



Count on it.

Form No. 3363-160 Rev A

Operator's Manual

Guardian 72" Recycler Mower **Groundsmaster® 300 Series Traction Units** Model No. 30716—Serial No. 310000001 and Up



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

Introduction

This rotary-blade lawn cutting deck 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 cutting grass on well-maintained lawns in parks, sports fields, and on commercial grounds. It is not designed for cutting brush, mowing grass and other growth alongside highways, or for agricultural uses.

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 numbers are stamped into a plate that is mounted on the rear of the mower deck. 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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Safety

This machine meets or exceeds CEN standard EN 836:1997, ISO standard 5395:1990, and ANSI B71.4-2004 specifications in effect at the time of production.

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert symbol (Figure 1), which means Caution, Warning, or Danger—personal safety instruction. Failure to comply with the instruction may result in personal injury or death.

Safe Operating Practices

The following instructions are from the CEN standard EN 836:1997, ISO standard 5395:1990, and ANSI B71.4-2004.

Training

- Read the *Operator's Manual* and other training material carefully. If the operator or mechanic can not read the language of this manual, it is the owner's responsibility to explain this material to them.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner is responsible for training the users
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent and is responsible for accidents or injuries occurring to himself or herself, other people, or property.

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including hard hat, safety glasses and ear protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
- Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire which can be thrown by the machine.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
 - Use only an approved container.

- Never remove fuel cap or add fuel with engine running. Allow engine to cool before refueling. Do not smoke.
- Never refuel or drain the machine indoors.
- Check that operator's presence controls, safety switches, and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operation

- Never run an engine in an enclosed area.
- Only operate in good light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting the engine. Only start the engine from the operator's position. Use seat belts if provided.
- Slow down and use extra care on hillsides. Be sure to travel in the recommended direction on hillsides. Turf conditions can affect the machine's stability. Use caution while operating near drop-offs.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never raise the deck with the blades running.
- Never operate with guards not securely in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Do not change the engine governor setting or overspeed the engine.
- Stop on level ground, lower the cutting units, disengage drives, engage parking brake (if provided), shut off engine before leaving the operator's position for any reason.
- Stop equipment and inspect the blades after striking objects or if an abnormal vibration occurs. Make necessary repairs before resuming operations.
- Keep hands and feet away from the cutting units.
- Look behind and down before backing up to be sure of a clear path.
- Never carry passengers and keep pets and bystanders away.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if not mowing.
- Do not operate the mower under the influence of alcohol or drugs.
- Lightning can cause severe injury or death. If lightning is seen or thunder is heard in the area, do not operate the machine; seek shelter.

- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- The operator shall turn on flashing warning lights, if provided, whenever traveling on a public road, except where such use is prohibited by law.

Maintenance and Storage

- Disengage drives, lower the cutting units, move traction pedal to Neutral, set parking brake, stop engine and remove key. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting units, drives, muffler. Let engine cool before storing and do not store near flames, and engine to help prevent fires. Clean up oil or fuel spillage.
- Let engine cool before storing and do not store near flame.
- Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
- Park machine on level ground. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Use care when checking blades. Wrap the blades or wear gloves, and use caution when servicing them. Only replace blades. Never straighten or weld them.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.
- Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.

Toro Mower Safety

The following list contains safety information specific to Toro products or other safety information that you

must know that is not included in the CEN, ISO, or ANSI standard.

This product is capable of amputating hands and feet and throwing objects. Always follow all safety instructions to avoid serious injury or death.

Use of this product for purposes other than its intended use could prove dangerous to user and bystanders.

- Know how to stop the engine quickly.
- Do not operate the machine while wearing tennis shoes or sneakers.
- Wearing safety shoes and long pants is advisable and required by some local ordinances and insurance regulations.
- Handle fuel carefully. Wipe up any spills.
- Check the safety interlock switches daily for proper operation. If a switch should fail, replace the switch before operating the machine.
- Using the machine demands attention. To prevent loss of control:
 - Do not drive close to sand traps, ditches, creeks, embankments, or other hazards.
 - Avoid sudden stops and starts.
 - When near or crossing roads, always yield the right-of-way.
 - Lower the cutting unit when going down slopes.
- The grass deflector must always be installed and in the lowest position on the side discharge cutting unit. Never operate the mower without the deflector or entire grass collector.
- If the cutting unit discharge area ever plugs, shut the engine off before removing the obstruction.
- Cut grass slopes carefully. Do not start, stop, or turn suddenly.
- Do not touch the engine or muffler while the engine is running or soon after it has stopped because these areas could be hot enough to cause burns.

Maintenance and Storage

- Check the blade mounting bolts frequently to be sure that they are tightened to specification.
- Make sure that all hydraulic line connectors are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
- Keep your body and hands away from pin hole leaks or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, not your hands,

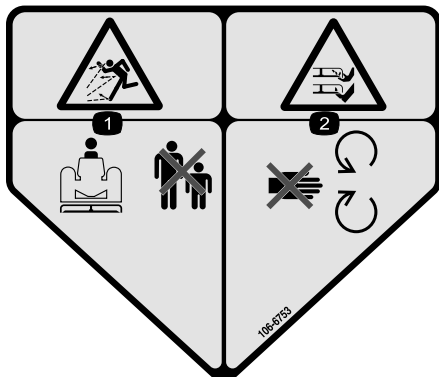
to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury.

- Before disconnecting or performing any work on the hydraulic system, all pressure in the system must be relieved by stopping the engine and lowering the cutting units to the ground.
- If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing, and any parts of the body away from the cutting units, attachments, and any moving parts. Keep everyone away.
- Do not overspeed the engine by changing governor settings. To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer.
- The engine must be shut off before checking the oil or adding oil to the crankcase.
- Make sure that the mower fuel tank is empty if the machine is to be stored in excess of 30 days. Do not store the mower near any open flame or where gasoline fumes may be ignited by a spark.
- Perform only those maintenance instructions described in this manual. If major repairs are ever needed or if assistance is desired, contact an Authorized Toro Distributor.
- To make sure of optimum performance and continued safety certification of the machine, use only genuine Toro replacement parts and accessories. Replacement parts and accessories made by other manufacturers could be dangerous, and such use could void the product warranty.

Safety and Instructional 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.



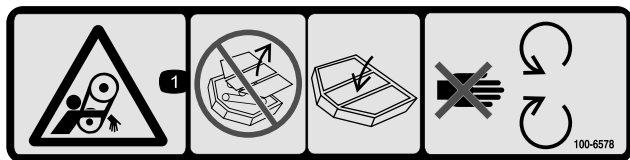
106-6753

1. Thrown object hazard—keep bystanders a safe distance from the machine.
2. Cutting/dismemberment hazard of hand or foot, mower blade—stay away from moving parts.



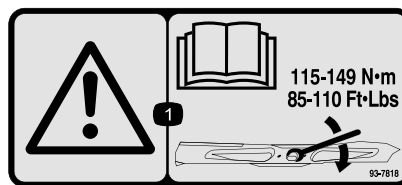
107-2915

1. Entanglement hazard, shaft—keep bystanders a safe distance from the machine.



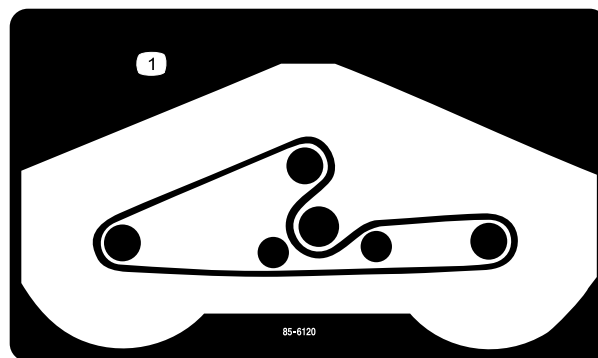
100-6578

1. Entanglement hazard, belt—do not operate the machine with the shields or guards removed; always keep the shields and guards in place; stay away from moving parts.



93-7818

1. Warning—read the *Operator's Manual* for instructions on torquing the blade bolt/nut to 115-149 N-m (85-110 ft-lb).



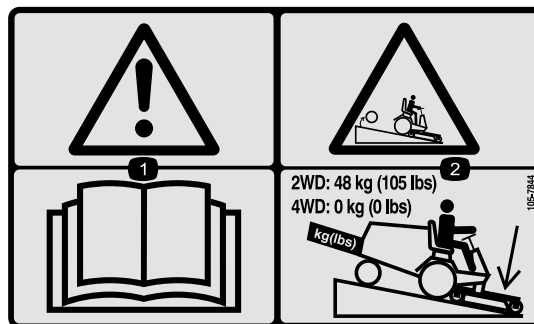
85-6120

1. Belt routing



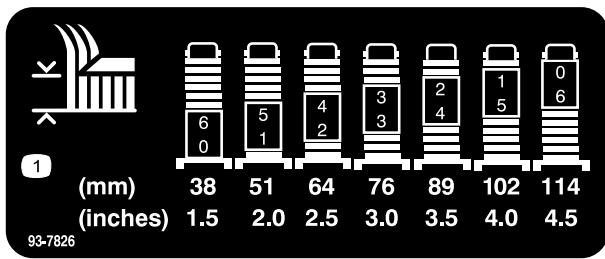
93-6697

1. Read the *Operator's Manual*.
2. Add SAE 80w-90 (API GL-5) oil every 50 hours.



105-7844

1. Warning—read the *Operator's Manual*.
2. Rear wheel weight is required when operating a two-wheel drive Groundsmaster 328-D or Goundsmaster 345.



93-7826

1. Height-of-cut adjustment
-

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	Large castor wheel assembly	2	Install the castor wheel assemblies.
	Small castor wheel assembly	2	
2	Drive shaft	1	Install the drive shaft to the traction unit
3	No parts required	–	Connect the right-hand push arm to the cutting unit
4	No parts required	–	Connect the left-hand push arm to the cutting unit
5	Bolt, 5/16 x 1-3/4 inches	2	Connect the drive shaft to the cutting unit gear box
	Locknut, 5/16 inches	2	
	Roll pin, 3/16 x 1-1/2 inches	2	
6	No parts required	–	Install the lift chains
7	No parts required	–	Grease the machine.
8	No parts required	–	Install rear weight

Media and Additional Parts

Description	Qty.	Use
Parts Catalog	1	Review the material and save in an appropriate place:
Operator's Manual	1	
Declaration of Conformity	1	

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

1. Remove the tensioning caps from the spindle shafts and slide off the spacers and thrust washers (Figure 2 & Figure 3).

1

Installing the Castor Wheel Assemblies

Parts needed for this procedure:

2	Large castor wheel assembly
2	Small castor wheel assembly

Procedure

The thrust washers, spacers, and tensioning caps have been installed on the castor wheel spindles for shipping.

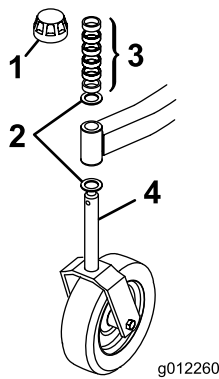


Figure 2

- | | |
|-------------------|---------------------------------|
| 1. Tensioning cap | 3. Spacers |
| 2. Thrust washers | 4. Large (front) castor spindle |

- Slide the spacers onto the castor spindle to get the desired height-of-cut; refer to the Height-of-Cut Chart in the Adjusting the Height of cut section . Slide a thrust washer onto the spindle. Push the large castor spindle through the front castor arm and the small castor spindle through the rear castor arm. Install another thrust washer and the remaining spacers onto the spindle and install the tensioning cap to secure the assembly (Figure 2 & Figure 3).

Important: The thrust washers, not the spacers, must contact the top and bottom of the castor arm.

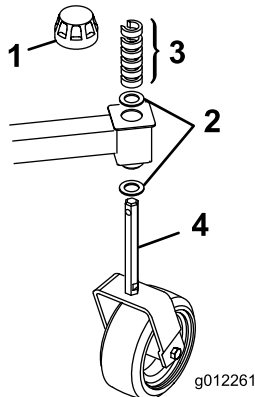


Figure 3

- | | |
|-------------------|--------------------------------|
| 1. Tensioning cap | 3. Spacers |
| 2. Thrust washers | 4. Small (rear) castor spindle |

- Ensure that all four castor wheels are set at the same height-of-cut; then roll the cutting unit off of the wooden pallet.

2

Installing the Drive Shaft to the Traction Unit

Parts needed for this procedure:

- | | |
|---|-------------|
| 1 | Drive shaft |
|---|-------------|

Procedure

Slide the smaller yoke end of the drive shaft onto the traction unit PTO shaft while aligning the mounting holes (Figure 4). Secure them with a roll pin. Do not install the front end of the drive shaft at this time.

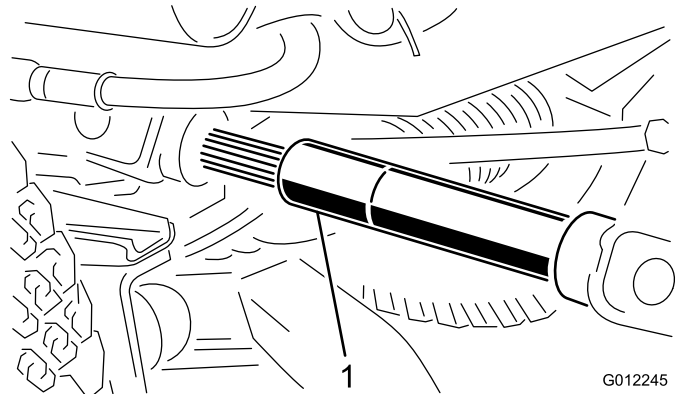


Figure 4

1. Drive shaft

3

Connecting the Right-Hand Push Arm to the Cutting Unit

No Parts Required

Procedure

⚠ WARNING

The right-hand push arm is spring loaded to about 100 lb. (45 kg). Sudden release of the push arm could cause injury.

Another person is needed to push the arm down during this procedure.

1. Remove the 2 self-tapping screws securing the PTO shield to the top of the cutting unit gear box mounting plate and remove the shield (Figure 5).

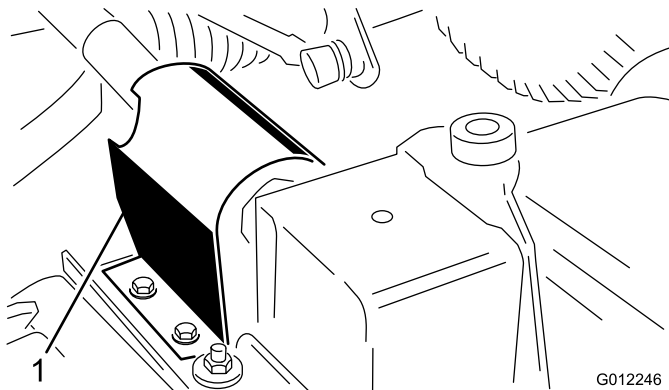


Figure 5

1. PTO shield

2. Move the cutting unit into position in front of the traction unit.
3. Measure the distance from the end of the right-hand push arm to the center of the ball joint (grease fitting) (Figure 6). The distance should be 2-3/4 inches (70 mm). If the distance is not 2-3/4 inches (70 mm), loosen the jam nut securing the ball joint to the push arm and rotate the ball joint in or out until the correct distance is attained (Figure 6). Do not tighten the jam nut at this time.

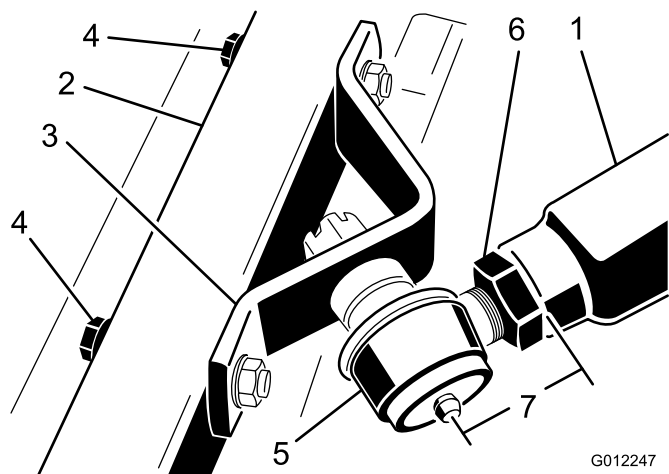


Figure 6

- | | |
|------------------------|--------------------------|
| 1. Right-hand push arm | 4. Capscrews and washers |
| 2. Castor arm | 5. Ball joint |
| 3. Ball joint mount | 6. Jam nut |

4. Have another person carefully push down on the push arm until the holes in the ball joint mount line up with the holes in the castor arm. Immediately slide a 4 x 4 inch block of wood between the top of the push arm and the underside of the chassis.

5. Secure the ball joint mount to the castor arm with 2 capscrews (7/16 x 3 inches), flat washers (7/16 inches), and flange nuts (7/16 inches). Position the flat washers to the outside of the castor arm.
6. Tighten the large jam nut securing the ball joint to the push arm (Figure 6). When tightening the jam nut, hold the ball joint straight to permit proper oscillation during raising and lowering of the cutting unit. Carefully remove the wood block holding the push arm down.

4

Connecting the Left-Hand Push Arm to the Cutting Unit

No Parts Required

Procedure

⚠ WARNING

The left-hand push arm is spring loaded to about 150 lb. (68 kg). Sudden release of the push arm could cause injury.

Another person is needed to push the arm down during this procedure.

1. Remove the 2 capscrews, flat washers, and flange nuts securing the left-hand ball joint mount and chain bracket to the left-hand castor arm (Figure 7). Remove the ball joint mount and chain bracket.
2. Remove the cotter pin and castle nut securing the left-hand ball joint mount to the left-hand push arm on the traction unit. Install the ball joint mount (removed from the castor arm) to the push arm with the castle nut and cotter pin previously removed (Figure 7).
3. Measure the distance from the end of the left-hand push arm to the center of the ball joint (grease fitting) (Figure 7). The distance should be 2-1/2 inches (64 mm). If the distance is not 2-1/2 inches (64 mm), loosen the jam nut securing the ball joint to the push arm and rotate the ball joint in or out until the distance is attained (Figure 7). Do not tighten the jam nut at this time.

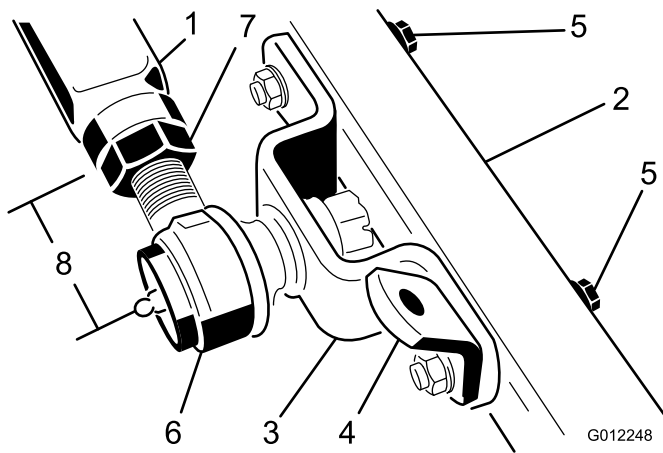


Figure 7

1. Left-hand push arm
2. Castor arm
3. Ball joint mount
4. Chain mount
5. Capscrews and washers
6. Ball joint
7. Jam nut

4. Have another person carefully push down on the push arm until the holes in the ball joint mount line up with the holes in the castor arm. Immediately slide a 4 x 4 inch block of wood between the top of the push arm and the underside of the chassis.

⚠ WARNING

Sudden release of the push arm could cause injury.

Make sure that the wooden block does not slip out.

5. Secure the ball joint mount and chain bracket to the castor arm with the capscrews, flat washers, and flange nuts previously removed. Position the flat washers to the outside of the castor arm. Mount the chain bracket in the forward set of holes.
6. Tighten the large jam nut securing the ball joint to the push arm. When tightening the jam nut, hold the ball joint straight to permit proper oscillation during raising and lowering of the cutting unit. Carefully remove the wood block holding the push arm down.

5

Connecting the Drive Shaft to the Cutting Unit Gear Box

Parts needed for this procedure:

2	Bolt, 5/16 x 1-3/4 inches
2	Locknut, 5/16 inches
2	Roll pin, 3/16 x 1-1/2 inches

Procedure

Important: The drive shaft yokes must be exactly in line with each other when the outer yoke is installed on the gear box splined PTO shaft. Remove the sleeve and change the yoke position if the alignment is not correct. Misalignment of the two yokes will shorten the life of the drive shaft and cause unnecessary vibration when the cutting unit is operated.

1. Line up the holes in the yoke and input shaft of the gear box. Slide the yoke onto the shaft and secure them together with a roll pin and 2 capscrews (5/16 x 1-3/4 inches) and locknuts (5/16 inch) (Figure 8).

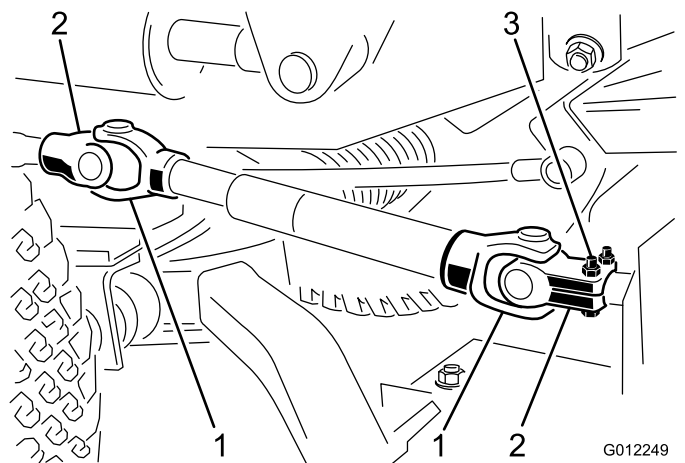


Figure 8

1. Drive shaft yokes
2. Yokes in phase
3. Roll pin and capscrews

2. Mount the PTO shield to the top of the cutting unit gear box mounting plate with the 2 self-tapping screws previously removed.

6

Installing the Lift Chains

No Parts Required

Procedure

1. Connect the lift chains to the lift arm and cutting unit chain brackets with 6 shackles, shackle pins (3/8 x 1-1/2 inches), and cotter pins (1/8 x 3/4 inch) (Figure 9). To ensure that the cutting unit lifts properly, secure the chains to the following links when connecting:
 - Front chains-9th link
 - Rear chain-5th link
2. Check the operation to ensure that the chains lift the deck tight against the stops when the lift arm is raised.

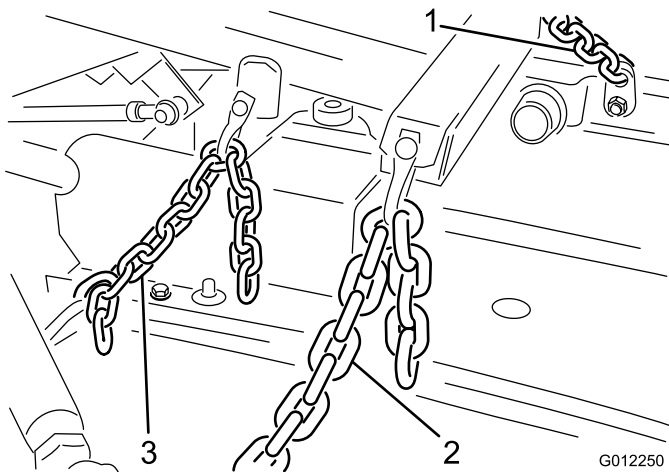


Figure 9

1. Front left lift chain
2. Front right lift chain
3. Rear lift chain

Greasing the Bearings and Bushings. Failure to properly grease the machine will result in premature failure of critical parts.

8

Installing Rear Weight

No Parts Required

Procedure

Two Wheel Drive Groundsmaster 300 Series Traction Units comply with the ANSI B71.4-2004 and EN 836 Standards when equipped with rear weight. Refer to chart in Traction Unit Operator's Manual to determine the combinations of weight required. Order parts from your local Authorized Toro Distributor.

Four Wheel Drive Groundsmaster 300 Series Traction Units do not need additional rear weight to comply with the ANSI B71.4-2004 and EN 836 Standards.

7

Greasing the Machine

No Parts Required

Procedure

Before operating the machine, it must be greased to ensure proper lubricating characteristics; refer to

Product Overview

Specifications

Note: Specifications and design are subject to change without notice.

Width of Cut	72 inches (1.829 m)
Height of Cut	Adjustable from 1–1/2 to 4–1/2 inches (38 to 114 mm) in 1/2 inch (13 mm) increments
Net Weight	607 lb. (275 kg)

Attachments/Accessories

A selection of Toro approved attachments and accessories are available for use with the machine to enhance and expand its capabilities. Contact your Authorized Service Dealer or Distributor or go to www.Toro.com for a list of all approved attachments and accessories.

Operation

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

⚠ CAUTION

If you leave the key in the ignition switch, someone could accidentally start the engine and seriously injure you or other bystanders.

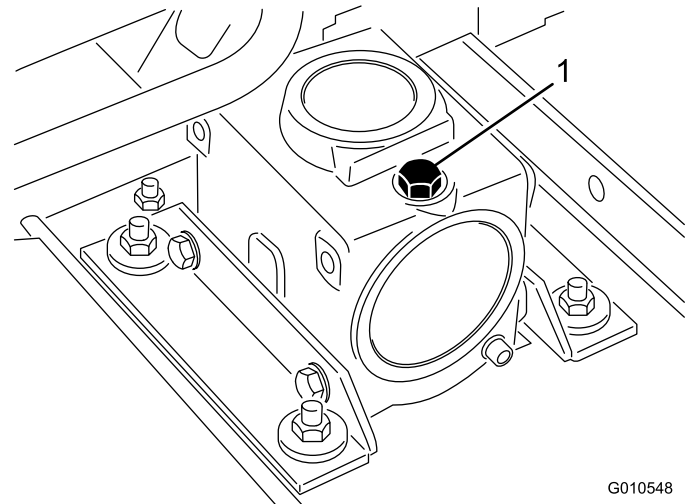
Remove the key from the ignition before you do any maintenance.

Checking the Lubricant in the Gear Box

Service Interval: Every 50 hours

The gear box is designed to operate on SAE 80–90 wt. gear lube. Although the gear box is shipped with lubricant from the factory, check the level before operating the cutting unit.

1. Position the machine and cutting unit on a level surface.
2. Remove the dipstick/fill plug from the top of the gear box (Figure 10) and make sure that the lubricant is between the marks on the dipstick. If the lubricant level is low, add enough lubricant until the level is between the marks.



G010548

Figure 10

1. Dipstick/fill plug

Adjusting the Height-of-Cut

The height of cut is adjustable from 1-1/2 to 4-1/2 inches (38 to 114 mm) in 1/2 inch (13 mm) increments, by adding or removing an equal number of spacers from the front and rear castor forks. The height-of-cut chart below gives the combinations of spacers to use for all height-of-cut settings.

Height-of-Cut Setting (inches)	Spacers Below Castor Arm	
	Front	Rear
1-1/2	0	0
2	1	1
2-1/2	2	2
3	3	3
3-1/2	4	4
4	5	5
4-1/2	6	6

Start the engine and raise the cutting unit so that the height-of-cut can be changed. Stop the engine after the cutting unit is raised.

1 inch (25 mm) height-of-cut can be attained by modifying the castor forks as follows:

1. Remove the front and rear castor forks from the cutting deck and remove the wheels from the forks.
2. Drill out the 0.438 inch diameter holes (Figure 11 & Figure 12) in each side of the castor forks to 0.50 inch or 0.516 inch diameter.
3. Using the new holes, install the castor wheels on the forks and install the forks on the deck.

Note: The height-of-cut decal will now be off by 1/2 inch (13 mm) for spacer placement and the height-of-cut will be 1 to 4 inches (25 to 102 mm).

Front Castor Wheels

1. Remove the tensioning cap from the spindle shaft and slide the spindle out of the front castor arm. Remove the washer from the spindle shaft. Slide the spacers onto the spindle shaft to get desired the height-of-cut, then slide the washer onto the shaft (Figure 11).
2. Push the castor spindle through the front castor arm, install the other thrust washer and remaining spacers onto the spindle, and install the tensioning cap to secure the assembly (Figure 11).

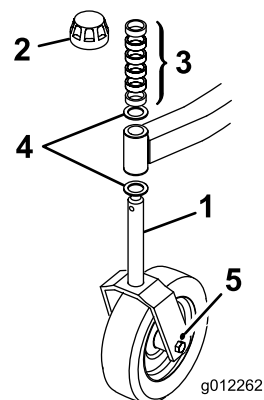


Figure 11

1. Front castor wheel
2. Tensioning cap
3. Spacers
4. Thrust washers
5. 0.438 inch diameter hole

Rear Castor Wheels

1. Remove the tensioning cap from the spindle shaft (Figure 12).
- Note:** The rear castor fork assembly does not need to be removed from the castor arm to change the height-of-cut.
2. Remove or add the C-shaped spacers at the narrow portion of the spindle shaft, below the castor arm, to get the desired height-of-cut (Figure 12). Make sure that the thrust washers-not the spacers-contact the top and bottom of the castor arm.
3. Install the tensioning cap to secure the assembly (Figure 12).
4. Ensure that all four castor wheels are set at the same height-of-cut.

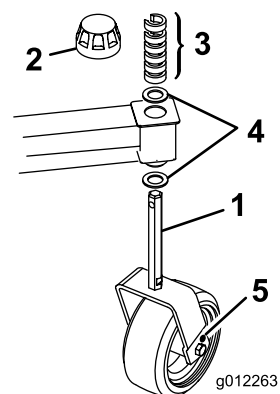


Figure 12

1. Rear castor wheel
2. Tensioning cap
3. Spacers
4. Thrust washers
5. 0.438 diameter hole

Adjusting the Rollers

Note: If the cutting unit is to be used in the 1 or 1-1/2 inches (25 or 38 mm) height-of-cut setting, the cutting unit rollers must be repositioned in the top bracket holes.

1. Remove the cotter pins securing the roller shafts to the underside of the deck.
2. Slide the shafts out of the lower bracket holes, align the rollers with the top holes, and install the shafts.
3. Install the cotter pins to secure the assemblies.

Adjusting the Skids

Adjust the skids by loosening the flange nuts, positioning the skids as desired, and tightening the flange nuts (Figure 13).

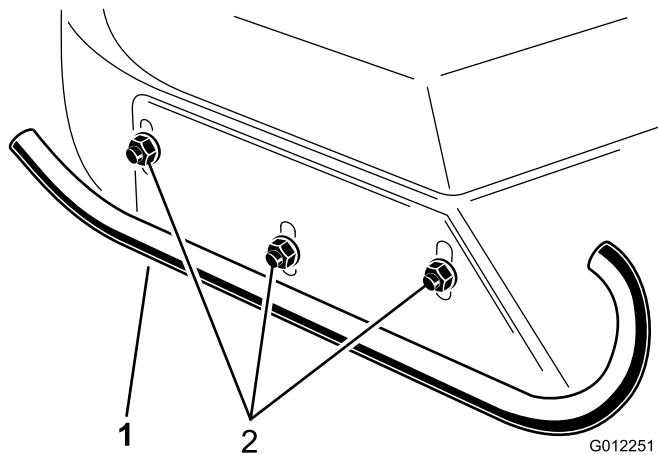


Figure 13

1. Skid

2. Flange nuts

Operating Tips

The use of protective equipment, such as but not limited to, for eyes, ears, feet, and head is recommended.

⚠ CAUTION

This machine produces sound levels in excess of 85 dBA at the operator's ear and can cause hearing loss through extended periods of exposure. Wear hearing protection when operating this machine.

Wear hearing protection when operating this machine.



Figure 14

1. Warning—wear hearing protection.

Mow When Grass is Dry

Mow either in the late morning to avoid the dew, which causes grass clumping, or in late afternoon to avoid the damage that can be caused by direct sunlight on the sensitive, freshly mowed grass.

Select the Proper Height-of-Cut Setting to Suit Conditions

Remove approximately 1 inch (26 mm) or no more than 1/3 of the grass blade when cutting. In exceptionally lush and dense grass you may have to raise the height-of-cut setting another notch. When cutting in 1 or 1-1/2 inches (25 or 38 mm) height-of-cut, add a second washer between the rear castor forks and the bottom of the castor arm housings to increase the blade rake.

Mowing in Extreme Conditions

Air is required to cut and recut grass clippings in the mower housing, so do not set the height-of-cut too low or totally surround the housing by uncut grass. Always try to have one side of the mower housing free from uncut grass, allowing air to be drawn into the housing. When making an initial cut through the center of an uncut area, operate the machine slower and back up if the mower starts to clog.

Always Mow with Sharp Blades

A sharp blade cuts cleanly and without tearing or shredding the grass blades like a dull blade. Tearing and shredding causes the grass to turn brown at the edges which impairs growth and increases susceptibility to diseases. Make sure that the blade is in good condition and a full sail is present.

Check the Condition of the Deck

Make sure that the cutting chambers are in good condition. Straighten any bends in the chamber components to ensure correct blade tip/chamber clearance.

Stopping

If the machine has to be stopped while cutting, a clump of grass clippings may be deposited on the lawn. Follow this procedure for stopping while cutting

1. With the deck engaged, move onto a previously cut area.
2. Shift to neutral, move the throttle control lever to the Slow position, and rotate the ignition key to Off.

After Operating

To ensure optimum performance, clean the underside of the mower housing after each use. If residue is allowed to build up in the mower housing, cutting performance will decrease.

Maintenance

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 2 hours	<ul style="list-style-type: none">• Tighten the castor wheel nuts
After the first 10 hours	<ul style="list-style-type: none">• Tighten the castor wheel nuts• Torque the blade bolts
Before each use or daily	<ul style="list-style-type: none">• Lubricate the grease fittings• Check the blades
Every 50 hours	<ul style="list-style-type: none">• Check the gear box lubricant• Check the blade drive belt adjustment• Clean under the cutting unit belt covers• Tighten the castor wheel nuts• Torque the blade bolts
Every 400 hours	<ul style="list-style-type: none">• Change the gear box lubricant

⚠ CAUTION

If you leave the key in the ignition switch, someone could accidentally start the engine and seriously injure you or other bystanders.

Remove the key from the ignition switch before you do any maintenance.

Pre Maintenance

Important: The fasteners on the covers of this machine are designed to remain on the cover after removal. Loosen all of the fasteners on each cover a few turns so that the cover is loose but still attached, then go back and loosen them until the cover comes free. This will prevent you from accidentally stripping the bolts free of the retainers.

Lubrication

Service Interval: Before each use or daily

The machine has grease fittings that must be lubricated regularly with No. 2 General Purpose Lithium Base Grease. If the machine is operated under normal conditions, lubricate all bearings and bushings daily or immediately after every washing.

Lubricate the following areas:

- Front castor spindle bushings (Figure 15)
- Castor wheel bearings (Figure 15) & Figure 16)
- Blade spindle bearings (Figure 17)
- Idler arm pivot (Figure 17)
- Right and left push arm ball joints (Figure 17)

Also remove the rear castor spindle shaft from the castor arm and coat the hex shaft with No. 2 general

purpose lithium base grease or molybdenum base grease every 50 hours (Figure 16).

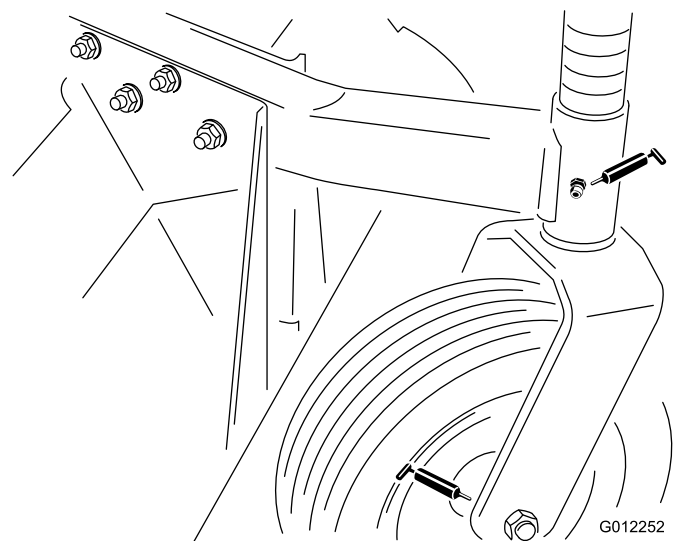


Figure 15

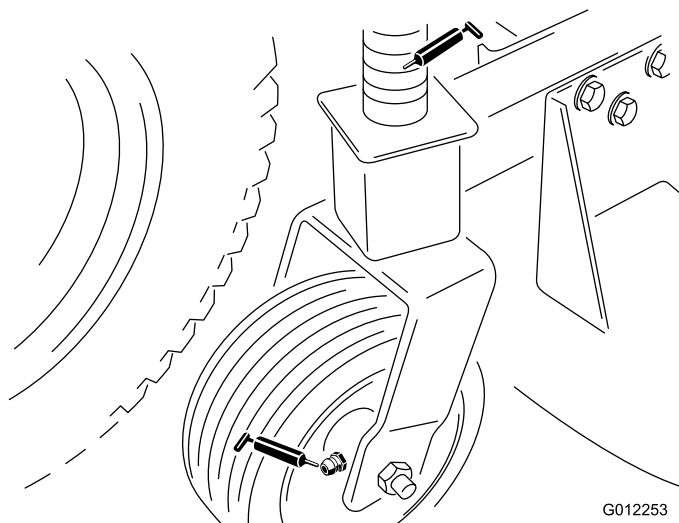


Figure 16

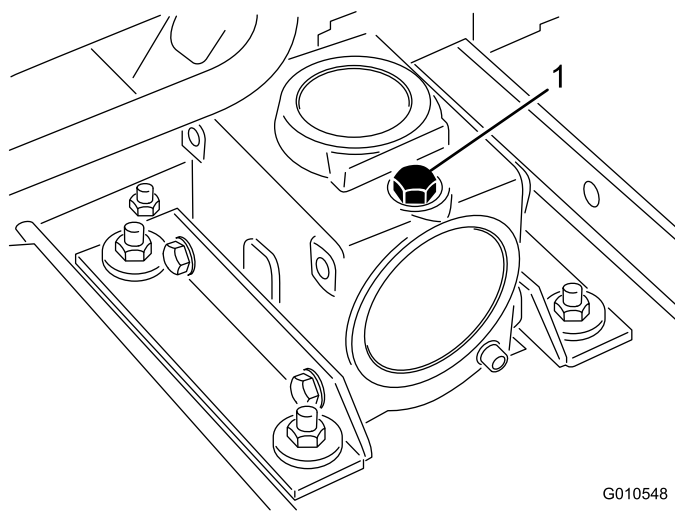


Figure 18

1. Dipstick/fill plug

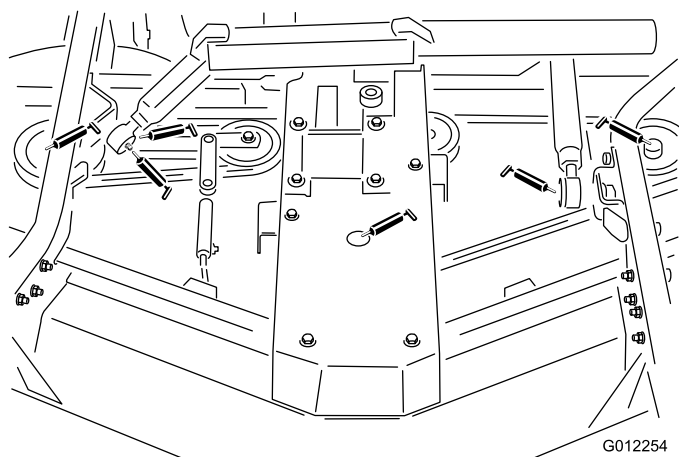


Figure 17

Position the machine and cutting unit on a level surface and lower the cutting unit. Remove the dipstick/fill plug from the top of the gear box (Figure 18) and make sure that the lubricant is between the marks on the dipstick. If the lubricant level is low, add SAE 80-90 wt. gear lube until the level is between the marks

Separating the Cutting Unit from the Traction Unit

1. Position the machine on level surface, lower the cutting unit to the floor, shut the engine off and engage the parking brake.
2. Remove the self-tapping screws securing the shield to the top of the cutting unit and set the shield aside.
3. Drive out the roll pin securing the drive shaft yoke to the input shaft of the gear box (Figure 19). Loosen the capscrews and locknuts and slide the yoke off of the input shaft. If the traction unit will be used without the cutting unit, drive the roll pin out of the yoke at traction unit PTO shaft and remove the entire drive shaft from the traction unit.

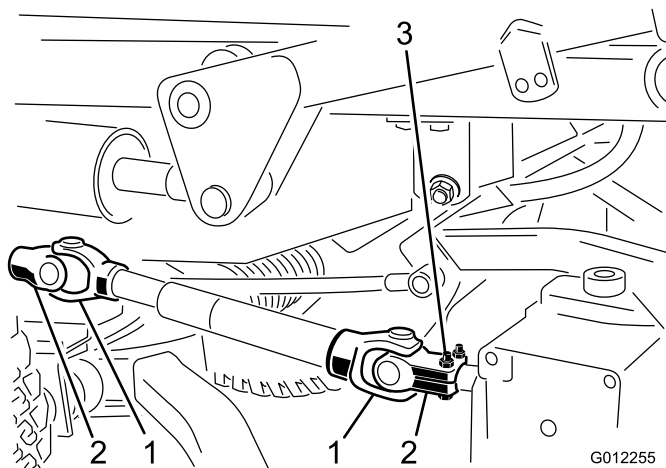


Figure 19

1. Drive shaft yokes
2. Yokes in phase
3. Roll pin and capscrews

⚠ DANGER

If the engine is started and the PTO shaft is allowed to rotate, serious injury could result.

Do not start the engine and engage the PTO lever when the PTO shaft is not connected to the gear box on the cutting unit.

4. Disconnect the cotter pins and clevis pins securing the lift chains to the lift arms.

⚠ WARNING

The right-hand push arm is spring loaded to about 100 lb. (45 kg) and the left-hand push arm is spring loaded to about 150 lb. (68 kg). Sudden release of the push arm could cause injury.

Another person is needed to push the arm down during this procedure.

5. Have another person push down on the right push arm while you remove the capscrews, flat washers, and locknuts securing the ball joint mount to the castor arm on the cutting unit (Figure 20). Now the helper can carefully allow the push arm to move upward, which will gradually release the 100 pounds (45 kg) of spring load.

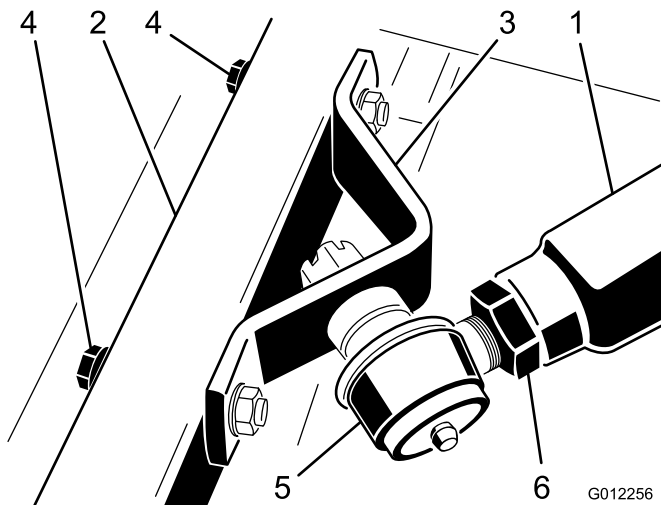


Figure 20

- | | |
|------------------------|--------------------------|
| 1. Right-hand push arm | 4. Capscrews and washers |
| 2. Castor arm | 5. Ball joint |
| 3. Ball joint mount | 6. Jam nut |

6. Have another person push down on the left push arm while you remove the capscrews, flat washers, and locknuts securing the ball joint mount and chain bracket to the castor arm on the cutting unit (Figure 21). Now the helper can carefully allow the push arm to move upward, which will gradually release the 150 pounds (68 kg) of spring load

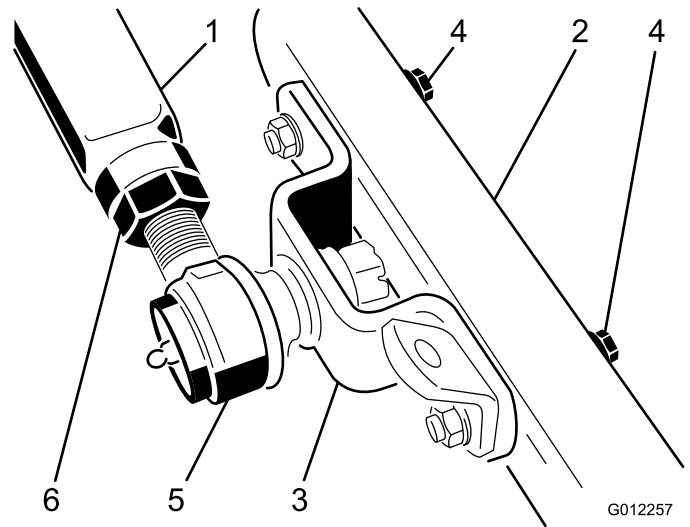


Figure 21

- | | |
|-----------------------|--------------------------|
| 1. Left-hand push arm | 4. Capscrews and washers |
| 2. Castor arm | 5. Ball joint |
| 3. Ball joint mount | 6. Jam nut |

7. Roll the cutting unit away from the traction unit.

Mounting the Cutting Unit to the Traction Unit

1. Position the machine on a level surface and shut the engine off.
2. Move the cutting unit into position in front of the traction unit.

⚠ WARNING

The right-hand push arm is spring loaded to about 100 lb. (45 kg) and the left-hand push arm is spring loaded to about 150 lb. (68 kg). Sudden release of the push arm could cause injury.

Another person is needed to push the arm down during this procedure.

3. Have another person carefully push down on the right push arm until the holes in the ball joint mount line up with the holes in the castor arm (Figure 20).
4. Secure the ball joint mount to the castor arm with the capscrews, flat washers, and flange nuts. Position the flat washers to the outside of the castor arm.
5. Have another person carefully push down on the left push arm until the holes in the ball joint mount line up with the holes in the castor arm (Figure 21). Immediately slide a 4 x 4 inch block of wood between the top of the push arm and the underside of the chassis.

⚠ WARNING

Sudden release of the push arm could cause injury.

Make sure that the wooden block does not slip out.

- Secure the ball joint mount and chain bracket to the castor arm with the capscrews, flat washers, and flange nuts. Position the flat washers to the outside of the castor arm. Mount the chain bracket in the forward set of holes.
- Carefully remove the wood block holding the push arm down.
- Line up the holes in the yoke and input shaft of the gear box. Slide the yoke onto the shaft and secure them together with a roll pin, 2 capscrews (5/16 x 1-3/4 inches), and 2 locknuts (5/16 inches).

Replacing the Drive Belt

The blade drive belt, tensioned by the spring loaded idler pulley, is very durable. However, after many hours of use, the belt will show signs of wear. Signs of a worn belt are: squealing when belt is rotating, blades slipping when cutting grass, frayed edges, burn marks and cracks. Replace the belt if any of these conditions are evident.

- Lower the cutting unit to the shop floor. Remove the belt covers from the top of the cutting unit and set the covers aside.
- Unhook the spring from the idler arm bracket to release the belt tension (Figure 22). Remove the cotter pin and clevis pin securing the idler arm bracket to the idler arm.

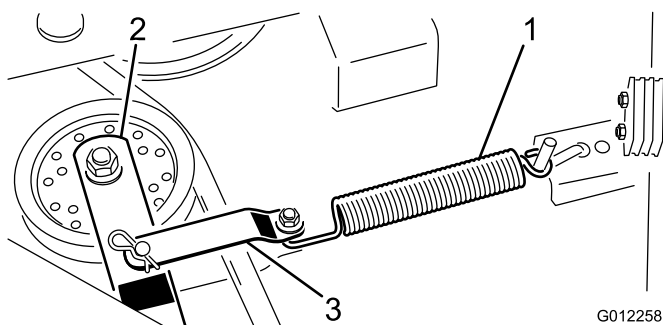


Figure 22

- Spring
- Idler arm
- Idler arm bracket

- Remove the capscrews and nuts securing the gear box plate to the deck channels (Figure 23). Lift the gear box plate and gear box off of the deck channels and lay it on top of the deck.

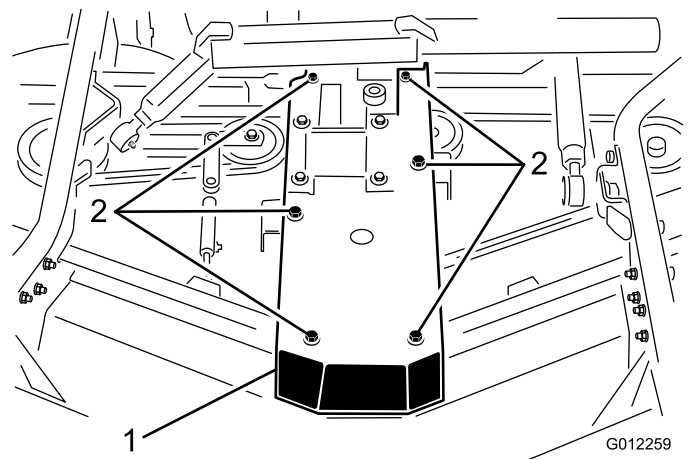


Figure 23

- Gear box plate
- Capscrews and nuts

- Remove the old belt from around the spindle pulleys and through the idler pulley assembly.
- Route the new belt around the spindle pulleys and through the idler pulley assembly as shown in Figure 24.

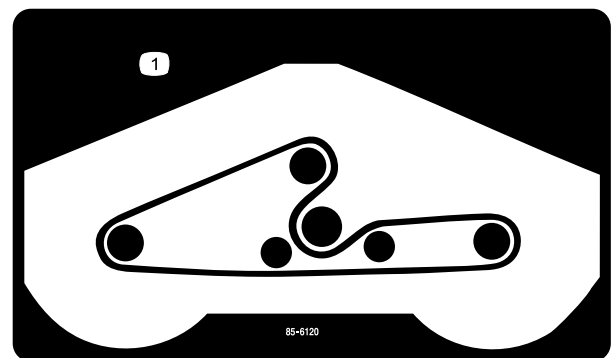


Figure 24

- Belt routing

- Reposition the gear box plate on the deck channels while routing the belt around the gear box pulley. Mount the gear box plate to the deck channels with the capscrews and nuts previously removed.
- Install the idler arm bracket to the idler arm with the cotter pin and clevis pin (Figure 22). Hook the spring onto the idler arm bracket. To ensure that there is proper tension on the drive belt, the spring should be extended to a length of approximately 7 inches (18 cm). If the spring is not extended to this length, relocate the spring rod to a new mounting hole further away from the belt.
- Install the belt covers.

Servicing the Front Bushings in the Castor Arms

The castor arms have bushings pressed into the top and bottom of the tube and after many hours of operation, the bushings will wear. To check the bushings, move the castor fork back and forth and from side to side. If the castor spindle is loose inside the bushings, the bushings are worn and must be replaced.

1. Raise the cutting unit so that the wheels are off of the floor. Block the cutting unit so that it cannot accidentally fall.
2. Remove the tensioning cap, spacer(s), and thrust washer from the top of the castor spindle.
3. Pull the castor spindle out of the mounting tube. Allow the thrust washer and spacer(s) to remain on the bottom of the spindle.
4. Insert a pin punch into the top or bottom of the mounting tube and drive the bushing out of the tube (Figure 25). Also drive the other bushing out of the tube. Clean the inside of the tubes to remove dirt.

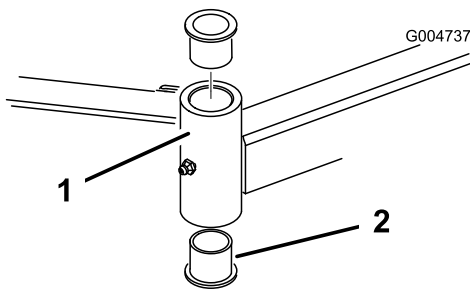


Figure 25

1. Castor arm tube 2. Bushings

5. Apply grease to the inside and outside of the new bushings. Using a hammer and flat plate, drive the bushings into the mounting tube.
6. Inspect the castor spindle for wear and replace it if damaged.
7. Push the castor spindle through the bushings and mounting tube. Slide the thrust washer and spacer(s) onto the spindle. Install the tensioning cap on the castor spindle to retain all parts in place.

Servicing the Castor Wheels and Bearings

The castor wheel rotates on a high-quality roller bearing and is supported by a spanner bushing. Even after many hours of use, provided that the bearing was kept well lubricated, the bearing wear will be minimal. However, failure to keep the bearing lubricated will cause rapid

wear. A wobbly castor wheel usually indicates a worn bearing.

1. Remove the locknut from the capscrew holding the castor wheel assembly between the castor fork (Figure 26). Grasp the castor wheel and slide the capscrew out of the fork.
2. Pull the spanner bushing out of the wheel hub (Figure 26).

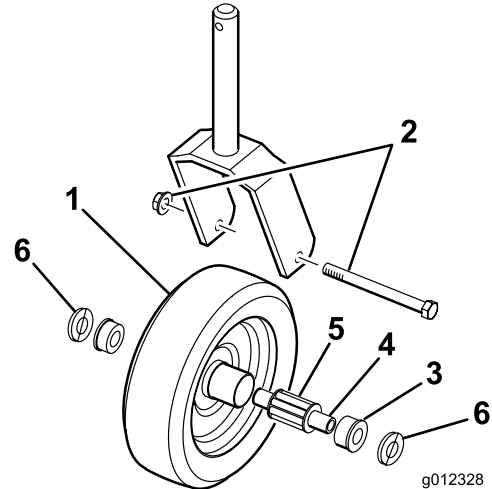


Figure 26

- | | |
|-------------------------|--------------------|
| 1. Castor wheel | 4. Spanner bushing |
| 2. Capscrew and locknut | 5. Roller bearing |
| 3. Bushing (2) | 6. Washer (2) |

3. Remove the bushing from the wheel hub and allow the bearing to fall out (Figure 26). Remove the bushing from the opposite side of the wheel hub.
4. Check the bearing, spanner, and inside of the wheel hub for wear. Replace damaged parts.
5. To assemble the castor wheel, push the bushing into the wheel hub. Slide the bearing into the wheel hub. Push the other bushing into the open end of the wheel hub to captivate the bearing inside the wheel hub.
6. Carefully slide the spanner through the bushings and the wheel hub (Figure 26).
7. Install the castor wheel assembly between the castor fork and secure it in place with the capscrew, washers, and locknut.
8. Lubricate the castor wheel bearing through the grease fitting, using No. 2 general purpose lithium base grease.

Removing and Installing the Blade(s)

The blade must be replaced if a solid object is hit, the blade is out-of-balance, worn, or bent. Always use

genuine Toro replacement blades to ensure safety and optimum performance. Never use blades made by other manufacturers because they could be dangerous.

1. Raise the cutting unit to the highest position, engage the parking brake, stop the engine, and remove the ignition key. Block the cutting unit to prevent it from accidentally falling.
2. Grasp the end of the blade using a rag or thickly padded glove. Remove the blade bolt, anti-scalp cup, and blade from the spindle shaft (Figure 27).

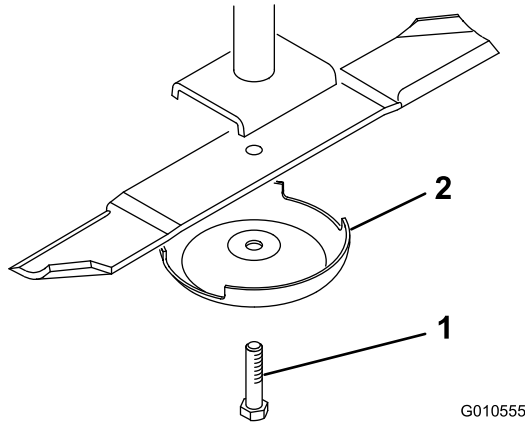


Figure 27

1. Blade bolt
2. Anti-scalp cup

3. Install the blade-sail facing toward the cutting unit-with the anti-scalp cup and blade bolt. Tighten the blade bolt to 85-110 ft-lb (115-149 N-m).

Important: The curved part of the blade must be pointing toward the inside of the cutting unit to ensure proper cutting.

⚠ WARNING

Do not try to straighten a blade that is bent, and never weld a broken or cracked blade. Always use a new blade to ensure continued safety certification of the product.

Inspecting and Sharpening the Blade(s)

Service Interval: Before each use or daily
Every 50 hours

⚠ DANGER

A worn or damaged blade can break, and a piece of the blade could be thrown into the operator's or bystander's area, resulting in serious personal injury or death.

- Inspect the blade periodically for wear or damage.
- Do not try to straighten a blade that is bent.
- Never weld a broken or cracked blade.
- Replace a worn or damaged blade with a new Toro blade to ensure continued safety certification of the product.

Two areas must be considered when checking and servicing the cutting blade: the sail and the cutting edge. Both cutting edges and the sail, which is the turned up portion opposite the cutting edge, contribute to a good quality-of-cut. The sail is important because it pulls grass up straight, thereby producing an even cut. However, the sail will gradually wear down during operation, and this condition is normal. As the sail wears down, the quality-of-cut will degrade somewhat, although the cutting edges are sharp. The cutting edge of the blade must be sharp so that the grass is cut rather than torn. A dull cutting edge is evident when the tips of the grass appear brown and shredded. Sharpen the cutting edges to correct this condition.

1. Raise the cutting unit to the highest position, shut the engine off, and engage the parking brake. Block the cutting unit to prevent it from accidentally falling.
2. Examine the cutting ends of the blade carefully, especially where the flat and curved parts of the blade meet (Figure 28). Since sand and abrasive material can wear away the metal that connects the flat and curved parts of the blade, check the blade before using the machine. If wear is noticed (Figure 28), replace the blade; refer to Removing the Cutting Blade.

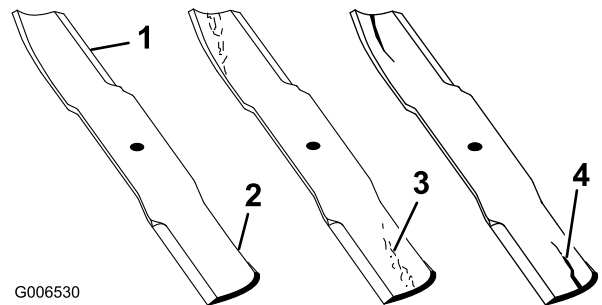


Figure 28

1. Cutting edge
2. Curved area/sail
3. Wear/slot forming
4. Crack

⚠ WARNING

If the blade is allowed to wear, a slot will form between the sail and flat part of the blade (Figure 28). Eventually, a piece of the blade may break off and be thrown from under the housing, possibly resulting in serious injury to yourself or bystanders.

- **Inspect the blade periodically for wear or damage.**
 - **Replace a worn or damaged blade with a new Toro blade to ensure continued safety certification of the product.**
3. Examine the cutting edges of all blades. Sharpen the cutting edges if they are dull or nicked. Sharpen only the top side of the cutting edge and maintain the original cutting angle to ensure sharpness (Figure 29). The blade will remain balanced if the same amount of metal is removed from both cutting edges.

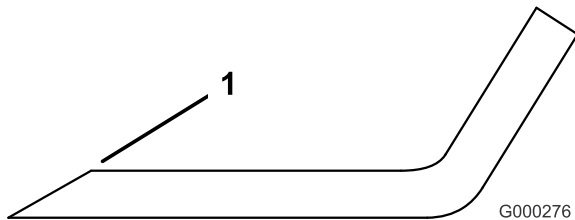


Figure 29

1. Sharpen at original angle
-
4. To check the blade for being straight and parallel, lay the blade on a level surface and check the ends. The ends of the blade must be slightly lower than the center, and the cutting edge must be lower than the heel of the blade. This blade will produce a good quality of cut and require minimal power from the engine. By contrast a blade that is higher at the ends than the center, or if the cutting edge is higher than the heel, the blade is bent or warped and must be replaced.
 5. Install the blade(s).

Checking and Correcting Mismatch of Blades

If there is mismatch between the blades, the grass will appear streaked when it is cut. This problem can be corrected by making sure that the blades are straight and all of the blades are cutting on the same plane.

1. Using a 3 foot (1 meter) long carpenters level, find a level surface on the shop floor.

2. Raise the height-of-cut to the highest position; refer to Adjusting the Height-of-Cut.
3. Lower the cutting unit onto the flat surface. Remove the covers from the top of the cutting unit.
4. Unhook the spring from the idler arm bracket to release the belt tension.
5. Rotate the blades until the ends face forward and backward. Measure from the floor to the front tip of the cutting edge. Remember this dimension. Then rotate the same blade so that the opposite end is forward, and measure again. The difference between the dimensions must not exceed 1/8 inch (3 mm). If the dimension exceeds 1/8 inch (3 mm), replace the blade because it is bent. Make sure to measure all of the blades.
6. Compare the measurements of the outer blades with the center blade. The center blade must not be more than 3/8 inch (10 mm) lower than the outer blades. If the center blade is more than 3/8 inch (10 mm) lower than the outer blades, proceed to step 7 and add shims between the spindle housing and the bottom of the cutting unit.
7. Remove the bolts, flat washers, lock washers, and nuts from the outer spindle in the area where the shims must be added. To raise or lower the blade, add a shim, Part No. 3256-24, between the spindle housing and the bottom of the cutting unit. Continue to check the alignment of the blades and add shims until the tips of the blades are within the required dimension.
8. Hook the spring onto the idler arm bracket.
9. Install the belt covers.

Important: Do not use more than three shims at any one hole location. Use decreasing numbers of shims in adjacent holes if more than one shim is added to any one hole location.

Troubleshooting

Problem	Possible Cause	Corrective Action
The cutting unit will not cut or cuts poorly.	<ol style="list-style-type: none"> 1. The blades are dull. 2. One or more blades are bent or damaged. 3. The spindle bolts are loose. 4. The cutting unit belts are loose or broken. 5. The gear box pulley is loose. 6. A gear box shaft is broken. 7. The PTO belt is broken. 8. The PTO pulley is loose or broken. 9. The PTO shaft is broken. 10. The pulley on the engine output shaft is loose or broken. 	<ol style="list-style-type: none"> 1. Sharpen the blades. 2. Replace the blades. 3. Torque the spindle bolts to 85 to 110 ft-lb (115 to 149 N-m). 4. Tighten or replace the belts as necessary. 5. Tighten or replace the pulley. 6. Replace any broken shafts. 7. Replace the PTO belt. 8. Tighten or replace the pulley. 9. Replace the PTO shaft. 10. Tighten or replace the pulley.

Notes:

Notes:

Notes:



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.