SRS Crisafulli

OPERATION & MAINTENANCE MANUAL

ROTOMITE 6000CE

SERIAL #16080

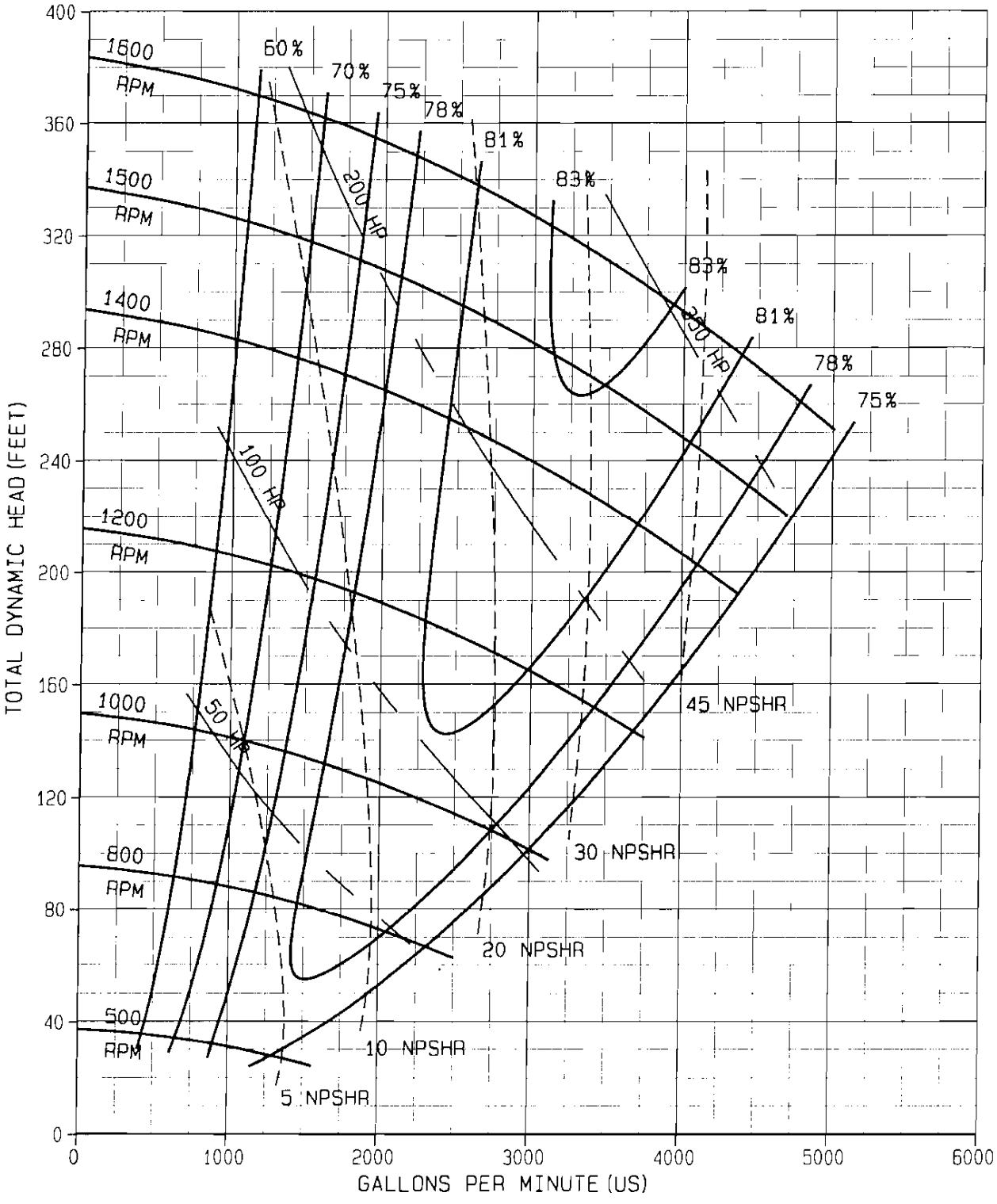
ASHBROOK

September 2011

Pump Type Model	Vane Diameter	Free Passage
LCC-M 150-500 6" Disch, 8" Suct	19.69"	3.00x3.5"

Clear Water Performance	Frame Size	Curve Number
The effects of specific gravity, viscosity and solids on performance with slurry must be accounted for. Alternate choice for frame size or seal type may also have some effects.	3 **Seal Type** P, M	E 8K-87 TP Basis B3008-93

GIW Industries Inc.
A KSB Company . KSB



08-JAN-09 3006X

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

TABLE OF CONTENTS

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

TABLE OF CONTENTS (cont.)

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

TABLE OF CONTENTS (cont.)

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SECTION 1 - INTRODUCTION & WARRANTY

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

INTRODUCTION

SLUDGE REMOVAL SYSTEM

In our continuing effort to provide excellence in low maintenance, easy to operate Sludge Removal Systems, we have assembled this Operations and Maintenance Manual. Contained in this manual is the information necessary to properly install, operate and maintain the Crisafulli Sludge Removal System.

SRS Crisafulli Inc., Sludge Removal Systems are effectively handling sludge for a variety of operations, which vary in size and handling requirements. Because of different requirements, the operator of each system must develop additional operational and safety guidelines, which will cover the specific site hazards of the individual operations.

We are dedicated to providing excellence in Sludge Removal Systems and after sale service. If you should have any questions or comments concerning your Sludge Removal System, please call us at 1-800-442-7867. We would appreciate hearing from you.

Sincerely,

The Employees of
SRS CRISAFULLI, INC.

SRS CRISAFULLI WARRANTY

The Company warrants all parts and assemblies to be free from defects in material and workmanship for a period of one (1) year after the date of acceptance unless otherwise stated on a SRS Crisafulli, Inc. ("SRSC" or the "Company") sales order document. This warranty does not cover normal wear, failure caused by corrosive applications, failure caused by abrasive materials, physical abuse or use for other than designed purposes. All parts and assemblies reported in writing to SRSC as defective in these respects, shall be repaired or replaced (FOB shipping point) without charge for routine shipping (priority shipping will be made optionally available at the customer's expense), providing that inspection by SRSC shows such defects exist. In all cases involving warranty returns, the transportation charges must be prepaid. In no event shall SRSC assume any liability for consequential cost or damage of any kind arising in connection with the use, inability to use, misuse or misapplication of SRSC products. BUYER IS SOLELY RESPONSIBLE FOR DETERMINING THE SUITABILITY OF GOODS SOLD HEREUNDER FOR USE BY BUYER.

To validate this warranty for SRSC equipment including SRSC dredging systems the customer must employ the Company to supervise the installation and to train the customer's staff in the operation of the Company's equipment. Further, SRSC's obligations pursuant to this warranty shall exist only when the customer has paid in full any moneys due SRSC, as set forth in the initial Sales Order and any modifications thereto, for the equipment subject to the warranty.

The following equipment is covered by the original manufacturer's warranty and is thus not covered by the Company's warranty: Electronic components, electric motors, bearings, and other vendor parts. SRSC is not responsible for expenses incurred due to failure of vendor parts including, but not limited to: freight, labor, travel expenses, and service fees, etc.

SRS Crisafulli, Inc. reserves the right to make all final decisions concerning part and assembly replacement, repair and all directly related costs. If a customer fails to comply with the stipulated conditions of operation, maintenance, and/or application of products purchased from the Company, or fails to permit SRSC to inspect defects before repairing, or alters the product in any way, the Company's warranty is void and the responsibility of SRSC shall terminate.

SRS Crisafulli, Inc. shall not be held responsible for our products after delivery to a transportation company, however, if there are shortages of equipment or damage, we will, when requested, cooperate fully in obtaining an adjustment.

No person, agent, or representative is authorized to give any warranty or make any representation contrary to the foregoing warranty by SRSC.

Due to the widely varying conditions under which SRSC products are used, the Company offers no warranty, expressed or implied, as to length of service life of equipment or parts.

Warranty Manager
SRS Crisafulli, Inc.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SECTION 2 - GENERAL SAFETY GUIDELINES

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

GENERAL SAFETY GUIDELINES

The following safety guidelines are for the safe operation of the Crisafulli Rotomite. Remember, no number of safety guidelines nor any amount of safety equipment can make operation of any piece of equipment totally safe unless the operator follows the guidelines and uses the equipment prudently. An alert, safety-conscious operator is the key to the safe operation of any piece of equipment.

ACCEPTANCE

Prior to acceptance of Crisafulli pumping equipment, check for the following damage:

1. Loose fasteners
2. Broken/bent parts
3. Oil leaks
4. Electric cable intact, if applicable

WARNING: Operation of damaged equipment could cause more extensive damage and possible injury to personnel.

If damages are detected, do not accept equipment until the shipping agent notes damaged or lost items on freight bill or express receipt. SRS Crisafulli will help you in making a claim against the carrier if items were damaged during shipment.

INSTALLATION

Upon installation, utilize the following checklist:

1. Review owner/operators manual.
2. Check and adhere to all warning/safety signs. If signs become illegible, replace them.
3. Ensure that all guards are secured firmly in place.
4. Ensure that all shafts turn freely.
5. Check all fluid levels.
6. Secure the discharge line.
7. Ensure that the discharge lines are capable of withstanding pressure generated by the pump.
8. First aid kit should be readily available.
9. Fire extinguisher should be located nearby.

WARNING: Prior to start up, obtain proper safety equipment as required, suggested equipment might be:

-Hard hat
-Ear protectors
-Safety goggles
-Rubber gloves
-Safety shoes
-Self-contained breathing apparatus
-Reflective clothing
-Sanitary overalls
-Fresh air supply equipment
-Life jackets
-Safety throw

OPERATIONS

CAUTION: Only responsible persons, authorized to do so, should operate the Rotomite.

After adhering to all of the above, perform the following procedures:

1. Check to see that all personnel and equipment are clear of moving parts prior to start up.

2. Start the engine.

3. Engage sludge pump to full flow.

4. Check for discharge leaks.

CAUTION: While working around waste/sewage pumps, avoid cuts which would permit infections from waste bacteria.

After prolonged pump operations, caution must be exercised while working in the vicinity of the power unit to avoid burns due to high temperatures.

CLEANLINESS, SERVICE AND MAINTENANCE

1. Keep the dredge clean. This will reveal any damage caused by vibration, wear, etc. and allow proper maintenance.

2. Shut power unit off during servicing operations unless work requires otherwise.

3. Correct mechanical problems as they are detected thereby eliminating further damage caused by these problems.

4. Block or crib the pump and components of the system which are suspended by hoists, jacks, slings, and hydraulic cylinders prior to working beneath them.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

Engineering Warning

If the Rotomite is involved in an accident, foreign object collides with it, it falls while unloading, etc., make sure to do a thorough exam of the pontoons and any parts involved. The pontoons are filled with a foam making them resistant to completely filling with water. However the water can and will erode the foam and rust the steel from within. All it takes to do serious damage to the pontoons is a small hole in the steel. Ensure the pontoons are intact after a collision.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SECTION 3 - INSTALLATION

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

INITIAL INSPECTION

The Rotomite was shipped in good condition but must be inspected for any damage that may have occurred during shipping and handling. Note and advise the factory of any damage immediately at the following address:

SRS Crisafulli Inc.
P.O. Box 1051
Glendive, MT 59330 (U.S.A.)

Phone: **406-365-3393**
Fax: **406-365-8088**
E-mail: **srsc@crisafulli.com**

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SLUDGE HANDLING SYSTEM INSTALLATION INSTRUCTIONS

PLACING THE ROTOMITE INTO THE WATER

1. The best and most often used method for placing the Rotomite into the pond is to attach 4 equal length slings to the lifting eyes that are welded to each corner of the platform. A crane should be used to place the Rotomite into a minimum of 36" of water.

   The Rotomite weighs approximately 35,500 pounds (dry.)

ATTACH DISCHARGE HOSE & CABLE

1. The simplest way to set up the floating discharge line is to set it up on land in a zigzag pattern on land. As the dredge pulls away from shore the discharge line will extend out.

2. In cases where the discharge piping utilizes flex sections and rigid sections, flex sections should be placed in between each rigid section. The unit must have a flex section attached directly to the pumps discharge and directly to the shore harvest station. The flex sections should be attached to the rigid sections with the clamps. When assembling the sections ensure that each “female” fitting has a rubber seal in it.

3. Once the clamps are on encircle the clamps at least three times with duct tape. This protects the clamps from getting snagged and coming undone accidently.

4. Attach the power cable to the dredge first, then lay the cable on top of the floating discharge line that is onshore in a zigzag pattern. Using at least three bungee cords or zip ties per rigid section of floatline attach the power cable to the floatline. The power cable does not get attached to the flex sections. Ensure that there is enough slack in the power cable to account for movement of the floating line.

SRS CRISAFULLI INC.
Installation Instructions Continued
Page 2

---

1. After the Rotomite is in the water, unreel the steel traverse cable and fasten to the anchor on the opposite side of the pond. The anchor may be a permanent anchor rod/eyebolt. Thread the cable through or around the anchor and fasten with 2 or 3 U-bolt style wire clamps with a thimble.

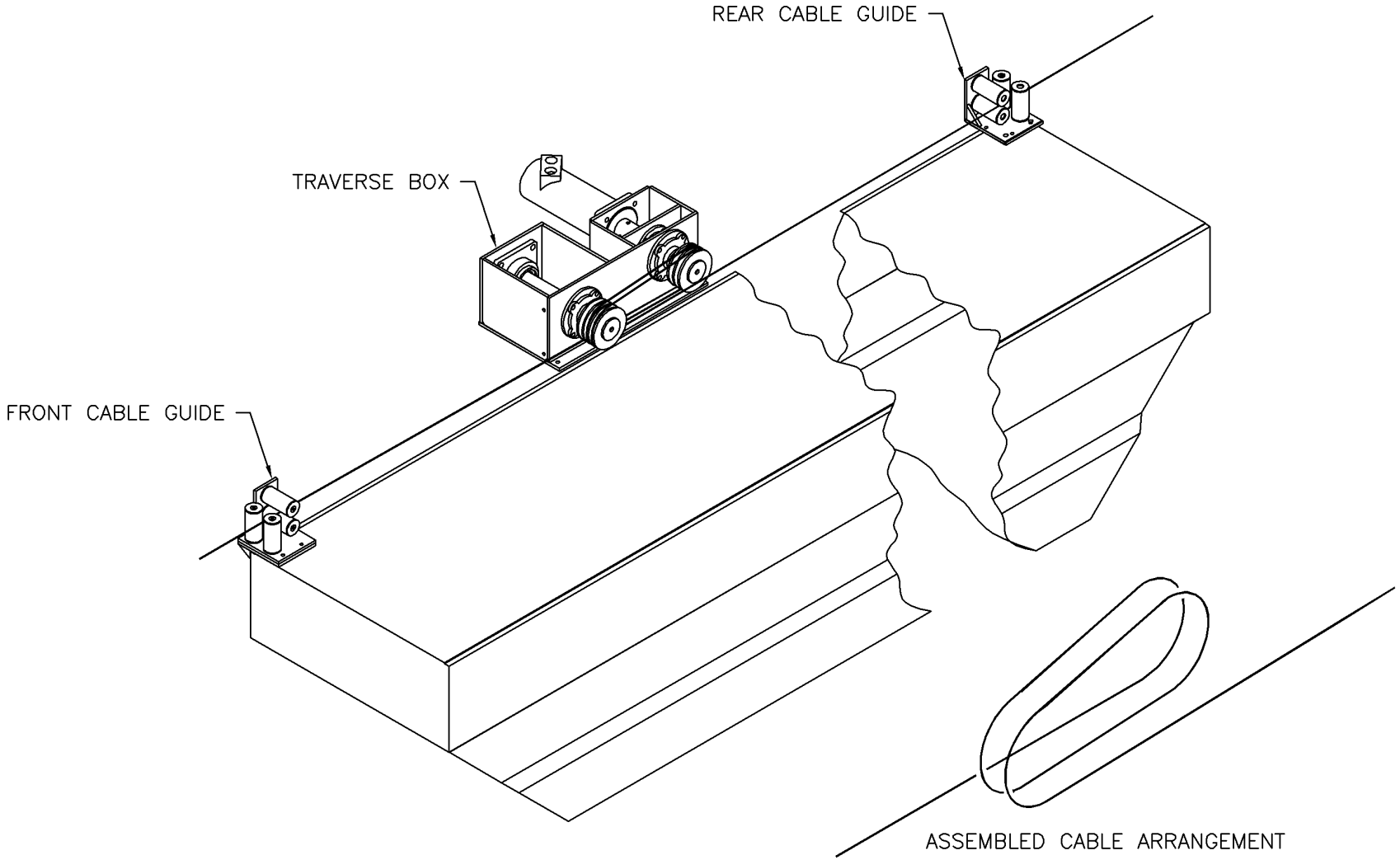
2. Hand stretch the cable to the remaining anchor and install, make a loop in the cable using a thimble and 2 or 3 wire rope clamps on the open end of the cable.

3. Attach the hand operated Griphoist winch between the remaining anchor and cable end, allow the cable to pass completely through the winch before tightening.

4. Run cable through traversing system on unit. Some barge models come equipped with hinged cable covers on the barge deck. Lift the cover up, put the cable under it and hinge the cover over the cable. (Some units may require removal of roller braces for cable installation. Reinstall braces after running cable.)

5. Tighten the Griphoist winch until the cable is pulled slightly above the waters surface.

6. Start traversing the unit. If the cable slips on the traversing winch drum during operation, either tighten the Griphoist winch or add an additional cable wrap on the traversing winch drum.



TO STRING WINCH CABLE, PLACE CABLE IN FRONT CABLE GUIDE. STRING CABLE UNDERNEATH THE FRONT SHEAVE AND IN THE GROOVE CLOSEST TO THE CENTER OF THE DREDGE. CONTINUE WITH THE CABLE AROUND THE REAR SHEAVE IN THE GROOVE CLOSEST TO THE CENTER OF THE DREDGE. PROCEED WITH A COUNTER CLOCKWISE WINDING OF THE CABLE AROUND BOTH SHEAVES. WHEN THE LAST GROOVE ON THE FRONT SHEAVE IS REACHED, STRING THE CABLE THROUGH THE REAR CABLE GUIDE.

SRS P.O. Box 1051 Crisafulli Dr. Glendive, MT 59330 USA
PHONE: 800-442-7867
FAX: (406) 365-8088
Crisafulli Sludge Removal Systems

ROTOMITE TRAVERSE CABLE ROUTING

DATE: 12/8/99	BY: JSN	DWG #: 99494

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SECTION 4 - START UP AND OPERATION

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SLUDGE HANDLING SYSTEM
START UP AND OPERATION INSTRUCTIONS

Read motor operators manual thoroughly before starting motor.

ROTATION

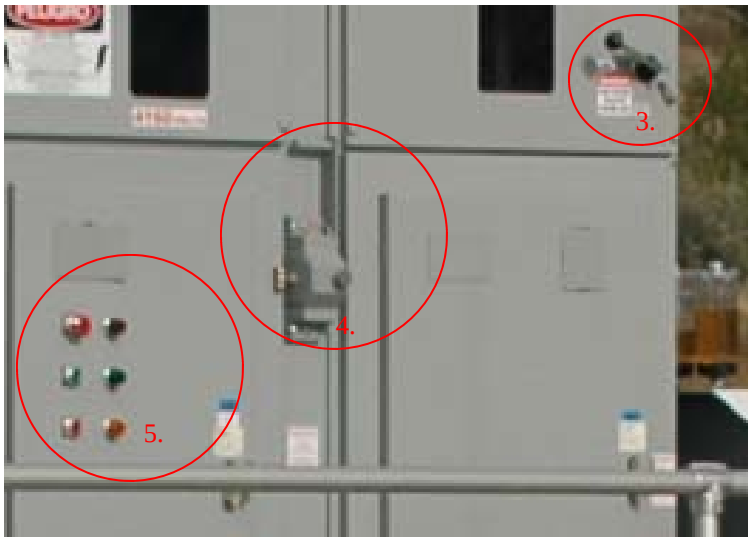
1. Proper rotation of the hydraulic system is critical. Looking at the shaft of the electric motor the shaft should rotate clockwise. The best way to check is for the electric motor to be disconnected then check rotation.

Important: The pump should only be rotated in one direction, prolonged rotation of the pump in the wrong direction could unseat the impeller from the shaft and cause damage.

START UP

1. Check fluid levels and fill as required. Grease all bearings prior to start up. There are (9) nine grease points on this unit. Four grease points are located at the front of the dredge underneath the traverse winch pulley guard (left front). Three more points are next to the filter mounts for the ladder pins. Each end of the cutterhead has a coupler seal with one grease zerk. All grease points should be greased before each day of operation. Check the motor O&M for lubrication instructions

Note: The power cable must be installed for the dredge to run.



2. To start the electric motor first move the switch on the onshore panel to the “ON” position.

3. Then turn the switch on the right hand panel to the “ON” position.

4. Lift the switch on the left panel.

5. Press the “Start” button on either the dash panel or on the left hand panel.

SRS CRISAFULLI INC.
Start up and Operation Instructions (continued)
Page -2-

OPERATION

1. After the operators manual has been read and understood, start the motor and allow a 5 - 10 minute warm up period. Upon startup, the hydraulic charge pressure for both the propulsion and the sludge pumps should read between 200 and 300 psi. As the pumps are stroked, the charge pressure should drop and then return to normal levels. As the control levers for the propulsion and the sludge pumps are moved forward, the working pressure should rise concurrently with a drop in charge pressure. The control of the sludge pump and propulsion may then be varied using the control dial and lever to control flow. The traverse speed can be varied using the traverse flow control. Lower the cutterhead into the water and start the pump. Allow the pump to run for about 2 to 4 minutes.

2. Start the auger forward and run for 1 to 2 minutes.

3. Check the discharge line for flow. If there is flow in the line, then lower the cutterhead into the waste material. If there is no flow, check the discharge line for blockage.

4. The cutterhead will mix the material with water and create a slurry. The slurry thickness can be varied by raising or lowering the cutterhead (or, on some models, increasing or decreasing the traversing speed). The slurry will weigh the discharge hose down and the floats will sink. If two or three of the floats sink, the discharge flow is too heavy and the line may plug. To lighten the discharge flow, slow the traversing winch or the propulsion until the floats reappear. Adjust the cutterhead depth as dredging proceeds so that the floats do not sink completely but remain partially submerged.

5. Before shutting the barge down, the cutterhead should be raised, allowing only water to purge the discharge line of sludge. Purging should last 3 to 5 minutes or until the discharge line is free from suspended solids. Length of time will vary proportionally with amount of discharge line used.

6. After shut down store the cutterhead in the raised position.

MAINTENANCE

1. The hydraulic oil reservoir should be filled as needed. When cold the oil level should be at the bottom of the sight gauge.

   Note: If the reservoir requires frequent filling, a hydraulic leak exists and requires service to repair.

2. Review all pertinent operation and maintenance sections of this catalog for the specific instructions for each individual component.

DREDGE CONTROLS

1. **Motor:** The **On/Off** button is on the left hand side of the dash. The read-out for the motor drive is also on the left hand side of the dash.

2. **Propulsion:** The propulsion control lever is located on the right of the dash. The lever is labeled **Forward/Reverse** with a detent for neutral**.** To move the dredge forward, push lever forward. The farther the lever is moved forward the faster the dredge will move. To move the dredge in reverse, move the lever to the rear. The farther the lever is moved the rear the faster the dredge will move. To stop the dredge, move the lever to the neutral position.

3. **Pump:** The sludge pump has a speed lever to help the operator attain maximum efficiency while dredging. The sludge pump speed lever is the left lever, located on the upper right side of the dash. To operate, push the lever up to increase the speed of the pump. Do not operate, with the sludge pump hydraulic pressure exceeding 5500 PSI. (See Note) The pump is capable of drawing more horsepower than the electric motor can provide. The faster the pump spins the more horsepower it draws.

Important: The full load amps of the motor must stay at or below 39.

Important: The pump should only be rotated in the forward direction, prolonged rotation of the pump in the wrong direction could unseat the impeller from the shaft and cause damage.

Note: If the sludge pump hydraulic pressure is exceeding 5500 PSI, something is wedged in the intake preventing the impeller from turning. Raise the cutterhead, turn the Rotomite off and check the intake for obstructions.

4. **Hoist:** The hoist control lever is located on the left, inside of the operator. To lift the ladder up pull the lever rearward. To lower the ladder, push the lever forward. The lever should spring back to center each time you let go of it. If it does not, consult the factory.

5. **Cutterhead:** The cutterhead control lever is located to the right of the operator and is the far right lever (if equipped with optional mudshield). This lever shall provide forward/off/reverse control. To operate cutterhead forward, push the lever forward. The lever should stay in that position until the operator moves it to off or reverse. To operate the cutterhead in reverse, pull the lever rearward. The lever will stay in that position until moved by the operator. The forward operating mode is most desirable when dredging. The reverse operating mode is an aid for removing foreign objects from the auger.

6. **Cutterhead Articulation:** The cutterhead articulation lever is located on the left side of the operator and is the outside lever. The cutterhead articulation lever can rotate the entire cutterhead shroud assembly approximately 40 degrees from horizontal before and during dredging. To rotate downward, push the lever forward. To rotate upward, pull the lever rearward. The lever will return to center when not held.

7. **Traverse (if so equipped):** The traverse system has Forward/Off/Reverse and speed controls which control the traverse cable winch. The Traverse Forward/Off/Reverse lever is located on the right of the operator behind cutterhead/mudshield levers. To move the dredge forward, push the lever forward. The lever will remain in that position until moved by the operator. To stop the dredge, move the lever back to the middle or neutral position. To move the dredge in reverse, pull the lever rearward. The lever will remain in that position until moved by the operator. The Traverse Fast/Slow control dial is located on the upper right side of the dash. With the traverse Forward /Off/Reverse lever in either of the forward or reverse position, move the dial counter-clockwise to make the dredge move slower. To speed the dredge up move the dial clockwise.

8. **Discharge Pressure Gauge:** The discharge pressure gauge is located on the dash of the Rotomite. The pressure gauge can be used to determine material flow. As the material flow increases or becomes heavier, the pressure will rise.

9. **Mudshield (If so equipped):** The mudshield articulation lever is located to the right of the operator. The inside or left hand lever is for the mudshield. Pushing the lever forward closes the mudshield. Pulling the lever rearward will open the mudshield approximately 90° from the closed position. The lever should detent to the neutral position upon release. If it does not, consult the factory.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

OPERATIONAL TIPS

These tips are provided to aid the operator in maximizing the performance and efficiency of the equipment. All applications are different, these tips are only suggestions and guidelines as to how this equipment should be run. Should any questions arise as to how the equipment should be performing, please consult the factory.

CUTTERHEAD DEPTH

For most applications, the cutterhead should be placed into approximately 12 inches of material. Depending on the viscosity of the material, this value may vary. As the operator becomes familiar with the material being pumped, he/she will be able to adjust the cutting depth according to the desired performance.

TRAVERSING

When traversing forward, tension must be maintained on the hoist winch cable at all times. When the cutterhead is adjusted properly it will be cutting a swath through the material that is parallel to the basin floor. If the tension is too loose, the cutterhead may start to dig into the material thereby burying itself and creating the potential for damage to the Flump. If the tension is too much, the cutterhead may be only skimming the material. While dredging, the Flump should be slightly higher on the front end than on the rear.

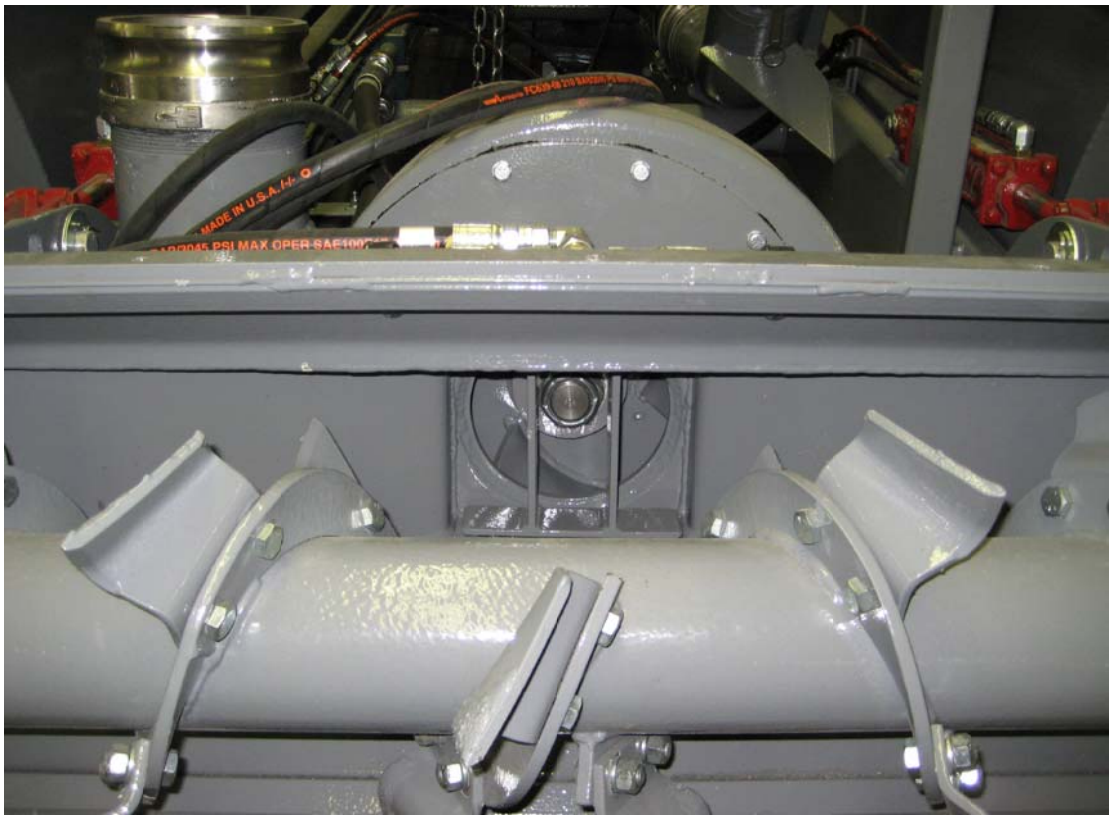
After the desired cutterhead depth has been achieved, the traverse speed should be adjusted to achieve the desired slurry concentration.

DISCHARGE LINE

Observing the discharge line is one of the more accurate means of determining if your slurry concentration is adequate. During normal dredging operations the discharge line should be about 25% – 33% submerged. If the discharge line begins to sink, the slurry concentration is too high. To remedy this, either the cutterhead can be raised up or the traverse speed can be decreased.

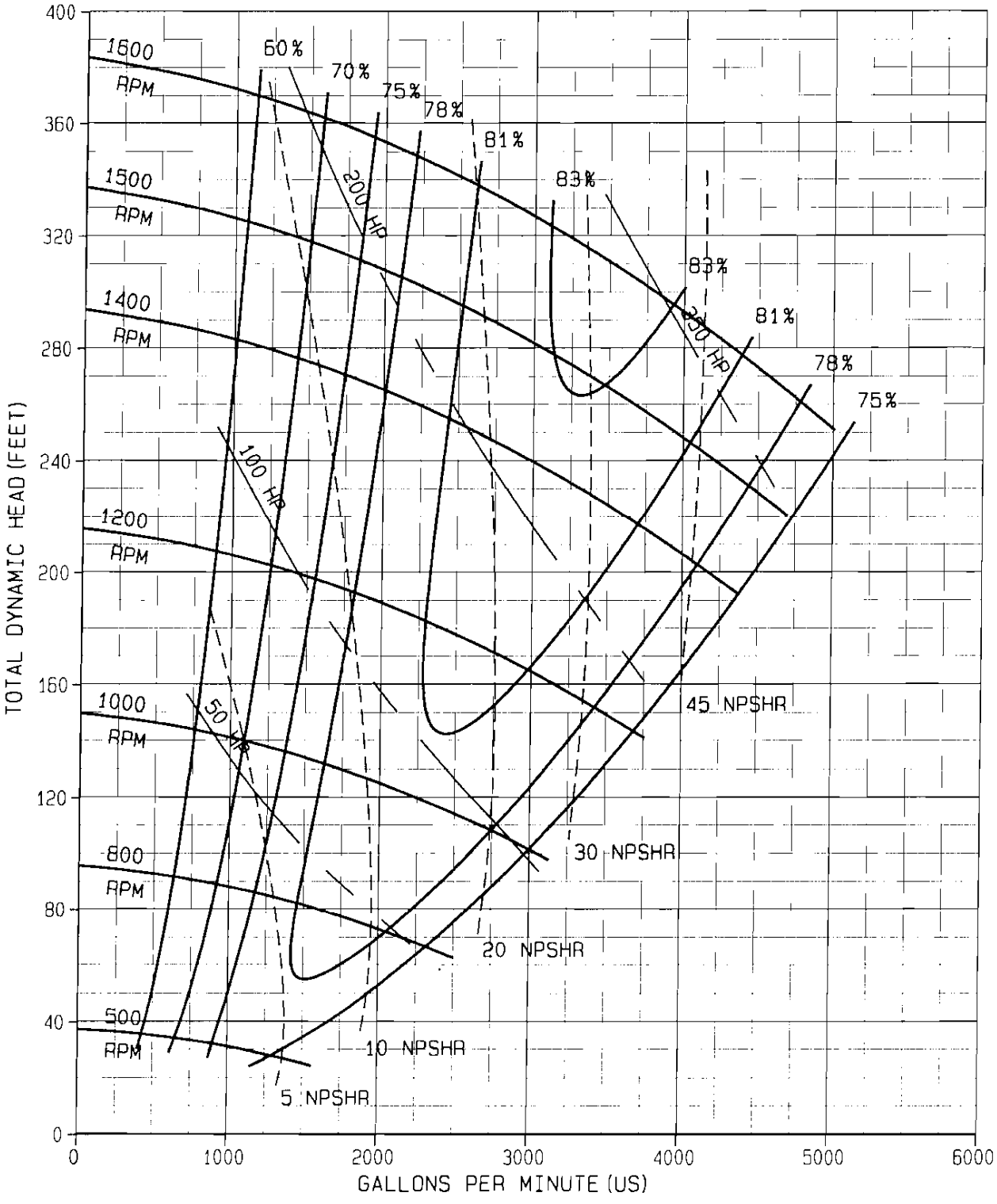
SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SECTION 5 - SLUDGE PUMP



Pump Type Model	Vane Diameter	Free Passage
LCC-M 150-500 6" Disch, 8" Suct	19.69"	3.00x3.5"
Clear Water Performance The effects of specific gravity, viscosity and solids on performance with slurry must be accounted for. Alternate choice for frame size or seal type may also have some effects.	**Frame Size** 3 **Seal Type** P, M	**Curve Number** E 8K-87 TP Basis B3008-93

GIW Industries Inc.
A KSB Company . KSB



SRS CRISAFULLI INC.
P.O. BOX 1051
Glendive, Montana 59330
1-800-442-7867

PUMP TROUBLESHOOTING GUIDE

SYMPTOMS	CAUSES	CORRECTIONS
Failure to pump	Pump not primed. Pump speed too low or head too high. Air leak. Plugged suction. Pump or suction pipe not completely filled with liquid. Air pocket in suction. Inlet of suction insufficiently submerged Foreign material in impeller	Prime pump. Consult SRS Crisafulli, Inc. Check and rework suction line. Remove obstacle. Check supply. Locate and correct. Increase suction pipe submergence. Remove foreign matter.
Reduced per-formance	Obstructed suction line or impeller. Insufficient submergence of the suction. Excessively worn impeller or wear ring. Direction of impeller rotation wrong. Speed too low or head too high. Viscosity of liquid different from design.	Remove obstruction. Increase suction pipe submergence. Replace impeller and/or wear ring. Reverse rotation. See start-up instructions. Consult SRS Crisafulli, Inc. Consult SRS Crisafulli, Inc.
Driver over loaded	Speed higher than design. Liquid specific gravity too high. Too large an impeller diameter. Low voltage. Total head lower than design. Foreign material in impeller. Misalignment. Shaft bent.	Reduce speed. Consult SRS Crisafulli, Inc. Consult SRS Crisafulli, Inc. Consult power company. Consult SRS Crisafulli, Inc. Remove foreign matter. Realign. Replace shaft.
Insufficient pres-sure developed	Excessive amount of air or gas in liquid. Speed too low. Direction of impeller rotation wrong. Head too high. Viscosity of liquid different from design. Impeller damaged.	Check for suction leak. Check Electrical - Consult SRS Crisafulli, Inc. Reverse rotation. See start-up instructions. Consult SRS Crisafulli, Inc. Consult SRS Crisafulli, Inc. Replace impeller.

SRS CRISAFULLI INC.
P.O. BOX 1051
Glendive, Montana 59330
1-800-442-7867

PUMP TROUBLESHOOTING GUIDE

SYMPTOMS	CAUSES	CORRECTIONS
Excessive noise	Misalignment. Material lodged in impeller. Worn bearings. Impeller bolt loose or broken. Cavitation. Direction of impeller rotation wrong. Suction improperly submerged. Operation at very low capacity. Shaft bent. Impeller damaged. Rotor out of balance, causing vibration.	Align rotating parts. Remove Material. Replace bearings. Replace bolt. Raise cutterhead to dilute slurry. Reverse rotation. See start-up instructions. Submerge suction further. Consult SRS Crisafulli, Inc. Replace shaft. Replace impeller. Balance or replace rotor.
Premature bear-ing failure	Grease line plugged or pinched. Worn bearing protection seals. Misalignment. Bent shaft. Water or contaminates entering bearings. Inadequate bearing lubrication. Wrong type of lubrications.	Repair or replace. Replace. Align all rotating parts. Replace shaft. Protect pump from environment. See lubrication schedule, Section 5. See lubrication schedule, Section 5.
Electric motor failure	High or low voltage. Electric surge. Poor electric connection. Overloads. Bearing failure. Cooling vent plugged Water.	Check voltage. Monitor voltage and consult power Company. Turn power off, clean and check connections. Check amperage. Do not exceed nameplate full load amperage. Change bearings in motor. Install proper screens. Protect pump from environment.
Rapid wear on coupling cushion	Misalignment. Bent shaft.	Align. Replace shaft.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

IMPELLER & VOLUTE REMOVAL AND INSTALLATION INSTRUCTIONS

REMOVAL

1. Disconnect and lockout the power source to insure that power to the pump will not be engaged while the work is being done.

CAUTION: Ensure adequate lifting devices are used.

2. Remove the pump from the cutterhead and discharge hose.

3. Remove the suction plate.

4. The impeller is threaded onto the bearing frame shaft. To remove it free rotation must be stopped. If the impeller still free spins when the unit is off the hydraulic mo tor can be removed and the shaft coupler can be used to torque on the shaft. If the shaft coupler is used the impeller must be blocked.

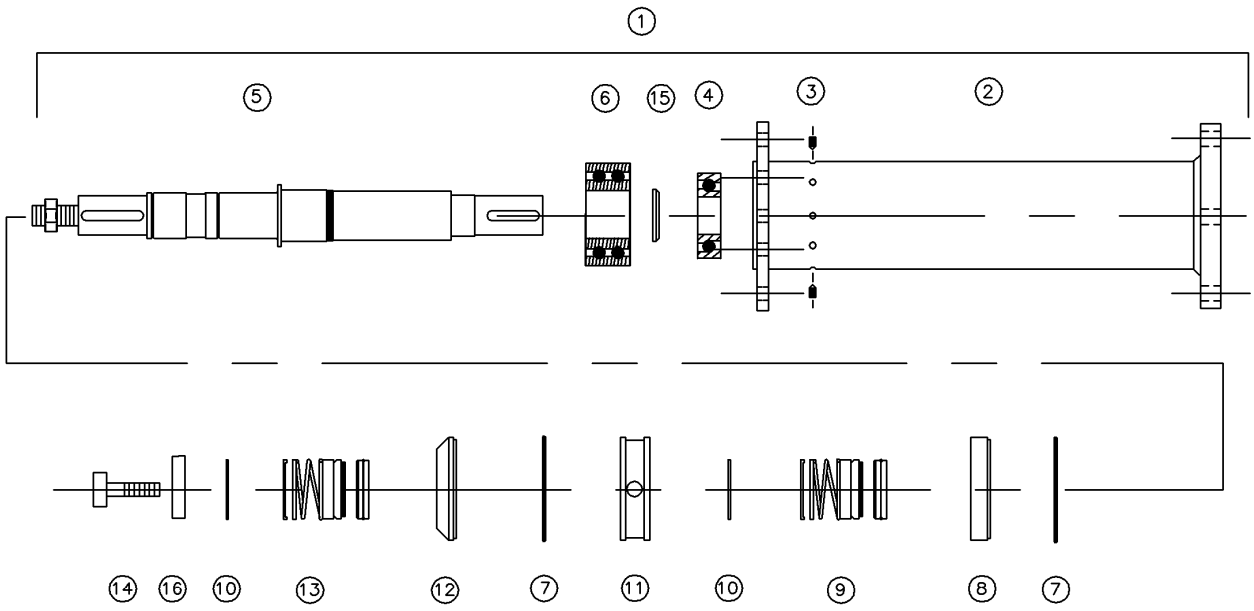
5. Remove the volute from the bearing frame.

INSTALLATION

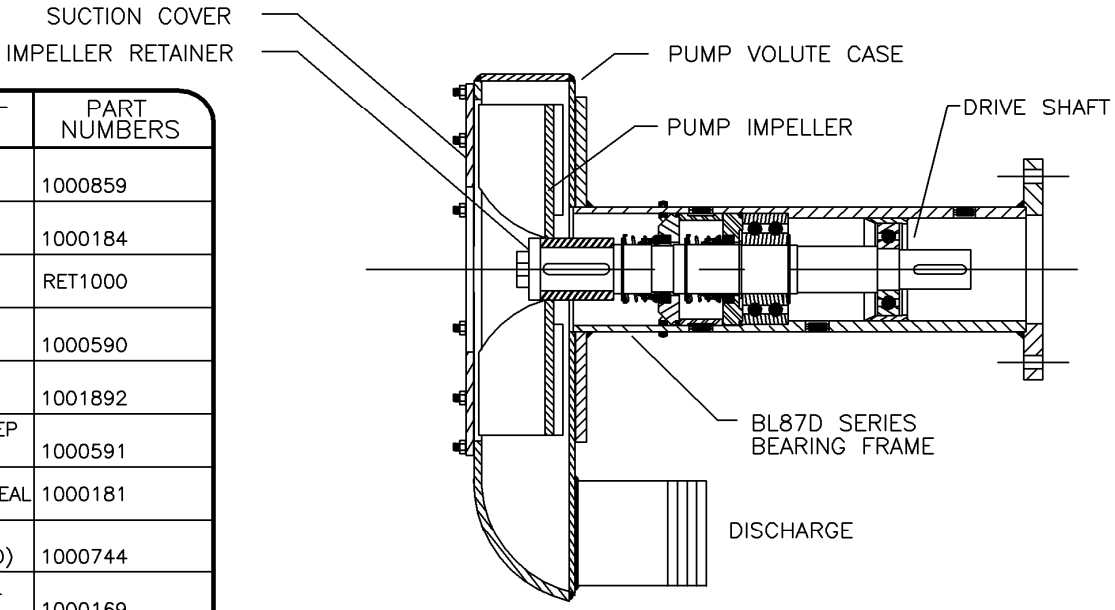
1. Bolt replacement volute up to the bearing frame flange. Use .030” paper gasket at bearing frame and standard 150# flange gasket on discharge.

2. Install impeller and volute in reverse order per the impeller installation instructions.

3. Ensure to use anti-sieze on the bearing frame shaft.



EXPLODED ASSEMBLY VIEW



ASSEMBLY VIEW

PARTS LIST	PART NUMBERS
① COMPLETE ASSEMBLY	1000859
② BEARING FRAME HOUSING	1000184
③ SET SCREWS	RET1000
④ SINGLE ROW BALL BEARING	1000590
⑤ BEARING FRAME SHAFT	1001892
⑥ DOUBLE ROW DEEP GROOVE BEARING	1000591
⑦ 3/16" O-RING SEAL	1000181
⑧ STATIONARY SEAL HOLDER (INBOARD)	1000744
⑨ MECHANICAL SEAL (INBOARD)	1000169
⑩ SEAL RETAINING RING	1000183
⑪ SPACER RING	1001893
⑫ STATIONARY SEAL HOLDER (OUTBOARD)	1000182
⑬ MECHANICAL SEAL (OUTBOARD)	1000170
⑭ *IMPELLER RETAINING FASTENER	BT750X150NC-8
⑮ BEARING NUT	1000745
⑯ IMPELLER RETAINING WASHER	WA375X1500X4375

*FASTENER MAY BE EITHER A STUD & NUT COMBINATION OR A BOLT & TAPPED HOLE COMBINATION. (BOTH SHOWN)

REV. (3) JSN 11/21/96

SRS Crisafulli — Sludge Removal Systems

BL87D SERIES BEARING FRAME ASSEMBLY DRAWING

Dwn By: BMK	Ckd.:	Date: 7/7/94	Dwg.#: CPC-92260B

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

BL87D SERIES BEARING FRAME REPAIR INSTRUCTIONS
DRAWING CPC – 92260B

DISASSEMBLY

Remove suction base retaining bolts and suction base cover. Remove the impeller retaining nut. Withdraw impeller from pump case. Note: (2) 5/8-16 set screws may be removed from impeller base plate to allow use of bar type puller. Remove volute. Remove upper 1/2" pipe plug for access to remove (2) set screws in coupling. Remove bolts in flanges between bearing frame and upper chamber and separate. Remove snap ring and outboard mechanical seal. Remove set screws from bearing frame housing. Remove outboard stationary seal holder, O-ring seal and spacer ring. Remove snap ring and inboard mechanical seal. Remove inboard stationary seal holder and O-ring seal.

The entire shaft assembly will now slide out through the pump volute end of the bearing frame. Press off single row bearing. Remove bearing nut and press off double row bearing. The shaft should be inspected for excessive runout. Thoroughly clean the inside of the bearing frame prior to reassembly.

REASSEMBLY

Reassembly of the bearing frame should proceed in the reverse order of the disassembly instructions. The shaft bearing assembly should slide into place easily. The stationary seal holders should slide into place. The eight (8) allenhead set screws should be coated with NEVER SEIZE, when reinstalled and torqued to 8 ft. lbs. The impeller retaining nut should be coated with LOCTITE 242 (or equal) and tightened to 450 ft. lbs.

The completed assembly should rotate freely without vibration. The completed assembly must be checked for leaks. The assembly must be pressurized to 3 PSI for a minimum of 20 minutes. This is done by removing one of the pipe plugs between the primary and secondary seals and applying the pressure here. Check both seal areas thoroughly with a soapy solution. After successful leak test, attach bearing frame to upper shaft housing, using .030" paper gasket. After reassembly fill the bearing frame with Exxon Nuto H 46 hydraulic oil (or equal) until the sight bottles are approximately half full.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

MECHANICAL SEAL REMOVAL & INSTALLATION

Refer to Drawing #92260B

OUTBOARD SEAL REMOVAL

1. Remove pump impeller as outlined in impeller removal instructions.

2. Remove any burrs or foreign material from shaft.

3. Remove seal retaining ring (10). Using an external snap ring pliers.

4. Remove rotating assembly of outboard mechanical seal (13) by pulling assem bly out by hand. The rotating part consists of a spring holder, the spring, an elastomer bellows, a driving band, a disc, a retainer and a primary ring. Some force may be required as the elastomer bellows can adhere to the shaft.

5. Remove the eight setscrews (3) from the bearing frame housing.

6. Remove the outboard stationary seal holder (12) and the O-ring (7). A hole has been drilled and tapped on each side of the seal holder to allow for insertion of a pair of 1/4" threaded rods. Insert a threaded rod, at least 18" long, into each hole to assist in removal of the seal holder.

7. Remove the mating ring and the O-ring from the stationary seal holder.

OUTBOARD SEAL INSTALLATION

1. Remove any burrs, corrosion, or foreign material from the bearing frame shaft and its housing.

2. Clean the seal chamber (housing & shaft), the stationary seal holder and the seal retaining ring with solvent.

   Note: The seal chamber must be dry and clean before continuing seal installation.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

OUTBOARD SEAL INSTALLATION CONT.

3. Install the mating ring and the O-ring into the stationary seal holder. Apply a light oil lubricant to the O-ring to ease installation.

   Note: Avoid cutting or rolling the O-ring during installation.
   Do not touch or scratch the seal faces.
   Do not force or strike any seal parts.

4. Install the O-ring (7) into the housing. Apply a light oil lubricant to the O-ring. Care must be taken not to cut, twist or roll the O-ring.

5. Install the stationary seal holder (12). Using 18" threaded rods will ease installation. While installing the holder be careful not to hit the mating ring on the shaft, as this can lead to seal failure.

6. Reinstall the eight setscrews. Coat set screws with Loctite. Tighten setscrews evenly to 8 lb.-ft.

7. Reinstall the rotating seal parts. A lubricant of mild soap and water can be ap plied to the elastomer bellows to ease installation. A seal pusher is used to evenly push rotating assembly into place.

8. Reinstall the seal-retaining ring. Inspect ring for wear and damage, replace as necessary.

9. Reinstall the impeller as outlined in impeller installation instructions.

INBOARD SEAL REMOVAL

1. Remove the outboard seal as indicated in Outboard Seal Removal Section above.

2. Remove the spacer ring (11).

3. Remove the seal retaining ring (10).

4. Remove the rotating assembly consisting of the inboard seal (9) as stated in Step 4 of outboard seal removal instructions.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

INBOARD SEAL REMOVAL CONT.

5. Remove the inboard stationary seal holder (8) and the O-ring (7) as outlined in step 6 of outboard seal removal instructions.

6. Remove the mating ring and the O-ring from the stationary seal holder.

INBOARD SEAL INSTALLATION

1. Remove any burrs, corrosion, or foreign material from bearing frame shaft and housing.

2. Clean the seal chamber (housing & shaft), the stationary seal holder and the seal retaining ring with solvent.

   Note: Seal chamber must be dry and clean before continuing seal installation.

3. Install the mating ring and the O-ring into the stationary seal holder. Apply a light oil lubricant to the O-ring to ease installation.

   Note: Avoid cutting or rolling the O-ring during installation.
   Do not touch or scratch the seal faces.
   Do not force or strike any seal parts.

4. Install the O-ring (7) into the housing. Apply a light oil lubricant to the O-ring. Care must be taken not to cut, twist or roll the O-ring.

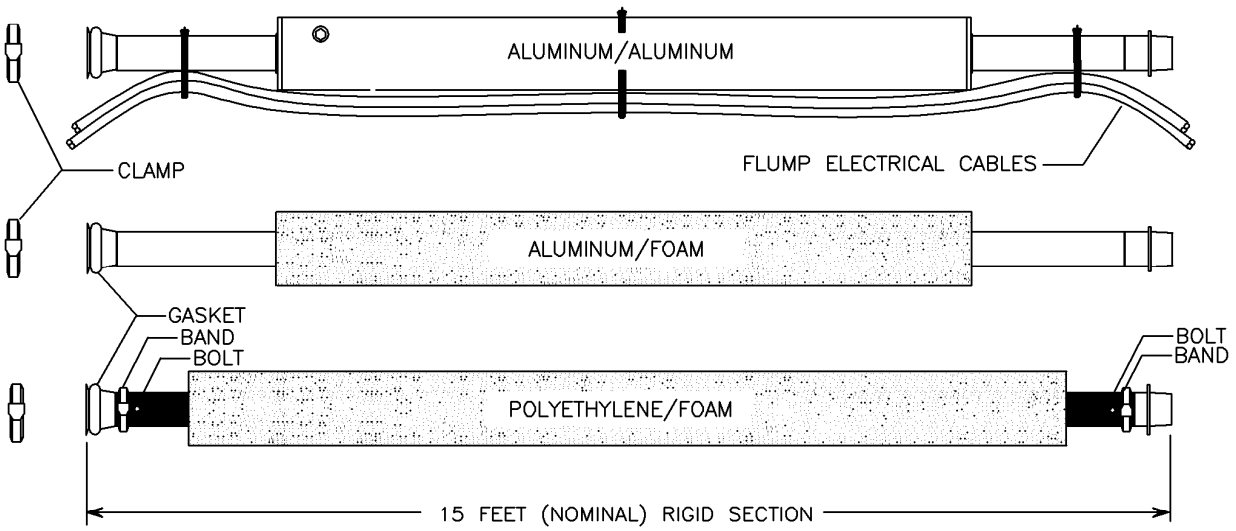
5. Install the stationary seal holder (8). Using 18" threaded rods will ease installa tion. While installing the holder be careful not to hit the mating ring on the shaft, as this can lead to seal failure.

6. Reinstall the rotating seal parts. A lubricant of mild soap and water can be ap plied to the elastomer bellows to ease its installation. A seal pusher, (supplied), is used to evenly push rotating assembly into place.

7. Reinstall the seal retaining ring. Inspect the ring for wear and damage and re- place if necessary.

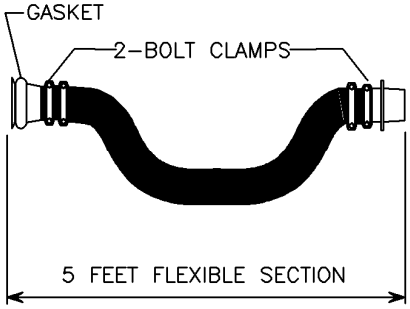
ALUM/ALUM, **ALUM/FOAM**, POLY/FOAM, FLEX

LIGHTWEIGHT • FLOATING • SLUDGE/SLURRY TRANSFER • BOLTLESS



*FEATURES

ASSEMBLED LENGTH	ALUM/ALUM: 20 FEET (6.1 METERS) ALUM/FOAM: 20 FEET (6.1 METERS) POLY/FOAM: 25 FEET (7.62 METERS) FLEXIBLE SECTION: 5 FEET (1.52 METERS)
RIGID SECTION	15 FEET LONG (4.57 METERS) RIGID PIPE SECTION WITH MALE/FEMALE IRRIGATION QUICK COUPLERS BANDED**& BOLTED (POLY ONLY) ON EACH END, RUBBER GASKET, LOCKING CLAMP, AND AN INTEGRAL 10 FOOT FLOAT.
MATERIALS OF CONSTRUCTION	ALUMINUM OR PE3408 UHMW POLYETHYLENE
FLEXIBLE SECTION	5 FEET LONG (1.52 METERS) FLEXIBLE 100 PSI HOSE SECTION WITH MALE/FEMALE IRRIGATION QUICK COUPLERS (2)2–BOLT CLAMPS*** ON EACH END, RUBBER GASKET, AND A LOCKING CLAMP.
MATERIALS OF CONSTRUCTION	AN ABRASION RESISTANT CORE, NYLON (OR VYTACORD) REINFORCING AND AN EXTERIOR ABRASION RESISTANT COVER.
QUICK COUPLERS	GALVANIZED STEEL AND/OR ALUMINUM IRRIGATION QUICK COUPLERS.
CABLE CLAMPS	ADJUSTABLE ELASTOMERIC HOSE/CABLE CLAMPS (3 PER FLOAT ASSEMBLY)



OPTIONAL FEATURES

CORROSION RESISTANT	STAINLESS STEEL FASTENERS AND COUPLERS
ASSEMBLY LENGTH	10 FEET TO 40 FEET

LIGHTWEIGHT FLEXIBILITY

THE CRISAFULLI INTEGRAL FLOATING DISCHARGE LINE SOLVES THE PROBLEM GENERALLY ASSOCIATED WITH STANDARD DISCHARGE SYSTEMS. THE SYSTEM IS DESIGNED TO ALLOW MAXIMUM FLEXIBILITY WITHOUT HOSE KINKING OR WITHOUT FRETTING THE HOSE. THE INTEGRAL FLOATS REDUCE THE AMOUNT OF DRAG CAUSED BY THE FLOATS AS THEY MOVE THROUGH THE LIQUID OR SLUDGE. THE INTEGRAL FLOATS ALSO ALLOW THE SECTIONS TO BE STACKED WITHOUT THE QUICK DISCONNECTS BEING DAMAGED. EACH SECTION CAN BE HANDLED EASILY AND QUICKLY SET UP.

*THESE FEATURES MAY CHANGE WITHOUT NOTICE. ** STAINLESS STEEL
*** MILD STEEL ZINC COATED

NOMINAL DIAMETER	RIGID SECTION						FLEX SECTION
	ALUM/ALUM		ALUM/FOAM		POLY/FOAM		
	RATED PSI	LBS.	RATED PSI	LBS.	RATED PSI	LBS.	LBS.
3"	125	30	125	30	160	40	10
4"	125	35	125	35	110	50	15
6"	125	40	125	40	80	90	20
8"	95	65	95	55	65	125	30
10"			75	75	50	165	45
12"			75	105	50	235	55

REV. 3 (MDM) 5/6/03

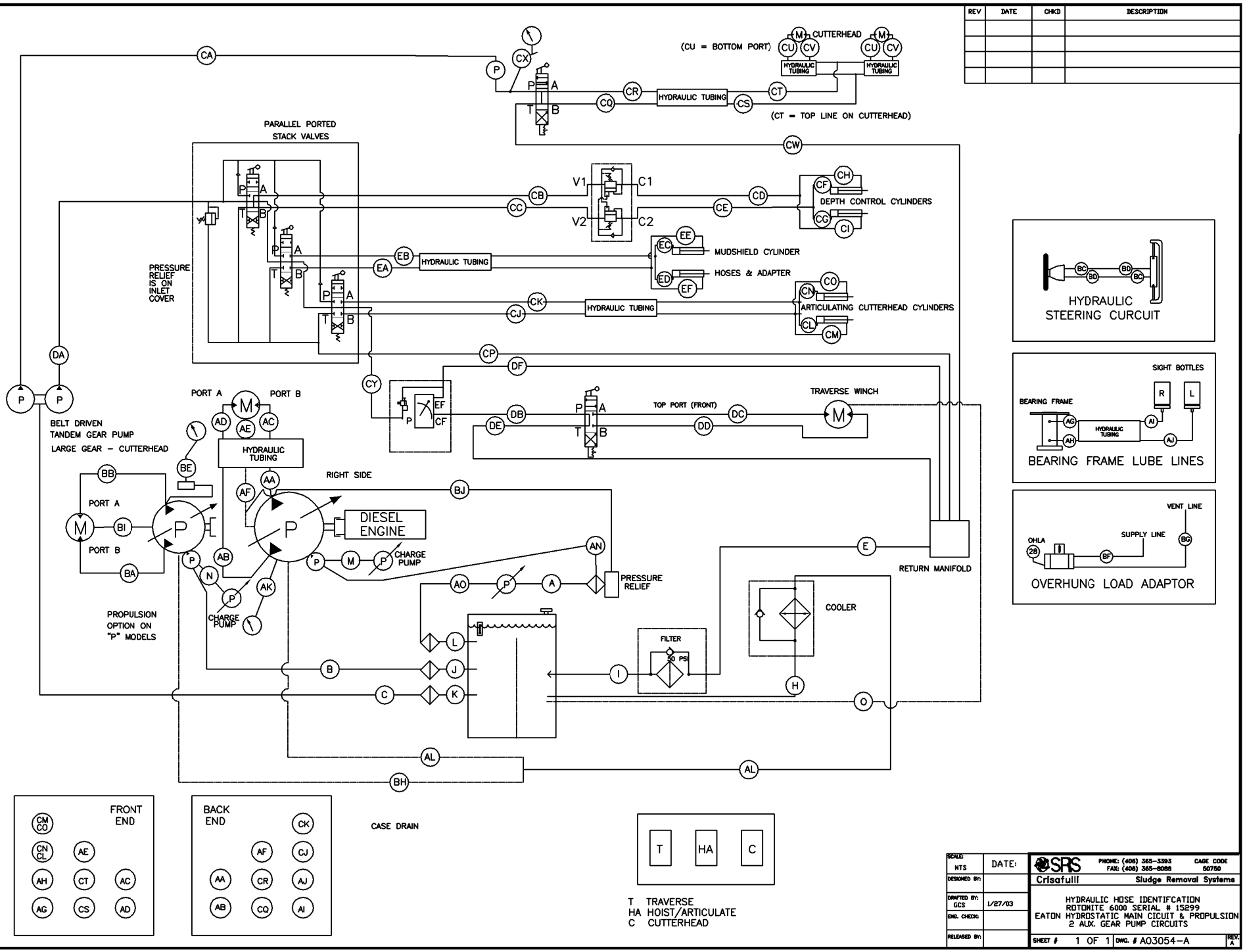
SRS Crisafulli — Sludge Removal Systems

INTEGRAL FLOATING DISCHARGE PIPELINE

Dwn By: CKR	Ckd.:	Date: 7/3/91	Dwg.#: CPC–91338

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SECTION 6 - HYDRAULICS


REV | DATE | CHKD | DESCRIPTION
(CU = BOTTOM PORT)
CUTTERHEAD
HYDRAULIC TUBING
(CT = TOP LINE ON CUTTERHEAD)
PARALLEL PORTED STACK VALVES
PRESSURE RELIEF IS ON INLET COVER
DEPTH CONTROL CYLINDERS
MUDSHIELD CYLINDER
HOSES & ADAPTER
ARTICULATING CUTTERHEAD CYLINDERS
TRAVERSE WINCH
TOP PORT (FRONT)
BELT DRIVEN TANDEM GEAR PUMP
LARGE GEAR – CUTTERHEAD
PORT A
PORT B
RIGHT SIDE
DIESEL ENGINE
CHARGE PUMP
PRESSURE RELIEF
RETURN MANIFOLD
COOLER
FILTER
20 PSI
PROPULSION OPTION ON "P" MODELS
CASE DRAIN
FRONT END
BACK END
T TRAVERSE
HA HOIST/ARTICULATE
C CUTTERHEAD
HYDRAULIC STEERING CURCUIT
SIGHT BOTTLES
BEARING FRAME
BEARING FRAME LUBE LINES
VENT LINE
SUPPLY LINE
OHLA
OVERHUNG LOAD ADAPTOR
SCALE: NTS
DESIGNED BY:
DRAFTED BY: GCS
ENG. CHECK:
RELEASED BY:
DATE: 1/27/03
SRS Crisafulli
PHONE: (406) 365-3393 FAX: (406) 365-8088
CAGE CODE 50750
Sludge Removal Systems
HYDRAULIC HOSE IDENTIFCATION
ROTONITE 6000 SERIAL # 15299
EATON HYDROSTATIC MAIN CIRCUIT & PROPULSION
2 AUX. GEAR PUMP CIRCUITS
SHEET # 1 OF 1
DWG. # A03054-A
REV. A

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SAMPLE INTERVAL AND PROCEDURE

TARGET CLEANLINESS

- Minimum cleanliness code rating of ISO 16/14/12 or numerically lower for particle sizes of 2, 5, 15 micrometers or larger, respectively.

SAMPLE INTERVAL

- The following sample intervals are for hydraulic systems in use under normal operating conditions at pressures in excess of 3000 psi at the aforementioned cleanliness code.

  Immediately – Following a maintenance event or for a system in distress. (i.e. increased heat, erratic operation, or unusual sound)

  3 months – For systems operated 8 hours per day or less

  2 months – For systems operated 8 hours per day or greater

- Following initial commission or major rebuild.

  Before startup

  After testing or first day of operation

  After one month of operation

Equipment not sampled at the recommended intervals will void the warranty on all hydraulic components. SRS Crisafulli, Inc will supply sample bottles. After sampling, the bottle is to be sealed and returned for analysis to SRS Crisafulli, Inc., 1610 Crisafulli Drive, Glendive, MT 59330. Additional sample bottles will be sent upon the return of filled units or at customers request.

SRS CRISAFULLI INC.
Sample Interval and Procedure (continued)
Page -2-

SAMPLE PROCEDURE

- Check all filters and verify that no filter is operating through the bypass. The suction filters are equipped with visual indicator lights on the instrument panel. The return filter is equipped with a visual indicator on the filter housing mounted to the hydraulic tank.

- If possible, operate the unit until a hydraulic temperature of 100 degrees Fahrenheit is reached before sampling.

- Locate the sample port on the pressure side of the return filter mounted to the hydraulic tank. See following drawing #02648. Locate the supplied matching quick coupler and sample hose. Verify that each are clean and lint free.

- Shut the unit down to reduce the possible mess associated with connecting the quick coupler and hose.

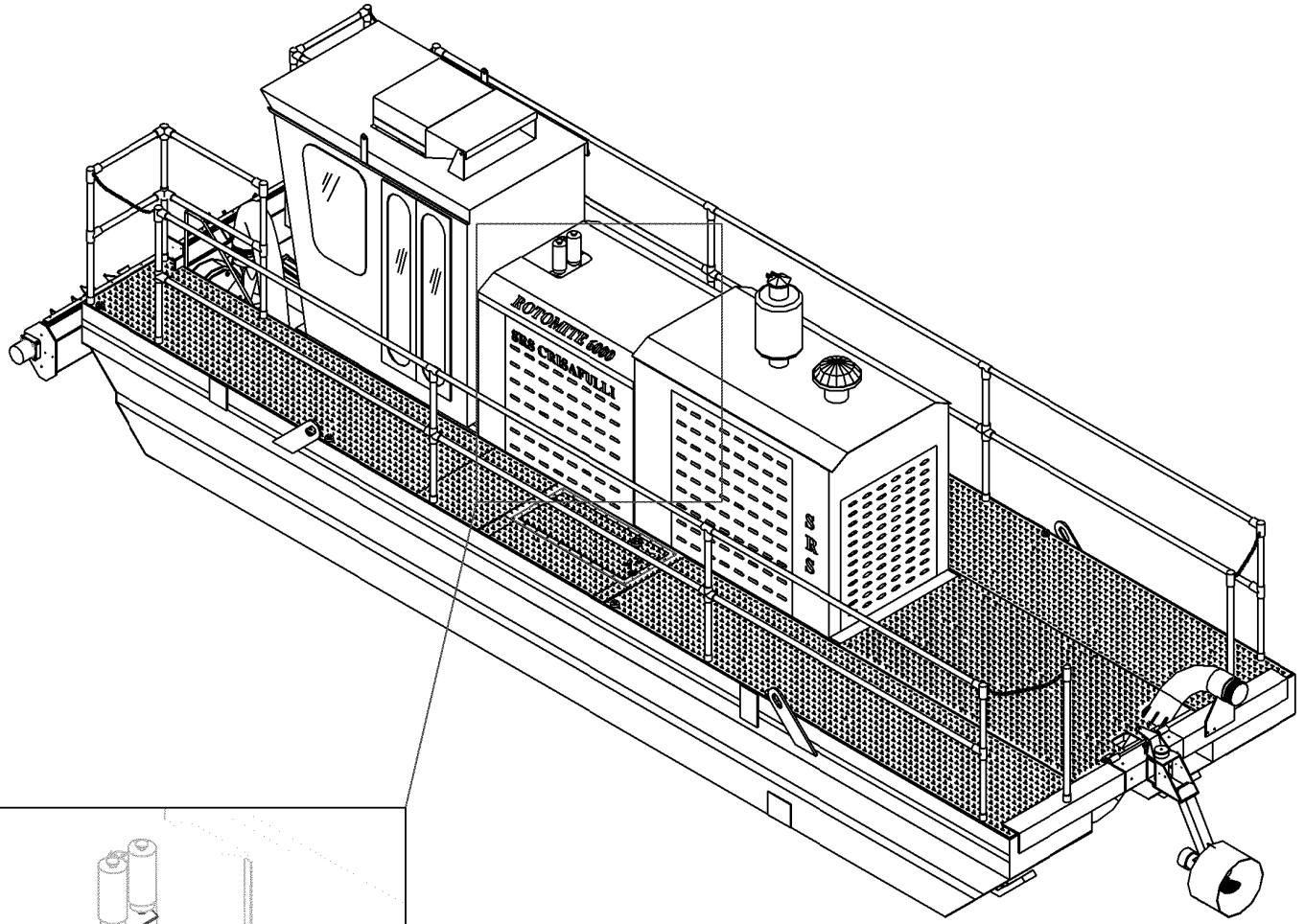
- Approximately two cups of hydraulic fluid should be ran through the sample valve and hose to flush any possible contaminants. The flushed fluid will need to be collected and properly disposed of.

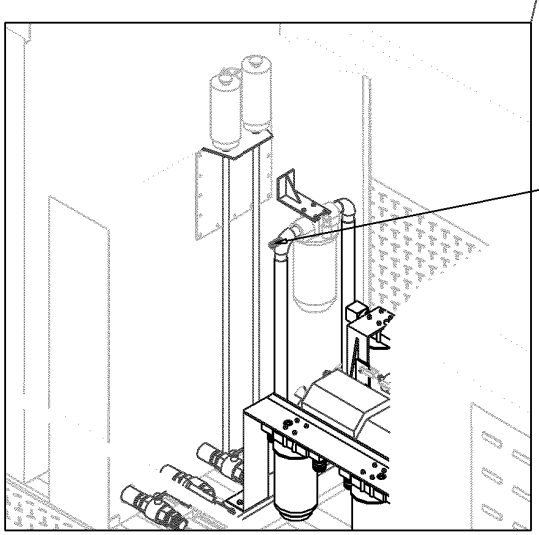
- Restart the unit. After flushing the valve and hose, redirect the sample hose to fill the supplied sample bottle. The bottle is to be filled to the fill line or approximately ¾ full if no fill line is evident.

- Disconnect the quick coupler and hose, store in a clean environment. Do not drain the hose into the sample bottle upon disconnecting it.

- Return the sample to SRS Crisafulli for fluid analysis.

- Consult the factory with any questions.





SRS Crisafulli
Sludge Removal Systems
1610 Crisafulli Drive
Glendive, MT 59330 USA
PHONE: 800-442-7867
www.crisafulli.com

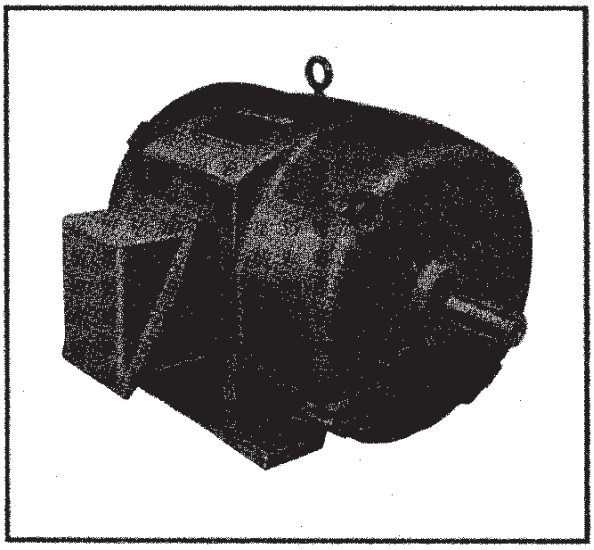
SAMPLE PORT, QUICK COUPLER, LOCATION

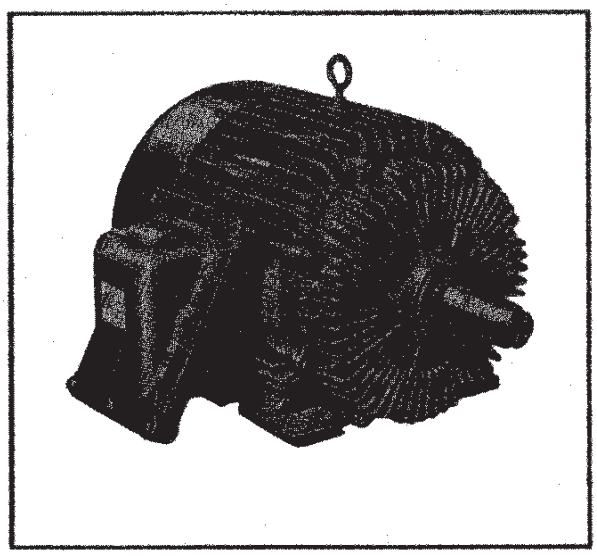
DATE: 11/11/02 | BY: GCS | DWG #: A02648-A

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SECTION 7 - ELECTRIC MOTOR

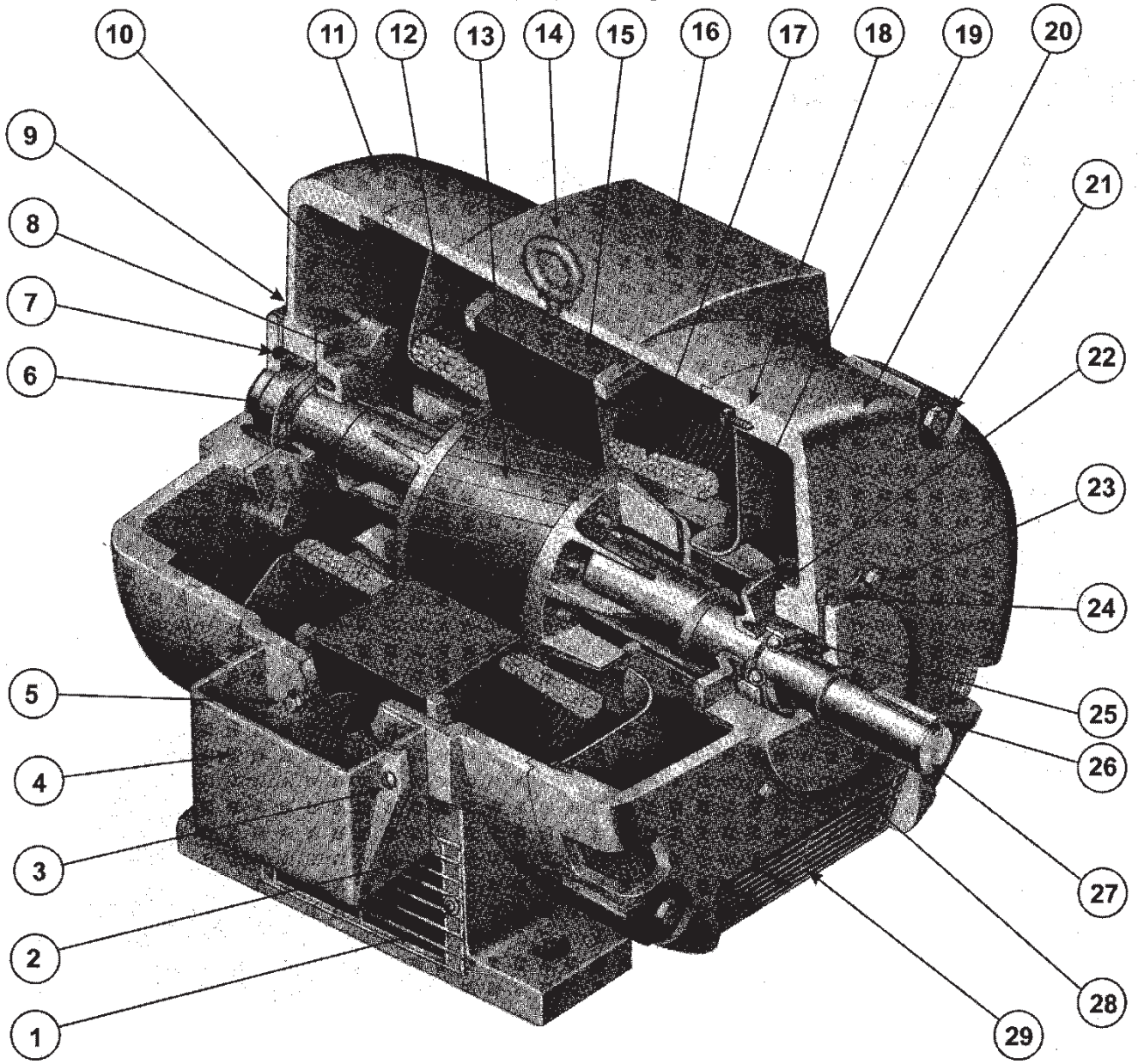
Standard Induction Motors





Installation, Operation, & Maintenance Instructions

TYPICAL CUTAWAY VIEW OF A DRIPPROOF, HORIZONTAL INTEGRAL HORSEPOWER MOTOR & PARTS DESCRIPTION 364 THRU 445 FRAME SIZE



ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	** Frame Vent Screen	11.	Bracket O.P.E.	21.	Bracket Holding Bolt
2.	Conduit Box Bottom	12.	Baffle Plate O.P.E.	22.	Inner Bearing Cap P.E.
3.	Conduit Box Top-Holding Screw	13.	Rotor Core	23.	Inner Bearing Cap Bolt
4.	Conduit Box Top	14.	Lifting Eye Bolt	24.	Grease Plug
5.	Conduit Box Bottom-Holding Bolt	15.	Stator Core	25.	*Ball Bearing P.E.
6.	*Ball Bearing O.P.E.	16.	Frame	26.	Shaft Extension Key
7.	Pre-loading Spring	17.	Stator Winding	27.	Shaft
8.	Inner Bearing Cap O.P.E.	18.	Baffle Plate Holding Screw	28.	Drain Plug (grease)
9.	Grease Plug	19.	Baffle Plate P.E.	29.	**Bracket Screen
10.	Inner Bearing Cap Bolt	20.	Bracket P.E.		

P.E. = Pulley End

O.P.E. = Opposite Pulley End

* = Bearing Numbers are shown on motor nameplate when requesting information or parts always give complete motor description, model and serial numbers.

** = Bracket and frame screens are optional.

WARNING

These instructions must be followed to ensure safe and proper installation, operation and maintenance of the motor. They should be brought to the attention of all persons who install, operate or maintain this equipment.

GENERAL INFORMATION

Motors are all fully factory tested and inspected before shipping. Damage during shipment and storage can occur. Motors not correctly matched to the power supply and/or the load will not operate properly. These instructions are intended as a guide to identify and eliminate these problems before they are overlooked or cause further damage.

ACCEPTANCE

Check carefully for any damage that may have occurred in transit. If any damage or shortage is discovered, do not accept until an appropriate notation on the freight bill is made. Any damage discovered after receipt of equipment should be immediately reported to the carrier.

STORAGE

A. Keep motors clean
   1. Store indoors
   2. Keep covered to eliminate airborne dust and dirt.
   3. Cover openings for ventilation, conduit connections, etc. to prevent entry of rodents, snakes, birds, and insects, etc.

B. Keep motors dry
   1. Store in a dry area indoors
   2. Temperature swings should be minimal to prevent condensation.
   3. Space heaters are recommended to prevent condensation.
   4. Treat unpainted flanges, shafts, and fittings with a rust inhibitor.
   5. Check insulation resistance before putting motor into service. (Consult manufacturer for guidelines).

C. Keep Bearings Lubricated
   1. Once per month, rotate shaft several turns to distribute grease in bearings.
   2. If unit has been stored more than one year, add grease before start-up. (Refer to lubrication procedure).

INSTALLATION

UNCRATING AND INSPECTION

After uncrating, check for any damage which may have been incurred in handling. The motor shaft should turn freely by hand. Repair or replace any loose or broken parts before attempting to use the motor.

Check to be sure that motor has not been exposed to dirt, grit, or excessive moisture in shipment or storage before installation.

Measure insulation resistance (see operation). Clean and dry the windings as required.

Never start a motor which has been wet without having it thoroughly dried.

SAFETY

Motors should be installed, protected and fused in accordance with latest issue of National Electrical Code, NEMA Standard Publication No. MG 2 and local codes.

Eyebolts or lifting lugs are intended for lifting the motor only. These lifting provisions should never be used when lifting or handling the motor with other equipment (i.e. pumps, gear boxes, fans or other driven equipment) as a single unit. Be sure the eyebolt is fully threaded and tight in its mounting hole.

Eyebolt lifting capacity ratings is based on a lifting alignment coincident with the eyebolt centerline. Eyebolt capacity reduces as deviation from this alignment increases. See NEMA MG 2.

Frames and accessories of motors should be grounded in accordance with National Electrical Code (NEC) Article 430. For general information of grounding refer to NEC Article 250.

Rotating parts such as pulleys, couplings, external fans, and shaft extensions should be permanently guarded.

LOCATION

In selecting a location for the motor, consideration should be given to environment and ventilation. A motor with the proper enclosure for the expected operating condition should be selected.

The ambient temperature of the air surrounding the motor should not exceed 40°C (104°F) unless the motor has been especially designed for high ambient temperature applications. The free flow of air around the motor should not be obstructed.

The motor should never be placed in a room with a hazardous process, or where flammable gases or combustible material may be present, unless it is specifically designed for this type of service.

1. Dripproof (open) motors are intended for use indoors where atmosphere is relatively clean, dry and non-corrosive.
2. Totally enclosed motors may be installed where dirt, moisture and corrosion are present, or in outdoor locations.
3. Explosion proof motors are built for use in hazardous locations as indicated by Underwriters' label on motor. Consult UL, NEC, and local codes for guidance.

Refer to manufacturer for application assistance.

FLOOR MOUNTING

Motors should be provided with a firm, rigid foundation, with the plane of four mounting pads flat within .010" for 56 to 210 frame; .015" from 250 through 500 frame. This may be accomplished by shims under the motor feet. For special isolation mounting, contact manufacturer for assistance.

V-BELT DRIVE

1. Select proper type and number of belts and sheaves. Excessive belt load will damage bearings. Sheaves should be in accordance to NEMA Spec. MG-1 or as approved by the manufacturer for a specific application.
2. Align sheaves carefully to avoid axial thrust on motor bearing. The drive sheave on the motor should be positioned toward the motor so it is as close as possible to the bearing.

3. When adjusting belt tension, make sure the motor is secured by all mounting bolts before tightening belts.
4. Adjust belt tension to belt manufacturers recommendations. Excessive tension will decrease bearing life.
5. For more information see Publication SB528.

DIRECT CONNECTED DRIVE

Flexible or solid shaft couplings must be properly aligned for satisfactory operation. On flexible couplings, the clearance between the ends of the shafts should be in accordance with the coupling manufacturer's recommendations or NEMA standards for end play and limited travel in coupling.

MISALIGNMENT and RUN-OUT between direct connected shafts will cause increased bearing loads and vibration even when the connection is made by means of a flexible coupling. Excessive misalignment will decrease bearing life. Proper alignment, per the specifications of the coupling being used, is critical.

Some large motors are furnished with roller bearings. Roller bearings should **not** be used for direct drive.

ELECTRICAL CONNECTIONS

CAUTION

Install and ground per local and national codes. Consult qualified personnel with questions or if repairs are required.

WARNING

1. Disconnect power before working on motor or driven equipment.
2. Motors with automatic thermal protectors will automatically restart when the protector temperature drops sufficiently. Do not use motors with automatic thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.
3. Motors with manual thermal protectors may start unexpectedly after protector trips. If manual protector trips, disconnect motor from power line. After protector cools (five minutes or more) it can be reset and power may be applied to motor.
4. Discharge all capacitors before servicing motor.
5. Always keep hands and clothing away from moving parts.
6. Never attempt to measure the temperature rise of a motor by touch. Temperature rise must be measured by thermometer, resistance, imbedded detector, or thermocouple.
7. Electrical repairs should be performed by trained and qualified personnel only.
8. Failure to follow instructions and safe electrical procedures could result in serious injury or death.
9. If safety guards are required, be sure the guards are in use.

1. All wiring, fusing, and grounding must comply with National Electrical Codes and local codes.
2. To determine proper wiring, rotation and voltage connections, refer to the information and diagram on the nameplate, separate connection plate or decal. If the plate or decal has been removed, contact manufacturer for assistance.
3. Use the proper size of line current protection and motor controls as required by the National Electrical Code and local codes. Recommended use is 125% of full load amps as shown on the nameplate for motors with 40°C ambient and a service factor over 1.0. Recommended use is 115% of full load amps as shown on the nameplate for all other motors. Do not use protection with larger capacities than recommended. Three phase motors must have all three phases protected.

THERMAL PROTECTOR INFORMATION

The nameplate will indicate one of the following:

1. Motor is thermally protected
2. Motor is not thermally protected
3. Motor is provided with overheat protective device

For examples, refer to paragraphs below:

1. Motors equipped with built-in thermal protection have "THERMALLY PROTECTED" stamped on the nameplate. Thermal protectors open the motor circuit electrically when the motor overheats or is overloaded.
   The protector cannot be reset until the motor cools. If the protector is automatic, it will reset itself. If the protector is manual, press the red button to reset.
2. Motors without thermal protection have nothing stamped on nameplate about thermal protection.
3. Motors that are provided with overheat protective device that does not open the motor circuit directly will indicate "WITH OVERHEAT PROTECTIVE DEVICE".
   A. Motors with this type of "Overheat Protective Device" have protector leads brought out in the motor conduit box marked "P1" and "P2". These leads are intended for connection in series with the stop button of the 3-wire pilot circuit for the magnetic starter which controls the motor. See Figure 1.
   B. The circuit controlled by the above "Overheat Protective Device" must be limited to a maximum of 600 volts and 360 volt-amps.

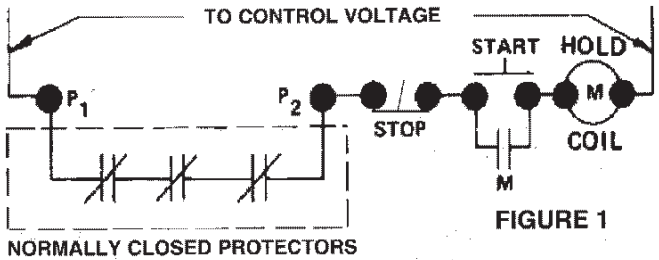
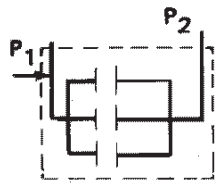


FIGURE 1



Normally Open (N/O) Motor Thermostats may be used in conjunction with controls installed by Original Equipment Manufacturers.

FIGURE 1A

CHANGING ROTATION

1. Keep hands and clothing away from rotating parts.
2. Before the motor is coupled to the load, determine proper rotation.
3. Check rotation by jogging or bumping. Apply power to the motor leads for a short period of time, enough to just get motor shaft to rotate a slight amount to observe shaft rotating direction.
4. Three phase - interchange any two (2) of the three (3) line leads. Single phase - reconnect per the connection diagram on the motor.

REDUCED VOLTAGE STARTING

Motors used on reduced voltage starting, should be carefully selected based upon power supply limitations and driven load requirements. The motors starting torque will be reduced when using reduced voltage starting. The elapsed time on the start step should be kept as short as possible and should not exceed 5 seconds. It is recommended that this time be limited to 2 seconds. Refer to manufacturer for application assistance.

OPERATION

WARNING

Disconnect and lock out before working on motor or driven equipment.

BEFORE INITIAL STARTING

1. If a motor has become damp in shipment or in storage, measure the insulation resistance of the stator winding.

$$\text{Minimum Insulation Resistance In Megohms} = 1 + \frac{\text{Rated Voltage}}{1000}$$

Do not attempt to run the motor if the insulation resistance is below this value.

2. If insulation resistance is low, dry out the moisture in one of the following ways:
   a. Bake in oven at temperature not more than 90°C (194°F).
   b. Enclose motor with canvas or similar covering, leaving a hole at the top for moisture to escape, and insert heating units or lamps.
   c. Pass a current at low voltage (rotor locked) through the stator winding. Increase the current gradually until the winding temperature, measured with a thermometer, reaches 90°C (194°F). Do not exceed this temperature.
3. See that voltage and frequency stamped on motor and control nameplates correspond with that of the power line.
4. Check all connections to the motor and control with the wiring diagram.
5. Be sure rotor turns freely when disconnected from the load. Any foreign matter in the air gap should be removed.
6. Leave the motor disconnected from the load for the initial start (see following caution). Check for proper rotation. Check for correct voltage (within ± 10% of nameplate value) and that it is balanced within 1% at the motor terminals. After the machine is coupled to the load, check that the nameplate amps are not exceeded. Recheck the voltage level and balance under load per the above guidelines.

   Shut down the motor if the above parameters are not met or if any other noise or vibration disturbances are present. Consult NEMA guidelines or the equipment manufacturer if any questions exist before operating equipment.

CAUTION

For motors nameplated as "belted duty only", do not run motor without belts properly installed.

COLLECTOR RINGS (Wound Rotor Motors Only)

The collector rings are sometimes treated at the factory to protect them while in stock and during shipment. The brushes have been fastened in a raised position. Before putting the motor into service, the collector rings should be cleaned to remove this treatment. Use a cleaning fluid that is made for degreasing electrical equipment. All of the brushes must be released and lowered to the collector surface. Keep the rings clean and maintain their polished surfaces. Ordinarily, the rings will require only occasional wiping with a piece of canvas or non-linting cloth. Do not let dust or dirt accumulate between the collector rings.

BRUSHES (Wound Rotor Motors Only)

See that the brushes move freely in the holders and at the same time make firm, even contact with the collector rings. The pressure should be between 2 and 3 pounds per square inch of brush surface.

When installing new brushes, fit them carefully to the collector rings. Be sure that the copper pigtail conductors are securely fastened to, and make good contact with, the brushholders.

ALLOWABLE VOLTAGE AND FREQUENCY RANGE

If voltage and frequency are within the following range, motors will operate, but with somewhat different characteristics than obtained with correct nameplate values.

1. Voltage: Within 10% above or below the value stamped on the nameplate. On three phase systems the voltage should be balanced within 1%. A small voltage unbalance will cause a significant current unbalance.
2. Frequency: Within 5% above or below the value stamped on the nameplate.
3. Voltage and Frequency together: Within 10% (providing frequency above is less than 5%) above or below values stamped on the nameplate.

CLEANLINESS

Keep both the interior and exterior of the motor free from dirt, water, oil and grease. Motors operating in dirty places should be periodically disassembled and thoroughly cleaned.

CONDENSATION DRAIN PLUGS

All explosion proof and some totally enclosed motors are equipped with automatic drain plugs, they should be free of oil, grease, paint, grit and dirt so they don't clog up. The drain system is designed for normal floor (feet down) mounting. For other mounting positions, modification of the drain system may be required, consult manufacturer.

SERVICE

WARNING

Disconnect power before working on motor or driven equipment. Motors with automatic thermal protectors will automatically restart when the protector temperature drops sufficiently. Do not use motors with automatic thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.

CAUTION

Overgreasing bearings can cause premature bearing and/or motor failure. The amount of grease added should be carefully controlled.

NOTE

If lubrication instructions are shown on the motor nameplate, they will supersede this general instruction.

Motors are pregreased with a polyurea mineral oil NGLI grade 2 type grease unless stated otherwise on the motor nameplate. Some compatible brands of polyurea mineral base type grease are: Chevron SRI #2, Rykon Premium #2, Exxon Polyrex EM or Texaco Polystar RB.

Motors are properly lubricated at the time of manufacture. It is not necessary to lubricate at the time of installation unless the motor has been in storage for a period of 12 months or longer (refer to lubrication procedure that follows).

LUBRICATION PROCEDURES

1. Stop motor. Disconnect and lock out of service.
2. Remove contaminants from grease inlet area.
3. Remove filler and drain plugs.
4. Check filler and drain holes for blockage and clean as necessary.
5. Add proper type and amount of grease. See the Relubrication Time Intervals table for service schedule and Relubrication Amounts table for volume of grease required.
6. Wipe off excess grease and replace filler and drain plugs (see following warning).
7. Motor is ready for operation.

WARNING

If motor is nameplated for hazardous locations, do not run motor without all of the grease or drain plugs installed.

RELUBRICATION TIME INTERVAL AND AMOUNTS

(For motors with regreasing provisions).

Service Condition	NEMA FRAME SIZE					
	140-180		210-360		400-510	
	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM
Standard	3 yrs.	6 months	2 yrs.	6 months	1 yr.	3 months
Severe	1 yr.	3 months	1 yr.	3 months	6 months	1 month
Seasonal	See Note 2.					

NOTE

1. For motors nameplated as "belted duty only" divide the above intervals by 3.
2. Lubricate at the beginning of the season. Then follow service schedule above.

SEASONAL SERVICE: The motor remains idle for a period of 6 months or more.

STANDARD SERVICE: Up to 16 hours of operation per day, indoors, 100°F maximum ambient.

SEVERE SERVICE: Greater than 16 hours of operation per day. Continuous operation under high ambient temperatures (100° to 150°F) and/or any of the following: dirty, moist locations, high vibration (above NEMA standards), heavy shock loading, or where shaft extension end is hot.

RELUBRICATION AMOUNTS

(For motors with regreasing provisions).

NEMA FRAME SIZE	VOLUME cu. in. (fluid oz.)
140	.25 (.14)
180	.50 (.28)
210	.75 (.42)
250	1.00 (.55)
280	1.25 (.69)
320	1.50 (.83)
360	1.75 (.97)
400	2.25 (1.2)
440	2.75 (1.5)
500	3.00 (1.7)

TROUBLESHOOTING

WARNING

1. Disconnect power before working on motor or driven equipment.
2. Motors with automatic thermal protectors will automatically restart when the protector temperature drops sufficiently. Do not use motors with automatic thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.
3. Motors with manual thermal protectors may start unexpectedly after protector trips. If manual protector trips, disconnect motor from power line. After protector cools (five minutes or more) it can be reset and power may be applied to motor.
4. Discharge all capacitors before servicing motor.
5. Always keep hands and clothing away from moving parts.
6. Never attempt to measure the temperature rise of a motor by touch. Temperature rise must be measured by thermometer, resistance, imbedded detector, or thermocouple.
7. Electrical repairs should be performed by trained and qualified personnel only.
8. Failure to follow instructions and safe electrical procedures could result in serious injury or death.
9. If safety guards are required, be sure the guards are in use.

If trouble is experienced in the operation of the motor, make sure that:

1. The bearings are in good condition and operating properly.
2. There is no mechanical obstruction to prevent rotation in the motor or in the driven load.
3. The air gap is uniform. (Consult manufacturer for specifications).
4. All bolts and nuts are tightened securely.
5. Proper connection to drive machine or load has been made.

In checking for electrical troubles, be sure that:

1. The line voltage and frequency correspond to the voltage and frequency stamped on the nameplate of the motor.
2. The voltage is actually available at motor terminals.
3 The fuses and other protective devices are in proper condition.
4. All connections and contacts are properly made in the circuits between the control apparatus and motor.

These instructions do not cover all details or variations in equipment nor provide for every possible condition to be met in connection with installation, operation or maintenance. Should additional information be desired for the purchaser's purposes, the matter should be referred to the manufacturer.

MOTOR TROUBLE SHOOTING CHART

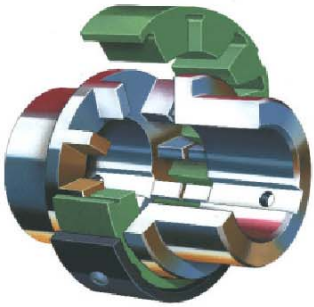
Your motor service and any trouble shooting must be handled by qualified persons who have proper tools and equipment.

TROUBLE	CAUSE	WHAT TO DO
Motor fails to start	Blown fuses	Replace fuses with proper type and rating
	Overload trips	Check and reset overload in starter.
	Improper power supply	Check to see that power supplied agrees with motor nameplate and load factor.
	Improper line connections	Check connections with diagram supplied with motor.
	Open circuit in winding or control switch	Indicated by humming sound when switch is closed. Check for loose wiring connections. Also see that all control contacts are closing.
	Mechanical failure	Check to see if motor and drive turn freely. Check bearings and lubrication.
	Short circuited stator	Indicated by blown fuses. Motor must be rewound.
	Poor stator coil connection	Remove end bells, locate with test lamp.
	Rotor defective	Look for broken bars or end rings.
	Motor may be overloaded	Reduce load.
Motor stalls	One phase may be open	Check lines for open phase.
	Wrong application	Change type or size. Consult manufacturer.
	Overload	Reduce load.
	Low voltage	See that nameplate voltage is maintained. Check connection.
	Open circuit	Fuses blown, check overload relay, stator and pushbuttons.
Motor runs and then dies down	Power failure	Check for loose connections to line, to fuses and to control.
Motor does not come up to speed	Not applied properly	Consult supplier for proper type.
	Voltage too low at motor terminals because of line drop.	Use higher voltage on transformer terminals or reduce load. Check connections. Check conductors for proper size.
	Starting load too high	Check load motor is supposed to carry at start.
	Broken rotor bars or loose rotor	Look for cracks near the rings. A new rotor may be required as repairs are usually temporary.
	Open primary circuit	Locate fault with testing device and repair.
Motor takes too long to accelerate and/or draws high amp	Excessive load	Reduce load.
	Low voltage during start	Check for high resistance. Adequate wire size.
	Defective squirrel cage rotor	Replace with new rotor.
	Applied voltage too low	Get power company to increase power tap.
Wrong rotation	Wrong sequence of phases	Reverse connections at motor or at switchboard.
Motor overheats while running under load	Overload	Reduce load.
	Frame or bracket vents may be clogged with dirt and prevent proper ventialation of motor.	Open vent holes and check for a continuous stream of air from the motor.
	Motor may have one phase open	Check to make sure that all leads are well connected.
	Grounded coil	Locate and repair.
	Unbalanced terminal voltage	Check for faulty leads, connections and transformers.
Motor vibrates	Motor misaligned	Realign.
	Weak support	Strengthen base
	Coupling out of balance	Balance coupling.
	Driven equipment unbalanced	Rebalance driven equipment.
	Defective bearings	Replace bearing.
	Bearings not in line	Line up properly.
	Balancing weights shifted	Rebalance motor.
	Polyphase motor running single phase	Check for open circuit.
	Excessive end play	Adjust bearing or add shim.
Unbalanced line current on polyphase motors during normal operation	Unequal terminal volts	Check leads and connections.
	Single phase operation	Check for open contacts.
	Unbalanced voltage	Correct unbalanced power supply.
Scraping noise	Fan rubbing air shield	Remove interference.
	Fan striking insulation	Clear fan.
	Loose on bedplate	Tighten holding bolts.
Noisy operation	Airgap not uniform	Check and correct bracket fits or bearing.
	Rotor unbalance	Rebalance.
Hot bearings general	Bent or sprung shaft	Straighten or replace shaft.
	Excessive belt pull	Decrease belt tension.
	Pulleys too far away	Move pulley closer to motor bearing.
	Pulley diameter too small.	Use larger pulleys.
	Misalignment	Correct by realignment of drive.
Hot bearings ball	Insufficient grease	Maintain proper quantity of grease in bearing.
	Deterioration of grease or lubircant contaminated	Remove old grease, wash bearings thoroughly in kerosene and replace with new grease.
	Excess lubricant	Reduce quantity of grease, bearing should not be more than 1/2 filled.
	Overloaded bearing	Check alignment, side and end thrust.
	Broken ball or rough races	Replace bearing, first clean housing thoroughly.

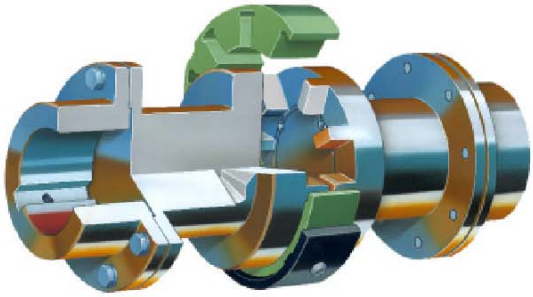
This is the Original Document in English Language

Figure 1 - Wrapflex coupling range

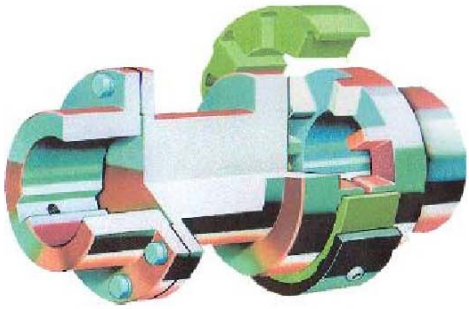
Type 10R



Type 31R



Type 35R



1. General Information

1.1. Falk Wrapflex Couplings are designed to provide a mechanical connection between the rotating shafts of mechanical equipment, using flexible disc elements to accommodate inherent misalignment while transmitting the power and torque between the connected shaft.

1.2. These instructions are intended to help you to install and maintain your Falk Wrapflex coupling. Please read these instructions prior to installing the coupling, and prior to maintenance of the coupling and connected equipment. Keep these instructions near the coupling installation and available for review by maintenance personnel. For special engineered couplings, Rexnord may provide an engineering drawing containing installation instructions that take precedence over this document.

1.3. Rexnord Industries, LLC owns the copyright of this material. These Installation and Maintenance instructions may not be reproduced in whole or in part for competitive purposes

1.4. Symbol descriptions:

STOP Danger of injury to persons.

Damages on the machine possible.

Pointing to important items.

Hints concerning explosion protection

2. Safety and Advice Hints

STOP DANGER!

2.1. Safety should be a primary concern in all aspects of coupling installation, operation, and maintenance.

2.2. Do not make contact with the coupling when it is rotating and/or in operation.

2.3. Because of the possible danger to person(s) or property from accidents which may result from improper use or installation of these products, it is extremely important to follow the proper selection, installation, maintenance and operational procedures.

2.4. All personnel involved in the installation, service, operation, maintenance, and repair of this coupling and the connected equipment must read, understand, and comply with these Installation and Maintenance instructions.

PRECAUTION!

For this coupling to meet the ATEX requirements, you must precisely follow these installation and maintenance instructions, and the supplement form 0005-08-49-01. This supplement outlines the ATEX requirements. If the operator does not follow these instructions, the coupling will immediately be considered non-conforming to ATEX.

2.5. All rotating power transmission products are potentially dangerous and can cause serious injury. They must be properly guarded in compliance with OSHA, ANSI, ATEX, European machine safety standards and other local standards. It is the responsibility of the user to provide proper guarding.

2.6. For ATEX requirements the guard must have a minimum of 12.7 mm (1/2 inch) radial clearance to the coupling outside diameter and allow for proper ventilation.

2.7. Make sure to disengage the electrical power and any other sources of potential energy before you perform work on the coupling.

2.8. Proper lockout-tag out procedures must be followed to safeguard against unintentional starting of the equipment.

2.9. All work on the coupling must be performed when the coupling is at rest with no load.

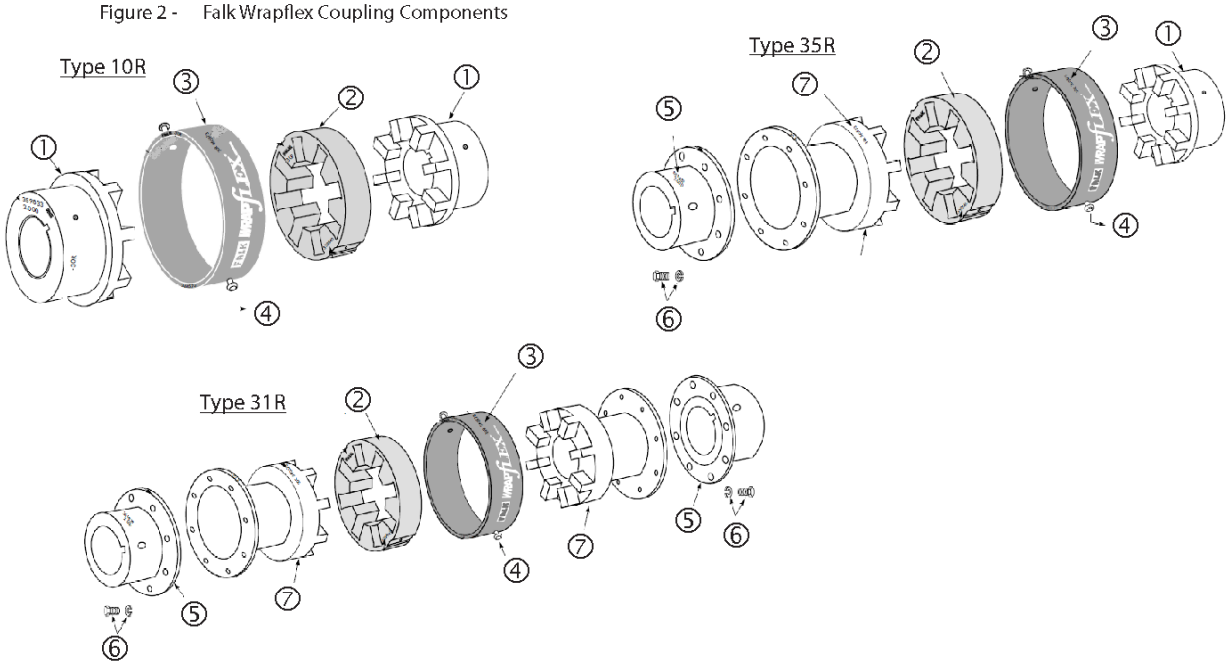
2.10. Do not start or jog the motor, engine, or drive system without securing the coupling components. If the equipment is started with only a hub attached, the hub must be properly mounted and ready for operation, with the key and set screw (if included) fastened. When the full coupling assembly is started, all fasteners and hardware must be completely and properly secured. Do not run the coupling with loose fasteners.

2.11. The coupling may only be used in accordance with the technical data provided in the Falk Wrapflex coupling catalog. Customer modifications and alterations to the coupling are not permissible.

2.12. All spare parts for service or replacement must originate from or be approved by Rexnord Industries, LLC

3. Components and Part Numbers

Figure 2 - Falk Wrapflex Coupling Components



Rexnord Industries, LLC, 5555 S. Moorland Rd., New Berlin, WI 53151-7953
Telephone: 262-796-4060 Fax: 262-796-4064
e-mail: info@rexnord.com web: www.rexnord.com

Table 1 - Falk Wrapflex Coupling Component part numbers

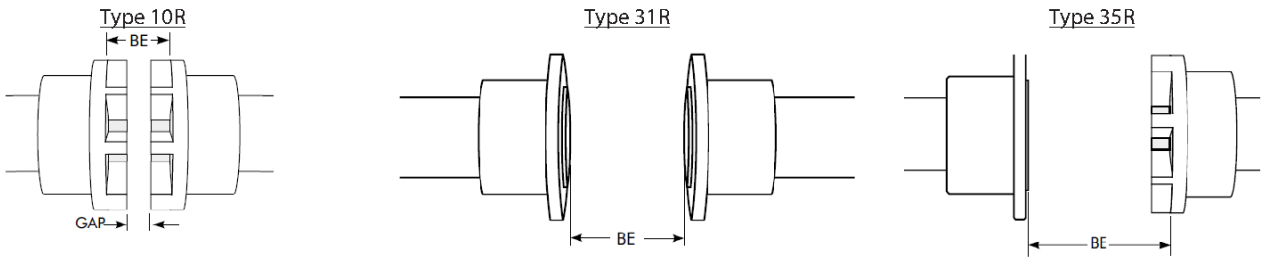
Size	Hub			Flex Element with fasteners	Cover			T-hub	Flange fasteners	Spacer hub
	Rough bore	Taper Lock	Rough bore stainless steel		Nylon	Steel	Cover fastener			
	1.1	1.2	1.3	2	3.1	3.2	4	5	6	7
2R	3302297	-	-	3701853	3701853	-	2927918	-	-	-
3R	3302298	-	-	3701854	3701854	-	2927918	-	-	-
4R	3302299	-	-	3701855	3701855	-	2927924	-	-	-
5R	0359831	3400346	3301249	0789006	0360571	0359845	2919837	0251670A	Part of T-hub delivery	For Spacer hub part numbers contact Rexnord
10R	0359832	3400347	3301250	0789007	0360572	0359846	2919838	0251671A		
20R	0359833	3400348	3301251	0789008	0360573	0359847	2919842	0251672A		
30R	0359834	3400349	3301252	0789009	0436990	0359848	2919842	0251673A		
40R	0359835	3400350	3301253	0789010	0436991	0359849	2921012	0258639A		
50R	0359836	3400351	3301254	0789011	0436992	0359850	2921014	0258640A		
60R	3301259			3700220		3301262	2921227	0258641A		
70R	3301260			3700221		3301263	2921227	0265854A		
80R	3301261			3700222		3301264	2921227	0266172A		

STOP DANGER!

Be sure to disengage the electrical power and any other sources of potential energy before you perform work on the hub and coupling assembly.

4. Hub mounting

Figure 3 -



4.1. Examine the coupling assembly to insure there is no visible damage.

4.2. Clean the hub bores and shafts using lint free cloth. Remove any nicks or burrs.

4.3. When assembled, the key(s) should have a close side-to-side fit in the keyway in the hub and shaft, with a slight clearance over the top of the key.

4.4. Remove the cap screws that attach the hubs to the adapters, and remove both hubs.

⚠ CAUTION: When heating hubs is required, an oven is preferred and an open flame is not recommended. If flame heating is considered mandatory, it is important to provide uniform heating to avoid distortion and excessive temperature. A thermal stick applied to the hub surface will help determine the hub temperature.

STOP DANGER!

Touching hot hubs causes burns. Wear safety gloves to avoid contact with hot surfaces.

5. Straight Bore with Clearance/Slip Fit

5.1. Install the key(s) in the shaft.

5.2. Check to be sure that the set screw(s) in the hub does not protrude into the keyway or the bore. Remove or back out the set screw to provide clearance during assembly.

5.3. Slide the hub up the shaft to the desired axial position.

5.4. Assemble and tighten the set screw(s) using a calibrated torque wrench to the values shown in Table 2

Table 2 - Set Screw Tightening Torque

Screw Size		M6	M8	M10	M12	M16	1/4"	3/8"
Hex Head Key Size		M3	M4	M5	M6	M8	1/8"	3/16"
Standard hubs	Tightening torque (Nm)	6	12	25	50	100	8	25
	Tightening torque (lb-in)	55	110	220	440	880	70	220
Stainless steel hubs	Tightening torque (Nm)	4	7	12	25	50	4	12
	Tightening torque (lb-in)	30	60	110	220	550	35	110

⚠ CAUTION: Never use two set screws with one on top of the other in the same tapped hole.

6. Straight Bore with Interference Fit

6.1. Accurately measure the bore and shaft diameters to assure proper fit.

6.2. Install the key(s) in the shaft.

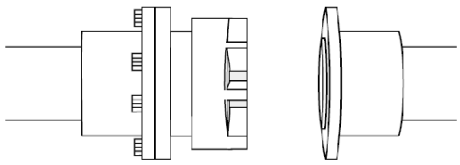
6.3. Heat the hub in an oven until the bore is sufficiently larger than the shaft.

6.4. 350°F (177°C) is usually sufficient for carbon steel hubs. Do not exceed 500°F (260°C).

6.5. With the hub expanded, install it quickly on the shaft to the desired axial position. A pre-set axial stop device can be helpful.

7. Install Spacer hub(s) - types R31 and R35 only

Figure 4 -



7.1. Carefully position spacer hub(s) on register of shaft hub and fasten parts together. Torque flange fasteners to specification in Table 3.

Table 3 - Flange fasteners tightening torque

R31/R35 Flange Fastener	M6	M8	M10	M12	M16
Wrench size	10	13	17	19	24
Tightening torque (Nm)	15	35	68	125	200
Tightening torque (lb-in)	130	310	600	1100	1800

8. Shaft alignment

8.1. Place element cover over the hub

8.2. Move the equipment into place

ATTENTION! Soft Foot – The equipment must rest flat on its base. If one or more feet of the machine are shorter, longer, or angled in some way to prevent uniform contact (a condition commonly known as "soft foot") it must now be corrected.

ATTENTION! To improve the life of the coupling, the shafts must be aligned to minimize deflection of the flexing elements. Shaft alignment is required in the axial, parallel, and angular directions, with each of these values not to exceed the recommended installation limits shown in Table 4. Shaft alignment can be measured using various established methods, including Laser Alignment, Reverse Dial Indicator, and Rim and Face. Refer to Rexnord bulletin 538-214 "Coupling Alignment Fundamentals" for instructions regarding shaft alignment.

Rexnord Industries, LLC, 5555 S. Moorland Rd., New Berlin, WI 53151-7953
Telephone: 262-796-4060 Fax: 262-796-4064
e-mail: info@rexnord.com web: www.rexnord.com

8.3. Move the connected equipment to achieve acceptable alignment. When properly aligned, the hubs will be centered and approximately parallel.

8.4. Table 4 shows recommended installation limits for Parallel, Angular, and Axial alignment.

8.5. The "Parallel Misalignment" value (P) is the offset between the centers of the hubs, as shown in Figure 5.

8.6. When Parallel Offset is measured by rotating the hubs in unison with dial indicators the total indicated reading (TIR) should be divided by (2) to calculate "P".

8.7. It should be noted that parallel offset measured on the hub surfaces includes misalignment of the equipment shafting plus any variation (TIR) in the hubs. This may be helpful to consider during problem solving for alignment difficulties.

8.8. The "Angular Misalignment" value is the maximum difference between the measurements X and Y taken at opposite ends of the hub flanges, as shown in Figure 5.

8.9. These dimensions are suggested for initial installation. Additional capacity is available to compensate for thermal and structural equipment movement.

ATTENTION! Falk's Type R10, R31, and R35 Wrapflex couplings are not appropriate for limited end-float applications

Figure 5 -

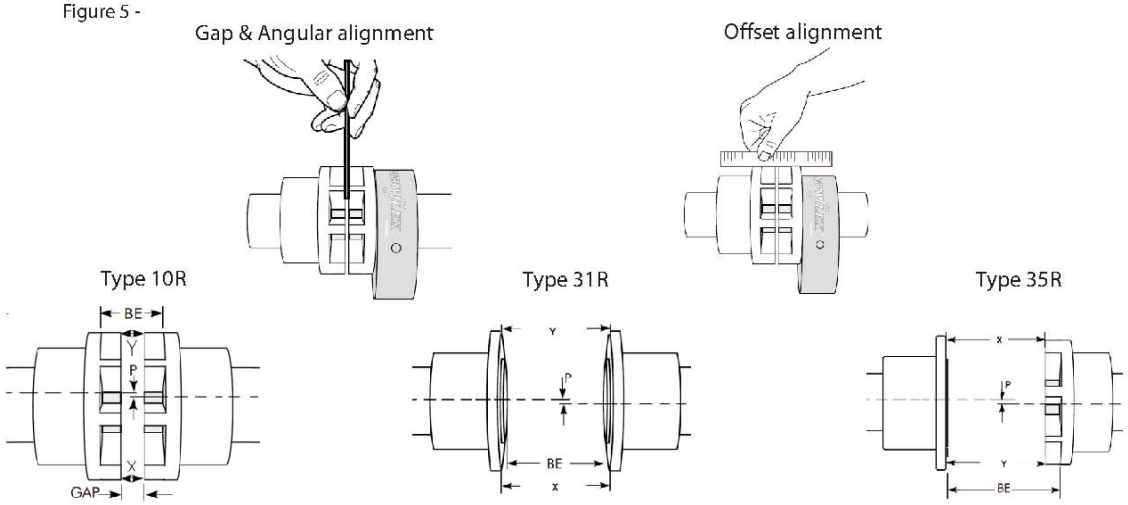


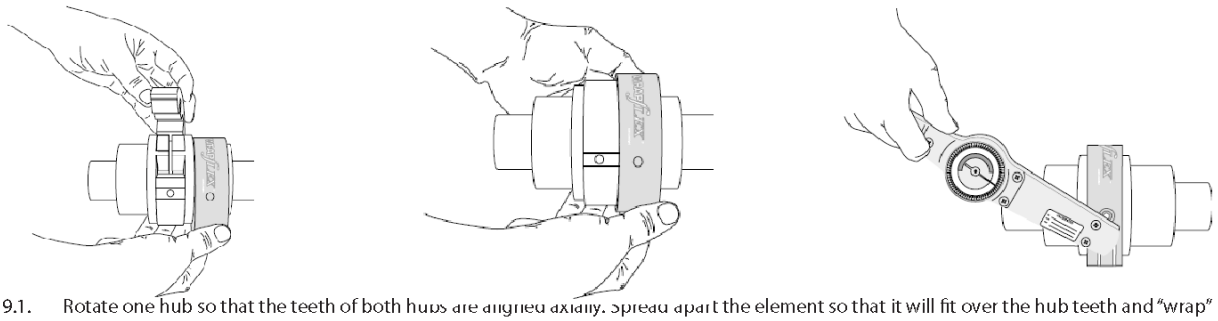
Table 4 - Installation limits

Size	BE *		Parallel offset - P		Angular (X-Y)			Gap* (±10%)		Parallel offset - P		Max Angular (X-Y)			Gap* (±10%)		Allowable speed
	mm	inch	mm	inch	degree	mm	inch	mm	inch	mm	inch	degree	mm	inch	mm	in	n-min
2R	16.5	0.65	0.25	0.01	0.25	0.17	0.007	1.50	0.062	0.50	0.062	1	0.68	0.027	1.50	0.062	4500
3R	18.5	0.73	0.25	0.01	0.25	0.22	0.009	1.50	0.062	0.50	0.062	1	0.89	0.035	1.50	0.062	4500
4R	19.5	0.77	0.25	0.01	0.25	0.25	0.01	1.50	0.062	0.50	0.062	1	1.01	0.04	1.50	0.062	4500
5R	20.0	0.77	0.5	0.02	0.25	0.28	0.011	2.0	0.062	1.0	0.04	1	1.12	0.044	2.0	0.062	4500
10R	24.0	0.93	1.0	0.04	0.25	0.33	0.013	2.0	0.062	2.0	0.08	1	1.33	0.052	2.0	0.062	4500
20R	32.0	1.24	1.0	0.04	0.25	0.45	0.018	2.0	0.062	2.0	0.08	1	1.78	0.07	2.0	0.062	4500
30R	36.0	1.4	1.0	0.04	0.25	0.51	0.02	2.0	0.062	2.0	0.08	1	2.06	0.081	2.0	0.062	4500
40R	47.0	1.84	1.5	0.06	0.25	0.65	0.026	5.0	0.188	3.0	0.12	1	2.62	0.103	5.0	0.188	3600
50R	61.0	2.39	1.5	0.06	0.25	0.83	0.033	5.0	0.188	3.0	0.12	1	3.32	0.131	5.0	0.188	3000
60R	75.4	2.96	1.5	0.06	0.25	0.99	0.039	5.0	0.188	3.0	0.12	1	3.98	0.157	5.0	0.188	2500
70R	84.4	3.31	1.5	0.06	0.25	1.18	0.046	5.0	0.188	3.0	0.12	1	4.71	0.186	5.0	0.188	2100
80R	96.8	3.82	1.5	0.06	0.25	1.43	0.056	6.0	0.25	3.0	0.12	1	5.73	0.225	6.0	0.25	1800

* "BE" dimension tolerance is ±10% of "Gap" listed. Hubs can be mounted for shorter than standard BE lengths as long as shaft ends do not extend into "Gap" and keys extend key on barrel of hub into tooth space. Stake key(s) in place for an interference fit without setscrew. Overhanging hubs is not recommended.

9. Final Assembly - Element and cover installation

Figure 6 -



9.1. Rotate one hub so that the teeth of both hubs are aligned axially. Spread apart the element so that it will fit over the hub teeth and "wrap" the element between the two hubs. As shown on Figure 6.

9.2. Move the cover alongside the element with the fastener hole of the cover approximately aligned with the locating slot on the element as shown in figure 6. A soft mallet may be needed to install the cover on larger size couplings. If using a nylon cover, the cover's locating key will engage the slot in the element when cover and element are properly aligned — this will aid in blind assembly.

9.3. Push or tap the cover onto the element until it is centered axially on the element. If using a steel cover, push or tap the cover onto the element and center the cover axially while making sure that the fastener holes on the cover and element are aligned. For the 5R-50R steel covers, use the flats on the O. D. of the steel cover as avisual aid to align the cover's threaded hole with the slot and clearance hole of the element.

9.4. Install and tighten cover fasteners to the specified torque in Table 5, as shown in figure 6.

☞ DO NOT over tighten

Table 5 - Cover fasteners tightening torque

Coupling size	2	3	4	5	10	20	30	40	50	60	70	80
Screw size	M3	M3	M4	M4	M4	M6	M6	M8	M8	M10	M10	M10
Hex Head Key size	M2	M2	M2.5	M2.5	M2.5	M4	M4	M5	M5	M6	M6	M6
Tightening torque (Nm)	0.2	0.2	0.5	0.5	0.5	2.5	2.5	5	5	15	15	15
Tightening torque (lb-in)	2	2	5	5	5	22	22	45	45	135	135	135

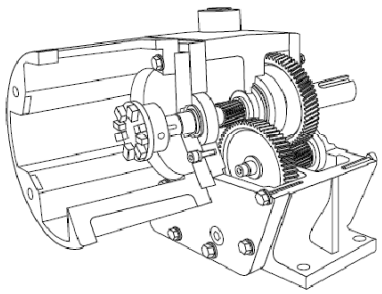
STOP DANGER!

Do not operate the coupling without the cover fasteners installed.

10. Blind Assembly

The term blind assembly refers to the ability to complete the assembly or connection of the coupling components without being able to actually see the coupling. Wrapflex couplings may be blind or axially assembled within motor adapters or bell housings.

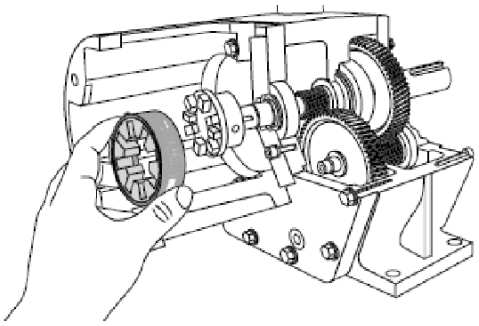
Figure 7 -



10.1. Mount both hubs on their respective shafts with the shaft ends flush with the end of the hub faces, unless instructed otherwise. Double-check the spacing of the assembly to be sure the required coupling hub face gap will be achieved when assembled.

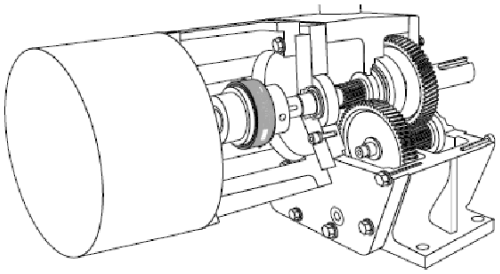
Rexnord Industries, LLC, 5555 S. Moorland Rd., New Berlin, WI 53151-7953
Telephone: 262-796-4060 Fax: 262-796-4064
e-mail: info@rexnord.com web: www.rexnord.com

Figure 8 -



10.2. Mount the cover onto the flexible element, making certain to tighten both cover fasteners to the specified torque in Table 5. Make certain the element split is not overlapping, and position the assembled cover/element assembly onto the lower of the two hubs if a vertical assembly, or on the hub within the bell housing or motor adapter for horizontal arrangements.

Figure 9 -



10.3. Bring the motor shaft hub axially into engagement with the element until the teeth seat within the element and the motor or bell housing adapter pilot is properly seated. Wrapflex hubs have a slightly tapered lead to facilitate this engagement. Complete the assembly by torquing the motor to the bell housing or motor adapter with the proper fasteners.

11. Preventive Maintenance & Element Replacement

STOP DANGER!

Be sure to disengage the electrical power and any other sources of potential energy before you perform work on the coupling assembly or individual components.

A periodic visual inspection of the element should be performed. Without removing the cover, check for element wear debris or cracks in the side of the element just underneath the cover. If wear debris or cracks are noted, the following maintenance procedure should be performed.

11.1. Remove the cover and element and inspect the element for wear. Replace the element if wear exceeds 10 % of the tooth thickness or cracks have appeared with one of the following characteristics:

- One or more cracks have broken through to the O.D. of the element, such that splitting or separation of the element web is imminent.
- One or more cracks extend the full thickness of a tooth.

11.2. Check the alignment before re-installing or replacing the element. Excessive or rapid element wear is generally an indication of coupling misalignment. If alignment is not within the limits specified in Table 4, re-align the coupling according to the alignment instructions.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

SECTION 8 - LUBRICATION & MAINTENANCE

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

LUBRICATION & MAINTENANCE SCHEDULE

ROTOMITE

DAILY:

DESCRIPTION OF CHECK & MAINTENANCE	REMARKS
Inspect general condition of unit	
Engine oil	15W - 40 Diesel engine oil
Oil leakage	
Oil pressure gauge registration	About 3 Í 4kg/cm^2 1400 rpm
Oil pressure warning lamp	
Fuel leakage	
Fuel level	
Coolant level and condition	1/2" above the radiator core
Radiator filler cap fitting condition	To be securely tightened
ALL belts (fan, alternator, air conditioning, water pump)	Check, tighten or replace
Coolant temperature registration	170 Í 210^{0}F
Battery	Level and condition
Grease zerks	2 pumps of grease
Hydraulic hoses, pumps, valves & components	Check hose condition & connections for leaks
Hydraulic reservoir	Check oil level
Gauges & sight bottles	Check for functionality, replace if necessary
Hydraulic cylinder	Check piston rods, pins and cylinder valves
Pivoting Traverse Gear Box (if applicable)	Check for leaks & oil level

WEEKLY:

DESCRIPTION OF CHECK & MAINTENANCE	REMARKS
Cutter head bolts	Check wear & tighten bolts as required
Cutter head tines	Check for wear and replace as needed
Engine oil filter element	Replace, initially 50 hours

EVERY 100 HOURS:

DESCRIPTION OF CHECK & MAINTENANCE	REMARKS
Primary fuel filter	Drain filter housing and refill with clean diesel fuel
Secondary fuel filter	Drain filter housing and refill with clean diesel fuel
Main dredge pump	Check and/or tighten impeller retaining bolt

EVERY 250 HOURS:

DESCRIPTION OF CHECK & MAINTENANCE	REMARKS
Engine oil and engine oil filter element replacement	Replace according to periodic maintenance

EVERY 500 HOURS:

DESCRIPTION OF CHECK & MAINTENANCE	REMARKS
Fuel filter	Replace element
Impeller	Check for wear and unserviceability

EVERY 1000 HOURS:

DESCRIPTION OF CHECK & MAINTENANCE	REMARKS
Sample hydraulic oil	Contact SRS Crisafulli, Inc. for recommendations
Hydraulic filters	Replace element
Valve clearance check	Consult engine manufacturer
Traverse winch drum & idler pulleys	Check for wear or unserviceability
Traverse cable	Check for wear or unserviceability
Lateral positioning cables	Check for wear or unserviceability
Lateral positioning winch drum	Check for wear or unserviceability
Safety decals	Clean or replace as necessary

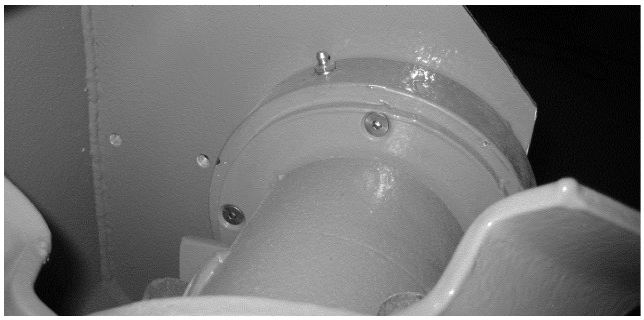
NOTE: The service intervals after 1000 operation hours should also be made every 200 operation hours in accordance with this check and maintenance schedule.

SRS CRISAFULLI, INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

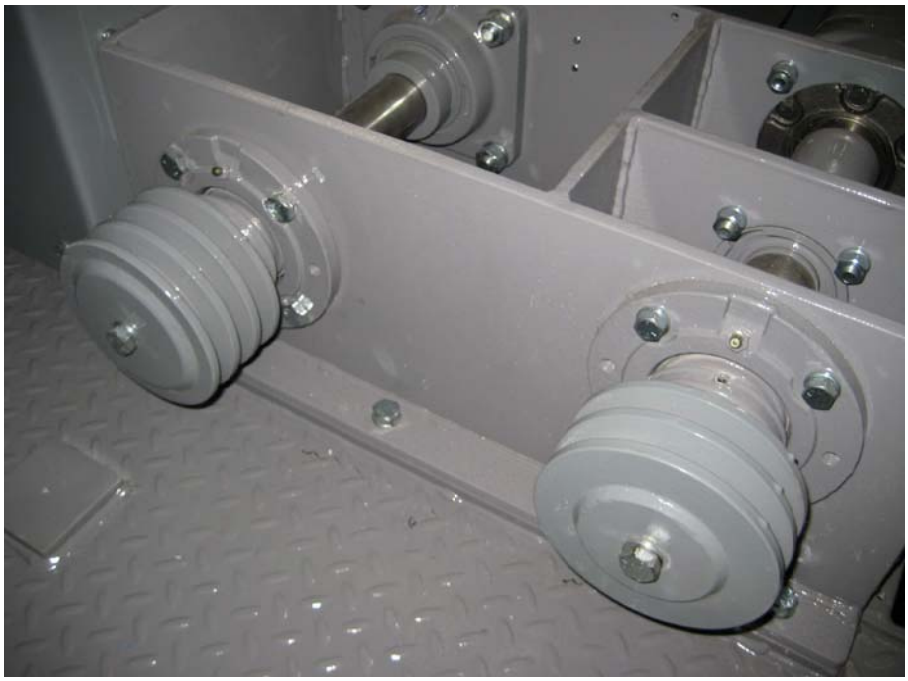
Grease Recommendation

All bearings on Crisafulli pumps are prelubricated prior to shipment with Shell Alvania grease. During shipment the bearings are subjected to vibration which may work the grease out of the bearings. All bearings should be relubricated by the owner prior to start up of the pump. Any of the following greases may be used:

- -Shell Alvania
- -Amoco Rycon No. 3
- -Chevron SRI
- -Lubrication Engineers Alamplex 1275



CUTTERHEAD SEALS



TRAVERSE BEARINGS
SEALS

LADDER PINS

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

OIL RECOMMENDATIONS

Crisafulli submersible hydraulic pumps are designed to operate with premium quality anti-wear hydraulic oil or fluids approved for tractor transmission/hydraulic systems. These oils contain rust inhibitor, oil oxidation, and special anti-wear additives. The pumps will operate satisfactorily using oils with a wide range of viscosity. Oils categorized from OW to 50W per SAE Standard J3000 or 32 to 100 per ISO Standard VG can be satisfactory. Refer to the temperature recommendations for more information.

Most premium grade anti-wear hydraulic oils are satisfactory for usage. The following is an example oil premium grade anti-wear oils:

Amoco	-Rykon
Atlantic Richfield	-Duro AW
Bel-Ray Company, Inc.	-Raylene
Chevron	-Chevron EP
Cities Service Company	-Citgo A/W
Conoco	-Super Hydraulic Oil
Davis Howland Oil Corporation	-DSL-40
Dryen Oil Company, Inc.	-Paradene AW
Exxon Company	**-Nuto H 46**
Gulf Oil Corporation	-AW
E.F. Houghton and Company	-Hydrodrive HP
Mobil Oil Corporation	-Mobile DTE
Penzoil	-AW Hydraulic Oil
Phillips Petroleum Company	-Magnus A
Shell Oil Company	-Tellus
Standard Oil of Ohio	-Industron
Sun Oil Company	-Sunviswr
	-Sunvis 700 Series
Texaco, Inc.	-Rando HD
Union Oil Company	-UNAX AW

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

TRAVERSE CABLE INSPECTION

A cabling system is only as strong as the weakest point, be it a wire rope, hook, or connection. Timetables for replacement intervals of wire rope are not applicable. The proper way to determine if replacement is necessary is through a documented inspection process. The following instructions will describe how, when, and what to look for during an inspection as well as the documentation needed. Any degradation of the wire rope severely reduces the load capacity. Abrasion, bending, and crushing are the ABC's of rope inspection to discover early conditions that allow for safe replacement. Each inspection needs to be completed by a competent person.

Periodic inspections need to be conducted and documented on a set schedule. The inspection duration depends on the amount of service the cabling system in enduring. The following intervals are a guide to use for inspection intervals. These intervals are only a guide and should be deemed as such; additional inspections should be conducted whenever appropriate.

WIRE ROPE INSPECTION SCHEDULE

HEAVY SERVICE (35+ HOURS/WEEK) ---- WEEKLY
INTERMITENT SERVICE (10-35 HOURS/WEEK) ---- MONTHLY
LIGHT SERVICE (LESS THAN 10 HOURS/WEEK)---- EACH USE

INSPECTION GUIDELINES

Maintain inspection records in accordance with above schedule

Prior to each use a walk-around inspection needs to be conducted, addressing the following items.

Check all equipment functions related to the traverse system

Visual inspection for unsafe conditions, i.e., broken wires, kinking, twisting, or corrosion. Attention needs to be directed toward any new damage.

c) Function and ease of cable movement should be verified.

Inspect all end connections such as hooks, splices, and snatch blocks for excessive wear or distortion.

3) An annual inspection and report of *all* traverse related components needs to be conducted.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

4) The utmost in care must be taken during inspection of all components. Safety is the number one priority and must be at the forefront of each person's mind while on or around equipment.

WIRE ROPE INSPECTION

The following is a general list of inspection criteria; the main types of failure are covered. If additional inspection data or procedures are desired contact the American Iron and Steel Institute. The listed criteria are to be used as a guide and not a substitute for a competent inspector.

Occasionally a single wire will break after installation. If no other breaks occur at the same time, there is no need for concern. However, if other breakages occur, the cause should be carefully investigated.

ABRASION

Wire rope (cable) abrades as it moves through abrasive mediums or over drums and sheaves. Most standards require removal from service if the outer wire diameter wear exceeds 1/3 of the original wire diameter. This is not easy to measure. Other listed inspections will provide evidence of abrasion also.

ROPE STRETCH

All wire rope stretches as loads are applied. The amount of stretch and the rate at which that occurs can be used as a judge to determine replacement time. As rope degrades, continued application of a constant load will produce varying amounts of stretch. By recording and paying attention to the amount of tightening required, one may judge the condition of the rope. Stretch occurs in three phases:

Phase 1: Initial stretch, during beginning of service, caused by setup and adjustments to operation.

Phase 2: Service life, after break-in a long period of minimal stretch will occur. The stretch results from normal wear and fatigue.

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

Phase 3: Warning period, an accelerated rate of stretch occurs during this period. The rope has reached the point of rapid degradation. The system should be removed from service and the rope should be replaced.

REDUCTION IN DIAMETER

Any reduction in diameter indicates that some form of degradation has taken place. Some forms are:

excessive external abrasion
internal or external corrosion
loosening or tightening of rope lay
inner wire breakage
rope stretch

An evaluation of the rope diameter needs to be started immediately upon putting the cable into service. Readings will need to be taken in accordance with inspection schedule, in the same spots and under similar loading each time the rope is measured. After initial loading the diameter of the rope should be measured and recorded. The diameter after initial reduction will soon stabilize and only a small decrease will occur during the life of the cable. If a sizable reduction in diameter is found, use should stop immediately. While a reduction in the diameter is one judge of cable strength it should not be used alone. A cable may not have had a sizable reduction in diameter but may be unsafe due to other existing conditions. The rope diameter is only one criterion for replacement and should be used with the other listed inspections in determining the replacement time for the wire rope.

CORROSION

One of the most serious yet difficult to evaluate forms of degradation is corrosion. The usual cause for corrosion on wire ropes stems from a lack of lubrication. An oxidation inhibiting, alkali free, nonwater soluble, viscous lubricant with high film strength should be used. Corrosion will occur internally before there are any visual signs on the surface. Pitting on the surface is cause for immediate replacement. Severe rusting can lead to premature failure. SRS Crisafulli uses galvanized wire rope to deter corrosion. In cases where corrosion is still occurring a stainless steel rope may need to be used.

TABLE 6.5 Tightening Torque Ranges for American Standard Steel Bolts (Hardware, Dry, Nonlubricated, and Zinc Plated)

	SAE Grade 2		SAE Grade 5			
Bolt Size	Tightening Torque Range, lb.ft	Clamp Load Range, lb	Tightening Torque Range, lb.ft	Clamp Load Range, lb	Tightening Torque Range, lb.ft	Clamp Load Range, lb
1/4-20	5.7-4.3	1,813-1,360	9.1-6.9	2,926-2,195	12.9-9.7	4,134-3,101
1/4-28	6.5-4.9	2,075-1,556	10.5-7.9	3,349-2,512	14.8-11.1	4,732-3,549
5/16-18	11.7-8.8	2,987-2,240	18.8-14.1	4,821-3,616	26.2-20.0	6,812-5,109
5/16-24	12.9-9.7	3,306-2,480	20.8-15.6	5,336-4,002	29.5-22.1	7,540-5,655
3/8-16	20.7-15.5	4,418-3,314	33.4-25.1	7,130-5,348	47.2-35.4	10,075-7,556
3/8-24	23.5-17.6	5,005-3,754	37.9-28.4	8,078-6,059	53.5-40.1	11,414-8,561
7/16-14	33.1-24.9	6,059-4,544	53.5-40.1	9,780-7,335	75.6-56.7	13,819-10,364
7/16-20	37.0-27.8	6,766-5,075	59.7-44.8	10,920-8,190	84.4-63.3	15,431-11,573
1/2-13	50.6-37.9	8,088-6,066	81.6-61.2	13,055-9,791	1115.3-86.5	18,447-13,835
1/2-20	57.0-42.7	9,114-5,835	91.9-69.0	14,711-11,033	130.0-97.4	20,787-15,590
9/16-12	73.0-54.7	10,374-7,780	117.7-88.1	16,744-12,558	166.4-124.8	23,660-17,745
9/16-18	81.4-61.0	11,571-8,678	131.3-98.1	18,676-14,007	185.6-139.2	26,390-19,793
5/8-11	100.6-75.5	12,882-9,662	162.4-121.8	20.792-15,594	229.5-172.1	29,380-22,035
5/8-18	114-85.5	14,592-10,944	184-138	23,552-17,664	260.0-195.0	33,280-24,960
3/4-10	178.5-133.9	19,038-14,279	288-216	30,728-23,046	407.1-305.3	43,420-35,368
3/4-16	199-149.5	21,261-15,946	321.7-241.3	34,316-25,737	454.6-341.0	48,490-45,045
7/8-9	288-216	26,334-19,751	464.9-348.7	42,504-31,878	656.9-492.7	60,060-45,045
7/8-14	317-238	29,013-19,751	512.2-384.1	46,828-35,121	723.7-542.8	66,170-49,628
1-8	432-324	34,542-25,907	696.9-522.7	55,752-41,814	984.8-738.6	78,780-59,085
1-12	472-354	37,791-28,343	761.1-571.8	60,996-45,747	1077-808	86,190-64,643

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

RECOMMENDED UNIT SPARE PARTS LIST

CUTTERHEAD

ITEM #	QTY	DESCRIPTION	PART NUMBER
1.	2	Cutterhead drive motors	#1000008
2.	10	Tiller tines - left hand	#1000035
3.	10	Tiller tines – right hand	#1000034
4.	2	Cutterhead shaft seal	#1002877
5.	2	Cutterhead shaft O-ring	#1000038

GENERAL

ITEM #	QTY	DESCRIPTION	PART NUMBER
1.	1	Propeller	# 1007062
2.	1	Pump front discharge hose	# 1007175
3.	1	Wrapflex coupler element	#1007144

HYDRAULICS

ITEM #	QTY	DESCRIPTION	PART NUMBER
1.	2	Hydraulic return filter element	#1001063
2.	2	Charge pump filter element	#1001080
3.	6	Hydraulic suction filter element	#1001083
4.	1	Hydraulic suction screen	# 1001407

SRS CRISAFULLI INC.
P.O. Box 1051
Glendive, Montana 59330
1-800-442-7867

PUMP SPARE PARTS

ITEM #	QTY	DESCRIPTION	PART NUMBER
1.	1	Impeller	#1007167
2.	1	Volute	#1007166
3.	1	Primary mechanical seal	#1000170
4.	1	Secondary mechanical seal	#1000169
5.	1	Double row bearing	#1000591
6.	1	Single row bearing	#1000590
7.	2	O-ring (bearing frame)	#1000181
8.	1	Impeller retaining lock nut	#1000693
9.	1 set	Retaining screws w/nuts	#1000189

TRAVERSE

ITEM #	QTY	DESCRIPTION	PART NUMBER
1.	1	Traverse winch drum (3 groove)	# 1000851
2.	1	Traverse winch drum (2 groove)	# 1000852
3.	6	Traverse cable guide rollers	# 1002641

See cover page for unit serial number.

To quickly order spare parts, call toll-free 1-800-442-7867. When placing your phone order, please give the Sludge System Serial Number and Part Numbers.

MANUFACTURING WORK ORDER NUMBERS

ITEM	PART NUMBER	JOB NUMBER	DESCRIPTION
1	1007400	23617-0000	ROTOMITE 6000EC, FINAL ASSEMBLY
2	1007486	23617-0001	Cutterhead
3	1007428	23617-0002	Shroud
4	1007425	23617-0003	Auger
5	1007429	23617-0004	Rock Guard
6	1007488	23617-0005	Motor Mount Disc
7	1007592	23617-0006	Platform
8	1007597	23617-0007	Traverse Assembly
9	1003203	23617-0008	Traverse Frame
10	1000851	23617-0009	Traverse Sheave 3 Groove
11	1000852	23617-0010	Traverse Sheave 2 Groove
12	1003433	23617-0011	Traverse Cable Guide Front
13	1002974	23617-0012	Traverse Sheave
14	1007590	23617-0013	Traverse Cable Guide Rear
15	1002641	23617-0014	Traverse Rollers
16	1007596	23617-0015	Traverse Winch Guard
17	1007594	23617-0016	Power Unit Assy
18	1007593	23617-0017	Cab Assy
19	1007608	23617-0018	Cab Frame
20	1004022	23617-0019	Cab Sheeting
21	1004024	23617-0020	Cab Roof Sheeting
22	1004025	23617-0021	Cab Floor
23	1004026	23617-0022	Cab Valve Body-Left
24	1004028	23617-0023	Cab Valve Body-Right
25	1004034	23617-0024	Cab Door Assy
26	1004936	23617-0025	Dash
27	1007588	23617-0026	Flow Meter Mnt Bracket
28	1004037	23617-0027	Depth Ind. Cab Mnt.
29	1004038	23617-0028	Hyd Tank
30	1006634	23617-0029	Cab Subframe
31	1007605	23617-0030	Propulsion
32	1007586	23617-0031	Propulsion Mount
33	1007578	23617-0032	Propulsion Strut

MANUFACTURING WORK ORDER NUMBERS cont.

ITEM	PART NUMBER	JOB NUMBER	DESCRIPTION
34	1007579	23617-0033	Propulsion Stru
35	1007580	23617-0034	Propulsion Covers
36	1007583	23617-0035	Propulsion Nozzle
37	1007585	23617-0036	Propulsion Shaft Coupler
38	1007573	23617-0037	Propulsion Adaper, Thruster Motor
39	1007118	23617-0038	Ladder
40	1007177	23617-0039	Hyd Tubing Assy
41	1007234	23617-0040	Hydraulic Pump
42	1007601	23617-0041	Bearing Frame
43	1004860	23617-0042	Seat Post Adapter
44	1007674	23617-0043	Electric Panel Frame
45	1007668	23617-0044	Power Unit Frame
46	1007683	23617-0045	Enclosure Assembly
47	1004051	23617-0046	Enclosure Skirts
48	————-	23617-0047	————-
49	1007681	23617-0048	Enclosure End & Center
50	1007682	23617-0049	Enclosure Hood
51	1007687	23617-0050	Enclosure Grill
52	1007692	23617-0051	Enclosure Doors
53	1001027	23617-0052	Hydraulic Return Manifold
54	1007671	23617-0053	Pump Drive Stand
55	1007670	23617-0054	Pump Drive Mounts
56	1007677	23617-0055	Adjusters
57	1007690	23617-0056	Charge Pressure Filter Bracket
58	1007691	23617-0057	High Pressure Filter Bracket
59	1007688	23617-0058	Rear Deck Plate
60	1007696	23617-0059	Elec. Hose Carrier
61	1007700	23617-0060	Handrail
62	1007724	23617-0061	Dash Panel
63	1007230	23617-0062	Adapter Plate
64	1000861	23617-0063	Shaft Coupler
65	1007746	23617-0064	Propulsion Sight Bottle Bracket
66	1001576	23617-0065	Hose Bracket Set

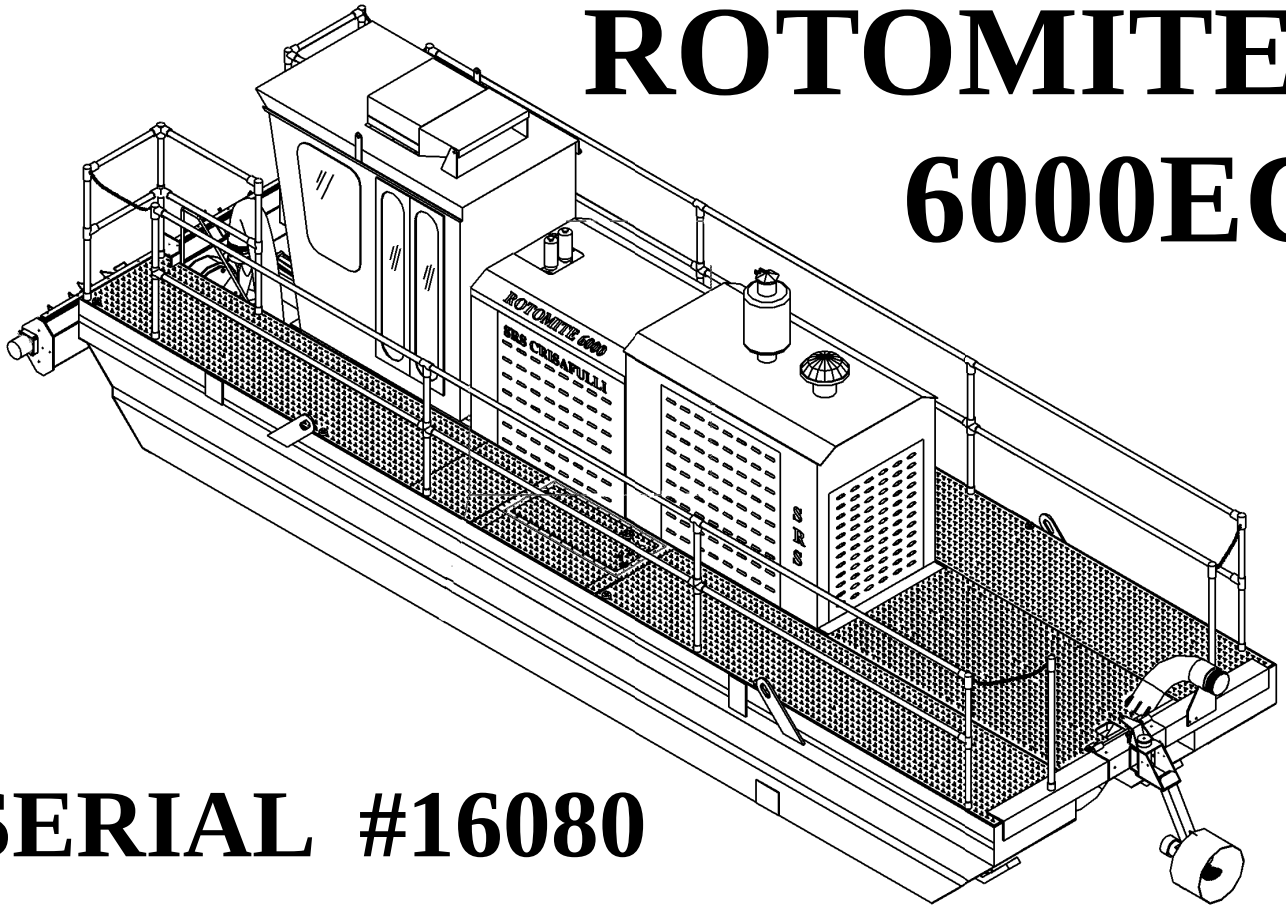
MANUFACTURING WORK ORDER NUMBERS cont.

ITEM	PART NUMBER	JOB NUMBER	DESCRIPTION
67	1001761	23617-0066	Art. Cylinder to Cutterhead Pins
68	1001762	23617-0067	Cutterhead Cylinder to Ladder Pins
69	1007706	23617-0068	Ladder Pins
70	1004941	23617-0069	Eaton HD 39 Series Cable Bracket
71	1007753	23617-0070	Walkway
72	1001315	23617-0071	Main Pump Hydraulic Hose Guard
73	1007758	23617-0072	Cab Walkplate
74	1004942	23617-0073	Eaton HD Pump Cable Bracket
75	1007763	23617-0074	Traverse Cable Guard Rear
76	1007689	23617-0075	Hydraulic Power Assembly
77	1007764	23617-0076	Cable Passage Guards
78	1007817	23617-0077	Rear Discharge Assembly
79	1007816	23617-0078	Pressure Transducer Mount
80	1007818	23617-0079	Adapter, 8” MQ-8”Flange
81	1007886	23617-0080	Hose Guard

SRS

Crisafulli

ROTOMITE 6000EC



SERIAL #16080

P.O. Box 1051
1610 Crisafulli Drive
Glendive, MT 59330

Phone: 1-406-365-3393
Fax: 1-406-365-8088
Toll Free: 1-800-442-7867