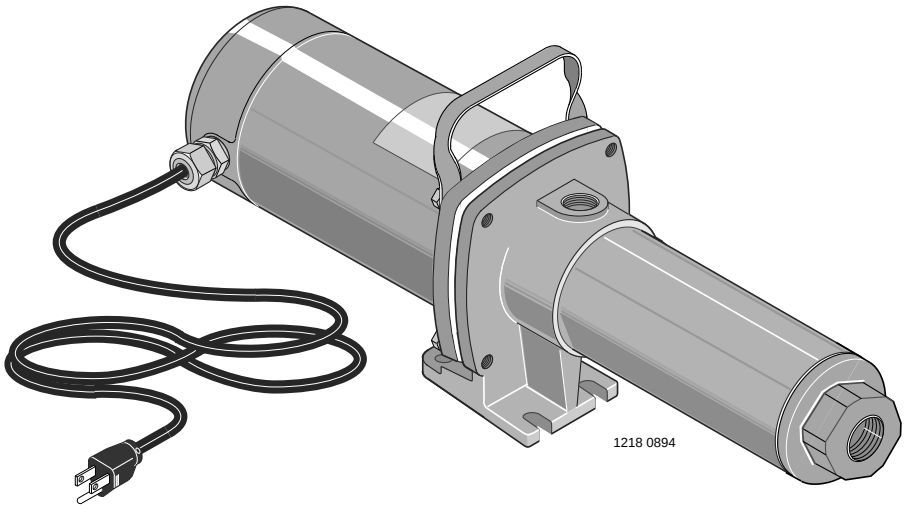
BERKELEY®

OWNER'S MANUAL

INSTALLATION AND OPERATING INSTRUCTIONS
REPAIR PARTS LIST

Signature 2000
High Pressure Booster Pump
60 Hz. 1/2 through 1-1/2 HP



SERIES	HP	PHASE	AVG. GPM
MGP7C-01	1/2	1	7
MGP7C3-01, MGP7C3-575	1/2	3	7
MGP7D-01	3/4	1	7
MGP7D3-01, MGP7D3-575	3/4	3	7
MGP7E-01	1	1	7
MGP7E3-01, MGP7E3-575	1	3	7
MGP20E-01	1	1	20
MGP20E3-01, MGP20E3-575	1	3	20
MGP20F-01	1-1/2	1	20
MGP20F3-01, MGP20F3-575	1-1/2	3	20

WICOR **Canada Company**
1800 Courtney Park Drive East, Unit 5-7, Mississauga, Ontario, L5T 1W1

BE327 (Rev. 6/23/98)

READ AND FOLLOW SAFETY INSTRUCTIONS!

⚠ DANGER

⚠ WARNING

⚠ CAUTION

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

ELECTRICAL SAFETY

⚠ WARNING

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

Ground pump before connecting to power supply.

⚠ Some models of pump are supplied with 3-connector grounding type cord. Connect only to properly grounded, GFCI protected outlet. Do not lift pump by electrical cord.

⚠ Pump is non-submersible. Keep motor dry at all times. Do not wash motor. Do not immerse. Protect motor from wet weather.

⚠ If using extension cord, use only UL approved indoor/outdoor, 3-wire, grounding type cord. Do not allow any part of cord or receptacle ends to sit in water or damp locations.

⚠ Unplug pump before servicing.

⚠ CAUTION Burn Hazard. 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.

Follow local and/or national plumbing and electrical codes when installing.

⚠ WARNING Hazardous Pressure. DO NOT run the pump with discharge shutoff, as hose may burst or pump may be damaged due to high temperatures.

GENERAL SAFETY

To avoid risk of serious bodily injury and property damage, read safety instructions carefully before installing pump.

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

⚠ WARNING Risk of electric shock. To avoid fatal shocks, proceed as follows if pump needs servicing.

A. **Disconnect power to pump outlet box before pulling pump cord plug.** After plug is pulled, let pump cool for 20 minutes before attempting to work on it.

B. **Take extreme care when changing fuses.** To reduced chance of fatal electrical shocks, **DO NOT** stand in water or put your finger in the fuse socket.

C. **Ground** electrical outlet box.

D. **Use only Ground Fault Circuit Interrupter (GFCI) protected grounded outlet** for cord plug.

Never run pump dry. To do so can damage internal parts, overheat pump (which can cause burns to people handling or servicing pump), and will void warranty!

Do not pump chemicals or corrosive liquids with pump.

⚠ WARNING Hazardous Pressure.

A. **Use high pressure reinforced type discharge hose ONLY.** See parts list for available hose, nozzle and fittings. A high pressure relief valve is recommended.

B. **DO NOT use garden hose with H.P. Booster pump!** Garden hose will not stand the discharge pressure produced and will fail!

C. **High pressure discharge stream is dangerous!** To avoid injury, **DO NOT aim the discharge stream at any person or animal.**

D. **BE SURE pump suction pipe pressure plus pump discharge pressure does not exceed pressure rating of hose and fittings!** See Table I for pump discharge pressure ratings.

INSPECT THE SHIPMENT

The high pressure booster pump has been carefully inspected and packaged to assure safe delivery. Inspect the pump and fittings and report to the carrier any items which are damaged or missing.

INSTALLATION

The pump is designed to boost city water pressure or water pressure from a private water system. Use this high pressure stream to wash down milk parlors, barns, garages and driveways, or for fire protection.

The pump is portable with a convenient carrying handle. If an existing pressure water system is to be used as a water supply, it can be connected with available fittings and 3/4" or 1" high pressure hose to the pump inlet. A special heavy duty 3/4" or 1" suction hose with fittings is available as an accessory. If pump is permanently mounted on wall, use a 3/4" or 1" pipe or heavy-duty hose for suction line. 20 GPM models require one-inch discharge hose to reduce friction losses.

TABLE I - DISCHARGE PRESSURE

Series	HP	No. of Stages	Rated Flow in GPM	Discharge Pressure PSI at Rated Flow	Discharge Pressure PSI at No Flow
MGP7C	1/2	9	7	90	130
MGP7C3	1/2	9	7	90	130
MGP7D	3/4	12	7	123	173
MGP7D3	3/4	12	7	123	173
MGP7E	1	16	7	162	229
MGP7E3	1	16	7	162	229
MGP20E	1	7	20	75	110
MGP20E3	1	7	20	75	110
MGP20F	1-1/2	9	20	97	143
MGP20F3	1-1/2	9	20	97	143

*For total discharge pressure, add this pressure to suction pipe pressure. For example, an MGP7C pump taking suction from a 100 psi water service line will produce 130 + 100 = 230 psi total discharge pressure at 0 GPM flow. If suction pressure drops to 50 psi, discharge pressure will drop to 180 psi.

⚠WARNING Hazardous pressure. Pump body may explode if pressures exceed rated limits. Maximum inlet pressure is 80 PSI. Maximum discharge pressure is 315 PSI. Warranty is void if these pressure limits are exceeded.

HIGH PRESSURE BOOSTER PUMP INSTALLATION INSTRUCTIONS

These instructions cover high pressure booster pump installations as shown below:

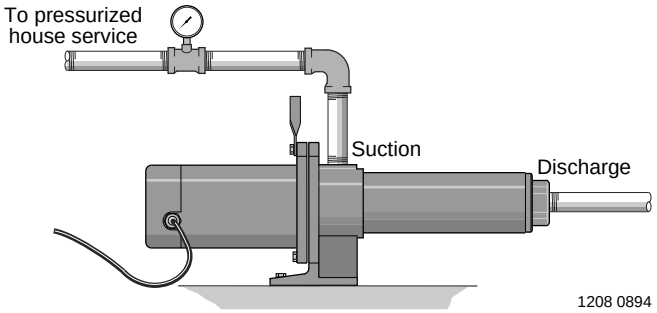


Figure 1 – Connection to house service.

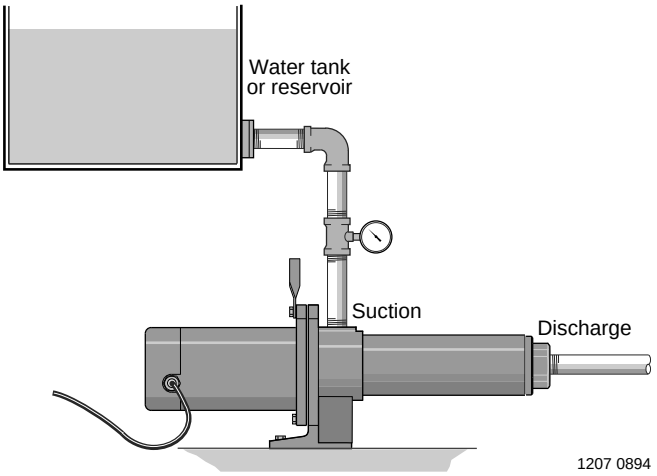


Figure 2 – Connection to water reservoir.

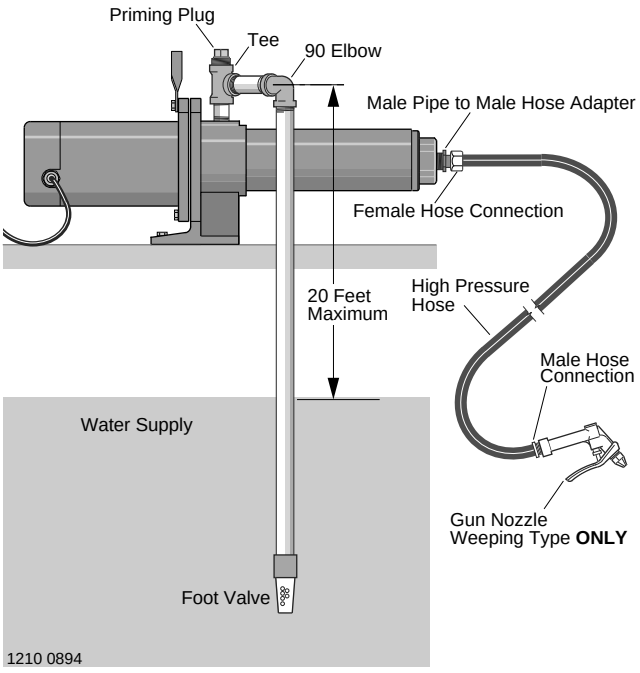


Figure 3 – Cistern or shallow well installation.

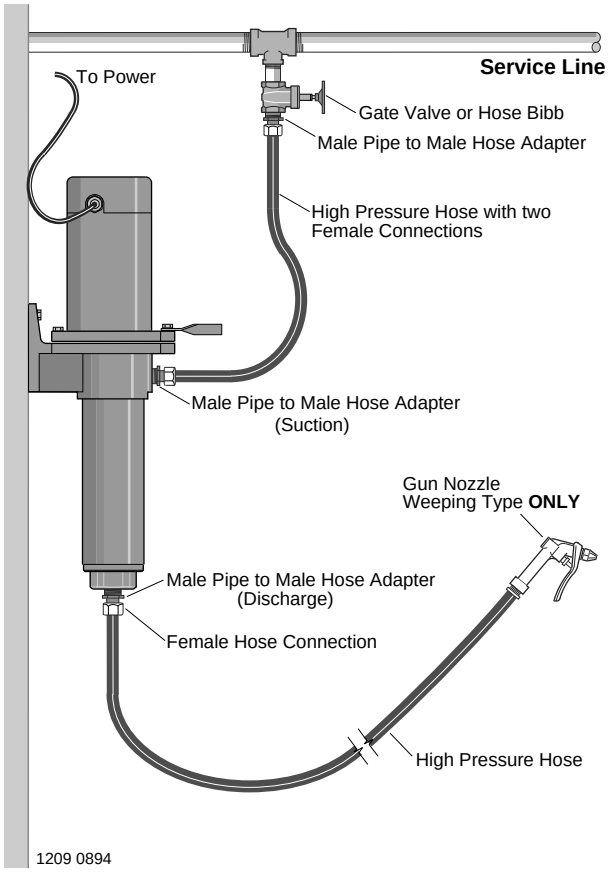


Figure 4 – Wall mounted to pressurized service line.

To reduce friction losses to a minimum, inlet (suction) line should be **short** and have as few elbows as possible.

Size inlet according to the chart below:

Ave. GPM	Threaded Inlet Size	Recom-mended Inlet Line Size	Recom-mended Discharge Line Size
7	3/4" NPT	1"	1"
20	3/4" NPT	1-1/4"	1-1/4"

An inlet strainer will prevent suspended debris from clogging pump.

The internal running surfaces of the pump and seals require water lubrication for good, consistent operation. **Allowing pump to run dry will severely damage pump and seals.**

Install a pressure gauge in pump inlet line. Keep at least two pounds per square inch pressure (2 PSI) in inlet line whenever pump is operating. If this is not possible, consult customer service representative.

LUBRICATION

It is not necessary to lubricate pump or motor. The motor is equipped with sealed ball bearings, lubricated for the life of the bearing. The mechanical shaft seal in the pump is self-lubricating and requires no adjustment. Disassemble pump to replace seal (See "Maintenance", Pages 7 and 8).

OPERATION

NOTICE: Observe the following precautions when operating the pump:

1. **Keep the motor dry! Do not** direct stream from pump discharge onto the motor!
2. ⚠WARNING **Hazardous pressure. Do not** run the pump with discharge shutoff, as hose may burst or pump may be damaged due to high temperatures.
3. **Do not** use a standard trigger gun with this pump. Use only trigger guns with an automatic weeping feature. These are available as accessories and are provided with three nozzles. The smallest nozzle restricts the flow, allowing use of a smaller water source. The two larger nozzles are used if the water source will supply the pump's full capacity.
4. **Do not** run pump dry; to do so may damage the seal.
5. To avoid internal damage to pump, **Do not** operate with water temperature above 175 degrees F.

⚠ Disconnect power before working on pump, motor, pressure switch, or wiring.

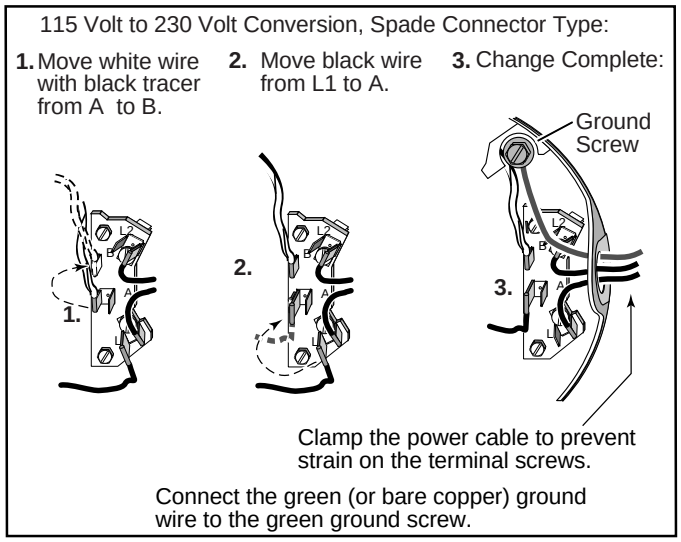


Figure 5: Motor wiring connection, Spade Connector

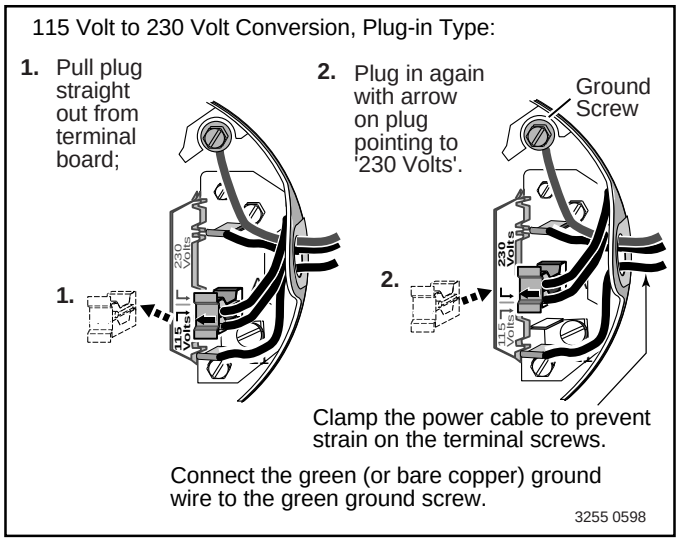


Figure 6: Motor wiring connection, Plug-in

ELECTRICAL

⚠ Ground motor before connecting to electrical power supply.

⚠ Failure to ground motor can cause severe or fatal electrical shock hazard.

⚠ Explosion hazard. Do not ground to a gas supply line.

⚠ To avoid dangerous or fatal electrical shock, turn OFF power to motor before working on electrical connections.

⚠ Supply voltage must be within ±10% of nameplate voltage. Incorrect voltage can cause fire or serious damage to motor and voids warranty. If in doubt consult a licensed electrician.

⚠ Use wire size specified in Wiring Chart (Table II, Page 6). If possible, connect pump to a separate branch circuit with no other appliances on it.

⚠ Wire motor according to diagram on motor nameplate. If nameplate diagram differs from diagrams above, follow nameplate diagram.

WIRING CONNECTIONS

1. Install, ground, wire and maintain this pump in compliance with the National Electrical Code (NEC) or the Canadian Electrical Code (CEC) and with all local codes and ordinances that apply. Consult your local building inspector for local information.
2. Make sure that the voltage, frequency and phase (single phase or three phase) of the power supply agree with that stamped on the motor nameplate. If in doubt, check with the power company.
3. Some models are equipped with three phase motors. Three phase motors require magnetic starters and can rum in either direction, depending on how they are connected to the power supply.

NOTICE: Dual voltage motors are factory wired for 115 volts. If necessary, reconnect the motor for 230 volts, as shown. Do not alter the wiring in single voltage motors.

Install, ground, wire, and maintain your pump in comliance with the National Electrical Code (NEC) or the Canadian Electrical Code (CEC), as applicable, and with all local codes and ordinances that apply. Consult your local building inspector for code information.

NOTICE: Clamp the power cable to prevent strain on the terminal screws.

NOTICE: Your Motor Terminal Board (under the motor end cover) looks like one of those shown above. Do not change motor wiring if line voltage is 115 volts or if you have a single voltage motor. Connect power supply as shown for your supply voltage.

To Convert 115 Volts to 230 Volts, Spade connector type (see Figure 5).

1. Unplug the motor.
2. Loosen the two screws on the end of the motor. Gently pull the canopy from the motor.

   NOTICE: Do not pull or jerk wires.
3. Connect the green (or bare copper) ground wire to the green ground screw first (see Figure 5). Use a solid copper wire at least as large as the power supply wires.
4. Move the white wire with black tracer from the “A” position to the “B” position on the terminal board.
5. Move the BLACK wire from the “L1” position to the “A” position on the terminal board.
6. Change is complete.

To Convert 115 Volts to 230 Volts, Plug-in type (see Figure 6).

1. Unplug the motor.
2. Loosen the two screws on the end of the motor. Gently pull the canopy from the motor.

   NOTICE: Do not pull or jerk wires.
3. Connect the green (or bare copper) ground wire to the green ground screw first (see Figure 6). Use a solid copper wire at least as large as the power supply wires.
4. Pull the plug straight out from the terminal board, from 115 Volt socket (Figure 6).
5. Plug in again with arrow on plug pointing to 230 Volts.
6. Change is complete.

NOTICE: Some models are equipped with three phase motors. Three phase motors require magnetic starters and can run in either direction, depending on how they are connected to the power supply.

To Check For Proper Rotation – 3 Phase Motors

⚠WARNING Risk of electrical shock.

1. Be sure power is disconnected to motor when working on electrical connections.
2. Remove the motor end cover, exposing motor shaft. Momentarily start pump. If hookup is correct, the shaft will rotate clockwise.
3. If rotation is not clockwise, reverse any two leads to the starter. The rotation will now be correct.

GROUNDING THE MOTOR

Ground the pump permanently using a wire of size and type specified by local or National Electrical Code.

Models with factory installed cord and plug:

⚠WARNING Risk of electric shock. This equipment is only for use on 115V and is equipped with an approved 3-conductor cord and 3-prong, grounding-type plug. To reduce the risk of electric shock, be certain that it is connected to a properly grounded, grounding-type receptacle. Do not modify or remove plug. Make sure pump circuit meets National Electrical Code. To avoid dangerous electrical shock hazard, keep cord dry at all times.

Models without cord and plug:

1. Connect ground wire first. Connect the ground first, then to green grounding terminal provided under motor canopy (see Figure 5) identified as GRD. Make ground connection to this terminal. **Do not** connect motor to electrical power supply until unit is permanently grounded; otherwise serious or fatal electrical shock hazard may be caused.
2. For best ground connection, connect to a grounded lead in the service panel or to a metal underground water pipe or well casing at least 10 ft. long. If plastic pipe or insulated fittings are used, run ground wire directly to the metal well casing or use ground electrode furnished by the power company.

MAINTENANCE

Pump Disassembly

⚠WARNING Hazardous voltage. Can shock, burn or cause death. Disconnect power to pump before servicing.

Tools required:
1. 7/16” open end wrench (2 required).
2. Flat blade screwdriver with insulated handle.
3. Work bench with vise recommended.
4. Pliers or similar tool.
5. Pipe wrench.

TABLE II - RECOMMENDED FUSING AND WIRING

For 115/230 volt, 1-phase and 230/460 volt, 3-phase. For 575 volt installations, consult a licensed electrician.

Motor H.P.	Volts/ Phase	Max. Load Amps	Branch Fuse Rating Amps	Wire Length			
				0’-50’	51-100’	101-200’	201-300’
				Wire Size			
1/2	115/1	12.4	20	12	12	10	8
1/2	230/1	6.2	15	14	14	14	14
1/2	230/3	3.1	15	14	14	14	14
1/2	460/3	1.55	15	14	14	14	14
3/4	115/1	14.8	20	12	12	8	6
3/4	230/1	7.4	15	14	14	14	14
3/4	230/3	3.6	15	14	14	14	14
3/4	460/3	1.8	15	14	14	14	14
1	115/1	19.2	25	10	10	8	6
1	230/1	9.6	15	14	14	14	12
1	230/3	4.7	15	14	14	14	14
1	460/3	2.35	15	14	14	14	14
1-1/2	230/1	12.0	15	14	14	14	12
1-1/2	230/3	6.8	15	14	14	14	14
1-1/2	460/3	3.4	15	14	14	14	14

Impeller Stack Changeout (See Figure 7)

Remove pump from service and mount vertically in vise (if available) motor side down. Hold at center of motor. It may be desirable to wrap motor with a shop rag to protect outside surface.

Proceed as follows:

1. Attach pipe wrench to flats on discharge connection and turn clockwise to remove (left hand threads).
2. Remove screws holding motor canopy and remove canopy. Pull straight off as shown. Leave switch wires attached (if present).

   ⚠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.
3. Unscrew capacitor clamp and remove capacitor. Do not disconnect capacitor wires. Slide 7/16" open end wrench in behind spring loaded centrifugal switch as shown. Place on motor shaft flats to hold shaft stationary.
4. With one 7/16" wrench in place on motor shaft, place second wrench on shaft hex at pump end and unscrew impeller stack by turning counter-clockwise.
5. Once loose from motor shaft, hold shaft by snap ring using a pliers or similar tool, and pull stack from shell. You may have to apply a back and forth motion to break stack loose from shell.

To assemble with replacement impeller stack, keep pump in the vertical position, motor down, and reverse instructions 1 through 5.

Assembly hints:

A. Apply a soapy water solution to suction and discharge O-Rings to ease seating of shell.

B. Make sure mechanical shaft seal spring is in proper position on motor shaft.

C. On three-phase models, apply Loctite No. 271 to motor shaft threads before reinstalling stack.

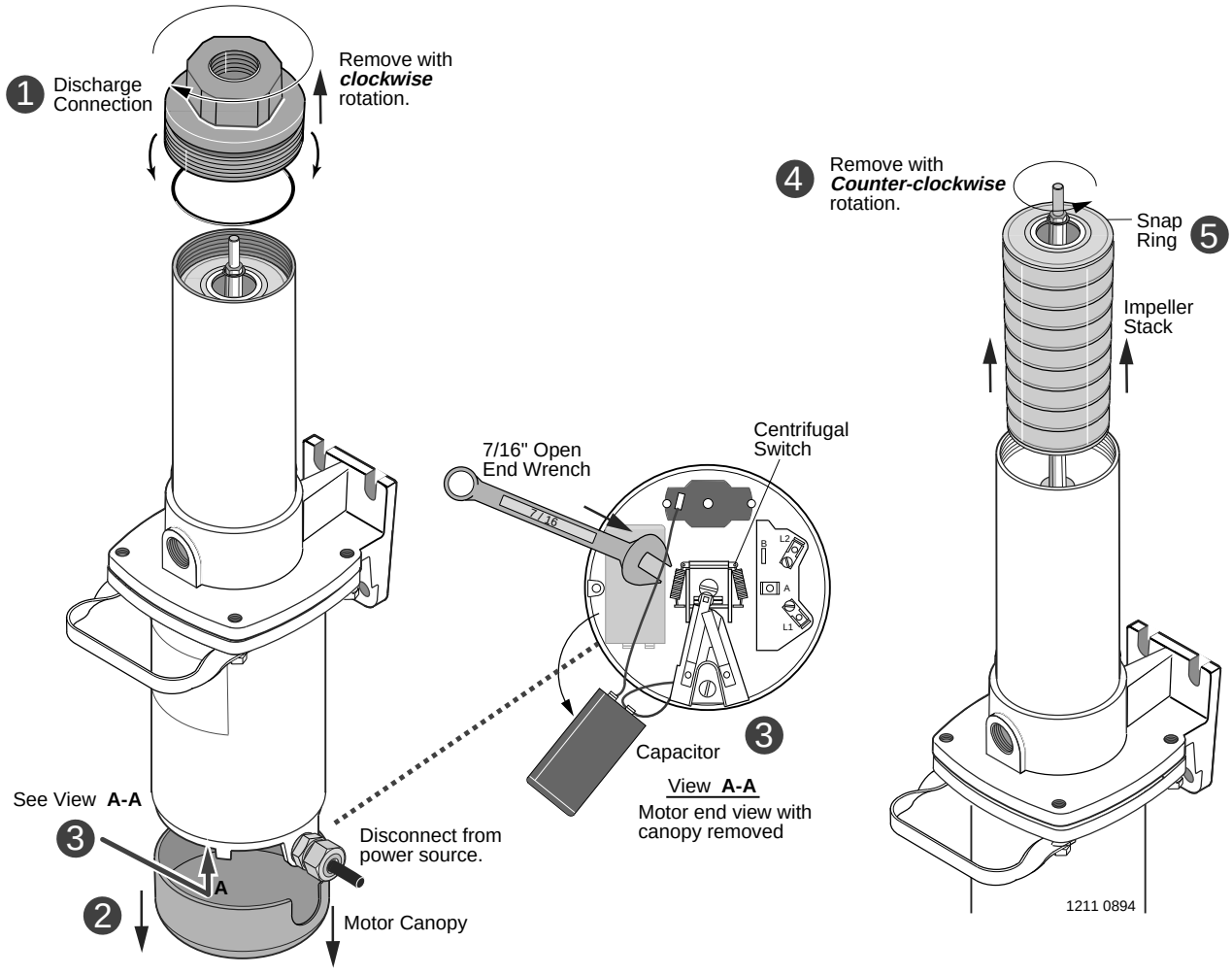


Figure 7 – Impeller stack changeout.

Mechanical Seal Changeout
(refer to Figures 7 and 8)

This procedure is best completed with the pump held in a vertical position, motor down.
First complete **"Disassembly"** instructions 1 through 5 under **"Impeller Stack Changeout."** (see Figure 7).

6. Remove 4 capscrews holding pump body to motor. Pump handle will come off with top capscrews.
7. Unscrew pump shell from pump body, turning clockwise (left hand threads).
8. Remove mechanical shaft seal spring and rotating half from motor shaft. Use care not to scratch motor shaft when removing rotating half.
9. Remove pump body from motor and place on flat surface, face down. Again, use care not to scratch motor shaft.
10. Use a screwdriver to push ceramic seat out from seal cavity as shown.
11. Installation of ceramic seat:
    A. Turn pump body over so seal cavity is up; clean cavity thoroughly.
    B. Clean polished surface of ceramic seat with a clean cloth.
    C. Lubricate outside rubber surface of seat with soapy water. Place cardboard washer over polished face of seat and press into seal cavity using a 3/4" socket or a piece of 3/4" standard pipe.
    D. Be sure polished surface of seat is free of dirt and has not been damaged by insertion. Remove excess soapy water. Dispose of cardboard washer.
12. Installation of rotating half and spring:
    A. Reinstall pump body on motor using extreme caution not to hit ceramic portion of seal on motor shaft. Reattach pump body to motor using capscrews. Be sure to reinstall pump handle at this time.
    B. Inspect shaft to make sure that it is clean.
    C. Clean face of rotating half of seal with a clean cloth.
    D. Lubricate inside diameter of rotating half with soapy water and slide onto motor shaft (sealing face first).
    E. Place spring over motor shaft so it rests on rotating half.
13. To complete reassembly from this point, reverse instructions 1 through 5 under **"Impeller Stack Changeout."**

    NOTICE: Lubricate suction and discharge O-Rings with soapy water for easier installation of shell.

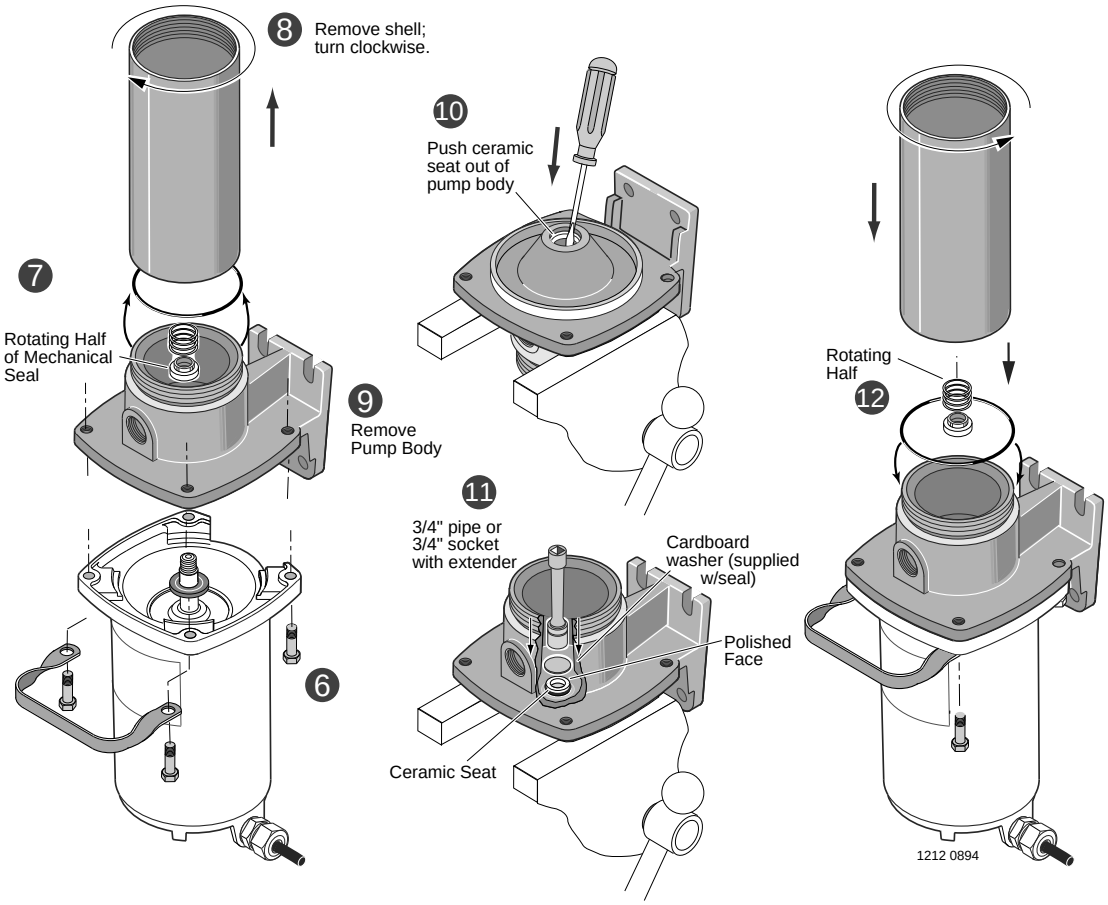


Figure 8 – Mechanical seal changeout.

BERKELEY LIMITED WARRANTY

Berkeley/Wicor Canada Company (“Wicor”) warrants to the original consumer purchaser (“Purchaser”) of its products that they are free from defects in material or workmanship.

If within twelve (12) months from the date of installation or twenty-four (24) months from the date of manufacture any such product shall prove to be defective, it shall be repaired or replaced at Berkeley’s/Wicor’s option, subject to the terms and conditions set forth below.

General Terms and Conditions

Purchaser must pay all labor and shipping charges necessary to replace product covered by this warranty. This warranty shall not apply to products which, in the sole judgement of Berkeley/Wicor, have been subject to negligence, abuse, accident, misapplication, tampering, alteration; nor due to improper installation, operation, maintenance or storage; nor to other than normal application, use or service, including but not limited to, operational failures caused by corrosion, rust or other foreign materials in the system, or operation at pressures in excess of recommended maximums.

Requests for service under this warranty shall be made by contacting the installing Berkeley/Wicor dealer as soon as possible after the discovery of any alleged defect. Berkeley/Wicor will subsequently take corrective action as promptly as reasonably possible. No requests for service under this warranty will be accepted if received more than 30 days after the term of the warranty.

The warranty on all three phase submersible motors is void if three-leg overload protection of recommended size is not used.

This warranty sets forth Berkeley’s/Wicor’s sole obligation and purchaser’s exclusive remedy for defective products.

BERKELEY/WICOR 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 DURATION OF THE APPLICABLE EXPRESS WARRANTIES PROVIDED HEREIN.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusions 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.

In the U.S.: Berkeley, 293 Wright St., Delavan, WI 53115

In Canada: Wicor Canada Company, 1800 Courtney Park Drive East, Unit 5-7, Mississauga, Ontario L5T 1W1

Wicor Canada Company, 200-E, Rue St-Louis, St-Jean-Sur-Richelieu, Québec J3B 1Y1

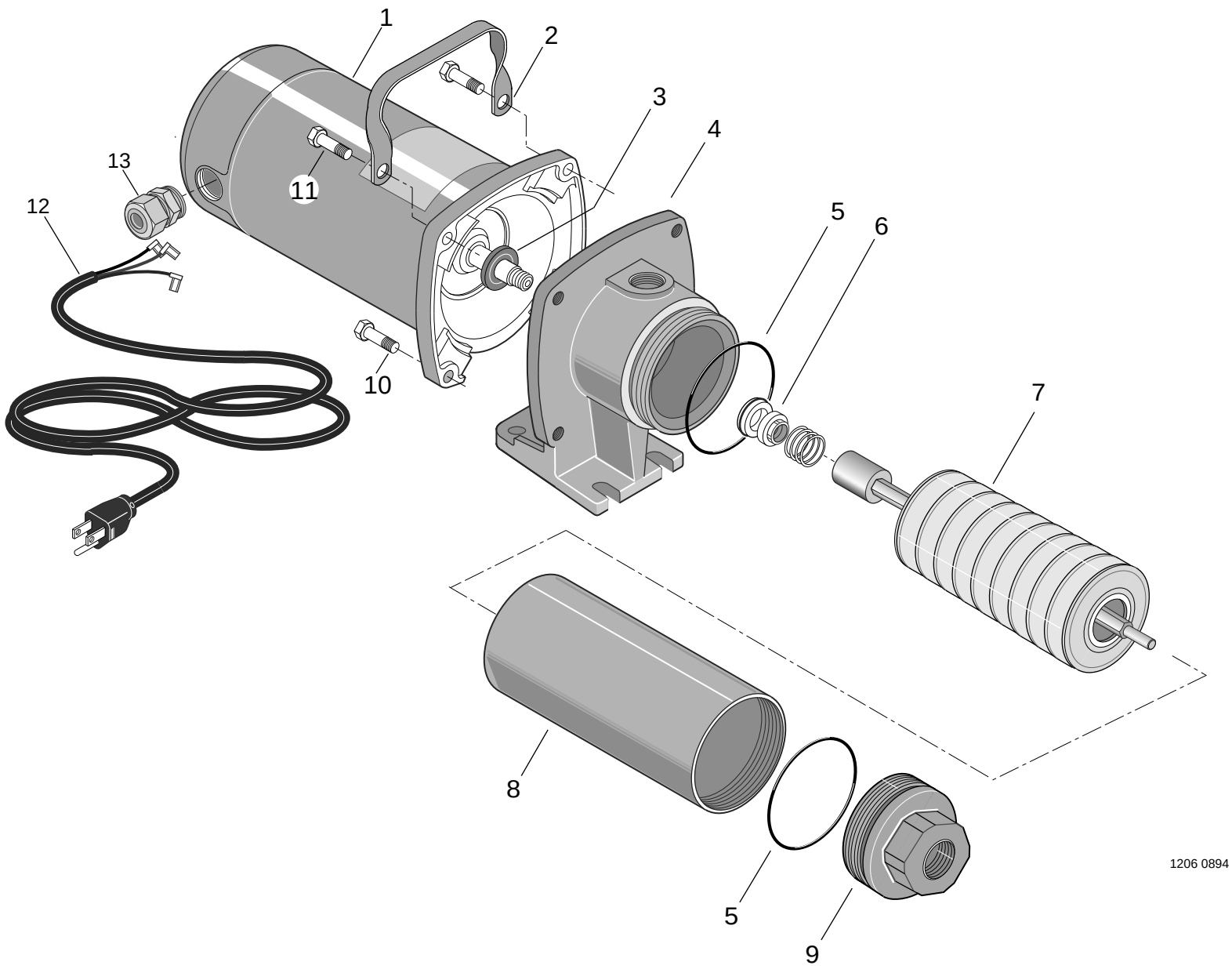


Figure 8 – Exploded view.

REPAIR PARTS LIST

Key No.	Description	Qty.	MGP7C-01 MGP7C3-01 MGP7C3-575 1/2 HP	MGP7D-01 MGP7D3-01 MGP7D3-575 3/4 HP	MGP7E-01 MGP7E3-01 MEP7E3-575 1 HP	MGP20E-01 MGP20E3-01 MGP20E3-575 1 HP	MGP20F-01 MGP20F3-01 MGP20F-575 1-1/2 HP
1	Motor - 115/230 Volt, Single Phase	1	A100CHL	A100DHL	A100EHL	A100EHL	AE100FHL
1	Motor - 230/460 Volt, Three Phase	1	AP100CH	AP100DH	AP100EH	AP100EH	AP100FH
1	Motor - 575 Volt, Three Phase	1	J218-989	J218-990	J218-991	J218-991	J218-992
2	Handle	1	C54-21	C54-21	C54-21	C54-21	C54-21
3	Water Slinger	1	C69-2	C69-2	C69-2	C69-2	C69-2
4	Pump Body	1	C2-85	C2-85	C2-85	C2-85	C2-85
5	O-Ring	2	U9-49	U9-49	U9-49	U9-49	U9-49
6	Shaft Seal	1	U109-118	U109-118	U109-118	U109-118	U109-118
7	Pump Stack	1	P325-333R	P325-334R	P325-335R	P325-336R	P325-337R
8	Pump Shell	1	P56-430SSL	P56-431SSL	P56-432SSL	P56-433SSL	P56-434SSL
9	Discharge Assembly	1	C152-3	C152-3	C152-3	C152-3	C152-3
10	Capscrew - 3/8 x 16 x 1-1/4”	2	U30-75ZP	U30-75ZP	U30-75ZP	U30-75ZP	U30-75ZP
11	Capscrew - 3/8 x 16 x 1-1/2”	2	U30-76ZP	U30-76ZP	U30-76ZP	U30-76ZP	U30-76ZP
12	Cord and Plug Assembly (115 volt, Single Phase only)	1	U17-402	U17-1238	–	–	–
13	Cord Connector (Single Phase only)	1	U71-7	U71-7	–	–	–

THE FOLLOW ACCESSORIES MY BE ORDERED FOR THE HIGH PRESSURE BOOSTER PUMPS

Hose 6’-3/4” w/Female Ends (150 PSI Rating)	Pkg. 83
Hose 25’-3/4” w/Male & Female Ends (150 PSI Rating)	Pkg. 84
Adapter 3/4” NPT x 3/4” Hose	Pkg. 85
Sprayer Gun	Pkg. 87
Nozzle - High Pressure	Pkg. 86
Suction Vacuum Relief Valve	Pkg. 96
Hose 25’ - 1” ID with 3/4” Ends (315 PSI Rating)	Pkg. 162