

IMPROPER INSTALLATION WILL DAMAGE THE PUMP AND VOID THE WARRANTY
PLEASE READ AND SAVE THIS MANUAL

RECORD MODEL # _____ - _____ SERIAL # _____

This manual covers the Wright Morgan Grid Tie Booster Pump – WM-95873.



Wright Morgan Grid Tie Booster Pump WM-95873

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1. WARNINGS

Please review the following warnings. These are listed for both personal safety and the safety of the products. Disregarding or ignoring these warnings can result in **SERIOUS INJURY** and/or **VOID THE WARRANTY**. If this system is being installed without a licensed pump installer, an electrician or knowledge of electrical circuits is **HIGHLY** recommended.

If any questions or concerns regarding these warnings should arise, please contact Wright Morgan directly at sales@wrightmorgan.com. Wright Morgan pumps and/or its parent company, Solar Power & Pump Co, is **NOT LIABLE** for any **DAMAGE** or **INJURY**.

- The system should be installed and serviced by qualified personnel only. All electrical codes should be observed. Make **ABSOLUTELY CERTAIN** all power sources are disconnected prior to wiring.
- Extreme heat can damage the pump. Protect the pump from sunlight or other heat sources.
- Install proper system grounding for safety and lightning protection. Proper grounding can significantly reduce the chance of extreme damage. See Section 4.4 Grounding and Lightning Protection
- Under-sizing the wires or failing to install a fuse or circuit breaker can cause a Fire Hazard and cause damage to the motor. Follow all guidelines in Section 4
- Do not run the pump dry.

2. INSTALLATION REQUIREMENTS

Non-submersible pumps - Do not submerge pump or motor in water. Do not allow water to drip on the motor. Protect the pump and motor from sunshine. If the pump is installed outdoors, supply weather protection, such as a sheet-metal shield, shed or well house.

Filtration requirements - It is recommended that an intake foot valve or strainer is used ahead of this booster pump to prevent large debris from damaging the unit.

If pumping water for human or animal consumption a 10-Inch Inline Filter (Dankoff Solar PN – 11033) is recommended for all other installations and should be installed close to the pump's intake. If filters are expected to clog often, maintenance may be minimized by plumbing two or more filters in parallel. The 10-Inch Inline Filter has a clear bowl that allows direct observation of the filter condition.

A filter cartridge may look clean and still be clogged with fine silt embedded in the fibers. If the pump becomes increasingly noisy over time, it is usually due to a clogging filter cartridge and indicates a filter cartridge change is required. A cartridge that is discolored may not be clogged. As long as the pump runs quietly, the filter is good.

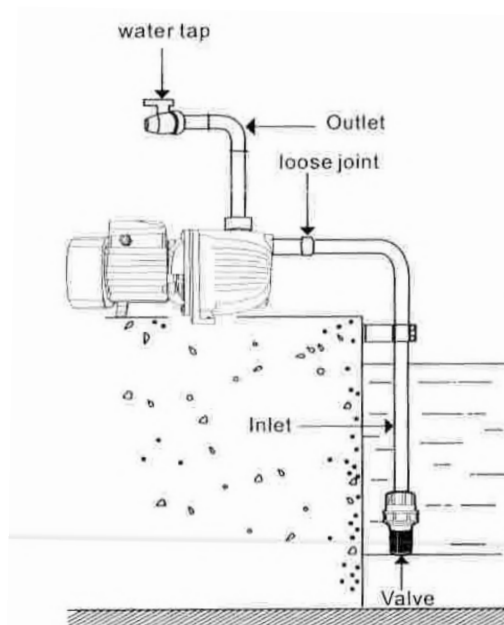


Pump must not run dry - Water is the lubricant for the pump. If the pump runs completely dry, it will overheat and fail. If pumping from a tank, cistern or any water source that can run low accidentally, a Dry Run Sensor or Float Switch must be used.

A Float Switch placed in the supply tank is an alternative to the dry run sensor. The switch is closed when the tank water supply is at a high level. When the water level drops to a low level, the switch will open and remove power from the pump motor. The Float Switch has two advantages over a dry run sensor in that the Float Switch will close and start the pump motor when the water level rises, and the pump will not lose prime.

This pump comes with an integrated pressure switch between the pump and the tank. This pressure switch greatly improves the longevity of the pump by powering off the pump motor once internal tank pressure has been achieved. In this way, the pump only runs when water is pulled from the tank.

3. PLUMBING SYSTEM DESIGN



Reference System Diagram – tank not shown beneath pump

Minimize Suction Lift – Suction lift refers to the pressure (negative pressure) on the suction (inlet) side of the pump. As the vertical distance from the pump inlet to water increases, the suction lift pressure also increases. The practical suction/intake pipe limit for any pump is 20 vertical feet to water at sea level (subtract 1 ft. for every 1000 ft. of elevation). Limiting the pipe length to 2 to 3 feet will allow the pump to run quietly and more reliably. Placing the pump downhill from the water source also helps to minimize suction lift.

Intake Pipe – Keep the intake pipe distances as short as possible. Do not use thin-wall hose or soft tubing on the pump's intake. It may collapse under suction and restrict the flow.



Polyethylene pipe (black flexible Polypipe) can be prone to slight leakage at the fittings, ensure all connections are watertight.

Increase pipe size as the distance from the water source increases. Use pipe reducer fittings to adapt the pump's inlet or outlet to a larger pipe size where necessary.

The intake pipe must not be obstructed or restricted by undersized pipe, excessive suction lift, or a clogged filter. Excessive suction at the pump inlet causes cavitation (formation of vapor bubbles). Cavitation causes a very loud buzzing noise and also causes rapid wear to the pump. A slight buzzing noise is acceptable.

Avoid humps in the intake line that can trap air pockets and block the flow. Ensure the intake pipe is free of leaks.

Inline Filter – If using an inline filter (not shown in the diagram above) it should be mounted horizontally and as low as possible to prevent air in the filter from blocking water flow. Leave space below the filter for a pan to catch water when replacing the filter cartridge.

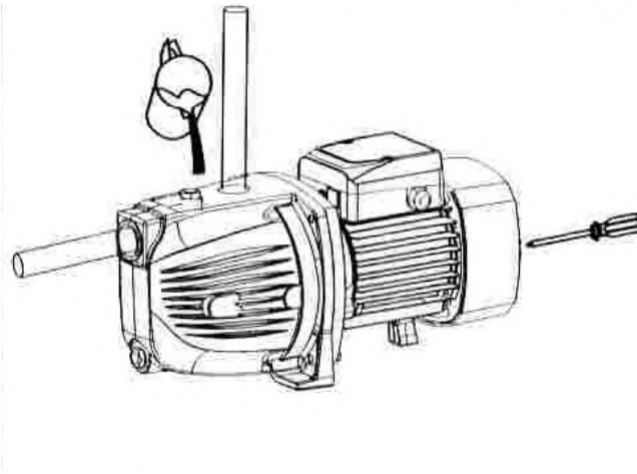
Some inline filters may have a red push-button valve to release pressure for maintenance. Wright Morgan does not recommend this filter type. If the filter is incorrectly installed (too high above the water source) the suction may pull the valve open and introduce air. To prevent this, seal the push-button with silicone sealant or epoxy, or replace the button with a bolt and nut, sealed with silicon and tightened down.

Foot Valve – The foot valve is a valve installed at the water intake that allows water to flow in one direction only. It is required in any case where the pump is located higher than the low-water level in the source. Use a high quality spring-loaded foot valve to avoid loss of prime.

Priming the Pump – The Wright Morgan Grid Tie Booster Pump self-priming, so long as the pump body is filled with water before first use. Before starting the pump turn the fan to check whether the pump rotates easily.

Unscrew the water injection screw, fill the pump body with clean water through the injection hole, and then tighten the water injection screw after purging the air. The valve should be closed a little when starting, and the valve should be adjusted to the required flow rate after water is discharging.





Pipe Unions – If rigid piping (copper or PVC) is directly plumbed to the pump, unions are required. Unions make pump replacement easy, without the need to cut and re-solder or re-glue the pipe.

Float Switch – A float switch is a mechanical device that opens or closes a contact depending on its orientation in the water. A float switch may be used if dropping water level is causing a dry run condition or in a storage tank, pond or cistern to turn the pump off when full. It can be wired directly to the power cable to control the pump motor. WrightMorgan.com carries both switch types outlined below:

- Wright Morgan recommends wiring a *normally open* switch if you want to turn off the pump when the reservoir you are drawing FROM is low.
- Wright Morgan recommends wiring a *normally closed* switch if you want to turn off the pump when the storage tank you are pumping INTO is full.

Most float switches are rated for 15 AMPS at 230 VAC, ensure your motor does not exceed the capacity of the switch.

Mounting the Pump – The pump may be mounted horizontally or vertically. If mounted vertically face the pump head downward.

Freeze Protection – Take every precaution to prevent the pump from freezing. The forged brass pump head will survive most light freezes, but a hard freeze may damage it. If the pump is insulated for freeze protection, keep the motor exposed to prevent overheating.



4. ELECTRICAL WIRING

The Wright Morgan Grid Tie Booster Pump comes with a standard 110V AC 3-prong cable attached. Simply plug the cable into a minimum 15 amp 110V outlet to power the pump.

5. TROUBLESHOOTING

Motor Doesn't Turn On

1. Check fuse or breaker and any control or wiring devices in line.

Pump Spins But Doesn't Pump Water

1. Check direction of rotation. If not clockwise (viewed from front-end) reverse inlet and outlet.
2. Check Prime - Open priming plug or valve and re-prime the pump. Check all the fittings, a pinhole leak in the suction pipe will cause loss of prime. Inspect, pressure-test, clean or replace the foot valve. Ensure no debris are trapped in the foot valve.
3. Polyethylene Pipe Fittings – Ensure fittings are tight. Gently heat with torch or hot water and retighten hose clamp with a wrench. Replace stripped clamps. Use stainless steel clamps.

Noisy Pump – A noisy pump indicates cavitation which can cause rapid pump wear.

Steady Buzzing sound – Indicates excessive suction. Check for any or a combination of the following:

1. High suction lift -- mount pump as close to the water source as possible.
2. Undersized suction pipe.
3. Clogged filter -- Fiber filter cartridges may be clogged and look clean (fine silt is in the fibers).
4. Soft, flexible hose on intake line may be crushed or kinked by suction -- replace with rigid pipe material.

Unsteady buzzing sound – Indicates leak in suction line allowing air to enter. Try the following:

1. Check for bubbles in inline (transparent) filter or air in outlet water.
2. Check prime. Open priming plug or valve and re-prime the pump. Check all the fittings, a pinhole leak in the suction pipe will cause loss of prime. Inspect, pressure-test, clean or replace the foot valve. Ensure no debris are trapped in the foot valve.
3. Some inline filters may have a red push-button valve to release pressure for maintenance. If the filter is incorrectly installed (too high above the water source) the suction may pull the valve open and introduce air. To prevent this, seal the push-button with silicone sealant or epoxy, or replace the button with a bolt and nut, sealed with silicon and tightened down.
4. If no source of air leakage is present, water may have high concentrations of dissolved gases which release as bubbles in the suction pipe. Reduce suction lift if possible. Install an air chamber in the intake line, with a valve on top. Pour water in to replace air when problem reappears.
5. Turning the filter to a horizontal position will move the bubbles out of the flow path of the water. Do not turn the filter upside down, as this could induce dirt into the pump during filter change.



Noise and vibration in the pipes / Extreme vibration of the pressure gauge – One of vanes in the pump is broken. The pump head must be rebuilt. There should be almost no vibration.

Low Flow Rate / Pump Turns Fast and Draws Low Current – Pump is worn out from dirt, rust or other abrasive particles in water, or from cavitation, from running dry or age.

Low Flow Rate / Pump Turns Slowly and Draws High Current (may run hot and/or blow fuses) / Pump is Difficult to Turn

1. Excessive vertical lift, beyond the system's capacity
2. Mineral Deposits - Turn shaft with two fingers. If difficult to turn, use vinegar to dissolve the mineral deposits in the plumbing. Remove pipes from the pump and allow solution to circulate through the pump by turning it backwards. Replace or rebuild the pump if deposits cannot be removed.

Low Flow Rate / Pump turns Slow, Motor Cool

1. Voltage at motor measures lower than voltage at source. Power wire is undersized. Consult wire size chart.

Pump Will Not Turn – The shaft coupler can't be turned by hand. The fuse is blowing or breaker is tripping.

1. After a period of disuse or storage, the impeller may lock up. Using pliers on the shaft coupler, gently rotate the pump backwards (counterclockwise).
2. Debris is jammed in the pump. Disconnect the plumbing, pour water into outlet, and run pump in reverse (by reversing polarity). Watch for debris exiting inlet. Damage to the pump is likely.

Pump Emits Crunching Sounds, Black Material in Outlet – Internal parts are broken, either by debris in pump, severe freezing or external shock.

Rusty/Noisy Bearings

Pump head - Steel ball bearings are visible at pump head shaft. Rust caused by water drip or submersion. Pump head must be rebuilt to replace the bearing.

Pump Frozen by Low Temperature / Blown fuse or circuit breaker tripped – Allow the pump to thaw. Observe performance. If the motor is damaged, replace or rebuild. Check all plumbing for damage and leaks and protect from future freezing.

6. MAINTENANCE

Regularly clear filters and debris from inlet suction lines.

Properly winterize pump by draining all water prior to the first freeze.



7. PUMP REPAIRS

FAILURES

Pump Head – The pump head is user repairable with the proper maintenance kit and tools. See the diagram in section 8 of this manual. Visit www.wrightmorgan.com for available kits and instructional videos on maintenance and repair.

WARRANTY CLAIMS must include receipt to prove date of purchase.

TO SHIP PUMP TO WRIGHT MORGAN FOR REPAIR:

Please contact Wright Morgan to set up a repair and receive an RMA number

Email: sales@wrightmorgan.com

Have the MODEL & SERIAL NUMBERS available before initiating a return for repair.

WARRANTY

Wright Morgan products are warranted to be free from defects in material and workmanship for ONE (1) YEAR from date of purchase.

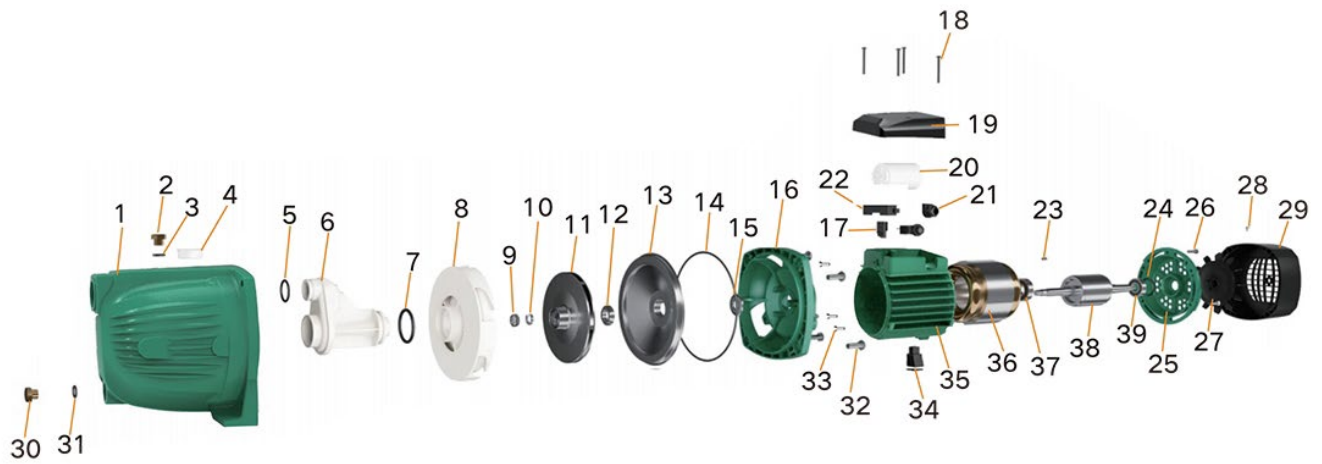
Failure to provide correct installation, operation, or care for the product, in accordance with instructions, will void the warranty.

Product liability, except where mandated by law, is limited to repair or replacement, at the manufacturer's discretion. No specific claim of merchantability shall be assumed or implied beyond what is printed on the manufacturer's printed literature. No liability shall exist from circumstances arising from the inability to use the product, or its inappropriateness for any specific purpose. It is the user's responsibility to determine the suitability of the product for any particular use.

In all cases, it shall be the responsibility of the customer to insure a safe installation in compliance with local, state and national electrical codes.



8. PARTS DIAGRAM



NO.	Part
1.	Pump body
2.	Screw
3.	O-ring
4.	Seal
5.	O-ring
6.	Ejector
7.	O-ring
8.	Diffusor
9.	Locknut
10.	Washer
11.	Impeller
12.	Mechanical seal
13.	Dam-board
14.	O-ring
15.	Water washer
16.	Motor front cover
17.	Seal sheath
18.	Bolt
19.	Terminal box
20.	Capacitor

NO.	Part
21.	Cable sheath
22.	Terminal block
23.	Shaft key
24.	Spring washer
25.	Motor end cover
26.	Screw
27.	Fan
28.	Bolt
29.	Fan cover
30.	Screw
31.	O-ring
32.	Screw
33.	Screw
34.	Motor foot
35.	Motor body
36.	Coil
37.	Bearing
38.	Rotor
39.	Bearing