Form No. 3393-383 Rev B

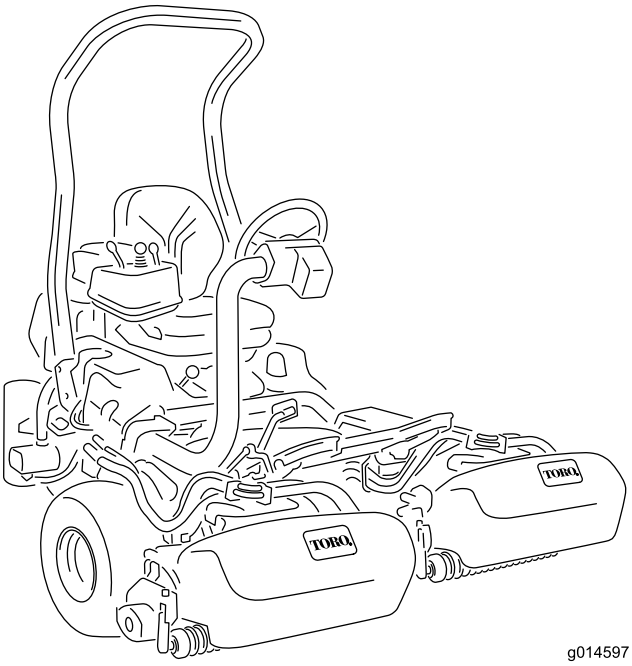
TORO®

Count on it.

Operator's Manual

Greensmaster® 3320 TriFlex™ Traction Unit

Model No. 04530—Serial No. 315000001 and Up



g014597

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

CE

3393-383 B

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.

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Important: This engine is not equipped with a spark arrester muffler. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land. Other states or federal areas may have similar laws.

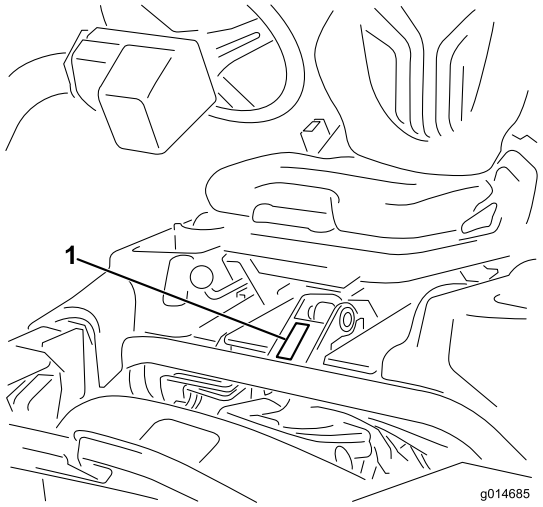


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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.

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.



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.

© 2015—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
Safe Operating Practices 4
Toro Mower Safety 6
Sound Power Level 7
Sound Pressure Level 7
Vibration Level 7
Safety and Instructional Decals 8
Setup 11
1 Installing the Roll Bar 12
2 Installing the Seat 12
3 Installing the Steering Wheel 13
4 Activating and Charging the Battery 13
5 Installing the Optional Oil Cooler 14
6 Installing the Grass-Basket Hooks 15
7 Installing the Cutting Units 15
8 Adding Rear Weight 17
9 Installing EU Decals 17
Product Overview 18
Controls 18
Specifications 25
Attachments/Accessories 25
Operation 25
Think Safety First 25
Checking the Engine Oil 25
Filling the Fuel Tank 26
Checking the Hydraulic-Fluid Level 27
Checking the Reel-to-Bedknife Contact 28
Checking the Tire Pressure 28
Checking the Torque of the Wheel Nuts 28
Breaking-in the Machine 28
Starting the Engine 28
Checking the Safety Interlock System 29
Installing and Removing the Cutting Units 29
Training Period 32
Mowing 32
Driving the Machine without Mowing 33
Transporting the Machine 33
Loading the Machine 33
Inspecting and Cleaning After Mowing 34
Towing the Machine 34
Maintenance 35
Recommended Maintenance Schedule(s) 35
Daily Maintenance Checklist 36
Lubrication 37
Greasing the Machine 37
Engine Maintenance 37
Servicing the Air Cleaner 37
Changing the Engine Oil and Filter 38
Replacing the Spark Plugs 38
Fuel System Maintenance 39
Replacing the Fuel Filter 39
Inspecting the Fuel Lines and Connections 39
Electrical System Maintenance 39
Servicing the Battery 39
Locating the Fuses 40
Drive System Maintenance 41
Adjusting the Transmission for Neutral 41
Adjusting the Transport Speed 41
Adjusting the Mowing Speed 42
Brake Maintenance 42
Adjusting the Brakes 42
Hydraulic System Maintenance 43
Changing the Hydraulic Oil and Filter 43
Checking the Hydraulic Lines and Hoses 43
Cutting Unit Maintenance 44
Backlapping the Reels 44
Storage 45

Safety

This machine has been designed in accordance with EN ISO 5395:2013 and ANSI B71.4-2012 specifications in effect at the time of production when 54 kg (119 lb) of weight is added to the rear wheel.

Note: The addition of attachments made by other manufacturers that do not meet American National Standards Institute certification will cause noncompliance of this machine.

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert symbol (Figure 2), which means Caution, Warning, or Danger—personal safety instruction. Failure to comply with the instruction may result in personal injury or death.

Safe Operating Practices

Training

- Read the *Operator's Manual* and other training material carefully. Be familiar with the controls, safety signs, and the proper use of the equipment.
- If the operator or mechanic can not read the language of this manual, it is the owner's responsibility to explain this material to them.
- Never allow children or people unfamiliar with these instructions to use or service the mower. Local regulations may restrict the age of the operator.
- Never mow while people, especially children, or pets are nearby.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
- Do not carry passengers.
- All drivers and mechanics should seek and obtain professional and practical instruction. The owner is responsible for training the users. Such instruction should emphasize:
  - the need for care and concentration when working with ride-on machines;
  - control of a ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are:
    - ◊ insufficient wheel grip;
    - ◊ being driven too fast;
    - ◊ inadequate braking;
    - ◊ the type of machine is unsuitable for the task;
    - ◊ lack of awareness of the effect of ground conditions, especially slopes.
    - ◊ The owner/user can prevent and is responsible for accidents or injuries occurring to people, or damage to property.

Preparation

- While mowing, always wear substantial, slip-resistant footwear, long trousers, safety glasses, and hearing protection. Long hair, loose clothing, or jewelry may get tangled in moving parts. Do not operate the equipment when barefoot or wearing open sandals.
- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- Replace faulty silencers/mufflers.
- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operation

- Do not operate the engine in a confined space where dangerous carbon monoxide and other exhaust gasses can collect.
- Mow only in daylight or in good artificial light.
- Before attempting to start the engine, disengage all blade attachment clutches, shift into neutral, and engage the parking brake.
- Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care. To guard against overturning:
  - do not stop or start suddenly when going up or downhill;
  - machine speeds should be kept low on slopes and during tight turns;
  - stay alert for humps and hollows and other hidden hazards;
  - never mow across the face of the slope, unless the mower is designed for this purpose.
- Stay alert for holes in the terrain and other hidden hazards.
- Watch out for traffic when crossing or near roadways.
- Stop the blades from rotating before crossing surfaces other than grass.
- When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
- Never operate the machine with damaged guards, shields, or without safety protective devices in place. Be sure all

interlocks are attached, adjusted properly, and functioning properly.

- Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- Before leaving the operator's position:
  - stop on level ground;
  - disengage the power take-off and lower the attachments;
  - change into neutral and set the parking brake;
  - stop the engine and remove the key.
- Disengage drive to attachments when transporting or not in use.
- Stop the engine and disengage drive to attachment:
  - before refuelling;
  - before removing the grass catcher/catchers;
  - before making height adjustment unless adjustment can be made from the operator's position.
  - before clearing blockages;
  - before checking, cleaning or working on the mower;
  - after striking a foreign object or if an abnormal vibration occurs. Inspect the mower for damage and make repairs before restarting and operating the equipment.
- Reduce the throttle setting before stopping the engine and, if the engine is provided with a fuel shut-off valve, turn the fuel off at the conclusion of mowing.
- Keep hands and feet away from the cutting units.
- Look behind and down before backing up to be sure of a clear path.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop the reels when not mowing.
- Do not operate the mower under the influence of alcohol or drugs.
- Lightning can cause severe injury or death. If lightning is seen or thunder is heard in the area, do not operate the machine; seek shelter.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Rollover Protection System (ROPS) - Use and Maintenance

- The ROPS is an integral and effective safety device. Keep a folding ROPS in the raised and locked position and use the seat belt when operating the machine.
- Lower a folding ROPS temporarily only when absolutely necessary. Do not wear the seat belt when folded down.
- Be aware there is no rollover protection when a folded ROPS is in the down position.
- Be certain that the seat belt can be released quickly in the event of an emergency.
- Check the area to be mowed and never fold down a folding ROPS in areas where there are slopes, drop offs or water.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.
- Keep the ROPS in safe operating condition by periodically thoroughly inspecting for damage and keeping all mounting fasteners tight.
- Replace a damaged ROPS. Do not repair or revise.
- Do not remove the ROPS.
- Any alterations to a ROPS must be approved by the manufacturer.

Safe Handling of Fuels

- To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Never remove fuel cap or add fuel with the engine running.
- Allow engine to cool before refueling.
- Never refuel the machine indoors.
- 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.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment with a portable container, rather than from a fuel dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.
- Do not use a nozzle lock open device.
- If fuel is spilled on clothing, change clothing immediately.
- Never overfill fuel tank. Replace fuel cap and tighten securely.

Maintenance and Storage

- Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.

- Allow the engine to cool before storing in any enclosure.
- To reduce the risk of fire hazard, keep the engine, silencer/muffler, battery compartment, and fuel storage area free of grass, leaves, or excessive grease.
- Replace worn or damaged parts for safety.
- Check the grass catcher frequently for wear or deterioration.
- Keep all parts in good working condition and all hardware and hydraulic fittings tightened. Replace all worn or damaged parts and decals.
- If the fuel tank has to be drained, do this outdoors.
- Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.
- On multi-reel machines, take care as rotating one reel can cause other reels to rotate.
- Disengage drives, lower the cutting units, set parking brake, stop engine and remove key. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting units, drives, mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Use care when checking the reels. Wrap the reels or wear gloves, and use caution when servicing them.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.
- 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.

Toro Mower Safety

The following list contains safety information specific to Toro products or other safety information that you must know that is not included in the ANSI standards.

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

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

Operation

- Know how to stop the engine quickly.
- Always wear substantial, slip-resistant shoes. Do not operate the machine while wearing sandals, tennis shoes, or sneakers. Wearing safety shoes and long pants is advisable and required by some local ordinances and insurance regulations.
- Handle fuel carefully. Wipe up any spills.
- Check the safety interlock switches daily for proper operation. If a switch has failed, replace the switch before operating the machine.
- Before attempting to start the engine, sit on the seat, pull on the raise/lower mow control to ensure that the cutting units are disengaged, ensure that the traction pedal is in neutral, and engage the parking brake.
- Using the machine demands attention. To prevent loss of control:
  - Do not drive close to sand traps, ditches, creeks, or other hazards.
  - Reduce speed when making sharp turns. Avoid sudden stops and starts.
  - This machine is not designed or equipped for on-road use and is a "slow-moving vehicle." If you must cross or travel on a public road, you should be aware of and comply with local regulations, such as required lights, slow moving vehicle signs, and reflectors.
  - Watch out for traffic when near or crossing roads. Always yield the right-of-way.
  - Apply the service brakes when going downhill to keep forward speed slow and to maintain control of the machine.
- Shut the engine off before emptying the baskets.
- Raise the cutting units when driving from one work area to another.
- Do not touch the engine, muffler, or exhaust pipe while the engine is running or soon after it has stopped because these areas could be hot enough to cause burns.
- Stay clear of the rotating screen at the side of the engine to prevent direct contact with your body or clothing.
- If a cutting unit strikes a solid object or vibrates abnormally, stop immediately, turn the engine off, wait for all motion to stop, and inspect the machine for damage. A damaged reel or bedknife must be repaired or replaced before operation is continued.
- Before getting off of the seat, move the functional control lever to neutral (N), raise the cutting units and wait for the reels to stop spinning. Set the parking brake. Stop the engine and remove the key from the ignition switch.
- Traverse slopes carefully. Do not start or stop suddenly when traveling uphill or downhill.
- The operator must be skilled and trained in how to drive on hillsides. Failure to use caution on slopes or hills may cause loss of control and cause the machine to tip or roll, possibly resulting in personal injury or death.

- If the engine stalls or loses headway and cannot make it to the top of a slope, do not turn the machine around. Always back slowly, straight down the slope.
- When a person or pet appears unexpectedly in or near the mowing area, **stop mowing**. Careless operation, combined with terrain angles, ricochets, or improperly positioned guards can lead to thrown object injuries. Do not resume mowing until the area is cleared.
- Whenever the machine is left unattended, make sure the cutting units are fully raised, the reels are not spinning, the key is removed from the ignition switch, and the parking brake is set.
- Always use the seat belt with the ROPS when operating the machine.
- Do not operate this machine on slopes exceeding 15 degrees.

Maintenance and Storage

- Make sure all hydraulic line connectors are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
- Keep your body and hands away from pin hole leaks or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, not your hands, to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury.
- Before disconnecting or performing any work on the hydraulic system, all pressure in the system must be relieved by stopping the engine and lowering the cutting units and attachments to the ground.
- Check all fuel lines for tightness and wear on a regular basis. Tighten or repair them as needed.
- If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing, and any parts of the body away from the cutting units, attachments, and any moving parts, especially the screen at the side of the engine. Keep everyone away.
- Do not overspeed the engine by changing governor settings. To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer..
- The engine must be shut off before checking the oil or adding oil to the crankcase.
- If major repairs are ever needed or if assistance is desired, contact an Authorized Toro Distributor.
- To assure optimum performance and continued safety certification of the machine, use only genuine Toro replacement parts and accessories. Replacement parts and accessories made by other manufacturers could be dangerous, and such use could void the product warranty.
- Disconnect the cutting units from the power supply, using the cutting unit power disconnect couplers, before performing any work on the cutting units.

Sound Power Level

This unit has a guaranteed sound power level of 97 dBA, which includes an Uncertainty Value (K) of 1 dBA.

Sound power level was determined according to the procedures outlined in ISO 11094.

Sound Pressure Level

This unit has a sound pressure level at the operator's ear of 81 dBA, which includes an Uncertainty Value (K) of 1 dBA.

Sound pressure level was determined according to the procedures outlined in EN ISO 5395:2013.

Vibration Level

Hand-Arm

Measured vibration level for right hand = 0.20 m/s^2

Measured vibration level for left hand = 0.31 m/s^2

Uncertainty Value (K) = 0.15 m/s^2

Measured values were determined according to the procedures outlined in EN ISO 5395:2013.

Whole Body

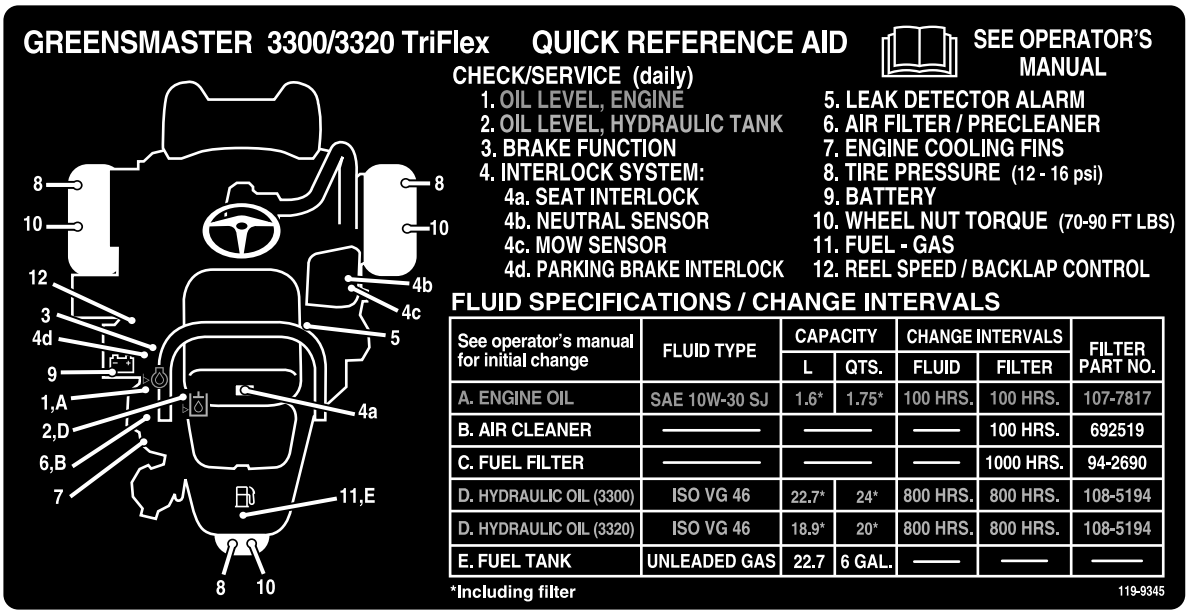
Measured vibration level = 0.14 m/s^2

Uncertainty Value (K) = 0.07 m/s^2

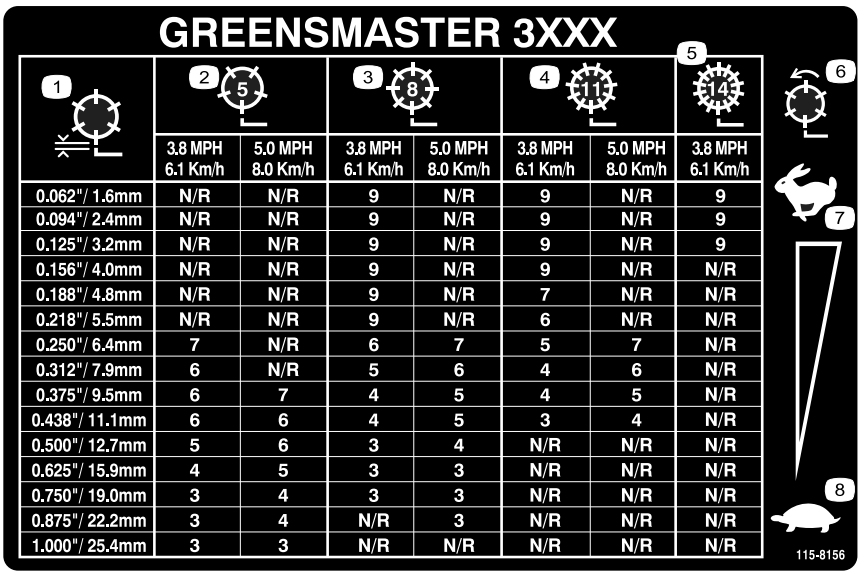
Measured values were determined according to the procedures outlined in EN ISO 5395:2013.

Safety and Instructional Decals

Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.

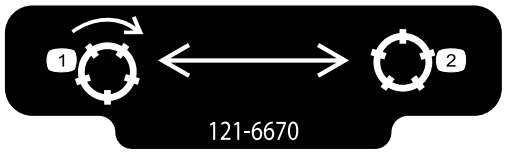


119-9345



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



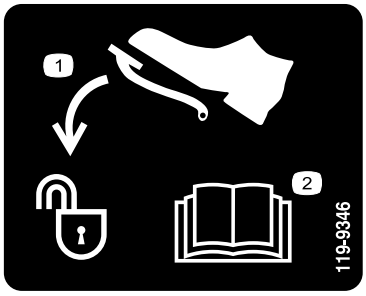
121–6670

1. Engage the reels.
2. Disengage the reels.

CALIFORNIA SPARK ARRESTER WARNING

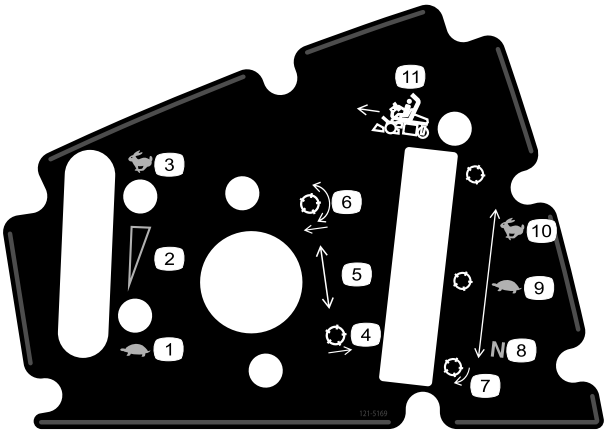
Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. 117-2718

117–2718



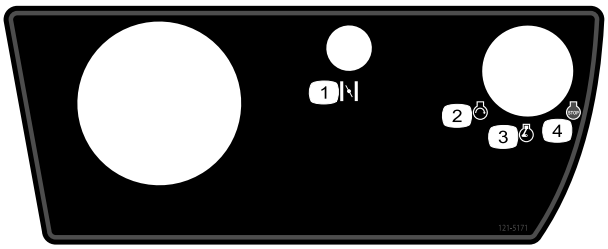
119-9346

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



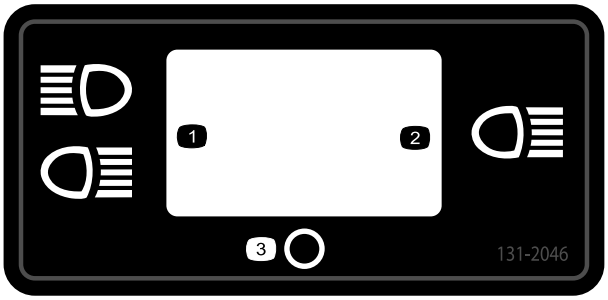
121–5169

1. Slow
2. Continuous variable setting
3. Fast
4. Raise the reels
5. Reel position setting
6. Lower and engage the reels
7. Reel—backlapping
8. Neutral—used for backlapping
9. Slow—use for mowing
10. Fast—use for transport
11. Functional control lever



121–5171

1. Choke
2. Engine—start
3. Engine run
4. Engine—stop



131-2046

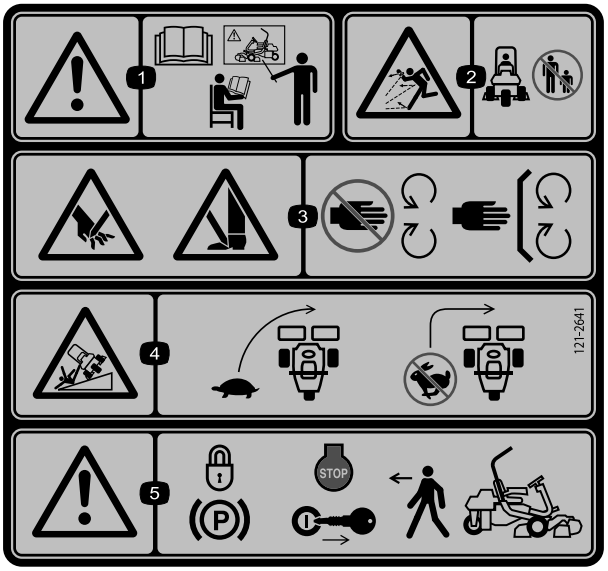
1. Double lights
2. Single light
3. Off



Battery Symbols

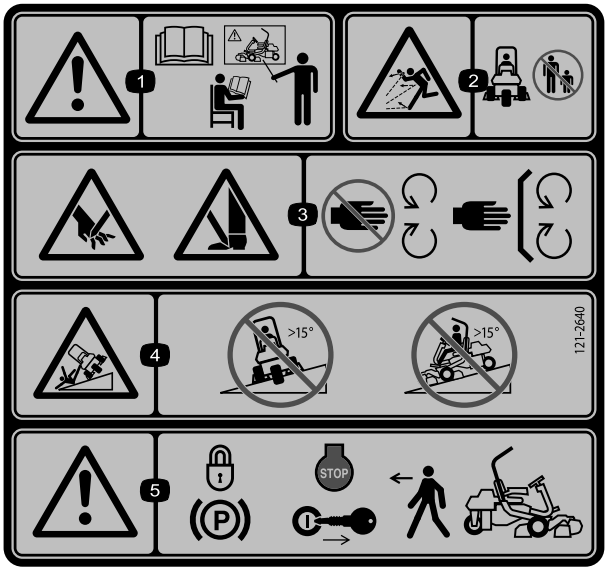
Some or all of these symbols are on your battery

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 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.



121–2641

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Thrown object hazard—keep bystanders a safe distance from the machine.
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 machine before turning, do not turn at high speeds.
5. Warning—lock the parking brake, stop the engine and remove the ignition key before leaving the machine.



121–2640

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Thrown object hazard—keep bystanders a safe distance from the machine
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 slopes greater than 15 degrees or down slopes greater than 15 degrees.
5. Warning—lock the parking brake, stop 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 Seat wiring harness	1 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 (model 04613, 04614, or 04615) Cutting unit upper weight Hex head bolts Grass Basket	1 3 3 6 3	Install the cutting units
8	Weight kit, 119-7129 (for 2-wheel drive units) Weight kit, 120-5750 (for units with the 3-wheel drive kit installed)	1 1	Add rear weight.
9	Warning decal 121–2640	1	Install EU decals, if required.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual (machine) Engine Operator's Manual (engine)	1 1	Read before operating the machine
Parts Catalog	1	Save for future parts ordering
Operator Training Materials	1	View before operating the machine
Pre-delivery Inspection Sheet Noise rating certificate Certificate of compliance	1 1 1	Save for future reference
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) (Figure 3)

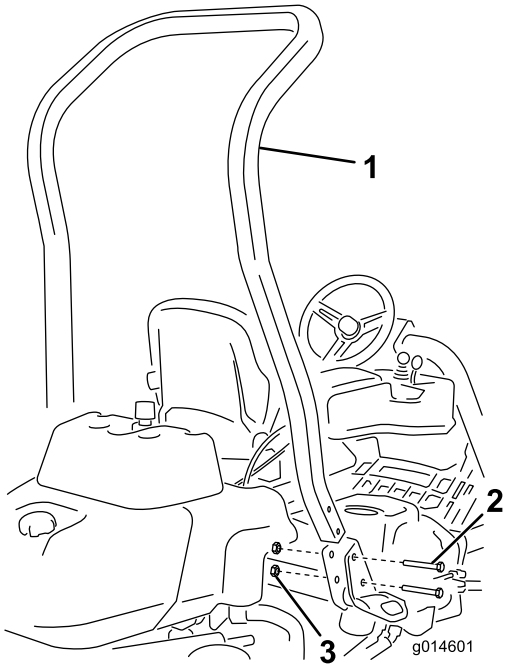


Figure 3

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
1	Seat wiring harness

Procedure

Note: Mount the seat in the front set of mounting holes to gain an additional 7.6 cm (3 inches) in the forward adjustment, or in the rear mounting holes for an additional 7.6 cm (3 inches) in the rearward adjustment.

1. Remove and discard the lag bolts securing the seat slides and cut the shipping straps.
2. Remove the 4 bolts (5/16 x 3/4 inch) and washers from the shipping bracket and discard the bracket.
3. Secure the seat to the seat base with 4 bolts and washers removed previously (Figure 4).

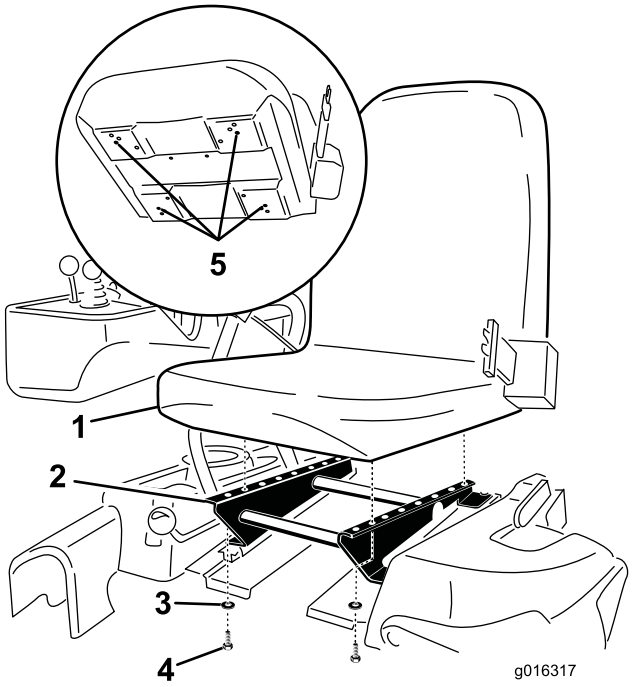


Figure 4

1. Seat
2. Seat base
3. Washer
4. Bolt (5/16 x 3/4 inch)
5. Install the seat using these holes.

4. Locate the open connector on the main wiring harness to the right of the seat and connect it to the wiring harness that came with the seat.
5. Route the seat wiring harness around the seat slides, ensuring that it will not be pinched when the seat moves, and connect it to the port on the bottom of the seat.

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 5).

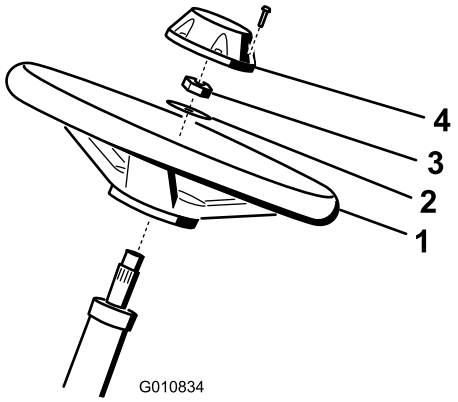


Figure 5

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

2. Slide the washer onto the steering shaft (Figure 5).
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 5).
4. Install the cap to the steering wheel and secure it with 6 bolts (Figure 5).

4

Activating and Charging the Battery

No Parts Required

Procedure

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

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 6).

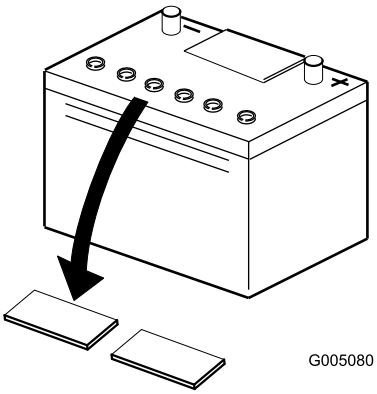


Figure 6

3. Carefully fill each cell with electrolyte until the plates are covered with about 6 mm (1/4 inch) of fluid (Figure 7).

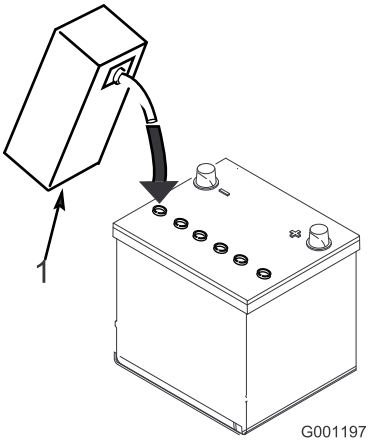


Figure 7

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 7).

⚠ WARNING

Charging the battery produces gasses that can explode.

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

5. Connect a 2 to 4 amp battery charger to the battery posts. Charge the battery for 2 hours at 4 amps or for 4 hours at 2 amps until the specific gravity is 1.250 or higher and the temperature is at least 16° C (60° F) with all cells gassing freely.
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

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.

⚠ 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.**

⚠ WARNING

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

7. Place the battery on the battery tray and secure it with the battery clamp and fasteners removed previously (Figure 8).

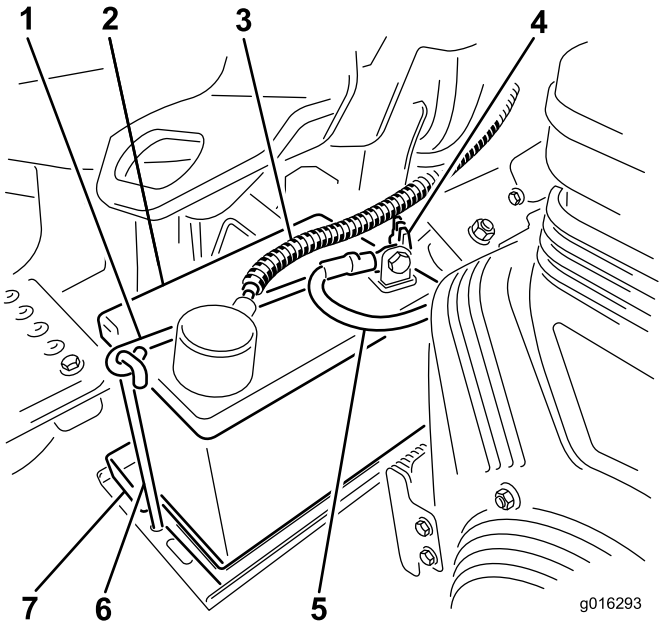


Figure 8

Gasoline model shown, your model may vary.

1. Battery clamp
2. Battery
3. Positive (+) battery cable
4. Battery-clamp wing nut
5. Negative (-) battery cable
6. Battery-clamp hook
7. Battery tray

8. 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 8). 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.**

5

Installing the Optional Oil Cooler

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, to the machine.

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 9).

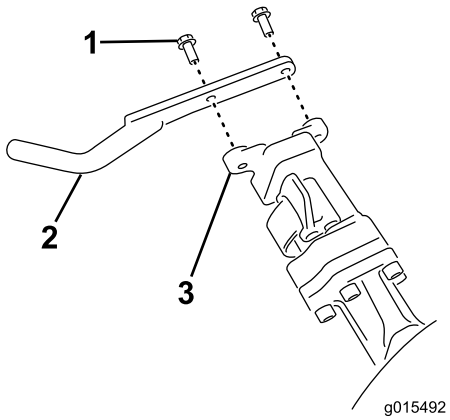


Figure 9

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 (model 04613, 04614, or 04615)
3	Cutting unit upper weight
6	Hex head bolts
3	Grass Basket

Procedure

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 the cutting unit has to be tipped to expose bedknife/reel, prop up rear of cutting unit to make sure nuts on back end of bedbar adjusting screws are not resting on work surface (Figure 10).

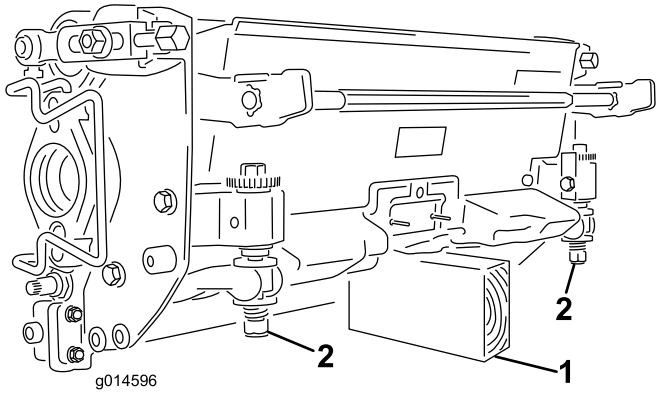


Figure 10

1. Prop (not provided)
2. Bedknife adjusting nut (2)

Note: All cutting units are shipped with the counter weight mounted to the right end and the motor mount and drive coupler mounted to the left end of the cutting unit.

1. Disconnect the cutting unit power disconnect couplers; refer to Cutting Unit Power Disconnect (page 24).

⚠ CAUTION

If you do not disconnect the power to the cutting units, someone could accidentally start the cutting unit, causing serious injury to hands and feet.

Always separate the cutting unit power disconnect couplers before working on the cutting units.

2. Apply grease to the inside diameter of the drive coupler.
3. The cutting unit is shipped without a front roller. Obtain a roller (Models 04625, 04626, or 04627) from your local Toro Distributor. Install the roller using the loose parts supplied with the cutting unit and installation instructions included with the roller.
4. Remove the 2 bolts securing the weight to the side of the cutting unit (Figure 11).

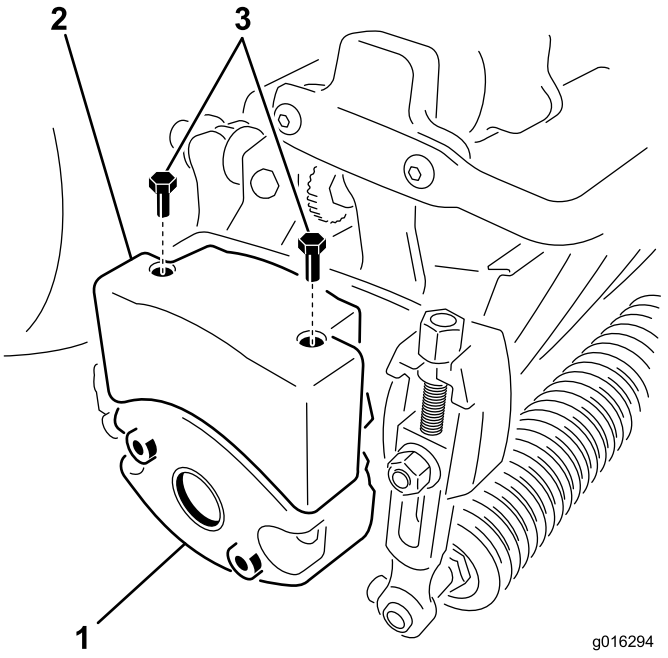


Figure 11

1. Cutting until weight (flip over)
2. Upper weight
3. Hex head screws

5. Rotate the weight 180 degrees so that the open screw holes that were on the underside of the weight are now on top. Install the weight to the cutting unit using the bolts removed previously.
6. Install an upper weight to the cutting unit weight using 2 hex head screws (Figure 11).
7. If installing the center cutting unit, lift up on the foot rest and swing it up, allowing access to the center cutting unit position (Figure 12).

⚠ 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.

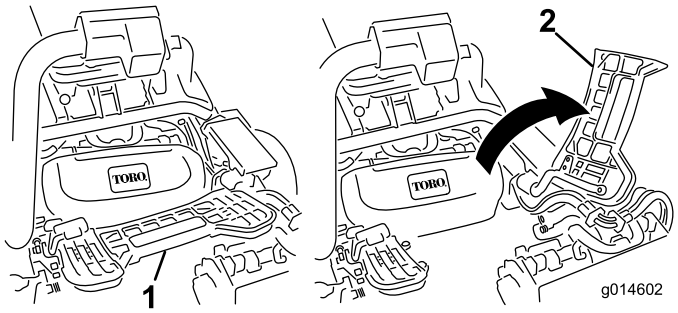


Figure 12

1. Footrest—closed
2. Footrest—open

8. Position the cutting unit under the suspension arm.
9. With the latches on the suspension-arm bar pointing up (i.e., open) (Figure 13), push the suspension arm down so that the bar fits over the bar across the top of the cutting unit (Figure 14).

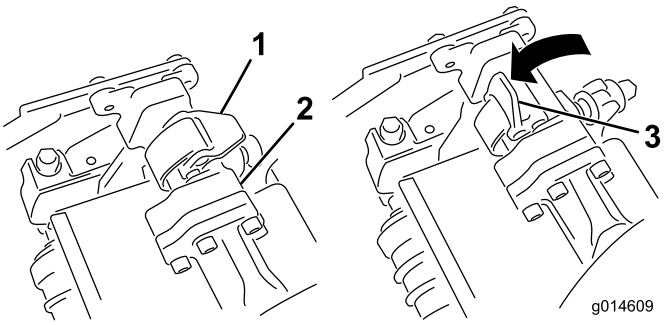


Figure 13

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

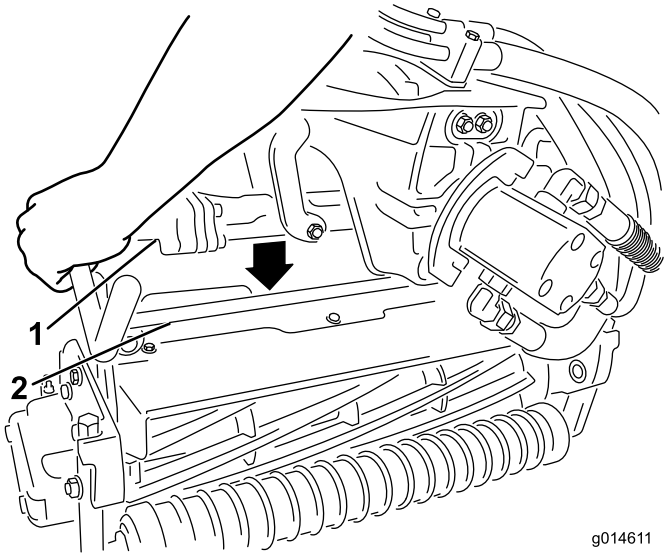


Figure 14

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

10. Close the latches down and around the cutting-unit bar and lock them in place (Figure 13).

    Note: A "click" can be heard and felt when the latches are properly locked in place.

11. Coat the spline shaft of the cutting unit motor with clean grease (Figure 15).

12. 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 an audible "click" from both sides of the motor (Figure 15).

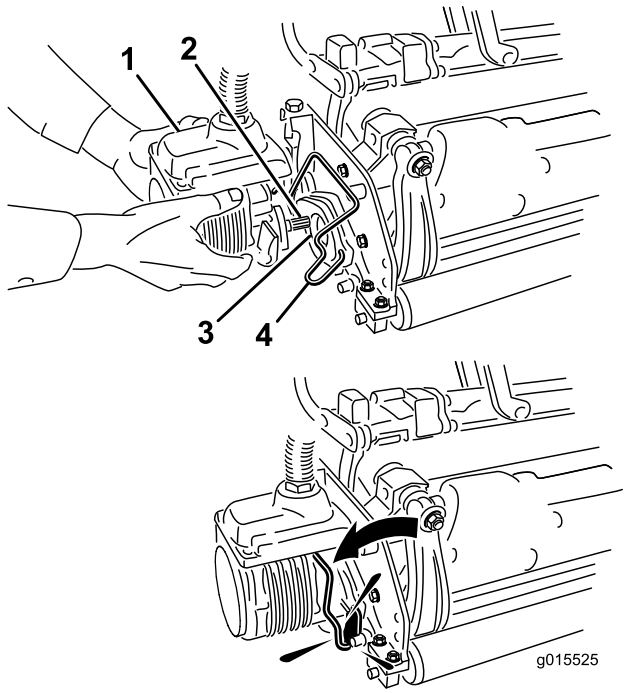


Figure 15

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

13. Mount a grass basket onto the basket hooks on the suspension arm.

14. Repeat this procedure for the other cutting units.

15. Connect the cutting unit power disconnect couplers; refer to Cutting Unit Power Disconnect (page 24).

8

Adding Rear Weight

Parts needed for this procedure:

1	Weight kit, 119-7129 (for 2-wheel drive units)
1	Weight kit, 120-5750 (for units with the 3-wheel drive kit installed)

Procedure

This unit complies with the ANSI B71.4-2004 and EN 836 Standards when equipped with weight kit 119-7129 (2-wheel drive units) or 120-5750 (3-wheel drive units).

9

Installing EU Decals

Parts needed for this procedure:

1	Warning decal 121–2640

Procedure

If this machine will be used in the EU, affix the warning decal 121–2640 over warning decal 121–2641.

Product Overview

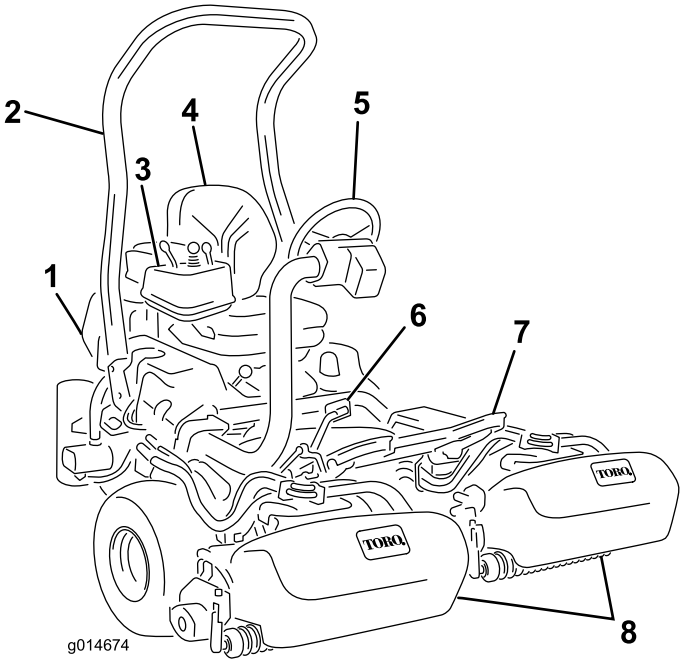


Figure 16

1. Engine
2. Roll bar
3. Control panel
4. Seat
5. Steering wheel
6. Traction pedal
7. Foot rest
8. Cutting units

Controls

Traction Pedal

The traction pedal (Figure 17) 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 18).

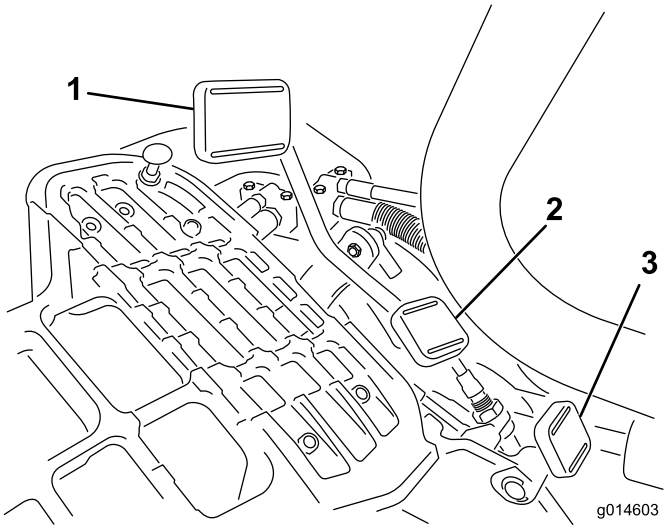


Figure 17

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



Figure 18

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

Note: Move the steering arm fully forward before lifting the seat.

Throttle Control

The throttle control (Figure 19) gives the operator the ability to control the speed of the engine. Moving the throttle control toward the Fast position increases the engine rpm; moving the throttle control toward Slow will decrease the engine rpm.

Note: The engine cannot be stopped by the use of the throttle control.

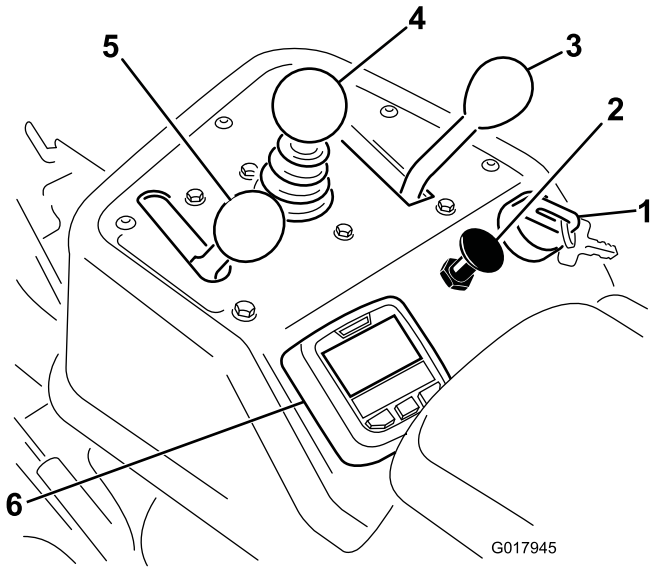


Figure 19

1. Ignition switch
2. Choke
3. Functional-control lever
4. Raise/Lower Mow Control
5. Throttle control
6. InfoCenter

Choke

To start a cold engine, close the carburetor choke by pulling the choke control (Figure 19) out to the Closed position. After the engine starts, regulate the choke to keep the engine running smoothly. As soon as possible, open the choke by pushing it in to the Open position. A warm engine requires little or no choking.

Raise/Lower Mow Control

Moving the control (Figure 19) 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 the reels can be stopped by pulling back on the control momentarily and releasing it. This feature is known as Tap-off and is adjustable in the InfoCenter. Restart the reels by moving the control forward.

Functional-Control Lever

The functional-control lever (Figure 19) provides 2 traction selections plus a Neutral position. It is permissible to 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 19) 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 will move to the On position. Turn the key counterclockwise to the Off position to stop the engine.

Backlap Switch

The backlap switch is located under the plastic cover to the left of the seat. Use the backlap switch (Figure 20) in conjunction with the raise/lower mow control lever and the reel speed control for backlapping the reels.

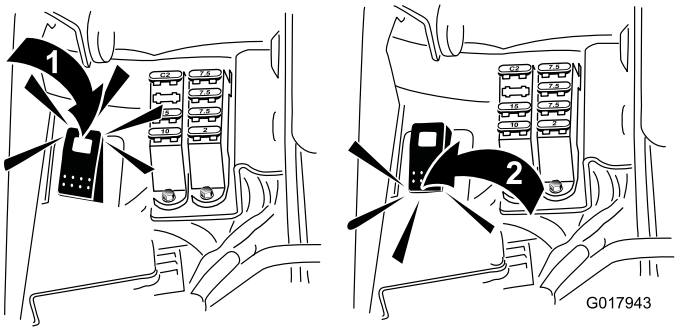


Figure 20

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

Using the InfoCenter LCD Display

The InfoCenter LCD display shows information about your machine such as the generator status, the speed, and various diagnostics and other information about the machine and the battery pack. Figure 21 and Figure 22 illustrate the splash screen and main information screen of the InfoCenter. You can switch between the splash screen and main information screen at any time by pressing any of the InfoCenter buttons and then selecting the appropriate directional arrow.

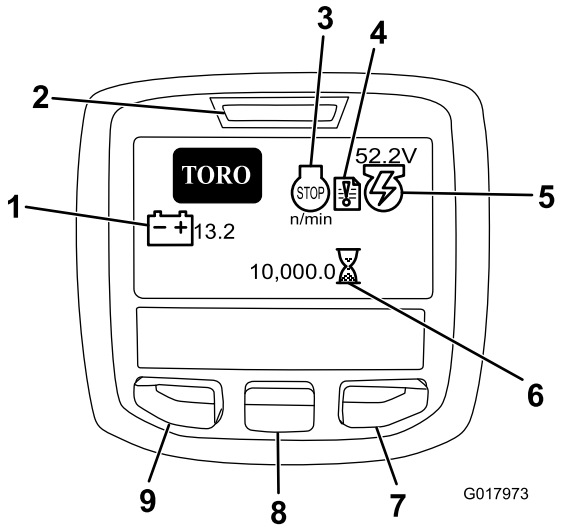


Figure 21

1. Battery voltage
2. Power light/fault indicator
3. Engine rpm/status
4. Fault log
5. Generator voltage/status
6. Hour meter
7. Right button
8. Down button
9. Menu access/back button

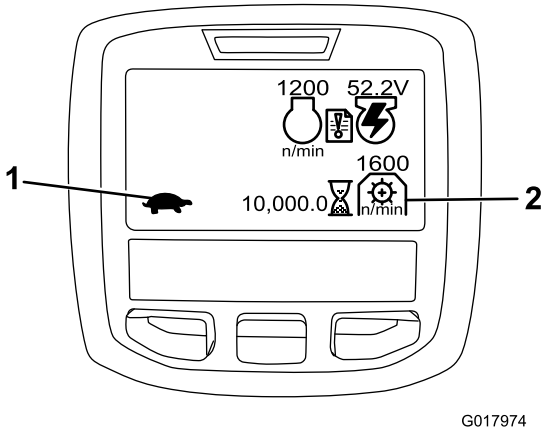


Figure 22

1. Functional control status
2. PTO speed

- Engine rpm/status—indicates the engine rpm.
- Fault log—indicates that there is a current fault log to review.
- Generator voltage/status—indicates the generator voltage.

- Hour meter—indicates the total hours the machine has operated. It starts to function whenever the key switch is rotated to On.
- PTO speed—indicates the PTO speed.
- Glow plug—indicates that the glow plug is active.
- Battery voltage—indicates the battery potential in Volts.
- Coolant temperature—indicates the engine coolant temperature in either °C or °F.
- Functional control status—transport mode is indicated by a rabbit and mow mode is indicated by a turtle.
- Engine oil pressure light—this icon appears if the engine oil pressure drops below a safe level.
- Menu access/back button—press this button to access the InfoCenter menus. You can use it to back out of any menu you are currently using.
- Down button—use this button to scroll down menus.
- Right button—use this button to open a menu where a right arrow indicates additional content.

Note: The purpose of each button may change depending on what is required at the time. Each button will be labeled with an icon displaying its current function.

Using the Menus

To access the InfoCenter menu system, press the menu access button while at the main screen. This will bring you to the main menu. Refer to the following tables for a synopsis of the options available from the menus:

Main Menu	
Menu Item	**Description**
Faults	The Faults menu contains a list of the recent machine faults. Refer to the Service Manual or your Authorized Toro Distributor for more information on the Faults menu and the information contained there.
Service	The Service menu contains information on the machine such as hours of use and other similar numbers.
Diagnostics	The Diagnostics menu lists various states that the machine currently has. You can use this to troubleshoot certain issues as it will quickly tell you which machine controls are on and which are off.
Settings	The Settings menu allows you to customize and modify configuration variables on the InfoCenter display.
About	The About menu lists the model number, serial number, and software version of your machine.

Service	
Menu Item	**Description**
Hours	Lists the total number of hours that the machine, engine, reels, backlap, and fan have been on, as well as the number of hours the machine has been transported and overheated.
Counts	Lists the number of preheats and starts the machine has experienced.

Diagnostics	
Menu Item	**Description**
Engine Run	Indicates if the following items are active: Key start, key run, joystick lower, joystick raise, neutral, seat or parking brake, OK run, and RTR or ETR.
S1–S4	Controls the raising and lowering of the solenoids.
Reels Enable	Indicates if the eReel is enabled.

Settings	
Menu Item	**Description**
Units	Controls the units used on the InfoCenter. The menu choices are English or Metric.
Language	Controls the language used on the InfoCenter.
LCD Backlight	Controls the brightness of the LCD display.
LCD Contrast	Controls the contrast of the LCD display.
Protected Menus	Allows the distributor/engineer to access protected menus by inputting a passcode.
Protection Settings	Controls the protected menus.
Reset Defaults	Resets the InfoCenter to default settings.
Raise Delay	Controls the raise delay time for the center cutting unit.
Lower Delay	Controls the lower delay for the center cutting unit.
Tapoff Delay	Controls the tap-off delay.
Reel Speed	Controls the reel speed.
Backlap rpm	Controls the backlap rpm speed.

About	
Menu Item	**Description**
Model	Lists the model number of the machine.
SN	Lists the serial number of the machine.
TEC 5001	Lists the software revision of the master controller.
InfoCenter	Lists the software revision of the InfoCenter.
CU1	Lists the software revision of the first cutting unit.
CU2	Lists the software revision of the second cutting unit.
CU3	List the software revision of the third cutting unit.
Generator	Lists the serial number of the generator.
CAN Bus	Lists the machine communication bus status.

Center Cutting Unit Raise/Lower Delay

The raise and lower delay time for the center cutting may be adjusted independently with the InfoCenter. Each setting may be adjusted from 1 to 9 according to the table below. The factory default setting is 6 (375 ms) and is optimized for a 3.8 mph mow speed.

Increment Number	Delay Time (Seconds)
1	0.100
2	0.150
3	0.200
4	0.250
5	0.300
6	0.375
7	0.475
8	0.600
9	0.750
10	0.925

Tap-off Delay

The tap-off delay feature allows the cutting units to turn off without raising, and may be adjusted with the InfoCenter. The delay setting represents the maximum time for the raise/lower joystick to remain in the raise position to activate this feature. The factory default setting is 1 which disables this feature.

Increment Number	Delay Time (Seconds)
1	Off
2	0.050
3	0.100
4	0.150
5	0.200
6	0.250
7	0.300
8	0.350
9	0.400
10	0.450

Setting the Reel Speed

To achieve a consistent, high quality–of–cut and a uniform after cut appearance, it is important that the reel speed control be correctly set.

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 23) 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 23

4. To set the reel speed, on the InfoCenter open the Main Menu and scroll down to Settings.
5. In the Settings menu scroll down to Reel Speed and use the ± button to set the reel speed to the desired number.

Machine Configuration Passcode

There are 5 operating configuration settings that are adjustable within the setting menu of the InfoCenter: Raise and lower delay, tap-off delay, reel speed, and backlap speed. These setting can be protected by a user defined passcode by opening the Main menu and scrolling down to the Settings menu. Find Protect Settings and select On.

When protect setting On is selected the user is prompted to enter a 4 digit passcode. After the passcode is set, the keyswitch must be turned off and back on to enable and save this feature. After enabling the protect settings option, the configuration settings are hidden until the user defined passcode is entered.

Note: If the user defined passcode is forgotten, a temporary passcode can be obtained through your authorized Toro distributor.

Diagnosing the Fault-Log Indicator

The fault-log indicator icon appears on the main screen in the event of a fault in the machine (Figure 21). When this icon is present there is a new log entry in the Faults menu that you or your distributor can use to identify the problem.

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

Seat-Adjusting Lever

The seat-adjusting lever is located on the front, right corner of the seat (Figure 24), allowing you to adjust the seat fore and aft. Push the lever to the left (towards the center), to release the lock and slide the seat.

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

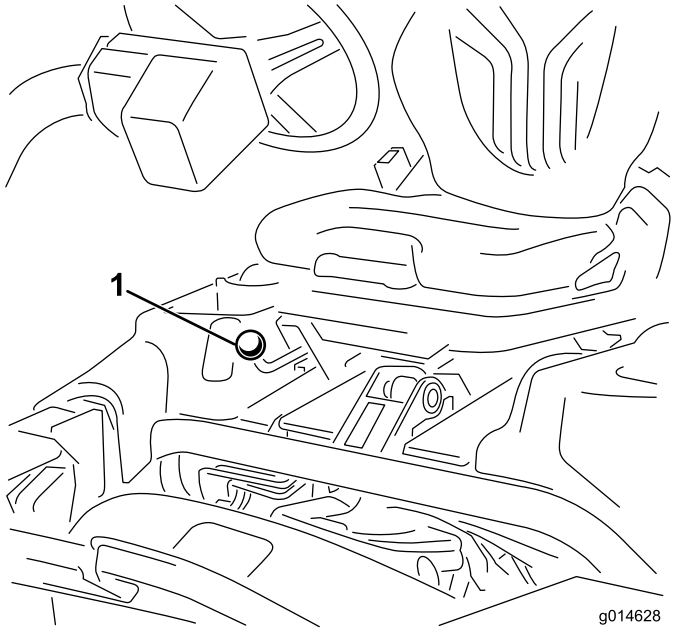


Figure 24

1. Seat-adjusting lever

Note: Before lifting the seat, slide it to the furthest back position and move the steering arm fully forward.

Fuel-Shutoff Valve

Close the fuel-shutoff valve (Figure 25) behind the seat and under the fuel tank when storing or transporting the machine on a truck or trailer.

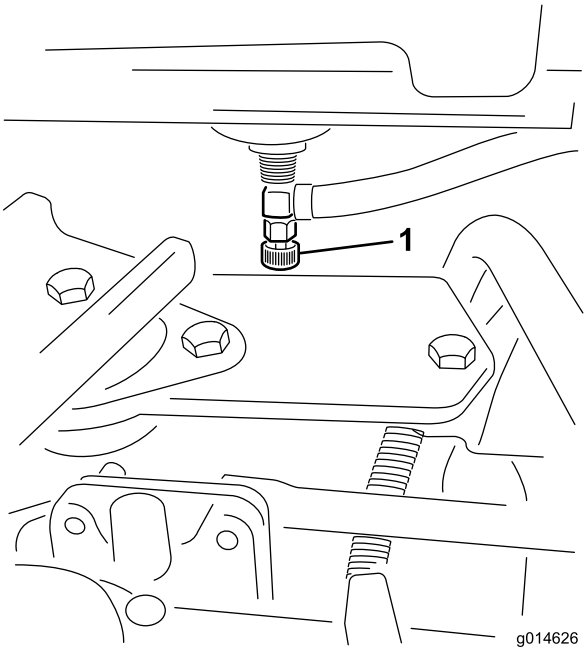


Figure 25

1. Fuel shutoff (under the fuel tank)

Parking-Brake Lever

Pull up on the brake lever (Figure 26) to set the parking brake. Disengage it by pulling up on the release latch and lowering the brake handle. Lock the parking brake any time you leave the machine.

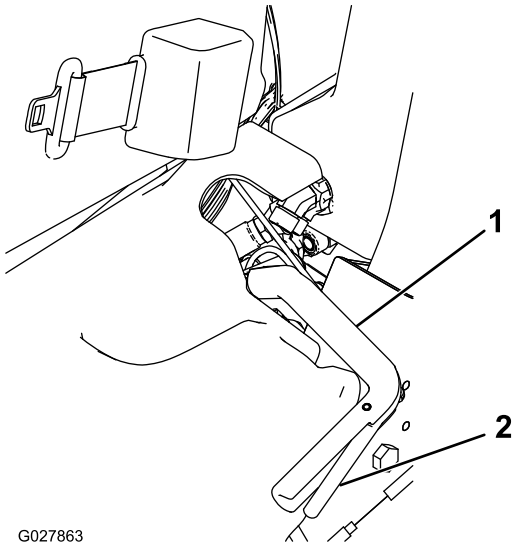


Figure 26

1. Parking-brake lever
2. Release latch

Cutting Unit Power Disconnect

Before installing, removing, or working on the cutting units, disconnect the cutting units from the power supply by separating the cutting unit power disconnect connector (Figure 27), located at the base of the rollover bar on the left

side of the machine. Plug the connectors together before operating the machine.

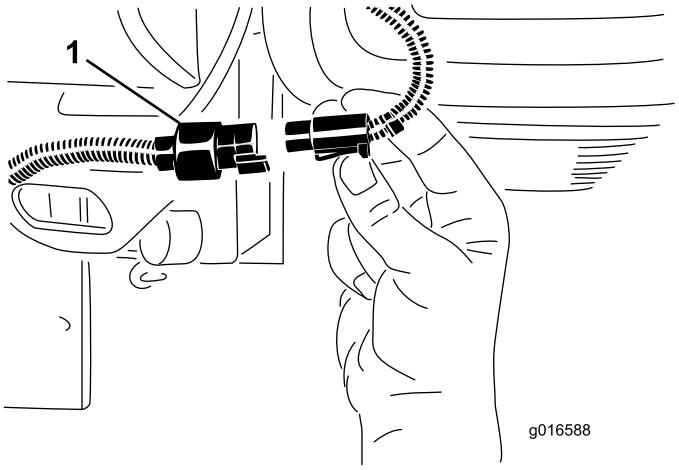


Figure 27

1. Cutting unit power disconnect connector

⚠ CAUTION

If you do not disconnect the power to the cutting units, someone could accidentally start the cutting unit, causing serious injury to hands and feet.

Always separate the cutting unit power disconnect connectors before working on the cutting units.

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	119 cm (46.9 inches)
Overall length (w/baskets)	249 cm (98.0 inches)
Overall width	179 cm (70.62 inches)
Overall height	205 cm (80.83 inches)
Weight	Refer to the machine serial tag (Figure 1).

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.

Operation

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

Think Safety First

Please carefully read all of the safety instructions and symbols in the safety section. Knowing this information could help you or bystanders avoid injury.

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

Checking the Engine Oil

The engine is shipped with 1.65 liters (1-3/4 quarts) (w/filter) of oil in the crankcase; however, the oil level must be checked before and after the engine is first started.

The engine uses any high-quality detergent oil having the American Petroleum Institute (API) service classification of SG, SH, or SJ or higher. The recommended viscosity (weight) is SAE 30.

1. Position the machine on a level surface.
2. Unscrew the dipstick and wipe it with a clean rag. Screw the dipstick into the tube and make sure it is seated fully (Figure 28).

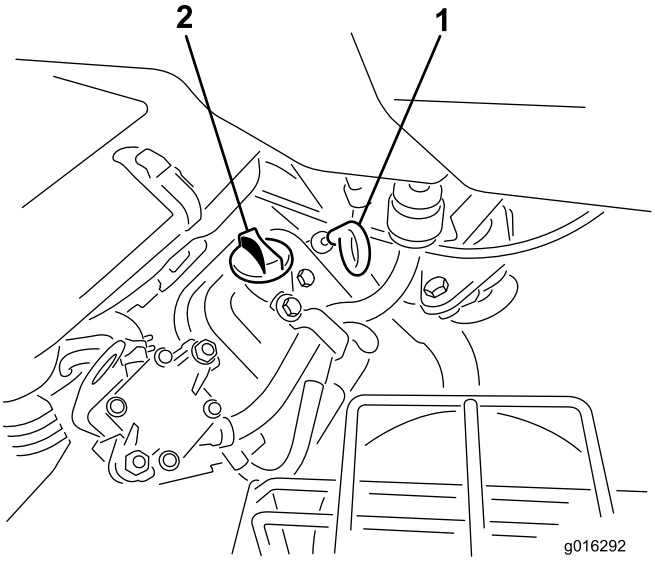


Figure 28

1. Dipstick
2. Filler cap

3. Unscrew the dipstick out of the tube and check the oil level.
4. If the oil level is low, remove the filler cap from the valve cover and pour oil into the opening in the valve cover until the oil level is up to the Full mark on the dipstick. Add the oil slowly and check the level often during this process. **Do not overfill.**

Important: **Check the oil level every 8 operating hours or daily.**

5. Install the filler cap and dipstick firmly in place.

Filling the Fuel Tank

- For best results, use only clean, fresh (less than 30 days old), unleaded gasoline with an octane rating of 87 or higher ((R+M)/2 rating method).
- **Ethanol:** Gasoline with up to 10% ethanol (gasohol) or 15% MTBE (methyl tertiary butyl ether) by volume is acceptable. Ethanol and MTBE are not the same. Gasoline with 15% ethanol (E15) by volume is not approved for use. **Never use** gasoline that contains more than 10% ethanol by volume, such as E15 (contains 15% ethanol), E20 (contains 20% ethanol), or E85 (contains 85% ethanol). Using unapproved gasoline may cause performance problems and/or engine damage which may not be covered under warranty.
- **Do not** use gasoline containing methanol.
- **Do not** store fuel either in the fuel tank or fuel containers over the winter unless a fuel stabilizer is used.
- **Do not** add oil to gasoline.

⚠ DANGER

In certain conditions, gasoline is extremely flammable and highly explosive. A fire or explosion from gasoline can burn you and others and can damage property.

- **Fill the fuel tank outdoors, in an open area, when the engine is cold. Wipe up any gasoline that spills.**
- **Never fill the fuel tank inside an enclosed trailer.**
- **Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 1 inch (25 mm) below the bottom of the filler neck. This empty space in the tank allows gasoline to expand.**
- **Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by a spark.**
- **Store gasoline in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of gasoline.**
- **Do not operate without entire exhaust system in place and in proper working condition.**

⚠ DANGER

In certain conditions during fueling, static electricity can be released causing a spark which can ignite the gasoline vapors. A fire or explosion from gasoline can burn you and others and can damage property.

- **Always place gasoline containers on the ground away from your vehicle before filling.**
- **Do not fill gasoline containers inside a vehicle or on a truck or trailer bed because interior carpets or plastic truck bed liners may insulate the container and slow the loss of any static charge.**
- **When practical, remove gas-powered equipment from the truck or trailer and refuel the equipment with its wheels on the ground.**
- **If this is not possible, then refuel such equipment on a truck or trailer from a portable container, rather than from a gasoline dispenser nozzle.**
- **If a gasoline dispenser nozzle must be used, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.**

1. Clean around the fuel-tank cap and remove it (Figure 29).

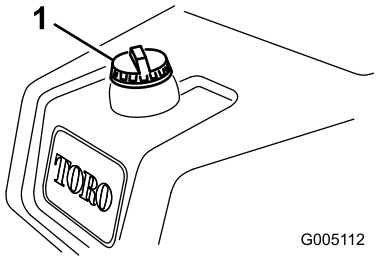


Figure 29

1. Fuel-tank cap

2. Add unleaded regular gasoline to the fuel tank until the level is 25 mm (1 inch) below the bottom of the filler neck.

   This space in the tank allows gasoline to expand. **Do not fill the fuel tank completely full.**

   Note: The fuel tank capacity is 22.7 L (6 US gallons).

3. Install the fuel-tank cap securely. Wipe up any gasoline that may have spilled.

Checking the Hydraulic-Fluid Level

The hydraulic-fluid reservoir is filled at the factory with approximately 18.9 L (5 US gallons) of high quality hydraulic fluid. Before operating the machine each day, check level of the hydraulic fluid in the white plastic window on the front of the hydraulic-fluid reservoir (behind the seat on the left side). The fluid should be between the lines in the window; 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, Vickers 35 VQ (Eaton ATS373-C)

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 gallon) containers or 55 gallon drums from your Mobil Distributor.

Note: 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 oz) bottles. One bottle is sufficient for 15-22 L (4-6 gallons) of hydraulic oil. Order part no. 44-2500 from your authorized Toro distributor. **This red dye is not recommended for use with biodegradable fluids. Use food coloring.**

Important: Regardless of the hydraulic fluid type used, any machine used for off green applications, verticutting or used during ambient temperatures above 29° C (85° F) should have Oil Cooler Kit installed; refer to 5 Installing the Optional Oil Cooler (page 14).

Filling the Hydraulic Tank

1. Position the machine on a level surface. Make sure the machine has cooled down so the oil is cold.
2. Remove the cap from the reservoir (Figure 30).

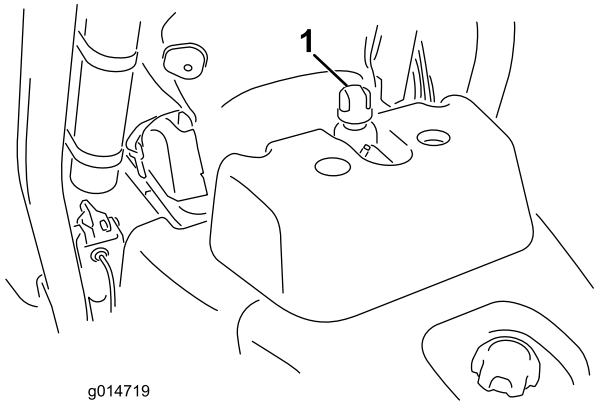


Figure 30

1. Hydraulic-tank cap

3. Slowly fill the reservoir with the appropriate hydraulic fluid until the level is at or within 6 mm (1/4 inch) of the arrow in the symbol next to the white window in the front of the reservoir (Figure 31). Do not overfill.

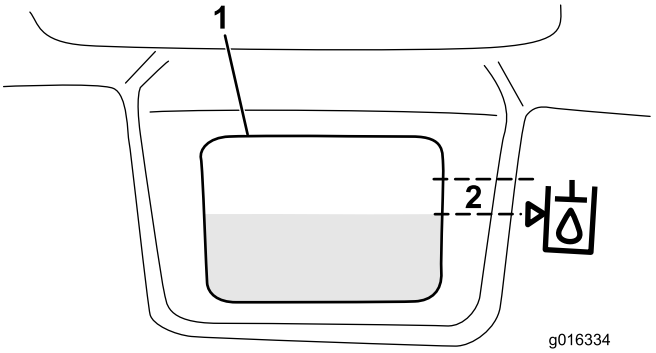


Figure 31

1. White window on the front of the hydraulic reservoir
2. Fill to within this area.

Important: To prevent system contamination, clean the top of the hydraulic fluid containers before puncturing. Ensure the pour spout and funnel are clean.

4. Install the reservoir cap. Wipe up any fluid that may have spilled.

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

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 Adjusting the Reel to Bedknife in the Cutting Unit Operator's Manual.

Before checking the reels, disconnect the cutting unit power disconnect couplers; refer to Cutting Unit Power Disconnect (page 24). Connect them when finished.

⚠ CAUTION

If you do not disconnect the power to the cutting units, someone could accidentally start the cutting unit, causing serious injury to hands and feet.

Always separate the cutting unit power disconnect couplers before working on the cutting units.

Checking the Tire Pressure

The tires are over-inflated at the factory for shipping purposes. Reduce the pressure to the proper levels before starting the unit.

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 1-4 hours of operation and again after 10 hours of operation. Torque the nuts every 200 hours thereafter.

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.

To ensure optimum performance of the brake system, burnish (break-in) the brakes before using the machine. To burnish the brakes, firmly apply the brakes and drive the machine at mowing speed until the brakes are hot, as indicated by their smell. An adjustment to the brakes may be required after break-in; refer to Adjusting the Brakes.

Starting the Engine

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

1. Sit on the seat, lock the parking brake, disengage the raise/lower mow control and move the functional control lever to Neutral.
2. Remove your foot from the traction pedal and make sure the pedal is in the Neutral position.
3. Move the choke lever to the closed position (only when starting a cold engine) and the throttle lever to the half throttle position.
4. Insert and rotate the ignition key clockwise until the engine starts. After the engine starts, regulate the choke to keep the engine running smoothly. As soon as possible, open the choke by pushing it in to the Off position. A warm engine requires little or no choking.
5. Check the machine out with the following procedures after the engine has started:

   A. Move the functional control lever to the Mow position and release the parking brake. Move the throttle control to the Fast position and momentarily engage the reels by moving the raise/lower mow control lever forward. The cutting units should drop and all the reels should turn.

   B. Move the raise/lower mow control lever rearward. The cutting reels should stop and the cutting units should raise to the full transport position.

   C. Set the brake to keep the machine from moving, and operate the traction pedal through the forward and reverse positions.

   D. Continue the above procedure for 1-2 minutes. Neutralize the functional control lever, lock the parking brake, and turn the engine off.

   E. Check for oil leaks. If oil leaks appear, check the tightness of the hydraulic fittings. If oil leaks continue to appear, contact your local Toro Distributor for assistance and, if necessary, replacement parts.

Important: A trace of oil on the motor or wheel seals is normal. Seals require a small amount of lubrication to perform properly.

Note: When the machine is new and the bearings and reels are tight, it is necessary to use the Fast throttle control position for this check. A fast throttle setting may not be required after the break-in period.

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 the machine.

- The traction pedal is in neutral.
- The functional control lever is in neutral.

The safety interlock system prevents the machine from moving unless:

- The parking brake is off.
- The operator is seated.
- The functional control lever is in Mow or Transport.

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 be sure the interlock system is operating correctly:

1. Sit on the seat, move the traction pedal to Neutral, move the functional control lever to Neutral, and engage the parking brake.
2. Try to depress the traction pedal.

   Note: The pedal should not depress, 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 Neutral, move the functional control lever to Neutral, and engage the parking brake.
4. Move the functional control lever to mow or transport and try to start the engine.

   Note: The engine should not crank, 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 Neutral, move the functional control lever to Neutral, and engage the parking brake.
6. Start the engine and move the functional control lever to mow or transport.

   Note: The engine should kill, 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 Neutral, move the functional control lever to Neutral, and engage the parking brake.
8. Start the engine.
9. Release the parking brake, move the functional control lever to mow, and rise from the seat.

   Note: The engine should kill, 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 Neutral, move the functional control lever to Neutral, 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.

    Note: If they do, the interlock system is not operating correctly.

    Correct the problem if it is not operating properly.

Installing and Removing the Cutting Units

Installing the Cutting Units

1. Disconnect the cutting unit power disconnect couplers; refer to Cutting Unit Power Disconnect (page 24).

   ⚠ CAUTION

   If you do not disconnect the power to the cutting units, someone could accidentally start the cutting unit, causing serious injury to hands and feet.

   Always separate the cutting unit power disconnect couplers before working on the cutting units.
2. Lift up on the foot rest and swing it open, allowing access to the center cutting unit position (Figure 32).

⚠ 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.

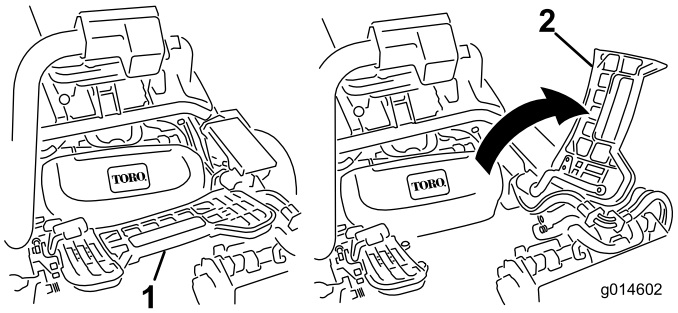


Figure 32

1. Footrest—closed
2. Footrest—open

3. Position the cutting unit under the center suspension arm.
4. With the latches on the suspension-arm bar pointing up (i.e., open) (Figure 33), push the suspension arm down so that the bar fits over the bar across the top of the cutting unit (Figure 34).

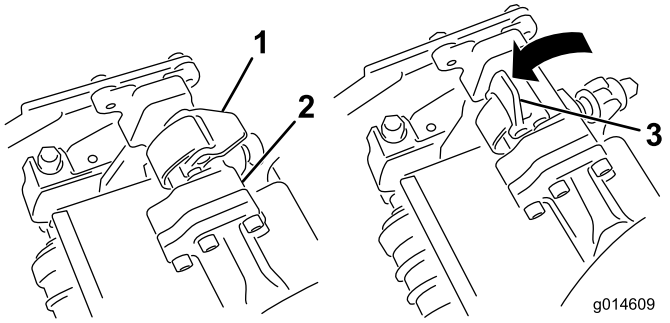


Figure 33

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

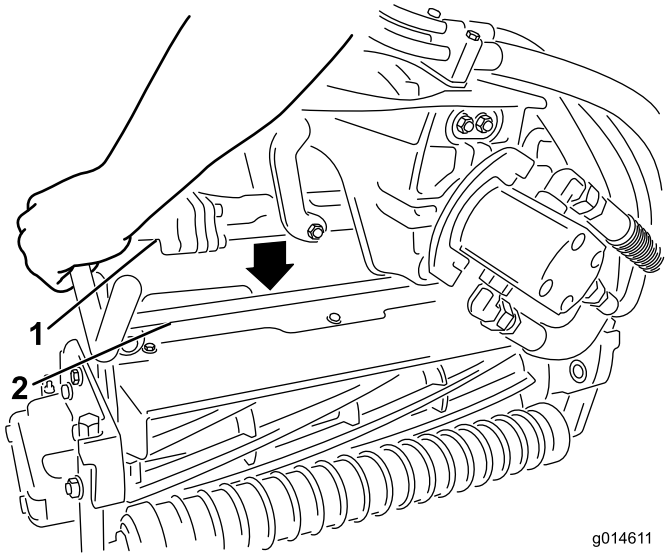


Figure 34

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

5. Close the latches down and around the cutting-unit bar and lock them in place (Figure 33).

   Note: A “click” can be heard and felt when the latches are properly locked in place.
6. Coat the spline shaft of the cutting unit motor with clean grease (Figure 35).
7. 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 an audible “click” from both sides of the motor (Figure 35).

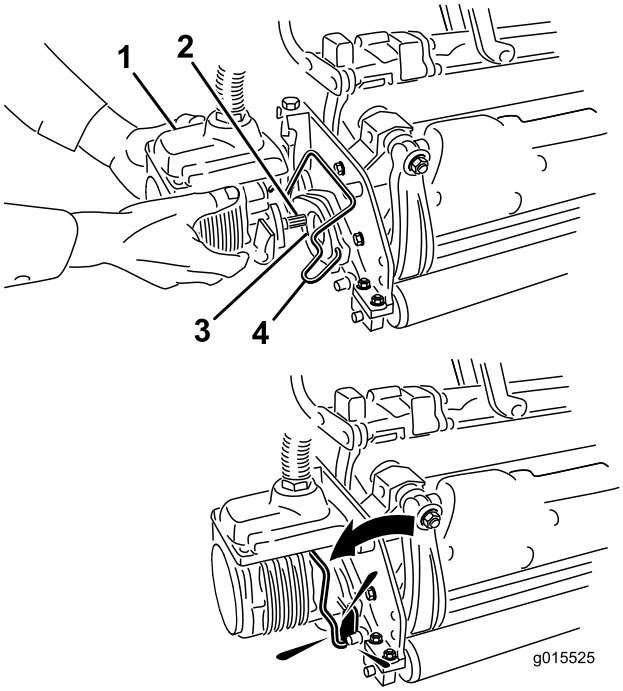


Figure 35

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

8. Mount a grass basket onto the basket hooks on the suspension arm.
9. Repeat this procedure for the other cutting units.
10. Connect the cutting unit power disconnect couplers; refer to Cutting Unit Power Disconnect (page 24).

Removing the Cutting Units

1. Disconnect the cutting unit power disconnect couplers; refer to Cutting Unit Power Disconnect (page 24).

⚠ CAUTION

If you do not disconnect the power to the cutting units, someone could accidentally start the cutting unit, causing serious injury to hands and feet.

Always separate the cutting unit power disconnect couplers before working on the cutting units.

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

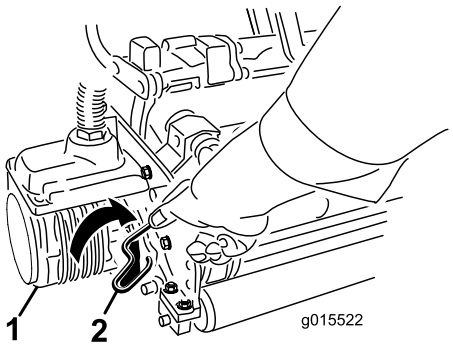


Figure 36

1. Reel motor
2. Motor-retaining bar

4. Move the motor to the storage location on the front of the suspension arm (Figure 37).

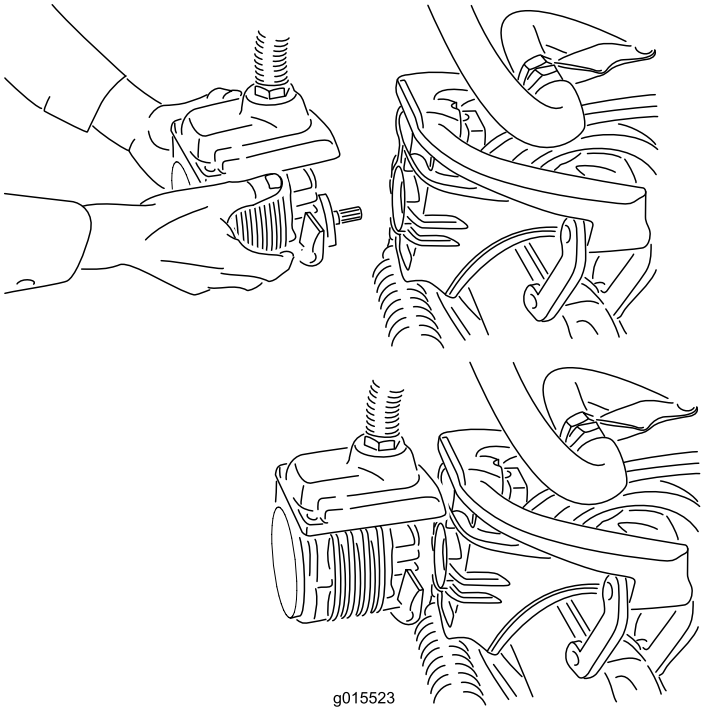


Figure 37

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 machine without the cutting units installed, secure them to the suspension arms using cable ties.

5. Open the latches on the suspension-arm bar of the cutting unit you are removing (Figure 33).
6. Disconnect the latches from the cutting-unit bar.

7. Roll the cutting unit out from under the suspension arm.
8. Repeat steps 3 through 7 for the other cutting units as required.
9. Connect the cutting unit power disconnect couplers; refer to Cutting Unit Power Disconnect (page 24).

Training Period

Before mowing greens with the machine, it is recommended that you find a clear area and practice starting and stopping, raising and lowering the cutting units, turning, etc. This training period will be beneficial to the operator in gaining confidence in the performance of the machine.

Mowing

Note: Before mowing greens with the machine, find a clear area and practice starting and stopping, raising and lowering the cutting units, turning, etc. This training period will be beneficial to the operator in gaining confidence in the performance of the machine.

Note: Before mowing, 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 will be less apt to lay down and therefore be difficult to trap between the reel blades and bedknife.

1. Approach the green with the shift selector in the No. 1 position. Start on one edge of the green so that the ribbon procedure of cutting may be used.

   Note: This holds compaction to a minimum and leaves a neat, attractive pattern on the greens.

2. Actuate the mow pedal as the front edge 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: Familiarize yourself with the fact that the No. 1 cutting unit reel is delayed and therefore, you should practice to try to gain the required timing necessary to minimize the cleanup mowing operation.

3. 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 38).

   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 (Figure 38).

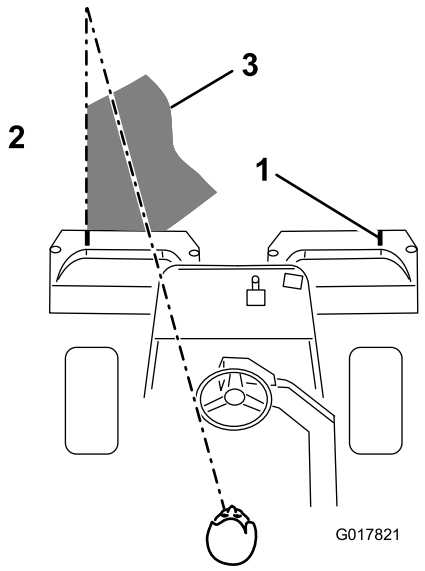


Figure 38

1. Alignment marker
2. Cut grass on left
3. Keep focal spot 1.8-3 m (6-10 ft) ahead of the machine.

4. As the front of the baskets cross the edge of the green, depress the lift pedal.

   Note: This will stop the reels and lift the cutting units. Timing of this procedure is important, so the mowers do not cut into the fringe area. However, as much of the green as possible should be cut to minimize the amount of grass left to mow around the outer periphery

5. Cut down on operating time and ease lineup for the next pass by momentarily turning the machine in the opposite direction, then turning in the direction of the uncut portion; i.e., if intending to turn right, first swing slightly left, then right.

   Note: This will assist in getting the machine more quickly aligned for the next pass.

   Follow the same procedure for turning in the opposite direction. It is a good practice to try to make as short of a turn as possible. However, turn in a wider arc during warmer weather to minimize the possibility of bruising the turf.

   Important: The machine should never be stopped on a green with the cutting unit reels operating as damage to the turf may result. Stopping on a wet green with the machine may leave marks or indentations from the wheels.

6. Finish cutting the green by mowing the outer periphery and replace the flags.

   Note: Be sure to change the direction of cutting from the previous mowing. Always keep weather and turf

conditions in mind and be sure to change the direction of mowing from the previous cutting.

Note: At the end of the periphery cut, momentarily pull back on the raise/lower mow lever to shut the reels off without raising them. Continue moving forward until the reel stops rotating, then, drive off the green and raise the reels (This will help prevent dribbling grass onto the green while raising the reels).

7. 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 will add unnecessary weight to the machine, thereby increasing the load on the engine, hydraulic system, brakes, etc.

Driving the Machine without Mowing

Make sure the cutting units are in the full up position. 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.

Transporting the Machine

Use a heavy-duty trailer or truck to transport the machine. Ensure that the trailer or truck has all necessary brakes, lighting, and marking as required by law. Please carefully read all the safety instructions. Knowing this information could help you, your family, pets, or bystanders avoid injury.

⚠ WARNING

Driving on the street or roadway without turn signals, lights, reflective markings, or a slow moving vehicle emblem is dangerous and can lead to accidents causing personal injury.

Do not drive machine on a public street or roadway.

To transport the machine:

1. If using a trailer, connect it to the towing vehicle and connect the safety chains.
2. If applicable, connect the trailer brakes.
3. Load the machine onto the trailer or truck.
4. Stop the engine, remove the key, set the brake, and close the fuel valve.
5. Use the metal tie down loops on the machine to securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes.

Loading the Machine

Use extreme caution when loading the machine onto a trailer or a truck. One full-width ramp that is wide enough to extend beyond the rear tires is recommended instead of individual ramps for each side of the machine (Figure 39). The lower rear section of the machine frame extends back between the rear wheels and serves as a stop for tipping backward. Having a full-width ramp provides a surface for the frame members to contact if the machine starts to tip backward. If it is not possible to use one full-width ramp, use enough individual ramps to simulate a full-width continuous ramp.

The ramp should be long enough so that the angles do not exceed 15 degrees (Figure 39). A steeper angle may cause mower components to get caught as the unit moves from the ramp to the trailer or truck. Steeper angles may also cause the machine to tip backward. If loading on or near a slope, position the trailer or truck so that it is on the down side of the slope and the ramp extends up the slope. This will minimize the ramp angle. The trailer or truck should be as level as possible.

Important: Do not attempt to turn the machine while on the ramp; you may lose control and drive off the side.

Avoid sudden acceleration when driving up a ramp and sudden deceleration when backing down a ramp. Both maneuvers can cause the machine to tip backward.

⚠ WARNING

Loading a machine onto a trailer or truck increases the possibility of backward tip-over and could cause serious injury or death.

- **Use extreme caution when operating a machine on a ramp.**
- **Ensure that the ROPS is in the up position while using the seat belt when loading the machine. Ensure that the ROPS will clear the top of an enclosed trailer.**
- **Use only a single, full-width ramp; do not use individual ramps for each side of the machine.**
- **If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the machine.**
- **Do not exceed a 15-degree angle between the ramp and the ground or between the ramp and the trailer or truck.**
- **Avoid sudden acceleration while driving the machine up a ramp, to avoid tipping backward.**
- **Avoid sudden deceleration while backing the machine down a ramp, to avoid tipping backward.**

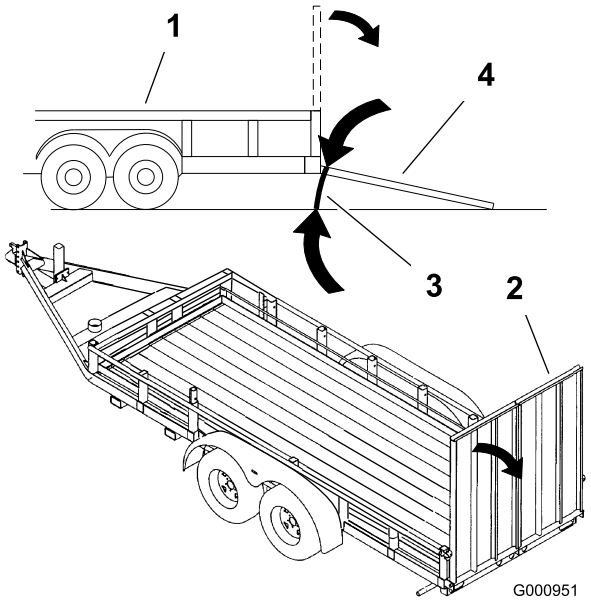


Figure 39

1. Trailer
2. Full-width ramp
3. Not greater than 15 degrees
4. Full-width ramp—side view

Inspecting and Cleaning After Mowing

At the completion of the mowing operation, thoroughly wash the machine with a garden hose without a nozzle so excessive water pressure will not cause contamination and damage to the seals and bearings. 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 mow and lift pedal and 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.

Towing the Machine

In case of an emergency the machine can be towed for a short distance (less than 0.4 km (1/4 mile)). However, Toro does not recommend this as standard procedure.

Important: Do not tow the machine faster than 3-5 km/h (2-3 mph) because the drive system may be damaged. If the machine must be moved a considerable distance, 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 40).

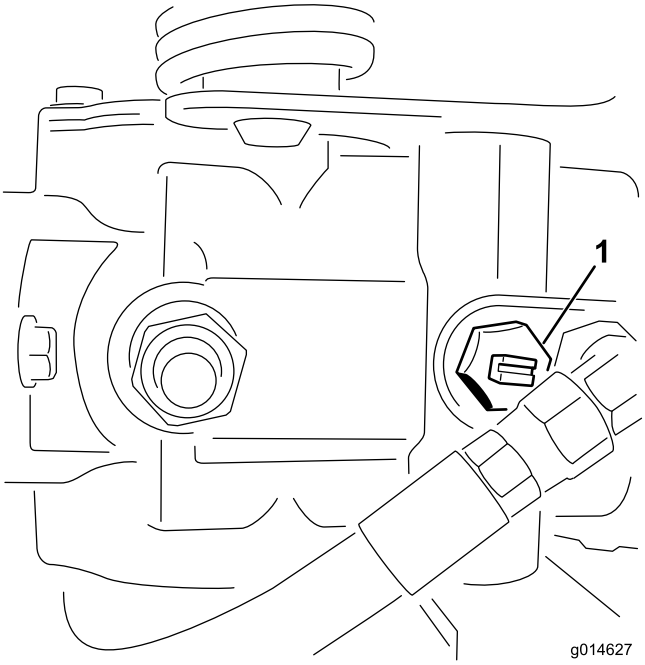


Figure 40

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 40). Do not start the engine when the valve is open.

Maintenance

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

Note: Looking for an *Electrical Schematic* or *Hydraulic Schematic* for your machine? Download a free copy of the 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 and disconnect the wire from the spark plug before you do any maintenance. Set the wire aside so that it does not accidentally contact the spark plug.

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 torque of the wheel nuts.
After the first 25 hours	• Change the engine oil and filter.
After the first 50 hours	• Change the hydraulic-oil filter. • Check the engine rpm (at idle and full throttle).
Before each use or daily	• Check the engine oil. • Check the hydraulic fluid level. • Check the reel-to-bedknife contact. • Inspect and cleanup after mowing. • Check the hydraulic lines and hoses.
Every 50 hours	• Service the air cleaner foam pre-cleaner (more frequently when operating conditions are dusty or dirty). • Check the battery electrolyte level. • Check the battery cable connections.
Every 100 hours	• Service the air cleaner cartridge (more frequently when operating conditions are dusty or dirty). • Change the engine oil and filter.
Every 200 hours	• Check the torque of the wheel nuts.
Every 400 hours	• Grease the machine.
Every 800 hours	• Replace the spark plugs. • Replace the fuel filter. (Replace sooner if the fuel flow is restricted.) • Change the hydraulic oil, 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.

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 leak detector alarm (if equipped).							
Check the brake operation.							
Check the fuel level.							
Check the hydraulic oil level.							
Check the engine oil level.							
Clean the engine air cooling fins.							
Inspect the air filter pre-cleaner.							
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.							

Important: **Refer to your engine *Operator's Manual* for additional maintenance procedures.**

Note: Looking for an *Electrical Schematic* or *Hydraulic Schematic* for your machine? Download a free copy of the schematic by visiting www.Toro.com and searching for your machine from the Manuals link on the home page.

Notation for Areas of Concern		
Inspection performed by:		
Item	Date	Information

Lubrication

Greasing the Machine

Service Interval: Every 400 hours

Lubricate the grease fitting with No. 2 general-purpose, lithium-base grease.

1. Wipe the grease fitting clean so foreign matter cannot be forced into the bearing or bushing (Figure 41).

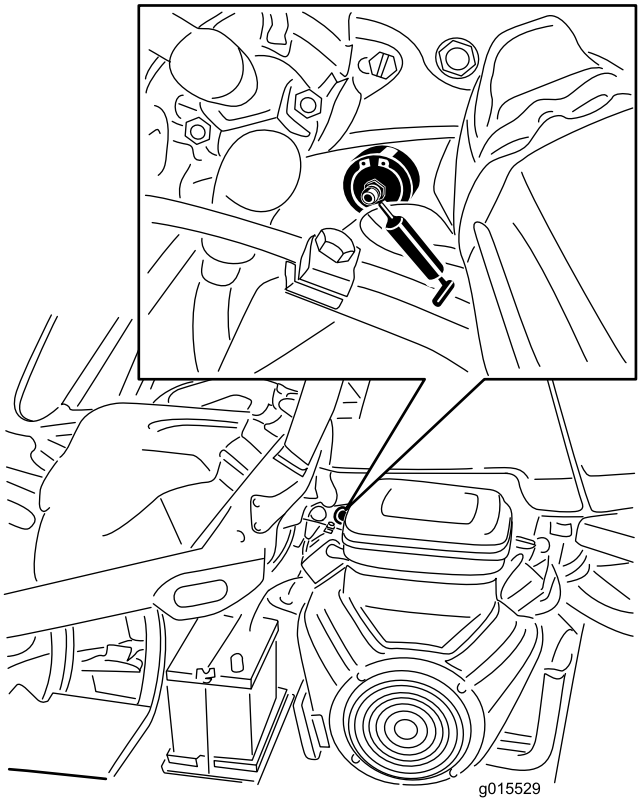


Figure 41

Left side of gasoline model shown; your model may vary

2. Pump grease into the bearing or bushing until the grease is visible. Wipe up excess grease.

Engine Maintenance

Servicing the Air Cleaner

Service Interval: Every 50 hours—Service the air cleaner foam pre-cleaner (more frequently when operating conditions are dusty or dirty).

Every 100 hours—Service the air cleaner cartridge (more frequently when operating conditions are dusty or dirty).

1. Release the locking clips and remove the air cleaner cover (Figure 42). Clean the cover thoroughly.

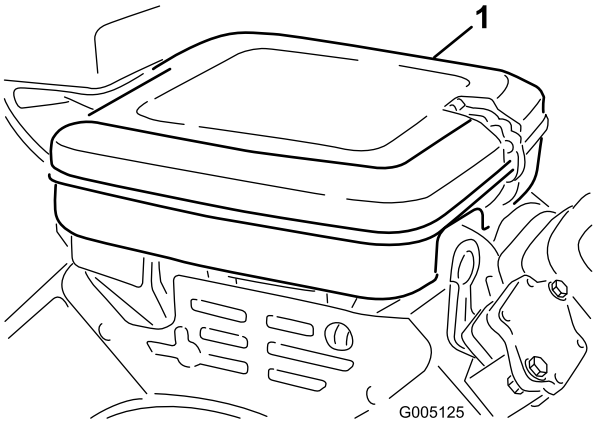


Figure 42

1. Air-cleaner cover

2. Remove the wing nut securing the elements to the air cleaner body.
3. If the foam element is dirty, remove it from the paper element (Figure 43). Clean it thoroughly, as follows:
   A. Wash the foam element in a solution of liquid soap and warm water. Squeeze it to remove dirt, but do not twist it because the foam may tear.
   B. Dry it by wrapping it in a clean rag. Squeeze the rag and foam element dry.

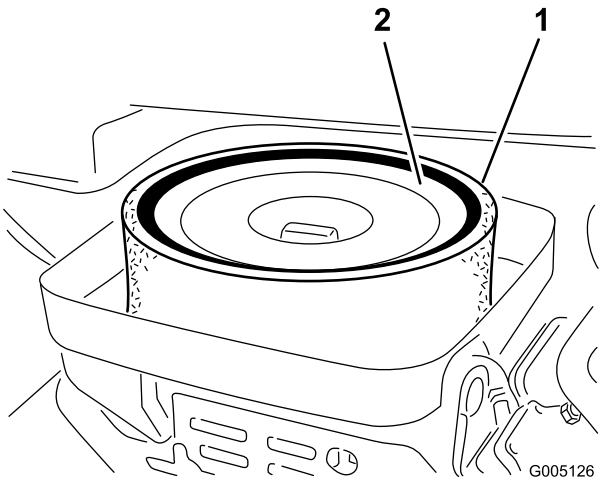


Figure 43

1. Foam element
2. Paper element

4. When servicing the foam element, check the condition of the paper element. Clean it by gently tapping it on a flat surface or replace it if needed.
5. Install the foam element, paper element, and air cleaner cover.

   Important: Do not operate the engine without the air cleaner element because extreme engine wear and damage will likely result.

Changing the Engine Oil and Filter

Service Interval: After the first 25 hours

Every 100 hours

1. Remove the drain plug (Figure 44) and let oil flow into a drain pan. When the oil stops, install the drain plug.

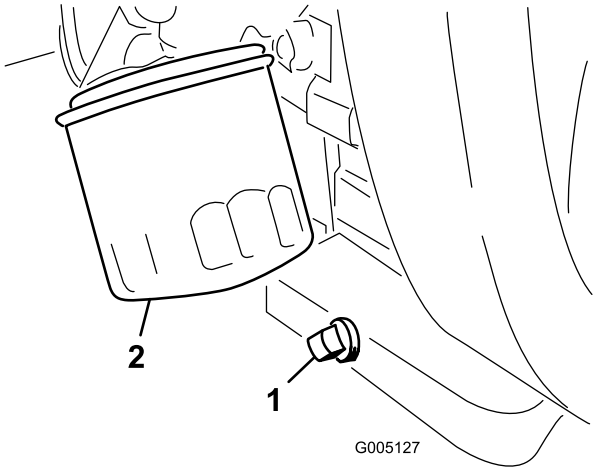


Figure 44

1. Drain plug
2. Oil filter

2. Remove the oil filter (Figure 44). Apply a light coat of clean oil to the new filter gasket.
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 Checking the Engine Oil (page 25).
5. Dispose of the used oil properly.

Replacing the Spark Plugs

Service Interval: Every 800 hours

The recommended air gap is 0.76 mm (0.030 inch)

The correct spark plug to use is a Champion RC 14YC.

Note: The spark plug usually lasts a long time; however, the plug should be removed and checked whenever the engine malfunctions.

1. Clean the area around the spark plugs so foreign matter cannot fall into the cylinder when the spark plug is removed.
2. Pull the spark plug wires off of the spark plugs and remove the plugs from the cylinder head.
3. Check the condition of the side electrode, center electrode, and center electrode insulator to ensure that there is no damage.

   Important: Replace a cracked, fouled, dirty, or otherwise malfunctioning spark plug. Do not sand blast, scrape, or clean electrodes by using a wire brush because grit may eventually release from the plug, fall into the cylinder, and damage the engine.
4. Set the air gap between the center and side of the electrodes at 0.76 mm (0.030 inch) (Figure 45).

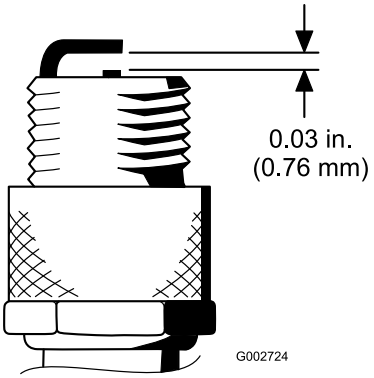


Figure 45

5. Install the correctly gapped spark plug with gasket seal, and tighten the plug to 23 N-m (200 in-lb). If a torque wrench is not used, tighten the plug firmly.

Fuel System Maintenance

Replacing the Fuel Filter

Service Interval: Every 800 hours (Replace sooner if the fuel flow is restricted.)

An in-line filter is incorporated into the fuel line between the fuel tank and carburetor (Figure 46). Be sure the arrow on the filter is pointing away from the fuel tank.

⚠ DANGER

In certain conditions, gasoline is extremely flammable and highly explosive. A fire or explosion from gasoline can burn you and others and can damage property.

- **Drain gasoline from the fuel tank when the engine is cold. Do this outdoors in an open area. Wipe up any gasoline that spills.**
- **Never smoke when draining gasoline, and stay away from an open flame or where a spark may ignite the gasoline fumes.**

1. Close the fuel-shutoff valve, loosen the hose clamp on the carburetor side of filter, and remove the fuel line from the filter (Figure 46).

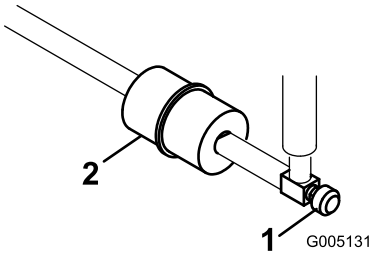


Figure 46

1. Fuel-shutoff valve 2. Fuel filter

2. Place a drain pan under the filter, loosen the remaining hose clamp and remove the filter (Figure 46).
3. Install the new filter with the arrow on the filter body pointing away from the fuel tank.

Inspecting the Fuel Lines and Connections

Service Interval: Every 2 years

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

Electrical System Maintenance

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. Reconnect the cables, positive (+) cable first, and coat the terminals with petroleum jelly.

⚠ 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.

Locating the Fuses

The fuses in the machine's electrical system are located under the seat (Figure 47) and under the right arm cover (Figure 48).

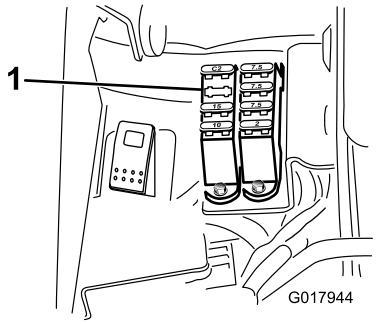


Figure 47

1. Fuses

Fuse Layout	
Hydraulic Fan Kit 15 A	Lift Reel E-Reel Enable 7.5 A
	Reel Engage Lift/Lower 7.5 A
Lights Leak Detector 15 A	Start/Run Diag. Lights Leak Detector 7.5 A
Run 10 A	ECM Logic Power 2 A

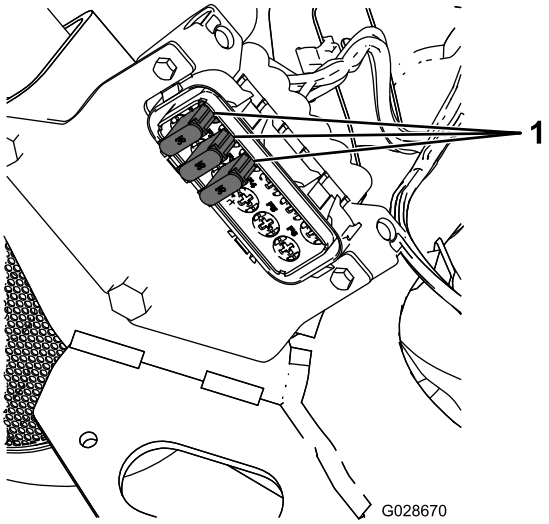


Figure 48

1. Fuses

Fuse Layout
35 A
35 A
35 A

Drive System Maintenance

Adjusting the Transmission for Neutral

If the machine creeps when the traction control pedal is in the neutral position, the neutral return mechanism must be adjusted.

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

   Note: 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 Slow, and check the front wheel that is off of the floor; it must not be rotating.

3. If the wheel is rotating, stop the engine and proceed as follows:

   A. Loosen the nut securing the eccentric to the top of the hydrostat (Figure 49).

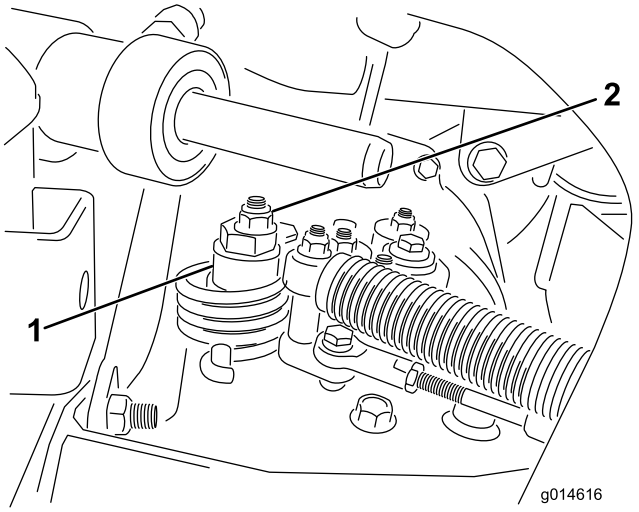


Figure 49

1. Eccentric
2. Locknut

   B. Move the functional control lever to Neutral and the throttle to Slow. 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 49). 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 an adjustment may be required if the pedal reaches full stroke before it contacts the pedal stop, or if a decrease in transport speed is desired.

To obtain 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 50) before tension is felt on the cable, an adjustment is required:

1. Put the functional control lever in the transport position and loosen the locknut securing the pedal stop to the floor plate (Figure 50).
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: The tension on the cable must not be excessive or cable life will be reduced.

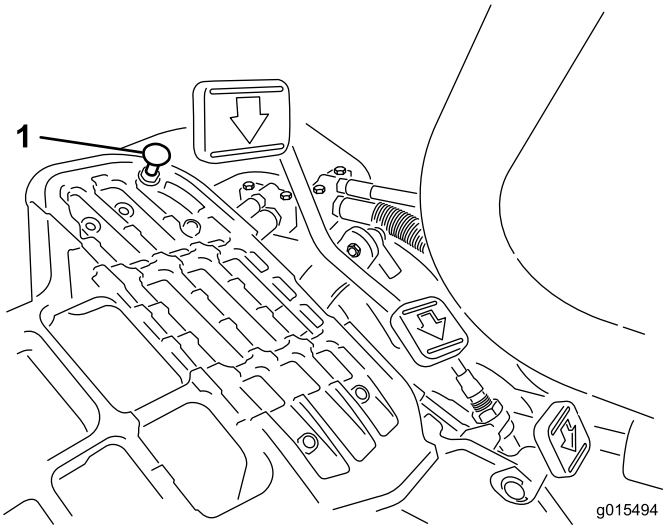


Figure 50

1. Pedal stop

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 the desired transport speed is obtained.
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 51).
2. Loosen the nut securing the lock and mow brackets on the pedal pivot.

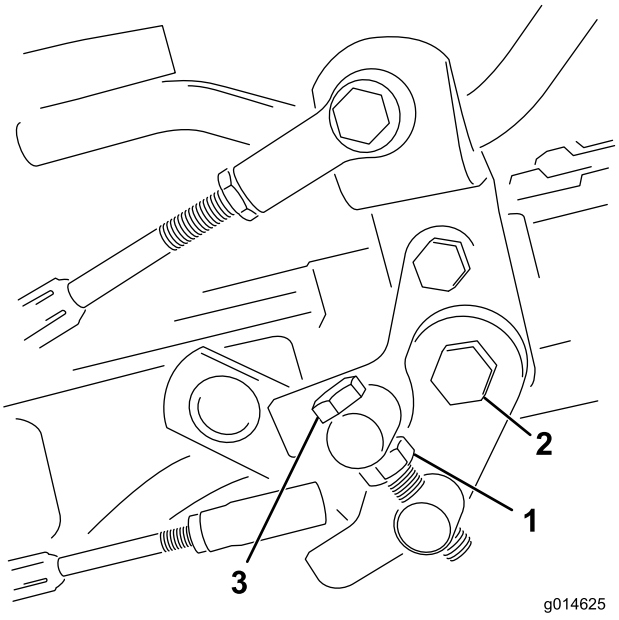


Figure 51

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 51). Check the adjustment and adjust as required.

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.

Hydraulic System Maintenance

Changing the Hydraulic Oil and Filter

Service Interval: After the first 50 hours

Every 800 hours

If the oil becomes contaminated, contact your local Toro distributor because the system must be flushed. Contaminated oil looks milky or black when compared to clean oil.

1. Clean the area around the filter mounting area (Figure 52). Place a drain pan under the filter and remove the filter.

   Note: If the oil is not going to be drained, disconnect and plug the hydraulic line going to the filter.

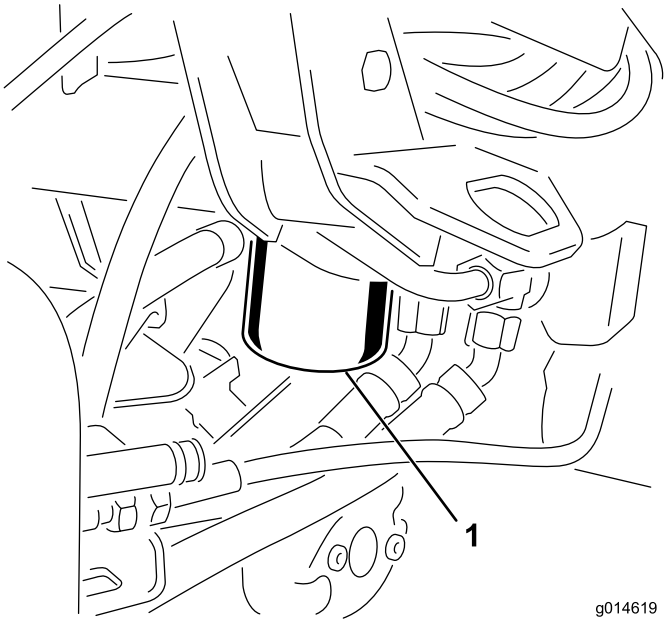


Figure 52

1. Hydraulic-oil 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 3/4 turn further. The filter should now be sealed.
3. Fill the hydraulic reservoir with hydraulic oil; refer to Filling the Hydraulic Tank (page 27).
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.
5. Stop the machine, recheck the fluid level and replenish as required.
6. Dispose of the oil and filter properly.

Checking the Hydraulic Lines and Hoses

⚠ WARNING

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

- **Make sure 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 pin hole 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

Backlapping the Reels

⚠ WARNING

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

- **Keep 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, stop the engine, 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*.
4. Start the engine and run at low idle speed. If the engine stalls, increase the engine speed.
5. Switch the Backlap Switch to the Reverse (R) position (Figure 53).

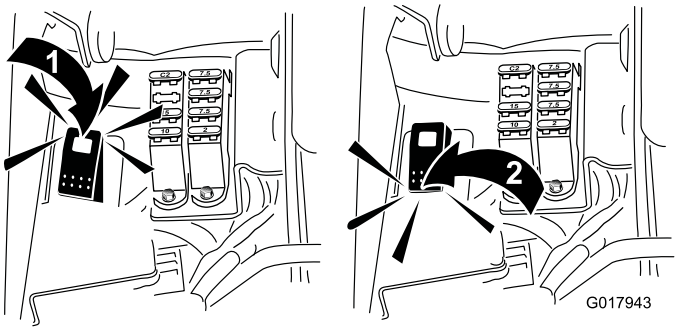


Figure 53

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

6. On the InfoCenter pull up the Main Menu and scroll down to Settings.
7. In the Settings menu scroll down to Backlap rpm and use the ± button to select the desired backlap speed.
8. 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.
9. Apply lapping compound with a long handle brush. Never use a short handled brush.
10. If the reels stall or become erratic while backlapping, select a higher reel speed setting until the speed stabilizes.
11. To make an adjustment to the cutting units while backlapping, turn the reels off by moving the Raise/Lower Mow control rearward and stop the engine. After completing adjustments, repeat steps 4 through 9.
12. Repeat the procedure for all cutting units you want to backlap.
13. When finished, return the Backlap Switch to the Forward (F) position, replace the cover, and wash all the lapping compound off of the cutting units. Adjust the cutting unit reel to bedknife as needed. Move the cutting unit reel speed control to the desired mowing position.

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

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 reels and bedknives, if necessary; refer to the Cutting Unit *Operator's Manual*. Use a rust preventive on bedknives and reel blades. Grease and oil all lubrication points; refer to Lubrication (page 37).
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 Oil and Filter (page 43) and Checking the Hydraulic Lines and Hoses (page 43).
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 (page 39).
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 38).
6. Remove the spark plugs, pour one ounce of SAE 30 oil into the cylinders, and crank slowly to distribute the oil. Replace the spark plugs; refer to Replacing the Spark Plugs (page 38).
7. Clean dirt and chaff from the cylinder, cylinder head fins, and blower housing.
8. 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.
9. If possible, store the machine in a warm, dry location.

Notes:

International Distributor List

Distributor:	Country:	Phone Number:	Distributor:	Country:	Phone Number:
Agrolanc Kft	Hungary	36 27 539 640	Maquiver S.A.	Colombia	57 1 236 4079
Balama Prima Engineering Equip.	Hong Kong	852 2155 2163	Maruyama Mfg. Co. Inc.	Japan	81 3 3252 2285
B-Ray Corporation	Korea	82 32 551 2076	Mountfield a.s.	Czech Republic	420 255 704 220
Casco Sales Company	Puerto Rico	787 788 8383	Mountfield a.s.	Slovakia	420 255 704 220
Ceres S.A.	Costa Rica	506 239 1138	Munditol S.A.	Argentina	54 11 4 821 9999
CSSC Turf Equipment (pvt) Ltd.	Sri Lanka	94 11 2746100	Norma Garden	Russia	7 495 411 61 20
Cyril Johnston & Co.	Northern Ireland	44 2890 813 121	Oslinger Turf Equipment SA	Ecuador	593 4 239 6970
Cyril Johnston & Co.	Republic of Ireland	44 2890 813 121	Oy Hako Ground and Garden Ab	Finland	358 987 00733
Equiver	Mexico	52 55 539 95444	Parkland Products Ltd.	New Zealand	64 3 34 93760
Femco S.A.	Guatemala	502 442 3277	Perfetto	Poland	48 61 8 208 416
ForGarder OU	Estonia	372 384 6060	Pratoverde SRL.	Italy	39 049 9128 128
G.Y.K. Company Ltd.	Japan	81 726 325 861	Prochaska & Cie	Austria	43 1 278 5100
Geomechaniki of Athens	Greece	30 10 935 0054	RT Cohen 2004 Ltd.	Israel	972 986 17979
Golf international Turizm	Turkey	90 216 336 5993	Riversa	Spain	34 9 52 83 7500
Guandong Golden Star	China	86 20 876 51338	Lely Turfcare	Denmark	45 66 109 200
Hako Ground and Garden	Sweden	46 35 10 0000	Solvert S.A.S.	France	33 1 30 81 77 00
Hako Ground and Garden	Norway	47 22 90 7760	Spypros Stavrinides Limited	Cyprus	357 22 434131
Hayter Limited (U.K.)	United Kingdom	44 1279 723 444	Surge Systems India Limited	India	91 1 292299901
Hydroturf Int. Co Dubai	United Arab Emirates	97 14 347 9479	T-Markt Logistics Ltd.	Hungary	36 26 525 500
Hydroturf Egypt LLC	Egypt	202 519 4308	Toro Australia	Australia	61 3 9580 7355
Irrimac	Portugal	351 21 238 8260	Toro Europe NV	Belgium	32 14 562 960
Irrigation Products Int'l Pvt Ltd.	India	0091 44 2449 4387	Valtech	Morocco	212 5 3766 3636
Jean Heybroek b.v.	Netherlands	31 30 639 4611	Victus Emak	Poland	48 61 823 8369

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.

Toro General Commercial Product 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 C