


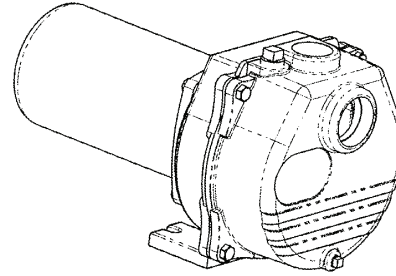


A. Y. McDonald Mfg. Co.

88000 CENTRIFUGAL PUMPS INSTALLATION INSTRUCTIONS



SAFETY WARNING
BEFORE OPERATING OR INSTALLING THIS PUMP, READ THIS MANUAL AND FOLLOW ALL SAFETY RULES AND OPERATING INSTRUCTIONS.



SAFETY - CAREFULLY READ THE SAFETY MESSAGES IN THIS MANUAL AND ON PUMP

FOR DUAL VOLTAGE MOTORS
Voltage change instructions are located on motor label or on wiring access cover.

CAUTION -
• DO NOT OPERATE THIS PUMP DRY!
• Review instruction before operating.

WARNING - ELECTRICAL PRECAUTIONS
All wiring, electrical connections, and system grounding must comply with the National Electrical Code (NEC) and with any local codes and ordinances. Employ a licensed electrician. For non-thermally protected motors use with approved motor control that matches motor input in full load amperes with overload element(s) selected or adjusted in accordance with control instructions.

WARNING - RISK OF ELECTRIC SHOCK

- Have an electrician provide electrical power to the motor.
- Motor must be grounded and terminal cover in place to reduce electrical shock hazard.
- Keep motor operating area as dry as possible.
- A ground fault interrupter (GFI) protected circuit is recommended for use with an electrical device operating near water.
- Always disconnect power before servicing.
- Not investigated for use in swimming pool areas.

APPLICATION

This pump is suitable for installations where the vertical distance from the pump to the water level does not exceed 25 ft. In all installations, friction losses in the suction pipe must be taken into consideration.

PERFORMANCE

MODEL NUMBER	HP	Discharge Pressure (in PSI) at 5 ft. lift				Max PSI
		10	20	30	40	
		CAPACITIES IN U.S. GPM				
88075	3/4	63	52	40	12	45
88100	1	72	62	46	20	45
88150	1 1/2	90	82	64	40	47
88200	2	97	90	74	47	48

INSTALLATION

PUMP LOCATION: The pump should be installed in a clean, dry and ventilated location which provides adequate drainage and room for servicing and protection from freezing temperatures. It should be bolted down evenly on a good foundation, preferably concrete, to prevent the development of unnecessary stress. Locating the pump as close as possible to the source of water supply reduces the friction losses in the suction pipe and provides for maximum capacities.

SUCTION PIPE: It is recommended that only new clean pipe or hose be used and the size be the same as that of the pump suction tapping. A check valve is recommended to ensure easier priming. If the pump is installed any appreciable distance away from the source of water supply, the suction pipe should be increased by one size. The suc-

tion pipe must always slope upwards from the water source to the pump to avoid air pockets in the line. In cases where the pump has to be reprimed often and it is not necessary that a lot of water be delivered, it is advisable to use a 90° or 45° elbow on the suction line. This enables the pump to prime sooner and also prevents kinking of the hose. In cases where a maximum volume of water is required over a prolonged period of time, the suction line should be led almost horizontally to the pump. Non-toxic thread compound should be used on all pipe joints and connections should be thoroughly tightened. A strainer should be connected to the bottom end of the suction pipe and it should be well submerged at all times.



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⚠ WARNING - RISK OF ELECTRICAL SHOCK

• **WIRING:** Make sure the voltage and frequency of the power supply agrees with that stamped on the motor nameplate. If in doubt, check with the power company.

⚠ WARNING - ELECTRICAL PRECAUTIONS

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SINGLE PHASE: Determine incoming voltage to motor. Where possible, use 230V. Connect wiring to terminal board located inside motor end cover. Be sure voltage connections agree with wiring diagram on motor nameplate.

THREE PHASE: Three Phase motors require magnetic starters, and can run in either direction, depending on how they are connected to the power supply.

Check for Proper Rotation: Remove the motor end cover to expose the motor shaft. If hookup is correct, the shaft will rotate clockwise. If rotation is not clockwise, reverse any two leads to the starter. The rotation will now be correct.

⚠ WARNING - RISK OF ELECTRICAL SHOCK

GROUNDING THE MOTOR: WIRING TO THIS PUMP MUST BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE OR YOUR LOCAL ELECTRIC CODE. IF MORE INFORMATION IS NEEDED, CALL YOUR LOCAL LICENSED ELECTRICIAN OR YOUR POWER COMPANY.

It is recommended that a permanent ground connection be made to the unit using a conductor of appropriate size from a metal underground water pipe or a grounded lead in the service panel. Do not ground to a gas supply line. Do not connect to electric power supply until unit is permanently grounded. Connect the ground wire to the approved ground and then connect to the terminal provided.

OPERATION - PRIMING THE PUMP

⚠ WARNING - DO NOT RUN THE PUMP BEFORE PRIMING IT. THE SEAL AND IMPELLER COULD BE PERMANENTLY DAMAGED

PRIMING THE PUMP: A priming plug is provided in the top of the casing to fill the pump with water. Once filled and the priming plug replaced, the pump will prime. The priming time depends upon the vertical and horizontal distance between the pump and the water level.

⚠ CAUTION - DO NOT run the pump before filling the pump case with liquid, as it may damage the seal.

PRIMING UNDER PRESSURE: (Refer to Figure 1) Should it be necessary to prime under pressure, place a check valve on the discharge line of the pump and a pet cock or a ball type air bleeder in place of the priming plug, or an air bleed line with a gate valve connected to the discharge line. It will then be possible for the liquid to remain in the discharge pipe and allow the pump to bleed off the remaining air, thereby facilitating priming.

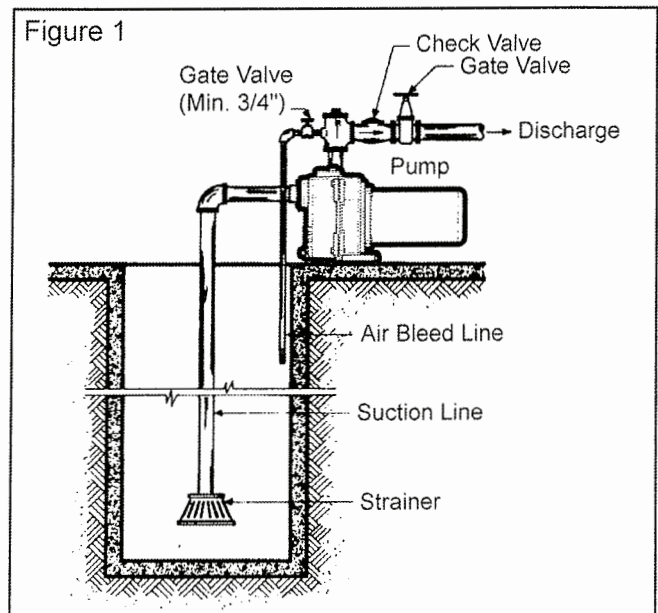
IMPELLER ROTATION: The impeller must rotate in a counter-clockwise direction as seen facing the pump from the front of the casing. In the event of wrong rotation for electric motor models, refer to the instructions furnished with the motor. The rotation of three phase motors can be changed by interchanging any two lead wires.

STARTING THE PUMP: Never operate the pump dry as this may damage the seal. If an exceptionally long suction line is used, the water in the pump casing may become overheated or vapour locked. Should this occur, replace the water in the casing with cold water and continuing priming.

DRAINING: Should the pump be subject to freezing temperatures, it will be necessary to drain the pump completely. To drain, remove the drain plug located at the bottom of the front face of the pump casing and the priming plug and make sure that the drain hole is not

restricted. After the water has been drained, operating the pump for a few seconds will ensure that the impeller is devoid of water (make sure that the suction line is also devoid of water).

STORAGE OF PUMP: Drain liquid from pump to prevent freezing. It is recommended that a good rust inhibitor be put in the liquid end to prevent excessive corrosion. Be sure motor is kept dry and covered. When restoring the use of the pump, replace all plugs and make sure all connections are tightly sealed. After a complete check is made, make the initial prime according to directions under the section, Priming the Pump.



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MAINTENANCE

! WARNING - ELECTRICAL PRECAUTIONS

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LUBRICATION:

- a) The pump requires no lubrication.
- b) For electrical motor models, refer to instruction provided by the motor manufacturer.

Disassembly (Refer to Figure 2):

- 1) Shut off the power to the pump at the main service panel and disconnect the power supply from motor.
- 2) Open a tap in the water system to release the pressure.
- 3) Remove the drain and fill plugs to allow the pump to drain.
- 4) Remove the four bolts (11) and remove casing (1).
- 5) Remove three screws to separate diffuser (3) from motor adapter (2).
- 6) Remove cap (5) and insert a screwdriver to prevent the shaft from turning while unscrewing the impeller (4). For Larger size motors remove rear cover and hold shaft using a flat wrench inserted from the side, through the opening in the end housing. Impeller has right-hand thread. If impeller cannot be turned by hand, insert a flat object into the impeller vane.

Note: Use strap wrench on impeller eye to remove impeller.

- 7) Slip the rotating seal (13) off the impeller hub.
- 8) To replace seal seat (13A); remove bolts (10) to separate the motor (9) from the motor adapter (2). Push seal seat (13A) out of motor adapter (2) from motor side.

Reassembly:

- 1) Clean all the parts thoroughly before assembling.
- 2) Lightly lubricate (soapy water) the rubber cap on the ceramic seal (13A) and push it into the adapter using thumbs only. Make sure the smooth surface of the ceramic seat faces outwards. NOTE: If the pump will remain out of service for longer than one week, the seal components must be installed dry (no lubrication).
- 3) Put the adapter back on the motor.
- 4) Lubricate the rotating seal (13)(soapy water) and slip it onto the impeller hub with the 'carbon' ring towards the ceramic seat. Apply thread locker to shaft threads prior to installing impeller.
- 5) Replace the impeller (4) and the diffuser (3).
- 6) Replace the casing (1) making sure that the gasket is not damaged and is in place.
- 7) Reconnect the tubes to the casing and to the pressure switch.
- 8) Reconnect the power.
- 9) Prime pump, start, check for leaks.

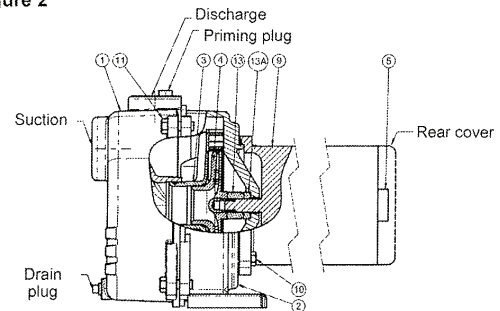
Preventative Maintenance:

At the end of the season, drain remaining water from casing from the drain plug at the bottom and flush the pump out with clean water. Replace plug and fill the pump end with an R.V. (Recreational Vehicle) Antifreeze. Ensure that the pump end is completely drained and flushed prior to priming in the new season.

PRECAUTIONS

Whenever pump is dismantled and then reassembled, always check to see that the impeller rotates freely within the diffuser.

Figure 2



TROUBLESHOOTING

SYMPTOM	CAUSE	REMEDY
Failure to pump	Pump not properly primed.	Make sure pump casing and suction line are full of water. See priming instructions.
	Speed too low	Check voltage at motor terminals and at meter when pump is operating. If low, refer to wiring instructions or check with your power company. Check loose connections.
	Total head more than for which pump was intended	A pump designed for higher head needed.
	Suction lift is too great.	Locate pump closer to source of water. Make sure suction piping is large enough.



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TROUBLESHOOTING (cont.)

SYMPTOM	CAUSE	REMEDY
Reduced capacity and/or head:	Air pockets or leaks in suction line.	Check suction piping.
	Clogged impeller	Remove and clean.
	Strainer too small or clogged	Use larger strainer or clean.
	Insufficient submergence of suction line.	Add lengths of suction pipe to keep submerged end well below the water surface.
	Excessive suction lift.	If caused by suction pipe friction, enlarge piping.
	Total head more than that for which pump was intended	A pump designed for higher head is needed.
	Excessively worn impeller	Order replacement parts using Repair Parts List.
Pump loses prime:	Air leaks in suction line.	Check suction piping.
	Excessive lift and operating too near shut-off point.	Move pump nearer water level.
	Water level drops while pumping, uncovering suction piping.	Check water supply. Add length of pipe to suction to keep submerged end under water.
Mechanical troubles and noise	Bent shaft and/or damaged bearings.	Take motor to authorized motor repair shop.
	Suction and/or discharge piping not properly supported and anchored	See that all piping is supported to relieve strain on pump assembly.

LIMITED WARRANTY

LIMITED WARRANTY TO DISTRIBUTORS, WHOLESALERS, UTILITIES AND CONTRACTORS ONLY AND EXCLUSION AND DISCLAIMER OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED: A.Y. McDonald Mfg. Co. (McDonald) warrants its pumps and pump accessories against defects in workmanship and material for two (2) years from date of manufacture or one (1) year from the date of installation, whichever is earliest. McDonald will at their discretion replace, or repair and return, or refund the purchase price of any pump or pump part found, upon inspection, to be defective in workmanship or material. A letter containing the serial and model numbers of the product(s) and describing the defect should be forwarded to McDonald promptly upon discovery thereof at the address indicated below. Upon written authorization from McDonald, the product(s) should be promptly shipped to McDonald with transportation costs prepaid. If the product is found to be defective, within the terms of this warranty, credit will be issued to offset the transportation cost of the return to McDonald for all shipments within the continental United States, and repaired or replacement product(s) will be shipped prepaid by McDonald. McDonald is not responsible for labor or other charges necessitated by the removal and reinstallation of any pump or any part or parts thereof.

This warranty does not apply to damage caused by sand or abrasive materials in the water, corrosion due to aggressive waters, storm, fire, wind, accident or similar casualty or by improper electrical supply, improper installation, careless handling, misuse or negligence. McDonald shall not be liable for any consequential or incidental damages to the purchaser or anyone else. Some states do not allow exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. Equipment and accessories not manufactured by McDonald are warranted only to the extent of the original manufacturer's warranty, including the motors, tanks, air volume controls and pressure switches which may be part of the pump system.

THIS WARRANTY IS THE ONLY WARRANTY APPLICABLE TO THIS PURCHASE. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED AND EXCLUDED. IT IS UNDERSTOOD AND AGREED THAT McDONALD'S LIABILITY, WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY THEORY, IN NEGLIGENCE OR IN STRICT LIABILITY, SHALL NOT EXCEED THE TERMS SET FORTH IN THE PRECEDING PARAGRAPH. THE PRICE STATED FOR THE GOODS IS A CONSIDERATION IN LIMITING McDONALD'S LIABILITY. THIS WARRANTY IS EXTENDED TO DISTRIBUTORS, WHOLESALERS, UTILITIES AND CONTRACTORS WHO HAVE PURCHASED PRODUCTS PRODUCED BY McDONALD. McDONALD EXTENDS NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ON SUCH PRODUCTS TO "CONSUMERS" AS THAT TERM IS DEFINED IN THE MAGNUSON-MOSS WARRANTY FEDERAL TRADE COMMISSION IMPROVEMENT ACT (15 USCS SECTIONS 2301 ET SEQ.) AND THE REGULATIONS PROMULGATED THEREUNDER.



WARNING: It is unlawful in **CALIFORNIA & VERMONT** (effective 1/1/2010); **MARYLAND** (effective 1/1/2012); **LOUISIANA** (effective 1/1/2013) and the **UNITED STATES OF AMERICA** (effective 1/4/2014) to use any product in the installation or repair of any public water system or any plumbing in a facility or system that provides water for human consumption if the wetted surface area of the product has a weighted average lead content greater than 0.25%. This prohibition does not extend to service saddles used in California, Louisiana or under USA Public Law 111-380.



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