



**27" Verticutting Reel
Reelmaster® 3100-D Attachment**

Model No. 03217—Serial No. 240000001 and Up

Operator's Manual

Contents

	Page
Introduction	2
Safety	3
Safe Operating Practices	3
Safety and Instruction Decals	3
Specifications	4
Setup	5
Replace Center Cutting Unit Pivot Pin	5
Leveling Front Roller	5
Adjusting the Blade Depth	5
Adjust Front and Rear Grass Shields	6
Adjusting the Roller Scrapers	6
Mount Verticutting Reel	6
Operation	7
Training Period	7
Operating Tips	7
Maintenance	8
Lubrication	8
Servicing Rollers	8
Removing Verticutting Reel	9
Removing Verticutting Blades From Shaft	9
Install Verticutting Blades	10
Assemble Verticutting Reel	10
The Toro General Commercial Products Warranty	12

Introduction

Read this manual carefully to learn how to operate and maintain your product properly. The information in this manual can help you and others avoid injury and product damage. Although Toro designs and produces safe products, you are responsible for operating the product properly and safely.

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. The model and serial numbers are located on the side plate.

Write the product model and serial numbers in the space below:

Model No. _____

Serial No. _____

This manual identifies potential hazards and has special safety messages that help you and others avoid personal injury and even death. **Danger**, **Warning**, and **Caution** are signal words used to identify the level of hazard. However, regardless of the hazard, be extremely careful.

Danger signals an extreme hazard that *will* cause serious injury or death if you do not follow the recommended precautions.

Warning signals a hazard that *may* cause serious injury or death if you do not follow the recommended precautions.

Caution signals a hazard that may cause minor or moderate injury if you do not follow the recommended precautions.

This manual uses two other words to highlight information.

Important calls attention to special mechanical information and **Note:** emphasizes general information worthy of special attention.

Safety

Safe Operating Practices

- Read, understand, and follow all instructions in the traction unit operator's manual before operating the verticutting unit.
- Read, understand, and follow all instructions in this operator's manual before operating the verticutting unit.
- Never allow children to operate the verticutting units. Do not allow adults to operate traction unit or verticutting units without proper instruction. Only trained operators who have read this manual should operate the verticutting units.
- Never operate the verticutting units when under the influence of drugs or alcohol.
- Keep all shields and safety devices in place. If a shield, safety device or decal is illegible or damaged, repair or replace it before operation is commenced. Also tighten any loose nuts, bolts, and screws to ensure verticutting unit is in safe operating condition.
- Always wear substantial shoes. Do not operate verticutting units while wearing sandals, tennis shoes, sneakers or shorts. Also, do not wear loose fitting clothing which could get caught in moving parts. Always wear long pants and substantial shoes. Wearing safety glasses, safety shoes and a helmet is advisable and required by some local ordinances and insurance regulations.

- Remove all debris or other objects that might be picked up and thrown by the verticutting unit reel blades. Keep all bystanders away from the working area.
- If the verticutting blades strike a solid object or the unit vibrates abnormally, stop and shut the engine off. Check verticutting unit for damaged parts. Repair any damage before restarting and operating the verticutting unit.
- Lower the verticutting units to the ground and remove key from ignition switch whenever machine is left unattended.
- Be sure verticutting units are in safe operating condition by keeping nuts, bolts and screws tight.
- Remove key from ignition switch to prevent accidental starting of the engine when servicing, adjusting or storing the machine.
- Perform only those maintenance instructions described in this manual. If major repairs are ever needed or assistance is desired, contact an Authorized Toro Distributor.
- To ensure optimum performance and safety, always purchase genuine Toro replacement parts and accessories to keep the Toro all TORO. **Never use “will-fit” replacement parts and accessories made by other manufacturers.** Look for the Toro logo to assure genuineness. Using unapproved replacement parts and accessories could void the warranty of The Toro Company.

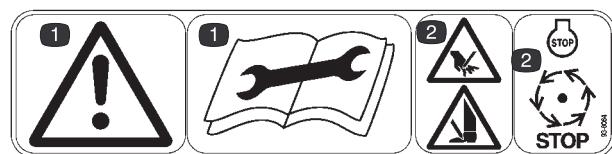
Safety and Instruction Decals



Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.



67-7960



Part No. 93-6688 (for CE)

1. Danger—read and understand the operator's manual before performing any maintenance.
2. Cutting hazard of hands or feet—stop the engine before approaching reel area.

Specifications

Reel construction	Blades and spacers bolted to square shaft
Dethatching range	Up to 1/4 in. (6mm) deep blade penetration
Blade diameter	7-1/4 in. (18.4cm)
Power	Hydraulic motor splined to reel shaft
Reel bearings	Self aligning, roller ball type with cast housing
Roller adjustment	Front roller fixed. Rear roller adjustable

Important Traction unit must be equipped with 27" Lift Arms, Model 03220 to accommodate 27" verticutting reels

Set-Up

Note: Determine the left and right sides of the machine from the normal operating position.

Loose Parts

Note: Use this chart as a checklist to ensure that all parts have been received. Without these parts, total setup cannot be completed.

Description	Qty.	Use
O-ring	1	For use with reel motor bearing housing
CE Decal	1	Affix to cutting unit for CE.
Operator's manual	1	Read before operating.
Parts catalog	1	
Registration Card	1	Fill out and return to Toro

Setup

Note: Determine the left and right sides of the machine from the normal operating position.

Replace Center Cutting Unit Pivot Pin

Note: On traction units with a serial number of 210000001 or prior, the pivot pin, on the center cutting unit carrier frame only, must be replaced with a new longer pivot pin, part no. 104-1392 and spacer, 63-0070 to move cutting unit rearward (Fig. 1). Order these parts from your local Toro Distributor.

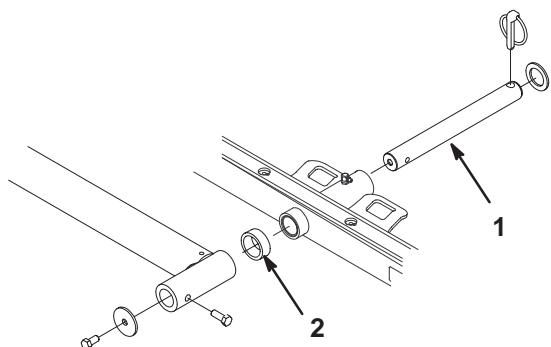


Figure 1

1. Pivot pin
2. Spacer

Leveling Front Roller

Note: Front roller has been leveled at the factory.

1. Place the verticutting reel on a level surface.

Note: To raise rear roller off the ground, place a flat bar under the verticutting reel blades (Fig. 2). Be sure that the bar covers the full length of the verticutting reel blades.

2. Rock verticutting reel on blades, so front roller touches level surface. If a gap between front roller and surface is greater than .010" (.25mm), proceed as follows:
 - Loosen the lock nuts securing the front roller brackets to the side plates.
 - Push rearward on the front roller until roller is level on surface, then, tighten the nuts. Do not turn the capscrews—doing so may alter the roller adjustment.

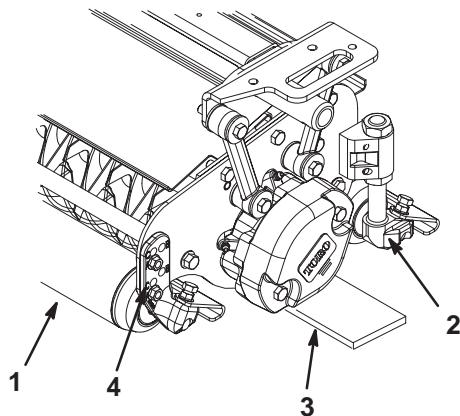


Figure 2

1. Front roller	3. Flat bar
2. Rear roller	4. Front roller bracket

Adjusting the Blade Depth

Note: The maximum recommended setting is 1/4 in. (6 mm) deep blade penetration.

1. Place the verticutting reel on a level surface.
2. Place 2 gauge bars, which have the desired depth of blade penetration below the ground, under the front and rear rollers of the verticutting reel (on each end of the reel) (Fig. 3).

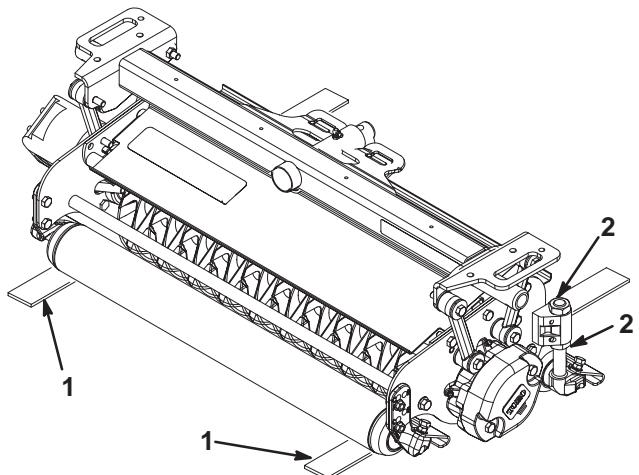


Figure 3

1. Gauge bar (1/4" thick)
2. Adjusting nuts

3. Turn the adjusting nut on each height-of-cut bracket (Fig. 3) so that the reel blades come in contact with the level surface on both ends.

Note: As the verticutting blades wear, the diameter of the reel will decrease and the depth setting will change. Check height setting periodically to insure desired setting is achieved.

Adjust Front and Rear Grass Shields

Note: When operating in turf conditions where much debris is encountered, or unusually heavy thatch, open the front and rear discharge shields to help allow the debris to discharge from the reel.

1. Loosen the capscrews on the pivot of the grass shield.
2. Rotate the grass shield to the desired setting and tighten the capscrew.

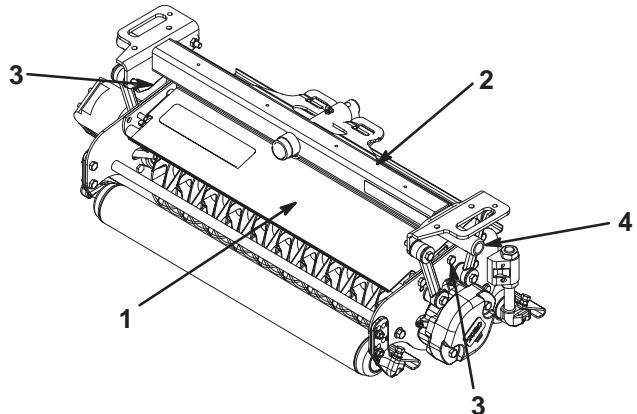


Figure 4

1. Front grass shield
2. Rear grass shield
3. Front grass shield mounting screws
4. Rear grass shield mounting screw

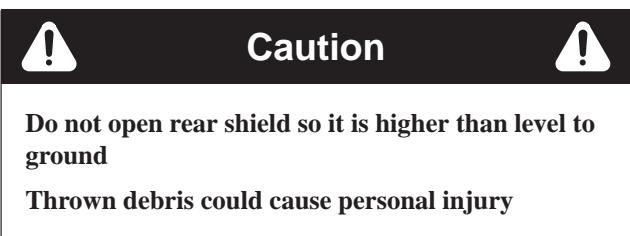


Figure 5

1. Front roller scraper
2. Rear roller scraper

3. Ensure that the scraper rod is parallel to the roller and the level surface.
4. Tighten flange nuts to lock adjustment.

Mount Verticutting Reel

Important When lowering verticutting reels, care must be taken to prevent damage to the reel blades due to contact with a concrete floor or a paved surface.

Verticutting reels, can be installed at any of the three mounting locations on the traction unit. Figure 6 shows the orientation of the hydraulic drive motor for each of the locations. For the #3 location requiring the motor to be mounted on the left end of the cutting unit, switch the counter weight from the left end of the cutting unit to the right end of the cutting unit.

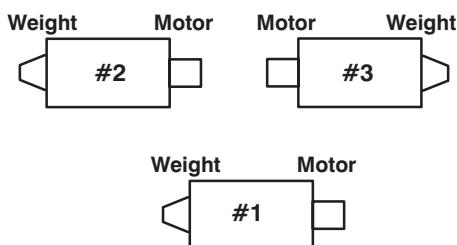


Figure 6

Adjusting the Roller Scrapers

1. Loosen flange nut securing roller scrapers (Fig. 5).
2. Move scraper rods in or out to attain 0.0 to 0.03 in. (.0 to .75mm) clearance between the scraper and roller.

Note: Counter weights are shipped installed to left end of the verticutting reels. The capscrews on the right end are used for securing the hydraulic motor.

5. Verticutting reels are mounted to traction unit the same way cutting units are. Refer to Traction Unit Operator's Manual for mounting instructions.

Operation

Training Period

Before operating the verticutting reels, evaluate the performance of the reel at the desired setting. Operate in a clear, unused area to determine if the desired results will be achieved. Adjust as desired.

Operating Tips

1. Operate the traction unit at full throttle, full reel speed (setting 11) and between 3–5 MPH (5–8 Km/h).
2. Maximum setting on the verticutting blades is 1/4" (6mm) deep penetration.

3. Power requirements to operate the verticutting reels will vary with turf and soil conditions. Travel speed may need to be reduced in some conditions.
4. When operating in turf conditions where much debris is encountered, or unusually heavy thatch, open the front and rear discharge shields to help allow the debris to discharge from the reel.



Do not open rear shield so it is higher than level to ground

Thrown debris could cause personal injury

Maintenance

Lubrication

Each unit has (3) grease fittings that must be lubricated regularly with No. 2 General Purpose Lithium Base Grease.

1. The grease fitting locations and quantities are: reel bearings (2) and carrier frame (1).

Note: Lubricate only one reel bearing fitting on each end.

Important Lubricating immediately after washing helps purge water out of bearings and increases bearing life.

2. Wipe each grease fitting with a clean rag.
3. Apply grease until clean grease is detected around seal guard of reel and pivot pin.
4. Wipe excess grease away.

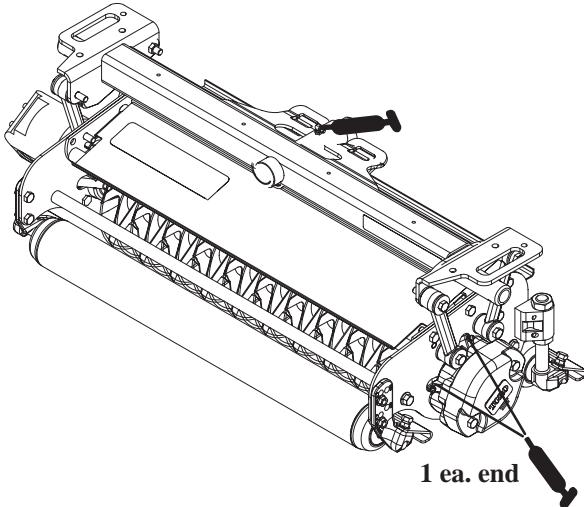


Figure 7

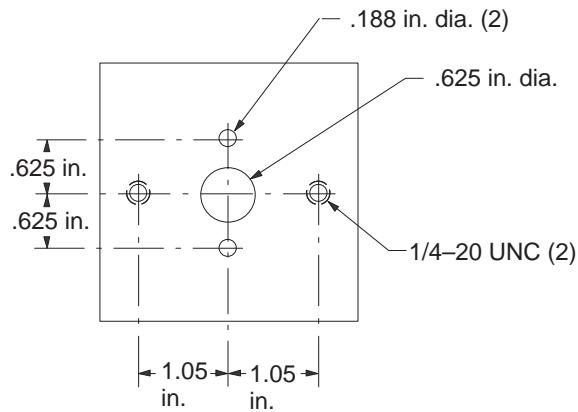


Figure 8

1. Slide seal tool over roller shaft.
2. Using the tool as a template, locate, mark, and drill 2 holes (7/64 in. [.109 in.] diameter) in outer face of seal.
3. Screw 2 self-tapping screws (No. 8 [.164 in.] x 3/4 in.) into outer face of seal.
4. Install 2 capscrews (1/4 x 1 in.) into seal tool.

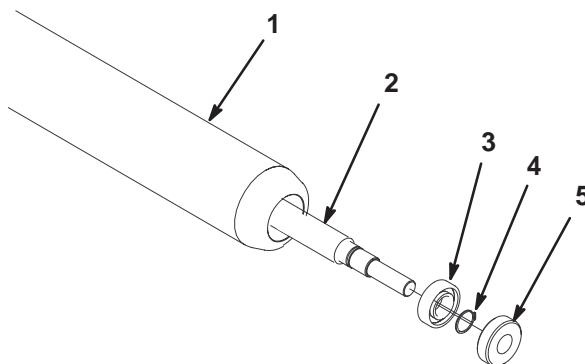


Figure 9

1. Roller	4. Snap ring
2. Roller shaft	5. Grease seal
3. Ball bearing	

5. Alternate tightening sequence of 1/4 in. capscrews to pull seal out of housing.

Note: Seal will be destroyed when servicing the rear roller. Do not attempt to re-use these seals.

Servicing Rollers

Seal Removal

Using a 1/4 in. thick, 3 in. x 3 in. square piece of steel and the following specifications, make a seal removal tool (Fig. 8).

Bearing Removal

Reference: The bearings are pressed on to the shaft (.0003-.0016 in. interference) and loose fit to housing (.0020-.0035 in. clearance).

1. Remove snap ring on each end of roller (Fig. 9).

2. Loosely secure roller assembly in bench vise and lightly tap one end of roller shaft until free from housing.
3. Remove second bearing from shaft. Support bearing on inner race and tap on roller shaft.
4. Inspect bearings, shaft, and snap ring for damage. Replace damaged components. Re-assemble roller.

Assembly

1. Press bearing onto one end of shaft. Apply pressure to inner race only.
2. Install snap ring on same end as assembled bearing.
3. Install shaft with single bearing into tube assembly.
4. Install second bearing into roller assembly. Press only on inner race. The inner race will contact shoulder of shaft before outer race contacts shoulder of housing.
5. Install second snap ring.
6. Fill 50% of new seal cavity with grease. (This will re-lube bearing and fill void)
7. Press new seal flush to .03 in. recessed into housing. Repeat for other side.

Removing Verticutting Reel

1. Remove hydraulic motor from the unit. Remove verticutting reel from the machine.

Note: A 3/8-inch drive ratchet with an extension will fit into the square hole of the coupling.

2. Unscrew left reel coupler from the reel shaft. **This coupler is left hand threaded.**
3. Unscrew right reel coupling from the reel shaft. **This coupler is right hand threaded.**

Important Support reel to prevent it from dropping when the bearing housings are removed.

4. Remove capscrews from both bearing housings. Pull bearing housings and bearings from reel. Remove reel from the unit.

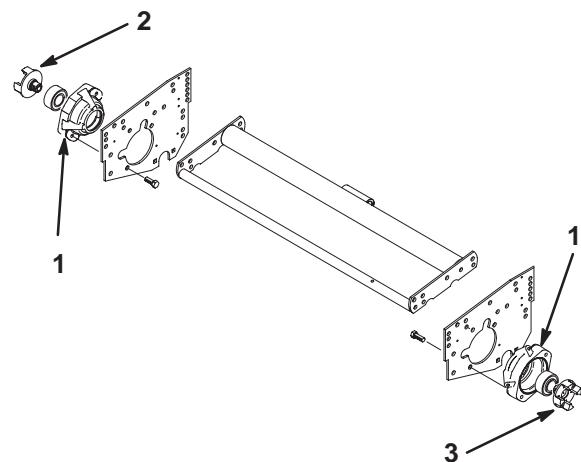


Figure 10

1. Bearing housing
2. Right reel coupling
3. Left reel coupling

Removing Verticutting Blades From Shaft

1. Remove seal guards from each end of verticutting shaft.
2. Secure the end of the verticutting shaft, which has only one washer and nut, in a vise.
3. On other end of shaft, rotate nut counter-clockwise. Remove nut.



Caution



The blades are extremely sharp and may have burrs that will cut your hands.

Use caution when removing the blades from the shaft.

4. Remove small spacer, washer, blades and large spacers. Clean and lubricate square shaft with a light coating of grease to simplify assembly.

Important Do not invert verticutting reel blades. The order of disassembly is extremely important. Do not invert verticutting reel blades when disassembling or reverse the order when assembling. Note the verticutting blades index hole. The index hole is provided for assembly in order to obtain the proper helix for the verticutting reel.

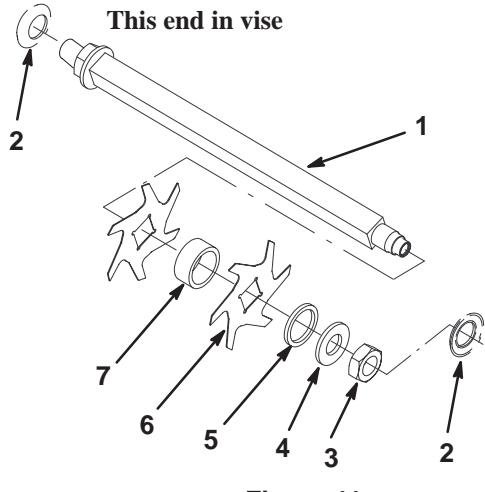


Figure 11

1. Shaft	5. Small spacer
2. Seal guard	6. Blade (19)
3. Nut	7. Large spacer (18)
4. Washer	

Install Vetricutting Blades

1. First, assemble a reel blade (Fig. 11).
2. Next, assemble a large spacer.
3. Do not invert reel blades when reassembling on reel shaft. If the blades are inverted, the blades that are in use, (rounded) will be mixed with the sharp ends of the blades which were not in use. This will cause unsatisfactory performance in the verticutting reel unit. Attention should always be taken when disassembling verticutting blades from reel.
4. Install the next blade clockwise so the index reference hole is not aligned with the first blade hole by one flat of the shaft. Continue to install spacers and blades in this manner until the full complement of blades have been installed. When properly assembled, the blades will be staggered in such a manner to give a helix appearance.
5. Install small spacer to shaft.
6. Apply Blue Loctite #242 to nut. Install nut onto shaft, (machined side of nut toward spacer) and tighten to 80 – 100 ft-lb.
7. Inspect seal guards. Install seal guards onto shaft positioning as shown in figure 12.

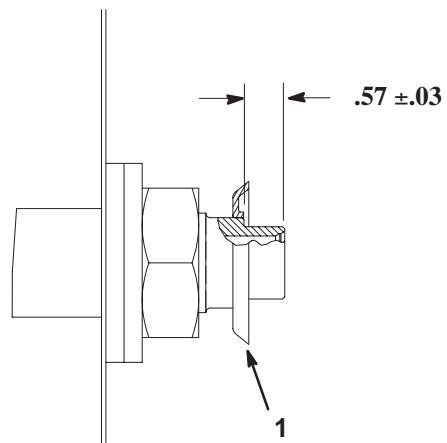


Figure 12

1. Seal guard

Assemble Vetricutting Reel

1. Inspect bearings and replace if worn or damaged. Replace both bearings as a set.
2. Make sure bearing seating surfaces and threads on reel shaft ends are clean. Apply anti-seize lubricant to both bearing seating surfaces.
3. Align reel inside the unit with the bearing housing holes. The reel must be positioned so that the nut end of the shaft (left-hand threads) is on the left side of the unit (as viewed from rear).
4. Slide bearings and bearing housings onto the reel shaft.
5. Make sure bearing housings are installed with the grease fittings pointing up and to the front of the unit.
6. Secure bearing housings and bearings on the reel shaft ends and unit with the capscrews.
7. Remove grease from the threaded end of reel couplers and the reel shaft. Make sure grease is completely removed.
8. Apply removable Loctite 242 or equivalent to reel coupler threads. **Do not get Loctite on the bearing seal.**
9. Screw right reel coupler to the reel. **This coupling is right hand threaded.**
10. Screw left reel coupler to the reel. **This coupling is left hand threaded.** Torque both couplers from 55 to 65 Ft-lb.
11. Install end weight, and capscrews to the bearing housing.
12. Complete verticutting reel set-up and adjustment sequence.
13. Grease both bearings.



The Toro General Commercial Products Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Commercial Product ("Product") to be free from defects in materials or workmanship for two years or 1500 operational hours*, whichever occurs first. Where a warrantable condition exists, we will repair the Product at no cost to you including diagnosis, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.

* Product equipped with hour meter

Instructions for Obtaining Warranty Service

You are responsible for notifying the Commercial Products Distributor or Authorized Commercial Products Dealer from whom you purchased the Product as soon as you believe a warrantable condition exists.

If you need help locating a Commercial Products Distributor or Authorized Dealer, or if you have questions regarding your warranty rights or responsibilities, you may contact us at:

Toro Commercial Products Service Department

Toro Warranty Company

8111 Lyndale Avenue South

Bloomington, MN 55420-1196

952-888-8801 or 800-982-2740

E-mail: commercial.service@toro.com

Owner Responsibilities

As the Product owner, you are responsible for required maintenance and adjustments stated in your operator's manual. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim.

Items and Conditions Not Covered

Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. This express warranty does not cover the following:

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, modified, or unapproved accessories
- Product failures which result from failure to perform required maintenance and/or adjustments
- Product failures which result from operating the Product in an abusive, negligent or reckless manner
- Parts subject to consumption through use unless found to be defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to, blades, reels, bedknives, tines, spark plugs, castor wheels, tires, filters, belts, etc.

Countries Other than the United States or Canada

Customers who have purchased Toro products exported from the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer. If all other remedies fail, you may contact us at Toro Warranty Company.

- Failures caused by outside influence. Items considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved coolants, lubricants, additives, or chemicals, etc.
- Normal "wear and tear" items. Normal "wear and tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.

Parts

Parts scheduled for replacement as required maintenance are warranted for the period of time up to the scheduled replacement time for that part.

Parts replaced under this warranty become the property of Toro. Toro will make the final decision whether to repair any existing part or assembly or replace it. Toro may use factory remanufactured parts rather than new parts for some warranty repairs.

General Conditions

Repair by an Authorized Toro Distributor or Dealer is your sole remedy under this warranty.

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. Except for the Emissions warranty referenced below, if applicable, there is no other express warranty. All implied warranties of merchantability and fitness for use are limited to the duration of this express warranty.

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note regarding engine warranty: The Emissions Control System on your Product may be covered by a separate warranty meeting requirements established by the U.S. Environmental Protection Agency (EPA) and/or the California Air Resources Board (CARB). The hour limitations set forth above do not apply to the Emissions Control System Warranty. Refer to the Engine Emission Control Warranty Statement printed in your operator's manual or contained in the engine manufacturer's documentation for details.