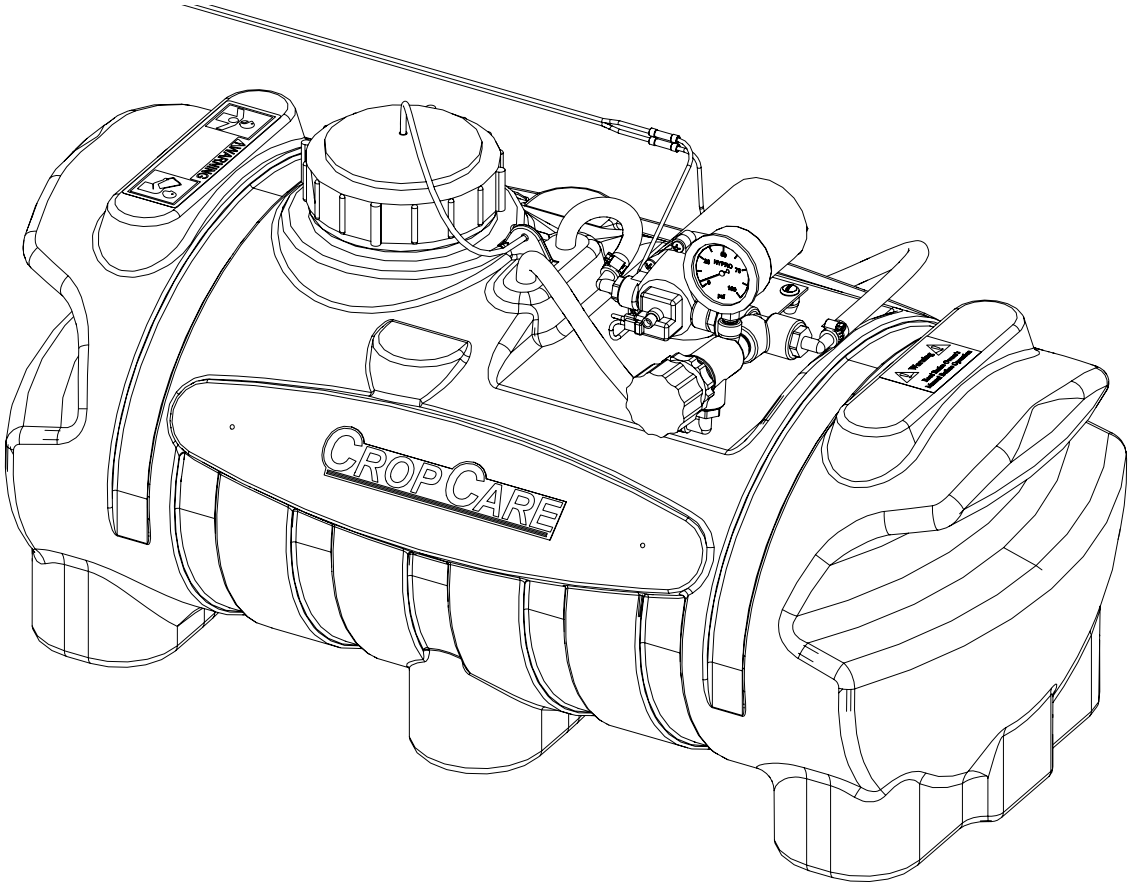
CROPCARE
by PBZ

Owner's Manual

25 Gallon Liquid Applicator
Model BA25K



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

Form: BA25KOM
Rev. A.2 Date 04/19

Table Of Contents

Identification of Machine

- Model #'s: BA25K
- The model number and revision identification decal is located on top of the tank .

Specifications

25 gallon Liquid Applicator
Model #: BA25K

Tank capacity ..... 25 gal
Min power supply ..... 12 volt / 10 amp
Wiring harness length ..... 8'

Pump:
Type ..... Diaphragm pump
Manufacturer ..... Shurflo®
Max pressure ..... 60 psi
Open flow rate ..... 1.8 gpm

Before You Begin

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

- If you purchased a model BA25K, the spray nozzles, spray hose, nozzle bodies, and boom clamps are not included.
- Be aware of all safety guidelines, warnings, and cautions including those of any piece of equipment the liquid applicator may be mounted upon or used with accordingly.
- Read and understand the inoculant or chemical manufacturer's labels, warnings, and instructions.
- Know and fulfill all state pesticide applicator license requirements.
- Familiarize yourself and other operators with the sprayer'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 in this section.

- NEVER MOUNT, FILL, OR SERVICE THE LIQUID APPLICATOR WHEN THE EQUIPMENT IS RUNNING! Always turn the equipment off, the tractor off, and unhook the piece of equipment before mounting, filling, or servicing.
- The operator should be a responsible adult. Do not allow persons to operate this liquid applicator until they have displayed a thorough understanding of applicator safety precautions and operational use!
- Never attempt to operate this applicator when under the influence of alcohol or drugs.
- A chemical warning decal and an owner's manual warning decal are located on the applicator's tank. Be aware of their location. See Figure 1 and Figure 2 on page 2. Always replace any warning decals that aren't legible or are missing.
- If there is any portion of this manual that you do not fully understand, please contact the original retailer.

Figure 1: Chemical Warning Decal(# DEMT3980)

Figure 2: Owner's Manual Decal(# DE39)

Safety Precautions

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.

Note: If you are permanently mounting the sprayer in an outdoors location that isn't protected from the elements, it is important that you cover the pump to protect it.

- 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.

Note: If possible, it is recommended to use one large spray nozzle instead of two very small spray nozzles. Small spray nozzles are more likely to be hindered by spray drift.

- Never exceed the load rating of the piece of equipment that the liquid applicator is mounted on. The 25 gallon liquid applicator weighs around 250 lbs. with a full tank.
- Have all operators practice operating the applicator until all persons are completely capable of safe operation.
- Give the applicator a visual inspection for any worn parts, leaking hoses, or other visible problems, and make the necessary repairs. See the maintenance section(page 9).

During Operation

- NEVER MOUNT, FILL, OR SERVICE THE LIQUID APPLICATOR WHEN THE EQUIPMENT IS RUNNING! Always turn the equipment off, the tractor off, and unhook the piece of equipment before mounting, filling, or servicing.
- Always be aware of bystanders, particularly children!
- No passengers are allowed on the mounting equipment or the applicator at anytime.
- Never leave running equipment, including the liquid 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 applicator, always remember to rinse the tank and flush the pump of all harmful chemical residue. Store the applicator in an area protected from the elements. Do not permit children to play on or around the 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.
- Always disconnect the power to the pump when working on the pump. Failure to do this could result in electrical shock.

Mounting the Applicator

This liquid applicator is designed to be mounted on a baler, forage harvester, bagger, blower, and any other applicable piece of equipment. Mounting the liquid applicator correctly and securely will ensure consistent and safe operation.

Base Unit

1. Mount the liquid applicator on the given equipment in a location that can withstand the weight of the applicator with a full tank. The 25 gallon liquid applicator weighs around 250 lbs with a full tank.
2. The chosen mounting location should also be easily accessible for filling the applicator's tank and for viewing the pressure gauge.
3. The location of the liquid applicator should not cause the liquid applicator to interfere with the operation of the given piece of equipment it is mounted on.
4. For optimal stability, mount the liquid applicator with bolts using the six holes in the sprayer's bottom. See Figure 3 on page 6. It is recommended that you measure the distance between the bottom mounting holes because tank measurements can vary up to 1/8". See figure 4 on page 6.
5. Lastly, the pressure gauge must be installed on the applicator unit. The pressure gauge is threaded into the 1/4" female inlet on the relief valve. Before installing the pressure gauge, wrap Teflon tape or liquid Teflon around the gauge's threads. Use a wrench on the gauge's brass nut to tighten the guage. DO NOT thread the gauge by hand or over- tighten it.

Note: Do not tighten bolts past 1/2" in the six holes in the sprayer bottom.

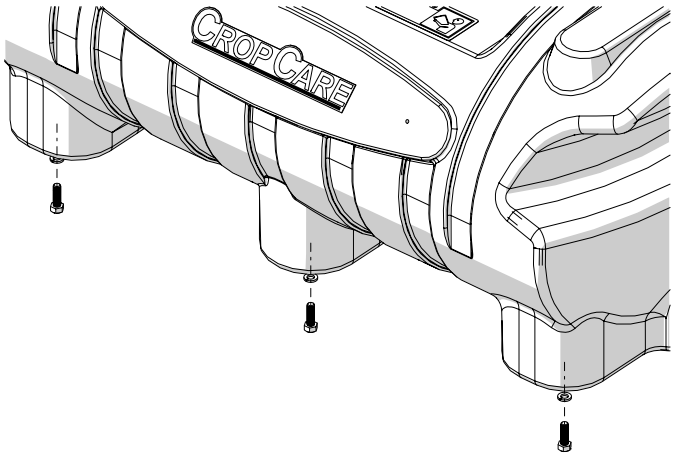


Figure 3: Applicator unit mounting

Note: If you are permanently mounting the sprayer in an outdoors location that isn't protected from the elements, it is important that you cover the pump to protect it.

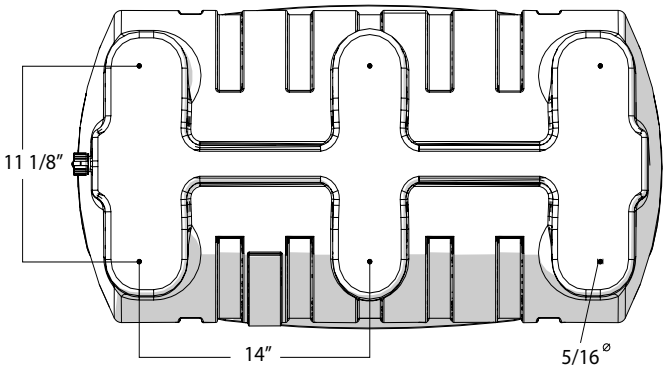


Figure 4: Bottom hole dimentions

Applicator Spray Nozzles

-With the liquid applicator securely mounted, you now need to properly mount the spray nozzle(s) 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 complete coverage and safe operation.
2. Attach the vinyl spray hose to the discharge barb 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(s) with an included hose clamp. The spray nozzles, nozzle body caps, and tip strainers are all installed into the nozzle body. See Figure 5 on page 7 for a breakdown of the complete nozzle body.
4. The recommended technique for mounting the nozzle body(s) is on a piece of round or square tubing with a boom clamp. Your applicator kit includes two 1/2" round boom clamps. See the Accessories section on page 17 for ordering different size round or square boom clamps. See Figure 5 on page 7 for a diagram of how the spray nozzle bodies are mounted on tubing.

Note: If the desired mounting location lacks tubing for mounting, it may be possible to install a piece of tubing on your equipment for optimal mounting.

5. Depending on the size of the application area on the piece of equipment, you will need to use one or two spray nozzles. Begin by installing the nozzle body elbow and test to see if the spray pattern covers the entire application area. If two spray nozzle bodies are needed for complete coverage, install the nozzle body tee first and the nozzle body elbow secondly. See Figure 5 on page 7.

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

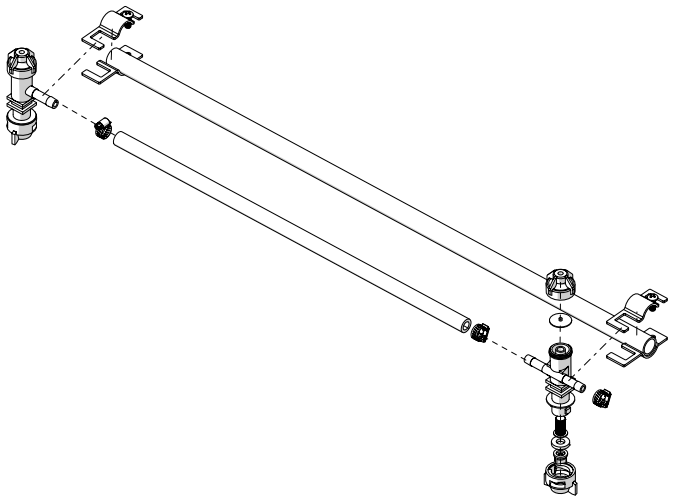


Figure 5: Nozzle body mounting

Wiring Harness

1. The wiring harness coming from the pump should be routed from the applicator to the tractor or to the power source.

2. Connect the pump wiring harness to the wiring harness with the control box using the plugs on the ends of the harnesses.

3. The control box now needs to mounted in a location that is easily accessible for operation. Insert bolts through the metal tabs on the back of control box for optimal mounting. See Figure 6 on page 8.

4. The power wiring harness(connected to control box) 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 brown wire needs to be connected to the negative terminal of the battery or to a good ground source.

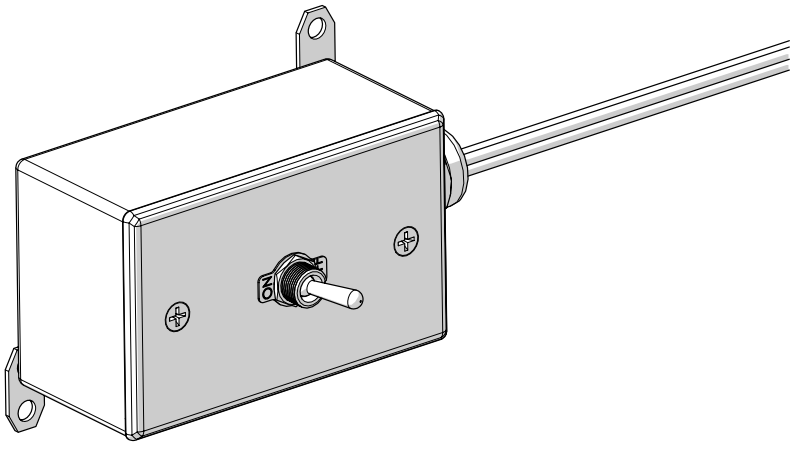


Figure 6: Control box mounting

Calibrating the Applicator

To ensure accurate and complete coverage, the liquid 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 gallon per ton(gpt) recommendation of the inoculant/chemical manufacturer.
2. Determine the minute per ton(mpt) rating of the crop through the given piece of equipment.
3. Use the calibration formula to determine the necessary nozzle and pressure setting.

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

1. Determine the gallon per ton recommendation.

The inoculant/chemical manufacturer should provide instructions that detail how many gallons per ton(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(mpt) rating of the crop through your piece of equipment.

You now need to calculate the minute per ton(mpt) rating or simply the number of minutes it takes for one ton of crop to be processed by the piece of equipment you are using the liquid applicator on.

Example: Your baler can bale a 2.5 ton load in 25 minutes. The minute per ton rating would be 10 minutes per ton(25 min/2.5ton=12mpt)

3. Use the calibration formula to determine the optimal sray nozzel and pressure setting.

1. Determine the necessary gallons per minute(gpm) per nozzle. The calibration formula is gallons per minute(gpm) = gallon per ton(gpt) / minute per ton. Use the gallons per ton(gpt) and the minutes per ton(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 2 minutes. Using the formula, you would find that you need a flow rate of .125 gpm (.25 gpt / 2 mpt) per nozzle.

Note: If you are using two spray nozzles, you will need to divide the gallons per minute calculation by two. Example: If you have two nozzles and you calculated your gpm to be .20, you will actually need .10 gpm per spray nozzle.

2. Using the gallons per minute calculation, use the calibration chart on page 8 to determine correct spray nozzle size and pressure setting.

Example: Suppose you calculated your necessary gallons per minute to be .20, you should to use the yellow XR11002VP nozzle and set the pump's pressure at 40 psi using the relief valve.

Calibrating the Applicator

Calibrating Chart

Nozzle Size	Gallons per Minute(gpm) of One Nozzle at Given PSI Rating					
	15	20	30	40	50	60
TP650033SS	N/A	N/A	.029	.03	.04	.04
TP650050SS	N/A	N/A	.04	..05	.06	.06
XR8001VS*	.06	.07	.09	.10	.11	.12
XR110015VP*	.09	.11	.13	.15	.17	.18
XR11002VP*	.12	.14	.17	.20	.22	.24
XR11003VP*	.18	.21	.26	.30	.34	.37
XR11004VP	.24	.28	.35	.40	.45	.49
XR11005VP	.31	.35	.43	.50	.56	.61
XR11006VP	.37	.42	.52	.60	.67	.73
XR11008VP	.49	.57	.69	.80	.89	.98
XR11010SS	.61	.71	.87	1.00	1.12	1.22

* Denotes the spray nozzles included in the applicator kit. Additional nozzles are available, contact original retailer for ordering information.

Operating Instructions

Before operating your liquid 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 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 applicator unit a thorough inspection, covering the hoses, wiring harness, and other applicator components. Ensure that the suction strainer and the tank are rinsed out.
2. Calibrate the liquid applicator for the given conditions following the directions listed in the Calibrating section on page 6. Install the correct spray nozzle(s) on the 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 the original retailer.
4. Connect the power wiring harness to an approved 12 volt power source as described in the Mounting the Applicator section on page 4.

During Operation:

1. Fill the applicator tank with the correct amount of water and inoculant as instructed by the manufacturer of the inoculant being used.
2. Turn on the pump using the control switch and set the pressure by turning the relief valve. The pressure should be set to the optimal rate found when you calibrated the liquid applicator.
3. When you are finished using the applicator, turn the control switch to off. If the applicator's tank becomes empty, remember to turn the control switch to off.

Operating Instructions

Following Operation:

1. Thoroughly rinsing the applicator of any chemical residue is an important activity. It is recommended to fill the tank with fresh water and engage the pump until the system is entirely free of chemical residue. It is important not to rinse the applicator in an area where humans, animals, or sensitive plants could come in contact with chemical residue.
2. Store the applicator in a location where it will be away from human or animal activity. Do not allow children to play on or near the applicator.

Maintenance Instructions

Routine Maintenance:

It is very important to perform routine maintenance on your liquid applicator before and after each use. Good maintenance practices will help to guard against any unnecessary 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. Contact the original retailer 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 tank 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 (page 3). Following these guidelines will help to ensure many years of smooth and trouble-free pumping.

Winterizing Your Applicator:

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

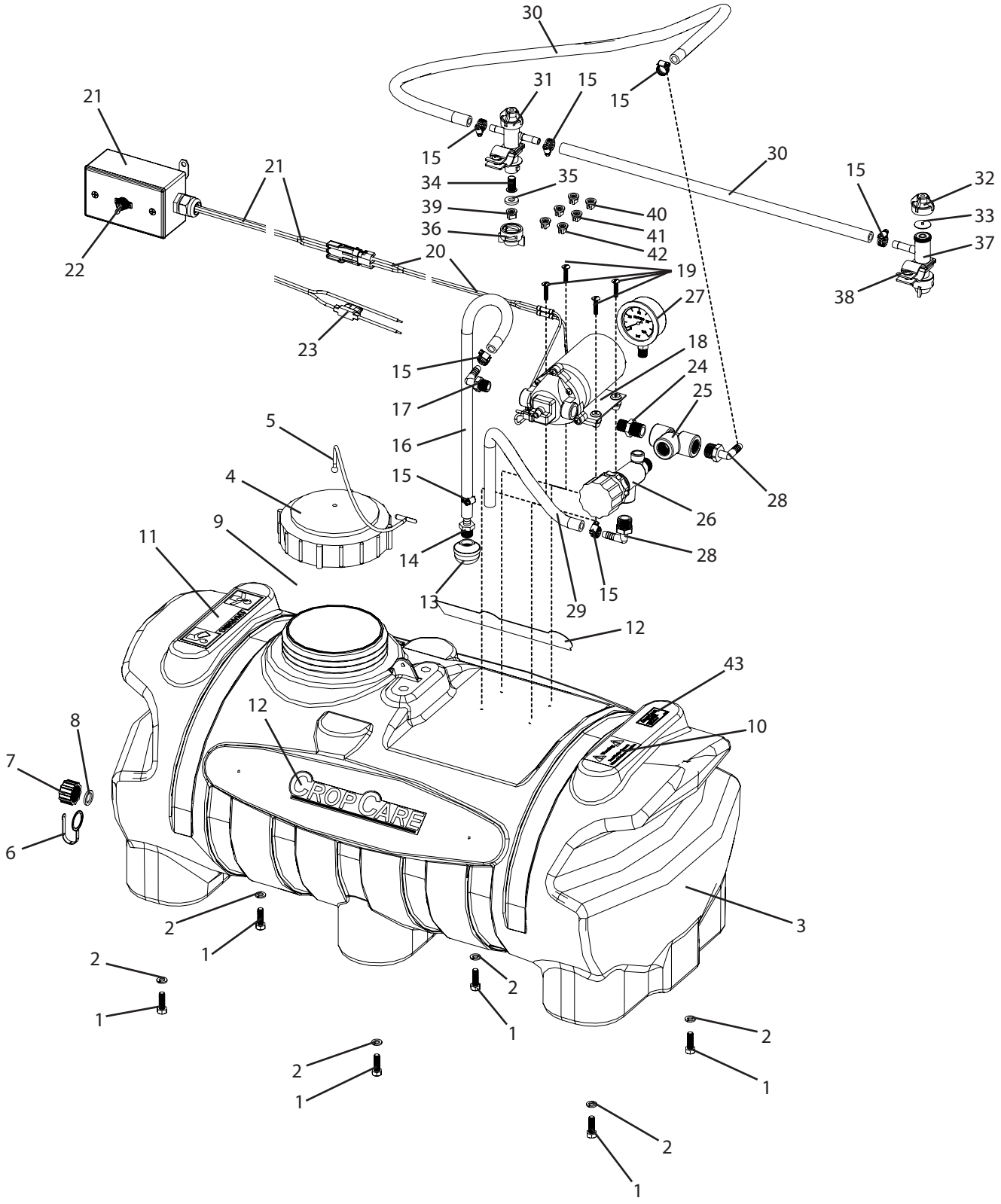
1. Verify that the tank is empty and rinsed out. Dump a ½ gallon of RV nontoxic antifreeze into the tank. It is not recommended to use standard Antifreeze. Standard antifreeze can be harmful to humans, animals, crops, and the environment.
2. Engage the pump for several minutes. Ensure that the antifreeze has been pumped through the entire system.
3. Store the applicator in a dry location away from the elements.
4. Before operation in the spring it is recommended to flush the 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 applicator's components before operation.

Troubleshooting

During the many years you will use your liquid 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. Contact the original retailer for ordering parts and contact information.

Problem/Symptoms	Possible Causes	Solutions
Low Rate of Flow	Suction strainer is partially clogged	Remove suction strainer and rinse
	Tip strainer is partially clogged	Rinse or replace the tip strainer (ref# 32)
	Pump valves are damaged/bad	Replace the valves (ref# 4) or contact the original retailer for repairs
	Low voltage	Use a power source with at least 10 amps and 12 volts
Pump Doesn't Prime	Suction line is clogged	Inspect the suction line for debris.
	Suction strainer is clogged	Remove suction strainer and rinse.
	Pump damaged from chemicals that weren't rinsed out properly	Contact original retailer for service and pump repairs.
Pump Doesn't Run	Wiring harness fuse is blown	Replace the fuse on wiring harness (ref# 20)
	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 contact original retailer for repair.
No Spray Flow	Spray nozzle(s) clogged	Remove the spray nozzle(s) and rinse it out.
	Suction strainer is clogged	Remove suction strainer and rinse
	Tip strainer is clogged	Rinse or replace the tip strainer(ref # 32)

BA25K Breakdown



BA25K Breakdown

Parts List

Ref #	Qty.	Parts Number	Description
1	6	H5C516*12	Hex cap screw, 5/16" x 1/2", grade 5
2	6	LW516	Lock washer, 5/16"
3	1	T248	Tank, 25 gal liquid applicator, BA25K, BA25E-S
4	1	60322 ***	Tank lid, poly, black
5	1	10873 ***	Lanyard, 12" long
6	1	19025 ***	Tank Outlet Cap Tether for Den Hartog Applicator Tank
7	1	19024 ***	Tank Outlet Cap for Den Hartog Applicator Tank
8	1	10960 ***	Tank Outlet Cap Gasket for Den Hartog Applicator Tank
9	1	11042 ***	EPDM gasket for 5" lid
10	1	DE39 ***	Owner's manual warning decal
11	1	DEMT3980 ***	Chemical warning decal
12	2	DE46 ***	Crop Care® logo decal
13	1	10416D	Suction strainer, 3/8" fpt, 40 mesh
14	1	3A3838	Hose adapter, 3/8" mpt x 3/8" barb, poly
15	7	62604052	Hose clamp, 1/4" - 5/8", stainless, round
16	21"	1206	EPDM rubber hose, 3/8", 200 psi
17	1	3EL3838	Hose adapter elbow, 3/8" mpt x 3/8" barb
18	1	8000-543-936 **	SHURflo® pump, 1.8 gpm, 12 volt
19	4	SBT316*1	Stove bolt, truss head, 10-24 x 1"
20	1	F1512	Wiring harness (connects to pump)
21	1	F1511	Wiring harness with control box
22	1	DC7200102 *	Control toggle switch, on-off-on
23	1	ATC-15 *	Buss fuse, 15 amp
24	1	3M1238	Reducing nipple, 1/2" mpt x 3/8" mpt
25	1	8TT12	Pipe tee, 1/2" fpt, poly, schedule 80
26	1	2312012PP **	Relief valve, 1/2", poly
27	1	GG100	Pressure gauge, liquid-filled, 2 1/2", 100 psi
28	2	3EL1238	Hose adapter elbow, 1/2" mpt x 3/8" barb, poly
29	14"	1206	Reinforced vinyl tubing, 3/8", 250 psi
30	15'	1206	EPDM rubber hose, 3/8", 200 psi
31	1	22252312375NYB	Nozzle body tee, 3/8"
32	1	2195010NYB *	Chemsaver end cap assembly
33	1	CP21953EPR *	EPDM rubber diaphragm
34	2	8079PP100	Tip strainer, 100 mesh, stainless steel, green
35	2	CP19438EPR	Seat washer, rubber

* Part is included in complete assembly.

** Pump & relief valve parts breakdown on pages 15 and 16 respectively.

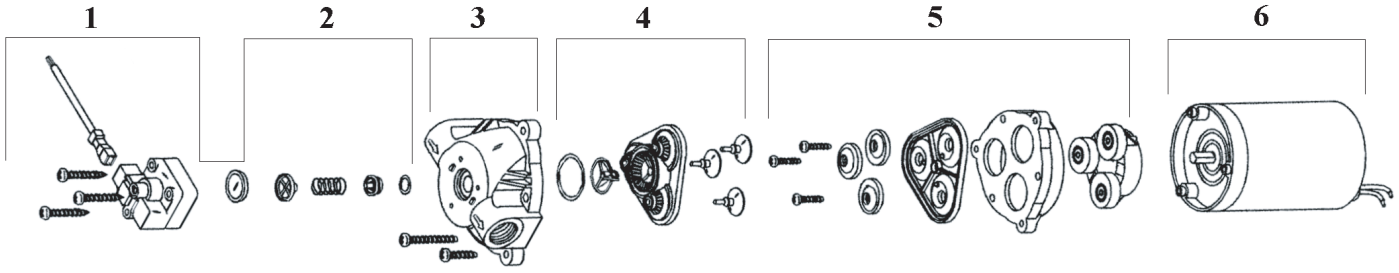
*** Parts are included with the T248 tank.

Parts List Cont.

Ref #	Qty.	Parts Number	Description
36	2	CP256071NY	Cap, TeeJet Round Black
37	1	22251311375NYB	Nozzle body elbow, 3/8" (components same as tee)
38	2	QJ11112 **	Boom clamp, 1/2"
39	2	XR8001VS	Teejet® spray nozzle, stainless steel, 80 degrees, 1.0, orange
40	2	XR110015VP	Teejet® spray nozzle, polymer, 110 degrees, 1.5, blue
41	2	XR11002VP	Teejet® spray nozzle, polymer, 110 degrees, 2.0, yellow
42	2	XR11003VP	Teejet® spray nozzle, polymer, 110 degrees, 3.0, green
43	1	DE177	Decal, Model BA25K, Rev. A.2

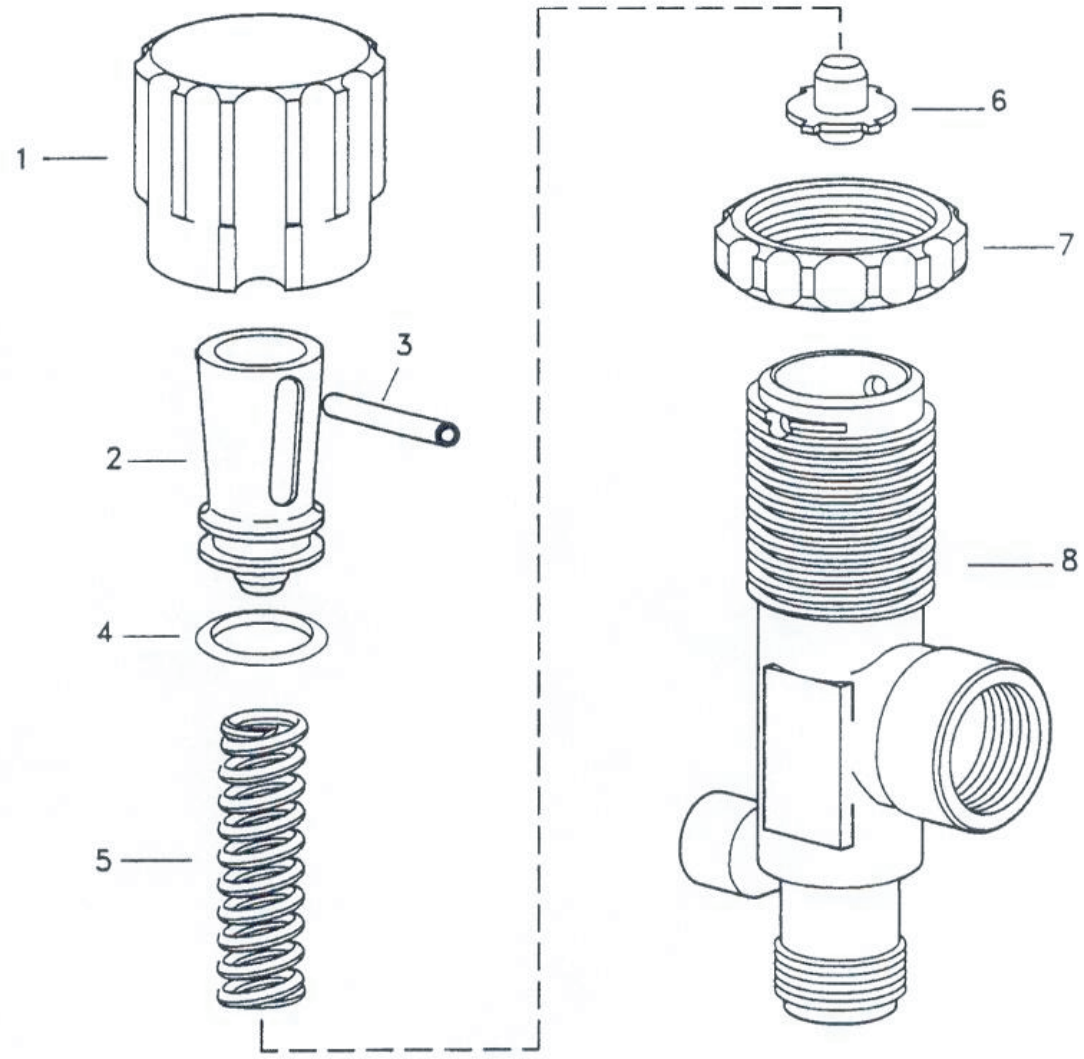
* Part is included in a complete assembly
** Alternative boom clamps for mounting are available in the Accessories section on page 17.
*** Parts are included with the T248 tank.

SHURflo® Pump Breakdown Part # 8000-543-936



Ref #	Qty.	Part Number	Description
1	1	9437505	Switch kit, viton, 60 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	1111104	SHURflo® motor, 12 volt

Relief Valve Breakdown Part # 2312012PP



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 # 3,4,5)

CropCare® Limited Warranty

25 Gallon Liquid Applicator BA25, BA25K

Warranty Coverage

CropCare® hereby provides a Limited One (1) Year Warranty on the 25 gallon liqiud applicators, models BA25, BA25K, manufactured by CropCare® from the original date of purchase. Liquid applicators built by CropCare® are warrantied against any manufacturer's defects that may occur to any of the applicator's components in the 12 months following the original date of purchase. This warranty covers the purchaser of this liquid applicator and any other owners who own it during the one year warranty period. To retain the warranty, the liquid applicator must be operated and maintained as ascribed by its owner's manual.

Warranty Is Void if:

1. The liquid applicator has been subjected to, in the opinion of Crop Care®, negligent handling, misuse, an accident or if the instructions in the owner's manual were not completely followed.
2. The liquid 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 liquid applicator and its components were subject to freezing or freezing conditions. The liquid applicator must have been winterized as per the maintenance instructions to retain the warranty.
4. The liquid 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 and flammable liquids) was used and/or if the applicator operator failed to rinse all chemical residue out of the applicator's components after use.
6. The pump was allowed to get wet repeatedly or was unprotected from the elements.

Getting Service

All liquid 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. 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.CropCareEquipment.com