Every additional fitting has the effect of moving the equipment farther away from the water.

NOTE If more than 10 suction fittings are needed, the pipe size must be increased.

3.3.6 Check the Water Flow

After the system is plumbed, verify water flow to the booster pump by disconnecting the inlet supply line at the booster pump and then turning on the filtration pump. Water should flow from the line.

If there is no water flow, check the following:

1. Verify that the installation is correct. Refer to Figure 6.

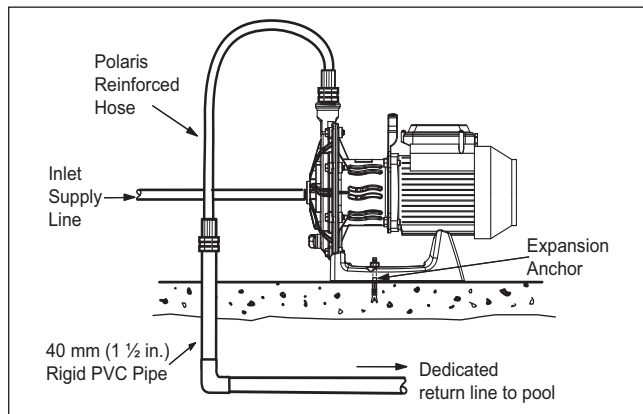


Figure 6. Complete Installation.

2. Install a ball valve and the throttle on the return line after the booster pump inlet.
3. Use smaller eyeball fittings in the pool return lines or plug a return line.

Once flow is established, the pump is ready for operation.

3.3.7 Conduct Pressure Test

⚠ WARNING

When pressure testing a system with water, air is often trapped in the system during the filling process. This air will compress when the system is pressurized. Should the system fail, this trapped air can propel debris at a high speed and cause injury. Every effort to remove trapped air must be taken, including opening the bleed valve on the filter and loosening the pump basket lid on the filter pump while filling the pump.

⚠ WARNING

Trapped air in system can cause filter lid to be blown off, which can result in death, serious personal injury, or property damage. Be sure all air is properly out of system before operating. **DO NOT USE COMPRESSED AIR TO PRESSURE TEST OR CHECK FOR LEAKS.**

⚠ WARNING

When pressure testing the system with water, it is very important to make sure that the pump basket lid on the filter pump is completely secure.

⚠ WARNING

Do not pressure test above 240 kPa (35 PSI). Pressure testing must be done by a trained pool professional. Circulation equipment that is not tested properly can fail, which could result in severe injury or property damage.

1. Fill the system with water, using care to eliminate trapped air.
2. Pressurize the system with water to no more than 240 kPa (35 PSI).
3. Close the valve to trap pressurized water in the system.
4. Observe the system for leaks and/or pressure decay.
5. For technical support, call the technical support department at +1.800.688.552.

Section 4. Operation

4.1 Start-up

CAUTION

Never run the booster pump without water. Running the pump "dry" for any length of time can cause severe damage to both the pump and motor and will void the warranty.

CAUTION

Never run the booster pump without the cleaner connected. Running the pump without the cleaner connected will cause damage to the pump impeller and will void the warranty.

If this is a new pool installation, make sure all piping is clear of construction debris and has been properly pressure tested. The filter should be checked for proper installation, verifying all connections and clamps are secure according to the manufacturer's recommendations.

⚠ WARNING

To avoid risk of damage or injury, verify that all power is turned off before starting this procedure.

1. Turn filtration pump ON.
2. Release all pressure from the system and open the filter pressure release valve.
3. If the filter pump is located below the water level of the pool, opening the filter pressure release valve will prime the pump with water.
4. Once all the air has left the filter, close the pressure release valve.
5. Turn on the power to the pool filtration pump. Then turn on the booster pump.
6. The booster pump should prime. The time it takes to prime will depend on the elevation and length of pipe used on the suction supply pipe. See *Section 3.3.6* for proper elevation and pipe size.
7. If the booster pump does not prime and all the instructions to this point have been followed, check for a suction leak.

NOTE Covering the pump with plastic will create condensation, and this moisture will damage the pump. The best way to protect your pump is to have a qualified service technician or electrician properly disconnect the electrical wiring at the switch or junction box. Once the power is removed, the two (2) unions can be loosened and the pump stored indoors. For safety, and to prevent entry of contaminants, reinstall all conduit and terminal box covers.

4. When the system is reopened for operation, make sure all piping, valves, wiring, and equipment are in accordance with the manufacturer's recommendations. Pay close attention to the filter and electrical connections.
5. The pump must be primed prior to starting; refer to *Section 4.1, Start-up*.

Section 5. Maintenance

5.1 Winterizing the Pump

CAUTION

The pump **must** be protected when freezing temperatures are expected. Allowing the pump to freeze will cause severe damage and void the warranty.

CAUTION

Do not use antifreeze solutions in the pool, spa, or hot tub systems! Antifreeze is highly toxic and may damage the circulation system. The only exception to this is Propylene Glycol. For more information see your local pool/spa supply store or contact a qualified swimming pool service company.

1. Drain **all** water from the pump, system equipment, and piping.
2. Remove the drain plug. Store the drain plug in a safe location and reinstall it when the cold weather season is over. **Do not lose the o-ring.** (Drain Plug with O-ring Set, R0446000).
3. Keep the motor covered and dry.

Section 6. Troubleshooting and Repair

Zodiac Group Australia Pty Ltd strongly recommends that you call a licensed and qualified service professional in to perform any repairs on the filter/pump system. To locate an independent service company, check your local yellow pages or visit www.zodiac.com.au.

6.1 Troubleshooting

Symptom	Possible Problem/Solution
The cleaning/circulating system is not operating correctly.	<p>Verify that skimmer baskets, pump basket and other screens are clean. Clean as necessary.</p> <p>Check filter and clean as necessary.</p> <p>Check valve positions. Adjust as necessary.</p> <p>NOTE Multiple pieces of equipment operating at one time (for example, waterfalls, spa jets, and surface returns) may prevent the cleaning system from working properly.</p> <p>Check the cleaning system manually to ensure that the system is adjusted according to the manufacturer's recommendations.</p>
Bubbles present in the filtration pump basket.	<p>Air in system. Check the pool or spa water level to ensure it is at the proper level and that air is not being drawn into the suction piping. If the water is at normal level, turn off the pump. Remove the lid and check for debris around the lid o-ring seat or improper installation of the lid seal, as either of these conditions will cause air to leak into the system. Clean the lid o-ring and place on the lid. Hand-tighten the lid to make an air tight seal. Do not use any tools to tighten the lid. Turn the pump back on.</p>
Air leaks are still present.	<p>Check the suction side piping union. While the pump is running, try to tighten the union. If this does not stop the air leak, turn off the pump. Loosen both unions and slide the pump out of the way. Remove, clean and re-install both union o-rings on the filtration pump.</p> <p>Reposition the pump next to the piping and secure the union nuts to the pump. With clean union o-rings, hand-tightening of the unions should create a seal. If the unions still do not seal, gently tighten with a large pair of tongue-and-groove pliers.</p> <p>Do not over-tighten.</p>
There is no air in the system, but the pressure is still low.	<p>It is possible that debris is caught in the pump impeller. The pump impeller moves the water, and the vanes in the impeller can become blocked with debris. See <i>Section 6.2, Service Technician Maintenance, 6.2.1, Blocked Impeller</i>, for more information.</p>
There is no debris blocking the impeller and the pressure is still low.	<p>The pump impeller is showing signs of normal wear. Have a qualified service technician check the impeller and replace as necessary.</p> <p>If the pump is part of a relatively new installation, it could be an electrical problem. Contact a qualified service technician. Have the technician check for loose electrical connections and check the voltage at the pump motor while it is in operation. The voltage must be within 10% of the motor's data plate rating. If the voltage is not within 10%, contact a qualified electrician and/or the local power service provider.</p> <p>Pump seal is leaking air. Have a qualified service technician replace the seal.</p>
The pump is leaking water between the motor and pump body.	<p>This is caused by a damaged or failed mechanical seal. Replace the seal. See <i>Section 6.2, Service Technician Maintenance, 6.2.4, Mechanical Seal Replacement</i>.</p>
The pump gets hot and shuts off periodically.	<p>Ensure that there is adequate room around the motor to circulate air and keep the motor cool. Have a qualified electrician check for loose connections and check the voltage at the pump motor while it is in operation. The voltage must be within 10% of the motor's data plate rating. If the voltage is not within 10%, contact a qualified electrician and/or the local power service provider.</p>

6.2 Service Technician Maintenance

⚠ WARNING

This pump must be serviced by a professional service technician, qualified in pool/spa installation. The following procedures must be followed exactly. Improper installation and/or operation can create dangerous electrical hazards, which can cause high voltages to run through the electrical system, possibly causing property damage, serious injury, or death. Improper installation and/or operation will void the warranty.

6.2.1 Blocked Impeller

⚠ WARNING

While servicing the pump, switch off the circuit breakers at the power source. Severe personal injury or death may occur if the pump starts while your hand is inside the pump.

1. Turn off the pump. Switch off the circuit breaker to the pump motor.
2. Look inside the pump for any debris. Remove any debris found inside.
3. Switch on the circuit breaker to the pump motor.
4. Turn on the pump, and see if the problem is solved.
5. If the impeller is still blocked with debris and it is not possible to remove the debris, the pump will need to be disassembled in order to access the inlet and outlet of the impeller.

6.2.2 Impeller Removal

⚠ WARNING

While servicing the pump, switch off the circuit breakers at the power source. Severe personal injury or death may occur if the pump starts while your hand is inside the pump.

1. Turn off the pump. Switch off the circuit breaker to the pump motor. If you are not replacing the motor, do not disconnect the electrical wiring.

NOTE If you are replacing the motor, Zodiac Group Australia Pty Ltd strongly recommends that a qualified service technician or electrician properly disconnect the electrical wiring at the pump motor.

2. Turn off any valves to prevent pool water from reaching the pump. Drain the water from the pump by loosening the unions or removing the drain plugs.
3. Using a 9/16" wrench, loosen the bolts connecting the pump volute to the motor backplate. See Figure 7.

4. Pull the volute from the backplate. The impeller is connected to the motor shaft.

NOTE At this point you have access to the inlet and outlet of the impeller to remove any debris.

5. Remove the motor shaft cover on the back of the motor by twisting the hex-head screw with a 90° crescent wrench. See Figure 7. The motor shaft will be exposed.

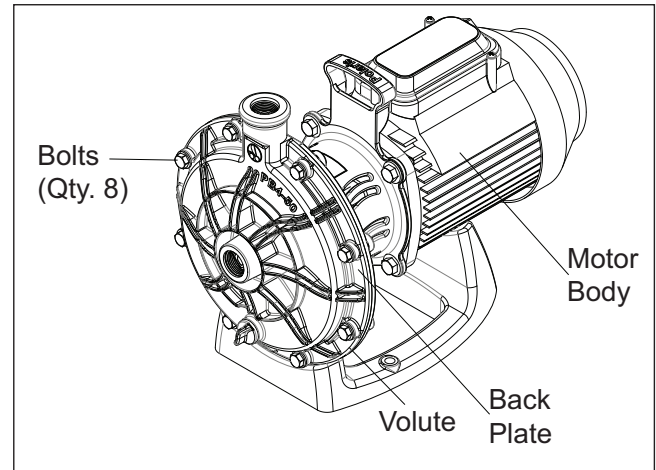


Figure 7. Remove the Pump Volute

6. Hold the motor shaft with a 1/2" wrench while unscrewing the impeller from the motor shaft with your hand.

NOTE The impeller is a right-handed thread, therefore turn the impeller counter-clockwise to unscrew.

7. Inspect the impeller for signs of rubbing and/or damage.

6.2.3 Impeller Replacement

1. Press the new carbon face seal half (see Figure 8) on the motor shaft using a twisting motion. Make sure the carbon surface is facing toward the ceramic ring in the backplate. See Section 6.2.4 for seal replacement procedure.

CAUTION

VERY IMPORTANT! Grasp the lower portion of the seal (opposite the carbon face) when installing the seal, or it will be damaged.

NOTE To assist assembly, **only** use water and soap solution as a lubricant. Any other lubricant will destroy the seal after a short period of time.

NOTE Exercise great care to keep the seal and mating parts clean.

2. While holding the motor shaft with a 1/2" wrench, thread the impeller onto the motor shaft. Hand-tighten the impeller until it is secure. **Do not overtighten.**

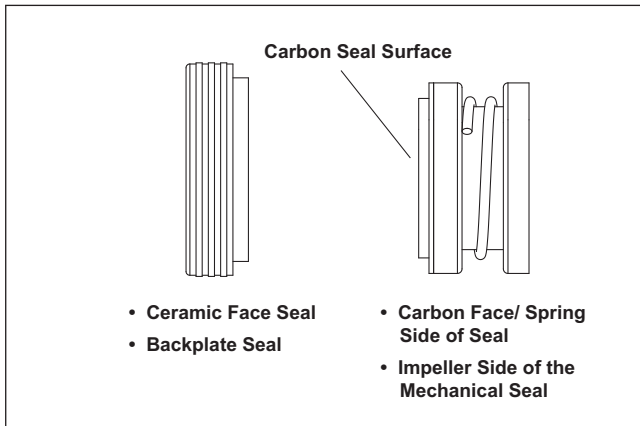


Figure 8. Replace the Mechanical Seal

3. Replace the motor shaft cover by inserting the cover tabs into the slots and rotating the cover 90° clockwise.
4. Install and tighten the bolts lightly in a crossing “X” pattern using a 9/16" wrench, starting with the inner (middle) four (4) then the outer (top and bottom) four (4) to draw the backplate to the body in an even manner. Once all the bolts are snug, torque in the same order to 18 ft-lbs.
5. Open the pressure release valve on the filter, and make sure it is clean and ready for operation.
6. Switch on the circuit breaker to the pump motor.
7. Turn on the pump and check the system for normal operation.
8. Once all the air has left the filter, close the pressure release valve.

6.2.4 Mechanical Seal Replacement

NOTE This is a two (2) part replacement process.
The mechanical seal must be replaced as a set.

NOTE Refer to Figure 9 for an illustration of the location of the mechanical seal and impeller.

⚠ WARNING

Do not damage the ceramic or carbon surfaces of the seals. If surfaces are damaged, leaks will occur.

1. To access the mechanical seal, follow steps 1 through 6 of *Section 6.2.2, Impeller Removal*.
2. Remove the carbon face seal half from the motor shaft. Refer to Figure 8. This is a spring-loaded seal. Grasp the portion of the seal closest to the impeller body and pull the seal off using a twisting motion.
3. Remove the motor from the backplate following the steps in *Section 6.2.5, Motor Replacement*.

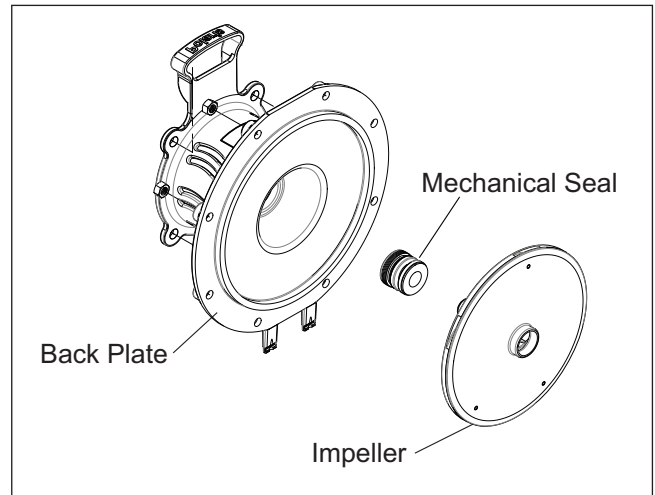


Figure 9. Back Plate, Impeller and Mechanical Seal Location

4. Place the backplate o-ring side down and force the ceramic seal out using a screwdriver or drift pin.
5. Turn the backplate o-ring side up and insert the new ceramic seal side into the backplate. Use great care to press the seal in squarely with your fingers. The ceramic is easily damaged and must be pressed in using only your fingers or soft tools. Do not use any lubricant other than water and soap solution.
6. Install the motor following the steps in *Section 6.2.5, Motor Replacement*.
7. Install the backplate following the steps in *Section 6.2.3, Impeller Replacement*.

6.2.5 Motor Replacement

CAUTION

To ensure continued safety and reliable operation, Zodiac Group Australia Pty Ltd requires that you replace the motor with a motor that has the identical HP rating and service factor (Zodiac Group Australia Pty Ltd approved only).

⚠ WARNING

To avoid the risk of property damage, severe personal injury, or death, turn off the pump and switch off the circuit breaker to the pump motor before beginning this procedure.

1. Have a qualified service technician or electrician properly disconnect the electrical wiring at the pump motor.
2. To disassemble the pump volute from the motor, follow steps 1 through 6 in *Section 6.2.2, Impeller Removal*.

- Remove the four (4) 9/16" bolts and remove the motor.

NOTE Before removing the backplate, note the alignment of the backplate to the motor. Label is facing upward. See Figure 10.

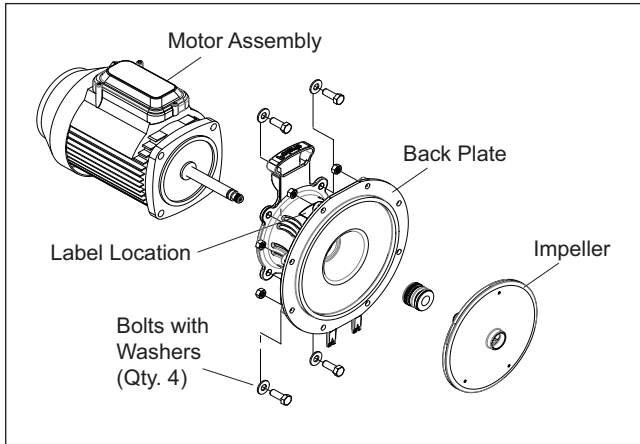


Figure 10. Remove Back Plate

- If installing a new motor, remove the protective plastic cap from the motor shaft. Place the motor on the backplate. The label should be facing upward.
- Replace the four (4) bolts and washers holding the backplate to the motor.
- To reassemble the pump after replacing the motor, follow steps 1 through 9 of *Section 6.2.3, Impeller Replacement*.
- Have a qualified service technician or electrician properly connect the electrical wiring at the pump motor.

NOTE Zodiac Group Australia Pty Ltd recommends that the mechanical seals be replaced at the same time the motor is replaced. See *Section 6.2.4, Mechanical Seal Replacement*, for details.

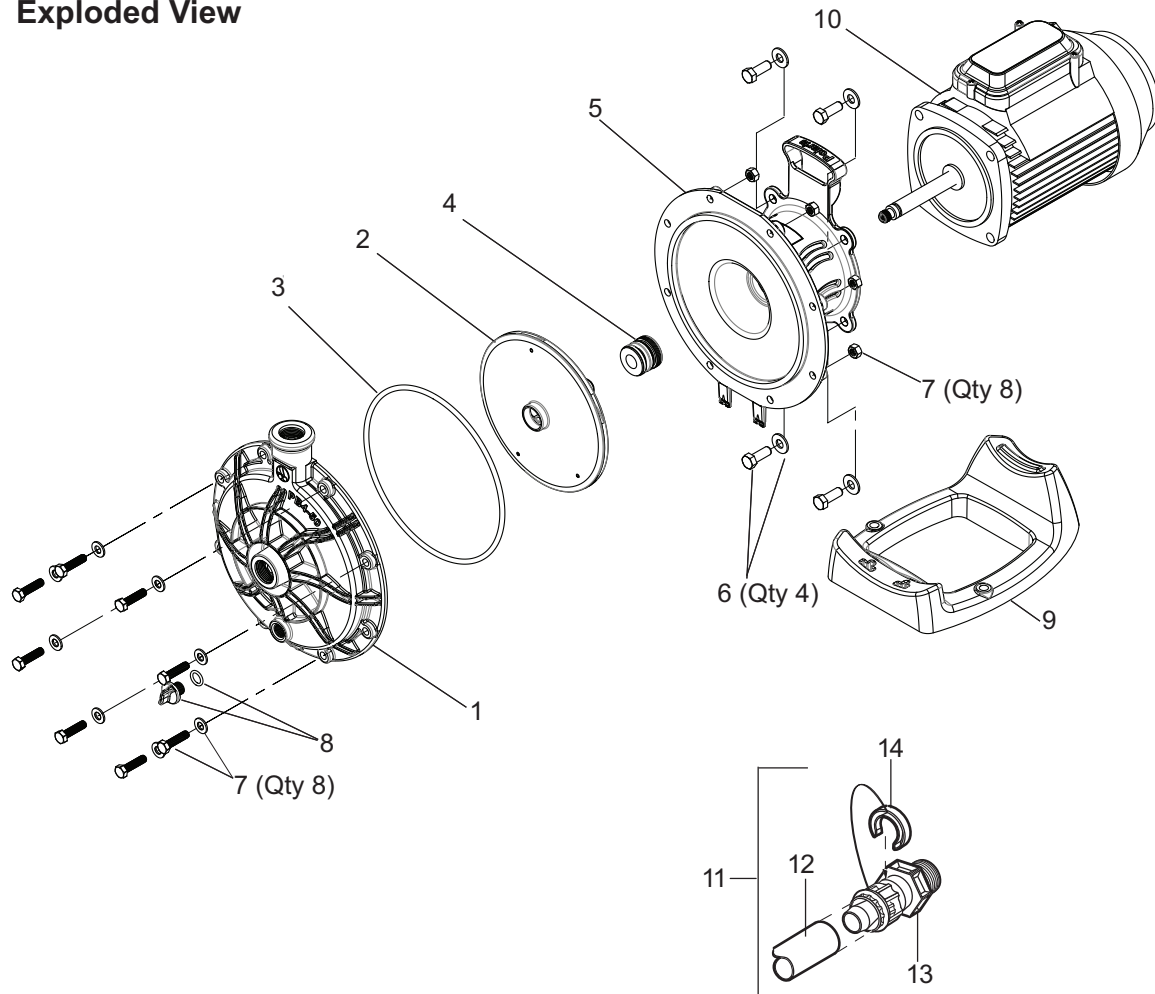
Section 7. Product Specifications and Technical Data

7.1 Replacement Parts List

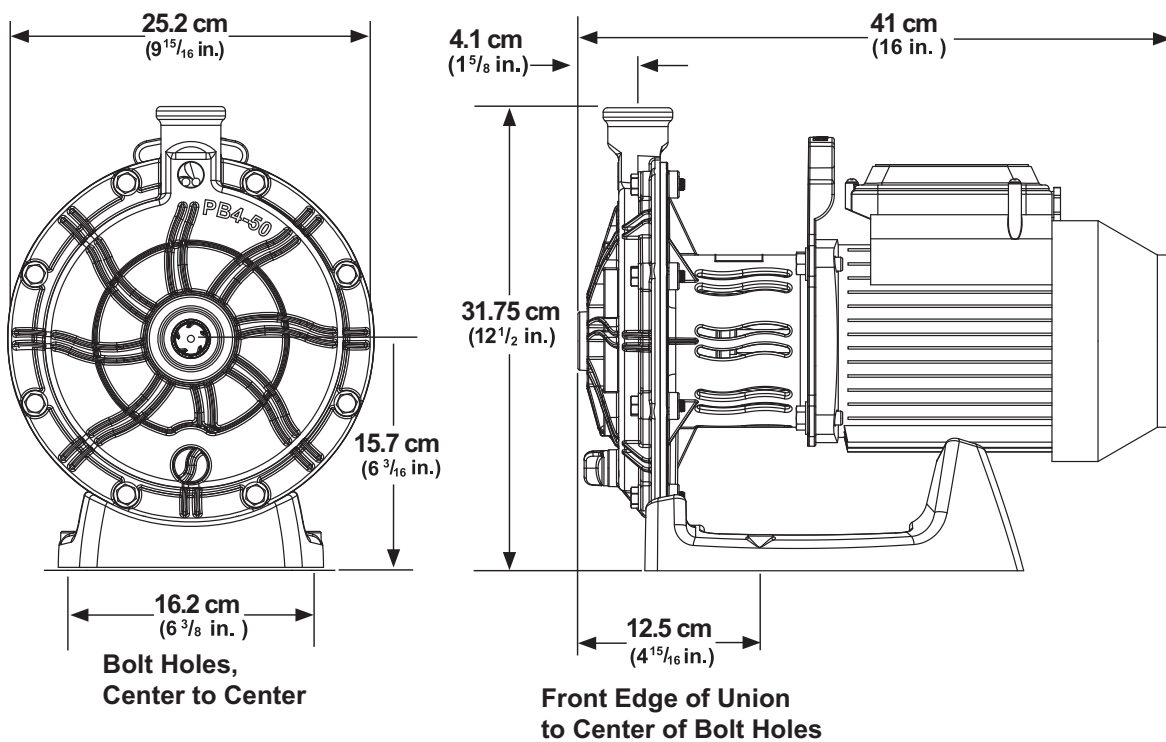
To order or purchase parts for Polaris pumps, contact your nearest Polaris dealer. If they cannot supply you with what you need, contact the technical support department at +1.800.688.552 or www.zodiac.com.au.

Key No.	Description	Qty	Order Part No.
1	Volute, PB4-50,	1	R0520500
2	Impeller, PB4-50,	1	R0520600
3	O-Ring, Bracket Adapter, 50-cycle Pump	1	WS0137300
4	Seal, Ceramic/Spring	1	W0479401A
5	Seal Plate/Bracket, PB4-50,	1	R0520700
6	Bolt, Stainless, Bracket to Motor w/ washers	4	W0446700
7	Bolt/Nut, Stainless, Volute to Bracket	8	R0520800
8	Drain Plug w/ O-Ring	2	W0446000A
9	Pump Base, PB4-50,	1	R0520900
10	Motor, Threaded Shaft, 50-cycle Pump	1	B0022000
11	Installation Kit, Softube® Quick Connects	1	W4230007
12	Pump Hose, 6 ft., Flexible Reinforced	1	W4230009
13	Softube Quick Connect w/ Retainers	4	W4230023
14	Pump Quick Connect Retainer	4	W4230029

7.2 Exploded View



7.3 Pump Dimensions



NOTE When installing pump, leave a minimum of 0.6 m (2 ft.) of clearance above the pump for service.