Form No. 3417-544 Rev A

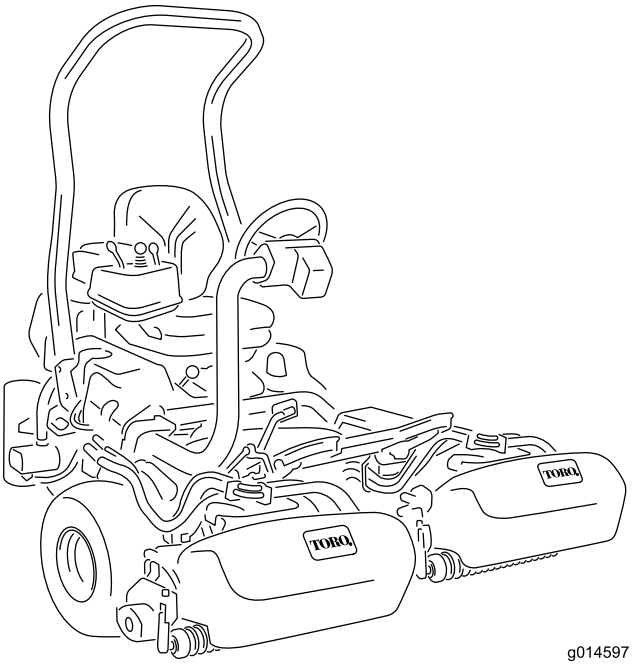
TORO®

Count on it.

Operator's Manual

Greensmaster® 3400 TriFlex® Traction Unit

Model No. 04520—Serial No. 400000000 and Up



g014597

Register at www.Toro.com.
Original Instructions (EN)

CE

3417-544 A

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

⚠ 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.

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

This spark ignition system complies with Canadian ICES-002

It is a violation of California Public Resource Code Section 4442 or 4443 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the engine is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order or the engine is constructed, equipped, and maintained for the prevention of fire.

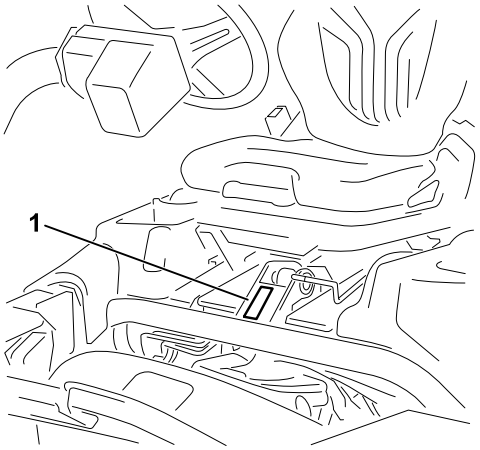
Introduction

This machine is a ride-on, reel-blade lawn mower intended to be used by professional, hired operators in commercial applications. It is primarily designed for cutting grass on well-maintained lawns in parks, golf courses, 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. Figure 1 identifies the location of the model and serial numbers on the product. Write the numbers in the space provided.



g228077

Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety-alert symbol (Figure 2), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.



g000502

Figure 2

1. Safety-alert symbol

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

© 2017—The Toro® Company
8111 Lyndale Avenue South
Bloomington, MN 55420

Contact us at www.Toro.com.
Printed in the USA
All Rights Reserved

Contents

Safety 4
General Safety 4
Safety and Instructional Decals 4
Setup 9
1 Installing the Roll Bar 10
2 Installing the Seat 10
3 Installing the Steering Wheel 10
4 Activating and Charging the Battery 11
5 Installing the Oil Cooler (optional) 12
6 Installing the Grass-Basket Hooks 13
7 Installing the Cutting Units 13
8 Adding Rear Weight 13
9 Installing EU Decals 13
10 Installing the CE Guard Kit 13
11 Reducing the Tire Pressure 14
12 Burnishing the Brakes 14
Product Overview 14
Controls 14
Specifications 18
Attachments/Accessories 18
Operation 18
Before Operation Safety 18
Filling the Fuel Tank 19
Performing Daily Maintenance 20
During Operation Safety 20
Breaking in the Machine 21
Starting and Shutting Off the Engine 21
Checking the Safety-Interlock System 22
Driving the Machine without Mowing 22
Mowing 23
After Operation Safety 24
Inspecting and Cleaning after Mowing 24
Hauling the Machine 24
Towing the Machine 25
Maintenance 26
Recommended Maintenance Schedule(s) 26
Daily Maintenance Checklist 27
Pre-Maintenance Procedures 28
Pre-Maintenance Safety 28
Engine Maintenance 28
Engine Safety 28
Servicing the Air Cleaner 28
Servicing the Engine Oil 29
Fuel System Maintenance 31
Draining Water from the Fuel Filter 31
Replacing the Fuel Filter/Water Separator 31
Inspecting the Fuel Lines and Connections 32
Electrical System Maintenance 32
Electrical System Safety 32
Servicing the Battery 32
Locating the Fuses 33
Drive System Maintenance 33
Checking the Tire Pressure 33
Checking the Torque of the Wheel Nuts 33
Adjusting the Transmission for Neutral 33
Adjusting the Transport Speed 34
Adjusting the Mowing Speed 35
Cooling System Maintenance 35
Cooling System Safety 35
Cleaning the Radiator Screen 35
Checking the Engine-Coolant Level 36
Brake Maintenance 36
Adjusting the Brakes 36
Belt Maintenance 37
Adjusting the Alternator Belt 37
Hydraulic System Maintenance 37
Hydraulic System Safety 37
Servicing the Hydraulic Fluid 37
Checking the Hydraulic Lines and Hoses 39
Cutting Unit Maintenance 40
Cutting Unit Safety 40
Installing and Removing the Cutting Units 40
Checking the Reel-to-Bedknife Contact 42
Setting the Reel Speed 42
Backlapping the Reels 43
Diagnostics System 44
Diagnosing the Service Indicator Light 44
Storage 45

Safety

This machine has been designed in accordance with EN ISO 5395:2013 and ANSI B71.4-2017 and meets these standards when the appropriate weight kit is added.

General Safety

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

Using this product for purposes other than its intended use could prove dangerous to you and bystanders.

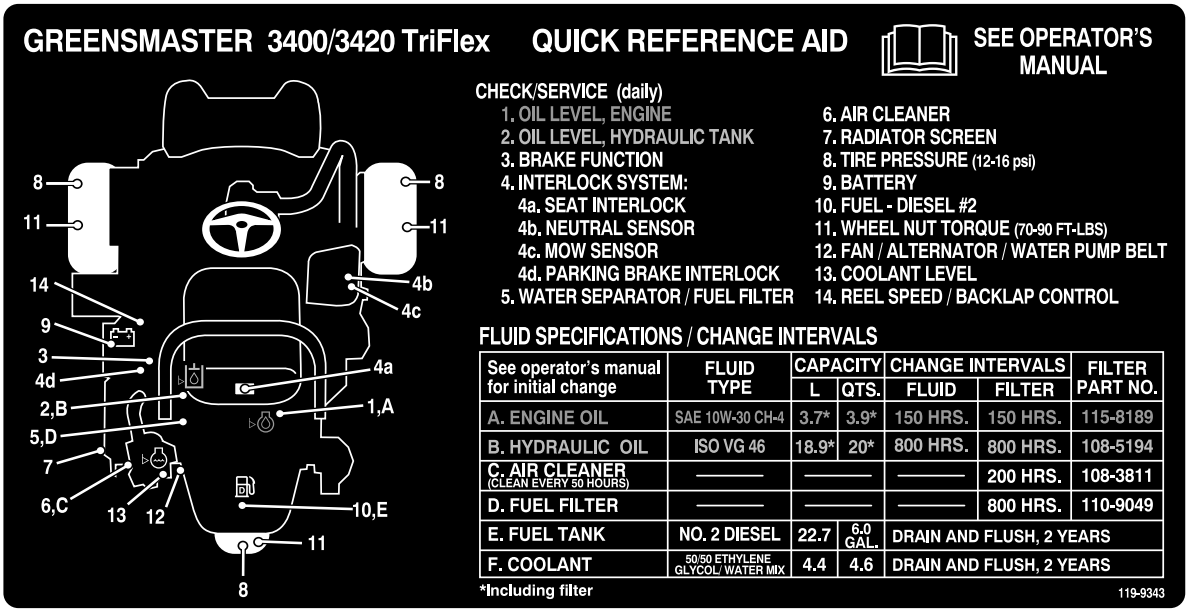
- Read and understand the contents of this *Operator's Manual* before starting the engine.
- Do not put your hands or feet near moving components of the machine.
- Do not operate the machine without all guards and other safety protective devices in place and working on the machine.
- Keep clear of any discharge opening. Keep bystanders and pets a safe distance away from the machine.
- Keep children out of the operating area. Never allow children to operate the machine.
- Stop the machine and shut off the engine before servicing, fueling, or unclogging the machine.

Improperly using or maintaining this machine can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety-alert symbol, which means Caution, Warning, or Danger—personal safety instruction. Failure to comply with these instructions may result in personal injury or death.

You can find additional safety information where needed throughout this *Operator's Manual*.

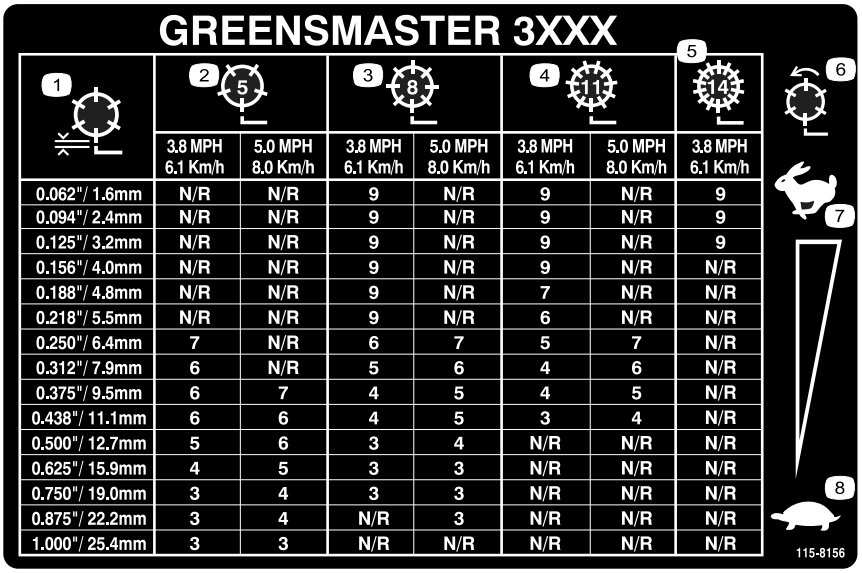
Safety and Instructional Decals

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 missing.



decal119-9343

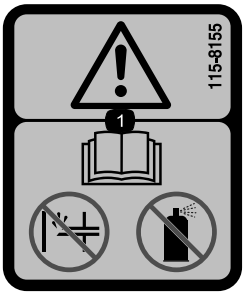
119-9343



decal115-8156

115-8156

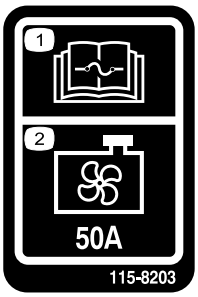
1. Reel height
2. 5–Blade cutting unit
3. 8–Blade cutting unit
4. 11–Blade cutting unit
5. 14–Blade cutting unit
6. Reel speed
7. Fast
8. Slow



decal115-8155

115-8155

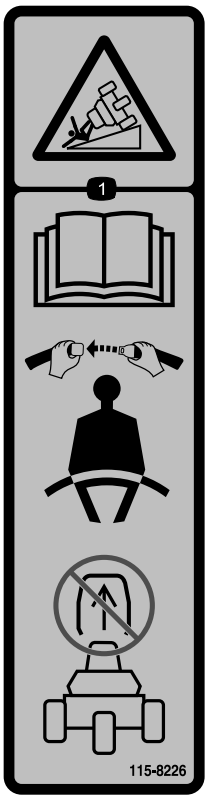
1. Warning—read the *Operator's Manual*, do not prime or use starting fluid.



decal115-8203

115-8203

1. Read the *Operator's Manual* for fuse information.
2. Radiator fan—50 A



decal115-8226

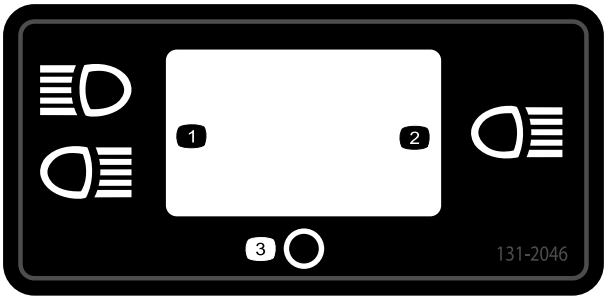
115-8226

1. Tipping hazard—read the *Operator's Manual*; always wear a seat belt when operating; do not remove the rollover protection system (ROPS).



decal117-2718

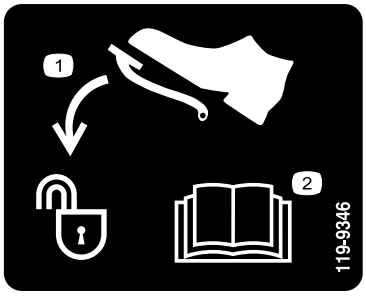
117–2718



decal131-2046

131-2046

1. Double lights
2. Single light
3. Off



decal119-9346

119-9346

1. Press the pedal to unlock.
2. Read the *Operator's Manual* for more information.

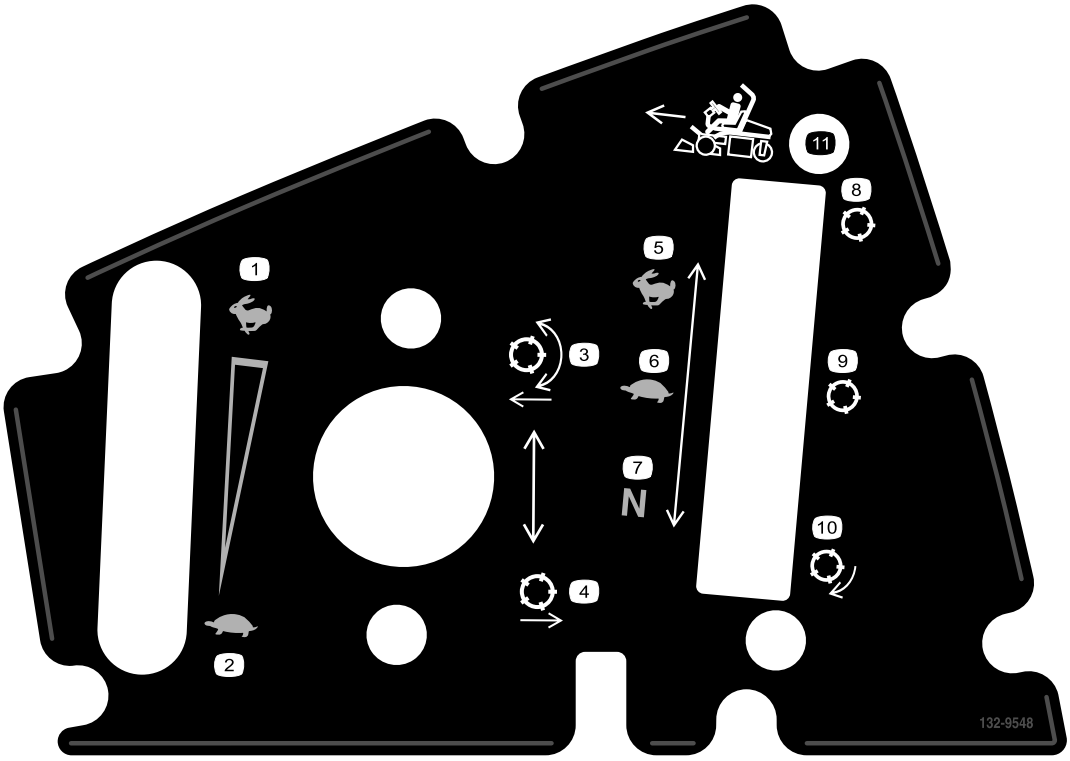


decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery.

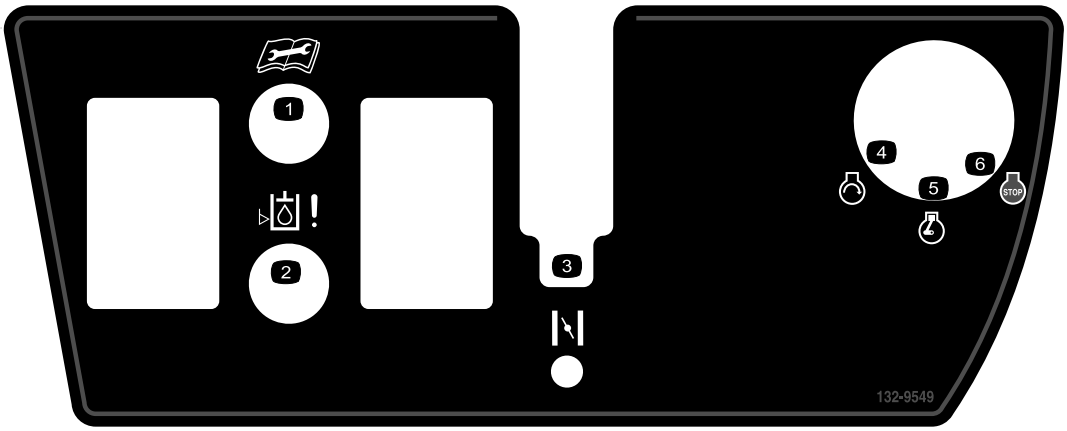
1. Explosion hazard
2. No fire, open flame, or smoking
3. Caustic liquid/chemical burn hazard
4. Wear eye protection.
5. Read the *Operator's Manual.*
6. Keep bystanders a safe distance away from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries.
8. Battery acid can cause blindness or severe burns.
9. Flush eyes immediately with water and get medical help fast.
10. Contains lead; do not discard



decal132-9548

132-9548

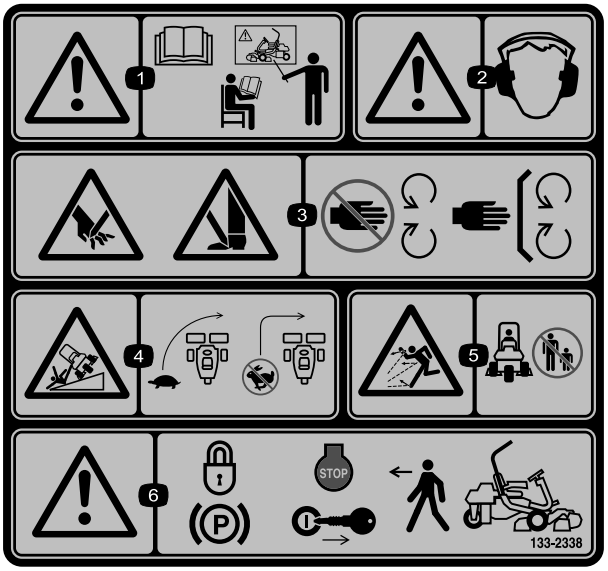
1. Engine speed—fast
2. Engine speed—slow
3. Lower and engage the reels
4. Raise and disengage the reels
5. Reel speed—fast
6. Reel speed—slow
7. Reel speed—neutral
8. Reel—transport
9. Reel—mow
10. Reel—backlaping
11. Move forward



decal132-9549

132-9549

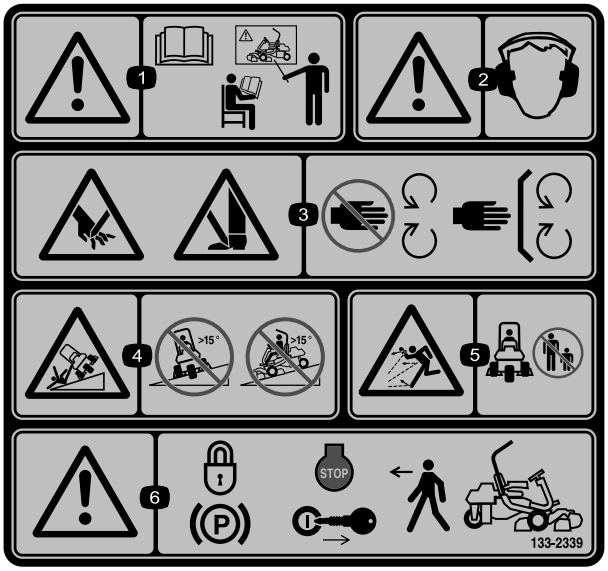
1. Read the *Operator's Manual* before servicing or performing maintenance.
2. Hydraulic fluid level
3. Choke
4. Engine—start
5. Engine—run
6. Engine—stop



decal133-2338

133-2338

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Warning—wear hearing protection.
3. Cutting/dismemberment hazard of hand or foot, mower blade—stay away from moving parts; keep all guards and shields in place.
4. Tipping hazard—slow the machine before turning, do not turn at high speeds.
5. Thrown object hazard—keep bystanders a safe distance away from the machine.
6. Warning—lock the parking brake, shut off the engine, and remove the ignition key before leaving the machine.



decal133-2339

133-2339

Replaces Decal 133-2338 for CE Machines

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Warning—wear hearing protection.
3. Cutting/dismemberment hazard of hand or foot, mower blade—stay away from moving parts; keep all guards and shields in place.
4. Tipping hazard—do not drive across or down slopes greater than 15 degrees.
5. Thrown object hazard—keep bystanders a safe distance away from the machine.
6. Warning—lock the parking brake, shut off the engine, and remove the ignition key before leaving the machine.

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	Roll bar Bolt (1/2 x 3-3/4 inches) Flange nut (1/2 inch)	1 4 4	Install the roll bar.
2	Seat-completion kit	1	Install the seat to the base.
3	Steering wheel Locknut (1-1/2 inches) Washer Steering-wheel cap	1 1 1 1	Install the steering wheel.
4	No parts required	–	Activate and charge the battery.
5	No parts required	–	Install the optional oil cooler.
6	Grass-basket hook Flange bolts	6 12	Install the grass-basket hooks.
7	Gauge bar Cutting unit (obtain from your Toro Distributor) Grass basket	1 3 3	Install the cutting units.
8	Weight Kit, Part No. 121-6665 (purchase separately) Note: This kit is not required for units with the 3 wheel drive kit installed.	1	Add rear weight.
9	Warning decal (Part No. 133-2339)	1	Install EU decals, if required.
10	CE Guard Kit (Model No. 04442—purchase separately)	1	Install the CE Guard Kit, if required.
11	No parts required	–	Reduce the tire pressure.
12	No parts required	–	Burnish the brakes.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual	1	Review it before operating the machine.
Engine owner's manual	1	Use it to reference engine information.
Operator training materials	1	Read/view the materials before operating the machine.
Declaration of Conformity Noise rating certificate	1 1	For CE compliance
Ignition keys	2	Start the engine.

1

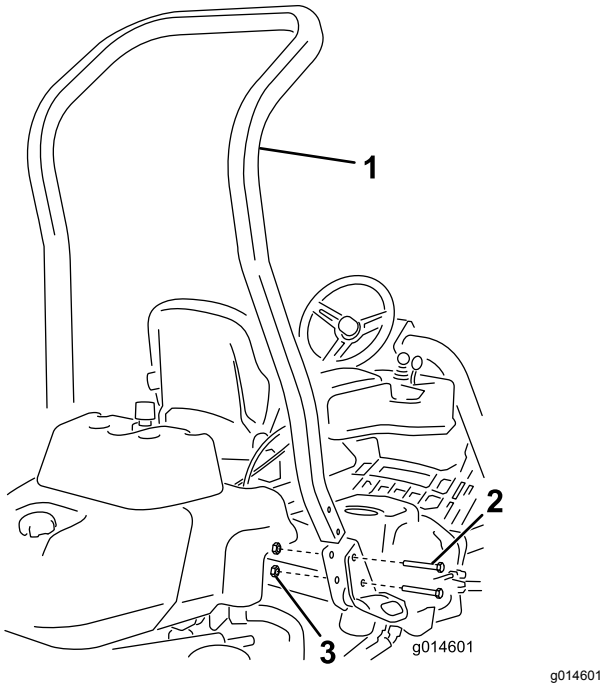
Installing the Roll Bar

Parts needed for this procedure:

1	Roll bar
4	Bolt (1/2 x 3-3/4 inches)
4	Flange nut (1/2 inch)

Procedure

1. Remove the top crate support from the crate.
2. Remove the roll bar from the crate.
3. Install the roll bar into the pockets on each side of the machine, using 4 bolts (1/2 x 3-3/4 inches) and 4 flange nuts (1/2 inch) as shown in Figure 3.



g014601

Figure 3

1. Roll bar
2. Bolt (1/2 x 3-3/4 inches)
3. Flange nut (1/2 inch)

4. Torque the fasteners to 136 to 149 N·m (100 to 110 ft-lb).

2

Installing the Seat

Parts needed for this procedure:

1	Seat-completion kit

Procedure

Acquire your desired seat kit from your distributor and install it as directed in the instruction included with the kit.

3

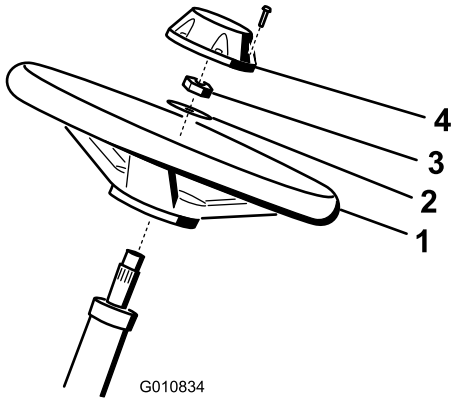
Installing the Steering Wheel

Parts needed for this procedure:

1	Steering wheel
1	Locknut (1-1/2 inches)
1	Washer
1	Steering-wheel cap

Procedure

1. Slide the steering wheel onto the steering shaft (Figure 4).



g010834

Figure 4

1. Steering wheel
2. Washer
3. Locknut
4. Cap

2. Slide the washer onto the steering shaft (Figure 4).

3. Secure the steering wheel to the shaft with a locknut and tighten it to 27 to 35 N·m (20 to 26 ft-lb) (Figure 4).
4. Install the cap to the steering wheel and secure it with 6 bolts (Figure 4).

4

Activating and Charging the Battery

No Parts Required

Procedure

Use only electrolyte (1.265 specific gravity) to fill the battery initially.

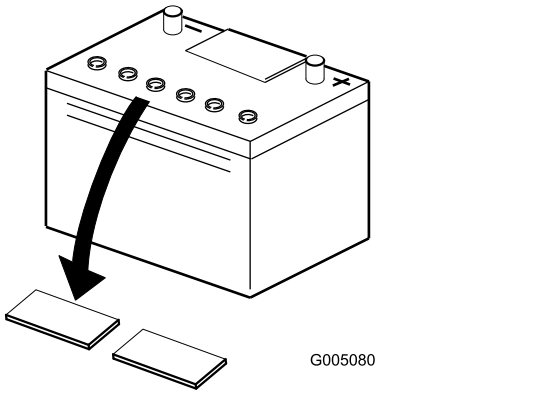
⚠ WARNING

CALIFORNIA
Proposition 65 Warning

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

1. Remove the fasteners and battery clamp and lift out the battery.

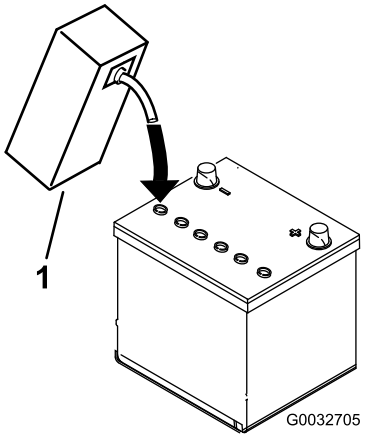
   Important: **Do not add electrolyte while the battery is in the machine. You could spill it, causing corrosion.**
2. Clean the top of the battery and remove the vent caps (Figure 5).



g005080

Figure 5

3. Carefully fill each cell with electrolyte until the plates are covered with about 6 mm (1/4 inch) of fluid (Figure 6).



g032705

Figure 6

1. Electrolyte

4. Allow approximately 20 to 30 minutes for the electrolyte to soak into the plates. Fill as necessary to bring the electrolyte to within about 6 mm (1/4 inch) of the bottom of the fill well (Figure 6).
5. Connect a 2 to 4 A battery charger to the battery posts. Charge the battery for at least 2 hours at 4 A or for at least 4 hours at 2 A until the specific gravity is 1.250 or higher and the temperature is at least 16°C (60°F) with all cells gassing freely.

⚠ WARNING

Charging the battery produces gasses that can explode.

Never smoke near the battery and keep sparks and flames away from the battery.

Important: **If you do not charge the battery for at least the time specified above, you may reduce the life of the battery.**

6. When the battery is charged, disconnect the charger from the electrical outlet and battery posts.

Note: After the battery has been activated, add only distilled water to replace normal loss, although maintenance-free batteries should not require water under normal operating conditions.

⚠ WARNING

Battery terminals or metal tools could short against metal tractor components causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **When removing or installing the battery, do not allow the battery terminals to touch any metal parts of the tractor.**
- **Do not allow metal tools to short between the battery terminals and metal parts of the tractor.**

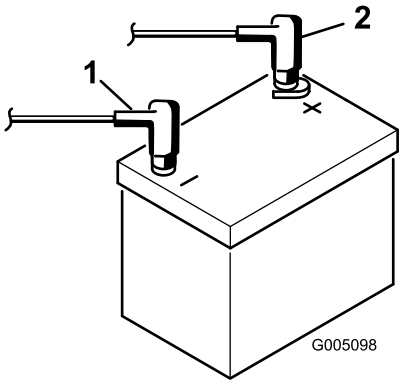
Important: **Failure to correctly activate the battery may result in battery gassing and/or premature battery failure.**

7. Install the vent caps.
8. Place the battery on the battery tray and secure it with the battery clamp and fasteners removed previously.
9. Install the positive cable (red) to the positive (+) terminal and then the negative cable (black) to the negative (–) terminal of the battery and secure them with the bolts and nuts (Figure 7). Slide the rubber boot over the positive terminal to prevent a possible short from occurring.

⚠ WARNING

Incorrect battery cable routing could damage the tractor and cables causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **Always disconnect the negative (black) battery cable before disconnecting the positive (red) cable.**
- **Always connect the positive (red) battery cable before connecting the negative (black) cable.**



g005098

Figure 7

1. Negative (-)
2. Positive (+)

5

Installing the Oil Cooler (optional)

No Parts Required

Procedure

If you are operating the machine in hot climates, where the ambient temperature is above 29° C (85° F), or using it for heavy-duty use (mowing other than greens, such as fairways or verticutting), install a Hydraulic Oil Cooler Kit, Part No. 119-1691.

6

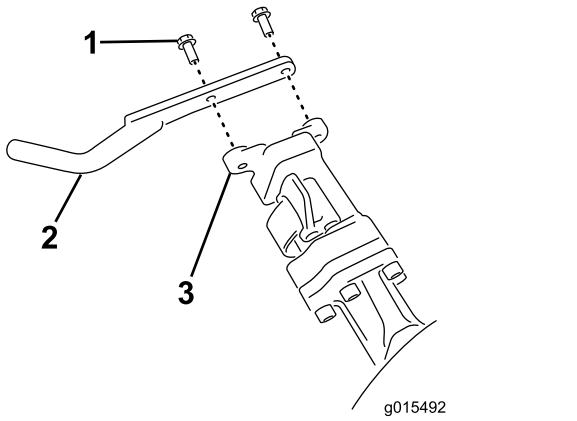
Installing the Grass-Basket Hooks

Parts needed for this procedure:

6	Grass-basket hook
12	Flange bolts

Procedure

Install the 6 grass-basket hooks onto the ends of the suspension-arm bars using the 12 flange bolts (Figure 8).



g015492

Figure 8

1. Flange bolt
2. Grass-basket hook
3. Suspension-arm bar

7

Installing the Cutting Units

Parts needed for this procedure:

1	Gauge bar
3	Cutting unit (obtain from your Toro Distributor)
3	Grass basket

Procedure

1. Setup the cutting units as described in the cutting unit *Operator's Manual*.
2. Apply grease to the inside diameter of the drive coupler.
3. Install the cutting units as described in Installing the Cutting Units (page 40).

8

Adding Rear Weight

Parts needed for this procedure:

1	Weight Kit, Part No. 121-6665 (purchase separately) **Note:** This kit is not required for units with the 3 wheel drive kit installed.

Procedure

This unit complies with EN ISO 5395:2013 and ANSI B71.4-2017 when equipped with Weight Kit, Part No. 121-6665.

Note: If the unit is equipped with a 3-Wheel Drive Kit, additional weight is not required to meet EN ISO 5395:2013 and ANSI B71.4-2017.

9

Installing EU Decals

Parts needed for this procedure:

1	Warning decal (Part No. 133-2339)

Procedure

If this machine will be used in the EU, affix the warning decal 133-2339 over English warning decal 133-2338.

10

Installing the CE Guard Kit

EU Only

Parts needed for this procedure:

1	CE Guard Kit (Model No. 04442—purchase separately)

Procedure

This machine complies with EN ISO 5395:2013 when you equip it with the CE Guard Kit (Model No. 04442).

11

Reducing the Tire Pressure

No Parts Required

Procedure

The tires are over-inflated at the factory for shipping purposes. Reduce the pressure to the proper levels before starting the machine. Refer to Checking the Tire Pressure (page 33).

12

Burnishing the Brakes

No Parts Required

Procedure

Firmly apply the brakes and drive the machine at mowing speed until the brakes are hot, as indicated by their smell. You may need to adjust the brakes after the break-in period; refer to Adjusting the Brakes (page 36).

Product Overview

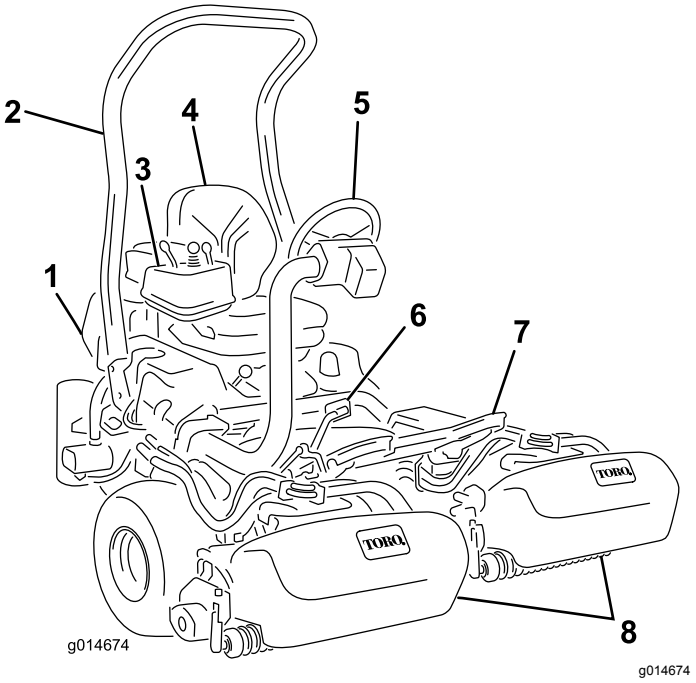


Figure 9

1. Engine
2. Roll bar
3. Control panel
4. Seat
5. Steering wheel
6. Traction pedal
7. Foot rest
8. Reels with grass baskets

Controls

Traction Pedal

The traction pedal (Figure 10) has 3 functions: to make the machine move forward, to move it backward, and to stop the machine. Press the top of the pedal to move forward and the bottom of the pedal to move backward or to assist in stopping when moving forward. Also, allow the pedal to move to the neutral position to stop the machine. For operator comfort, do not rest the heel of your foot on reverse when operating forward (Figure 11).

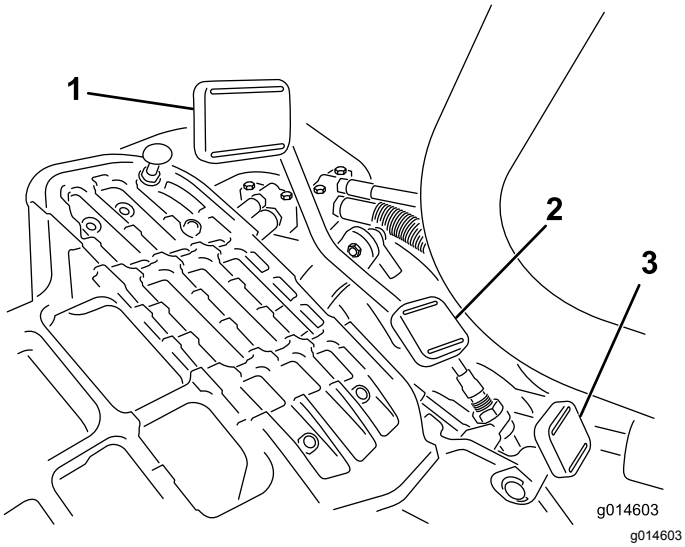


Figure 10

1. Traction pedal—forward
2. Taction pedal—reverse
3. Steering-arm-locking pedal



Figure 11

Ground speeds are as follows:

- 3.2 to 8 km/h (2 to 5 mph) forward mowing speed
- 16 km/h (10 mph) maximum transport speed
- 4.0 km/h (2.5 mph) reverse speed

Steering-Arm-Locking Pedal

Press the pedal (Figure 10) and raise or lower the steering arm for operator comfort, then, release the pedal to lock the arm in place.

Throttle Lever

The throttle lever (Figure 12) allows you to control the speed of the engine. Move the throttle lever toward the FAST position to increases the engine speed; move it toward the SLOW position to decrease the engine speed.

Note: You cannot stop the engine using the throttle lever.

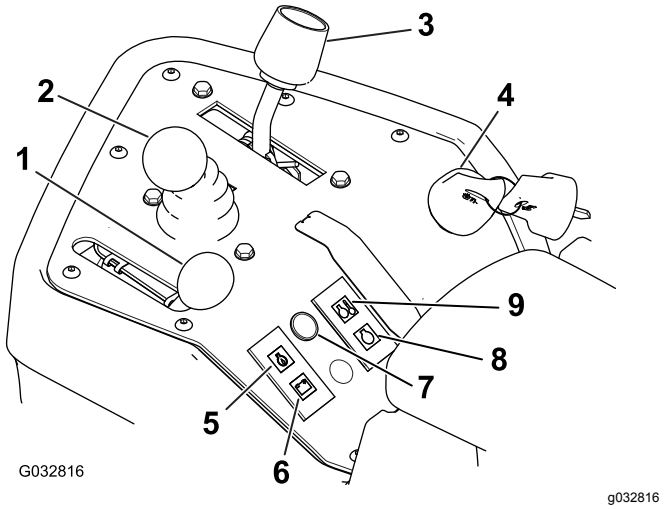


Figure 12

1. Throttle lever
2. Raise/Lower mow control
3. Functional-control lever
4. Ignition switch
5. Engine-oil-pressure light
6. Battery-warning light
7. Service-indicator light
8. Glow-plug-indicator light
9. Water-temperature light

Raise/Lower Mow Control

Moving the control (Figure 12) forward during operation lowers the cutting units and starts the reels. Pull back on the control to stop the reels and raise the cutting units. During operation, you can stop the reels by pulling back on the control momentarily and releasing it. Start the reels by moving the control forward.

Functional-Control Lever

The functional-control lever (Figure 12) provides 2 traction selections plus a NEUTRAL position. You can shift from mow to transport or transport to mow (not to neutral) while the machine is in motion; no damage will result.

- REAR position—neutral and backlapping
- MIDDLE position—used for mowing operation
- FRONT position—used for transport operation

Ignition Switch

Insert the key into the switch (Figure 12) and turn it clockwise as far as possible to the START position to start the engine. Release the key as soon as the engine starts; the key moves to the ON position. Turn

the key counterclockwise to the OFF position to shut off the engine.

Battery-Warning Light

The light (Figure 12) glows if the battery charge is low.

Engine-Oil-Pressure Light

The light (Figure 12) glows if the engine-oil pressure drops below a safe level.

Water-Temperature Light

The light (Figure 12) glows and the engine automatically shuts down when the engine-coolant temperature gets too high. If the engine shuts down, you can start the engine and drive the machine for 10 seconds before it will shutdown again, allowing you to move the machine to a location where you can allow it to cool down.

Service-Indicator Light

The service-indicator light (Figure 12) illuminates when the machine sensors detect an issue with 1 of the systems of the machine. If this light illuminates, stop what you are doing and drive to a safe location where you or a service technician can diagnose the problem. For more information on diagnosing system issues using the service indicator light, refer to Diagnosing the Service Indicator Light (page 44).

Glow-Plug-Indicator Light

When the glow-plug-indicator light (Figure 12) is lit, it indicates the glow plugs are on.

Note: The glow-plug-indicator light may illuminate for a short time after the engine has started; this is normal.

Hour Meter

The hour meter (Figure 13) indicates the total hours the machine has operated. It starts to function whenever you rotate the ignition switch to the ON position.

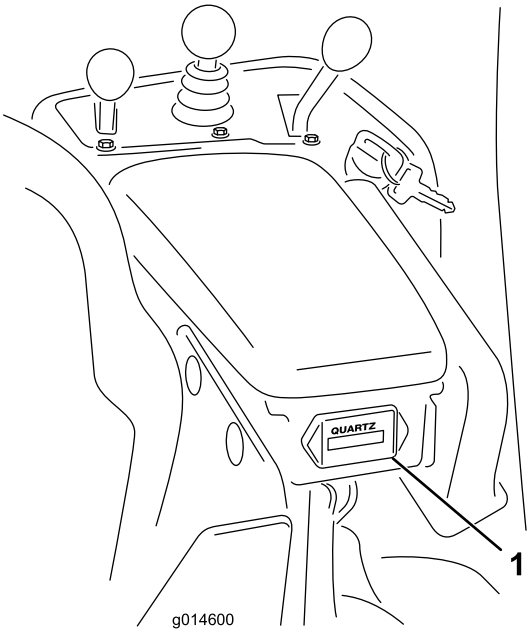


Figure 13

1. Hour meter

Parking-Brake Lever

Pull up on the brake lever (Figure 14) to set the parking brake. Disengage it by squeezing the release lever on the underside of the brake lever and lowering it down to the released position. Lock the parking brake any time you leave the machine.

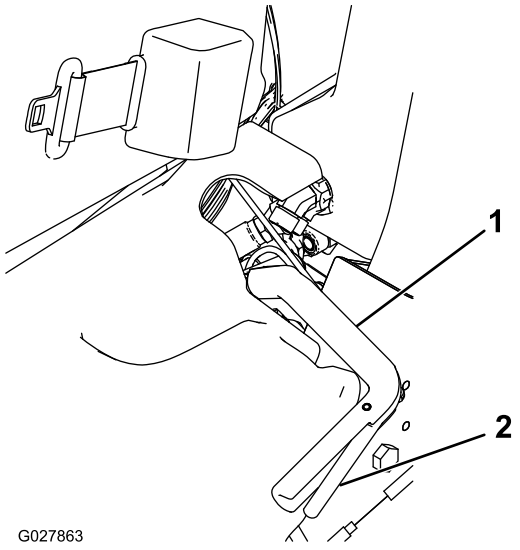


Figure 14

1. Parking-brake lever
2. Release lever

Backlap Lever

The backlap lever is located under the plastic cover to the left of the seat. Use the backlap lever (Figure 15)

in conjunction with the raise/lower mow control lever and the reel-speed control for backlapping the reels.

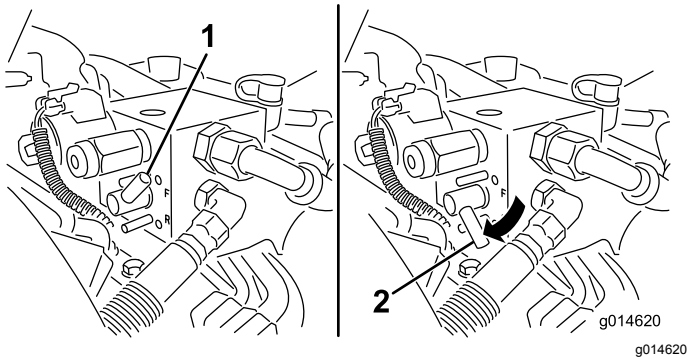


Figure 15

1. Backlap lever—mow position
2. Backlap lever—backlap position

Reel-Speed Control

The reel-speed control is located under the plastic cover to the left of the seat. Use the reel-speed control (Figure 16) to adjust the speed of the reels.

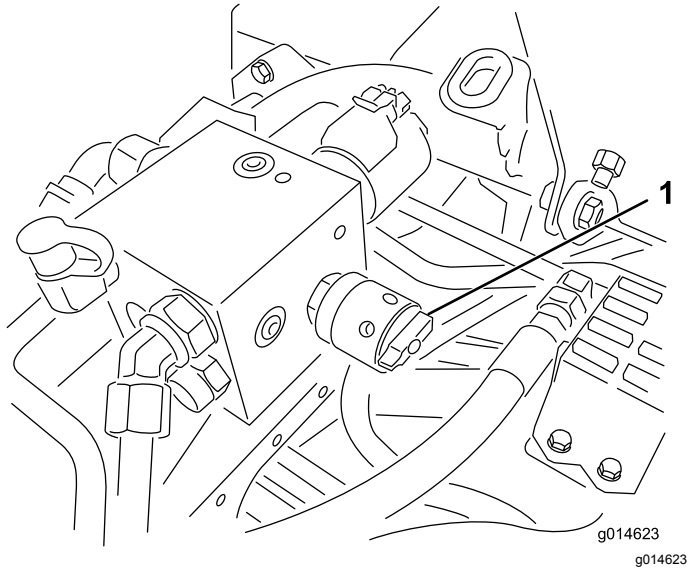


Figure 16

1. Reel-speed control

Seat-Adjusting Lever

The seat-adjusting lever is located on the front, left corner of the seat (Figure 17), allowing you to adjust the seat forward and rearward.

Note: If you need additional adjustment on the seat, you can remove the 4 nuts securing the seat slide rails to the base and move the seat slide rails to the second set of mounting holes provided.

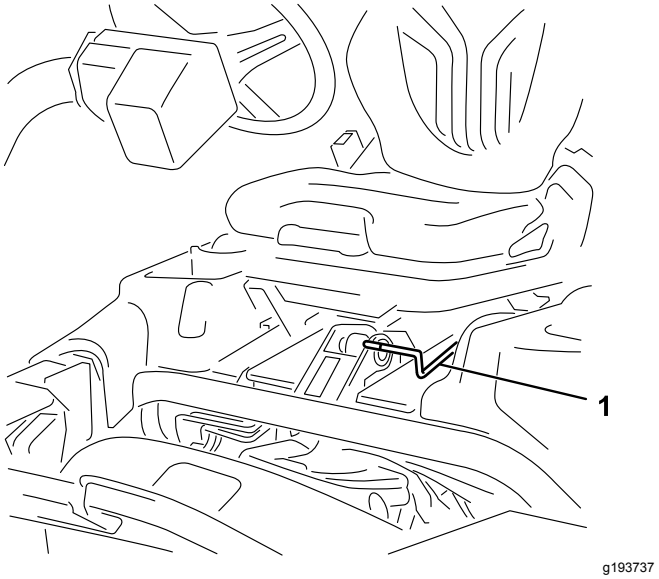


Figure 17

1. Seat-adjusting handle

Fuel-Shutoff Valve

Close the fuel-shutoff valve (Figure 18), behind the seat and under the fuel tank, when storing or transporting the machine on a truck or trailer.

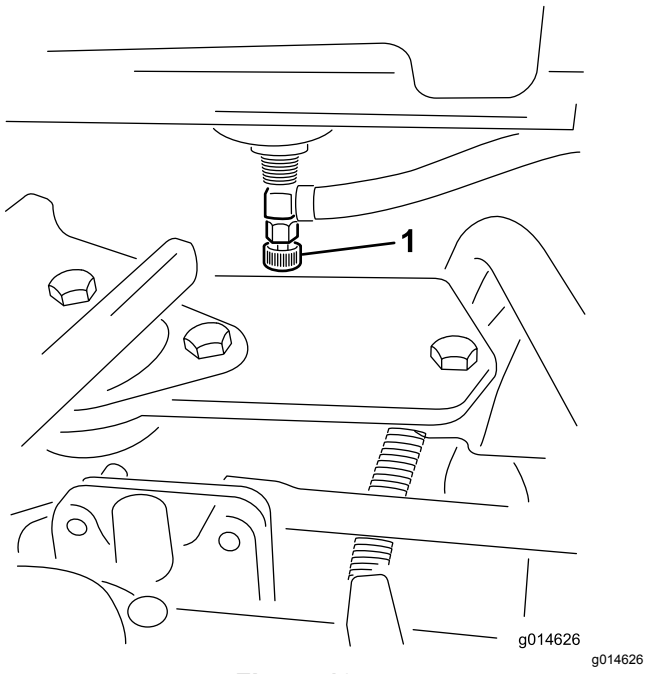


Figure 18

1. Fuel shutoff (under the fuel tank)

Specifications

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

Width of cut	151 cm (59.5 inches)
Wheel tread	128 cm (50.5 inches)
Wheel base	123 cm (48.5 inches)
Overall length (w/baskets)	249 cm (98 inches)
Overall width	179 cm (70.5 inches)
Overall height	205 cm (81 inches)
Net Weight w/reels (11 Blade)	696 kg (1,535 lb)

Attachments/Accessories

A selection of Toro approved attachments and accessories is 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.

To best protect your investment and maintain optimal performance of your Toro equipment, count on Toro genuine parts. When it comes to reliability, Toro delivers replacement parts designed to the exact engineering specification of our equipment. For peace of mind, insist on Toro genuine parts.

Operation

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

Before Operation Safety

General Safety

- Never allow children or untrained people to operate or service the machine. Local regulations may restrict the age of the operator. The owner is responsible for training all operators and mechanics.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- Know how to stop the machine and shut off the engine quickly.
- Check that operator-presence controls, safety switches, and shields are attached and functioning properly. Do not operate the machine unless they are functioning properly.
- Before mowing, always inspect the machine to ensure that the cutting units are in good working condition.
- Inspect the area where you will use the machine and remove all objects that the machine could throw.

Fuel Safety

- Use extreme care in handling fuel. It is flammable and its vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Never remove the fuel cap or fill the fuel tank while the engine is running or hot.
- Never refuel the machine in an enclosed space.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or other appliance.
- If you spill fuel, do not attempt to start the engine; avoid creating any source of ignition until the fuel vapors have dissipated.

Filling the Fuel Tank

- **Fuel tank capacity:** 22.7 L (6 U.S. gallons)
- **Recommended Fuel:**
  - For best results, use only clean, fresh diesel fuel or biodiesel fuels with low (<500 ppm) or ultra low (<15 ppm) sulfur content. The minimum cetane rating should be 40. Purchase fuel in quantities that can be used within 180 days to ensure fuel freshness.
  - Use summer-grade diesel fuel (No. 2-D) at temperatures above -7° C (20° F) and winter-grade (No. 1-D or No. 1-D/2-D blend) below that temperature. Use of winter-grade fuel at lower temperatures provides lower flash point and cold flow characteristics which will ease starting and reduce fuel filter plugging.

    Note: Use of summer-grade fuel above -7° C (20° F) will contribute toward longer fuel pump life and increased power compared to winter-grade fuel.
  - This machine can also use a biodiesel blended fuel of up to B20 (20% biodiesel, 80% petrodiesel). The petrodiesel portion should be low or ultra-low sulfur. Observe the following precautions:
    - ◊ The biodiesel portion of the fuel must meet specification ASTM D6751 or EN14214.
    - ◊ The blended fuel composition should meet ASTM D975 or EN590.
    - ◊ Painted surfaces may be damaged by biodiesel blends.
    - ◊ Use B5 (biodiesel content of 5%) or lesser blends in cold weather.
    - ◊ Monitor seals, hoses, gaskets in contact with fuel as they may be degraded over time.
    - ◊ Fuel filter plugging may be expected for a time after converting to biodiesel blends.
    - ◊ Contact your distributor if you wish for more information on biodiesel.

Your fuel tank has a sight glass (Figure 19) or a fuel gauge (Figure 20). Refer to these figures for this procedure.

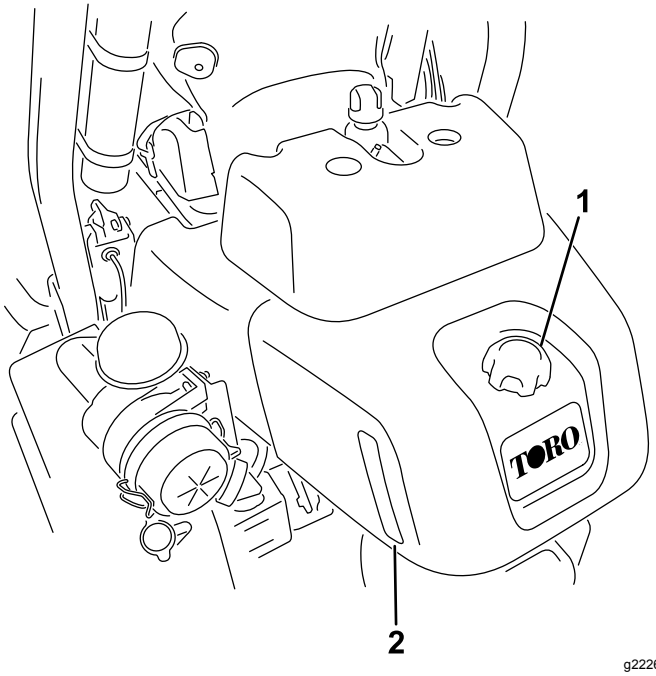


Figure 19

Fuel tank—sight glass equipped

1. Fuel-tank cap
2. Sight glass

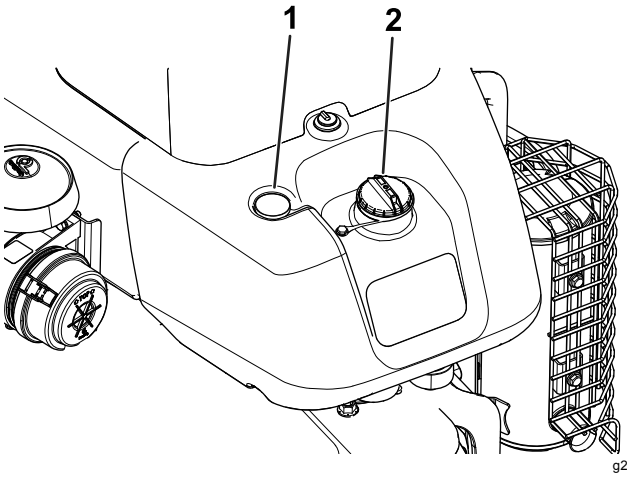


Figure 20

Fuel tank—fuel gauge equipped

1. Fuel gauge
2. Fuel-tank cap

1. Clean around the fuel-tank cap and remove it.
2. Fill the tank until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck.

   Important: **Do not overfill the tank. Use the sight glass or fuel gauge to check the amount of fuel in the tank.**
3. Install the cap.
4. Wipe up any fuel that may have spilled.

Performing Daily Maintenance

Before starting the machine each day, perform the following procedures:

- Check the engine-oil level—refer to Checking the Engine Oil (page 29).
- Drain water from the fuel filter—refer to Draining Water from the Fuel Filter (page 31).
- Check the cooling system—refer to Cooling System Safety (page 35).
- Check the tire pressure—refer to Checking the Tire Pressure (page 33).
- Check the hydraulic-fluid level—refer to Checking the Hydraulic-Fluid Level (page 37).
- Check the reel-to-bedknife contact—refer to Checking the Reel-to-Bedknife Contact (page 42).

During Operation Safety

General Safety

- The owner/operator can prevent and is responsible for accidents that may cause personal injury or property damage.
- Wear appropriate clothing, including eye protection; long pants; slip-resistant, substantial foot protection; and hearing protection. Tie back long hair and do not wear jewelry.
- Do not operate the machine while ill, tired, or under the influence of alcohol or drugs.
- Never carry passengers on the machine and keep bystanders and pets away from the machine during operation.
- Operate the machine only in good visibility to avoid holes or hidden hazards.
- Avoid mowing on wet grass. Reduced traction could cause the machine to slide.
- Before you start the engine, ensure that all drives are in neutral, the parking brake is engaged, and you are in the operating position.
- Keep your hands and feet away from the cutting units. Keep clear of the discharge opening at all times.
- Look behind and down before backing up to be sure of a clear path.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure your vision.
- Do not mow near drop-offs, ditches, or embankments. The machine could suddenly roll over if a wheel goes over the edge or if the edge gives way.
- Stop the cutting units whenever you are not mowing.
- Stop the machine and inspect the cutting units after striking an object or if there is an abnormal vibration in the machine. Make all necessary repairs before resuming operation.
- Slow down and use caution when making turns and crossing roads and sidewalks with the machine. Always yield the right-of-way.
- Disengage the drive to the cutting unit and shut off the engine before adjusting the height of cut (unless you can adjust it from the operating position).
- Never run an engine in an area where exhaust gasses are enclosed.
- Never leave a running machine unattended.
- Before leaving the operating position (including to empty the catchers or to unclog the chute), do the following:
  - Park the machine on level ground.
  - Disengage the power take-off and lower the attachments.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all moving parts to stop.
- Do not operate the machine when there is the risk of lightning.
- Do not use the machine as a towing vehicle.
- Use accessories, attachments, and replacement parts approved by The Toro® Company only.

Rollover Protection System (ROPS) Safety

- **Do not** remove the ROPS from the machine.
- Ensure that the seat belt is attached and that you can release it quickly in an emergency.
- Always wear your seat belt if your machine has a fixed roll bar.
- Check carefully for overhead obstructions and do not contact them.
- Keep the ROPS in safe operating condition by thoroughly inspecting it periodically for damage and keeping all the mounting fasteners tight.
- Replace a damaged ROPS. Do not repair or alter it.

Slope Safety

- Establish your own procedures and rules for operating on slopes. These procedures must include surveying the site to determine which

slopes are safe for machine operation. Always use common sense and good judgement when performing this survey.

- Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. Operating the machine on any slope requires extra caution.
- Operate the machine at a lower speed when you are on a slope.
- If you feel uneasy operating the machine on a slope, do not do it.
- Watch for holes, ruts, bumps, rocks, or other hidden objects. Uneven terrain could overturn the machine. Tall grass can hide obstacles.
- Choose a low ground speed so you will not have to stop or shift while on a slope.
- A rollover can occur before the tires lose traction.
- Avoid operating the machine on wet grass. Tires may lose traction; regardless if the brakes are available and functioning.
- Avoid starting, stopping, or turning the machine on a slope.
- Keep all movement on slopes slow and gradual. Do not suddenly change the speed or direction of the machine.
- Do not operate the machine near dropoffs, ditches, embankments, or bodies of water. The machine could suddenly roll over if a wheel goes over the edge or the edge caves in. Establish a safety area between the machine and any hazard (2 machine widths).

Breaking in the Machine

Refer to the engine manual supplied with the machine for oil change and maintenance procedures recommended during the break-in period.

Only 8 hours of mowing operation is required for the break-in period.

Since the first hours of operation are critical to future dependability of the machine, monitor its functions and performance closely so that minor difficulties, which could lead to major problems, are noted and can be corrected. Inspect the machine frequently during break-in for signs of oil leakage, loose fasteners, or any other malfunction.

Starting and Shutting Off the Engine

Note: Inspect the areas beneath the mowers to be certain they are clear of debris.

Starting the Engine

Important: **Do not use ether or other types of starting fluid.**

Note: You may need to bleed the fuel system before starting the engine if any of the following situations have occurred:

- Initial start up of a new engine
- The engine has ceased running due to lack of fuel.
- Maintenance has been performed upon fuel system components; ie. filter replaced, etc.

Refer to your engine owner's manual.

1. Sit on the seat, lock the parking brake, disengage the raise/lower mow control and move the functional-control lever to the NEUTRAL position.
2. Remove your foot from the traction pedal and make sure the pedal is in the NEUTRAL position.
3. Move the throttle lever to the SLOW position.
4. Insert the key into the switch and rotate it to the ON position. Hold it in the ON position until the glow-plug-indicator light goes off (approximately 6 seconds).
5. Turn the ignition key to the START position.

   Important: **To prevent overheating of the starter motor, do not engage the starter longer than 10 seconds. After 10 seconds of continuous cranking, wait 60 seconds before engaging the starter motor again.**
6. Release the key when the engine starts and allow it to move to the ON position.
7. Allow the engine to warm up for a few minutes before operating.

   Important: **When starting the engine for the first time or after an overhaul of the engine, operate the machine in forward and reverse for one to two minutes. Turn the steering wheel to the left and right to check the steering response. Then shut the engine off (see Stopping in Starting and Stopping the Engine) and wait for all moving parts to stop. Check for oil leaks, loose parts and any other noticeable malfunctions.**

Shutting Off the Engine

1. Move the throttle lever to the SLOW position, disengage the raise/lower mow control, and move the functional-control lever to the NEUTRAL position.
2. Rotate the ignition key to the OFF position to shut off the engine. Remove the key from the switch to prevent accidental starting.

3. Close the fuel shut-off valve before storing the machine.

Checking the Safety-Interlock System

⚠ CAUTION

If the safety interlock switches are disconnected or damaged the machine could operate unexpectedly causing personal injury.

- **Do not tamper with the interlock switches.**
- **Check the operation of the interlock switches daily and replace any damaged switches before operating the machine.**

The purpose of the safety-interlock system is to prevent operation of the machine where there is possible injury to the operator or damage to the machine.

The safety-interlock system prevents the engine from starting unless:

- The traction pedal is in the NEUTRAL position.
- The functional-control lever is in the NEUTRAL position.

The safety-interlock system prevents the machine from moving unless:

- The parking brake is disengaged.
- The operator is seated.
- The functional-control lever is in the MOW position or the TRANSPORT position.

The safety-interlock system prevents the reels from operating unless the functional-control lever is in the MOW position.

Perform the following system checks daily to ensure that the interlock system is operating correctly:

1. Sit on the seat, move the traction pedal to the NEUTRAL position, move the functional-control lever to the NEUTRAL position, and engage the parking brake.
2. Try to press the traction pedal.

   The pedal should not press, which means that the interlock system is operating correctly. Correct the problem if it is not operating properly.
3. Sit on the seat, move the traction pedal to the NEUTRAL position, move the functional-control lever to the NEUTRAL position, and engage the parking brake.
4. Move the functional-control lever to the MOW position or the TRANSPORT position and try to start the engine.

   The engine should not turnover or start, which means that the interlock system is operating correctly. Correct the problem if it is not operating properly.
5. Sit on the seat, move the traction pedal to the NEUTRAL position, move the functional-control lever to the NEUTRAL position, and engage the parking brake.
6. Start the engine and move the functional-control lever to the MOW position or the TRANSPORT position.

   The engine should shut off, which means that the interlock system is operating correctly.

   Correct the problem if it is not operating properly.
7. Sit on the seat, move the traction pedal to the NEUTRAL position, move the functional control lever to the NEUTRAL position, and engage the parking brake.
8. Start the engine.
9. Release the parking brake, move the functional control lever to the MOW position, and rise from the seat.

   The engine should shut off, which means that the interlock system is operating correctly. Correct the problem if it is not operating properly.
10. Sit on the seat, move the traction pedal to the NEUTRAL position, move the functional control lever to the NEUTRAL position, and engage the parking brake.
11. Start the engine.
12. Move the raise/lower mow control forward to lower the cutting units. The cutting units should lower but not start rotating.

    If they start rotating, the interlock system is not operating correctly; correct the problem before operating the machine.

Driving the Machine without Mowing

Ensure that the cutting units are fully raised. Move the functional-control lever to the TRANSPORT position. Use the brakes to slow the machine while going down steep hills to avoid loss of control. Always approach rough areas at a reduced speed and cross severe undulations carefully. Familiarize yourself with the width of the machine. Do not attempt to pass between objects that are close together so that costly damage and down time can be prevented.

Mowing

Before mowing greens, find a clear area and practice starting and stopping the machine, raising and lowering the cutting units, turning, etc.

Inspect the green for debris, remove the flag from the cup, and determine the best direction to mow. Base the direction to mow on the previous mowing direction. Always mow in an alternate pattern from the previous mowing so that the grass blades are less apt to lay down and therefore be difficult to trap between the reel blades and the bedknife.

1. Approach the green with the functional-control lever in the MOW position and the throttle at full speed.
2. Start on 1 edge of the green so that you can use the ribbon procedure of cutting.

   Note: This holds compaction to a minimum and leaves a neat, attractive pattern on the greens.
3. Actuate the raise/lower mow lever as the front edges of the grass baskets cross the outer edge of the green.

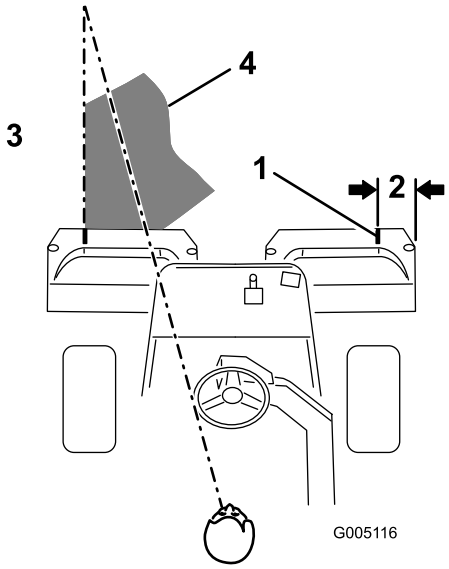
   Note: This procedure drops the cutting units to the turf and starts the reels.

   Important: **The No. 1 cutting unit reel is delayed; therefore, you should practice to gain the required timing necessary to minimize the cleanup mowing operation.**
4. Overlap a minimal amount with the previous cut on return passes.

   Note: To assist in maintaining a straight line across the green and keep the machine an equal distance from the edge of the previous cut, establish an imaginary sight line approximately 1.8 to 3 m (6 to 10 ft) ahead of the machine to the edge of the uncut portion of the green (Figure 21). Some find it useful to include the outer edge of the steering wheel as part of the sight line; i.e., keep the steering wheel edge aligned with a point that is always kept the same distance away from the front of the machine.
5. As the front edges of the baskets cross the edge of the green, move the raise/lower mow lever rearward and hold it until all the cutting units have risen. This stops the reels and lifts the cutting units.

   Note: It is important to time this step correctly so that you do not cut into the fringe area yet cut as much of the green as possible to minimize the amount of grass left to mow around the outer periphery.
6. To cut down on operating time and ease lineup for the next pass, momentarily turn the machine in the opposite direction, then turn it in the direction of the uncut portion; i.e., if intending to turn right, first swing slightly left, then right.

   Note: This helps to get the machine more quickly aligned for the next pass. Try to make as short of a turn as possible except during warmer weather when a wider arc minimizes the turf bruising.



g005116

Figure 21

1. Alignment strip
2. Approximately 12.7 cm (5 inches)
3. Cut grass on the left
4. Keep a focal spot 2 to 3 m (6 to 10 ft) ahead of the machine.

   Note: The steering wheel does not return to its original position after you complete a turn.

   Important: **Never stop the machine on a green with the cutting unit reels operating as damage to the turf may result. Stopping the machine on a wet green may leave marks or indentations from the wheels.**
7. If the leak detector alarm (if equipped on your model) sounds or you notice an oil leak while cutting on a green, immediately raise the cutting units, drive directly off the green, and stop the machine in an area away from the green. Determine the cause of the leak and correct the problem.
8. Finish cutting the green by mowing the outer periphery. Be sure to change the direction of cutting from the previous mowing.

   Note: Always keep weather and turf conditions in mind and be sure to change the direction of mowing from the previous cutting.
9. When finished mowing the outer periphery, tap the raise/lower mow lever rearward to stop the

reels, then drive off the green. When all the cutting units are off of the green, raise them.

Note: This minimizes grass clumps left on the green.

10. Replace the flag.
11. Empty the grass baskets of all clippings before transporting to the next green.

    Note: Heavy wet clippings place an undue strain on the baskets and add unnecessary weight to the machine, thereby increasing the load on the engine, hydraulic system, brakes, etc.

After Operation Safety

General Safety

- Clean grass and debris from the cutting units, drives, mufflers, cooling screens, and engine to help prevent fires. Clean up oil or fuel spills.
- Shut off the fuel while storing or transporting the machine.
- Disengage the drive to the attachment whenever you are transporting or not using the machine.
- Allow the engine to cool before storing the machine in any enclosure.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.

Towing Safety

- Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.
- Follow the manufacturer's recommendation for weight limits for towed equipment and towing on slopes. On slopes, the weight of the towed equipment may cause loss of traction and loss of control.
- Never allow children or others in or on towed equipment.
- Travel slowly and allow extra distance to stop when towing.

Inspecting and Cleaning after Mowing

After mowing, thoroughly wash the machine with a garden hose without a nozzle so that excessive water pressure does not contaminate and damage the seals and bearings. **Do not wash a warm engine or electrical connections with water.**

After cleaning, inspect the machine for possible hydraulic fluid leaks, damage or wear to hydraulic and mechanical components, and the cutting units for sharpness. Also, lubricate the brake-shaft assembly with SAE 30 oil or spray lubricant to deter corrosion and help keep the machine performing satisfactorily during the next mowing operation.

Hauling the Machine

- Use care when loading or unloading the machine into a trailer or a truck.
- Use full-width ramps for loading the machine into a trailer or a truck. Do not exceed a 15° angle between the ramp and the trailer or truck.
- Tie the machine down securely using straps, chains, cable, or ropes. Both front and rear straps should be directed down and outward from the machine.

Towing the Machine

In case of an emergency, you can tow the machine for up to 0.4 km (1/4 mile).

Important: **Do not tow the machine faster than 3 to 5 km/h (2 to 3 mph) to avoid damaging the drive system. If you must move the machine more than 0.4 km (1/4 mile), transport it on a truck or trailer.**

1. Locate the bypass valve on the pump and rotate it so that the slot is vertical (Figure 22).

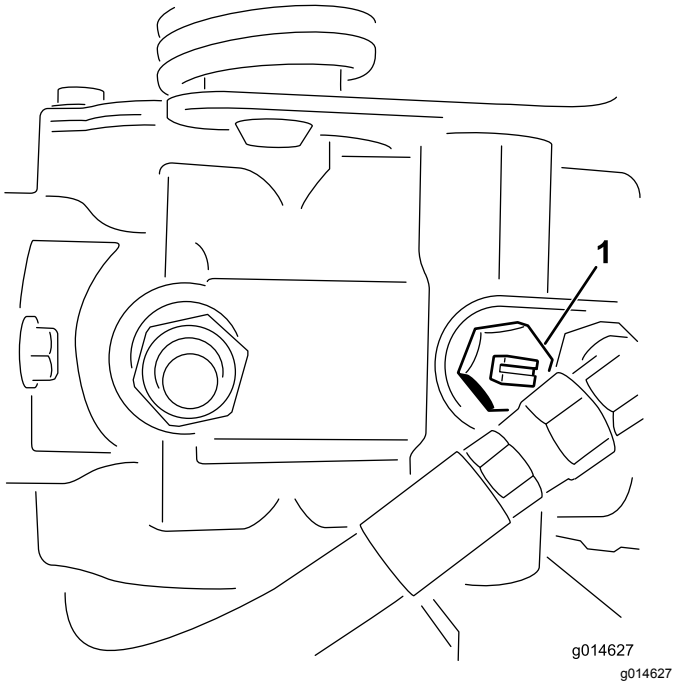


Figure 22

1. Bypass valve-slot shown in closed (horizontal) position

2. Before starting the engine, close the bypass valve by rotating it so that the slot is horizontal (Figure 22). Do not start the engine when the valve is open.

Maintenance

⚠ WARNING

Failure to properly maintain the machine could result in premature failure of machine systems causing possible harm to you or bystanders.

Keep the machine well maintained and in good working order as indicated in these instructions.

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

Note: Download a free copy of the electrical or hydraulic schematic by visiting www.Toro.com and searching for your machine from the Manuals link on the home page.

Important: **Refer to your engine operator's manual for additional maintenance procedures.**

⚠ CAUTION

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

Remove the key from the ignition.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first hour	• Check the torque of the wheel nuts.
After the first 8 hours	• Check the tension on the alternator belt.
After the first 10 hours	• Check the torque of the wheel nuts.
After the first 50 hours	• Change the engine oil and filter. • Change the hydraulic-fluid filter. • Check the engine rpm (at idle and full throttle).
Before each use or daily	• Check the safety-interlock system. • Inspect and cleanup after mowing. • Check the engine oil. • Drain water from the fuel filter. • Check the tire pressure. • Clean the radiator screen. Clean it hourly if conditions are extremely dusty and dirty. • Check the engine-coolant level. • Check the hydraulic-fluid level. • Check the hydraulic lines and hoses. • Check the reel-to-bedknife contact.
Every 50 hours	• Check the battery electrolyte level. • Check the battery cable connections.
Every 150 hours	• Change the engine oil and filter.
Every 200 hours	• Service the air-cleaner filter (more frequently when operating conditions are dusty or dirty). • Check the torque of the wheel nuts.
Every 800 hours	• Replace the fuel filter. • Change the hydraulic fluid, filter, and tank breather. • Check the engine rpm (at idle and full throttle). • Check the valve clearance.
Every 2 years	• Check the fuel lines and connections. • Replace moving hoses. • Drain and flush the cooling system.

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the safety-interlock operation.							
Check the instrument operation.							
Check the brake operation.							
Check/empty the fuel filter/water separator.							
Check the fuel level.							
Check the hydraulic-fluid level.							
Check the engine-oil level.							
Clean the screen and radiator.							
Inspect the air filter.							
Check any unusual engine noises.							
Check the reel-to-bedknife adjustment.							
Check the hydraulic hoses for damage.							
Check for fluid leaks.							
Check the tire pressure.							
Check the height-of-cut adjustment.							
Touch-up damaged paint.							

Notation for Areas of Concern

Inspection performed by:		
Item	**Date**	**Information**

Pre-Maintenance Procedures

Pre-Maintenance Safety

- Before adjusting, cleaning, repairing, or leaving the machine, do the following:
  - Park the machine on a level surface.
  - Move the throttle switch to the low-idle position.
  - Disengage the cutting units.
  - Lower the cutting units.
  - Ensure that the traction is in neutral.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all moving parts to stop.
  - Allow machine components to cool before performing maintenance.
- If the cutting units are in the transport position, use the positive mechanical lock (if available) before you leave the machine unattended.
- If possible, do not perform maintenance while the engine is running. Keep away from moving parts.
- Use jack stands to support the machine or components when required.
- Carefully release pressure from components with stored energy.

Engine Maintenance

Engine Safety

- Shut off the engine before checking the oil or adding oil to the crankcase.
- Do not change the governor speed or overspeed the engine.

Servicing the Air Cleaner

Service Interval: Every 200 hours—Service the air-cleaner filter (more frequently when operating conditions are dusty or dirty).

- Check the air-cleaner body for damage which could cause an air leak; replace it if it is damaged. Check the whole intake system for leaks, damage, or loose hose clamps.
- Changing the air filter before it is necessary increases the chance of dirt entering the engine when the filter is removed.
- Ensure that the cover is seated correctly and seals with the air cleaner body.

1. Release the latches securing the air-cleaner cover to the air-cleaner body (Figure 23).

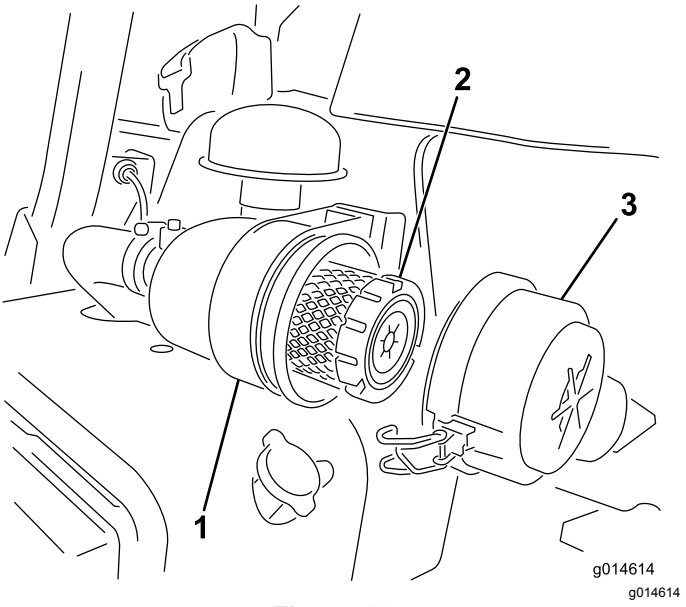


Figure 23

1. Air-cleaner body
2. Air filter
3. Air-cleaner cover

2. Remove the cover from the air-cleaner body.
3. Before removing the filter, use low pressure air (275 kPa (40 psi), clean and dry) to help remove large accumulations of debris packed between the outside of the primary filter and the canister. This cleaning process prevents debris getting

into the intake when you remove the primary filter.

Important: **Avoid using high pressure air which could force dirt through the filter into the intake tract.**

4. Remove and replace the primary filter, as follows:.

   Important: **Do not clean the used element.**

   A. Inspect the new filter for shipping damage; **do not use a damaged element.**

   B. Carefully pull the old filter out of the filter body and discard it.

   C. Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister, checking the sealing end of the filter and the body.

      Important: **Do not apply pressure to the flexible center of the filter.**

5. Clean the dirt ejection port located in the removable cover. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.
6. Install the cover orienting the rubber outlet valve in a downward position—between approximately 5 o'clock to 7 o'clock when viewed from the end.
7. Secure the latches (Figure 23).

Servicing the Engine Oil

Checking the Engine Oil

Service Interval: Before each use or daily

The engine is shipped with 3.7 L (3.9 US qt) (w/filter) of oil in the crankcase; however, you must check the oil level before and after starting the engine the first time.

Use high-quality engine oil that meets the following specifications:

- API Classification Level Required: CH–4, CI–4 or higher.
- Preferred oil: SAE 10W–30
- Alternate oil: SAE 15W–40

Toro Premium Engine oil is available from your distributor in the 10W–30 viscosity. See the parts catalog for part numbers.

Note: The best time to check the engine oil is when the engine is cool before it has been started for the day. If it has already been run, allow the oil to drain back down to the sump for at least 10 minutes before checking. If the oil level is at or below the Add mark on the dipstick, add oil to bring the oil level to the FULL mark. **Do not overfill**.

Important: **Keep the engine oil level between the upper and lower limits on the oil gauge; the engine may fail if you run it with too much or too little oil.**

1. Position the machine on a level surface.
2. Remove the dipstick and wipe it with a clean rag (Figure 25).

   Important: **Remove the dipstick while filling the engine with oil. When adding engine oil or filling oil, there *must be* clearance between the oil fill device and the oil fill hole in the valve cover as shown in Figure 24. This clearance is necessary to permit venting when filling, which prevents oil from overrunning into breather.**

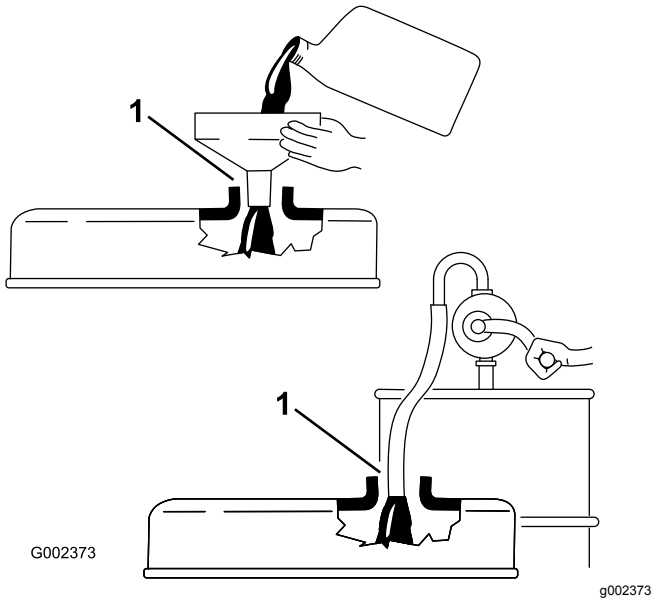


Figure 24

1. Note clearance

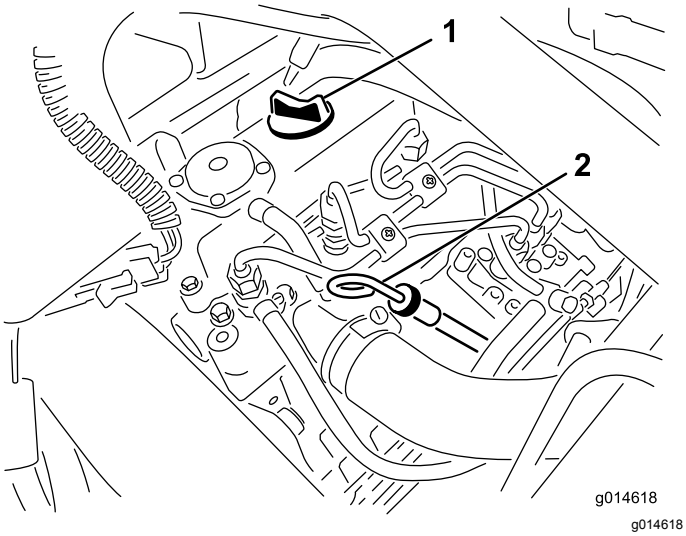


Figure 25

1. Filler cap
2. Dipstick

3. Push the dipstick into the tube and make sure it is seated fully.
4. Remove the dipstick from the tube and check the level of oil.

   Note: If the oil level is low, remove the filler cap from the valve cover and **slowly** add enough oil to raise the level to the FULL mark on the dipstick.

   Add the oil slowly and check the level often during this process. **Do not overfill.**
5. Replace the dipstick.
6. Start and run the engine at idle for 30 seconds, then shut the engine off. Wait 30 seconds, then repeat steps 2 through 5.
7. Install the filler cap and dipstick firmly in place.

Changing the Engine Oil and Filter

Service Interval: After the first 50 hours

Every 150 hours

1. Remove the drain plug and let oil flow into a drain pan. When the oil stops, install the drain plug (Figure 26).

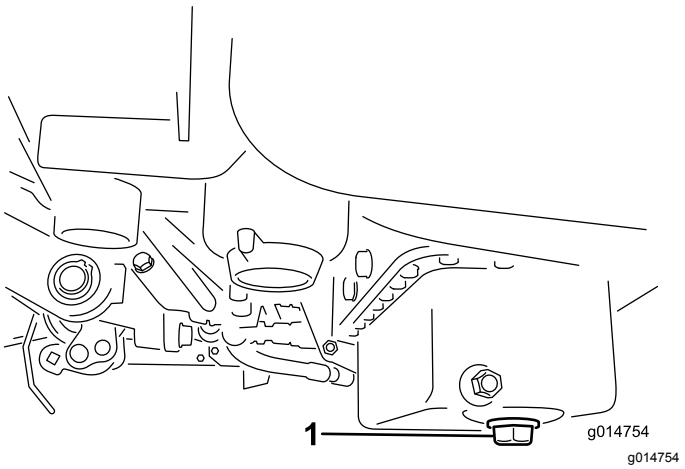


Figure 26

1. Drain plug

2. Remove the oil filter (Figure 27). Apply a light coat of clean oil to the new filter gasket.

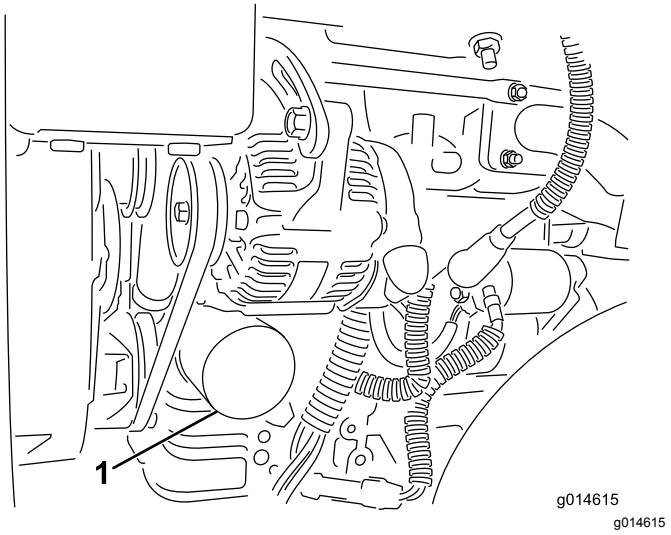


Figure 27

1. Oil filter

3. Screw the filter on by hand until the gasket contacts the filter adapter, then tighten 1/2 to 3/4 turn further. **Do not overtighten**.
4. Add oil to the crankcase; refer to Changing the Engine Oil and Filter (page 30).
5. Dispose of the used oil properly.

Fuel System Maintenance

Draining Water from the Fuel Filter

Service Interval: Before each use or daily

1. Position the machine on a level surface and shut off the engine.
2. Place a drain pan under the fuel filter.
3. Open the drain plug on the fuel filter approximately one turn and drain any accumulated water (Figure 28).

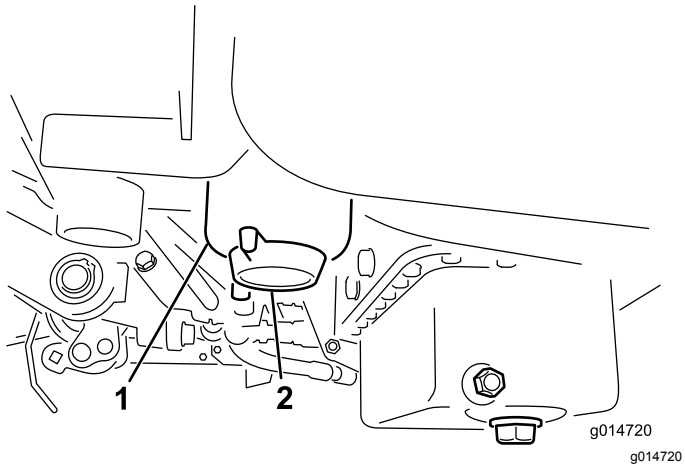


Figure 28

1. Fuel filter
2. Drain plug

4. Tighten the plug after draining.

   Note: Because the accumulated water will be mixed with diesel fuel, drain the fuel filter into a suitable container and dispose of it properly.

Replacing the Fuel Filter/Water Separator

Service Interval: Every 800 hours

1. Close the fuel-shutoff valve (Figure 29) below the fuel tank.

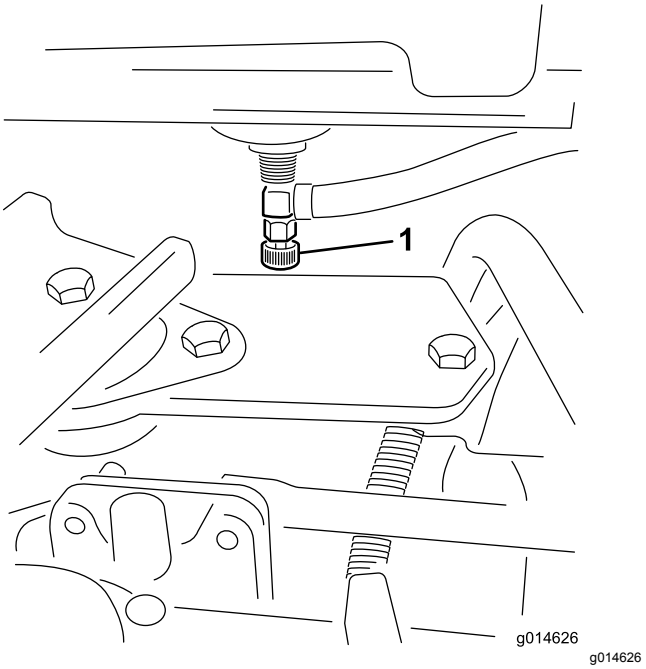


Figure 29

1. Fuel-shutoff valve

2. Clean the area where the filter canister mounts (Figure 30).
3. Place a drain pan under the fuel filter.
4. Open the filter drain plug (Figure 30).

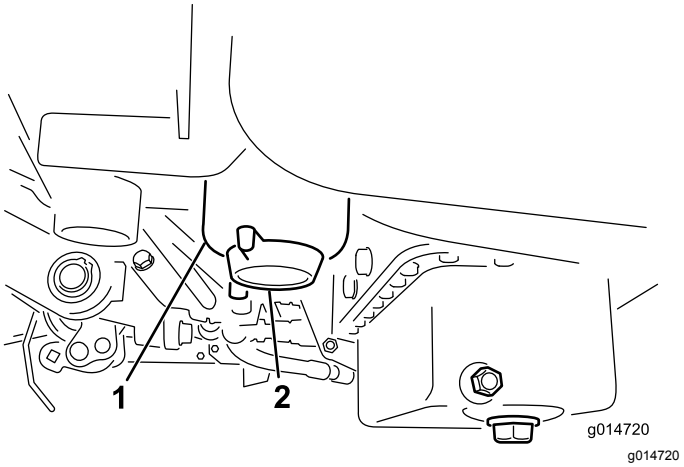


Figure 30

1. Fuel filter /water separator canister
2. Filter-drain plug

5. Unscrew the filter canister and dispose of it according to local regulations.

6. Screw the filter on by hand until the gasket contacts the filter adapter, then tighten 1/2 to 3/4 turn further.
7. Ensure that the filter-drain plug is closed. Open the fuel-shutoff valve.

Inspecting the Fuel Lines and Connections

Service Interval: Every 2 years

Inspect the fuel lines for deterioration, damage, or loose connections.

Electrical System Maintenance

Electrical System Safety

- Disconnect the battery before repairing the machine. Disconnect the negative terminal first and the positive last. Connect the positive terminal first and the negative last.
- Charge the battery in an open, well-ventilated area, away from sparks and flames. Unplug the charger before connecting or disconnecting the battery. Wear protective clothing and use insulated tools.

WARNING

CALIFORNIA
Proposition 65 Warning

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

Servicing the Battery

Properly maintain the battery electrolyte and keep the top of the battery clean. Store the machine in a cool place to prevent the battery from running down.

Check the electrolyte level every 50 operating hours or, if machine is in storage, every 30 days.

⚠ DANGER

Battery electrolyte contains sulfuric acid which is a deadly poison and causes severe burns.

- **Do not drink electrolyte and avoid contact with skin, eyes or clothing. Wear safety glasses to shield your eyes and rubber gloves to protect your hands.**
- **Fill the battery where clean water is always available for flushing the skin.**

Maintain the cell level with distilled or demineralized water. Do not fill the cells above the bottom of the split ring inside each cell.

Keep the top of the battery clean by washing it periodically with a brush dipped in ammonia or bicarbonate of soda solution. Flush the top surface

with water after cleaning it. Do not remove the fill caps while cleaning the battery.

The battery cables must be tight on the terminals to provide good electrical contact.

⚠ WARNING

Incorrect battery cable routing could damage the tractor and cables causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **Always disconnect the negative (black) battery cable before disconnecting the positive (red) cable.**
- **Always connect the positive (red) battery cable before connecting the negative (black) cable.**

If corrosion occurs at the terminals, disconnect the cables, negative (-) cable first, and scrape the clamps and terminals separately. Connect the cables, positive (+) cable first, and coat the terminals with petroleum jelly.

Locating the Fuses

The fuses in the electrical system are located under the seat (Figure 31).

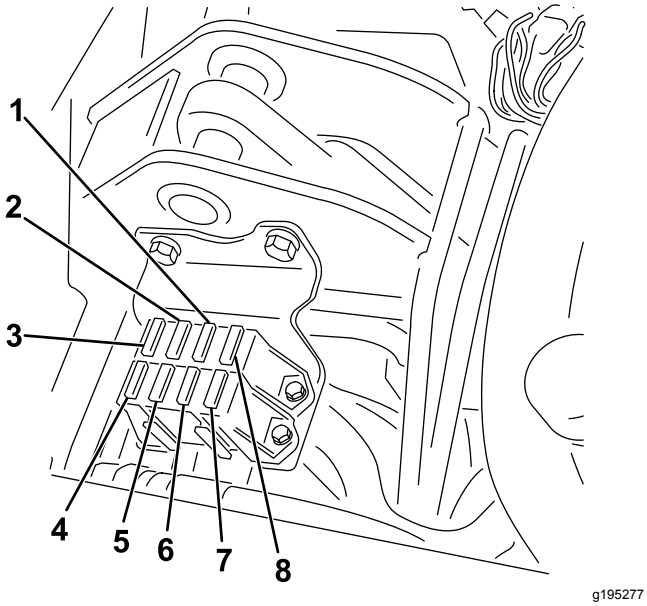


Figure 31

1. Start/run, Diagnostic lights, and glow—7.5 A
2. Reel engage, lift/lower, fan—7.5 A
3. Lift reel, E-reel enable, and over temp—7.5 A
4. No fuse
5. Lights and leak detector—15 A
6. Starter—15 A
7. Run—10 A
8. ECM logic and power—2 A

Drive System Maintenance

Checking the Tire Pressure

Service Interval: Before each use or daily

Vary the tire pressure for all 3 wheels, depending upon your turf conditions, from a minimum of 83 to a maximum of 110 kPa (12 psi to 16 psi).

Checking the Torque of the Wheel Nuts

⚠ WARNING

Failure to maintain proper torque of the wheel nuts could result in personal injury.

Torque the wheel nuts to 95 to 122 N·m (70 to 90 ft-lb) after 1 to 4 hours of operation and again after 10 hours of operation. Torque every 200 hours thereafter.

To ensure even distribution, torque the wheel nuts in a star pattern.

Adjusting the Transmission for Neutral

If the machine creeps when the traction-control pedal is in the NEUTRAL position, adjust the neutral-return mechanism.

1. Block up under the frame so that one of the front wheels is off of the floor.

   Note: If machine is equipped with a 3-Wheel Drive Kit, also raise and block rear wheel.

2. Start the engine, move the throttle to the SLOW position, and ensure that the front wheel that is off of the floor is not rotating.
3. If the wheel is rotating, shut off the engine and proceed as follows:

   A. Loosen the nut securing the eccentric to the top of the hydrostat (Figure 32).

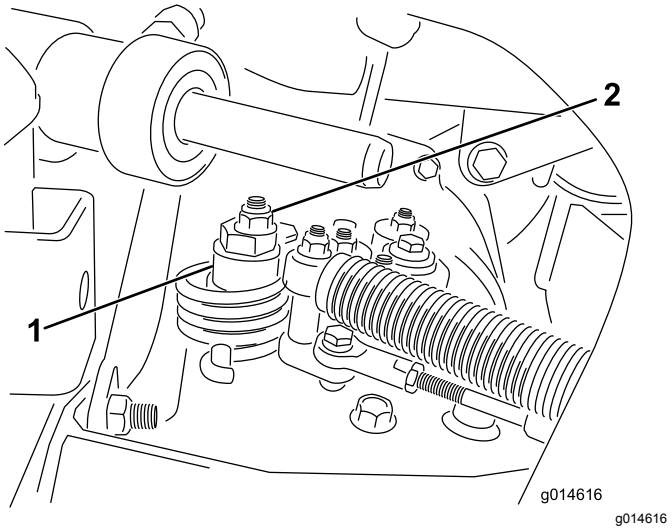


Figure 32

1. Eccentric
2. Locknut

B. Move the functional-control lever to the NEUTRAL position and the throttle to the SLOW position. Start the engine.

C. Rotate the eccentric until creep does not occur in either direction. When the wheel stops rotating, tighten the nut locking the eccentric and the adjustment (Figure 32). Verify the adjustment with the throttle in the SLOW and FAST position.

Note: If the wheel still turns when the eccentric is at the maximum adjustment, contact your Authorized Service Distributor or refer to the *Service Manual* for further adjustment.

Adjusting the Transport Speed

Obtaining the Maximum Transport Speed

The traction pedal is adjusted for maximum-transport speed at the factory, but you may need to adjust it if the pedal reaches full stroke before it contacts the pedal stop, or if you want to a decrease the transport speed.

To obtain the maximum-transport speed, put the functional control lever in the TRANSPORT position and press down on the traction pedal. If the pedal contacts the stop (Figure 33) before you feel tension on the cable, perform the following adjustment procedure:

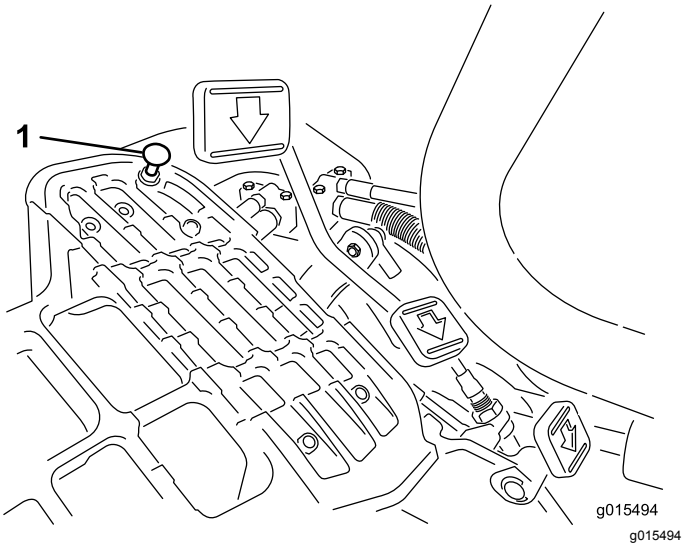


Figure 33

1. Pedal stop

1. Put the functional-control lever in the TRANSPORT position and loosen the locknut securing the pedal stop to the floor plate (Figure 33).
2. Tighten the pedal stop until it does not contact the traction pedal.
3. Continue applying a light load on the transport pedal and adjust the pedal stop so it contacts the pedal rod and tighten the nuts.

Important: **Ensure that the tension on the cable is not excessive or you will reduce the cable life.**

Reducing the Transport Speed

1. Press down on the traction pedal and loosen the locknut securing the pedal stop to the floor plate.
2. Loosen the pedal stop until you obtain the desired transport speed.
3. Tighten the locknut securing the pedal stop.

Adjusting the Mowing Speed

The mow speed is set to 3.8 mph at the factory.

The forward moving speed can be adjusted from 0 to 8 km/h (0 to 5 mph).

1. Loosen the jam nut on the trunnion bolt (Figure 34).
2. Loosen the nut securing the lock and mow brackets on the pedal pivot.

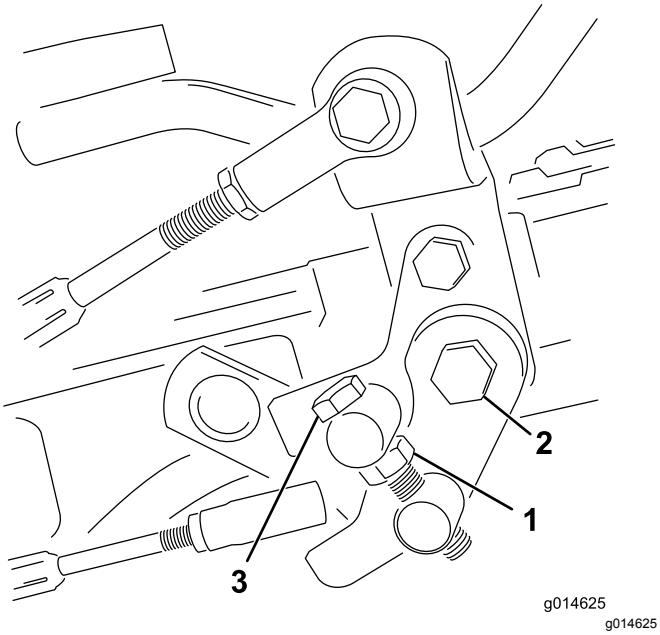


Figure 34

1. Jam nut
2. Nut
3. Trunnion bolt

3. Rotate the trunnion bolt clockwise to reduce the mowing speed and counterclockwise to increase the mowing speed.
4. Tighten the jam nut on the trunnion bolt and the nut on the pedal pivot to lock the adjustment (Figure 34). Check the adjustment and adjust as required.

Cooling System Maintenance

Cooling System Safety

- **Swallowing engine coolant can cause poisoning; keep out of reach from children and pets.**
- Discharge of hot, pressurized coolant or touching a hot radiator and surrounding parts can cause severe burns.
  - Always allow the engine to cool at least 15 minutes before removing the radiator cap.
  - Use a rag when opening the radiator cap, and open the cap slowly to allow steam to escape.

Cleaning the Radiator Screen

Service Interval: Before each use or daily Clean it hourly if conditions are extremely dusty and dirty.

To prevent the system from overheating, keep the radiator screen and radiator clean. Check and clean the screen and radiator daily or, if necessary, hourly. Clean these components more frequently in dusty, dirty conditions.

1. Remove the radiator screen (Figure 35).

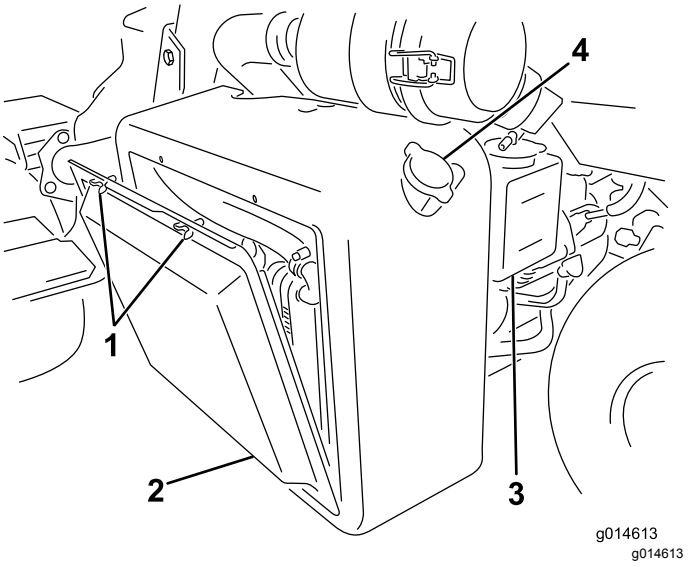


Figure 35

1. Wing bolts
2. Radiator screen
3. Reserve tank
4. Radiator cap

2. Working from the fan side of the radiator, blow out the radiator with compressed air.
3. Clean the screen and install it.

Checking the Engine-Coolant Level

The capacity of the cooling system is approximately 4.6 L (4.9 US qt).

Fill the cooling system with a 50/50 solution of water and permanent ethylene glycol antifreeze. Check the level of the coolant at the beginning of each day before starting the engine.

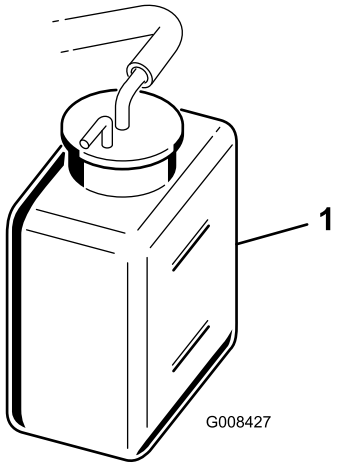
⚠ CAUTION

If the engine has been running, the pressurized, hot coolant can escape and cause burns.

- **Do not open the radiator cap when the engine is running.**
- **Use a rag when opening the radiator cap, and open the cap slowly to allow steam to escape.**

1. Park the machine on a level surface.
2. Check the coolant level (Figure 35 and Figure 36).

   It should be between the lines on the reserve tank when the engine is cold.



g008427

Figure 36

1. Reserve tank

3. If the coolant is low, remove the reserve tank cap and add a 50/50 mixture of water and permanent ethylene glycol antifreeze. **Do not overfill.**
4. Install the reserve-tank cap.

Brake Maintenance

Adjusting the Brakes

If the brake fails to hold the machine while parked, you can adjust the brakes using the bulkhead fitting near the brake drum; contact your Authorized Service Distributor or refer to the *Service Manual* for more information.

Note: Burnish the brakes annually; refer to 12 Burnishing the Brakes (page 14).

Belt Maintenance

Adjusting the Alternator Belt

Service Interval: After the first 8 hours

Ensure that the belt is properly tensioned to ensure proper operation of the machine and prevent unnecessary wear.

1. Shut off the engine, set the parking brake, and remove the ignition key.
2. Apply moderate thumb pressure to the belt between the pulleys (10 kg or 22 lb). The belt should deflect 7 to 9 mm (0.28 to 0.35 inch). If not, complete the following procedure to adjust the belt tension:

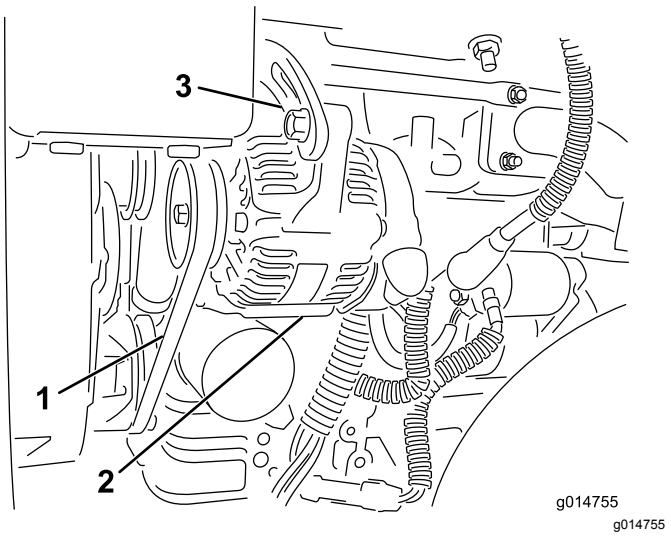


Figure 37

1. Alternator belt—apply pressure here
2. Alternator
3. Adjusting strap

   A. Loosen the bolts securing the alternator to the engine and adjusting strap.
   B. Inspect the belt for wear or damage and replace if it is worn.
   C. Using a lever placed between the alternator and the engine block, pull the alternator out to obtain the correct belt tension and tighten the bolts.

Hydraulic System Maintenance

Hydraulic System Safety

- **Ensure that all hydraulic-fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to the hydraulic system.**
- **Keep your body and hands away from pinhole leaks or nozzles that eject high-pressure hydraulic fluid.**
- **Use cardboard or paper to find hydraulic leaks.**
- **Safely relieve all pressure in the hydraulic system before performing any work on the hydraulic system.**
- **Seek immediate medical attention if fluid is injected into skin. Injected fluid must be surgically removed within a few hours by a doctor.**

Servicing the Hydraulic Fluid

Checking the Hydraulic-Fluid Level

The hydraulic-fluid reservoir is filled at the factory with approximately 20.8 L (5.5 US gallons) of high-quality hydraulic fluid. Check the level of the hydraulic fluid before operating the machine each day. Depending on your machine, you can use the white plastic window on the front of the hydraulic-fluid reservoir (behind the seat on the left side) or the dipstick on the top of the tank to check the fluid level. The fluid should be between the lines in the window or the 2 marks on the dipstick; if not, add an appropriate fluid as described in the following sections:

The recommended replacement fluid is as follows:

Toro Premium All Season Hydraulic Fluid (Available in 5-gallon pails or 55-gallon drums. See parts catalog or Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, other fluids may be used provided they meet all the following material properties and industry specifications. We do not recommend the use of synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product.

Note: Toro will not assume responsibility for damage caused by improper substitutions, so use only products from reputable manufacturers who will stand behind their recommendation.

High Viscosity Index/Low Pour Point Anti-wear Hydraulic Fluid, ISO VG 46	
Material Properties:	
Viscosity, ASTM D445	cSt @ 40°C 44 to 48 cSt @ 100°C 7.9 to 8.5
Viscosity Index ASTM D2270	140 to 160
Pour Point, ASTM D97	-34°F to -49°F
Industry Specifications:	
Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0	

Important: **The ISO VG 46 Multigrade fluid has been found to offer optimal performance in a wide range of temperature conditions. For operation in consistently high ambient temperatures, 18°C (65°F) to 49°C (120°F), ISO VG 68 hydraulic fluid may offer improved performance.**

Premium Biodegradable Hydraulic Fluid-Mobil EAL EnviroSyn 46H

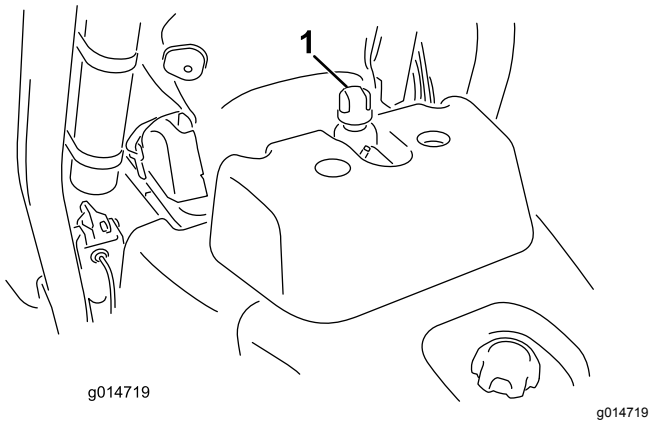
Important: **Mobil EAL EnviroSyn 46H is the only synthetic biodegradable fluid approved by Toro. This fluid is compatible with the elastomers used in Toro hydraulic systems and is suitable for a wide-range of temperature conditions. This fluid is compatible with conventional mineral oils, but for maximum biodegradability and performance, the hydraulic system should be thoroughly flushed of conventional fluid. The oil is available in 19 L (5 US gallons) containers or 208 L (55 US gallons) drums from your Mobil Distributor.**

Important: **Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 20 ml (2/3 fl oz) bottles. One bottle is sufficient for 15 to 22 L (4 to 6 US gallons) of hydraulic fluid. Order Part No. 44-2500 from your authorized Toro distributor. *This red dye is not recommended for use with biodegradable fluids.***

Important: **Regardless of the hydraulic fluid type used, any machine used for mowing fairways, verticutting, or used during ambient temperatures above 29°C (85°F) should have the Oil Cooler Kit (Part No. 117-9314) installed.**

Filling the Hydraulic Tank

Refer to Figure 38 for this procedure.



g014719

Figure 38

1. Hydraulic-tank cap or dipstick location

1. Position the machine on a level surface.

   Note: Ensure that the machine has cooled down so that the fluid is cold.

2. Check the fluid level according to the tank on your machine:

   - If your tank has a sight window, check the oil level there and proceed to step 5.
   - If your tank does not have a sight window, locate the dipstick on the top of the hydraulic tank and proceed to step 3.

3. Remove the dipstick and wipe it with a clean rag, then screw the dipstick back into the tank.

4. Remove the dipstick and check the fluid level. If the fluid is between the marks on the dipstick, the level is sufficient. If the level is not between the marks, more fluid is needed.

5. Remove the cap or dipstick (depending on your machine) from the hydraulic fluid tank and slowly fill the tank with the appropriate high-quality hydraulic fluid until the level is between the 2 lines on the sight window or 2 marks on the dipstick.

6. Install the cap or dipstick and up any fluid that may have spilled.

   Important: **Check the level of the hydraulic fluid before the engine is first started and daily thereafter.**

Changing the Hydraulic Fluid and Filter

Service Interval: After the first 50 hours

Every 800 hours

If the fluid becomes contaminated, have your Toro distributor flush the system. Contaminated fluid looks milky or black when compared to clean fluid.

1. Clean the area around the filter mounting area (Figure 39). Place a drain pan under the filter and remove the filter.

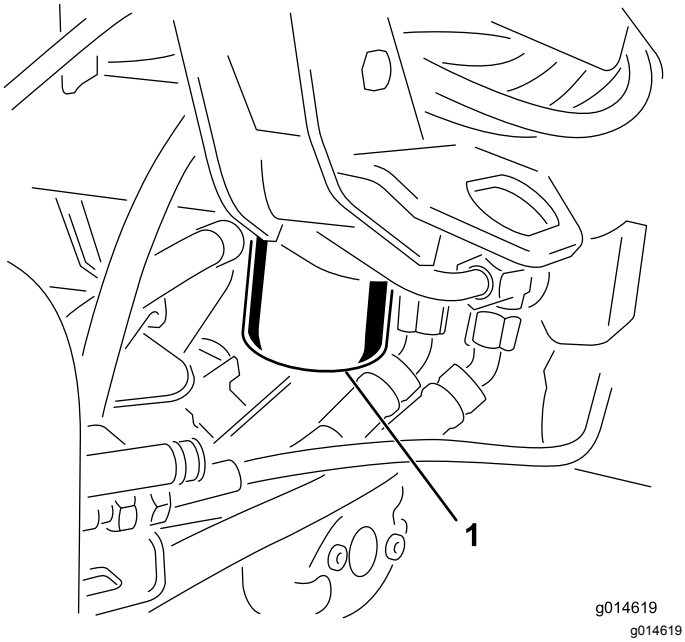


Figure 39

1. Hydraulic-fluid filter

Note: If you will not be draining the fluid, disconnect and plug the hydraulic line going to the filter.

2. Fill the replacement filter with the appropriate hydraulic fluid, lubricate the sealing gasket, and hand turn it until the gasket contacts the filter head. Then tighten it 3/4 turn further.
3. Fill the hydraulic reservoir with hydraulic fluid; refer to Filling the Hydraulic Tank (page 38).
4. Start the machine and run it at idle for 3 to 5 minutes to circulate the fluid and remove any air trapped in the system. Shut off the engine and check the fluid level.
5. Dispose of the fluid and filter properly.

Checking the Hydraulic Lines and Hoses

⚠ WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury.

- **Ensure that all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to the hydraulic system.**
- **Keep your body and hands away from pinhole leaks or nozzles that eject high-pressure hydraulic fluid.**
- **Use cardboard or paper to find hydraulic leaks.**
- **Safely relieve all pressure in the hydraulic system before performing any work on the hydraulic system.**
- **Get immediate medical help if fluid is injected into skin.**

Check the hydraulic lines and hoses daily for leaks, kinked lines, loose mounting supports, wear, loose fittings, weather deterioration, and chemical deterioration. Make all necessary repairs before operating.

Cutting Unit Maintenance

Cutting Unit Safety

A worn or damaged blade or bed-knife can break, and a piece could be thrown at you or bystanders, resulting in serious personal injury or death.

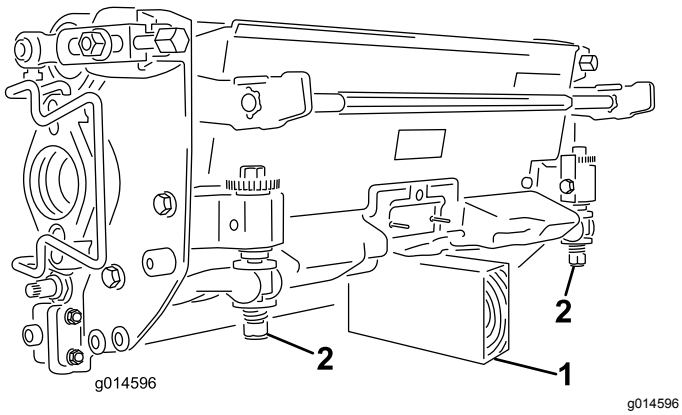
- Inspect the blades and bed-knives periodically for excessive wear or damage.
- Use care when checking the blades. Wear gloves and use caution when servicing them. Only replace or backlap the blades and bed-knives; never straighten or weld them.
- On machines with multiple cutting units, take care when rotating a reel; it can cause the reels in the other cutting units to rotate.

Installing and Removing the Cutting Units

Note: When sharpening, setting the height-of-cut, or performing other maintenance procedures on the cutting units, store the cutting unit reel motors in the storage location on the front of the suspension arms to prevent damage to them.

Important: **Do not raise the suspension to the transport position when the reel motors are in the holders in the machine frame. Damage to the motors or hoses could result.**

Important: **Whenever you need to tip the cutting unit, prop up the rear of the cutting unit to ensure that the nuts on the bedbar adjusting screws are not resting on the work surface (Figure 40).**



g014596

Figure 40

1. Prop (not provided)
2. Bedbar-adjusting-screw nut (2)

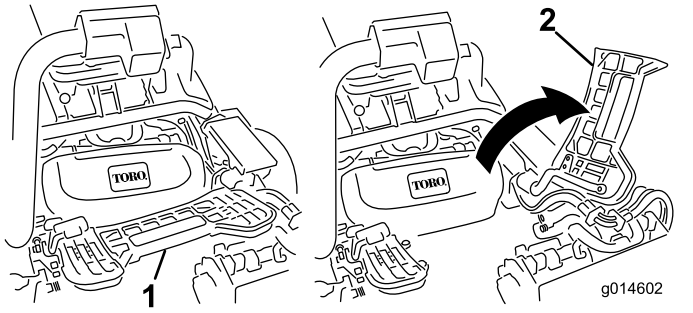
Installing the Cutting Units

1. Lift up on the foot rest and swing it open, allowing access to the center cutting unit position (Figure 41).

⚠ CAUTION

The foot rest can pinch fingers if it falls into the closed position.

Keep your fingers clear of the area where the foot rest seats while it is open.

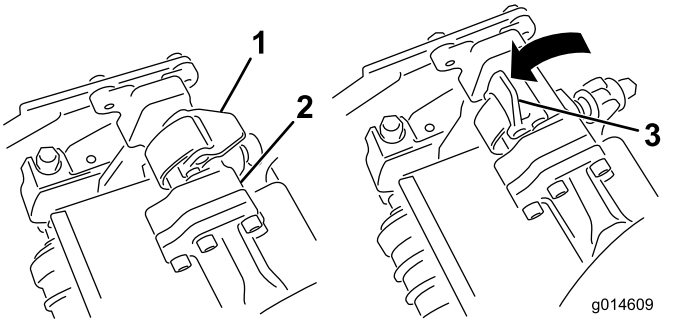


g014602

Figure 41

1. Footrest—closed
2. Footrest—open

2. Position the cutting unit under the center suspension arm.
3. With the latches on the suspension-arm bar pointing up (i.e., open) (Figure 42), push the suspension arm down so that the bar fits over the bar across the top of the cutting unit (Figure 43).



g014609

Figure 42

1. Latch—closed position
2. Suspension-arm bar
3. Latch—open position

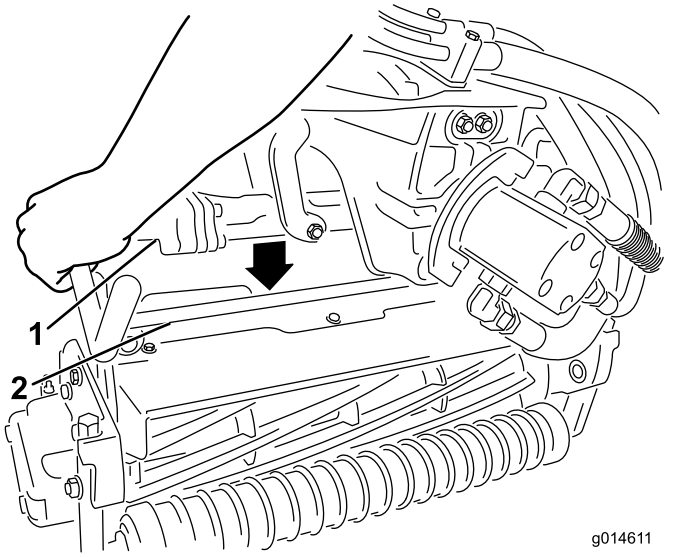


Figure 43

1. Suspension-arm bar
2. Cutting-unit bar

4. Close the latches down and around the cutting-unit bar and lock them in place (Figure 42).

   Note: You can hear a click and feel when the latches are properly locked in place.

5. Coat the spline shaft of the cutting unit motor with clean grease (Figure 44).
6. Insert the motor into the left side of the cutting unit (as viewed from the operator's position) and pull the motor retaining bar on the cutting unit toward the motor until you hear a click from both sides of the motor (Figure 44).

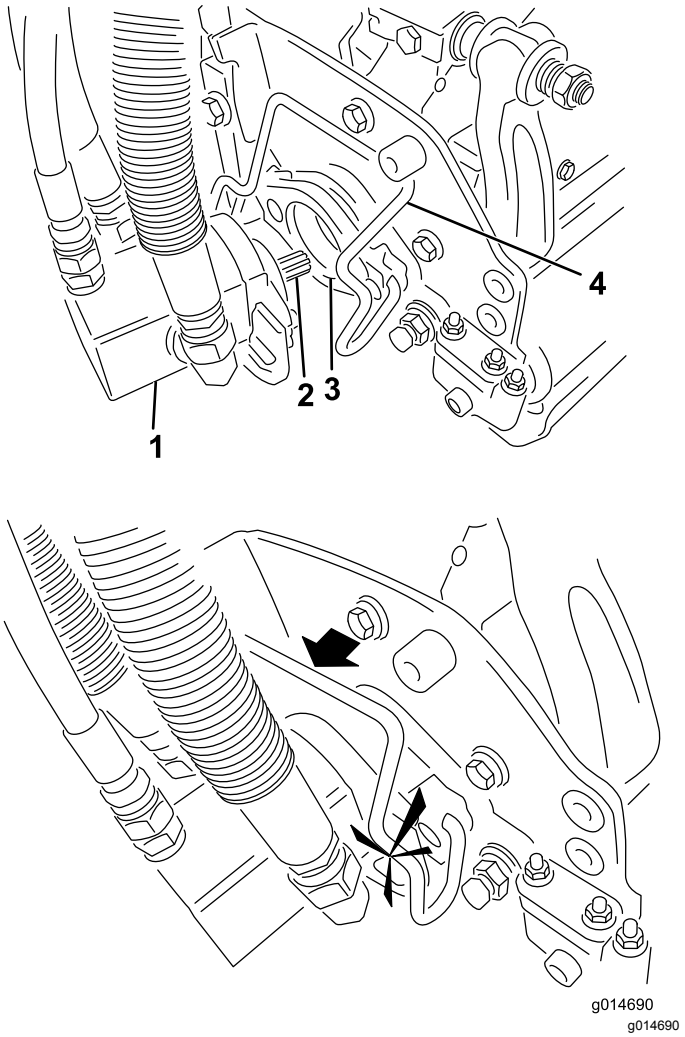


Figure 44

1. Reel motor
2. Spline shaft
3. Cavity
4. Motor-retaining bar

7. Mount a grass basket onto the basket hooks on the suspension arm.
8. Repeat this procedure for the other cutting units.

Removing the Cutting Units

1. Park the machine on a clean level surface, lower the cutting units to the ground until the suspension hydraulics are fully extended, shut off the engine, and set the parking brake.
2. Push the motor retaining bar out of the slots on the motor toward the cutting unit and remove the motor from the cutting unit.

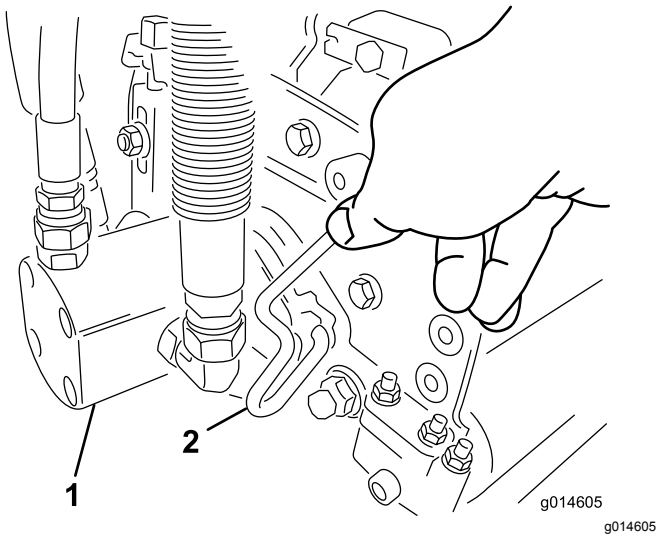


Figure 45

1. Reel motor
2. Motor-retaining bar

3. Move the motor to the storage location on the front of the suspension arm (Figure 46).

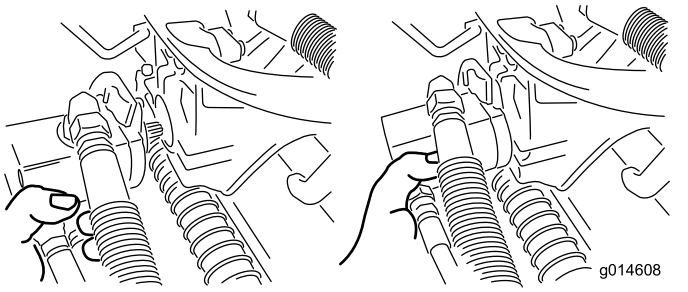


Figure 46

Note: When sharpening, setting the height-of-cut, or performing other maintenance procedures on the cutting units, store the cutting unit reel motors in the storage location on the front of the suspension arms to prevent damage to them.

Important: **Do not raise the suspension to the transport position when the reel motors are in the holders in the machine frame. Damage to the motors or hoses could result. If you must move the traction unit without the cutting units installed, secure them to the suspension arms using cable ties.**

4. Open the latches on the suspension-arm bar of the cutting unit you are removing (Figure 42).
5. Disconnect the latches from the cutting-unit bar.
6. Roll the cutting unit out from under the suspension arm.
7. Repeat steps 2 through 6 for the other cutting units as required.

Checking the Reel-to-Bedknife Contact

Each day before operating the machine, check the reel-to-bedknife contact, regardless if the quality of cut had previously been acceptable. There must be light contact across the full length of the reel and bedknife; refer to the Cutting Unit *Operator's Manual*.

Setting the Reel Speed

To achieve a consistent, high-quality cut and a uniform, after-cut appearance, you must correctly set the reel speed control (located on the manifold block under the cover to the left of the seat). Adjust the reel speed control as follows:

1. Select the height-of-cut at which the cutting units are set.
2. Choose the desired ground speed best suited for conditions.
3. Using the appropriate graph (See Figure 47) for 5, 8, 11, or 14 blade cutting units, determine the proper reel speed setting.

	5		8		11		14
	3.8 MPH 6.1 Km/h	5.0 MPH 8.0 Km/h	3.8 MPH 6.1 Km/h	5.0 MPH 8.0 Km/h	3.8 MPH 6.1 Km/h	5.0 MPH 8.0 Km/h	3.8 MPH 6.1 Km/h
0.062"/ 1.6mm	N/R	N/R	9	N/R	9	N/R	9
0.094"/ 2.4mm	N/R	N/R	9	N/R	9	N/R	9
0.125"/ 3.2mm	N/R	N/R	9	N/R	9	N/R	9
0.156"/ 4.0mm	N/R	N/R	9	N/R	9	N/R	N/R
0.188"/ 4.8mm	N/R	N/R	9	N/R	7	N/R	N/R
0.218"/ 5.5mm	N/R	N/R	9	N/R	6	N/R	N/R
0.250"/ 6.4mm	7	N/R	6	7	5	7	N/R
0.312"/ 7.9mm	6	N/R	5	6	4	6	N/R
0.375"/ 9.5mm	6	7	4	5	4	5	N/R
0.438"/ 11.1mm	6	6	4	5	3	4	N/R
0.500"/ 12.7mm	5	6	3	4	N/R	N/R	N/R
0.625"/ 15.9mm	4	5	3	3	N/R	N/R	N/R
0.750"/ 19.0mm	3	4	3	3	N/R	N/R	N/R
0.875"/ 22.2mm	3	4	N/R	3	N/R	N/R	N/R
1.000"/ 25.4mm	3	3	N/R	N/R	N/R	N/R	N/R

g014736

Figure 47

4. To set the reel speed, rotate the knob (Figure 48) until the indicator arrows are in line with the number designating desired setting.

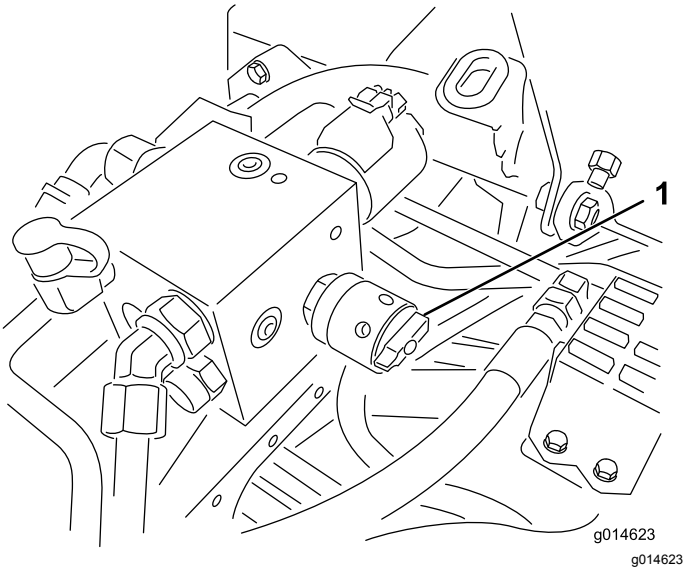


Figure 48

1. Reel-speed control

Note: You can increase or decrease the reel speed to compensate for turf conditions.

Backlapping the Reels

⚠ WARNING

Contact with the reels or other moving parts can result in personal injury.

- **Keep your fingers, hands, and clothing away from the reels or other moving parts.**
- **Never attempt to turn the reels by hand or foot while the engine is running.**

1. Position the machine on a level surface, lower the cutting units, shut off the engine, and engage the parking brake.
2. Remove the plastic cover to the left side of the seat.
3. Make initial reel to bedknife adjustments appropriate for backlapping on all cutting units which are to be backlapped; refer to the Cutting Unit *Operator's Manual*.

⚠ DANGER

Changing the engine speed while backlapping may cause the reels to stall.

- **Never change the engine speed while backlapping.**
- **Backlap only at idle engine speed.**

4. Start the engine and run at low idle speed.
5. Rotate the backlap lever to the REVERSE (R) position (Figure 49).

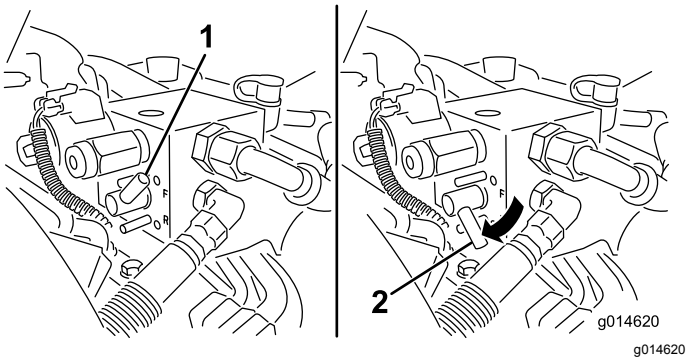


Figure 49

1. Backlap lever—FORWARD position
2. Backlap lever—REVERSE position

6. Rotate the reel-speed control to setting 1 (Figure 50).

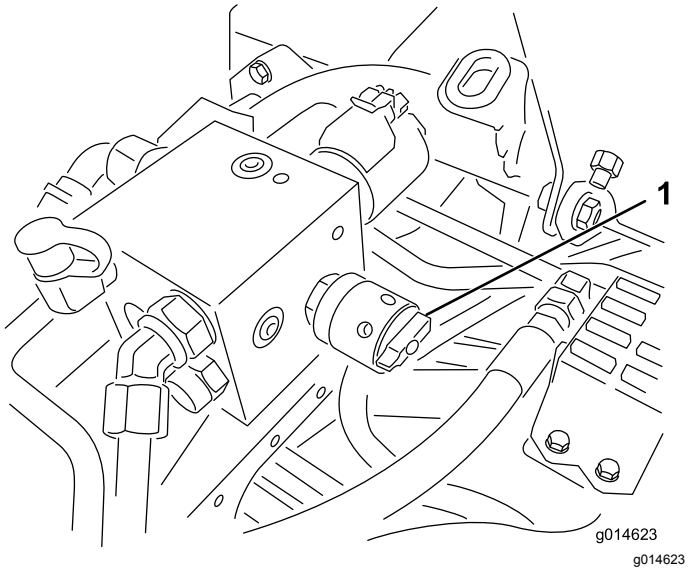


Figure 50

1. Reel-speed control

7. With the functional-control lever in the NEUTRAL position, move the raise/lower mow control forward to start the backlapping operation on the designated reels.
8. Apply lapping compound with a long handle brush. Never use a short handled brush.
9. If the reels stall or become erratic while backlapping, select a higher reel speed setting until the speed stabilizes, then return the reel speed to setting 1 or to your desired speed.
10. To make an adjustment to the cutting units while backlapping, turn the reels off by moving the raise/lower mow control rearward and shut off the engine. After completing adjustments, repeat steps 4 through 8.
11. Repeat the procedure for all cutting units you want to backlap.
12. When finished, return the backlap levers to the FORWARD (F) position, replace the cover, and wash all lapping compound off of the cutting units. Adjust cutting unit reel to bedknife as needed. Move the cutting unit reel speed control to the desired mowing position.

    Important: **If the backlap lever is not returned to the FORWARD (F) position after backlapping, the cutting units will not raise or function properly.**

Diagnostics System

Diagnosing the Service Indicator Light

The service indicator light illuminates in the event of a fault in the machine. When this light is on, you can access the computer codes to diagnose the problem by entering diagnostic mode. In diagnostic mode, the service indicator light flashes a number of times, giving you the error code that you or your distributor can use to identify the problem.

Note: You cannot start the engine in diagnostic mode.

Entering Diagnostic Mode

1. Stop the machine, set the parking brake, and turn the ignition key to the OFF position.
2. Move the functional-control lever to the TRANSPORT position.
3. Ensure that the backlap lever is set to the FORWARD (F) position.
4. Get off the seat.
5. Hold the raise/lower mow control in the RAISED position.
6. Turn the ignition switch to the RUN position.
7. Count the codes as they begin to flash (you may release the raise/lower mow control once they begin flashing).

When finished, turn the key to the OFF position to exit diagnostic mode.

Determining the Error Code

The system will display the last 3 faults that occurred in the last 40 hours. It displays the faults through a series of blinking lights, as follows:

- If there are no faults, the light will blink steadily at a medium rate without pauses (1 Hz).
- If there is a fault, it will first blink the tens place, followed by a pause, followed by the ones place. For the following examples, a # represents a blink. Examples:
  - If the code is 15, the blink pattern will be #_#####
  - If the code is 42, the blink pattern will be ####_##
  - If the code is 123, the blink pattern will be ##########_###
- If there are more than one fault, the tens place of the next fault will begin after a pause after the ones place of the first fault.

Note: The system stores only the three most recent fault codes.

For a list of error codes, refer to your Authorized Distributor or the *Service Manual*.

Storage

If you wish to store the machine for a long period of time, the following steps should be performed prior to storage:

1. Remove accumulations of dirt and old grass clippings. Sharpen the blades and bedknives, if necessary; refer to the *Cutting Unit Operator's Manual*. Use a rust preventive on bedknives and blades. Grease and oil all lubrication points.
2. Block up the wheels to remove any weight on the tires.
3. Drain and replace the hydraulic fluid and filter and inspect the hydraulic lines and fittings. Replace, if necessary; refer to Changing the Hydraulic Fluid and Filter (page 39) and Checking the Hydraulic Lines and Hoses (page 39).
4. All fuel should be removed from the fuel tank. Run the engine until it stops from lack of fuel. Replace the fuel filter; refer to Replacing the Fuel Filter/Water Separator (page 31).
5. While the engine is still warm, drain the oil from the crankcase. Refill it with fresh oil; refer to Changing the Engine Oil and Filter (page 30).
6. Clean dirt and chaff from the cylinder, cylinder head fins, and blower housing.
7. Remove the battery and charge it fully. Either store it on the shelf or on the machine. Leave the cables disconnected if it is stored on the machine. Store the battery in a cool atmosphere to avoid quick deterioration of the charge in the battery.
8. If possible, store the machine in a warm, dry location.

Notes:

European Privacy Notice

The Information Toro Collects
Toro Warranty Company (Toro) respects your privacy. In order to process your warranty claim and contact you in the event of a product recall, we ask you to share certain personal information with us, either directly or through your local Toro company or dealer.

The Toro warranty system is hosted on servers located within the United States where privacy law may not provide the same protection as applies in your country.

BY SHARING YOUR PERSONAL INFORMATION WITH US, YOU ARE CONSENTING TO THE PROCESSING OF YOUR PERSONAL INFORMATION AS DESCRIBED IN THIS PRIVACY NOTICE.

The Way Toro Uses Information
Toro may use your personal information to process warranty claims, to contact you in the event of a product recall and for any other purpose which we tell you about. Toro may share your information with Toro's affiliates, dealers or other business partners in connection with any of these activities. We will not sell your personal information to any other company. We reserve the right to disclose personal information in order to comply with applicable laws and with requests by the appropriate authorities, to operate our systems properly or for our own protection or that of other users.

Retention of your Personal Information
We will keep your personal information as long as we need it for the purposes for which it was originally collected or for other legitimate purposes (such as regulatory compliance), or as required by applicable law.

Toro's Commitment to Security of Your Personal Information
We take reasonable precautions in order to protect the security of your personal information. We also take steps to maintain the accuracy and current status of personal information.

Access and Correction of your Personal Information
If you would like to review or correct your personal information, please contact us by email at legal@toro.com.

Australian Consumer Law

Australian customers will find details relating to the Australian Consumer Law either inside the box or at your local Toro Dealer.

The Toro Warranty

A Two-Year 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:

Toro Commercial Products Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196

952–888–8801 or 800–952–2740
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, brake pads and linings, clutch linings, blades, reels, rollers and bearings (sealed or greasable), bed knives, spark plugs, castor wheels and bearings, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, and check valves, etc.
- Failures caused by outside influence. Conditions considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved fuels, coolants, lubricants, additives, fertilizers, water, or chemicals, etc.
- Failure or performance issues due to the use of fuels (e.g. gasoline, diesel, or biodiesel) that do not conform to their respective industry standards.
- 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.

Deep Cycle and Lithium-Ion Battery Warranty:

Deep cycle and Lithium-Ion 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. Note: (Lithium-Ion battery only): A Lithium-Ion battery has a part only prorated warranty beginning year 3 through year 5 based on the time in service and kilowatt hours used. Refer to the *Operator's Manual* for additional information.

Maintenance is at Owner's Expense

Engine tune-up, lubrication, cleaning and polishing, replacement of 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 supplied with your product 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.

374-0253 Rev D