Form No. 3404-731 Rev C

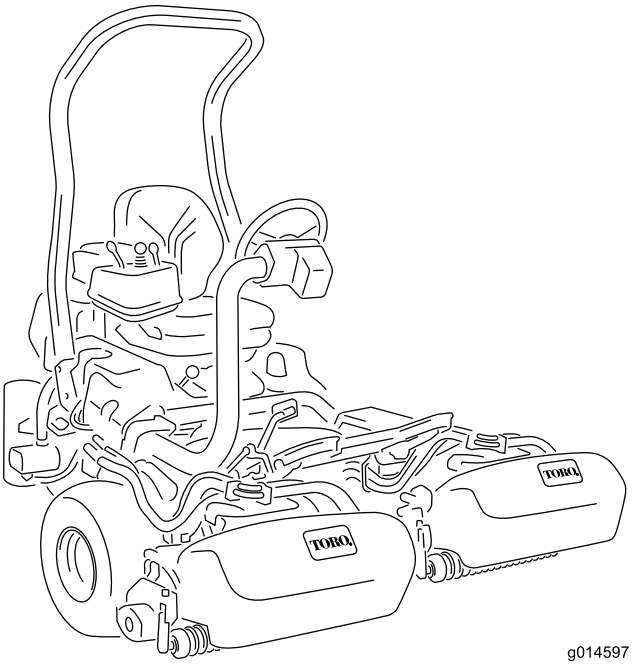
TORO®

Count on it.

Operator's Manual

Greensmaster® 3420 TriFlex® Traction Unit

Model No. 04540—Serial No. 316000001 and Up



g014597

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

CE

3404-731 C

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

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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

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

Introduction

This machine is a ride-on, reel-blade lawn mower intended to be used by professional, hired operators in commercial applications. It is primarily designed for cutting grass on well-maintained lawns in parks, golf courses, sports fields, and on commercial grounds. It is not designed for cutting brush, mowing grass and other growth alongside highways, or for agricultural uses.

Read this information carefully to learn how to operate and maintain your product properly and to avoid injury and product damage. You are responsible for operating the product properly and safely.

You may contact Toro directly at www.Toro.com for product and accessory information, help finding a dealer, or to register your product.

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure 1 identifies the location of the model and serial numbers on the product. Write the numbers in the space provided.

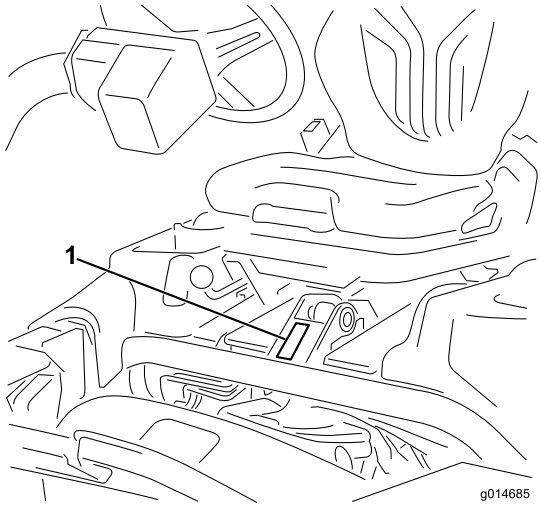


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Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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

g000502

Figure 2

1. Safety-alert symbol

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

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8111 Lyndale Avenue South
Bloomington, MN 55420

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Safety

This machine has been designed in accordance with EN ISO 5395:2013 and ANSI B71.4-2012 and meets these standards when the appropriate weight kit is added.

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

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Use only accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including substantial, slip-resistant footwear, safety glasses, and hearing protection. Tie back long hair. Do not wear jewelry.
- Inspect the area where you will use the equipment and remove all objects that could be thrown by the machine, such as rocks, toys, and wire.
- Check that operator presence controls, safety switches, and guards are attached and functioning properly. Do not operate the machine 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.
- Operate the machine only in good light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and the parking brake is engaged before the starting engine. Start the engine only from the operator's position.
- Slow down and use extra care on hillsides. Turf conditions can affect the machine's stability. Use caution while operating near drop-offs.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never operate without guards securely in place. Be sure all interlocks are attached, adjusted, and functioning properly.
- Do not change the engine governor setting or overspeed the engine.
- Stop the machine on level ground, lower the cutting units, disengage the drives, engage the parking brake, and shut off the engine before leaving the operator's position for any reason, including emptying the grass baskets.
- Stop and inspect the machine after striking objects or if an abnormal vibration occurs. Make necessary repairs before resuming operations.
- Keep hands and feet away from the cutting units.
- Look behind and down before backing up to be sure of a clear path.
- Never carry passengers and keep pets and bystanders away.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop the reels if not mowing.
- Do not operate the machine when tired, ill, or 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. Use the seat belt when operating the machine.
- Ensure that you can release the seat belt quickly in the event of an emergency.
- 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.

Maintenance and Storage

- Park the machine on level ground, disengage the drives, lower the cutting units, set the parking brake, stop the engine, remove the key, and disconnect spark plug wire(s). Wait for all movement to stop before adjusting, cleaning, or repairing the machine.
- Clean grass and debris from cutting units, drives, mufflers, and the engine to help prevent fires. Clean up oil or fuel spills.
- Let the engine cool before storing and do not store the machine near flames.
- Shut off the fuel while storing or transporting the machine. Do not store fuel near flames or drain the fuel tank indoors.
- Never allow untrained personnel to service the machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect the battery and remove the spark plug wire(s) before making any repairs. Disconnect the negative terminal first and the positive last. Connect the positive terminal first and the negative terminal last.
- Use care and wear gloves when checking the reels.
- 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 the charger before connecting or disconnecting it from the battery. Wear protective clothing and use insulated tools.
- Keep all parts in good working condition and all hardware and hydraulic fittings tightened. Replace all worn or damaged decals.

Toro Mower Safety

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

This product is capable of amputating hands and feet and of 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.
- Check the safety interlock switches daily for proper operation.
- Before attempting to start the engine, disengage all blade attachment clutches, shift into 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.
- The grass baskets must be in place during operation of the reels or thatchers for maximum safety. Shut the engine off before emptying the baskets.
- Raise the cutting units when driving from 1 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. Repair or replace a damaged reel or bedknife before continuing operation.
- Before getting off the seat, move the functional control lever to NEUTRAL, 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 animal 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.

Maintenance and Storage

- Ensure that all hydraulic line connectors are tight and that 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 ensure 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.

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.

Hand-Arm Vibration Level

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 Vibration Level

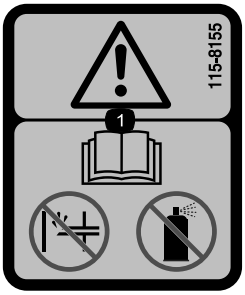
Measured vibration level = 0.14 m/s^2

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

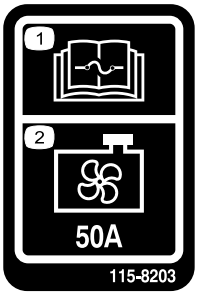
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or missing.



decal115-8155

115-8155

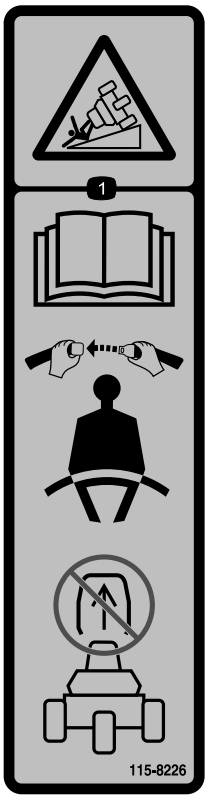
1. Warning—read the *Operator's Manual*, do not prime or use starting fluid.



decal115-8203

115-8203

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



decal115-8226

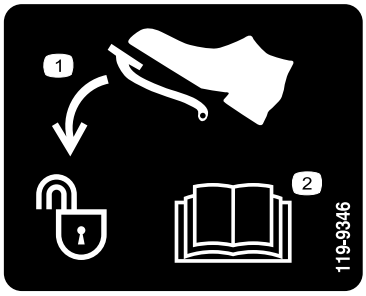
115-8226

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

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

decal117-2718

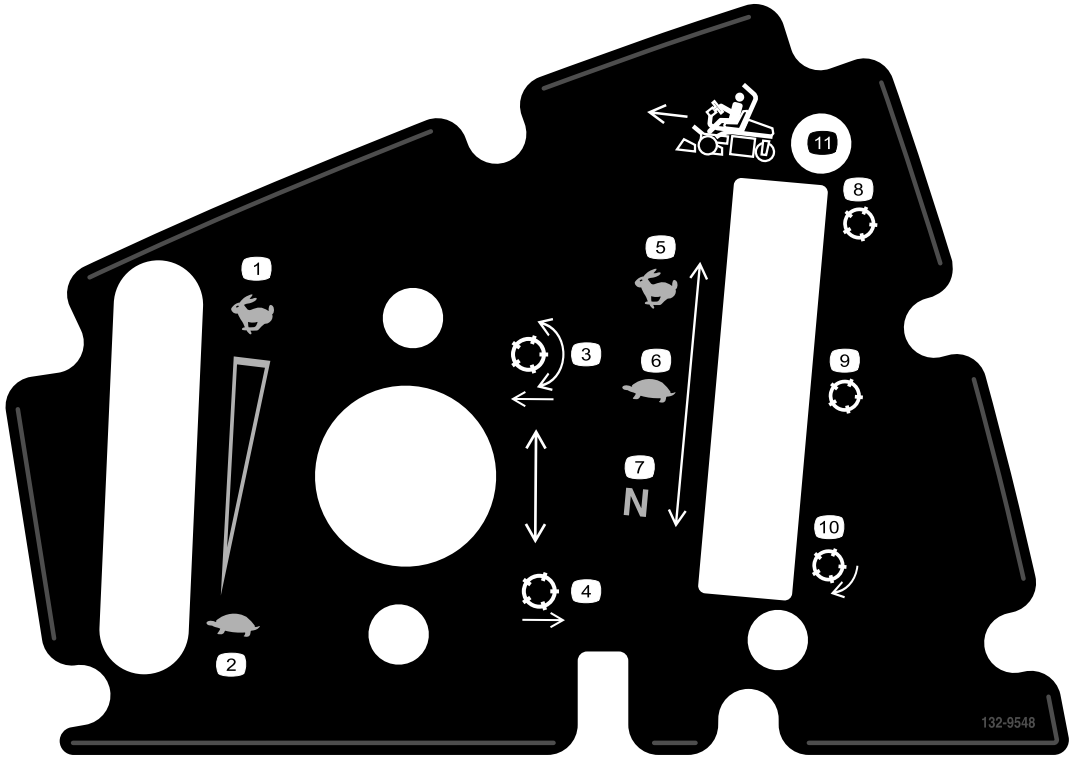
117–2718



decal119-9346

119-9346

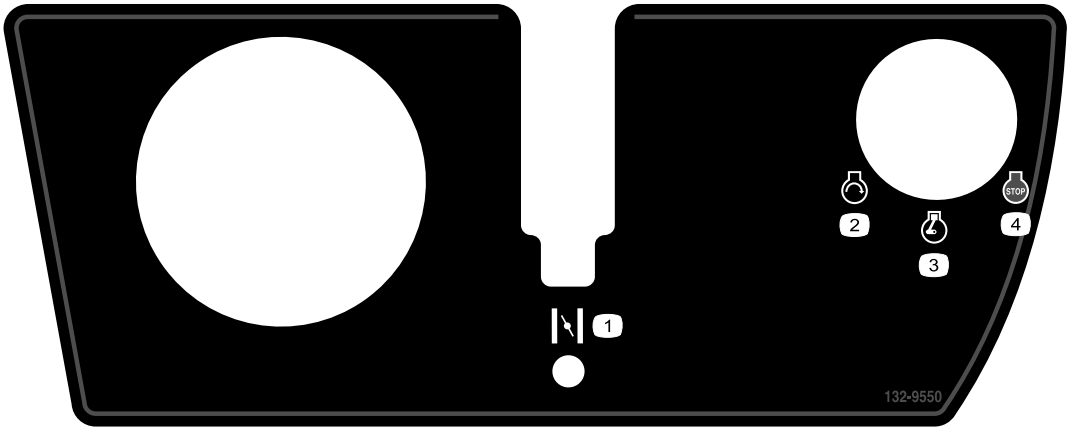
1. Press pedal to unlock
2. Read the *Operator's Manual* for more information.



decal132-9548

132-9548

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



decal132-9550

132-9550

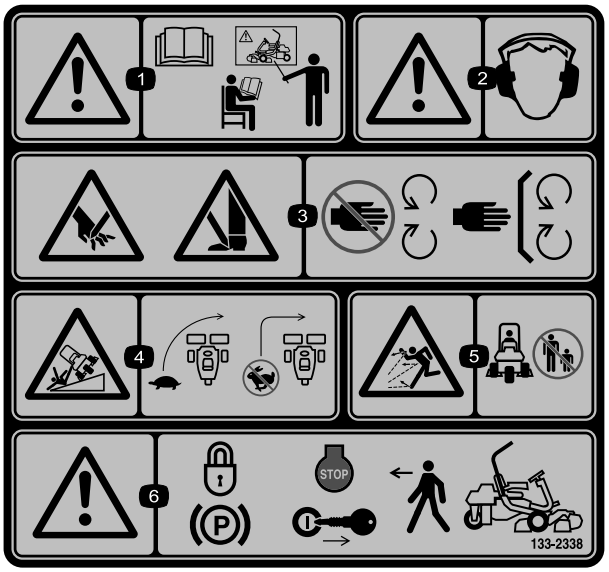
1. Choke
2. Engine—start
3. Engine—run
4. Engine—stop

decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery

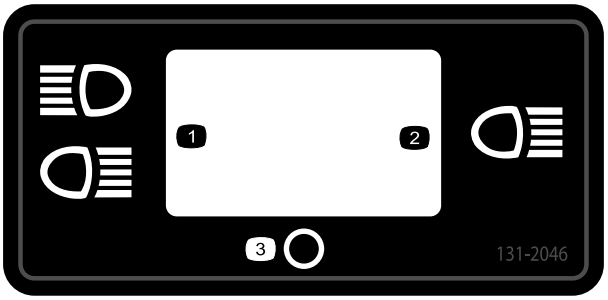
1. Explosion hazard
2. No fire, open flame, or smoking
3. Caustic liquid/chemical burn hazard
4. Wear eye protection.
5. Read the *Operator's Manual.*
6. Keep bystanders a safe distance away from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries.
8. Battery acid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



decal133-2338

133-2338

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



decal131-2046

131-2046

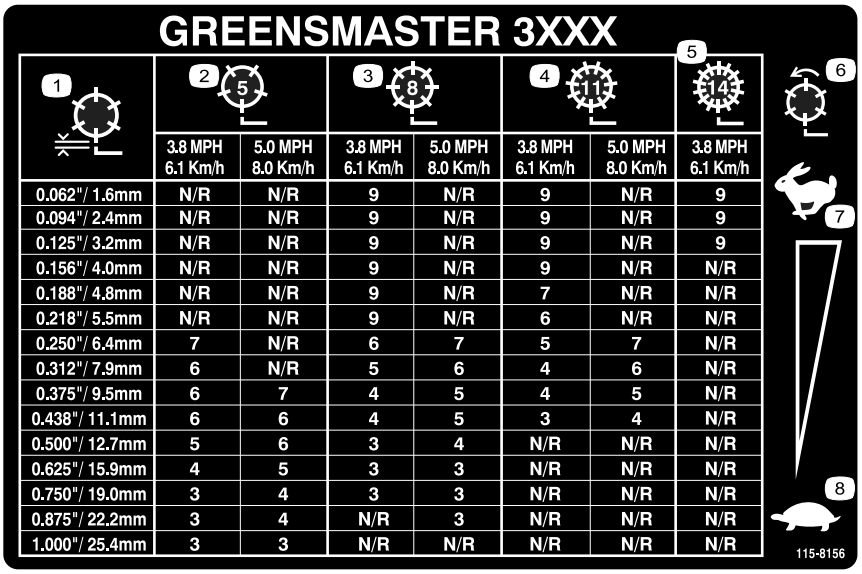
1. Double lights
2. Single light
3. Off

decal133-2339

133-2339

Replaces Decal 133-2338 for CE Machines

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

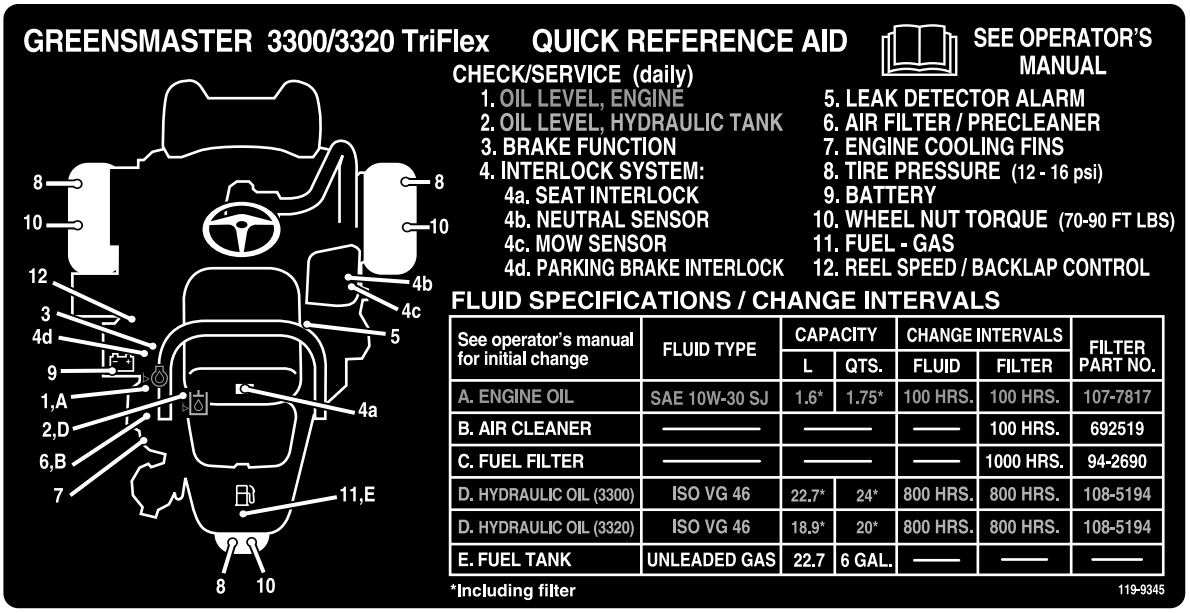


	3.8 MPH 6.1 Km/h	5.0 MPH 8.0 Km/h	3.8 MPH 6.1 Km/h	5.0 MPH 8.0 Km/h	3.8 MPH 6.1 Km/h	5.0 MPH 8.0 Km/h	3.8 MPH 6.1 Km/h
0.062"/ 1.6mm	N/R	N/R	9	N/R	9	N/R	9
0.094"/ 2.4mm	N/R	N/R	9	N/R	9	N/R	9
0.125"/ 3.2mm	N/R	N/R	9	N/R	9	N/R	9
0.156"/ 4.0mm	N/R	N/R	9	N/R	9	N/R	N/R
0.188"/ 4.8mm	N/R	N/R	9	N/R	7	N/R	N/R
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

decal115-8156

115-8156

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



See operator's manual for initial change	FLUID TYPE	CAPACITY		CHANGE INTERVALS		FILTER PART NO.
		L	QTS.	FLUID	FILTER	
A. ENGINE OIL	SAE 10W-30 SJ	1.6*	1.75*	100 HRS.	100 HRS.	107-7817
B. AIR CLEANER	——	——		——	100 HRS.	692519
C. FUEL FILTER	——	——		——	1000 HRS.	94-2690
D. HYDRAULIC OIL (3300)	ISO VG 46	22.7*	24*	800 HRS.	800 HRS.	108-5194
D. HYDRAULIC OIL (3320)	ISO VG 46	18.9*	20*	800 HRS.	800 HRS.	108-5194
E. FUEL TANK	UNLEADED GAS	22.7	6 GAL.	——	——	——

decal119-9345

119-9345

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 wire 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 (obtain from your authorized Toro Distributor) Grass basket Electric-reel-motor counterweight Capscrew	1 3 3 3 6	Install the cutting units and counter weights.
8	No parts required	–	Set the clip-control feature.
9	Weight kit – Part No. 119-7129 (purchase separately)	1	Add rear weight.
10	CE Guard Kit—Part No. 04443 (sold separately)	1	Install the CE guard kit.
11	Warning decal 133-2339	1	Install EU decals, if required.
12	No parts required	–	Reduce the tire pressure.
13	No parts required	–	Burnish the brakes.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual (traction unit) Engine Owner'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

Description	Qty.	Use
Pre-delivery Inspection Sheet Noise rating certificate Certificate of compliance	1 1 1	Save for future reference
Ignition keys	2	Start the engine.

1

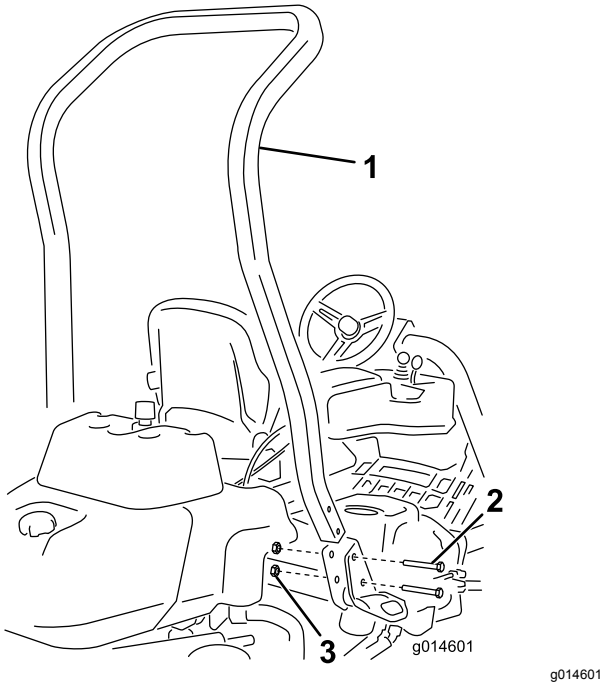
Installing the Roll Bar

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) as shown in Figure 3.



g014601

Figure 3

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

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

2

Installing the Seat

Parts needed for this procedure:

1	Seat
1	Seat wire 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).

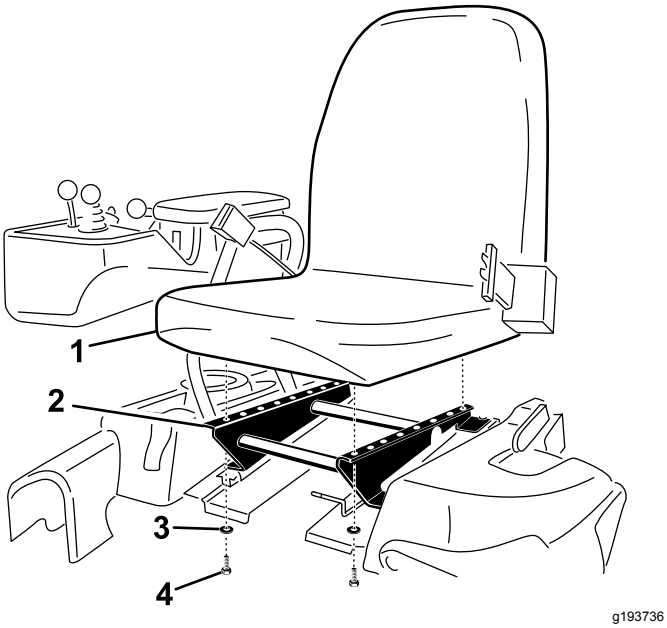


Figure 4

1. Seat
2. Seat base
3. Washer
4. Bolt (5/16 x 3/4 inch)

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

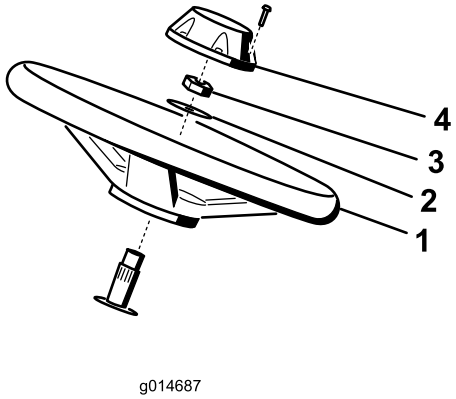
Installing the Steering Wheel

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).



g014687

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 the battery initially.

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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

Important: **Do not add electrolyte while the battery is in the machine. You could spill it, causing corrosion.**

2. Clean the top of the battery and remove the vent caps (Figure 6).

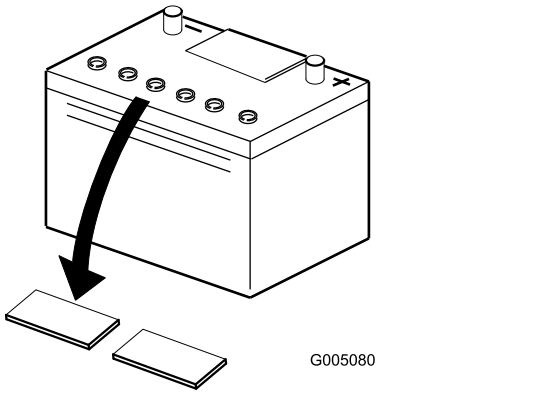


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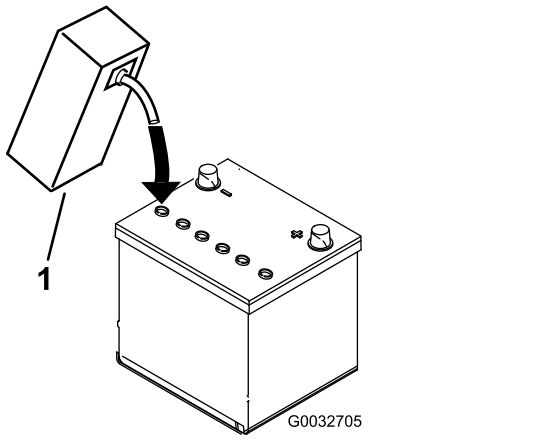
Figure 6

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



g032705

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

⚠ WARNING

Charging the battery produces gasses that can explode.

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

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

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

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

⚠ WARNING

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

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

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

7. Install the vent caps.
8. Place the battery on the battery tray and secure it with the battery clamp and fasteners removed previously.
9. Install the positive cable (red) to the positive (+) terminal and then the negative cable (black) to the negative (–) terminal of the battery and secure them with the bolts and nuts (Figure 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.**

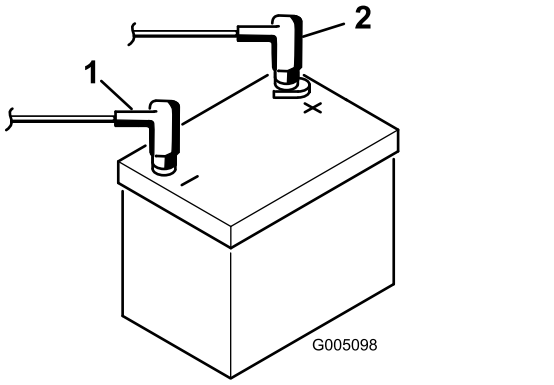


Figure 8

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

5

Installing the Oil Cooler (optional)

No Parts Required

Procedure

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

6

Installing the Grass-Basket Hooks

Parts needed for this procedure:

6	Grass-basket hook
12	Flange bolts

Procedure

Install the 6 grass-basket hooks onto the ends of the suspension-arm bars using the 12 flange bolts (Figure 9).

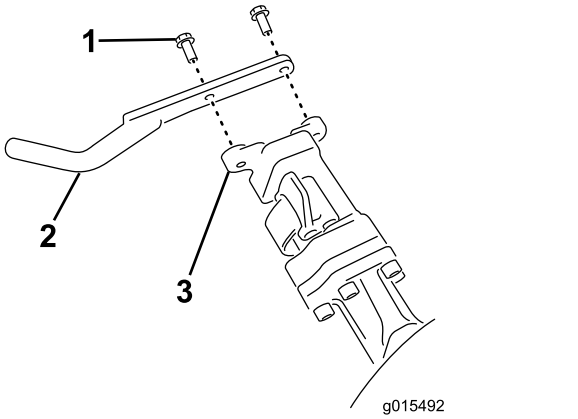


Figure 9

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 (obtain from your authorized Toro Distributor)
3	Grass basket
3	Electric-reel-motor counterweight
6	Capscrew

Procedure

1. Setup the cutting units as described in the cutting unit *Operator's Manual*.
2. Apply grease to the inside diameter of the drive coupler.
3. Install the electric-reel-motor counterweight as described in Installing the Electrical Counterweights (page 32).
4. Install the cutting units as described in Installing the Cutting Units (page 32).

8

Setting the Clip-Control Feature

No Parts Required

Procedure

To achieve a consistent, high quality-of-cut and a uniform after cut appearance, the machine has a clip-control feature that varies the speed of the reels with the speed of the machine, to maintain a constant clip. This feature is OFF by default; to configure it and turn it ON, refer to Setting the Clip-Control Feature (page 22)

9

Adding Rear Weight

Parts needed for this procedure:

1	Weight kit – Part No. 119-7129 (purchase separately)

Procedure

This unit complies with the ANSI B71.4-2012 and EN ISO 5395:2013 Standards when equipped with the Weight Kit (Part No. 119-7129).

10

Installing the CE Guard Kit

Parts needed for this procedure:

1	CE Guard Kit—Part No. 04443 (sold separately)

Procedure

Install the CE guard kit; refer to the CE Guard Kit for Greensmaster 3420 TriFlex Traction Unit Installation Instructions.

11

Installing EU Decals

Parts needed for this procedure:

1	Warning decal 133-2339

Procedure

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

12

Reducing the Tire Pressure

No Parts Required

Procedure

The tires are over-inflated at the factory for shipping purposes. Reduce the pressure to the proper levels before starting the machine. Refer to Checking the Tire Pressure (page 29).

13

Burnishing the Brakes

No Parts Required

Procedure

Firmly apply the brakes and drive the machine at mowing speed until the brakes are hot, as indicated by their smell. You may need to adjust the brakes after the break-in period; refer to Adjusting the Brakes (page 45).

Product Overview

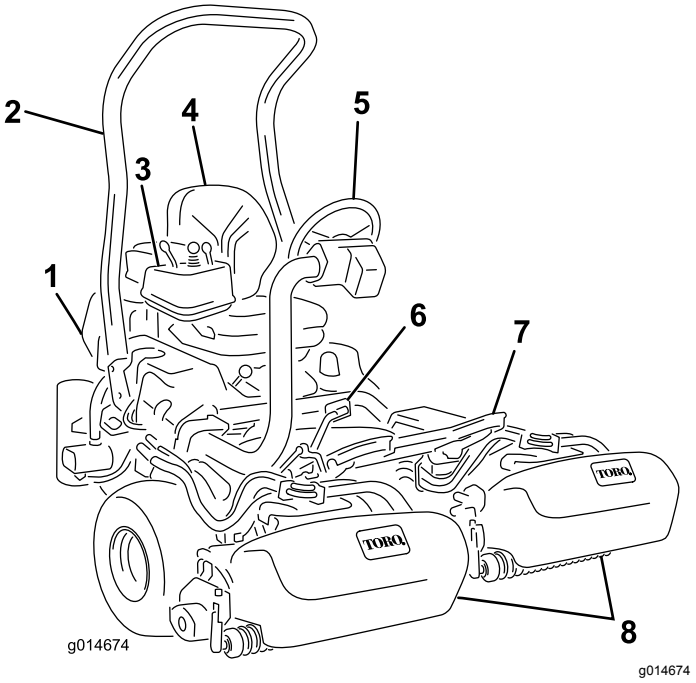


Figure 10

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

Controls

Traction Pedal

The traction pedal (Figure 11) 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 your comfort, do not rest the heel of your foot on reverse when operating forward (Figure 12).

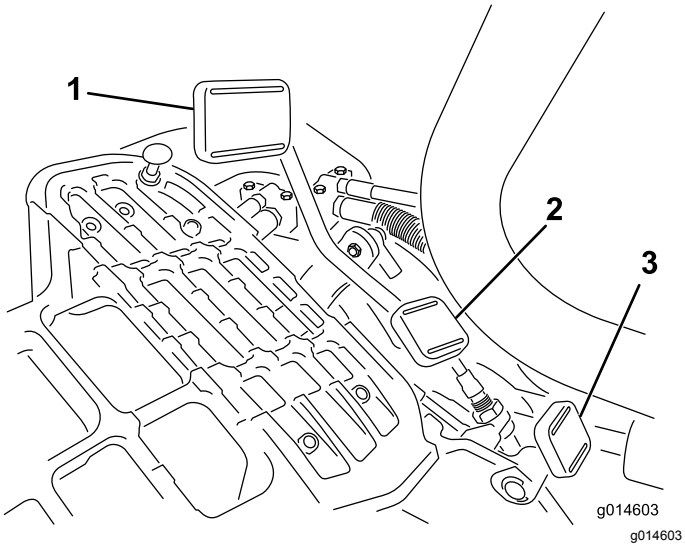


Figure 11

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

Figure 12

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

Throttle Lever

The throttle lever (Figure 13) allows you to control the speed of the engine. Move the throttle lever toward the FAST position to increases the engine speed; move it toward the SLOW position to decrease the engine speed.

Note: You cannot shut off the engine using the throttle lever.

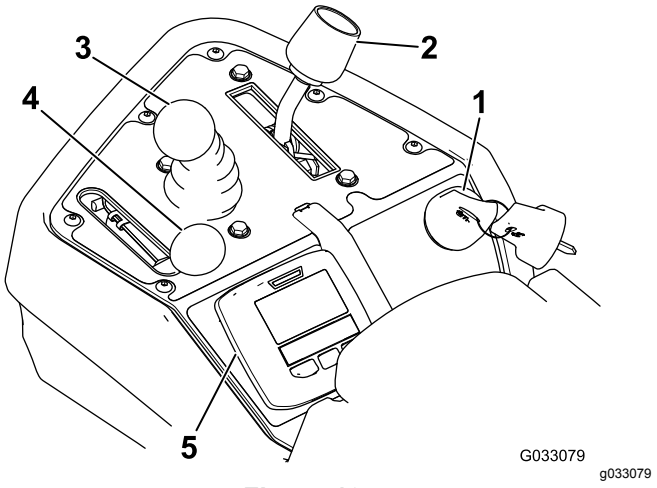


Figure 13

1. Ignition switch
2. Functional-control lever
3. Raise/Lower mow control
4. Throttle lever
5. InfoCenter

Raise/Lower Mow Control

Moving the control (Figure 13) 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. Start the reels by moving the control forward.

Functional Control Lever

The functional control lever (Figure 13) 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 13) 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.

Parking-Brake Lever

Pull up on the brake lever (Figure 14) to set the parking brake. Disengage it by squeezing the release lever on the underside of the brake lever and lowering

it down to its released position. Lock the parking brake any time you leave the machine.

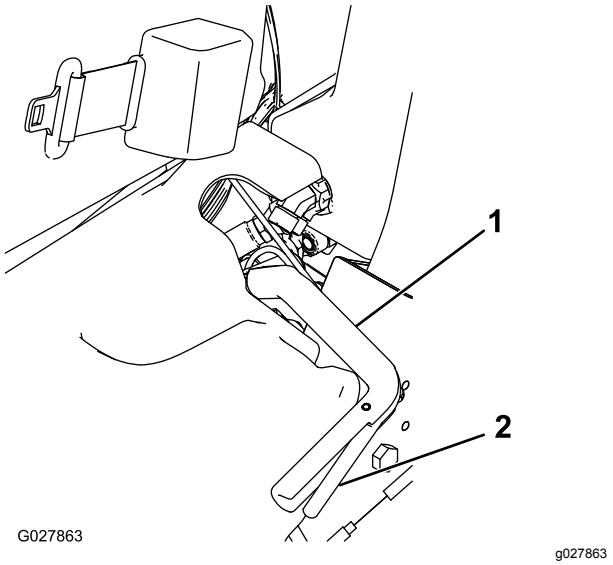


Figure 14

1. Parking-brake lever
2. Release lever

InfoCenter Control

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 15 and Figure 16 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.

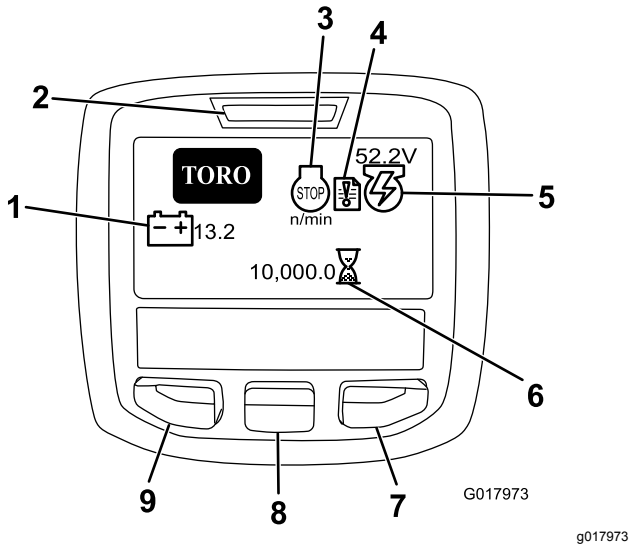


Figure 15

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

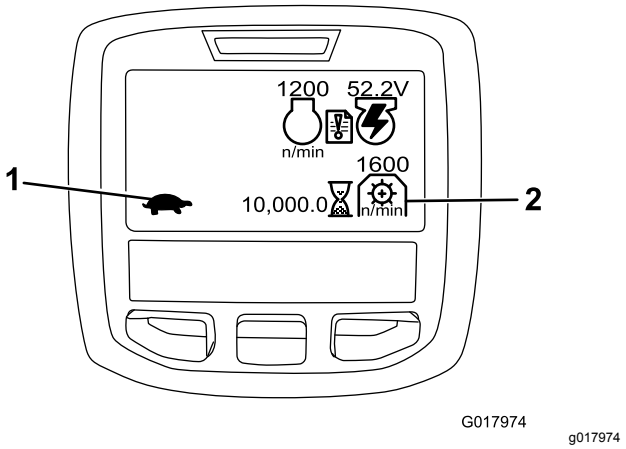


Figure 16

1. Functional control status
2. PTO speed

- ENGINE RPM/STATUS—indicates the engine speed in 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.
- 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 brings 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.
BACKLAP	Turns backlapping ON/OFF (once ON you can turn backlapping Off with this setting or by turning off the ignition key).

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.

CLIP CONTROL	Turns the automatic clip-control feature ON/OFF.
BLADE COUNT	Set the number of blades in each reel. This setting is only necessary if CLIP CONTROL is set to ON.
CLIP (FOC)	Sets the desired clip. This setting is only necessary if CLIP CONTROL is set to ON.

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.

Adjusting the Center Cutting Unit Raise/Lower Delay

Adjust the raise and lower delay time for the center cutting with the InfoCenter, as desired from 1 to 10 according to the table below. The factory default setting is 6 (375 ms) and is optimized for a 3.8 mph (6.1 km/h) 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

Adjusting the Tap-off Delay

The tap-off delay feature allows the cutting units to turn off without raising, and you may adjust it 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 Clip-Control Feature

To achieve a consistent, high quality-of-cut and a uniform after cut appearance, the machine has a clip-control feature that varies the speed of the reels with the speed of the machine, to maintain a constant clip. This feature is OFF by default; configure it and turn it ON as follows:

1. From the SETTINGS menu, select CLIP CONTROL.
2. Set CLIP CONTROL to ON.
3. From the SETTINGS menu, select BLADE COUNT.
4. Set the BLADE COUNT to match the number of blades in each of your reels.
5. From the SETTINGS menu, select CLIP (FOC)
6. Set CLIP (FOC) to the desired clip setting.

Setting the Reel Speed

The clip-control feature automatically sets the reel speed to match the machine speed. If you choose not to use the clip-control feature, set the reel speed manually 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 (Figure 16) 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

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Figure 17

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

You can set a passcode on the InfoCenter so that operator's cannot change the following machine settings without it: RAISE DELAY, LOWER DELAY, TAP-OFF DELAY, REEL SPEED, BACKLAP SPEED, CLIP CONTROL, BLADE COUNT, and CLIP (FOC).

1. From the SETTINGS menu, select PROTECT SETTINGS.
2. Set PROTECT SETTINGS to ON.
3. When prompted, enter a 4-digit passcode.
4. Turn the ingnition key to OFF to save the code.

Note: If you forget the user defined passcode, you can obtain a temporary passcode from 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. 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 Toro distributor or the *Service Manual*.

Seat-Adjusting Lever

The seat-adjusting lever is located on the front, left corner of the seat (Figure 18), allowing you to adjust the seat forward and rearward.

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

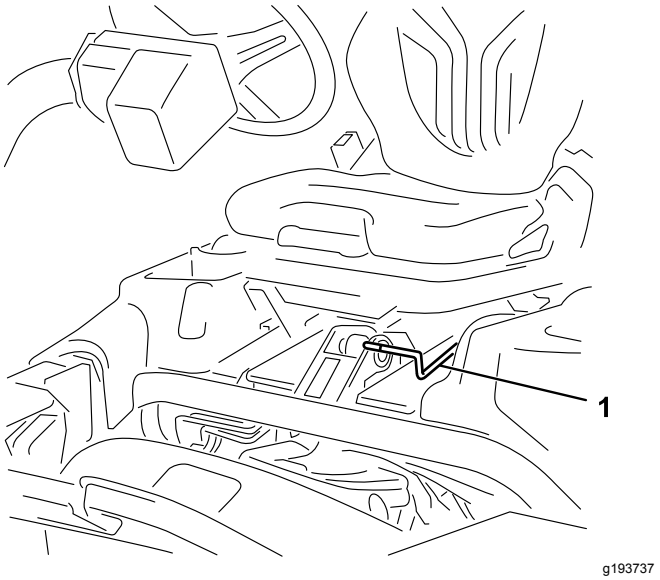

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Figure 18

1. Seat-adjusting handle

Fuel-Shutoff Valve

Close the fuel-shutoff valve (Figure 19), behind the seat and under the fuel tank, when storing or transporting the machine on a truck or trailer.

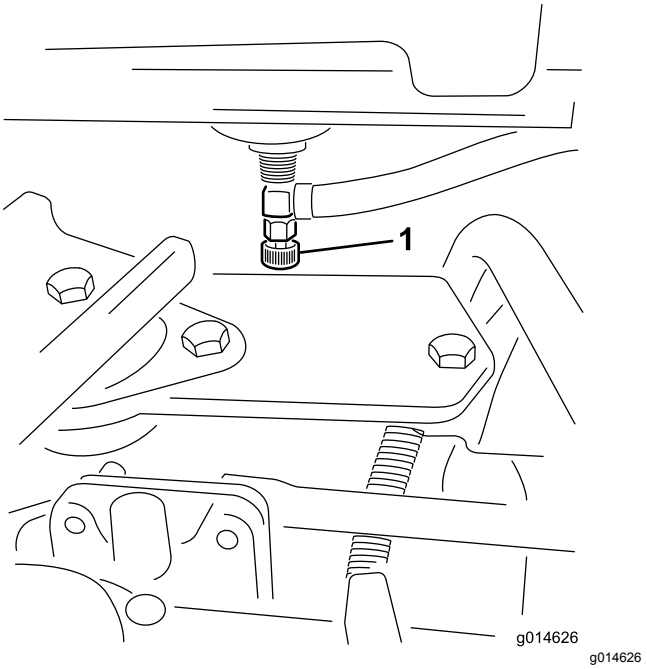

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Figure 19

1. Fuel shutoff (under the fuel tank)

Cutting Unit Power Disconnect Connectors

Before installing, removing, or working on the cutting units, disconnect the cutting units from the power supply by separating the cutting unit power disconnect connectors (Figure 20), located at the base of the rollover bar on the left side of the traction unit. Plug the connectors together before operating the machine.

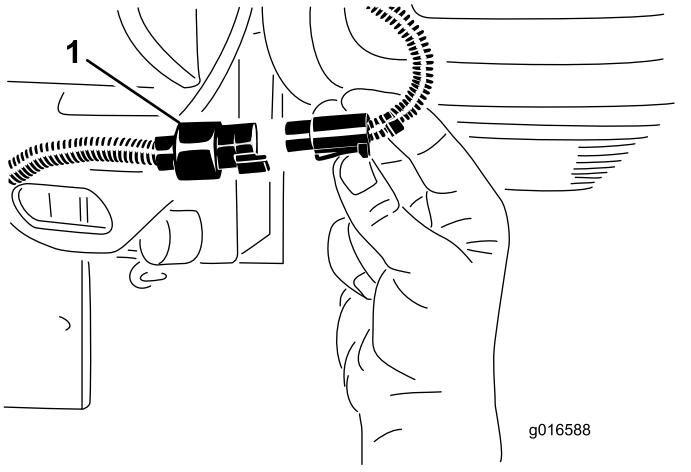

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Figure 20

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 (70.6 inches)
Overall height	205 cm (80.8 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.

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

Operation

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

Think Safety First

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

⚠ DANGER

Operating the machine on wet grass or steep slopes can cause sliding and loss of control.

- **Reduce speed and use extreme caution on slopes.**
- **Do not operate the machine near water.**

⚠ DANGER

Wheels dropping over edges can cause rollovers, which may result in serious injury, death, or drowning.

Do not operate the machine near drop-offs.

⚠ CAUTION

This machine produces sound levels that can cause hearing loss through extended periods of exposure.

Wear hearing protection when operating this machine.

Use protective equipment for eyes, ears, hands, feet, and head.

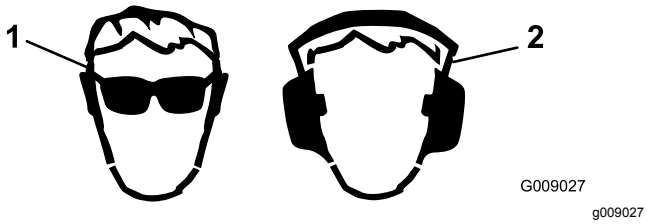

Figure 21

1. Wear eye protection.
2. Wear hearing protection.

Checking the Engine Oil

Service Interval: Before each use or daily

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

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

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

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

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

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

1. Position the machine on a level surface.
2. Remove the dipstick and wipe it with a clean rag (Figure 23).

   Important: **Remove the dipstick while filling the engine with oil. When adding engine oil or filling oil, there *must be* clearance between the oil fill device and the oil fill hole in the valve cover as shown in Figure 22. This clearance is necessary to permit venting when filling, which prevents oil from overrunning into breather.**

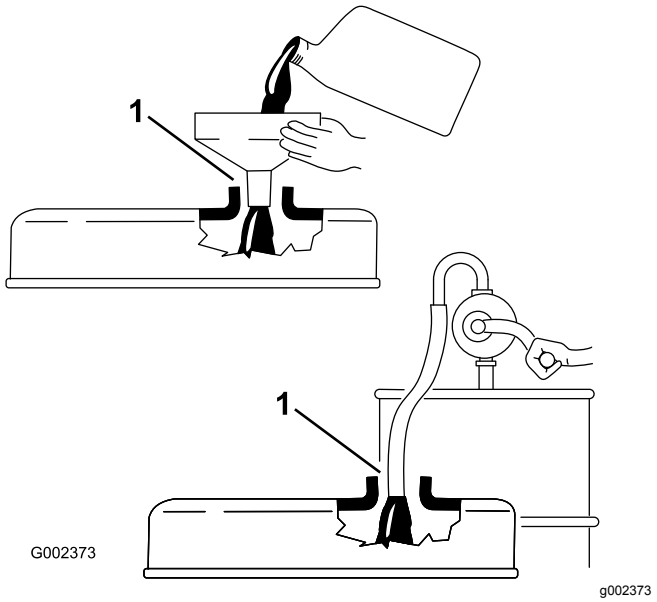

Figure 22

1. Note clearance

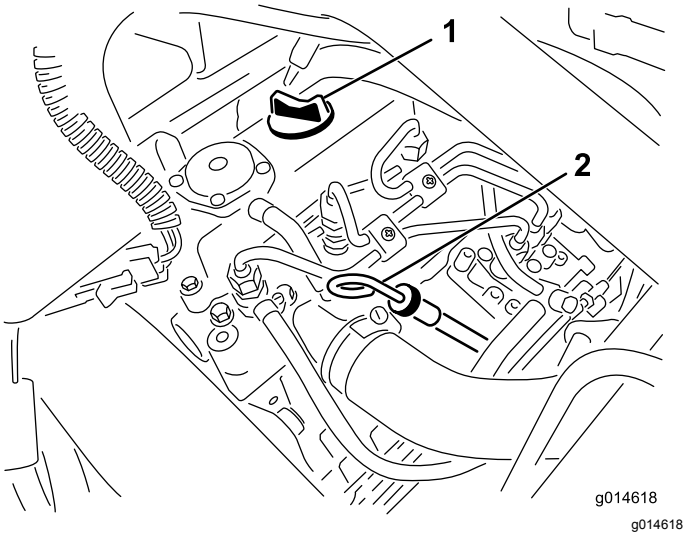

Figure 23

1. Filler cap
2. Dipstick

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

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

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

Filling the Fuel Tank

Use only clean, fresh diesel fuel or biodiesel fuels with low (<500 ppm) or ultra low (<15 ppm) sulfur content. The minimum cetane rating should be 40. Purchase fuel in quantities that can be used within 180 days to ensure fuel freshness.

Fuel tank capacity: 22.7 L (6 U.S. gallons)

Use summer grade diesel fuel (No. 2-D) at temperatures above -7° C (20° F) and winter grade (No. 1-D or No. 1-D/2-D blend) below that temperature. Use of winter grade fuel at lower temperatures provides lower flash point and cold flow characteristics which will ease starting and reduce fuel filter plugging.

Use of summer grade fuel above -7° C (20° F) will contribute toward longer fuel pump life and increased power compared to winter grade fuel.

⚠ DANGER

Under certain conditions, diesel fuel and fuel vapors are highly flammable and explosive. A fire or explosion from fuel can burn you and others and can cause property damage.

- **Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck. This empty space in the tank allows the fuel to expand.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in a clean, sealed, safety-approved container.**

⚠ DANGER

In certain conditions, fuel is extremely flammable and highly explosive. A fire or explosion from fuel 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 fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is 25 mm (1 inch) below the bottom of the filler neck. This empty space in the tank allows fuel to expand.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of fuel.**
- **Always place fuel containers on the ground away from your vehicle before filling**
- **Do not fill fuel 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 the machine from the truck or trailer and refuel it 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 fuel dispenser nozzle.**
- **If a fuel 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 (Figure 24).

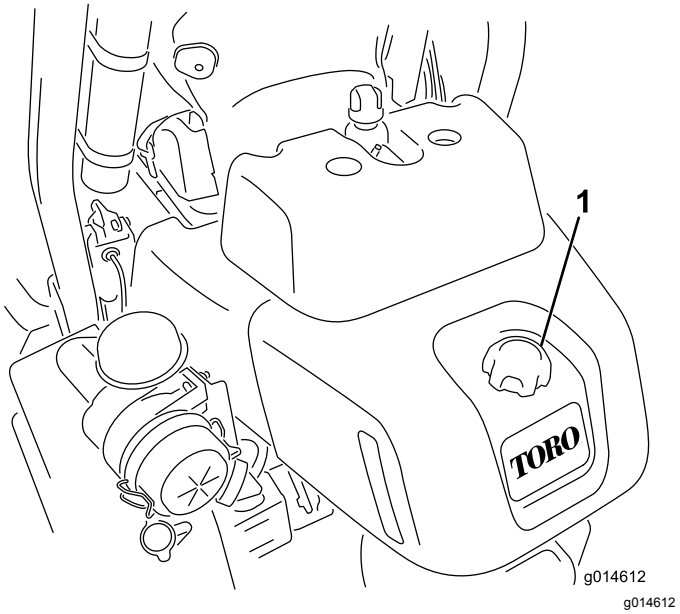

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Figure 24

1. Fuel-tank cap

2. Remove the fuel-tank cap.
3. Fill the tank until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck.

   Important: **Do not overfill.**
4. Install the cap.
5. Wipe up any fuel that may have spilled.

Using Biodiesel Fuel

This machine can also use a biodiesel blended fuel of up to B20 (20% biodiesel, 80% petrodiesel). The petrodiesel portion should be low or ultra low sulfur. Observe the following precautions:

- The biodiesel portion of the fuel must meet specification ASTM D6751 or EN14214.
- The blended fuel composition should meet ASTM D975 or EN590.
- Painted surfaces may be damaged by biodiesel blends.
- Use B5 (biodiesel content of 5%) or lesser blends in cold weather
- Monitor seals, hoses, gaskets in contact with fuel as they may be degraded over time.
- Fuel filter plugging may be expected for a time after converting to biodiesel blends.
- Contact your distributor if you wish for more information on biodiesel

Checking the Cooling System

The capacity of the cooling system is approximately 4.6 L (4.9 US qt). Keep the radiator screen clean; refer to Cleaning the Radiator Screen (page 44).

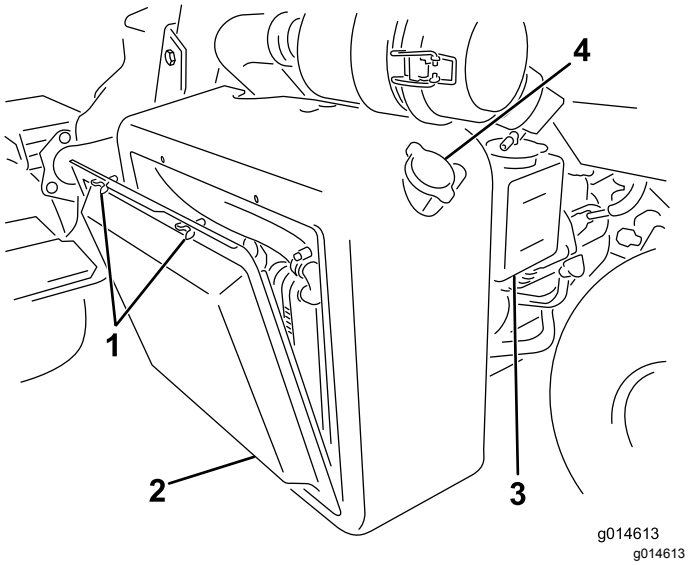

Figure 25

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

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

⚠ CAUTION

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

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

1. Park the machine on a level surface.
2. Check the coolant level (Figure 26).

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

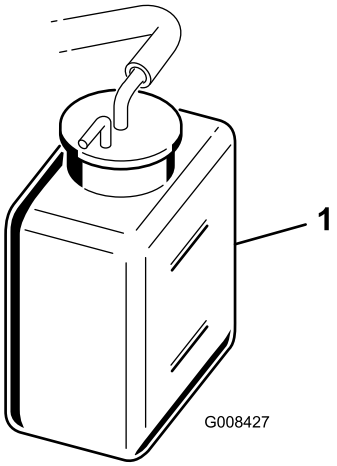

Figure 26

1. Reserve tank

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

Checking the Hydraulic-Fluid Level

The hydraulic-fluid reservoir is filled at the factory with approximately 25.7 L (6.8 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 50 cSt @ 100°C 7.9 to 8.5
Viscosity Index ASTM D2270	140 to 160
Pour Point, ASTM D97	-34°F to -49°F
Industry Specifications:	
Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0	

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

Premium Biodegradable Hydraulic Fluid-Mobil EAL EnviroSyn 46H

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

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

Important: **Regardless of the hydraulic fluid type used, any traction unit 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 Oil Cooler (optional) (page 16).**

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 27).

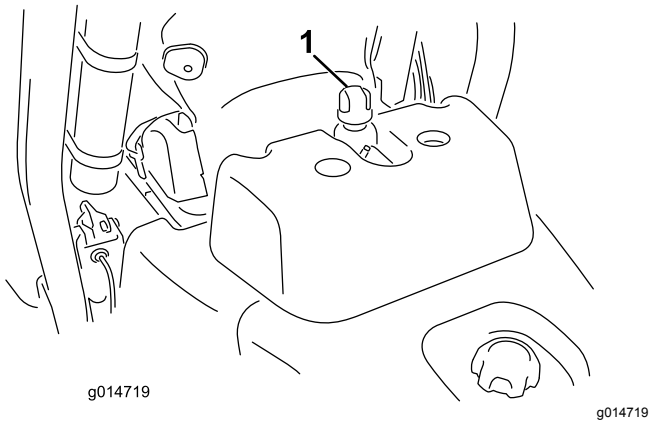

Figure 27

1. Hydraulic-tank cap
2. Breather

3. Slowly fill the reservoir with the appropriate hydraulic fluid until the level reaches the Full mark in the white window in the front of the reservoir. Do not overfill.

   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 the Cutting Unit *Operator's Manual*.

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

Checking the Tire Pressure

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

Vary the tire pressure for the rear wheel 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 (70-90 ft-lb) after 1-4 hours of operation and again after 10 hours of operation. Torque every 200 hours thereafter.

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

Breaking in the Machine

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

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

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

Starting the Engine

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

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

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

Refer to your engine owner's manual.

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

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

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

Shutting Off the Engine

1. Move the throttle lever to the SLOW position, disengage the raise/lower mow control, and move the functional-control lever to the NEUTRAL position.
2. Rotate the starter key to the OFF position to shut the engine off. Remove the key from the switch to prevent accidental starting.
3. Close the fuel-shutoff valves before storing the machine.

Checking the Safety-Interlock System

⚠ CAUTION

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

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

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

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

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

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

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

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

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

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

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

   The engine should 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 the NEUTRAL position, move the functional control lever to the NEUTRAL position, and engage the parking brake.
8. Start the engine.
9. Release the parking brake, move the functional control lever to the MOW position, and rise from the seat.

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

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

Installing and Removing the Cutting Units

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

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

Important: **Whenever you need to tip the cutting unit, prop up rear of cutting unit to ensure that the nuts on the bedbar adjusting screws are not resting on work surface (Figure 28).**

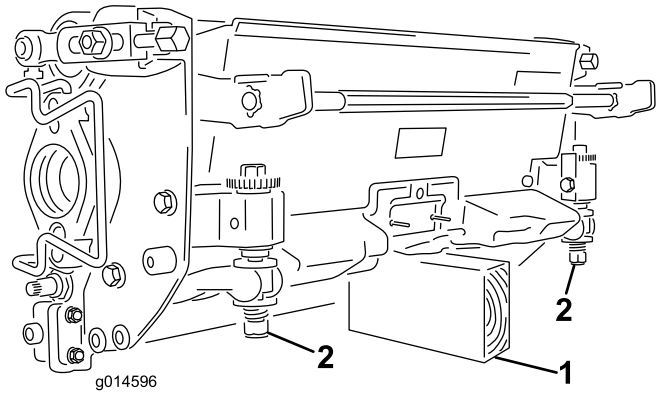

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Figure 28

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

Installing the Electrical Counterweights

Secure the electrical counterweight to the existing counterweight with 2 capscrews as shown in Figure 29.

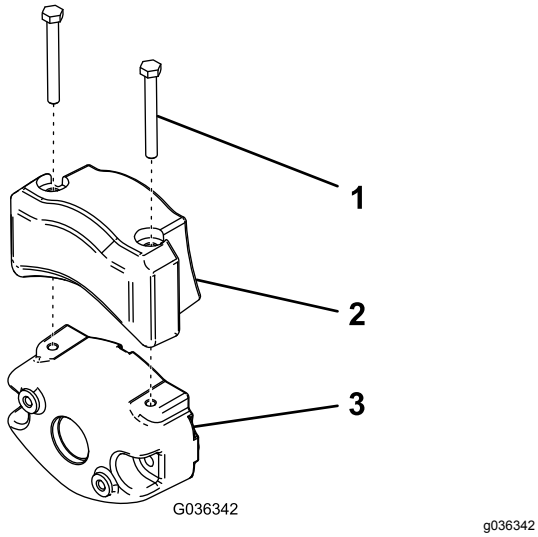

Figure 29

1. Cap screw (2)
2. Electrical counterweight
3. Existing counterweight

Installing the Cutting Units

1. Disconnect the cutting unit power disconnect couplers; refer to Cutting Unit Power Disconnect Connectors (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 30).

   ⚠ CAUTION

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

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

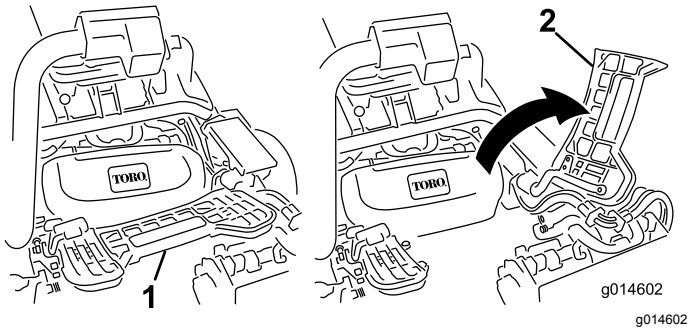

Figure 30

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 31), push the suspension arm down so that the bar fits over the bar across the top of the cutting unit (Figure 32).

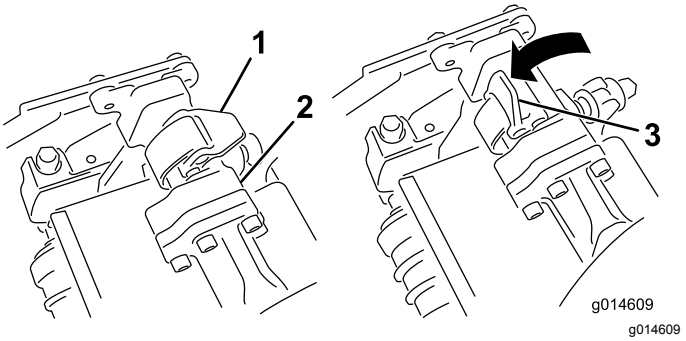

Figure 31

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

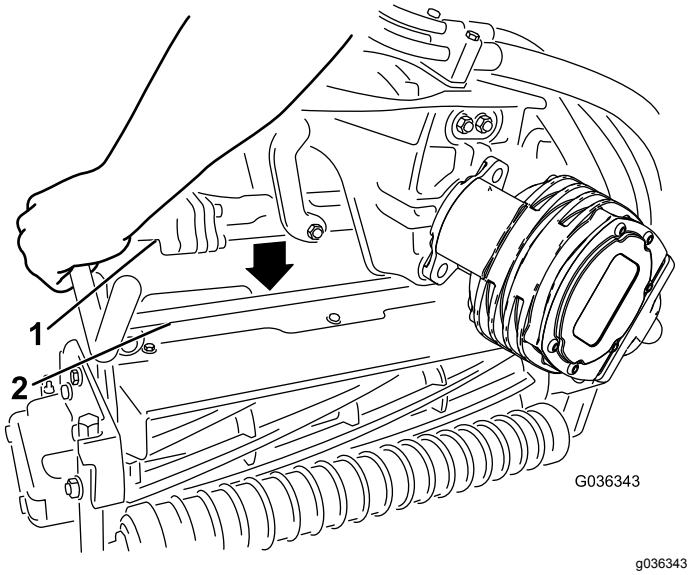

Figure 32

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 31).

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

6. Coat the spline shaft of the cutting unit motor with clean grease (Figure 33).
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 a click from both sides of the motor (Figure 33).

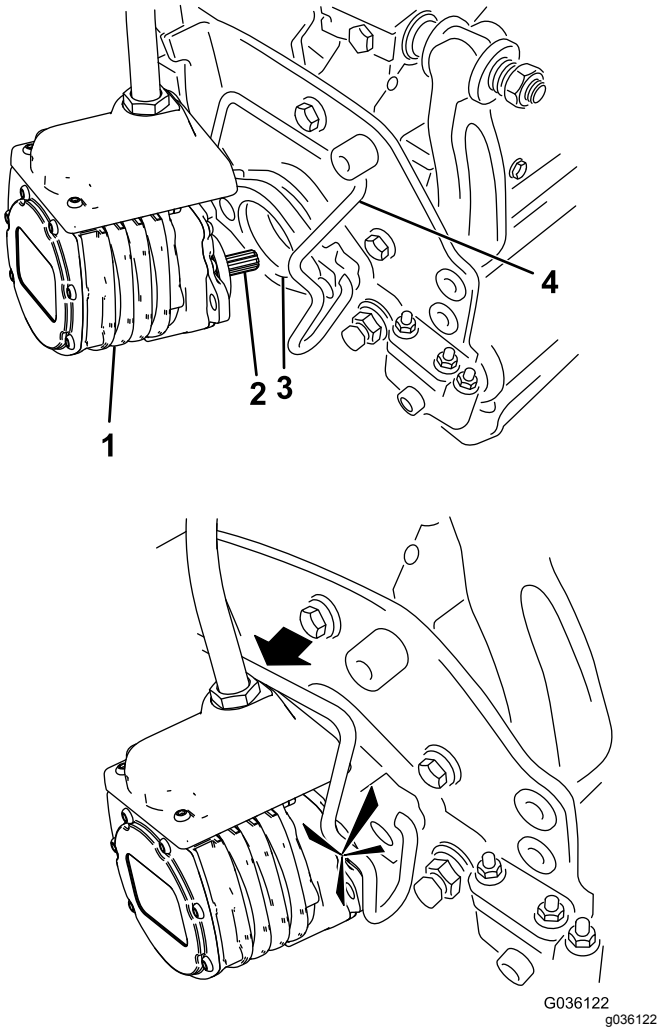

Figure 33

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 Connectors (page 24).

Removing the Cutting Units

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

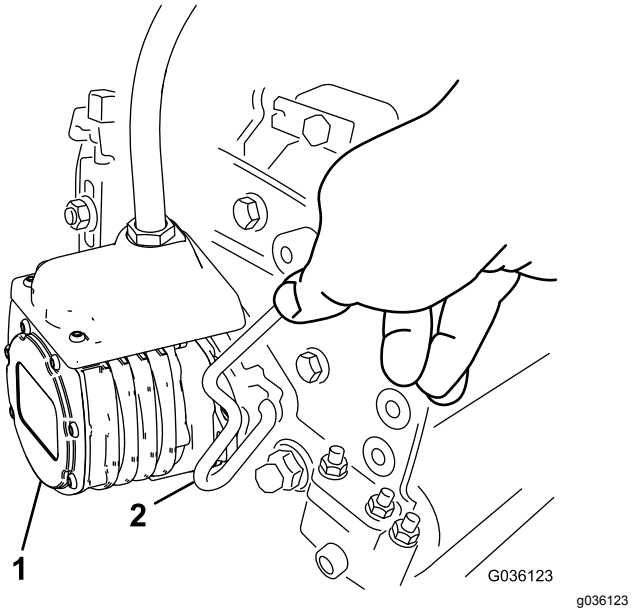

Figure 34

1. Reel motor
2. Motor-retaining bar

4. Move the motor to the storage location on the front of the suspension arm (Figure 35).

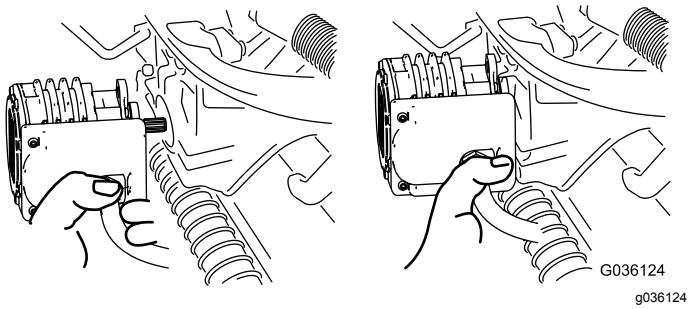

Figure 35

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

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

5. Open the latches on the suspension-arm bar of the cutting unit you are removing (Figure 31).
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 Connectors (page 24).

Mowing

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

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

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

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

3. Actuate the raise/lower mow lever as the front edges of the grass baskets cross the outer edge of the green.

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

Important: **The No. 1 cutting unit reel is delayed; therefore, you should practice to gain the required timing necessary to minimize the cleanup mowing operation.**

4. Overlap a minimal amount with the previous cut on return passes.

Note: To assist in maintaining a straight line across the green and keep the machine an equal distance away 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 36). Some find it useful to include the outer edge of the steering wheel as part of the sight line; i.e. keep the steering wheel edge aligned with a point that is always kept the same distance away from the front of the machine.

5. As the front edges of the baskets cross the edge of the green, move the raise/lower mow lever rearward and hold it until all the cutting units have risen. This will stop the reels and lift the cutting units.

Note: It is important to time this step correctly so that you do not cut into the fringe area yet cut as much of the green as possible to minimize the amount of grass left to mow around the outer periphery.

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

Note: This assists in getting the machine more quickly aligned for the next pass. Try to make as short of a turn as possible except during warmer weather when a wider arc will minimize the turf bruising.

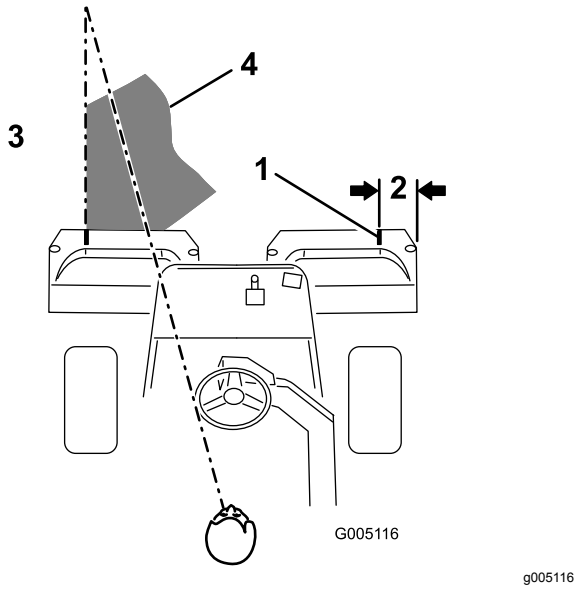

Figure 36

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

Note: Due to the nature of the power steering system, the steering wheel will not return to its original position after a turn has been completed.

Important: **Never stop 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.**

7. If the leak detector alarm sounds while cutting on a green, immediately raise the cutting units, drive directly off the green and stop the machine in an area away from the green. Determine the cause of the alarm and correct the problem.
8. Finish cutting the green by mowing the outer periphery. Be sure to change the direction of cutting from the previous mowing.

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

   Note: This minimizes grass clumps left on the green.
10. Replace the flag.
11. Empty the grass baskets of all clippings before transporting to the next green.

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

Inspecting and Cleaning after Mowing

After mowing, thoroughly wash the machine with a garden hose without a nozzle so that excessive water pressure will not contaminate and damage the seals and bearings. **Never wash a warm engine or electrical connections with water.**

After cleaning, inspect the machine for possible hydraulic fluid leaks, damage or wear to hydraulic and mechanical components, and the cutting units for sharpness. Also, lubricate 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.

Driving the Machine without Mowing

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

Hauling the Machine

- Use care when loading or unloading the machine into a trailer or a truck.
- Use a full-width ramp for loading the machine into a trailer or a truck.
- Tie the machine down securely using straps, chains, cable, or ropes. Both front and rear straps should be directed down and outward from the machine.

Towing the Machine

In case of an emergency, you can tow the machine 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 to 5 km/h (2 to 3 mph) because it may damage the drive system. If the machine must be moved further than 0.4 km (1/4 mile), transport it on a truck or trailer.**

1. Locate the bypass valve on the pump and rotate it so that the slot is vertical (Figure 37).

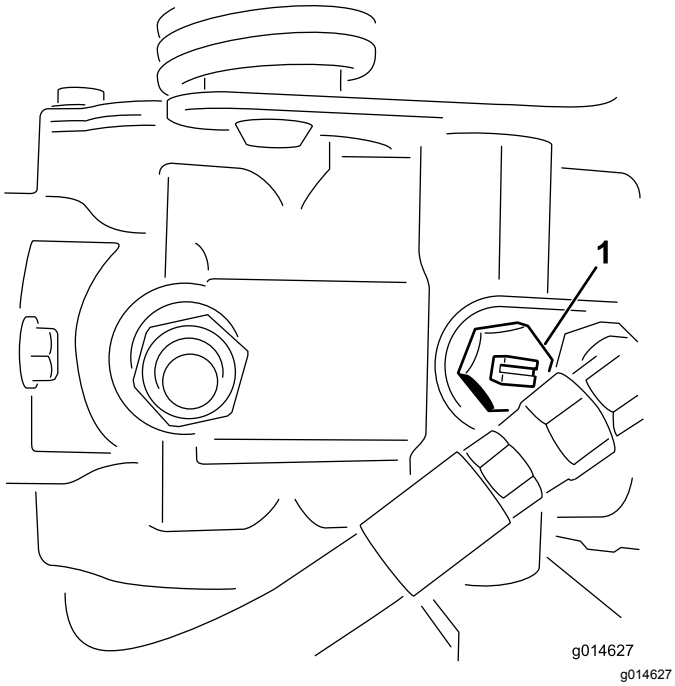

Figure 37

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

Important: **Refer to your engine owner'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 wires from the spark plugs before you do any maintenance. Set the wires aside so that they do not accidentally contact the spark plugs.

Recommended Maintenance Schedule(s)

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

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the safety interlock operation.							
Check the instrument operation							
Check the leak detector alarm.							
Check the brake operation.							
Check the fuel level.							
Check the hydraulic fluid 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.							

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

Engine Maintenance

Servicing the Air Cleaner

Service Interval: Every 200 hours

- Check the air-cleaner body for damage which could cause an air leak; replace it if it is damaged. Check the whole intake system for leaks, damage, or loose hose clamps.
- Service the air-cleaner filter before 200 hours if the engine performance suffers due to extremely dusty, dirty conditions. Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.
- Ensure that the cover is seated correctly and seals with the air cleaner body.

1. Release the latches securing the air-cleaner cover to the air-cleaner body (Figure 38).

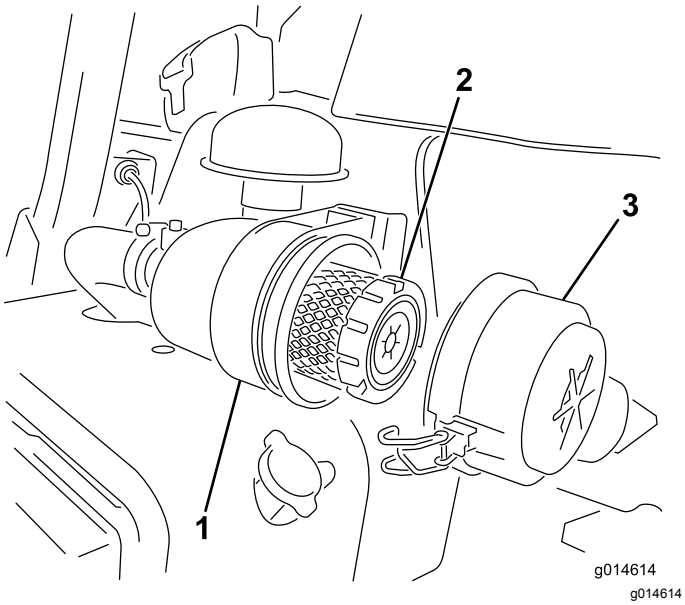

Figure 38

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

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

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

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

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

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

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

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

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

5. Clean the dirt ejection port located in the removable cover. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.
6. Install the cover orienting the rubber outlet valve in a downward position—between approximately 5:00 to 7:00 when viewed from the end.
7. Secure the latches (Figure 38).

Changing the Engine Oil and Filter

Service Interval: After the first 50 hours

Every 150 hours

1. Remove the drain plug and let oil flow into a drain pan. When the oil stops, install the drain plug (Figure 39).

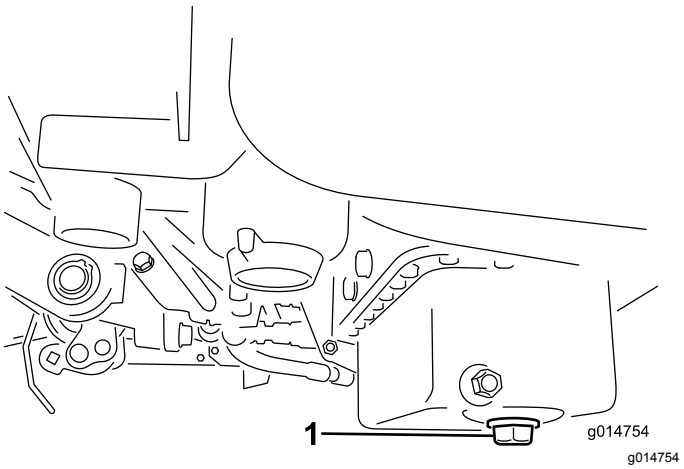

Figure 39

1. Drain plug

2. Remove the oil filter (Figure 40). Apply a light coat of clean oil to the new filter gasket.

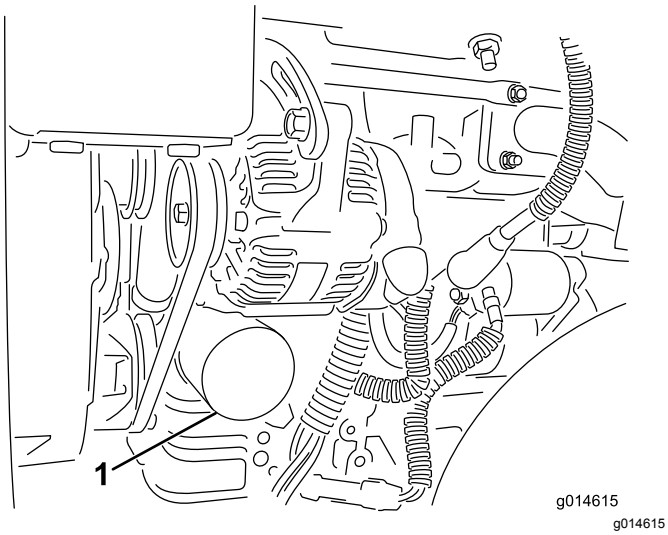

Figure 40

1. Oil filter

3. Screw the filter on by hand until the gasket contacts the filter adapter, then tighten 1/2 to 3/4 turn further. **Do not overtighten**.
4. Add oil to the crankcase; refer to Checking the Engine Oil (page 25).
5. Dispose of the used oil properly.

Fuel System Maintenance

Replacing the Fuel Filter/Water Separator

Service Interval: Every 800 hours

1. Close the fuel-shutoff valve (Figure 41) below the fuel tank.

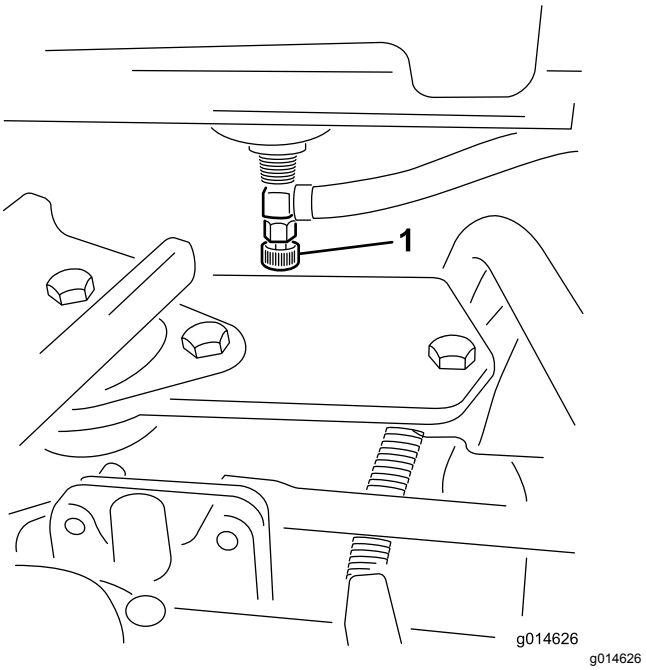

Figure 41

1. Fuel-shutoff valve

2. Clean the area where the filter canister mounts (Figure 42).
3. Place a drain pan under the fuel filter.
4. Open the filter drain plug (Figure 42).

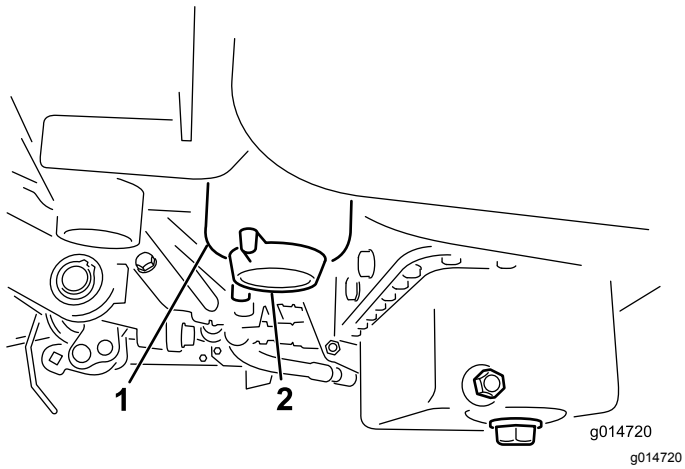

Figure 42

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

5. Unscrew the filter canister and dispose of it according to local regulations.
6. Screw the filter on by hand until the gasket contacts the filter adapter, then tighten 1/2 to 3/4 turn further.
7. Ensure that the filter-drain plug is closed. Open the fuel-shutoff valve.

Inspecting the Fuel Lines and Connections

Service Interval: Every 2 years

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

Electrical System Maintenance

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 lethal if consumed and causes severe burns.

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

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

Keep the top of the battery clean by washing it periodically with a brush dipped in ammonia or bicarbonate of soda solution. Flush the top surface with water after cleaning it. Do not remove the fill caps while cleaning the battery.

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

⚠ WARNING

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

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

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

⚠ 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 electrical system are located under the seat (Figure 43).

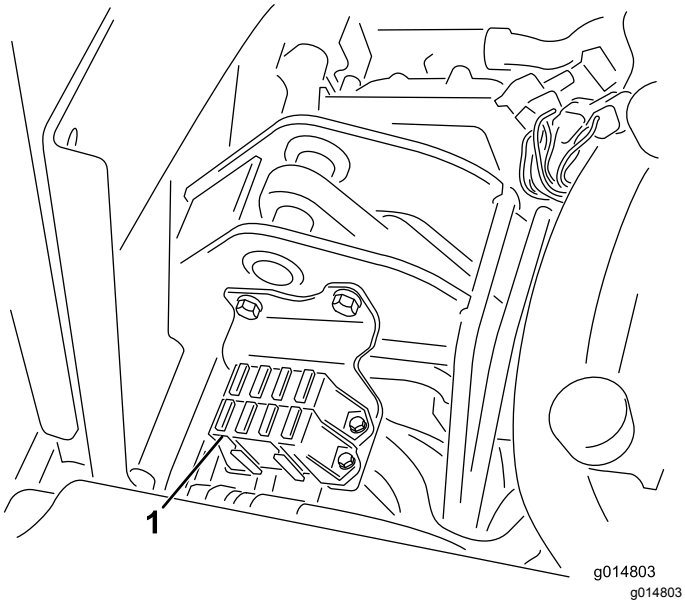

Figure 43

1. Fuses

Fuse Layout	
Optional 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

Drive System Maintenance

Adjusting the Transmission for Neutral

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

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

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

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

   A. Loosen the nut securing the eccentric to the top of the hydrostat (Figure 44).

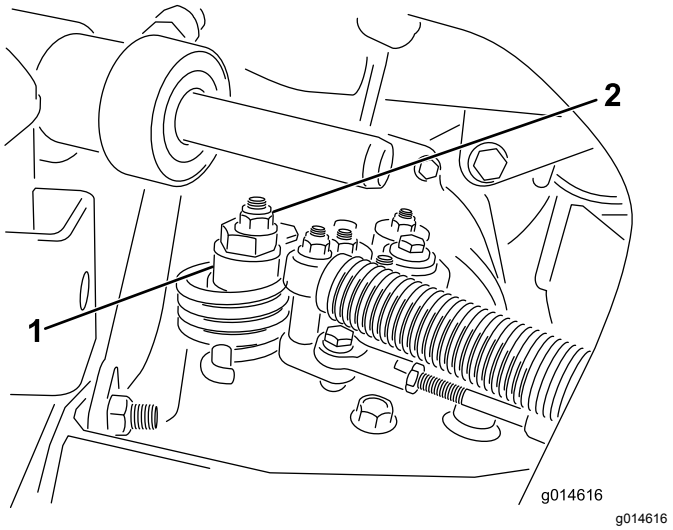

Figure 44

1. Eccentric
2. Locknut

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

   C. Rotate the eccentric until creep does not occur in either direction. When the wheel stops rotating, tighten the nut locking the eccentric and the adjustment (Figure 44). Verify the adjustment with the throttle in the SLOW and FAST position.

   Note: If the wheel still turns when the eccentric is at the maximum adjustment, contact your Authorized Service Distributor

or refer to the *Service Manual* for further adjustment.

Adjusting the Transport Speed

Obtaining the Maximum Transport Speed

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

To obtain the maximum-transport speed, put the functional control lever in the TRANSPORT position and press down on the traction pedal. If the pedal contacts the stop (Figure 45) before you feel tension on the cable, perform the following adjustment procedure:

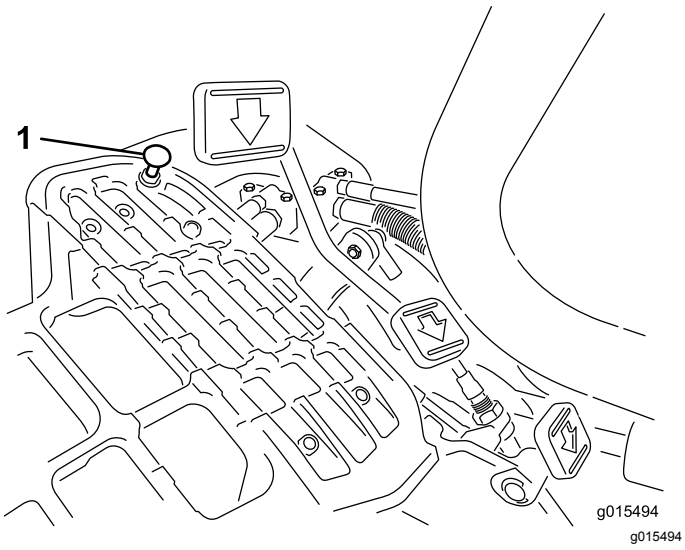

Figure 45

1. Pedal stop

1. Put the functional-control lever in the TRANSPORT position and loosen the locknut securing the pedal stop to the floor plate (Figure 45).
2. Tighten the pedal stop until it does not contact the traction pedal.
3. Continue applying a light load on the transport pedal and adjust the pedal stop so it contacts the pedal rod and tighten the nuts.

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

Reducing the Transport Speed

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

Adjusting the Mowing Speed

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

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

1. Loosen the jam nut on the trunnion bolt (Figure 46).
2. Loosen the nut securing the lock and mow brackets on the pedal pivot.

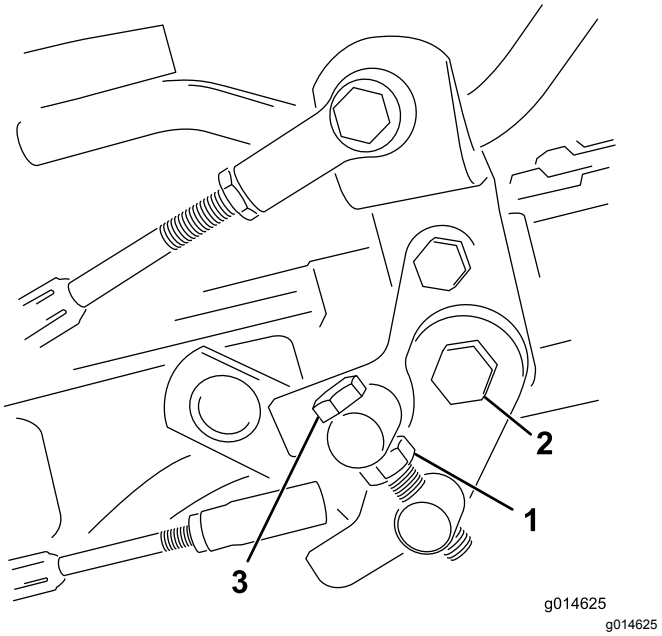

Figure 46

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 46). Check the adjustment and adjust as required.

Cooling System Maintenance

Cooling System Safety

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

Cleaning the Radiator Screen

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

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

1. Remove the radiator screen (Figure 47).

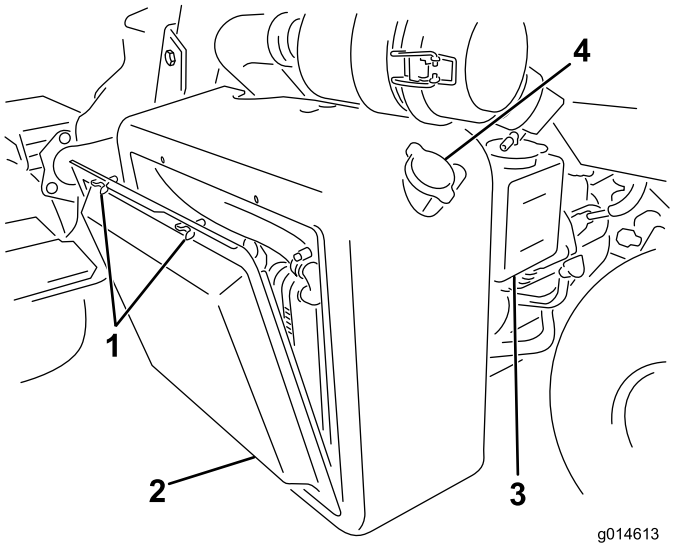

Figure 47

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

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

Checking the Engine-Coolant Level

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

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

⚠ CAUTION

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

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

1. Park the machine on a level surface.
2. Check the coolant level (Figure 47 and Figure 48).

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

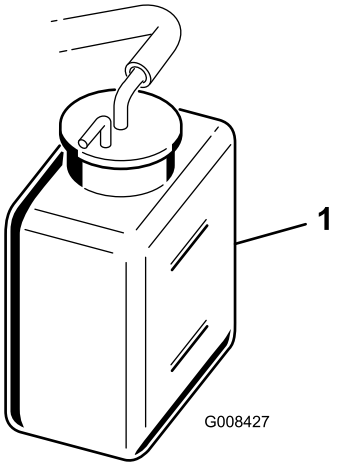

Figure 48

1. Reserve tank

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

Brake Maintenance

Adjusting the Brakes

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

Note: Burnish the brakes annually; refer to 13 Burnishing the Brakes (page 18).

Belt Maintenance

Adjusting the Alternator Belt

Service Interval: After the first 8 hours

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

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

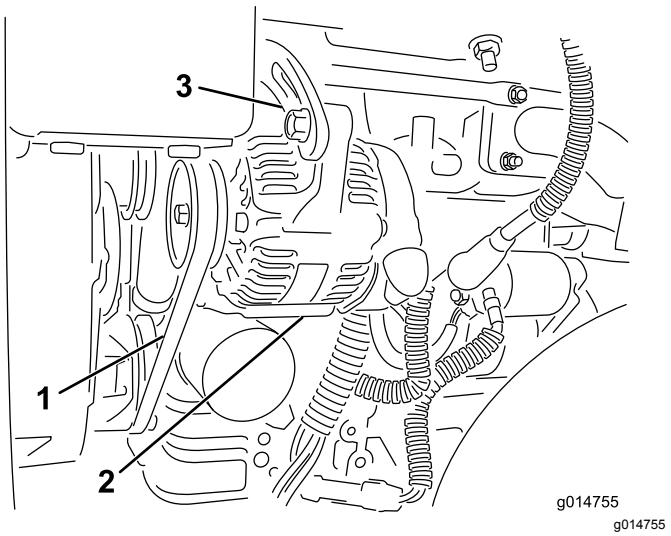

Figure 49

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

A. Loosen the bolts securing the alternator to the engine and adjusting strap.

B. Inspect the belt for wear or damage and replace if it is worn.

C. Using a lever placed between the alternator and the engine block, pull the alternator out to obtain the correct belt tension and tighten the bolts.

Hydraulic System Maintenance

Changing the Hydraulic Fluid and Filter

Service Interval: After the first 50 hours

Every 800 hours

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

1. Clean the area around the filter mounting area (Figure 50). Place a drain pan under the filter and remove the filter.

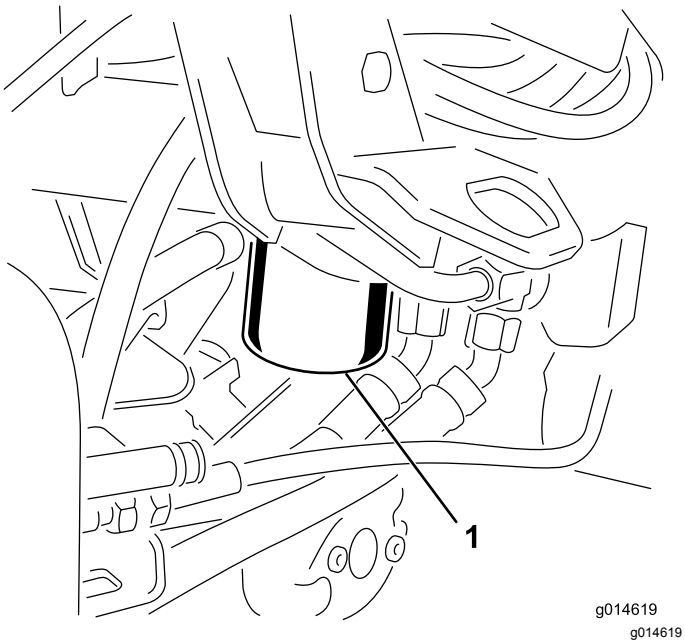

Figure 50

1. Hydraulic-oil filter

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

2. Fill the replacement filter with the appropriate hydraulic fluid, lubricate the sealing gasket, and hand turn it until the gasket contacts the filter head. Then tighten it 3/4 turn further.
3. Fill the hydraulic reservoir with hydraulic fluid; refer to Filling the Hydraulic Tank (page 29).
4. Start the machine and run it at idle for 3 to 5 minutes to circulate the fluid and remove any air trapped in the system. Shut off the engine and check the fluid level.
5. Dispose of the oil and filter properly.

Checking the Hydraulic Lines and Hoses

⚠ WARNING

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

- **Ensure that all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to the hydraulic system.**
- **Keep your body and hands away from 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 your 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. On the InfoCenter control, from the SERVICE menu, select BACKLAP.
6. Set BACKLAP to ON.
7. Pull up the Main Menu and scroll down to Settings.
8. In the SETTINGS menu scroll down to BACKLAP RPM and use the ± button to select the desired backlap speed.
9. 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.
10. Apply lapping compound with a long handle brush. Never use a short handled brush.
11. If the reels stall or become erratic while backlapping, select a higher reel speed setting until the speed stabilizes.
12. 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 10.
13. Repeat the procedure for all cutting units you want to backlap.
14. When finished, return the InfoCenter BACKLAP setting to OFF or turn the ignition key to the OFF position to return the machine to forward cutting operation.
15. Wash all lapping compound off of the cutting units. Adjust cutting unit reel to bedknife as needed. Move the cutting unit reel speed control to the desired mowing position.

Storage

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

1. Remove accumulations of dirt and old grass clippings. Sharpen the blades and bedknives, if necessary; refer to the *Cutting Unit Operator's Manual*. Use a rust preventive on bedknives and blades. Grease and oil all lubrication points.
2. Block up the wheels to remove any weight on the tires.
3. Drain and replace the hydraulic fluid and filter and inspect the hydraulic lines and fittings. Replace, if necessary; refer to Changing the Hydraulic Fluid and Filter (page 46) and Checking the Hydraulic Lines and Hoses (page 46).
4. All fuel should be removed from the fuel tank. Run the engine until it stops from lack of fuel. Replace the fuel filter; refer to Replacing the Fuel Filter/Water Separator (page 40).
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 39).
6. Clean dirt and chaff from the cylinder, cylinder head fins, and blower housing.
7. Remove the battery and charge it fully. Either store it on the shelf or on the machine. Leave the cables disconnected if it is stored on the machine. Store the battery in a cool atmosphere to avoid quick deterioration of the charge in the battery.
8. If possible, store the machine in a warm, dry location.

Notes:

Notes:

European Privacy Notice

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

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

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

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

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

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

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

Australian Consumer Law

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

The Toro Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Commercial product ("Product") to be free from defects in materials or workmanship for two years or 1500 operational hours*, whichever occurs first. This warranty is applicable to all products with the exception of Aerators (refer to separate warranty statements for these products). Where a warrantable condition exists, we will repair the Product at no cost to you including diagnostics, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.
* Product equipped with an hour meter.

Instructions for Obtaining Warranty Service

You are responsible for notifying the Commercial Products Distributor or Authorized Commercial Products Dealer from whom you purchased the Product as soon as you believe a warrantable condition exists. If you need help locating a Commercial Products Distributor or Authorized Dealer, or if you have questions regarding your warranty rights or responsibilities, you may contact us at:

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

952–888–8801 or 800–952–2740
E-mail: commercial.warranty@toro.com

Owner Responsibilities

As the Product owner, you are responsible for required maintenance and adjustments stated in your *Operator's Manual*. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim.

Items and Conditions Not Covered

Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. This warranty does not cover the following:

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, or modified non-Toro branded accessories and products. A separate warranty may be provided by the manufacturer of these items.
- Product failures which result from failure to perform recommended maintenance and/or adjustments. Failure to properly maintain your Toro product per the Recommended Maintenance listed in the *Operator's Manual* can result in claims for warranty being denied.
- Product failures which result from operating the Product in an abusive, negligent, or reckless manner.
- Parts subject to consumption through use unless found to be defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to, brake pads and linings, clutch linings, blades, reels, rollers and bearings (sealed or greasable), bed knives, spark plugs, castor wheels and bearings, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, and check valves, etc.
- Failures caused by outside influence. Conditions considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved fuels, coolants, lubricants, additives, fertilizers, water, or chemicals, etc.
- Failure or performance issues due to the use of fuels (e.g. gasoline, diesel, or biodiesel) that do not conform to their respective industry standards.
- Normal noise, vibration, wear and tear, and deterioration.
- Normal "wear and tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.

Parts

Parts scheduled for replacement as required maintenance are warranted for the period of time up to the scheduled replacement time for that part. Parts replaced under this warranty are covered for the duration of the original product warranty and become the property of Toro. Toro will make the final decision whether to repair any existing part or assembly or replace it. Toro may use remanufactured parts for warranty repairs.

Deep Cycle and Lithium-Ion Battery Warranty:

Deep cycle and Lithium-Ion batteries have a specified total number of kilowatt-hours they can deliver during their lifetime. Operating, recharging, and maintenance techniques can extend or reduce total battery life. As the batteries in this product are consumed, the amount of useful work between charging intervals will slowly decrease until the battery is completely worn out. Replacement of worn out batteries, due to normal consumption, is the responsibility of the product owner. Battery replacement may be required during the normal product warranty period at owner's expense. Note: (Lithium-Ion battery only): A Lithium-Ion battery has a part only prorated warranty beginning year 3 through year 5 based on the time in service and kilowatt hours used. Refer to the *Operator's Manual* for additional information.

Maintenance is at Owner's Expense

Engine tune-up, lubrication, cleaning and polishing, replacement of filters, coolant, and completing recommended maintenance are some of the normal services Toro products require that are at the owner's expense.

General Conditions

Repair by an Authorized Toro Distributor or Dealer is your sole remedy under this warranty.

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. Except for the Emissions warranty referenced below, if applicable, there is no other express warranty. All implied warranties of merchantability and fitness for use are limited to the duration of this express warranty.

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note regarding engine warranty:

The Emissions Control System on your Product may be covered by a separate warranty meeting requirements established by the U.S. Environmental Protection Agency (EPA) and/or the California Air Resources Board (CARB). The hour limitations set forth above do not apply to the Emissions Control System Warranty. Refer to the Engine Emission Control Warranty Statement supplied with your product or contained in the engine manufacturer's documentation for details

Countries Other than the United States or Canada

Customers who have purchased Toro products exported from the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer.

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