

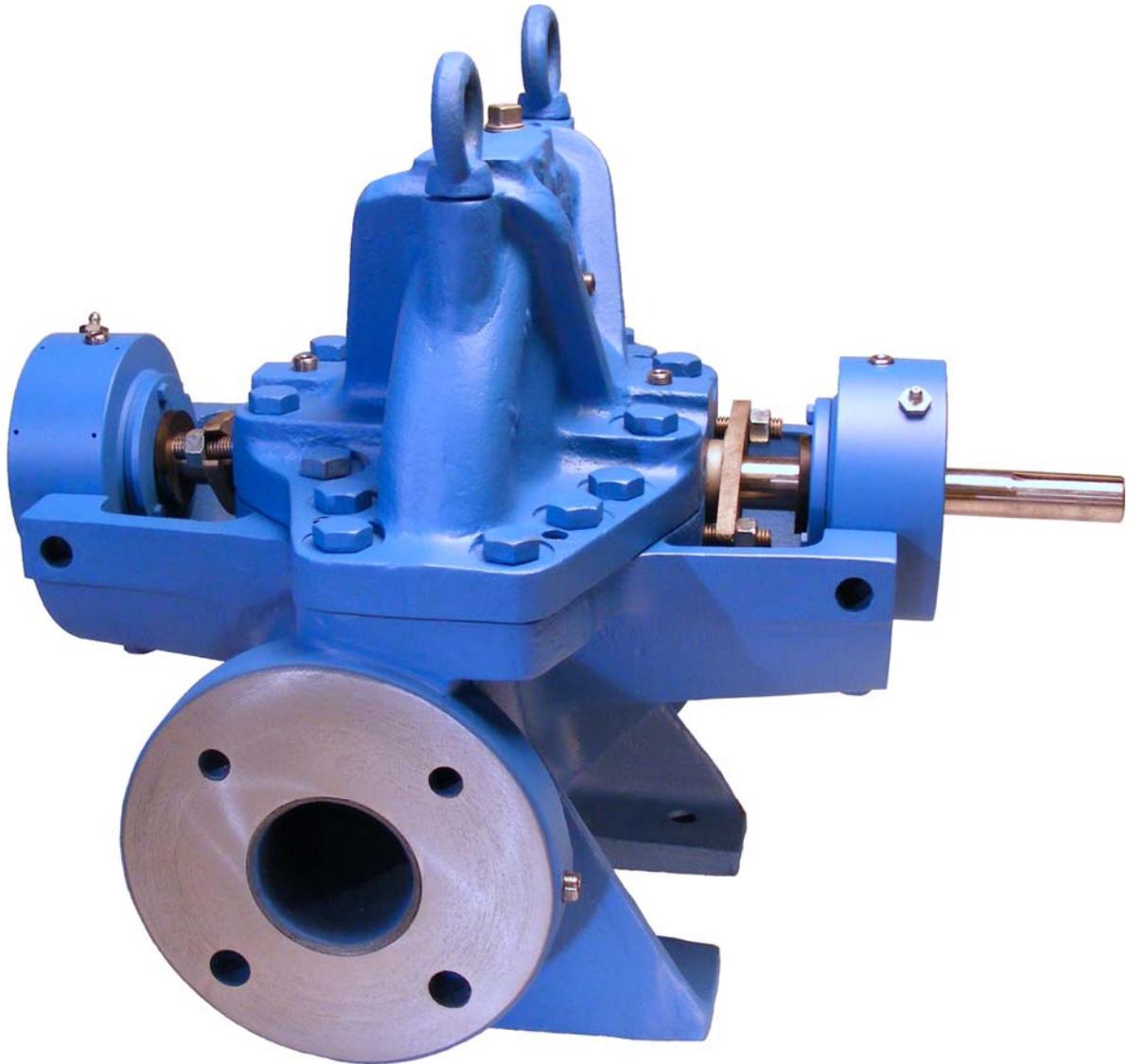
# **SUMMIT PUMP**

---

**Model DSR**

Single Stage, Double Suction Pumps

**Installation, Operation, and Maintenance Manual**



© 2014 by Summit Pump, Inc. All rights reserved.



## **WARRANTY**

Pumping units assembled by Summit Pump, Inc., Green Bay, WI are guaranteed to be free from defects in material and workmanship for one year from date of shipment from factory in Green Bay, WI. The obligation under this Warranty, statutory or otherwise, is limited to replacement or repair at Green Bay, WI, of such part as shall appear to us upon inspection at such point, to have been defective in material or workmanship.

This Warranty does not obligate Summit Pump, Inc. to bear the cost of labor or transportation charges in connection with replacement or repair of defective parts; nor shall it apply to a pump upon which repairs or alterations have been made unless authorized by Summit Pump, Inc.

No warranty is made in respect to engines, motors, or trade accessories, such being subject to warranties of their respective manufacturers.

No express implied or statutory warranty, other than herein set forth is made or authorized to be made by Summit Pump, Inc.

In no event shall Summit Pump, Inc. be liable for consequential damages or contingent liabilities arising out of the failure of any Summit Pump, Inc. pump or parts thereof to operate properly.

## **LIABILITY**

Summit Pump, Inc. shall not be liable for personal physical injury, damage or delays caused by failure to follow the instructions and procedures for installation, operation and maintenance contained in this manual.

The equipment is not for use in or with any nuclear facility or fire sprinkler system. Buyer accepts the responsibility for insuring that the equipment is not used in violation and Buyer shall indemnify and hold Seller harmless from any and all liability (including such liability resulting from seller's negligence) arising out of said improper use.

## **COPYRIGHT**

This Installation, Operation, and Maintenance Manual contains proprietary information, which is protected by copyright. No part of this Installation, Operation, and Maintenance Manual may be photocopied or reproduced without prior written consent from Summit Pump.

The information contained herein is for informational use only and is subject to change without notice. Summit Pump assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual.



# Contents

1. INTRODUCTION	1
SAFETY	1
2. RECEIPT AND STORAGE	2
RECEIVING THE PUMP	2
STORING THE PUMP	2
HANDLING	2
LIFTING	2
3. INSTALLATION	3
LOCATION	3
FOUNDATION	3
BASEPLATE GROUTING	4
PIPING CONNECTION	5
SUCTION	5
DISCHARGE	6
ALIGNMENT	6
4. OPERATION	7
CHECKING ROTATION	7
LUBRICATION	7
SEALING	8
PRIMING	8
START UP	9
SHUT DOWN	9
APPENDIX A - PUMP TROUBLE SHOOTING	10
APPENDIX B - MAINTENANCE TIMETABLE	11
APPENDIX C - MAINTENANCE AND REPAIR	12
DISASSEMBLY PROCEDURES	12
ASSEMBLY PROCEDURES	14
APPENDIX D	16
MECHANICAL SEAL	
APPENDIX E – PUMP CROSS SECTIONS	17



## 1. INTRODUCTION

---

This installation, operation, and maintenance manual is designed to help you achieve the best performance and longest life from your Summit Pump. This pump is a horizontal split case volute centrifugal pump with enclosed impeller. It is designed for general water service.

If there are any questions regarding this pump or its application, which are not covered in this manual, please contact your local Summit Pump distributor.

For information or technical assistance on the driver service, contact the driver manufacturer's local dealer or representative.

### SAFETY

The following message types are used in this manual to alert maintenance personnel to procedures that require special attention for the protection and safety of both personnel and equipment:

<b>WARNING!</b>
Failure to comply with the warnings in this manual could result in personal injury or death.

<b>CAUTION!</b>
Failure to comply with the cautions in this manual could result in destruction of or damage to equipment.

<b>NOTE:</b> <i>Identifies a condition or procedure which is essential to proper equipment operation.</i>
---

## 2. RECEIPT AND STORAGE

---

### RECEIVING THE PUMP

Immediately upon arrival, carefully inspect the pump for evidence of damage during transit. Immediately report any damage to your local Summit Pump distributor.

### STORING THE PUMP

#### TEMPORARY

Temporary storage is less than six months. Store pump in a clean, dry place, free from extreme swings in temperature and humidity. Rotate the shaft once a week to avoid bearing damage.

#### LONG TERM

Long Term Storage is more than six months. Follow temporary storage guidelines and consult with factory for detailed long term guidelines.

### HANDLING

Pump unit boxes and crates may be unloaded using a forklift or slings depending on size and package construction.

#### WARNING!

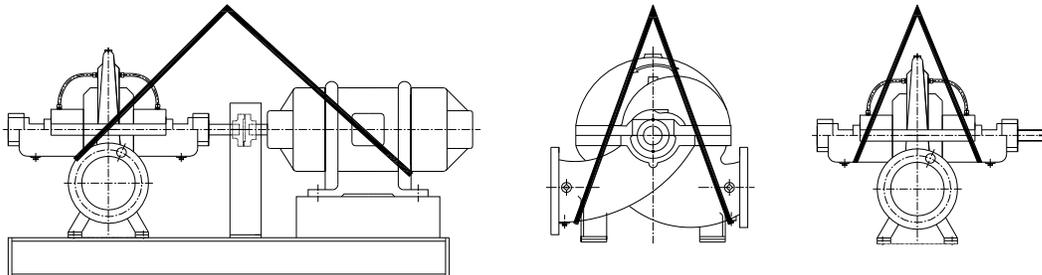
Pumps and assemblies are heavy, improper handling can result in serious injury.

### LIFTING

To avoid damage to pump and/or motor unit should be lifted using a sling nylon, chain or wire rope. The slings should be placed so lift is equally supported at four or more points. To avoid damage, See figure below to guide placement of slings.

#### CAUTION!

Be sure all components are securely fastened to baseplate before lifting.



### 3. INSTALLATION

#### LOCATION

The pump should be located as close as practical to the supply of liquid. Other location considerations are easy access for inspection and maintenance and ample overhead space for lifting with crane or hoist.

The final location consideration is to assure that maximum NPSHa is available at the suction flange. NPSHa must always be greater than NPSHr.

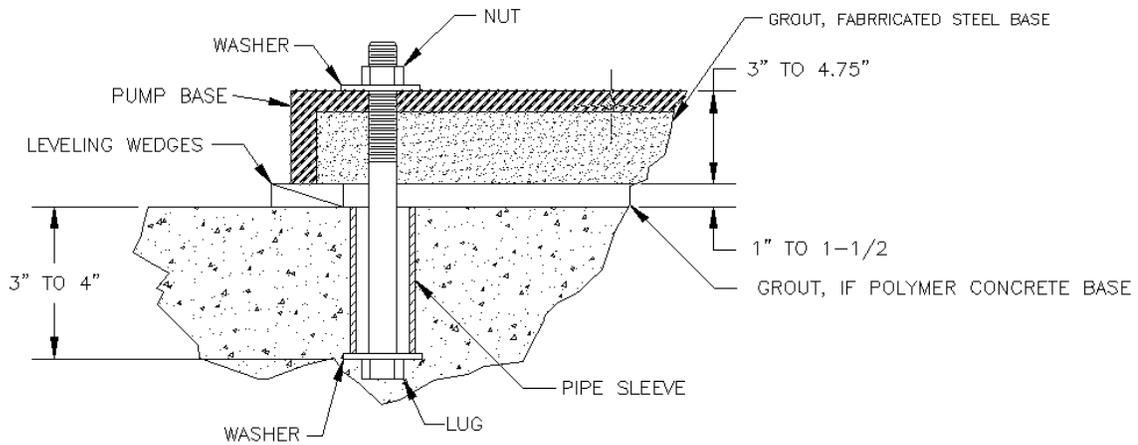
#### FOUNDATION

##### CONCRETE SUB-BASE

The concrete sub foundation performs a number of functions. It must support the weight of the entire pump assembly, maintain the alignment of all system components, and absorb the loads, forces and vibrations that are developed under normal operating conditions. The concrete material used must be top quality and conform to local building codes as well as the contractor's strength requirements. Reinforcing bars and mesh should be used as required. The mounting surface of the concrete foundation must be flat and level beneath the footprint of the sub-base, or the pump could be installed out of square. This could create problems aligning the piping, place extra loads on the couplings and bearings, and alter the operating levels of lubricants or hydraulic fluids in the system. It is recommended that the top surface of the slab be held flat and level to Ff50/F150 according to American Concrete Institute (#117) and the Canadian Standards Association (#A23.1) which is approximately 1/8" per 10 foot.

The mass weight of the sub foundation should be 3-5 times the mass weight of pump, motor and baseplate. Dimensionally, it should be 3" to 6" longer and wider than the polymer concrete or fabricated steel baseplate. Anchor bolts are installed in pipe sleeves. The pipe diameter is 2.5 times larger than the anchor bolt diameter. This sleeve/bolt assembly is embedded in the base when poured.

Anchor bolt sizes: 1"-8UNC. Length is 7.5 to 10" depending on base thickness and overall size.

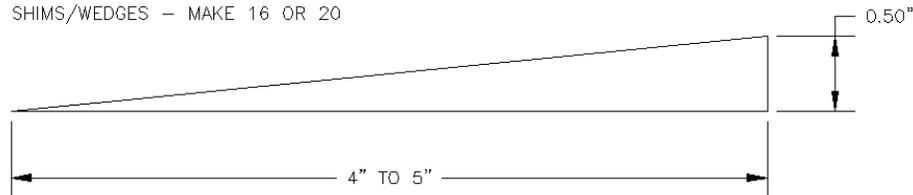


## BASEPLATE GROUTING

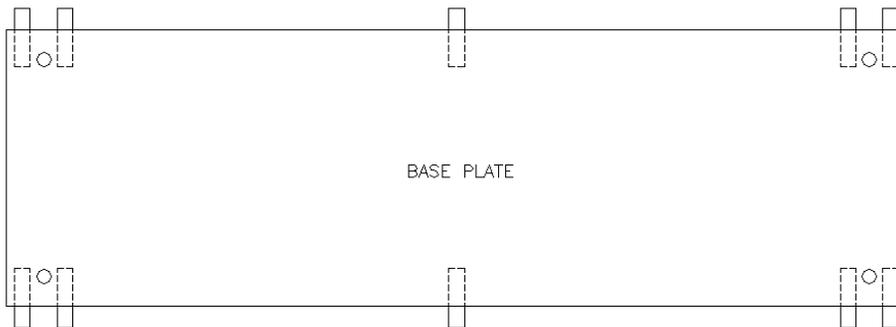
1. This grouting instruction assumes a concrete sub base has been put in place to accept the baseplate. The sub base should be clean of dirt, oil and any other debris.
2. Shims/wedges should be put in place on the sub base, as shown below. Shims/wedges should be steel, as shown.

### SHIMS/WEDGES (wood)

SHIMS/WEDGES - MAKE 16 OR 20



3. Locations are shown in figure below. Use 2 to 3 per stack to obtain desired gap between baseplate and sub-base. Normal gap is 1 inch to 1-1/2 inches.



SHIM PLACEMENT

4. Carefully lower baseplate with pump and motor onto sub base over anchor bolts.
5. Level baseplate to 0.125" over length and 0.088" in over width.
6. When leveling is complete, tighten anchor bolts uniformly hand tight.
7. Build a plywood form around baseplate supported on the sub base. It should be 3" high and 1" to 1.5" larger than the baseplate. Its size should be large enough to include the shims or wedges that are left in place.
8. Use a high quality non-shrinking epoxy grout, following manufacturer's mixing and installation instructions.
9. When grout has cured, per grout manufacturer's recommended cure time, tighten anchor bolt till secure.
10. When grouting is complete, check coupling alignment and re-align as necessary.

## PIPING CONNECTION – SUCTION / DISCHARGE

Connect piping in a manner that is as short and direct as possible. Independent pipe supports and anchors must be used in all installations. Never support piping with pump flanges.

### SUCTION PIPING

Never use suction piping smaller than the suction flange size. Use pipe one to two sizes larger than the pump suction with an eccentric reducer at the pump suction flange. Install reducer flat side on top if the suction side incurs a lift. Place the flat side on the bottom if the suction side is flooded.

Elbows at the pump suction should be avoided. If used, the vertical position is the only acceptable position. Horizontal positioning where the elbow plane is parallel to the pump shaft will result in excessive axial loads on the pump shaft and could lead to breakage.

If a horizontal elbow is used, it must be at least ten (10) suction pipe diameters from the suction flange.

Shut off valves should be located as close as possible to the suction source, not at the pump.

**CAUTION!**

Do not throttle the pump using the suction valve. This valve is for pump isolation during maintenance.

See Fig 2a, b, c for correct and incorrect installations.

Suction piping should be sized to ensure a flow velocity of Four (4) to seven (7) feet per second.

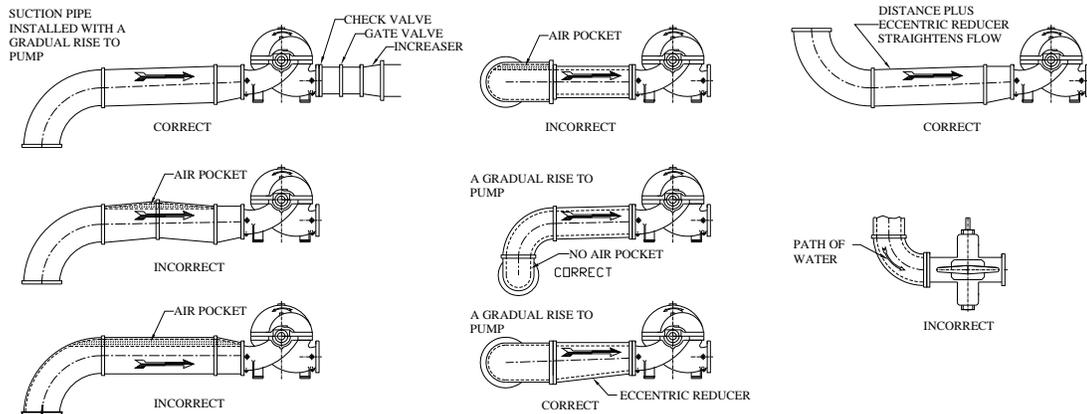


Fig 2a, b, c

## DISCHARGE PIPING

For a short run, use the same diameter pipe as the discharge flange pipe diameter. For a long run, the discharge pipe should be one (1) to two (2) sizes larger than the discharge flange diameter. If the larger size discharge pipe is used, install the pipe increaser directly onto the pump discharge flange. A check valve (first) and isolation valve should be installed in the discharge line. (The check valve prevents back flow during pump shutdowns. The isolation valve is for pump isolation during maintenance.) If an increaser is used, mount it directly on the pump discharge flange with the check and isolation valve directly downstream.

## ALIGNMENT

### CAUTION

Careful alignment is an extremely important consideration to ensure long pump life.

The pump and driver were aligned at the factory, however that alignment will have been disturbed during transportation and handling. Alignment must be rechecked. If necessary, align the motor to the pump not the pump to the motor. Check both parallel and angular alignment. Final alignment should be within 0.005" in all planes at operating temperature.

Alignment checking needs to be done several times prior to pump start up. Those alignment recommendations are as follow:

### WARNING!

Lock out Power to avoid personal injury.

1. Prior to grouting, to remedy misalignment caused by transportation
2. After grouting, to correct any changes that occurred during grouting.
3. After piping is connected to ensure possible pipe strains have changed alignment.
4. Hot alignment, after the pump has reached operating temperature, if the pump is used in high temperature service.
5. Alignment is accomplished by adding or removing shims under the motor feet and moving the motor as required.

**4. OPERATION**

**CHECKING ROTATION**

<b>CAUTION!</b>
Lock out power to avoid personal injury.

<b>WARNING!</b>
Operating the pump in the opposite direction may cause damage to casing and impeller

1. Lockout power to drive.
2. Remove coupling guard.
3. Remove coupling grid/sleeve element so that the motor half of coupling can spin free from the pump half.
4. Unlock power to motor.
5. Clear personnel from immediate area, jog motor just enough to determine direction of rotation. Rotation must be same as arrow on pump.
6. If same lock out pump, reassemble coupling grid/sleeve to connect pump half.
7. If direction is wrong change electrical wiring connection and repeat Step 4, 5 and 6.
8. Install coupling guard
9. Unlock motor, pump is ready to run.

**LUBRICATION**

Summit DSR pumps are grease lubricated. The pump has been pre-greased at the factory for 2000 hours operation. Re-greasing should occur at 2000 hours or at three month intervals.

Acceptable greases are shown in the table below:

**Table 5**

Acceptable Greases	
Citgo	Mystic EP2
Keystone	81EP2
Mobil	Mobil Grease XHP222
Mobil Synthetic	SCH 100

■ TO RE-GREASE LUBRICATED BEARINGS

1. Wipe dirt and foreign matter from the grease nipples (44) on top of the bearing housings (31, 33).
2. Remove grease relief plugs (56).
3. Fill grease through fittings until there is grease coming out of the relief hole.
4. Reinstall relief plugs.

**SEALING**

<b>WARNING!</b>
Lock out power to avoid personal injury

**PACKING**

1. The packing should be as loose as possible without an air leak, when the pump is started. As the pump runs in, gradually tighten the gland bolts evenly. Recommend adjusting the packing nuts no more than one flat every 25 minutes. There must be some leakage. The leakage should be reduced to 40 – 60 drops per minute. Normally this will take 50 – 60 minutes for packing to seal.

**MECHANICAL SEALS**

1. Check all fasteners to be sure they are tight.
2. Turn shaft by hand to ensure no binding exists.
3. Check seal, flush lines for leaks, if shut off valves exist, turn on.

**PRIMING**

A centrifugal pump should never be operated unless first filled with liquid and ALL of the air vented out. The pump must NOT be operating to prime it. Slowly rotate the pump several turns by hand when priming. An operating pump cannot be vented as the water will exit, but not the air.

The pump must be fully primed and suction pipe full of liquid before the pump is started.

<b>CAUTION!</b>
Do not operate the pump dry, rotating parts may seize, damaging pump.

Pump can be primed by the following methods:

1. Liquid supply is above pump. Close the discharge valve first, and then open the suction valve. Remove vent plug on top of casing, allow air to vent, until liquid is flowing out, replace vent plug, start pump, open discharge valve.
2. If pump has a suction lift, a foot valve will be needed on the end of the suction line. It will be in the sump or vessel below the pump. Use same procedure as listed above in No.1 priming method. If pump does not run for extended periods, pump may lose prime and will require re-priming; detailed in No.1 priming method above.

## **START UP**

### ■ TO START UP THE PUMP

1. Make sure the pump is vented, and suction, any recirculation and flush valves are open.
2. Close the discharge valve at least 80%.
3. Start pump motor.
4. Slowly open discharge valve until desired flow is obtained. Never use the suction valve to regulate flow.

## **SHUT DOWN**

### ■ TO SHUT DOWN THE PUMP

1. Gradually close the discharge valve completely and turn off the power to the motor. The pump must not run for more than a few seconds with the discharge valve closed.
2. Close any recirculation, and flush valves.
3. Lock out electrical power to pump motor.

## APPENDIX A – PUMP TROUBLE SHOOTING

---

### CHECKLIST FOR OPERATING DIFFICULTIES

#### TEN SYMPTOMS

1. Pump does not delivery water:
2. Insufficient capacity delivered:
3. Insufficient pressure developed:
4. Pump loses prime after starting:
5. Pump requires excessive power:
6. Stuffing box leaks excessively:
7. Packing has short life:
8. Pump vibrates or is noisy:
  
9. Bearings have short life:
10. Pump overheats and seizes:

#### POSIBLE CAUSES

- 1-2, 3-4, 6-11-14-16-17-22-23
- 2- 3-4-5-6-7-8-9-11-14-17-20-22-23-29-30-31
- 5-14-16-17-20-22-29-30-31
- 2-3-5-6-7-8-11, 12-13
- 15-16-17-18-19-20-23-24-26-27-29-33-34-37
- 13-24-26-32-33-24-35-36-38-39-40
- 12-13-24-26-28-32-33-34-35-36-37-38-39-40
- 2-3-4-9-10-11-21-23-24-25-26-27-28-30-35-36
- 41-42-43-44-45-46-47
- 24-26-27-28-35-36-41-42-43-44-45-46-47
- 1-4-21-22-24-27-28-35-36-41

### FORTY-SEVEN POSSIBLE

### CAUSES OF TROUBLE

#### Suction Troubles

1. Pump not primed.
2. Pump or suction pipe not completely filled with liquid.
3. Suction lift too high.
4. Insufficient margin between suction pressure and vapor pressure.
5. Excessive amount of air or gas in liquid.
6. Air pocket in suction line.
7. Air leaks into suction line.
8. Air leaks into pump through stuffing boxes.
9. Foot valve too small.
10. Foot valve partially clogged.
11. Inlet of suction pipe insufficiently submerged.
12. Water-seal pipe plugged.
13. Seal cage improperly located in stuffing box, preventing sealing fluid entering space to form the seal.

#### System Troubles

14. Speed too low
15. Speed too high
16. Wrong direction of rotation.
17. Total head of system higher than design head of pump.
18. Total head of system lower than pump design head.
19. Specific gravity of liquid different from design.
20. Viscosity of liquid differs from that for which designed.
21. Operation at very low capacity.
22. Parallel operation of pumps unsuitable for operations.

#### Mechanical Troubles

23. Foreign matter in Impeller.
24. Misalignment.
25. Foundations not rigid.
26. Shaft bent.
27. Rotating part rubbing on stationary part.

28. Bearings worn.
29. Wearing rings worn.
30. Impeller damaged.
31. Casing gasket defective, permitting internal leakage.
32. Shaft or shaft sleeves worn or scored at the packing.
33. Packing improperly installed.
34. Incorrect type of packing for operating conditions.
35. Shaft running off center because of worn bearings or misalignment.
36. Rotor out of balance resulting in vibration.
37. Gland too tight resulting in no flow of liquid to lubricate packing.
38. Failure to provide cooling liquid to water-cooled stuffing boxes.
39. Excessive clearance at bottom of stuffing box between shaft and casing, causing packing to be forced into pump interior.
40. Dirt or grit in scaling liquid, leading to scoring of shaft or shaft sleeve.
41. Excessive thrust caused by a mechanical failure inside the pump or by the failure of the hydraulic balancing
42. Excessive grease or oil in antifriction-bearing housing or lack of cooling, causing excessive bearing temperature.
43. Lack of lubrication.
44. Improper installation of antifriction bearings (damage during assembly, incorrect assembly of stacked brg., use of unmatched brgs. as a pair, etc.)
45. Dirt getting into bearing.
46. Rusting of bearings due to water getting into housing.
47. Excessive cooling of water-cooled brg. Resulting in condensation.

## **APPENDIX B – MAINTENANCE TIMETABLE**

---

### **DAILY MAINTENANCE**

1. Check bearing temperature. Use an instrument such as a thermometer, surface pyrometer or Infrared thermometer. Do not use your hand. Temperature must be below 180° F.
2. Check suction and discharge pressures.
3. Check shaft packing for excessive leakage.

### **THREE MONTH MAINTENANCE**

1. Grease bearings per instructions in Section 4, Page 7.
2. Check grease that comes out relief plug. If white, indicates water contamination. Wash out contaminated grease, replace with new grease.

### **SIX MONTH MAINTENANCE**

1. Check packing and replace, if necessary. Be sure lantern ring is centered in the stuffing box and seal water piping is in good condition.
2. Take vibration readings and compare to previous readings.
3. Check shaft sleeve, if grooved/worn; replace. (If not replaced when worn, packing life will be reduced.)

### **YEARLY MAINTENANCE**

1. Depending on the fluid pumped and pump operating hours during the year, check pump performance and vibration inspection records. If necessary remove upper casing and inspect casing halves, impeller, sleeves and wear rings. These inspections can range from once a year to once every three to five years.

## APPENDIX C - MAINTENANCE AND REPAIR

---

**WARNING!**

WEAR EYE PROTECTION. Failure to do so can result in serious injury.

**WARNING!**

Lock out pump motor to prevent accidental start up leading to possible serious injury

**WARNING!**

Pump parts are heavy. Use proper lifting techniques to avoid personal injury

### DISASSEMBLY PROCEDURES

■ TO DISASSEMBLE YOUR PUMP

1. Lock out pump driver (motor)
2. Shut off suction valve, discharge valve, recycle and flush tubing prior to disconnecting the lines.
3. Ensure pressure is vented off and then disconnect flush tubing and drain casing of liquid.
4. Remove coupling guard.
5. Disconnect coupling, inspect grid/sleeve for wear.
6. If oil lubricated, remove oiler and drain plugs. Drain oil into suitable drip pan. Dispose of oil in acceptable responsible manner.
7. Remove packing glands (17), if packed. If mechanical seal equipped, slide seals (65) towards the bearing housings.
8. With a suitable punch, drive out the two straight roll pins (55) which are used to align upper and lower half casings. (See Figure 5)
9. Remove the casing bolts holding the two casing halves together.
10. Utilizing the lifting eye bolts on the upper casing half (1B), lift the upper half.
11. Remove bearing housing screws (54).
12. Remove/detach bearing housing from casing.
13. Lift out the rotating assembly. Use care in lifting and handling. Place rotor on two V support blocks for further disassembly and inspection.

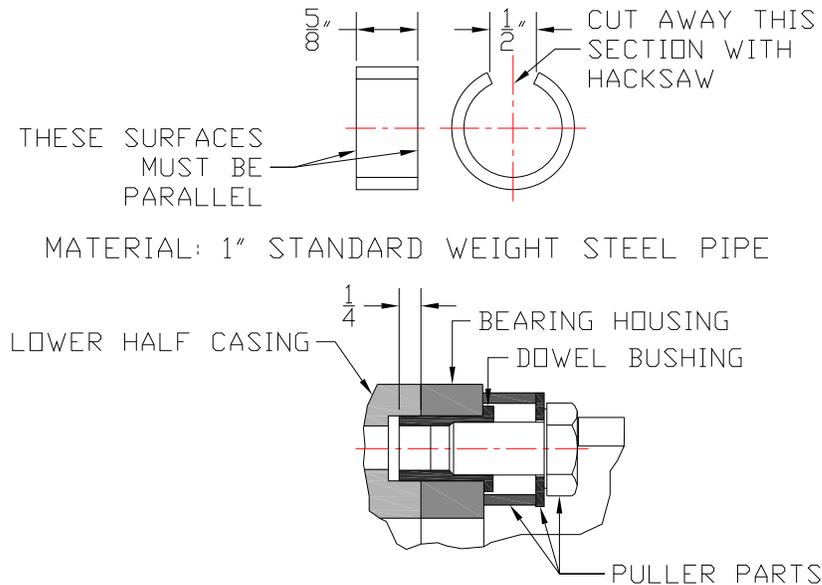


Fig 5.

14. The casing wear rings (7) are on the rotor. They are fixed by two diametrically opposed screws (24) inserted into the casing wear ring (7) and located in grooves in the lower casing half.
15. Remove bearing housing cap screw (54). Remove the bearing covers (37) and slide the bearing housings (31&33) off the bearings.
16. Release the OB bearing lock washer (23) and loosen the lock nut (22) and remove from the non-drive end of pump shaft.
17. Depending on the sealing configuration, remove glands or mechanical seals (See Appendix D Mechanical Seals)
18. Remove two socket head screws, securing each shaft nut (20). Use a “C” spanner wrench to remove shaft nuts. Slide off shaft sleeves (14).
19. Measure and mark impeller location (record measurement) Remove the impeller (2), casing wear rings (7) impeller key (32) from pump shaft (6).
20. As the parts are removed from the rotor, carefully inspect each one for wear and any damage. A good general rule is to replace any part showing wear regardless if performance has not declined.
  - a. Inspect casing, seal bore and, impeller, for wear (corrosion, erosion) pitting, and cracks.
  - b. Check shaft for run-out and key seats for burrs or wear. Check sleeves for grooves, pits, ect. Replace as needed.
  - c. Remove bearings, do not reuse. New bearings must be installed on rotating assembly.
  - d. Discard gaskets (73) and O-rings (15) and replace.

## ASSEMBLY

1. Clean all gasket surfaces, threads and O ring grooves prior to starting assembly.
2. Fit casing gasket (73) to the bottom half of the casing, use a small amount of contact adhesive to hold gasket in position during assembly.
3. Insert impeller key on shaft.
4. Determine rotation, vane tips point away from the apparent flow directions. Slide impeller (2) onto shaft (6) and key (32).
5. Slide the two sleeves with O-rings and shaft nuts onto the shaft. Be careful not to damage the sleeve O-rings during this step. The sleeves and nuts determine the impeller location. (Note: 2.5x3-10C pumps do not have sleeves.)
6. Locate impeller centrally on its keyway. This position may be changed during final assembly. (The 2.5SLR impeller position is fixed when nut is tightened)
7. When gland packing is used, slide on throttling bushing and glands.
8. When mechanical seals are used, slide the seal onto the shaft and over the sleeves. Refer to Mechanical Seal Manufacturer Installation Instructions, normally furnished with the mechanical seal.
9. Slide water deflectors (40) and bearing covers (35, 37), thrust and radial onto their respective shaft ends.
10. Install radial bearing (16) onto drive end of shaft.

The recommended bearing installation method is heating the bearings using an induction heater.

<b>WARNING!</b>
WEAR INSULATED GLOVES when using heater. Failure to do so can result in serious personal injury while handling hot bearings.

11. Install thrust bearing (18) on non-drive end of shaft. Slide lock washer (23) onto shaft, screw locknut (22) on to shaft until lock washer is tight against bearing. Tighten locknut, bend lock washer tab into bearing locknut.
12. Slide casing rings(7) over shaft(6) ends be sure anti-rotation screws(47) are correctly orientated to the match holes in the lower half(1A). Slide bearing housing (31.33) over bearings, install four cap screws (54), and bearing cover and tighten. Slide water deflectors to bearing covers, thrust and radial end. Install dust cover (38) shaft end, cover onto thrust bearing housing, and tighten cap screws.
13. Fill the bearing housing full of grease using grease nipple (44) till it comes out grease relief. Replace grease relief plug (56).
14. Using an OSHA approved sling and hoist, install the rotating assembly into the lower

casing half.

15. Be sure the casing ring anti-rotation screws (47) are in their correct position (they are not on the ring centerline); Install the cap screws that fix the rotating assembly position in the casing.
16. Centralize the impeller within the casing, tighten the shaft nuts and lock their position with the set screws in ring.
17. If mechanical seals are used, set their position.
18. Check assembly for free rotation, by rotating the assembly by hand.
19. Using a sling through the lifting eye bolts and hoist upper casing half and lower down over the rotating assembly onto the lower casing half.
20. Check to ensure wear rings are correctly located in upper casing half.
21. When the upper casing half is resting on the lower half, align the casing alignment roll pins; drive them into the mating lower holes.
22. Install the casing bolts (50) and torque to specified value on chart below.

TORQUE CHART		
Frame	Pump Size	Foot-lbs.-Dry
S	2.5x3-10C	105
	3x5-12K	
	4x6-12B	
M	6X8-13	105
	6X8-16	
	6X10-18	
	8X10-14	
L	10X12-16A/B	250
	12X18-25	

23. Check for free rotation, by rotating the assembly by hand.
24. If using packing, three rings of packing, a lantern ring and more, two rings of packing. Tighten gland nuts finger tight. Tighten later after pump has started. If using a mechanical seals, see Appendix D, Mechanical Seals.
25. Install external auxiliary piping if needed.
26. Check for free rotation, by rotating the assembly by hand.
27. Check pump casing halves for any drain plugs removed, reinstall.
28. Pump is ready to go back into service or into storage.

## APPENDIX D – MECHANICAL SEALS

---

**WARNING!**

Lock out power to avoid personal injury

**NOTE: Failure to follow seal manufacturer's installation instructions may shorten the seal life.**

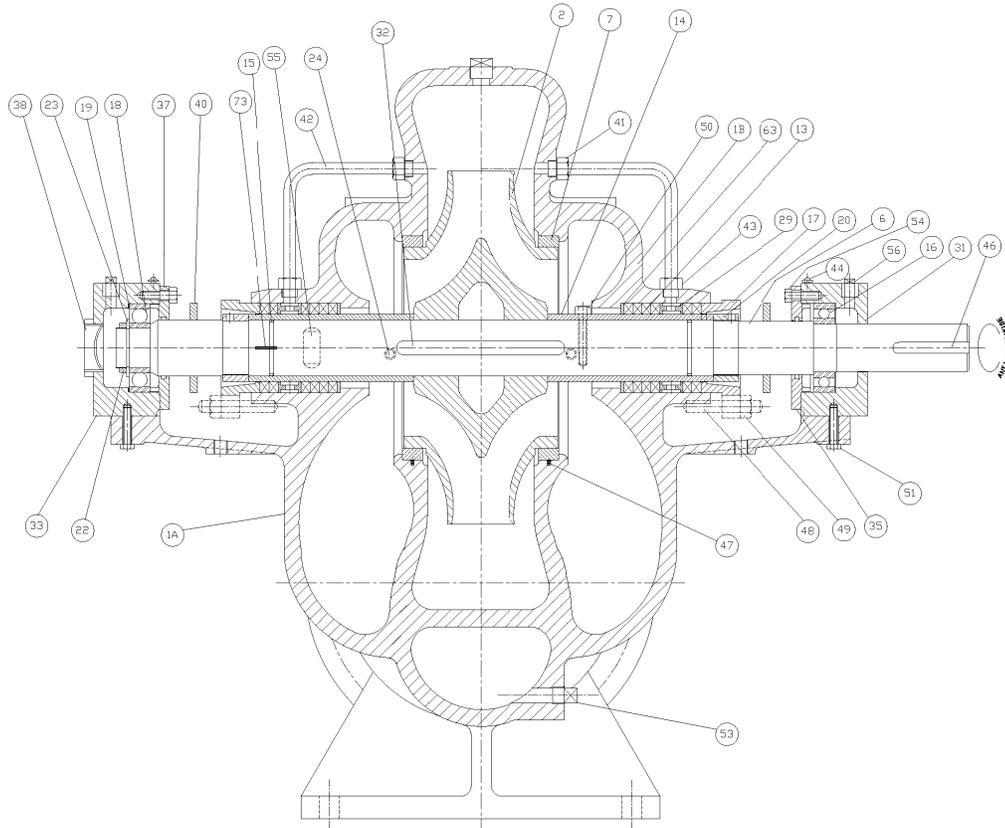
### MECHANICAL SEAL INSTALLATION

1. The mechanical seals should be installed in conjunction with a pump rotating assembly rebuild.
2. Read and understand the mechanical seal manufacturer's installation instruction before starting the installation.
3. Remove from package, inspect for any damage. Take care not to damage/scuff either of the seal faces during installation.
4. Using the provided lubricant (P-80) soap/water solution, silicone grease or glycerin, lubricate the new sleeves on the shaft.
5. Install the seal by sliding it onto the shaft while slowly rotating it until the flush plug is in the desired direction. Do not tighten any of the seal screws until the rotating assembly has been placed into the pump, per Appendix C assembly Step Number 17.
6. Slide the cartridge seal until it meets the gasket and the seal matches the seal chamber studs.
7. Tighten the set collar screws evenly around shaft (1/8" Allen wrench). Seal sizes 2.375 and smaller = 40 in lb., 2.5" and larger 85 in lb.
8. Leave clips in place until pump is ready to run. REMOVE before starting pump.

**NOTE: Failure to remove clips will result in seal damage and seal leakage.**

9. Return to pump assembly, Step 25 Page 15.

**APPENDIX E – PUMP CROSS SECTION**



<b>SUMMIT DSR PARTS LIST (Except 2-1/2 x 3)</b>				
<b>Item #</b>	<b>Qty.</b>	<b>Description</b>		
1A	1	Casing, Lower Half	37	1 Cover, Bearing OB (Thrust)
1B	1	Casing, Upper Half	38	1 Dust Cover
2	1	Impeller	40	2 Deflector, Water
6	1	Shaft	41	4 Nut, Tubing
7	2	Ring, Casing	42	2 Tubing, Seal Water
13	2	Packing	43	2 Buttress Nipple
14	2	Sleeve, Shaft	44	4 Grease Nipple
15	2	O-ring, Sleeve	46	1 Key, Coupling
16	1	Bearing IB (Radial)	47	2 Anti-Rotation Screws
17	2	Gland	48	4 Stud, Gland
18	1	Bearing OB (Thrust)	49	4 Nut, Gland
19	1	Shim	50	Cap Screws, Casing
20	2	Nut, Shaft Sleeve	51	2 Cap Screw Bearing Housing
21	1	Nut, Impeller (2-1/2R Only)	52	2 Dowel Bushing
22	1	Locknut, OB Bearing	53	2 Pipe Plug
23	1	Lock washer OB Bearing	54	4 Cap Screws Bearing Cover
24	2	Screw, Casing Wear Ring	55	2 Roll Pins
29	2	Ring, Lantern	56	2 Grease Relief Plug
31	1	Housing, IB Bearing	63	2 Bushing, Stuffing Box
32	1	Key, Impeller	65	2 Seal, Mechanical
33	1	Housing, OB Bearing	73	1 Gasket, Casing
35	1	Cover, Bearing IB (Radial)		

Installation, Operation, and Maintenance Manual

---

Purchase Date: \_\_\_\_\_

Purchase Order#: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Equipment Number: \_\_\_\_\_

PO Box 12145 Green Bay, WI 54307

[www.summitpump.com](http://www.summitpump.com)

REV 1/2015

SUMMIT PUMP MODEL DSR

