Form No. 3364-847 Rev A

TORO®

Count on it.

Operator's Manual

Dethatching Reel

for Greensmaster® 3000 Series

Model No. 04496—Serial No. 310000001 and Up

CE

To register your product or download an *Operator's Manual* or *Parts Catalog* at no charge, go to www.Toro.com.

Original Instructions (EN)

Introduction

This product complies with all relevant European directives, for details please see the separate product specific Declaration of Conformity (DOC) sheet.

This dethatching reel is mounted to a ride-on machine and is intended to be used by professional, hired operators in commercial applications. It is primarily designed for dethatching grass on well-maintained lawns in parks, golf courses, sports fields, and on commercial grounds.

Read this information carefully to learn how to operate and maintain your product properly and to avoid injury and product damage. You are responsible for operating the product properly and safely.

You may contact Toro directly at www.Toro.com for product and accessory information, help finding a dealer, or to register your product.

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 number plate is located on the cross tube. Write the numbers in the space provided.

Model No. _____

Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety alert symbol (Figure 1), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.



Figure 1

1. Safety alert symbol

This manual uses 2 other words to highlight information. **Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

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Setup

Loose Parts

Use the chart below to verify that all parts have been shipped.

Procedure	Description	Qty.	Use
1	No parts required	–	Adjust the reel blades for positive setting
3	No parts required	–	Adjust the grass shield.
4	No parts required	–	Adjust the front roller scraper.
5	No parts required	–	Adjust the rear wheel scrapers.
6	No parts required	–	Installing the dethatcher units.

Important: Read this Operator's Manual thoroughly before operating the dethatching unit. Failure to do so may result in damage to the dethatching reel.

Note: The dethatching unit is shipped completely assembled.

1

Adjusting the Reel Blades for Positive Setting (Above Ground)

No Parts Required

Note: Rear wheel brackets are mounted to rear frame assembly.

1. Place dethatcher unit on a level surface.
2. Loosen (2) locknuts on carriage bolts securing rear wheel brackets to dethatcher frame (Figure 2).
3. Place a gauge bar, which has the desired height of blade above ground, under each end of dethatcher reel blades.
4. Turn the adjusting capscrews on each end of the dethatcher unit so rear wheel brackets raise to the maximum "up" position (Figure 2). Rest rear wheels onto the level surface (with reel blades contacting gauge bars) and adjust the wheel bracket on the side where the rear wheel is above the level surface-until that wheel contacts the level surface. Retighten both carriage bolt locknuts.

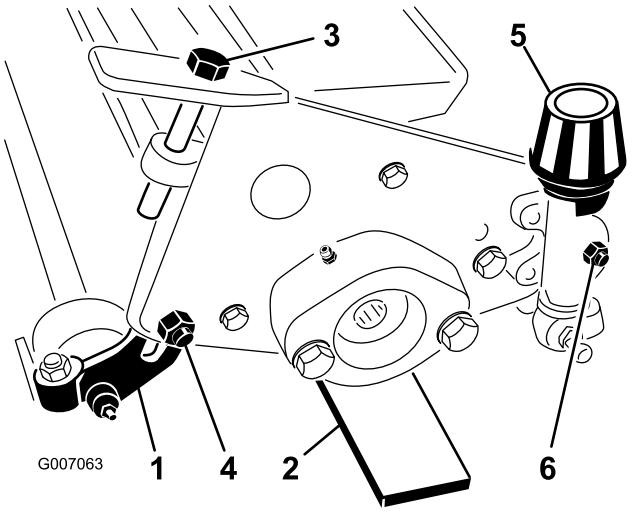


Figure 2

1. Rear wheel brackets
2. Gauge bar
3. Adjusting capscrew
4. Locknut
5. Height of cut knob
6. Locknut

2

Adjusting the Reel Blades For Negative Setting (Below Ground)

No Parts Required

Procedure

Note: Maximum recommended negative setting is 1/4" deep blade penetration.

1. Place dethatcher unit on a level surface.
2. Place (4) gauge bars, which have the desired depth of blade penetration below ground, under the front roller and rear wheels of dethatcher unit (Figure 3).

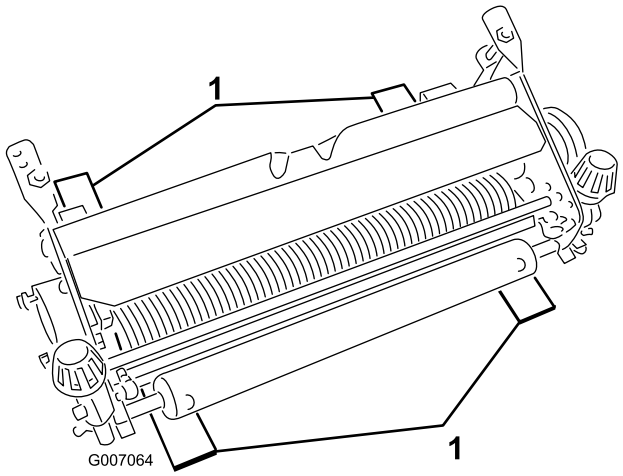


Figure 3

1. Gauge bar (4)

3. With both rear wheels contacting the level surface, loosen both height of cut knob locknuts. Rotate the height of cut knobs until both ends of the front roller contact the level surface. Verify contact by using a piece of paper to check each roller end. Retighten both height of cut knob locknuts (Figure 2).

3

Adjusting the Grass Shield

No Parts Required

Procedure

1. Loosen (2) capscrews retaining front grass shield.
2. Adjust grass shield to desired setting and tighten capscrews.
3. Rotate dethatcher blades to insure blades do not contact or interfere with grass shield.

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

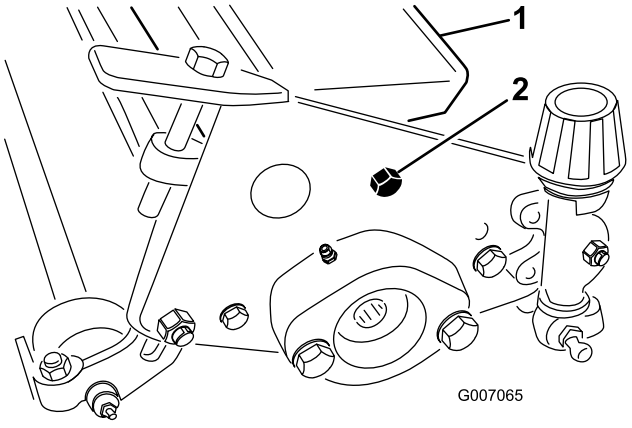


Figure 4

1. Grass shield
2. Grass shield screws

Note: Bar on rear of shield is adjustable to decrease ground clearance. Make sure bar is repositioned if dethatcher blades are replaced.

4

Adjusting the Front Roller Scraper

No Parts Required

Procedure

1. Loosen locknut and jam nut securing each end of front roller scraper to brackets.

2. Adjust roller scraper until there is .030"-.060" clearance between scraper and roller.

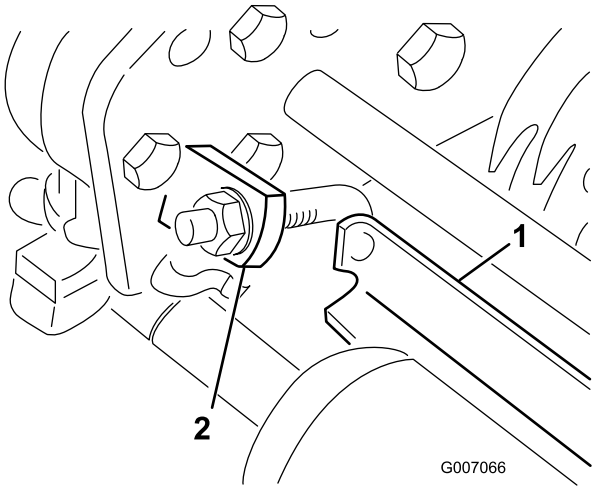


Figure 5

1. Front roller scraper 2. Roller bracket

3. Tighten locknuts and jam nuts securing roller scraper to brackets.

5

Adjusting the Rear Wheel Scrapers

No Parts Required

Procedure

1. Loosen jam nut and locknut securing each rear wheel scraper to bracket.
2. Adjust each scraper until there is .030" - .060" clearance between front edge of scraper and wheel.

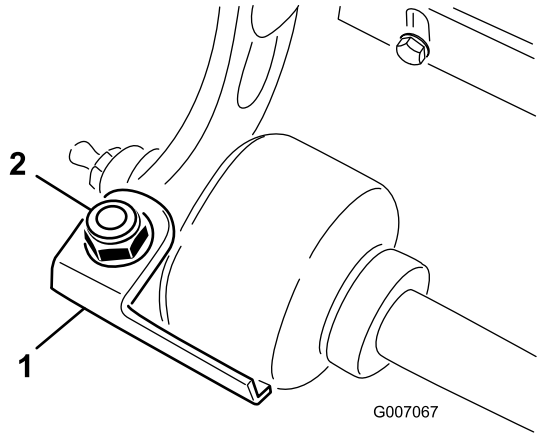


Figure 6

1. Rear wheel scraper 2. Jam nut

3. Tighten locknuts and jam nuts securing scrapers to brackets.

   Note: Scraper adjustment can be changed to meet turf conditions.

6

Installing the Dethatcher Units

No Parts Required

Procedure

Important: If dethatcher is set at a negative setting, care must be taken to prevent damage to reel blades, due to contact with concrete floors or a paved surfaces.

Note: When mounting Dethatcher Units on a Greensmaster 3200 or 3200-D traction unit, Pull Link Kit, Toro Part No. 94-9630 must be installed to each unit. Pull link kits are not required when installing Dethatcher Units on any other Greensmaster models.

1. Park the machine on a level surface, lower lift arms, stop engine and set parking brake.
2. Slide dethatcher unit under traction unit pull frame while hooking lift roller onto lift arm.

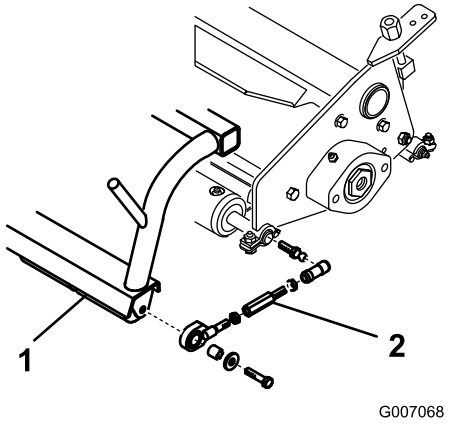


Figure 7

1. Pull frame
2. Pull link kit

Note: When mounting Dethatcher Unit in right front position on Greensmaster 32xx series traction units, remove counter weight from left end of unit and mount on right end. Motor to be connected to left end.

A. Install Pull Link Kit, Toro Part No. 94-9630 per instructions supplied with kit.

B. Adjust the reel drive motor mounting screws so approximately 1/2 in. of threads is exposed on each screw (Figure 8).

C. Coat the spline shaft of the motor with clean grease and install the motor by rotating the motor clockwise so the motor flanges clear the mounting screws. Rotate the motor counterclockwise until the flanges encircle the mounting screws and tighten the screws.

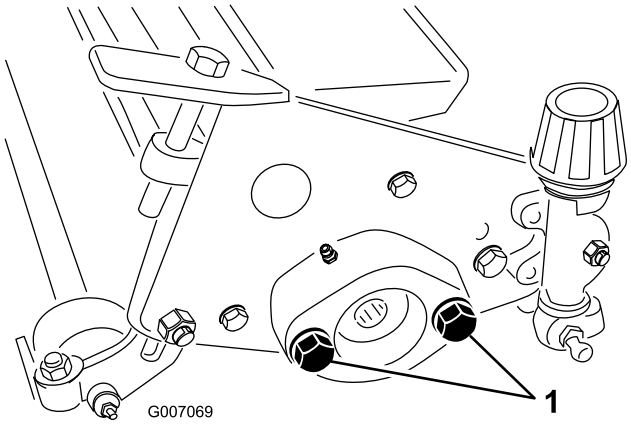


Figure 8

1. Reel drive mounting screws

Operation

Training Period

Before operating the dethatching units on a green, evaluate the performance of the dethatcher at the desired setting. Operate in a clear, unused area to determine if the desired results will be achieved. Adjust the dethatcher if a change is desired.

Note: When dethatching units are mounted on Greensmaster 3200, 3200–D or 3250–D Traction Units and are operated under heavy loads, an adjustment to the carrier frame and reel circuit relief valve may be required. Proceed as follows:

Adjust Carrier Frame Rollers for Greensmaster 3200, 3200-D & 3250-D

1. Position traction unit on a level surface and lower cutting unit carrier frames to the floor.
2. Loosen jam nut on carrier frame stop screw and rotate screw to lower carrier frame rollers to the ground. Tighten jam nut after adjustment is attained.

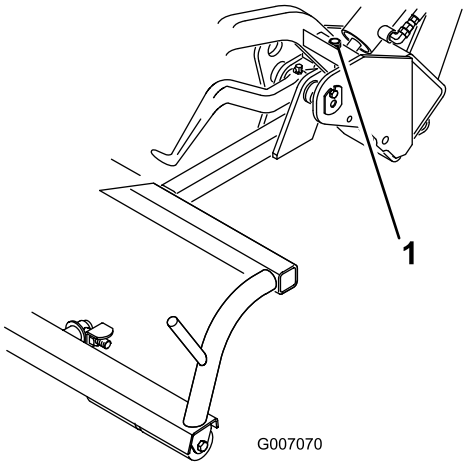


Figure 9

1. Carrier frame roller
2. Stop screw

3. When cutting units are reinstalled, readjust carrier frame stop screw so there is 3/8" ±1/8" clearance between carrier frame rollers and floor.

Checking/Adjusting the Reel Circuit Relief Valve Pressure

Greensmaster 32xx Series (Model No. 04380 & 04381), Greensmaster 32xx Series (Model No. 04383-269999999 & Up) & Greensmaster 3150 (Model No. 04357-269999999 & Up)

A. Precautions for Hydraulic Testing

⚠ CAUTION

Failure to use gauges with recommended pressure (psi) rating as listed in test procedures could result in damage to the gauge and possible personal injury from leaking hot oil.

All testing should be performed by 2 people. One person should be in the seat to operate the machine, and the other should read and record test results.

⚠ CAUTION

Operate all hydraulic controls to relieve system pressure and avoid injury from pressurized hydraulic oil. Controls must be operated with the ignition switch in RUN and the engine OFF. Return ignition switch to OFF when pressure has been relieved. Remove key from the ignition switch.

⚠ WARNING

Before disconnecting or performing any work on the hydraulic system, all pressure in the system must be relieved by stopping the engine and lowering or supporting the cutting units or other implements.

Keep body and hands away from pin hole leaks or nozzles that eject hydraulic fluid under high pressure. Do not use hands to search for leaks; use paper or cardboard. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury. If fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury. Gangrene may result from such an injury.

1. Thoroughly clean the machine before disconnecting or disassembling any hydraulic components. Always keep in mind the need for cleanliness when working on hydraulic equipment. Contamination will cause excessive wear of components.
2. Put caps or plugs on any hydraulic lines left open or exposed during testing or removal of components.
3. The engine must be in good operating condition. Use a tachometer when making a hydraulic test. Engine speed can affect the accuracy of the tester readings.
4. The inlet and the outlet hoses must be properly connected and not reversed (tester with pressure and flow capabilities) to prevent damage to the hydraulic tester or components.

B. Manifold Relief Valve Pressure Check

1. Make sure hydraulic oil is at normal operating temperature by operating the machine for approximately 10 minutes.
2. Make sure machine is parked on a level surface with the cutting units lowered. Make sure engine is off and the parking brake is engaged.
3. Read Precautions for Hydraulic Testing.
4. Disconnect hose connection on the bulkhead that leads to the left reel motor inlet port.
5. Disconnect the hose connection at the gear pump that leads to the Port P1, identified on the bottom of hydraulic manifold.
6. Install tester in series with the hose and bulkhead connection. Make sure the flow control valve is fully open.
7. Connect T-connector and gauge to the fitting and hose connection at the gear pump.
8. If a backlap kit is installed, make sure backlap knob on the valve block is in the mow position. Make sure reel speed knob is set to maximum.

⚠ CAUTION

Keep away from reels during test to prevent personal injury from the rotating reel blades.

9. Start engine and move throttle to full speed. Engage the cutting units.
10. Watch pressure gauge carefully while slowly closing the flow control valve to fully closed. If pressure gauge does not read 3000 psi, shut off engine and adjust relief valve. Proceed to Adjusting Manifold Relief Valves, Item C.

C. Adjust the Manifold Relief Valve

⚠ WARNING

Never adjust the relief valve with the hydraulic system pressurized. Hydraulic oil may spray out of the valve with the cap off. Personal injury may result. Always install the cap and tighten before pressurizing the system.

1. On rear side of manifold, remove cap from the relief valve with an allen wrench (Figure 10).

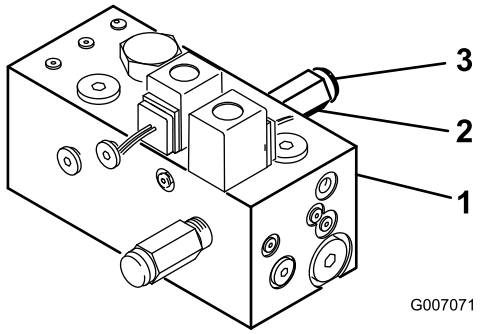


Figure 10

1. Manifold
2. Relief cartridge
3. Cap

Note: An 1/8-turn of the adjustment socket is about 50 psi, or 1 turn is about 400 psi.

2. To increase pressure setting, turn the adjustment socket inside the valve 1/8 of a turn clockwise.
3. To decrease pressure setting, turn the adjustment socket inside the valve 1/8 of a turn counter-clockwise.
4. Install and tighten cap to valve. Retest pressure setting (3000 psi maximum)
5. Disengage thatcher units. Shut off engine.
6. Disconnect tester from manifold and hose. Reconnect hose to the pump.
7. When cutting units are reinstalled, relief valve setting can remain at 3000 psi.

⚠ CAUTION

Do not exceed 3000 psi relief valve pressure. Personal injury may result from leaking oil.

Optional Blade Configurations

The dethatching unit is shipped from the factory with 1/2" spacing between blades. Using different combinations of 1/4" thick spacers (Toro Part No. 17–1600) and 3/4" thick spacers (Toro Part No. 82–6600) blade spacings of 1/2", 3/4", 1" or 1–1/4" can be attained.

Operating Tips

- Operate the traction unit at full throttle varying ground speed to meet dethatching loads.
- Maximum recommended negative setting on the dethatcher blades is 1/4" deep penetration.
- Power requirements to operate the dethatcher units will vary with turf and soil conditions. Travel speed may need to be reduced in some conditions.

Maintenance

Lubrication

Service Interval: Every 20 hours

There are (6) grease fittings on each dethatching unit. A hand operated grease gun is recommended for best results.

Grease Type:#2 multipurpose lithium base grease.

1. Wipe each grease fitting with a clean rag.
2. Apply grease to reel bearings, front roller bearings and rear wheel bearings until pressure is felt.

   Important: Do not apply too much pressure or grease seals will be permanently damaged.
3. Wipe excess grease away

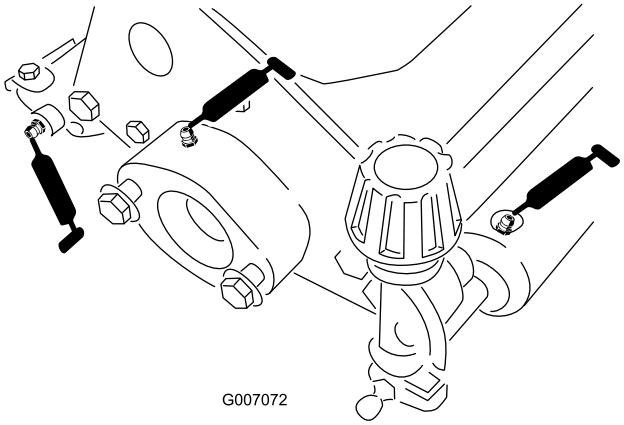


Figure 11

Reel Maintenance

Removing the Reel

1. Loosen (2) screws and washers securing counterweight to end of dethatcher unit. Remove counterweight.
2. Loosen (2) screws securing reel motor to other end of dethatcher unit. Remove reel motor.
3. Remove (2) capscrews and lockwashers securing the reel bearing housings to each end of dethatcher unit (Figure 12).

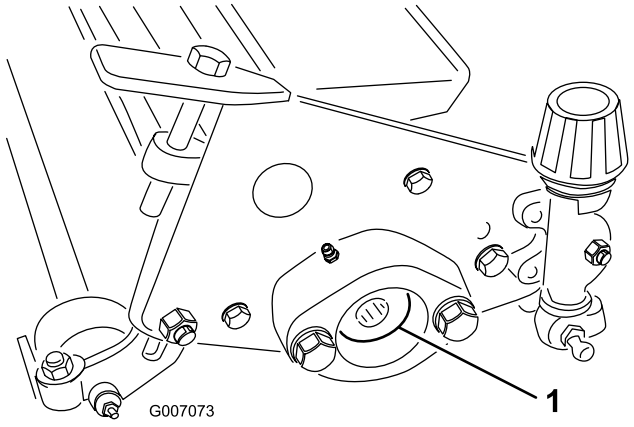


Figure 12

1. Bearing housing

4. Remove setscrews from locking collars on reel bearings (Figure 13).

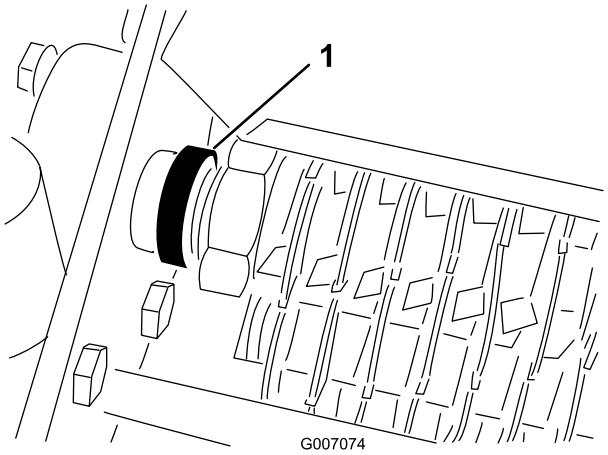


Figure 13

1. Locking collar

5. With a drive pin and hammer, loosen the locking collars by driving the locking collar in direction opposite to normal rotation.
6. Slide bearing housings and locking collars off dethatcher reel shaft.
7. Carefully pull reel assembly out of dethatcher frame.

Removing the Blades From Shaft

1. Remove one of the 1–1/8 in. nuts from shaft.

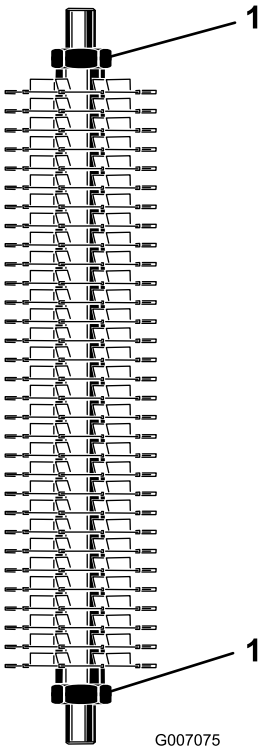


Figure 14

1. 1–1/8" nut

2. Disassemble spacers and dethatching blades from shaft.

   Important: When disassembling blades from hex shaft, pay close attention to the position of the index holes in the blades. This is very important for the re-assembly of the blades.

   ⚠ CAUTION

   Use caution when removing blades from shaft as they are extremely sharp and may have burrs that will cut your hands.

3. After blades and spacers are removed, clean and lubricate hex shaft with a light coating of grease to simplify assembly.

   Important: The two 3/4" spacers must be assembled on each end of shaft. Do not invert individual dethatching reel blades. The order of disassembly is extremely important. Do not invert dethatching reel blades when disassembling or reverse the order when assembling. Note the thatcher blades index hole. The index hole is provided for assembly in order to obtain the PROPER HELIX FOR THE DETHATCHING REEL.

Installing the Dethatcher Blades (1/2" Spacing)

Use the following procedure to assure the proper helix is attained when installing the dethatcher blades.

1. First, assemble one 3/4 in. spacer on reel shaft, then assemble a reel dethatcher blade.
2. Next, assemble the 1/2 in. spacer.
3. Do not invert individual dethatcher reel blades when reassembling on reel shaft. This will cause unsatisfactory performance of the dethatcher unit. Attention should always be taken when disassembling dethatching blades from reel.
4. Install the next blade counter-clockwise so the index reference hole is not aligned with the first blade hole by one hex of the shaft (Figure 15). 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 centered on the shaft and staggered in such a manner to give a helix appearance.

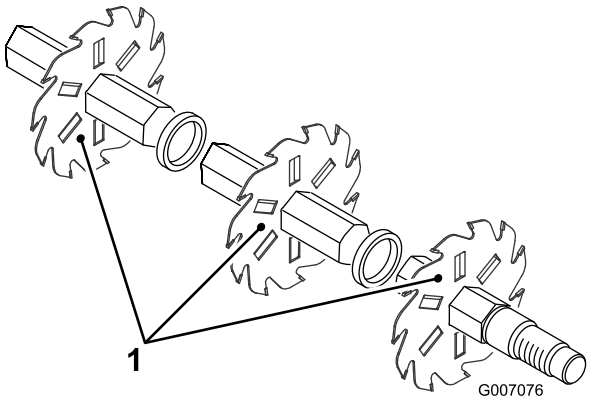


Figure 15

1. Index reference holes

5. After assembly of the spacers and blades, apply Blue Loctite #242 to the 1-1/8 in. nut and tighten to 80 -100 ft-lb. Blades to be centered on shaft within ±.06.

   Note: If spline nuts were removed from ends of Dethatching reel, apply Blue Loctite #242 to nut threads before re-installing. Torque nuts to 40-60 ft-lb (Left hand nut is a left hand thread).

   Important: Make sure the sharp edge of the blades are in the direction of the rotation of the dethatching unit.

Assemble Reel To Frame

1. Slide a locking collar onto each end of reel shaft. Larger I.D. of collar to be facing outward.

2. Slide a locking collar onto each end of reel shaft. Larger I.D. of collar to be facing outward.
3. Install and secure a reel bearing housing to each end of dethatcher unit with capscrews and lockwashers previously removed.
4. Position reel shaft assembly so it is centered between dethatcher side plates within .12".
5. Use a drive pin and hammer to tighten the locking collars on the reel shaft bearings. Tighten in direction of rotation. Tighten setscrews (2).
6. Secure counterweight to end of dethatcher unit with (2) screws and washers.
7. Secure reel motor to other end of dethatcher unit with (2) screws.
8. Check positive or negative reel setting and readjust, if necessary.

The Toro Total Coverage Guarantee

A 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. This warranty is applicable to all products with the exception of Aerators (refer to separate warranty statements for these products). Where a warrantable condition exists, we will repair the Product at no cost to you including diagnostics, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.
* Product equipped with an 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:

Commercial Products Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
E-mail: commercial.warranty@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 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, or modified non-Toro branded accessories and products. A separate warranty may be provided by the manufacturer of these items.
- Product failures which result from failure to perform recommended maintenance and/or adjustments. Failure to properly maintain your Toro product per the Recommended Maintenance listed in the *Operator's Manual* can result in claims for warranty being denied.
- 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, brakes pads and linings, clutch linings, blades, reels, bed knives, tines, spark plugs, castor wheels, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, and check valves, etc.
- 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, fertilizers, water, or chemicals, etc.
- Normal noise, vibration, wear and tear, and deterioration.
- 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 are covered for the duration of the original product warranty and 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 remanufactured parts for warranty repairs.

Note Regarding Deep Cycle Battery Warranty:

Deep cycle batteries have a specified total number of kilowatt-hours they can deliver during their lifetime. Operating, recharging, and maintenance techniques can extend or reduce total battery life. As the batteries in this product are consumed, the amount of useful work between charging intervals will slowly decrease until the battery is completely worn out. Replacement of worn out batteries, due to normal consumption, is the responsibility of the product owner. Battery replacement may be required during the normal product warranty period at owner's expense.

Maintenance is at Owner's Expense

Engine tune-up, lubrication cleaning and polishing, replacement of Items and Conditions Not Covered filters, coolant, and completing Recommended Maintenance are some of the normal services Toro products require that are at the owner's expense.

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

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.