

CROPCARE

TM

Equipment Built For You

DRUM APPLICATOR

Model DA1221

Owner's Manual



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A Paul B Zimmerman Inc. Company

PaulB LLC thanks you for choosing to purchase one of our drum applicator models. We appreciate your business and want to personally fill all of your sprayer needs. We also desire to provide you with the technical support and needed parts that will allow you to continue operation without disruption. See the Contact Us section on page 17.

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Before You Begin

- ◆ **Please read and understand this manual and its instructions and warnings completely before operating the drum applicator.**
- ◆ **Be aware of all safety guidelines, warnings, and cautions including those of any piece of equipment the drum applicator may be mounted upon or used with accordingly.**
- ◆ **Read and understand the inoculant or chemical manufacturer's labels, warnings, and instructions.**

! 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 in this section.

- ◆ **NEVER MOUNT OR SERVICE THE DRUM APPLICATOR WHEN THE EQUIPMENT IS RUNNING.** Always turn the equipment off, the tractor off, and unhook the piece of equipment before mounting or servicing.
- ◆ The operator should be a responsible adult. **Do not allow persons to operate this drum applicator until they have displayed a thorough understanding of applicator safety precautions and operational use!**
- ◆ Never attempt to operate this drum applicator when under the influence of alcohol or drugs.
- ◆ If there is any portion of this manual that you do not fully understand, please contact PaulB LLC.

Before Operation

- ◆ Carefully study and understand this owner's manual.
- ◆ **Read and follow the 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's clothing requirements are listed under the "Personal Protective Equipment" (PPE) section in the chemical instructions.**
- ◆ Have all operators practice operating the drum applicator until all persons are completely capable of safe operation.
- ◆ **Give the drum applicator a visual inspection** for any worn parts, leaking hoses, or other visible problems, and make the necessary repairs. See the maintenance section on page 9.

During Operation

- ◆ **NEVER MOUNT OR SERVICE THE DRUM APPLICATOR WHEN THE EQUIPMENT IS RUNNING.** Always turn the equipment off, the tractor off, and unhook the piece of equipment before mounting or servicing.
- ◆ Never leave running equipment, including the drum applicator, unattended!
- ◆ Remember that accidents can even happen to seasoned operators. Always take your time and follow all safety instructions.
- ◆ When you are finished using the drum applicator, always remember to flush the pump of all harmful chemical residue. Store the drum applicator in an area protected from the elements. Do not permit children to play on or around the drum applicator.

Pump Safety Precautions

- ◆ Never pump flammable, explosive, petroleum-based, or any other non-compatible products such as gasoline, fuel oil, kerosene, etc. Such practices will void the manufacturer's warranty.
- ◆ **DO NOT** allow the pump to get wet or to be exposed to the elements. Allowing the pump to get wet or to be exposed to the elements voids the manufacturer's warranty.
- ◆ **Note: The pump may be run dry for limited periods without resulting in damage.**
- ◆ Never attempt to adjust the pressure of 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 drum applicator is designed to be hung on the side of a drum. Mounting the drum applicator correctly and securely will ensure consistent and safe operation.

Drum Applicator Unit

1. Hang the drum applicator on the side of a drum with the pump on the outside.
2. Place the suction and return hoses into the drum. Make sure the suction hose reaches the bottom of the drum.
3. The location of the drum applicator should not cause the drum applicator to interfere with the operation of any given piece of equipment.

Drum Applicator Spray Nozzles

With the drum applicator is securely mounted, you now need to properly mount the spray nozzle in the desired location. Mounting technique 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 to the discharge barb on the pump with an included hose clamp. 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.
3. Connect the vinyl hose to the nozzle body with an included hose clamp. (See Figure 1 for nozzle body mounting visual.) The spray nozzle, nozzle body cap, and tip strainer then need to be installed onto the nozzle body. See page 12 for a breakdown of the complete nozzle body.
4. The recommended technique for mounting the nozzle body is on a piece of round or square tubing with a boom clamp. Your drum applicator kit includes one 3/4" round boom clamp. See the Accessories section on page 16 for ordering different size round or square boom clamps.

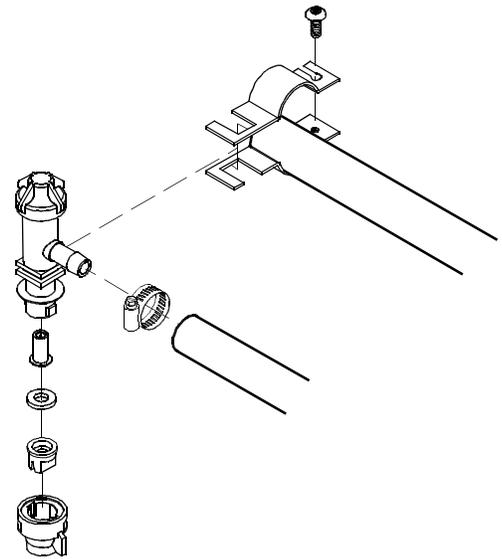


Figure 1: Nozzle Body Mounting

Wiring Harness

1. The wiring harness coming from the pump should be routed from the drum applicator to the tractor battery or another 12 volt DC power source.
2. There are two 8' wiring harness extensions include with the applicator. Connect the pump plug to one or two 8' wiring harness extensions (depending on the length required to reach the power source). Connect the battery connector and fuse to the wiring harness extension and attach it to the battery or another 12 volt DC power source.
3. The wiring harness needs to be connected to a 12 volt DC power source. 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 10 amp capability. The black wire needs to be connected to the negative terminal of the battery or to a good ground source.

Calibrating the Drum Applicator

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 up into the following three steps:

1. Determine the gpt recommendation of the inoculant/chemical manufacturer.
2. Determine the mpt rating of the crop through the given piece of equipment.
3. Use the calibration formula to determine the necessary nozzle and pressure setting.

1. Determine the gallon per ton recommendation.

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

2. Determine the minute per ton rating of the crop through your piece of equipment.

You now need to calculate the mpt 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 on.

Example: If your blower processes 2 tons per minute, the mpt is $1 \text{ minute} / 2 \text{ tons} = 0.50$.

3. Determine the necessary gallon per minute for the spray nozzle.

The calibration formula is $\text{gpm} = \text{gpt} / \text{mpt}$. Use the gpt and the mpt found in steps 1-2 to determine the gallons per minute using the formula.

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

4. Determine the correct spray nozzle size and pressure settings.

Using the gpm calculation, use the calibration chart on page 7 to determine correct spray nozzle size and pressure setting.

Example: Suppose you calculated your necessary gpm to be .50, you should to 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 you replace your sprayer nozzles after every spraying season. Nozzle replacement will ensure accurate spraying performance.

Calibration Chart

Tip Size*	Tip Capacity in gallons per minute at given psi ** (<i>1 tip</i>)					
	15	20	30	40	50	60
650033	.021	.023	.29	.033	n/a	.04
650050	.03	.035	.04	.05	n/a	.06
8001	.06	.07	.09	.10	.11	.12
110015	.09	.11	.13	.15	.17	.18
11002	.12	.14	.17	.20	.22	.25
11003	.18	.21	.26	.30	.34	.37
11004***	.25	.28	.35	.40	.45	.49
11005***	.31	.35	.43	.50	.56	.61
11006***	.37	.42	.52	.60	.67	.73
11008***	.49	.56	.69	.80	.89	.98
11010	n/a	n/a	.87	1.00	1.12	1.22

* 80 degree tips available in sizes 015-08

** Rates based on water density

*** Included with kit, other sizes available upon request

Definition of Terms:

- gpt: gallons per ton
- mpt: minutes per ton
- gpm: gallons per minute
- psi: pounds per square inch
- Calibration Formula: $gpm = gpt / mpt$

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. This will allow you to safely operate the unit without accident or interruption.

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 following the directions listed in the Calibrating section on page 6. Install the correct spray nozzle(s) on the drum applicator.
3. Before using any inoculant or chemical ensure that it isn't a petroleum-based product or a non-compatible chemical for the pump. Using petroleum-based products or non-compatible chemicals voids the manufacturer's warranty. If you are unsure of the acceptableness of a chemical or substance, contact PaulB LLC.
4. Connect the power wiring harness to an approved 12 volt power source as described in the Mounting the Drum Applicator section on page 4.

During Operation

1. Fill the drum with the correct amount of water and inoculant as instructed by the manufacturer of the inoculant being used.
2. Turn on the pump with the switch on the pump and set the pressure by turning the relief valve. The pressure should be set to the optimal rate found when you calibrated 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.

Following Operation:

1. Thoroughly rinsing the drum applicator of any chemical residue is an important activity. It is recommended to fill the drum or another container with some fresh water, place the suction hose into it and engage the pump until the system is entirely free of chemical residue. It is important not to 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 or animal activity. Do not allow children to play on or 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 unnecessary drum applicator 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. See the Contact Us section on page 17 for parts ordering instructions.
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 suction strainer should be taken out and rinsed regularly.
4. Always follow all pump safety precautions and warnings (See page 3). Following these guidelines will help to ensure many years of smooth and trouble-free pumping.

Winterizing Your Drum Applicator

To avoid damage from freezing and corrosion, it is important to winterize your drum applicator before temperatures grow too cold. Failure to winterize your drum applicator will void the manufacturer's warranty.

1. Dump a ½ gallon of RV nontoxic antifreeze into a bucket or another container. Place the suction and return lines into it. **It is not recommended to use standard Antifreeze. Standard 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. It would also be beneficial to do a thorough inspection of all the drum applicator's components before operation.

Trouble Shooting

During the many years you will 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 our trained sprayer technicians for technical advice at no charge. See the Contact Us section on page 17 for ordering parts and contact information.

<i>Problems/Symptoms</i>	<i>Possible Causes</i>	<i>Solutions</i>
Low Rate of Flow	Suction strainer is partially clogged	Remove suction strainer and rinse (ref# 13)
	Tip strainer is partially clogged	Rinse or replace the tip strainer (ref# 25)
	Pump valves are damaged/bad	Replace the valves(ref# 4) or See PaulB LLC for repairs.
	Low voltage	Use a power source with at least 10 amps and 12 volts.
Pump Doesn't Prime	Leak in the suction line	Inspect the suction line for any damage.
	Suction strainer is clogged	Remove suction strainer and rinse (ref# 13)
	Pump damaged from chemicals that weren't rinsed out properly	See PaulB LLC for service and pump repairs.
Pump Doesn't Run	Wiring harness fuse is blown	Replace the fuse on wiring harness (ref# 5).
	Incorrect voltage	Ensure you are using a 10 amp, 12 volt power source.
	Pump pressure switch is malfunctioning	Replace the pressure switch(ref# 1) or see PaulB LLC for repair.
No Spray Flow	Spray nozzle(s) clogged	Remove the spray nozzle and rinse it out.
	Suction strainer is clogged	Remove suction strainer and rinse
	Tip strainer is clogged	Rinse or replace the tip strainer(ref# 25)

PaulB LLC Limited Warranty

Drum Applicator

Model: DA1221

Warranty Coverage

PaulB LLC hereby provides a **Limited One (1) Year Warranty** on the drum applicator, model DA1221 manufactured by PaulB LLC from the date of original purchase. Drum applicators built by PaulB LLC are warranted against any manufacturer's defects that may occur to any of the drum applicator's components in the 12 months following the original date of purchase. This warranty covers the purchaser of this drum applicator and any other owners who own it during the one year warranty period. To retain the warranty, the drum applicator must be operated and maintained as ascribed by its owner's manual.

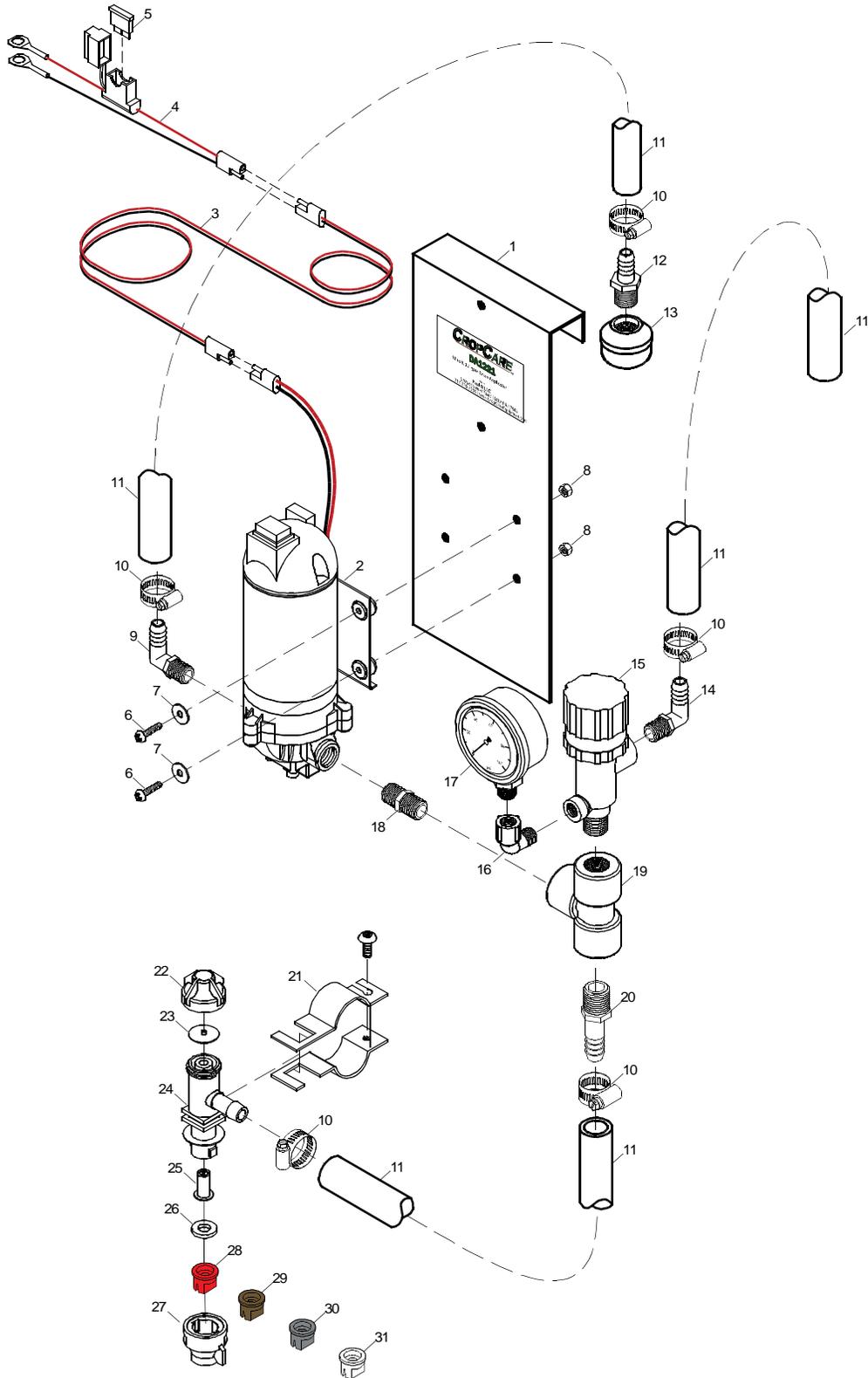
Warranty is void if:

1. The drum applicator has been subjected to, in the opinion of PaulB LLC, negligent handling, misuse, an accident or if the instructions in the owner's manual were not completely followed.
2. The drum applicator's components have been altered in any manner or repairs have taken place with unapproved parts. Alterations include adjusting the pressure setting of the pump.
3. The drum applicator and its components were subject to freezing or freezing conditions. The drum applicator must have been winterized as per the maintenance instructions to retain the warranty.
4. The drum applicator was powered by a power source other than a 10 amp, 12 volt DC power source.
5. A non-compatible chemical (including petroleum-based or flammable liquids) was used and/or if the drum applicator operator failed to rinse all chemical residue out of the drum applicator's components after use.
6. The pump was allowed to get wet repeatedly or was unprotected from the elements.

Getting Service

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

Drum Applicator Breakdown



Drum Applicator Unit Parts List

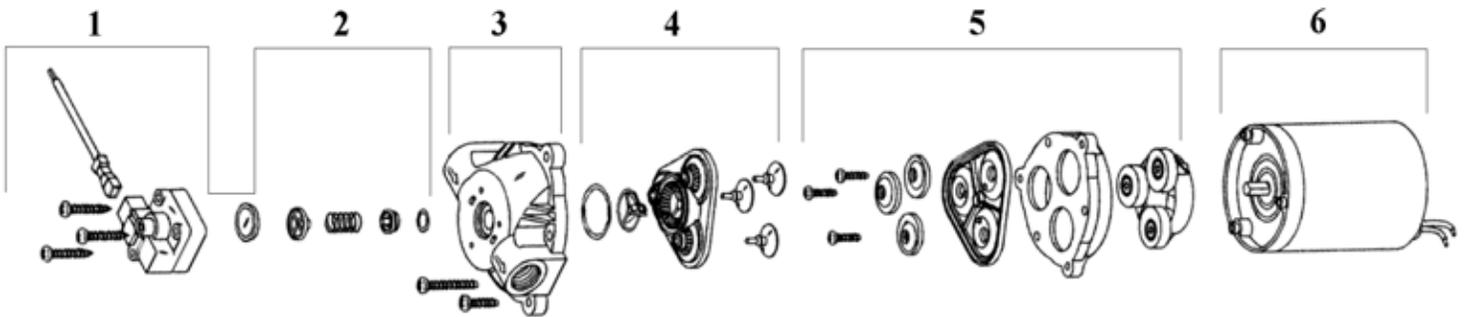
<i>Ref #</i>	<i>Qty.</i>	<i>Part Number</i>	<i>Description</i>
1	1	9438	Shur-flo pump hanging mount for drum
2	1	8007-594-838	** 2.1 gpm 12v pump
3	2	SPT-WHE-96-16G	8' wire harness extention
4	1	SPT-BCG-1215A-16G	Battery connector with fuse (includes #5)
5	1	ATC-15	* Buss fuse, 15 amp
6	4	MR1024*1S	10-24 x 1" stainless machine screw
7	4	FW10S	#10 flat washer stainless
8	4	NNC1024S	10-24 nylon lock nut stainless
9	1	3EL3838	3/8" MP x 3/8" barb poly elbow hose adapter
10	5	62604	Hose clamp, stainless, 1/4" - 5/8"
11	20'	6106	3/8" vinyl reinforced tubing
12	1	A3812BR	3/8" MP x 1/2" barb brass adapter
13	1	111010	Suction strainer 3/8" ID
14	1	3EL1238	1/2" MP x 3/8" barb poly elbow hose adapter
15	1	2312012PP	** 1/2" relief valve poly, 100 psi
16	1	3SE14	1/2" MP x 1/4" FP poly street elbow
17	1	GG100	Gauge liquid filled 2 1/2", 100 psi
18	1	8M1238	1/2" x 3/8" reducing nipple
19	1	8TT12	1/2" poly tee, sch. 80
20	1	3A1238	1/2" MP x 3/8" barb poly hose adapter
21	1	QJ11134	3/4" vari-quick boom clamp
22	1	2195010NYB	Chemsaver end cap assembly
23	1	CP21953EPR	EPDM rubber diaphragm
24	1	22251311375NYB	Vari-quick elbow 3/8"
25	1	8079PP50	Tip strainer, poly, 50 mesh, red
26	1	CP19437EPR	* Seat washer, rubber
27	1	256122NYR	QJ white flat fan cap (includes #26)
28	1	TP8004VP	Polymer visiflo flat spray tip
29	1	TP8005VP	Polymer visiflo flat spray tip
30	1	TP8006VP	Polymer visiflo flat spray tip
31	1	TP8008VP	Polymer visiflo flat spray tip

* Part is included in a complete assembly.

** Pump & relief valve parts breakdowns on pages 14 and 15 respectively.

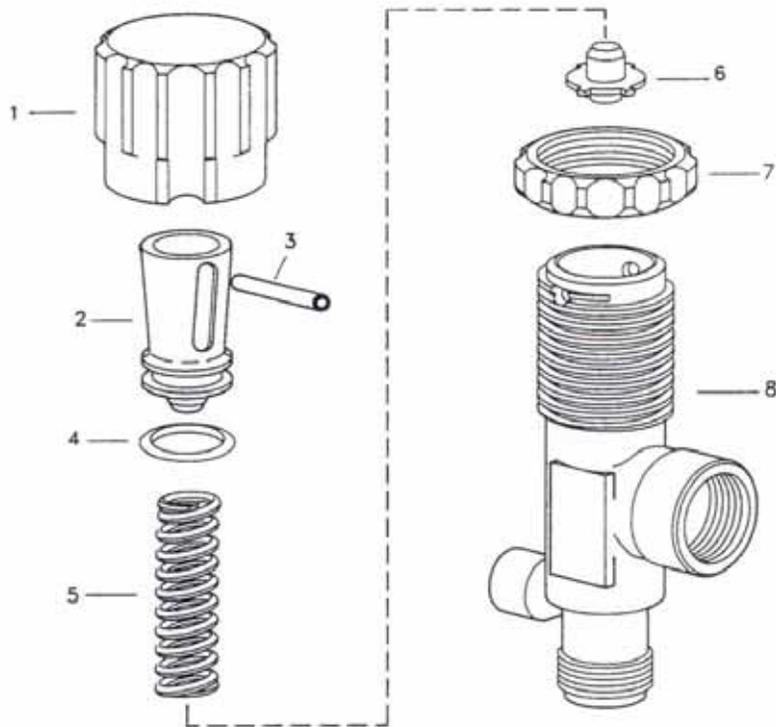
SHURflo® Pump Breakdown

Part # 8007-594-838



<i>Ref #</i>	<i>Qty.</i>	<i>Part Number</i>	<i>Description</i>
1	1	9437518	Switch kit, viton, 90 psi
2	1	9437405	Check valve kit
3	1	9437900	Upper housing kit
4	1	9439005	Valve kit, VITON
5	1	9438532	Diaphragm & drive kit, santoprene
6	1	1118401	SHURflo® motor, 12 volt
1-5	1	9438042	Complete pump head assembly

Relief Valve Breakdown Part # 2312012PP



<i>Ref #</i>	<i>Qty</i>	<i>Part Number</i>	<i>Description</i>
1	1	CP23122-NY	Nylon adjusting cap
2	1	CP23124-PP	Polypropylene spring retainer
3*	1	CP23126-302SS	Stainless retaining pin
4*	1	CP7717-15-EPR	EPDM rubber O-ring
5*	1	CP23127-302SS	Stainless spring
6	1	CP23125-PP	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 # 3,4,5)

Accessories

There are many beneficial accessories that can complement your drum applicator and help you to optimize your operation. If you need parts or accessories that aren't listed in this owner's manual, please contact us and we will attempt to fill all of your needs. See the Contact Us section on page 17 for information on ordering and shipping.

3/8" Vinyl Reinforced Hose

Part Number: 6106



Additional hose comes in handy for reaching those hard to get to places. This durable hose can be cut to length and is available in additional sizes.

1", 1 1/4", 1 1/2" Square Boom Clamps

Part Number: QJ111SQ-size



Are you mounting your spray nozzle bodies on a square piece of tubing? Try our durable boom clamps which are available in various sizes.

1/2", 3/4", 1", 1 1/4" Round Boom Clamps

Part Number: QJ111-size



Durable boom clamps are an effective tool for mounting your spray nozzle bodies. These boom clamps are available in various sizes.

Teejet® Spray Nozzles

Part Numbers: See Calibration Chart



Whether you need additional spray nozzles or need to replace existing nozzles, Teejet® spray nozzles are a great choice. These accurate and high-performance nozzles are available in a multitude of sizes.

Contact Us

We desire to give you continuing service in the best manner possible. This includes listening to your comments, suggestions, and problems. We will do our best to answer all questions thoroughly and in a timely manner. We have trained sprayer technicians who are more than willing to listen to any questions or problems and help you to find a feasible solution.

Ordering Parts

We have a fully-stocked parts department that will be able to meet all of your parts needs. Our trained salespersons will ensure that all purchases are processed smoothly and shipped in a timely manner. Our hardware store also has a plumbing, electrical, automotive, paint, lawn & garden, and a power tool department. We are set up to ship our products via UPS® and would be glad to work with you on the best shipping solution. If you desperately need a part, we are able ship UPS® Next Day Air for many locations.

Note: When ordering parts, please provide our sales staff with the correct part number and description listed on the parts list. **To directly reach our parts department, please call (717) 738-7355 ext 2000.**

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