

# PENGWYN



## DIRECT APPLICATION UNIT

1300 GALLON CENTER LANE  
LEGGED BRINE SYSTEM

ASSEMBLY  
OPERATION  
MAINTENANCE  
MANUAL

8-31-09

PENGWYN  
DIRECT APPLICATION SYSTEMS

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1300 GALLON CENTER LANE

PENGWYN  
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# Introduction

Thank you for choosing our ground-oriented central hydraulics system. Our goal has always been to provide great customer service and a safe, reliable product that emphasizes:

- **simplicity of operation**
- **operator safety**
- **management control**
- **reduced operating costs**
- **year round usage**

In order to reach our goal of reliability, your new Pengwyn system uses the rugged Autosucker™ on-demand pump. It has a dry valve design with fixed displacement that generates hydraulic flow to a series of poppet-style solenoid cartridge valves. Poppet valves are bang-bang solenoid devices which means they are either on or off. They are reliable, dirt tolerant, inexpensive to repair, contain only static seals, and are not damaged by long periods of sitting idle. These features, as well as the testing done on each system before it leaves the facility, contribute to the overall dependability.

Not only is your new system reliable, but it has been designed to be safe and easy for the operator, as well as the maintenance personnel. The operator has complete control of all the functions with the touch of a switch on the control console. This allows the operator to concentrate on the road. Another feature to help the operator is the system of alarms. The alarms alert the operator to any problems with a jam on the conveyor, low material on the conveyor, high hydraulic fluid temperature, and low hydraulic fluid level. This again keeps the operator from diverting attention from the roadway. Another safety consideration includes having all the hydraulics on the exterior of the cab and away from the operator.

Other features of your Pengwyn system include running hydraulic tools off the system itself and allowing for management programming of spreader constants. By allowing for management control and year round utilization, your system is cost effective and lowers de-icing material usage.

Please look to this manual for information on the major features, calibration of the system, and troubleshooting guidelines. This manual will help you operate and maintain your system. Pengwyn does offer training. We are available by calling 1-800-233-7568. Please call if you have a problem. We are here to help you.

# Limited Warranty

Pengwyn warrants LBS/SBS components to be free of defects in material and workmanship, under normal use and service for a period of two (2) years from date of shipment. Pengwyn's obligation under this warranty is limited to repairing or replacing at its factory, or other location designated by Pengwyn, any part or parts thereof which are returned within thirty (30) days of the date when failure occurs or defect is noted, with transportation charges prepaid, and which upon examination appears to Pengwyn's satisfaction to have been defective. **Such free repair or replacement does not include transportation charges, or the cost of installing the new part or any other expense incident thereto. Pengwyn will not be liable for other loss, damage, or expense directly or indirectly arising from the use of its products, nor will Pengwyn be liable for special, incidental or consequential damages.**

Ordinary wear and tear, and damage from abuse, misuse, neglect or alteration are not covered by this warranty. Pengwyn assumes no liability for expenses incurred or repairs made outside Pengwyn's factory except by written consent. Pengwyn's warranty also does not cover the requirement of control box programming. All control box programming is to be performed by the end user after receiving training and with the use of the technical manual. This warranty is null and void if instructions and operating procedures are not followed.

Equipment or parts not manufactured by this company, but which are furnished in connection with Pengwyn products, are covered directly by the warranty of the manufacturer supplying them. However, Pengwyn will assist in obtaining adjustment on such equipment or parts when necessary.

**It is recommended that spare parts be purchased for critical items to allow continued operation of equipment during the inspection, evaluation, or repair/replacement process.**

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND OF ANY OTHER OBLIGATION OR LIABILITY OF PENGWYN.

## **PRODUCT IMPROVEMENT LIABILITY DISCLAIMER**

Pengwyn reserves the right to make any changes in or improvements on its products without incurring any liability or obligation whatever and without being required to make any corresponding changes or improvements in products previously manufactured or sold.

# **ASSEMBLY**

## **Chapter Includes:**

- Installation
- Leg Assembly
- Nozzle Arrangement

# INSTALLATION

This section will help guide you through installation if it was not already performed at Pengwyn.

## **Install Support Legs**

Notes: The "Front" of the Legged Brine System is the side with the loading wheels on the frame; the "Rear" is the side with the plumbing and valves.

Using Fork Truck pockets located at the rear of the unit, lift Legged Brine System frame in the air and support it properly.

Release front folding legs and make sure they swing down, and the lock bars slip into their locked positions.

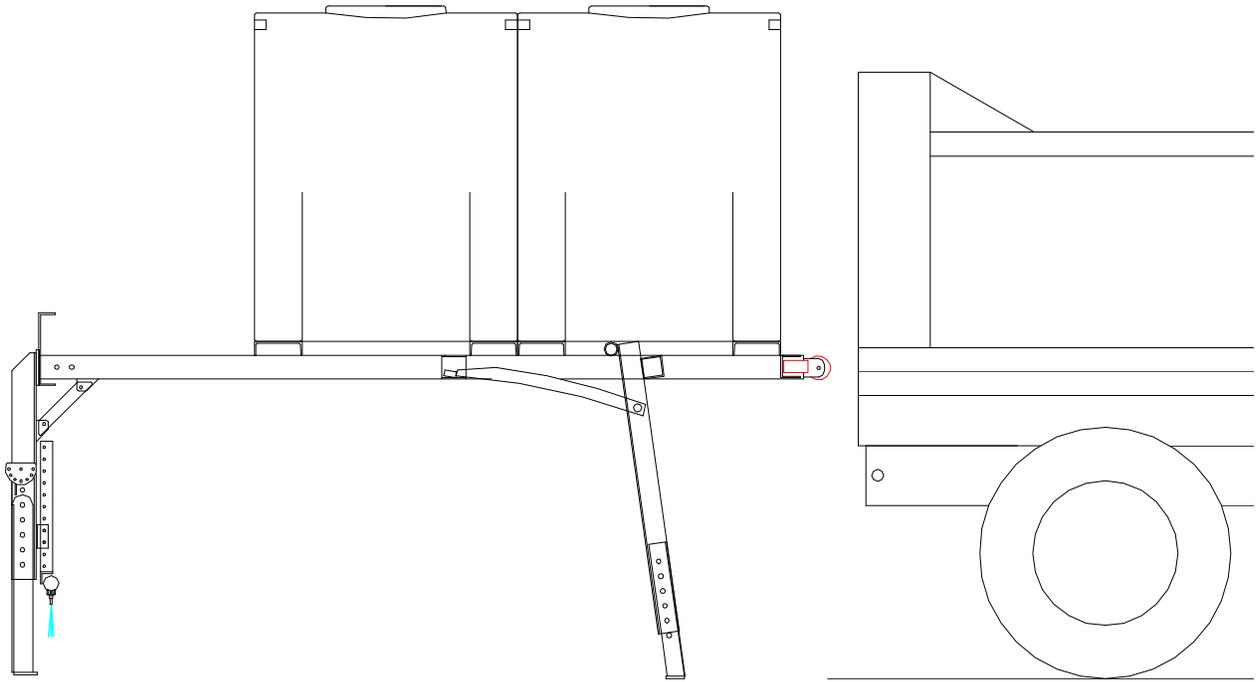
Install rear support legs to rear of frame using the eight supplied 5/8" - 11 x 2" Hex bolts, nuts, lock washers and flat washers (Four for each leg). The bolt plate at the top of the leg will install flush with the back-plate of the frame. The right and left lane spray bars should point away from the frame respectively. Leave the legs loose on the frame and bolt up the two 12" long leg braces that connect to the brackets on the front-side of the rear legs, and at the bottom of the frame. There is a leg brace for both rear legs. There are four bolts for the leg braces, and they are 1/2" - 13 x 1 1/4" Hex bolts, nuts, and lock washers. Now, tighten all rear leg bolts and rear leg brace bolts.

The Legged Brine System can now be set on the ground, and stand on it's own legs.

## **Install Center Lane Spray Bar**

The center lane spray bar has hole-punched angle iron that makes it adjustable in relationship to the ground. Decide how far off of the ground you want the spray nozzles to be, then attach the angle iron, located at each end of the spray bar, to the mounting brackets located on the front of the rear support legs. There are four 3/8" - 16 x 1" Hex bolts, nuts, and lock washers to attach the spray bar to its brackets.

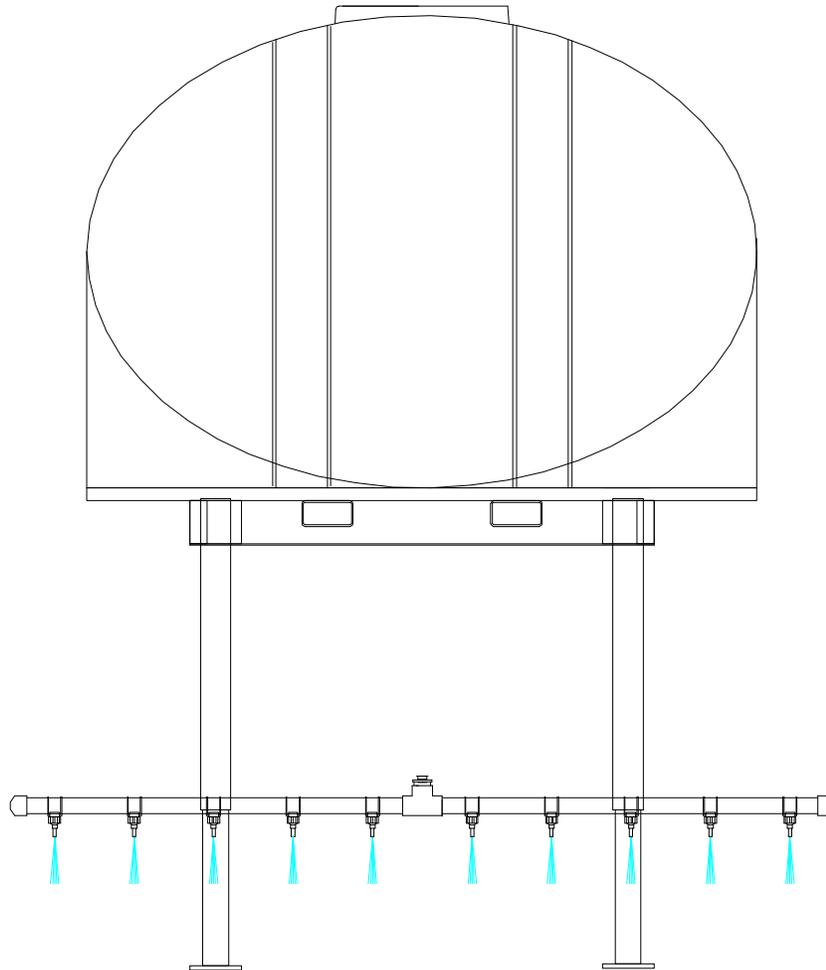
# LEG ASSEMBLY AND ADJUSTMENT



- Assemble rear legs by installing on each leg (4) bolts and hardware at point **A**.
- Install gusset plate and (2) bolts and hardware at point **B**.
- Lower the front legs and swing forward until the latching bar drops down locking the leg into the down position.
- Adjust the front leg height “**C**” so that the bottom of the front caster wheel is approximately 1”-2” below the bottom of the bed floor when the bed is fully down. This will allow the rear end of the bed floor to drop even or slightly below the caster at a slight dump angle of about 10 degrees.
- With this adjustment, when backing the truck under the brine unit, the truck will have lifted the front legs approximately 3” to 4” before the bed contacts the front legs. This allows the latch to be unlocked and the leg to swing under and retract during the remainder of the loading process.
- While the unit is loaded and the rear legs down, adjust the rear legs so that they are as near to the ground as possible.
- When the unit is properly positioned in the truck, the tail gate latch bar should be in the tail gate latches, then appropriately welded to the units long frame. A front ratchet strap is also recommended to keep the front of the unit from bouncing.

***Caution: Never load or unload the unit with any liquid in the tanks.***

# STANDARD NOZZLE ARRANGEMENT CENTER LANE



The bottom bar consists of (10) 1/4" nozzle tips on 9-1/4" centers.

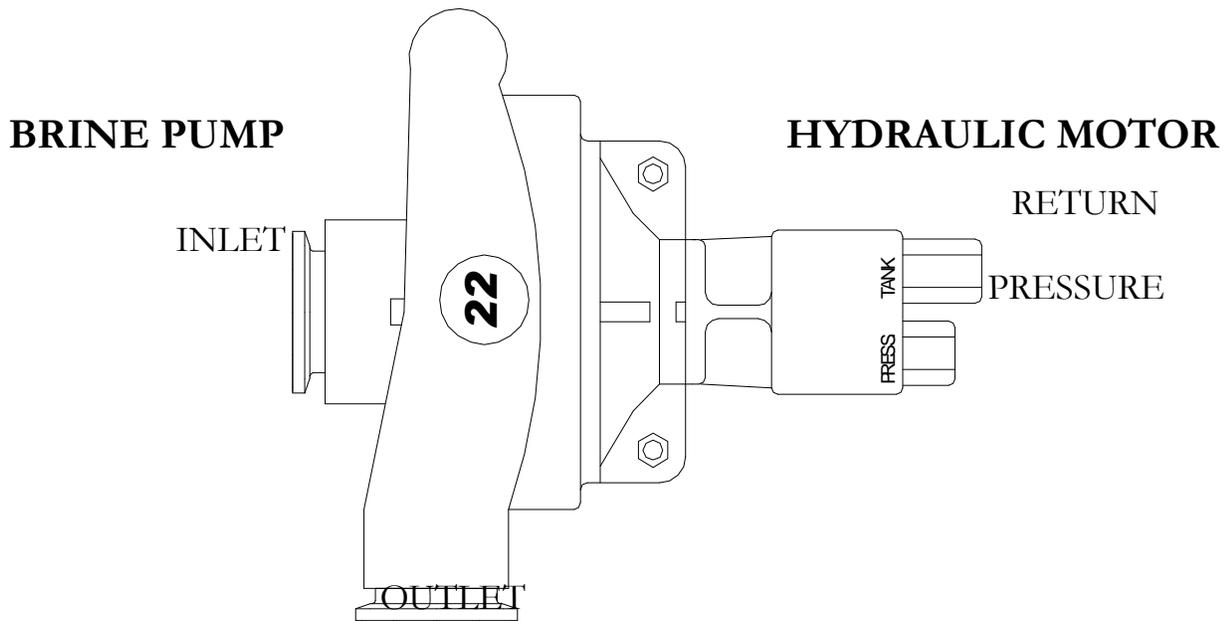
The nozzle flow is about 4 GPM per nozzle maximum.

# HOOK UP AND OPERATION

## Chapter Contents

- Hydraulic Hook Up
- Loading/Unloading
- Filling/Emptying
- Electrical Connections

# HYDRAULIC HOOK UP AND OPERATION



Most typical salt spreader hydraulic systems are 15-20 GPM and 2000 psi in capacity whether ground oriented or manual type controls. PENGWYN 'S' brine applicator has been designed to perform properly with the typical hydraulic controller conveyor circuit. If the customer wishes the unit to perform at the top end of the hydraulic system then 5/8" hosing is much preferred over the common 1/2" hosing. The safe pressure rating for the hoses should be 3000 psi.

The brine pump hydraulic motor has a pressure and a return fitting. Be sure to connect the return line to the longer motor fitting which contains a check valve which prevents reverse flow.

The HYPRO pump is a centrifugal design and within limits its output is roughly constant pressure at a given speed therefore it may not be necessary to increase motor speed when going from a single spray bar zone to multiple zones. A chart could be developed that would correlate application rates to the speed of the truck from a few trial runs using tap water, weather and road conditions permitting.

Those wishing for a more scientific approach can develop a more accurate chart by collecting the liquid in a trough over a timed period at each hydraulic spreader setting.

## **Loading**

Before loading Legged Brine System, verify the Loading Wheels are level with or higher than the floor of the truck bed, in the lowered position. If they are not, adjust the front support legs using the two 3/4 - 10 x 5" Hex Bolts, lock washers, and nuts on each leg so that the loading wheels are in the correct position.

Once the loading wheel height is adjusted, Back the truck up to the Legged Brine System and raise the truck bed so that wheels of the Legged Brine System ride into the bed, and the frame doesn't drag on the floor of the bed.

Back into the Legged Brine System and gradually lower the truck bed until the Legged Brine System frame is positioned in a preferable manner. (NOTE: PENGWYN recommends securing the Legged Brine System front, and rear to avoid any dismounting accidents.)

When the bed is fully lowered, the rear support legs should be located as low as possible, without touching the ground. The rear support legs are designed so they are easy to adjust using pins and clips. The upper pin, once the unloading height is set, should never have to be adjusted again, unless the Legged Brine System is used in a different truck. This pin will be the pivot point. When the Legged Brine System is loaded, pull the bottom pins of the rear support legs and swing the legs up into their transport position and re-pin the legs so they stay up while in operation.

Connect the wiring for the electrical valves with the 6-way weather pack connector, and connect liquid wetting pump hydraulics to the proper hydraulic circuit on the truck.

## **Unloading**

Empty liquid from tanks before removing Direct Application System from truck or trailer. Un-plug the weather pack electrical connector and place the protective caps over the exposed plug ends. Disconnect the hydraulic hosing for the liquid wetting pump from the truck.

To unload the Legged Brine System from the truck, remove the upper pins from the rear support legs and swing the legs down to their unloading positions. Re-insert the pins at the bottom. The rear support legs should be at their lowest position without touching the ground so the Legged Brine System loads and unloads into the truck correctly. Now, lift the bed so the frame of the Legged Brine System comes off of the floor of the bed. Drive truck forward and lower bed slowly at the same time. Make sure the front support legs swing down and into their locked positions! Continue driving forward and lowering bed. The Legged Brine System should roll off of the tail of the bed and now rest on its support legs.

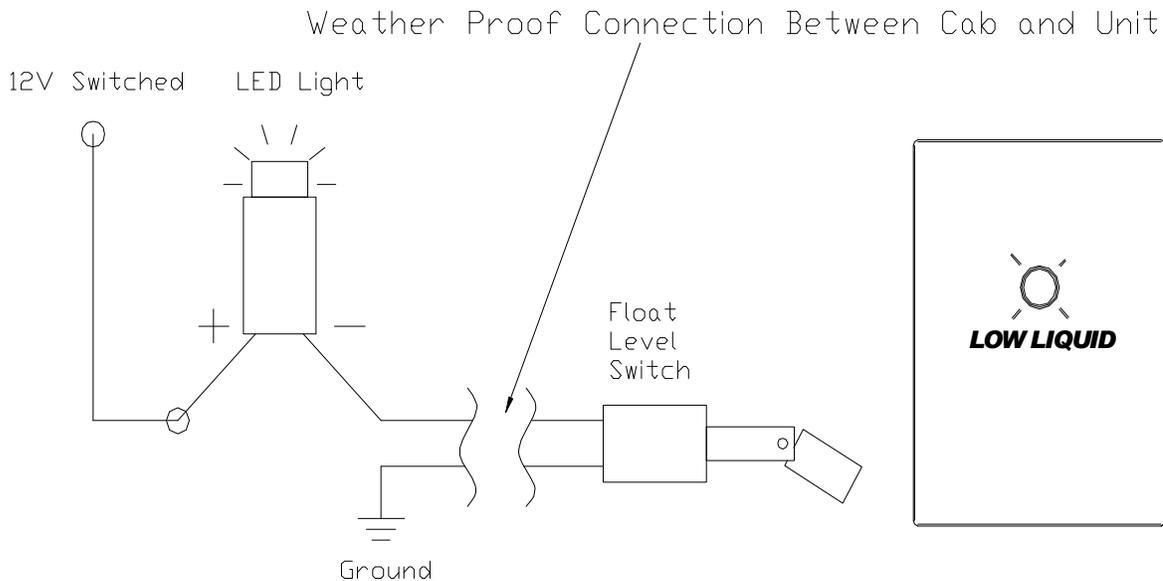
## Filling and Emptying Material

The Direct Application Systems are equipped with two 2" female cam lock fittings for loading and unloading the liquid tanks.

The cam lock nearest the driver's side is used to fill the tanks; it is connected directly to the main shut-off valve at the rear of the tanks. (NOTE: Make sure the main valve at the rear tank is open for liquid flow.) Open the valve at the cam lock to load liquid material, or empty the liquid material from the tanks by gravity.

The cam lock to the right of the driver's side cam lock is for pumping liquid material back into a storage tank. To do this, connect a hose to the storage tank and open the valve at the cam lock. Now, operate the hydraulic system that turns on the liquid wetting pump. (Note: Do not turn on any lanes with the switch box.) This will cause all liquid in the Direct Application System tanks to be pumped into the storage tank.

## Electrical Connections



# **MAINTENANCE**

## **Chapter Contents**

- Maintenance
- Troubleshooting
- Parts Lists
- Diagrams

## **Maintenance**

1. Always engage Weatherpack plugs and dust caps when system is not in use.
2. Check spray nozzle assemblies to assure that they are tight.
3. Check tank hold down fasteners before loading to make sure they are securely fastened.
4. Never leave tap water in the Direct Application System when freezing temperatures are expected.
5. At the end of snow and ice season, flush the system with tap water. Close the main tank valve to prevent any condensation in the tanks from entering the plumbing.
6. Grease rollers and loading wheels at the beginning and end of the season.

## **Troubleshooting**

### **Problem:**

### **Cause:**

### **Solution:**

No flow out of spray bar

Hydraulics connected wrong

Properly connect hydraulics

Strainer full of debris

Remove debris

Not enough flow from spray bar

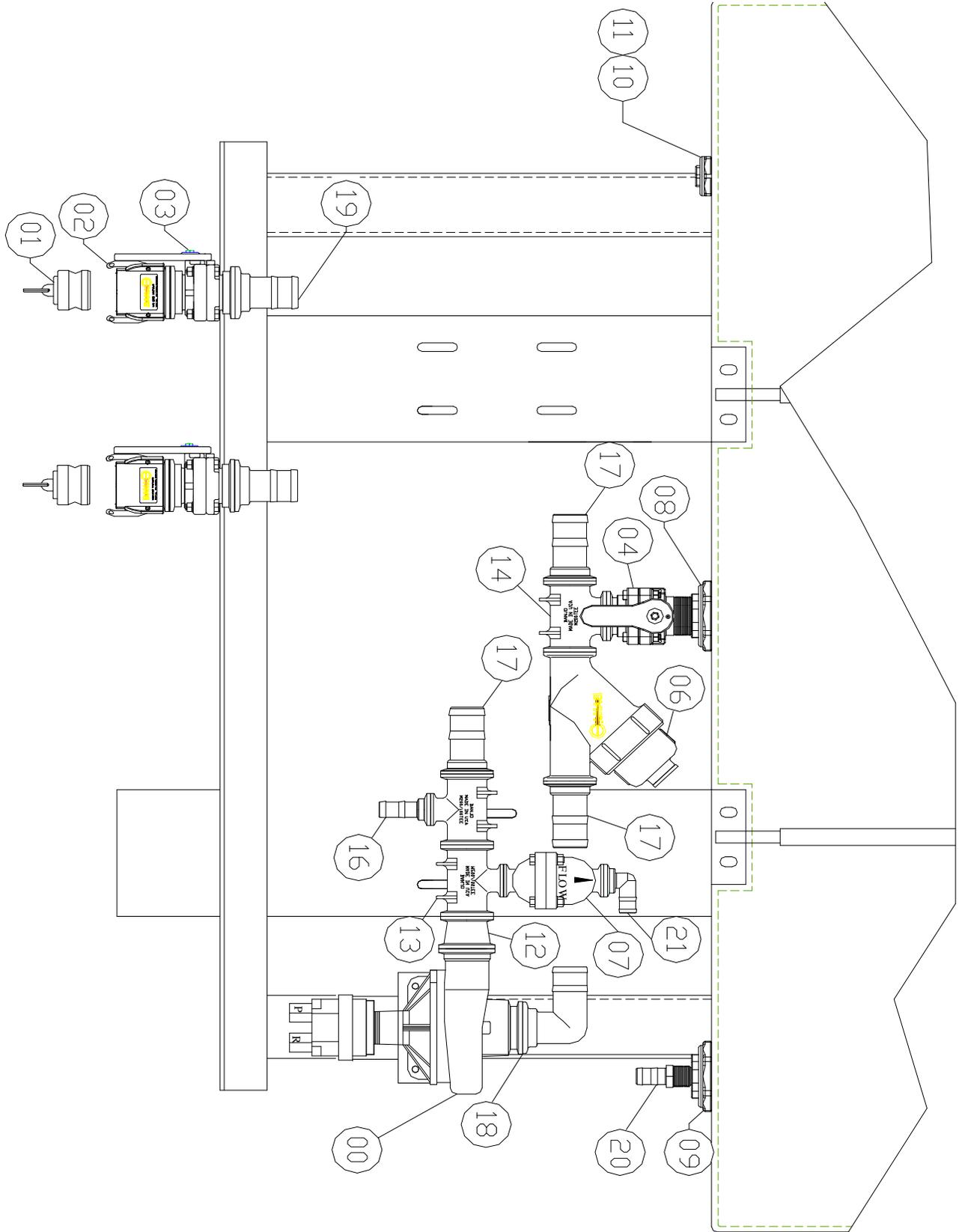
Not enough fluid

Add brine

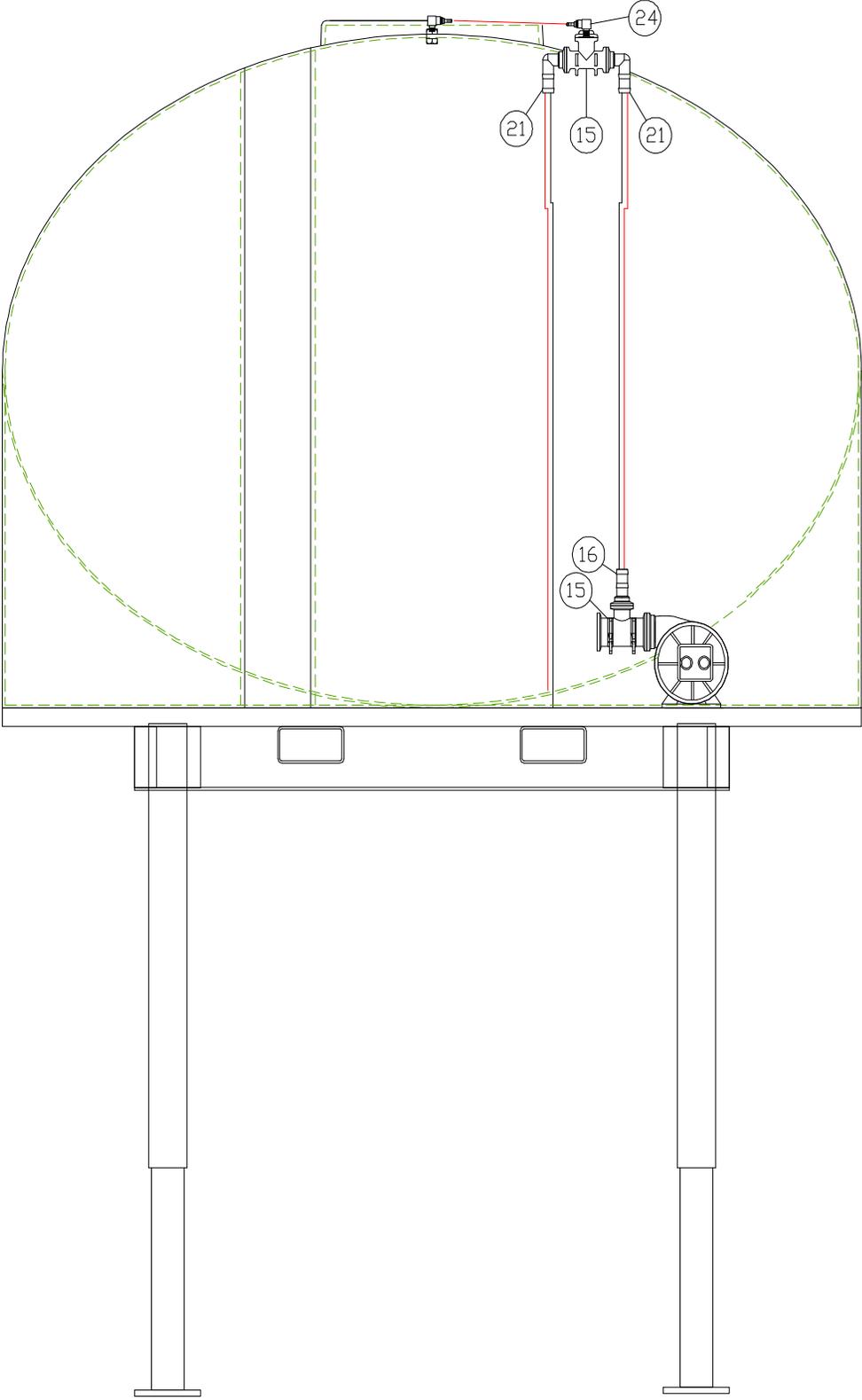
Needs calibrated

Check calibrations and change as necessary

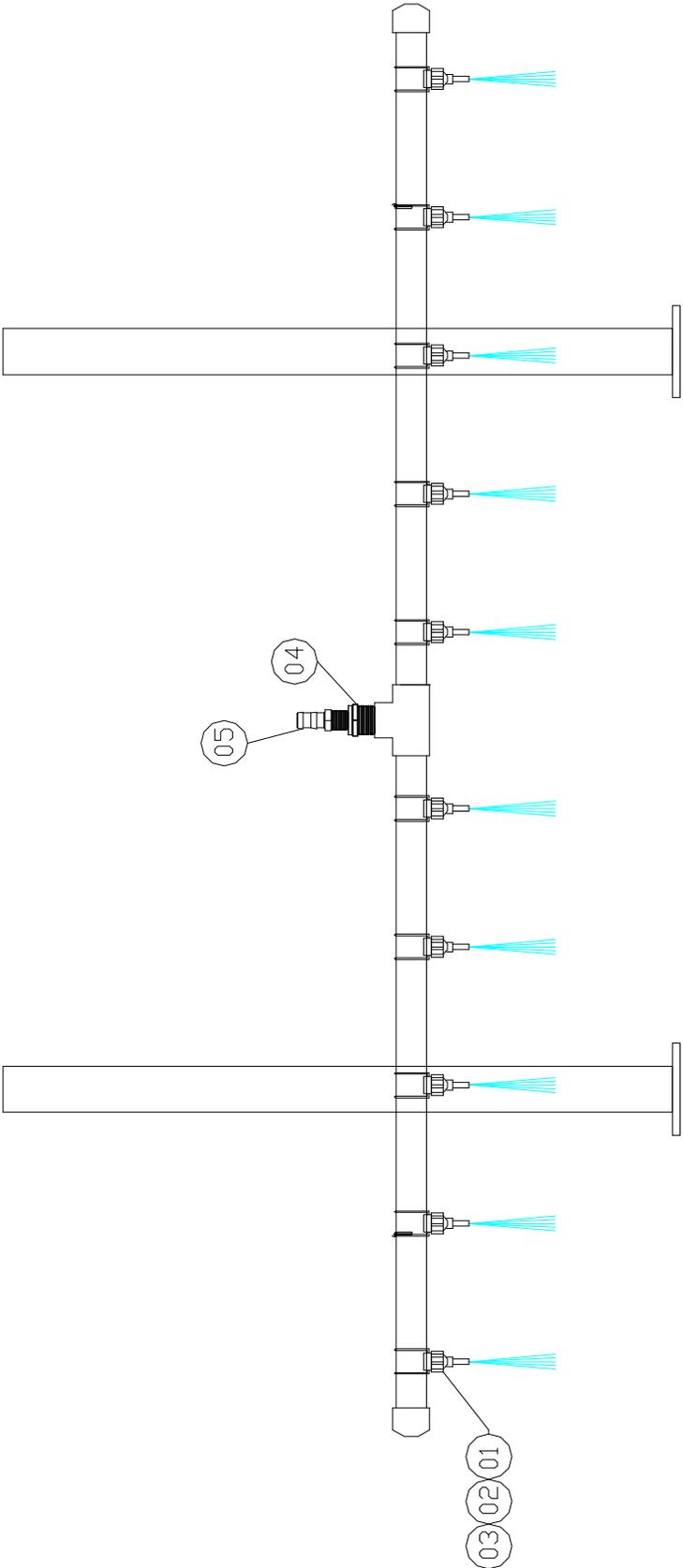
# Diagram 1: Parts Arrangement Overhead View



# Diagram 2: Parts Arrangement Rear View



# Diagram 3: Spray Bar Parts Arrangement



# Plumbing Parts Description

<i>ITEM</i>	<i>SIZE</i>	<i>DESCRIPTION</i>	<i>PENGWYN #</i>	<i>QTY</i>
00	2"	Hypro Centrifugal Pump	9306CHM5C	1
01	2"	Poly Camlock Plug	CAM200PL	2
02	2"	FLANGE x Female QDC	M220D	2
03	2"	Poly Ball Valve Stubby FLANGE x FLANGE	MVS220CF	2
04	2"	Poly Ball Valve Stubby MPT x FLANGE	VSMT200CF	1
05	2"	Banjo 3 Valve Manifold Assembly	MEV103CF	1
06	2"	Banjo Flanged Y Strainer 2" SP	MLS200-20	1
07	1"	Banjo Flange Pressure Spike Relief	MPRV100-075	1
08	2"	Poly Bulkhead Tank Fitting	TF200	1
09	1"	Poly Bulkhead Tank Fitting	TF100	1
10	1/2"	Poly Bulkhead Tank Fitting	TF050	1
11	1/2"	Float Switch	LS-501	1
12	2	Banjo Flange Reducer 2" FP x 2" SP	M220/200CPG	1
13	2"-1"	Banjo Flange Tee	M200100TEE	2
14	2"	Banjo Flange Tee	M200TEE	1
15	1"	Banjo Flange Tee	M100TEE	1
16	1"	Banjo 1" x 1" Hose Barb	M100BRB	1
17	2"	Banjo Flange x Barb	M200BRB	2
18	2"	Banjo Flange x Barb 90 Deg. Elbow	M220BRB90	1
19	2"	Banjo Flange x Barb	M220BRB	2
20	1"	Banjo Threaded Hose Barb	HB100	1
21	1"	Banjo Flange x Barb 90 Degree Elbow	M100BRB90	1
22	1"	Banjo Flange x Barb	M100BRB	1
23	2"	Banjo Flange x Barb 90 Degree Elbow	M200BRB90	3
24	1"	Flanged Plug with 1/4" FPT	M100PLG025	1
	1"	Banjo Flange Clamp 1"	FC100	5
	1"	Banjo Flange Gasket 1" EPDM	M100G	5
	2"	Banjo Flange Clamp 2" SP	FC200	11
	2"	Banjo Flange Gasket 2" EPDM SP	150G	11
	2"	Banjo Flange Clamp 2" FP	FC220	2
	2"	Banjo Flange Gasket 2" EPDM FP	200G	2

# LBS Spray Bar Parts Description

<i>ITEM</i>	<i>SIZE</i>	<i>DESCRIPTION</i>	<i>PENGWYN #</i>
01	1-1/2"	Clip Eyelet for 1-1/2" Pipe Size	20570-1-1/2-PPB
02		Clip Eyelet Ball w/ 1/4" FPT	CP20582-1/4-PPB
03	1/4"	Brass Hose Barb Spray Nozzle	HB-025-BR
04	1 1/2" x 1"	FPT Reducing Bushing	RB150-100
05	1"	Poly MPT x Barb	HB100

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