Form No. 3390-846 Rev C

Forward-Rotating Groomer Drive System-Greensmaster Flex™ 1800/2100 and eFlex® 1800/2100 Mower

Model No. 04259

Installation Instructions

The following groomer reels are also available for this product:

- 18-inch carbide groomer
- 18-inch spiral brush
- 18-inch soft grooming brush
- 18-inch stiff grooming brush
- 18-inch spring steel groomer
- 18-inch thin spring steel groomer
- 21-inch spring steel groomer
- 21-inch carbide groomer
- 21-inch spiral brush
- 21-inch soft grooming brush
- 21-inch stiff grooming brush
- 21-inch thin spring steel groomer

Contact your Authorized Toro Distributor for more information.

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

This product contains a chemical or chemicals known to the State of California to cause cancer, birth defects, or reproductive harm.

Loose Parts

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

Description	Qty.	Use
Locknut (3/8 x 16 inch)	4	Install the groomer drive system and a reel or brush.
Right drive cover	1	
Groomer belt	1	
Groomer drive	1	
Shoulder bolt	2	
Extension spring	1	
Right drive side plate	1	
Shim plate	1	
Right groomer arm	1	
Bolt (M6)	2	
Bushing	2	
Spring washer	2	
Locknut (3/8 x 24 inch)	2	
Left support plate	1	
Left groomer arm	1	
Washer	2	
Roller height spacer	6	
Bolt (1/4 inch)	4	
Driven pulley	1	
Inner compression spring	2	
Outer compression spring	2	

8111 Lyndale Avenue South
Bloomington, MN 55420

Register at www.Toro.com.

CE

Original Instructions (EN)
Printed in the USA

3390-846 C

Installing the Groomer Drive System

Important: **Read these instructions thoroughly before setting up or operating the groomer. Failing to follow setup or operating instructions in this manual may result in damage to the cutting unit and/or the groomer or the turf.**

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

1. Separate the cutting unit from the traction unit. Refer to the *Operator's Manual* for procedure.
2. Loosen the screws securing each end of the front roller to the height-of-cut arms (Figure 1).

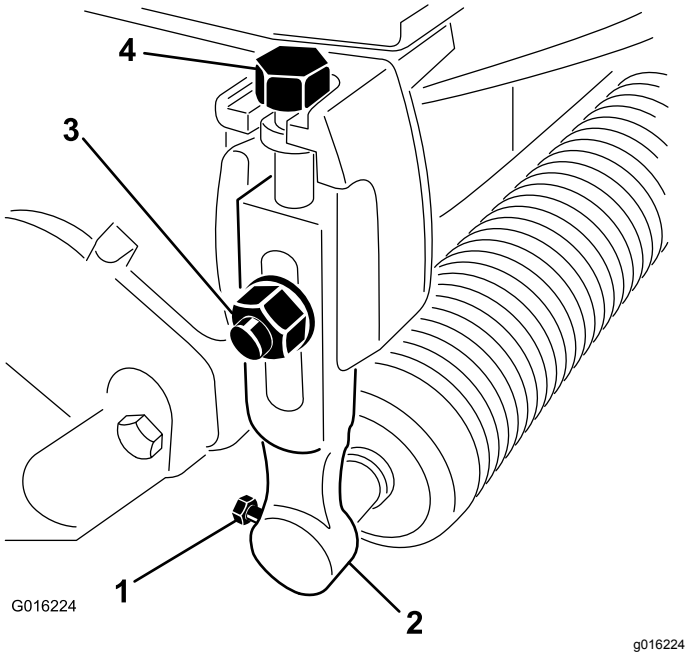

Figure 1

1. Roller mounting screws
2. Height-of-cut arm
3. Carriage bolt, washer, and locknut
4. Adjusting screw

3. Remove the plow bolts, washers, and locknuts securing the height-of-cut arms to each end of cutting unit (Figure 1). Remove the height-of-cut arms and roller assembly.

   Note: Retain all parts for use if the groomer is ever removed.

4. Remove the height-of-cut adjusting screws from the height-of-cut arms (Figure 1).
5. Remove the 2 bolts and nuts securing the counterweight to the right end of the cutting unit. Remove the counterweight (Figure 2).

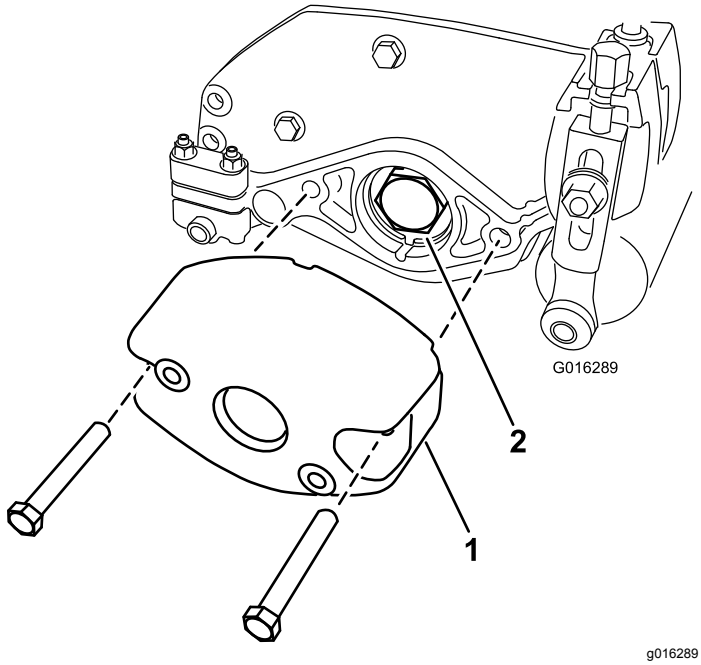

Figure 2

1. Counterweight
2. Bearing nut

6. Remove the bearing nut from the reel shaft (Figure 2).
7. Loosen the captive bolt securing the belt cover to the left end of the cutting unit until you can remove the cover (Figure 3).

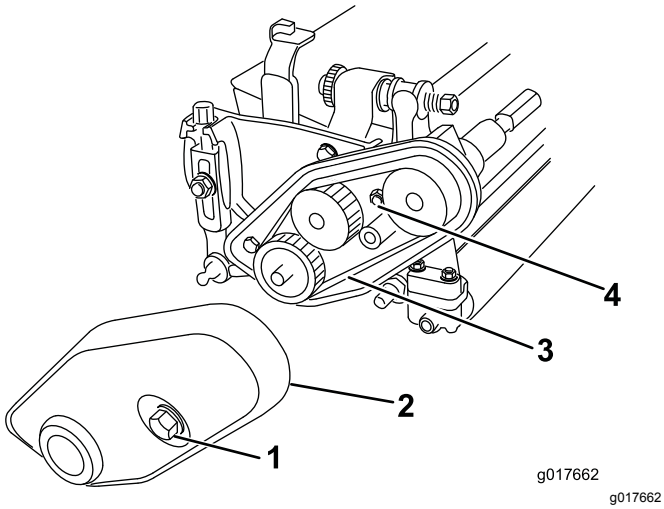

Figure 3

1. Belt cover bolt, captive
2. Belt cover
3. Belt
4. Belt tensioning nut

8. Loosen the belt tensioning nut and remove the belt (Figure 3).
9. Loosen the 2 set screws securing the lower pulley and remove the pulley from the reel shaft (Figure 4).

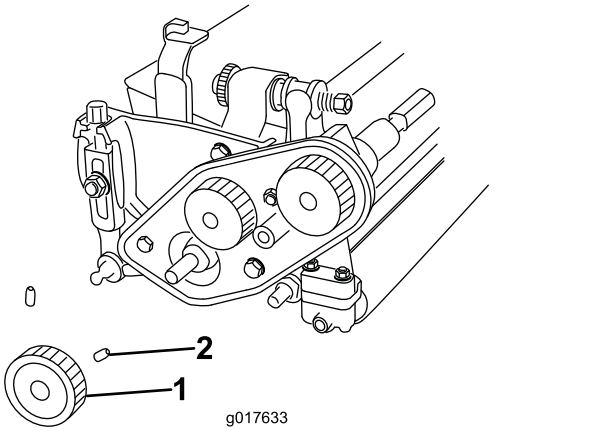

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Figure 4

1. Lower pulley
2. Set screw

10. Remove the 3 bolts securing the belt drive assembly to the cutting unit and remove the whole assembly (Figure 5).

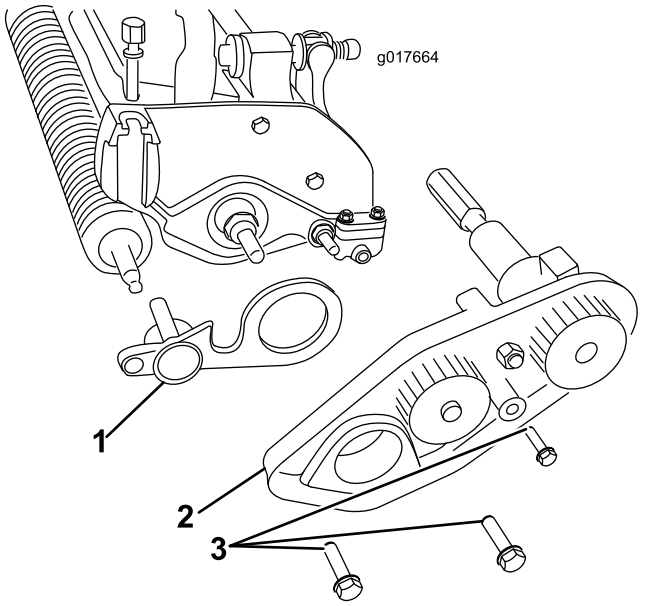

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Figure 5

1. Left support plate
2. Belt drive assembly
3. Bolts

11. Use a long-nose pliers to remove the compression springs on both sides of the cutting unit and replace them with the new inner and outer compression springs (Figure 6).

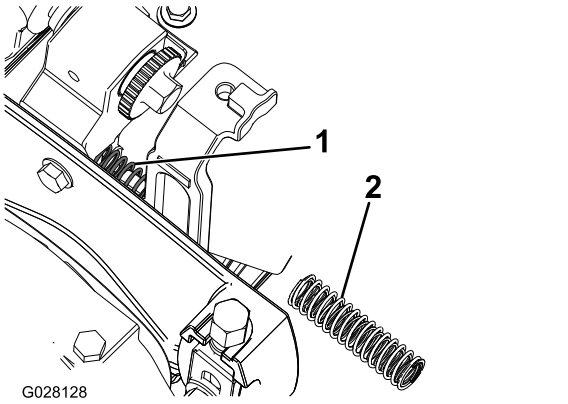

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Figure 6

1. Compression spring
2. Inner and outer compression spring

12. Slide the shim plate onto the rear of the right drive assembly as shown in Figure 7.

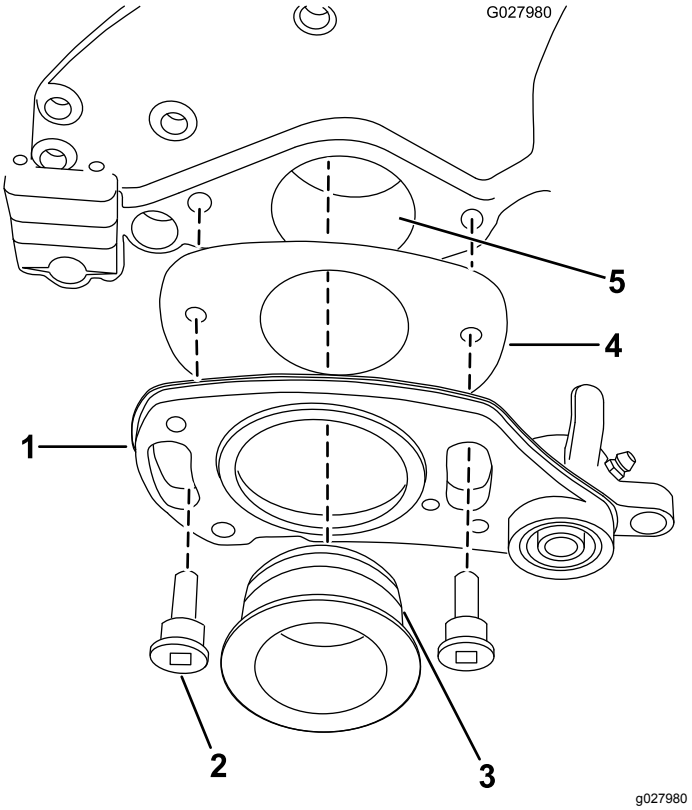

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Figure 7

1. Right drive assembly
2. Shoulder bolt
3. O-ring
4. Shim plate
5. Pilot bore

13. Put a light coating of grease on the O-ring and the pilot bore (Figure 7).
14. Secure the drive assembly using 2 shoulder bolts as shown in Figure 7.

    Note: Make sure that the side plate rotates freely.

15. Apply grease to the seals in the drive assembly bearing support and to the end of the groomer shaft (Figure 8).

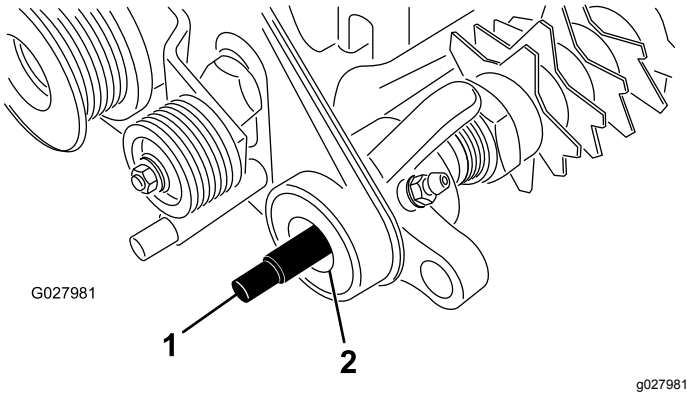


Figure 8

1. Groomer shaft
2. Seal lip

16. Slide the splined end of the groomer shaft into the drive-assembly bearing support (Figure 8).
17. Apply grease to the seal surface of the driven pulley, as shown in Figure 9.

    Note: Do not put grease on the area where the belt will ride.
18. Slide the pulley onto the groomer shaft (Figure 9).

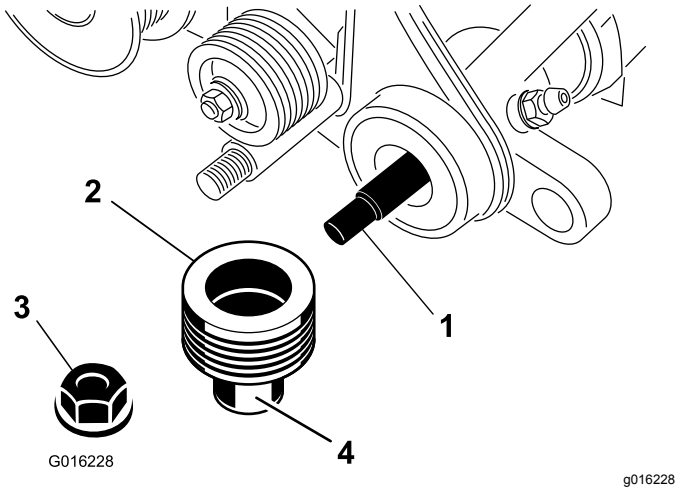


Figure 9

1. Groomer shaft
2. Driven pulley
3. Flange lock nut
4. Apply grease here

19. Secure the pulley to the shaft with a flange locknut and torque to 23 to 28 N·m (17 to 21 ft-lb) (Figure 9).
20. Apply grease to the seal in the left support plate and to the end of the groomer shaft (Figure 9).
21. Insert other end of the groomer shaft into the left support plate (Figure 5).
22. Install the reel belt-drive assembly using the previously removed bolts and ensure that the side plate rotates freely (Figure 5).
23. Install the lower pulley onto the reel drive shaft, securing it with the 2 set screws onto the key on the shaft (Figure 4).
24. Install the drive belt and tension it as described in the traction unit *Operator's Manual*.
25. Secure the groomer drive pulley to the reel shaft on the right side of the reel and torque it to 170 N·m (125 ft-lb) (Figure 10).

    Note: The use of an impact gun is not enough to ensure proper installation. Failure to properly torque the drive pulley can result in the assembly unscrewing itself during operation.

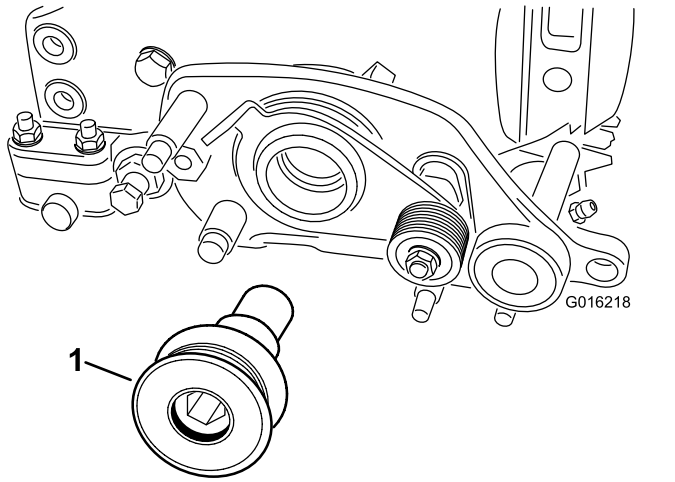


Figure 10

1. Drive pulley

26. Insert a bushing into the hole in the groomer drive assembly (Figure 11).

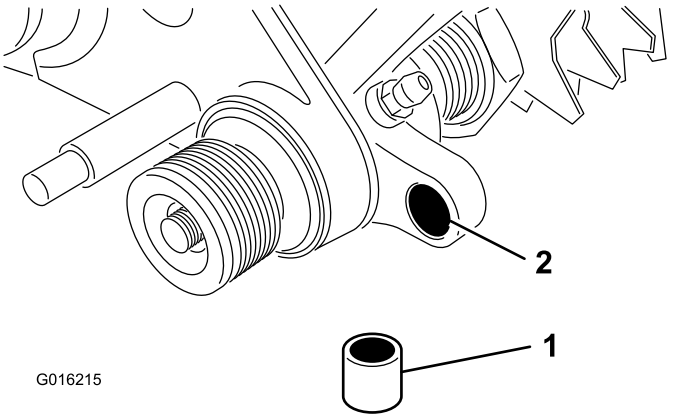


Figure 11

1. Bushing
2. Hole in groomer drive

27. Thread the height-of-cut adjusting screw into the top of the right adjuster arm assembly (Figure 12).

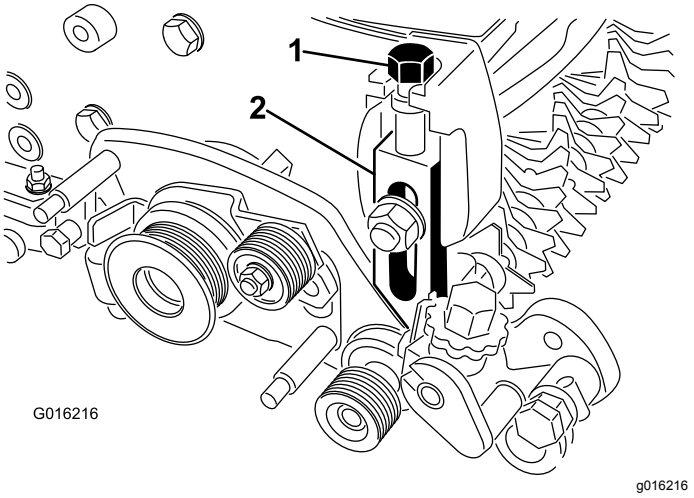


Figure 12

1. Height-of-cut screw
2. Right adjuster arm assembly

28. Install the right adjuster arm assembly to the cutting unit side plate using the existing plow bolt, nut, and a new washer.

    Note: Make sure that the rod end of the height-of-cut arm assembly slides into the bushing in the hole in the groomer drive assembly (Figure 12).

29. Secure the adjuster arm assembly rod end to the groomer drive assembly with a Belleville washer and locknut (Figure 13).

    Note: Do not overtighten the locknut. The washer should be compressed but the arm must be free to pivot.

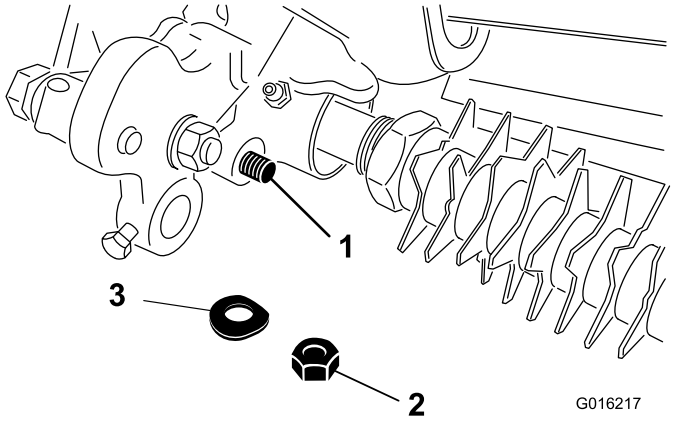


Figure 13

1. Rod end of the height-of-cut assembly
2. Locknut
3. Belleville washer

30. Insert the roller shaft into the right adjuster arm and loosely secure it with the bolt (Figure 14).

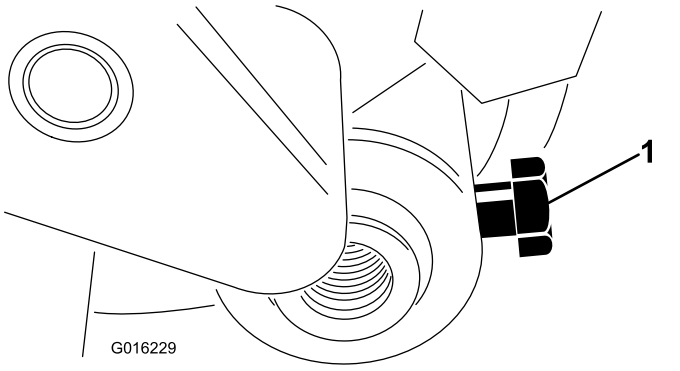


Figure 14

1. Roller shaft bolt

31. Thread the height-of-cut adjusting screw into the top of the left adjuster arm assembly (Figure 12).
32. Insert the roller shaft into the left adjuster arm. Do not tighten the bolt at this time.
33. Install the left adjuster arm assembly to the cutting unit side plate using the existing plow bolt, nut, and a new washer (Figure 12).

    Note: Make sure that the rod end slides into the bushing in the hole in the groomer drive assembly.

34. Secure the adjuster-arm assembly rod end to the groomer drive assembly with a Belleville washer and locknut (Figure 13).

35. Rotate the idler pulley until the shift lever spring can be hooked into the hole in the pulley bracket and onto the stud as shown in Figure 15.

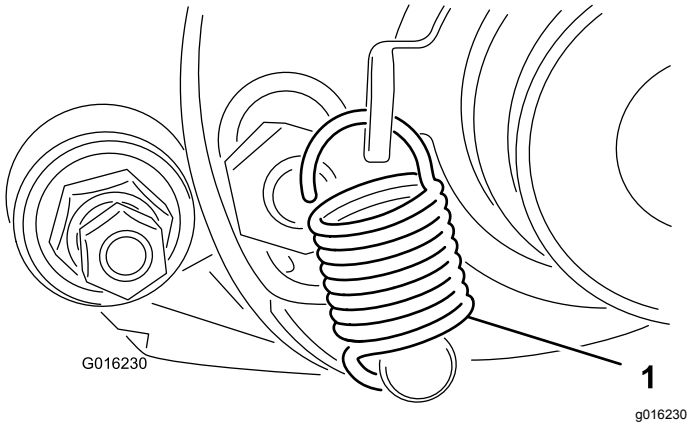


Figure 15

1. Shift lever spring

36. Route the belt onto the driver pulley, idler pulley, and driven pulley as shown in Figure 16.

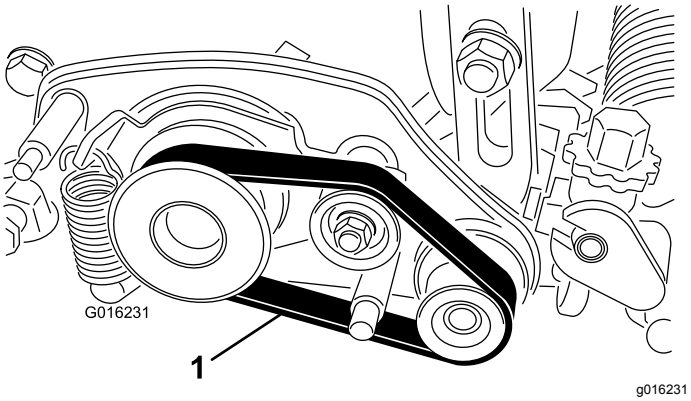


Figure 16

1. Drive belt

Important: **Ensure that the belt is centered on the pulleys and in the grooves (Figure 17).**

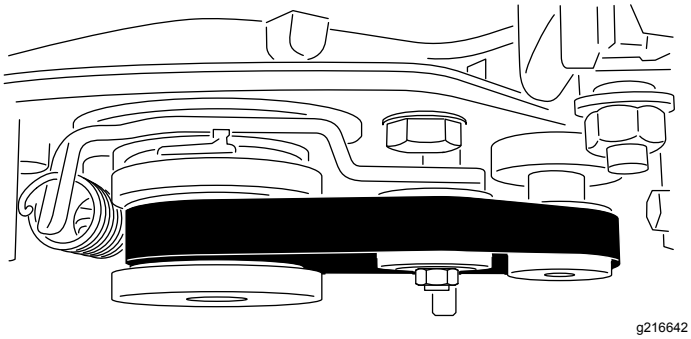


Figure 17

37. Mount the belt cover to the groomer housing assembly with 3 locknuts (Figure 18).

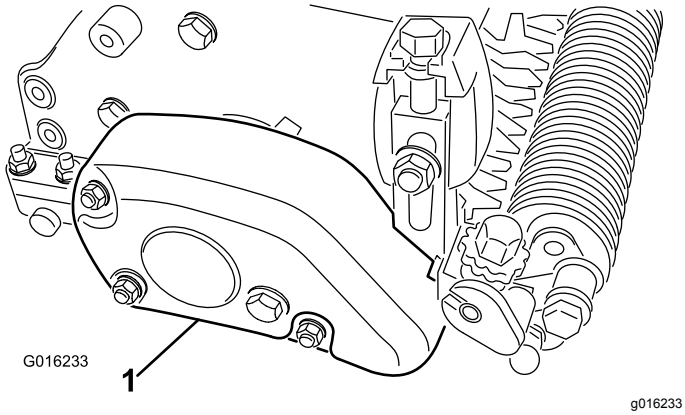


Figure 18

1. Belt cover

38. Center the roller between the adjuster arms and tighten the mounting bolts (Figure 14).

39. Lubricate the groomer bearings (Figure 19 and Figure 20) weekly or after every 10 operating hours, before extended periods of non-use, and immediately after every washing. Pump grease into the fittings until grease is purged onto the groomer shaft. Wipe excess grease from the seals and shaft.

Note: Operate the groomer for 30 seconds after greasing. Disengage the cutting unit and wipe excess grease from the seals and shaft.

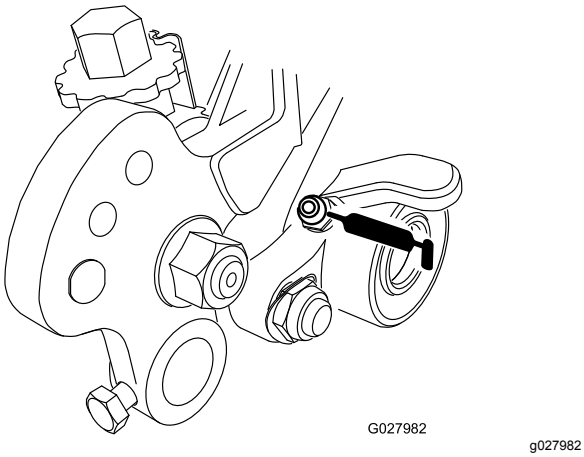


Figure 19

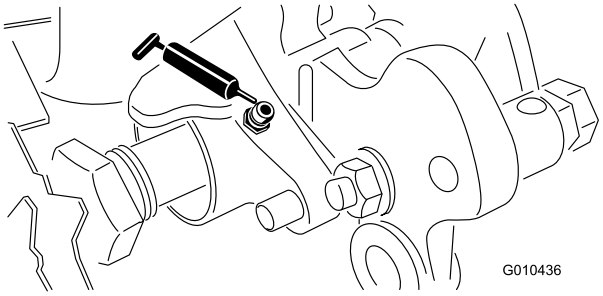


Figure 20

Operation

Introduction

Grooming is performed in the turf canopy above the soil level. Grooming promotes vertical growth of grass plants, reduces grain, and severs stolons producing a denser turf. Grooming produces a more uniform and tighter playing surface for faster and truer action of the golf ball.

Verticutting is a more aggressive cultivation technique designed to remove thatch by cutting through the turf canopy and into the thatch/mat layer. Grooming should not be considered a replacement for verticutting. Verticutting is generally a more rigorous and periodic treatment that can temporarily damage the playing surface, while grooming is a routine and gentler treatment designed to manicure the turf.

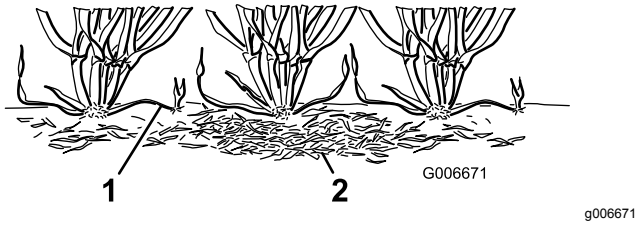


Figure 21

1. Grass runners (stolons)
2. Thatch

Grooming brushes are a more recent development which are designed to be less intrusive than conventional grooming blades when adjusted to lightly contact the turf canopy. Brushing may be more benefical for the ultra-dwarf cultivars, since these grass types have more of a upright growth pattern and do not fill in that well through horizontal growth. Brushes, however, can injure leaf tissue if they are set to penetrate too deeply into the canopy.

Grooming is similar to verticutting in its runner cutting action. Grooming blades however, should never penetrate the soil like verticutting or dethatching. Groomer blades are spaced closer together and are used more often than verticutters so that they are more effective in cutting runners and removing thatch.

Because grooming injures leaf tissue to some degree it should be avoided during periods of high stress. Cool season species such as creeping bent grass and annual blue grass should not be groomed during high temperature (and high humidity) periods in midsummer.

It is difficult to make precise recommendations on use of grooming reels because so many variables affect the performance of grooming, including:

- The time of the year (i.e., the growing season) and weather pattern

- The general condition of each green
- The frequency of grooming/cutting-both how many cuttings per week and how many passes per cutting
- The height-of-cut setting on the main reel
- The height/depth setting on the grooming reel
- How long the grooming reel has been in use on this green
- The type of grass on the green
- The overall greens management program (i.e. irrigation, fertilizing, spraying, coring, over seeding, etc.)
- Traffic
- Stress periods (i.e., high temperatures, high humidity, unusually high traffic)

These factors can vary from golf course to golf course and from green to green. It is important, therefore, to inspect the greens frequently and vary the grooming practice in accordance with the need.

The groomer is set at the factory with 13 mm (1/2 inch) blade spacing. The 13 mm (1/2 inch) setting allows you to groom slightly deeper to cut stolons without thinning out the turf excessively. By removing spacers and adding blades or adding spacers and removing blades the groomer can be changed to 6 mm (1/4 inch) or 19 mm (3/4 inch) spacing.

Grooming with 6 mm (1/4 inch) blade spacing is recommended for fast growth periods (spring through early summer) mainly to thin out the top layer of the canopy. Grooming with 19 mm (3/4 inch) blade spacing is recommended for slower growth periods (late summer through fall and winter). During high stress periods it may be desirable to not use the grooming reel.

Note: Grooming with 6 mm (1/4 inch) blade spacing will tend to remove more grass blades and thatch and cut more runners than grooming with 13 mm (1/2 inch) or 19 mm (3/4 inch) blade spacing. If you are grooming with 6 mm (1/4 inch) blade spacing, 1 or 2 groomings per week will probably be sufficient except during maximum growth periods.

Note: The practice of changing the direction of cut each time the green is cut should be continued when a groomer is used. This rotation will enhance the effects of the grooming.

Setting the Height/Depth of the Groomer

The groomer blade height/depth can be set using the following chart, figures, and procedure:

Rear Roller Spacers Required	Height-of-Cut (mm)	Height-of-Cut (inches)	Groomer Arm Position	Height-of-Grooming Range (mm)	Height-of-Grooming Range (inches)
0	1.5 mm 3.0 mm 4.8 mm 6.3 mm	0.06 inches 0.12 inches 0.19 inches 0.25 inches	A A B B	0.7 to 1.5 mm 1.5 to 3.0 mm 2.2 to 4.8 mm 3.0 to 6.3 mm	0.03 to 0.06 inches 0.06 to 0.12 inches 0.09 to 0.19 inches 0.12 to 0.25 inches
1	7.8 mm 9.6 mm	0.31 inches 0.38 inches	B B	3.8 to 7.8 mm 4.5 to 9.6 mm	0.15 to 0.31 inches 0.18 to 0.38 inches
2	11.1 mm 12.7 mm	0.44 inches 0.50 inches	B B	5.3 to 11.1 mm 6.3 to 12.7 mm	0.21 to 0.44 inches 0.25 to 0.50 inches
3	15.8 mm	0.625 inches	B	9.3 to 12.7 mm	0.37 to 0.50 inches
4	19.0 mm	0.75 inches	B	12.7 to 15.7 mm	0.50 to 0.62 inches

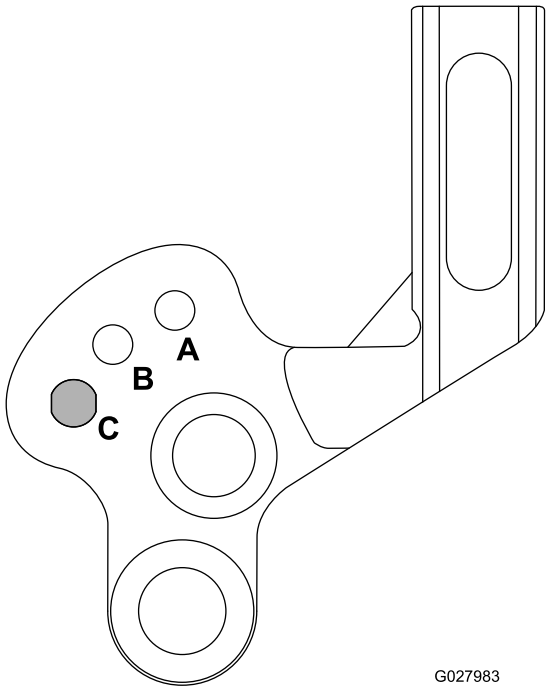


Figure 22

1. A = Low Height-of-Groom range
2. B = High Height-of-Groom range/Transport for A range
3. C = Transport for B range (reduces clearance to the grass basket)

Note: If you are using the groomer on an eFlex traction unit, note that the groomer will cause the unit to drain the battery faster than without. The deeper you set the groomer, the more power it will require and the faster the battery charge will be depleted.

1. Make sure the rollers are clean. Position the machine on a flat, level work surface.
2. Using the above chart, determine the amount of rear roller spacers required to attain the desired grooming height/depth.

   Note: If installing 3 or 4 spacers on each side of the rear roller, use the longer screws (included in loose parts) instead of the standard screws.
3. Set the height of cut of the main reel.
4. Using the above chart, determine the position required to attain the desired grooming height/depth. Raise or lower the grooming reel as follows;

   A. Loosen the bolts on the right and left groomer arms (Figure 23).

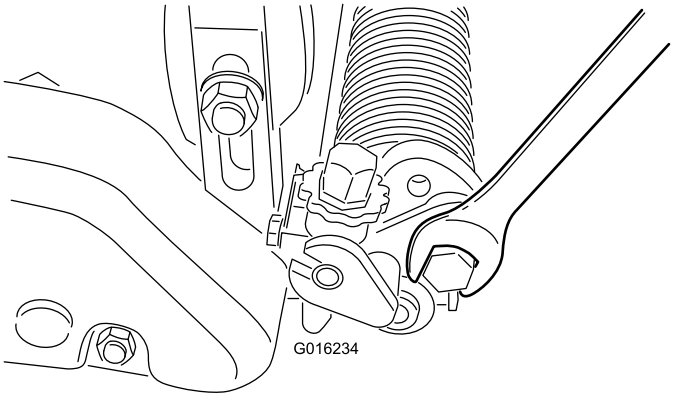


Figure 23

   B. Rotate the arms up or down to the A or B position (Figure 24).

   C. Tighten the bolts securing the adjustment.

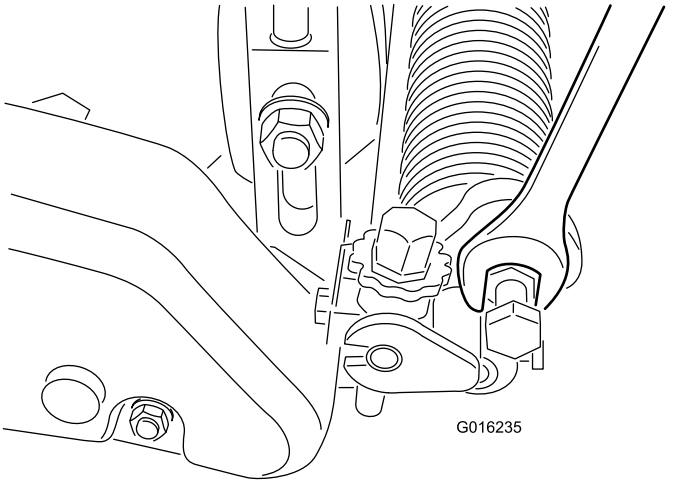


Figure 24

5. On 1 end of groomer shaft, measure the distance from the lowest tip of a groomer blade to work surface. Turn the groomer height adjusting knob (Figure 25) to raise or lower blade tip to the desired grooming height. Each notch on the adjusting knob is approximately equal to 0.08 mm (0.003 inch) of groomer depth.

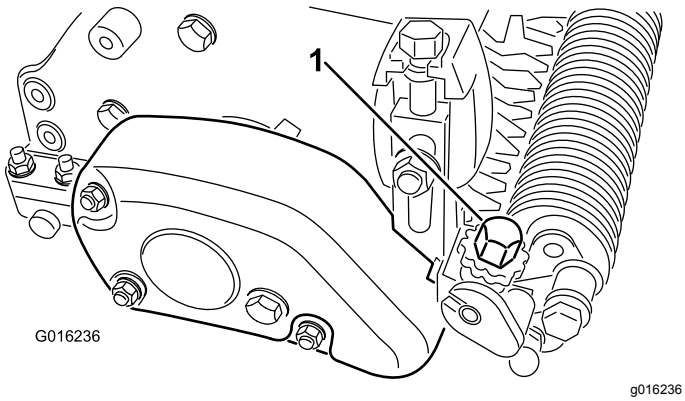


Figure 25

1. Groomer height adjusting knob

6. Repeat this procedure on the opposite end of the groomer, then check the setting on first side. Adjust as required.
7. If you are not using the grooming mode, raise the grooming reel from A to B or from B to C.

   Note: At higher grooming heights, the grooming reel may have to be set in the C position, making the raise/lower feature unavailable.

Testing the Performance of the Groomer

Important: **Improper or over-aggressive use of the grooming reel (i.e., too deep or too frequent grooming) may cause unnecessary stress on the turf leading to severe greens damage. Use the groomer cautiously.**

It is important to determine the performance of the groomer before putting it into regular use on greens. We strongly suggests that you use a formal test procedure. The following is a practical way of determining the proper height/depth setting:

1. Set the cutting reel to the height-of-cut that you would normally use without the grooming reel. Use a Wiehle roller and scraper for the front roller.
2. Set the groomer reel 1/2 the height-of-cut setting above the ground (e.g., for 3.2 mm (1/8 inch) height-of-cut setting, set the groomer at 1.6 mm (1/16 inch) above the ground).

   Note: If you are using the groomer brush, set it at the height-of-cut setting above the ground (e.g. for 3.2 mm (1/8 inch) height-of-cut setting, set the groomer at 3.2 mm (1/8 inch) above the ground).
3. Make a pass over the test green, then lower the groomer flush with the roller level and make another pass over the test green.

   Note: If you are using the groomer brush, lower it to 1/2 the height-of-cut setting above the ground (e.g. for 3.2 mm (1/8 inch) height-of-cut setting, set the groomer at 3.2 mm (1/8 inch) above the ground).
4. Compare the results. The first groomed area when the setting was 1/2 the height-of-cut setting above the ground will have removed significantly less grass and thatch than the second setting.

   Check the test green 2 or 3 days after the first grooming for general condition/damage. If the groomed areas are turning yellow/brown, and the non-groomed areas are green, then the grooming was too aggressive.

   Note: The color of the grass will change when you use the grooming reel. An experienced greens superintendent can judge by the color of the turf (along with close examination) if the current grooming practice is appropriate for the particular green. Because the grooming reel stands up more grass and removes thatch, the quality of the cut will not be the same as without the groomer. This effect is most noticeable the first few times you use a groomer on a green.

Note: On multiple passes (i.e., double and triple cutting), the groomer will continue to penetrate deeper on each successive pass. Multiple passes are not recommended.

5. After you test the performance of the groomer on a test green and obtain satisfactory results, you can begin grooming on the playing greens. However, each green may respond differently to grooming. In addition, growing conditions are constantly changing. Inspect the groomed greens frequently and make adjustments to the grooming procedure as often as necessary.

Transporting the Machine

When you wish to mow without the groomer or need to transport the machine, raise the grooming reel into its raised transport position as shown in Figure 22.

Maintenance

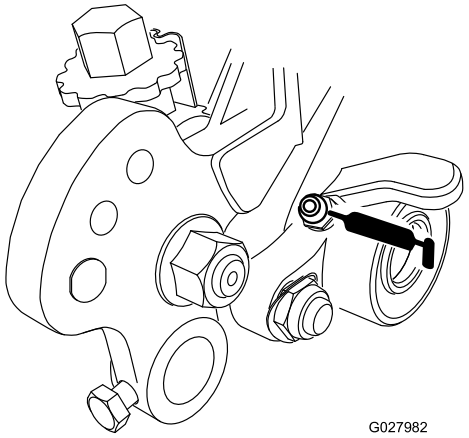
Cleaning the Grooming Reel

Wash off the grooming reel after use. Do not leave the grooming reel in water or the components will rust.

Greasing the Groomer Bearings

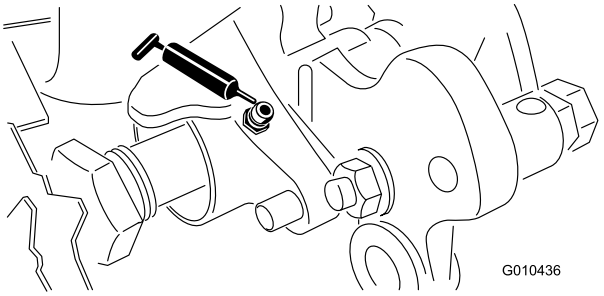
Lubricate the groomer bearings (Figure 26 and Figure 27) weekly or after every 10 operating hours, before extended periods of non use, and immediately after every washing. Pump grease into fittings until grease is purged onto groomer shaft. Wipe excess grease from the seals and shaft.

Note: Operate groomer for 30 seconds after greasing. Disengage cutting unit and wipe excess grease from the seals and shaft.



g027982

Figure 26



g010436

Figure 27

Inspecting the Blades

Inspect the grooming-reel blades frequently for damage and wear. Straighten bent blades with a pliers. Replace worn blades; torque the lock nuts to 42 to 49 N·m (31 to 36 ft-lb). When inspecting the blades, check to see that the right and left blade shaft end nuts are tight.

Note: If using spring steel blades, when one side of the blades become worn, remove the grooming reel, rotate it 180 degrees, and install it so that the unworn side is facing the direction of rotation.

Note: Because the groomer may introduce more debris (i.e., dirt and sand) into the cutting unit than what the reel would normally be exposed to, the bedknife and main reel should be checked for wear more frequently. This is especially important in sandy soil and/or when the groomer is set for penetration.

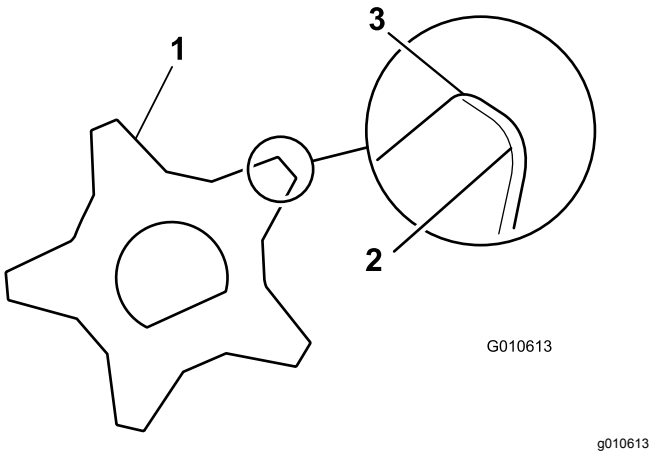


Figure 28

1. Grooming blade
2. Dull (rounded) edges
3. Sharp edges

Replacing the Grooming Reel

You can remove the grooming reel to replace individual blades or the entire shaft. Remove and replace the grooming reel shaft using the following procedure:

1. Remove the belt cover from the groomer housing (Figure 29).

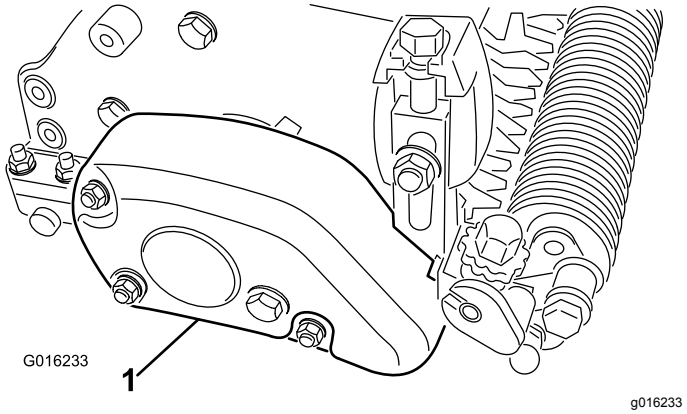


Figure 29

1. Belt cover

2. Remove the belt from the driver pulley, idler pulley, and driven pulley (Figure 30).

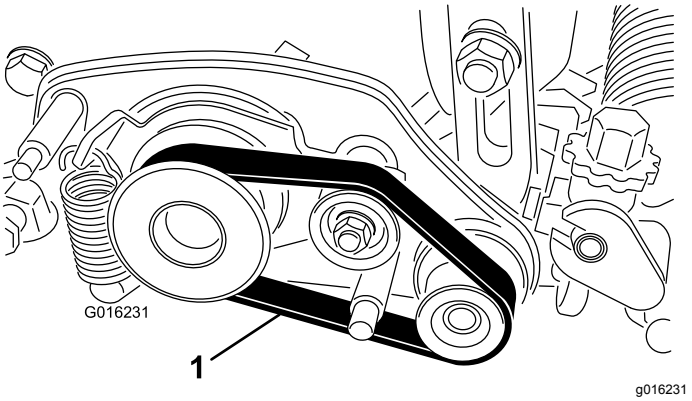


Figure 30

1. Belt

3. Loosen the bolt securing the roller shaft to the height-of-cut arm (Figure 31).

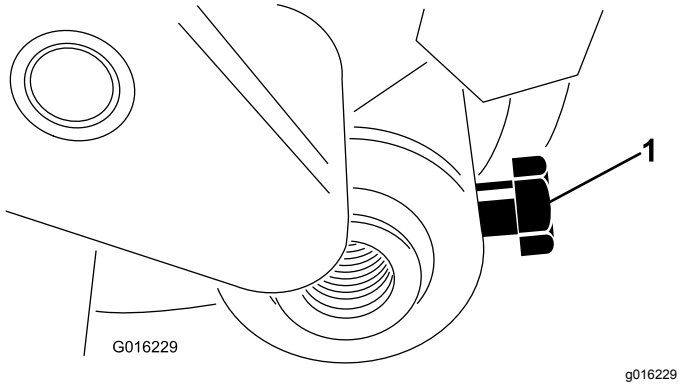


Figure 31

1. Roller shaft bolt

4. Remove the locknut and Belleville washer securing the height-of-cut arm assembly rod end to the groomer drive assembly (Figure 32).

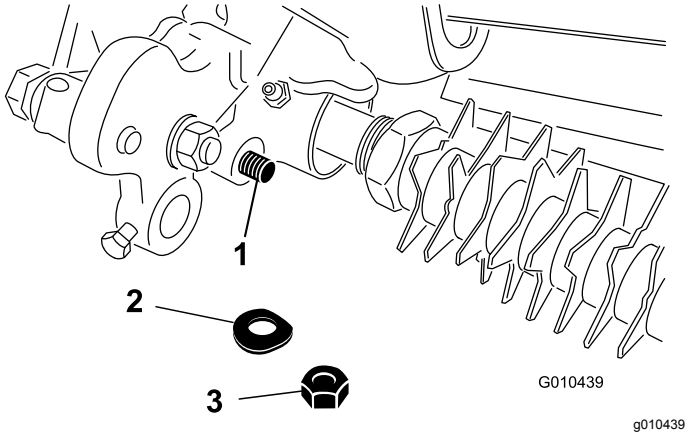


Figure 32

1. Rod end of height of cut assembly
2. Belleville washer
3. Locknut

5. Remove the plow bolt, nut, and washer securing the height-of-cut arm assembly to the side plate (Figure 33).

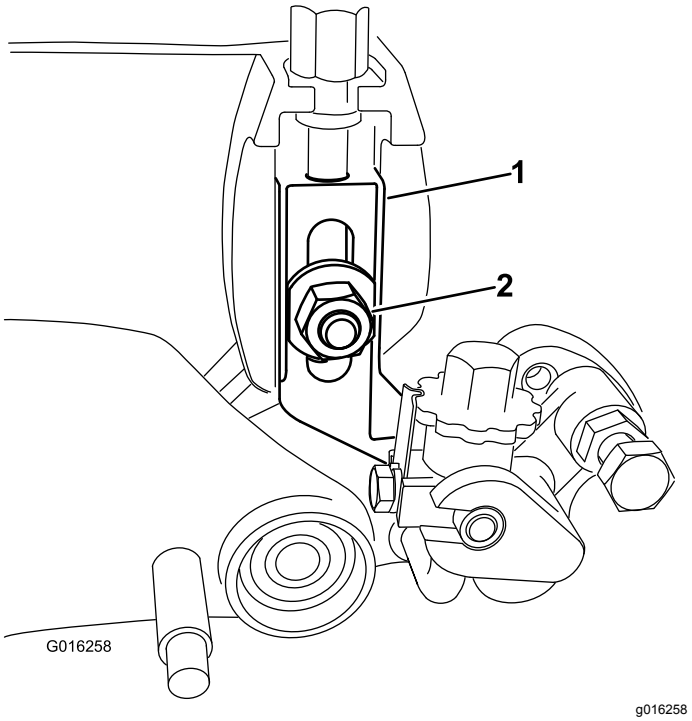


Figure 33

1. Right adjuster arm assembly
2. Washer and locknut

6. Remove the flange locknut securing the driven pulley to the end of the groomer shaft (Figure 34). Remove the pulley.

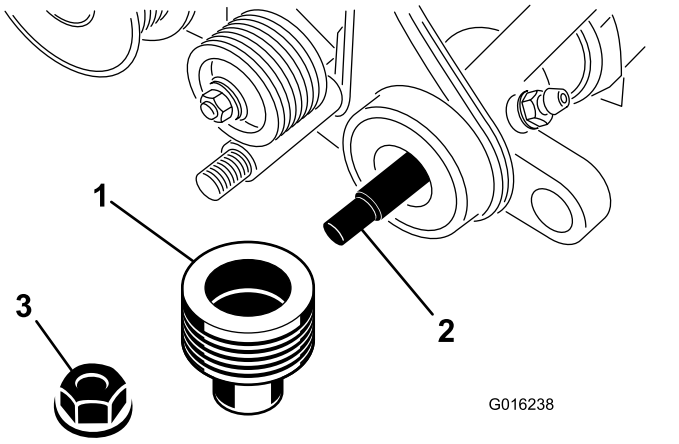


Figure 34

1. Groomer driven pulley
2. Grooming reel shaft
3. Flange locknut

7. Remove the groomer drive pulley from the reel shaft (Figure 35).

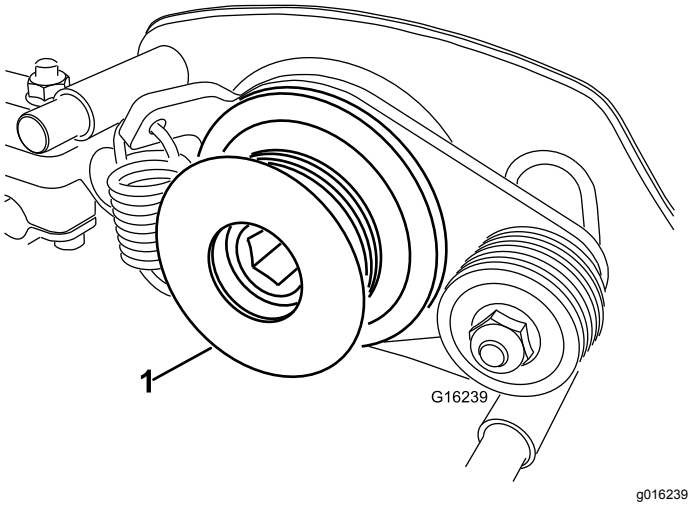


Figure 35

1. Groomer drive pulley

8. Remove the 2 shoulder bolts securing the groomer drive assembly to the side plate adapters (Figure 36).

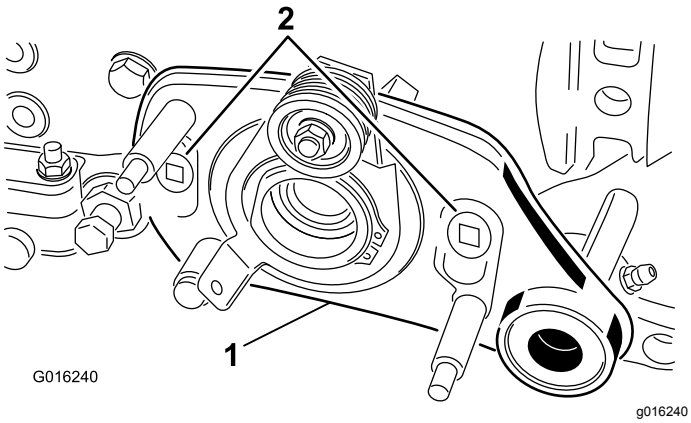


Figure 36

1. Groomer drive assembly 2. Shoulder bolts

9. Remove the groomer drive assembly from the bolts.
10. Remove the groomer shaft.
11. Torque the groomer drive pulley to 170 N·m (125 ft-lb).

   Note: The use of an impact gun is not enough to ensure proper installation. Failure to properly torque the drive pulley can result in the assembly unscrewing itself during operation.

Notes:

Declaration of Incorporation

The Toro Company, 8111 Lyndale Ave. South, Bloomington, MN, USA declares that the following unit(s) conform(s) to the directives listed, when installed in accordance with the accompanying instructions onto certain Toro models as indicated on the relevant Declarations of Conformity.

Model No.	Serial No.	Product Description	Invoice Description	General Description	Directive
04259	—	Forward-Rotating Groomer Drive System-Greensmaster Flex 1800/2100 and eFlex 1800/2100 Mower	FLEX GROOMER DRIVE, FORWARD ROTATING	Groomer Drive System (FR)	2006/42/EC

Relevant technical documentation has been compiled as required per Part B of Annex VII of 2006/42/EC.

We will undertake to transmit, in response to requests by national authorities, relevant information on this partly completed machinery. The method of transmission shall be electronic transmittal.

This machinery shall not be put into service until incorporated into approved Toro models as indicated on the associated Declaration of Conformity and in accordance with all instructions, whereby it can be declared in conformity with all relevant Directives.

Certified:

David Klis
Sr. Engineering Manager
8111 Lyndale Ave. South
Bloomington, MN 55420, USA
December 18, 2013

Authorized Representative:

Marcel Dutrieux
Manager European Product Integrity
Toro Europe NV
Nijverheidsstraat 5
2260 Oevel
Belgium

Tel. +32 16 386 659