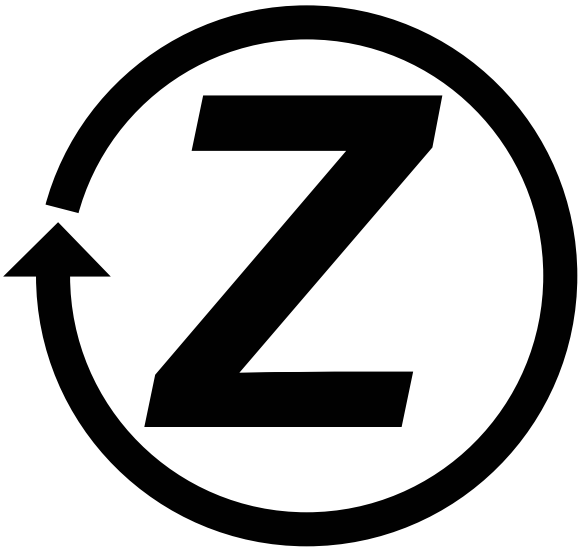
Operator's Manual



Z-SPRAY™
JUNIOR 36

For Serial Nos.
404,314,159 and Higher
Part No. 4504-420 Rev. C

Introduction

To the Owner

Introduction

Read this manual entirely BEFORE operating the Z-Spray.

The information presented herein will prepare you to operate the Z-Spray in a safe and knowledgeable manner. Operating the Z-Spray 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-Spray is dependent upon its operation within the guidelines and limitations outlined in this manual. Operating the Z-Spray 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 your Z-Spray in the spaces below. These numbers can be found on the left side of the engine plate. 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!**

g000502

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 the Spreader Sprayer 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 Operator's Manual and other training material. If the operator(s) or mechanic(s) can not read this manual, it is the owner's responsibility to explain this material to them.
- 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.

⚠ DANGER

In certain conditions gasoline is extremely flammable and vapors are explosive.

A fire or explosion from gasoline can burn you, others, and cause property damage.

- **Fill the fuel tank outdoors on level ground, in an open area, when the engine is cold. Wipe up any gasoline that spills.**
- **Never refill the fuel tank or drain the machine indoors or inside an enclosed trailer.**
- **Do Not fill the fuel tank completely full. Fill the fuel tank to the bottom of the filler neck. The empty space in the tank allows gasoline to expand. Overfilling may result in fuel leakage or damage to the engine or emission system.**
- **Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by spark.**
- **Store gasoline in an approved container and keep it out of the reach of children.**
- **Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel when engine is running or when the engine is hot.**
- **If fuel is spilled, Do Not attempt to start the engine. Move away from the area of the spill and avoid creating any source of ignition until fuel vapors have dissipated.**
- **Do Not operate without entire exhaust system in place and in proper working condition.**

⚠ DANGER

In certain conditions during fueling, static electricity can be released causing a spark which can ignite gasoline vapors. A fire or explosion from gasoline can burn you and others and cause property damage.

- **Always place gasoline containers on the ground away from your vehicle before filling.**
- **Do Not fill gasoline containers inside a vehicle or on a truck or trailer bed because interior carpets or plastic truck bed liners may insulate the container and slow the loss of any static charge.**
- **When practical, remove gas-powered equipment from the truck or trailer and refuel the equipment with its wheels on the ground.**
- **If this is not possible, then refuel such equipment on a truck or trailer from a portable container, rather than from a gasoline dispenser nozzle.**
- **If a gasoline dispenser nozzle must be used, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do Not use a nozzle lock open device.**

⚠ WARNING

Gasoline is harmful or fatal if swallowed. Long-term exposure to vapors has caused cancer in laboratory animals. Failure to use caution may cause serious injury or illness.

- **Avoid prolonged breathing of vapors.**
- **Keep face away from nozzle and gas tank/container opening.**
- **Keep away from eyes and skin.**
- **Never siphon by mouth.**

- 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

⚠ WARNING

Operating engine parts, especially the muffler, become extremely hot. Severe burns can occur on contact and debris, such as leaves, grass, brush, etc. can catch fire.

- **Allow engine parts, especially the muffler, to cool before touching.**
- **Remove accumulated debris from muffler and engine area.**

⚠ WARNING

Engine exhaust contains carbon monoxide, which is an odorless deadly poison that can kill you.

Do Not run engine indoors or in a small confined area where dangerous carbon monoxide fumes can collect.

- Operate only in daylight or good artificial light, keeping away from holes and hidden hazards.
- Lightning can cause severe injury or death. If lightning is seen or thunder is heard in the area, Do Not operate the machine; seek shelter.
- Be aware of weather conditions and check that spray nozzles, patterns, and volume are suitable.
- Be sure all drives are in neutral and parking brake is engaged before starting engine.
- Never operate the machine with damaged guards, shields, or covers. Always have safety shields, guards, switches and other devices in place and in proper working condition.
- Do Not change the engine governor setting or overspeed the engine.
- Park machine on level ground. Stop engine, wait for all moving parts to stop, remove key and engage parking brake:
  - Before checking, cleaning or working on the machine.
  - Before clearing blockages.
  - Whenever you leave the machine.
- Stop engine, wait for all moving parts to stop, and engage parking brake:

  – Before refueling.

⚠ WARNING

Hands, feet, hair, clothing, or accessories can become entangled in rotating parts. Contact with the rotating parts can cause traumatic amputation or severe lacerations.

- **Do Not operate the machine without guards, shields, and safety devices in place and working properly.**
- **Keep hands, feet, hair, loose jewelry, or clothing away from rotating parts.**

- **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.

Slope Operation

- Slopes are a major factor related to loss of control and rollover accidents, which can result in severe injury or death. The operator is responsible for safe slope operation. Operating the machine on any slope requires extra caution. Before using the machine on a slope, the operator must:
  - Review and understand the slope instructions in the manual and on the machine.
  - Evaluate the site conditions of the day to determine if the slope is safe for machine operation. Use common sense and good judgment when performing this evaluation. Changes in the terrain, such as moisture, can quickly affect the operation of the machine on a slope.
- Operate across slopes, never up and down. Avoid operation on excessively steep or wet slopes.
- Identify hazards at the base of the slope. Do not operate the machine near drop offs, ditches, embankments, water or other hazards. The machine could suddenly roll over if a wheel goes over the edge or the edge collapses. Keep a safe distance (twice the width of the machine) between the machine and any hazard. Use a walk behind machine or a hand held tool to operate in these areas.

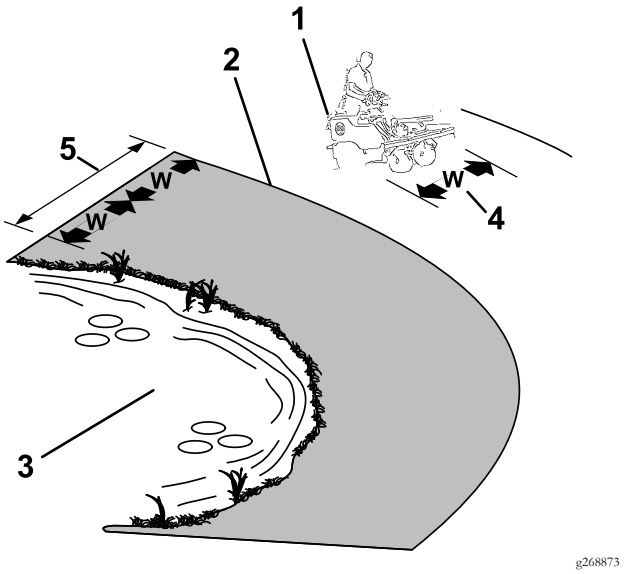


Figure 2

1. Safe Zone — Use the machine here
2. Danger Zone - Use a walk behind machine or a hand held tool near drop offs, ditches, embankments, water or other hazards.
3. Water
4. W=width of the machine
5. Keep a safe distance (twice the width of the machine) between the machine and any hazard.

- Avoid starting, stopping or turning the machine on slopes. Avoid making sudden changes in speed or direction; turn slowly and gradually.
- Do not operate a machine under any conditions where traction, steering or stability is in question. Be aware that operating the machine on wet grass, across slopes or downhill may cause the machine to lose traction. Loss of traction to the drive wheels may result in sliding and a loss of braking

and steering. The machine can slide even if the drive wheels are stopped.

- Remove or mark obstacles such as ditches, holes, ruts, bumps, rocks or other hidden hazards. Tall grass can hide obstacles. Uneven terrain could overturn the machine.
- Use extra care while operating with accessories or attachments. These can change the stability of the machine and cause a loss of control. Follow directions for counter weights.
- If you lose control of the machine, step off and away from the direction of travel of the machine.

Maintenance and Storage

- Disengage the spray or close the spreader gate, set the parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning or repairing.
- Keep engine and engine area free from excessive grease or oil and other debris which can accumulate in these areas. These materials can become combustible and may result in a fire.
- Let engine cool before storing and do not store near flame or any enclosed area where open pilot lights or heat appliances are present.
- Shut off fuel while storing or transporting. Do Not store fuel near flames or drain indoors.
- Park machine on level, hard ground. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Empty the tank and/or hopper before tilting unit for maintenance and before storing.
- Relieve the spray pressure from the system before servicing.
- Disconnect battery or remove spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.

⚠ DANGER

Charging or jump starting the battery may produce explosive gases. Battery gases can explode causing serious injury.

- **Keep sparks, flames, or cigarettes away from battery.**
- **Ventilate when charging or using battery in an enclosed space.**
- **Make sure venting path of battery is always open once battery is filled with acid.**
- **Always shield eyes and face from battery.**

⚠ DANGER

Battery electrolyte contains sulfuric acid, which is poisonous and can cause severe burns. Swallowing electrolyte can be fatal or if it touches skin can cause severe burns.

- **Wear safety glasses to shield eyes, and rubber gloves to protect skin and clothing when handling electrolyte.**
- **Do Not swallow electrolyte.**
- **In the event of an accident, flush with water and call a doctor immediately.**

⚠ CAUTION

If the ignition is in the "ON" position there is potential for sparks and engagement of components. Sparks could cause an explosion or moving parts could accidentally engage causing personal injury.

Be sure ignition switch is in the "OFF" position before charging the battery.

- Keep all guards, shields and all safety devices in place and in safe working condition.
- Check all bolts frequently to maintain proper tightness.
- Frequently check for worn or deteriorating components that could create a hazard.

⚠ WARNING

Removal or modification of original equipment, parts and/or accessories may alter the warranty, controllability, and safety of the machine. Unauthorized modifications to the original equipment or failure to use original manufacturer parts could lead to serious injury or death. Unauthorized changes to the machine, engine, fuel or venting system, may violate applicable safety standards such as: ANSI, OSHA and NFPA and/or government regulations such as EPA and CARB.

Transporting

Note: Refer to the chemical warning product label(s) before transporting the unit and follow all local/state/federal requirements for transporting chemicals.

Note: Make sure the spreader hopper cover and the spray wand are secure before transporting.

Transporting a Unit

Use a heavy-duty trailer or truck to transport the machine. Lock brake and block wheels. Be sure the fuel shut-off valve is closed during transport. Securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes. When securing the front of the unit, only use the tie down locations. If possible, both front and rear straps should be directed down and outward from the machine. Be sure that the trailer or truck has all necessary lighting and marking as required by law. Secure a trailer with a safety chain.

⚠ WARNING

Securing the machine on any upper frame location will cause the parking brake to not function properly, which could cause serious injury or death.

Only use the front tie down locations on the lower frame to secure the machine.

⚠ CAUTION

This machine does not have proper turn signals, lights, reflective markings, or a slow moving vehicle emblem. Driving on a street or roadway without such equipment is dangerous and can lead to accidents causing personal injury. Driving on a street or roadway without such equipment may also be a violation of State laws and the operator may be subject to traffic tickets and/or fines.

Do Not drive a machine on a public street or roadway.

⚠ WARNING

Loading a machine on a trailer or truck increases the possibility of backward tip-over. Backward tip-over could cause serious injury or death.

- **Use extreme caution when operating a machine on a ramp.**
- **Use only a single, full width ramp; Do Not use individual ramps for each side of the machine.**
- **If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the machine.**
- **Avoid sudden acceleration while driving machine up a ramp to avoid tipping backward.**
- **Avoid sudden deceleration while backing machine down a ramp to avoid tipping backward.**

Loading a Machine

Use extreme caution when loading machines on trailers or trucks. One full width ramp that is wide enough to extend beyond the rear tires is recommended instead of individual ramps for each side of the machine. If it is not possible to use one full width ramp, use enough individual ramps to simulate a full width continuous ramp.

A steep ramp angle may cause components to get caught as the machine moves from ramp to trailer or truck. Steeper angles may also cause the machine to tip backward. If loading on or near a slope, position the trailer or truck so it is on the down side of the slope and the ramps extends up the slope. This will minimize the ramp angle. The trailer or truck should be as level as possible.

Important: Do Not attempt to turn the machine while on the ramp, you may lose control and drive off the side.

Avoid sudden acceleration when driving up a ramp and sudden deceleration when backing down a ramp. Both maneuvers can cause the machine to tip backward.

Waste Disposal

Chemical Disposal: Improper chemical disposal can pollute the environment and cause health issues. Follow the disposal directions on the chemical manufacturer's label. Dispose of chemicals and containers in accordance to local/state/federal laws.

Motor Oil Disposal: Engine oil and hydraulic oil are both pollutants to the environment. Dispose of used oil at a certified recycling center or according to your state and local regulations.

Battery Disposal

⚠ DANGER

Battery electrolyte contains sulfuric acid, which is poisonous and can cause severe burns. Swallowing electrolyte can be fatal or if it touches skin can cause severe burns.

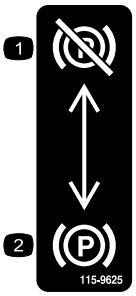
- **Wear safety glasses to shield eyes, and rubber gloves to protect skin and clothing when handling electrolyte.**
- **Do Not swallow electrolyte.**
- **In the event of an accident, flush with water and call a doctor immediately.**

Federal law states that batteries should not be placed in the garbage. Management and disposal practices must be within relevant federal, state, or local laws.

If a battery is being replaced or if the unit containing the battery is no longer operating and is being scrapped, take the battery to a local certified recycling center. If no local recycling is available return the battery to any certified battery reseller.

Safety and Instructional Decals

- Keep all safety signs legible. Remove all grease, dirt and debris from safety signs and instructional labels.
- Replace all worn, damaged, or missing safety signs.
- When replacement components are installed, be sure that current safety signs are affixed to the replaced components.
- If an attachment or accessory has been installed, make sure current safety signs are visible.
- New safety signs may be obtained from your authorized equipment dealer or distributor.
- Safety signs may be affixed by peeling off the backing to expose the adhesive surface. Apply only to a clean, dry surface. Smooth to remove any air bubbles.
- Familiarize yourself with the following safety signs and instruction labels. They are critical to the safe operation of your machine.



decal115-9625

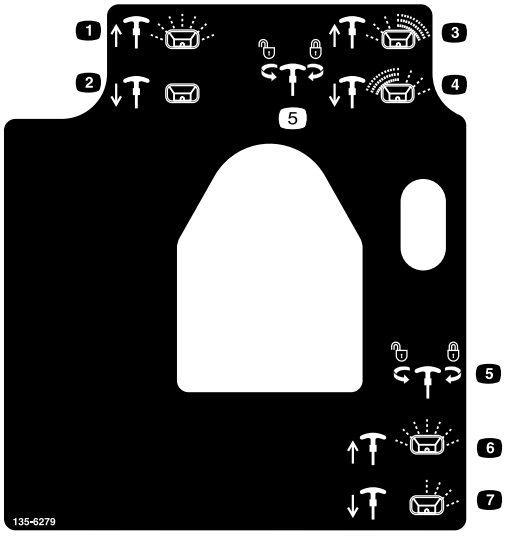
115-9625

1. Parking brake—disengaged
2. Parking brake—engaged

decal126-2055

126-2055

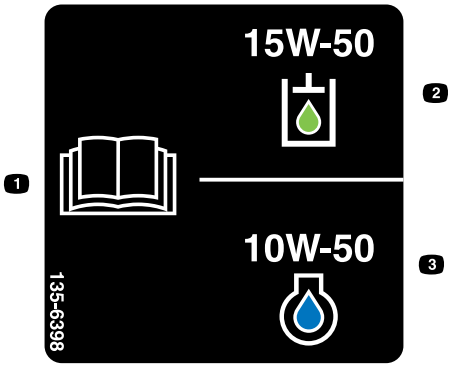
1. Wheel lug nut—torque to 129 N·m (95 ft-lb).
2. Wheel hub nut—torque to 319 N·m (235 ft-lb).
3. Read the *Operator's Manual* before performing maintenance; check the torque after the first 100 hours and every 500 hours after.



decal135-6279

135-6279

1. Spread On-Pull handle up
2. Spread Off-Push handle down
3. Spread pattern control-Pull handle up if heavy on left side
4. Spread pattern control-Push handle down if heavy on right side
5. Spread Lock-rotate counterclockwise to unlock; rotate clockwise to lock.
6. Deflector-Pull knob up to open
7. Deflector-Push knob down to close



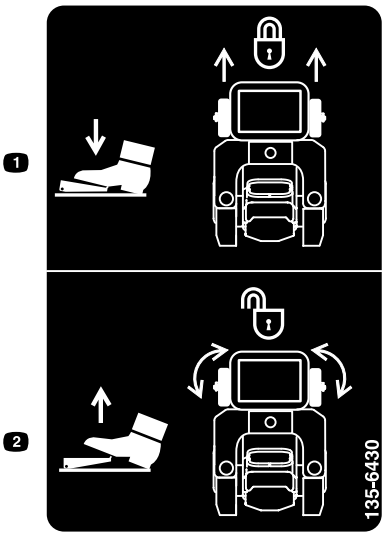
decal135-6398

135-6398

1. Read the *Operator's Manual*.
2. Only use green-colored 15W-50 hydraulic fluid.
3. Only use blue-colored 10W-50 engine oil.

decal135-6424

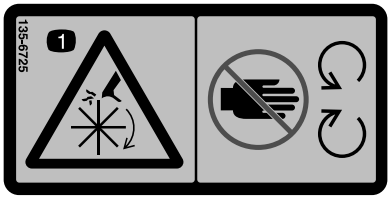
135-6424



decal135-6430

135-6430

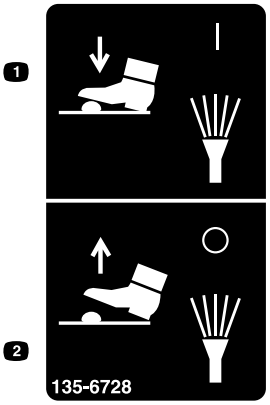
1. Press and hold the foot pedal to lock the caster wheels in the straight position.
2. Release the foot pedal to unlock the caster wheels to allow turning.



decal135-6725

135-6725

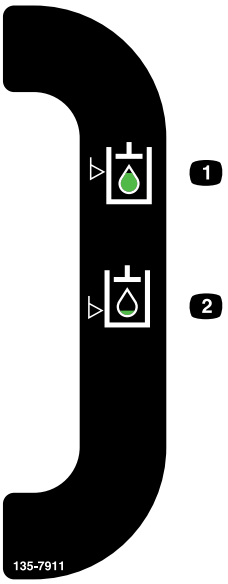
1. Cutting/dismemberment hazard of hand, spinner—stay away from moving parts.



decal135-6728

135-6728

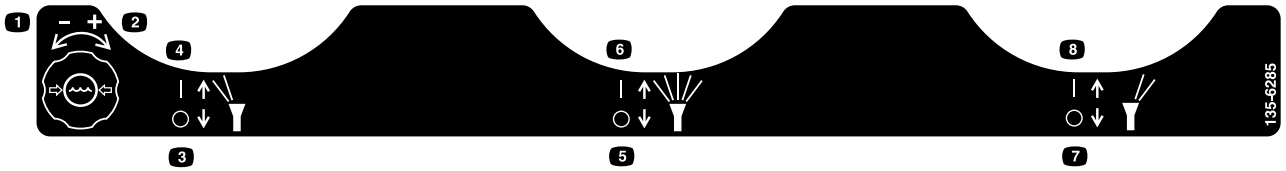
1. Press and hold foot button to turn on spray.
2. Release foot button to shut off spray.



decal135-7911

135-7911

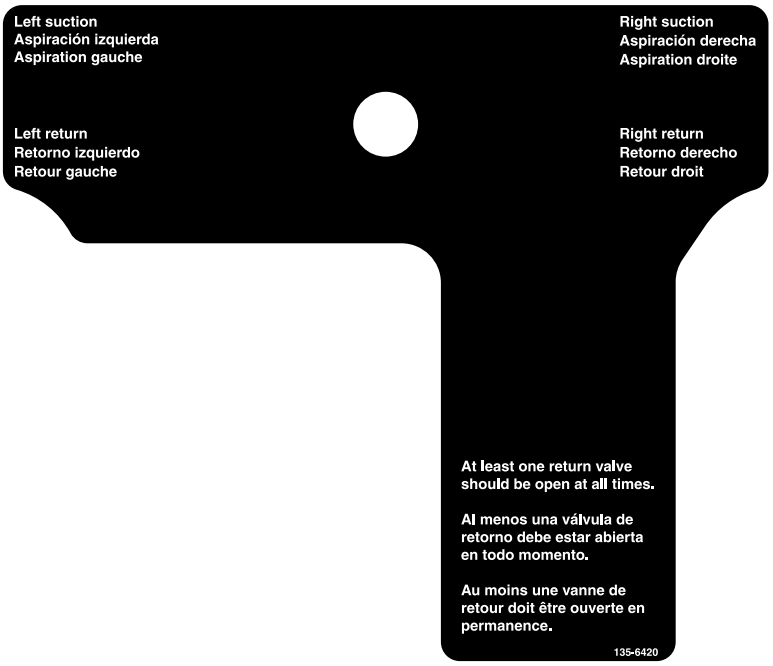
1. Hydro oil level—Full
2. Hydro oil level—Add



decal135-6285

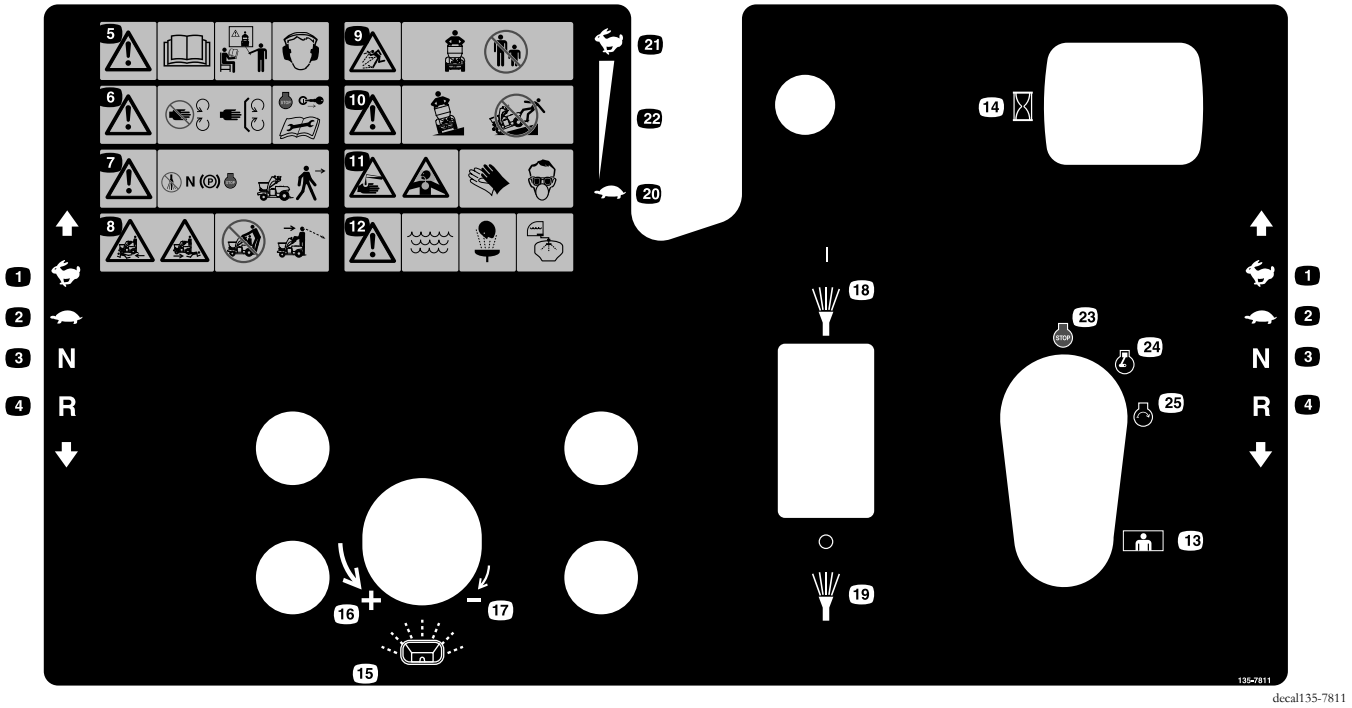
135-6285

1. Water pressure—decrease
2. Water pressure—increase
3. Left nozzle spray—off
4. Left nozzle spray—on
5. Center nozzle spray—off
6. Center nozzle spray—on
7. Right nozzle spray—off
8. Right nozzle spray—on



decal135-6420

135-6420



135-7811

1. Fast
2. Slow
3. Neutral
4. Reverse
5. Warning—read the *Operator's Manual*; do not operate this machine unless you are trained; wear hearing protection.
6. Warning—stay away from moving parts; keep all guards and shields in place; shut off the engine and remove the key before performing maintenance.
7. Warning—disengage the sprayer controls, move the drive lever to the neutral position, engage the parking brake, and shut off the engine before leaving the machine.
8. Crushing/dismemberment hazard of bystanders, forward and reverse—do not carry passengers; look behind and down when reversing.
9. Thrown object hazard—keep bystanders away.
10. Warning—only operate across slopes; do not operate up and down slopes.
11. Caustic liquid/chemical burn hazard; asphyxiation hazard, poisonous fumes or toxic gases—wear hand and skin protection; wear eye and respiratory protection.
12. Warning—use fresh, clean water for first-aid washing and rinsing the tank.
13. Operator presence control (OPC)
14. Hour meter
15. Spreader speed
16. Spreader speed—increase
17. Spreader speed—decrease
18. Spray pump—on
19. Spray pump—off
20. Throttle—slow
21. Throttle—fast
22. Continuous variable setting
23. Engine—off
24. Engine—on
25. Engine—start

	PSI	Drop Size	CAPACITY ONE NOZZLE IN GPM	CAPACITY ONE NOZZLE IN OZ./MIN	SPACING 20" GPA 4 MPH	GPA 5 MPH	GALLONS PER 1,000 SQ. FT. 3 MPH	4 MPH	5 MPH
AVI-110015 135-8285	30	VC	0.13	17	9.7	7.7	0.29	0.22	0.18
	40	VC	0.15	19	11.1	8.9	0.34	0.26	0.20
	50	VC	0.17	22	12.6	10.1	0.39	0.29	0.23
	60	C	0.18	23	13.4	10.7	0.41	0.31	0.24
AVI-11002 135-8298	30	VC	0.17	22	12.6	10.1	0.39	0.29	0.23
	40	VC	0.20	26	14.9	11.9	0.45	0.34	0.27
	50	VC	0.22	28	16.3	13.1	0.50	0.37	0.30
	60	VC	0.24	31	17.8	14.3	0.54	0.41	0.33
AVI-110025 135-5791	30	VC	0.22	28	16.3	13.1	0.50	0.37	0.30
	40	VC	0.25	32	18.6	***14.9***	0.57	0.43	***0.34***
	50	VC	0.28	36	21	16.6	0.63	0.48	0.38
	60	VC	0.31	40	23	18.4	0.70	0.53	0.42
AVI-11003 135-8283	30	XC	0.26	33	19.3	15.4	0.59	0.44	0.35
	40	VC	0.30	38	22	17.8	0.68	0.51	0.41
	50	VC	0.34	44	25	20	0.77	0.58	0.46
AVI-11004 135-8296	30	XC	0.35	45	26	21	0.79	0.60	0.48
	40	XC	0.40	51	30	24	0.91	0.68	0.54
	50	VC	0.45	58	33	27	1.00	0.77	0.61
AVI-11005 135-8284	30	XC	0.43	55	32	26	0.97	0.73	0.58
	40	XC	0.50	64	37	30	1.10	0.85	0.68
	50	VC	0.56	72	42	33	1.30	0.95	0.76
AVI-11006 135-8286	30	XC	0.52	67	39	31	1.20	0.88	0.71
	40	XC	0.60	77	45	36	1.40	1.00	0.82
	50	VC	0.67	86	50	40	1.50	1.10	0.91

Grey tips are to be used ONLY the 4 tip booms

HIGH VOLUME SPRAY CHART (XRC TIPS)

	PSI	Drop Size	CAPACITY ONE NOZZLE IN GPM	CAPACITY ONE NOZZLE IN OZ./MIN	HIGH VOLUME SPRAYING (SPACING) 20" GPA 4 MPH	GPA 5 MPH	GALLONS PER 1,000 SQ. FT. 3 MPH	4 MPH	5 MPH
XRC11010 135-8413	15	VC	0.61	78	45	36	1.40	1.00	0.83
	20	VC	0.71	91	53	42	1.60	1.20	0.97
	30	C	0.87	111	65	52	***2.00***	1.50	1.20
	40	C	1.00	128	74	59	2.30	1.70	1.40
XRC11015 117-5839	15	XC	0.92	118	68	55	2.10	1.60	1.30
	20	XC	1.06	136	79	63	2.40	1.80	1.40
	30	VC	1.30	166	97	77	2.90	2.20	1.80
	40	C	1.50	192	111	89	3.40	2.60	2.00

***NOTE:** Always double check your application rates.
Tabulations are based on spraying water at 70° F (21° C)

Coarse Very Coarse Extremely Coarse

135-6281

Spreader / Sprayer Calibration:

Mixing of liquid or dry product should be in accordance to manufacturers labels. Remember this is designed for low volume spraying so the mix will be more concentrated.

Remember that your machine is factory set to put down 1/3 gallon of liquid per 1,000 sq. ft (*at 5MPH and 40PSI*). For instance, some products call for 1.1 to 1.5 oz 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, then multiply that amount by the number of gallons your put in your tank

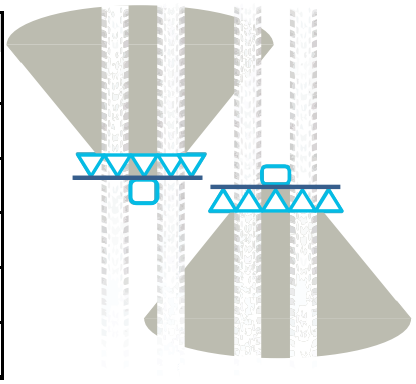
1.3 (median value of 1.1 to 1.5) X 3 (1.3 gallon tip) X gallons of water needed. If you were filling a 30 gallon tank your equation would look like this: ***1.3 X 3 X 30 = 117 ounces in 30 gallons of water.***

Approximate Granular Calibration

Product	*Lbs. per 1,000 sq ft*	*Full Rate*
Fine Pellets	1	4.75
	2	5.25
	3	5.5
Mixed Fine Pellets	2	5.0
	4	6.0
	6	6.5
Small Pellets	2	4.25
	4	5.5
	6	5.75
Nitrogen Pellets Med.	1	4.75
	2	5.5
	3	6.0
Med. Pellets & Granules	2	4.75
	4	5.5
	6	6.5
Large Heavy Pellets	2	5
	4	6.25
	6	7.25

*Calibrated at 5 MPH

Throw fertilizer back to the center of tire tracks



Accuway

Accuway balances the spread pattern, by shifting the product placement on the spinner. Placing the product on the impeller close to the shaft or the center will cause the spread pattern to be heavier to the right as it rides the impeller for a longer period. If the product is placed on the outer edge of the impeller, the spread pattern will be heavier to the left (*because the spinner is turning clockwise*).

1) Start with the Accuway control cable all the way forward or in (*this is home base*).

2) Begin to spread the product. As you are spreading you should be able to see the spread pattern in front of you. Generally, all spreaders will tend to throw fertilizer heavy to the right. As you continue to spread, pull the Accuway control towards you very slowly (*small increments*) until you begin to bring the spread pattern directly centered in front of you.

3) Once you have the spread pattern centered, lock the Accuway cable in place. There should be no reason to reset the Accuway for that product unless you see that the spread pattern has changed due to bumping the lever. If it has changed slightly, simply re-adjust the pattern while you're spreading.

Fine Mixed Fine Small Small/Med Medium Heavy

decal135-6281c

135-6281

Operation

Sprayer/Spreader 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)

~ Sprayer – 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 is 8 feet.

Creating pressure to these nozzles is done through the Throttle Valve. Threading the Throttle Valve in (Figure 3) will create pressure to either the boom nozzles or the hose reel. Threading the Throttle Valve out (Figure 4) 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 5). Clockwise turns create more pressure and counter-clockwise turns decrease pressure.

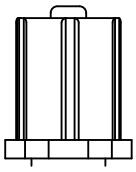


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Figure 3

Throttle Valve in to prepare spray

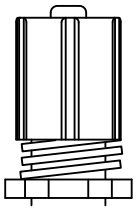

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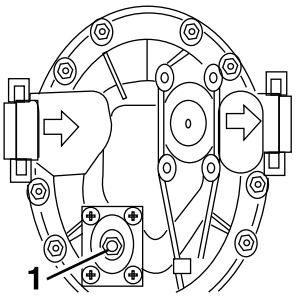
Figure 4

Throttle Valve out to create agitation



g268915

Figure 5

1. Pressure adjust on pump (Allen Wrench)

Turning on the spray system can be done one of two ways. Your first option would be the On/Off switch located on the control panel (Figure 6). This would be located on the lower/right side of the control panel. The second way to turn the spray system on is the foot switch located on the left side on the Foot Pan (Figure 7). This is a good way to turn on the spray system because it allows the operator to keep both hands on the control arms and drive the unit.

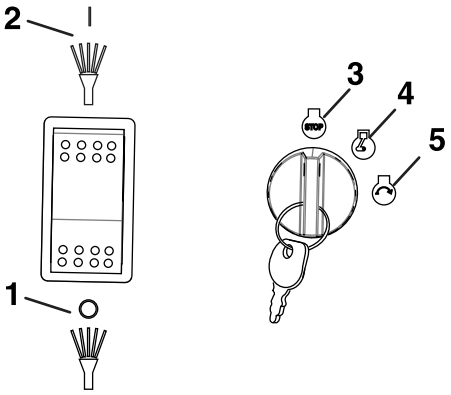


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Figure 6

Pump Switch-On/Off

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

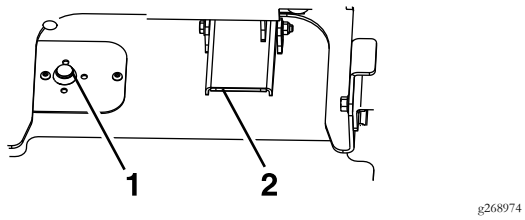


Figure 7

1. Foot Pan Switch
2. Locking Caster Foot Pedal

~Spreader – The Z-Spray units are equipped with a 120 lb spreader. The hydraulic hopper motor with the spreader control rate knob allows variable spread widths from 3 to 25 feet. This depends on volume/density, particle size and rate of travel, and weather conditions. The pattern can be increased or decreased while spreading depending on need. This allows you to spread and spray at the same time. A typical pattern is to overlap the fertilizer pattern inside the tire tracks and the spray pattern boom to boom. To spray and spread at the same time: Set the spread pattern for twice the width of the spray. For example; this model has a spray pattern width of 8 feet. Set the spread width to 16 feet and spread inside the tire tracks. The spray pattern will match boom to boom. The spread thins or feathers at the outer edges, eliminating sharp "edge of spread" lines, which cause stripes and streaks. Determine a dial setting on the low side. If setting is too low, cover the area more than one time. A higher setting can be used when a proven dial setting is established. Travel at a constant speed for consistent results. Remember-Published dial settings are approximate only. Open the hopper door after the spreader is turned on at operating speed.

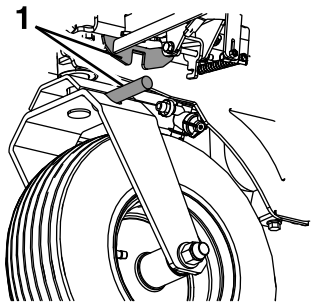
Operations

Upon turning the key on to start the unit, apply full choke. Once unit has started, release first the choke and then the brake. Push Joy Sticks forward equally to move unit forward. Should you want the unit to backup in the reverse direction, pull back on the Joy Sticks. If a turn is desired, push opposite Joy Stick of the direction you want the unit to head forward (if wanting to turn left, push the right Joy Stick forward while keeping the left Joy Stick slightly back of the right thus allowing the right tire to turn more than the left. Push more on the left Joy Stick if you desire to turn the unit to the right). Be cautious as turn radius changes with the speed you are going and the amount each Joy Stick is positioned forward or backward. Turning the liquid pump on and off can be made from two different locations. The common on/off switch for the pump is located on the control panel. There is a foot switch located on the left side of the foot plate to allow the operator to turn the pump on or off upon request (press on foot switch when you want the pump to turn on and release the foot switch when wanting to shutoff pump system).

Using the spreader system, there are 3 cables to operate the hopper door (far left cable), the diffuser (middle cable) and the deflector shield (lower right cable). By pulling on the far left hopper door cable, this will open the door and allow product to fall on the spinner. Adjustments as to how wide the door opens are made on the front on the hopper with the Hopper Rate Dial. This limits how wide the door will open and how much granular product will be coming out. The diffuser cable (middle cable) controls the spray pattern. Turning the cable knob counter-clockwise will loosen the cable lock and allow you to adjust (pull further out or push further in) this cable. Doing this will allow you to spread granular product heavier to the left, consistent in the middle or heavier to the right. Once you have adjusted to your desired pattern, turn the knob clockwise to lock in position.

The lower cable on the far-right hand side is the deflector shield cable. This cable allows you to lift and lower the deflector shield accordingly. During normal spreading applications, the deflector shield would stay in the up position and cable would be extended out all the way. When wanting to close off the left side and use the deflector shield, push in the cable and the shield will drop down blocking off granular product on the left side.

The Locking Caster System (Figure 7 and Figure 8) allows the operator to lock the front caster wheels in the forward position to create more side hill stability. The Locking Caster System is applied when the operator compresses the Locking Caster System foot pedal located on the right side of the foot plate. When compressing the foot pedal, locking mechanism slides over the caster pin locking the wheel in the forward/straight position. This system is spring loaded, so by releasing this pedal it will release the lock on the front caster wheels.



g271157

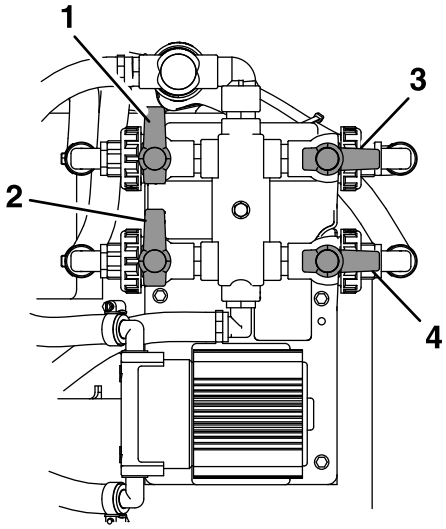
Figure 8

1. Caster pin locking mechanism

Spray/Spreader System

Valving

With this valving setup, you have the option of pulling product from both tanks simultaneously or independently. The picture below shows the right-side valves ON and the left side valves OFF.

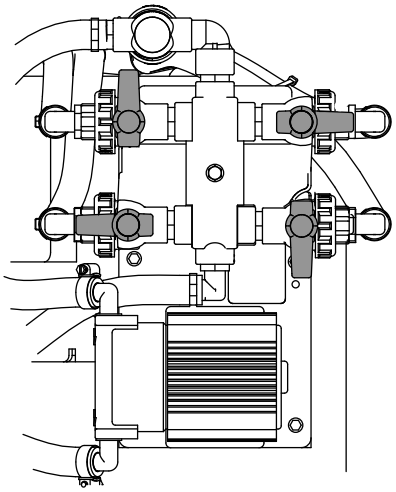


g271204

Figure 9

Pull liquid from right tank only

1. Left suction valve off
2. Left return valve off
3. Right suction valve on
4. Right return valve on

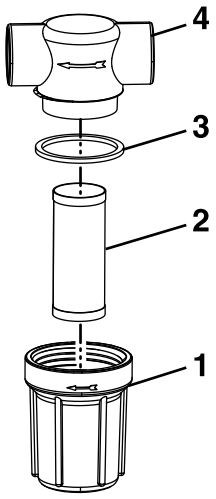


g271205

Figure 10

Transferring product from right tank to left

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).



g271206

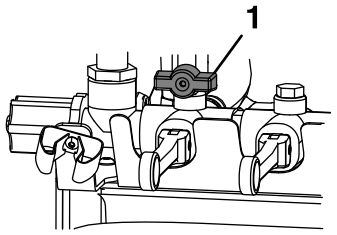
Figure 11

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 as well as the spot spray foot switch on the left side of the foot pan. 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 Coil Hose for spraying out of the hand spray gun. When Coil Hose is not in use, be sure to turn valve off to prevent boom tips from dripping.



g271228

Figure 12

1. Valve closed position

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.

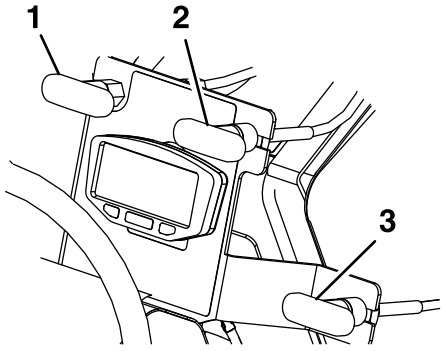
1.3 (median value of 1.1 to 1.5) X 3 (1/3 gallon tips) X gallons needed. If you were filling a 30-gallon tank your equation would look like this:

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

Spreader Calibration/Layout

The Spreader Motor Control determines the speed of the impeller in the front on the machine. Your machine is capable of varying its spread pattern from 3 – 25 feet with this control. Being hydraulically driven, the spread pattern is independent of the ground speed.

The hopper control cable opens and closes the door inside the base of the hopper. The maximum size of the opening will be determined by the rate adjustment on the Hopper Rate Dial. This will set your rate gate linkage bar to limit and stop the rate the door can open.



g271229

Figure 13

1. Hopper
2. Diffuser
3. Deflector

The Diffuser adjustment allows the user to adjust the intensity of the spread pattern. A small pull shifts the product placement on the impeller either to the edge of the impeller or the middle of the impeller. This in turn shifts the spread pattern heavier to the left (placing product to the edge of the impeller) or heavier to the right (placing product to the middle of the impeller).

Your machine is equipped with a 120 lb. Spyker model spreader. The hydraulic spreader motor with the spreader motor control has the ability to vary spread widths from 3 to 25 feet. This depends on volume/density, particle size and rate of travel, and weather conditions. The pattern can be increased or decreased while spreading depending on needs. This allows you to spread and spray at the same time. A typical pattern is to overlap fertilizer pattern back to the tire tracks and the spray pattern boom to boom.

To spray and spread at the same time: Set the spread pattern to twice the width of the spray. For example, the Junior 36 model has a spray width of 8 feet. Set the spreader width to 16 feet and spread back to the inside of tire tracks. The spray pattern will match boom to boom.

This feathers material at the outer edges, eliminating sharp "edge to spread" lines which cause stripes and streaks.

Determine a dial setting on the low side. If setting is too low, cover the area more than one time. A higher setting can be used when a proven dial setting is established. Travel at a constant speed.

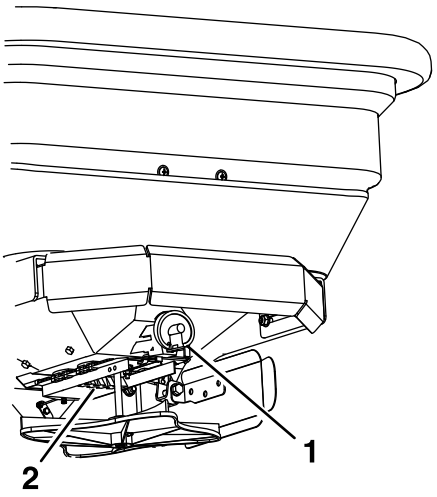


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Figure 14

1. Dial
2. Diffuser

Remember- Published dial settings are approximate only. Open the hopper door after the spreader is turned on at operating speed.

*Spray/Spread Calibration Decal Charts are available from the parts department.

Maintenance

Periodic 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.

Engine Maintenance

USE COMPRESSED AIR (NOT WATER) WHEN CLEANING ENGINE

Use only original equipment replacement parts. Other parts may not perform as well, may damage unit, and may result in injury.

Oil Recommendations: Only use blue-colored 10W-50 engine oil; Exmark Engine Oil 10W-50 is recommended for best performance. Other high-quality detergent oil are acceptable if classified for service SF, SG, SH, SJ or higher. Do not use special additives. Change engine oil after first 5 hours and then every 50 hours thereafter.

If the oil level is below the ADD mark, add oil until it reaches the FULL mark. Start the engine and run for a few seconds. Turn engine off and check dipstick for proper fill level.

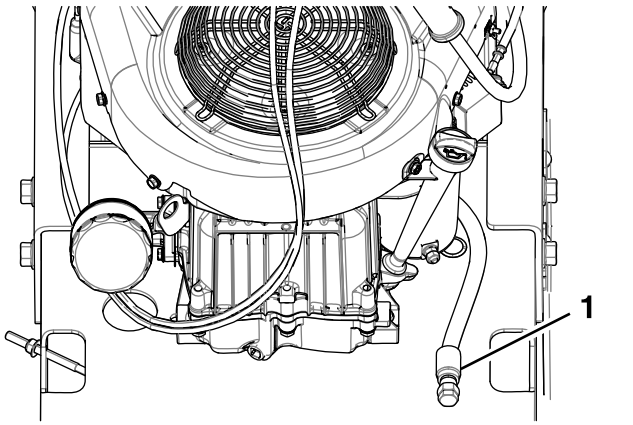

Figure 15

1. Engine oil drain hose on right side

Fuel Recommendations: Fuel must meet these requirements

- Clean, fresh, unleaded gasoline.
- A minimum of 87 octane/87 AKI (91 RON).
- Gasoline with up to 10% ethanol (gasohol) or up to 15% MTBE (methyl tertiary butyl ether) is acceptable.

Full maintenance information can be located in the engine manual provided.

Hydraulic System Maintenance

USE COMPRESSED AIR (NOT WATER) WHEN CLEANING HYDRAULIC SYSTEM

Hydro-Gear recommends that the fluid and filter(s) be changed after the first 100 hours and every 500 hours therafter. Use Exmark Premium Hydro Oil when replacing the oil in your system.

Hydraulic system requires 25 micron oil filters or equivalent to be used.

Check for hydraulic leaks daily to ensure proper fluid levels.

Traction Unit Maintenance

The Z-Spray has 5 grease fittings that require periodic greasing. These locations can be found on the wheel assembly (1 on each front wheel assembly), on the caster assembly (1 on each front caster assembly), and the drive belt idler (1 on idler arm).

Inspect wheel and caster assembly every 25 hours for bearing wear, damage, debris, and proper installation.

Inspect idler arm bushing every 50 hours for wear. These bushings are a wear item and will have to be replaced periodically.

Inspect all bolts, washers, nuts, pins and other mounting hardware of Z-Spray once a week to ensure that hardware pieces are properly tightened.

Spray System Maintenance

The Z-Spray has both a granular spreader system as well as a liquid spray system (24 gallon comes standard with two 12 gallon tanks). Maintaining these two systems will ensure you years of use, proper calibration and limit premature wear.

The spray system contains liquid storage tanks . Additional tanks can be mounted as accessories to either increase units liquid capacity, or allow a unit to have a separate system for different liquid products) 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 Z-Spray 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 coiled hose valve in closed position when not in use. This will prevent the boom nozzles from dripping due to pressure build-up in the hose reel.

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.

Spreader Maintenance

The Z-Spray come equipped with a 120 lb spreader and requires the same amount of attention and maintenance.

USE COMPRESSED AIR (NOT WATER) WHEN CLEANING HOPPER

Lubricate (Silicone Spray) Hopper, Deflector and Diffuser cables weekly.

Clean debris and product from Hopper daily to eliminate build up.

Keep hydraulic hose fittings tight and free of leaks.

Be sure that the 4ea Rate Gate & Diffuser Guides are not damaged to allow the hopper door to slide freely.

Check agitator wire on a daily basis. If wire is not present, product will run the risk of building up prior to reaching hopper door and not spreading evenly.

Maintenance Chart

Service Interval: As required

Service Actions(s)	Daily	Weekly	Bi-Weekly	Monthly	Yearly	Hours
Front Caster Wheels (grease)			X			
Front Caster Yokes (grease)			X			
Front Tire Pressure (18 PSI)		X				
Rear Tire Pressure (18 PSI)		X				
Rear Rim Nut Torque (95lbs)				X		
Idler Pulley Arm (grease)				X		
Belt Tension (1/2 inch deflection at 15lbs)			X			
Belt Wear (cracks, tears or missing material)			X			
Hopper Cables (lubricate w/ Silicone Spray)		X				
Accuway Cable (lubricate w/ Silicone Spray)		X				
Deflector Shield Cable (if applicable) (lubricate w/ Silicone Spray)		X				
Bottom of Hopper Tub (wire brush cleaning)			X			

Service Actions(s)	Daily	Weekly	Bi-Weekly	Monthly	Yearly	Hours
Hopper Bottom Bushing (change if needed)				X	Replace	
Impeller (change if needed)			X			
Engine Oil (check)	X					
Engine Air Filter Check (change if needed)						50 hrs
Engine Air Pre-Filter Check (change if needed)			X		Replace	
Engine Fuel Filter Check (change if needed)						25 hrs
Engine Spark Plugs				X	Replace	
Hydraulic Oil and filter (change)						After first 100 hrs and every 500 hrs thereafter
Hydraulic Oil Level (check)	X					
Hydro System Fittings (check for leaks)		X				
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				

Service Actions(s)	Daily	Weekly	Bi-Weekly	Monthly	Yearly	Hours
DIRECTO Valves (check)				X		
Spot Spray Gun (check)			X			
Spot Spray Gun Tip (check)			X			
Blow off fertilizer daily	X					

Troubleshooting

Engine:

- Not starting. There are a few reasons as to why your engine fails to start. If the engine does not turn over, then the battery could be dead, bad connection to the battery wires, keys which may be bad, 30 AMP fuse on the wiring harness (orange wire) may be blown or the starter solenoid may be bad (you will hear the starter solenoid trying to click on, but nothing is happening). Another common reason for a unit not starting is after unit has been washed. Water gets into the spark plug boot and gets the spark plug wet. Pull spark plug boot and dry (spray WD-40).
- Engine turns over but doesn't start. There are a few reasons as to why your engine will turn over but not start. If the fuel valve is turned off (under fuel tank), loose or bad spark plug, water in fuel, choke partially closed or wet and/or foul plugs. Check if no fuel or Fuel Tank lever is partially off.
- Engine won't stay running. Few things to look for if your engine does not stay running are clogged fuel filter, clogged and/or dirty air filter, fuel valve partially closed, water in fuel or low fuel.

Hydraulics:

- Hydraulic system making loud noise when running. This could be caused by a couple of things. The most common is if there is air in the system. This can be caused when changing out a hydro pump, replacing a hydraulic hose or having a loose fitting on the intake lines. If air is not present, check for low levels in the system. This happens when there is a leak in the hydraulic system somewhere or hydraulic fluids were just changed and did not get back to the proper fill level.
- Need to tow my unit; what do I need to do in order to not ruin my hydro pumps? There are Tow Valves on each of the hydro pumps (hex head with hole running through it on the left side rear of the hydraulic pump) that needs to be turn at least 1 ½ revolutions counterclockwise to open the hydraulic system (but NEVER remove). Once the unit is brought to a desired location, remember to tighten the tow valves back tight (clockwise).

Tracking:

Unit not tracking straight when pushing both control arms to the speed bar. This is caused when the linkage to the hydraulic pump is not even or a hydraulic pump is going bad. Traditionally the linkage needs to be adjusted so that they both have the same amount of pull. If it is pulling to the left, the left hydraulic pump linkage is longer than the right; you can either adjust the right to a longer linkage, or adjust the left to a shorter linkage to match the right.

Granular:

- There are numerous potential challenges that can happen on the granular side due to the amount of use this portion of the unit sees. If product is not spreading evenly or consistently, then look for a few things with your hopper impeller or hopper diffuser. If there is build up at the end of the Impeller tips or the tips are worn, this will cause an uneven and/or inconsistent spread pattern. Another potential challenge is if the pattern is not even when the Accuway is not part of the picture. This is sometimes caused when granular product is moist and holding on longer than normal.
- If granular product is leaking out from the hopper, determine where it is coming from and look at this repair options. If the granular product is leaking through the hopper shaft area, then your hopper bushing is worn. This will allow product to get in between the shaft and the hopper bushing. If granular product is leaking

through the hopper door area, then Diffuser Guides are loose or worn allowing a gap between the door and the hopper base. Also a potential factor is if the hopper cable is not completely closing the hopper door.

- When your hopper door cannot open, there are typically 3 things to look at. One is that your hopper cable may be frozen and locked up, the ball joint end may have broken off or there may be product jammed between the hopper door and the base (due to loose door guides).

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.

Charging Issues:

20 Amp Regulated Alternator

The 20 amp regulated alternator system provides AC current through two output leads to the regulator-rectifier. The regulator-rectifier converts the AC current to DC, and regulates current to the battery. The charging rate will vary with engine RPM and temperature.

1. Stator assembly (1) (Figure 16)
2. Two YELLOW leads (2) from Stator.
3. RED DC output lead (3) from connector.
4. Connector (4)
5. Two YELLOW AC input leads (5)
6. Regulator-rectifier (6)
7. RED DC output lead (7) to connector

Note: Stator (1), regulator-rectifier (6) and fly-wheel are NOT INTERCHANGEABLE with any other charging system.

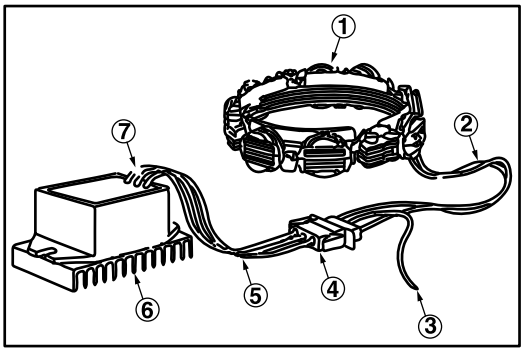

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Figure 16

Output Test

WHEN CHECKING THE ALTERNATOR COMPONENTS, PERFORM THE TEST IN THE FOLLOWING SEQUENCE:

Temporarily disconnect stator wire harness from regulator-rectifier.

1. Insert RED test lead into VΩ receptacle in meter.
2. Insert BLACK test lead into COM receptacle.
3. Rotate selector to V~ (AC VOLTS) position.

⚠ CAUTION

Attach meter test leads to the AC output terminals (YELLOW wires) in the connector BEFORE starting the engine. If the stator is grounded (defective) and the meter test leads contact the center DC output pin (RED wire) in the connector, arcing could occur, damaging the wiring.

4. Attach RED (2) and BLACK (1) test lead probes to the YELLOW wire (4) AC output terminals (6), of the connector (3), as shown in Figure 17. (Meter test clip leads may be attached to either AC output terminal).

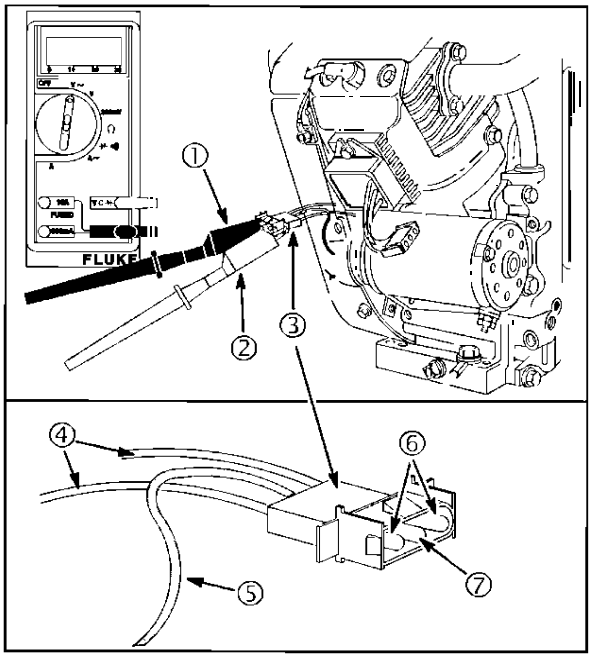

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Figure 17

5. If NO or LOW output is found check for bare wires or other defects. If shorted leads are not visible, replace the stator.
6. With the engine running at 3600 RPM output should be no less than 26 Volts.

DC Output Charging Wire Test

A simple test can be used to test the DC output charging wire circuit. If a wiring problem exists it can be corrected before testing regulator-rectifier.

Leave stator wire harness disconnected from regulator-rectifier. Equipment key switch must be in OFF position.

1. 1. Insert RED test lead into VΩ receptacle in meter.
2. Insert BLACK test lead into COM receptacle.
3. Rotate selector to V= = (DC volts) position.
4. Attach RED test lead probe (2) to the RED wire (5) DC output terminal (7), of the connector (Figure 17).
5. Attach BLACK test lead probe (1) to negative battery terminal.

6. Turn equipment key switch to ON position. Meter should display BATTERY VOLTAGE.
7. If meter does not display voltage, check for blown fuse or broken or shorted wire.

Regulator-Rectifier Test

The DC Shunt MUST be installed on the NEGATIVE (-) terminal of the battery, (Figure 18) to avoid blowing the fuse in the meter when testing the output of the 20 amp system. All connections must be clean and tight for correct readings.

1. Connect stator wire harness to regulator-rectifier.
2. Install DC Shunt (4) on NEGATIVE battery terminal.
3. Insert RED test lead into VΩ receptacle in meter and connect to RED post terminal on shunt (5), Figure 18.

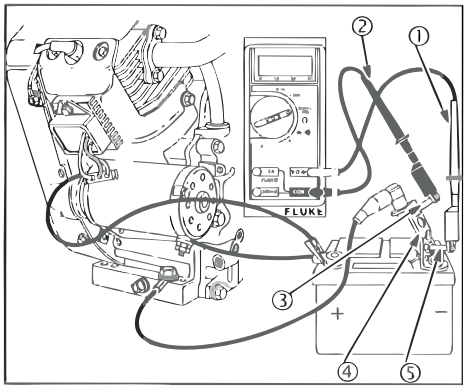

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Figure 18

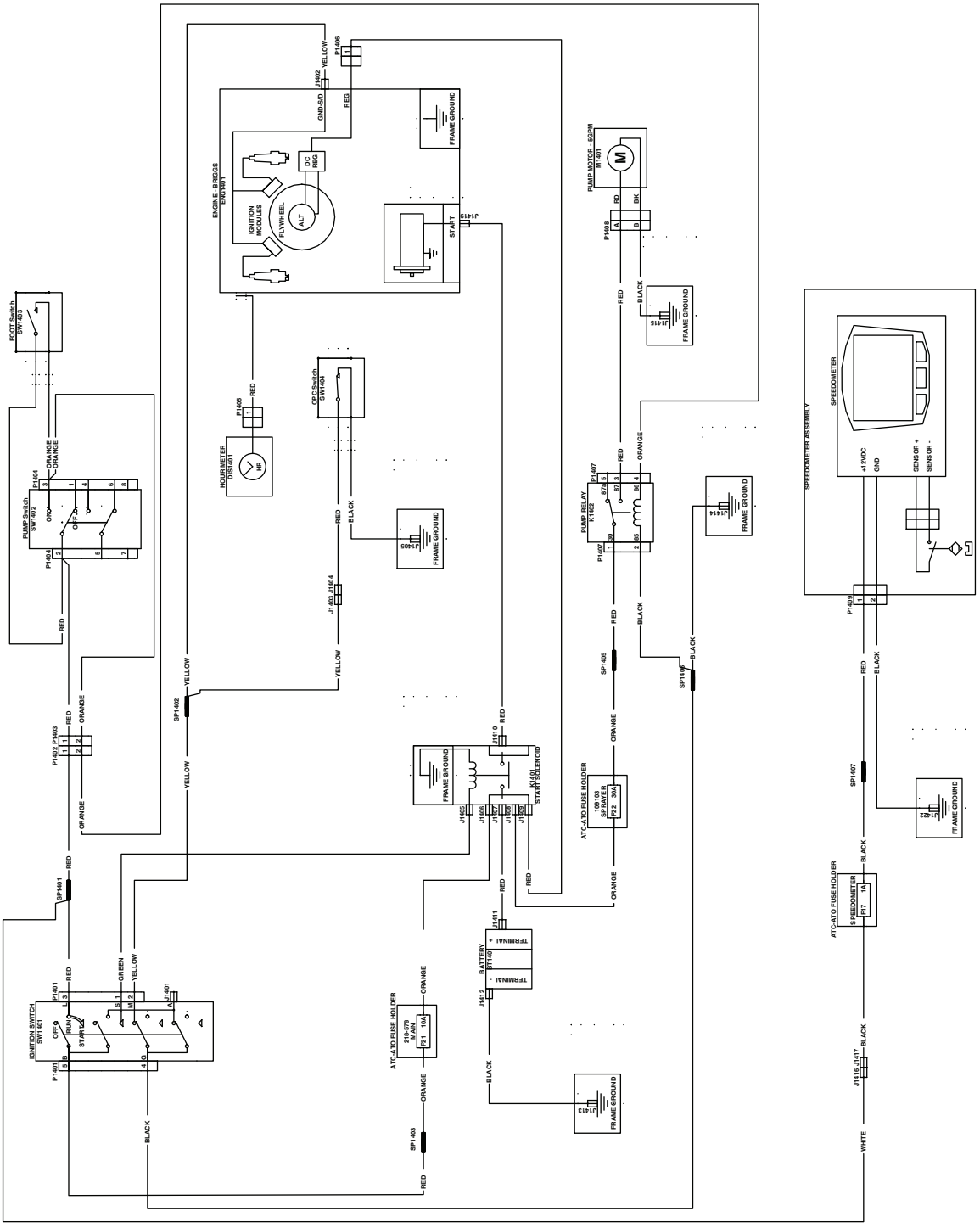
4. Insert BLACK test lead in COM receptacle in meter. Connect to BLACK post terminal on shunt (3).
5. Rotate selector to 300 mV position.
6. With the engine running at 3600 RPM, the output should be 3-20 Amps.

Note: Depending on battery voltage and/or current draw on system

If NO or LOW output is found, be sure that regulator-rectifier is grounded properly and all equipment connections are clean and secure. If there is still NO or LOW output, replace the regulator-rectifier.

Schematics

Electrical Schematic



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

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Serial No. _____

Date Purchased _____

Engine Model No. and Spec. No. _____

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