

# **EccentricPumps™**

## **Peristaltic Hose Pumps**

### **SLP/Mini 6 to 13 Assembly and Disassembly Maintenance Manual**

Please Read Instructions  
Carefully Before Operation

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<b>1</b>	<b><u>Basic Information</u></b>	<b>2</b>
1.1	Safety.....	2
1.2	Safety Labels Used In This Manual .....	2
1.3	Before You Start .....	3
1.4	Basic Tools Required For Assembly and Disassembly .....	3
1.5	SLP/Mini 6 / 10 / 13 Parts List.....	5
<b>2</b>	<b><u>Assembly Procedure</u></b>	<b>6</b>
2.1	Pre-Assembly Inspection .....	6
2.2	Bearing Assembly .....	6
2.3	Shaft Assembly .....	6
2.4	Seal Assembly .....	6
2.5	Gearbox Installation .....	7
2.6	Eccentric Shaft Installation .....	7
2.7	Roller Installation .....	8
2.8	Hose Installation.....	9
2.9	Front Cover Installation .....	12
2.10	Pump Lubrication .....	13
2.11	High RPM Pump Operation .....	14
2.12	Motor, Gearbox and Other Documentation.....	14
<b>3</b>	<b><u>Disassembly Procedure</u></b>	<b>15</b>
3.1	Front Cover Removal .....	15
3.2	Hose Removal.....	15
3.3	Roller Removal .....	16
3.4	Eccentric Shaft Removal .....	17
3.5	Pump Shaft Removal .....	17
3.6	Bearing Removal.....	18
3.7	Cleaning and Inspection.....	18
<b>4</b>	<b><u>Operating the Pump</u></b>	<b>18</b>

## 1 Basic Information

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This manual contains important information that will be useful for routine maintenance of your Eccentric Pump. Please read this manual and the **Eccentric Pumps Operation and Maintenance Manual** in their entirety before beginning work on your pump.

### 1.1 Safety

The procedures and information contained herein are meant to complement the **Eccentric Pumps Operation and Maintenance Manual**. The Operation and Maintenance manual contains specific safety information about your pump and the working environment.

### 1.2 Safety Labels Used In This Manual

Failure to follow the procedures in this manual can lead to injury, loss of property or death. In most cases, particularly sensitive procedures are called out with the following symbols:



Procedures that can jeopardize the pumping unit or other property are designated with this symbol.

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Procedures that have a general hazard to personnel or safety are designated with this symbol.

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Procedures that pose a risk of electrocution are designated with this symbol.

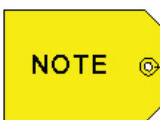
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Information that is critical to the safe operation of the equipment is called out with the following symbol:

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This symbol calls out important information that may not be included in the text.

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### 1.3 Before You Start

Be aware of your work space and visually inspect the area for hazards. Never adjust, inspect, work on or put your hands on or in a pump that is operating.



**Relieve all pressure in the suction, discharge and all process lines. Close all valves before and after the pump to isolate the unit. If applicable, isolate flush water or other process connections. Lock out the unit to ensure that the pump does not start while working on it. Turn off all power to the pump motor.**

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**The risk of exposure to electrical hazards must be eliminated. Be sure that the wiring, connections, and other electrical devices are properly isolated before servicing your pump.**

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**The pump and / or hose may contain the pumped fluid. Follow all safe handling procedures established by your facility to prevent exposure to hazardous chemicals or substances.**

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### 1.4 Basic Tools Required For Assembly and Disassembly

The following is a list of standard tools required for the proper assembly and disassembly of your Eccentric Pump:

- 10mm wrench
- 27mm wrench
- Adjustable wrench
- 3mm hex key
- 8mm hex key
- Hack saw
- External snap ring pliers
- Internal snap ring pliers
- Band-it clamp tool
- Flat head screw driver
- Dead blow hammer
- Small funnel
- Oil pan

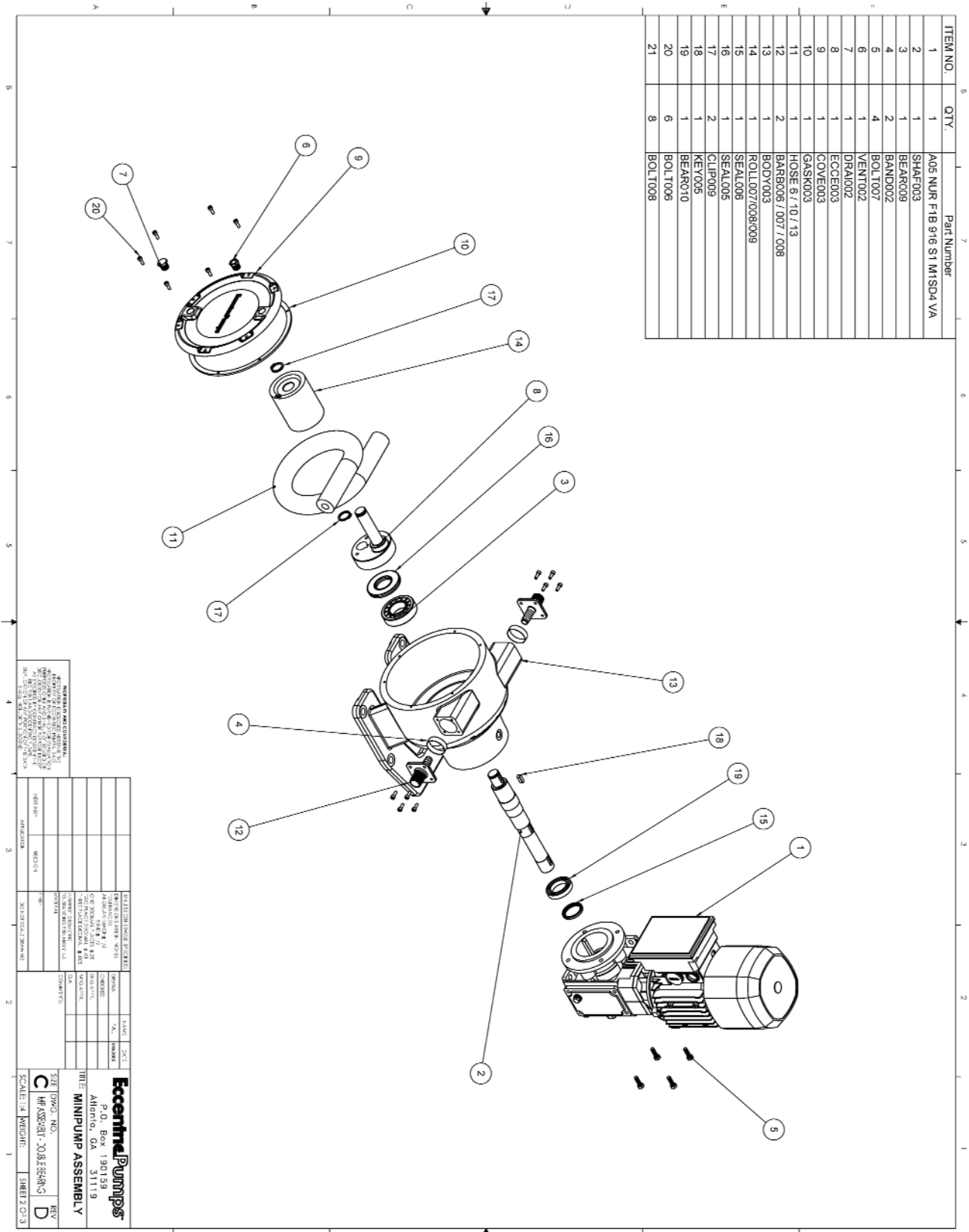


Figure 1: Exploded View of Major Pump Parts. Some Small Parts Are Not Shown.

## 1.5 SLP/Mini 6 / 10 / 13 Parts List

Part Number	Name	Material	Quantity
BAND002	Bandit Clamp	Stainless Steel	2
BAND020	Bandit Thriftool	Steel	1
BAND021	Bandit Pok-It II Tool	Steel	1
BARB006	Barb Mini 6	Stainless Steel / Hastelloy C / Titanium	2
BARB007	Barb Mini 10	Stainless Steel / Hastelloy C / Titanium	2
BARB008	Barb Mini 13	Stainless Steel / Hastelloy C / Titanium	2
BEAR009	Inboard Bearing	Steel	1
BEAR010	Outboard Bearing	Steel	1
BODY003	Main Pump Body	Epoxy Powder Coated Aluminum	1
BOLT006	Cover Bolt	Stainless Steel	6
BOLT007	Gearbox Bolt	Stainless Steel	4
BOLT008	Barb Bolt	Stainless Steel	8
CLIP009	Roller Positioning Clip	Steel	1
CLIP009	Eccentric Shaft Retaining Clip	Steel	1
CLIP003	Bearing Retaining Clip	Steel	1
CLIP004	Shaft Retaining Clip	Steel	1
COVE003	Pump Cover	Aluminum / Clear Polycarbonate	1
DRAI002	Drain Plug	Stainless Steel	1
ECCE003	Eccentric Shaft Mini 6 / 10 / 13	Steel	1
GASK003	Cover Gasket	EPDM	1
GREA001	Grease Fitting	Steel	1
GREASE	Grease	Grease	1
HOSE6	6 mm Hose	Various*	1
HOSE10	10 mm Hose	Various*	1
HOSE13	13 mm Hose	Various*	1
KEY005	Eccentric Shaft Key	Stainless Steel	1
KEY006	Gearbox Shaft Key	Stainless Steel	2
LUBE001	DST Hose Lubricant	Non-Hydrocarbon Synthetic Oil	1
ROLL007	Roller Mini 6	UHMW PE	1
ROLL008	Roller Mini 10	UHMW PE	1
ROLL009	Roller Mini 13	UHMW PE	1
SEAL005	Inboard Oil Seal	Steel / Buna	1
SEAL006	Outboard Oil Seal	Steel / Buna	1
SHAF003	Shaft	Steel	1
VENT002	Vent Plug	Plated Steel	1
WASH007	Cover Washer	Stainless Steel	6
WASH008	Gearbox Lock Washers	Stainless Steel	4
WIND002	Sight Glass	Plated Steel	1

\* Natural Rubber / Viton™ / Nitrile (Buna-N) / EPDM / Neoprene™ / Hypalon™ / Butyl / UHMW PE Lined

## 2 Assembly Procedure

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The following procedure should be used to assemble the pump.

### 2.1 Pre-Assembly Inspection

- Inspect all existing parts and replacement parts and make sure all are clean and undamaged. Parts that should be replaced as part of a complete pump rebuild include bearings, seals, hose, the front cover gasket and any other item that is worn or damaged.
- Inspect the bearing bores on the bearing housing to make sure they are within tolerance. Bores should be round and without grooves or other signs of wear.
- Make sure the bearing housing is free of dirt, filings, or other debris. An unclean bearing housing will greatly reduce the life of the bearings.

### 2.2 Bearing Assembly

- Heat the bearings in an oil bath or with an induction heater to 185°F.
- Inspect the shaft and bearing races for burrs and remove as required. Coat the shaft with light lubricating oil and slide on the hot inboard bearing followed by the outboard bearing. The bearings should slip easily on the shaft. As an alternate, you may carefully press the bearings onto the shaft.
- All bearings should be seated squarely against the shoulder of the shaft.
- Inspect the bearings and make sure that all rotate freely.
- Install the inboard bearing retaining ring on the shaft.

### 2.3 Shaft Assembly

- Coat the outer races of the bearings and the inner diameter of the bearing housing bores with light lubricating oil. Make sure there is no dirt or debris on either the bearings or the bearing housing bores.
- Slide the shaft into the pump from the front making sure that the bearing engages the bearing housing bore flush and straight. Tap the roller end of the shaft with a soft hammer or dead blow with a piece of wood and slide the shaft and bearing assembly into the bearing housing.



**Do not force the shaft and bearings into the bearing housing.  
This may cause damage to the bearings or the housing.**

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- Tap the shaft and bearings into the housing until it seats firmly against the shoulder of the housing.
- Install the internal retaining ring in front of the inboard bearing.

### 2.4 Seal Assembly

- Press a new seal into the outboard bore of the pump body. The elastomer surface should face outward towards the gearbox.
- Grease the pump with NLGI #2 type grease. Grease should be added until it passes through the inboard bearing. This provides a visual reference of the proper amount of grease required. Refer to the Operation and Maintenance manual for additional lubrication instruction. Do not over-grease.

- Press in a new inboard seal. Pay particular attention to the direction of the inboard seal. The elastomer surface should face the inside or process side of the pump, and the metal backing should face the bearing. This will ensure that the seal does not corrode.

**NOTE**

**Install the inboard seal with the elastomer facing the process side of the pump.**

- Make sure that the shaft rotates smoothly.

## 2.5 Gearbox Installation

- Lubricate the pump shaft and the keyway(s) with a never-seize compound. Some models may have two keys on the shaft. *See Figure 2.*
- The gearbox is manufactured with a hollow quill. Remove the plastic cap on the back of the gearbox to help with alignment of the shaft.



**Figure 2: Insert Key(s) in the Shaft**



**Figure 3: Installation of Gearbox**

- Install the gearbox by sliding it on the pump shaft. The pump can be turned on end to facilitate the installation of the gearbox. *See Figure 3.*
- The motor normally is positioned on top.
- Use lock washers and hex head cap screws to secure the gearbox to the pump with a **10 mm wrench**.

## 2.6 Eccentric Shaft Installation

- Remove the motor fan cover so that the pump shaft and key slot can be rotated to an upward-facing position. Install the eccentric shaft key. *See Figure 4 and Figure 5.*
- Slide the eccentric shaft over the end of the main pump shaft. The eccentric should slide easily over the shaft. *See Figure 6.*



**Figure 4: Remove Motor Fan Cover**



**Figure 5: Installation of Eccentric Shaft Key**

- Secure the eccentric shaft with the eccentric shaft retaining clip. *See Figure 7.*



**Figure 6: Place the Eccentric Shaft on the Main Pump Shaft**



**Figure 7: Installation of Eccentric Shaft Retaining Clip**

## 2.7 Roller Installation

- The roller is made of durable ultra-high molecular weight polyethylene. The 6, 10, and 13 size pumps have rollers of different diameters, so ensure that you have the correct diameter roller.
- Lubricate the eccentric shaft with DST lubricant. Place the roller over the end of the shaft. *See Figure 8.*



**Figure 8: Installation of Roller on to Shaft**



**Figure 9: Installation of Roller Retaining Clip**

- Install the external roller retaining clip. Verify that the roller turns freely on the shaft. See *Figure 9*.

## 2.8 Hose Installation

- Move the roller to the six o'clock position by turning the motor fan until the roller reaches the bottom of the pump. See *Figure 10*.



Figure 10: Turn Roller to Six O'clock Position



Figure 11: Pass Hose Through the Rear Opening of the Pump Body

- Pass one end of the hose through the rear opening on the inside of the pump body. See *Figure 11*.

### NOTE

**First install the hose through the rear port of the pump body on the left hand side when looking at it from the front.**

- Once the hose extends 2-3 inches beyond the pump body, slide the Band-it clamp over the hose and install the barb. Using the Band-it tool, clamp the band over the center of the barb, approximately 3/8" (9.5mm) from the back side of the barb. See *Figure 12*, *Figure 13* and *Figure 14*.



Figure 12: Assembly of Bandit Clamp and Barb



Figure 13: Bandit Clamp Installed



**Figure 14: Bandit Clamp Approximately 3/8" (9.5mm) from Back of Barb**



**Figure 15: Using a Dead Blow Hammer to Help Seat the Barb Assembly**

- Push the assembled hose end back into the clamp area and tighten the bolts. The fit through the pump body may be tight, and a dead blow hammer can help to seat the barb assembly. *See Figure 15.*



**The folded edge of the Bandit clamp can pose a cut hazard during assembly and disassembly. You can wrap the hose clamp with vinyl electrical tape to prevent cuts.**



**Figure 16: Installation of Barb Socket Head Cap Screws**



**Figure 17: Tightening Socket Head Cap Screws**



**Figure 18: Installation of Hose Through Front Opening**



**Figure 19: Installation of Second Barb Assembly Bolts**

- Pass the other end of the hose through the front port of the pump body. *See Figure 18.*
- Install the barb assembly as described above and tighten the barb socket head cap screws. *See Figure 19.*
- Using the motor fan, turn the roller to the 12 o'clock position and push the bottom of the hose inside the pump case. *See Figure 10.* The hose may be difficult to seat, and a dead blow hammer can be used to help slide the hose in the bottom of the pump case. *See Figure 20 and Figure 21.*



**All hoses are shipped to the proper length. If you find it necessary to cut the hose to make it fit into your pump, you are doing something wrong. Stop and call your Eccentric Pumps representative.**



**Figure 20: Turn Roller to the Twelve O'clock**



**Figure 21: Seating of the Hose with the Roller in the Twelve O'clock Position**

- Return the roller back to the six o'clock position. It is critical that the roller is at the bottom of the pump to ensure that the correct capacity of hose lube is added.



The roller must be returned to the six o'clock position before installing the front cover. Failure to do so will result in overfilling of the pump with hoselube.

## 2.9 Front Cover Installation

- Scrape all debris from the gasket surfaces. Clean both the front cover and the gasket surface of the pump body with acetone or brake cleaner to remove any residue. This is critical to ensure a leak-free assembly.



Both the pump body and front cover must be free of dirt, debris and residue to ensure a leak-free seal.



Figure 22: Aligning the Gasket on the Front Cover



Figure 23: Tightening the Front Cover

- Place the gasket on the cover. Please note that the holes in the gasket and cover are asymmetric. This ensures that the gasket and cover go on in only one direction. See Figure 22.



The hole pattern of the front cover is asymmetrical. Be sure to line up the gasket prior to placing it on the silicone bead.

- Using the flat washers and the socket head cap screws, install the front cover with a **3mm hex key**. See Figure 23. Tighten front cover socket head cap screws to 5 in-lb (0.6 Nm). See Figure 23.



Do not over-tighten the front cover bolts. Tighten front cover socket head cap screws to 5 in-lb (0.6 Nm).

## 2.10 Pump Lubrication

- Make sure that the roller and the eccentric shaft are in the 6 o'clock position. The end of the eccentric shaft will be visible through the sight glass port of the front cover. *See Figure 24.*
- Wrap the drain plug threads with Teflon™ tape and install the plug with an **8mm hex key**. *See Figure 25.*



**Figure 24: Roller Viewed through Sight Glass at Six O'clock Position**



**Figure 25: Installing the Drain Plug**

- Wrap the sight glass threads with Teflon™ tape and install using a **27mm wrench**. *See Figure 26.*



**Figure 26: Installation of Sight Glass**



**Figure 27: Filling the Pump with Hoselube**

- Using a funnel, fill the pump body with DST™ Hoselube until it is level with the bottom of the sight glass. The Mini 6/10/13 pump will require approximately 1 cup (approximately 250 ml). *See Figure 27.*
- Wrap the vent plug threads with Teflon™ tape and install. *See Figure 28.*



Figure 28: Installation of Pump Vent Plug



Figure 29: A Newly Rebuilt Eccentric Pump

### 2.11 High RPM Pump Operation

- When the pump is operating at a speed of 85 RPM or greater, the level of lubricating oil in the pump casing must be reduced to prevent splashing of oil. The oil acts as a lubricant between the hose and the roller and between the roller and its shaft. It also acts as a medium for heat dissipation from the hose. Since higher operating speeds provide more vigorous lubrication, the level of the oil should be reduced as follows:

Operating Speed	Reduction in Oil
0-85 RPM	As per Assembly and Disassembly Manual
85-105 RPM	Add 70% of recommended
105-115 RPM	Add 60% of recommended
115 RPM and greater	Add 50% of recommended

### 2.12 Motor, Gearbox and Other Documentation

Information relating to the motor, gearbox, variable frequency drives and other accessories is normally not provided. If it is supplied, operation and maintenance recommendations and procedures must be followed for the proper operation of your equipment.

### 3 Disassembly Procedure

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The following procedure should be used to disassemble the pump.

#### 3.1 Front Cover Removal

This procedure should be used to remove the hose after failure or for long term pump storage.



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**The lubricant and the hose may be contaminated with pumped fluid. Make sure all personnel are protected from contact with hazardous substances per your facility's procedures.**

**Make sure that all pressure has been relieved from the hose and take care to protect eyes and skin from any hazardous materials. Do not begin until the pump has been flushed and the contents of the pump body have been completely drained and flushed.**

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**Be sure that all power has been disconnected.**

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**Make sure your pump is electrically isolated. Unexpected operation of the pump can cause serious injury. Remove the fan cover only after the motor has been locked out.**

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- Open the drain plug with a **8mm hex key** and remove the lubricating oil. Dispose of all material properly. Take care, as the lubricating oil may be contaminated by the pumped fluid.
- Remove the vent plug with a **14mm wrench** and flush the pump case with a suitable solvent.
- Remove the socket head cap screws that hold the front cover with a **3mm hex key**. Discard the front cover gasket.
- Inspect and clean the sight glass and cover then set aside.

#### 3.2 Hose Removal

- Remove the motor fan cover and turn the fan by hand until the roller stops at the bottom of the pump case in the six o'clock position.
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**Low RPM pumps and high ratio gearbox may require many turns of the motor fan to move the roller to the six o'clock position.**

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- Remove the four bolts from each barb on both the inlet and outlet ports of the pump with a **3mm hex key**.
- The hose barb assembly is seated firmly in the pump casing. Use a screw driver to gently pull the hose barb assembly from the pump case. Pull out the hose about two or three inches beyond the end of the pump.
- If you are replacing the hose, cut off each barb, washer and band assembly by cutting the hose beyond the end of the barb. These parts may be reusable, depending on their condition. The barb can be taken to the bench so that the Band-it clamp can be removed with a **hack saw** or Dremel Type tool.
- If you are reusing the hose, the Band-it clamp may also be removed without damaging the hose by using a hack saw or Dremel type tool to cut the steel clamp. The Band-it clamp can also be removed with the hose still in the pump. Be careful not to damage the hose or the pump body.

**NOTE**

The Band-it clamp is split on the bottom so that one cut across the top will allow it to be separated. See *Figure 30*.



Figure 30: Band-it Clamp Cut with a Hack Saw



Figure 31: Hose Freed from Roller and Pump

- Remove the barb once the Band-it clamp has been removed.
- Pull the hose back through from the inside of the pump case by grasping the hose inside the pump and pulling. The center of the hose will still be held by the roller in the six o'clock position.
- Remove the second barb assembly as described above, or remove the hose with one barb assembly attached as indicated below.
- Turn the motor by hand until the roller is not compressing the hose. This will be near the nine o'clock position.
- Remove the hose from the pump body. See *Figure 31*.
- Safely discard the used hose per your facility's waste disposal policy.

### 3.3 Roller Removal

- Using **external snap ring pliers**, remove the roller positioning clip on the front of the eccentric shaft. See *Figure 32 and Figure 33*.



Figure 32: Removal of Roller Retaining Clip



Figure 33: Roller Removal

- Pull the roller off of the shaft. It should slide easily off.
- Inspect the roller for wear. The roller should fit onto the shaft snugly with minimal radial movement. There should be no nicks or scoring on the outside diameter of the roller. If the roller appears worn or is damaged, replace it before reassembly.

### 3.4 Eccentric Shaft Removal

- Using external snap ring pliers, remove the eccentric shaft retaining clip. *See Figure 34.*



Figure 34: Removal of Eccentric Shaft Retaining Clip



Figure 35: Removal of the Eccentric Shaft

- Remove the eccentric shaft from the main pump shaft. *See Figure 35.*

#### NOTE

**You may need to use a puller to disengage the eccentric shaft from the main pump shaft.**

- **Be sure to retain the eccentric shaft key.**

### 3.5 Pump Shaft Removal

- The pump shaft is held in place with an internal snap ring that is located behind the inboard grease seal. Therefore, it is necessary to remove the inboard seal prior to removal. This seal will likely be damaged when removed since it is held in place by a tight press fit.
- Use a **flat head screw driver** to remove the inboard oil seal.

- Using **internal snap ring pliers**, remove the bearing retaining clip from the pump body.
- Remove the outboard seal. The gearbox will need to be removed to access the outboard seal. This seal will likely be damaged when removed since it is held in place by a tight press fit.
- Tap the outboard end of the shaft towards the front of the pump with a **dead blow hammer** and slide the shaft and bearing assembly from the pump body out through the front of the pump.

### 3.6 Bearing Removal

- Remove the retaining ring from the shaft near the inboard bearing using external snap ring pliers.
- Using a press, carefully remove the bearings from the shaft and discard them.



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**Do not reuse bearings that have been pressed off of the shaft. The forces encountered during this operation will likely damage the balls or races.**

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### 3.7 Cleaning and Inspection

- Discard all used seals, gaskets and worn parts.
- Thoroughly clean all parts with an approved solvent and inspect for damage or wear. Replace all bearings, gaskets, washers, worn parts and hardware as necessary.
- Inspect the inner diameter of the pump roller. If the surface has been worn, replace the roller.
- Inspect all metal parts for signs of wear or cracks. Replace all worn parts.



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**Use only genuine Eccentric Pumps replacement parts. Non-standard parts will void your warranty and may damage your equipment.**

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## 4 Operating the Pump

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Please refer to the **Eccentric Pumps Operation and Maintenance Manual** before operating your pump.

END OF TEXT