FORM NO. 3323–181 Rev. A

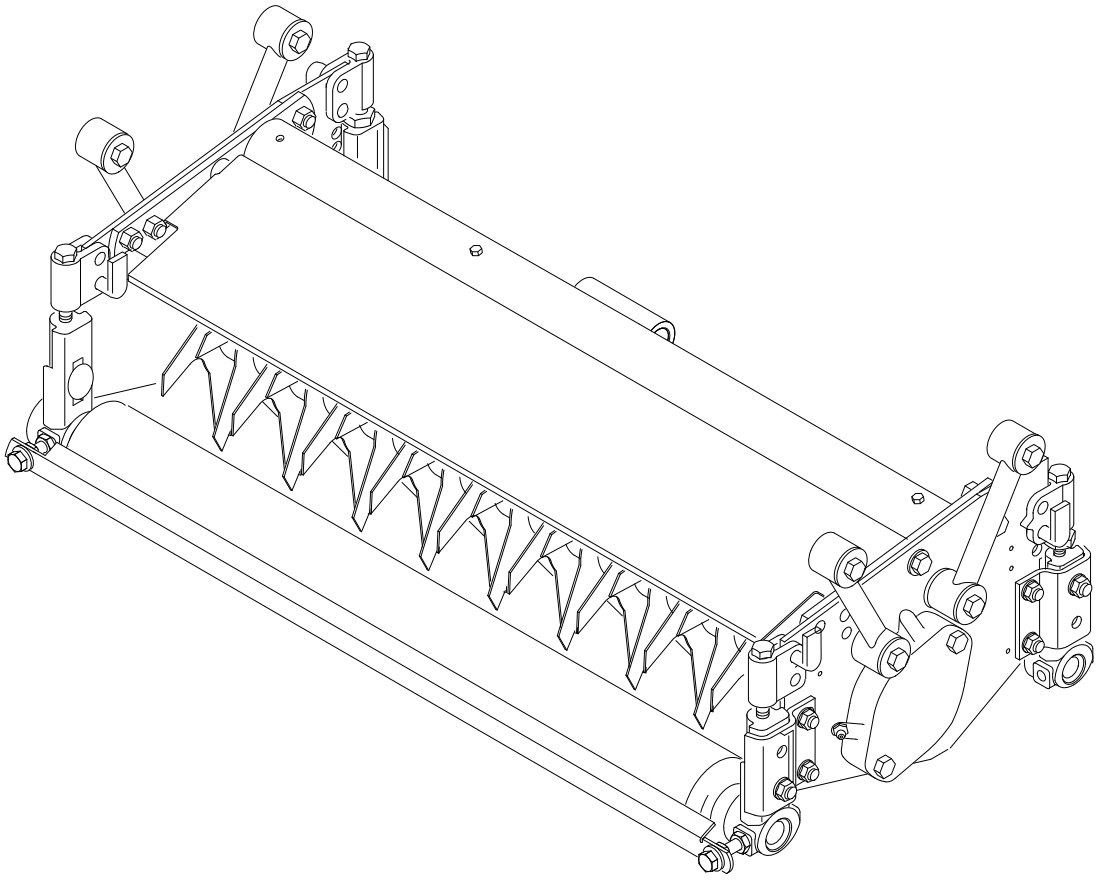
TORO®

MODEL NO. 03216

OPERATOR'S MANUAL

27" VERTICUTTING REEL

Reelmaster® 3100D



SPECIFICATIONS

Reel Construction: Blades and spacers bolted to square shaft.

Verticutting Range: Up to 1/4" deep blade penetration.

Reel Diameter: 7−1/4 in.

Power: Hydraulic motor splined to reel shaft.

Reel Bearings: Self aligning, roller ball type with cast housing.

Roller Adjustment: Adjustable front and rear rollers.

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

ADJUSTING VERTICUTTING REEL

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

LEVEL ROLLERS (Fig. 1 & 2)

1. Place the verticutting reel on a level surface.

2. Slightly loosen (crack) nuts securing front and rear roller brackets to angle brackets.

3. Secure top hole of each front roller height−of−cut support to first hole from the top of each side plate.

4. Secure bottom hole of each rear roller height−of−cut support to fifth hole from the top of each side plate.

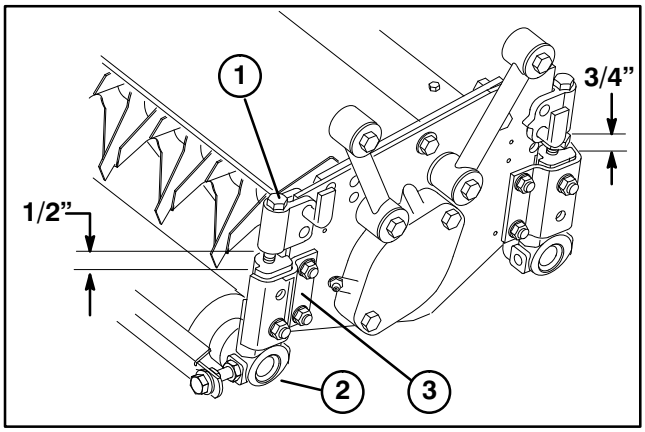


Figure 1
1. Support capscrew
2. Roller bracket
3. Angle bracket

5. Verify and/or adjust support capscrew to achieve 1/2" dimension between roller support and front roller bracket (2 places).

6. Verify and/or adjust support capscrew to achieve 3/4" dimension between roller support and rear roller bracket (2 places).

7. Place a 1/4" thick gauge bar under verticutting reel blades. Be sure bar covers full length of blades.

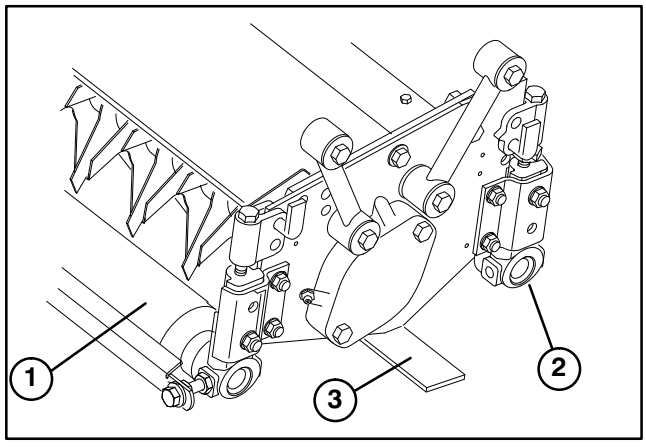


Figure 2
1. Front roller
2. Rear roller
3. Gauge bar

8. Push down on front roller and adjust either front support capscrew to level front roller. Rotate support capscrews on rear H.O.C. brackets to raise or lower rear roller brackets until both front and rear rollers are in contact with the flat surface and each end of reel blades rest on the gauge bar. Tighten nuts securing roller brackets to angle brackets.

ADJUSTING VERTICUTTING REEL

ADJUST BLADE DEPTH (Fig. 3)

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

1. Place the verticutting reel on a level surface.

2. Place (2) 1/4" gauge bars under the front and rear rollers of the verticutting reel. Make sure each bar covers the full length of each roller.

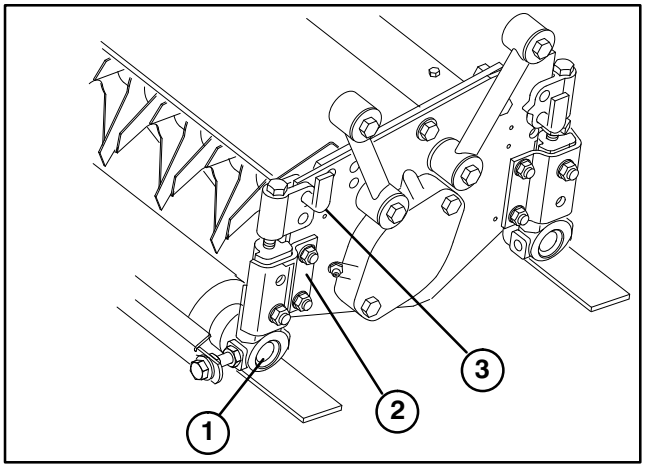


Figure 3
1. Roller bracket
2. Angle bracket
3. Adjusting pin

3. Slightly loosen (crack) nut securing each roller bracket to angle bracket.

4. Remove hairpin cotters and rear adjusting pins securing roller supports to sideplates.

5. Using chart (Fig. 4), determine appropriate hole in roller support and sideplate to achieve desired blade depth.

6. Align proper hole in roller support with proper hole in sideplate, (2 places) and secure with rear adjusting pins and hairpin cotters.

7. Repeat procedure on front roller, using chart (Fig. 4), to determine appropriate hole in roller support and sideplate to achieve desired blade depth.

8. Tighten nuts securing each roller bracket to angle bracket.

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.

FRONT			REAR		
Roller Support Hole (Top or Bottom)	Side Plate Hole (1 of 3) 1=top	Blade Depth	Roller Support Hole (Top or Bottom)	Side Plate Hole (1 of 6) 1=top	Blade Depth
Bottom Hole	2	−1/4"	Top Hole	2	−1/4"
Bottom Hole	2	−1/8"	Bottom Hole	4	−1/8"
Top Hole	1	0	Bottom Hole	4	0
Top Hole	1	+1/8"	Top Hole	3	+1/8"
Top Hole	1	+1/4"	Bottom Hole	5	+1/4"

Figure 4

ADJUST REAR GRASS SHIELD (Fig. 5)

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

1. Loosen the capscrew on the left side of the verticutting reel, located on the pivot of the rear grass shield.

2. Rotate the rear grass shield to the desired setting and tighten the capscrew.

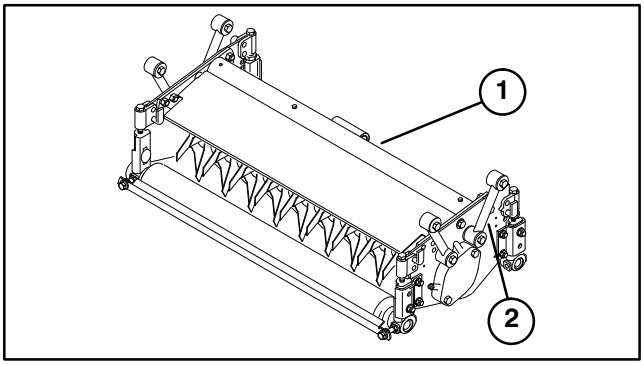


Figure 5
1. Rear grass shield
2. Shield screw

ADJUSTING VERTICUTTING REEL

MOUNT ROLLER SCRAPERS (Fig. 6)

1. Loosely secure a capscrew, (2) washers, a jam nut and a locknut to each end of roller scraper as shown in figure 6. Rear scraper installation is shown in figure 6, reverse scraper so edge is on top when installing on front roller.

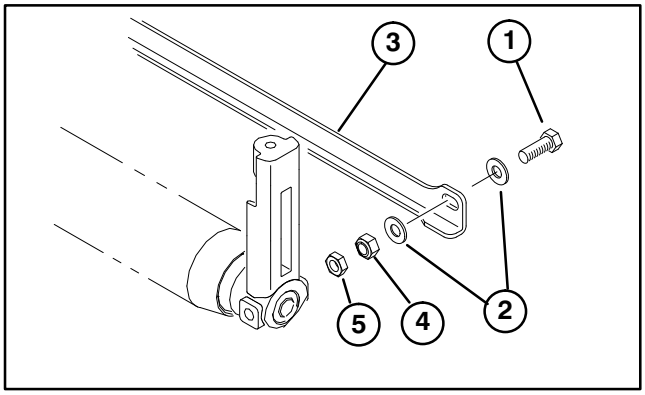


Figure 6

1. Capscrew
2. Washer
3. Rear roller scraper
4. Jam nut
5. Locknut

1. Thread each capscrew into roller brackets until desired clearance between scraper and roller is attained. Make sure scraper is parallel to roller. Tighten locknuts securing scraper to capscrews and jam nuts securing scraper to roller.

ADJUSTING ROLLER SCRAPERS (Fig. 7)

1. Thread jamnuts, on scraper rods, in or out to attain .060" clearance between scraper and roller.

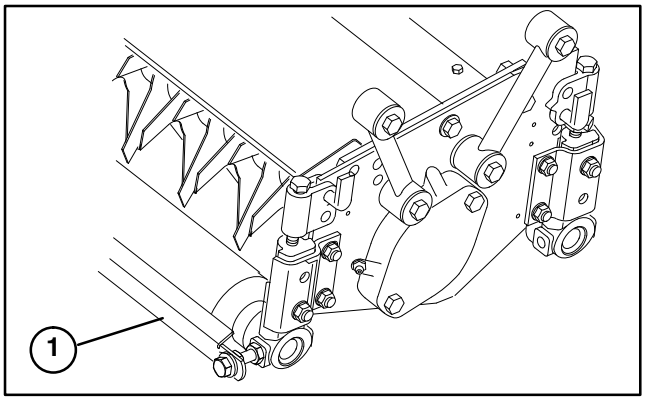


Figure 7
1. Roller scraper

2. Assure scraper rod is parallel to roller and level surface.

NOTE: Adjust scraper to desired position to meet turf conditions.

NOTE: Scraper may not need to be used in dry conditions.

MOUNT VERTICUTTING REEL (Fig. 8)

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 8 shows the orientation of the hydraulic drive motor for each of the locations. For any of the locations requiring the motor to be mounted on the right end of the cutting unit, install a counter weight on the left end of the cutting unit. For the locations requiring the motor to be mounted on the left end, install a counter weight on the right end of the cutting unit.

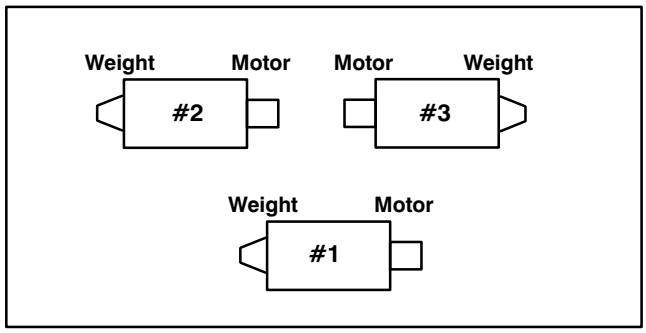


Figure 8

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

1. 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 on a fairway, 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 and between 3−5 MPH.

2. Maximum setting on the verticutting blades is 1/4" 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.

LUBRICATION

Each unit has (6) 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 ea.) front roller (2) and rear roller (2).

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

1. Wipe each grease fitting with a clean rag.

2. Apply grease until pressure is felt against handle.

IMPORTANT: Do not apply too much pressure or grease seals will be permanently damaged.

3. Wipe excess grease away.

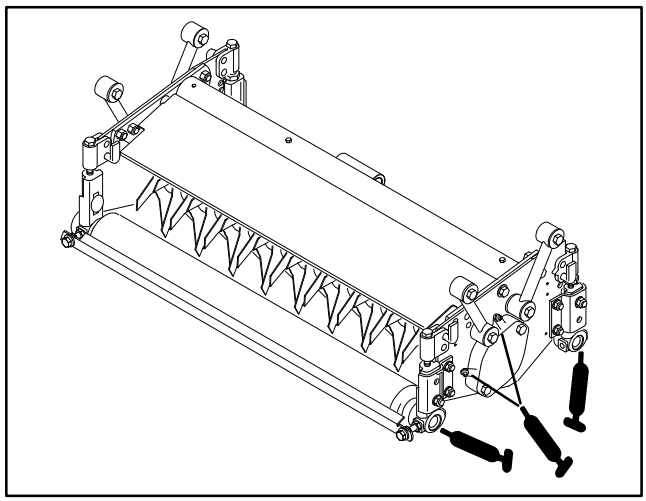


Figure 9

MAINTENANCE

REMOVING VERTICUTTING REEL (Fig. 10)

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

2. Remove front roller from the unit.

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

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

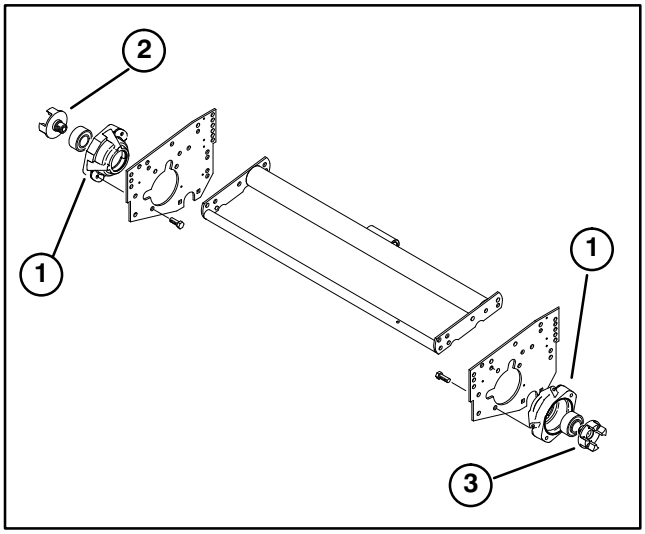


Figure 10

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

4. 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.

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

REMOVING VERTICUTTING BLADES FROM SHAFT (Fig. 11)

1. Secure end of blade shaft, opposite nut, in a vise.

2. On other end of shaft, rotate nut counter–clockwise. Remove nut.

CAUTION

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

3. Remove cupped end spacer, blades and 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 thatcher blades index hole. The index hole is provided for assembly in order to obtain the proper helix for the verticutting reel.

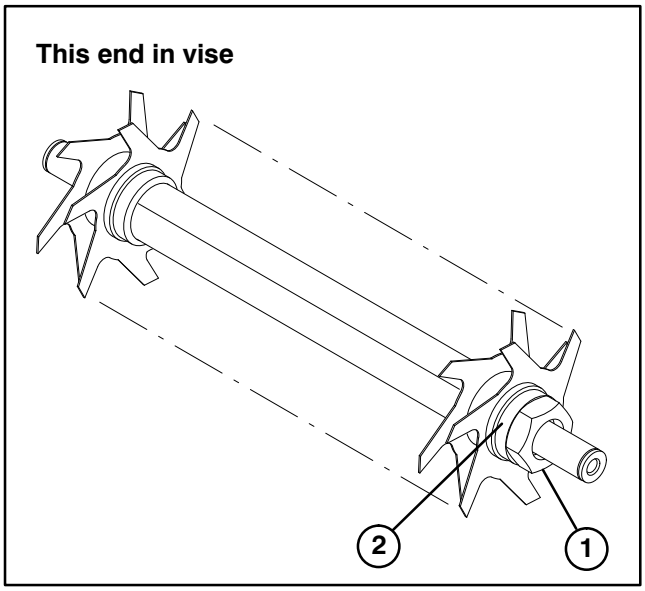


Figure 11

1. Nut
2. Cupped end spacer

INSTALL VERTICUTTING BLADES (Fig. 11)

1. First, assemble a reel blade.

2. Next, assemble a 1 in. and a 1/4 in. 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 ave been installed. When properly assembled, the blades will be staggered in such a manner to give a helix appearance.

5. Install cupped end spacer to shaft (flat end outward) (Fig. 11).

6. Apply Blue Loctite #242 to nut, install nut on shaft and tighten to 80 −100 ft−lb.

ASSEMBLE VERTICUTTING 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 front roller to unit.

12. Install cover gasket, weights, and capscrews to the bearing housing.

13. Complete verticutting reel set−up and adjustment sequence.

14. Grease both bearings.

OPTIONAL BLADE CONFIGURATIONS

The verticutting reel is shipped from the factory with 1" spacing between blades. Additional spacers are available for other spacing options per reel, if desired. Configurations are shown below.

1" Spacing (Standard) – Requires (24) Blades (part no. 93–3038), (2) 1/4" Thick Spacers (part no. 94–2720) and (25) 1" Thick Spacers (part no. 93–3092) (Fig. 12).

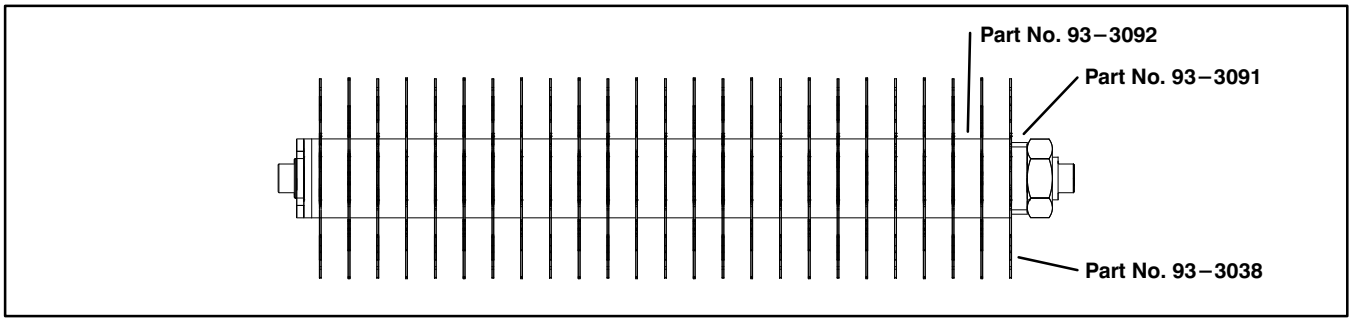


Figure 12

1–1/4" Spacing – Requires (20) Blades (part no. 93–3038), (21) 1/4" Thick Spacers (part no. 94–2720) and (19) 1" Thick Spacers (part no. 93–3092) (Fig. 13).

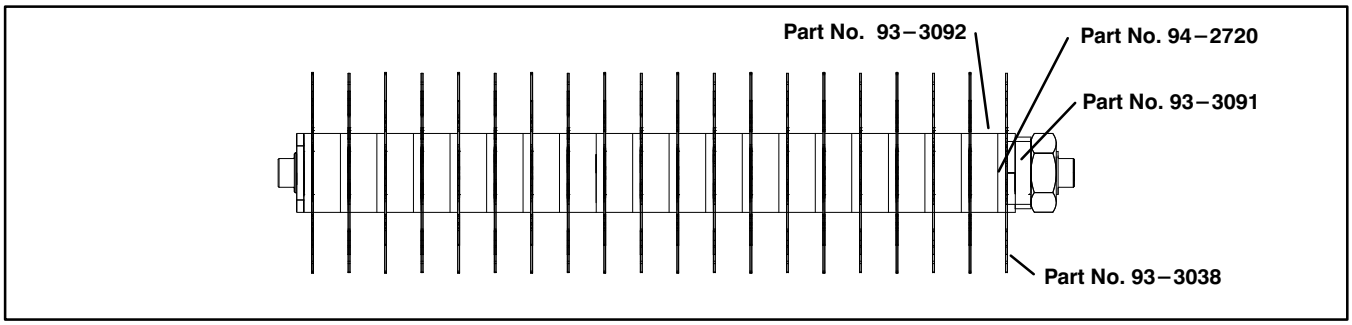


Figure 13

1–1/2" Spacing – Requires (17) Blades (part no. 93–3038), (32) 1/4" Thick Spacers (part no. 94–2720) and (16) 1" Thick Spacers (part no. 93–3092) (Fig. 14).

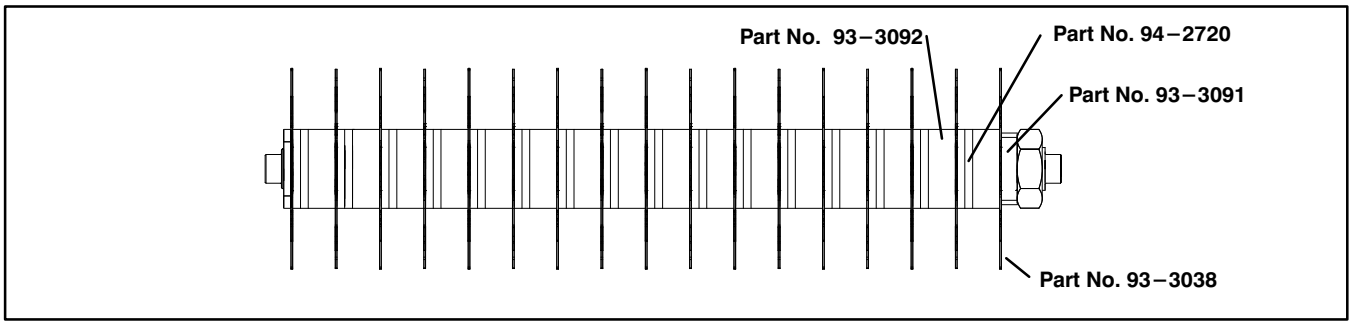


Figure 14

1–3/4" Spacing – Requires (14) Blades (part no. 93–3038), (39) 1/4" Thick Spacers (part no. 94–2720) and (14) 1" Thick Spacers (part no. 93–3092) (Fig. 15).

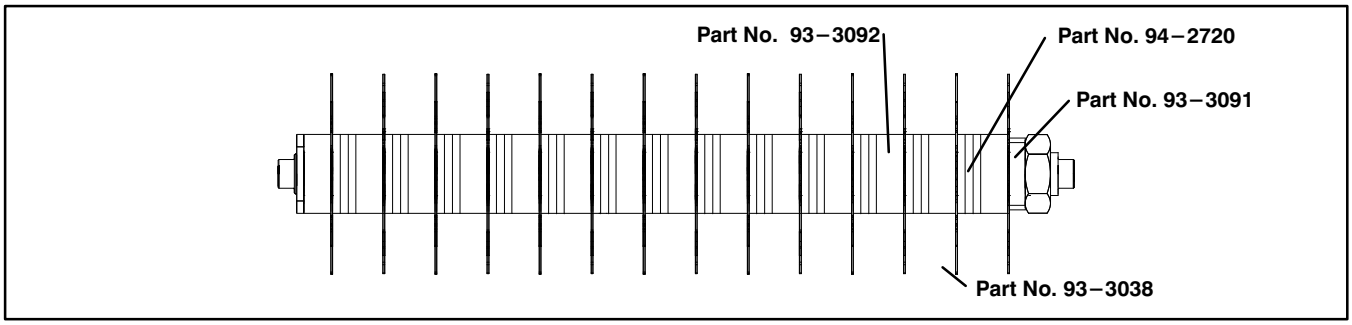


Figure 15

The Toro Commercial Products Two Year Limited Warranty

The Toro Company warrants your 1996 or newer Toro Commercial Product ("Product") purchased after January 1, 1997, to be free from defects in materials or workmanship for the period of time listed below. Where a warrantable condition exists, Toro 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.

Warranty Duration: Two years or 1500 operational hours*, whichever occurs first.
***Product equipped with hour meter**

Owner Responsibilities:

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

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
8111 Lyndale Avenue South
Minneapolis, MN, 55420–1196
Telephone: (612) 888–8801
Facsimile: (612) 887–8258
E–Mail: Commercial.Service@Toro.Com

Maintenance Parts:

Parts scheduled for replacement as required maintenance ("Maintenance Parts"), are warranted for the period of time up to the scheduled replacement time for that part.

Items/Conditions Not Covered:

Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. The items / conditions listed below are not covered by this warranty:

- Product failures which result from the use of non–Toro replacement parts, or from installation and use of add–on, modified, or unapproved accessories are not covered.
- Product failures which result from failure to perform required maintenance and/or adjustments are not covered.
- Product failures which result from operating the Product in an abusive, negligent or reckless manner are not covered.
- This warranty does not apply to 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.
- This warranty does not apply to 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.
- This warranty does not apply to 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.

Other Legal Disclaimers:

The above remedy of product defects through repair by an authorized distributor or dealer is the purchaser's sole remedy for any defect. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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 the express warranty.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

The Toro Company is not liable for indirect, incidental or consequential damages in connection with the use of the Product, including any cost or expense of providing substitute Product or service during periods of malfunction or non–use.

Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.

Note to California residents: 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), 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 California Emission Control Warranty Statement printed in your Owner's Manual or contained in the engine manufacturer's documentation for details.