2009 MAGNUM SmartSteer ™ C3C Spreader Sprayer

Operator's Manual

Model # MAGNUM SmartSteer ™ C3C

For technical support

Contact your local dealer or PermaGreen Supreme, Inc. at (800) 346-2001 or via e-mail at tech@permagreen.com

PermaGreen Supreme, Inc.
September, 2008
Basic Issue

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About this Manual

This operator manual is considered a permanent part of the machine. It must be available to all of the operators and person(s) servicing the machine at all times.

Should the machine be resold, this manual must remain with it.

All information, illustrations, and specifications contained in this manual were in effect at the time of publication. PermaGreen Supreme, Inc. reserves the right to change, modify, and/or discontinue specifications and/or design without notice.

Congratulations on the purchase of your new Magnum SmartSteer tm Sprayer Spreader. We at PermaGreen are confident that this machine will provide you with years of excellent performance and durability when operated and maintained as directed in this manual.

Date Purchased: _____

Model Number: _____

Serial Number: _____

Purchased From: _____

RECORD OF REVISIONS

Keep this record in the front of the manual. When a revision is provided, insert the revised pages in the manual. Record the revision number, the date the revision was inserted in the manual, and provide your initials or signature in the BY column.

REVISION	DATE	BY	DESCRIPTION

SAFETY SUMMARY

This safety advisory contains all the WARNINGs provided in this manual. They are presented in this section to advise you of their existence and to emphasize their importance.
The processes and procedures provided in this manual may include physical and chemical processes that require the use of pesticides, solvents, chemicals, paints, and other commercially available materials.

The operation and maintenance of the equipment provided in this manual require trained personnel.

The users of this publication must obtain the material safety data sheets [Occupational Safety and Health Act (OSHA) form 20, or equivalent] and product labels from the manufacturers or suppliers of the materials to be used. The users must become completely familiar with the health and safety information, and follow the procedures, recommendations, warnings, and cautions provided by the manufacturer or supplier for the safe use, handling, storage, application, and disposal of toxic or hazardous materials.

⚠WARNING **WARNING notices provided in this manual are intended to alert operating and maintenance personnel to hazardous situations which, If not avoided, COULD result in death or serious injury.**

⚠WARNING **An untrained operator or mechanic subjects himself and others to death or serious injury. Untrained or underage individuals are not to operate or maintain this equipment. The owner is responsible for training operators and mechanics. Before operating the machine, an operator must read and understand the Operator Manual and other training material. If the person cannot read English, the owner is responsible to explain the material to them. Training MUST include SUPERVISED driver's training with adequate practice time for the operator to become competent in controlling the machine under all conditions.**

The operator must be familiar with safe operation of the equipment, operator controls and safety signs.

The Operator Manual is part of this machine and MUST be available to the operator and service personnel at all times.

Read and follow product label and material safety data sheet precautions when handling the material you are pouring into the spray tank. Some materials may present health hazards and will require protective clothing and/or breathing equipment.

SAFETY SUMMARY (continued)

⚠WARNING

Gasoline is flammable and the vapors are explosive. Exhaust fumes can suffocate. Take these precautions to avoid death or serious injury:

- **Shut off fuel valve while transporting or maintaining this machine**
- **DO NOT smoke while operating or refueling.**
- **DO NOT add fuel when engine is running hot.**
- **DO NOT run engine indoors or in an enclosed area.**

⚠WARNING

Loss of control subjects the operator and others to death or serious injury. The operator must keep this machine under control at all times. This machine has a high center of gravity, and turf conditions affect stability.

DO NOT operate the machine:

- **While under the influence of drugs or alcohol**.
- **Unless daily and weekly maintenance has been performed. Refer to the Operator Manual for details.**
- **If the machine moves unexpectedly upon startup or when shifting into gear**.
- **In wet conditions, low light, or near drop-offs, holes, debris or other hazards.**
- **Unless you have inspected the work area and identified all hazards present.**
- **While shifting gears. Stop first, shift then operate.**
- **If engine speed exceeds 3,450 rpm.**

⚠WARNING **To maintain control on hillsides:**

- **Always use low gear and lean uphill for balance.**
- **Never operate as a ride-on on slopes over 15 degrees.**
- **Reduce the amount of granular and liquid products carried.**
- **Travel across the grade, beginning at the bottom and work your way up, avoiding sudden starts, stops or turns.**
- **DO NOT travel straight down hill. Zigzag dow with the clutch engaged to use engine back pressure to slow descent. Operate as a walk-behind in all situations where loss of control is possible.**

⚠WARNING

Before leaving the operator position, park on level ground or head across a hill grade, set the parking brake, shut off the engine and shift into REVERSE.

SAFETY SUMMARY (continued)

Do not attempt to start or operate the machine in a confined space; or where you or someone else could be trapped between the machine and any obstacle; or where you could loose your balance.

⚠WARNING **To avoid an unanticipated sudden movement of the machine at startup, follow these procedures. Before attempting to start, always verify that the transmission is completely in neutral by rolling it forward. . Set the parking brake. Do not operate the throttle lever while starting. Do not operate the machine if the neutral safety mechanism is not working.**

⚠WARNING **To prevent loss of control, the machine must be at a complete stop before shifting. Do not apply excessive force to the shift lever. If the transmission is difficult to shift, move the front wheels slightly to free up the transmission until it shifts easily.**

⚠WARNING **When turning, always lean into the turn. When operating on a slope, always lean into the slope. Observe the riding recommendations provided in FIGURE 6.**

⚠WARNING **To avoid personal injury, perform machine maintenance with the engine off. If the engine has been operating, make sure the engine has cooled before performing any maintenance on the engine.**

⚠WARNING **To prevent injury, wear eye protection when using compressed air or water to clean the hopper. Regulate the air pressure to 29 PSI (200 KILOPASCALS).**

⚠WARNING **Before using any of the toxic or hazardous materials specified in this manual, be aware of all handling, storage and disposal instructions provided by the manufacturer or supplier. Failure to follow the manufacturer's or supplier's recommendations can result in personal injury or disease.**

⚠WARNING **Read and follow product label and material safety data sheet precautions when handling, mixing, applying, and disposing of the material you are pouring into the hopper or mixing and pouring into the spray tank. Some materials may present health hazards and will require protective clothing and/or breathing equipment.**

SAFETY SUMMARY (continued)

Exposed moving parts can cause severe injury. Do not operate machine without guards in place. Follow lock out procedure before servicing machine.

If you can read this sign, a guard has been removed. DO NOT operate with guard removed.

INTRODUCTION

1. General

This Operator's manual provides a physical and mechanical description of the PermaGreen Supreme ride-on Magnum C3C Spreader Sprayer, and describes its operation.

The manual includes description, operation, inspection, filling information, starting, operating, and stopping information, servicing information, and cleanup information. The operating information includes adjustment procedures, calibration procedures, and operator fault isolation.

This document contains data that is proprietary to and controlled by PermaGreen Supreme, Inc. The manual may be downloaded from www.permagreen.com as a PDF file and printed for use with PermaGreen Supreme equipment. PermaGreen Supreme, Inc., reserves the right to control manual content. Therefore, this manual may not be altered in any way without the written permission of the PermaGreen Supreme, Inc.

2. Equipment Description

The PermaGreen Magnum C3C (refer to Figure 1) is a four-wheeled vehicle providing two working speeds. It is powered by a Honda engine, and controlled by the operator who stands on a rear-mounted hinged sulky. The operator steers and controls the vehicle using operator controls mounted on the vehicle handlebars. The hand-operated vehicle brakes are mounted on the sulky, and the parking brake is located at the rear of the left front tire.

3. Product Support Services

Replacement parts, technical publications, and other product support services are available from PermaGreen Supreme, Inc. Please contact:

PermaGreen Supreme, Inc.
5609 Murvhill Road
Valpariso, IN 46383-8324
Phone: 800 346 2001
Fax: 219 476 7113
e-mail: support@permagreen.com

Figure 1. Magnum C3C Spreader Sprayer

DESCRIPTION

1. Technical Description

The major functional elements of the PermaGreen Magnum C3C are described below (refer to Figure 2).

- The PermaGreen Magnum C3C Spreader Sprayer is built on a heavy gauge stainless steel frame. A polyethylene hood protects the undercarriage components from the dust and chemicals from the Spreader Sprayer and protects the operator from moving parts.

- The Spreader Sprayer operating, steering, and drive components are mounted on the front section of the two-section machine. The rear section is a sulky that the operator stands on during operation. The front brakes aid in controlling the machine. The handlebars independently operate the steering brakes.

- The Spreader Sprayer uses a pull-start, 200cc Honda Model GX200-HR2 engine that has an integral 1:2 gear reduction transmission with an oil-bath, centrifugal clutch. The heavy duty, hand-operated, centrifugal clutch engages when the engine speed is increased above idle.

- Normal engine idle speed is 1400 + 200/-150 rpm. When the engine is operating at full throttle, the normal engine operating speed is 3450 rpm.

- The transmission provides high and low forward speeds, neutral, and reverse. At an engine speed of 3450 rpm, high gear provides a forward speed of 5 mph (8 km/h). Low gear provides a forward speed of 3.5 mph (5.6 km/h).

- The interface between the engine/gearbox and transaxle is through a horizontal drive shaft and a belt and pulley arrangement.

- The interface between the gearbox and the spreader is through a jackshaft and belt/pulley arrangement to a 1:5 ratio gearbox that results in a speed reduction to approximately 411 rpm at both high speed and low speed operation.

- The spreader is designed and manufactured by PermaGreen Supreme. The spread pattern and spread rate are adjustable. A remotely operated deflector limits the spread pattern to the left side only for edging. When using the deflector, a remotely operated sliding plate closes the third hole to proportionally reduce the product flow and balance the spreader pattern.

- The hopper has been designed and built specifically for the Magnum C3C Spreader Sprayer. Its capacity is 150 pounds (68 kilograms) of granulated material. The hopper includes a shower cap that covers the hopper during rain.

- The sprayer system has a 12-gallon tank (45.4 liters) and uses the same jackshaft and belt/pulley arrangement to drive a pump that provides a nominal spray pressure of 15 ± 3 psi (103 ± 21 kPa). The sprayer uses Turbo Floodjet® nozzles that have flow rates matched to the machine travel speed and selected pattern.

- The high gear broadcast nozzle provides a spray pattern 11 feet (3.35 m^2) wide at 90 ± 9 ounces (2.7 ± 0.27 liters) per minute. The high gear trim nozzle provides a spray pattern three feet (0.9 meter) wide, with a proportional reduction of the flow rate.

  The low gear broadcast nozzle provides a spray pattern 11 feet (3.35 m^2) wide at 66 ± 7 ounces (2 ± 0.2 liters) per minute. The low gear trim nozzle provides a spray pattern three feet (0.9 meter) wide, with a proportional reduction of the flow rate.

- The front tires are 9.50-8 x 18 knobby tread; the rear tires are 6.50-6 x 12 turf tires. All tires are filled with a mixture of RV antifreeze and water to provide ballast.

- The Spreader Sprayer has rear wheel service brakes. A lever on the left handle operates the service brakes.

- The Spreader Sprayer has a multi-function display providing a variety of information. When the engine is OFF, it displays engine run time to the tenth of an hour. When the engine is ON, the display shows engine rpm. When the engine has accumulated 25 hours, the display flashes LUBE, indicating that the engine requires periodic maintenance. The flashing LUBE message will remain on for one hour of engine operation and then turn off regardless of whether the maintenance was performed. The message will reappear after an additional 25 hours of engine operating time.

- The Spreader Sprayer includes a hand-carried, Squeeze-and-Spray bottle for spot spraying areas to 500 ft^2 (46.5 $meters^2$) that cannot be effectively sprayed by the Magnum sprayer. The spray bottle is carried in a machine-mounted bracket, and includes a fill valve for refilling the bottle from the 12-gallon (45.4 liters) spray tank.

- The position of spreader sprayer handlebar is adjustable. A lever on the left handle permits them to lock into the up position for riding and a down position for walking.

- The Spreader Sprayer dimensions are:
  55 inches (140 millimeters) long,
  35.5 inches (90 millimeters) wide,
  41 inches (104 millimeters) high, with the handlebar lowered.

2. Optional Equipment

   The optional equipment available from PermaGreen for the Spreader Sprayer is listed below.

- Hitch-mounted carrying rack, with ramps and tail lights,
- Spare parts kit that includes commonly needed replaceable parts.
- Calibration kit, including collection pans, a collection pitcher, a gauging key, and a graduated cylinder for measurement of the collected product.
- 1/2 gallon per thousand nozzle kit

Driving, Operation and Safety

All operators and service personnel must be trained in the safety features, basic operation, and maintenance of the Magnum prior to use. Refer to Figure 2 for location of the main operating controls.

⚠WARNING **An untrained operator or mechanic subjects himself and others to death or serious injury. Untrained or underage individuals are not to operate or maintain this equipment. The owner is responsible for training operators and mechanics. Before operating the machine, an operator must read and understand the Operator Manual and other training material. If the person cannot read English, the owner is responsible to explain the material to them. Training MUST include SUPERVISED driver's training with adequate practice time for the operator to become competent in controlling the machine under all conditions.**

The operator must be familiar with safe operation of the equipment, operator controls and safety signs.

The Operator Manual is part of this machine and MUST be available to the operator and service personnel at all times.

DRIVING, OPERATION, AND SAFETY (continued)

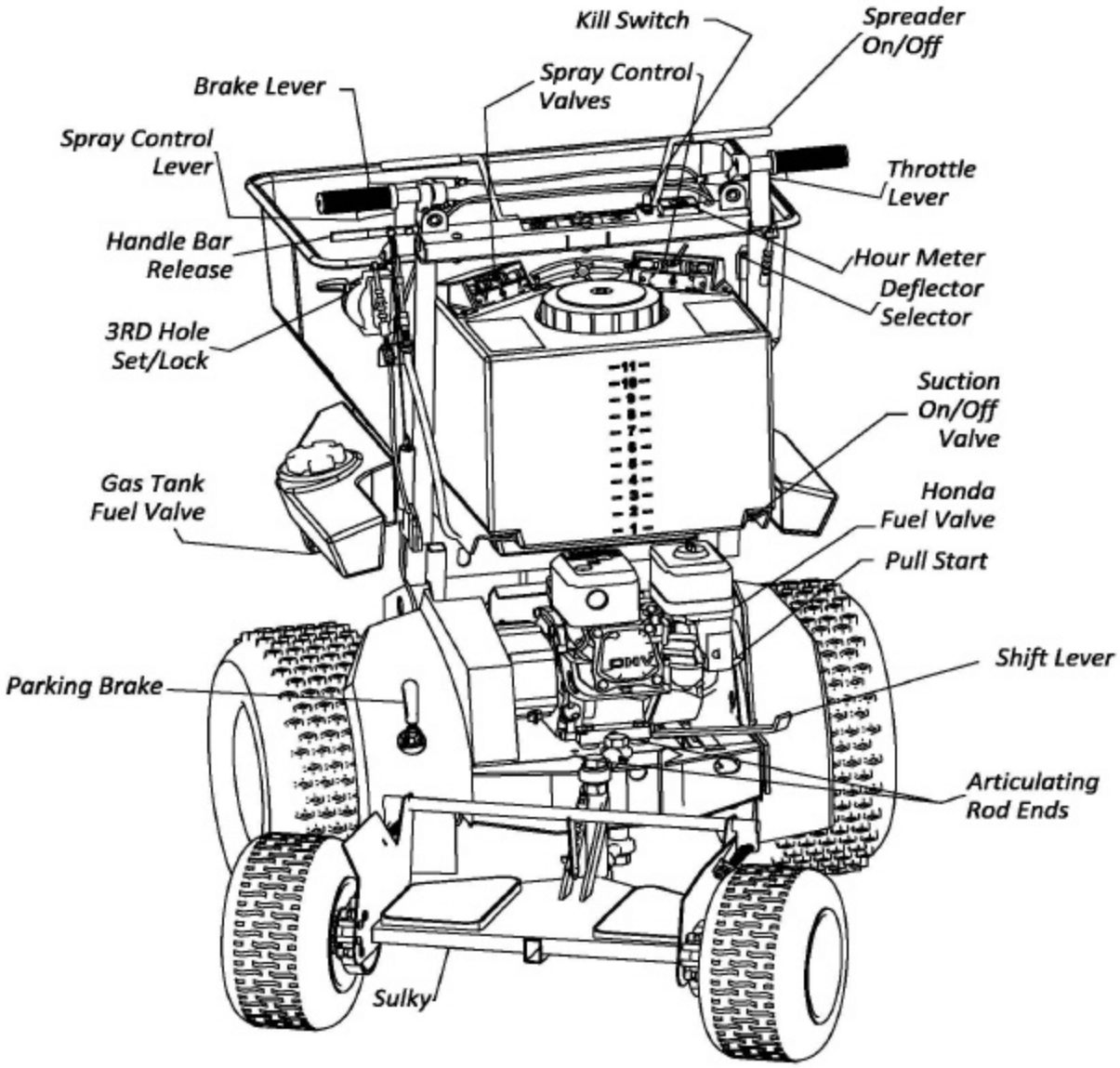


Figure 2. Magnum C3C Component Location

DRIVING, OPERATION, AND SAFETY (continued)

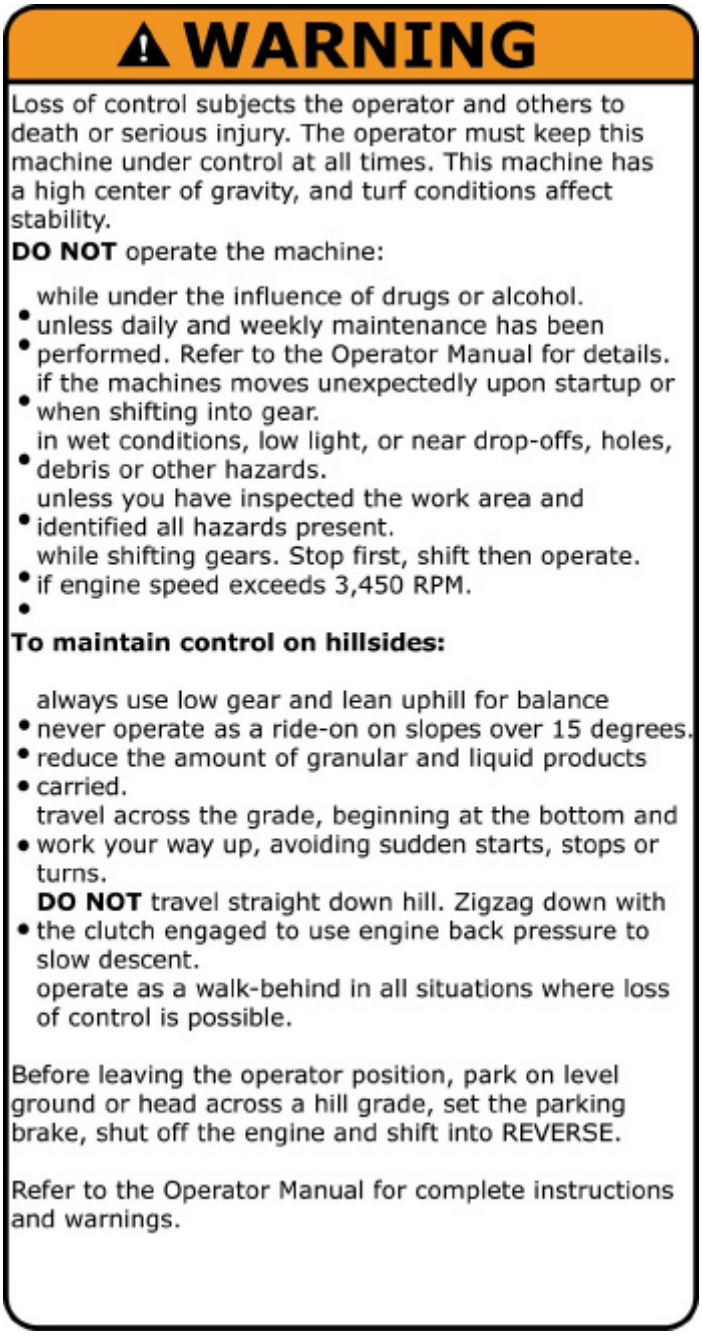
Operator Control Symbols, WARNINGs, and CAUTIONS

Pulley Pinch Point WARNING Placards

Located on the top surface of the spray tank, these placards provide the general WARNINGs for safe operation of the Spreader Sprayer.

Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 1 of 12)

DRIVING, OPERATION, AND SAFETY (continued)



⚠ WARNING

Loss of control subjects the operator and others to death or serious injury. The operator must keep this machine under control at all times. This machine has a high center of gravity, and turf conditions affect stability.

DO NOT operate the machine:

- while under the influence of drugs or alcohol.
- unless daily and weekly maintenance has been performed. Refer to the Operator Manual for details.
- if the machines moves unexpectedly upon startup or when shifting into gear.
- in wet conditions, low light, or near drop-offs, holes, debris or other hazards.
- unless you have inspected the work area and identified all hazards present.
- while shifting gears. Stop first, shift then operate.
- if engine speed exceeds 3,450 RPM.
-

To maintain control on hillsides:

- always use low gear and lean uphill for balance
- never operate as a ride-on on slopes over 15 degrees.
- reduce the amount of granular and liquid products carried.
- travel across the grade, beginning at the bottom and work your way up, avoiding sudden starts, stops or turns.
- **DO NOT** travel straight down hill. Zigzag down with the clutch engaged to use engine back pressure to slow descent.
- operate as a walk-behind in all situations where loss of control is possible.

Before leaving the operator position, park on level ground or head across a hill grade, set the parking brake, shut off the engine and shift into REVERSE.

Refer to the Operator Manual for complete instructions and warnings.

Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 2 of 12)

DRIVING, OPERATION, AND SAFETY (continued)

Pulley Pinch Point WARNING Placard

Located next to the pulleys and belts, these placards provides a graphic and written WARNING for keeping the hands clear of the belts and pulleys during operation.

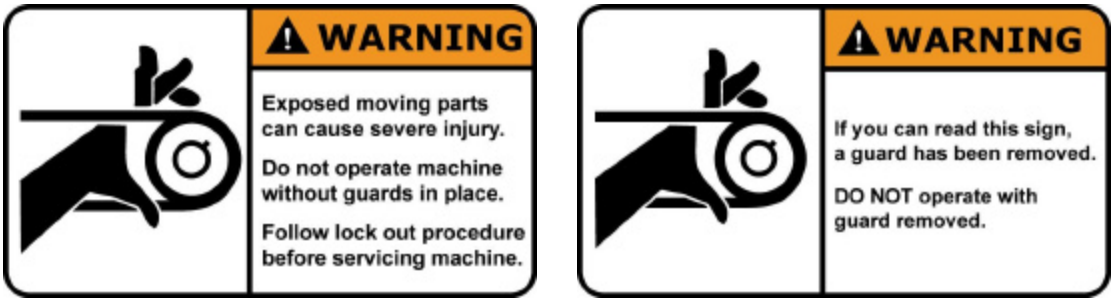


Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 3 of 12)

Machine Starting Instruction Symbol Placard

Located on the top surface of the spray tanks, this placard provides graphic starting instructions.

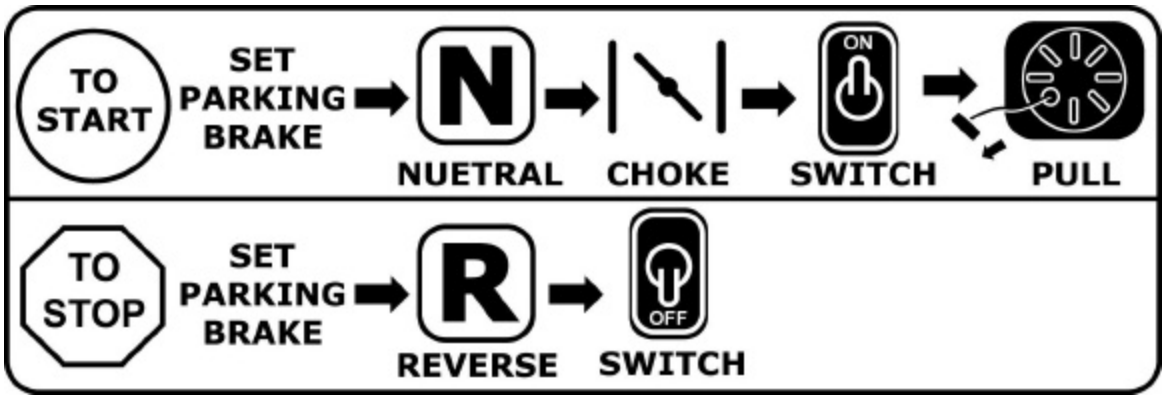


Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 4 of 12)

Machine Transport CAUTION Placard

Located on the surface of the fuel tank, this placard provides machine-handling precautions to prevent flooding the engine with gasoline while transporting the machine or performing maintenance that requires tipping the machine.

DRIVING, OPERATION, AND SAFETY (continued)

Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 5 of 12)

Gearshift Symbol Placard

Located on the frame just beneath the gearshift lever, this placard shows gear locations.

Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 6 of 12)

Transmission WARNING Placard

Located on the gearshift, this placard provides a written WARNING against shifting the transmission gears without first stopping the machine.

Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 7of 12)

Third Hole Adjustment Setting Lever Placard

Located next to the third-hole adjustment lever, this placard provides a graphic representation of the third-hole adjustment settings. In the fully up position, the hole is closed. In the fully down position, the hole is completely open. The hole opening in intermediate positions is proportional to its position.

DRIVING, OPERATION, AND SAFETY (continued)

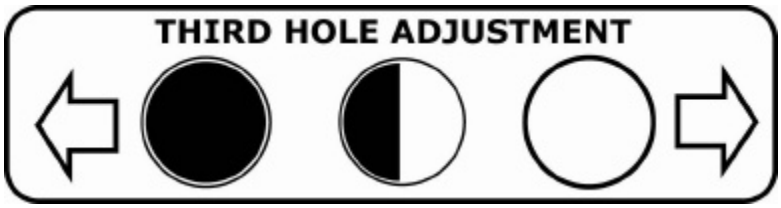


Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 8 of 12)

Deflector ON/OFF Placard

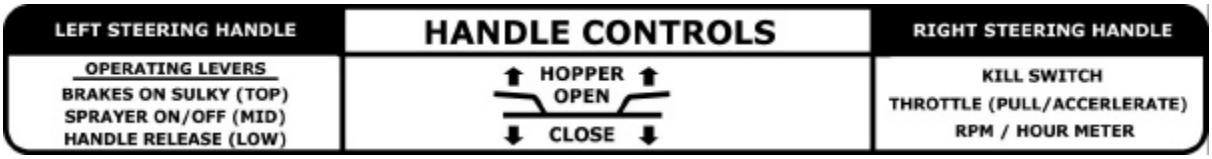
Located next to the deflector control, this placard shows the ON and OFF positions for the deflector control lever.

Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 9 of 14)

Handle Control Placard

Located at center of the handle bar, this placard provides graphic instructions for operating the spreader ON/OFF lever and shows the throttle lever, kill switch, hour meter, brakes, 2-handle release, and 2 spray on/off levers.

DRIVING, OPERATION, AND SAFETY (continued)



High Speed Sprayer Setting Placard

Located on the left-hand sprayer selector control panel, on the top surface of the spray tank, this placard shows the lever settings for operating the sprayer at HIGH speed.

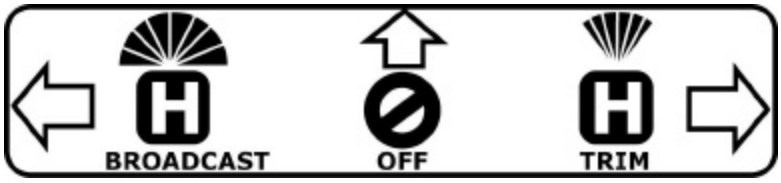


Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 10 of 12)

Low Speed Sprayer Setting Placard

Located on the right-hand sprayer selector control panel, on the top surface of the spray tank, this placard shows the lever settings for operating the sprayer at LOW speed.

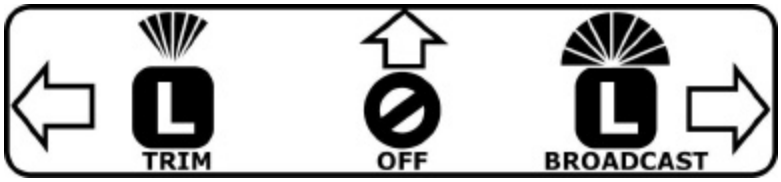


Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 11 of 12)

DRIVING, OPERATION, AND SAFETY (continued)

Parking Brake Setting Placard

Located on the left-hand fender, this placard shows the lever settings for the Parking Brake set and realeas.

Figure 3. Operator Control Symbols, WARNINGs, and CAUTIONs (sheet 12 of 12)

DRIVING, OPERATION, AND SAFETY (continued)

Safety Systems Check

It is mandatory that ALL new Magnums receive the following safety inspection prior to use and periodically, as called for, in Section 8 Maintenance. All operators and service personnel must be trained in the safety features, basic operation, and maintenance of the Magnum prior to use. Refer to Figure 2 for location of the main operating controls.

⚠WARNING **An untrained operator or mechanic subjects himself and others to death or serious injury. Untrained or underage individuals are not to operate or maintain this equipment. The owner is responsible for training operators and mechanics. Before operating the machine, an operator must read and understand the Operator Manual and other training material. If the person cannot read English, the owner is responsible to explain the material to them. Training MUST include SUPERVISED driver's training with adequate practice time for the operator to become competent in controlling the machine under all conditions.**

The operator must be familiar with safe operation of the equipment, operator controls and safety signs.

The Operator Manual is part of this machine and MUST be available to the operator and service personnel at all times.

1) Check and top off oil (refer to Table 9. in Section 8 Maintenance for proper type).
   a) Check engine oil.
   b) Check clutch housing oil.

2) Remove gas cap, fill gas tank. Replace gas cap securely.

⚠WARNING **Gasoline is flammable and the vapors are explosive. Exhaust fumes can suffocate. Take these precautions to avoid death or serious injury:**

Shut off fuel valve while transporting or maintaining this machine.
DO NOT smoke while operating or refueling
DO NOT add fuel when engine is running or hot
DO NOT run engine indoors or in an enclosed area

3) Perform the following safety systems checks. If ANY Safety System Check Fails, Do not continue the Test or operate the machine. Call Our Tech Support Department for instructions.

DRIVING, OPERATION, AND SAFETY (continued)

a) Make sure engine is not running and is cool.

b) Open the two fuel shutoff valves. One valve is located on the bottom side of the fuel tank, and the second is located on the back of the engine.

c) Check for proper Throttle Lever operation. Pull and release the Throttle Lever on the right handlebar. It must operate smoothly and automatically return to the idle position.

d) Check that the machine starts in NEUTRAL.

⚠WARNING **To avoid an unanticipated sudden movement of the machine at startup, follow these procedures. Before attempting to start, always verify that the transmission is completely in neutral by rolling it forward. . Set the parking brake. Do not operate the throttle lever while starting. Do not operate the machine if the neutral safety mechanism is not working.**

.

i) Move the Shift Lever until it contacts the right side of the Shift-Stop and release the Shift-Lever.

ii) Verify that this position locates NEUTRAL (the machine should easily roll forwards and backwards when in NEUTRAL).

iii) Engage the Parking Brake.

iv) Choke the engine, if necessary, but **DO NOT** operate the Throttle Lever while starting. High engine speed can cause the clutch to engage and the machine to lurch during starting.

v) Set the kill switch to the ON position.

vi) Have firm footing on the ground when attempting to start the Machine. Stand to the side, rather than to the rear of Machine when attempting to start.

vii) Pull the starter cord to start the engine. After the engine starts, place the choke in the RUN position.

e) Check for proper engine speed at Idle and full speed (perform this test while in NEUTRAL).

i) The engine **MUST** idle at no more than 1500 to 1550 rpm. I**F THE IDLE SPEED EXCEEDS 1500 to 1550 RPM**, adjust the idle speed. ?

DRIVING, OPERATION, AND SAFETY (continued)

ii) The engine **MUST** not exceed 3450 rpm at full throttle. If the full throttle speed exceeds 3450 rpm, adjust the full throttle speed as described in section 4-b? below.

f) Check that the machine starts **ONLY** in NEUTRAL.

i) Check that the machine **DOES NOT** start in **LOW GEAR**.

WARNING **Do not attempt to start or operate the machine in a confined space; or where you or someone else could be trapped between the machine and any obstacle; or where you could loose your balance.**

(a) Chock the wheels to prevent movement.
(b) Shift into **LOW GEAR**.
(c) Have firm footing on the ground when attempting to start the Machine. Stand to the side, rather than to the rear of Machine when attempting to start.
(d) Choke the engine (if necessary), and attempt to start the machine. It should **NOT** start. **IF THE MACHINE STARTS, DO NOT CONTINUE THE TEST OR OPERATE THE MACHINE. CALL OUR TECH SUPPORT DEPARTMENT IMMEDIATELY FOR INSTRUCTIONS**.

g) Check that the machine **DOES NOT** start in **REVERSE GEAR**. Repeat the preceding check process in for **REVERSE**.

h) Check that the machine can be shifted into **REVERSE, LOW AND HIGH GEAR**.
i) Start the machine.
ii) Shift into **REVERSE GEAR**. The machine should back up under power.
iii) Stop. Shift into **LOW GEAR**. The machine should go forward at about 3.5 mph under full throttle.
iv) Stop. Shift into HIGH GEAR. The machine should go forward at about 5 mph under full throttle

i) Check for proper Brake system operation. With the Machine under power in high gear on a paved surface, apply the brakes. Both rear wheels should drag equally without causing a change of course, left or right.

j) The Safety Systems Check is complete.

DRIVING, OPERATION, AND SAFETY (continued)

Drivers Training

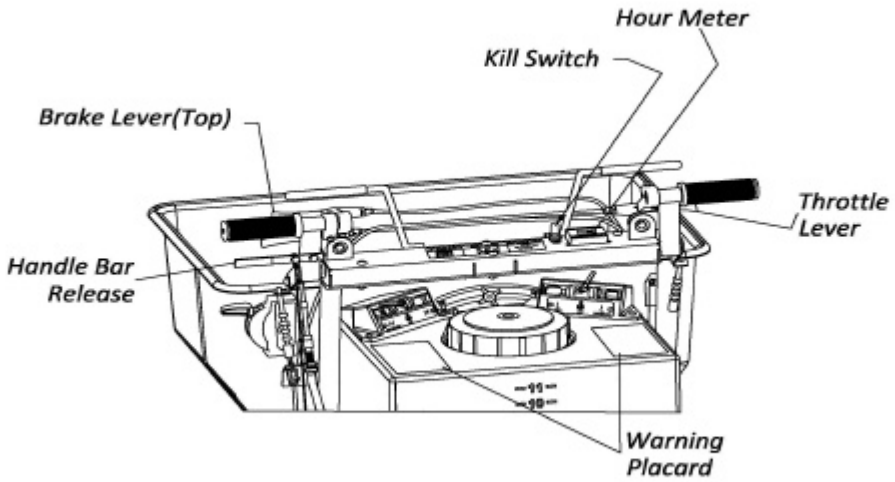


Figure 4. Operating Controls Location

1. Before attempting to drive the machine, refer to Figure 4 above and be sure the operator is familiar with all the operating controls and features.

2. Pre-Operation Site Inspection. Before operating the Spreader Sprayer, inspect the area that will be covered for operating hazards.

    a. Check and clear the area of hidden debris, toys, or other things that could damage the Spreader Sprayer.

    b. Check the area for hidden holes, ruts, and natural hazards such as raised tree roots.

    c. Check the area for hidden sprinkler heads and spray equipment.

    d. Check the area for drop offs, steep hills, and other hazards.

    e. Check the area for any low hanging clotheslines, branches, or other obstacles.

    f. If necessary, lay out the spreading/spraying lanes using flags to designate turning points.

DRIVING, OPERATION, AND SAFETY (continued)

3. Starting

⚠WARNING **TO AVOID SERIOUS BODILY INJURY OR PROPERTY DAMAGE CAUSED BY AN UNANTICIPATED RAPID MOVEMENT OF THE MACHINE, FOLLOW THESE PROCEEDURES. BEFORE ATTEMPTING TO START, ALWAYS VERIFY THAT THE TRANSMISSION IS COMPLETELY IN NEUTRAL. DO NOT ATTEMPT TO START IF YOU OR SOMEONE ELSE COULD BE TRAPPED BETWEEN THE MACHINE AND ANY OBSTICAL IF THE MACHINE SHOULD SUDDENLY MOVE. DO NOT OPERATE THE THROTTLE LEVER WHILE STARTING. DO NOT OPERATE THE MACHINE IF THE NEUTRAL SAFETY MECHANISM IS NOT WORKING.**

⚠WARNING **Loss of control subjects the operator and others to death or serious injury. The operator must keep this machine under control at all times. This machine has a high center of gravity, and turf conditions affect stability**.

DO NOT operate the machine:

- **While under the influence of drugs or alcohol**.
- **Unless daily and weekly maintenance has been performed**. **Refer to the Operator Manual for details.**
- **If the machine moves unexpectedly upon startup or when shifting into gear**.
- **In wet conditions, low light, or near drop-offs, holes, debris or other hazards.**
- **Unless you have inspected the work area and identified all hazards present.**
- **While shifting gears. Stop first, shift then operate.**
- **If engine speed exceeds 3,450 rpm.**

a. Open the two fuel shutoff valves. One valve is located on the bottom side of the fuel tank, and the second is located on the back of the engine.

b. Set Parking Brake.

c. Place the shift lever in the NEUTRAL position.

d. Set the kill switch to the ON position.

e. If necessary, move the choke lever to CHOKE while starting the engine. DO NOT operate the throttle lever while starting.

f. Pull the starter cord to start the engine. After the engine starts, place the choke in the RUN position.

DRIVING, OPERATION, AND SAFETY (continued)

4. Driver's Training (to be performed on a level paved area)

   a. Release the parking brake

   b. With the throttle lever released, shift the transmission to LOW gear.

   c. Step onto the sulky and grasp the handlebars.

   d. Pull the throttle lever to the fully open (3450 rpm) position against the handlebar. This will engage the centrifugal clutch, causing the Spreader Sprayer to move.

   e. To turn the Spreader Sprayer, turn the handlebars in the direction of the turn. Shift your body weight to the side of the direction of the turn.

   f. To stop, release the Throttle Lever and pull the Brake Lever.

   g. At this point the new operator must spend an adequate amount of time driving the machine in LOW Gear on an open flat area until the new operator is comfortable driving the machine.

   h. Drop the Handlebar and practice operating the machine while walking.

   i. To shift from LOW to HIGH, first stop the machine by releasing the Throttle Lever and pull the Brake Lever. When the machine has stopped completely, shift to HIGH gear. Do not apply excessive force to the shift lever. If it is difficult to shift, move the front wheels slightly to free up the transmission until it shifts easily. To shift from a forward gear to REVERSE or from REVERSE to a forward gear, first stop the machine by releasing the Throttle Lever and pull the Brake Lever. When the machine has stopped completely, shift to the desired gear. Do not apply excessive force to the shift lever. If it is difficult to shift, move the front wheels slightly to free up the transmission until it shifts easily.

⚠WARNING **TO AVOID SERIOUS BODILY INJURY AND DAMAGE TO THE TRANSMISSION OR GEAR SHIFT, THE MACHINE MUST BE AT A COMPLETE STOP BEFORE SHIFTING. DO NOT APPLY EXCESSIVE FORCE TO THE GEAR SHIFT. IF THE TRANSMISSION IS DIFICULT TO SHIFT, MOVE THE FRONT WHEELS SLIGHTLY TO FREE UP THE TRANSMISSION UNTIL IT SHIFTS EASILY.**

   j. At this point the new operator must spend an adequate amount of time driving the machine in HIGH Gear, both riding and jogging behind, on an open flat area until the new operator is comfortable driving the machine in HIGH gear.

   k. Add weight to the hopper and tank, and repeat steps (f.) through (j.)

DRIVING, OPERATION, AND SAFETY (continued)

5. Driving on hills.

WARNING **To maintain control on hillsides:**

- **Always use low gear and lean uphill for balance.**
- **Never operate as a ride-on on slopes over 15 degrees.**
- **Reduce the amount of granular and liquid products carried.**
- **Travel across the grade, beginning at the bottom and work your way up, avoiding sudden starts, stops or turns.**
- **DO NOT travel straight down hill. Zigzag dow with the clutch engaged to use engine back pressure to slow descent. Operate as a walk-behind in all situations where loss of control is possible.**

Before leaving the operator position, park on level ground or head across a hill grade, set the parking brake, shut off the engine and shift into REVERSE.

a. Remove the added weight from the machine. Adequate practice time must be provided for the new operator to become comfortable driving the machine on hills before adding weight to the machine. Practice with the handles up and down.

b. Operate the machine on ground that has a significant slope only in LOW, according to the following instructions (refer to Figure 5).

c. When you turn the machine, point the handlebar in the direction of the turn. Lean into the turn (toward the inside of the turn).

d. To climb a slope, shift to LOW. If you are spraying, set the sprayer to the LOW nozzles. If you are spreading, change the settings to LOW speed spreader operation. Lean into the slope (uphill).

e. To descend a slope, shift to LOW. If you are spraying, set the sprayer to the LOW nozzles. If you are spreading, change the settings to LOW speed spreader operation. Lean into the slope (uphill).

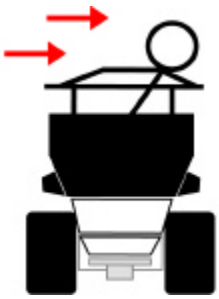
f. To traverse a slope, shift to LOW. If you are spraying, set the sprayer to the LOW nozzles. If you are spreading, change the settings to LOW speed spreader operation. Lean into the slope (uphill).

g. To climb, descend, or traverse slopes that are 15 degrees or greater, stop the machine, shift to LOW, step off the sulky, and release and lower the handlebar. Travel the slope walking behind the machine.

h. After completing travel or spreading/spraying on the slope, pull lever to release handlebar from locked lower position, raise the handlebar to the upright position, making sure it locks in place. Operate the Spreader Sprayer in either HIGH or LOW, as desired.

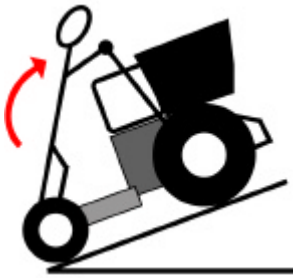
DRIVING, OPERATION, AND SAFETY (continued)

i. To stop machine operation, release the throttle lever and pull brake lever to bring the machine to a stop.
j. When finished operation or parking on a grade, head the machine across the slope, set the shift lever to REVERSE and place the Kill Switch to OFF, and set the parking brake.



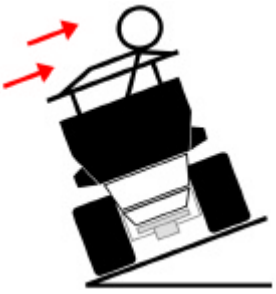
When you turn the machine, point the front of the machine in the direction of the turn. Shift your body weight toward the inside of the turn.

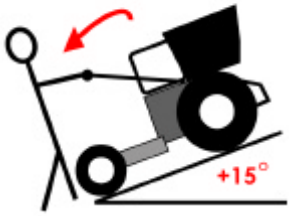
When you go up a slope, first stop and shift the machine into LOW (L) gear. Lean forward, into the slope as you drive up the slope.



When you go down a slope, first stop and shift the machine into LOW (L) gear. Lean to the rear, into the slope as you drive down the slope.

When you are driving the machine across a slope, first stop and shift the machine into LOW (L) gear. Lean into the hill as you travel across the slope.





If you have to go up, down, or across steep slopes (15 degrees, or steeper), stop and shift the machine into LOW (L) gear. Release and lower the handlebar. Walk behind the machine as you travel the slope.

When you reach level ground, return the handlebar to the upright position. Make sure the handlebar locks.

Figure 5. Riding the Magnum C3C Spreader Sprayer

6. Loading and unloading the machine from a vehicle.

WARNING **Do not attempt to start or operate the machine in a confined space; or where you or someone else could be trapped between the machine any obstacle; or where you could loose your balance.**

a. When loading, center the machine's tires on the ramps, stop, shift into LOW gear, drop the handle, and carefully walk the machine up the ramps using the Brake Lever as needed.

   i. Park the machine, turn the Kill Switch to Off, set the Parking Brake, shift into Reverse, , close the fuel shutoff valve by turning it counterclockwise, and chock the wheels.

   ii. Firmly tie down the machine and ramps using appropriate tie-down straps or all the tie-down devices provided by the Carrying Rack Manufacturer.

b. When unloading, remove the tie-down devices and lower the ramps, center the machine's tires on the ramps, open the fuel valve, start the machine, release the Parking Brake, shift into REVERSE gear, drop the handle, and carefully walk the machine down under power using the Brake Lever as needed.

7. Continue new operator training with Section 5 Spreader Calibration, Section 6 Sprayer Calibration, and Section 8 Maintenance..

Keeping the Magnum C3C Spreader Sprayer operating reliably requires attention to maintenance. This fact MUST be instilled in all operators and mechanics. Use the Daily Maintenance and Safety Checklist and the periodic maintenance Logs, provided in Section 8 of this manual, as a maintenance guide. Proper maintenance prevents damage to your machine, and prevents malfunctions that could occur if the maintenance was not performed. It is also essential for safe operation of the machine.

SPREADER CALIBRATION, ADJUSTMENT, AND OPERATION

Description of Spreader features, controls, and operation

This machine uses a familiar 3-hole cyclone type spreader mechanism that broadcast spreads a pattern width of 14 ± 1 feet (4.3 ± 0.3 meters), as shown in Figure 8.? Using a 7 ± 1 foot (2.1 ± 0.3 meters) overlap travel pattern provides an even distribution of most products. A remote controlled deflector is provided to cut off the right side of the spread pattern for trimming. A remote controlled first-hole adjustment plate is provided that should be used with the deflector to compensate for the amount of product required while trimming and to balance the spreader pattern for even distribution. An opening and closing handle remotely controls the delivery of granular material from the hopper. A rate control lever adjusts the amount of product delivered when the hopper is open. Refer to Figure 6 for location of these controls. The sprayer can be operated at the same time the spreader is in use, and the seven-foot overlap pattern is also effective for the sprayer.

Read and follow product label and material safety data sheet precautions when handling, mixing, applying, and disposing of the material you are pouring into the hopper or mixing and pouring into the spray tank. Some materials may present health hazards and will require protective clothing and/or breathing equipment.

The Spreader Sprayer requires periodic calibration and adjustment to verify the spreader and sprayer patterns and to verify the correct product delivery rates. Whenever you change products or rates of application and at one-month intervals, or more frequently during heavy use, verify that the distribution pattern and calibration are still valid. Adjust as necessary.

After completing spreader calibration, you should regularly compare the amount of product used to the number of square feet covered.

Spreader Operation

When spreading the engine RPM should be 3450, no matter if you are using high or low gear. If engine RPMs are too low the spread width will be too narrow.

Start spreader operation by pushing the operating lever forward to the OPEN position.

To stop spreader operation, pull the operating lever rearward to the CLOSED position.

SPREADER CALIBRATION, ADJUSTMENT, AND OPERATION

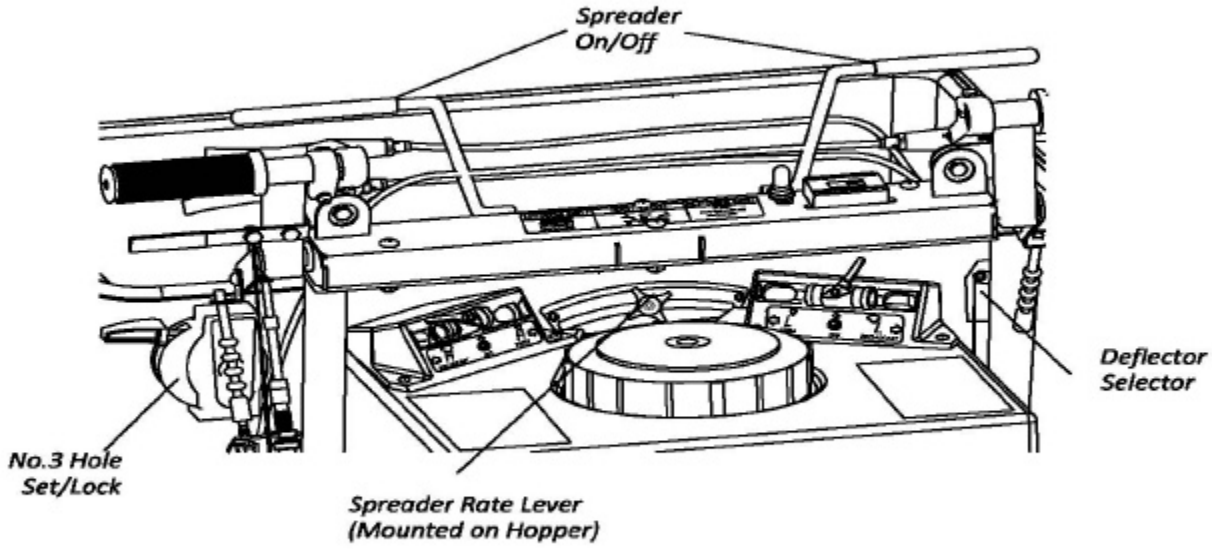


Figure 6. Spreader Rate Lever and Open/Close Lever

Spreader Calibration

Adjustment of the spreader establishes the correct spread pattern. The center discharge hole establishes the center of the pattern. The right-hand discharge hole establishes the spread pattern on the left-hand side. The left-hand (third-hole with slide plate) discharge hole establishes the discharge pattern on the right-hand side. Calibration establishes the correct application rate and balances the spreader pattern.

If you did not purchase a calibration kit with your Magnum, obtain the following materials:

- Eleven collection pans, 3 to 4 inches (8 to 10 centimeters) high and about 1 foot (0.3 meter) square (i.e., aluminum roasting pans)
- Clear tube, 1/2-inch (13 millimeter) internal diameter, 3 to 4 inches (8 to 10 centimeters) tall (to act as a graduated cylinder for measuring the collected fertilizer pellets). Use a thin-tipped permanent marker to mark the tube at quarter-inch (6 millimeter) increments all the way up the tube.
- Clear, graduated one quart (one liter) measuring cup.
- Stop watch or wristwatch.
- This owner's manual, and a pencil to record your collection amounts.

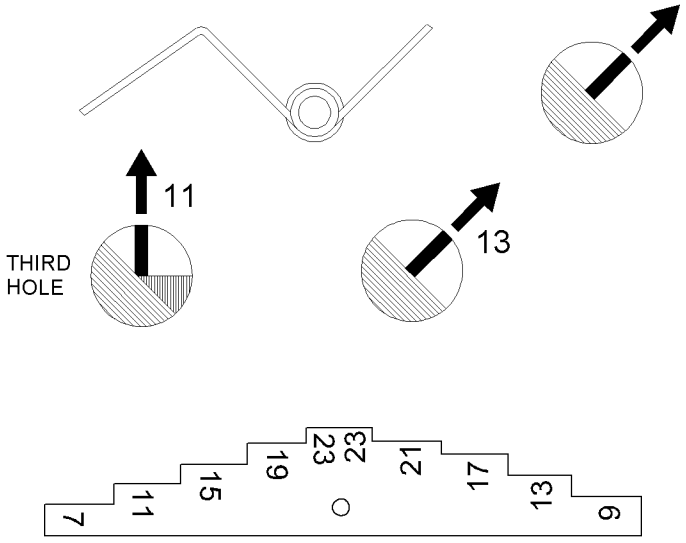
SPREADER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

1. Place the spreader operating lever in the CLOSED position. Verify that the spreader discharge holes are closed.

2. If the spreader discharge holes are not completely closed, adjust the length of the control cable running from the controls on the left handlebar down the handle to the outer hopper control plate by loosening and repositioning the locknuts.

3. Establish the spreader initial adjustment and calibration position as follows:

   a. Loosen the rate adjustment knob at the rear of the hopper. Insert the #13 position on the calibration gauge into the center adjustment hole, oriented as shown in Figure 7. Pull the spreader operating lever back until the shutoff plate touches the gauge.



Setting Gauge

Figure 7. Setting the Spreader Adjustment Holes

   b. Adjust the rate control arm in the rate control bracket to touch the shutoff plate stop. Tighten the rate adjustment knob. Remove the gauge.

   c. Place the spreader operating lever at the CLOSED position, then, return it to the OPEN position. Verify the gauge fits snugly in the hole at the #13 gauge position. Repeat the setting process, if necessary.

   d. Without changing the rate control arm setting, place the operating lever at the OPEN position. Insert the #11 position on the gauge, oriented as shown in Figure 7, in the third-hole right side pattern adjustment hole (left-hand hole). Move the third-hole remote

SPREADER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

adjustment lever (left-hand side of the hopper) so that the slide plate just contacts the gauge. Move the memory lock (grey sliding piece) until it pops into the lever and locks its position. Remove the gauge.

e. Place the third-hole remote adjustment lever at the OFF position, then return it to the memory lock position. Verify the gauge fits snugly in the hole in the #11 gauge position. Repeat the setting process, if necessary.

4. Determine the rate lever setting for each product that will be used. The machine is designed to apply fertilizer evenly by overlapping 50 percent of the last pass. Most fertilizer products spread 14 foot wide. One half of 14 feet (or 7 feet) is the effective material spread width, and used as the basis for calibration.

   a. Measure a distance of 143 feet (44 meters) over turf. This will provide a spread area of approximately 1,000 ft^2 (93 m^2). The effective material spread width is 7 feet; therefore, 7 x 143 = 1,001 ft^2 (93 m^2).

   b. With the machine in neutral (and the hopper closed), run the engine at full throttle. Check the tachometer to make sure the engine is running at 3450 rpm. Once we know that the engine is operating at the correct speed, we can be sure that you'll be traveling at the right speed, as well.

   c. With the machine traveling in HIGH at full throttle, use a stopwatch or wristwatch to measure and record the time required to travel the 143-foot (44 meter) turf course. The normal time is approximately 20 seconds.

   d. With the machine operating in LOW at full throttle, record the time required to cover the 143-foot (44 meter) turf course. The normal time is approximately 28 seconds.

   e. Place the Spreader Sprayer over a paved surface and place enough material to cover 1,000 ft^2 (93 m^2) in the hopper. This must be calculated for each specific product. The Spreader Sprayer may remain stationary on the hard surface for the remainder of the calibration to make collection and reuse of the material easier.

   f. In neutral, with the engine at full throttle, spread the product, but do not record the first time. The first time required to spread the product is not an accurate measure because some of the product always remains in the hopper.

   g. Leave the product that did not spread in the hopper and add enough additional material for 1000 ft^2 (93 m^2) of coverage to the hopper.

   h. Spread the product. Measure and record the time required to discharge the product.

   i. If the time to spread the product differs from the time measured in step (b), above, adjust the rate lever setting. Moving the rate lever to the right will decrease the time required to

SPREADER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

spread the product. Moving the rate lever to the left will increase the time required to spread the product.

j. If the rate lever required adjustment, add enough additional material for 1000 ft^2 of coverage to the hopper. Measure and record the time required to spread the product.

k. If necessary, adjust the rate lever setting and repeat the spread time test until the time to spread product for 1000 ft^2 (93 m^2) meets the 143-foot (44 meter) travel time. Recheck the center hole setting with the gage.

l. Using the calibration gage, check and record the center hole and third-hole settings for future reference. Record the rate lever setting for future reference. The calibration gauge and rate lever settings will not match.

m. To calibrate the spreader for LOW gear, set the rate lever at a lower number and spread enough material to cover 1000 ft^2 (93 m^2). Test and adjust the rate lever setting until the spreader is applying the correct amount of fertilizer per thousand square feet. Recheck the center hole setting with the gage. Record this setting for resetting the spreader.

n. Using the calibration gauge, check and record the center hole and third-hole settings for future reference, and record the rate lever setting for future reference.

5. If the Spreader Sprayer is to be used for spreading, set the rate lever for the material to be spread to the previously calibrated setting for the gear you intend to use. Check the distribution pattern.

6. Place 11 calibration pans in a line on two-foot centers on a paved area such as a parking lot (refer to Figure 8). NOTE: Checking and adjusting the distribution pattern requires multiple passes over the calibration pans. This process is done on a paved area to avoid burning the vegetation by over-fertilizing, and to allow the product to be collected and reused.

    a. With the material to be spread loaded in the spreader, make at least three passes from the same direction over the pans in a path perpendicular to the line of pans while spreading material.

SPREADER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

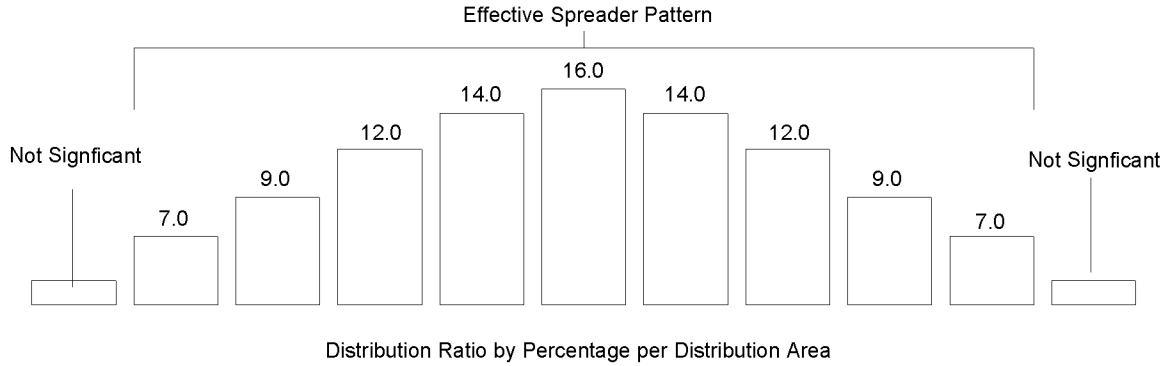


Figure 8. Spreader Material Distribution Ratio

b. Pour the contents of the first pan on your far left into the graduated cylinder or clear tube. Measure and record the material deposited (refer to Table 1). Dump the collected pellets back into the bag or hopper. Repeat this measurement for each pan, one by one, until all eleven pans are emptied and recorded.

c. Add together all eleven recorded numbers to find the total amount of material caught in the pans.

d. Divide the amount caught in each pan by the total amount. This is the percentage caught in each pan.

e. The distribution ratio should be approximately equal to that shown graphically in Figure 8, and by percentage in Table 1, with the shaded area of the table the most important. The unshaded area of the pattern receives negligible product distribution. NOTE: The distribution pattern shown in Figure 8 and Table 1 represents the ideal pattern, which may not be reproducible in the field.

Pan number, from left	1	2	3	4	5	center 6	7	8	9	10	11
Material percentage	*	7	9	12	14	16	14	12	9	7	*
*Amount Not Significant											

Table 1. Material Distribution Ratio by Percentage

f. To adjust the distribution pattern for the right side, move the lever as necessary to increase or decrease the opening in the adjustment hole. Reset the memory lock.

SPREADER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

g. Repeat the passes over the pans and measure the material deposited in the pans. Readjust the openings as necessary until the distribution pattern meets the requirements.

h. Record each opening setting for future recalibration.

Spreader Operation

Following calibration the spreader may be used to apply products. It is recommended that the products be applied in the following manner for best results.

The typical application procedure is to make an edging pass around the perimeter of the property and any ornamental beds etc. within. Drop the defector and close the No.3 hole adjuster to reduce the spread width by cutting off the material on the right side. Select the appropriate gear for the terrain and turf conditions. Use LOW gear on hills and in tight areas. Use HIGH gear on level and open areas. Set the Spreader Rate Lever to the pre-calibrated rate for the gear selected. Make the edging pass keeping the right front tire close to the edge. Stop. Return the deflector to the up position and the 3rd-hole adjuster to its broadcast setting. Change gears if desired and return the Spreader Rate Lever to the pre-calibrated rate for the gear selected. Fill in the center of the lawn by making parallel passes on 7-foot centers. The first pass should overlap back to the centerline of your wheel tracks of one of the edging passes. As you enter the fertilized area at the end of the pass shut off the hopper as you make a 180-degree turn. Quickly open the hopper as you come out of the turn heading back in the opposite direction with the fertilizer overlapping to the center of your last pass. Repeat this process though out the rest of the lawn.

An alternative method is to begin with the edging pass as in the previous section. Then reset the spreader to broadcast and fill in the center making descending spiral passes around the periphery ending in the center. This method automatically compensates for an unbalanced pattern distribution because the right side pattern always overlaps the left side pattern.

Either method may be used simultaneously with the spray features on the machine. When trim-spraying the edging pass use the appropriate trim nozzle for the gear selected and spray as needed. When Broadcast-spraying the center area use the appropriate Broadcast nozzle for the gear selected and spray as needed. To insure proper spray coverage, overlap closer to the right tire of the edging pass.

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION

Description of Sprayer features, controls, and operation

The spray pattern and spray rate are controlled by the engine speed and pump pressure, and the nozzle orifice. These are constants that do not change unless the machine or a component is not functioning correctly or is misaligned. An unloader valve inside the tank controls pump pressure. There is a suction shutoff valve located at the tank outlet. A strainer is located inside the tank. A spray control lever is mounted on the left handle to turn the spray on and off.

There is a pair of nozzles (broadcast & trim) for use while in LOW gear, and a second pair of nozzles (broadcast and trim) for use in HIGH gear. The standard nozzles are sized to apply approximately 1 quart per thousand square feet in either gear whether broadcasting or trimming. An optional kit is available that has nozzles sized to apply approximately ½ gallon per thousand square feet. Tank mounted spray selector valves control which nozzle sprays.

The sprayer has a pattern width of 11 feet (3.4 meters) using a single front mounted broadcast nozzle, as shown in Figure 9. The spray distribution pattern allows the use of the seven-foot (2.1 meters) overlap spreader travel pattern to achieve an even distribution of the sprayed product. Using the trim nozzle provides an even finished distribution using a single trim nozzle to deliver a spray pattern of 3 feet on the surface being treated.

The sprayer and spreader can be operated at the same time and provide even distribution of both the sprayed and spread products.

The Sprayer requires periodic calibration and adjustment to verify the sprayer patterns and to verify the correct product delivery rates. Whenever you change products or rates of application and at one-month intervals, or more frequently during heavy use, verify that calibration is still valid. Adjust as necessary.

Check and adjust Broadcast Spray pattern daily, prior to treating each lawn, and as needed to verify that the nozzles are properly aligned and spraying properly.

After completing spreader calibration, you should regularly compare the amount of product used to the number of square feet covered.

⚠WARNING **Before handling, mixing, or applying any pesticides, read and follow product label and material safety data sheet. Some materials may present health hazards and will require protective clothing and/or breathing equipment. Follow product label and MSDS disposal instructions and any local regulations that apply to the product**

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

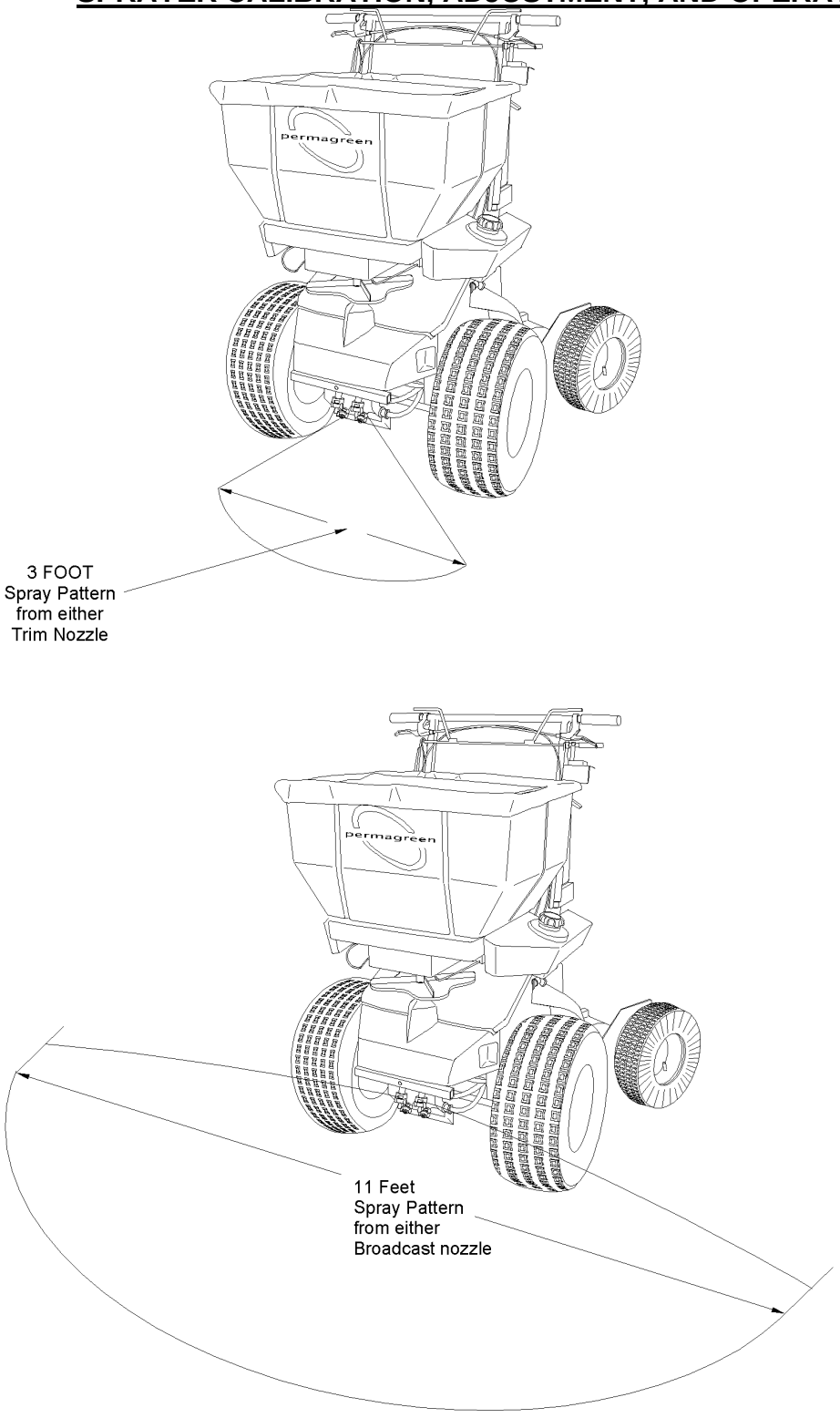


Figure 9. Sprayer Pattern

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

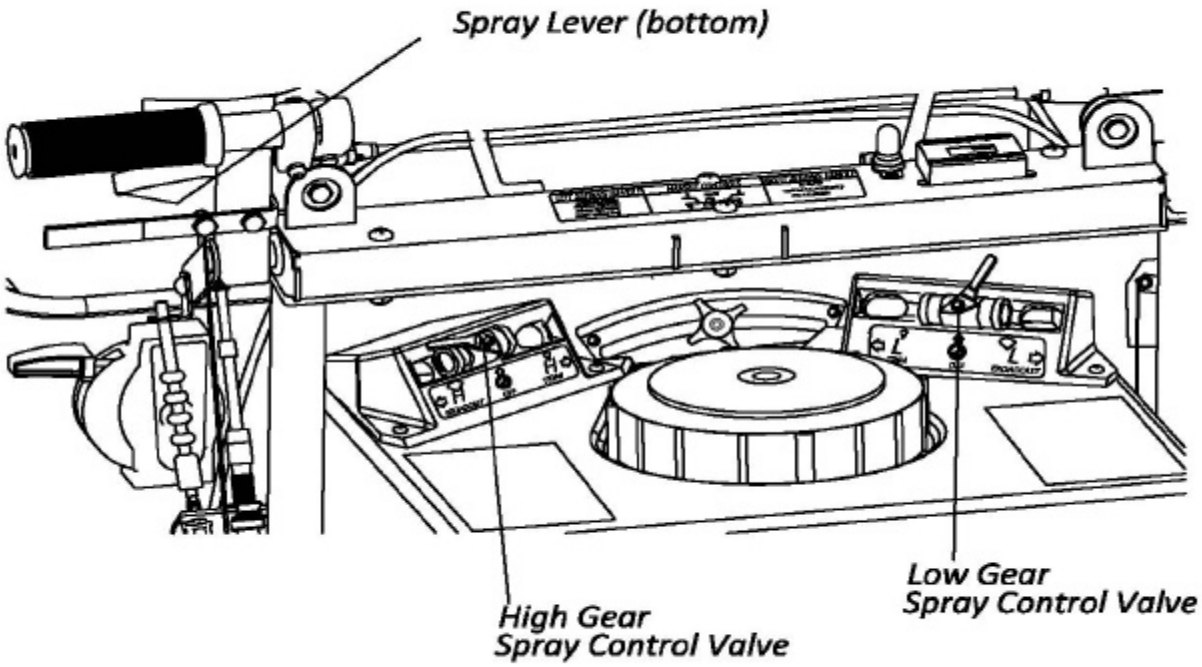


Figure 10. Spray Controls

Prepare for Sprayer calibration

1. Fill the spray tank with water.
2. Set the spray control valve for the nozzle to be checked to the ON position.
3. With the machine in neutral, pull the throttle lever to full operating speed of 3450 rpm.
4. To start momentary sprayer operation, pull the spray lever toward the handgrip. Spray until a steady spray pattern is achieved. Release the lever to stop spraying.
5. To start continuous sprayer operation, pull and hold the spray lever toward the handgrip. To stop sprayer operation, release the spray lever
6. Follow this procedure for each nozzle.

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

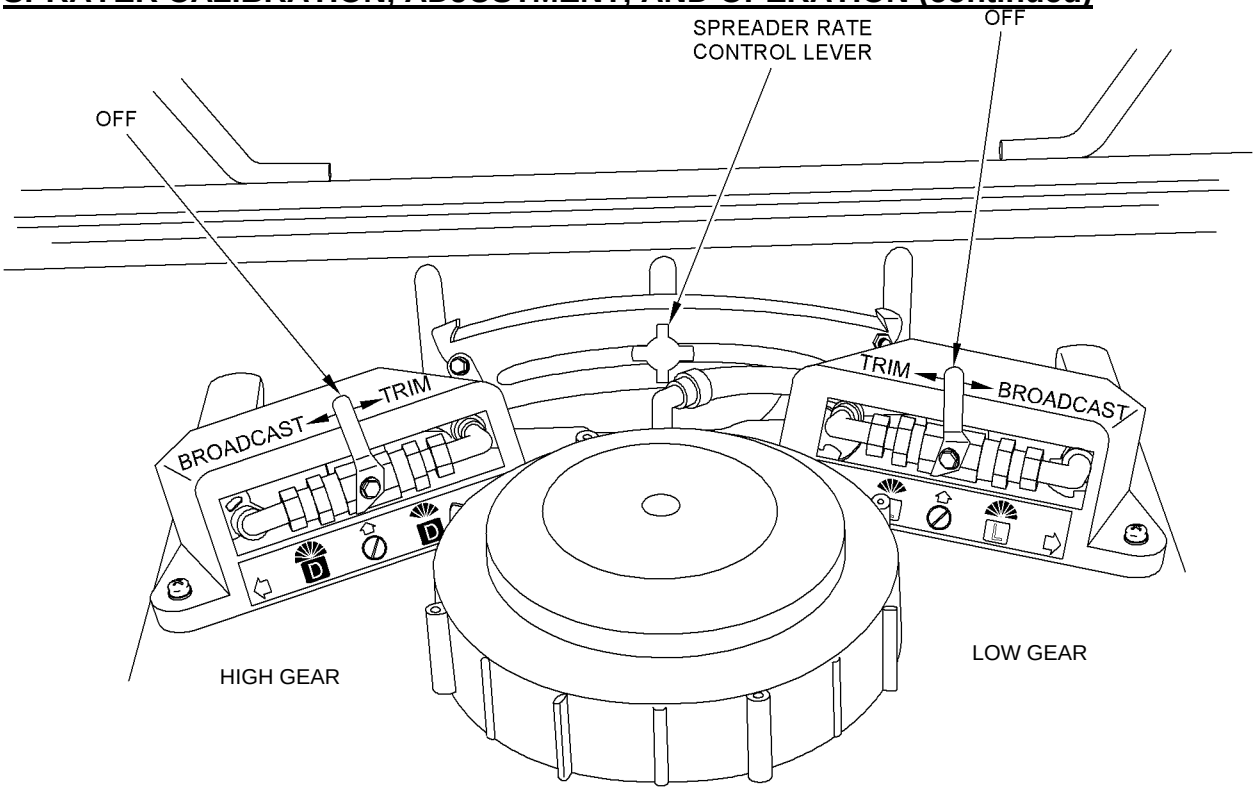


Figure 11. Setting the Spray Control Valve

Adjust the Broadcast Spray pattern

1. Park on a flat concrete of asphalt surface.

2. Referring to Figure. 11, select the HIGH gear broadcast nozzle by turning the left Spray Control Valve handle to the left. The right Spray Control Valve handle must be pointed up or down turning off the LOW gear nozzles.

3. With the machine in neutral and running, pull the throttle lever to full operating speed of 3450 rpm, and pull the Spray Lever.

4. Spray for 15 seconds until the spray pattern is visible on the surface. The spray pattern should resemble the 11foot spray pattern in Figure 9. Adjust as follows:

   a. Rotate the nozzles in the nozzle caps so that the spray pattern is centered forward.

   b. Rotate the nozzle body on the pipe nipple so that the spray pattern is slightly below? parallel to the ground.

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

c. Adjust the spray nozzle body so that the pattern width, measured from outermost droplets to outermost droplets, is 11 feet (3.4 meters). Increase the pattern width by raising the nozzle level. Decrease the pattern width by lowering the nozzle level.

5. Repeat the procedure for the LOW gear broadcast nozzle. Remember to turn off the HIGH gear Spray Control Valve.

Check and adjust Broadcast Spray pattern daily, prior to treating each lawn, and as needed to verify that the nozzles are properly aligned and spraying properly.

Adjust the trim spray pattern

1. Park on a flat concrete of asphalt surface.

2. Referring to Figure. 11, select the HIGH gear Trim nozzle by turning the left Spray Control Valve handle to the right. The right Spray Control Valve handle must be pointed up or down turning off the LOW gear nozzles.

3. With the machine in neutral and running, pull the throttle lever to full operating speed of 3450 rpm, and pull the Spray Lever.

4. Spray for 15 seconds until the spray pattern is visible on the surface. The spray pattern should resemble the 3-foot spray pattern in Figure 9. Adjust as follows:

   d. Rotate the nozzles in the nozzle caps so that the spray pattern is centered forward.

   e. Rotate the nozzle body on the pipe nipple so that the spray pattern is pointed slightly forward.

   f. Adjust the spray nozzle body so that the pattern width, measured from outermost droplets to outermost droplets, is three feet (0.9 meter). Increase the pattern width by raising the nozzle level. Decrease the pattern width by lowering the nozzle level.

5. Repeat the procedure for the LOW gear Trim nozzle. Remember to turn off the HIGH gear Spray Control Valve.

Check and adjust Trim Spray pattern daily, prior to treating each lawn, and as needed to verify that the nozzles are properly aligned and spraying properly.

Calibrate sprayer output

1. Set the spray control valve for the nozzle to be checked to the ON position.

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

2. Place a catch receptacle in position to catch the entire spray pattern from the nozzle to be checked. Pull the spray lever to begin spraying. Spray for one minute, collecting the nozzle output.

3. Measure the collected water.

    a. Output from the high gear broadcast nozzle (TF-VS5-Blue Band) must be 90 ± 9 ounces (2.7 ± 0.27 liters).

    b. Output from the low gear broadcast nozzle (TF-VS3-grey band) must be 66 ± 7 ounces (2 ± 0.2 liters).

    c. Output from the high gear trim nozzle (ULD120-03-blue) must be 39 ± 4 ounces (1.2 ± 0.12 liters).

    d. Output from the low gear trim nozzle (ULD120-02-yellow) must be 28 ± 3 ounces (828 ± 83 milliliters).

4. If the output from a nozzle is significantly outside the limits, refer to Section 4, FAULT ISOLATION.

The Sprayer requires periodic calibration and adjustment to verify the sprayer patterns and to verify the correct product delivery rates. Whenever you change products or rates of application and at one-month intervals, or more frequently during heavy use, verify that calibration is still valid. Adjust as necessary.

Calculating the Spray Mix Rate

The machine is designed to spray evenly by overlapping only 1.5 to 2 feet of the edge of the last spray pass. The effective spray width is 7 feet, which is exactly the same as the fertilizer effective material spread width of 7 feet.

⚠WARNING **Before handling, mixing, or applying any pesticides, read and follow product label and material safety data sheet. Some materials may present health hazards and will require protective clothing and/or breathing equipment. Follow product label and MSDS disposal instructions and any local regulations that apply to the product**

1. Calculate the time needed to treat 1000 square feet.

    a. Measure a distance of 143 feet (44 meters) over turf. This will provide a spread area of approximately 1,000 ft^2 (93 m^2). The effective spray width is 7 feet; therefore, 7 x 143 = 1,001 ft^2 (93 m^2).

    b. With the machine in neutral run the engine at full throttle. Check the tachometer to make sure the engine is running at 3450 rpm. Once we know that the engine is

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

operating at the correct speed, we can be sure that you'll be traveling at the right speed, as well.

c. With the machine traveling in HIGH gear at full throttle, use a stopwatch or wristwatch to measure and record the time required to travel the 143-foot (44 meter) turf course. The normal time is approximately 20 seconds.

d. EXAMPLE: It took 20 seconds to travel 143 feet.

e. Find the row in Table 2 that matches your measured time above.

2. Determine the product Label Rate, in ounces, required to treat 1000 square feet by locating that information on the Product label. If the label only lists pints per acre or quarts per acre you must convert that to ounces per 1000 square feet by using one of the following formulas

   a. Label lists only pints per acre.
      a. Multiply the number of pints by 16 to get ounces per acre.

      b. Divide number of ounces per acre by 43.56

      c. EXAMPLE: Apply 3 pints per acre. 3 x 16 = 48 ounces per acre. 48 / 43.56 = 1.1 ounce per thousand square feet.

   b. Label lists only quarts per acre.

      d. Multiply the number of quarts by 32 to get ounces per acre.

      e. Divide number of ounces per acre by 43.56

      f. EXAMPLE: Apply 1.5 quarts per acre. 1.5 x 32 = 48 ounces per acre. 48 / 43.56 = 1.1 ounce per thousand square feet.

   3. Find the column in Table 2 that matches the label rate in ounces per thousand above and read down to the time row from step 1. The box at the intersection of your time row and ounce per thousand column contains the number ounces needed to mix 1 gallon of spray solution.

      a. Referring to our EXAMPLES: The intersection of row 20 and column 1.1 is 4.69.

      b. 4.69 ounces of product is needed to make 1 gallon of spray.

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

143 Foot (44 meters) Travel Time, in seconds	Product Label Rate in Ounces/1000 Ft^2 (milliliters/93 meters^2)											Ounces of Product to Mix for One Gallon of Spray (milliliters/liter)
	0.5 (14.8)	**0.75 (22.2)**	**0.8 (23.7)**	**0.9 (26.6)**	**1.0 (29.6)**	**1.1 (32.5)**	**1.2 (35.5)**	**1.25 (37.0)**	**1.3 (38.4)**	**1.4 (41.4)**	**1.5 (44.4)**	
18	2.37 (18.5)	3.56 (27.8)	3.79 (29.6)	4.27 (33.3)	4.74 (37.0)	5.21 (40.7)	5.69 (44.4)	5.93 (46.3)	6.16 (48.1)	6.64 (51.8)	7.11 (55.5)	
19	2.25 (17.5)	3.37 (26.3)	3.59 (28.0)	4.04 (31.5)	4.49 (35.0)	4.94 (38.5)	5.39 (42.1)	5.61 (43.8)	5.84 (45.6)	6.29 49.1)	6.74 (52.6)	
20 (Nominal High Gear Time)	2.13 (16.6)	3.20 (25.0)	3.41 (26.6)	3.84 (30.0)	4.27 (33.3)	4.69 (36.6)	5.12 (39.1)	5.33 (41.6)	5.55 (43.3)	5.97 (46.6)	6.40 (49.9)	
21	2.03 (15.8)	3.05 (23.8)	3.25 (25.4)	3.66 (28.5)	4.06 (31.7)	4.47 (34.9)	4.88 (38.1)	5.08 (39.6)	5.28 (41.2)	5.69 (44.4)	6.10 (47.6)	
22	1.94 (15.1)	2.91 (22.7)	3.10 (24.2)	3.49 (27.20	3.88 (30.3)	4.27 (33.3)	4.65 (36.1)	4.85 (37.8)	5.04 (39.3)	5.43 (42.4)	5.82 (45.2)	
23	1.86 (14.5)	2.78 (21.7)	2.97 (23.2)	3.34 (26.1)	3.71 (28.9)	4.08 (31.8)	4.45 (34.7)	4.64 (36.2)	4.82 (37.6)	5.19 (40.5)	5.57 (43.5)	
24	1.78 (14.0)	2.67 (20.8)	2.84 (22.2)	3.20 (25.0)	3.56 (27.8)	3.91 (30.5)	4.27 (33.1)	4.44 (34.6)	4.62 (36.0)	4.98 (38.9)	5.33 (41.6)	
25	1.71 (13.4)	2.56 (20.0)	2.73 (21.3)	3.07 (24.0)	3.41 (26.6)	3.75 (29.3)	4.10 (32.0)	4.27 (33.3)	4.44 (34.6)	4.78 (37.3)	5.12 (39.9)	

Table 2. Spray Mix Rate

4. Filling the tank.

   a. Multiply the number of gallons of spray mix you want to add to the tank by the results of step 3-b.

   b. EXAMPLE: We want to fill the tank with 12 gallons of spray mix. 12 x 4.69 = 56.28 ounces of product needs to be added to enough water to fill the tank.

   c. If you wish to convert ounces to pints or quarts use one of the following formulas:

      a. Divide ounces by 16 to equal pints. EXAMPLE: 56.28 / 16 = 3.52 pints.

      b. Divide ounces by 32 to equal quarts. EXAMPLE: 56.28 / 32= 1.76 quarts.

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

Sprayer Operation

Following calibration the spryer may be used to apply products. It is recommended that the products be applied in the following manner for best results.

The typical application procedure is to make an edging pass around the perimeter of the property and any ornamental beds etc. within. Select the appropriate gear for the terrain and turf conditions. Use LOW gear on hills and in tight areas. Use HIGH gear on level and open areas. Select the appropriate trim nozzle for the gear selected and check that the other Spray Control vale is off. Make the edging pass keeping the right front tire close to the edge spraying as needed. Stop. Change gears if desired. Select the appropriate broadcast nozzle for the gear selected and check that the other Spray Control vale is off. Fill in the center of the lawn by making parallel passes on 7-foot centers spraying as needed. The first pass should overlap back to the centerline of your wheel tracks of one of the edging passes. Repeat this process though out the rest of the lawn.

An alternative method is to begin with the edging pass as in the previous section. Then reset the to broadcast and fill in the center making descending spiral passes around the periphery ending in the center spraying as needed.

Either method may be used simultaneously with the spreader features on the machine. Refer to Spreader Operation for detailed instructions.

Use extreme caution when spraying near desirable vegetation or painted surfaces to avoid damage.

Use extreme caution when spraying in windy conditions to avoid damage.

Spot Sprayer Operation

The Spreader Sprayer includes a hand-carried and hand-operated bottle used to apply spray in areas that the Spreader Sprayer cannot reach. When not in use, the spray bottle is carried in a machine-mounted bracket. The bottle includes a fill valve for refilling the bottle from the 12-gallon spray tank and holds enough spray to cover approximately 500 ft^2 (46.5 $meters^2$).

⚠WARNING **Before handling, mixing, or applying any pesticides, read and follow product label and material safety data sheet. Some materials may present health hazards and will require protective clothing and/or breathing equipment. Follow product label and MSDS disposal instructions and any local regulations that apply to the product**

1. Filling the Spray Bottle

    a. If the Spreader Sprayer is being used to spray the accessible turf areas, the spray bottle can be filled directly from the 12-gallon spray tank using the fill valve.

SPRAYER CALIBRATION, ADJUSTMENT, AND OPERATION (continued)

b. If the Spreader Sprayer is not in use, use the spray mix rate table to prepare the amount of spray you will need for the area you will be covering. Remove the sprayer cap and pour the spray into the spray bottle.

c. Install the spray bottle cap.

2. Applying the Spray

a. Plan the spray application pattern required to cover the manual application area. The spray application pattern must apply the spray downwind. Avoid spraying in windy conditions to avoid drift onto non-targeted areas.

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b. Invert the spray bottle. Squeeze the bottle with enough pressure to create the spray pattern needed. Do not walk through the sprayed mist

3. Cleanup After Use

a. Remove the spray bottle cap and spray components. Rinse the bottle, cap, and spray components in water.
b. Inspect the components for wear and damage before reassembly. Replace damaged and worn components
c. Dispose of spray and cleanup water according to the product label and material safety data sheet.

TROUBLESHOOTING PROBLEMS

1. Fault Isolation

The failure modes covered in this section are:

- Spreader Sprayer does not start
- Poor spread pattern
- Spreader Sprayer does not spread
- Low spray flow
- High spray flow
- Poor spray pattern
- Spreader Sprayer does not spray

Before beginning the fault isolation procedures, check the spreader sprayer for obvious evidence of damage or failure. This includes physical damage, missing or loose parts, and evidence of failure, such as unusual noises. Do not attempt to operate the Spreader Sprayer if there is evidence of failure until the machine has been repaired. Refer to Table 4 through Table 8 for the fault isolation procedures.

Failure Mode	Check	Corrective Action
Spreader Sprayer does not start.	Check shift lever setting. Shift lever must be set in neutral. Check the kill switch setting.	If the lever is not set in neutral, move the shift lever to the neutral position. If the starter switch is OFF, set it to ON If the engine does not start, refer to the engine manual.
Spreader Sprayer does not start.	Check the Spreader Sprayer fuel system. If the fuel system is not providing fuel flow to the engine: Check for fuel in the fuel tank. Make sure the fuel shutoff valves are open. Check for a clogged fuel line. Check for contamination in the fuel tank.	If necessary, add fuel to the fuel tank. If the fuel system is not set for operation, set the fuel system to the ON configuration. If the fuel system is contaminated, clean the fuel system.
	Check the choke setting.	If the fuel system has fuel present and the choke is properly set, refer to the engine manual for further fault isolation.

Table 4. Spreader Sprayer Does Not Start

TROUBLESHOOTING PROBLEMS (continued)

Failure Mode	Check	Corrective Action
Spreader Sprayer does not start	Check Honda return spring over long rod running to governor arm.	Replace spring – If you squeeze the throttle partly you can start and run unit until new spring is installed

Failure Mode	Check	Corrective Action
Spreader Sprayer starts but dies once placed into gear		Safety module needs replacing. Call 1-800-346-2001 ask for tech.

Failure Mode	Check	Corrective Action
Spreader output provides an uneven pattern.	Check for blockage of the spreader holes.	Move the rate adjustment lever to the highest setting, and with the engine at 3450 rpm, momentarily open the shutoff plate to discharge any clumps of material that may have blocked a discharge hole. Return the rate lever to the calibrated setting and check the pattern. If the pattern is still uneven, remove the material from the hopper and clean the holes.

	Check the pattern adjustment hole for the area of the pattern that is not correct.	Refer to the spreader adjustment procedure and the setting numbers recorded at prior spreader adjustments. Set the 3rd spreader pattern hole to the proper number and verify the pattern. Repeat and modify the adjustment as necessary.
	Inspect the impeller for worn or clogged blades.	Clean or replace the impeller.
	Inspect the impeller for worn or clogged blades.	Clean or replace the impeller.

Failure Mode	Check	Corrective Action
Spreader does not operate when the operator lever is pushed to the OPEN position.	Check for impeller rotation. If the impeller is not rotating, check the following components: Check the impeller shaft. Make sure the impeller shaft has not separated from the impeller and that the shaft assembly block is tight.	If the impeller and impeller shaft have separated, refer to the Maintenance and Repair manual for the repair procedure.
	Check the impeller belt and the drive pulley. Make sure the belt is correctly adjusted.	If the impeller belt is not adjusted so that the drive pulley is driving the belt, refer to the Maintenance and Repair manual for the repair procedure.

	If the impeller pulley and drive belt are correctly adjusted but the drive pulley and belt are not turning, check for rotation from the jackshaft to the engine drive pulley.	If the jackshaft is not rotating, refer to the Maintenance and Repair manual for the repair procedure.
	Check the operator lever adjustment. The operator lever must open the discharge holes.	If the operator lever does not open the discharge holes, adjust the operator lever according to the Maintenance and Repair manual.
	Check the discharge holes. If the operator lever exposes the discharge holes, the holes are clogged with foreign material or caked material.	Empty the hopper and clean the discharge holes. If you use water, use low-pressure shop air to completely dry the hopper before reloading.

Table 6. Spreader Does Not Operate

Failure Mode	Check	Corrective Action
Spray pattern not correctly aimed.	Check the spray nozzle positioning.	Correctly position the spray nozzle according to page 320, Sprayer Calibration and Adjustment.
Spray flow is low at 3450 rpm. This can decrease the width of the spray pattern.	Check the spray tank relief valve. The relief valve must provide a pressure of 15 psi (103 kPa).	If the pressure is low, clean, adjust, or replace the relief valve according to the Maintenance and Repair manual.
	Check the spray nozzle and strainer for an obstruction.	Clean, adjust, or replace the spray nozzle and strainer according to the Maintenance and Repair manual.
Spray flow is high at 3450 rpm. This can increase the width of the spray pattern.	Check the spray tank relief valve. The relief valve must provide a pressure of 15 psi (103 kPa).	If the pressure is high, clean, adjust, or replace the relief valve according to the Maintenance and Repair manual.
	Check the spray nozzle for damage.	If the spray nozzle is damaged, replace the spray nozzle according to the Maintenance and Repair manual.

Table 7. Incorrect Spray Pattern

Failure Mode	Check	Corrective Action
Sprayer has no output.	Open the drain valve and increase the engine speed to 3450 rpm. If the pump is primed, there will be flow.	If there is no flow, allow the air trapped in the system to escape. Close the valve when pressure and flow begin.
	Check the relief valve.	If there is no flow into the tank through the relief valve, the relief valve may be obstructed or has failed. Clean, repair, or replace the relief valve according to the Maintenance and Repair manual.
	If there is flow into the tank through the relief valve, check the pump control valve and nozzles.	Open the valve by manually operating the lever. Test the valve. Then, remove one of the nozzles and strainers and test the valve. Clean or replace the nozzles or control valve or the cable.
	If there is flow into the tank from the relief valve, disconnect the line from the relief valve to the control valve.	If there is no flow from the relief valve, the valve has failed in the bypass position. Repair or replace the relief valve according to the Maintenance and Repair manual.
	If there is no flow into the tank from the relief valve, check the suction strainer.	Remove and clean the strainer.
	If there is flow from the relief valve output, disconnect the line from the relief valve to the control valve at the control valve.	If there is no flow at the control valve, the line is obstructed or damaged. Clean or replace the line according to the Maintenance and Repair manual.
	If there is flow from the relief valve to the control valve, the control valve is obstructed or failed.	Check, clean, repair, or replace the control valve according to the instructions in the Maintenance and Repair manual.

Table 8. Sprayer Does Not Operate (sheet 1 of 2)

Failure Mode	Check	Corrective Action
Sprayer has no output (continued).	Check the pump.	Verify that the pump shaft is turning when the engine speed is increased to 3450 rpm. If necessary, tighten the setscrew on the pulley. If the pump shaft is turning, loosen the suction fitting and check for flow. If there is suction flow, tighten the suction fitting and loosen the discharge fitting. Check for high-pressure flow. If there is flow and pressure, tighten the discharge fitting. If there is no flow, replace the pump.

Table 8. Sprayer Does Not Operate (sheet 2 of 2)

MAINTENANCE

1. Maintenance

   Keeping the Magnum C3C Spreader Sprayer operating reliably requires attention to maintenance. Use the Daily Maintenance and Safety Checklist and the periodic maintenance tables, provided in Section 8 of this manual, as a maintenance guide. Proper maintenance prevents damage to your machine, and prevents malfunctions that could occur if the maintenance was not performed. It is also essential for safe operation of the machine.

⚠WARNING **To avoid personal injury, perform machine maintenance with the engine off. If the engine has been operating, make sure the engine has cooled before performing any maintenance on the engine.**

⚠WARNING **To prevent injury, wear eye protection when using compressed air or water to clean the hopper. Regulate the air pressure to 29 PSI (200 KILOPASCALS).**

⚠WARNING **Before using any of the toxic or hazardous materials specified in this manual, be aware of all handling, storage and disposal instructions provided by the manufacturer or supplier. Failure to follow the manufacturer's or supplier's recommendations can result in personal injury or disease.**

2. Daily maintenance to be performed at the completion of each day's use: When you perform the daily maintenance, date the maintenance log, initial the log, and check off each procedure. Pay particular attention to the following items:

   a. Make copies of the Daily Maintenance Log to be used for this machine. Record completion of each maintenance item. Keep the copy with your Operators Manual.

   b. Check the machine hour meter. Perform the scheduled maintenance required by the operation time (refer to the Maintenance and Repair manual).

   c. Check/ record/adjust engine idle speed to 1500 rpm (+ or –50)

   d. Check/record/adjust engine maximum speed to 3450rpm (+ or – 50)

   e. Check/adjust hopper settings and nozzle settings.

   f. Check/top off engine and clutch oil. Refer to Table 1.

   g. Empty hopper and low pressure wash mechanism.

   h. Remove hood and low pressure wash the engine. NOTE: WASH CARBURETOR, LINKAGE, UNDERSIDE AND FRONT OF ENGINE.

MAINTENANCE (continued)

i. Blow dry engine and machine.

j. Spray WD-40 or equivalent on carburetor, linkage, front of engine, and all other moving parts except pulleys and belts.

3. Maintenance if the machine will be left inactive for longer than a week. When you perform this maintenance, date the maintenance log, initial the log, and check off each procedure. Pay particular attention to the following items:

    a. Make copies of the Scheduled Maintenance Log to be used for this machine. Record completion of each maintenance item. Keep the copy with your Operators Manual.

    b. Remove fertilizer from hopper.

    c. Drain and flush the tanks and spray system.

    d. Remove hood covers.

    e. Using low-pressure water, wash the unit. Be sure to wash under the engine and around the engine base. (Where 4 bolts hold the engine to the frame).

    f. Also wash the transaxle top & bottom, making sure to get between the wheels and frame.
    g. Check for loose fasteners and worn parts. Replace if needed.

    h. Drain or empty gas or add a good fuel stabilizer.

    i. Grease wheel bearings, articulating rod end, pillow block, and transaxle (2) underside front of transaxle.

    j. Spray a light coating of WD-40 over the carburetor, and it's springs. Also any moving parts except pulleys and belts.

    k. Perform Safety Systems Check (refer to Section 3).

4. Scheduled maintenance to be performed after the first 25 hours of operation. When you perform this maintenance, date the maintenance log, initial the log, and check off each procedure. Pay particular attention to the following items:

    a. Make copies of the Scheduled Maintenance Log to be used for this machine. Record completion of each maintenance item. Keep the copy with your Operators Manual.

MAINTENANCE (continued)

b. Check the machine hour meter. When it flashes LUBE perform the 25-hour maintenance listed below. The Hour meter will stop flashing automatically whether maintenance has been done or not.

c. Perform the maintenance and inspections in the Daily Maintenance Checklist provided in the Maintenance section. Record all check results in the Daily Maintenance Checklist.

d. Change engine oil.

e. Change clutch oil.

f. Clean the air filter.

g. Clean debris from engine and muffler.

h. Grease the rear wheel bearings using Mobillux EP 2 grease, or equivalent. Each wheel has a zerk fitting. If a fitting is missing, replace the fitting.

i. Grease the articulating rod ends between the spreader and sulky using Mobillux EP 2 grease, or equivalent. Each rod end has a zerk fitting. If a fitting is missing, replace the fitting.

j. Grease each pillow block on the jackshaft located under the hood, using Mobillux EP 2 grease, or equivalent. Each pillow block has a zerk fitting. If a fitting is missing, replace the fitting.

k. Grease each zerk fitting (2) on front, underside of transmission/axle using Mobillux EP2 grease, or equivalent.

l. Grease each zerk fitting (2) on front wheel hubs using Mobillux EP2 grease, or equivalent.

m. If the spreader or sprayer requires calibration, refer to the procedures in section 4, CALIBRATION AND ADJUSTMENT.

n. Perform Safety Systems Check (refer to Section 3).

5. Scheduled maintenance to be performed WEEKLY or every 25 hours of operation. When you perform this maintenance, date the maintenance log, initial the log, and check off each procedure. Pay particular attention to the following items:

   a. Make copies of the Scheduled Maintenance Log to be used for this machine. Record completion of each maintenance item. Keep the copy with your Operators Manual.

MAINTENANCE (continued)

b. Check the machine hour meter. When it flashes LUBE perform the 25-hour maintenance listed below. The Hour meter will stop flashing automatically whether maintenance has been done or not.

c. Perform the maintenance and inspections in the Daily Maintenance Checklist provided in the Maintenance section. Record all check results in the Daily Maintenance Checklist.

d. Clean the air filter.

e. Clean debris from engine and muffler.

f. Grease the rear wheel bearings using Mobillux EP 2 grease, or equivalent. Each wheel has a zerk fitting. If a fitting is missing, replace the fitting.

g. Grease the articulating rod ends between the spreader and sulky using Mobillux EP 2 grease, or equivalent. Each rod end has a zerk fitting. If a fitting is missing, replace the fitting.

h. Grease each pillow block on the jackshaft located under the hood, using Mobillux EP 2 grease, or equivalent. Each pillow block has a zerk fitting. If a fitting is missing, replace the fitting.

i. Grease each zerk fitting (2) on front, underside of transmission/axle using Mobillux EP2 grease, or equivalent.

j. Grease each zerk fitting (2) on front wheel hubs using Mobillux EP2 grease, or equivalent.

k. If the spreader or sprayer requires calibration, refer to the procedures in section 4, CALIBRATION AND ADJUSTMENT.

l. Perform Safety Systems Check (refer to Section 3).

6. Scheduled maintenance to be performed MONTHLY or every 100 hours of operation. When you perform this maintenance, date the maintenance log, initial the log, and check off each procedure. Pay particular attention to the following items:

   a. Make copies of the Scheduled Maintenance Log to be used for this machine. Record completion of each maintenance item. Keep the copy with your Operators Manual.

   b. Check the machine hour meter. When it flashes LUBE perform the 25-hour maintenance listed below. The Hour meter will stop flashing automatically whether maintenance has been done or not.

MAINTENANCE (continued)

c. Perform the maintenance and inspections in the Daily Maintenance Checklist provided in the Maintenance section. Record all check results in the Daily Maintenance Checklist.

d. Change engine oil.

e. Change clutch oil.

f. Clean the air filter.

g. Clean the carburetor sediment cup (refer to engine manual).

h. Check and adjust the spark plug (refer to engine manual).

i. Check the fuel tank for contamination and residue. Clean the tank and filter if necessary.

j. Calibrate the spreader system.

k. Calibrate the sprayer system.

l. Grease the rear wheel bearings using Mobillux EP 2 grease, or equivalent. Each wheel has a zerk fitting. If a fitting is missing, replace the fitting.

m. Grease the articulating rod ends between the spreader and sulky using Mobillux EP 2 grease, or equivalent. Each rod end has a zerk fitting. If a fitting is missing, replace the fitting.

n. Grease each pillow block on the jackshaft located under the hood, using Mobillux EP 2 grease, or equivalent. Each pillow block has a zerk fitting. If a fitting is missing, replace the fitting.

o. Grease each zerk fitting (2) on front, underside of transmission/axle using Mobillux EP2 grease, or equivalent.

p. Grease each zerk fitting (2) on front wheel hubs using Mobillux EP2 grease, or equivalent.

q. Check the belts. Replace if necessary.

r. Check and adjust the brakes if necessary.

s. Flush and clean the spray tank and strainer.

t. If the spreader or sprayer requires calibration, refer to the procedures in section 3, CALIBRATION AND ADJUSTMENT.

MAINTENANCE (continued)

u. Perform Safety Systems Check (refer to Section 4).

7. Scheduled maintenance to be performed QUARTERLY or every 300 hours of operation. When you perform this maintenance, date the maintenance log, initial the log, and check off each procedure. Pay particular attention to the following items:

   a. Make copies of the Scheduled Maintenance Log to be used for this machine. Record completion of each maintenance item. Keep the copy with your Operators Manual.

   b. Check the machine hour meter. When it flashes LUBE perform the 25-hour maintenance listed below. The Hour meter will stop flashing automatically whether maintenance has been done or not.

   c. Perform the maintenance and inspections in the Daily Maintenance Checklist provided in the Maintenance section. Record all check results in the Daily Maintenance Checklist.

   d. Change engine oil.

   e. Change clutch oil.

   f. Replace the air filter (refer to engine manual).

   g. Clean the carburetor sediment cup (refer to engine manual).

   h. Check and adjust the spark plug (refer to engine manual).

   i. Check the fuel tank for contamination and residue. Clean the tank and filter if necessary.

   j. Calibrate the spreader system.

   k. Calibrate the sprayer system.

   l. Check cables. Replace if worn or damaged.

   m. Check and adjust the valve clearance. Unless you are technically qualified, these checks and adjustments must be done by an authorized Honda service center.

   n. Grease the rear wheel bearings using Mobillux EP 2 grease, or equivalent. Each wheel has a zerk fitting. If a fitting is missing, replace the fitting.

   o. Grease the articulating rod ends between the spreader and sulky using Mobillux EP 2 grease, or equivalent. Each rod end has a zerk fitting. If a fitting is missing, replace the fitting.

MAINTENANCE (continued)

p. Grease each pillow block on the jackshaft located under the hood, using Mobillux EP 2 grease, or equivalent. Each pillow block has a zerk fitting. If a fitting is missing, replace the fitting.

q. Grease each zerk fitting (2) on front, underside of transmission/axle using Mobillux EP2 grease, or equivalent.

r. Grease each zerk fitting (2) on front wheel hubs using Mobillux EP2 grease, or equivalent.

s. Check the belts. Replace if necessary.

t. Check and adjust the brakes if necessary.

u. Replace the Spinner Platter.

v. Flush and clean the spray tank and strainer.

w. Perform Safety Systems Check (refer to Section 4).

8. Year end maintenance when you perform this maintenance, date the maintenance log, initial the log, and check off each procedure. Pay particular attention to the following items:

a. Make copies of the Scheduled Maintenance Log to be used for this machine. Record completion of each maintenance item. Keep the copy with your Operators Manual.

b. Check the machine hour meter. When it flashes LUBE perform the 25-hour maintenance listed below. The Hour meter will stop flashing automatically whether maintenance has been done or not.

c. Perform the maintenance and inspections in the Daily Maintenance Checklist provided in the Maintenance section taking extra care in washing and applying WD-40 to ALL aluminum surfaces and moving parts.

d. Change engine oil.

e. Change clutch oil.

f. Check or replace the air filter (refer to engine manual).

g. Clean the carburetor sediment cup (refer to engine manual).

h. Check and adjust the spark plug (refer to engine manual).

MAINTENANCE (continued)

i. Check the fuel tank for contamination and residue. Clean the tank and filter if necessary. Drain the tank and run empty, or add fuel stabilizer to the gas and run through system.

j. Drain and clean the spray tank. Clean in-tank strainer. Flush whole system with water, then add RV anti-freeze and run through the lines.

k. Check cables. Replace if worn or damaged.

l. Check and adjust the valve clearance. Unless you are technically qualified, these checks and adjustments must be done by an authorized Honda service center.

m. Grease the rear wheel bearings using Mobillux EP 2 grease, or equivalent. Each wheel has a zerk fitting. If a fitting is missing, replace the fitting.

n. Grease the articulating rod ends between the spreader and sulky using Mobillux EP 2 grease, or equivalent. Each rod end has a zerk fitting. If a fitting is missing, replace the fitting.

o. Grease each pillow block on the jackshaft located under the hood, using Mobillux EP 2 grease, or equivalent. Each pillow block has a zerk fitting. If a fitting is missing, replace the fitting.

p. Grease each zerk fitting (2) on front, underside of transmission/axle using Mobillux EP2 grease, or equivalent.

q. Grease each zerk fitting (2) on front wheel hubs using Mobillux EP2 grease, or equivalent.

r. Check the belts. Replace if necessary.

s. Check and adjust the brakes if necessary.

t. Check and replace the Spinner Platter if necessary.

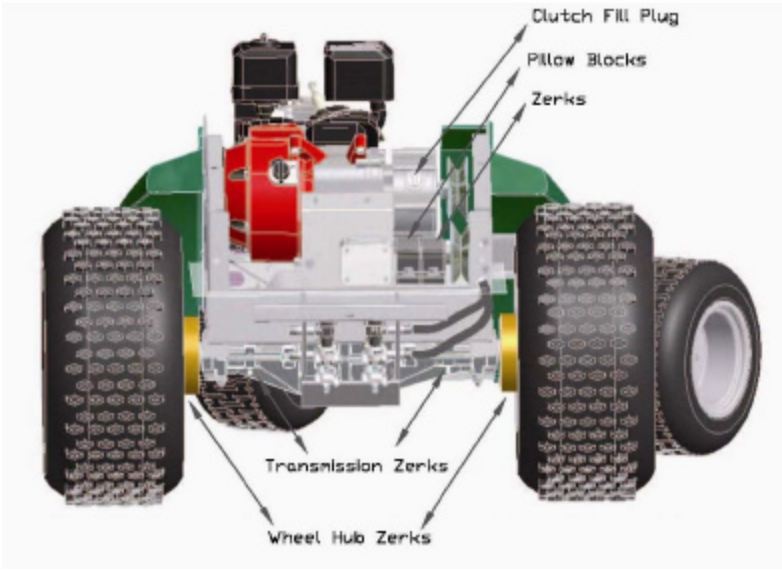
u. Perform Safety Systems Check (refer to Section 3).

7. Flush and clean the spray tank and strainer.

8. Additional Maintenance.

Replace fluid in tires on repaired or replaced tires. Front drive wheels should weigh NO LESS THAN 50 pounds, each. Rear tires on sulky should weigh NO LESS THAN 22 pounds, each. Recreational Vehicle (R.V.) anti-freeze solution is suggested. Refer to page 202? in Operator Manual.

MAINTENANCE (continued)



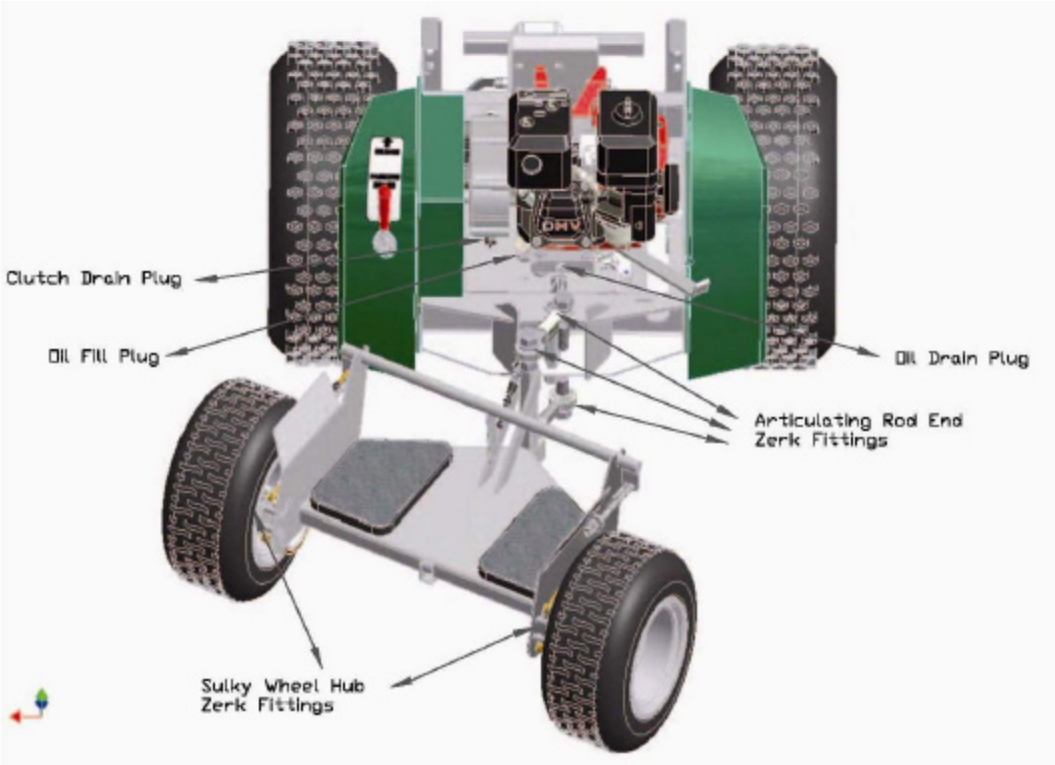


Figure 12. Grease Points

MAINTENANCE (continued)

DAILY MAINTENANCE AND SAFETY CHECKLIST LOG

Ride-On Magnum C3C Serial No._____

Reproduce sheets for this machine and record daily maintenance. Keep with machine.

Date	Initials of person performing maintenance	Record hours from meter and perform scheduled maintenance	Check/record and adjust Idle speed to 1500 RPM	Check/record/adjust run speed to 3,450 RPM	Check/adjust Hopper and nozzle settings	Check/top off engine and Clutch oil	Empty hopper, remove hood cover and low pressure wash or vacuum Machine	Blow dry machine	Spray WD-40 on all moving parts and engine exterior	Check and tighten all fasteners		

MAINTENANCE (continued)

FIRST 25 HOUR SCHEDULED MAINTENANCE AND SAFETY CHECKLIST LOG

Ride-On Magnum C3C Serial No._____

Reproduce sheets for this machine and record maintenance. Keep with machine.

MAINTENANCE AT FIRST 25 HOURS OF OPERATION				
DATE	**INITIALS**	**HOUR METER READING**	**CHECK OFF**	**MAINTENANCE TO BE PERFORMED**
NOTES:				Perform Daily maintenance
				Clean the air filter.
				Change engine oil*.
				Change engine gearbox oil*.
				Clean debris from engine and muffler.
				. Grease wheel bearings.
				Grease articulating rod ends
				Grease pillow blocks.
				Grease (2) transaxle zerks on front, underside
				Grease (2) Front wheel hubs
				Calibrate the spreader and sprayer, if required.
				Perform Safety Systems Check (Section 3)
*After the first 25 hours of operation, the oil change interval is at 100 hours.				

MAINTENANCE (continued)

MAINTENANCE AND SAFETY CHECKLIST LOG FOR MACHINES LEFT IDLE FOR MORE THAN 1 WEEK

Ride-On Magnum C3C Serial No._____

Reproduce sheets for this machine and record maintenance. Keep with machine.

MAINTENANCE TO BE PERFORMED IF MACHINE WILL BE IDLE FOR MORE THAN 1 WEEK				
DATE	**INITIALS**	**HOUR METER READING**	**CHECK OFF**	**MAINTENANCE TO BE PERFORMED**
				Perform Daily maintenance
NOTES:				Change engine oil.
				Change engine gearbox oil.
				Replace the air filter (refer to the engine manual).
				Clean the sediment cup (refer to the engine manual).
				Check and adjust the spark plug (refer to the engine manual).
				Check the fuel tank for contamination and residue. Clean the tank and filter if necessary.
				Calibrate spreader system. Operator Manual page 301
				Calibrate sprayer system. Operator Manual page 305
				Check cables. Replace if worn or damaged.
				Check and adjust the valve clearance*.
				Grease rear wheel bearings.
				Grease the articulating rod ends.
				Grease the pillow blocks.
				Grease (2) transaxle zerks on front, underside
				Grease (2) Front wheel hubs
				Check the belts. Replace if necessary.
				Check and adjust the brakes.
				Check the spinner platter. Replace if necessary.
				Perform Safety Systems Check (Section 3)
*Unless you are technically qualified, these checks and adjustments must be done by an authorized Honda service center.				

MAINTENANCE (continued)

SCHEDULED WEEKLY OR EVERY 25 HOUR MAINTENANCE AND SAFETY CHECKLIST LOG

Ride-On Magnum C3C Serial No._____

Reproduce sheets for this machine and record maintenance. Keep with machine.

WEEKLY MAINTENANCE or EVERY 25 HOURS OF OPERATION				
DATE	**INITIALS**	**HOUR METER READING**	**CHECK OFF**	**MAINTENANCE TO BE PERFORMED**
				Perform Daily maintenance
NOTES:				Clean the air filter.
				Check for loose fasteners.
				Clean debris from engine and muffler.
				Grease wheel bearings.
				Grease articulating rod ends.
				Grease pillow blocks.
				Grease (2) transaxle zerks on front, underside
				Grease (2) Front wheel hubs
				Calibrate the spreader and sprayer, if required.
				Perform Safety Systems Check (Section 3)

MAINTENANCE (continued)

SCHEDULED MONTHLY OR EVERY 100 HOUR MAINTENANCE AND SAFETY CHECKLIST LOG

Ride-On Magnum C3C Serial No._____

Reproduce sheets for this machine and record maintenance. Keep with machine.

MONTHLY MAINTENANCE or EVERY 100 HOURS OF OPERATION				
DATE	**INITIALS**	**HOUR METER READING**	**CHECK OFF**	**MAINTENANCE TO BE PERFORMED**
				Perform Daily maintenance
				Change engine gearbox oil.
				Clean the air filter (refer to the engine manual).
				Clean the sediment cup (refer to the engine manual).
				Check and adjust the spark plug (refer to the engine manual).
				Check the fuel tank for contamination and residue. Clean the tank and filter if necessary.
				Calibrate spreader system. Operator Manual page 301
				Calibrate sprayer system. Operator Manual page 305
				Grease wheel bearings.
				Grease the articulating rod ends.
				Grease the pillow blocks.
				Grease (2) transaxle zerks on front, underside
				Grease (2) Front wheel hubs
				Check the belts. Replace if necessary.
				Check and adjust the brakes.
				Flush and clean the spray tank and strainer.
				Perform Safety Systems Check (Section 3)
*Unless you are technically qualified, this cleaning must be done by an authorized Honda service center.				

MAINTENANCE (continued)

SCHEDULED QUARTERLY OR EVERY 300 HOUR MAINTENANCE AND SAFETY CHECKLIST LOG

Ride-On Magnum C3C Serial No._____

Reproduce sheets for this machine and record maintenance. Keep with machine.

QUARTERLY MAINTENANCE or EVERY 300 HOURS OF OPERATION				
DATE	**INITIALS**	**HOUR METER READING**	**CHECK OFF**	**MAINTENANCE TO BE PERFORMED**
				Perform Daily maintenance
NOTES:				Change engine oil.
				Change engine gearbox oil.
				Replace the air filter (refer to the engine manual).
				Clean the sediment cup (refer to the engine manual).
				Check and adjust the spark plug (refer to the engine manual).
				Check the fuel tank for contamination and residue. Clean the tank and filter if necessary.
				Calibrate spreader system. Operator Manual page 301
				Calibrate sprayer system. Operator Manual page 305
				Check cables. Replace if worn or damaged.
				Check and adjust the valve clearance*.
				Grease rear wheel bearings.
				Grease the articulating rod ends.
				Grease the pillow blocks.
				Grease (2) transaxle zerks on front, underside
				Grease (2) Front wheel hubs
				Check the belts. Replace if necessary.
				Check and adjust the brakes.
				Check the spinner platter. Replace if necessary.
				Perform Safety Systems Check (Section 3)
*Unless you are technically qualified, these checks and adjustments must be done by an authorized Honda service center.				

MAINTENANCE (continued)

YEAREND MAINTENANCE AND SAFETY CHECKLIST LOG

Ride-On Magnum C3C Serial No._____

Reproduce sheets for this machine and record maintenance. Keep with machine.

YEAREND MAINTENANCE				
DATE	**INITIALS**	**HOUR METER READING**	**CHECK OFF**	**MAINTENANCE TO BE PERFORMED**
				Perform Daily maintenance taking extra care in washing and applying WD-40 to ALL aluminum surfaces and moving parts.
NOTES:				Change engine oil.
				Change engine gearbox oil.
				Check or replace the air filter (refer to the engine manual).
				Clean the sediment cup (refer to the engine manual).
				Check and adjust the spark plug (refer to the engine manual).
				Check the fuel tank for contamination and residue. Clean the tank and filter if necessary. Drain tank and run empty, or add a fuel stabilizer to the gas and run through system.
				Drain and clean spray tank. Clean in-tank strainer. Flush whole spray system with water, then add RV anti-freeze and run though the lines.
				Check cables. Replace if worn or damaged.
				Check and adjust the valve clearance*.
				Grease rear wheel bearings.
				Grease the articulating rod ends.
				Grease the pillow blocks.
				Grease (2) transaxle zerks on front, underside
				Grease (2) Front wheel hubs
				Check the belts. Replace if necessary.
				Check and adjust the brakes.
				Check the spinner platter. Replace if necessary.
				Perform Safety Systems Check (Section 3)

*Unless you are technically qualified, these checks and adjustments must be done by an authorized Honda service center.

MAINTENANCE (continued)

Temperature Range	Oil Type	Oil Volume-Engine	Oil Volume-Clutch
Summer temperature operation, +50ºF (10° C) and higher	SAE 30	0.63 US quart (0.6 liter)	0.53 US quart (0.5 liter)
Summer temperature operation +50ºF (10° C) and higher	SAE 10W-30	0.63 US quart (0.6 liter)	0.53 US quart (0.5 liter)
Low temperature operation +30ºF to -22ºF (0°C to -30°C)	SAE 5W-30	0.63 US quart (0.6 liter)	0.53 US quart (0.5 liter)

Table 9. Engine and Clutch Oil Type, Volume, and Temperature Range

WARRANTY

PermaGreen Supreme, Inc. hereby warrants to the original purchaser that the Magnum C3C manufactured by PermaGreen Supreme, Inc. will be free from defects in material and workmanship for a period of one year from the date of delivery or the first 500 operating hours, whichever comes first, except as noted below.

PROTECTION PLAN

The Company will provide replacement parts for parts found defective. Such replacement parts will be free of charge to the purchaser for one year from the date of delivery or the first 500 operating hours, whichever comes first.

This Warranty is subject to the following exceptions and limitations:

PURCHASER RESPONSIBILITIES:

Timely maintenance, adjustments, and record keeping per the Maintenance Logs and Engine Manual.

Prior notification of PermaGreen Supreme, Inc. of the need for Warranty Service.

Transportation to and from the place of warranty repair.

Return of a Warranty Claim Form, the parts in question, and copies of Warranty Maintenance Logs, within 30 days of warranty repair, to PermaGreen Supreme, Inc. for examination and warranty approval as described in Warranty Instructions/Policy.

EXCLUSIONS:

No warranty is extended to any equipment or parts that have been altered, misused, improperly adjusted, neglected, or damaged by accident, disasters, or normal wear and tear.

No warranty is extended on any parts that are not manufactured by PermaGreen Supreme, Inc., such as the engine, which is covered by the manufacturer's warranty.

This Warranty does not cover replacement of expendable maintenance items made in connection with the required maintenance services after the item's first scheduled check and replacement as listed in the maintenance manual, such as: spark plugs, belts and filters.

PermaGreen Supreme, Inc. reserves the right to incorporate any changes in design into its products without obligation to make such changes on products previously manufactured.

LIMITATION OF REMEDIES

UNDER NO CIRCUMSTANCES, EXCEPT TO THE EXTENT PRESCRIBED BY APPLICABLE LAW, SHALL PERMAGREEN SUPREME, INC. BE LIABLE FOR ANY LOSS OR DAMAGE, DIRECT OR INDIRECT, SPECIAL OR CONSEQUENTIAL ARRISING OUT OF THE USE OF OR INABILITY TO USE THIS EQUIPMENT, INCLUDING BUT NOT LIMITED TO ANY CLAIM FOR LOSS OF PROFITS, LOSS OF SAVINGS OR REVENUE, LOSS OF USE OF EQUIPMENT OR ANY ASSOCIATED EQUIPMENT, FACILITIES OR SERVICE, DOWNTIME, THE CLAIMS OR COSTS OF THIRD PARTIES INCLUDING CUSTOMERS, AND INJURY TO PROPERTY. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have rights that vary from state to state.