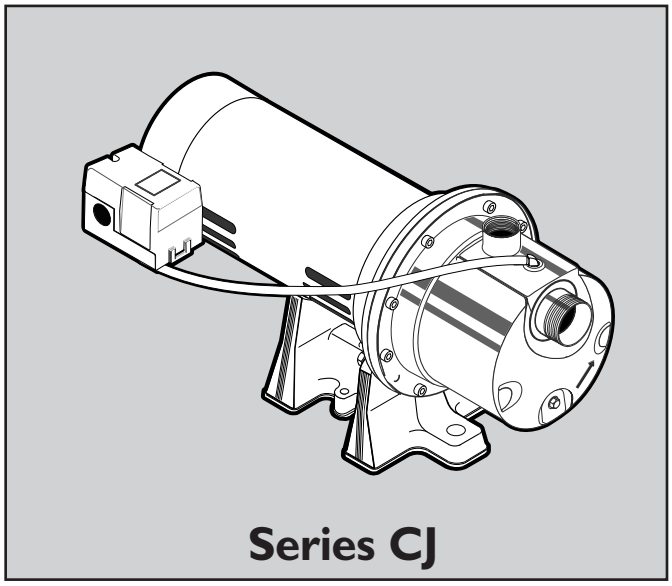
Sta-Rite Industries
Export Sales & Marketing Group

293 Wright Street, Delavan, WI 53115 U.S.A.
TELEPHONE; (262) 728-5551
TELEFAX (262) 728-4461
CABLE: STAREX TELEX: ITT 4970245

OWNER'S MANUAL

Shallow Well Jet Pumps/ Tank Systems



Series CJ

Installation/Operation/Parts

SX312 (Rev. 4/18/05)

Table of Contents

Thank you for purchasing a top quality, factory tested pump.

ATTACH ORIGINAL RECEIPT HERE FOR WARRANTY CONSIDERATION.

Limited Warranty

Sta-Rite warrants to the original consumer of the products listed below, that they will be free from defects in material and workmanship for the Warranty Period from the date of original installation or manufacture as noted.

Product	Warranty Period
Water Systems Products – jet pumps, small centrifugal pumps, submersible pumps and related accessories	*whichever occurs first:* 1 year from date of original installation, or 2 years from date of manufacture
Hydro-Flow Filters	1 year from date of purchase
Signature 2000 Fibrewound Tanks	5 years from date of original installation
Con-Aire® tanks	5 years from date of original installation
Epoxy-Line Tanks	3 years from date of original installation
Sump/Sewage/ Effluent Products	1 year from date of original installation, or 2 years from date of manufacture

Our warranty will not apply to any product that has been subject to negligence, misapplication, improper installation or maintenance. In the event a three phase submersible motor is operated with single phase power through a phase converter, or if three-leg ambient compensated, extra-quick trip overload relays of recommended size are not used, our warranty is void.

Buyer's only remedy and Sta-Rite's only duty is to repair or replace defective products (at Sta-Rite's choice). Buyer agrees to pay all labor and shipping charges associated with this warranty and to request warranty service through the installing dealer as soon as a problem is discovered. If warranty service is requested more than 30 days after the Warranty Period has ended, it will not be honored.

STA-RITE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR CONTINGENT DAMAGES WHATSOEVER.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE WARRANTY PERIOD PROVIDED HEREIN.

Certain states do not permit the exclusion or limitation of incidental or consequential damages or the placing of limitations on the duration of an implied warranty, therefore, the limitations or exclusions herein may not apply. This warranty sets forth specific legal rights and obligations, however, additional rights may exist, which may vary from state to state.

Supersedes all previous publications.

Sta-Rite Industries, 293 Wright St., Delavan, WI 53115

READ AND FOLLOW SAFETY INSTRUCTIONS!

⚠ **This is the safety alert symbol.** When you see this symbol on your pump or in this manual, look for one of the following signal words and be alert to the potential for personal injury:

⚠ DANGER warns about hazards that **will** cause serious personal injury, death or major property damage if ignored.

⚠WARNING warns about hazards that **can** cause serious personal injury, death or major property damage if ignored.

⚠ CAUTION warns about hazards that **will** or **can** cause minor personal injury or property damage if ignored.

The label **NOTICE** indicates special instructions which are important but not related to hazards.

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.

ELECTRICAL SAFETY

⚠WARNING Capacitor voltage may be hazardous. To discharge motor capacitor, hold insulated handle screwdriver **BY THE HANDLE** and short capacitor terminals together. Do not touch metal screwdriver blade or capacitor terminals. If in doubt, consult a qualified electrician.

⚠ WARNING

Hazardous voltage. Can shock, burn, or cause death.

Ground pump before connecting to power supply. Disconnect power before working on pump, motor or tank.

⚠ **Wire motor for correct voltage. See "Electrical" section of this manual and motor nameplate.**

⚠ **Ground motor before connecting to power supply.**

⚠ **Meet National Electrical Code, Canadian Electrical Code, and local codes for all wiring.**

⚠ **Follow wiring instructions in this manual when connecting motor to power lines.**

GENERAL SAFETY

⚠ CAUTION Do not touch an operating motor. Modern motors are designed to operate at high temperatures. To avoid burns when servicing pump, allow it to cool for 20 minutes after shut-down before handling.

Do not allow pump or any system component to freeze. To do so will void warranty.

Pump water only with this pump.

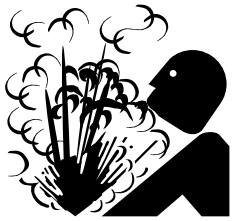
Periodically inspect pump and system components.

Wear safety glasses at all times when working on pumps.

Keep work area clean, uncluttered and properly lighted; store properly all unused tools and equipment.

Keep visitors at a safe distance from the work areas.

⚠WARNING Pump body may explode if used as a booster pump unless relief valve capable of passing full pump flow at 75 psi is installed.



⚠ WARNING

Hazardous pressure! Install pressure relief valve in discharge pipe.

Release all pressure on system before working on any component.

REPLACING AN OLD PUMP

⚠WARNING Hazardous voltage. Disconnect power to pump before working on pump or motor.

1. Drain and remove the old pump. Check the old pipe for scale, lime, rust, etc., and replace it if necessary.
2. Install the pump in the system. Make sure that all pipe joints in the suction pipe are air-tight as well as water tight. *If the suction pipe can suck air, the pump will not be able to pull water from the well.*
3. Adjust the pump mounting height so that the plumbing connections do not put a strain on the pump body. Support the pipe so that the pump body does not take the weight of piping or fittings.

You have just completed the well plumbing for your new shallow well jet pump. Please go to Page 6 for discharge pipe and tank connections.

WELL POINT (DRIVEN POINT) INSTALLATION (Figure 1)

1. Drive the well, using "drive couplings" and a "drive cap". "Drive fittings" are threaded all the way through and allow the pipe ends to butt against each other so that the driving force of the maul is carried by the pipe and *not* by the threads. The ordinary fittings found in hardware stores are not threaded all the way through the fitting and can collapse under impact. "Drive fittings" are also smoother than standard plumbing fittings, making ground penetration easier.
2. Mount the pump as close to the well as possible
3. Use the fewest possible fittings (especially elbows) when connecting the pipe from the well point to the pump suction port. The suction pipe should be at least as large as the suction port on the pump (include a check valve if your pump is not equipped with one – see Figure 1). Support the pipe so that there are no dips or sags in the pipe, so it doesn't strain the pump body, and so that it slopes slightly upward from the well to the pump (high spots can cause air pockets which can air lock the pump). Seal the suction pipe joints with teflon tape or a teflon based pipe joint compound. Joints must be air- and water-tight. *If the suction pipe can suck air, the pump cannot pull water from the well.* If one well point does not supply enough water, consider connecting two or three well points to one suction pipe.

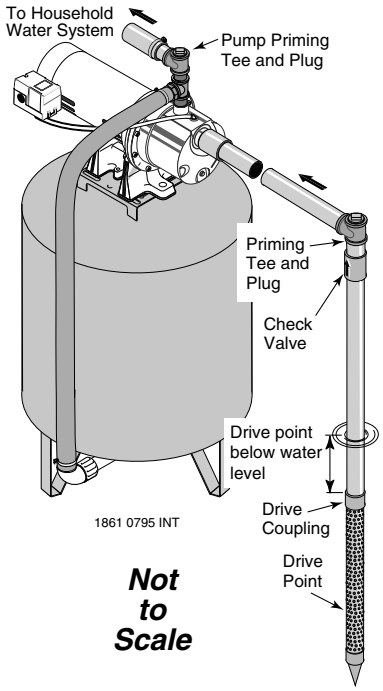


Figure 1: Driven Point Installation

You have just completed the suction piping for your new shallow well jet pump. Please go to Page 6 for discharge pipe and tank connections.

CASED WELL INSTALLATION, 2" OR LARGER CASING (Figure 2)

1. Mount the pump as close to the well as possible.
2. Assemble the foot valve, strainer, and well pipe (see Figure 2). Make sure that the foot valve works freely.

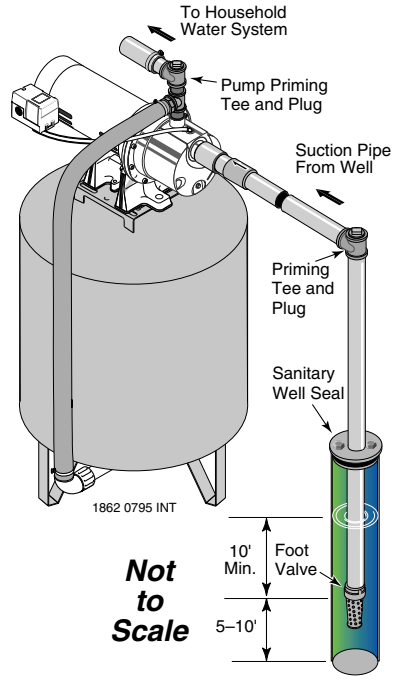


Figure 2: Cased Well Installation

3. Lower the pipe into the well until the strainer is five feet above the bottom of the well. It should also be at least 10 feet below the well's water level *while the pump is running* in order to prevent the pump from sucking air. Install a sanitary well seal.
4. Install a priming tee, priming plug, and suction pipe to the pump (see Figure 2). Connect the pipe from the well to the pump suction port, using the fewest possible fittings – especially elbows – as fittings increase friction in the pipe (however, include a foot valve – see Figure 2). The suction pipe should be at least as large as the suction port on the pump. Use teflon tape or a teflon-based pipe joint compound on threaded pipe joints. Support the pipe so that there are no dips or sags in the pipe, so it doesn't strain the pump body, and so that it slopes slightly upward from the well to the pump (high spots can cause air pockets which can air lock the pump). Seal the suction pipe joints with teflon tape or a teflon based pipe joint compound. Joints must be air- and water-tight. *If the suction pipe can suck air, the pump cannot pull water from the well.*

You have just completed the suction piping for your new shallow well jet pump. Please go to Page 6 for discharge pipe and tank connections.

INSTALLATION FOR SURFACE WATER (Figure 3)

1. The pump should be installed as close to the water as possible, with the fewest possible fittings (especially elbows) in the suction pipe. The suction pipe should be at least as large as the suction port on the pump.
2. Assemble a foot valve and suction pipe (see Figure 3). Make sure that the foot valve works freely. Use teflon tape or a teflon-based pipe joint compound on threaded pipe joints. Protect the foot valve assembly from fish, trash, etc, by installing a screen around it (see Figure 3).

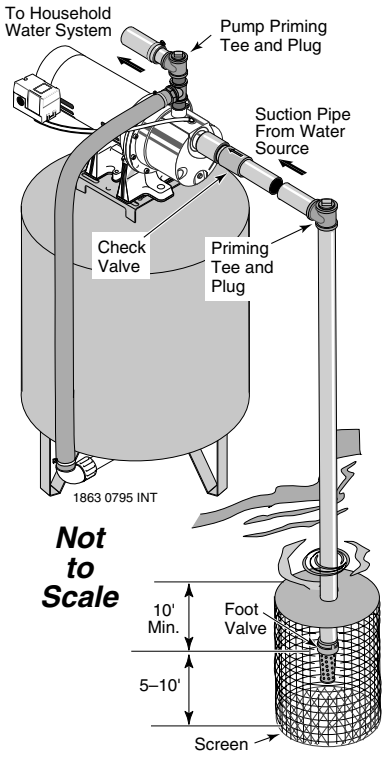


Figure 3: Surface Water Installation

3. Lower the pipe into the water until the strainer is five feet above the bottom. It should also be at least 10 feet below the water level in order to prevent the pump from sucking air.
4. Install a priming tee, priming plug, and suction pipe to the pump (see Figure 3). Support the pipe so that there are no dips or sags in the pipe, so it doesn't strain the pump body, and so that it slopes slightly upward from the well to the pump (high spots can cause air pockets which can air lock the pump). Seal the suction pipe joints with teflon tape or a teflon based pipe joint compound. Joints must be air- and water-tight. *If the suction pipe can suck air, the pump cannot pull water from the well.*

You have just completed the plumbing for your new shallow well jet pump. Please go to Page 6 for discharge pipe and tank connections.

PRE-CHARGE TANK CONNECTION (Figure 4)

1. Install two tees in the pump discharge port (see Figure 4). The pipe size must be at least as large as the discharge port.

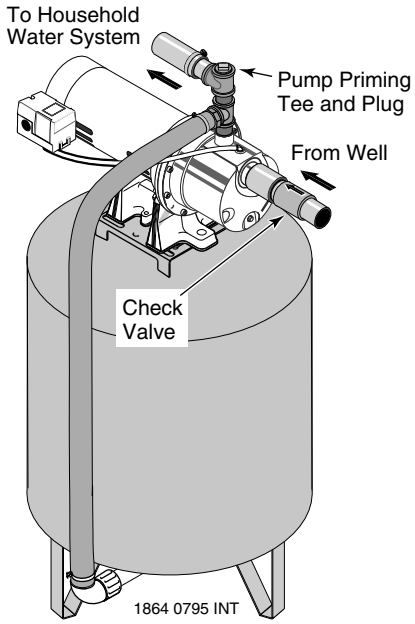


Figure 4: Pre-charged Tank Connections

2. Run a pipe or reinforced hose from one arm of the first tee to the port on the pre-charged tank.
3. Connect the other end of the discharge tee to your plumbing system.
4. Check the pre-charge of air in the tank with an ordinary tire gauge. The pre-charge should be 2 PSI less than the cut-in setting of the pump's pressure switch. The pre-charge is measured *when there is no water pressure in the tank.* Adjust the tank precharge pressure to 28 PSI for a model CJ90E pump (30/50 pressure switch), or to 38 PSI for a model CJ90F pump (40/60 pressure switch).

Congratulations! You have just completed the tank connection for your jet pump.

Please go to Pages 7 and 8 for electrical hookup.

Sealing Pipe Joints

Use only Teflon tape or Teflon based joint compounds for
making all threaded connections to the pump itself. **Do not use pipe joint compounds on plastic pumps:** they can react with the plastic in pump components. Make sure that all pipe joints in the suction pipe are air tight as well as water tight. *If the suction pipe can suck air, the pump will not be able to pull water from the well.*

VOLTAGE CONVERSION

⚠WARNING Hazardous voltage. Disconnect power at service panel before connecting pressure switch.

MOTOR SWITCH SETTINGS

Dual-voltage motors (motors that can operate at either 115 or 230 volts), are set at the factory to 230 volts. Do not change motor voltage setting if line voltage is 230 volts, or if you have a single voltage motor.

NOTE: Never wire a 115 volt motor to a 230 volt line.

REMOVE MOTOR END COVER

If you have a dual-voltage motor, and will connect it to 115 volts, follow the procedure below.

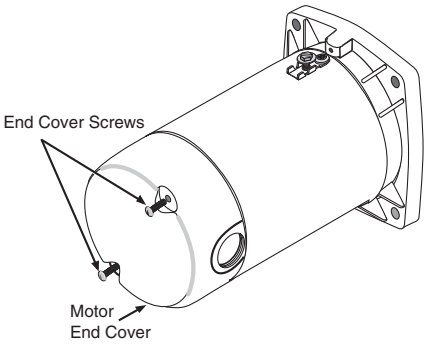


Figure 5: Removing Motor End Cover

You will need to remove the motor end cover to change the voltage setting.

Your motor terminal board (located under the motor end cover) should look like one of those below.

PLUG TYPE VOLTAGE SELECTOR

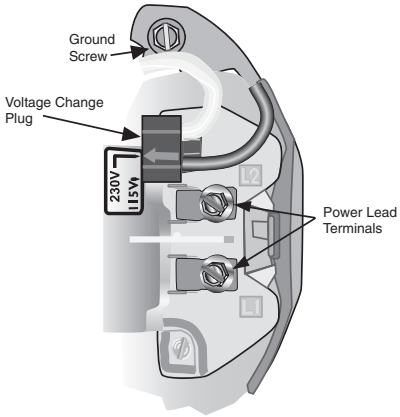


Figure 6: Voltage set to 230 volts, Plug Type

To change to 115 volts:

1. Make sure power is off.
2. Pull the plug straight up.
3. Move and attach the plug at the 115 volt position. The plug will now cover 2 metal tabs. The arrow on the plug will point to 115V.
4. The wires from the pressure switch should already be attached to to power lead terminals.
5. Reinstall the Motor end cover.

Go to Pressure Switch Wiring below.

DIAL TYPE VOLTAGE SELECTOR

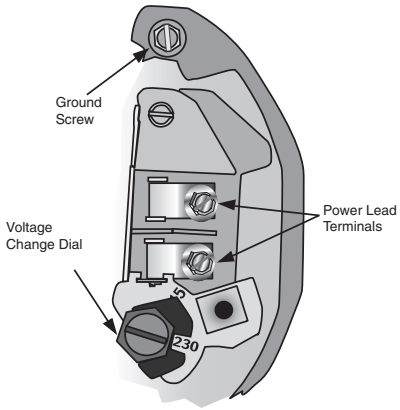


Figure 7: Voltage set to 230 volts, Dial Type

To change to 115 volts:

1. Make sure power is off.
2. Turn the dial counter-clockwise until 115 shows in the dial window.
3. The wires from the pressure switch should already be attached to to power lead terminals.
4. Reinstall the Motor end cover

PRESSURE SWITCH WIRING

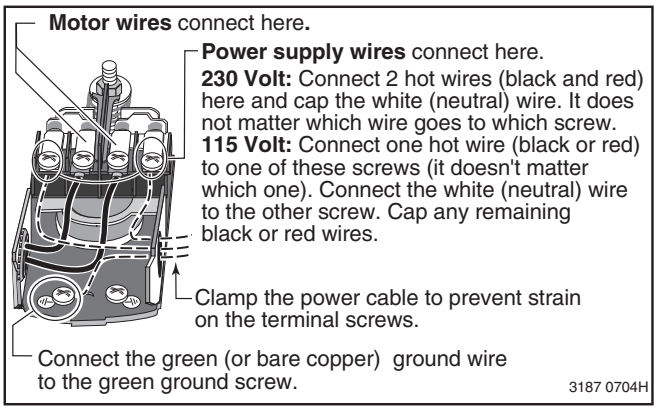


Figure 8: Pressure Switch Wiring

5. Go to Wiring Connections below.

HAZARDS, PRECAUTIONS

⚠ WARNING

Hazardous voltage. Can shock, burn, or cause death.

Disconnect power to motor before working on pump or motor.

Ground motor before connecting to power supply.

⚠ Risk of explosion. Do not ground to a gas supply line.

⚠ Disconnect power at panel before connecting pressure switch.

⚠ 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.

⚠ Use wire size (including ground wire) specified in Wiring Chart. If possible, connect the pump to a separate branch circuit with no other appliances on it.

⚠ Do not operate pump unless motor and pressure switch are connected to each other by a solid metal connection and are grounded.

WIRING CONNECTIONS

NOTICE: Your pump installation must comply with all local codes that apply.

1. In a new pump, the motor leads will already be connected to the switch; the motor will be hooked up for 230 volts. *If your power supply is 115 volts, see Figure 5, Page 7.*
2. Connect the ground wire (the green wire) first. Connect it to ground (see About Grounding, at left) and then to the terminal on the base or the side of the pressure switch marked GROUND, GRD, or ⏚ . There may be two ground terminals; if so, connect to either one. *See Figure 8 for details.*

   NOTICE: If you are connecting the motor to a 230 volt circuit using a four-conductor cable, connect both the neutral (white) and ground (green) to the ground terminal. The other two wires (two black wires or one black and one red wire) are the power supply wires.

. Connect the power supply wires to the pressure switch terminals marked LINE, L, or L1/L2. It doesn't matter which power supply wire goes to which of these terminals in the pressure switch. In a new pump, the motor leads will already be connected to the switch; the motor will be hooked up for 230 volts. *If your power supply is 115 volts, see Figure 6.* If you are replacing the pressure switch, connect the motor leads to the switch terminals marked LOAD, MOTOR, M or M1/M2. Make sure that either:

   a. The motor frame is connected to the pressure switch by a solid metal connection, or

   b. The motor ground terminal is connected to the switch ground terminal by a solid metal conductor at least as large as the wires carrying power to the motor.

4. Replace the pressure switch cover.

You have just completed the wiring for your pump.

Please go to Page 9 for startup preparations.

About Grounding

***Grounding* an electrical device protects you, the user, from dangerous electrical shocks and burns by providing a safe path for the electricity** in cases of current leakage to ground (due to a short circuit, broken wire, etc.). The circuit breaker will sense a rush of current and will open or 'trip', disconnecting the device and stopping the current flow.

A circuit breaker which includes a Ground Fault Circuit Interrupter (a "GFCI Breaker") will protect you from small current leakages to ground as well as short circuits. To avoid nuisance tripping of the GFCI, consult a licensed electrician about details of size and type of breaker to use.

For the best ground connection, connect the ground wire to a grounded lead in the service panel or to a metal underground water pipe or well casing at least 10 ft. long. If you use plastic pipe or insulated fittings, run the ground wire directly to the metal well casing or use the ground electrode furnished by the power company.

The ground wire should be of the same type and size as the wires used to carry power to the motor.

⚠WARNING ***Never* try to use a gas supply line as a grounding connection point. *It could explode.***

Never operate this pump unless the motor is solidly grounded.

If you are not sure about how to ground the pump and motor, consult a licensed electrician.

Wiring Chart – Recommended Wire and Fuse Sizes

Motor HP	Volts	Max. Load Amp	Branch Fuse Rating Amp	DISTANCE IN FEET(METERS) FROM MOTOR TO SUPPLY				
				0 - 100 (0 - 30)	101 - 200 (31 - 61)	201 - 300 (62 - 91)	301 - 400 (92 - 122)	401 - 500 (123 - 152)
				AWG WIRE SIZE (mm²)				
1	115/230	14.8/7.4	20/15	12/14 (3/2)	8/14 (8.4/2)	6/14 (14/2)	6/12 (4/3)	4/10 (21/5.5)
1-1/2	115/230	19.2/9.6	25/15	10/14 (5.5/2)	8/14 (8.4/2)	6/12 (14/3)	4/10 (21/5.5)	4/10 (21/5.5)

PRIMING

⚠ WARNING Never run pump against closed discharge. To do so can boil water inside pump, causing hazardous pressure in unit, risk of explosion and possibly scalding persons handling pump.

⚠ CAUTION Never run pump dry. Running pump without water may cause pump to overheat, damaging seal and possibly causing burns to persons handling pump. Fill pump with water before starting.

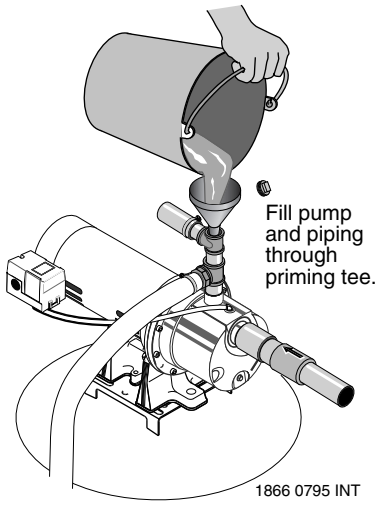


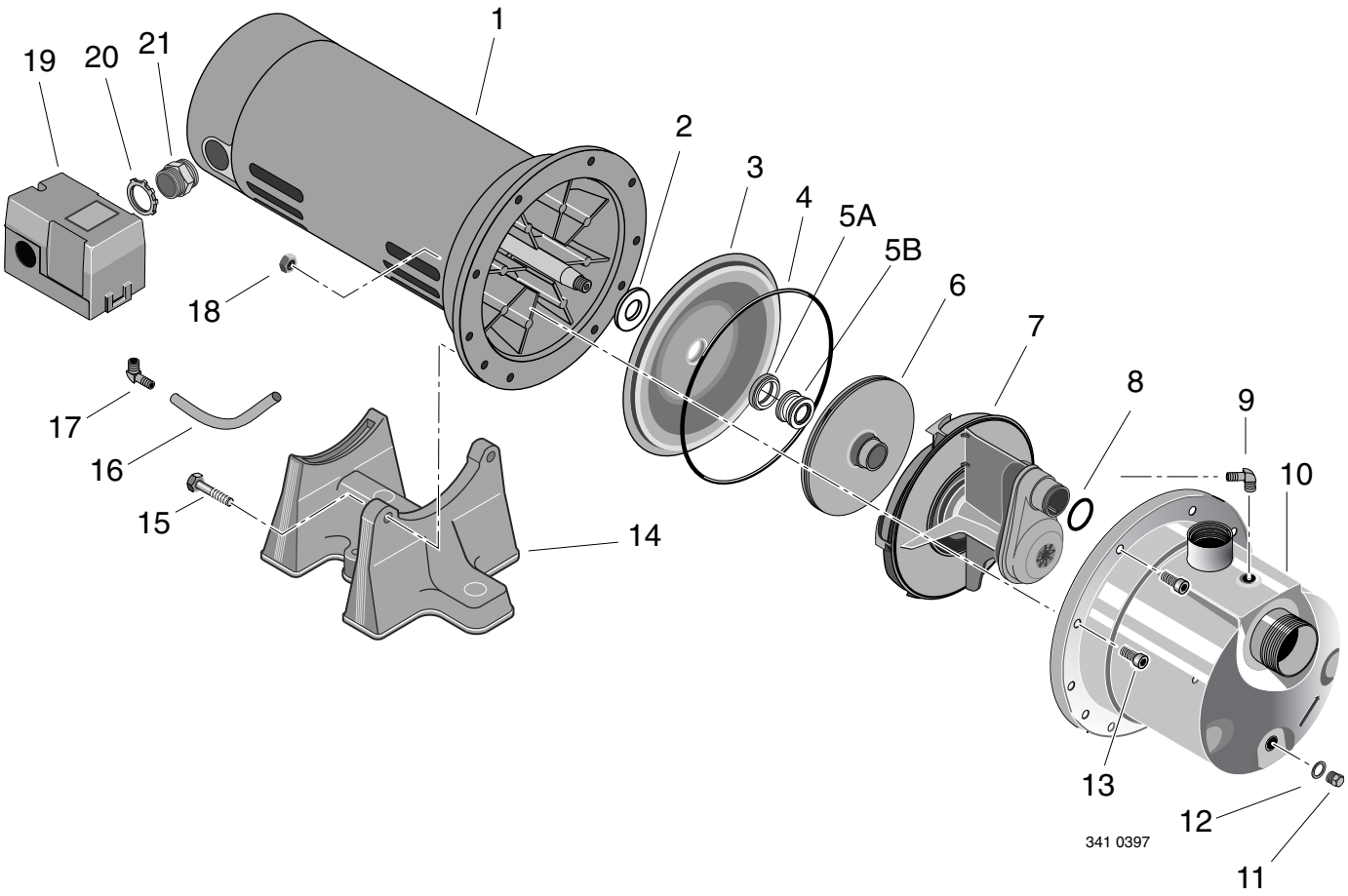
Figure 9: Prime the Pump

1. Remove the priming plug from the pump and fill the pump, fill all piping between the pump and the well, and make sure that all piping in the well is full. If you have also installed a priming tee in the suction piping, remove the plug from the tee and fill the suction piping.
2. Replace all fill plugs.
3. **Power on!** Start the pump. If you don't have water after 2 or 3 minutes, stop the pump and remove the fill plugs. Refill the pump and piping. You may have to repeat this several times in order to get all the trapped air out of the piping. A pump lifting water 25' may take as long as 15 minutes to prime.
4. After the pump has built up pressure in the system and shut off, check the pressure switch operation by opening a faucet or two and running enough water out to bleed off pressure until the pump starts. The pump should start when pressure drops to 30 PSI and stop when pressure reaches 50 PSI. Run the pump through one or two complete cycles to verify correct operation. This will also help clean the system of dirt and scale dislodged during installation.

Congratulations on a successful installation.

If you were unsuccessful, please refer to the Troubleshooting section (Page 10) or call our customer service technical staff.

Thank you for purchasing Sta-Rite Products.



Models CJ90E and CJ90F

Key No.	Part Description	No. Used	Model	
			CJ90E 1 HP	CJ90F 1-1/2 HP
1	Motor	1	J218-1006	J218-1007
2	Slinger	1	C69-7	C69-7
3	Seal Plate	1	784S0070	784S0070
4	O-Ring	1	111P0490	111P0490
5A	Shaft Seal Seat	1	111P0510	111P0510
5B	Shaft Seal Rotating	1	111P0500	111P0500
6	Impeller	1	101P1720	101P1720
7	Venturi	1	101P2900	101P2900
8	O-Ring	1	111P1100	111P1100
9	90° Hose Barb	1	171P4750T	171P4750T
10	Pump Body	1	723S0850	723S0850
11	Plug, Stainless Steel	1	121P2100	121P2100
12	Washer	1	111P0990	111P0990
13	Screw, Socket Head	8	121P0310	121P0310
14	Base	1	C4-42P	C4-42P
15	Bolt	2	U30-74SS	U30-74SS
16	Pressure Switch Tube	1	U37-672P	U37-673P
17	1/4″ NPT 90° Hose Barb	1	U111-212T	U111-212T
18	Nut, M6x1 SS	8	U36-207SS	U36-207SS
19	Pressure Switch	1	U217-1202	U217-1204
20	1/2″ Locknut	1	U36-112ZP	U36-112ZP
21	Connector	1	L43-5C	L43-5C

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Motor will not run	Disconnect switch is off	Be sure switch is on.
	Fuse is blown or circuit breaker tripped	Replace fuse or reset circuit breaker.
	Starting switch is defective	DISCONNECT POWER; Replace starting switch.
	Wires at motor are loose, disconnected, or wired incorrectly	Refer to instructions on wiring (Page 8). DISCONNECT POWER; check and tighten all wiring.
		⚠WARNING Capacitor voltage may be hazardous. To discharge capacitor, hold insulated handle screwdriver BY THE HANDLE and short capacitor terminals together. Do not touch metal screwdriver blade or capacitor terminals. If in doubt, consult a qualified electrician.
	Pressure switch contacts are dirty	DISCONNECT POWER and file contacts with emery board or nail file.
Motor runs hot and overload kicks off	Motor is wired incorrectly	Refer to instructions on wiring.
	Voltage is too low	Check with power company. Install heavier wiring if wire size is too small (See Electrical / Wiring Chart).
	Pump cycles too frequently	See section below on too frequent cycling.
Motor runs but no water is delivered*	Pump in new installation did not pick up prime through: 1. Improper priming 2. Air leaks	In new installation: 1. Re-prime according to instructions. 2. Check all connections on suction line with soapy water or shaving cream.
* (Note: *Stop pump;* then check prime before looking for other causes. Unscrew priming plug and see if water is in priming hole).	3. Leaking foot valve or check valve	3. Replace foot valve or check valve.
	Pump has lost prime through: 1. Air leaks 2. Water level below suction pipe inlet	In installation already in use: 1. Check all connections on suction line and shaft seal. 2. Lower suction line into water and re-prime. If receding water level in well exceeds 25' (7.6M), a deep well pump is needed.
	Foot valve or strainer is plugged	Clean foot valve or strainer.
	Ejector or impeller is plugged	Clean ejector or impeller.
	Check valve or foot valve is stuck shut	Replace check valve or foot valve.
	Pipes are frozen	Thaw pipes. Bury pipes below frost line. Heat pit or pump house.
	Foot valve and/or strainer are buried in sand or mud	Raise foot valve and/or strainer above bottom of water source. Clean foot valve and strainer.
	Water level is too low for shallow well setup to deliver water	A deep well jet package may be needed (over 25 ft. to water) to deliver water.
Pump does not deliver water to full capacity	Water level in well is lower than estimated	A deep well jet will be needed if your well is more than 25' (7.6M) depth to water.
	Steel piping (if used) is corroded or limed, causing excess friction	Replace with plastic pipe where possible, otherwise with new steel pipe.
	Piping is too small in size	Use larger piping.
	Packed well point	Backflush well point or sink new point.
Pump delivers water but does not shut off or pump cycles too frequently	Pressure switch is out of adjustment or contacts are welded together	DISCONNECT POWER; adjust or replace pressure switch.
	Faucets have been left open	Close faucets.
	Venturi, nozzle or impeller is clogged	Clean venturi, nozzle or impeller.
	Pipes leak	Check connections.
	Foot valves leak	Replace foot valve.
	Air charge too low in pre-charged tank	DISCONNECT POWER and open faucets until all pressure is relieved.
		Using tire pressure gauge, check air pressure in tank at valve stem located on the tank. If less than pressure switch cut-in setting (30/50 PSI for CJ90E, 40/60 PSI for CJ90F), pump air into tank from outside source until air pressure is 2 PSI less than cut-in setting of switch. Check air valve for leaks (use soapy solution) and replace core if necessary.
Air spurts from faucets	Pump is picking up prime	When pump has picked up prime, it should pump solid water with no air.
	Leak in suction side of pump	Suction pipe is sucking air. Check joints for leaks with soapy water.
	Well is gaseous	Consult factory about installing a sleeve in the well
	Intermittent over-pumping of well. (Water drawn down below foot valve.)	Lower foot valve if possible, otherwise restrict pump discharge