Form No. 3325-709 Rev B

TORO®

5-, 8- and 11-Blade Cutting Unit

for Reelmaster® 2000/3000 Series

Model No. 03210—210000001 and Up
Model No. 03211—210000001 and Up
Model No. 03212—210000001 and Up
Model No. 03213—210000001 and Up
Model No. 03214—220000001 and Up
Model No. 03237—230000001 and Up
Model No. 03238—230000001 and Up
Model No. 03239—230000001 and Up

Operator's Manual

CE
English

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Introduction

Read this manual carefully to learn how to operate and maintain your product. 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 stamped onto a plate on the cutting unit.

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.

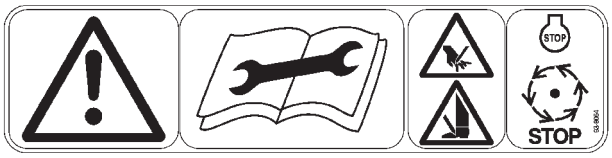
Caution signals a hazard that may cause minor or moderate injury if you do not follow the recommended precautions.

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

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.



Part No. 93-8064 (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 the reel area.



Part No. 67-7960

Specifications

General Specifications

Height of cut	6mm to 44mm 13mm to 67mm with fixed cutting unit
Frequency of clip (with variable speed set to maximum RPM)	5-blade at 1040 reel RPM at 8 km/h = 25mm clip 5-blade at 1040 reel RPM at 9.7 km/h = 30.5mm clip 8-blade at 1040 reel RPM at 8 km/h = 16mm clip 8-blade at 1040 reel RPM at 9.7 km/h = 19mm clip
Bedknife-to-reel adjustment	Single knob screw adjustment for bedknife to reel, located at center of bedbar. Each notch on the knob will move the bedknife .013mm.
Suspension system	Fully floating with hydraulic counterbalance cutting unit suspension system provides fore and aft oscillation. Main center pivot allows side-to-side oscillation. With optional Fixed Kit, Part No. 93-6915, cutting units can be locked into fixed (fore/aft) position for use with skids or anti-scalp rollers.

Specifications and design subject to change without notice.

Optional Equipment

Basket Kit* (27 in.)	Model No. 03223
High Height of Cut Kit* (27 in. & 32 in.)	Part No. 104-1395
3” Wiehle Roller Kit* (27 in.)	Model No. 03233
3” Wiehle Roller Kit* (32 in.)	Model No. 03234
Wiehle Roller Kit* (27 in.)	Model No. 03450
Wiehle Roller Kit* (32 in.)	Model No. 03475
Full Roller Kit* (27 in.)	Model No. 03440
Full Roller Kit* (32 in.)	Model No. 03479
Sectional Roller Kit* (27 in.)	Model No. 03445
Sectional Roller Kit* (32 in.)	Model No. 03476
Anti-Scalp Roller Kit* (27 in.)	Model No. 03447
Anti-Scalp Roller Kit* (32 in.)	Model No. 03477
3” Wiehle Roller Scraper Kit* (27 in.)	Part No. 104-1398
3” Wiehle Roller Scraper Kit* (32 in.)	Part No. 104-1399
Wiehle Roller Scraper Kit* (27 in.)	Part No. 94-5082
Wiehle Roller Scraper Kit* (32 in.)	Part No. 94-5081
Full Roller Scraper Kit* (27 in.)	Part No. 60-9560
Full Roller Scraper Kit* (32 in.)	Model No. 03478
Comb Kit*	Part No. 67-9400
Fixed Kit*	Part No. 93-6915
Skid Kit*	Part No. 94-3664
Heavy-Duty Bedknife** (27 in.)	Part No. 104-1380
Heavy-Duty Bedknife** (32 in.)	Part No. 104-1381
Backlapping Brush Assembly	Part No. 29-9100
Gauge Bar Assembly	Part No. 98-1852
Angle Indicator	Part No. 99-3503
Bedknife Screw Tool	Part No. 51-0880

*3 per kit

** For 25mm height of cut or above

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. You cannot complete set-up without these parts.

Description	Quantity	Use
Gasket O-ring Screw Cover plate	1 1 2 1	For use with RM2300 and RM2600 cutting units only
CE decal		Affix to cutting unit for CE
Operator’s manual		Read before operating
Parts catalog		
Registration card		Fill out and return to Toro

After the cutting unit is unboxed, use the following procedures to ensure the cutting units are adjusted properly.

1. Check each end of the reel for grease. Grease should be visibly evident in the reel bearings.
2. Ensure that all nuts and bolts are securely fastened.
3. Mount the front roller.
4. Adjust the bedknife to the reel.
5. Set height of cut and level the rear roller.

6. Verify height of cut and level the front roller.

7. Verify reel-to-bedknife clearance.

Important Thoroughly read both cutting unit and traction unit operator manuals. Failure to do so may result in damage to the cutting unit and/or poor performance.

Mounting the Front Roller

1. Remove the 2 lock nuts securing each angle bracket to the cutting unit (Fig. 1).

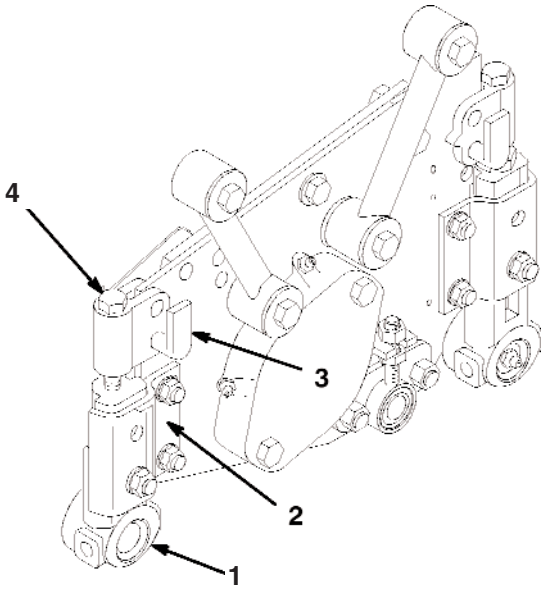


Figure 1

1. Roller bracket
2. Angle bracket
3. Height-of-cut pin
4. Support cap screw

2. Remove the height-of-cut pins (Fig. 1).

3. Insert the smaller-diameter shaft end of the roller into the white bushing in the roller bracket (Fig. 1), making sure the flanged end of the nylon bushing faces inside toward the roller. The hex of the roller bracket must mate with the hex of the adjustment nut.

4. Install the roller bracket onto other shaft end of the roller. The hex of the roller bracket must mate with the hex of the adjustment nut.

5. Hold one roller bracket stationary and use the other bracket as a wrench to loosen or tighten bearing clearance to allow the roller to rotate freely and to eliminate bearing end play.

Important If end play is excessive, seal failure may occur resulting in reduced bearing life.

6. Roller brackets must be aligned for installation onto the cutting unit. If necessary, to align after bearing adjustment, remove the roller bracket on the side with the flanged nylon bushing, align with the opposite roller bracket within ± one hex flat and replace.

7. Install height-of-cut pins in the 1/4 in. (6mm) setting. This will get the roller out of the way for later adjustments

8. Install the 2 lock nuts securing each angle bracket to the cutting unit.

Adjusting the Front Shield

The front shield is shipped from the factory raised at approximately a 25-degree angle. The shield can be adjusted for desired grass clippings dispersion.

1. Position the cutting unit on a flat level surface.

2. Loosen the pivot screw securing the shield to the side plate. Move the shield to the desired angle and tighten the screw (Fig. 2).

Note: To secure shield in down position, use mounting screws threaded into cross tube.

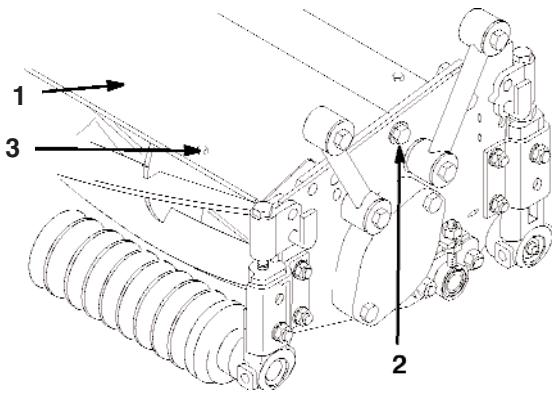


Figure 2

1. Shield
2. Pivot screw
3. Mounting screw

Adjusting the Bedknife Parallel to the Reel

1. A 3/4 in. (19 mm) wrench will be needed to rotate the bedknife adjustment knob. Each notch on the knob will move the bedknife .013mm (Fig. 3). Make sure reel contact is removed by rotating the bedknife adjustment knob counterclockwise.

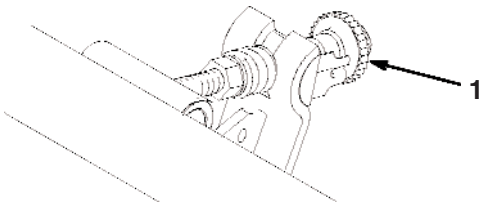


Figure 3

1. Bedknife adjusting knob

2. Set the cutting unit as shown in Figure 4. Do not rest the cutting unit on the bedknife adjusting knob as this will affect the reel-to-bedknife clearance. Place a block of wood under the round cross tube to hold the adjustment knob above the surface.

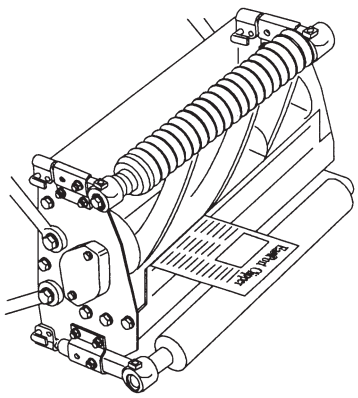


Figure 4

3. Rotate the reel, by hand, while tightening the bedknife adjustment knob. Stop when you feel light contact.

4. Insert a long strip of dry newspaper between the reel and the bedknife (Fig. 4) at either end of the bedknife, and rotate the reel by hand. The paper should be cleanly cut. Repeat this procedure at other end of the reel. If the paper does not cut cleanly, tighten the bedknife adjusting knob a maximum of two clicks and check to see if paper is cut cleanly. If it is not, go to the next step.

5. Remove the counter weights from the ends of the cutting units.

6. Loosen the two lock nuts securing the bedbar adjuster to the cutting unit side plate (Fig. 5).

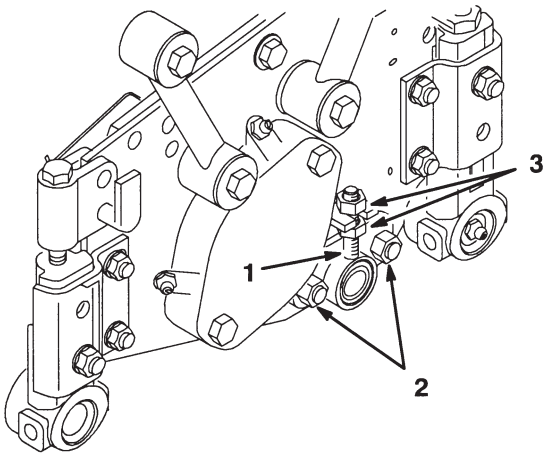


Figure 5

1. Bedbar adjuster
2. Lock nuts
3. Adjustment nuts

7. Adjust the nuts to move the bedbar adjuster up or down until paper is cut along the entire bedknife surface, when the bedknife adjustment knob is adjusted to no more than two clicks beyond first contact of reel bedknife (Fig. 5).

8. Tighten the lock nuts to 200 in.-lb. and verify adjustment.

9. On the Reelmaster 3100-D cutting units, install counter weights to appropriate ends of the cutting units (left side of center and front left cutting units and right side of the front right cutting unit).

10. On the Reelmaster 2300/2600 cutting units, install covers to appropriate ends of the cutting units (covers mounted to left side of center and the front left cutting units and right side of the front right cutting unit).

Setting Height of Cut and Leveling the Rear Roller

1. Position the cutting unit on a surface plate.

2. Adjust the support cap screw to achieve 25mm ± 1.5mm dimension between the height-of-cut support and the front roller bracket (2 places) (Fig. 6).

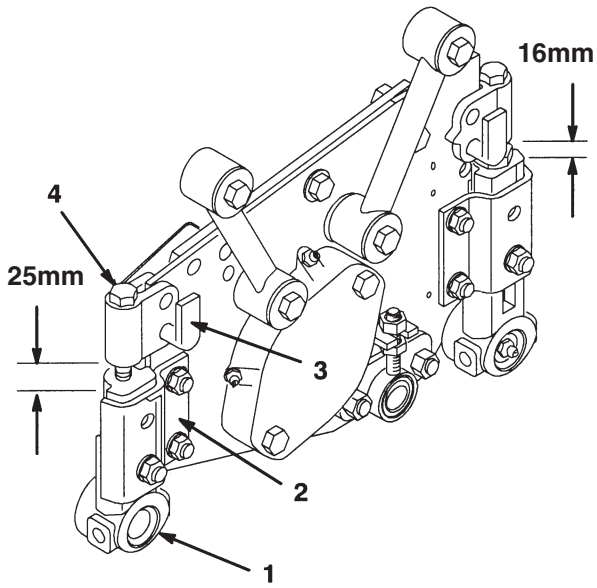


Figure 6

1 . Roller bracket
2. Angle bracket
3. Height-of-cut pin
4. Support cap screw

3. Adjust the support cap screw to achieve 16mm ± 1.5mm dimension between the height-of-cut support and the rear roller bracket (2 places) (Fig. 6).

4. Remove the hairpin cotters securing the rear height-of-cut pins and reinstall in the desired setting, as indicated on height-of-cut plate. The front height-of-cut pins should remain at the 1/4 6mm setting.

5. Position a straight, parallel sided bar under the reel blades and against the front face of the bedknife. For a 25mm height of cut or below, a 19mm thick bar is recommended. For heights of cut above 25mm, a 32mm thick bar is recommended.

   Note: The bar thickness does not affect adjustment. The recommended bars keep the cutting unit more balanced during adjustment. Make sure the bar covers the full length of the reel blades and the outermost contact points between reel and bar are equal distances from the center of the reel.

6. Verify whether the rear roller is level by trying to insert a piece of paper under each end of the roller. The paper should not fit under the roller.

7. Level the roller by adjusting the appropriate support cap screw on the rear the roller supports until the roller is parallel and entire length of the roller contacts the table.

8. Tighten the nuts securing the rear roller brackets to the angle brackets. Recheck to ensure that paper will not fit under each end of the roller.

Verifying the Height-of-Cut Setting and Leveling the Front Roller

1. On a gauge bar, set the head of the screw to your desired height of cut. This measurement is from the bar face to the underside of the screw head. A gauge bar (Part No. 98-1852) may be obtained from your local Toro Distributor.

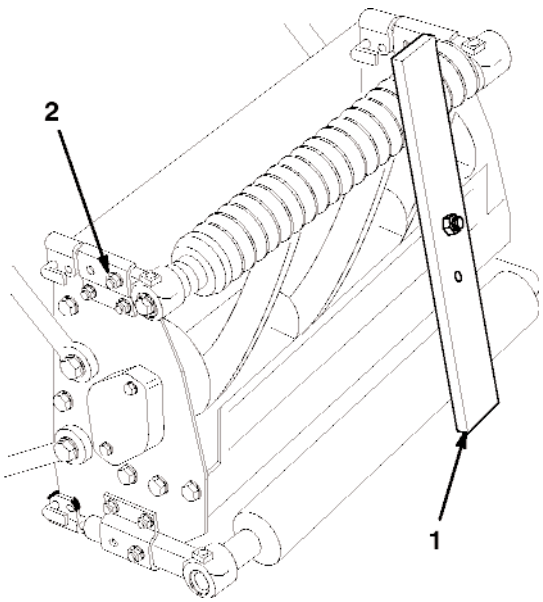


Figure 7

1. Gauge bar
2. Front roller bracket nut

2. Slightly loosen the nut securing each front roller bracket to the angle bracket (Fig. 7).

3. Remove the hairpin cotters securing the front height-of-cut pins and reinstall in the desired setting as indicated on the front height-of-cut plate.

4. Place the bar across the front and rear rollers and adjust the front roller support screws until the underside of the screw head engages the bedknife cutting edge (Fig. 7). Do this on both ends of reel. Make sure the rollers are free of debris and/or distortions on the roller surfaces.

5. Tighten the nuts securing the roller brackets.

6. Place the cutting unit on a flat surface and verify that the front and rear rollers contact the surface. Alternately push downward on opposite corners of the cutting unit. The amount of clearance allowable under any roller end depends on the turf conditions (sensitivity to lack of parallelism). Generally, 0.25 to 0.50mm will provide acceptable after-cut appearance. If clearance under any roller end is excessive, repeat the leveling of the front and rear rollers.

Verifying the Bedknife-to-Reel Adjustment

With the reels mounted to the traction unit, verify that the cutting unit will cut one thickness of newspaper across its entire width (paper to be perpendicular to the bedknife) (Fig. 8).

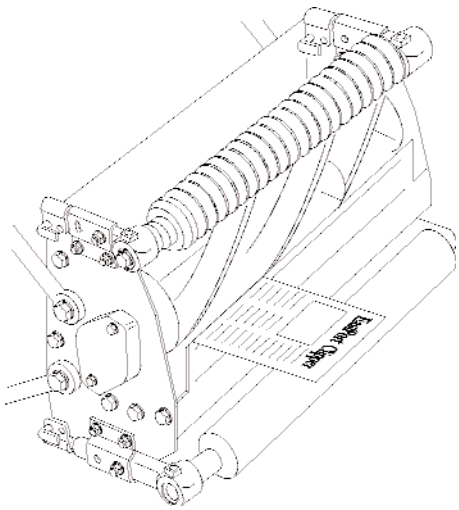


Figure 8

Changing Height of Cut

This procedure describes how to change the height of cut after a cutting unit has been set up as described in *Setup*, page 4. The height of cut can be changed with the cutting units on or off the traction unit.

Reposition the Front Roller

Note: If the front roller position does not need to change, as indicated on height-of-cut plates, go to *Reposition the Rear Roller,* page 8.

1. Loosen the nut securing each front roller bracket to the front angle brackets.

2. Remove the hairpin cotters securing the front height-of-cut pins and reinstall in the desired setting as indicated on the height-of-cut plate.

3. Tighten the nut securing **one** front roller bracket to the angle bracket. On this same end of the cutting unit, place the gauge bar across the front and rear rollers and adjust the screw on the gauge bar until the underside of the screw engages the bedknife's cutting edge.

4. Move the gauge bar to the other end of the reel and adjust the roller support screw, on the reel, until the underside of the screw head, on the gauge bar, engages the bedknife's cutting edge.

5. Tighten the nut securing this front roller bracket to the angle bracket.

Reposition the Rear Roller

1. On a gauge bar, set the head of screw to the desired height of cut. This measurement is from the bar face to the underside of the screw head. A gauge bar (Part No. 98-1852) may be obtained from your local Toro Distributor.

2. Slightly loosen the nut securing each rear roller bracket to the angle brackets.

3. Remove the hairpin cotters securing the rear height-of-cut pins and reinstall in the desired setting as indicated on the height-of-cut plate.

4. Place the bar across the front and rear rollers and adjust the rear roller support screws until the underside of the screw head engages the bedknife cutting edge. Do this on both ends of reel.

5. Tighten the nuts securing the roller brackets.

6. Repeat this procedure on the remaining cutting units.

Cutting Unit Attitude

Cutting unit attitude refers to the position of the cutting edge of the bedknife behind the center line of the reel (bottom deadcenter) (Fig. 9). This can be varied by changing the position of the front and rear rollers at a given height of cut.

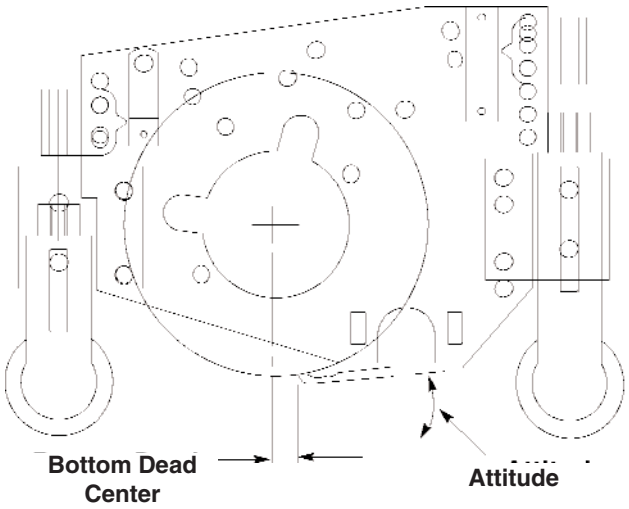


Figure 9

The farther the cutting edge is behind the reel's center line, the more aggressive the cutting unit will cut. Conversely, moving the cutting edge forward makes the cutting unit cut less aggressively.

The previous procedures used nominal cutting unit attitudes that work well in most turf conditions. The table below shows the relationship between the cutting unit attitude and turf conditions for improved after cut appearance. **It is important that all cutting units on a machine have the same attitude.**

Turf Condition	Cutting Unit Attitude	
	More Aggressive	Less Aggressive
Cool season grass	X	
Warm season grass		X
Deep leaf canopy	X	
Shallow leaf canopy		X
Higher height of cut	X	
Lower height of cut		X

Checking/Adjusting the Cutting Unit Attitude

For setting consistent cutting unit attitude, Toro strongly recommends using a two-screw gauge bar, Toro part no. 98-1852 (Fig. 10). The first screw is set for height of cut, and the second screw is set for cutting unit attitude. The second screw setting is an easy method of transferring cutting unit attitude to all cutting units on a machine.

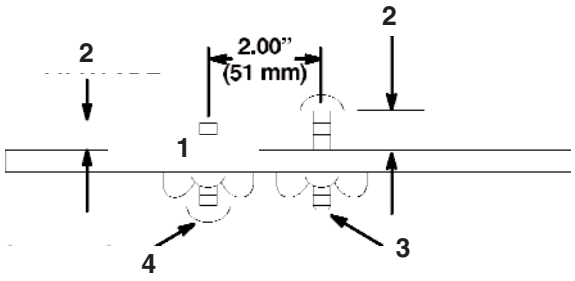


Figure 10

1. Attitude
2. Height-of-cut setting
3. First screw
4. Second Screw

1. Place an angle indicator, Toro Part No. 99-3503, on the bedknife and record the bedknife angle (Fig. 11).

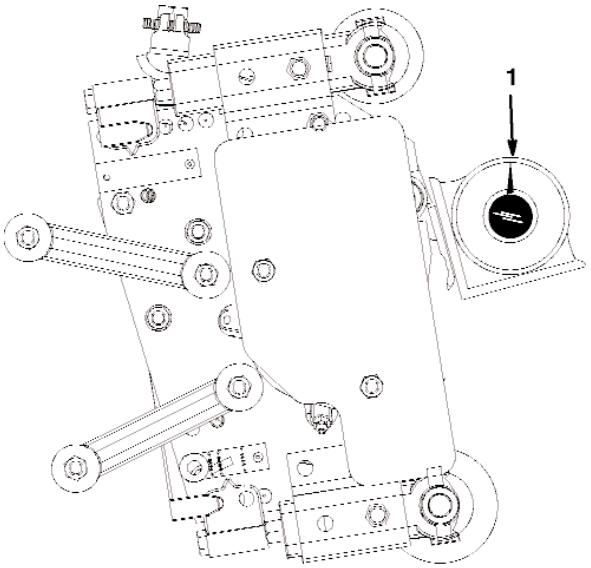


Figure 11

1. Bedknife angle

2. Using a two-screw gauge bar, Toro Part No. 98-1852, set the first screw to the desired height of cut.

3. Place the gauge bar across the front and rear rollers. The first screw head needs to fit snugly over the edge of the bedknife while the gauge bar contacts the rollers (Fig. 12).

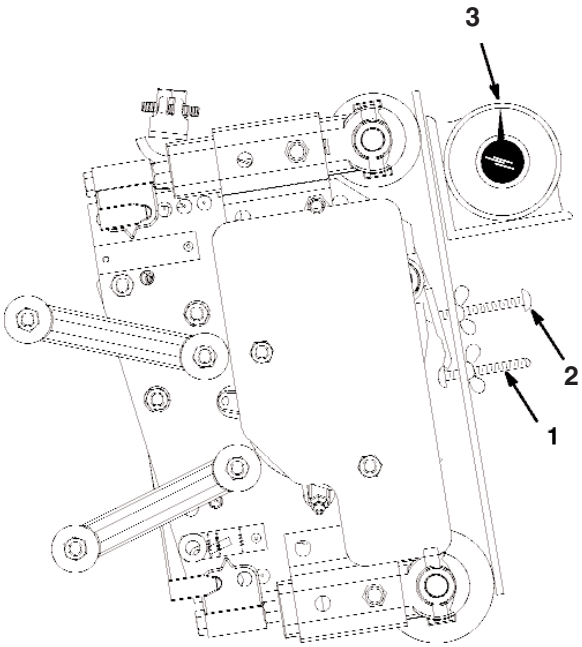


Figure 12

1. First screw
2. Second screw
3. Gauge bar angle

4. Adjust the second screw to contact the bedknife.

5. Place an angle indicator on the gauge bar and record the gauge bar angle (Fig. 12).

6. Bedknife Angle (step 1) — Gauge Bar Angle (step 5) = Cutting Unit Attitude (degrees)

7. For adjusting the cutting unit attitude, adjust the rollers to achieve desired cutting unit attitude.

Important Make sure the rollers are parallel to the reel; repeat the leveling procedure, if necessary.

Note: If the rollers are parallel to the reel before changing bedknife attitude, you can change one roller at a time and still maintain parallelism.

Operation

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

Cutting Unit Characteristics

The single knob bedknife-to-reel adjustment system incorporated in this cutting unit simplifies the adjustment procedure needed to deliver optimum mowing performance. The precise adjustment possible with the single knob/bedbar design gives the necessary control to provide a continual self-sharpening action—thus maintaining sharp cutting edges, assuring good quality of cut, and greatly reducing the need for routine backlapping.

In addition, the rear roller positioning system permits optimum bedknife attitude and location for varying heights of cut and turf conditions.

Cutting Unit Daily Adjustments

Before mowing each day, or as required, each cutting unit must be checked to verify proper bedknife-to-reel contact. **This must be performed even though quality of cut is acceptable.**

1. Lower the cutting units onto a hard surface, shut off the engine and remove the key from the ignition.

2. Slowly rotate the reel in reverse direction, listening for reel-to-bedknife contact. If no contact is evident, turn the bedknife adjusting knob clockwise, one click at a time, until you feel and hear light contact.

3. If you feel excessive contact, turn the bedknife adjusting knob counterclockwise, one click at a time, until no contact is evident. Then turn the bedknife adjusting knob one click at a time clockwise, until you feel and hear light contact.

Important Maintain light contact at all times. If light contact is not maintained, bedknife/reel edges will not sufficiently self-sharpen and dull cutting edges will result after operation. If excessive contact is maintained, bedknife/reel wear will be accelerated, uneven wear can result, and quality of cut may be adversely affected.

Note: As the reel blades continue to run against the bedknife a slight burr will appear on the front cutting edge surface the full length of the bedknife. If a file is occasionally run across the front edge to remove this burr, cutting will improve.

After extended running, a ridge will eventually develop at both ends of the bedknife. These notches must be rounded off or filed flush with the cutting edge of the bedknife to ensure smooth operation.

Lubrication

Each cutting unit has 6 grease fittings (with the optional front roller installed) that must be lubricated regularly with No. 2 general-purpose, lithium-base grease.

The grease fitting locations and quantities are: bedknife adjuster (2), every 50 hours (Fig. 13); reel bearings (2) and front and rear rollers (2 each) (Fig. 14).

Note: Lubricate only one reel bearing grease fitting on each end of the cutting unit.

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

1. Wipe each grease fitting with a clean cloth.

2. Apply grease until you feel pressure against the handle.

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

3. Wipe excess grease away.

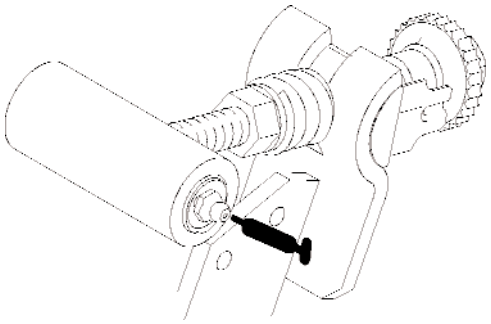


Figure 13
Grease every 50 hours

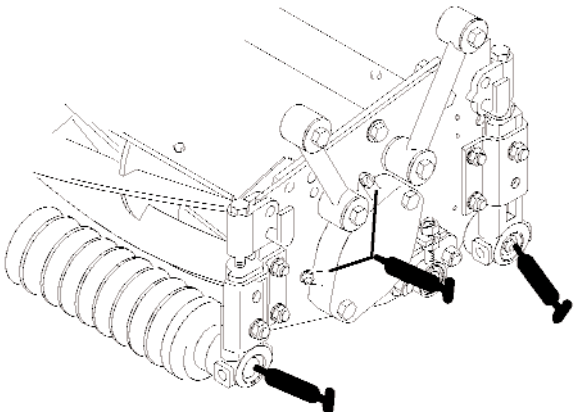


Figure 14
Grease every 8 hours

Backlapping

DANGER

While backlapping, reels may stall and then not restart.

Contact with the reel blades can cause personal injury or death.

- Never place hands or feet in the reel area while the engine is running.
- Do not attempt to restart reels by hand or foot.
- Do not adjust reels while the engine is running.
- If the reel stalls, stop the engine before attempting to clear the reel.

1. Position the machine on a clean, level surface, lower the cutting units, stop the engine, engage the parking brake and remove the key from the ignition switch.
2. Rotate the backlap knob to the backlap position. Rotate the reel speed knob to position 1.
3. Make initial reel-to-bedknife adjustments appropriate for backlapping on all cutting units. Start the engine and set it to low idle speed.
4. Engage the reels.
5. Apply lapping compound with a long-handled brush.
6. To make an adjustment to the cutting units while backlapping, turn OFF the reels and engine. After adjustments have been completed, repeat steps 4–6.
7. When backlap operation is completed, rotate the backlap knob to the MOW position, set the reel speed control to your desired mowing setting and wash all lapping compound from the cutting units.

Note: Additional instructions and procedures on backlapping are available in the *Toro Sharpening Reel & Rotary Mowers* manual, Form No. 80-300SL.

Note: For a better cutting edge, run a file across the front face of the bedknife when the lapping operation is completed. This will remove any burrs or rough edges that may have built up on the cutting edge.

Single-Point Spring Adjustment

If you remove the single-point adjustment assembly (Fig. 15) for servicing, make sure the spring is compressed, between washers, to a length of 22 mm. This adjustment is attained by tightening nut on the shaft of the single-point adjustment knob.

Note: The single-point adjustment assembly has left-handed threads.

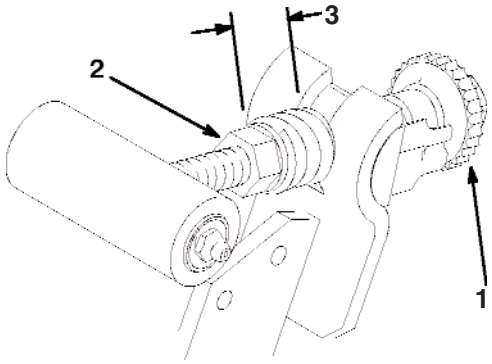


Figure 15

1. Single-point adjust assembly
2. Adjusting nut
3. 22mm between washers


TORO®