IMPORTANT!  Read all instructions in this manual before operating pump. As a result of Crane Pumps & Systems, Inc., constant product improvement program, product changes may occur. As such Crane Pumps & Systems reserves the right to change product without prior written notification.

Series: SGPC
1 HP, 1750 RPM, 60 Hz.

SUPERSEDED
Some parts may NOT be available

CRANE PUMPS & SYSTEMS
A Crane Co. Company
420 Third Street
Piqua, Ohio 45356
Phone: (937) 778-8947
Fax: (937) 773-7157
www.cranepumps.com

83 West Drive, Brampton
Ontario, Canada L6T 2J6
Phone: (905) 457-6223
Fax: (905) 457-2650

Form No. 101784-Rev. E
## TABLE OF CONTENTS

- USER GUIDE ......................................................................... 3
- WARNINGS AND SAFETY PRECAUTIONS .......................... 4
- A. PUMP SPECIFICATIONS ...................................................... 5
- B. GENERAL INFORMATION .................................................. 6
- C. INSTALLATION ................................................................. 6 - 7
- D. SERVICE and REPAIR ....................................................... 7 - 11
- E. REPLACEMENT PARTS .................................................... 11
- TROUBLESHOOTING .......................................................... 12
- CROSS-SECTION (Fig. 16) .................................................. 13
- EXPLODED VIEW (Fig. 17) ................................................... 14
- PARTS LIST ........................................................................ 15
- MOVEABLE For BASIN PACKAGE ........................................ 16
- ELECTRICAL DATA ............................................................. 17
- RETURNED GOODS POLICY ................................................. 17
- WARRANTY
- START-UP REPORTS
- WARRANTY REGISTRATION

- SPECIAL TOOLS AND EQUIPMENT
- INSULATION TESTER (MEGGER), DIELECTRIC TESTER
- SOCKET SET, ALLEN WRENCH SET,
- 1/2" OPEN END WRENCH
- CRECENT WRENCH, SCREWDRIVER
- HAMMER OR MALLET, PUNCH
Congratulations on your purchase of a Barnes UltraGRIND™ grinder pump system. With proper care and by following a few simple guidelines your grinder pump will give you many years of dependable service.

Use and Care
The UltraGRIND grinder pump station is designed to handle routine, domestic sewage. Solid waste materials should be thrown in the trash. While your station is capable of accepting and pumping a wide range of materials, regulatory agencies advise that the following items should not be introduced into any sewer either directly or through a kitchen waste disposal:
- Glass
- Metal
- Diapers
- Socks, rags or cloth
- Plastic objects (e.g., toys, utensils, etc.)
- Sanitary napkins or tampons

In addition you must NEVER introduce into any sewer:
- Explosives
- Flammable Material
- Lubricating Oil and/or Grease
- Strong Chemicals
- Gasoline

General Information
Your home wastewater disposal service is part of a low pressure sewer system. The key element in this system is the Barnes UltraGRIND grinder pump station. The basin collects all wastewater from the house. The solids in the sewage are then ground to a small size suitable for pumping in the slurry.

The grinder pump generates sufficient pressure to pump this slurry from your home to the wastewater plant.

Power Failure
Your grinder pump cannot dispose of wastewater or provide an alarm signal without electrical power. If electrical power service is interrupted, keep water usage to a minimum.

Warranty
Your grinder pump is furnished with a warranty against defects in material or workmanship. A properly completed Start-Up/Warranty Registration form must be on file at the Barnes factory in order to activate your warranty. In addition your pump must be installed in accordance with the installation instructions.
If you have a claim under the provisions of the warranty, contact your local Barnes Distributor.

When contacting your representative for service, please include your station serial number, pump model number, and pump serial number.

For future reference, record the following information:
Station Serial No: ______________________
Pump Model No: ______________________
Pump Serial No: ______________________
Local Distributor: ______________________
Distributor Telephone: ______________________
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!** Warns 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!** Warns about hazards that can or will cause minor personal injury or property damage if ignored. Used with symbols below.

**WARNING!** Warns 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.

Biohazard can cause serious personal injury.

Rotating machinery Amputation or severe laceration can result.

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.

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

Prevent large articles of clothing, large amounts of chemicals, other materials or substances such as are uncommon in domestic sewage from entering the system.

During power black-outs, minimize water consumption at the home(s) to prevent sewage from backing up into the house.

Always keep the shut-off valve completely open when system is in operation (unless advised otherwise by the proper authorities). Before removing the pump from the basin, be sure to close the shut-off valve. (This prevents backflow from the pressure sewer.)

Keep the control panel locked or confined to prevent unauthorized access to it.

If the pump is idle for long periods of time, it is advisable to start the pump occasionally by adding water to the basin.

**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.

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 the impeller or other moving parts.

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

Make sure lifting handles are securely fastened each time before lifting. Do not operate pump without safety devices in place. Always replace safety devices that have been removed during service or repair.

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

Secure the pump in its operating position so it can not tip over, fall or slide.

Cable should be protected at all times to avoid punctures, cuts, bruises and abrasions - inspect frequently.

Never handle connected power cords with wet hands.

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.

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.

Do not remove cord and strain relief. Do not connect conduit to pump.

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.

**IMPORTANT!** - Crane Pumps & Systems, Inc. is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.
PUMP SPECIFICATIONS:

DISCHARGE .......................... 1¼" NPT, Vertical
LIQUID TEMPERATURE ............... 104°F (40°C) Continuous
MOTOR HOUSING ...................... Cast Iron ASTM A-48, Class 30
SEAL PLATE ........................... Cast Iron ASTM A-48, Class 30
SUCTION SPACER ...................... Cast Iron ASTM A-48, Class 30
SUCTION HOUSING .................... Cast Iron ASTM A-48, Class 30
PUMP ROTOR ........................... ASTM CF-8A Stainless Steel

PUMP STATOR:

Design .......... Double Helix
Material ........... Buna-N

SHREDDING RING ................. Hardened 440C Stainless Steel
                            Rockwell C-55

CUTTER ................. Hardened 440C Stainless Steel
                       Rockwell C-55

SHAFT ......................... 416 Stainless Steel

SQUARE RING ................. Buna-N
O-Ring ......................... Buna-N
HARDWARE ....................... 300 Series Stainless Steel

SEAL:

Design ............ Single Mechanical
Material .......... Buna-N

Stationary Faces - Ceramic
Elastomer - Buna-N
Hardware - 300 series stainless steel

CORD ENTRY ................. 8 Ft. (2.4m), 15 Ft. (4.6m) Cord,
Pressure grommet for sealing and
strain relief

CORD ............................. CSA/UL Approved 10/3 Type SOW

SPEED ....................... 1750 RPM, 60Hz

UPPER BEARING:

Design ............ Single Row, Ball
Lubrication ...... Oil
Load ............... Radial

LOWER BEARING:

Design ............ Single Row, Ball
Lubrication ...... Oil
Load ............... Radial & Thrust

MOTOR:

Design ............ NEMA L Torque Curve, Oil Filled,
Squirrel Cage Induction
Insulation ........ Class B
Type ............... Permanent Split Capacitor (PSC),
Includes overload protection in motor

OPTIONAL EQUIPMENT .... Seal Material, Additional Cord,
WEIGHT ......................... 108 pounds

inches
(mm)
SECTION B: GENERAL INFORMATION

B-1) To the Purchaser:
Congratulations! You are the owner of one of the finest pumps on the market today. Barnes® pumps are products engineered and manufactured of high quality components. Over one hundred years of pump building experience along with a continuing quality assurance program combine to produce a pump which will stand up to the toughest applications. This Barnes manual will provide helpful information concerning installation, maintenance, and proper service guidelines.

B-2) Receiving/Unpacking:
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. Unpack pump and record pump serial and model number before installing. If the manual is removed from the packaging, do not lose or misplace.

B-3) Storage:
Short Term - 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 air dry enamel paint. All surfaces should then be sprayed with a rust-inhibiting oil.

Pump should be stored in its original shipping container. On initial start up, rotate shaft by hand to assure seal and motor rotate freely. If it is required that the pump be installed and tested before the long term storage begins, such installation will be allowed provided:

1.) The pump is not installed under water for more than one (1) month.
2.) Immediately upon satisfactory completion of the test, the pump is removed, thoroughly dried, repacked in the original shipping container, and placed in a temperature controlled storage area.

B-4) Service Centers:
For the location of the nearest Barnes Service Center, check your Barnes representative or Crane Pumps & Systems, Inc., Service Department in Piqua, Ohio, telephone (937) 778-8947 or in Brampton, Ontario, Canada (905) 457-6223.

SECTION C: INSTALLATION

C-1) Location:
The pump is designed to fit into your basin either by sliding down the rail assembly or by being mounted on a ring base.

Package Systems (Not Shown) - The package system comes complete and ready to place into the ground as outlined in the project specifications. The moveable portion of the Break Away Fitting (BAF), check valve, piping and guide bracket come assembled on the pump. To insure intergrity, the lower guide bracket (two pieces) and mounting hardware are located in the bag with this manual. Attach lower guide bracket prior to placing pump on guide rail in basin (Figure 2). On units with rail assemblies insert pump bracket and moveable portion of BAF into the guide channel and lower pump into basin (DO NOT DROP).
On units without rail assemblies, mount pump on ring base with (4) bolts. Connect discharge hose assembly and bracket. Once assembled, unit can be lowered into basin (DO NOT DROP). Now connect power cable to the junction box or control panel depending on system design. Assemble Lower guide bracket (5) to pump, by placing one cap screw (6) with flat washer (9) thru hole on bracket and in pump’s suction housing. Place flat washer (9), lockwasher (8), and hex nut (7) on cap screw (6) and hand tighten. Place second bolt thru and orient so heads are opposite each other. Torque both capscrews to 132 IN-LBS. See Figure 2.

C-2) Electrical Connections:

Warning! All model pumps and control panels must be properly grounded per the national electric code, state and local codes. Improper grounding voids warranty.

C-2.1) Power Cable:
The cord assembly mounted to the pump must NOT be modified in any way except for shortening to a specific application. Any splice between the pump and the control panel must be made in accordance with the National Electric Code and all applicable state and local electric codes. It is recommended that a junction box, be mounted outside the sump or be of at least Nema 4 construction if located within the wet well. DO NOT USE THE POWER/CONTROL CABLE TO LIFT PUMP!

C-2.2) Overload Protection:
The type of in-winding overload protector used is referred to as an inherent overheating protector and operates on the combined effect of temperature and current. This means that the overload protector will trip out and shut the pump off if the windings become too hot, or the load current becomes too high. It will then automatically reset and start the pump after the motor cools to a safe temperature. In the event of an overload, the source of this condition should be determined and rectified immediately. DO NOT LET THE PUMP CYCLE OR RUN IF AN OVERLOAD CONDITION OCCURS!

C-2.3) Wire Size:
If additional cable is required consult a qualified electrician for proper wire size. See Table on page 18 for further electrical information.

SECTION D: SERVICE AND REPAIR
NOTE: All item numbers in ( ) refer to Figures 16 & 17

Warning! Electrical power to the pump motors must be disconnected and locked out to prevent any dangerous electrical hazards or personnel danger before any service work is done to the pump.

Caution! Operating pump builds up heat and pressure; allow time for pump to cool to room temperature before handling or servicing.

Caution! Always wear eye protection when working on pumps.

D-1) Lubrication:
Anytime the pump is removed from operation, the cooling oil in the motor housing (1) should be checked visually for oil level and contamination.

D-1.1) Checking Oil:
Motor Housing- To check oil, set unit upright. Remove gland nut (18B) (see Fig. 15) from hex plug (22). Unscrew hex plug (22) from motor housing (1). DO NOT disconnect wiring from motor leads. With a flashlight, visually inspect the oil in the motor housing (1) to make sure it is clean and clear, light amber in color and free from suspended particles. Milky white oil indicates the presence of water. Oil level should be 1” above motor, when pump is in vertical position.

D-1.2) Testing Oil:
1. Place pump on its side, remove pipe plug (25) from motor housing (1) and drain oil into a clean, dry container.
2. Check oil for moisture contamination using a high potential oil tester with a range to 30 Kilovolts breakdown.
3. If oil is found to be clean and uncontaminated (measure above 15 KV. breakdown), refill the motor housing as per section D-1.3 with the same oil.
4. If oil is found to be dirty or moisture contaminated (or measures below 15 KV. breakdown), the pump must be carefully inspected for leaks at the shaft seal (10), cable assembly (18), and pipe plug (25), and O-rings (6), (11), before refilling with new oil. To locate the leak, perform a pressure test as per section D-1.4. After leak is repaired, refill with new oil as per section D-1.3.

Warning! Do not overfill oil. Overfilling of motor housing with oil can create excessive and dangerous hydraulic pressure which can destroy the pump and create a hazard. Overfilling oil voids warranty.

D-1.3) Replacing Oil:
Motor Housing- Drain all oil from motor housing and dispose of properly. Set unit upright and refill with new cooling oil as per Table 1. (See parts list for amount.) Fill to the 1” above motor as an air space must remain in the top of the motor housing to compensate for oil expansion (see Cross-section Fig. 16). Apply pipe thread compound to threads of hex plug (22) and pipe plug (22) then assemble to motor housing (1). Insert friction ring (18c), grommet (18d), another friction ring (18c), and gland nut (18b) into hex plug (22) and torque to 15 ft. lbs.
### Table 1 - Cooling Oil - Dielectric

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP</td>
<td>Enerpar SE 100</td>
</tr>
<tr>
<td>Conoco</td>
<td>Pale Paraffin 22</td>
</tr>
<tr>
<td>Mobil</td>
<td>D.T.E. Oil Light</td>
</tr>
<tr>
<td>G &amp; G Oil</td>
<td>Circulating 22</td>
</tr>
<tr>
<td>Texaco</td>
<td>Diala -Oil-AX</td>
</tr>
<tr>
<td>Woco</td>
<td>Prmium 100</td>
</tr>
</tbody>
</table>

### D-1.4) Pressure Test:
Before checking the pump for leaks around the shaft seal, square rings, and cord inlet, the oil level should be full as described in section D-1.3. Remove pipe plug (25) from motor housing (1). Apply pipe sealant to pressure gauge assembly and tighten into hole (see Fig. 3). Pressurize motor housing to 10 P.S.I. Use a soap solution around the sealed areas and inspect joints for “air bubbles”. If, after five minutes, the pressure is still holding constant, and no “bubbles” are observed, slowly bleed the pressure and remove the gauge assembly. Replace the pipe plug (25) using a sealant. If the pressure does not hold, then the leak must be located and repaired.

---

**Caution!** Pressure builds up extremely fast, increase pressure by “tapping” air nozzle. Too much pressure will damage seal. Do not exceed 10 p.s.i.

---

### D-2) Cutter & Suction Housing Service:

#### To remove suction housing (3):
To remove suction housing (3), first remove flat head screw (29), washer (30) and remove cutter (8) by holding the shaft stationary with a screwdriver, tap the cutter (8) loose in the counter-clockwise direction. (Heat may be needed to break the screw (29) loose.) Next remove cap screws (26) and pull suction housing assembly from motor assembly being careful not to damage o-ring (16). See Figure 4.

**NOTE:** With cutter removed, the seal spring is relaxed and some oil may seep from the motor housing.

#### To reassemble:
Remove four Allen type flat head screws (29), stator retaining ring (6) and rubber stator (5) from suction housing (3). The shredding ring (9) is press fitted in the body and must be removed with an arbor press. See Figure 5. Replace parts if worn or damaged.

Coat pump rotor (4) with white food grade grease. Lubricate o-ring (16) and install on bottom of seal plate. Lower motor sub-assembly onto suction housing sub-assembly while aligning discharge notch in motor housing with discharge of suction housing. Apply blue Loctite® to four hex head bolts (26) and fasten motor housing to suction housing. Torque to 11 ft-lbs. Thread cutter (8) onto end of shaft, aligning notches on cutter and rotor (4).

**NOTE:** Tighten with punch and hammer. Secure cutter (8) with washer (30) and flat head screw (29), applying green Loctite to screw.
D-3) Shaft Seal and Rotor Service:

Caution: handle seal parts with extreme care. Do not scratch or mar lapped surfaces.

To expose shaft seal (10) for examination, remove cutter (8) and suction housing assembly per section D-2. Next slide rotor (4) from motor shaft, replace if worn or damaged. Remove pumpout spacer (7), seal spring retainer (10D), seal spring (10C) and rotating seal member (10B) from motor shaft. See Figure 6. Examine all seal parts and especially contact faces. Inspect seal for signs of wear such as uneven wear pattern on stationary members, chips and scratches on either seal face. DO NOT interchange seal components, replace the entire shaft seal (10). If replacing seal, remove stationary (10A) from seal plate by prying out with flat screw driver, also drain oil.

To reassemble, clean and oil seal cavity in seal plate (2). Lightly oil DO NOT grease outer surface of stationary member (10A). Press stationary member (10A) firmly into seal plate (2), using a seal pusher, nothing but the seal pusher is to come in contact with seal face See Figure 7.

Important! Do not hammer on the seal pusher it will damage the seal face.

FIGURE 6

FIGURE 7

FIGURE 8

FIGURE 9

Make sure the stationary member is in straight. Slide a bullet over motor shaft. Lightly oil (DO NOT use grease) shaft, bullet and inner surface of bellows on rotating member (10B), See Figure 8. With lapped surface of rotating member (10B) facing inward toward stationary member (10A), slide rotating member (10B) over bullet and onto shaft, using seal pusher, until lapped faces of (10A) and (10B) are together See Fig. 9.

It is extremely important to keep seal faces clean during assembly. Dirt particles lodged between these faces will cause the seal to leak. Place spring (10C) over shaft and in place on rotating member (10B), spring will bottom out on rotating seal member. Slide retaining ring (10D) over shaft and let rest on spring (10C). Slide pumpout spacer (7) over shaft, vanes will face seal plate. Next slide pump rotor (4) over shaft with slots facing out. Assemble volute as outlined in paragraph D-2. Replace oil as outlined in paragraph D-1.3.
D-4) Motor and Bearing Service:
To examine or replace the motor (17) and bearings (13) and (14), disassemble volute as outlined in section D-2 and disassemble shaft seal as outlined in section D-3. Drain oil from motor as outlined in section D-1.3. Remove socket head cap screws (28). Position unit upright, using blocks to avoid resting unit on shaft. Vertically lift the motor housing (1) from seal plate (2) by lifting eye (21). Inspect square ring (11) for damage or cuts. Remove cable assembly (18) by unscrewing gland nut (18B) and hex plug (22) from motor housing (1). Remove cable lead wires from motor lead wires by disconnecting connectors (27). See Figure 10.

Remove the motor bolts and lift motor stator (17A) from seal plate (2). Remove motor rotor and shaft assembly (17B) from seal plate (2). Examine bearing (14) and replace if required. If replacement is required, remove bearing (14) from motor shaft using a wheel puller or arbor press. See Figure 11. Vertically lift motor stator from rotor. Inspect bearing (13), and wavy washer (35), if replacement is required, remove wavy washer (35) from motor shaft, remove bearing (35) from motor shaft using a wheel puller or arbor press. Inspect winding for shorts and check resistance values. Check rotor for wear. If rotor or the stator windings are defective, the complete motor must be replaced. Check motor capacitor (15), on single phase units with an Ohm meter by first grounding the capacitor by placing a screwdriver across both terminals and then removing screwdriver. Connect Ohm meter (set on high scale) to terminals, if needle moves to infinity (∞) then drifts back, the capacitor is good. If needle does not move or moves to infinity (∞) and does not drift back, replace capacitor (15).

Important! All parts must be clean before reassembly.

D-4.2) Reassembly:
When replacing bearings, be careful not to damage the rotor or shaft threads. Clean the shaft thoroughly. Apply adhesive compound to the shaft and press bearing (14) on the motor shaft, position squarely onto the shaft applying force to the inner race of the bearing only, until bearing seats against the retaining ring (34). Apply adhesive compound to the other end of motor shaft and press bearing (13) on, positioning squarely on the shaft shoulder, applying force to inner race of bearing only. Position wavy washer (35) on motor shaft above bearing (13) and lower motor stator over rotor.

Slide lower bearing (14) and motor (17) squarely into the seal plate (2) until bearing seats on the bottom. Bolt stator to seal plate (2) with capacitor bracket (24) secured under the head of one of the stator bolts. Torque to 78.8 in-lbs. Install capacitor (15) into bracket and connect two insulated flag terminals to the capacitor (two red leads from stator) see Figure 11.

Lubricate square ring (11) and place in groove on seal plate (2). Connect ground jumper wire (32) to top of stator using self tapping screw (33). Connect power cord leads to stator with splice connectors (27), see Figure 12, be sure all parts are on cable before assembling, see section D-5. While pulling the slack out of power cord, lower motor housing (1) down onto seal plate (2), bolt together with two socket head cap screws (28), Blue Loctite the bolts and torque to 17.5 inch pounds. See Figure 10. Assemble volute as outlined in paragraph D-2. Replace oil as outlined in paragraph D-1.3.

SINGLE PHASE 115-230 VOLT AC

<table>
<thead>
<tr>
<th>Power Cable (18) Motor Lead Number</th>
<th>Green</th>
<th>Red (Flag Terminal)</th>
<th>capacitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green (Ground)</td>
<td>1</td>
<td>1</td>
<td>capacitor</td>
</tr>
<tr>
<td>Black</td>
<td>2</td>
<td>2</td>
<td>capacitor</td>
</tr>
<tr>
<td>White</td>
<td></td>
<td></td>
<td>capacitor</td>
</tr>
<tr>
<td>Red (Flag Terminal)</td>
<td></td>
<td></td>
<td>capacitor</td>
</tr>
</tbody>
</table>

FIGURE 10

FIGURE 11

FIGURE 12
SINGLE PHASE 115-230 VOLT AC w/Press Cutout

Power Cable (18) Motor Lead Number
Green (Ground) Green
Black 1
White 2
Red (Flag Terminal) Capacitor
Red (Flag Terminal) Capacitor

D-4.3) Optional Pressure Cutout:
(See Figure 14) Apply Permatex to bent end of switch tube (19) and thread pressure switch (20) onto tube. Apply Permatex to other end of tube and thread into seal plate (2). Connect black motor lead to jumper wire (31) and then to one terminal on pressure switch (20). Feed power cord through hex plug (22) and top of motor housing (1). Place splice connectors to power cord ends, and connect other jumper wire (31) to second terminal on pressure switch and then to the black power cord lead. Connect white motor lead to white lead on power cord (see Figure 13). Assemble volute as outlined in paragraph D-2. Replace oil as outlined in paragraph D-1.3.

D-5) Cable Assembly:
Check power cable (18A) for cracks or damage and replace if required. Place parts (18B, C & D) and hex plug (22) on power cord (18A). Bring cord set (18) through opening in top of motor housing (1), be shure motor leads to power cable have been connected (see sections D-4.2 or D-4.3). Refill with cooling oil (if it has been drained) as outlined in paragraph D-1.3. Apply pipe sealant to hex plug (22) and install into motor housing (1). Insert one friction ring (18C), grommet (18D), another friction ring (18C) and gland nut (18B) into hex plug (22) and tighten gland nut (18B) to 15 ft. lbs. to prevent water leakage (see Figure 15).

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. (E-4)
2. Pump model number. (E-3)
3. Pump part number. (E-2)
4. Part description.
5. Item part number.
6. Quantity required.
7. Shipping instructions.

E-2 Part Number:
The part number consists of a six (6) digit number, which appears in the catalog. A one or two letter suffix may follow this number to designate the design configuration. This number is used for ordering and obtaining information.

E-3 Model Number:
This designation consists of numbers and letters which represent the discharge size, series, horsepower, motor phase and voltage, speed and pump design. This number is used for ordering and obtaining information.

E-4 Serial Number:
The serial number block will consist of a six digit number, which is specific to each pump and may be preceded by a alpha character, which indicates the plant location. This number will also be suffixed with a four digit number, which indicates the date the unit was built (Date Code). EXAMPLE: A012345 0490.

Reference the six digit portion (Serial Number) of this number when referring to the product.
**SGPC GRINDER PUMP TROUBLE SHOOTING**

**CAUTION!** Always disconnect the pump from the electrical power source before handling. If the system fails to operate properly, carefully read instructions and perform maintenance recommendations. If operating problems persist, the following chart may be of assistance in identifying and correcting them:

**MATCH "CAUSE" NUMBER WITH CORRELATING "CORRECTION" NUMBER.**

**NOTE:** Not all problems and corrections will apply to each pump model.

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSE</th>
<th>CORRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump will not run</td>
<td>1. Poor electrical connection, blown fuse, tripped breaker or other interruption of power, improper power supply.</td>
<td>1. Check all electrical connections for security. Have electrician measure current in motor leads, if current is within ±20% of locked rotor Amps, impeller is probably locked. If current is 0, overload may be tripped. Remove power, allow pump to cool, then recheck current.</td>
</tr>
<tr>
<td></td>
<td>2. Motor or switch inoperative (to isolate cause, go to manual operation of pump).</td>
<td>2a. Reposition pump or clean basin as required to provide adequate clearance for float.</td>
</tr>
<tr>
<td></td>
<td>2a. Float movement restricted.</td>
<td>2b. Disconnect level control. Set ohmmeter for a low range, such as 100 ohms full scale and connect to level control leads. Actuate level control manually and check to see that ohmmeter shows zero ohms for closed switch and full scale for open switch. (Float Switch).</td>
</tr>
<tr>
<td></td>
<td>2b. Switch will not activate pump or is defective.</td>
<td>3. Make sure liquid level is at least equal to suggested turn-on point.</td>
</tr>
<tr>
<td></td>
<td>3. Insufficient liquid level.</td>
<td>4. Recheck all sizing calculations to determine proper pump size.</td>
</tr>
<tr>
<td></td>
<td>16. Check jumper between #7 and #8 in control panel.</td>
<td>5. Check discharge line for restrictions, including ice if line passes through or into cold areas.</td>
</tr>
<tr>
<td>Pump will not turn off</td>
<td>2a. Float movement restricted.</td>
<td>6. Remove and examine check valve for proper installation and freedom of operation.</td>
</tr>
<tr>
<td></td>
<td>2b. Switch will not activate pump or is defective.</td>
<td>7. Open valve.</td>
</tr>
<tr>
<td></td>
<td>4. Excessive inflow or pump not properly sized for application.</td>
<td>8. Check cutter for freedom of operation, security and condition. Clean cutter and inlet of any obstruction.</td>
</tr>
<tr>
<td></td>
<td>9. Pump may be airlocked.</td>
<td>9. Loosen union slightly to allow trapped air to escape. Verify that turn-off level of switch is set so that the suction is always flooded. Clean vent hole.</td>
</tr>
<tr>
<td>Pump hums but does not run</td>
<td>1. Incorrect voltage</td>
<td>11. Repair fixtures as required to eliminate leakage.</td>
</tr>
<tr>
<td></td>
<td>8. Cutter jammed or loose on shaft, worn or damaged, inlet plugged.</td>
<td>12. Check pump temperature limits &amp; fluid temperature.</td>
</tr>
<tr>
<td>Pump delivers insufficient capacity</td>
<td>1. Incorrect voltage</td>
<td>13. Replace portion of discharge pipe with flexible connector.</td>
</tr>
<tr>
<td></td>
<td>4. Excessive inflow or pump not properly sized for application.</td>
<td>14. Turn to automatic position.</td>
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<tr>
<td></td>
<td>5. Discharge restricted.</td>
<td>15. Check for leaks around basin inlet and outlets.</td>
</tr>
<tr>
<td></td>
<td>6. Check valve stuck closed or installed backwards.</td>
<td>16. A jumper between #7 and #8 is required for standard SGPC grinder pumps. For pumps with Closed Valve Protection (CVP) the jumper is replaced with the red and orange leads from the pump, the system pressure may exceed the rating of the CVP.</td>
</tr>
<tr>
<td></td>
<td>7. Shut-off valve closed.</td>
<td></td>
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<tr>
<td></td>
<td>8. Cutter jammed or loose on shaft, worn or damaged, inlet plugged.</td>
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</tr>
<tr>
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<td>9. Pump may be airlocked.</td>
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</tr>
<tr>
<td></td>
<td>11. Fixtures are leaking.</td>
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</tr>
<tr>
<td></td>
<td>12. Excessive water temperature.</td>
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</tr>
<tr>
<td></td>
<td>13. Fixtures are leaking.</td>
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<td>14. Turn to automatic position.</td>
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</tr>
<tr>
<td></td>
<td>15. Ground water entering basin.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16. A jumper between #7 and #8 is required for standard SGPC grinder pumps. For pumps with Closed Valve Protection (CVP) the jumper is replaced with the red and orange leads from the pump, the system pressure may exceed the rating of the CVP.</td>
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## PARTS LIST

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Contact your local Distributor or the Factory for other seal materials, cord lengths and other optional equipment.

(*) Included with cord set item #18.
## MOVEABLE ASSEMBLY P/N: 102172*
For SGPC UltraCAV Gridr Pump with “C” Channel Rail

<table>
<thead>
<tr>
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(*) Pump NOT included under these part numbers. The Moveable Assembly will be factory assembled to the pump when a Basin Package system is ordered.
<table>
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<tr>
<th>PUMP MODEL</th>
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<th>PH</th>
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<th>LOCKED ROTOR AMPS</th>
<th>CORD SIZE</th>
<th>CORD TYPE</th>
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CVP = Closed Valve Protection
M = Moveable Fitting
(*) = GE Motor Winding Resistance for 230/1 - Main: 2.36, Start 9.33

**IMPORTANT!**

**WARRANTY REGISTRATION**

Your product is covered by the enclosed Warranty. This warranty is ONLY effective provided the warranty is complete and returned to Crane Pumps & Systems, Inc. Warranty Service Group. If this pump is being installed in a new basin package assembly, use the start up form in the “START-UP/TROUBLESHOOTING” manual to register your product.

If this pump was purchased as a stand alone unit, use the form in this manual.

**IMPORTANT!** If you have a claim under the provision of the warranty, contact your local Crane Pumps Distributor.

**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.
Limited 1 Year Warranty

We warrant that products of our manufacture will be free of defects in material and workmanship under normal use and service for twelve (12) months after notice of owner’s acceptance, but no greater than twenty-four (24) months after receipt of shipment, when installed and maintained in accordance with our instructions.

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. 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) excessive 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.
START-UP / WARRANTY REGISTRATION FORM

This form is designed to provide assurance that customer service and a quality product are the number one priority with Crane Pumps & Systems, Inc. Please fill out the following questions as completely and accurate as possible.

When complete, mail this form to:

Crane Pumps & Systems, Inc
Warranty Service Group
420 Third Street
Piqua, Ohio 45356

REPORTS THAT ARE NOT RETURNED CAN DELAY OR VOID WARRANTY.

Pump Owner’s Name: ________________________________
Address: _______________________________________
Location of Installation _______________________________
Phone ___________________________
Purchased From (Crane Pumps & Systems Representative/Distributor) ________________

Pump Model ___________________________ Serial No. ________________
Part Number ____________________________
Voltage __________ Phase ___________ Hertz ___________ Horsepower ___________

Condition of Cable Jacket Good _____________ Fair _____________ Poor ________________

Resistance of Cable and Pump Motor (measured at pump control)
White-Black ___________ Ohms

Resistance of Ground Circuit between Control Panel and outside of pump _____________ Ohms
MEG Ohms check of insulation: White to Ground _____________ Black to Ground ___________

Was Equipment Stored? _______ Length of Storage ________________
Liquid Being Pumped ___________________________
Debris in bottom of station? _______________ Was debris removed in your presence? __________

Tip bottom two floats (All pumps should remain off).
Tip third float, (and Off float) one pump comes on.
Tip fourth float (and Off float), high level alarm on (on simplex) (both pumps On).

Is the control panel used a Barnes’ control panel? Yes ________ No __________
Barnes Pumps control panel part number ________________________________

ELECTRICAL READINGS:

Single Phase:
Voltage supply at panel line connection, Pump Off, L1, L2 ________________
Voltage supply at panel line connection, Pump On, L1, L2 ________________
Amperage: Load connection, Pump On L1 ___________ L2 ___________

FINAL CHECK:
Flow: Does station appear to operate at proper rate? ____________ Pump down time ________________
Comments: __________________________________________________________

Equipment difficulties during start-up _________________________________________
__________________________________________________

MANUALS:
Has operator received pump instructions and part manual? ________________________________

I Certify this report to be accurate (Name of Start-Up person) __________________________ Date: ________________

Employed By: __________________________ Date: ________________