INSTALLATION AND OPERATION MANUAL
SELF-PRIMING CENTRIFUGAL PUMPS

Models: 1-1/2" - 3" Universal Drive
WB4, WB6, WB9, WB12,
WB19, WB21, WSB4,
WSB6, WSB9, WSB12,
WSB19, WSB21,
WHB7, WSBH7

DISCONTINUED
Parts may
NOT be available

IMPORTANT: Read all instructions in this manual before operating pump.
As a result of Burks® Pumps constant product improvement program, product changes
may occur. As such Burks Pumps reserves the right to change product without prior
written notification.
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SAFETY FIRST!

Please Read This Before Installing Or Operating Pump. This information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols:

**IMPORTANT!** Warnings about hazards that can result in personal injury or indicates factors concerned with assembly, installation, operation, or maintenance which could result in damage to the machine or equipment if ignored.

**CAUTION!** Warnings about hazards that can or will cause minor personal injury or property damage if ignored. Used with symbols below.

**WARNING!** Warnings about hazards that can or will cause serious personal injury, death, or major property damage if ignored. Used with symbols below.

- **Hazardous fluids** can cause fire or explosions, burns or death could result.
- **Toxic Fumes** - Breathing can cause nausea, fainting or death.
- **Biohazard** can cause serious personal injury.
- **Rotating machinery** Amputation or severe laceration can result.
- **Extremely hot** - Severe burns can occur on contact.
- **Hazardous pressure** Eruptions or explosions could cause personal injury or property damage.
- **Hazardous voltage** can shock, burn or cause death.
- **Eye protection required**

Only qualified personnel should install, operate and repair pump. Any wiring of pumps should be performed by a qualified electrician.

**WARNING!** To reduce risk of electrical shock, pumps and control panels must be properly grounded in accordance with the National Electric Code (NEC) or the Canadian Electrical Code (CEC) and all applicable state, province, local codes and ordinances. Improper grounding voids warranty.

**WARNING!** To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Lock out power and tag.

**WARNING!** Operation against a closed discharge valve will cause premature bearing and seal failure on any pump, and on end suction and self priming pump the heat build may cause the generation of steam with resulting dangerous pressures. It is recommended that a high case temperature switch or pressure relief valve be installed on the pump body.

**WARNING!** This pump is designed to handle materials which could cause illness or disease through direct exposure. Wear adequate protective clothing when working on the pump or piping.

**CAUTION!** Pumps build up heat and pressure during operation-allow time for pumps to cool before handling or servicing.

**WARNING!** Do not pump hazardous materials (flammable, caustic, etc.) unless the pump is specifically designed and designated to handle them.

**CAUTION!** Do not block or restrict discharge hose, as discharge hose may whip under pressure.

**WARNING!** Do not wear loose clothing that may become entangled in moving parts.

**WARNING!** Keep clear of suction and discharge openings. DO NOT insert fingers in pump with power connected.

Always wear eye protection when working on pumps.

Make sure lifting handles are securely fastened each time before lifting. DO NOT operate pump without safety guards in place. Always replace safety devices that have been removed during service or repair. Secure the pump in its operating position so it can not tip over, fall or slide.

DO NOT exceed manufacturers recommendation for maximum performance, as this could cause the motor to overheat.

**WARNING!** Electrical cable should be protected at all times to avoid punctures, cut, bruises and abrasions. Inspect frequently. Never handle connected power cords with wet hands.

**WARNING!** To reduce risk of electrical shock, all wiring and junction connections should be made per the NEC or CEC and applicable state or province and local codes. Requirements may vary depending on usage and location.

**WARNING!** Submersible Pumps are not approved for use in swimming pools, recreational water installations decorative fountains or any installation where human contact with the pumped fluid is common.

If pump is equipped with a gas or diesel powered engine, carefully read instruction manual supplied by engine manufacturer before operating.

**WARNING!** Products returned must be cleaned, sanitized, or decontaminated as necessary prior to shipment, to insure that employees will not be exposed to health hazards in handling said material. All Applicable Laws And Regulations Shall Apply.

Bronze/brass and bronze/brass fitted pumps may contain lead levels higher than considered safe for potable water systems. Various government agencies have determined that leaded copper alloys should not be used in potable water applications. For non-leaded copper alloy materials of construction, please contact factory.

**BURKS® Pumps is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.**
Limited Warranty

We warrant to our immediate customer and to the ultimate consumer that products of our manufacture will be free of defects in material and workmanship under normal use and service for the following time periods, when installed and maintained in accordance with our instructions.

Pump Products: One (1) year from date of installation or (24) twenty-four months from date of shipment, whichever occurs first. Cleaning Products: Twelve (12) months from date of installation or eighteen (18) months from date of shipment, whichever occurs first. As used herein, "the ultimate consumer" is defined as the purchaser who first uses the product after its initial installation or, in the case of product designed for non-permanent installation, the first owner who used the product. It is the purchaser’s or any sub-vendee’s obligation to make known to the ultimate consumer the terms and conditions of this warranty. This warranty gives you specific legal rights, and there may also be other rights which vary from state to state. In the event the product is covered by the Federal Consumer Product Warranties Law (1) the duration of any implied warranties associated with the product by virtue of said law is limited to the same duration as stated herein, (2) this warranty is a LIMITED WARRANTY, and (3) no claims of any nature whatsoever shall be made against us, until the ultimate consumer, his successor, or assigns, notifies us in writing of the defect, and delivers the product and/or defective part(s) freight prepaid to our factory or nearest authorized service station. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply.

THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY AND ALL WARRANTIES WITH RESPECT TO ANY PRODUCT SHALL BE TO REPLACE OR REPAIR AT OUR ELECTION, F.O.B. POINT OF MANUFACTURE OR AUTHORIZED REPAIR STATION, SUCH PRODUCTS AND/OR PARTS AS PROVEN DEFECTIVE. THERE SHALL BE NO FURTHER LIABILITY, WHETHER BASED ON WARRANTY, NEGLIGENCE OR OTHERWISE.

Unless expressly stated otherwise, guarantees in the nature of performance specifications furnished in addition to the foregoing material and workmanship warranties on a product manufactured by us, if any, are subject to laboratory tests corrected for field performance. Any additional guarantees, in the nature of performance specifications must be in writing and such writing must be signed by our authorized representative. Due to inaccuracies in field testing if a conflict arises between the results of field testing conducted by or for user, and laboratory tests corrected for field performance, the latter shall control. Components or accessories supplied by us but manufactured by others are warranted only to the extent of and by the terms and conditions of the original manufacturer’s warranty. RECOMMENDATIONS FOR SPECIAL APPLICATIONS OR THOSE RESULTING FROM SYSTEMS ANALYSES AND EVALUATIONS WE CONDUCT WILL BE BASED ON OUR BEST AVAILABLE EXPERIENCE AND PUBLISHED INDUSTRY INFORMATION. SUCH RECOMMENDATIONS DO NOT CONSTITUTE A WARRANTY OF SATISFACTORY PERFORMANCE AND NO SUCH WARRANTY IS GIVEN.

This warranty shall not apply when damage is caused by (a) improper installation, (b) improper voltage, (c) lightning, (d) sand or other abrasive material, (e) scale or corrosion build-up due to excessive chemical content. Any modification of the original equipment will also void the warranty. We will not be responsible for loss, damage or labor cost due to interruption of service caused by defective parts. Neither will we accept charges incurred by others without our prior written approval.

This warranty is void if our inspection reveals the product was used in a manner inconsistent with normal industry practice and/or our specific recommendations. The purchaser is responsible for communication of all necessary information regarding the application and use of the product. UNDER NO CIRCUMSTANCES WILL WE BE RESPONSIBLE FOR ANY OTHER DIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOST INCOME, LABOR CHARGES, DELAYS IN PRODUCTION, IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY ANY DEFECTS IN MATERIAL AND/OR WORKMANSHIP AND/OR DAMAGE OR DELAYS IN SHIPMENT. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

No rights extended under this warranty shall be assigned to any other person, whether by operation of law or otherwise, without our prior written approval.
SECTION A: GENERAL INFORMATION

A-1) To the Purchaser:

Congratulations! You are the owner of one of the finest pumps on the market today. Burks® Pumps are products engineered and manufactured of high quality components. Over eighty years of pump building experience along with a continuing quality assurance program combine to produce a pump which will stand up to the toughest pumping projects. This manual will provide helpful information concerning installation, maintenance, and proper service guidelines.

A-2) Receiving:

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the company that delivered the pump. If the manual is removed from the crating, do not lose or misplace.

A-3) Storage:

Short Term - Burks Pumps are manufactured for efficient performance following long inoperative periods in storage. For best results, pumps can be retained in storage, as factory assembled, in a dry atmosphere with constant temperatures for up to six (6) months.

Long Term - Any length of time exceeding six (6) months, but not more than twenty four (24) months. The units should be stored in a temperature controlled area, a roofed over walled enclosure that provides protection from the elements (rain, snow, wind blown dust, etc.), and whose temperature can be maintained between +40 deg. F and +120 deg. F. If extended high humidity is expected to be a problem, all exposed parts should be inspected before storage and all surfaces that have the paint scratched, damaged, or worn should be recoated with a water base, air dry enamel paint. All surfaces should then be sprayed with a rust-inhibiting oil.

A-4) Service Centers:

For the location of the nearest Burks Pumps Service Center, check your catalog, your Burks Pumps representative or Burks Pumps in Piqua, Ohio, telephone (937) 778-8947.

SECTION B: INSTALLATION RECOMMENDATIONS:

B-1) Location:

Locate the pump as close to the source of supply as possible. Although the pump will operate on suction lifts of 25 feet, it is desirable to keep the suction lift less than 15 feet, if possible. The closer the pump can be located to the source of supply, the faster the pump will prime and a greater capacity can be pumped.

All pump units rotate clockwise when looking from the motor end (driven end) of the pump. Also, rotation arrows are located on the pump. On three phase units with threaded suction/discharge connections the impellers are threaded on the shaft and it is necessary to slide one half of the flexible coupling back when checking rotation in order to eliminate the possibility of unscrewing the impeller and damaging the pump. NOTE: Where impellers thread on pump shaft, never check the direction of electric motor rotation without first disconnecting flexible coupling.

Locate the pump on a firm footing to make sure the pump will not move due to vibration. Flex coupled and V-belt driven units should be permanently grouted onto a cement foundation. The pumps should be level to provide favorable operating conditions. In addition, the flexible coupling should be realigned after grouting in order to eliminate excessive wear on the coupling.

Allow a minimum of 18 inches in front of the pump case cover or hatch cover to permit easy removal and access to the interior of the pump. On belt driven units, allow a minimum of 10 inches at the shaft end to permit easy removal of the pedestal or rotating cartridge.

B-2) Suction:

It is advisable to use a suction line of the same size as the pump port size. All horizontal suction lines should slope up to the pump to avoid trapped air pockets. An adjustable stand, pipe clamp or floor flange must be installed to support the weight of the suction line. On suction lifts less than 5 feet, it is sometimes possible to increase capacity slightly by oversizing the suction line, but oversized suction pipe on high suction lifts will create priming problems. Using a smaller suction line than the pump port size can cause internal damage to the pump.

The suction line must not have holes, even small holes. The smallest air leak in the suction line may prevent the pump from priming. Coat all threaded connections in the suction line with pipe thread compound to insure an air tight joint. In addition, suction flanges should be pulled up tight to prevent air leaks. Where fiber gaskets are used, coat them with grease.
Use a strainer on suction line to prevent the entrance of oversize solids. This strainer should be submerged deep enough to prevent air from being drawn into the suction line, thus reducing the pump's capacity and pressure.

**CAUTION!**

THIS PUMP SHOULD NOT BE OPERATED WITHOUT A STRAINER ON THE END OF THE SUCTION LINE TO PREVENT STICKS, STONES, RAGS AND OTHER FOREIGN MATTER FROM BEING DRAWN INTO THE IMPELLER. THE STRAINER SHOULD BE CLEANED REGULARLY TO INSURE FULL FLOW.

**B-3) Discharge:**
Connect discharge hose or pipe to discharge on pump.
If Discharge hose is used, protect it from being driven over.
Do not use quick closing check valves.

**SECTION C: OPERATION RECOMMENDATIONS:**

1. Fill the pump case with liquid prior to starting the pump. A self priming pump does require the case to be at least 2/3 full of liquid in order to self prime. Operate at sufficient speed to prime pump. Generally speaking, the pump will prime faster if it is operated at a fast speed.

2. Place the self-feeding grease lubricator in operation by turning the wing nut on the threaded plunger shaft counter clockwise as far as it will go. Do not force the plunger into the grease cup as this can cause a seal failure. See Maintenance Recommendations, Paragraphs 1 and 2 for instructions on filing the grease cup.

3. In cold weather operation, the pump will not freeze as long as it is running. However, it may freeze if it is not drained while standing idle. To drain the pump, remove the drain plug at the bottom of the pump case and rotate the impeller at least once to assure removal of all the water.

4. The discharge of a self priming centrifugal pump may be closed briefly without damaging the pump. However, the water will soon heat up and this can damage the pump seal.

5. It is not desirable to run the pump without liquid in the pump case. If the pump must be run in order to check the operation of the engine or motor, fill the case with sufficient water to keep the rotating seal wet. This will eliminate damage to the seal and other pump parts.

6. If the pump has been idle for some time, the impeller may appear to be stuck or locked in place. This is usually caused by a film of rust or dirt between the impeller and volute. A little extra force on the crank may break it loose. If not, the pump must be dismantled.

**SECTION D: MAINTENANCE RECOMMENDATIONS:**

**D-1) Seal Lubrication:**
A self-feeding lubricator is provided to supply grease to the shaft seal of the pump. The grease cup is empty when the wing nut, positioned at the outer end of the threaded plunger shaft, recedes to the cap of the grease cup. To refill the grease cup, rotate the wing nut clockwise as far as it will go, attach a zerk gun to the zerk fitting, then fill until grease oozes from the relief hole on the side of the cup. For operation, return the wing nut to the end of the plunger. Never force the plunger into the grease cup as this can cause seal failures. (See Fig. 1)

A #1 grease is normally recommended. However, where high ambient temperatures are encountered, such as in direct sunlight, a #2 grease can be used. Use a water resistant, nonfiberous grease. Lithium base greases are excellent and molydisulphide is acceptable. Normally, the sodium soap base greases are the only non-water resistant types that are not acceptable for mechanical seal lubrication.

**FIGURE 1**

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**GREASE ZERK CONNECTION**

**WING NUT**

**PRESSURE RELIEF HOLE**

**FIGURE A**

**FIGURE B**

**FIGURE C**

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If the pump is inoperative for a long period of time, or appears not to use any grease, remove and clean the cup thoroughly. Caked grease in the cup can create a problem of non-lubrication to the seal.

Under normal conditions, a grease cup full of grease will last three to four months. If a grease seal requires grease every day, and it is not leaking past the outer lip seal it indicates that the seal is wearing out. The internal pressure of the pump will often force the cup plunger out when the seal leaks badly.

D-2) Shaft Seal Replacement:
All parts of the pump are easily dismantled by simply removing nuts and screws. Rotating parts of the shaft seal grip the shaft by friction and may be frozen to the shaft through long usage.

If the mechanical shaft seal is not leaking and it is necessary to dismantle part of the pump for inspection or cleaning DO NOT disturb the shaft seal other than its spring if the impeller is removed. Once a shaft seal has been in operation it cannot be removed and replaced without leaking.

**CAUTION**

HANDLE PARTS WITH EXTREME CARE.
DO NOT SCRATCH OR MAR LAPPED SURFACES.

It is recommended to remove the pump side from the support bracket. After the pump has been disassembled make sure that the shaft and seat areas in the pump side are as clean as possible. The shaft must not be sharp, but neatly rounded and polished to a 1/32" radius. This radius and the shaft, on which the rubber bellows grips, must be polished with 180 to 240 grit emery cloth. The seal will install relatively easy if the shaft is properly polished.

Install the seat assembly (1 and 2 or 1A and 2A, see Figure 2) in pump side adapter (12) using SAE# 10 oil on the rubber parts. They may install easier by first inserting the rubber part and then sliding the seat part into the rubber. All of this must be done with the fingers only.

Now assemble the spring and rotating portion of the seal onto the impeller shaft (19). Lubricate the impeller shaft (19) and the inside of the bellows each with 2 or 3 drops of SAE# 10 oil. Install this assembly into adapter (12), this may take several minutes, therefore, oscillate the seal back and forth on the shaft to make sure it does not stick to the shaft until gage pin is in place and the clamp tightened.

If for any reason the gage pin does not give proper clearance, quickly adjust the impeller clearance before the rubber bellows seats on the shaft.

D-3) Impeller:
These pumps have their impellers threaded on with right hand threads.

The clearance between an open faced impeller and its wear surface in the volute is set at the factory at approximately .015 inches. This clearance is re-adjustable by relocating the shaft at the clamping arrangement. In cases where much sand is being pumped, close clearances may bind the impeller and volute and overload the motor. It may be necessary to provide extra clearance on these.

When reassembling a dismantled pump, clean all parts and especially areas where gaskets and o-rings are located. Grease all gaskets and o-rings and areas where o-rings must slide when assembling.

1 - Ni-Resist Stationary Seat
1A- Ceramic Stationary Seat
2 - Buna-N Seat Ring
2A- Buna-N Seat Cup
3 - Stainless Retainer
4 - Stainless Drive Band
5 - Stainless Spring
6 - Stainless Springholder
7 - Crane-Carb® Mating Ring
7A- Carbon Mating Ring
8 - Buna-N Bellows

**Cross Section of Seals.**
Two Styles Shown.
<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>POSSIBLE CAUSE(S)</th>
<th>CORRECTIVE ACTION</th>
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| Little or no discharge and unit will not prime | 1. Casing not filled with water  
2. Total head too high  
3. Suction head higher than pump designed for.  
4. Impeller partially or completely plugged  
5. Hole or leak in suction line  
6. Foot-valve too small.  
7. Impeller damaged.  
8. Foot-valve or suction line not submerged deep enough in water; pulling air.  
9. Insufficient inlet pressure or suction head.  
10. Suction piping too small.  
11. Casing gasket leaking.  
12. Suction or discharge line valves closed.  
13. Piping is fouled or damaged.  
14. Clogged strainer or foot-valve.  
15. Incorrect engine speed. | 1. Fill pump casing. Using a foot-valve will extend pump life and facilitate immediate priming.  
2. Shorten suction head.  
3. Lower suction head, install foot-valve and prime.  
4. Disassemble pump and clean out impeller.  
5. Repair or replace suction line.  
6. Match foot-valve to piping or install one size larger foot-valve  
7. Disassemble pump and replace impeller.  
8. Submerge lower in water.  
9. Increase inlet pressure by adding more water to tank or increasing back pressure by turning gate valve on discharge line partially closed position.  
10. Increase pipe size to pump inlet size or larger.  
11. Replace.  
12. Open.  
13. Clean or replace.  
14. Clean or replace.  
15. Increase speed. |
| Loss of suction after satisfactory operation. | 1. Air leak in suction line.  
2. When unit was last turned off, water siphoned out of pump casing.  
3. Suction head higher than pump designed for.  
4. Insufficient inlet pressure or suction head.  
5. Clogged foot-valve, strainer, or pump.  
6. Defective wearplate(s). | 1. Repair or replace suction line.  
2. Refill (reprime) pump casing before restarting.  
3. Lower suction head, install foot-valve and primer.  
4. Increase inlet pressure by adding more water to tank or increasing back pressure by turning gate valve on discharge line to partially closed position.  
5. Unclog, clear or replace as necessary.  
6. Replace. |
| Pump overloads driver | 1. Total head lower than pump rating, unit delivering too much water.  
2. Specific gravity and viscosity of liquid being pumped different than the pump rating.  
3. Speed too high. | 1. Increase back pressure on pump by turning gate valve on discharge line to partially closed position that will not overload engine.  
2. Consult factory.  
3. Check and correct, lower speed. |
| Pump vibrates and/or makes excessive noise | 1. Mounting plate or foundation not rigid enough.  
2. Foreign material in pump causing unbalance.  
3. Impeller bent.  
4. Cavitation present.  
5. Piping not supported to relieve any strain on pump assembly. | 1. Reinforce.  
2. Disassemble pump and remove.  
3. Replace impeller.  
4. Check suction line for proper size and check valve in suction line if completely open, remove any sharp bends before pump and shorten suction line.  
5. Make necessary adjustments. |
| Pumps runs but no fluid. | 1. Faulty suction piping (air leak).  
2. Pump located too far from fluid source.  
3. Gate valve closed.  
5. Fouled foot-valve.  
6. Discharge height too great.  
7. Fouled impeller.  
8. Faulty mechanical seal | 1. Replace  
2. Replace  
3. Open  
4. Clean or replace  
5. Clean or replace  
6. Lower the height  
7. Clean or replace.  
8. Replace |
| Pumps leaks at shaft | 1. Worn mechanical seal.  
2. Replacement seal not installed properly. | 1. Replace  
2. Follow Maintenance instructions carefully. |
SECTION E: REPLACEMENT PARTS

E-1 ORDERING REPLACEMENT PARTS:
When ordering replacement parts, ALWAYS furnish the following information:

1. Pump serial number and date code.
2. Pump model number.
3. Pump part number.
4. Part description.
5. Item part number.
6. Quantity required.
7. Shipping instructions.

IMPORTANT! When Ordering Parts, ALWAYS Provide The Complete Part Number, Serial Number and Model Number. INFORMATION SUBJECT TO CHANGE WITHOUT NOTICE.
RETURNED GOODS
RETURN OF MERCHANDISE REQUIRES A "RETURNED GOODS AUTHORIZATION".
CONTACT YOUR LOCAL CRANE PUMPS & SYSTEMS, INC. DISTRIBUTOR.

Products Returned **Must** Be Cleaned, Sanitized, Or Decontaminated As Necessary Prior To Shipment, To Insure That Employees Will Not Be Exposed To Health Hazards In Handling Said Material. All Applicable Laws And Regulations Shall Apply.