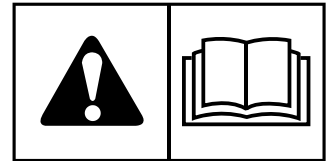




# ***OPERATOR'S MANUAL***

## **Pathfinder Series Pathfinder XC Series Spreader / Sprayer**



<b>Model</b>	<b>Description</b>
5901752	PATHFINDER (FS2100)
5901753	PATHFINDER XC (FS2200)

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# General Information

Thank you for purchasing this quality-built Ferris product. We're pleased that you've placed your confidence in the Ferris brand. When operated and maintained according to the instructions in this manual, your Ferris product will provide many years of dependable service.

This manual contains safety information to make you aware of the hazards and risks associated with this machine and how to avoid them. This machine is designed and intended to be used and maintained according to the manual and operated by trained professionals for the application of dry and wet material to established lawns and is not intended for any other purpose. It is important that you read and understand these instructions thoroughly before attempting to start or operate this equipment. **Save these original instructions for future reference.**

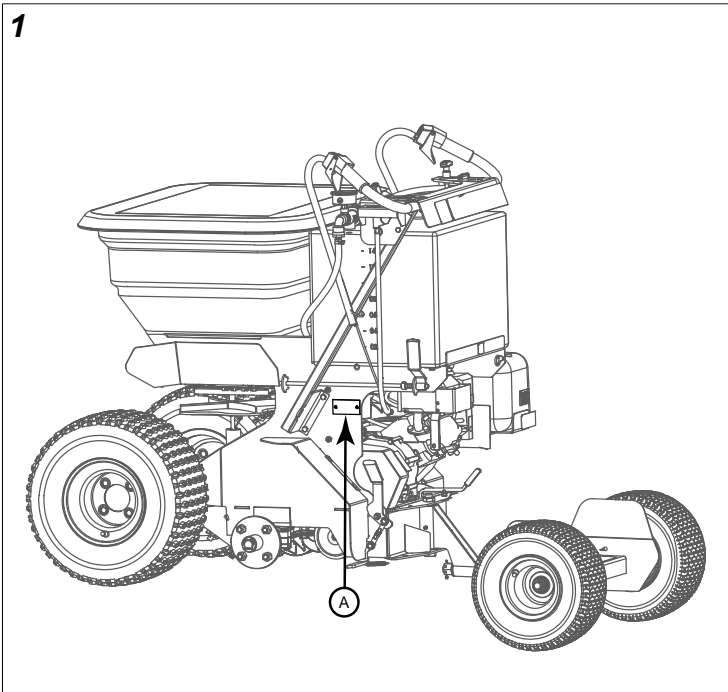
The images in this document are representative, and are meant to complement the instructional copy they accompany. Your unit may vary from the images displayed. *LEFT* and *RIGHT* are as seen from the operator's position.

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ferrismowers.com

## Identifying Your Unit

The following products are covered by this manual:  
5901752 & 5901753

The product identification tag (A, Figure 4) can be found in the location as shown in Figure 4.



**BRIGGS & STRATTON**  
**MILWAUKEE, WI 53201, USA**  
**ASSEMBLED IN THE USA**

**PART NO.**                      **SERIAL NO.**  
**XXXXXXX**                      **XXXXXXXXXX**

PRODUCT REFERENCE DATE	
Unit Model Number:	
Unit Serial Number:	
Mower Deck Model Number (if applicable):	
Mower Deck Serial Number (if applicable):	
Dealer Name:	
Date Purchased:	
ENGINE REFERENCE DATA	
Engine Make:	
Engine Model:	
Engine Type / Specification:	
Engine Code / Serial Number:	

When contacting your authorized service dealer for replacement parts, service or information you **MUST** have these numbers.

*Note:* For the location of the engine identification numbers refer to the engine owner's manual.

The Illustrated Parts Lists for this machine can be downloaded from [ferrismowers.com](http://ferrismowers.com). Please provide model and serial number when ordering replacement parts.

## Operator Safety

Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of the unit, severe personal injury or death to you, or bystanders, or damage to property or equipment.

The safety alert triangle (⚠) in text signifies important cautions or warnings which must be followed.

### California Proposition 65

#### ⚠ WARNING

This product can expose you to chemicals including gasoline engine exhaust, which is known to the State of California to cause cancer and carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

### Operating Safely

Congratulations on purchasing a superior-quality piece of lawn and garden equipment. Our products are designed and manufactured to meet or exceed all industry standards for safety.

Do not operate this machine unless you have been trained. Reading and understanding this operator's manual is a way to train yourself.



Keep both feet on the operator platform at all times. Power equipment is only as safe as the operator. If it is misused, or

not properly maintained, it can be dangerous! Remember, you are responsible for your safety and that of those around you.

Use common sense, and think through what you are doing. If you are not sure that the task you are about to perform can be safely done with the equipment you have chosen, ask a professional: contact your local authorized dealer.

### Chemical Safety

#### ⚠ WARNING

Any spreading materials used in this machine may be hazardous if inhaled or if it makes contact with your skin. Caustic liquid or chemical burns could occur if spreading materials are not used properly.

- Read and follow all the instructions and warnings on Material Safety Data Sheets (MSDS) from manufacturer for all spreading materials used.
- Become familiar with and follow all warnings, recommendations, instructions and procedures for: first aid measures, safe use, mixing, handling, applying, spills clean-up, storage and disposal of all spreading materials as listed on the manufacturer's label or MSDS of any spreading materials.
- Wear all personal protective equipment as recommended on the manufacturer's label or MSDS of any spreading materials. Personal protective equipment may include safety glasses or goggles and/or face shields, chemical resistant gloves, rubber boots, and a respirator or air purifying filter mask.
- Before working on this machine, clean the hopper thoroughly according to the recommendations of the chemical manufacturer (see MSDS and product labels).
- Obtain the proper training before using or handling any spreading materials. Follow all local, state and federal requirements for the handling and spreading of spreading materials.
- Be sure to verify there is an adequate supply of clean water and soap nearby and immediately wash off any spreading materials that may contact you, as recommended on the manufacturer's label or MSDS of any spreading materials.
- Handle spreading materials in a well-ventilated area.
- Keep clean water available for immediate rinsing off and clean-up of any spilled spreading materials, as recommended on the manufacturer's label or MSDS of any spreading materials.
- Never enter the hopper without the correct personal protective equipment (PPE), as recommended on the manufacturer's label or MSDS of any spreading materials.

## **WARNING**

- Reduce your speed and minimize the weight of your load (in the hopper) when operating on hills or rough terrain to avoid possible instability, tipping or rollover of the machine.
- Granular materials in the hopper may shift during operation. This is most common while turning, going up, down or across hills, when suddenly changing speed, or operating on rough terrain. This shift in load may cause possible instability, tipping or rollover of the machine. Reduce your speed in these situations.

## **Training**

- Read, understand, and follow all instructions in the manual and on the unit before starting. If the operator(s) or mechanic(s) cannot read the language this manual is provided in, 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 labels.
- All operators and mechanics should be trained. The owner is responsible for training the users.
- Only allow responsible adults, who are familiar with the instructions, to operate the unit.
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent, and is responsible for, accidents or injuries occurring to themselves, other people, or property.

## **Preparation**

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Use only accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including safety shoes, safety glasses, and ear protection. Long hair, loose clothing, or jewelry may get tangled in moving parts.
- Inspect the area where the equipment is to be used and remove all objects such as rocks, toys, and wire, which could possibly damage the unit's tires.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
- Use only an approved container for gasoline.
- Never remove fuel cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke. Never refuel or drain the machine indoors.
- Check that safety switches and shields are attached and functioning properly. Do not operate unless they function properly.
- Become familiar with and follow all warnings, recommendations, instructions and procedures for safe use, handling, applying, storage and disposal of all chemicals as listed on the manufacturer's label of any herbicides, pesticides or other chemicals.

- Wear all personal protective equipment as recommended on the manufacturer's label or MSDS of any herbicides, pesticides or other chemicals. Personal protective equipment may include safety glasses or goggles and/or face shields, chemical resistant gloves, rubber boots and a respirator or filter mask.

## **WARNING**

It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered or grass-covered land unless the exhaust system is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws. Contact an Authorized Service Dealer to obtain a spark arrester designed for the exhaust system installed on this engine.

- OSHA regulations may require the use of hearing protection when exposed to sound levels greater than 85 dBA for an 8 hour time period.

## **WARNING**

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.

## **Children**

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the unit and operating activity. Never assume that children will remain where you last saw them.

- Keep children out of the operating area and under the watchful care of another responsible adult.
- Be alert and turn the unit off if children enter the area.
- Before and while driving in reverse, look behind and down for small children.
- Never carry children, even with the spreader spinner off. They may fall off and be seriously injured or interfere with the safe operation of the unit. Children who have been given rides in the past may suddenly appear in the operation area for another ride and could be run over or backed over by the machine.
- Never allow children to operate the unit.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

## **Safe Handling of Gasoline**

To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.

- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only approved gasoline containers.
- Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling.

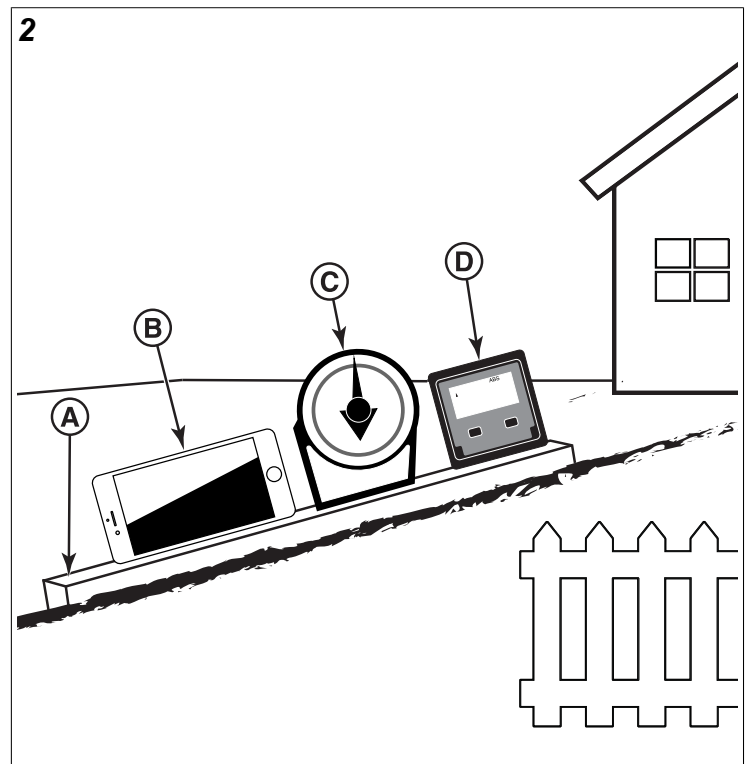
- Never fuel the machine indoors.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light such as near a water heater or other appliance.
- Never fill containers inside a vehicle or on a truck bed with a plastic bed liner. Always place containers on the ground away from your vehicle before filling.
- Remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
- Keep 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.
- If fuel is spilled on clothing, change clothing immediately.
- Never over-fill the fuel tank. Replace gas cap and tighten securely.
- Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
- If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
- Replace all fuel tank caps and fuel container caps securely.

## Operation

- Keep both feet on the operator platform at all times.
- Never run an engine in an enclosed area.
- Operate only in the daylight or with good artificial light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position.
- Be sure of your footing while using pedestrian controlled equipment, especially when backing up. Walk, don't run. Reduced footing could cause slipping.
- Slow down and use extra care on hillsides. Be sure to travel in the recommended direction on hillsides. Turf conditions can affect the machines stability. Use caution when operating near drop-offs.
- Do not Operate in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never leave a running unit unattended. Always disengage the spreader spinner, set parking brake, stop engine, and remove keys before dismounting. Keep hands and feet away from the rotating parts.
- Disengage the spreader spinner when not operating.
- Never operate with guards not securely in place. Be sure all switches are attached, adjusted properly and functioning properly.
- Do not change the engine governor setting or overspeed the engine.

- Stop on level ground, lower implements, disengage spreader spinner, engage parking brake, shut off engine before leaving the operator's position for any reason.
- Look behind and down before backing up to be sure of a clear path.
- Never carry passengers and keep pets and bystanders away.
- Do not operate the unit while under the influence of alcohol or drugs.
- Slow down and use caution when making turns and crossing roads and sidewalks. Disengage spreader spinner if not operating.
- Use 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.
- To reduce fire hazard, keep unit free of grass, leaves & excess oil. Do not stop or park over dry leaves, grass or combustible materials.

## Slope Identification Guide



### How to measure the slope of a lawn surface with a smartphone or an angle finder tool:



#### WARNING

Do not operate on slopes greater than 8 degrees.

1. Use a straight edge at least two (2) feet long (A, Figure 2). A 2x4 or a straight piece of metal works well.
2. Angle finder tools.
  - a. **Use your smartphone:** Many smartphones (B, Figure 2) have an inclinometer (angle finder) located

under the compass application (app). Or, search an app store for an Inclinometer app.

- b. **Use angle finder tools:** Angle finder tools (C & D, Figure 2) are available at local hardware stores or online (also called inclinometer, protractor, angle meter, or angle gauge). Dial type (C) or digital type (D) work, others may not. Follow user instructions with the angle finder tool.
3. Place the two (2) feet long straight edge along the steepest part of the lawn slope. Place the board up and down the slope.
4. Lay the smartphone or angle finder tool on the straight edge and read the angle in degrees. This is the slope of your lawn.

*Note:* A paper gauge slope identification guide is included in your product literature packet and is also available to download from the manufacturer's website (ferrismowers.com).

## Slope Operation

Slopes are a major factor related to loss-of-control and tipover accidents, which can result in severe injury or death. All slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not drive on it.



### **DANGER** **LOSS OF CONTROL**

Tipping Hazard: Operating on slopes can be hazardous and cause loss of control.

- Do NOT operate on slopes over 8° degrees.
- Go across slopes, NOT up and down.
- Reduce speed and use extreme caution on slopes.
- Do NOT operate on slopes when grass is wet.
- Avoid sudden turns or rapid speed changes.
- Reduce your speed and minimize the weight of your load in the hopper to half capacity when operating on hills or rough terrain to avoid possible instability, tipping or rollover of the machine.
- Avoid turning down slopes; if possible turn up slopes.



### **DANGER**

Wet or soft slope hazard

- Wet or soft slopes can cause sliding and loss of control
- Do NOT operate on slopes when grass is wet. Tires may lose traction and cause sliding and loss of control.
- Do NOT operate on slopes when soil is soft (such as after heavy rains). Tires may lose traction and cause sliding and loss of control.



### **DANGER**

Retaining walls and drop-offs around steps and water are a common hazard.

- Do NOT operate down slopes towards or near water, retaining walls, or dropoffs.
- Give yourself a minimum of two machine widths of clearance around these hazards.
- Wheels dropping over retaining walls, edges, ditches, embankments, or into water can cause rollovers, which may result in serious injury, death, or drowning.
- Reduce your speed when operating over rough terrain or near these hazards.
- This machine could suddenly roll over if a wheel goes over an edge or if the edge breaks away.

#### **Do:**

- Go across slopes, not up and down.
- Remove obstacles such as rocks, tree limbs, etc.
- Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
- Use slow speed. Choose a slow speed so that you will not have to stop or change speed while on the slope.
- Use extra care with accessories. These can change the stability of the unit.
- Keep all movement on the slopes slow and gradual. Do not make sudden changes in speed or direction.

#### **Do NOT:**

- Avoid starting, stopping, and sharp turning on a slope. If tires lose traction (i.e. machine stops forward motion on a slope), stop and drive slowly off the slope.
- Do not turn on slopes unless necessary, and then, turn slowly and gradually uphill, if possible. Never operate straight down slopes.
- Do not operate near drop-offs, ditches, or embankments. The operator could lose footing or balance or machine could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
- Do not operate on wet grass. Reduced footing or traction could cause sliding.
- Do not try to stabilize the unit by putting your foot on the ground (ride-on units).
- Do not operate on slopes over 8° degrees.
- Do not operate on slopes if you cannot mount a slope forwards.

## Operating On Slopes

Learn how to operate the unit on slopes and use your body position to improve traction and control of the machine.

Operation on slopes can be dangerous. Slopes are a major factor related to accidents, which can result in severe injury or death. Using the unit on a slope that is too steep where you do not have adequate wheel traction (and control) can cause sliding, loss of steering, control, and possible rollover. If you feel unsure about operating the unit on a slope, don't do it. It's not worth the risk.

- This machine has a high center of gravity and may become unstable on slopes. Always lean towards the slope of a hill when operating on slopes.
- Do not operate on slopes when grass is wet.

### **Go across slopes, not up and down.**

- Operation down slopes can be dangerous and cause sliding, loss of steering, control, and possible rollover. Do NOT operate down a slope unless absolutely necessary. Drive very slowly in the lowest gear and be careful. Never make a sharp turn or sudden start or stop, as this can cause loss of traction, sliding, loss of steering, control and possible rollover. Apply the rear brakes first to slow your speed while descending a slope.
- Avoid turning down slopes; if possible turn up slopes.
- Lean your body towards the uphill side drive wheel, while keeping a firm grip on the handle bar. This body position adds more weight to the uphill side drive wheel to maximize traction and control.
- Always be very gentle operating the controls, travel at a slower speed than normal. Practice operating up and down slopes before traveling at normal speed.
- Do NOT accelerate quickly or change speed or direction suddenly while operating, as this may cause the machine's front wheels to come off the ground (up slopes) and to reduce the tendency to cause the machine to slip and slide (down slopes).

### **Operate up and down slopes (only if you cannot operate across the slope):**

- It is recommended to operate up and down the face of slopes only when you cannot operate across the slopes. This may be the preferred technique for operating on very gentle slopes and to avoid going across a slope.
- Operate up the slope and lean your body forward (towards the control panel), while keeping a firm grip on the handle bar. This body position helps keep the front wheels on the ground.
- Do NOT accelerate quickly, as this may cause the machine's front wheels to come off the ground.
- Exert strong force and keep a firm grip on the handle bars to maintain control and resist the machine tendency to turn uphill.
- Operate down the slope and lean your body rearward, while keeping a firm grip on the handlebar. This body position adds more weight to the rear wheels and improves stability, downhill braking, and control

- Never store the machine or fuel container inside where there is an open flame, such as in a water heater. Allow unit to cool before storing.
- Do not store fuel near flames or drain indoors.
- Keep all hardware tight and keep all parts in good working condition. Replace all worn or damaged decals.
- Never tamper with safety devices. Check their proper operation regularly.
- Disengage spreader spinner, set parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning, or repairing.
- Clean grass and debris from moving parts, drives, mufflers, and engine to prevent fires. Clean up oil or fuel spillage.
- Let engine cool before storing and do not store near flame.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
- Park machine on level ground. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- 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 sparks and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothes and use insulated tools.
- Check brake operation frequently. Adjust and service as required.
- Use only factory authorized replacement parts when making repairs.
- Always comply with factory specifications on all settings and adjustments.
- Only authorized service locations should be utilized for major service and repair requirements.
- Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment, damage, and voiding of manufacturer's warranty.

## **Maintenance, Storage, and Safety**

- Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
- Always follow the engine manual instructions for storage preparation before storing the unit for both short and long term periods.
- Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.



**WARNING**

Units with hydraulic pumps, hoses, or motors: Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. If foreign fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury, or gangrene may result. Keep body and hands away from pin holes or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, and not hands, to search for leaks. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. If leaks occur, have the unit serviced immediately by your authorized dealer.

**WARNING**

Stored energy device: Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.

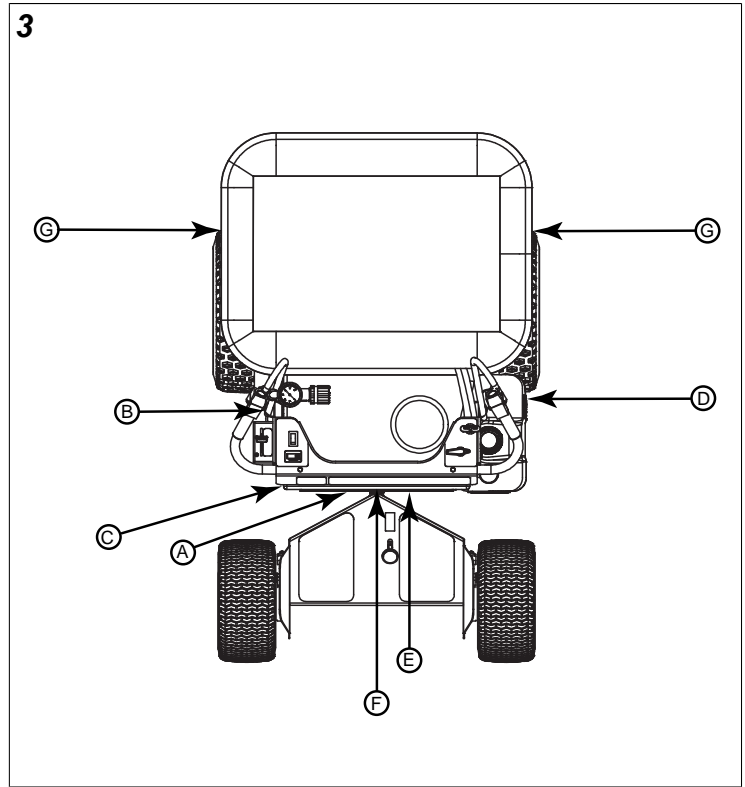
- Always disengage the spreader spinner and close the hopper gate before performing maintenance or storing.
- Empty the fertilizer hopper before lifting or tilting the machine for maintenance or storage.

**Safety Decals**

Read the safety decals before operating your unit. The cautions and warnings are for your safety. Understand and follow all safety decals to avoid a personal injury or damage to the unit.

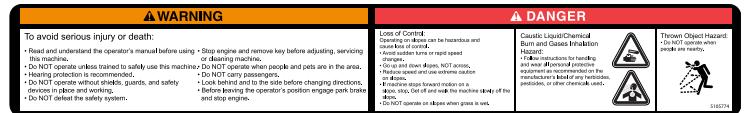
**WARNING**

If any safety decals become worn or damaged, and cannot be read, order replacement decals from your local dealer.

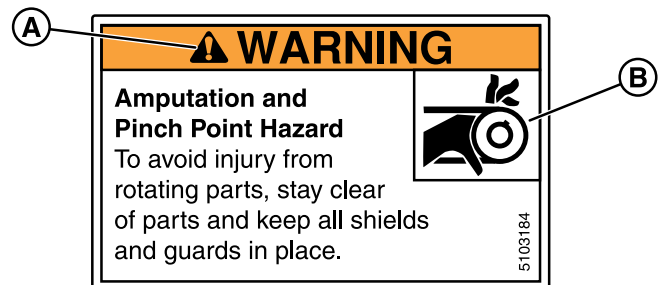


- A. Part No: 5105774 Decal, Warning, Combo
- B. Part No: 5103184 Decal, Warning, Hand in Belt
- C. Part No: 5106504 Decal, Warning, Guard
- D. Part No: 5106505 Decal, Caution, Flooding
- E. Part No: 5106506 Decal, Warning, Injury and Transmission Damage
- F. Part No: 5106507 Decal, Caution, Muffler Temp
- G. Part No: 5106503 Decal, Warning, Moving Parts

**5105774 - Decal, Warning**



**5103184 - Decal, Warning, Rotating Parts**

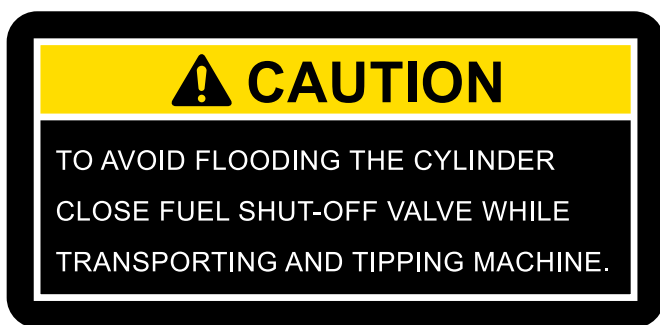


- A. Safety alert triangle.
- B. Amputation - Rotating parts.

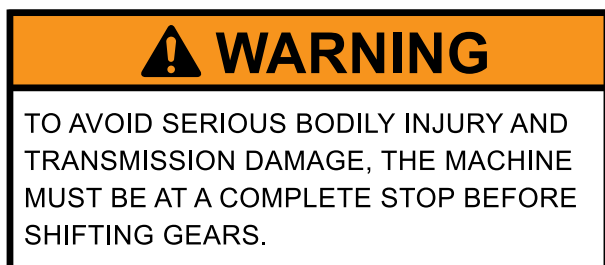
## 5106504 - Decal, Warning, Guard



## 5106505 - Decal, Caution, Flooding



## 5106506 - Decal, Warning, Injury and Trans Damage





## 5106507 - Decal, Caution, Muffler Temp




### A. Safety alert triangle.

### Safety Alert Symbol and Signal Words

The safety alert symbol () is used to identify safety information about hazards that can result in personal injury. A signal word (DANGER, WARNING, or CAUTION) is used with the alert symbol to indicate the likelihood and the potential severity of injury. In addition, a hazard symbol may be used to represent the type of hazard.

 **DANGER** indicates a hazard which, if not avoided, **will result in death or serious injury**.

 **WARNING** indicates a hazard which, if not avoided, **could result in death or serious injury**.

 **CAUTION** indicates a hazard which, if not avoided, **could result in minor or moderate injury**.

**NOTICE** indicates a situation that **could result in damage to the product**.

### Safety Interlock System

This unit is equipped with a transmission neutral start safety interlock switch. These safety systems are present for your safety, do not attempt to bypass safety switches, and never tamper with safety devices. Check their operation regularly.

#### Test 1 — Engine should NOT start if:

- Transmission is in ANY gear.

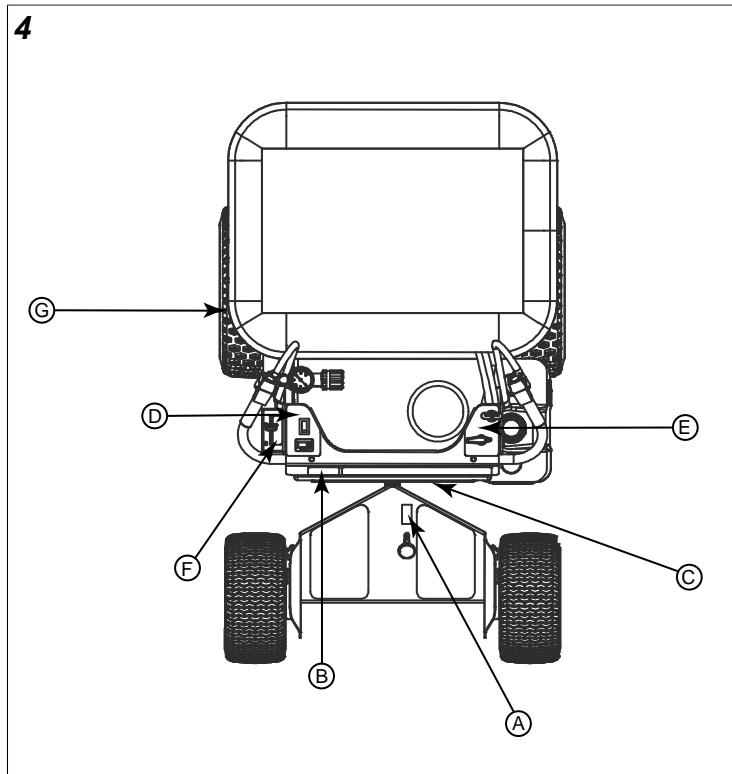
#### Test 2 — Engine SHOULD start if:

- Transmission is in the NEUTRAL position.
- The ignition switch in in the ON position.

*Note:* Once the engine has stopped, the parking brake must be engaged and the transmission must be placed in the NEUTRAL position, after the operator returns to the operator's position to start the engine.

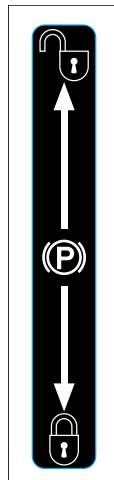
# Features and Controls

## Instructional Decals



- A. 5105775 - Decal, Brake Pedal
- B. 5105769 - Decal, Combination Spray Control
- C. 5106500 - Decal, Gear Selector
- D. 5106520 -- Decal, Pathfinder Left Console
- E. 5106521 - Decal, Pathfinder Right Console
- F. 5106522 - Decal, Pathfinder Gate Lever
- G. 5102628 - Decal, Parking Brake

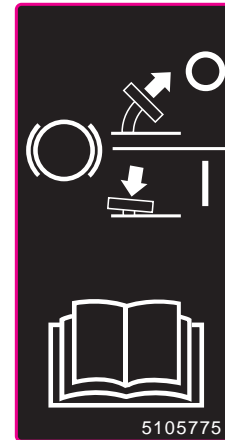
### 5102628 - Decal, Parking Brake



To engage the parking brake, pull the lever rearward and up. To lock the parking brake, pull the lever down. To unlock the parking brake, push the lever up.

See the *Driving Controls* section for more information.

### 5105775 - Decal, Brake Pedal



(I) Depress the brake pedal to engage the brakes on the rear wheels. (O) Release the brake pedal to disengage the brakes on the rear wheels.

See the *Driving Controls* section for more information.

### 5106500 - Decal, Gear Selector

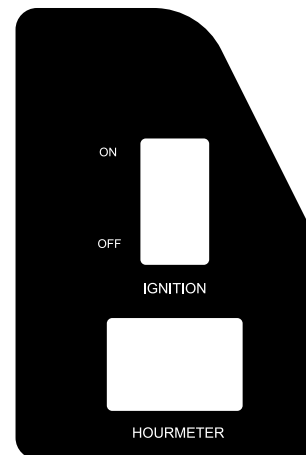


To select desired gear, move the lever horizontally.

- R - Reverse
- N - Neutral
- 1 - First (1st) Gear
- 2 - Second (2nd) Gear

See the *Driving Controls* section for more information.

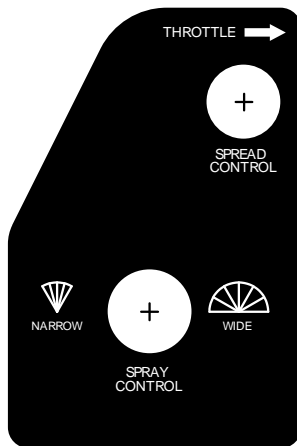
### 5106520 - Decal, Left Console



The left console decal includes the Engine Ignition Switch and the Hourmeter.

See the *Driving Controls* section for more information.

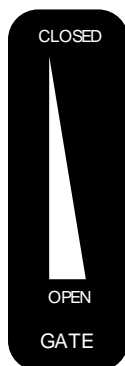
### 5106521 - Decal, Right Console



The right console decal includes the Spread Control Lever and the Spray Control Knob.

See the *Spreading and Spraying Controls* section for more information.

### 5106522 - Decal, Gate Lever



The Gate Lever controls the flow of granular material from the hopper. Move the lever up or down to set desired flow rate.

See the *Spreading and Spraying Controls* section for more information.

### 5105769 - Decal, Combo Spray Control



The Combination Spray Control Decal includes the Spray Control Lever and the Spray Pressure Control.

Left: Spray Control Lever: Depress the lever to open spray valves and start spray operation (I). Release the lever to close valves and stop spray operation (O).

Right: Spray Pressure Control: Turn the knob clockwise to increase spray pressure. Turn the knob counter clockwise to decrease spray pressure.

See the *Spreading and Spraying Controls* section for more information.

## Driving Controls

### Engine Ignition Switch

The engine ignition switch controls the ignition circuit of the engine. To start and run the engine, press the switch to "ON." To stop the engine, press the switch to "OFF."

### Handlebars

The handlebars provide steering control of the machine. Grasp at the location of the foam grips.

### Brake Pedal

Depress the brake pedal to engage the rear wheel brakes and slow down the unit. See Instructional Decal 5105775.

### Throttle Lever

Gradually squeeze the throttle lever to drive the unit forward. Depress the lever deeper to increase speed. Release the throttle lever to return to idle speed.

## Spreading and Spraying Controls

### Spread Control Lever

The spread control lever controls a baffle below the hopper gate. This baffle controls the center of spread pattern. Unlock the lever by turning counterclockwise. Then, move the lever up or down to change the position of the baffle. Once desired baffle position is achieved, lock the position by turning the lever clockwise. See Instructional Decal 5106521.

## **Gate Stop**

The gate stop controls the minimum to maximum opening of the hopper. The gate stop is located on the front of the hopper. Rotate the knob clockwise or counterclockwise until desired gate opening is achieved.

## **Gate Lever**

The gate lever controls the valve that opens at the bottom of the hopper. To open the hopper valve (to allow granular flow), pull on the gate lever. To close the hopper valve (to stop granular flow), push the gate lever.

## **Spray Control Lever**

The spray control lever controls the flow of liquid from the tank to the spray nozzles. To open the valve, move the lever to the horizontal position. To close the valve, move the lever to the vertical position. See Instructional Decal 5105769.

## **Spray Control Knob**

The spray control knob controls the spray width pattern. To spray with the broadcast nozzle, turn the knob to the "WIDE" position. The "WIDE" position provides a maximum spray width of eleven feet (11'). To spray with the the trim nozzle, turn the knob to the "NARROW" position. The "NARROW" position provides a maximum spray width of three feet (3'). See Instructional Decal 5106521.

# Operation

## Before First Time Operation

- Be sure to read all information in the *Operator Safety* and *Operation* sections before attempting to operate this unit.
- Become familiar with all of the controls and how to stop the unit.
- Drive in an open area without operating the spreader and/or sprayer to become accustomed to the unit.



### WARNING

Never operate on slopes greater than 8 degrees.

- Select slow ground speed before driving onto a slope. Use extra caution when operating on slopes with any accessories attached to the unit.
- Operate across slopes, NOT up and down. Use caution when changing direction on slopes and do NOT start or stop on a slope.



### WARNING

- Never allow passengers to ride on the unit.
- Before leaving the operator's platform for any reason, engage the parking brake, and turn off spreader and sprayer functions.
- Fuel is highly flammable and must be handled with care. Never fill the tank when the engine is hot from recent operation. Do NOT allow open flame, smoking, or matches in the area. Avoid over-filling and wipe up any spills.

## Checks Before Starting

- Fill the fuel tank to the bottom of the filler neck with fresh fuel. This will allow for fuel expansion. Do not overfill. Refer to the engine manual for fuel recommendations. Do not add oil to the gasoline.
- Understand the controls, their locations, their functions, and their safety requirements.
- Refer to Maintenance, Storage, and Safety section to learn how to perform all the necessary inspection and maintenance steps.

## Operating the Spreader

The spreader has a pattern width of approximately 14 feet. By using passes with an approximate 7 foot width, the granular product will be evenly distributed with the proper amount of overlap.

1. Adjust the gate stop to the desired setting.
2. Completely close the hopper gate and add fertilizer to the hopper.
3. Install the hopper shower cap if necessary.
4. Carefully step onto the operator platform.
5. Place the gear selector in second gear (2).

6. Squeeze the throttle lever to start the machine rolling forward.
7. Slide the gate lever to the OPEN position.
8. To stop the spreading operation, slide the gate lever to the CLOSED position, release the throttle lever, and depress the brake pedal.

## Operating the Sprayer

The sprayer has a pattern width of approximately 11 feet. Always spray downwind. Avoid spraying in windy conditions.

1. Add required materials to the spray tank.
2. Carefully step onto the operator's platform.
3. Rotate the spray width knob to the desired setting.
4. Place the gear selector into second gear (2).
5. Squeeze the throttle lever to begin driving the unit.
6. Activate the spray control lever.
7. To stop spraying, deactivate the spray control lever. Release the throttle lever, and depress the brake pedal.

## Transporting the Unit



### WARNING



Use extreme caution when loading the unit onto a trailer or rack.

- Ramps should be long enough so that the angle between the ramp and ground does not exceed 12 degrees.
  - Use first gear (1) when loading and unloading the machine.
1. Drive the unit onto on a heavy-duty trailer or hitch-mounted rack.
  2. Engage the parking brake.
  3. Use straps, cable, chains, or rope to securely fasten the unit down.

# Calibration

## Spreader Flow Rate Calibration

The following instructions provide a method for adjusting the flow of fertilizer from the hopper so that the correct amount of fertilizer is applied to a 1000 ft<sup>2</sup> (92 m<sup>2</sup>) area. The machine is designed to apply fertilizer evenly by overlapping each pass by 50 percent. The spread width for most products is approximately 14 feet (4,2 m). This means that the center of each pass should be approximately 7 feet (2,1 m) from the center of the previous pass. The effective material spread width is 7 feet (2,1 m) and is the basis for calibration.

1. Measure a distance of 143 feet (44 m) on a flat paved surface. Using a paved surface will allow the fertilizer to be recollected and will prevent burning the turf if the application rate is largely different from what is intended. Traveling 143 feet (44 m) with the machine equates to covering approximately 1000 ft<sup>2</sup> (92 m<sup>2</sup>) with fertilizer (7 ft (2,1 m) x 143 ft (44 m) = 1001 ft<sup>2</sup> (92 m<sup>2</sup>)).
2. Set the gate stop to a setting of 5. This will be used as the starting setting for dialing in the correct gate stop setting for the particular material that is being used.

*Note:* The spreader will have to be calibrated for each different type of material that is spread. Make sure to record the final gate stop setting once the correct application rate has been achieved.

3. Place the spreader gate lever in the CLOSED position. Place enough material in the hopper to cover 1000 ft<sup>2</sup> (92 m<sup>2</sup>).
4. Begin the spreading operation while moving toward the 143 foot (44 m) marker. With the machine moving at full speed, the hopper should just empty out as the machine passes the marker. If the hopper empties before the marker is reached, turn the gate stop dial to a slightly lower setting and repeat the process. If the hopper empties after the marker is reached, turn the gate stop dial to a slightly higher setting and repeat the process. Continue this process until the proper dispensing rate is achieved.
5. When the calibration is complete, collect the fertilizer that has been dispensed for reuse. Never leave the fertilizer on the pavement where it can wash away in runoff.

## Centering the Spread Pattern

The following instructions provide a method for adjusting the center of the spread pattern so that fertilizer is evenly distributed over the width of the spread area.

1. Obtain the following items:
  - Eleven collection pans, 3 (7,6 cm) to 4 inches (10,2 cm) tall and 12 inches (30 cm) square (e.g. aluminum roasting pans).
  - Clear tube, 1/2" (1,27 cm) internal diameter, 4 inches tall (10,2 cm). Use a permanent marker to mark the tube at 1/4" (0,7 cm) increments all of the way up the tube. This will act as a measuring device for the collected fertilizer pills.

- A ruler or tape measure.
- A method of recording the collection amounts.

2. Set the gate stop to a setting of 5.
3. Move the hopper gate control to the OPEN position (the hopper must initially be empty).
4. Turn the pattern control **counter-clockwise** to release the lock and move the lever in or out so that the baffle can be seen centered just below the opening of the gate in the bottom of the hopper. Turn the pattern control **clockwise** to lock into position.
5. Move the hopper gate control to the CLOSED position.
6. Load the hopper with the fertilizer to be used for calibration.
7. Place the eleven collection pans on a flat paved surface in a straight line on two-foot centers. Using a paved surface will allow the fertilizer to be recollected and will prevent burning the turf if the application pattern is largely different from what is intended.
8. Make at least three passes traveling directly over the center pan in a path perpendicular to the row of pans.

*Note:* All of the passes must be made in the same direction.

9. Pour the contents of the first pan on the left into the graduated tube and record the amount of material that is in the tube. Repeat this measurement for each of the eleven collection pans. Add together all of the eleven numbers to find the total material that was dispensed.
10. Divide the amount caught in each pan by the total amount. This is the percentage that was caught in each pan.
11. The distribution should increase towards the center pan and decrease toward the outside pans. The distribution should also be approximately the same on each side. If it appears that the left side is receiving more material, pull the spread control lever out slightly and repeat the process. If it appears that the right side is receiving more material, push the spread control lever in slightly and repeat the process. Only slight adjustments are needed to make spread pattern changes.
12. Once the correct distribution is achieved, measure the distance from the console surface to the top of the spread control lever. Record this measurement as the setting to be used for the particular fertilizer being evaluated.

*Note:* The spreader will have to be calibrated for each different type of material that is spread.

13. When the calibration is complete, collect the fertilizer that has been dispensed for reuse. Never leave the fertilizer on the pavement where it can wash away in runoff.

## Calibrating the Spray Flow Rate

If the output from the nozzles is slightly different from the values listed below, adjust the pressure relief valve slightly. Unscrewing the valve knob will decrease the system pressure and will decrease the output from the tips. Screwing the valve



knob in will increase the system pressure and will increase the output from the tips.

If the output from the nozzles is drastically different from the values listed below, there may be other problems with the system. Refer to the Troubleshooting section for more information.

1. Fill the spray tank with water.
2. With the engine at full throttle, adjust the unit's spray system pressure until the pressure gauge reads 20psi.
3. Engage the unit's parking brake and ensure the ground speed control levers are in the neutral position.
4. Place a container in a position beneath one of the spray nozzles so that all of the spray being dispensed by the nozzle can be captured in the container.
5. Move the pump switch to the "ON" position. Run the pump for exactly one minute.
6. Measure the collected water. The amount collected for each tip should be as follows:
  - Blue Turbo Teejet Tip: 27 oz/min.

# Maintenance Schedule

The following schedule should be followed for normal care of your unit. You will need to keep a record of your operating time. Determining operating time is easily accomplished by observing the hour meter.

<b>UNIT MAINTENANCE</b>
<b>Daily Inspections</b>
Spray the shaft bushing in the bottom of the hopper with a light oil lubricant such as WD-40®.
Check the entire unit for loose hardware or other problems. Resolve any issues before operating the unit.
Check the unit's safety interlock system.
<b>25 Hour Maintenance Interval</b>
Check the tire pressure in all four tires.
Clean debris from the engine and muffler.
Grease the wheel bearings on the operator platform.
Wash the machine with low pressure water.
Apply a light oil lubricant such as WD-40® to all moving parts except for belts and pulleys.
<b>50 Hour Maintenance Interval</b>
Check the unit's brakes. Adjust if necessary.
Grease caster pivot tube bearings.
<b>100 Hour Maintenance Interval</b>
Inspect the fuel tank for debris. Clean if necessary.
Inspect the fuel filter. Clean or replace as necessary.

<b>UNIT MAINTENANCE</b>
Inspect the belts. Replace if necessary.
Flush and clean spray tank.
Check the spray system output rate. Replace spray tips and/or adjust pressure setting as necessary.

<b>ENGINE MAINTENANCE</b>
<b>Daily Inspections</b>
Check the engine oil level.
Clean visible debris from engine compartment.
<b>One (1) month of 20 Hour Maintenance Period, whichever comes first</b>
Initial change of the engine oil.*
<b>50 Hour Maintenance Interval</b>
Clean the air filter.**
Inspect/Clean spark arrester.***
<b>Refer to engine owner's manual</b>
Service air filter
Change engine oil and filter.
Check/Replace spark plugs.

\* See the engine manufacturer's operator's manual.

\*\* More often in hot (over 85° F; 30° C) weather or dusty operating conditions.

\*\*\* If equipped. Replace if damaged.

# Troubleshooting

While normal care and regular maintenance will extend the life of your equipment, prolonged or constant use may eventually require that service be performed to allow it to continue to operating properly.

This troubleshooting guide lists the most common problems, their causes, and remedies.

## Machine Does Not Start

FAILURE MODE	CAUSE OF PROBLEM	CORRECTIVE ACTION
Machine does not start	The fuel level in the tank is low.	Add fuel to the fuel tank.
	The fuel line is clogged.	Clean the fuel line.
	The fuel tank has contamination.	Clean out the fuel tank and add fresh fuel.
	The choke setting is incorrect.	Ensure that the choke setting is correct for the starting conditions. Cold starts will require the choke to be activated while warm starts may not require the choke.

## Spreading System Operates Incorrectly

FAILURE MODE	CAUSE OF PROBLEM	CORRECTIVE ACTION
Spreader pattern is uneven or spreader does not operate.	The gate opening in the bottom of the hopper is blocked.	Remove the material from the hopper and dislodge any clumps around the gate opening. Inspect the agitator wire and make sure that it is not worn, damaged, or missing.
	The spread control baffle is positioned incorrectly.	Follow the procedure in the <i>Calibration</i> section of this manual for centering the spread pattern.
	The input shaft of the platter gearbox is not turning.	Make sure that the platter gear motor spins freely by hand. Inspect the gear motor fuse located under the console to ensure it is not blown.
	The platter is dirty, worn or damaged.	Inspect the platter and clean or replace if necessary.
	The platter clip is damaged or missing.	Inspect the platter spring clip on the bottom of the platter. If it is damaged or missing, the platter may not spin even though the platter motor shaft is rotating. Replace the platter spring clip if necessary.

## Spraying System Operates Incorrectly

FAILURE MODE	CAUSE OF PROBLEM	CORRECTIVE ACTION
Spraying pattern is uneven or spraying system does not operate.	The spray nozzle tips are out of position.	Ensure the spray nozzles are not damaged or that the nozzle mounting tab is not bent.
	The pressure relief valve is set incorrectly.	Verify that the pressure gauge reads approximately 20 psi at full engine speed when spraying. Adjust the pressure relief knob in or out to obtain this pressure. Tighten the locking nut against the pressure relief knob.
	The strainer or tip is clogged.	Remove the spray nozzle tip. Inspect the tip orifice and the strainer to ensure they are not clogged. Clean or replace these components as necessary.
	The filter is clogged.	Remove the sediment from the filter housing and inspect the filter screen. Clean or replace the screen as necessary.
	The pump won't operate.	Inspect the pump fuse located in the fuse box. Ensure that either the spray pump ON/OFF console switch activates the pump.
	Hoses are kinked.	Smooth out hoses and use wire ties to make sure that they do not kink again.
	Spray tank volume is low.	Refill the spray tank. Note that in very rough or hilly conditions, the liquid in the spray tanks may slosh around and the tank discharge tube may starve when the tank level is low. This can cause poor spraying performance.
	The engine speed is too low.	Operate the machine at full engine speed. The spray system is designed to operate most efficiently at full engine speed.
	The pump is worn or damaged.	Replace the pump.

# Specifications

Specifications are correct at time of printing and are subject to change without notice.

## ENGINE

For complete engine specifications see the engine manufacturer's operator's manual included with your unit.

Fits models: 5901752 & 5901753

Honda GX160	
<b>Make</b>	Honda
<b>Model</b>	GX160-URH2
<b>Electrical System</b>	N/A

## CHASSIS

<b>Fuel Tank Capacity</b>	2.5 gallons (9,5 L)
<b>Front Tires</b>	
Tire Size	18" X 9.50 - 8
Inflation Pressure	15 psi (1,03 bar) / RV antifreeze added for ballast and traction
<b>Rear Tires</b>	
Tire Size	13 X 6.50 - 6
Inflation Pressure	20 psi (1,38 bar)

## TRANSMISSIONS

<b>Transmission Model</b>	Peerless 855 Series
<b>Gear selections</b>	2 forward, 1 reverse, neutral
<b>Speed</b>	Low gear: 3.5 mph (5,6 km/h)
	High gear: 5.0 mph (8,0 km/h)

## DIMENSIONS

For model: 5901752

<b>Overall Length</b>	54.0" (137 cm)
<b>Overall Width</b>	35.5" (90 cm)
<b>Overall Height</b>	49.0" (124 cm)
<b>Weight (dry)</b>	375 lbs (170 kg)
<b>Weight (wet)</b>	600 lbs (272 kg)

For model: 5901753

<b>Overall Length</b>	58.0" (147 cm)
<b>Overall Width</b>	35.5" (90 cm)
<b>Overall Height</b>	50.5" (128 cm)
<b>Weight (dry)</b>	450 lbs (204 kg)
<b>Weight (wet)</b>	785 lbs (356 kg)

## SPREADER

Fits models: 5901752

<b>Spreader Model</b>	Spyker 120 Series
<b>Capacity</b>	100 lbs (45,4 kg)

Fits models: 5901753

<b>Spreader Model</b>	Spyker 220 Series
<b>Capacity</b>	220 lbs (90,7 kg)

