VORTEX
CLOSE COUPLED
PUMP/MOTOR
SERIES

INSTRUCTION MANUAL
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PRECAUTIONS

!WARNING!
PERSONAL INJURY MAY RESULT IF PROCEDURES OUTLINED IN THIS MANUAL ARE NOT FOLLOWED

• NEVER APPLY HEAT TO REMOVE IMPELLER. IT MAY EXPLODE DUE TO TRAPPED LIQUID.
• NEVER USE HEAT TO DISASSEMBLE PUMP. EXPLOSION COULD OCCUR DUE TO TRAPPED LIQUID.
• NEVER OPERATE PUMP WITHOUT COUPLING GUARD CORRECTLY INSTALLED.
• NEVER OPERATE PUMP BEYOND THE RATED CONDITIONS TO WHICH THE PUMP WAS SOLD.
• NEVER START PUMP WITHOUT PROPER PRIME (SUFFICIENT LIQUID IN PUMP CASING).
• NEVER OPERATE PUMP BELOW RECOMMENDED MINIMUM FLOW OR WHEN DRY.
• ALWAYS LOCK OUT POWER TO THE MOTOR BEFORE PERFORMING PUMP MAINTENANCE.
• NEVER OPERATE PUMP WITHOUT SAFETY DEVICES INSTALLED.
• NEVER OPERATE PUMP WITH DISCHARGE VALVE CLOSED.
• NEVER OPERATE PUMP WITH SUCTION VALVE CLOSED.
• DO NOT CHANGE CONDITIONS OF SERVICE WITHOUT APPROVAL OF AN AUTHORIZED GUSHER REPRESENTATIVE.

PUMP SAFETY TIPS

SAFETY APPAREL
• INSULATED WORK GLOVES WHEN HANDLING HOT BEARINGS OR USING BEARING HEATER.
• HEAVY WORK GLOVES WHEN HANDLING PARTS THAT HAVE SHARP EDGES, ESPECIALLY IMPELLERS.
• SAFETY GLASSES (WITH SIDE SHEILD) TO PROTECT EYES, ESPECIALLY IN MACHINE SHOP AREAS.
• STEEL-TOED SHOES TO PROTECT FEET WHEN HANDLING PARTS, HEAVY TOOLS, ETC.
• ANY OTHER EQUIPMENT NEEDED TO PROTECT AGAINST HAZARDOUS/TOXIC FLUIDS.

COUPLING GUARDS
• NEVER OPERATE A PUMP WITHOUT COUPLING GUARDS PROPERLY INSTALLED.

FLANGED CONNECTIONS
• NEVER FORCE PIPING TO MAKE CONNECTION WITH A PUMP.
• USE ONLY FASTENERS OF PROPER SIZE AND MATERIAL.
• ENSURE THERE ARE NO MISSING FASTENERS.
• BEWARE OF CORRODED OR LOOSE FASTENERS.

OPERATION
• DO NOT OPERATE BELOW MINIMUM RATED FLOW, OR WITH SUCTION/DISCHARGE VALVES CLOSED.
• DO NOT OPEN VENT OR DRAIN VALVES, OR REMOVE PLUGS WHILE THE SYSTEM IS PRESSURIZED.

MAINTENANCE SAFETY
• ALWAYS LOCKOUT POWER
• ENSURE PUMP IS ISOLATED FROM THE SYSTEM AND PRESSURE IS RELIVED BEFORE DISASSEMBLING PUMP, REMOVING PLUGS, OR DISCONNECTING PIPING.
• USE PROPER LIFTING AND SUPPORTING EQUIPMENT TO PREVENT SERIOUS INJURY.
• OBSERVE PROPER DECONTAMINATION PROCEDURES.
• KNOW AND FOLLOW COMPANY SAFETY REGULATIONS.
• NEVER APPLY HEAT TO REMOVE IMPELLER.
FOREWORD

THE DESIGN, CRAFTSMANSHIP, AND MATERIALS USED IN GUSHER PUMPS PROVIDES FOR OPTIMUM PERFORMANCE AND LONG, TROUBLE-FREE SERVICE. AS WITH ANY MECHANICAL DEVICE, PROPER USE AND PERIODIC MAINTENANCE WILL ENHANCE THE PERFORMANCE AND LIFE OF YOUR PUMP. THIS MANUAL IS PROVIDED AS A GUIDELINE FOR PROPER INSTALLATION, OPERATION AND MAINTENANCE. THIS MANUAL MUST BE READ AND UNDERSTOOD BEFORE INSTALLING AND OPERATING ANY PUMP.

GUSHER PUMPS INC. SHALL NOT BE LIABLE FOR PHYSICAL INJURY, DAMAGE OR DELAYS CAUSED BY A FAILURE TO OBSERVE THE INSTRUCTIONS FOR INSTALLATION, OPERATION, AND MAINTENANCE CONTAINED IN THIS MANUAL.

WARRANTY

GUSHER PUMPS INC. WILL REPLACE OR REPAIR, WITHIN ONE YEAR OF SHIPMENT FROM OUR PLANT, ANY PUMP IN OUR JUDGEMENT THAT HAS FAILED DUE TO DEFECTS IN MATERIALS OR WORKMANSHIP, PROVIDED THE PUMP HAS BEEN PROPERLY INSTALLED AND MAINTAINED AND HAS NOT BEEN SUBJECT TO ABUSE. THESE PUMPS MUST RETURN TO GUSHER PUMPS INC. WITH COMPLETE HISTORY OF SERVICE FOR INSPECTION AND WARRANTY CONSIDERATION. GUSHER PUMPS INC. DOES NOT ACCEPT THE RESPONSIBILITY FOR TRANSPORTATION TO AND FROM OUR PLANT. FURTHERMORE, WE DO NOT ASSUME ANY RESPONSIBILITY FOR CONSEQUENTIAL DAMAGE OR LOSS OF PRODUCTION.

WARRANTY IS ONLY VALID WHEN GENUINE GUSHER PARTS ARE USED.

SUPERVISION BY AN AUTHORIZED GUSHER REPRESENTATIVE IS RECOMMENDED TO ENSURE PROPER INSTALLATION. ADDITIONAL MANUALS CAN BE OBTAINED BY CONTACTING YOUR LOCAL GUSHER REPRESENTATIVE OR BY CALLING 859-824-5001.

RECEIVING AND INSPECTION

THE UTMOST CARE HAS BEEN TAKEN AT THE FACTORY TO PRODUCE THE PUMP, HOWEVER, DUE TO CIRCUMSTANCES BEYOND OUR CONTROL, YOU MUST INSPECT THE PUMP UPON RECEIPT AND FOLLOW THE INSTALLATION INSTRUCTIONS COMPLETELY BEFORE START-UP.

1. CHECK FOR CRACKED OR DAMAGED PARTS. IF UPON RECEIPT, YOU FIND THE PUMP DAMAGED, FILE A CLAIM WITH THE DELIVERING CARRIER.
2. REVIEW THE MOTOR TAG. VERIFY THE HORSEPOWER, VOLTAGE, AND R.P.M. VERSES YOUR ORDER.
3. REVIEW THE PUMP NAME TAG VERSES YOUR ORDER TO ENSURE EVERYTHING MATCHES.
   A. MODEL NUMBER
   B. HEAD IN FEET (FT. HD.)
   C. GALLONS PER MINUTE (G.P.M.)
   D. CONSTRUCTION:
      1. ALL IRON.
      2. ALL IRON WITH STAINLESS STEEL SHAFT AND IMPELLER.
      3. ALL STAINLESS STEEL.
4. SUCTION AND DISCHARGE PORTS SHOULD BE COVERED. IF THEY ARE NOT, REVIEW THEM TO ENSURE THERE ARE NO OBSTRUCTION.
5. IF THERE IS ANYTHING THAT APPEARS TO BE INCORRECT, CALL THE FACTORY IMMEDIATELY.
INSTALLATION

AFTER CAREFUL PRELIMINARY INSPECTION, YOU MAY PROCEED WITH THE INSTALLATION OF THE PUMP INTO YOUR SYSTEM.

1. LOWER THE PUMP INTO SYSTEM.
2. MAKE SURE THE MOTOR BASE AND CASING IS SETTING FIRMLY ON THE SUPPORT. (IT MAY BE NECESSARY TO USE METAL SHIMS TO LEVEL.)
3. SECURE THE MOTOR BASE AND CASING BY USING HOLD-DOWN SCREWS. AGAIN, CARE MUST BE TAKEN TO ENSURE THE MOTOR AND PUMP ARE LEVEL AND SETTING FIRMLY ON THE SUPPORT.
4. MAKING PIPE CONNECTIONS:
   A. EXTREME CARE MUST BE TAKEN TO SUPPORT ALL PIPING WITHOUT CAUSING ANY STRAIN ON THE PUMP.
   B. INSTALL PIPE HANGER ON THE PIPE SO THAT ALL PIPING WEIGHT IS SUPPORTED BY THE HANGER AND NOT BY THE PUMP OR THE CASING.
   C. BOLT HOLES MUST LINE-UP WITHOUT PRYING TO INSERT BOLTS.
   D. WHEN TIGHTENING FLANGE BOLTS, PIPE FLANGES MUST NOT BE FORCED TOGETHER.
   E. CHECK VALVE SHOULD BE PLACED IN DISCHARGE LINE BETWEEN GATE VALVE AND PUMP DISCHARGE PIPE TO PREVENT LIQUID FROM RUNNING BACK THROUGH THE PUMP AND CAUSING REVERSE ROTATION. THIS IS EXTREMELY IMPORTANT IN APPLICATIONS WITH INTERMITTENT DUTY WHERE THE PUMP MAY BE ROTATING BACKWARDS WHEN SERVICE IS RESUMED. THIS WILL CAUSE DAMAGE TO THE PUMP AND THE DRIVE MOTOR.
   F. PRESSURE GAUGE SHOULD BE LOCATED AT THE PUMP DISCHARGE, AS ALL PERFORMANCE DATA IS TAKEN AT PUMP DISCHARGE.
5. MAKE ELECTRICAL CONNECTION TO CONFORM WITH STATE AND LOCAL CODES. MOTORS ARE SUPPLIED WITH A WIRING DIAGRAM. FOLLOWING THE WIRING DIAGRAM FOR YOUR PARTICULAR ELECTRICAL REQUIREMENTS.
6. FILL PUMP AND SYSTEM WITH LIQUID. CHECK FOR ANY LEAKS.

MAINTENANCE

1. LUBRICATION: ALL PUMPS ARE LUBRICATED AT THE FACTORY AND SHOULD NOT REQUIRE ADDITIONAL LUBRICATION AT START-UP. A WELL PLANNED MAINTENANCE SCHEDULE CAN ONLY BE DEVISED AFTER CAREFUL OBSERVATION OF THE PUMP FOR THE FIRST SIX MONTHS OF OPERATION AND THE LUBRICATION THAT HAS BEEN REQUIRED. EACH PUMP INSTALLATION IS UNIQUE AND REQUIRES A DIFFERENT LUBRICATION SCHEDULE COMPATIBLE WITH THAT SPECIFIC OPERATION.

   TO LUBRICATE:
   A. REVIEW THE MOTOR NAME PLATE FOR TYPE OF LUBRICANT TO USE. IF THIS DATA IS NOT ON THE MOTOR NAME PLATE, CONSULT WITH THE MOTOR PRODUCER TO OBTAIN THIS INFORMATION.
   B. LOCATE ZERK FITTINGS ON THE MOTOR. IF NO ZERK FITTINGS ARE FOUND, THE BEARINGS ARE SEALED FOR LIFE AND REQUIRE NO LUBRICANT.

PRIMING

NO CENTRIFUGAL PUMP WILL OPERATE SATISFACTORILY UNTIL IT HAS BEEN PROPERLY PRIMED. DO NOT ATTEMPT TO PRIME PUMP WHEN OPERATING AND DO NOT UNDER ANY CIRCUMSTANCES OPERATE THE PUMP WITHOUT BEING COMPLETELY PRIMED. SOME OF THE MOST COMMON METHODS OF PRIMING ARE FLOODED SUCTION, FOOT VALVE IN SUCTION LINE, EJECTOR (STEAM, WATER OR AIR OPERATED) AND VACUUM PUMP.

WITH FLOODED SUCTION, REMOVE THE AIR VENT IN TOP OF PUMP CASING TO RELEASE ENTRAINED AIR.

WITH FOOT VALVE THE PUMP AND SUCTION PIPE MUST BE FILLED WITH THE LIQUID BEING PUMPED. IT IS RECOMMENDED TO FILL THE DISCHARGE PIPE SEVERAL FEET ABOVE THE PUMP DISCHARGE, LEAVE VENT OPEN WHILE FILLING PIPE AND PUMP. THE PUMP WILL REMAIN PRIMED UNLESS THE FOOT VALVE LEAKS OR IF THE LIQUID IS CONTAMINATED AND DOES NOT ALLOW FOOT VALVE TO CLOSE TIGHT.

BUMP START THE MOTOR TO VERIFY CORRECT ROTATION.

UPON INITIAL START-UP, PUMPS MAY SEEM TO RUN TIGHT AND HOT. THIS IS CAUSED BY BREAKING-IN OF OIL SEALS AND BALL BEARINGS. PUMP WILL OPERATE NORMALLY AFTER APPROXIMATELY 150 HOURS OF SERVICE. REVIEW THE MOTOR TAG FOR MAXIMUM TEMPERATURE LIMITS.

START-UP

CHECK PUMP FOR VIBRATION LEVELS, BEARING TEMPERATURE, AND EXCESSIVE NOISE. IF NORMAL LEVELS ARE EXCEEDED, SHUT DOWN AND INVESTIGATE.

DO NOT LUBRICATE WHILE SHAFT IS IN MOTION.

A. REVIEW THE MOTOR NAME PLATE FOR TYPE OF LUBRICANT TO USE. IF THIS DATA IS NOT ON THE MOTOR NAME PLATE, CONSULT WITH THE MOTOR PRODUCER TO OBTAIN THIS INFORMATION.
B. LOCATE ZERK FITTINGS ON THE MOTOR. IF NO ZERK FITTINGS ARE FOUND, THE BEARINGS ARE SEALED FOR LIFE AND REQUIRE NO LUBRICANT.
MECHANICAL SEAL

THE MOST IMPORTANT FACTOR IN THE MECHANICAL SEAL, OTHER THAN THE SEALING QUALITIES, IS THE FACT THAT ONCE IT HAS BEEN PROPERLY INSTALLED THERE IS LITTLE OR NO MAINTENANCE REQUIRED. SOME OF THE MOST COMMON REASONS FOR SEAL FAILURE ARE:

- IMPROPER INSTALLATION
- SHAFT MISALIGNMENT AND SHAFT WHIP
- WRONG SELECTION FOR LIQUID PUMPED
- DIRT OR GRIT BETWEEN FACES

- SEAL GLAND TIGHTENED UNEVENLY SO STATIONARY SEAT IS NOT PERPENDICULAR TO SHAFT
- OPERATION WITHOUT LIQUID

THE LIFE OF A MECHANICAL SEAL DEPENDS ON VARIOUS FACTORS SUCH AS CLEANLINESS AND LUBRICATING PROPERTIES OF LIQUID BEING PUMPED. DUE TO THE DIVERSITY OF OPERATING CONDITIONS IT IS NOT POSSIBLE TO GIVE DEFINITE INDICATIONS TO ITS LIFE.

MAINTENANCE HISTORY

SERIAL NO._________________________BOM CODE:_________________________
MODEL NO._________________________IMP. DIA._________________________
OPERATING COND.________________ GPM @ ___________________ FT. HEAD
HP______________________________SPEED/RPM________________________
START-UP DATE__________________AMPS AT START-UP____________________
PRESSURE AT START-UP________________________

GREASE LUBRICATION

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TYPE OF GREASE USED:_________________________________________

NOTES:______________________________________________________
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|________________________________________________________________|
EXPLODED VIEW FOR VORTEX CLOSED COUPLED

1  MOTOR
2  STEM
3  SHAFT SLEEVE GASKET
4  SHAFT SLEEVE
5  SEAL GLAND
6  SEAL GLAND GASKET
7  MECHANICAL SEAL
8  STEM PLATE
9  HOUSING GASKET
10 KEY
11 IMPELLER
12 WASHER
13 RETAINING BOLT
14 IMPELLER HOUSING

DUE TO THE NUMEROUS AMOUNT OF POSSIBLE NUMBERS, NO PART NUMBERS ARE INCLUDED IN THIS CHART. FOR YOUR PARTICULAR APPLICATION, PROVIDE THE FACTORY WITH THE SERIAL NUMBER. A BILL OF MATERIAL CAN THEN BE PROVIDED TO YOU.
Gusher Pumps is a division of Ruthman Companies

Ruthman Companies
Corporate Headquarters
1212 Streng Street
Cincinnati, OH. 45233
Phone: 513-559-1901
Fax: 513-559-0035
Web: www.ruthmancompanies.com

Gusher Pumps of Dry Ridge
22 Ruthman Drive
Dry Ridge, KY. 41035
Phone: 859-824-5001
Fax: 859-824-3011
Web: www.gusher.com

Gusher Pumps of Williamstown
115 Industrial Drive
Williamstown, KY. 41097
Phone: 859-824-3100
Fax: 859-824-7248
Web: www.gusher.com

Gusher Pumps of California
8226 Salt Lake Avenue
Cudahy, CA 90201
Phone: 323-773-0847
Fax: 323-773-8462
Email: gusherca@aol.com

Gusher Pumps of New Castle
403 North Ninth Street
New Castle, IN. 47362
Phone: 765-529-5624
Fax: 765-521-0008
Email: gusherpumpnc@gmail.com

Bsm Pump Corp.
180 Frenchtown Road
North Kingstown, RI 02852
Phone: 401-471-6350
Fax: 401-471-6370
Web: www.bsmpump.com

Nagle Pumps
1249 Center Avenue
Chicago Heights, IL 60411
Phone: 708-754-2940
Fax: 708-754-2944
Web: www.naglepumps.com

Wagner Process Equipment
3727 Metro Drive, Suite B
Stockton, CA 95215
Phone: 209-931-0100
Fax: 209-931-7910
Web: www.wagnerprocess.com

Great Lakes Pump & Supply Co.
1075 Naughton
Troy, MI 48083
Phone: 248-528-9100
Fax: 248-528-9015
Web: www.greatlakespump.com

Process Systems, Inc.
Michigan, Main Headquarters
23633 Pinewood
Warren, MI. 48091
Phone: 586-757-5711
Fax: 586-758-6996
Web: www.psi4pumps.com

Indiana
485 N State Route 3431
South Melloitt, IN. 47958
Phone: 765-295-2206
Fax: 765-295-2243
Web: www.psi4pumps.com

Worldwide:
Ruthmann Pumpen
Thomas-Edison-Str. 11
52499 Baesweiler, Germany
Tel: 0049 (0) 2401-80 489 0
Fax: 0049 (0) 2401-80 489 20
Web: www.ruthmannpumpen.de

Gusher Pumps Shanghai
上海格晞尔泵有限公司
913 Changlin Rd. Suite 4012
Shanghai, China 200443
上海市市长临路913号4012室
Phone: +86 021 55151993
Fax: +86 021 55425733
Web: www.gusher.cn