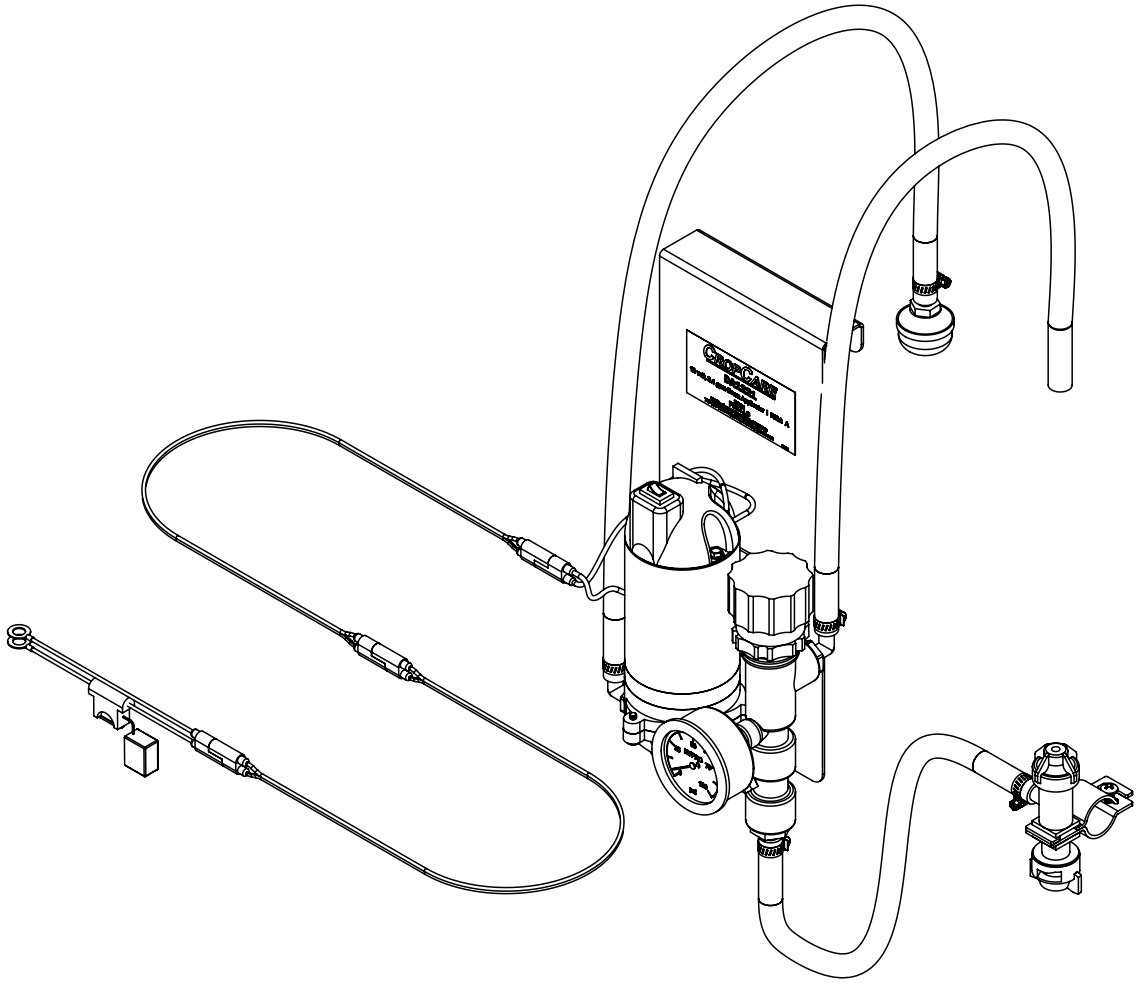
CROPCARE
by PBZ

Owner's Manual

Drum Applicator
Model DA1221



Manufactured by PBZ LLC
A Paul B Zimmerman Inc. Company
www.ZimmermanEquipment.com

Form: DA1221OM
Rev: B Date 06/21

Table Of Contents

Identification of Machine

- Model #'s: DA1221
- The model number and revision identification decal is located on the pump mount.

Specifications

Drum Applicator

Min power supply ..... 12 volt / 10 amp
Wiring harness length ..... 16'
Shipping weight ..... 14 lbs

Pump:
Type ..... Diaphragm pump
Manufacturer ..... Shurflo®
Max pressure ..... 100 psi
Max flow rate ..... 2.1 gpm

Before You Begin

Please read and understand this manual and its instructions and warnings completely before operating the applicator.

- Be aware of all safety guidelines, warnings, and cautions including those of the piece of equipment that the applicator may be mounted on.
- Read and understand the inoculant or chemical manufacturer's labels, warnings, and instructions.
- Familiarize yourself and other operators with the applicator's components and how all parts are operated.

Safety Precautions

General Guidelines

Every year many unnecessary accidents occur due to improper equipment handling and a disregard for safety precautions. You, the operator, can avoid accidents by observing the precautions listed in this section.

- Never handle or service the applicator while the equipment is running. Always turn off the applicator and disconnect it from the power source before handling or serving it.
- The operator should be a responsible adult. Do not allow persons to operate the applicator until they have displayed a thorough understanding of applicator safety precautions and operational use!
- Never attempt to operate the applicator when under the influence of alcohol or drugs.
- The best defense against accidents is a careful and responsible operator.
- If there is any portion of this manual that you do not fully understand, please contact the original retailer.

Before Operation

- Carefully study and understand this owner's manual.
- Read and follow inoculant or chemical manufacturer's labels, warnings, and instructions! A material safety data sheet (MSDS) should be provided by the chemical manufacturer.
- To avoid injury from chemical hazards, wear the proper protective clothing. Each chemical manufacturer lists its clothing requirements under the "Personal Protective Equipment (PPE) section in the chemical instructions.
- Give the applicator a visual inspection for any worn parts, loose bolts, or other visible problems, and make the necessary repairs. See the Maintenance Instructions section (page 9) for help.
- Make sure the area is clear of any people or obstructions before using the applicator.
- Have all operators practice operating the applicator and its attachments, using clean water only, until all persons are completely capable of safe operation.

Safety Precautions

During Operation

- Always be aware of bystanders, particularly children!
- Never handle or service the applicator while the equipment is running. Always turn off the applicator and disconnect it from the power source before handling or servicing it.
- Never leave running equipment unattended!
- Remember that accidents can even happen to seasoned operators. Always take your time and follow all safety instructions.

Pump Safety Precautions

- Never pump flammable, explosive, or petroleum based fluids such as gasoline, fuel oil, kerosene, etc.
- Never allow the pump to get wet or to be exposed to the elemets. Doing so will void the manufacturer's warranty.
- Note: The pump may be run dry for limited periods of time without resulting in damage.
- Never attempt to adjust the pressure demand switch on the pump. Any unapproved pump adjustment will void the manufacturer's warranty.
- Always disconnect the power to the pump when working on the pump. Failure to do this could result in electrical shock.

Mounting the Drum Applicator

This applicator is designed to be mounted on the side of a drum. Mounting the applicator correctly and securely will ensure consistent and safe operation.

Drum Applicator Unit

1. Mount the drum applicator (a) on the side of a drum (b) with the pump on the outside as shown (Figure 1).
2. Place the suction (c) and return (d) hoses into the drum. Make sure the suction hose reaches to the bottom of the drum.
3. The location of the drum applicator should not cause it to interfere with the operation of any other piece of equipment.

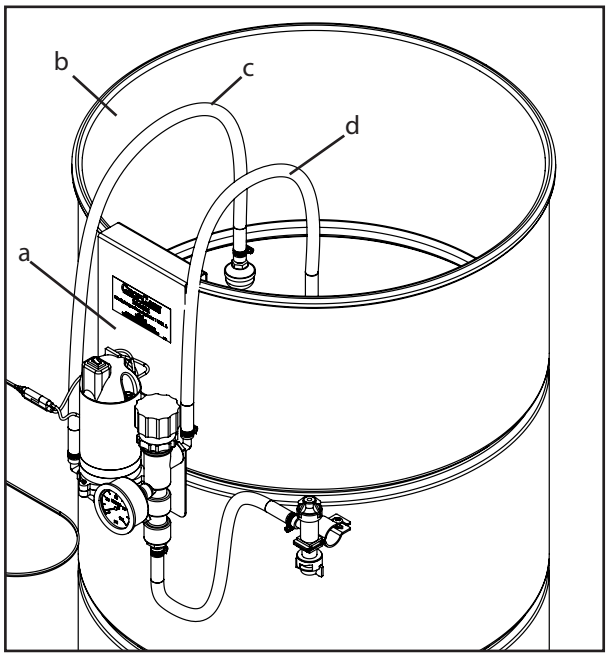


Figure 1: Drum applicator mounting

Mounting the Drum Applicator

Drum Applicator Spray Nozzle

With the drum applicator securely mounted, you now need to properly mount the spray nozzle in the desired location. Mounting techniques may vary with the piece of equipment being used.

1. Determine the optimal location for applying the liquid inoculant or other chemicals. Ensure that this location will provide the most complete spray coverage and safe operation.
2. Attach the vinyl spray hose (a) to the discharge barb on the poly tee (b) below the relief valve (c) with an included hose clamp (d) (Figure 2).
3. Route the vinyl hose to the desired application location on the piece of equipment. Ensure that the hose will not interfere with the operation of the equipment.
4. Connect the vinyl hose (a) to the nozzle body (e) with an included hose clamp (d) (Figure 2).
5. The spray nozzle (a), spray nozzle cap (b), and tip strainer (c) then need to be installed onto the nozzle body (d) (Figure 3).
6. The recommended technique for mounting the nozzle body is on a piece of round or square tubing (e) with a boom clamp (f) (Figure 3).
7. Your drum applicator kit includes one 3/4" standard pipe boom clamp.

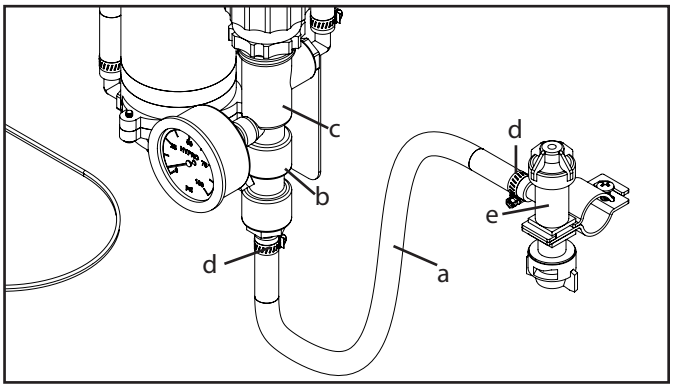


Figure 2: Hose routing

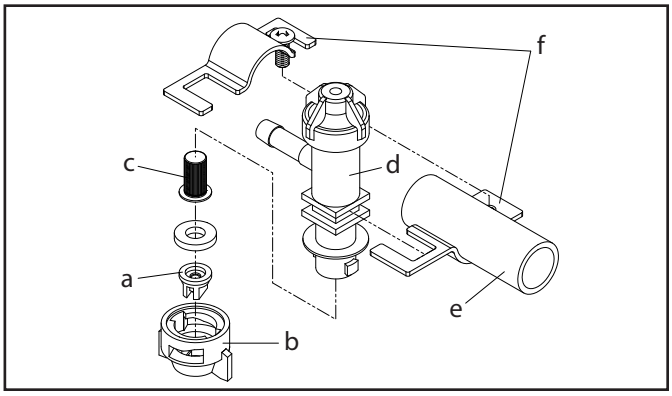


Figure 3: Nozzle assembly

Wiring Harness

1. The pump wiring harness should be routed from the drum applicator to the tractor battery or another 12 volt, 10 amp, DC power source.
2. There are two 8' wiring harness extensions (a) included with the applicator. Connect the pump wiring harness to one or both 8' harness extensions (depending on the length required to reach the power source). Connect the battery wiring harness (b) and 15 amp fuse (c) to the wiring harness extension and attach it to the battery or another 12 volt, 10 amp, DC power source (Figure 4).
3. Connect the red wire to a positive power source either at the tractor's battery terminal or at a power access point with at least 12 volt, 10 amp capability. The black wire needs to be connected to the negative terminal of the battery or to a good ground source.

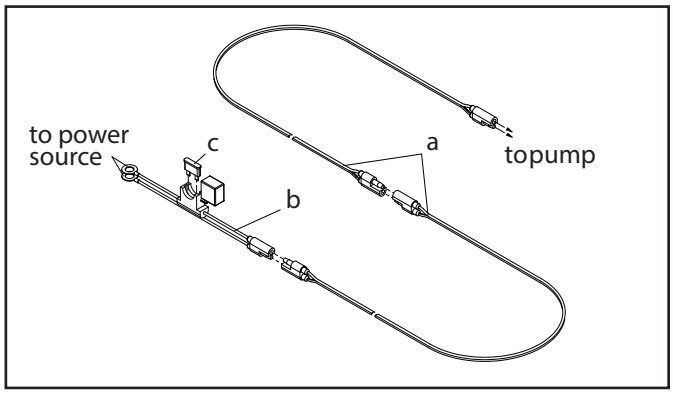


Figure 4: Wiring harness

Calibrating the Drum Applicator

Note: All calibration needs to be done with water only!

To ensure accurate and complete coverage, the drum applicator must be calibrated to determine the correct spray nozzle size and pressure setting. The calibration process is simplified when broken down into the four following steps:

1. Determine the gpt (gallons per ton) recommendation of the inoculant/chemical manufacturer.
2. Determine the mpt (minutes per ton) rating of the crop through the given piece of equipment.
3. Determine the necessary gpm (gallons per minute) for the spray nozzle.
4. Determine the correct spray nozzle size and pressure setting.

1. Determine the gpt recommendation

The inoculant/chemical manufacturer should provide instructions that detail how many gpt (gallons per ton) should be applied for various crops. This amount will likely vary depending on what crop you are applying the inoculant/chemical to.

2. Determine the mpt rating of the equipment

You now need to calculate the mpt (minutes per ton) rating or simply, how many minutes it takes for one ton to be processed by the piece of equipment you are using the drum applicator with.

Example: If your blower processes 2 tons per minute, the mpt calculation is: 1 minute ÷ 2 tons = 0.50 mpt.

3. Determine the necessary gpm for the spray nozzle

The calibration formula is gpm = gpt ÷ mpt. Use the gpt (gallons per ton) and the mpt (minutes per ton) found in steps 1-2 to determine the gpm (gallons per minute) using the formula.

Example: Assume the gpt recommendation is .25 gallons of inoculant per ton of silage and your blower processes 1 ton of silage every 0.50 minutes. Using the formula, you would find that you need a flow rate of .50 gpm (.25 gpt ÷ 0.50 mpt) per nozzle.

4. Determine the nozzle size and pressure setting

Using the gpm calculation, use the calibration chart (page 8) to determine correct spray nozzle size and pressure setting.

Example: Suppose you calculated your necessary gpm to be .50. Using the calibration chart you would find that you should use the brown 11005 nozzle and set the pump's pressure at 40 psi using the relief valve.

Note: Due to normal wear, Teejet® recommends that all spray nozzles be replaced after every season of use. Nozzle replacement will ensure accurate spraying performance.

Calibrating the Sprayer

Drum Applicator Calibration Chart

Tip Size *	Tip capacity in gpm (gallons per minute) at given psi (pounds per square inch) **			
	30 psi	40 psi	50 psi	60 psi
TP650033	.29	.033	n/a	.04
TP650050	.04	.05	n/a	.06
TP8001 (orange)	.09	.10	.11	.12
TP80015 (green)	.13	.15	.17	.18
TP8002 (yellow)	.17	.20	.22	.25
TP8003 (blue)	.26	.30	.34	.37
TP8004 *** (red)	.35	.40	.45	.49
TP8005 *** (brown)	.43	.50	.56	.61
TP8006 *** (gray)	.52	.60	.67	.73
TP8008 *** (white)	.69	.80	.89	.98
TP8010	.87	1.00	1.12	1.22

* 110 degree tips available in sizes 01-08

** Rates based on water density

*** Included with kit

Operating Instructions

Before operating your drum applicator, it is important that you read this entire manual and know all safety precautions. Always take your time and be alert when operating your drum applicator in order to avoid an accident.

Before Operation

1. Before operation it is important to give the drum applicator unit a thorough inspection, covering the hoses, wiring harness, and other applicator components. Ensure that the suction strainer and the drum are rinsed out.
2. Calibrate the drum applicator for the given conditions. Follow the directions listed in the Calibrating the Drum Applicator section (page 6).
3. Install the correct spray nozzle on the drum applicator.
4. Before using any inoculant/chemical ensure that it is not a petroleum-based product, or a product that is not compatible with the pump.
5. Connect the power wiring harness to a 10 amp, 12 volt power source as described in the Mounting the Drum Applicator section (page 4).

Warning: Using a petroleum-based, or non-compatible product will void the manufacturer's warranty. If you are unsure as to whether or not a chemical or substance is acceptable, contact an authorized Zimmerman™ dealer.

During Operation

1. Fill the drum with the correct amount of water and inoculant/chemical as instructed by the manufacturer of the product.
2. Turn on the pump with the switch (a) located on the top of the pump and set the pressure by turning the relief valve (b) (Figure 5). The pressure should be set to the rate found when calibrating the drum applicator.
3. When you are finished using the drum applicator, turn the control switch to off. If the drum becomes empty, remember to turn the pump switch to off.

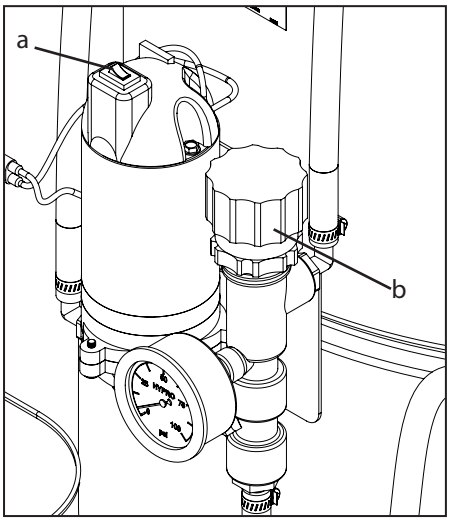


Figure 5: Switch and relief valve

Following Operation

1. Rinse the drum applicator of any inoculant/chemical residue. It is recommended to fill the drum or another container with some fresh water, place the suction hose into the water, and engage the pump until the system is entirely free of chemical residue.

Warning: Do not rinse the drum applicator in an area where humans, animals, or sensitive plants could come in contact with chemical residue.

2. Store the drum applicator in a location where it will be away from human and animal activity. Do not allow children to play near the drum applicator.

Maintenance Instructions

Routine Maintenance

It is very important to perform routine maintenance on your drum applicator before and after each use. Good maintenance practices will help to guard against any breakdowns or accidents.

1. It is recommended to perform a visual and physical inspection for any worn parts, damaged hoses, or other visible problems. Make all necessary repairs before operation. For technical help, or to order parts, contact the original retailer.
2. After each use it is important to rinse the pump and all components by running water through the system. Fill the drum or another container with a sufficient amount of fresh water and engage the pump. Rinsing the pump with fresh water will greatly improve the life of the pump.
3. The nozzle tip strainer (Figure 6) and the suction strainer (Figure 7) should be taken out and rinsed regularly.
4. Always follow all pump safety precautions and warnings (page 3). Following these guidelines will help to ensure many years of smooth and trouble-free pumping.

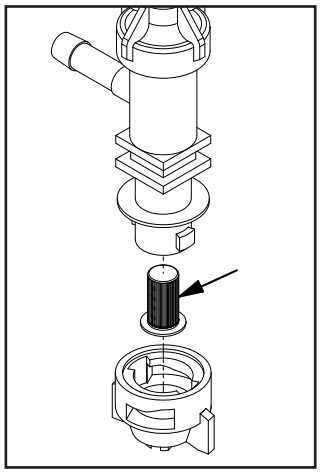


Figure 6: Tip Strainer

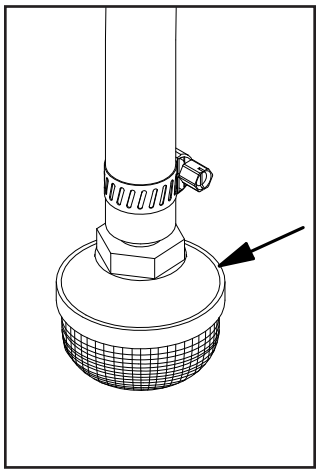


Figure 7: Suction strainer

Note: Due to normal wear, Teejet® recommends that you replace your sprayer nozzles after every spraying season. Nozzle replacement will ensure accurate spraying performance.

Winterizing your Drum Applicator

It is essential that you winterize your drum applicator to avoid damage and to allow for optimal performance. The winterization process should be undertaken before freezing conditions and/or after each season of use. Failure to winterize your drum applicator will void the manufacturer's warranty.

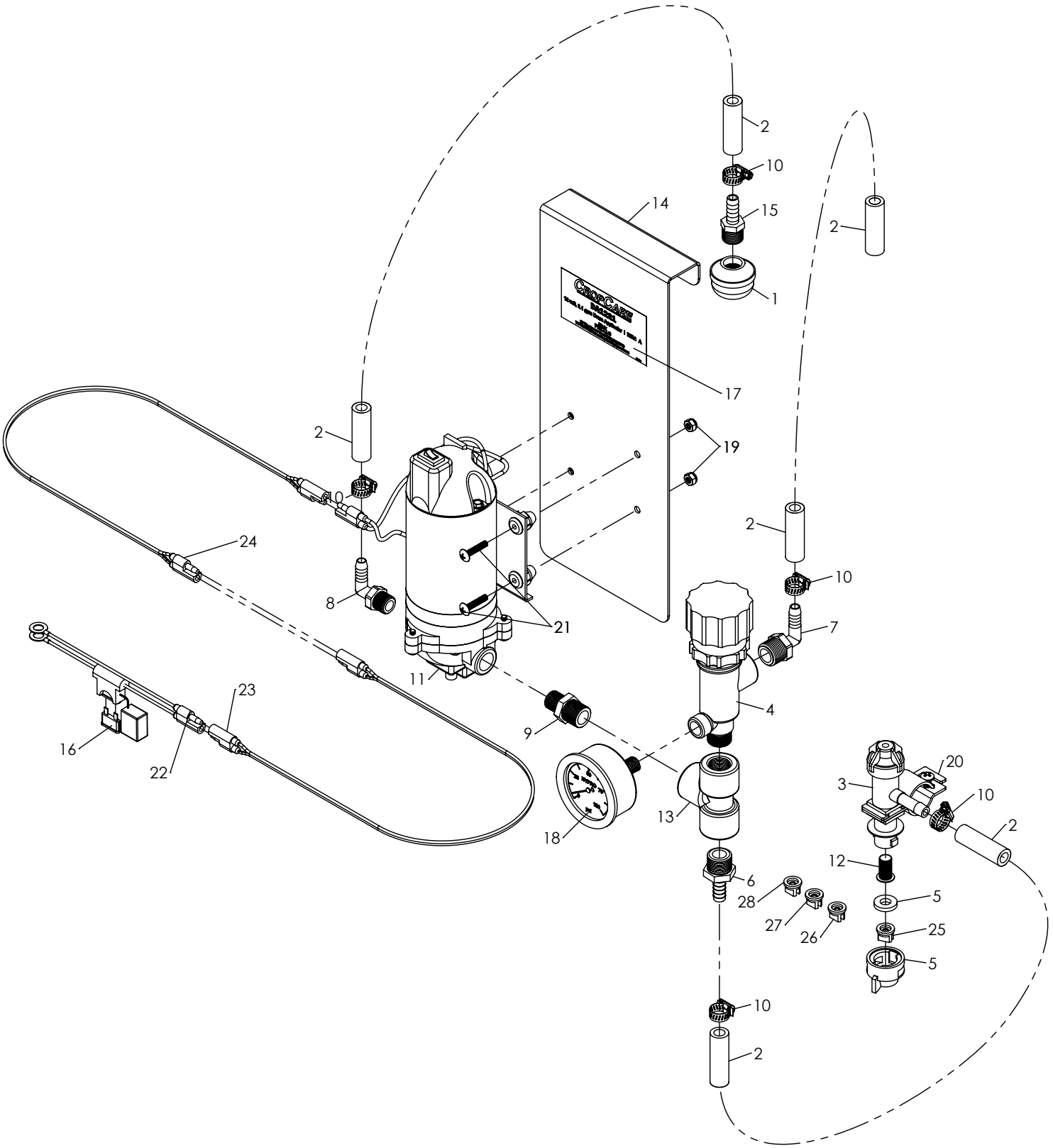
1. Pour a ½ gallon of RV nontoxic antifreeze into a bucket or other container. Place the suction and return lines into it. It is not recommended to use engine antifreeze. Engine antifreeze can be harmful to humans, animals, crops, and the environment.
2. Engage the pump for several minutes. Ensure that the antifreeze has been pumped through the entire system.
3. Store the drum applicator in a dry location away from the elements.
4. Before operation in the spring it is recommended to flush the drum applicator with fresh water to cleanse it of the antifreeze and any other buildup.

Troubleshooting

As you use your drum applicator, it is possible that you will encounter minor problems that can be easily fixed. The following problems and respective causes and solutions should cover most of the potential problems that you may face. If you are having problems please attempt to use this troubleshooting section to solve the problem. If you are unable to fix the problem please contact the original retailer for service.

Problems/Symptoms	Possible Causes	Solutions
Low Rate of Flow	Suction Strainer is partially clogged	Remove the suction strainer and rinse
	Tip strainer is clogged	Remove tip strainer and rinse
	Pump valves are damaged/bad	Replace the valves or contact the original retailer for repairs
	Low voltage	Use a power source with at least 10 amps and 12 volts
Pump Will Not Prime	Leak in suction line	Inspect the suction line for any damage
	Suction strainer is clogged	Remove the suction strainer and rinse
	Pump is damaged from chemicals not being properly rinsed out	Contact the original retailer for service and pump repairs
Pump Will Not Run	Fuse is blown	Replace the fuse on the wiring harness
	Incorrect voltage	Ensure that a 10 amp, 12 volt power source is being used
	Pump pressure switch is malfunctioning	Replace the pressure switch or contact the original retailer for repairs
No Spray Flow	Spray tip is clogged	Remove the spray tip and rinse out
	Suction strainer is clogged	Remove the suction strainer and rinse
	Tip strainer is clogged	Romove the tip strainer and rinse
Pump Pulsating On and Off	Relief valve pressure is set above the pressure setting of the pressure demand switch	Lower the pressure with the relief valve
	Pump pressure switch is malfunctioning	Replace the pressure switch or contact the original retailer for repairs

DA1221 Breakdown



DA1221 Parts List

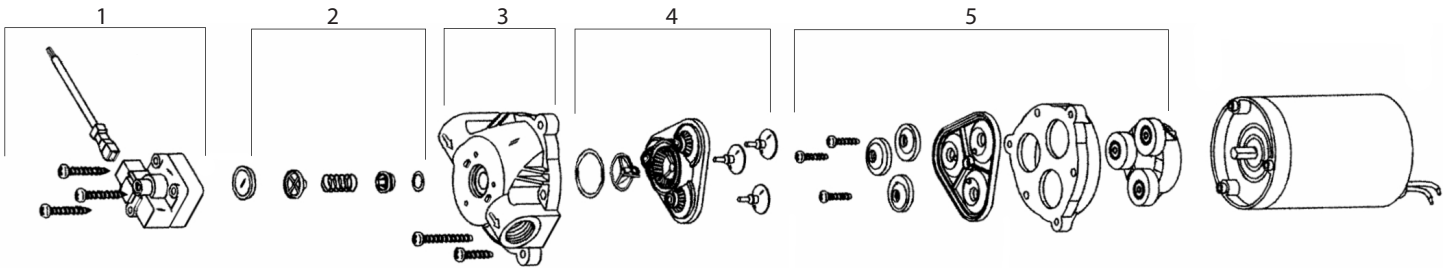
Ref #	Qty.	Part Number		Description
1	1	10416D		Suction strainer, 3/8" ID, 40 mesh
2	20 FT	1206		EPDM rubber hose, 3/8" 200 psi
3	1	22251311375NYB	****	Body, Nozzle Elbow 3/8" QJ300
4	1	2312012PP	***	1/2" poly relief valve, 100 psi
5	1	114441A1CELR	**	Quick TeeJet cap & seal gasket set
6	1	3A1238		poly hose adapter, 1/2" MNPT x 3/8" barb
7	1	3EL1238		1/2" MP x 3/8" barb poly hose adapter
8	1	3EL3838		3/8" MPT x 3/8" barb poly elbow hose adapter
9	1	3M1238		poly pipe nipple, 1/2" x 3/8" MNPT
10	5	62606		Hose Clamp, Narrow 5/16"-7/8" SS
11	1	8007-594-838	*	2.1 gpm 12 volt pump w/sw and fuse vi-san
12	1	8079PP50		stainless nozzle screen, 50 mesh, red
13	1	8TT12		1/2" poly tee, sch. 80
14	1	9438		Pump mount for Drum Applicator
15	1	A3838BR		Brass adapter 3/8" MPT x 3/8" barb
16	1	ATC-15		ATC fuse, 15amp
17	1	DE61		Decal, DA1221 Specs
18	1	GG100B		100 psi liquid filled pressure gauge, back mount
19	4	NNC1024		nylon lock nut, 10-24
20	1	QJ11134		3/4" vari-quick-clamp
21	4	SBT316*1		Stove bolt truss 3/16" x 1"
22	1	SPT-BCG-1215A-16G		Battery connector with fuse
23	1	SPT-WHE-96-16G		8' wire harness extension
24	1	SPT-WHE-96-16G		8' wire harness extension
25	1	TP8004VP		Teejet spray tip, XR, ceramic, yellow
26	1	TP8005VP		Teejet spray tip, XR, ceramic, brown
27	1	TP8006VP		Teejet spray tip, XR, ceramic, gray
28	1	TP8008VP		Teejet spray tip, XR, ceramic, white

* Pump breakdown is listed on page 13
** Nozzle cap and gasket breakdown is listed on page 13
*** Relief valve breakdown is listed on page 14
**** Nozzle body breakdown is listed on page 14

Breakdowns & Parts Lists

Shurflo® Pump Breakdown

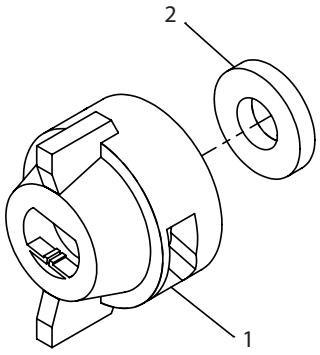
Model: 8007-594-838



Shurflo® Pump Parts List

Ref #	Qty.	Part Number	Description
1	1	9437518	Switch kit, vition, 90 psi
2	1	9437405	Check valve kit
3	1	9437900	Upper housing kit
4	1	9439005	Valve kit, viton
5	1	9438532	Diaphragm and drive kit, santoprene

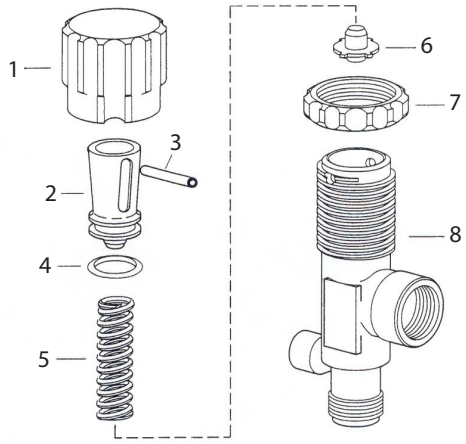
Nozzle Cap and Gasket Breakdown & Parts List



Ref #	Qty.	Part Number	Description
1	1	CP114440A1CE	QJ cap, fan tip
2	1	CP19438EPR	Seat washer, rubber

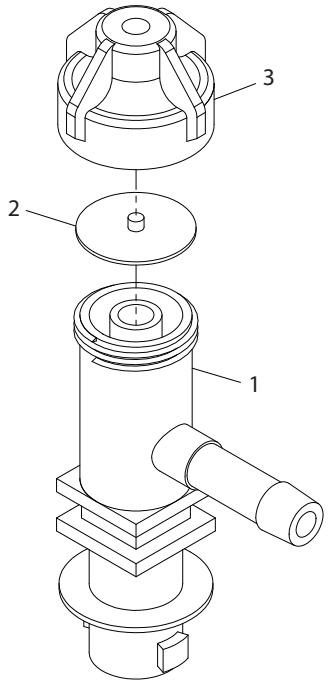
Breakdowns & Parts Lists

Relief Valve Breakdown & Parts List



Ref #	Qty.	Part Number	Description
1	1	CP23122-NY	Nylon adjusting cap
2	1	N/A	Polypropylene spring retainer
3	1	*	Stainless retaining pin
4	1	*	EPDM rubber O-ring
5	1	*	Stainless spring
6	1	N/A	Polypropylene guide seat
7	1	CP23123-PP	Poly lock ring
8	1	CP23128-PP	Polypropylene body, 1/2" MNPT
*	1	PK-AB23120-KIT	Spare parts kit (includes ref. #'s 3, 4, 5)

Nozzle Body Breakdown & Parts List



Ref #	Qty.	Part Number	Description
1	1	N/A	Elbow body, 3/8" (Includes items 2-3)
2	1	CP21953EPR	Rubber diaphragm
3	1	2195010NYB	Diaphragm cap, 10 psi

Limited Warranty

Drum Applicator: Model# DA1221

Warranty Coverage

Zimmerman™ hereby provides a Limited One (1) Year Warranty on Drum Applicators, manufactured by Zimmerman™. Drum Applicators manufactured by Zimmerman™ are warranted against any manufacturer's defects in any of the applicator's components in the 12 months following the original date of purchase.

Defective components will be repaired or replaced at the discretion of the manufacturer. It is the responsibility of the purchaser to return warranted components to the manufacturer. This warranty is limited to the repair or replacement of applicator components only. Zimmerman™ is not to be held liable for incidental or consequential damages of any kind. This warranty covers the purchaser of this applicator and any other owners who own it during the one year warranty period.

To retain the warranty, the applicator must be operated and maintained as ascribed by its owner's manual. For warranty service, please have a copy of the purchase invoice available.

Warranty Is Void if:

1. The applicator has been subjected to, in the opinion of Zimmerman™, negligent handling, misuse, an accident or if the instructions in the owner's manual were not completely followed.
2. The applicator's components have been altered in any manner or repairs have taken place with unapproved parts.
3. The applicator and its components were subject to freezing or freezing conditions. The sprayer must have been winterized as per the maintenance instructions to retain the warranty.
4. A non-compatible chemical was used and/or if the applicator operator failed to rinse all chemical residue out of the applicator's components after use.
5. A petroleum-based, oil-based, or flammable product was used and caused damage to the pump, hoses, or any other component.

Getting Warranty Service

All drum applicator warranty claims must be made through the original retailer. All warranty claims must be submitted with an invoice or a proof of purchase that denotes the purchase date and place of purchase. If you have any questions or comments concerning this warranty, please contact the original retailer.

Ordering Parts

Please contact the original retailer to order replacement parts for your product.

CROPCARE®

Manufactured by PBZ LLC
A Paul B Zimmerman Inc. Company
www.ZimmermanEquipment.com