

RUSSELL PUMP

Model PA515

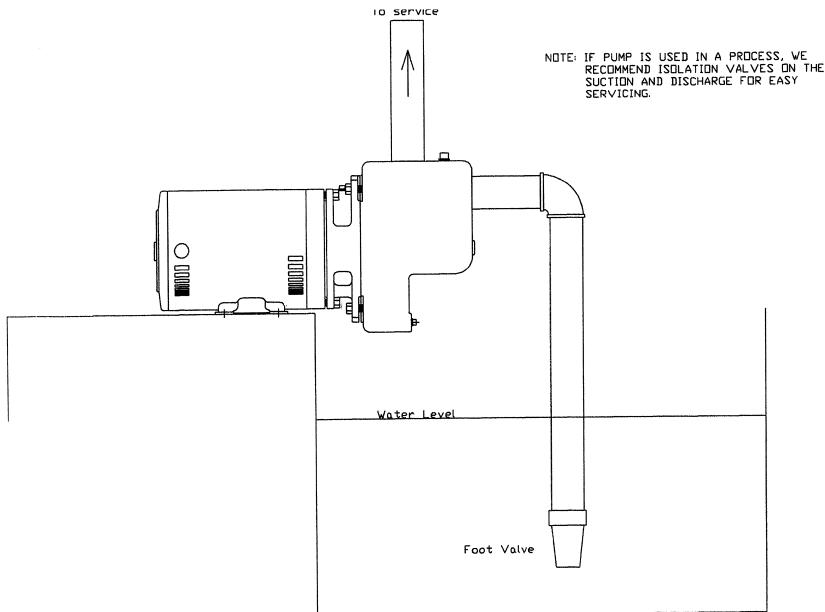
Installation, Operation and Maintenance Information



Typical Applications
Water Transfer, Light Irrigation,
Dewatering, Lawn Sprinkling,
Pressure Boosting, Heat Pumps.
Air Conditioning Systems

Russell Pump and Engineering Inc.
102 W. Chicago Street
Albion, IA 50005
641-488-2319

Typical Piping Diagram



SUCTION PIPING

Always use pipe that is the same size or one size larger than the suction size of the pump. **NEVER** use pipe smaller than the pump suction size. Locate the pump as close to the liquid source as possible. Try to locate the pump suction below the liquid surface if possible. We recommend a gate valve in the suction line for easy isolation and servicing. A foot or check valve could also be added to minimize repriming cycles but are not mandatory.

CAUTION — Never use the suction isolation valve to throttle the pump.

Make sure all suction piping, valves, and elbows are air tight. Loose joints will allow air to enter the suction line and priming will NOT occur. Always make sure suction pipe and fittings are independently supported. **NEVER** use the pump to act as pipe support; this could make the pump bind or break.

DISCHARGE PIPING

Always use pipe that is the same size or one size larger than the discharge size of the pump. If you use pipe smaller than the 1 1/2" NPT discharge on the PA515, the pumping capacity will be diminished. A check valve, gate valve and a union should also be installed in the discharge line for pump throttling and servicing. Make sure the discharge line is well supported. **NEVER** use the pump as pipe support.

ELECTRICAL CONSIDERATIONS

Electrical supply must be a separate branch circuit with fuses or circuit breakers. Install a disconnect switch as close to the pump as possible. Wire in accordance with the National Electric Code and local codes where applicable.

CAUTION — Always disconnect electrical power when handling the pump or controls.

Motors must be wired for proper voltage. Motor wiring diagram is on the motor nameplate. Single-phase motors are usually furnished as dual voltage 115/230/1/60. Three-phase motors are usually furnished as tri voltage 208/230/460/3/60. All three-phase motors require a magnetic motor starter and thermal overload protection. Check motor nameplate to confirm overload protection is built in. All single-phase motors above 1 HP require magnetic starters and thermal overload protectors. Always limit your wire size so the maximum voltage is no more than 10% of motor nameplate voltage at the motor leads. If this voltage drop is exceeded, motor and pump life will be greatly diminished.

MOTOR ROTATION

The correct motor rotation (when viewed from the motor end of the pump) is clockwise. Pop cap off the back of the motor; the motor shaft is now exposed for viewing. Switch the power on and off quickly and observe the motor shaft. If the rotation is counterclockwise change any two motor leads on a three-phase motor. Single-phase motors are nonreversible.

PUMP STARTUP

Do NOT run the pump dry. Fill the pump with liquid for the initial start through the discharge opening in the top of the casing. This can be done before the discharge piping is installed. The 1/4 NPT hole in the top of the casing could also be used for initial priming but it will take longer to fill. The casing will require about 1 gallon of water to fill it.

Make sure the suction gate valve is wide open; when the pump is in operation this valve should never be throttled. Open the discharge gate valve about 1/4 open. This will prime the pump and force air out. NEVER run the pump dry. Rotating parts will eventually seize and mechanical seal damage may occur. NEVER run the pump at shutoff conditions. Energy from the motor is imparted to the liquid which is converted to heat. The liquid may flash to vapor causing the pump to burst.

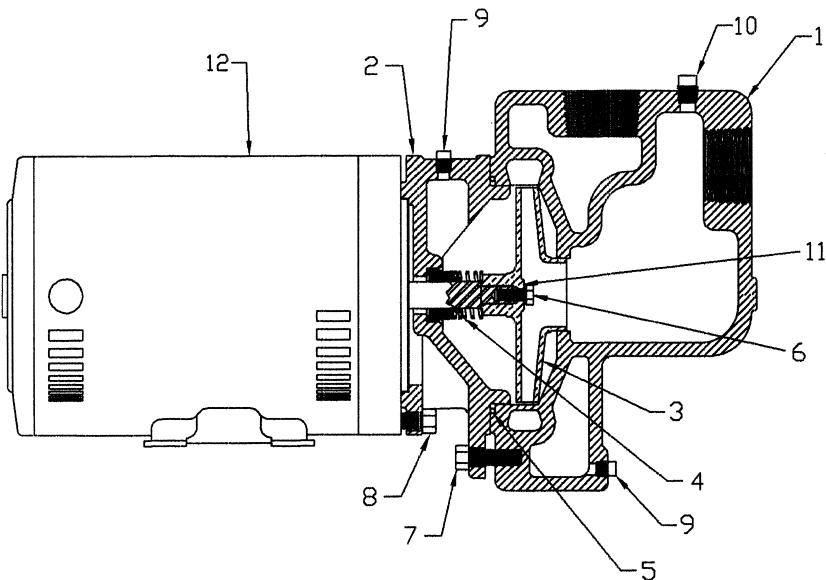
Once the pump is started and running adjust the discharge gate valve to your desired pressure. Make sure there are no leaks in pump connections and piping. Check your motor amps to make sure the motor is running within its rated capacity. The pump should be running smooth with no vibration or excessive noise.

MAINTENANCE

The bearings in the close-coupled motor are sealed and permanently greased. No other greasing is required. Periodic 6-month checks of the unit should be made to make sure the unit runs smoothly at its desired performance. If possible keep a log of the suction pressure, discharge pressure and motor amps. Over a period of time this information can tell you if the pump parts are starting to wear. If a problem arises check the troubleshooting section for guidance. If the problem cannot be rectified call the factory.

PUMP DISASSEMBLY

1. Shut disconnect off. Always make sure the power to the pump is off.
2. Close suction and discharge gate valves.
3. Drain the pump by removing the top 1/4" NPT pipe plug and the 1/8" NPT pipe plug near the bottom of the casing.
4. Remove the motor hold-down bolts.
5. Remove the four bolts that hold the adapter to the casing.
6. Slide back pull-out assembly out of casing; it may be necessary to pry them apart.
7. Remove the casing o-ring and set it aside. Inspect it to make sure it's not cut. Clean the o-ring groove on the casing.
8. Remove the impeller cap screw on three phase motors. Single phase motors do not utilize impeller cap screws.
9. The back of the motor will have a small cap on it; pry it off. This reveals the end of the motor shaft which has a screwdriver slot or flats on it.
10. Remove the impeller. Use a screwdriver or a wrench to hold the exposed motorshaft. Carefully grab the impeller (be careful not to cut yourself on any sharp edges) and turn it counterclockwise. It may be very hard to get the impeller free.
11. Remove the mechanical seal rotating elements.
12. Remove the four bolts holding the adapter to the motor. The adapter, which still has the stationary members of the seal in it, will now pull off the motor.
13. Remove the stationary member of the seal and clean all the parts. Be very careful not to scratch the seal face—this will cause the seal to leak.
14. To reassemble use a new mechanical seal and follow the directions in reverse.



1	CASING PA515	CLASS 30 CAST IRON	40025	1
2	ADAPTER A510	CLASS 30 CAST IRON	30000	1
3	IMPELLER A510	BRONZE	20000	1
4	MECHANICAL SEAL	BUNA-N EPT VITON	S-100 S-101 S-102	1
5	D-RING CASING	BUNA-N EPT VITON	S-109 S-110 S-111	1
6	CAP SCREW	1/4-28UNC X 5/8 SS	70040	1
7	CAP SCREW	3/8-16 X 1 1/4 STEEL	19932	4
8	CAP SCREW	3/8-16 X 1 STEEL	19931	4
9	PIPE PLUG	1/8 NPT BRONZE	69845	2
10	PIPE PLUG	1/4 NPT BRONZE	68585	1
11	LOCKWASHER	1/4 303 SS	0130197	1
12	MOTOR	NEMA 56J	-	1

NOTE: Single phase models do NOT require part numbers 70040 or 0130197

Troubleshooting

A.) PUMP WILL NOT RUN

- 1.) Circuit breaker is open
- 2.) Thermal overload has tripped
- 3.) Improper voltage supplied to the motor
- 4.) Wiring connections are loose
- 5.) Blown fuse
- 6.) Pump controls in off position
- 7.) Motor wired improperly
- 8.) Motor is defective
- 9.) Pump is not properly primed

B.) GPM CAPACITY IS LOW

- 1.) Pump is not throttled correctly
- 2.) Pump is running backwards
- 3.) Suction lift is too great
- 4.) The impeller was sized wrong — the diameter is too small
- 5.) Impeller is worn — clearance opened up
- 6.) Suction piping is loose, allowing air in
- 7.) NPSHA is too low
- 8.) Piping is undersized
- 9.) The impeller has a vane or vanes plugged with debris
- 10.) A strainer is partially plugged
- 11.) Pump is undersized for the system
- 12.) Phase loss — one leg of a 3-phase motor went out

C.) EXCESSIVE NOISE/VIBRATION

- 1.) Rotating parts are binding
- 2.) Pump is cavitating
- 3.) Defective motor
- 4.) Pump is running backwards
- 5.) Air or gas in system
- 6.) Impeller is plugged with debris
- 7.) Pump or piping is loose
- 8.) Pump is not throttled correctly — running wide open

D.) PUMP LOSES PRIME AFTER STARTING

- 1.) Air leak in suction piping
- 2.) Total suction lift is too great
- 3.) Suction pipe not sufficiently submerged; check water level at liquid source