Operator's Manual

SPRAY SYSTEM–30 GALLON

KIT NO. 135-9607

For Serial Nos.
406,294,345 and Higher

Part No. 4504-499 Rev. A

Introduction

To the Owner

Introduction

Read this manual entirely BEFORE operating the Z-Plug equipment.

The information presented herein will prepare you to operate the Z-Plug equipment in a safe and knowledgeable manner. Operating the Z-Plug equipment in a proper manner will provide a safer working environment, create more efficient results and promote higher quality.

Keep this manual on hand at all times for ready reference. The tested safety and design(s) of the Z-Plug equipment is dependent upon its operation within the guidelines and limitations outlined in this manual. Operating the Z-Plug equipment outside of the stated safety guidelines presented in this manual run the risk of injury and a void in the warranty.

Product Registration

Immediately record the model and serial number of the Z-Plug equipment in the spaces below. These numbers can be found on the back side of the tank frame. Providing this information will help assure that you get the correct parts, informed about any updates or product reviews.

Model Number:

_____

Serial Number:

_____

Contents

Safety

Safety Alert Symbol

This Safety Alert Symbol (Figure 1) is used both in this manual and on the machine to identify important safety messages which must be followed to avoid accidents.

This symbol means: **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

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Figure 1
Safety Alert Symbol

The safety alert symbol appears above information which alerts you to unsafe actions or situations and will be followed by the word **DANGER**, **WARNING**, or **CAUTION**.

DANGER: Indicates an imminently hazardous situation which, if not avoided, **Will** result in death or serious injury.

WARNING: Indicates a potentially hazardous situation which, if not avoided, **Could** result in death or serious injury.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, **May** result in minor or moderate injury.

This manual uses two other words to highlight information. **Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

Safe Operating Practices

Always shut off the engine, and remove the key. Wait for all movement to stop and allow the machine to cool before adjusting, cleaning, storing, or repairing it.

Chemical Safety

The intended use of this accessory is for lawn care.

⚠ WARNING

Chemical substances used in the spreader-sprayer system may be hazardous and toxic to you, bystanders, animals, plants, soils or other property.

- **Carefully read and follow the chemical warning labels and Safety Data Sheets (SDS) for all chemicals used and protect yourself according to the chemical manufacturer's recommendations. Ensure that as little skin as possible is exposed while using chemicals. Use appropriate Personal Protective Equipment (PPE) to guard against personal contact with chemicals, such as:**

  – safety glasses, goggles, and/or face shield

  – chemical resistant gloves

  – rubber boots or other substantial footwear

  – hearing protection

  – respirator or filter mask

  – clean change of clothes, soap, and disposable towels, to be kept on-hand, in the event of a chemical spill.
- **Keep in mind that there may be more than one chemical used, and information on each chemical should be assessed.**
- **Refuse to operate or work on the spreader-sprayer if this information is not available!**
- **Before working on a spreader-sprayer system, make sure that the system has been triple rinsed and neutralized according to the recommendations of the chemical manufacturer(s) and all of the valves have been cycled three times.**
- **Verify there is an adequate supply of clean water and soap nearby, and immediately wash off any chemicals that contact you.**

- Obtain proper training before using or handling chemicals.
- Use the correct chemical for the job.
- Follow the chemical manufacturer's instructions for the safe application of the chemical and Do Not exceed recommended system application pressure.
- Handle chemicals in a well ventilated area.

- Have clean water available especially when filling the spray tank.
- Do Not eat, drink, or smoke while working with chemicals.
- Do Not clean spray nozzles by blowing through them or placing in mouth.
- Always wash your hands and other exposed areas as soon as possible after finishing the work.
- Keep chemicals in their original packages and in a safe location.
- Properly dispose of unused chemicals and chemical containers as instructed by the chemical manufacturer and your local codes.
- Chemicals and fumes are dangerous; never enter the tank, hopper, or place your head over or in the opening.
- Follow all local/state/federal requirements for the spreading/spraying of chemicals.

Training

- Read the Z-Plug Operator's Manual along with this accessory manual and other training material. If the operator(s) or mechanic(s) can not read the manuals it is the owner's responsibility to explain this material to them; other languages may be available on our website.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner is responsible for training the users.
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- Only adults and mature teenagers should operate the spreader-sprayer, and even mature teenagers should have adult supervision. Be sure a teenager:
  1. has read and understands the Operator's Manual and recognizes the risks involved;
  2. is sufficiently mature to use caution; and
  3. is of sufficient size and weight to operate the controls comfortably and to manage the spreader-sprayer without taking risks.
- The owner/user can prevent and is responsible for accidents or injuries occurring to himself or herself, other people or property.

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use approved accessories and attachments.
- Wear appropriate clothing including safety glasses, substantial slip-resistant footwear, and hearing protection. Tie back long hair and avoid loose clothing or loose jewelry which may get tangled in moving parts.

⚠ CAUTION

This machine produces sound levels in excess of 85 dBA at the operator's ear and can cause hearing loss through extended periods of exposure.

Wear hearing protection when operating this machine.

- Inspect the area where the equipment is to be used and remove all rocks, toys, sticks, wires, bones, and other foreign objects which may be contaminated by chemicals and/or affect the stability of the machine.
- Check that the operator presence controls, safety switches, and shields are attached and functioning properly. Do Not operate unless they are functioning properly.
- Check all sprayer components for wear and leaks before applying pressure to the system. Do Not use if leaking or damaged.
- Do Not fill, calibrate, or clean the unit when people, especially children, or pets are in the area.
- Make sure the operator platform is clean and free from chemical residue and debris buildup.

Operation

- **NEVER** carry passengers. **DO NOT** operate the machine when people, especially children, or pets are in the area.
- Be alert, slow down and use caution when making turns. Look behind and to the side before changing directions.
- Stop spreading/spraying when making tight turns to minimize uneven distribution pattern, application rate, and chemical drift.

- Chemicals may drift and cause injury to people and animals; it may also damage plants, soil, or other property.
- Do Not operate the machine under the influence of alcohol or drugs.
- Use extreme care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- Reduce the weight of the load when operating on hills and rough terrain to avoid tipping or overturning of the unit.
- Liquid loads and granular materials can shift. This shifting happens most often while turning, going up or down hills, suddenly changing speeds, or while driving over rough surfaces. Shifting loads can cause the unit to tip over.
- When operating with a heavy load, reduce your speed and allow for sufficient stopping distance. Use extra caution on slopes.
- Reduce speed and load when operating on rough terrain, uneven ground, and near curbs, holes, and other sudden changes in terrain. Loads may shift, causing the sprayer to become unstable.

⚠ WARNING

Sudden changes in terrain may cause abrupt steering control movement, possibly resulting in hand and arm injuries.

Reduce speed when operating on rough terrain or near curbs.

- Safely relieve liquid from spray wand every time engine is turned off.

⚠ WARNING

Spray wand traps liquids under high pressure, even when engine is off. High pressure spray discharge could cause serious injury or death.

- **Keep clear of nozzle and Do Not direct spray or stream at people, pets, or non-work area property.**
- **Do Not direct spray on or near electrical power components or source.**
- **Do Not repair spray wand, hoses, seals, nozzle, or other wand components; replace them.**
- **Do Not attach hoses or other components to the end of the spray wand nozzle.**
- **Do Not attempt to disconnect the spray wand from the unit while the system is pressurized.**
- **Do Not use spray wand if trigger lock is damaged or missing.**
- **Do Not keep spray wand in locked-open position when job is complete.**

- When draining or relieving system, Do Not let anyone stand in front of nozzles and Do Not drain on a person's feet.

Safety and Instructional Decals

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Specifications

Systems

Sprayer System

- Maximum Tank Capacity: 30 gal (114 L)
- 8 ft (2.4 m) Boom
- 5.0 gpm (22.7 L/min)

Dimensions

Boom Assembly

Overall Width:

62.5 inches (159 cm)

Overall Length:

7 inches (18 cm)

Overall Height:

5.2 inches (13 cm)

Overall Weight:

18 lb (8 kg)

Tank Assembly

Overall Width:

38.5 inches (98 cm)

Overall Length:

26.5 inches (67 cm)

Overall Height:

25.7 inches (65 cm)

Overall Weight:

88 lb (40 kg)

Setup

Accessory Removal

Remove any mid-mount accessory that is currently on the machine; refer to the Z-Plug Operator's manual and the installed accessory Operator's manual for instructions.

Install Boom

1. Insert (2) 3/8 x 1 1/4 inch Flange Bolts into Holes on Boom.

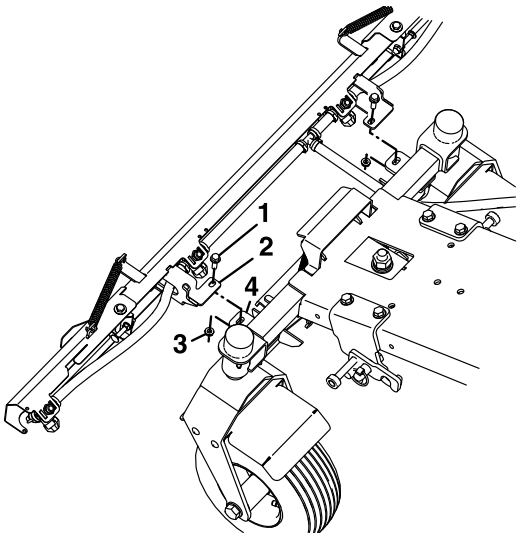

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Figure 2

1. Bolt
2. Boom
3. Nut
4. Frame

2. Mount Boom on Frame (align mounting tabs).
3. Fasten with (2) 3/8 inch Flange Nuts.

Install 30 Gallon Aux Tank

1. Drive the Z-Plug machine to the rear of the attachment. Position the rear wheel to the middle of the accessory. Slowly start turning the machine over the Aux Tank attachment (make sure that you line up the ball swivel in the neck of the attachment and the pull pin beneath the nose of the traction unit to make it easy for mounting).

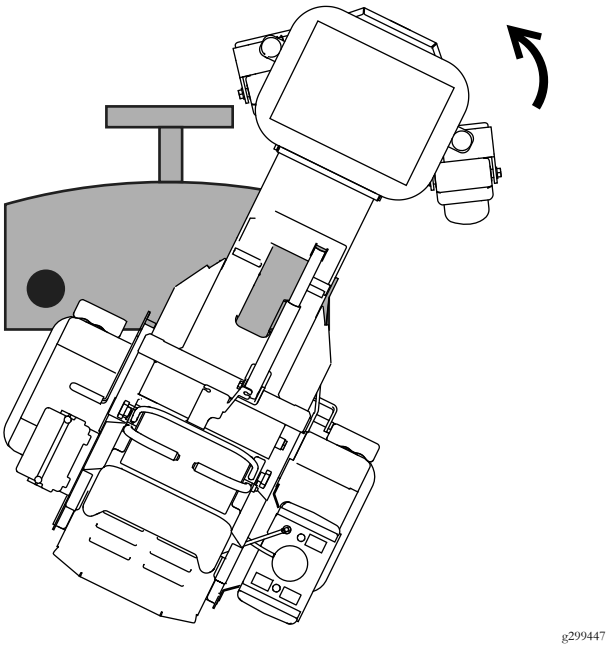

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Figure 3

1. Turning towards accessory

2. Shut off the engine and wait for all movement to stop.
3. When installing for the first time, remove Battery Cover, from the Z-Plug machine, by unhooking strap.
4. Detach the Negative (black) Wire from battery. Tuck Negative Battery Cable off to the side.
5. Remove Cotter Pin, Washer and Hitch Pin.
6. Remove Anchor Release Pin and Latch from each side of frame.

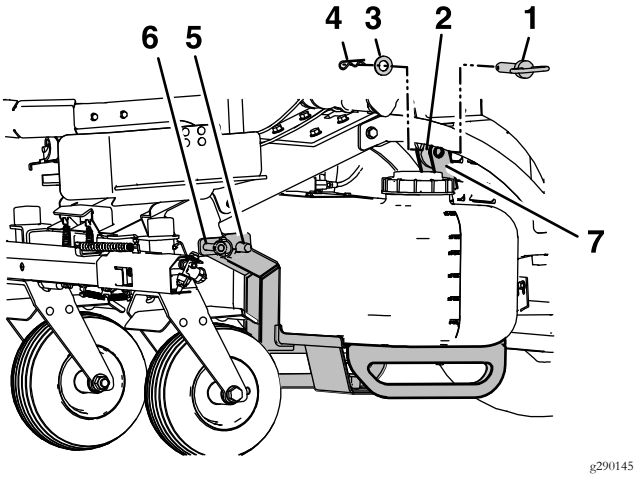

Figure 4

1. Hitch pin
2. Swivel ball
3. Washer
4. Cotter pin
5. Front hook
6. Anchor pin
7. Tank Arm

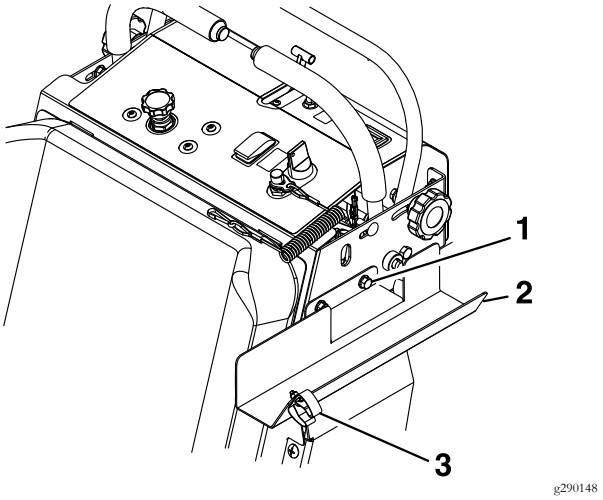

Figure 5

1. Bolt
2. Spray Gun Tray
3. Spray Gun Clip

7. Align Mounting Holes of Tank Arm with the Center Hole on Swivel Ball.
8. Insert Hitch Pin through Tank Arm and Swivel Ball.
9. Insert Washer and Cotter Pin on Hitch Pin.
10. Insert Anchor Release Pins/Latches and Connect Hose to Boom Hose.

Install Spray Gun Tray

1. Locate Spray Gun Tray mounting holes.
2. Insert (2) 5/16 x 3/4 inch Flange Bolts into Spray Gun Tray.
3. Fasten with (2) 5/16 inch Flange Nuts.
4. Locate Spray Gun Clip mounting hole.
5. Insert (1) 10-32 x 1/2 inch into Spray Gun Clip.
6. Fasten with (1) 10-32 Nut.

Install Aux Electrical Harness

Replace Ground Connector

1. Cut existing O-Ring connector on AUX Harness.
2. Strip approximately 1/4” of insulation from wire.
3. Crimp Butt Connector onto wire.

Install Rocker Switch

1. Remove switch plug by pressing tabs together.
2. Orient plug closest to operator.

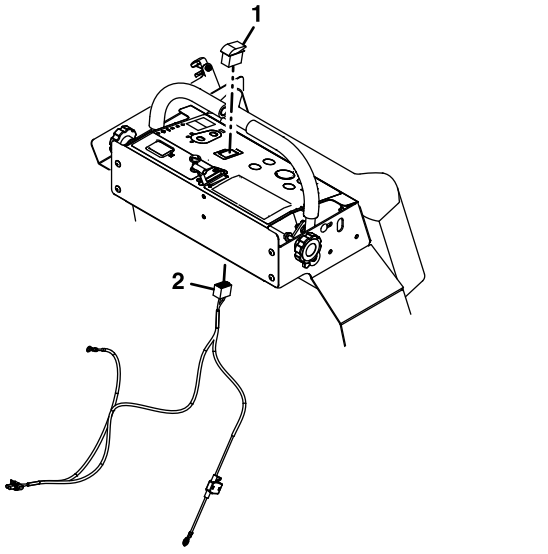

Figure 6

1. Switch
2. Harness

3. Insert Rocker Switch into Slot.

Install Aux Harness

1. Plug Switch Connector to Rocker Switch.
2. Connect the Power Wire (orange) to the bottom Solenoid Post.

Connect the Ground Wire

1. Cut cable ties holding the Ignition Harness Ground Wire.
2. Cut Female Blade connector on Ignition Harness Ground Wire.
3. Strip approximately 1/4 inch of insulation from wire.
4. Crimp the Butt Connector on Aux Harness (step 2.8.1) to this wire.

Connect the Pump Connector

1. Route the Pump Connector underneath the Hydro Pump Reservoir.
2. Loop around bracket once and hold with a cable tie.
3. Connect Pump Connector to Pump on AUX 30 Gal Tank. Then, reconnect the ground cable at the battery.

Operation

Sprayer Operations

Overview

The sprayer and spreader can be operated either together or individually (spray liquid and spread granular at the same time or separately). Regardless of your situation, make sure that unit is running at full throttle (this will create proper hydraulic pressure to the hopper motor and proper charge voltage back to the battery)

The spray system has the ability to spray in 3 sections of the boom. The wing booms (left and right) each have their own nozzles creating a 24 inch liquid path on either side. The middle boom is equipped with 2 nozzles covering a 48 inch liquid path. The 3 valves can be operated individually (left, right or middle) or simultaneously together to create a 8 foot pattern. The total spray pattern options consist of a 2 foot path (either boom wing), 4 foot path (center section), 6 foot path (center and a boom wing) or 8 foot path (all 3 valves in the down position).

Creating pressure to these nozzles is done through the Throttle Valve. Threading the Throttle Valve in (Figure 7) will create pressure to either the boom nozzles or the hose reel. Threading the Throttle Valve out (Figure 8) will bring pressure to the tank(s) and create agitation. If threading the Throttle Valve in does not create the desired pressure, check your In-line filter housing and make sure that the gasket is present and the housing is screwed on tight. If desired pressure is still not achieved, pressure adjustments can be made at the pump (Figure 9). Clockwise turns create more pressure and counter-clockwise turns decrease pressure.

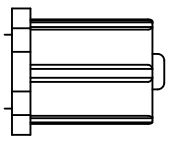

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Figure 7

Throttle Valve in to prepare spray

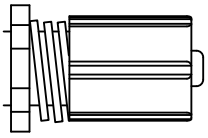

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Figure 8

Throttle Valve out to create agitation

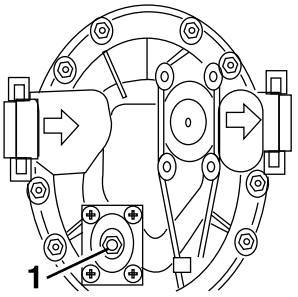

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Figure 9

1. Pressure adjust on pump (Allen Wrench)

Use the On/Off switch located on the control panel (Figure 10) to turn on the spray system.

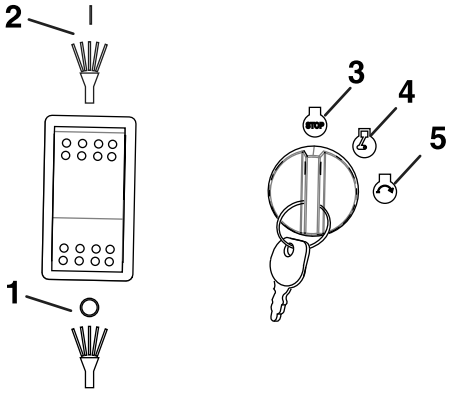

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Figure 10

Pump Switch-On/Off

1. Spray pump switch-Off
2. Spray pump switch-On
3. Engine-Off
4. Engine-On
5. Engine-Start

Spray System

Valving

Periodically check the in-line filter for any debris in the screen. If debris is present, this can create erratic pressure spikes and/or not allow the proper flow through system. After clearing any debris, ensure that

gasket remains intact and tighten in-line filter cap (if not installed properly, this will allow air to get in the system and system will lose or not create pressure).

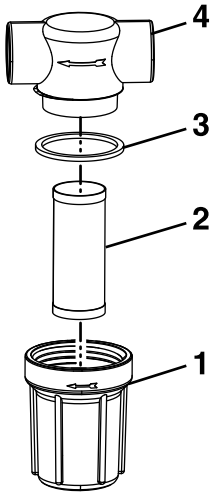

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Figure 11

1. Cap
2. Filter
3. Gasket
4. In-line filter housing

The pump switch located on the control panel turns on the spray system pump. Once the pump is turned on, the throttle valve is turned clockwise to increase pressure and/or counter-clockwise to release pressure (and create agitation if the pump is on). The pressure can be read on the gauge (decreasing pressure from gauge will increase agitation in the tank).

Opening the chrome valve allows liquid to the 15 foot Hose Coil for spraying out of the hand spray gun. When Hose Coil is not in use, be sure to turn valve off to prevent boom tips from dripping.

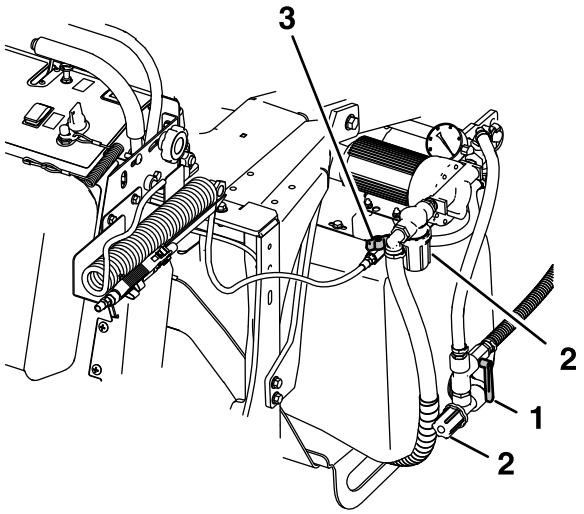

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Figure 12

1. Valve closed position
2. Strainer
3. Chrome valve

Spray Calibration/Tip Chart/Liquid Quantities

The Z-Spray liquid system comes standard with lavender colored Air Injected tips which will apply liquid material @ .34 (1/3) gallons per 1,000 sq. ft. @ 5 mph and 40 psi. Each tip has a 5-psi shut-off screen to prevent drip.

Your machine is capable of using tips from ¼ to 1 gallon in size. See chart for your desired drop rate.

Tip Color	MPH	Pressure	Gallons/ 1,000 sq. ft.
Yellow	5	40 psi	.27 (1/4) gallon
Lavender	5	40 psi	.34 (1/3) gallon
Red	5	40 psi	.54 (1/2) gallon
Brown	5	50 psi	.76 (3/4) gallon
Grey	4	40 psi	1 gallon

The following are some general guidelines for sprayer calibration (Note: this chart only applies if using Air Injected tips. Using other tips will require different calculations). Please refer to the spray chart provided for complete calibration (spray charts are located on the backside of the knee pad for quick in the field reference).

The Throttle Valve adjusts pressure. The Throttle Valve is located on the left side of the Manifold assembly. Turn clockwise to increase pressure, counter clockwise to decrease pressure. Pressure will be displayed on the Pressure Gauge. Once the nozzles are opened, you will notice a slight decrease in pressure (adjust accordingly).

To determine liquid quantities per tank, understand what tips you have on your machine (factory set is 1/3 gallon per 1,000 sq. ft. through the Lavender tips). For instance some products call for 1.1 to 1.5oz per 1,000 sq. ft. We would recommend using 1.3 (median value of 1.1 to 1.5). Since you are using a 1/3-gallon tip, you need to multiply by 3, and then multiply that number of gallons you need to put in your tank.

1.3 (median value of 1.1 to 1.5) X 3 (1/3 gallon tips) X gallons needed. If you were filling a 30-gallon tank your equation would look like this:

1.3 X 3 X 30 = 117 ounces in 30 gallons of water.

Remove Attachment

Note: Only the aux tank portion of the sprayer attachment needs to be removed for the installation of other Z-Plug attachments. The spray boom, spray gun, and harness may remain on the machine.

1. Empty liquid from the tank.
2. Disconnect the electrical connection at the pump. Secure harness to the machine, out of the way.
3. Disconnect pump hose from boom hose. Secure boom hose to machine, out of the way.
4. Adjust the hydraulic cylinder so that the attachment starts to make contact with the ground (taking weight off of the head)
5. Shut off engine, wait for all moving parts to stop and remove key.
6. Pull cotter pin, washer, and hitch pin disconnecting the lift mechanism center linkage from the accessory.
7. Remove the lynch pins from the front hooks and slide the accessory plates outward and rotate them away from the accessory lift pin.
8. Lift the front of the attachment and remove the accessory pins from the hitch plates.
9. Block up the accessory so it can be stored safely and will make future reinstallation easier.
10. Position yourself back on the traction unit.
11. Drive away from the aerator head by turning either left or right (turning to the right of the head — reference Figure 13) by turning the front of the traction unit in either direction.

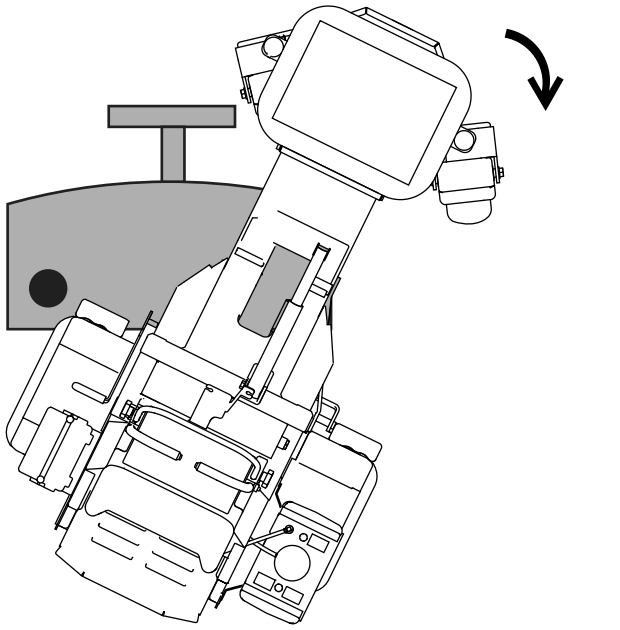

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Figure 13

Maintenance

Always shut off the engine, and remove the key. Wait for all movement to stop and allow the machine to cool before adjusting, cleaning, storing, or repairing it.

Periodic Maintenance

Spray System Maintenance

Maintaining the system will ensure you years of use, proper calibration and limit premature wear.

The spray system contains a liquid storage tank that can disperse a host of liquid and/or wettable powder. To get maximum life and performance out of the spray system, it is recommended that the tank(s), nozzles and hoses be flushed of all products after each use. Storing product in system for an extended time may cause build up in hoses, premature cracking on hoses, creates leaks in the hoses, clogged nozzles and filters, and a host of other potential liquid system challenges (depending on your water source, not draining the water out of the system and storing the kit dry can create algae buildup).

Make sure that both the In-line filter screen and nozzle tip screens are checked weekly and cleaned if needed. Clogged filters can lead to improper liquid dispersal and will create inaccurate spray rates.

Keep hose reel coil in closed position when not in use. This will prevent the boom nozzles from dripping due to pressure build-up in the hose coil.

Check 5 psi check ball screens daily. Build up on screen will create clogging and inaccurate spray rates.

Check spray system In-line filter gasket weekly. Improper gasket placement, missing gasket or filternot tightened down can create loss in pump pressure.

Check spray tips for any clogging of materials or foreign objects. Clean out tank on daily basis for proper storing.

Maintenance Chart

Service Interval: As required

Service Actions(s)	Daily	Weekly	Bi-Weekly	Monthly	Yearly	Hours
Spray Nozzles (tip) (check)			X			
Spray Nozzle (tip) Screens (check)		X				
Spray Nozzle Gasket (check)			X			
Spray System Hoses (check)		X				
In-Line Filter (check)		X				
In-Line Filter Gasket (check)		X				
DIRECTO Valves (check)				X		
Spot Spray Gun (check)			X			
Spot Spray Gun Tip (check)			X			
Blow off fertilizer daily	X					

Troubleshooting

Spray System:

- Liquid is dribbling from the tips. This effect is potentially caused by a few things. If the Cap Gasket is missing, the 5 PSI Check Ball is stuck and not closing or Diaphragm (rear of Nozzle Body) is damaged. Also check to see if the Pressure Regulator is turned all the way up (no bypass).
- Pressure not staying consistent. This is normally caused due to air being introduced to the system. Air is introduced in a few ways through the system. Air can come through one of the hose connections, the In-line filter housing not being tight or not having a gasket to seal housing, sucking air from an auxiliary tank or liquid level is too low.

California Proposition 65 Warning Information

What is this warning?

You may see a product for sale that has a warning label like the following:

WARNING: Cancer and Reproductive Harm—www.p65Warnings.ca.gov.

What is Prop 65?

Prop 65 applies to any company operating in California, selling products in California, or manufacturing products that may be sold in or brought into California. It mandates that the Governor of California maintain and publish a list of chemicals known to cause cancer, birth defects, and/or other reproductive harm. The list, which is updated annually, includes hundreds of chemicals found in many everyday items. The purpose of Prop 65 is to inform the public about exposure to these chemicals.

Prop 65 does not ban the sale of products containing these chemicals but instead requires warnings on any product, product packaging, or literature with the product. Moreover, a Prop 65 warning does not mean that a product is in violation of any product safety standards or requirements. In fact, the California government has clarified that a Prop 65 warning "is not the same as a regulatory decision that a product is 'safe' or 'unsafe.'" Many of these chemicals have been used in everyday products for years without documented harm. For more information, go to https://oag.ca.gov/prop65/faqs-view-all.

A Prop 65 warning means that a company has either (1) evaluated the exposure and has concluded that it exceeds the "no significant risk level"; or (2) has chosen to provide a warning based on its understanding about the presence of a listed chemical without attempting to evaluate the exposure.

Does this law apply everywhere?

Prop 65 warnings are required under California law only. These warnings are seen throughout California in a wide range of settings, including but not limited to restaurants, grocery stores, hotels, schools, and hospitals, and on a wide variety of products. Additionally, some online and mail order retailers provide Prop 65 warnings on their websites or in catalogs.

How do the California warnings compare to federal limits?

Prop 65 standards are often more stringent than federal and international standards. There are various substances that require a Prop 65 warning at levels that are far lower than federal action limits. For example, the Prop 65 standard for warnings for lead is 0.5 µg/day, which is well below the federal and international standards.

Why don't all similar products carry the warning?

- Products sold in California require Prop 65 labelling while similar products sold elsewhere do not.
- A company involved in a Prop 65 lawsuit reaching a settlement may be required to use Prop 65 warnings for its products, but other companies making similar products may have no such requirement.
- The enforcement of Prop 65 is inconsistent.
- Companies may elect not to provide warnings because they conclude that they are not required to do so under Prop 65; a lack of warnings for a product does not mean that the product is free of listed chemicals at similar levels.

Why does Exmark include this warning?

Exmark has chosen to provide consumers with as much information as possible so that they can make informed decisions about the products they buy and use. Exmark provides warnings in certain cases based on its knowledge of the presence of one or more listed chemicals without evaluating the level of exposure, as not all the listed chemicals provide exposure limit requirements. While the exposure from Exmark products may be negligible or well within the "no significant risk" range, out of an abundance of caution, Exmark has elected to provide the Prop 65 warnings. Moreover, if Exmark does not provide these warnings, it could be sued by the State of California or by private parties seeking to enforce Prop 65 and subject to substantial penalties.

Service Record

Date:	Description of Work Done:	Service Done By:

Place Model No. and Serial No. Label Here (Included in the Literature Pack) or Fill in Below

Model No. _____

Serial No. _____

Date Purchased _____

Engine Model No. and Spec. No. _____

Engine Serial No. (E/No) _____

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