

EccentricPumps™

Peristaltic Hose Pumps

SLP 058 to 654 Assembly and Disassembly Maintenance Manual

Please Read Instructions
Carefully Before Operation

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1	Basic Information	2
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 058 / 128 / 218 Parts List	5
1.6	SLP 440 / 654 Parts List	6
2	Disassembly Procedure	7
2.1	Front Cover Removal	7
2.2	Hose Removal.....	8
2.3	Roller Removal	9
2.4	Eccentric Shaft Removal	10
2.5	Pump Shaft Removal	10
2.6	Bearing Removal.....	10
2.7	Motor, Gearbox and Other Documentation.....	11
2.8	Cleaning and Inspection.....	11
3	Assembly Procedure	12
3.1	Pre-Assembly Inspection	12
3.2	Bearing Assembly	12
3.3	Shaft Assembly	12
3.4	Seal Assembly	12
3.5	Gearbox Installation.....	13
3.6	Eccentric Shaft Installation	13
3.7	Roller Installation	13
3.8	Hose Installation.....	14
3.9	Front Cover Installation	17
3.10	Pump Lubrication.....	19
3.11	High RPM Pump Operation	19
4	Operating the Pump	20

1 Basic Information

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.



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



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

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



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

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 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.



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.



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.

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:

- 6mm wrench
- 27mm wrench
- 30 mm wrench
- Adjustable wrench
- ½” wrench
- 6mm 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

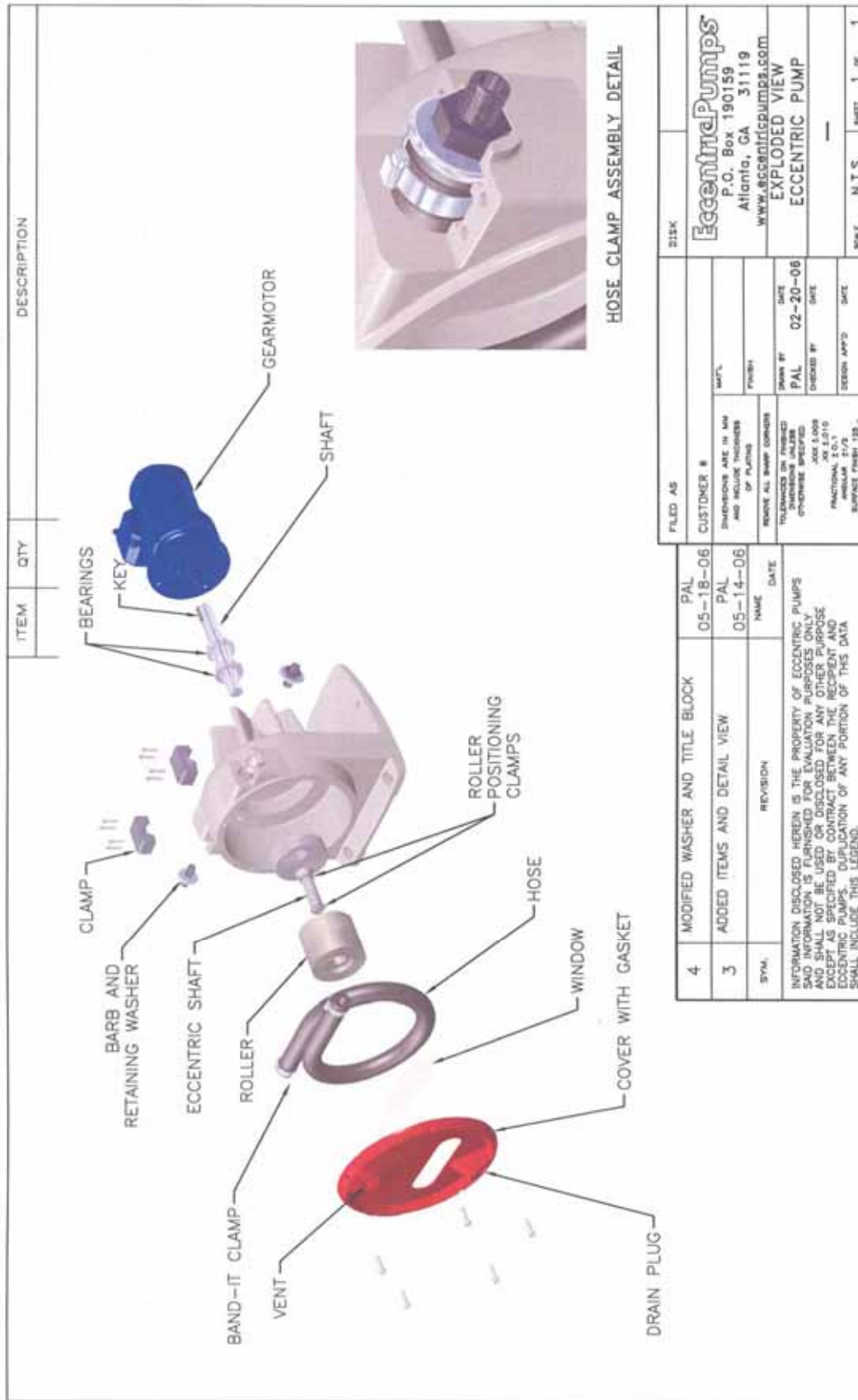


Figure 1: Exploded View of Major Pump Parts. Some Small Parts Are Not Shown.

1.5 SLP 058 / 128 / 218 Parts List

Part Number	Name	Material	Quantity
BAND001	Bandit Clamp	Stainless Steel	2
BAND020	Bandit Thriftool	Steel	1
BAND021	Bandit Pok-It II Tool	Steel	1
BARB001	Barb 128	Poly / Stainless Steel	2
BARB002	Barb 218	Poly / Stainless Steel	2
BARB003	Barb 058	Poly / Stainless Steel	2
BEAR003	Inboard Bearing	Steel	1
BEAR004	Outboard Bearing	Steel	1
BODY001	Main Pump Body	Epoxy Powder Coated Aluminum	1
BOLT001	Cover Bolt	Stainless Steel	5
BOLT002	Gearbox Bolt	Stainless Steel	4
BOLT003	Clamp Bolt	Stainless Steel	8
CLAM001	Hose Clamp	Epoxy Powder Coated Aluminum	2
CLIP001	Roller Positioning Clip	Steel	2
CLIP002	Eccentric Shaft Retaining Clip	Steel	1
CLIP003	Bearing Retaining Clip	Steel	1
CLIP004	Shaft Retaining Clip	Steel	1
COVE001	Pump Cover	Epoxy Powder Coated Aluminum	1
DRAI001	Drain Plug	Stainless Steel	1
ECCE001	Eccentric Shaft 058 / 128 / 218	Steel	1
GASK001	Cover Gasket	Neoprene	1
GREA001	Grease Fitting	Steel	1
GREASE	Grease	Grease	1
HOSE058	10 mm Hose	Various*	1
HOSE128	15 mm Hose	Various*	1
HOSE218	19 mm Hose	Various*	1
KEY001	Eccentric Shaft Key	Stainless Steel	1
KEY002	Gearbox Shaft Key	Stainless Steel	1
LUBE001	DST Hose Lubricant	Non-Hydrocarbon Synthetic Oil	1
ROLL001	Roller 128 With Bearings	UHMW PE / Steel / PTFE	1
ROLL003	Roller 058 With Bearings	UHMW PE / Steel / PTFE	1
ROLL004	Roller 218 With Bearings	UHMW PE / Steel / PTFE	1
SEAL001	Inboard Oil Seal	Steel / Buna	1
SEAL002	Outboard Oil Seal	Steel / Buna	1
SHAF001	Shaft	Steel	1
VENT001	Vent Plug	Plated Steel	1
WASH001	Cover Washer	Stainless Steel	5
WASH002	Gearbox Lock Washers	Stainless Steel	4
WASH003	Barb Positioning Washer	Stainless Steel	2
WIND002	Sight Glass	Plated Steel	1

* Natural Rubber / Viton™ / Nitrile (Buna-N) / EPDM / Neoprene™ / Hypalon™

1.6 SLP 440 / 654 Parts List

Part Number	Name	Material	Quantity
BAND001	Bandit Clamp	Stainless Steel	2
BAND020	Bandit Thriftool	Steel	1
BAND021	Bandit Pok-It II Tool	Steel	1
BARB004	Barb 440	Poly / Stainless Steel	2
BARB005	Barb 654	Poly / Stainless Steel	2
BEAR007	Inboard Bearing	Steel	1
BEAR008	Outboard Bearing	Steel	1
BODY002	Main Pump Body	Epoxy Powder Coated Aluminum	1
BOLT001	Cover Bolt	Stainless Steel	5
BOLT004	Gearbox Bolts	Stainless Steel	4
BOLT005	Clamp Bolt	Stainless Steel	8
CLAM002	Hose Clamp	Epoxy Powder Coated Aluminum	2
CLIP005	Roller Positioning Clip	Steel	2
CLIP006	Eccentric Shaft Retaining Clip	Steel	1
CLIP007	Bearing Retaining Clip	Steel	1
CLIP008	Shaft Retaining Clip	Steel	1
COVE002	Pump Cover	Epoxy Powder Coated Aluminum	1
DRAI001	Drain Plug	Stainless Steel	1
ECCE004	Eccentric Shaft 440 / 654	Steel	1
GASK002	Cover Gasket	Fabric Reinforced Neoprene	1
GREA001	Grease Fitting	Steel	1
GREASE	Grease	Grease	1
HOSE440	25 mm Hose	Various*	1
HOSE654	29 mm Hose	Various*	1
KEY003	Eccentric Shaft Key	Stainless Steel	1
KEY004	Gearbox Shaft Key	Stainless Steel	1
LUBE001	DST Hose Lubricant	Non-Hydrocarbon Synthetic Oil	1
ROLL005	Roller 440 With Bearings	UHMW PE / Steel / PTFE	1
ROLL006	Roller 654 With Bearings	UHMW PE / Steel / PTFE	1
SEAL003	Inboard Oil Seal	Steel / Buna	1
SEAL004	Outboard Oil Seal	Steel / Buna	1
SHAF002	Shaft	Steel	1
VENT001	Vent Plug	Plated Steel	1
WASH001	Cover Washer	Stainless Steel	5
WASH004	Gearbox Lock Washers	Stainless Steel	4
WASH005	Barb Positioning Washer	Stainless Steel	2
WASH006	Roller Positioning Washer	Stainless Steel	2
WIND002	Cover Sight Glass	Plated Steel	1

* Natural Rubber / Viton™ / Nitrile (Buna-N) / EPDM / Neoprene™ / Hypalon™

2 Disassembly Procedure

The following procedure should be used to disassemble the pump.

2.1 Front Cover Removal

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



The lubricant and the hose may be contaminated with pumped fluid. 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.



Be sure that all power has been disconnected.



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.

- Open the drain plug with a **30mm wrench** and remove the lubricating oil. Dispose of all material properly. Take care, as the lubricating oil may be contaminated by the pumped fluid. *See Figure 2.*
- Remove the vent plug with a **27mm wrench** and flush the pump case with a suitable solvent.
- Remove the socket head cap screws that hold the front cover with a **6mm hex key**. Discard the front cover gasket.
- Inspect and clean the sight glass and cover then set aside.



Figure 2: Drain Plug Removal



Figure 3: Roller at Six o'clock Position

2.2 Hose Removal

- Remove the motor fan cover with a **6mm wrench** and turn the fan by hand until the roller stops at the bottom of the pump case in the six o'clock position. *See Figure 3.*

NOTE

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.

- Remove the four bolts from each clamp on both the inlet and outlet ports of the pump with a **5mm hex key** and lift off the clamps.
- The hose barb assembly is seated firmly in the pump casing. Place a smooth, small diameter rod into the barb and lift the hose and barb assembly. Pull out the hose about two or three inches beyond the end of the pump. *See Figure 4.*



Figure 4: Pulling the Barb Assembly from the Pump Casing with a Smooth Metal Rod



Figure 5: Cutting the Band-it Clamp with a Hack Saw

- 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. *See Figure 5.*



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.

- Remove the barb and the washer once the Band-it clamp has been removed. Certain high pressure applications may have the washer tack welded to the barb.
- 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. *See Figure 6.*



Figure 6: Removal of the Hose from the Pump Body



Figure 7: Removal of One Barb Assembly with Hose Pulled Through Pump Casing

- 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. *See Figure 7.*
- Remove the hose from the pump body.
- Safely discard the used hose per your facility's waste disposal policy.

2.3 Roller Removal

- Using **external snap ring pliers**, remove the outboard roller positioning clip on the front of the eccentric shaft. *See Figure 8.*



Figure 8: Removal of Outboard Retaining Clip



Figure 9: Detail of the Flanged Bearing and Retaining Clips

- Slide the outboard roller positioning washer off of the shaft, if so equipped.



The 440 and 654 units may have a positioning washer located on the shaft both in front of and behind the roller. Older versions will have flanged bearings that are visible in the bore of the roller. *See Figure 9.*

- Pull the roller off of the shaft. It should slide easily off.
- Slide the inboard roller positioning washer off of the shaft, if so equipped.
- Remove the inboard roller positioning clip.

- Inspect the roller and sleeve bearing assembly 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 PTFE coating of the bearings appears worn or if the roller is damaged, replace it before reassembly.

2.4 Eccentric Shaft Removal

- Using external snap ring pliers, remove the eccentric shaft retaining clip. *See Figure 10.*



Figure 10: Removal of Eccentric Shaft Retaining Clip



Figure 11: Removal of the Eccentric Shaft

- Remove the eccentric shaft from the main pump shaft. *See Figure 11.*

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.**

2.5 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.

2.6 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.



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.

2.7 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.

2.8 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 sleeve bearings located in the inner diameter of the pump roller. If the PTFE surface has been worn, replace the entire roller assembly. Eccentric Pumps ships new rollers with the sleeve bearings pre-installed.
- Inspect all metal parts for signs of wear or cracks. Replace all worn parts.



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

3 Assembly Procedure

The following procedure should be used to assemble the pump.

3.1 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, 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.

3.2 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 press the bearings onto the shaft.
- All bearings should be seated 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.

3.3 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 bearings engage 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.**

- 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.

3.4 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 side of the pump. 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.

3.5 Gearbox Installation

- Lubricate the pump shaft and the keyway with a never-seize compound.
- 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.
- Install the gearbox by sliding it on the pump shaft.
- The motor normally is positioned on top. *See Figure 3.*
- Use lock washers and hex head cap screws to secure the gearbox to the pump with a ½” wrench.

3.6 Eccentric Shaft Installation

- Slide the eccentric shaft over the end of the main pump shaft. Install the key. Both the eccentric and the key should slide easily together. *See Figure 12.*



Figure 12: Eccentric Shaft and Key Assembly



Figure 13: Installation of Eccentric Shaft Retaining Clip

- Secure the eccentric shaft with the eccentric shaft retaining clip. *See Figure 13.*

3.7 Roller Installation

- The roller is factory assembled with the appropriate sleeve bearings installed. The 058, 128, and 218 size pumps have flanged bearings installed in the bore of the roller, and the 440 and 654 have straight sleeve bearings. *See Figure 9 above.*
- Install the inboard external roller retaining clip using **external snap ring pliers**. Make sure that the snap ring is fully seated in the groove on the shaft. *See Figure 14.*



Figure 14: Installation of Inboard Roller Retaining Ring



Figure 15: Installation of Roller onto Lubricated Shaft

- Install the inboard positioning washer if your pump is so equipped (SLP/440 and SLP/654).
- Lubricate the shaft and sleeve bearings with Hoselube and slide the roller onto the eccentric shaft. The roller size is typically marked on the roller itself. Verify that you have the correctly sized roller. *See Figure 15.*
- Install the outboard positioning washer if your pump is so equipped (SLP/440 and SLP/654).
- Install the outboard external roller retaining clip. Verify that the roller turns freely on the shaft. *See Figure 16.*



Figure 16: Installation of the Outboard Roller Retaining Clip



Figure 17: Installation of the Hose into the Pump Body with the Roller at Six o'clock

3.8 Hose Installation

- Move the roller to the six o'clock position by turning the motor fan until the roller reaches the desired position.
- Turn the hose into a 360 degree loop and pass each end through the openings on the inside of the pump body. *See Figure 17.*

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. Then pass the other end through the front port on the right hand side. See Figure 18.

- Once the hose extends 2-3 inches beyond the pump body, slide the Band-it clamp over the hose and install the positioning washer and barb. Using the Band-it tool, clamp the band over the center of the barb. You must make sure that the band fits inside the recess of the clamp and housing. It is easiest to measure the distance on the pump then position the band accordingly before tightening. *See Figure 19 and Figure 20.*



Position the band so that it will be located in the recess of the clamp and the pump body.



Figure 18: Hose Ready for Barb Assembly



Figure 19: Installation of Band-it Clamp, Positioning Washer and Barb

- High pressure applications may require the use of a positioning washer that is welded to the barb. Your Eccentric Pumps representative can assist you.



Figure 20: Tightening the Band with the Band-it Tool



Figure 21: 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 or smooth steel rod can help to seat the barb assembly. *See Figure 21 and Figure 22.*



Figure 22: Guiding the Barb with a Smooth Steel Rod



Figure 23: Correct Position of the Barb Hex and Pump Body

NOTE

The hex on the barb must be aligned with the corresponding hex on the pump body. This will hold the barb assembly firmly in place when the clamp is tightened. See *Figure 23*.



Figure 24: Correct Position of the Barb Assembly



Figure 25: Installation of the Hose Clamp While Using a Rod to Position the Barb

- Verify that the barb and washer are correctly positioned. The hose needs to be installed tight to the washer and pump case. See *Figure 24*.
- Use a smooth steel rod to hold the barb in place, and tighten the hex head cap screws to 115 in-lb (13 Nm) for the 058/128/218 and to 140 in-lb (16.0 Nm) for the 440/654 pump. See *Figure 25* and *Figure 26*.
- Turn the roller to the 12 o'clock position and push the bottom of the hose inside the pump case. The hose may be difficult to seat on the 440 or 654 units. A dead blow hammer can be used to help slide the hose in the bottom of the pump case. See *Figure 27*.



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 26: Torque the Bolts to the Required Value



Figure 27: 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 the correct capacity of hoselube. See Figure 28.



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. See Figure 28.



Figure 28: Roller in the Proper Six o'clock Position Prior to Front Cover Assembly



Figure 29: Cleaning the Gasket Surface

3.9 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.

- Place a bead of 100% silicone sealant on the gasket surface of the front cover. The purpose of the silicone sealant is to hold the gasket in place during assembly of the front cover. The

sealant does provide some secondary sealing, but it is not required to seal the pump. See Figure 30.



Figure 30: Placing a Bead of Silicone Sealant on the Front Cover to Hold the Gasket in Place



Figure 31: Installing the Gasket

- 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 31.



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

- Line up the front cover with its gasket and the pump body by placing a socket head cap screw in the top hole and screwing it into the pump body. See Figure 32.
- Using the flat washers and the socket head cap screws, install the front cover with a **6mm hex key**.

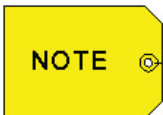


Figure 32: Lining up the Front Cover and Gasket with the Pump Body



Figure 33: Tighten the Front Cover to the Proper Torque

- Tighten front cover socket head cap screws to 25 in-lb (2.8 Nm) for the 058/128/218 and to 35 in-lb (4.0 Nm) for the 440/654 pump. See Figure 33.



Do not over-tighten the front cover bolts. This will cause the gasket to deform and the pump to leak.

3.10 Pump Lubrication

- Wrap the drain plug threads with Teflon™ tape and install the plug with a **30mm wrench**. See *Figure 34*.



Figure 34: Installation of Pump Drain Plug

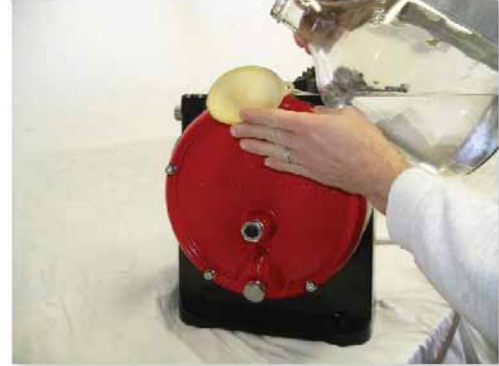


Figure 35: Filling the Pump with Hoselube

- Wrap the sight glass threads with Teflon™ tape and install.
- Using a funnel, fill the pump body with DST™ Hoselube until it is level with the bottom of the sight glass. The 058/128/218 pump will require approximately 0.25 gallons (approximately 1 liter) and the 440 and 654 will require approximately 0.5 gallons (approximately 2 liters). See *Figure 35*.
- Wrap the vent plug threads with Teflon™ tape and install. See *Figure 36*.



Figure 36: Installation of Pump Vent Plug



Figure 37: A Newly Rebuilt Eccentric Pump

3.11 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

4 Operating the Pump

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

END OF TEXT