Form No. 3401-692 Rev B

TORO®

Count on it.

Operator's Manual

# Greensmaster® 3250-D 2-Wheel-Drive Traction Unit

**Model No. 04384—Serial No. 316000001 and Up**

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

CE

*3401-692* B

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

**⚠ WARNING**

**CALIFORNIA**
**Proposition 65 Warning**

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

**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.

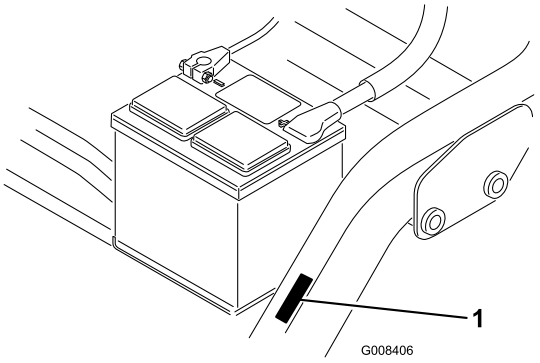
# Introduction

This machine is a ride-on, reel-blade lawnmower 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.




g008406

**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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**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 when 18 kg (40 lb) of ballast has been added to the rear wheel and the appropriate weight kit is installed to the rear castor. An additional guard kit is required for EN ISO 5395:2013 compliance. For proper compliance, see the Setup section.**

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

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

# Safe Operating Practices

## Training

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

## Preparation

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

## Operation

- Do not operate the engine in a confined space where dangerous carbon monoxide and other exhaust gasses can collect.
- Mow only in daylight or in good artificial light.
- Before attempting to start the engine, disengage all blade attachment clutches, shift into neutral, and engage the parking brake.
- Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care. To guard against overturning:
  - do not stop or start suddenly when going up or downhill;
  - machine speeds should be kept low on slopes and during tight turns;
  - stay alert for humps and hollows and other hidden hazards;
  - never mow across the face of the slope, unless the mower is designed for this purpose.
- Stay alert for holes in the terrain and other hidden hazards.
- Watch out for traffic when crossing or near roadways.

- Stop the blades from rotating before crossing surfaces other than grass.
- When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
- Never operate the machine with damaged guards, shields, or without safety protective devices in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- Before leaving the operator's position:
  - stop on level ground;
  - disengage the power take-off and lower the attachments;
  - change into neutral and set the parking brake;
  - stop the engine and remove the key.
- Disengage drive to attachments when transporting or not in use.
- Shut off the engine and disengage drive to attachment:
  - before refuelling;
  - before removing the grass catcher/catchers;
  - before making height adjustment unless adjustment can be made from the operator's position.
  - before clearing blockages;
  - before checking, cleaning or working on the mower;
  - after striking a foreign object or if an abnormal vibration occurs. Inspect the mower for damage and make repairs before restarting and operating the equipment.
- Reduce the throttle setting before stopping the engine and, if the engine is provided with a fuel shut-off valve, turn the fuel off at the conclusion of mowing.
- Keep hands and feet away from the cutting units.
- Look behind and down before backing up to be sure of a clear path.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop the reels when not mowing.
- Do not operate the mower under the influence of alcohol or drugs.
- Lightning can cause severe injury or death. If lightning is seen or thunder is heard in the area, do not operate the machine; seek shelter.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

## Rollover Protection System (ROPS)—Use and Maintenance

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

## Safe Handling of Fuels

- To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Never remove fuel cap or add fuel with the engine running.
- Allow engine to cool before refueling.
- Never refuel the machine indoors.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light such as on a water heater or on other appliances.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place

containers on the ground away from your vehicle before filling.

- Remove equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment with a portable container, rather than from a fuel dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.
- Do not use a nozzle lock open device.
- If fuel is spilled on clothing, change clothing immediately.
- Never overfill fuel tank. Replace fuel cap and tighten securely.

## Maintenance and Storage

- Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.
- To reduce the risk of fire hazard, keep the engine, silencer/muffler, battery compartment, and fuel storage area free of grass, leaves, or excessive grease.
- Replace worn or damaged parts for safety.
- Check the grass catcher frequently for wear or deterioration.
- Keep all parts in good working condition and all hardware and hydraulic fittings tightened. Replace all worn or damaged parts and decals.
- If the fuel tank has to be drained, do this outdoors.
- Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.
- On multi-reel machines, take care as rotating one reel can cause other reels to rotate.
- Disengage drives, lower the cutting units, set parking brake, shut off the engine and remove the key. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting units, drives, mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Use care when checking the reels. Wrap the reels or wear gloves, and use caution when servicing them.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.

## Hauling

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

# 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 referenced standards.

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

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

## Operation

- Know how to stop the engine quickly.
- Always wear substantial, slip-resistant shoes. Do not operate the machine while wearing sandals, tennis shoes, or sneakers. Wearing safety shoes and long pants is advisable and required by some local ordinances and insurance regulations.
- 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 vehicle to tip or roll, possibly resulting in personal injury or death.
- Handle fuel carefully. Wipe up any spills.
- Check the safety interlock switches daily for proper operation. If a switch should fail, replace the switch before operating the machine
- Before attempting to start the engine, sit on the seat, depress the lift pedal, and release it to

ensure the cutting units disengaged. Verify that the traction system is in neutral and the parking brake is set.

- 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.
  - 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 one work area to another.
- Do not touch the engine, muffler, or exhaust pipe while the engine is running or soon after it has stopped because these areas could be hot enough to cause burns.
- Before getting off of the seat, move the functional control lever to neutral (N), lower the cutting units and wait for the reels to stop spinning. Engage the parking brake. Shut off the engine and remove the key from the switch.
- Traverse slopes carefully. Do not start or stop suddenly when traveling uphill or downhill.
- The operator must be skilled and trained in how to drive on hillsides. Failure to use caution on slopes or hills may cause loss of control and cause the machine to tip or roll, possibly resulting in personal injury or death.
- If the engine stalls or loses headway and cannot make it to the top of a slope, do not turn the machine around. Always back slowly, straight down the slope.
- When a person or pet appears unexpectedly in or near the mowing area, **stop mowing**. Careless operation, combined with terrain angles, ricochets, or improperly positioned guards can lead to thrown object injuries. Do not resume mowing until the area is cleared.
- Never remove the ROPS (Roll Over Protection System) and always use the seat belt when operating the machine.
- Before getting off of the seat, move the functional control lever to neutral (N), raise the cutting units and wait for the reels to stop spinning. Engage the parking brake. Shut off the engine and remove the key from the switch.
- Whenever the machine is left unattended, make sure the cutting units are fully raised, the reels are not spinning, the key is removed from the ignition switch, and the parking brake is set.

## Maintenance and Storage

- Make sure all hydraulic line connectors are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
- Keep your body and hands away from pin hole leaks or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, not your hands, to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury.
- Before disconnecting or performing any work on the hydraulic system, all pressure in the system must be relieved by stopping the engine and lowering the cutting units and attachments to the ground.
- Check all fuel lines for tightness and wear on a regular basis. Tighten or repair them as needed.
- If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing, and any parts of the body away from the cutting units, attachments, and any moving parts, especially the screen at the side of the engine. Keep everyone away.
- To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer. Maximum governed engine speed should be 2,760 rpm.
- 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 100 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 84 dBA, which includes an Uncertainty Value (K) of 1 dBA.

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

# Vibration Level

**Hand-Arm**

Measured vibration level for right hand = 0.41 $m/s^2$

Measured vibration level for left hand = 0.36 $m/s^2$

Uncertainty Value (K) = 0.2 $m/s^2$

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

**Whole Body**

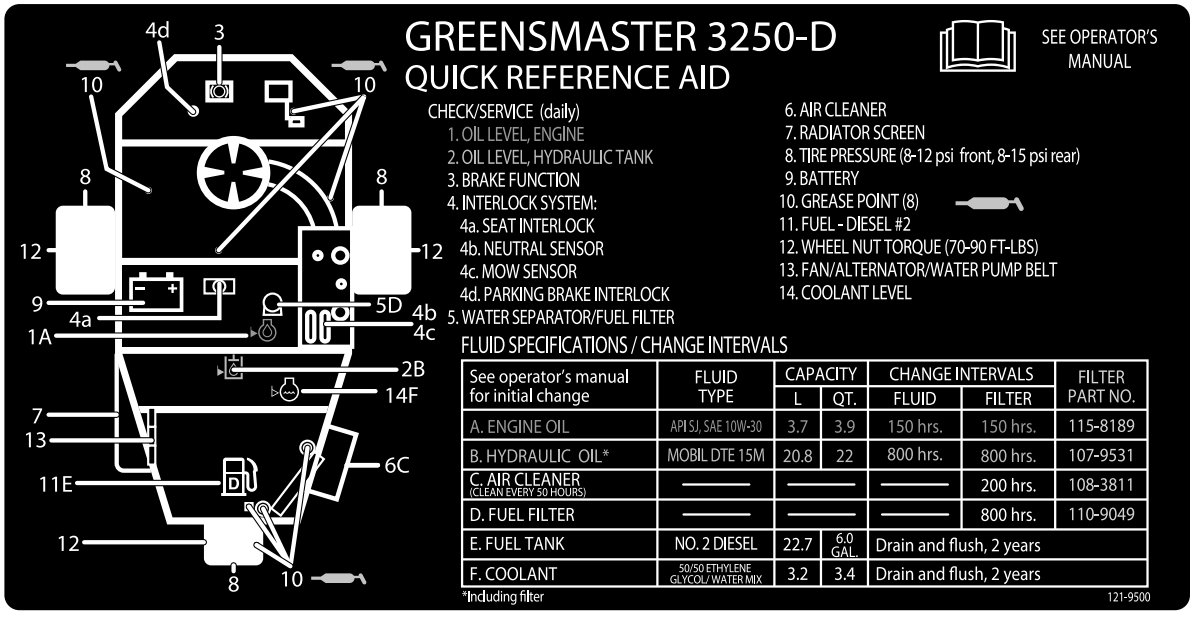
Measured vibration level = 0.25 $m/s^2$

Uncertainty Value (K) = 0.12 $m/s^2$

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.




decal121-9500

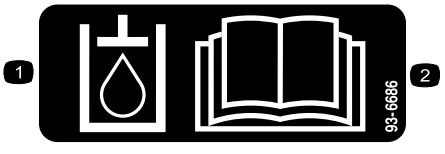
**121–9500**




decal93-8068

**93–8068**

1. Read the *Operator's Manual* for instructions on locking and unlocking the steering arm.




decal93-6686

**93–6686**

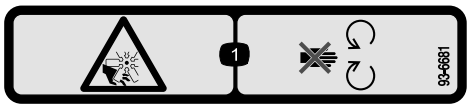
1. Hydraulic fluid
2. Read the *Operator's Manual.*




decal93-9051

**93-9051**

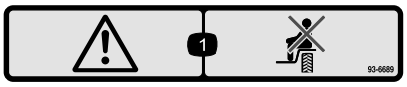
1. Read the *Operator's Manual.*




decal93-6681

**93-6681**

1. Cutting/dismemberment—hazard, fan-stay away from moving parts.




decal93-6689

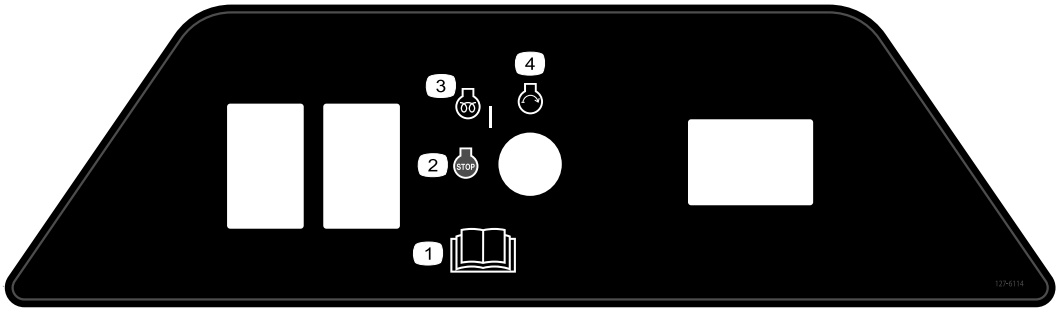
**93-6689**

1. Warning—do not carry passengers.




decal117-2718

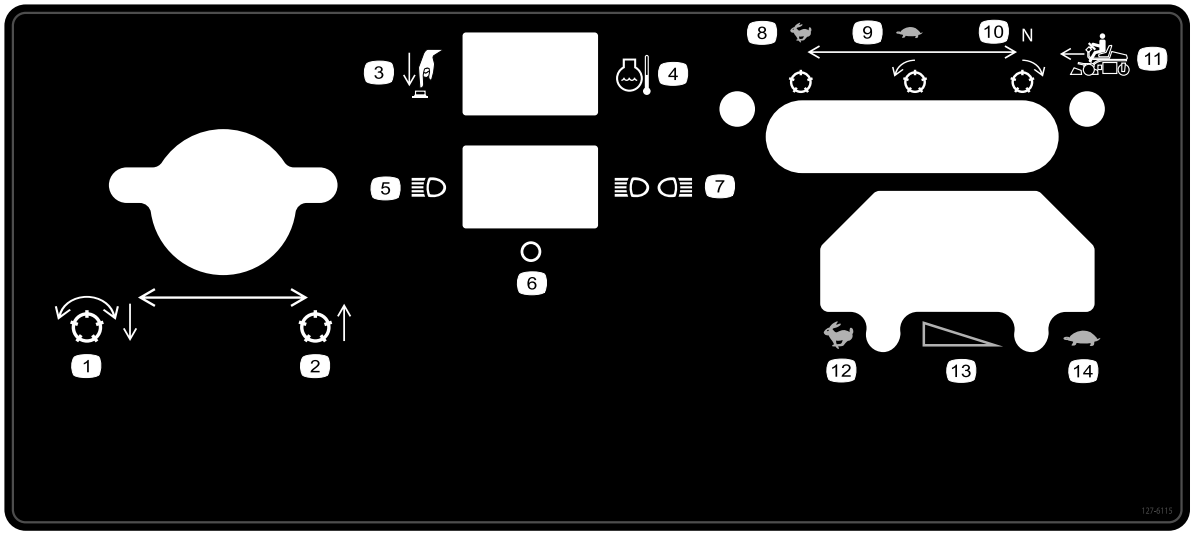
**117–2718**




decal127-6114

**127-6114**

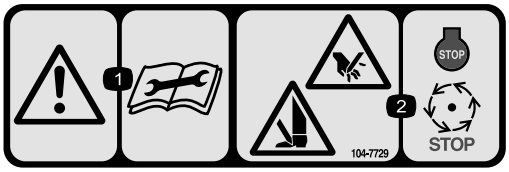
1. Read the *Operator's Manual*.
2. Engine—shut off
3. Engine—preheat
4. Engine—start




decal127-6115

**127-6115**

1. Lower and engage the reels
2. Raise the reelss
3. Press the button
4. Engine coolant temperature
5. Single light
6. Off
7. Double lights
8. Fast, stationary reel
9. Slow, forward reel
10. Neutral, reverse reel
11. Forward movement
12. Fast
13. Gradual speed change
14. Slow

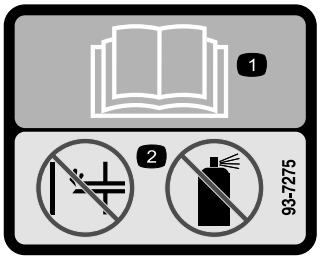



decal104-7729

**104–7729**

1. Warning—read the instructions before servicing or performing maintenance.
2. Cutting/dismemberment hazard; hand or foot—stop the engine and wait for moving parts to stop.

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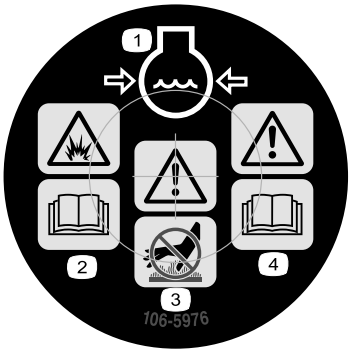



decal93-7275

**93-7275**

1. Read the *Operator's Manual.*
2. Do not use starting aids.

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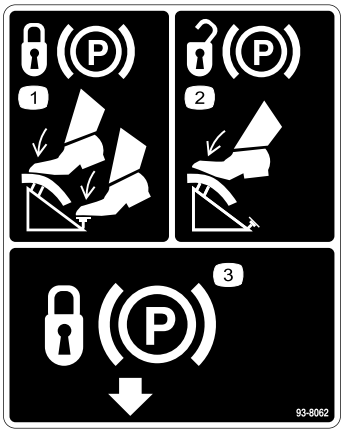



decal106-5976

**106-5976**

1. Engine coolant under pressure
2. Explosion hazard—read the *Operator's Manual*.
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual*.

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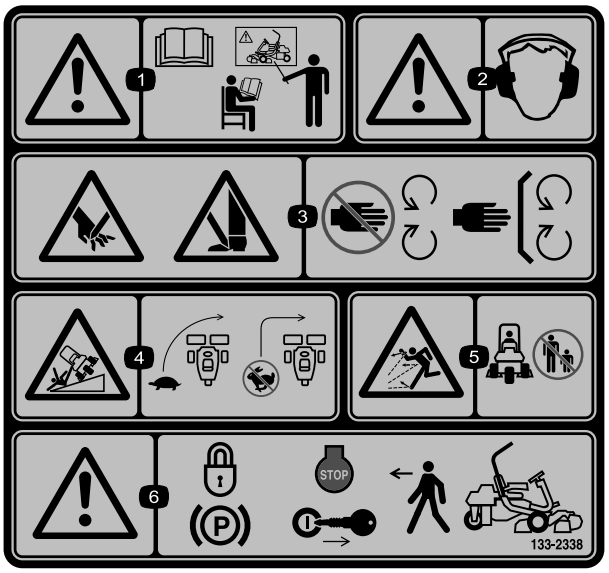



decal93-8062

**93-8062**

1. To lock the parking brake, press the brake pedal and the parking-brake lock.
2. To unlock the parking brake, press the brake pedal.
3. Parking-brake lock

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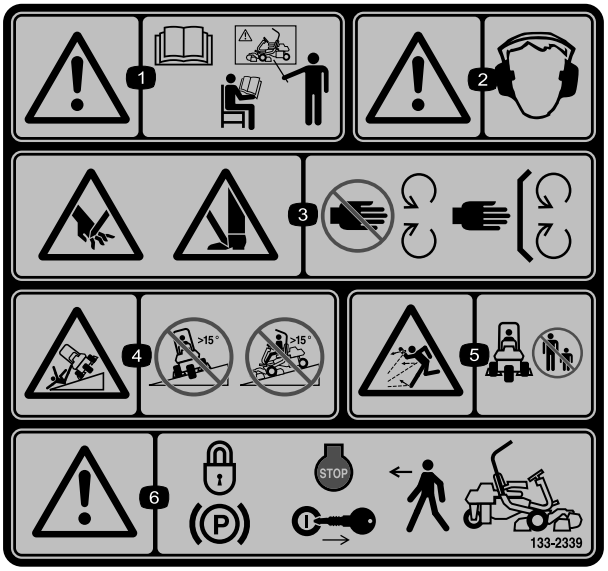



decal133-2338

**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.

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decal133-2339

**133-2339**

Replaces Decal 133-2338 for CE Machines

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

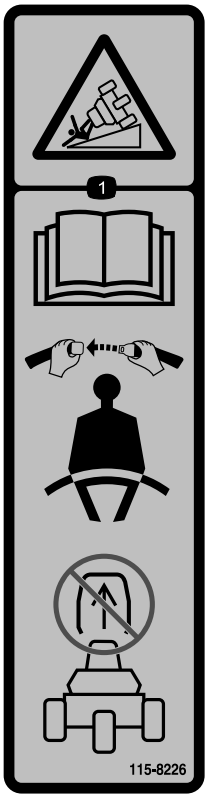



decalbatterysymbols

**Battery Symbols**

Some or all of these symbols are on your battery.

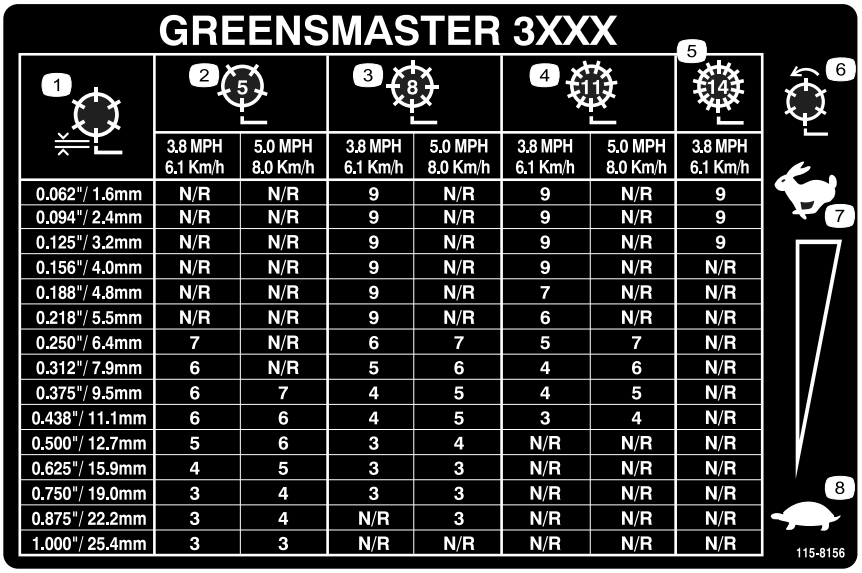
1. Explosion hazard
2. No fire, open flames, or smoking
3. Caustic liquid/chemical burn hazard
4. Wear eye protection.
5. Read the *Operator's Manual.*
6. Keep bystanders a safe distance away from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries.
8. Battery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




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).




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

# Setup

## Loose Parts

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

| Procedure | Description | Qty. | Use |
|---|---|---|---|
| 1 | Seat<br>Nut (5/16 inch) | 1<br>4 | Mount the seat to the base. |
| 2 | No parts required | – | Activate and charge the battery. |
| 3 | No parts required | – | Install the battery. |
| 4 | ROPS assembly<br>Bolt (5/8 x 4-1/2 inch)<br>Locknut (5/8 inch) | 1<br>4<br>4 | Install the ROPS. |
| 5 | No parts required | – | Check the tire pressure. |
| 6 | Carrier frame<br>Spacer<br>Bolt (1/2 inch x 3-1/4 inches)<br>Locknut (1/2 inch) | 2<br>2<br>2<br>2 | Mount the front carrier frames. |
| 7 | No parts required | – | Adjust the carrier frame rollers. |
| 8 | No parts required | – | Install the oil cooler (optional). |
| 9 | Offset lift hook (Refer to the Cutting Unit Operator's Manual for the Installation Instructions)<br>Screw (supplied with the cutting unit)<br>Bolt (#10 x 5/8 inch)<br>Jam nut (#10)<br>Cutting unit (sold separately)<br>Ball stud (supplied with the cutting unit)<br>Grass Basket | 3<br>6<br>1<br>1<br>3<br>6<br>3 | Install the cutting units. |
| 10 | No parts required | – | Adjust the transport height. |
| 11 | Rear weight kit (Part No. 100-6442; purchase separately)<br>Calcium chloride (purchase separately)<br>Rear weight kit (Part No. 99-1645; purchase separately) | 1<br>18 kg (40 lb)<br>1 | Add rear ballast. |
| 12 | Warning decal 121-2641 | 1 | Install the EU decal, if required. |
| 13 | CE guard kit (Part No. 04441; purchase seperately) | | Install the EU guard kit. |

## Media and Additional Parts

| Description | Qty. | Use |
|---|---|---|
| Operator's Manual (traction unit)<br>Engine Operator's Manual (engine) | 1<br>1 | Read before operating the machine. |
| Parts Catalog | 1 | Save for future parts ordering. |
| Operator Training Materials | 1 | View before operating the machine. |
| Pre-delivery Inspection Sheet<br>Noise rating certificate<br>Certificate of compliance | 1<br>1<br>1 | Save for future reference. |
| Ignition keys | 2 | Use to start the engine. |

**Note:** Mounting fasteners for the Greensmaster 3250-D cutting units are included with the cutting units.

# 1

# Mounting the Seat

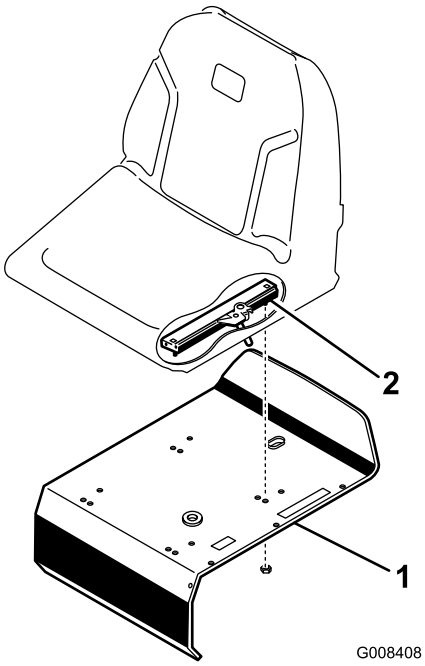
**Parts needed for this procedure:**

| | |
|---|---|
| 1 | Seat |
| 4 | Nut (5/16 inch) |

## Procedure

**Note:** Mount the seat slides 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 the locknuts securing the seat slides to the shipping base straps. Discard the locknuts.
2. Connect the wire harness to the seat switch.
3. Secure the seat slides to the seat support with the locknuts (5/16 inches) supplied in the loose parts (Figure 3).




g008408

**Figure 3**

1. Seat support
2. Seat slide

# 2

# Activating and Charging the Battery

**No Parts Required**

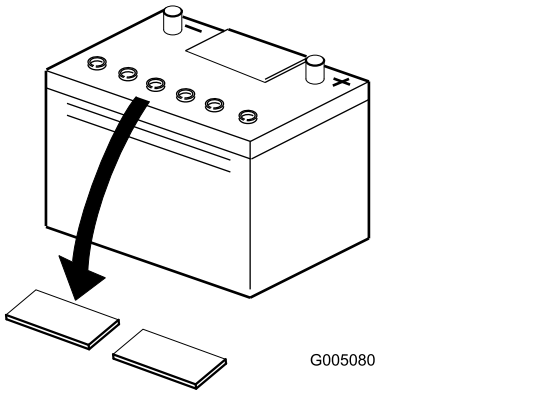
## Procedure

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

1. Loosen the bolt on the battery retainer, move the retainer away from the battery 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 4).

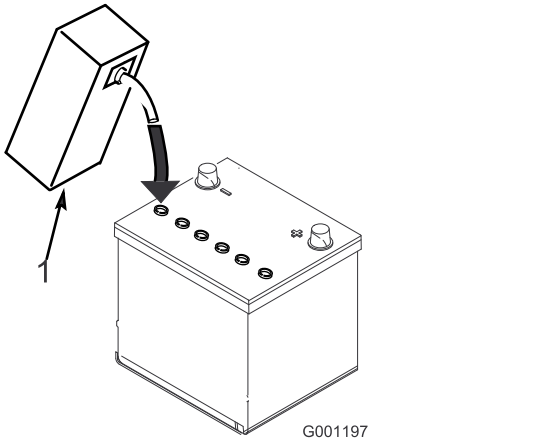



g005080

**Figure 4**

1. Vent caps

3. Carefully fill each cell with electrolyte until the plates are covered with about 6 mm (1/4 inch) of fluid (Figure 5).




g001197

**Figure 5**

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 5).

**⚠ WARNING**

**Charging the battery produces gasses that can explode.**

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

5. Connect a 2 to 4 A battery charger to the battery posts. Charge the battery for 2 hours at 4 A or for 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.
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.

# 3

# Installing the Battery

**No Parts Required**

## Procedure

1. Mount the battery with the battery terminals toward the hydraulic tank.

**WARNING**

**CALIFORNIA**
**Proposition 65 Warning**

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

**⚠ WARNING**

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

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

2. Connect the positive battery cable (red) from the starter solenoid to the positive post (+) of the battery (Figure 6). Secure it with a wrench and coat the terminal with petroleum jelly. Ensure that the cable clears the seat, in the rear-most position, which could damage the cable.

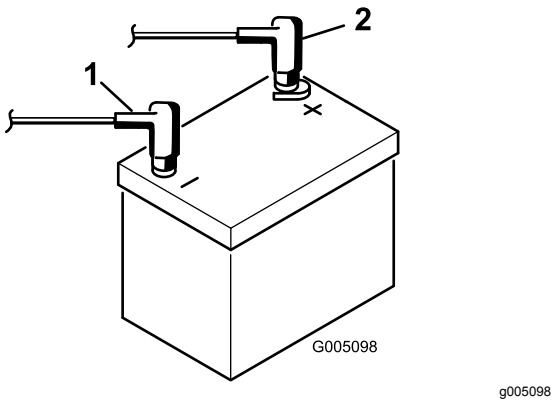



**Figure 6**

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

3. Connect the black ground cable to the negative (-) post of the battery. Secure it with a wrench and coat the terminal with petroleum jelly.

**⚠ 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.**

4. Place the terminal covers over the battery posts.
5. Slide the battery retainer into position and tighten the mounting bolt.

# 4

# Installing the ROPS (Rollover Protection Structure)

**Parts needed for this procedure:**

| | |
|---|---|
| 1 | ROPS assembly |
| 4 | Bolt (5/8 x 4-1/2 inch) |
| 4 | Locknut (5/8 inch) |

## Procedure

1. Position the ROPS so the top of the tube is curved toward the front of the machine (Figure 7).

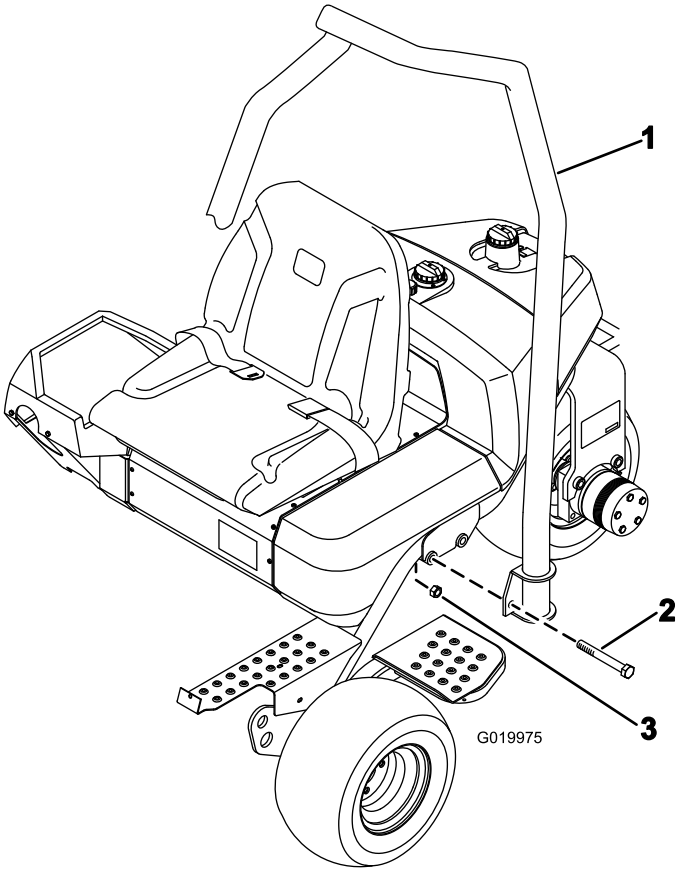



**Figure 7**

1. ROPS assembly
2. Bolt (5/8 x 4-1/2 inches)
3. Locknut (5/8 inch)

2. Lower the ROPS onto the frame, aligning it with the mounting holes (Figure 7).

3. Secure each side of the ROPS to the frame with 2 bolts (5/8 x 4-1/2 inches) and locknuts as shown in Figure 7. Torque to 183 to 223 N-m (135 to 165 ft-lb).

# 5

# Checking the Tire Pressure

**No Parts Required**

## Procedure

The tires are over inflated for shipping. Therefore, release some of the air to reduce the pressure.

Vary the tire pressure for the front wheels, depending upon your turf conditions, from a minimum of 55 kPa to a maximum of 83 kPa (8 to 12 psi).

Vary the tire pressure for the rear wheel from a minimum of 55 kPa to a maximum of 103 kPa (8 to 15 psi).

# 6

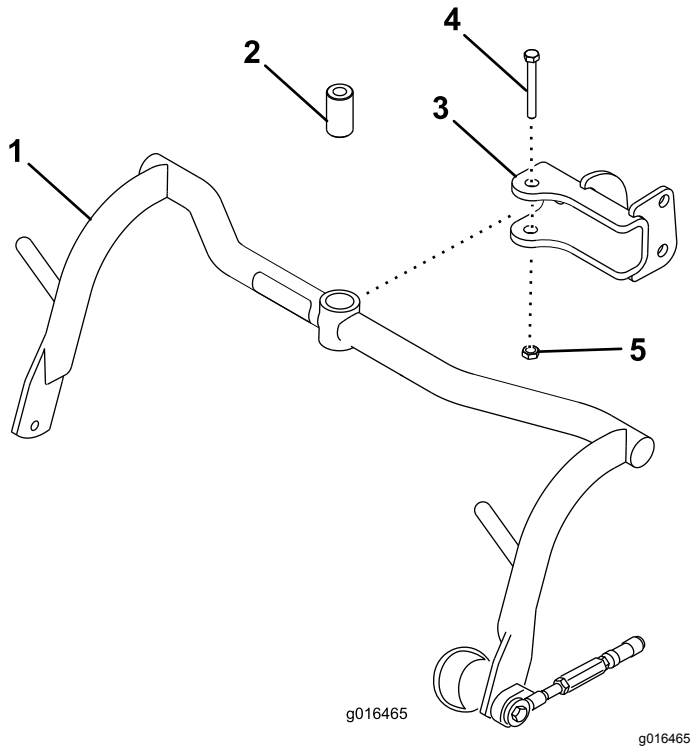
# Mounting the Front Carrier Frames

**Parts needed for this procedure:**

| | |
|---|---|
| 2 | Carrier frame |
| 2 | Spacer |
| 2 | Bolt (1/2 inch x 3-1/4 inches) |
| 2 | Locknut (1/2 inch) |

## Procedure

1. Mount a carrier frame assembly to each clevis with a spacer, bolt (1/2 x 3-1/4 inch), and locknut (1/2 inch); refer to Figure 8. Torque to 91 to 113 N·m (67 to 83 ft/lb).




g016465

**Figure 8**

1. Carrier frame
2. Spacer
3. Clevis
4. Bolt (1/2 x 3-1/4 inches)
5. Locknut (1/2 inch)

2. Lubricate the bushings in each carrier frame with No. 2 lithium grease.

# 7

# Adjusting the Carrier Frame Rollers

**No Parts Required**

## Procedure

1. Position the machine on a level surface and lower the cutting unit carrier frames to the floor.
2. Verify that there is 13 mm (1/2 inch) clearance between the carrier frame rollers and the floor.
3. If you must adjust the clearance, loosen the jam nut on the carrier frame stop screw (Figure 9) and rotate the screw up or down to raise or lower the carrier frame. Tighten the jam nut to secure the adjustment.

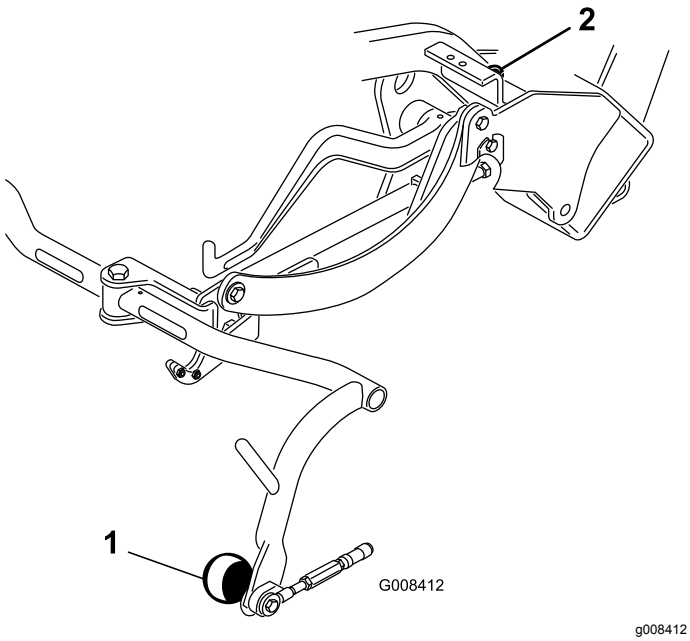



**Figure 9**

1. Carrier frame roller
2. Carrier frame stop screw

# 8

# Installing the Oil Cooler (Optional)

**No Parts Required**

## Procedure

If you are operating the machine, where ambient temperatures range from 20 to 49°C (70 to 120°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. 104-7701) to the machine.

# 9

# Installing the Cutting Units

**Parts needed for this procedure:**

| | |
|---|---|
| 3 | Offset lift hook (Refer to the Cutting Unit *Operator's Manual* for the Installation Instructions) |
| 6 | Screw (supplied with the cutting unit) |
| 1 | Bolt (#10 x 5/8 inch) |
| 1 | Jam nut (#10) |
| 3 | Cutting unit (sold separately) |
| 6 | Ball stud (supplied with the cutting unit) |
| 3 | Grass Basket |

## Procedure

**Note:** When sharpening, setting the height of cut, or performing other maintenance procedures on the cutting units, store the cutting unit reel motors in the support tubes to prevent damaging the hoses.

***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.**

1. Remove the cutting units from the cartons. Assemble and adjust them as listed in the cutting unit *Operator's Manual.*
2. Slide the cutting unit under the pull frame while hooking the lift hoop onto the lift arm.
3. Slide the sleeve back on each ball joint receiver and hook the receiver onto the cutting unit ball stud (Figure 10).

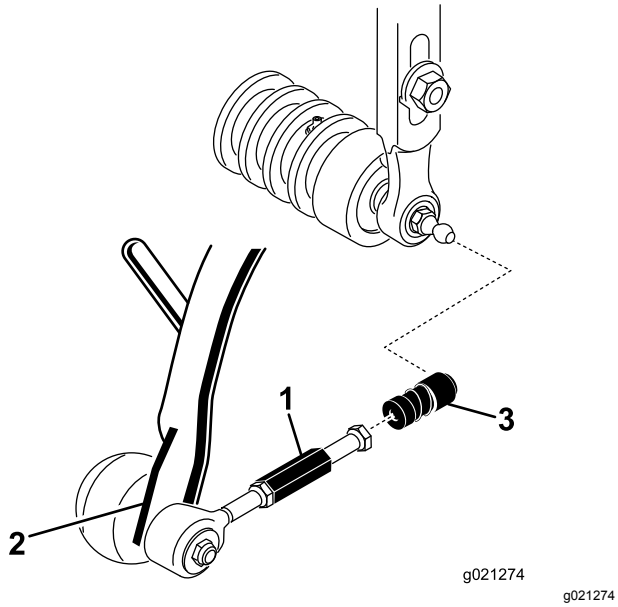



**Figure 10**

1. Pull link extension
2. Pull arm
3. Ball joint receiver

4. Mount the basket onto the carrier frame.
5. Adjust the pull links until there is 2 to 3 mm (1/16 to 1/8 inch) clearance between the lip of the basket and the reel blades. Make sure that the basket lips are equidistant from the reel blades all the way across the reel blades.
6. Align the sockets in the ball joints so the open side of the socket is centered toward the ball stud. Tighten the jam nuts to secure the sockets in position.
7. Ensure that there is approximately 13 mm (1/2 inch) of the threads exposed on each reel drive motor mounting bolt (Figure 11).

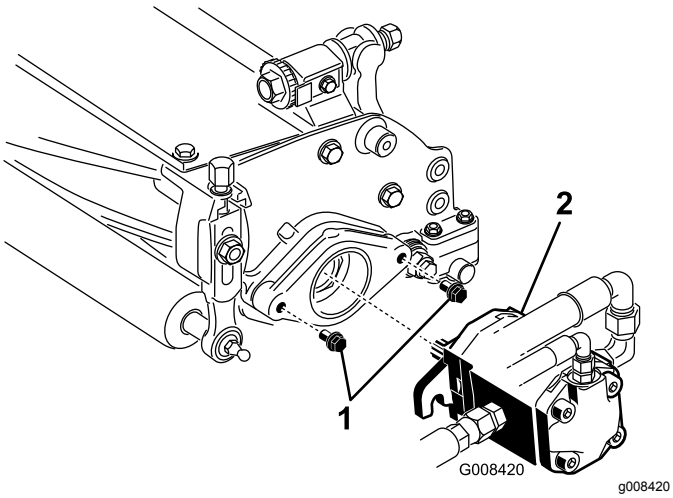



**Figure 11**

1. Mounting bolts
2. Drive motor

8. Coat the spline shaft of the motor with clean grease and install the motor by rotating the motor clockwise so that the motor flanges clear the studs. Rotate the motor counterclockwise until the flanges encircle the studs (Figure 11).
9. Tighten the mounting bolts (Figure 11).

# 10

# Adjusting the Transport Height

**No Parts Required**

## Procedure

Check the transport height (Figure 13 and Figure 14) and adjust it if required.

1. Position the tractor on a level surface.
2. On cutting units equipped with a offset lift hook (Figure 12 inset), verify that the distance from the top of the carrier frame adjusting screw to the back of the carrier frame is 25 mm (1 inch). If the distance is not 25 mm (1 inch), go to step 4.

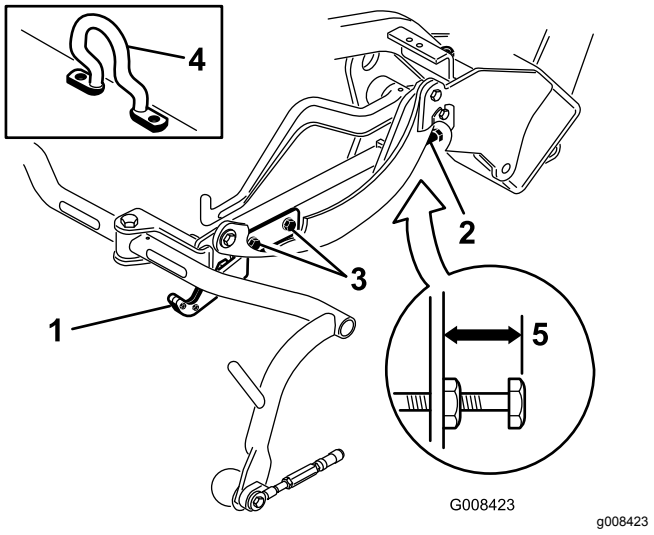



**Figure 12**

1. Transport plate
2. Adjusting screw
3. Transport plate mounting screw
4. Offset lift hook
5. 25 mm (1 inch)

3. On cutting units equipped with a chain link or a straight lift hook (Figure 13 and Figure 14 insets), verify that the distance from the top of the carrier frame adjusting screw to the back of the carrier frame is 22 mm (7/8 inch). If the distance is not 22 mm (7/8 inch), proceed to step

4. If the cutting unit is equipped with an offset lift link (Figure 12), proceed to the next step.

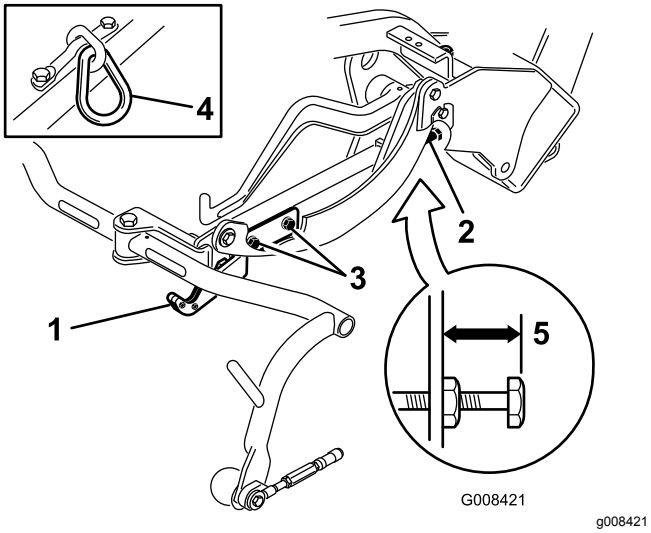



**Figure 13**

1. Transport plate
2. Adjusting screw
3. Transport plate mounting screw
4. Chain link
5. 22 mm (7/8 inch)

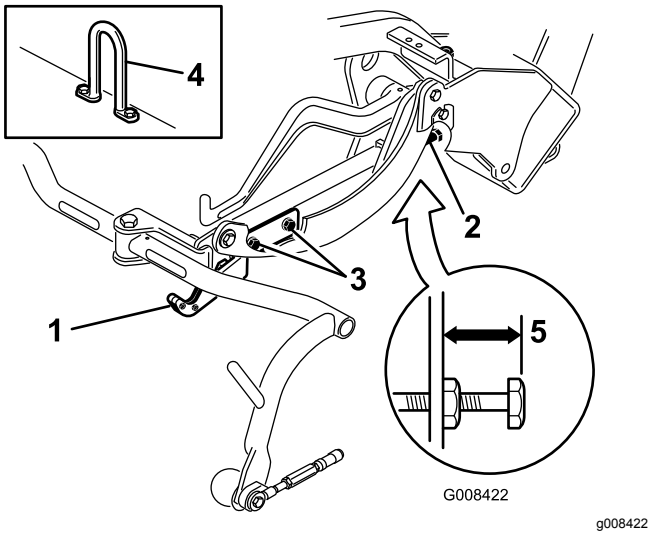



**Figure 14**

1. Transport plate
2. Adjusting screw
3. Transport plate mounting screw
4. Link hook
5. 22 mm (7/8 inch)

4. Loosen the transport plate mounting screws (Figure 13, Figure 14, and Figure 12).
5. Raise the cutting units to the transport position.

   ***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.**

6. Ensure that each carrier frame is at the same height from the ground. If they are, proceed to step 8.
7. If the carrier frames are not at the same height, loosen the jam nut on the carrier frame adjusting screw (Figure 12, Figure 13, and Figure 14). Rotate the screw outward to raise and inward to lower. Tighten the jam nut after you obtain the proper height.
8. Rotate the transport plate until it locks the pull frame. Tighten the screws.

# 11

# Adding Rear Ballast

**Parts needed for this procedure:**

| | |
|---|---|
| 1 | Rear weight kit (Part No. 100-6442; purchase separately) |
| 18 kg (40 lb) | Calcium chloride (purchase separately) |
| 1 | Rear weight kit (Part No. 99-1645; purchase separately) |

## Procedure

This unit complies with the ANSI B71.4-2004 and EN ISO 5395:2013 when it is equipped with a rear weight kit, part no. 100-6442 and 18 kg (40 lb) of calcium chloride ballast is added to the rear wheel. If a 3–wheel drive kit is installed on the machine, use rear weight kit (Part No. 99-1645) and 18 kg (40 lb) of calcium chloride.

***Important:*** **If a puncture occurs in a tire with calcium chloride, remove the machine from the turf area as quickly as possible. To prevent possible damage to the turf, immediately soak the affected area with water.**

# 12

# Installing the EU Decal

**Parts needed for this procedure:**

| | |
|---|---|
| 1 | Warning decal 121-2641 |

## Procedure

If using this machine in the EU, affix the warning decal 121-2641 over English warning decal 121-2640.

# 13

# Installing the EU Guard Kit

**Parts needed for this procedure:**

| | |
|---|---|
| | CE guard kit (Part No. 04441; purchase seperately) |

## Procedure

This unit complies with EN ISO 5395:2013 when it is equipped with a CE guard kit.

# Product Overview

## Controls

### Traction and Stopping Pedal

The traction pedal (Figure 15) 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 16).

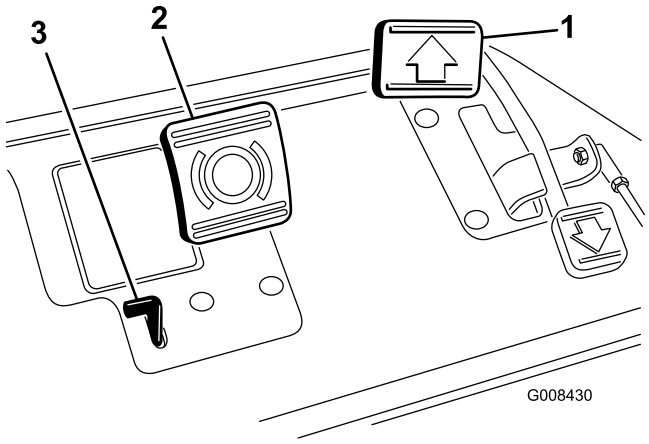



**Figure 15**

1. Traction pedal
2. Brake pedal
3. Parking brake lever




**Figure 16**

### Brake Pedal

The brake pedal (Figure 15) actuates an automotive drum-type mechanical brake at each traction wheel.

## Parking Brake Lever

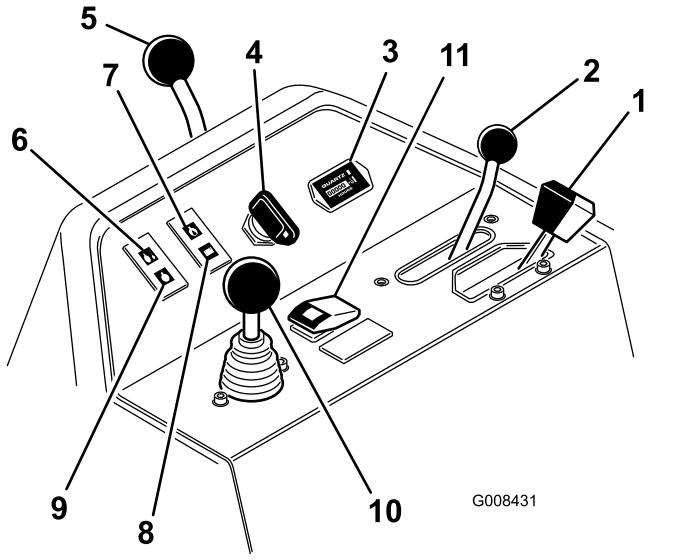
Pressing the brake pedal to actuate the brake assembly, then pressing the small lever indicated (Figure 15) keeps the brakes actuated for parking. Disengage it by pressing the brake pedal. Lock the parking brake whenever you leave the machine.

## Throttle Control

The throttle control (Figure 17) allows you to control the speed of the engine. Moving the throttle control toward the FAST position increases the engine speed; moving the throttle control toward SLOWdecreases the engine rpm. Ground speeds are as follows:

- 3.2 to 8 km/h (2 to 5 mph) forward mowing speed
- 14.1 km/h (8.8 mph) maximum transport speed
- 4.0 km/h (2.5 mph) reverse speed

**Note:** You cannot shut off the engine using the throttle control.




g008431

**Figure 17**

1. Throttle control
2. Functional control lever
3. Hour meter
4. Ignition switch
5. Steering arm locking lever
6. Water temperature light
7. Engine-oil pressure light
8. Battery warning light
9. Glow plug indicator light
10. Raise/Lower mow control
11. High temperature override button

## Functional Control Lever

The functional control lever (Figure 17) provides 2 traction selections plus a NEUTRAL position. You can shift from mow to transport or transport to mow (not to neutral) while the machine is in motion. No damage will result.

- Rear Position—neutral and backlapping
- Middle Position—used for mowing
- Front Position—used for transport

## Hour Meter

The hour meter (Figure 17) indicates the total hours that the machine has operated. It starts to function whenever the key switch is rotated to the ON position.

## Ignition Switch

Insert the key into the switch (Figure 17) and turn it clockwise as far as possible to the START position to start the engine. Release the key as soon as the engine starts; the key moves to the ON position. Turn the key counterclockwise to the OFF position to shut off the engine.

## Steering Arm Locking Lever

Rotate the lever (Figure 17) rearward to loosen the adjustment, raise or lower the steering arm for your comfort, then, rotate the lever forward to tighten the adjustment.

## Water Temperature Light

The light (Figure 17) glows and the engine automatically shuts off whenever the engine coolant temperature is too high.

## Engine Oil Pressure Light

The light (Figure 17) glows if the engine-oil pressure drops below a safe level.

## Battery Warning Light

The light (Figure 17) glows if the battery charge is low.

## Glow Plug Indicator Light

When the glow plug indicator light (Figure 17) is lit, it indicates the glow plugs are on.

## Raise/Lower Mow Control

Moving the control (Figure 17) forward during operation lowers the cutting units and starts the reels. Pull back on the control to stop the reels and raise the cutting units. During operation, you can stop the reels by pulling back on the control momentarily and releasing it. Start the reels by moving the control forward.

## High Temperature Override Button

If the engine shuts off because it is overheated, press the override button (Figure 17) in and hold it until you can move the machine to a safe location and allowed to cool down.

**Note:** When using the override button, you must hold it down continuously to operate. Do not use it for extended periods of time.

## Backlap Lever

Use the backlap lever (Figure 18) in conjunction with the raise/lower mow control lever and the reel speed control for backlapping the reels.

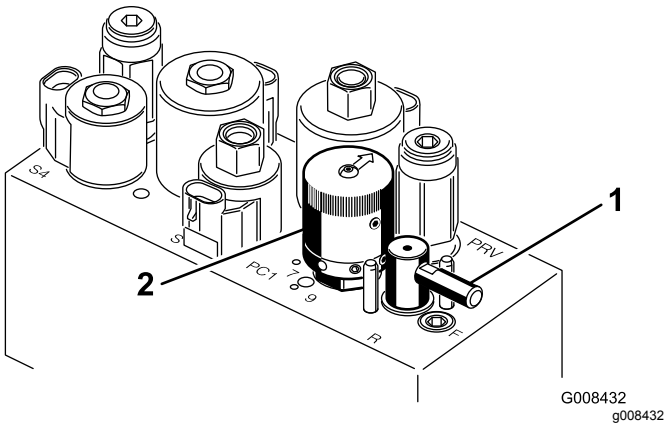



**Figure 18**

1. Backup lever
2. Reel speed control

## Reel Speed Control

Use the reel speed control (Figure 18) to adjust the speed of the reels.

## Seat Adjusting Lever

The seat adjusting lever on the left side of the seat (Figure 19) allows a 18 cm (7 inch) fore and aft adjustment.

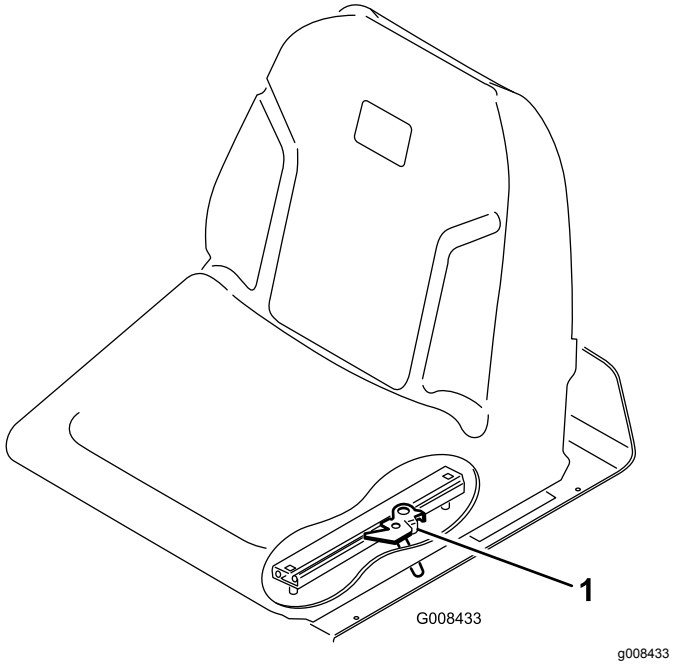



**Figure 19**

1. Seat adjusting handle

## Fuel-Shutoff Valve

Close the fuel-shutoff valve (Figure 20), located under the fuel tank, when storing or transporting the machine on a truck or trailer.

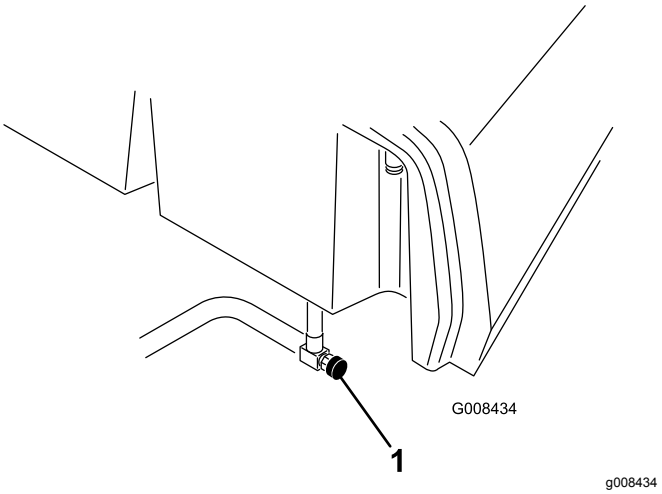



**Figure 20**

1. Fuel-shutoff valve

# Specifications

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

| | |
|---|---|
| Width of cut | 150 cm (59 inches) |
| Wheel tread | 128 cm (50.5 inches) |
| Wheel base | 123 cm (48.6 inches) |
| Overall length (w/baskets) | 238 cm (93.9 inches) |
| Overall width | 173 cm (68 inches) |
| Overall height | 197 cm (77.5 inches) |
| Engine speed settings | High Idle: 2,710 ± 50 rpm<br>Low Idle: 1,500 ± 50 rpm |
| Net weight w/reels | 552 kg (1,216 lb) |

## Attachments/Accessories

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

# Operation

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

## Think Safety First

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

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

## Checking the Engine Oil

**Service Interval:** Before each use or daily

The engine is shipped with oil in the crankcase; however, you must check the oil level before and after you start the engine for the first time.

Crankcase capacity is approximately 3.7 L (3.9 US quarts) with the filter.

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.** If the oil level is between the Full and Add marks, no oil addition is required.

***Important:*** **Keep the engine-oil level between the upper and lower limits on the oil gauge. Engine failure may occur as a result of over filling or under filling the engine oil.**

1. Position the machine on a level surface.
2. Remove the dipstick and wipe it with a clean rag (Figure 22). Push the dipstick into the tube and make sure that it is seated fully. Remove the dipstick from the tube and check the level of oil. 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.**

***Important:*** **Make sure that the dipstick is removed 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 21. This clearance is necessary to permit venting when filling, which prevents oil from overrunning into breather.**

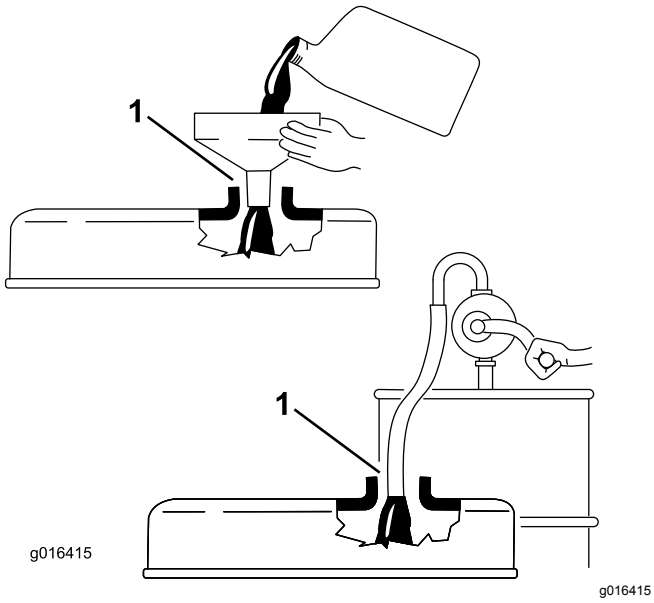



**Figure 21**

1. Note clearance

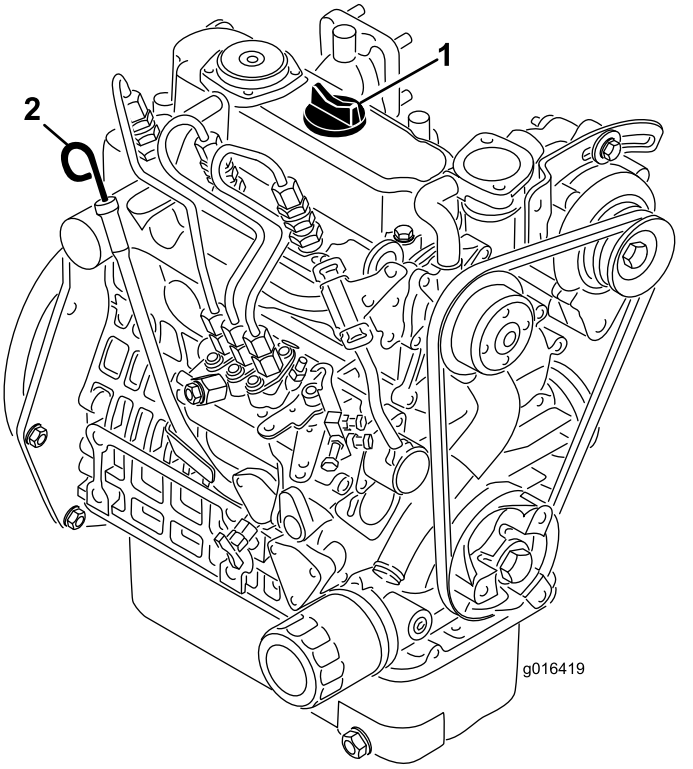



**Figure 22**

1. Filler cap
2. Dipstick

3. Replace the dipstick.
4. Start and run the engine at idle for 30 seconds, then shut the engine off. Wait 30 seconds, then repeat steps 2–3.

   ***Important:*** **Check the level of oil every 8 operating hours or daily. Change the oil and filter initially after the first 50 hours of operation, thereafter change the oil and the filter every 150 hours. However, change the oil more frequently when the engine is operated in extremely dusty or dirty conditions.**
5. 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 US 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. Using winter-grade fuel at lower temperatures provides lower flash point and cold flow

characteristics, which eases starting and reduce fuel filter plugging.

Use of summer grade fuel above –7°C (20°F) contributes 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.**

***Biodiesel Ready***

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:

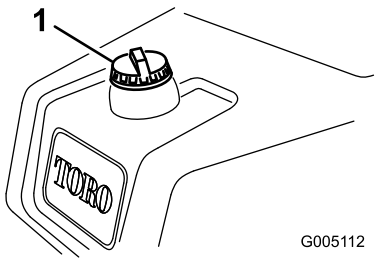
- The biodiesel portion of the fuel must meet specification ASTM D6751 or EN14214.
- The blended fuel composition should meet ASTM D975 or EN590.
- Painted surfaces may be damaged by biodiesel blends.
- Use B5 (biodiesel content of 5%) or lesser blends in cold weather
- Monitor seals, hoses, gaskets 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.

**⚠ 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 equipment from the truck or trailer and refuel the equipment with its wheels on the ground.**
- **If this is not possible, then refuel such equipment on a truck or trailer from a portable container rather than from a fuel-dispenser nozzle.**
- **If you must use a fuel dispenser nozzle, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.**

1. Clean around the fuel-tank cap (Figure 23).




g005112

**Figure 23**

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

# Checking the Cooling System

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

The capacity of the cooling system is approximately 3.2 L (3.3 US qt). Refer to Cleaning the Radiator Screen (page 43).

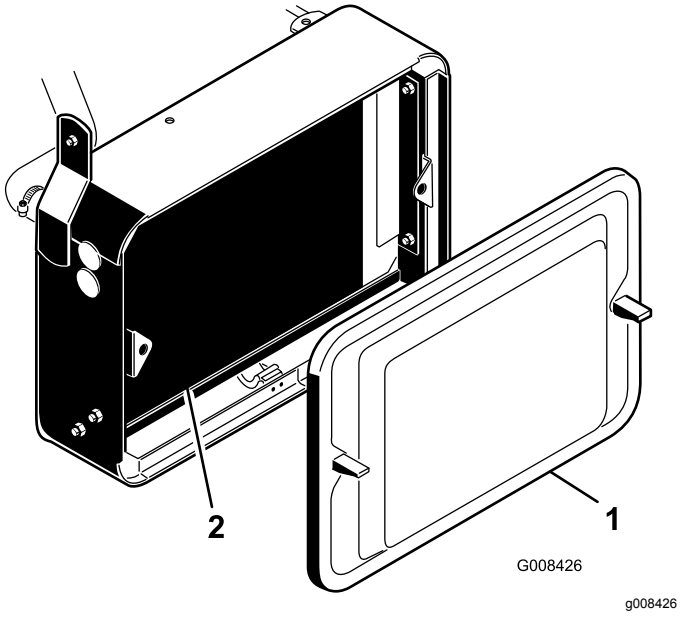



**Figure 24**

1. Radiator screen
2. Radiator

The cooling system is filled 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 25). It should be between the lines on the reserve tank when the engine is cold.

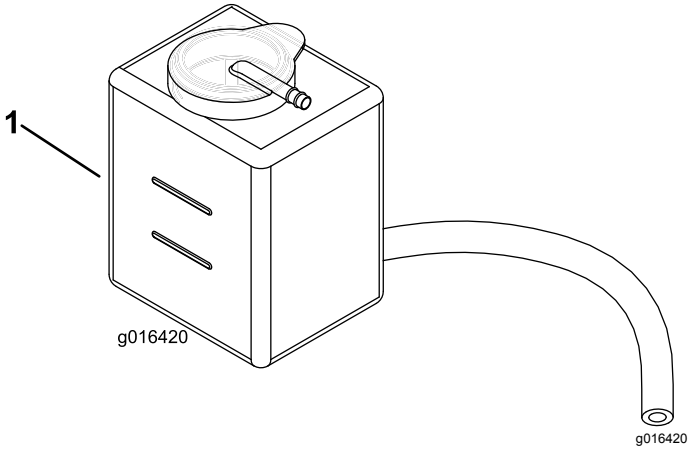



**Figure 25**

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

**Service Interval:** Before each use or daily

## Recommended Hydraulic Fluid

The machines reservoir is filled at the factory with approximately 20.8 L (5.5 US gallons) of high-quality hydraulic fluid. **Check the level of the hydraulic fluid before starting the engine for the first time and daily thereafter**. 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, you may use other fluids provided that they meet all the following material properties and industry specifications. Do not use synthetic fluid. Contact 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.

### Hydraulic Fluid Table

| Material Properties | |
|---|---|
| Viscosity, ASTM D445 | cSt at 40°C (104°F): 55 to 62 |
| | cSt at 110°C (230°F): 9.1 to 9.8 |
| Viscosity index, ASTM D2270 | 140 to 152 |
| Pour Point, ASTM D97 | -37° to -43°C (-35 to -46 F) |
| **Industry Standards** | |
| API GL-4, AGCO Powerfluid 821 XL, Ford New Holland FNHA-2-C-201.00, Kubota UDT, John Deere J20C, Vickers 35VQ25 and Volvo WB-101/BM. | |

***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° to 49°C (65° to 120°F), ISO VG 68 hydraulic fluid may offer improved performance.**

**Premium Biodegradable Hydraulic Fluid-Mobil EAL EnviroSyn 46H**

***Important:*** **Mobil EAL EnviroSyn 46H is the only synthetic biodegradable fluid approved by Toro. This fluid is compatible with the elastomers used in Toro hydraulic systems and is suitable for a wide-range of temperature conditions. This fluid is compatible with conventional mineral oils, but for maximum biodegradability and performance the hydraulic system should be thoroughly flushed of conventional fluid. The oil is available in 19 L (5 US gallons) containers or 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 to 22 L (4 to 6 gal) of hydraulic fluid. Order Part No. 44-2500 from your authorized Toro distributor.**

***Important:*** **Regardless of hydraulic fluid type used, any machine used for mowing fairways, verticutting or used during ambient temperatures 18° to 49°C (65° to 120°F) should have Oil Cooler Kit, Part No. 104–7701, installed.**

## Checking the Hydraulic Fluid Level

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 and check the level of fluid. The fluid should be up to the bottom of the screen in the filler neck (Figure 26).

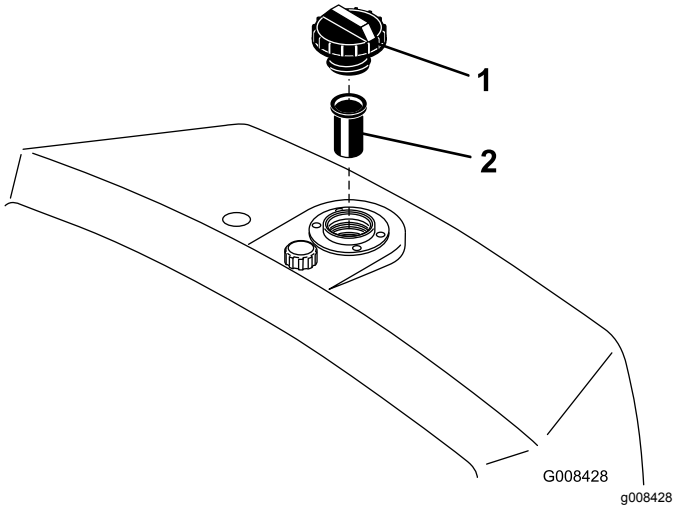



**Figure 26**

1. Hydraulic reservoir
2. Screen

3. If the fluid level is low, slowly fill the reservoir with the appropriate hydraulic fluid until the level reaches the bottom of the screen. **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.

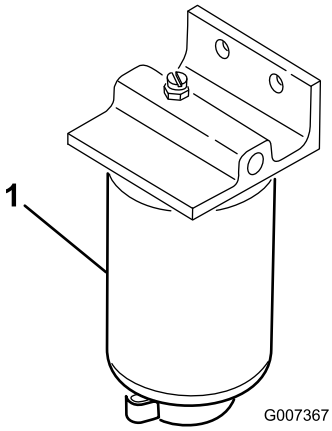
   ***Important:*** **Check level of hydraulic fluid before engine is first started and daily thereafter.**

# Draining Water from the Fuel Filter

**Service Interval:** Before each use or daily

1. Position the machine on a level surface and stop the engine.
2. Place a drain pan under the fuel filter (Figure 27).
3. Open the drain plug on the bottom of the fuel filter and drain any accumulated water (Figure 27). Tighten the plug after draining.

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




g007367

**Figure 27**

1. Fuel filter

# Checking the Tire Pressure

Vary the tire pressure for the front wheels, depending upon your turf conditions, from a minimum of 55 kPa to a maximum of 83 kPa (8 to 12 psi).

Vary the tire pressure for the rear wheel from a minimum of 55 kPa to a maximum of 103 kPa (8 to 15 psi).

# Checking the Torque of the Wheel Nuts

**Service Interval:** After the first hour

**⚠ WARNING**

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

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

# Checking the Reel-to-Bedknife Contact

**Service Interval:** Before each use or daily

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

# 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 is required to break-in the machine.

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

To ensure optimum performance of the brake system, burnish (break-in) the brakes before using the machine. To burnish the brakes, firmly apply the brakes and drive the machine at mowing speed until the brakes are hot, as indicated by their smell. You may need to adjust the brakes after break-in; refer to Adjusting the Brakes (page 44).

# Starting and Stopping the Machine

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

## Starting the Machine

***Important:*** **The fuel system may have to be bled 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; e.g., the filter has been replaced.

Refer to Draining Water from the Fuel Filter (page 28).

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

1. Ensure that the parking brake is set, the raise/lower mow control is disengaged, and the functional control is in 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 SLOW position.
4. Insert the key into the switch and rotate it to ON. Hold it in the ON position until the glow plug indicator light goes off (approximately 6 seconds).
5. Immediately turn the ignition key to the START position. Release the key when the engine starts and allow it to move to the ON position. Move the throttle control to SLOW.

   ***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. Allow the engine to warm up for a few minutes before applying a load.

   ***Important:*** **When the engine is started for the first time, or after an overhaul of the engine, operate the machine in forward and reverse for 1 to 2 minutes. Turn the steering wheel to the left and right to check the steering response. Then shut off the engine (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.**

## Stopping the Machine

1. Move the throttle control to SLOW, disengage the raise/lower mow control, and move the functional control to neutral.
2. Rotate the starter key to OFF 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 the machine.

The safety interlock system prevents the engine from starting unless:

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

The safety interlock system prevents the machine from moving unless:

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

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

Perform the following system checks daily to be sure the interlock system is operating correctly:

1. Sit on the seat, move the traction pedal to NEUTRAL, move the functional control lever to NEUTRAL, and engage the parking brake. Try to depress the traction pedal. The pedal should not depress, which means that the interlock system is operating correctly. Correct the problem if it is not operating properly.
2. Sit on the seat, move the traction pedal to NEUTRAL, move the functional control lever to NEUTRAL, and engage the parking brake. Move the functional control lever to mow or transport and try to start the engine. The engine should not crank, which means that the interlock system is operating correctly. Correct the problem if it is not operating properly.
3. Sit on the seat, move the traction pedal to NEUTRAL, move the functional control lever to NEUTRAL, and engage the parking brake. Start the engine and move the functional control lever to mow or transport. The engine should kill, which means that the interlock system is operating correctly. Correct the problem if it is not operating properly.
4. Sit on the seat, move the traction pedal to NEUTRAL, move the functional control lever to NEUTRAL, and engage the parking brake. Start the engine. Release the parking brake, move the functional control lever to mow, and rise from the seat. The engine should kill, which means that the interlock system is operating correctly. Correct the problem if it is not operating properly.
5. Sit on the seat, move the traction pedal to NEUTRAL, move the functional control lever to NEUTRAL, and engage the parking brake. Start the engine. Move the raise/lower mow control forward to lower the cutting units. The cutting units should lower but not start rotating. If they do, the interlock system is not operating correctly. Correct the problem.

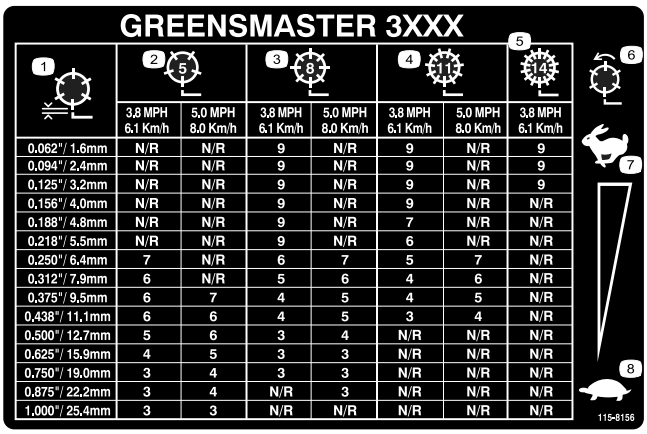
# Setting the Reel Speed

To achieve a consistent, high quality-of-cut and a uniform after cut appearance, it is important that the reel speed control (located on the manifold block under seat) be correctly set.

Adjust the reel speed control as follows:

1. Select the height of cut at which the cutting units are set.

2. Choose the desired ground speed best suited for conditions.
3. Using the appropriate graph (See Figure 28) for 5-, 8-, 11- or 14-blade cutting units, determine the proper reel speed setting.

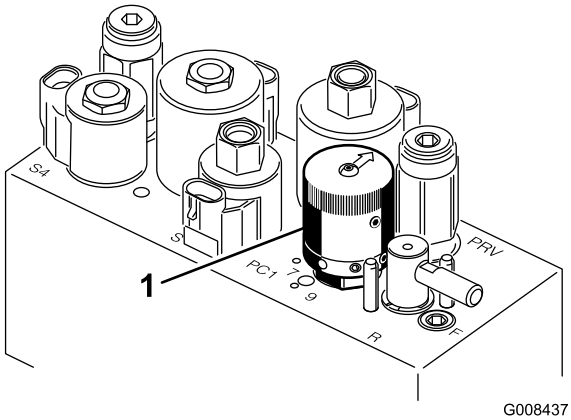



| | 3,8 MPH 6.1 Km/h | 5,0 MPH 8.0 Km/h | 3,8 MPH 6.1 Km/h | 5,0 MPH 8.0 Km/h | 3,8 MPH 6.1 Km/h | 5,0 MPH 8.0 Km/h | 3,8 MPH 6.1 Km/h |
|---|---|---|---|---|---|---|---|
| 0.062"/ 1.6mm | N/R | N/R | 9 | N/R | 9 | N/R | 9 |
| 0,094"/ 2,4mm | N/R | N/R | 9 | N/R | 9 | N/R | 9 |
| 0,125"/ 3,2mm | N/R | 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

**Figure 28**

4. To set the reel speed, rotate the knob (Figure 29) until the indicator arrows are in line with the number designating desired setting.




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**Figure 29**

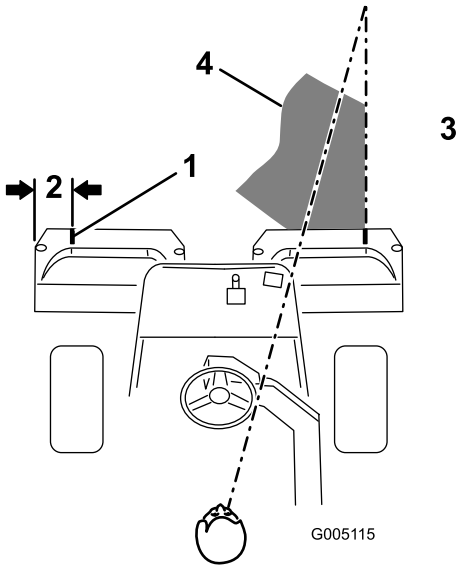
1. Reel speed control

**Note:** Reel speed can be increased or decreased to compensate for turf conditions.

# Preparing the Machine for Mowing

To assist in aligning the machine for successive cutting passes, do the following to the No. 2 and No. 3 cutting unit baskets:

1. Measure in approximately 12.7 cm (5 inches) from the outer edge of each basket.
2. Either place a strip of white tape or paint a line onto each basket paralleling the outer edge of each basket (Figure 30).




g005115

**Figure 30**

1. Alignment strip
2. Approximately 12.7 cm (5 inches)
3. Cut grass on right
4. Keep focal spot 1.8–3 m (6–10 ft) ahead of the machine.

# Training Period

Before mowing greens with the machine, find a clear area and practice starting and stopping, raising and lowering the cutting units, turning, etc. This training period will help you in gaining confidence in the performance of the machine.

# Preparing to Mow

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

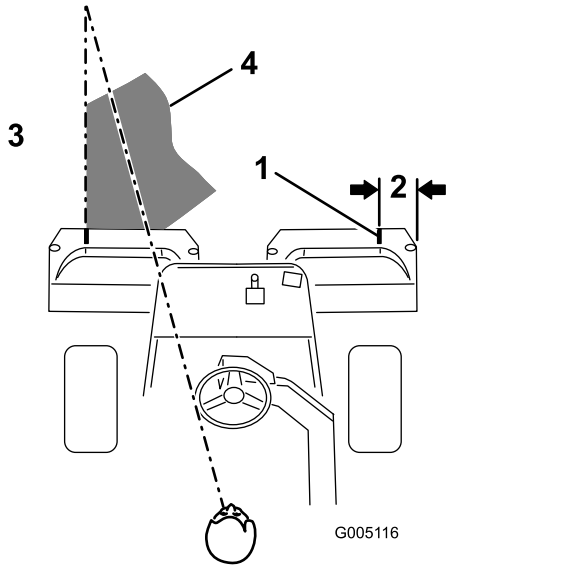
# Mowing

1. Approach the green with the functional control lever in the middle position. Start on one edge of the green so that the ribbon procedure of cutting may be used. This holds compaction to a minimum and leaves a neat, attractive pattern on the greens.
2. Actuate the mow pedal as the front edge of the grass baskets cross the outer edge of the green.

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

***Important:*** **Familiarize yourself with the fact that the No. 1 cutting unit reel is delayed and therefore, you should practice to try to gain the required timing necessary to minimize the cleanup mowing operation.**

3. Overlap a minimal amount with the previous cut on return passes. To assist in maintaining a straight line across the green and keep the machine an equal distance from the edge of the previous cut, establish an imaginary sight line approximately 1.8 to 3 m (6 to 10 ft) ahead of the machine to the edge of the uncut portion of the green (Figure 30 and Figure 31). Some find it useful to include the outer edge of the steering wheel as part of the sight line; i.e. keep the steering wheel edge aligned with a point that is always kept the same distance away from the front of the machine (Figure 30 and Figure 31).




g005116

**Figure 31**

1. Alignment strip
2. Approximately 12.7 cm (5 inches)
3. Cut grass on left
4. Keep focal spot 1.8–3 m (6–10 ft) ahead of the machine.

4. As the front of the baskets cross the edge of the green, depress the lift pedal. This will stop the reels and lift the cutting units. Timing of this procedure is important, so the mowers do not cut into the fringe area. However, as much of the green as possible should be cut to minimize the amount of grass left to mow around the outer periphery
5. Cut down on operating time and ease lineup for the next pass by momentarily turning the machine in the opposite direction, then turning in the direction of the uncut portion; i.e., if intending to turn right, first swing slightly left, then right. This will assist in getting the machine more quickly aligned for the next pass. Follow the same procedure for turning in the opposite direction. It is a good practice to try to make as short of a turn as possible. However, turn in a wider arc during warmer weather to minimize the possibility of bruising the turf.

   ***Important:*** **The machine should never be stopped on a green with the cutting unit reels operating as damage to the turf may result. Stopping on a wet green with the machine may leave marks or indentations from the wheels.**
6. Finish cutting the green by mowing the outer periphery. Be sure to change the direction of cutting from the previous mowing. Always keep weather and turf conditions in mind and be sure to change the direction of mowing from the previous cutting. Replace the flag.

   At the end of the periphery cut, momentarily pull back on the raise/lower mow lever to shut the reels off without raising them. Continue moving forward until the reel stops rotating, then, drive off the green and raise the reels (This will help prevent dribbling grass onto the green while raising the reels).
7. Empty the grass baskets of all clippings before transporting to the next green. Heavy wet clippings place an undue strain on the baskets and will add unnecessary weight to the machine, thereby increasing the load on the engine, hydraulic system, brakes, etc.

# Transporting the Machine

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

**⚠ WARNING**

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

**Do not drive machine on a public street or roadway.**

1. If using a trailer, connect it to the towing vehicle and connect the safety chains.
2. If applicable, connect the trailer brakes.
3. Load the machine onto the trailer or truck.

4. Shut off the engine, remove the key, set the brake, and close the fuel valve.
5. Use the metal tie down loops on the machine to securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes.

# Loading the Machine

Use extreme caution when loading the machine onto a trailer or a truck. One full-width ramp that is wide enough to extend beyond the rear tires is recommended instead of individual ramps for each side of the machine (Figure 32). The lower rear section of the machine frame extends back between the rear wheels and serves as a stop for tipping backward. Having a full-width ramp provides a surface for the frame members to contact if the machine starts to tip backward. If it is not possible to use 1 full-width ramp, use enough individual ramps to simulate a full-width continuous ramp.

The ramp should be long enough so that the angles do not exceed 15 degrees (Figure 32). A steeper angle may cause mower components to get caught as the unit moves from the ramp to the trailer or truck. Steeper angles may also cause the machine to tip backward. If loading on or near a slope, position the trailer or truck so that it is on the down side of the slope and the ramp extends up the slope. This minimizes the ramp angle. The trailer or truck should be as level as possible.

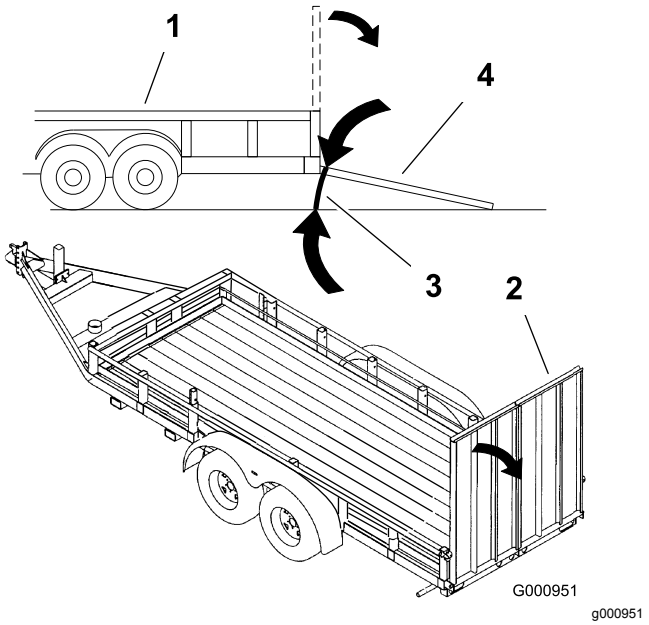
***Important:*** **Do not attempt to turn the machine while on the ramp; you may lose control and drive off the side.**

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

**⚠ WARNING**

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

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



g000951

**Figure 32**

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

# Inspecting and Cleaning After Mowing

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

After cleaning, inspect the machine for possible hydraulic fluid leaks and damage or wear to hydraulic and mechanical components. Check the cutting units for sharpness. Also, lubricate the traction pedal and brake shaft assembly with SAE 30 oil or 31 spray lubricant to deter corrosion and help keep the machine performing satisfactorily during the next mowing operation.

# Towing the Machine

In case of an emergency, you can tow the machine for 400 m (1/4 mile). But, this should not be a 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 you must transport the machine more than 400 m (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 33).

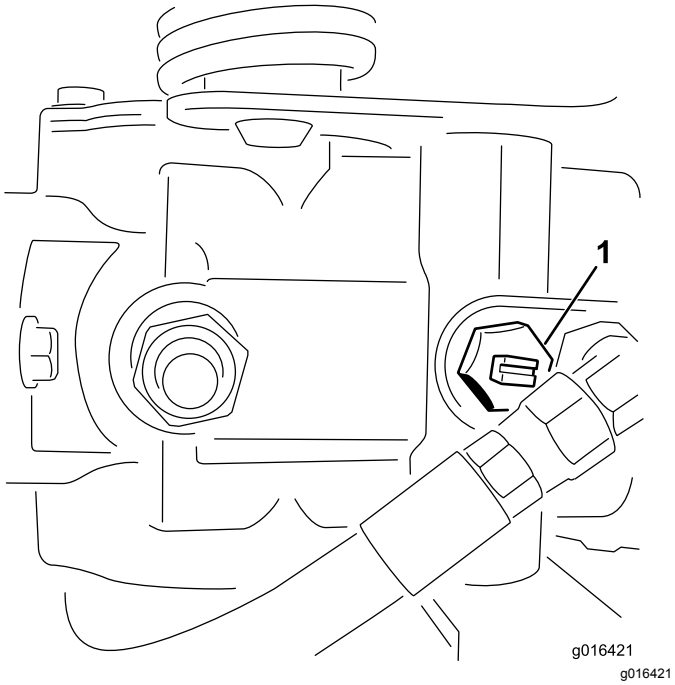



**Figure 33**

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 33).

***Important:*** **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.

## 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.<br>• Change the hydraulic-fluid filter.<br>• Check the engine speed (at idle and full throttle). |
| Before each use or daily | • Check the engine oil.<br>• Clean debris off of the radiator screen and radiator. Clean hourly if conditions are extremely dusty and dirty.<br>• Check the hydraulic-fluid level.<br>• Drain any water from the fuel filter.<br>• Check the reel-to-bedknife contact.<br>• Check the hydraulic lines and hoses. |
| Every 25 hours | • Check the battery electrolyte level. (If the machine is in storage, check the level every 30 days.) |
| Every 50 hours | • Lubricate the bearings and bushings.<br>• Check the battery cable connections. |
| Every 150 hours | • Change the engine oil and filter. |
| Every 200 hours | • Check the torque of the wheel nuts.<br>• Service the air cleaner filter (more frequently when operating conditions are dusty or dirty). |
| Every 800 hours | • Replace the fuel filter.<br>• Change the hydraulic fluid, hydraulic-fluid filter, and tank breather.<br>• Check the engine speed (at idle and full throttle).<br>• Check the valve clearance. |
| Yearly | • Burnish the brakes. |
| Every 2 years | • Check the fuel lines and connections.<br>• Drain and flush cooling system.<br>• Replace any loose hoses. |

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

**⚠ CAUTION**

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

**Remove the key from the ignition.**

# Daily Maintenance Checklist

Duplicate this page for routine use.

| Maintenance Check Item | For the week of: | | | | | | |
|---|---|---|---|---|---|---|---|
| | Mon. | Tues. | Wed. | Thurs. | Fri. | Sat. | Sun. |
| Check the safety interlock operation. | | | | | | | |
| Check the instrument operation | | | | | | | |
| Check the brake operation. | | | | | | | |
| Check the fuel filter/water separator. | | | | | | | |
| Check the fuel level. | | | | | | | |
| Check the engine oil level. | | | | | | | |
| Clean the screen and radiator. | | | | | | | |
| Inspect the air filter. | | | | | | | |
| Check any unusual engine noises. | | | | | | | |
| Check the reel-to-bedknife adjustment. | | | | | | | |
| Check the hydraulic hoses for damage. | | | | | | | |
| Check for fluid leaks. | | | | | | | |
| Check the tire pressure. | | | | | | | |
| Check the height-of-cut adjustment. | | | | | | | |
| Lubricate all grease fittings.[1] | | | | | | | |
| Lubricate the traction and brake linkage. | | | | | | | |
| Touch-up damaged paint. | | | | | | | |
| 1. Immediately after every washing, regardless of the interval listed. | | | | | | | |

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

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

## Notation for Areas of Concern

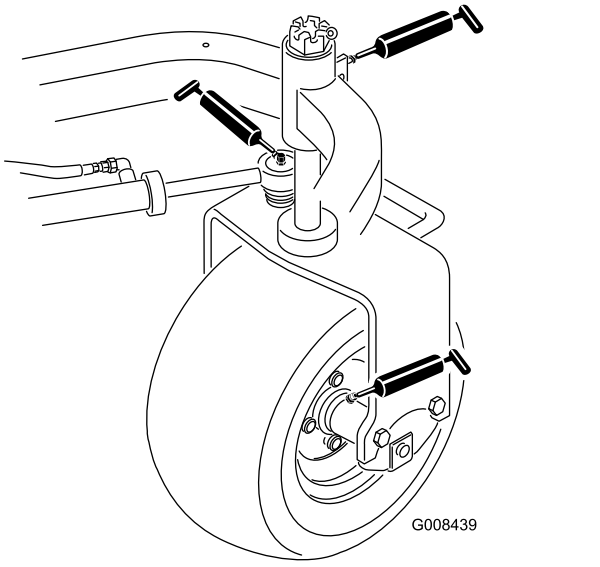
| Inspection performed by: | | |
|---|---|---|
| **Item** | **Date** | **Information** |
| | | |
| | | |
| | | |
| | | |
| | | |

# Lubrication

The machine has grease fittings that must be lubricated regularly with No. 2 lithium grease. If the machine is operated under normal conditions, lubricate all bearings and bushings **after every** 50 hours of operation. Lubricate fittings immediately after every washing, regardless of the interval listed.

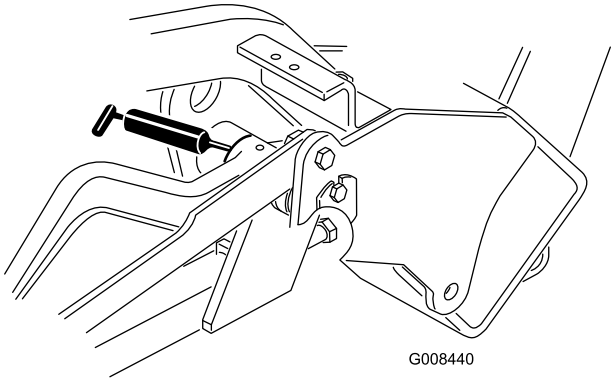
Lubricate the following machine bearings and bushings:

- Rear wheel hub (1) (Figure 34)
- Castor bearing (1) (Figure 34)
- Steering cylinder (2) (Figure 34)
- Lift arms (3) (Figure 35)
- Traction pedal pivot (1) (Figure 36)
- Carrier frame pivot (3) (Figure 37)



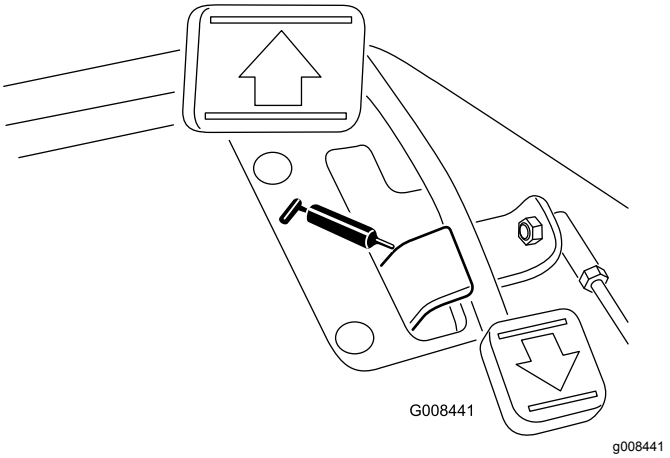

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**Figure 34**



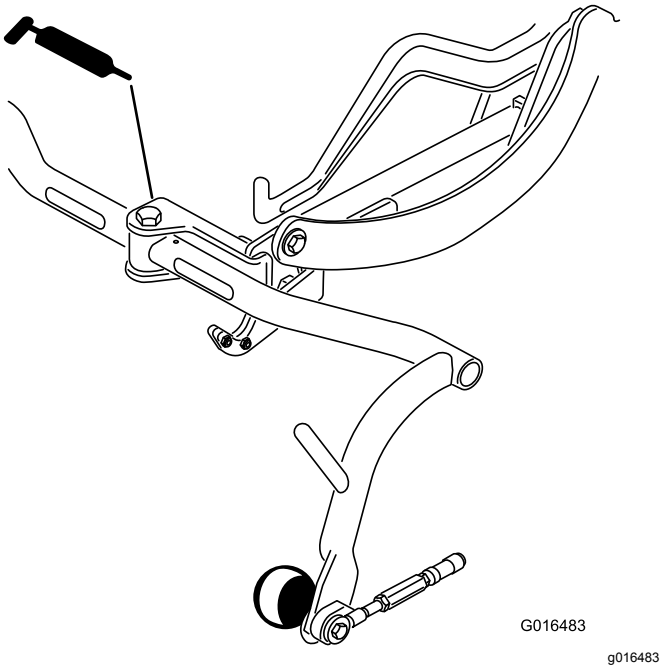

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**Figure 35**




g008441

**Figure 36**




g016483

**Figure 37**

1. Wipe the grease fitting clean so foreign matter cannot be forced into the bearing or bushing.
2. Pump grease into the bearing or bushing.
3. Wipe up excess grease.
4. Apply grease to the reel motor spline shaft and onto the lift arm when the cutting unit is removed for service.
5. Apply a few drops of SAE 30 engine oil or spray lubricant (WD 40) daily to all pivot points after cleaning.

**Note:** Refer to the cutting unit *Operator's Manual* for cutting unit lubrication requirements.

# 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 damaged. Check the whole intake system for leaks, damage, or loose hose clamps.
- 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).

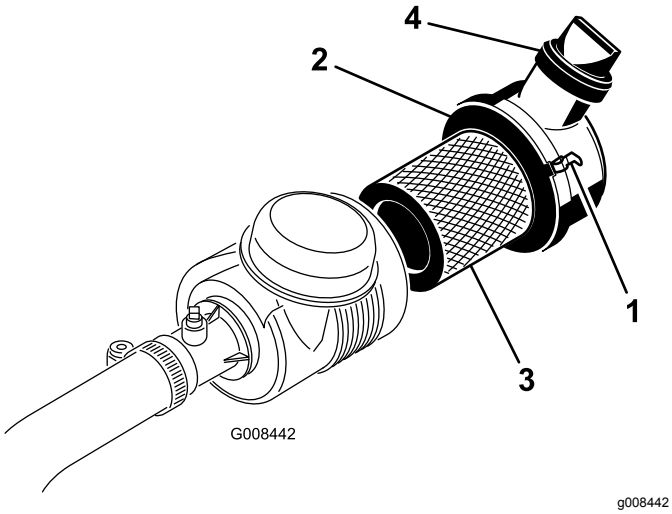



**Figure 38**

1. Air-cleaner latches
2. Dust cap
3. Filter
4. Outlet valve

2. Remove the cover from the air-cleaner body.

   **Note:** Before removing the filter, use low pressure air (276 kPa (40 psi), clean and dry) to help remove large accumulations of debris packed between outside of primary filter and the canister. Avoid using high pressure air, which could force dirt through the filter into the intake tract. This cleaning process prevents debris from migrating into the intake when you remove the primary filter.

3. Remove and replace the primary filter.

   **Note:** Do not clean the used element due to the possibility of damaging the filter media. Inspect the new filter for shipping damage, checking the sealing end of the filter and the body. Do not use a damaged element. Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister. Do not apply pressure to the flexible center of the filter.

4. Clean the dirt ejection port located in the removable cover.
5. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.
6. Install the cover orienting the rubber outlet valve in a downward position—between approximately 5 o'clock to 7 o'clock when viewed from the end.
7. Install the cover and 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 (Figure 39) and let the oil flow into a drain pan. When the oil stops, install the drain plug.

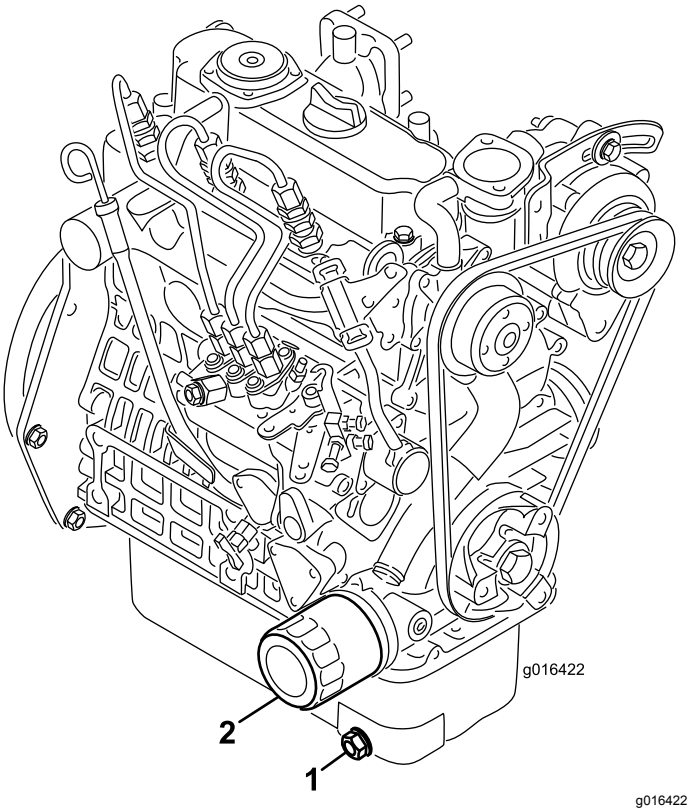



**Figure 39**

1. Drain plug
2. Oil filter

2. Remove the oil filter. Apply a light coat of clean oil to the new filter gasket.
3. Screw the filter on by hand until the gasket contacts the filter adapter, then tighten 1/2 to 3/4 turn further. **Do not overtighten**.

4. Add oil to the crankcase; refer to Checking the Engine Oil (page 24).
5. Dispose of the used oil and filter properly.

# Fuel System Maintenance

## Servicing the Fuel Filter

**Service Interval:** Every 800 hours

1. Close the fuel shutoff valve (Figure 40) below the fuel tank.

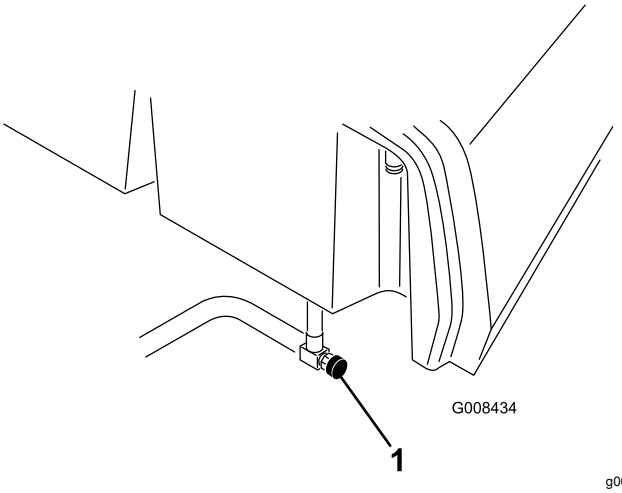



**Figure 40**

1. Fuel shut-off valve

2. Clean the area where the filter canister mounts (Figure 41).
3. Place a drain pan under the fuel filter.
4. Open the filter drain plug and breather valve (Figure 41).

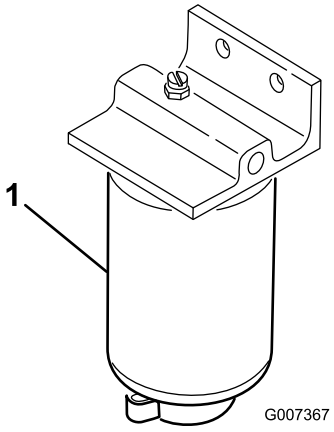



**Figure 41**

1. Fuel filter
2. Filter drain plug
3. Breather valve

5. Remove the filter canister and clean the mounting surface.
6. Lubricate the gasket on the filter canister with clean oil.

7. Install the filter canister by hand until the gasket contacts the mounting surface, then rotate an additional 1/2 turn.
8. Tighten the drain plug on the bottom of the filter canister and open the fuel-shutoff valve.
9. Dispose of the fuel and filter according to local regulations.

## 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

**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.***

Voltage: 12 V, 530 A (cold-cranking)

The battery electrolyte level must be properly maintained and the top of the battery kept clean. If the machine is stored in a location where temperatures are extremely high, the battery will run down more rapidly than if the machine is stored in a location where temperatures are cool.

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

**⚠ DANGER**

**Battery electrolyte contains sulfuric acid, which is fatal 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.**

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**

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

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

**⚠ WARNING**

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

**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.**

- **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.**

# Storing the Battery

If you store the machine wfor more than 30 days, remove the battery and charge it fully. Either store it on the shelf 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. To prevent the battery from freezing, make sure it is fully charged. The specific gravity of a fully charged battery is 1.265 to 1.299.

# Locating the Fuses

The fuses in the electrical system of the machine are located under the seat (Figure 42).

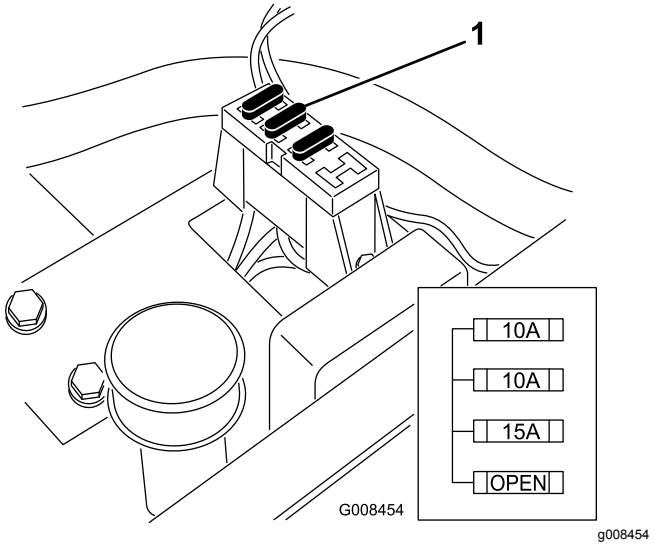



**Figure 42**

1. Fuses

# Drive System Maintenance

## Adjusting the Transmission for Neutral

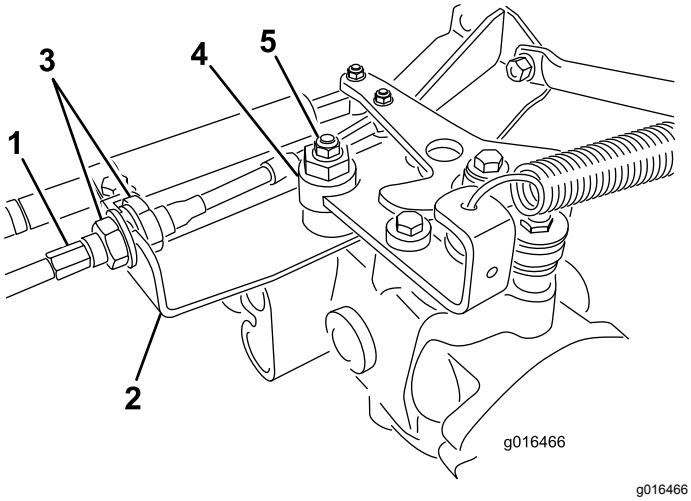
If the machine creeps when the traction control pedal is in the NEUTRAL position, adjust the neutral return mechanism.

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

   **Note:** Note: If machine is equipped with a 3–wheel drive kit, also raise and block rear wheel.

2. Start the engine, move the throttle to SLOW, and check the front wheel that is off the floor; it must not rotate.
3. If the wheel is rotating, shut off the engine and do the following:

   A. Loosen both jam nuts securing the traction control cable to the bulkhead on the hydrostat (Figure 43). Make sure that the jam nuts are loosened equally and sufficiently to allow adjustment.




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**Figure 43**

1. Traction cable
2. Bulkhead
3. Jam nuts
4. Eccentric
5. Locknut

   B. Loosen the nut securing the eccentric to the top of the hydrostat (Figure 43).

   C. Move the functional control lever to NEUTRAL and the throttle to SLOW. Start the engine.

   D. 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 43). Verify the adjustment with the throttle in the SLOW and FAST positions.

   E. From each side of the bulkhead, tighten the locknuts **evenly**, securing the traction cable to the bulkhead (Figure 43). Do not twist the cable.

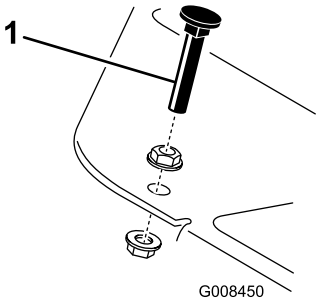
   **Note:** If cable tension exists when the functional control lever is in neutral, the machine may creep when the lever is moved to the MOW or TRANSPORT position.

   **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

The traction pedal is adjusted for maximum transport speed at the factory, but an adjustment may be required if the pedal reaches full stroke before it contacts the pedal stop, or if a decrease in transport speed is desired.

Press down on the traction pedal. If the pedal contacts the stop (Figure 44) before tension is felt on the cable, an adjustment is required:




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**Figure 44**

1. Pedal stop

1. Loosen the flange-head locknuts securing the pedal stop to the floor plate (Figure 44).
2. Adjust the pedal stop so that it contacts the pedal rod and tighten the nuts.

# Adjusting the Mowing Speed

The mowing speed of the machine is adjusted at the factory, but you can adjust the speed.

1. Loosen the jam nut on the trunnion bolt (Figure 45).
2. Loosen the nut securing the lock and mow brackets on the pedal pivot.

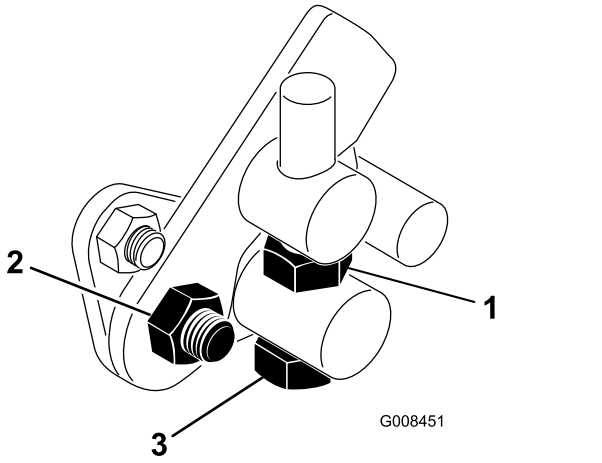



**Figure 45**

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 45). Check the adjustment and adjust as required.

# *Cooling System Maintenance*

# Cleaning the Radiator Screen

To prevent the system from overheating, the radiator screen and radiator must be kept 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 46).
2. Working from the fan side of the radiator, blow out the radiator with compressed air.

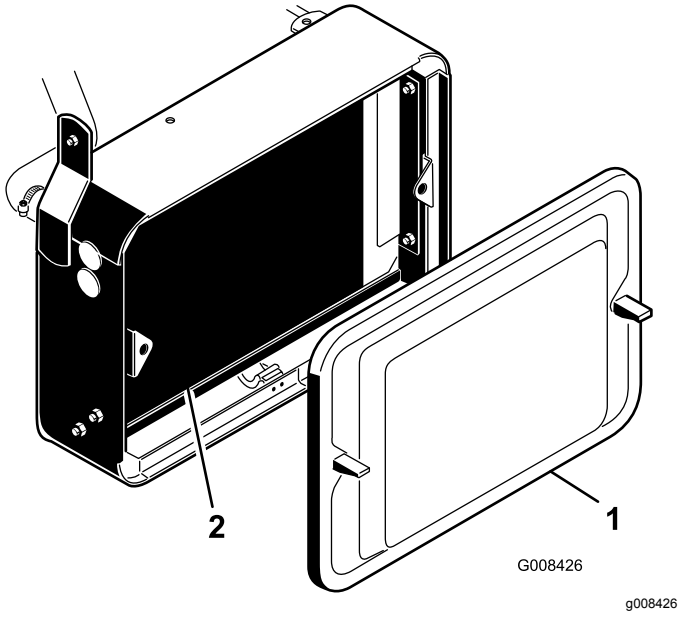



**Figure 46**

1. Radiator screen
2. Radiator

3. Clean the screen and install it.

# Brake Maintenance

## Adjusting the Brakes

**Service Interval:** Yearly

A brake adjustment rod is located on each side of the machine so that you can adjust the brakes. Adjust the brakes as follows:

1. While moving forward in transport speed, press the brake pedal; both wheels should lock equally.

   **⚠ CAUTION**

   **Testing the brakes in a confined area where others are present could cause injury.**

   **Always check the brakes in a wide, open-spaced, flat area which is free of other persons and obstructions before and after adjustment.**

2. If the brakes do not lock equally, disconnect the brake rods by removing the cotter pin and clevis pin (Figure 47).

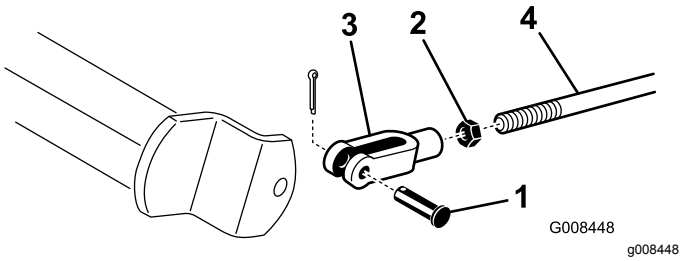



**Figure 47**

1. Clevis pin and cotter pin
2. Jam nut
3. Clevis
4. Brake shaft

3. Loosen the jam nut and adjust the clevis accordingly (Figure 47).
4. Assemble the clevis to the brake shaft (Figure 47).
5. Check the amount of free travel of the brake pedal when the adjustment is completed. There should be 13 to 25 mm (1/2 to 1 inch) travel before the brake shoes make contact with the brake drums. Adjust if necessary.
6. While moving forward in transport speed, press the brake pedal; both brakes should lock equally. Adjust if necessary.
7. Burnish the brakes annually; refer to the Adjusting the Brakes (page 44) section.

# 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, engage 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:

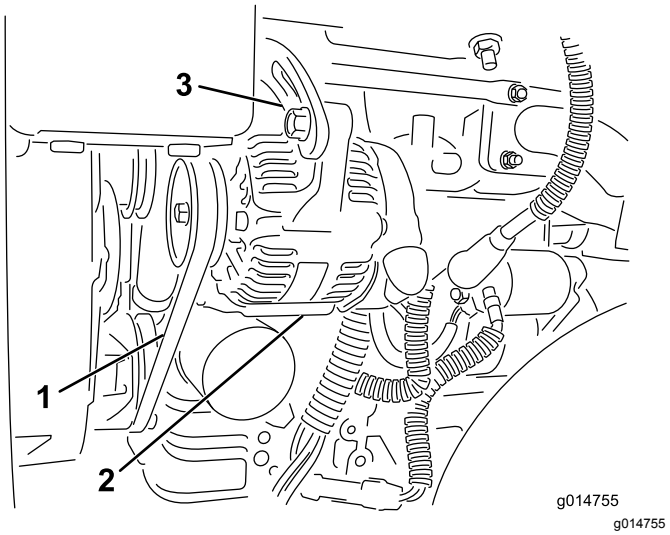



**Figure 48**

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.

# Adjusting the Cutting Unit Lift/Drop

The cutting unit lift/drop circuit is equipped with a flow control valve (Figure 49). This valve is preset at the factory but an adjustment may be required to compensate for differences in hydraulic oil temperatures, mowing speeds, attachments, etc. If an adjustment is required, proceed as follows:

**Note:** Allow the hydraulic fluid to reach full operating temperature before adjusting the flow control valve.

1. Raise the seat and locate the flow control valve for the center pull frame (Figure 49) located on the side of the hydraulic manifold.
2. Loosen the jam nut on the flow control valve.
3. Rotate the knob 1/16 turn counterclockwise if the center cutting unit is dropping too late or 1/16 turn clockwise if the center cutting unit is dropping too early.
4. After the desired setting has been achieved, tighten the jam nut.

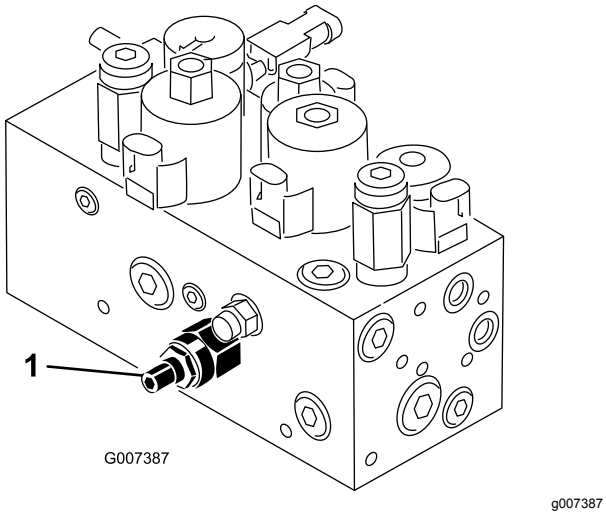



**Figure 49**

1. Flow control valve

# Backlapping the Reels

**⚠ WARNING**

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

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

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brake.
2. Unlock and raise the seat to expose the controls.
3. Make initial reel to bedknife adjustments appropriate for backlapping on all cutting units which are to be backlapped; refer to the cutting unit *Operator's Manual.*

**⚠ DANGER**

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

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

4. Start the engine and run at low idle speed.
5. Rotate the backlap lever to the "R" position (Figure 50).

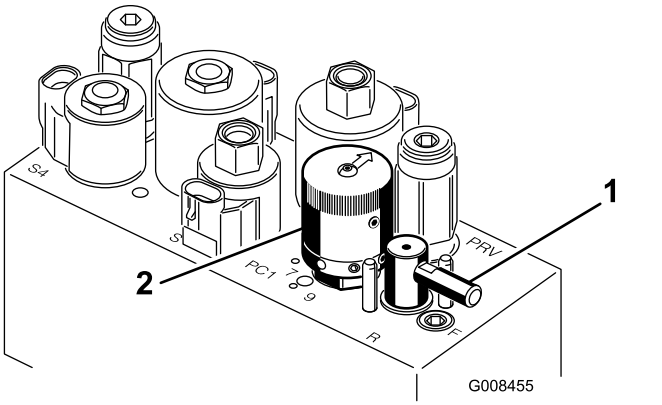



**Figure 50**

1. Backlap lever
2. Reel speed control

6. Rotate the reel speed control to setting 1 (Figure 50).
7. With the functional control lever in the NEUTRAL position, move the Raise/Lower Mow control forward to start the backlapping operation on the designated reels.

8. Apply lapping compound with a long handle brush. Never use a short handled brush.
9. If the reels stall or become erratic while backlapping, select a higher reel speed setting until the speed stabilizes, then return the reel speed to setting 1 or to your desired speed.
10. To adjust the cutting units while backlapping, turn the reels off by moving the Raise/Lower Mow control rearward and shut off the engine. After completing adjustments, repeat steps 4 through 8.
11. Repeat the procedure for all cutting units you want to backlap.
12. When finished, return the backlap levers to the “F” position, lower the seat, and wash all lapping compound off the cutting units. Adjust cutting unit reel to bedknife as needed. Move the cutting unit reel speed control to the desired mowing position.

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

# *Hydraulic System Maintenance*

## Changing the Hydraulic Fluid and Filter

**Service Interval:** After the first 50 hours

Every 800 hours

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

1. Clean the area around the filter mounting area (Figure 51). Place a drain pan under the filter and remove the filter.

   **Note:** If you are not going to drain the fluid, disconnect and plug the hydraulic line going to the filter.

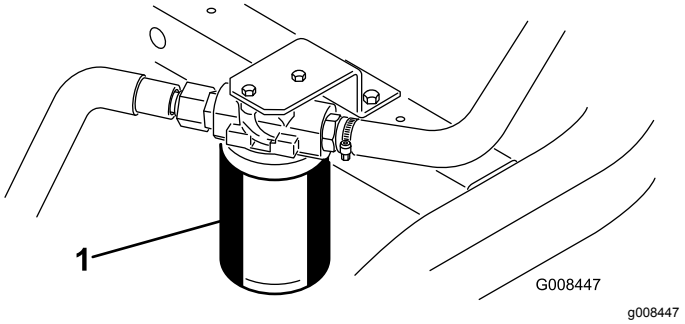



**Figure 51**

1. Hydraulic oil filter

2. Fill the replacement filter with the appropriate hydraulic fluid, lubricate the sealing gasket, and hand turn it until the gasket contacts the filter head. Then tighten it 3/4 turn further. The filter should now be sealed.
3. Fill the hydraulic reservoir with approximately 20.8 L (5.5 US gallons) of hydraulic fluid; refer to Checking the Hydraulic Fluid Level (page 27).
4. Start the machine and run it at idle for 3 to 5 minutes to circulate the fluid and remove any air trapped in the system.
5. Stop the machine, check the fluid level and replenish as required.
6. Dispose of the oil and filter properly.

# Checking the Hydraulic Lines and Hoses

**⚠ WARNING**

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

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

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

# Storage

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

1. Remove accumulations of dirt and old grass clippings. Sharpen the reels and bedknives, if necessary; refer to the cutting unit *Operator's Manual*. Use a rust preventive on bedknives and reel blades. Grease and oil all lubrication points; refer to Lubrication (page 37).
2. Block up the wheels to remove any weight on the tires.
3. Drain and replace the hydraulic fluid and filter and inspect the hydraulic lines and fittings. Replace, if necessary; refer to Changing the Hydraulic Fluid and Filter (page 46) and Checking the Hydraulic Lines and Hoses (page 47).
4. Remove all fuel from the fuel tank. Run the engine until it shuts off from lack of fuel. Replace the fuel filter; refer to Servicing the Fuel Filter (page 39).
5. While the engine is still warm, drain the oil from the crankcase. Refill it with fresh oil; refer to Changing the Engine Oil and Filter (page 38).
6. 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 location to prevent the battery from discharging quickly..
8. Store the machine in a warm, dry location.

# Notes:

# 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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