Notice to Installer: Instructions must remain with installation.

"Quality Pumps Since 1939"

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

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Pressure Booster System Series 352

INSTALLATION INSTRUCTIONS

These installation instructions are applicable for Series 352 Pressure Booster Pumps Only

PREINSTALLATION CHECKLIST - ALL INSTALLATIONS

ATTENTION: READ CAREFULLY BEFORE ATTEMPTING TO INSTALL OR OPERATE YOUR PUMP. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION AND ADDITIONAL INSTRUCTIONS INCLUDED WITH EQUIPMENT. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN FOR FUTURE REFERENCE.

⚠ WARNING **SEE BELOW FOR LIST OF WARNINGS**

1. **Make sure that the pump is plugged into a properly grounded electrical receptacle.** Use an Underwriters Laboratory listed circuit analyzer to test for proper installation of the circuit and ground. Any service to circuits or receptacles should be conducted by a qualified licensed electrician.
2. **Do not remove the ground pin from the plug under any circumstances.** If the ground pin is damaged, replace the power cord or plug before use.
3. All electrical installations must conform to the requirements of the National Electrical Code and all local codes.
4. It is strongly recommended that the unit be plugged into a GFCI protected circuit.
5. **Disconnect power before servicing the pump or motor by unplugging the unit from the outlet.**
6.  Do not touch the motor when operating and allow the motor to cool before touching.
7. Pump is built to handle clear water only; it is not designed to handle water containing sand, silt or other abrasives.
8.  Do not use to pump flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc. Do not use in flammable and/or explosive atmospheres.
9.  Do not use this product in hazardous environments or anywhere a spark could potentially ignite explosive gases.
10. Do not handle this product with wet hands or while standing in water or on a wet or damp surface.
11. Units are supplied with an automatically resetting thermal overload device and can restart without warning.
12.  Provide a means of pressure relief if the pump discharge can be shut off or obstructed. Pumps operating against a closed discharge can create very hot pumped liquid, which can cause burns.
13. Do not install unit outdoors. This unit is not weatherproof nor is it able to be submersed in water or any other liquid.
14. Do not ground to a gas supply line.
15.  Hazardous voltage. Can shock, burn or cause death. Ground pump before connecting to power supply.
16.  Hazardous pressure! Install pressure relief valve in discharge pipe. Release all pressure on system before working on any component.
17. According to the state of California (Prop 65), this product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.
18. Risk of Electric Shock. This pump has not been investigated for use in swimming pool areas.
19. Use only components that are rated for maximum pressure pump can produce when used in boosting system or any other system. Do not exceed the total maximum pressure boost as listed per model in Performance Chart A.
20. Never examine, make wiring changes or touch the motor before disconnecting the main electrical supply switch. The thermal device may have opened the electrical circuit. All motors should be equipped with a correctly fused disconnect switch to provide protection. Consult local or United States National Electrical Codes for proper fuse protection based on motor data chart (See Chart B).

⚠ CAUTION **SEE BELOW FOR LIST OF CAUTIONS**

1. Make certain that the power source conforms to the requirements of the equipment as stated on the product nameplates and wire motor for correct voltage. See Chart B of this manual, and motor nameplate.
2. Check hoses for weak or worn conditions before use and make certain that all connections are secure.
3. Periodically inspect the pump for damage and perform routine maintenance as required.
4. The maximum temperature of the pumped liquid must not exceed 120°F. The minimum allowable temperature is 40°F.
5. Support pump and piping when assembling and when installed. Failure to do so may cause piping to break, pump to fail, motor bearing failures, etc.
6. This unit is not waterproof and is not intended to be used in showers, saunas or other potentially wet locations. The motor is designed to be used in a clean dry location with access to an adequate supply of cooling air. Ambient temperature around the motor should not exceed 149ºF (65ºC).
7. Supply voltage must be within ± 10% of nameplate voltage. Incorrect voltage can cause fire or seriously damage motor and voids warranty. If in doubt, consult a licensed electrician.
8. Use wire size specified in wiring Chart B. Make certain that the power supply conforms to the electrical specifications of the motor supplied. See Motor Data Chart B. Connect pump to a separate branch circuit with no other appliances on it. If motor wiring diagram differs from diagram shown below, follow diagram on motor.

NOTE: Pumps with the "CSA-CUS" mark are tested to UL standard UL778 and certified to CSA standard C22.2 No. 108.

REFER TO WARRANTY ON PAGE 2.

LIMITED WARRANTY

Manufacturer warrants, to the purchaser and subsequent owner during the warranty period, every new product to be free from defects in material and workmanship under normal use and service, when properly used and maintained, for a period of one year from date of purchase by the end user, or 18 months from date of original manufacture of the product, whichever comes first. Parts that fail within the warranty period, one year from date of purchase by the end user, or 18 months from the date of original manufacture of the product, whichever comes first, that inspections determine to be defective in material or workmanship, will be repaired, replaced or remanufactured at Manufacturer's option, provided however, that by so doing we will not be obligated to replace an entire assembly, the entire mechanism or the complete unit. No allowance will be made for shipping charges, damages, labor or other charges that may occur due to product failure, repair or replacement.

This warranty does not apply to and there shall be no warranty for any material or product that has been disassembled without prior approval of Manufacturer, subjected to misuse, misapplication, neglect, alteration, accident or act of God; that has not been installed, operated or maintained in accordance with Manufacturer's installation instructions; that has been exposed to outside substances including but not limited to the following: sand, gravel, cement, mud, tar, hydrocarbons, hydrocarbon derivatives (oil, gasoline, solvents, etc.), or other abrasive or corrosive substances, wash towels or feminine sanitary products, etc. in all pumping applications. The warranty set out in the paragraph above is in lieu of all other warranties expressed or implied; and we do not authorize any representative or other person to assume for us any other liability in connection with our products.

Contact Manufacturer at, 3649 Cane Run Road, Louisville, Kentucky 40211, Attention: Customer Service Department to obtain any needed repair or replacement of part(s) or additional information pertaining to our warranty.

MANUFACTURER EXPRESSLY DISCLAIMS LIABILITY FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES OR BREACH OF EXPRESSED OR IMPLIED WARRANTY; AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND OF MERCHANTABILITY SHALL BE LIMITED TO THE DURATION OF THE EXPRESSED WARRANTY.

Some states do not allow limitations on the duration of an implied warranty, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

TROUBLE SHOOTING GUIDE

⚠ WARNING **ELECTRICAL PRECAUTIONS -** Before servicing a pump, always shut off the main power breaker and then unplug the pump. Make sure you are not standing in water and are wearing insulated protective sole shoes. Under flooded conditions, contact your local electric company or a qualified licensed electrician for disconnecting electrical service prior to pump removal.

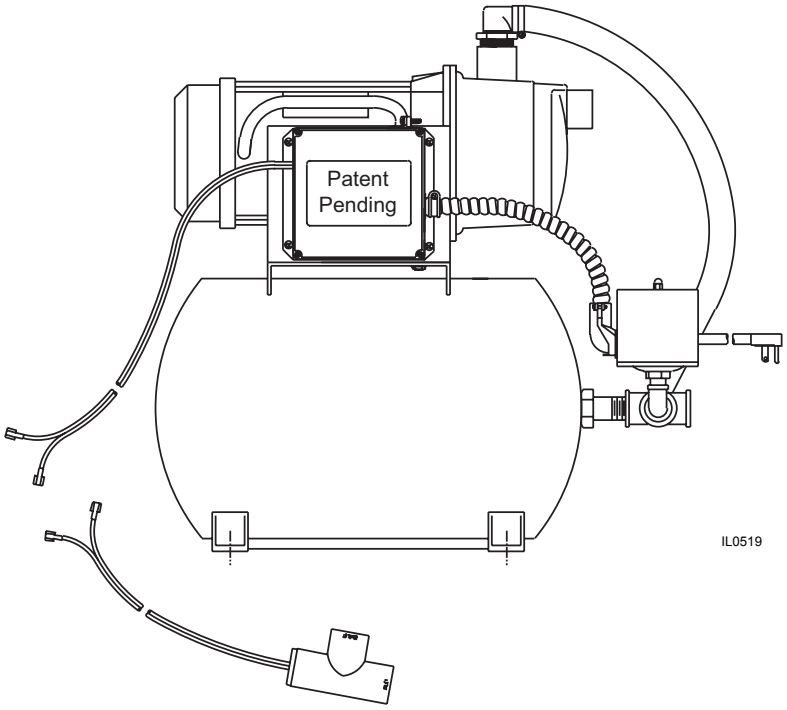
Symptom	Possible Cause(s)	Corrective Action
Pump won't start or run at full speed.	1. Blown fuse or open circuit breaker.	1. Replace fuse or close circuit breaker. See wire size chart for proper breaker/fuse size.
	2. Power supply in OFF position.	2. Turn power on.
	3. Incorrect voltage at motor (check voltage with motor running).	3. Low voltage. a. Voltage must be within ± 10% of motor rated voltage. Check incoming voltage. Contact power company. b. Make certain that voltage of motor matches voltage of power supply. See motor name plate and motor wiring diagrams. c. Check wire size from main switch to pump. See wire size chart for correct wire size.
	4. Loose, broken or incorrect wiring.	4. Rewire any incorrect circuits. Tighten connections, replace defective wires.
	5. Defective motor.	5. Replace motor.
	6. Pump hydraulic components clogged/worn/damaged.	6. Replace worn parts or entire pump. Clean parts if required.
Pump operates, but delivers little or no water.	1. Manual or solenoid valves plumbed into system restricting flow.	1. a. Check all valves on pump inlet and discharge sides of system to be sure they are opened properly to allow flow to and from the pump. b. Bleed trapped air in pump which keeps water from reaching the pump. (Normally due to closed valve in discharge plumbing).
	2. In-line filter restricting flow.	2. Check all in-line filters to be sure they are not plugged or restricted.
	3. Low line voltage.	3. See low line voltage corrective action (above).
	4. Inadequate water supply to booster pump.	4. Check pressure on inlet side of booster to be sure positive pressure is maintained to the booster pump.
	5. Undersized piping.	5. Replace undersized piping.
	6. Leak on inlet side of system.	6. Make sure connections are tight. Repair leaks as necessary.
	7. Worn or defective pump parts or pump.	7. Replace worn parts or entire plugged impeller. Clean parts if required.
	8. Suction lift too great.	8. Pump should be operated under flooded suction only.
	9. Pump not primed.	9. Prime pump - Make certain inlet pipe is drawn up tight and pump and pipe are full of water.
Excessive noise while pumping.	1. Pump not secured to firm foundation.	1. Secure properly.
	2. Piping not supported.	2. Make necessary adjustments.
	3. Restricted inlet line.	3. Clean or correct.
	4. Cavitation (noise like marbles in pump).	4. Increase inlet pipe size.
	5. Worn motor bearings.	5. Replace bearings or motor.
Pump leaks.	1. Worn mechanical seal (leaks at shaft).	1. Replace shaft (rotary) seal.
	2. Worn o-ring seals.	2. Replace o-ring seals, located inside both ends of the stainless steel shell.

DESCRIPTION

Figure 1

Pressure booster pumps increase water pressure from city mains or private water systems. This system is powered by a 1/2 HP single phase motor with thermal overload protection. The 20 gallon bladder tank is pressurized with air to 38 PSI.

NOTE: Use pump with clear water only.



SPECIFICATIONS

Chart A: Performance Specifications

Gallons per Minute			10	8	6	4	Max. Press. PSI	Suction Inlet Port NPT	Dischcharge Outlet Port NPT
Model Number	HP	Stage	PSI @ GPM						
352-0005 (Painted Tank) 352-0006 (SS Tank)	1/2	1	34	43	51	63	63	3/4”	3/4”

Motor voltage: Single phase 1/2 HP - 115V, 60 Hz.

Chart B: 115V, 60 Hz Motor Data & Minimum Wire Size (Gauge)

Motor HP	Service Factor Motor Amps	Phase†	Distance In Feet From Motor To Service Panel					Breaker Size (Amps)
			0-50	50-100	100-150	150-200	200-300	
			Wire Size					
1/2	8.5	1	14	14	14	12	12	15

†Thermal overload protector - automatic reset.

SAFETY INSTRUCTIONS

Carefully read and follow all safety instructions in this manual and on pump. Keep safety labels in good condition. Replace missing or damaged safety labels.

This is a SAFETY ALERT SYMBOL. When you see this symbol on the pump or in the manual, look for one of the following signal words and be alert to the potential for personal injury or property damage.

⚠ DANGER Warns of hazards that **WILL** cause serious personal injury, death or major property damage if ignored.

⚠ WARNING Warns of hazards that CAN cause serious personal injury or death, if ignored.

⚠ CAUTION Warns of hazards that MAY cause minor personal injury, product or property damage if ignored.

IMPORTANT: Indicates factors concerned with operation, installation, assembly or maintenance which could result in damage to the machine or equipment if ignored.

NOTE: Indicates special instructions which are important but are not related to hazards.

GENERAL

1. Wear safety glasses when working with pumps.
2. Periodically inspect pump and system components.
3. Protect electrical cord. Replace or repair damaged or worn cords immediately.
4. Do not insert finger or any object into pump or motor openings.

LOCATION

1. Locate pump as close to the fluid source as possible, keeping the inlet pipe short as possible.
2. Place unit where the pump and piping are protected from the weather and extremes of heat, humidity and below freezing temperatures.
3. Mount unit in a dry location that is easily accessible for inspection and maintenance. If a dry location is not available, mount it on a foundation well above the wet floor.
4. Allow ample clearance around unit for free air circulation.

SUCTION LIMITATIONS

1. Units are non self-priming.
2. Pressure booster pumps are not recommended for suction lift applications.

PIPING

1. Use galvanized piping, rigid plastic or other suitable pipe that will not collapse under suction or rupture due to pressure.

⚠ CAUTION If hose is used, make sure it is the reinforced industrial type that is rated higher than the shutoff pressure of the system. Ordinary garden hose will collapse and starve the pump of water.

2. The diameter of the inlet and discharge pipe should be no smaller than the corresponding ports of the pump (See Chart A). Smaller pipe will reduce the capacity of the pump.
3. Avoid air pockets in inlet piping or air will accumulate at high points, making priming difficult.
4. Use pipe compound on all joints and connections. Use Teflon tape or plastic joint stik, on plastic pipe.

IMPORTANT: The entire system must be air and water tight for efficient/ proper operation.

IMPORTANT

Figure 2 - No Air Pockets in Inlet Pipe

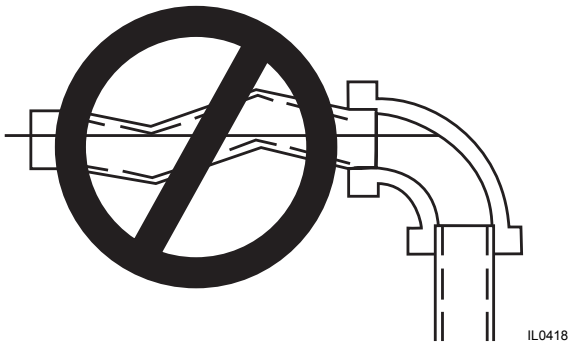


Figure 3 - Inlet Pipe Must Not Leak

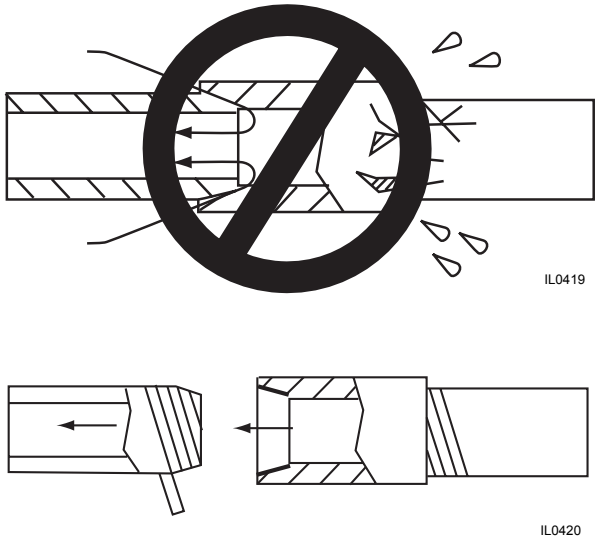
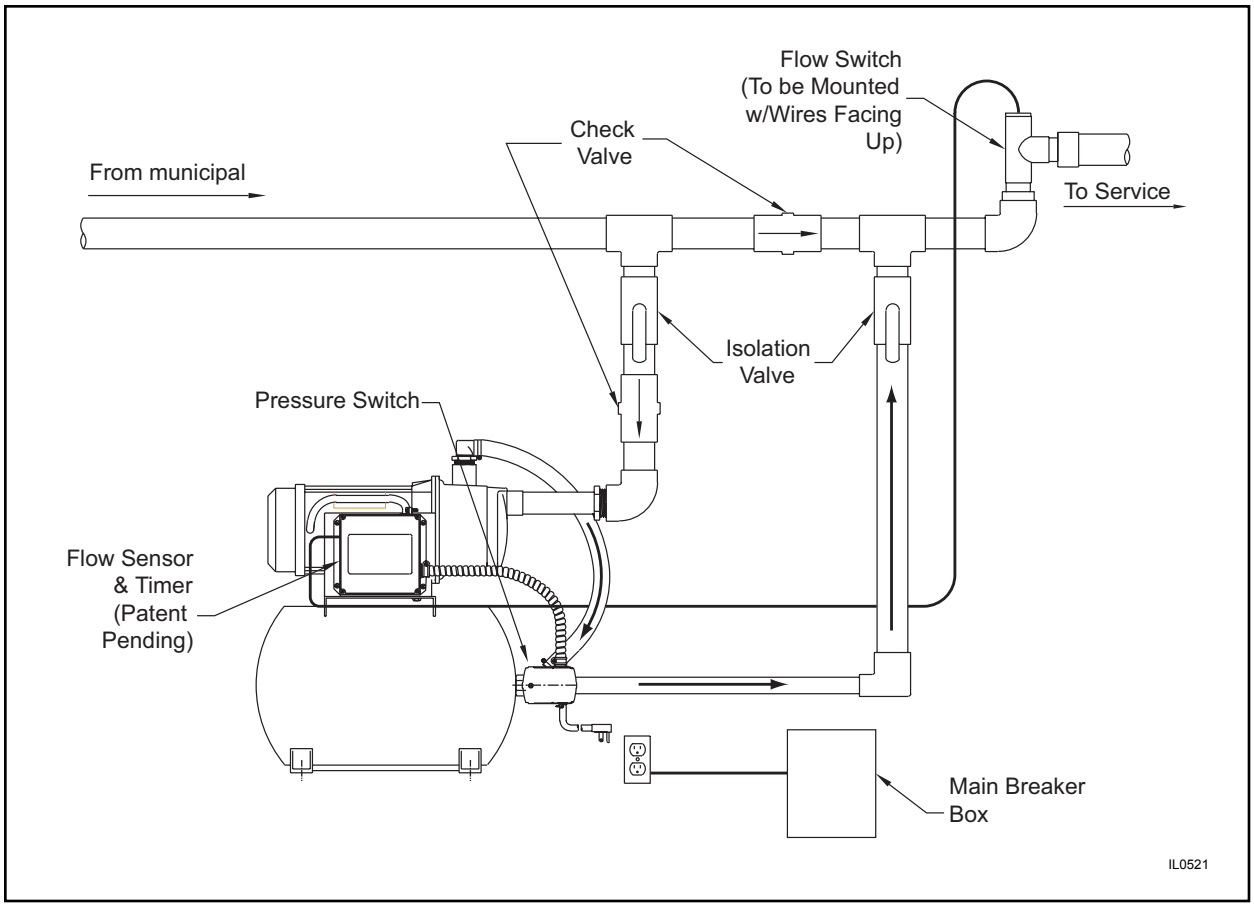


Figure 4 - Pump used to boost incoming city pressure (automatic operation).



IMPORTANT: Pump is built to handle clear water only; it is not designed to handle water containing sand, silt or other abrasives.

1. Refer to Figure 4 for typical installations.
2. Bolt pressure booster system to a secure foundation.
3. Locate the pump so that there will always be a positive supply of water to the pump (See Figure 4).
4. For service convenience, the installer is recommended to add gate valves and unions as needed to provide for easier maintenance.
5. Pressure gauges on the inlet and outlet, provided by the installer, are recommended to show if sufficient water is being supplied to the pump and to show service pressure.

WIRING

1. Maintain this pump in accordance with your local electrical code and all other codes and ordinances that apply. Consult your local building inspector for local code information.
2. Plug the 115V plug from the pressure switch into a properly grounded 115V receptacle. A properly grounded receptacle will have the ground wire connected back to the grounding bar at the service panel or control panel. Do not connect motor to electrical power supply until you have determined that the receptacle you are using has been properly grounded. **Do not ground to a gas supply line.**

IMPORTANT: Check local and/or United States National Electrical Codes for proper grounding information.

3. **Specific Wiring Procedure** (Refer to Minimum Wire Size Chart B). Your pressure booster has a 115V single phase motor and is factory connected for 115V.

IMPORTANT: Do not use an extension cord or splice wires. Joints should be made in an approved junction box. If the above information or the following wiring diagrams are confusing, consult a licensed electrician.

4. Your unit is supplied with a pressure switch, flow sensor and a control box. The only wire connection needed is to plug the two red wires from the control box into the two red wires on the flow sensor (See Figure 4).

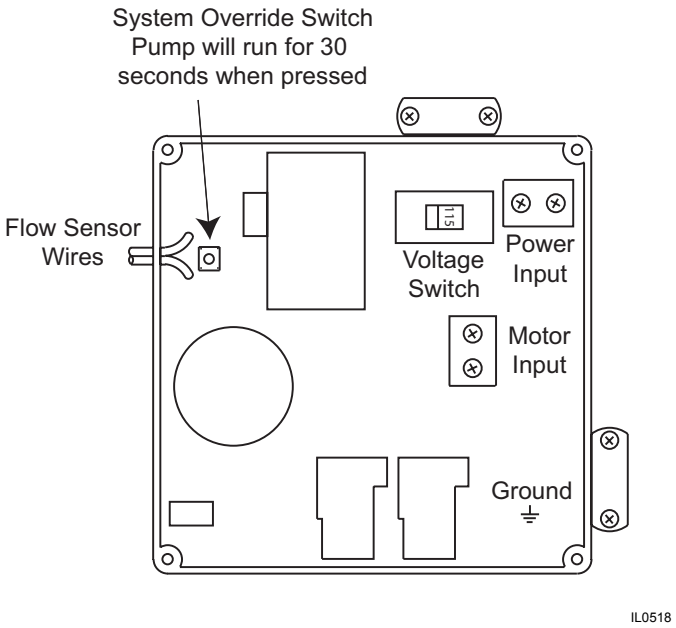
INSTALLATION (continued)

MOTOR PROTECTION

This single phase motor has built in thermal protection. The overload protects the motor against burnout from overload of low voltage, high voltage and other causes. The device is automatic and resets itself once the temperature has dropped to a safe point. Frequent tripping of the device indicates trouble in the motor or power lines and immediate attention is needed.

⚠ WARNING Never examine, make wiring changes or touch the motor before disconnecting the main electrical supply switch. The thermal device may have opened the electrical circuit. The pump motor should be equipped with a correctly fused disconnect switch to provide protection. Consult local or United States National Electrical Codes for proper fuse protection based on motor data chart (See Chart B).

Figure 5 - Control Box



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OPERATION

⚠ CAUTION Unit must be full of fluid before operating. Do not run dry, or against a closed discharge. Do not pump dirty water or abrasive liquids. To do so will cause pump failure and will void the warranty.

VALVES

The inlet and outlet isolation valves should be in the full open position.

PRIMING

NOTE: Before starting the pump it is absolutely necessary that **both the pump and the inlet pipe be completely filled with water.**

PRESSURE BOOST INSTALLATIONS

Priming is automatic when pump is connected to a pressure source such as a hydrant or city main (See Figure 4).

1. Open valves or nozzle on inlet and discharge side of pump.
2. Move the red off/on switch on the motor to the on position. Open a faucet nearest the booster unit. When the water flow from the faucet reaches one gallon per minute, or greater, the pump will automatically start. Keep the faucet open for approximately 30 seconds to relieve trapped air in the line. When the faucet is closed, the pump will continue to run for 30 seconds, or until pressure reaches 60 PSI, whichever condition is reached first.

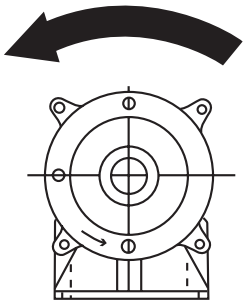
⚠ CAUTION The pressure switch is factory set at 60 PSI and must not be changed.

3. If you installed a pressure gauge at the pump inlet, a reading of 2 PSI minimum should show whenever the pump is in operation. This reading ensures that there is an ample supply of water into the pump inlet housing.
4. The controller, flow sensor and pressure switch continuously monitor water pressure and flow. The system automatically turns the unit off if pressure reaches 60 to 63 PSI. The control package also protects the unit from dry run by shutting down in 30 seconds if water usage drops below 1 gallon per minute.

MOTOR/PUMP ROTATION

1. The motor rotates in a counter clockwise rotation when facing the pump end and cannot be reversed.

Figure 6 - Correct Motor/Pump Rotation (all units)



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START - UP PROCEDURE

Once the preceding instructions have been completed, the unit is ready for normal operation.

1. During the first few hours of operation, inspect the pump, piping and any auxiliary equipment used in connection with the unit.
2. Check for leaks, excessive vibration or unusual noises.
3. As stated in #4 above, the booster unit will turn on and off automatically, based on water usage.

MAINTENANCE

ROUTINE

Pump should be checked routinely for proper operation. Replace or clean any filters and line strainers that may be installed on a regular basis.

DRAINING

The pump can be drained of water by removing the bottom front plug on the pump housing. Store in a dry warm area.

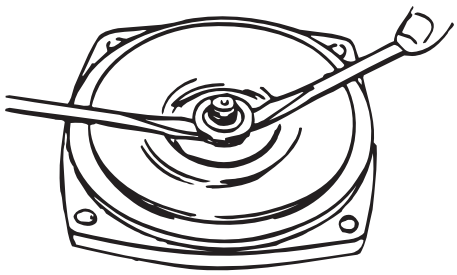
LUBRICATION

The motor has prelubricated bearings. No lubrication is required.

PUMP DISASSEMBLY

1. Remove the four screws holding the pump housing to the motor mounting ring.
2. Remove the pump housing, nozzle assembly and diffuser.
3. Remove screw holding the impeller to the motor shaft.
4. Using two flat-bladed screwdrivers, gently pry the impeller off the motor shaft.
5. Remove the spring holding the shaft seal in place.

Figure 7 - Remove mechanical seal.



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MECHANICAL SEAL REPLACEMENT

1. Follow instructions under “Pump Disassembly”.
2. Remove the mechanical seal assembly.
   a. The rotary portion of the seal assembly (carbon ring, Buna-N gasket and spring will slide easily off the end of shaft).
   b. Using two (2) screwdrivers, pry the ceramic seal and rubber gasket from the recess of the mounting ring (See Figure 7).

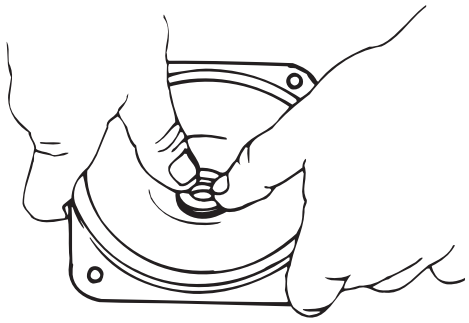
⚠ CAUTION The precision lapped faces of the mechanical seal are easily damaged. Handle the replacement seal carefully. Short seal life will result if seal faces (ceramic & carbon) are nicked, scratched or dirty.

3. Clean the seal cavity of the mounting ring and the motor thoroughly.
4. Wet outer edge of rubber cup on ceramic seat with liquid soap solution. Use sparingly (one drop only).

NOTE: Liquid soap solution - one drop of liquid soap combined with one teaspoonful of water.

5. With thumb pressure, press ceramic seal half firmly and squarely into seal cavity. Polished face of ceramic seat is up. If seal will not seat correctly, remove, placing seal face up on bench. Reclean cavity. Seal should now seat correctly (See Figure 8).

Figure 8 - Press in seal.



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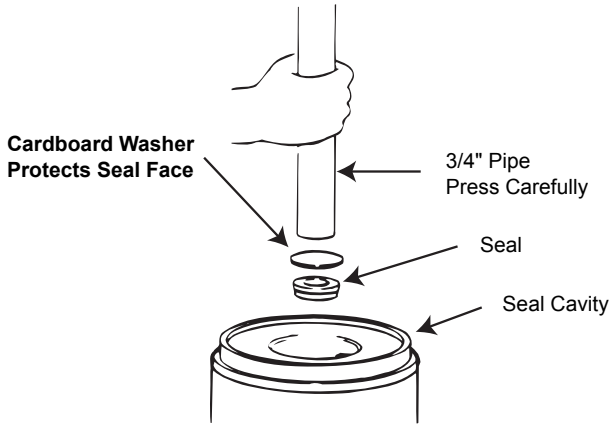
6. If seal does not seat correctly after recleaning cavity, place a cardboard washer over polished seal face and carefully press into place using a piece of standard clean 3/4” pipe as a press (See Figure 9).

IMPORTANT: Do not scratch seal face.

Figure 9 - If necessary, press with cardboard and pipe.



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7. Dispose of cardboard washer and recheck seal face to be sure it is free of dirt, foreign particles, scratches and grease.
8. Inspect shaft to be sure it is free of nicks and scratches.
9. Apply liquid soap solution sparingly (one drop is sufficient) to inside diameter of rubber rotating member.
10. Slide rotating seal member (carbon face down toward ceramic face) and spring over the shaft.

IMPORTANT: Do not nick or scratch carbon face of seal when handling. Because damage to the shaft seal can occur in disassembly, a new seal will be necessary.

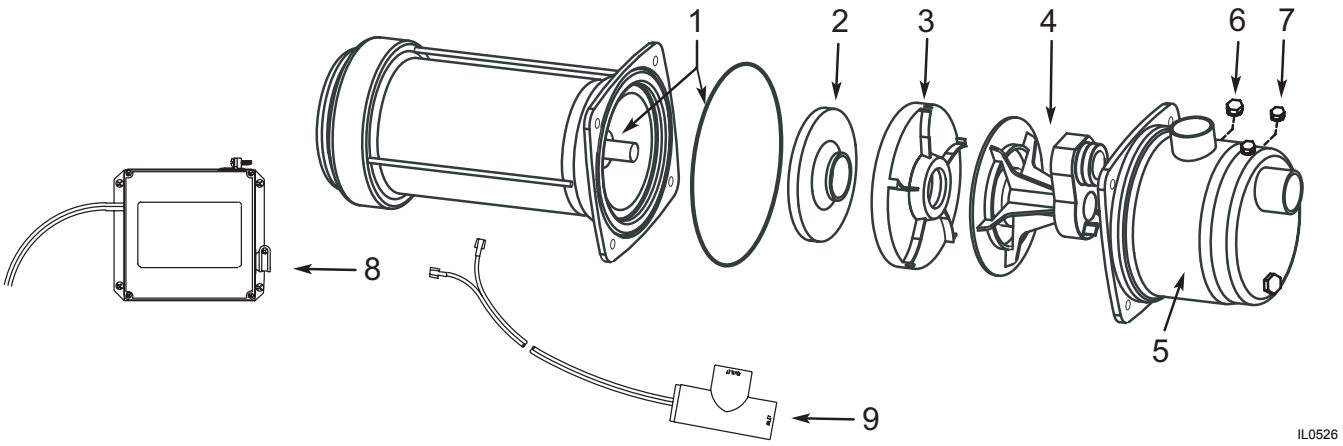
PUMP REASSEMBLY

Before reassembling the pump, carefully inspect the component parts, looking for damage, wear or heat distortion. For replacement parts, see Replacement Parts List Figure 10.

1. Reassembly should follow the reverse order of the disassembly procedure with special care given to replacement of the rotary seal.
2. Check o-ring for damage. Replacing the o-ring is recommended.
3. After reassembly, apply power momentarily to unit (15 to 30 seconds, using the over ride switch in control box. See Figure 5). The pump and motor should rotate freely.

REPLACEMENT PARTS LIST MODEL 352

Figure 10



Ref. No.	Description	Part Number	Qty.
*1	Shaft seal and gasket	021329	1
*2	Impeller	021331	1
*3	Diffuser	021332	1
*4	Nozzle assembly	021333	1
5	Pump housing	021334	1
6	Large plug & O-Ring	021335	1
7	Small Plug & O-Ring	021336	2
8	Solid State Controls	021948	1
9	PVC Flow sensor	021947	1

*May be purchased as a kit. Order #021337.