Form No. 3375-824 Rev C

TORO®

Count on it.

# Operator's Manual

# Reelmaster® 3550 Traction Unit

**Model No. 03910—Serial No. 313000001 and Up**

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

CE



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**

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

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

# 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.

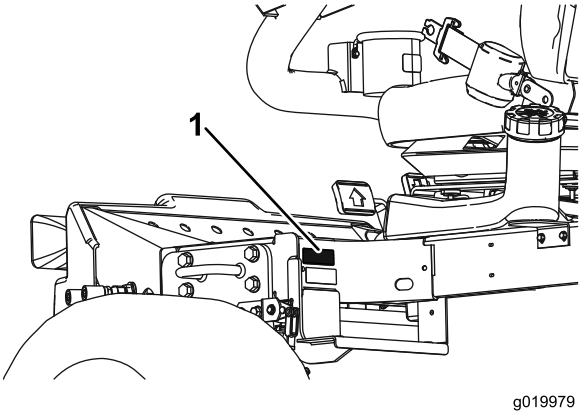



**Figure 1**

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.



**Figure 2**

1. Safety alert symbol

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

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**Bloomington, MN 55420**



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# Contents


Safety ..... 4
Safe Operating Practices ..... 4
Toro Mower Safety ..... 5
Sound Power Level ..... 7
Sound Pressure Level ..... 7
Vibration Level ..... 7
Safety and Instructional Decals ..... 8
Setup ..... 12
1 Installing the Cutting Units ..... 13
2 Adjusting the Turf Compensation Spring ..... 15
3 Install CE Decals ..... 15
4 Installing the Hood Latch (CE Only) ..... 15
5 Using the Cutting Unit Kickstand ..... 16
Product Overview ..... 18
Controls ..... 18
Specifications ..... 20
Attachments/Accessories ..... 20
Operation ..... 20
Checking the Engine Oil Level ..... 20
Filling the Fuel Tank ..... 21
Checking the Cooling System ..... 22
Checking the Hydraulic System ..... 22
Checking the Reel to Bedknife Contact ..... 23
Checking the Tire Pressure ..... 23
Torquing the Wheel Nuts ..... 23
Positioning the Seat ..... 23
Starting and Stopping the Engine ..... 24
Setting the Reel Speed ..... 25
Adjusting the Lift Arm Counterbalance ..... 25
Bleeding the Fuel System ..... 26
Understanding the Diagnostic Light ..... 27
Diagnostic Ace Display ..... 27
Checking the Interlock Switches ..... 27
Towing the Traction Unit ..... 29
Operating Tips ..... 29
Maintenance ..... 30
Recommended Maintenance Schedule(s) ..... 30
Daily Maintenance Checklist ..... 31
Service Interval Chart ..... 32
Premaintenance Procedures ..... 32
Removing the Hood ..... 32
Removing the Battery Cover ..... 32
Lubrication ..... 33
Greasing the Bearings and Bushings ..... 33
Engine Maintenance ..... 35
Servicing the Air Cleaner ..... 35
Changing the Engine Oil and Filter ..... 35
Fuel System Maintenance ..... 36
Servicing the Fuel Tank ..... 36
Inspecting the Fuel Lines and Connections ..... 36
Draining the Water Separator ..... 36
Changing the Fuel Filter Canister ..... 36
Bleeding Air from the Injectors ..... 36
Electrical System Maintenance ..... 37
Caring for the Battery ..... 37
Fuses ..... 37
Drive System Maintenance ..... 38
Adjusting the Traction Drive for Neutral ..... 38
Cooling System Maintenance ..... 39
Cleaning the Engine Cooling System ..... 39
Brake Maintenance ..... 39
Adjusting the Parking Brake ..... 39
Belt Maintenance ..... 40
Servicing the Engine Belts ..... 40
Controls System Maintenance ..... 41
Adjusting the Throttle ..... 41
Hydraulic System Maintenance ..... 41
Changing the Hydraulic Filter ..... 41
Changing the Hydraulic Fluid ..... 41
Checking the Hydraulic Lines and Hoses ..... 42
Cutting Unit System Maintenance ..... 43
Using the Optional Gauge Bar ..... 43
Backlapping the Cutting Units ..... 43
Storage ..... 44
Storing the Battery ..... 44
Preparation for Seasonal Storage ..... 44
Schematics ..... 46

# Safety

**This machine meets or exceeds CEN standard EN 836:1997 (when appropriate decals applied), and ANSI B71.4-2004 specifications in effect at the time of production.**

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

# Safe Operating Practices

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

## Training

- Read the *Operator's Manual* and other training material carefully. 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 following:
  - 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 as follows:
    - ◊ 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
    - ◊ Incorrect hitching and load distribution

## Preparation

- While mowing, always wear substantial footwear, long trousers, hard hat, safety glasses, and hearing protection. Long hair, loose clothing, or jewelry may get tangled in moving parts. Do not operate the equipment when barefoot or wearing open sandals.
- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- **Warning**—Fuel is highly flammable. Take the following precautions:
  - Store fuel in containers specifically designed for this purpose.
  - Refuel outdoors only and do not smoke while refueling.
  - Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel while the engine is running or when the engine is hot.
  - If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
  - Replace all fuel tank and container caps securely.
- 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 fumes 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. Only start the engine from the operator's position. Never remove the ROPS and always wear the seat belts during operation.
- Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times.
- Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care. Do the following to guard against overturning:
  - Do not stop or start suddenly when going up or downhill.
  - Keep machine speeds 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.
- Do the following 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 the drive to attachments, stop the engine, and remove the ignition key in the following conditions:
  - Before making height adjustments, unless the 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 (check immediately). Inspect the cutting units for damage and make repairs before restarting and operating the equipment.
- Disengage the drive to attachments when transporting or when not machine is not in use.
- Stop the engine and disengage the drive to attachments before the following:
  - Refueling
  - Making height adjustment, unless the adjustment can be made from the operator's position
- 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.
- Never raise the cutting units with the reels running.
- 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.
- 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.
- The operator shall turn on flashing warning lights, if provided, whenever traveling on a public road, except where such use is prohibited by law.

## Maintenance and Storage

- 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 fire hazard, keep the engine, silencer/muffler, battery compartment fuel storage area, cutting units and drives free of grass, leaves, or excessive grease. Clean up oil or fuel spillage.
- Replace worn or damaged parts for safety.
- If the fuel tank has to be drained, do this outdoors.
- When machine is to be parked, stored, or left unattended, lower the cutting units unless a positive mechanical lock is provided.
- Disengage drives, lower the cutting units, set parking brake, stop engine and remove key. Wait for all movement to stop before adjusting, cleaning or repairing.
- Shut off fuel while storing or transporting. Do not store fuel near flames.
- Park the machine on level ground. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- 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.

# Toro Mower Safety

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

**⚠ WARNING**

**Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you. Do not run engine indoors or in an enclosed area.**

## Preparation

Be sure to establish your own special procedures and work rules for unusual operating conditions (e.g., slopes too steep for operation). **Survey the complete mowing site to determine which hills can be safely operated on.** When performing this site survey, always use common sense and take into consideration the turf condition and the rollover risk. To determine which hills or slopes may be safely operated on, use the slope chart provided in the manual. To perform a site survey, follow the procedure outlined in the Operation section of the this manual. **The maximum side hill angle is detailed on the slope decal affixed on the machine.**

## Training

The operator must be skilled and trained in how to drive on hillsides. Failure to use caution on slopes or hills may cause the vehicle to tip or roll, possibly resulting in personal injury or death.

## Operation

- Know how to stop the machine and engine quickly.
- Do not operate the machine while wearing tennis shoes or sneakers.
- Wearing safety shoes and long pants is advisable and required by some local ordinances and insurance regulations.
- Keep hands, feet, and clothing away from moving parts and the mower discharge area.
- Fill the fuel tank until level is 1/2 inch (12 mm) below the bottom of the filler neck. Do not overfill.
- Check the safety interlock switches daily for proper operation. If a switch should fail, replace the switch before operating the machine.
- When starting the engine, engage the parking brake, put the traction pedal in neutral, and disengage the blade drive. After the engine starts, release the parking brake and keep your foot off of the traction pedal. The machine must not move. If movement is evident, refer to the Maintenance section of this manual to adjust the traction drive.
- Use extreme caution when operating close to sand traps, ditches, creeks, steep hillsides, or other hazards.
- Reduce speed when making sharp turns.
- Do not turn on hills.
- Do not operate on a side hill that is too steep. A rollover may occur before losing traction.
- The slope angle at which the machines will tip is dependent on many factors. Among these are mowing conditions such as wet or undulating terrain, speed (especially in turns), position of the cutting units (up or down), tire pressure, and operator experience. At side hill angles of 20 degrees or less, the risk of a rollover is low. As the slope angle increases to a recommended maximum limit of 25 degrees, the risk of a rollover increases to a moderate level. **Do not exceed a 25 degree side hill slope angle because the risk of a rollover and serious injury or death is very high.**
- For steering control, lower the cutting units when going down slopes.
- Avoid sudden stops and starts.
- Use the reverse pedal for braking.
- Watch for traffic when near or crossing roads. Always yield the right-of-way.
- Raise the cutting units when driving from one work area to another.
- Do not touch the engine, muffler, exhaust pipe, or hydraulic tank while the engine is running or soon after it has stopped because these areas could be hot enough to cause burns.
- This machine is not designed or equipped for on-road use and is a slow-moving vehicle. If you must cross or travel on a public road, you should be aware of and comply with local regulations, such as required lights, slow moving vehicle signs, and reflectors.

## Maintenance and Storage

- Before servicing or making adjustments, stop the engine and remove the ignition key.
- Ensure that the entire machine is properly maintained and in good operating condition. Frequently check all nuts, bolts, screws, and hydraulic fittings.
- 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. If fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.
- Before disconnecting or performing any work on the hydraulic system, all pressure in the system must be relieved by stopping the engine and lowering the cutting units to the ground.

- If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing, and any parts of the body away from the cutting units, attachments, and any moving parts. Keep everyone away.
- Do not overspeed the engine by changing governor settings. To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer.
- The engine must be shut off before checking the oil or adding oil to the crankcase.
- 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 101 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 85 dBA, which includes an Uncertainty Value (K) of 1 dBA.

Sound pressure level was determined according to the procedures outlined in EN 836.

# Vibration Level

**Hand-Arm**

Measured vibration level for right hand = 0.28 $m/s^2$

Measured vibration level for left hand = 0.26 $m/s^2$

Uncertainty Value (K) = 0.14 $m/s^2$

Measured values were determined according to the procedures outlined in EN 836.

**Whole Body**

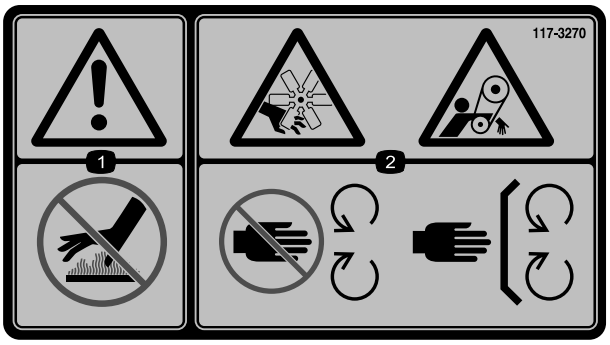
Measured vibration level = 0.2 $m/s^2$

Uncertainty Value (K) = 0.1 $m/s^2$

Measured values were determined according to the procedures outlined in EN 836.

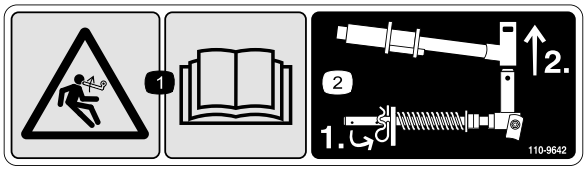
# Safety and Instructional Decals

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



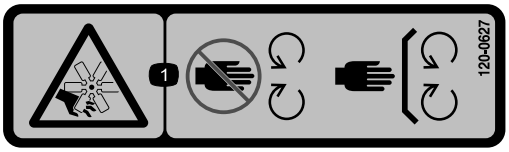

**117-3270**

1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, hand; entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.



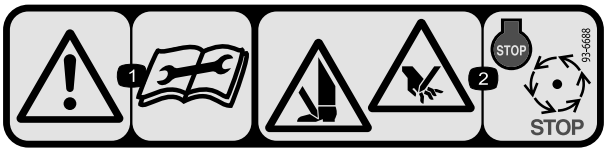

**110-9642**

1. Stored energy hazard—read the *Operator's Manual.*
2. Move the cotter pin to the hole closest to the rod bracket and then remove the lift arm and pivot yoke.




**120-0627**

1. Cutting/dismemberment hazard, fan—stay away from moving parts, keep all guards and shields in place.



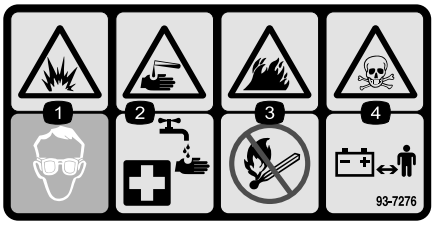

**93–6688**

1. Warning—read the *Operator's Manual* before performing maintenance.
2. Cutting hazard of hand or foot—stop the engine and wait for all moving parts to stop.



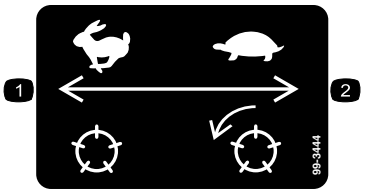

**106-6755**

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.*



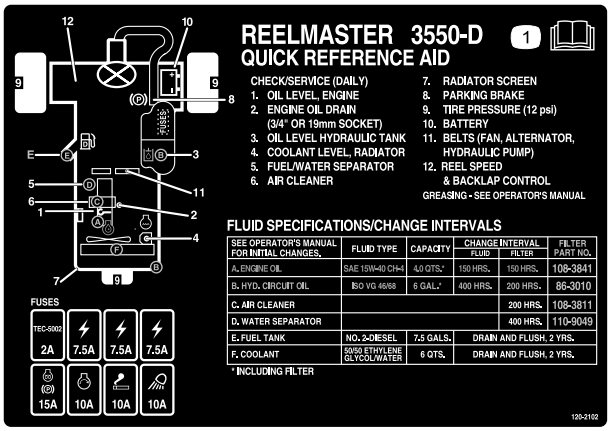

**93-7276**

1. Explosion hazard—wear eye protection.
2. Caustic liquid/chemical burn hazard—to perform first aid, flush with water.
3. Fire hazard—no fire, open flames, or smoking.
4. Poison hazard—keep children a safe distance from the battery.



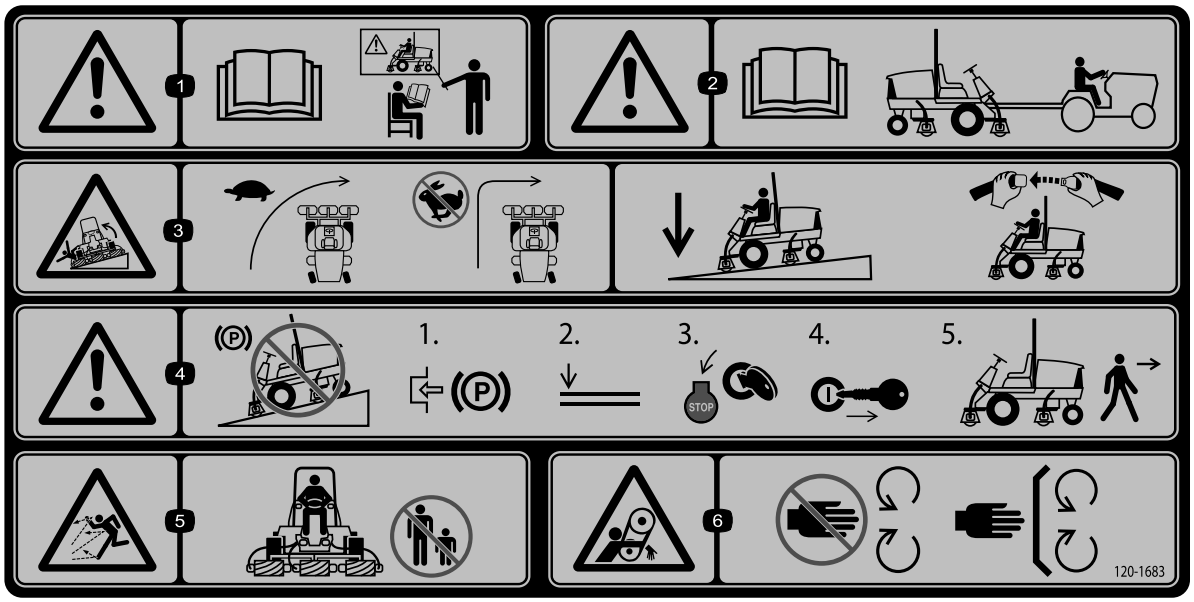

**99–3444**

1. Transport speed
2. Mow speed



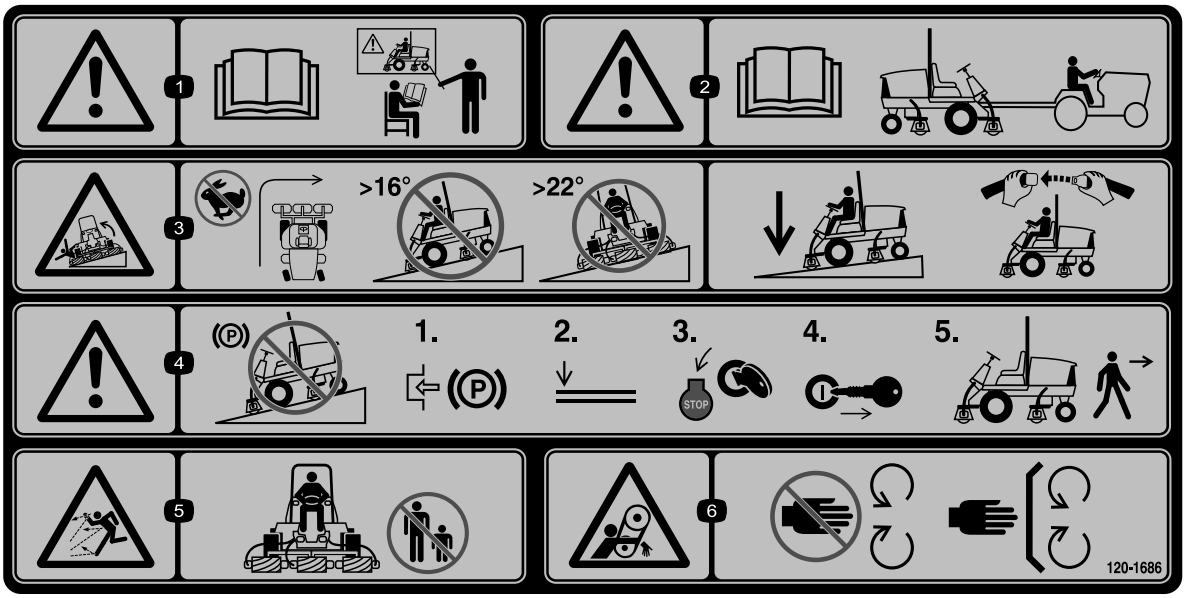

**120–2102**

1. Read the *Operator's Manual*




**120–1683**

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Warning—read the *Operator's Manual* before towing the machine.
3. Tipping hazard—slow machine before turning, do not turn at high speeds; lower the cutting unit when driving down slopes; use a roll over protection system and wear the seat belt
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting units, stop the engine and remove the ignition key before leaving the machine.
5. Thrown object hazard—keep bystanders a safe distance from the machine.
6. Entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.



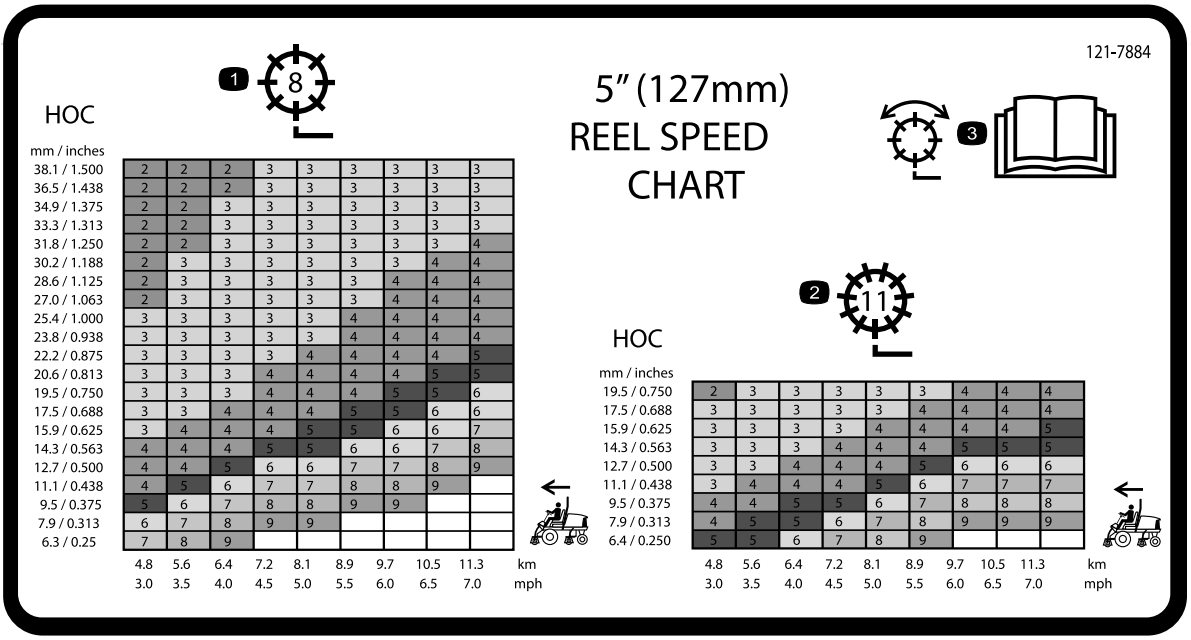

**120–1686**

(Affix over part no. 120–1683 for CE*)

* This safety decal includes a slope warning required on the machine for compliance to the European Lawn Mower Safety Standard EN836:1997. The conservative maximum slope angles indicated for operation of this machine are prescribed by and required by this standard.

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Warning—read the *Operator's Manual* before towing the machine.
3. Tipping hazard—do not turn at high speeds; do not drive up or down slopes greater than 16 degrees; do not drive across sloes greater than 22 degrees.
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting units, stop the engine and remove the ignition key before leaving the machine.
5. Thrown object hazard—keep bystanders a safe distance from the machine.
6. Entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.

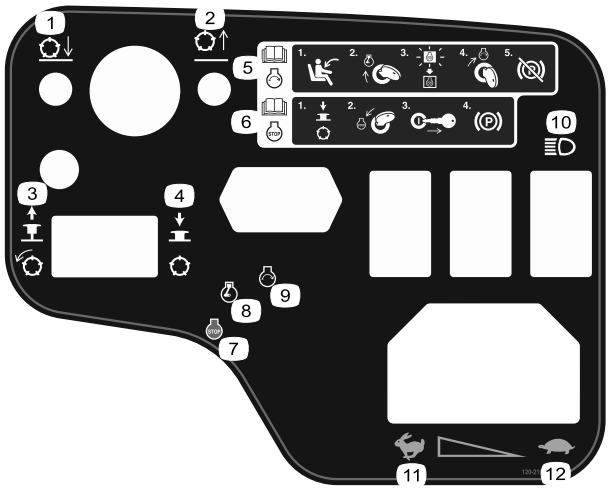
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**121–7884**

1. 8 blade reel adjustment
2. 11 blade reel adjustment
3. Read the *Operator's Manual* for information on adjusting the reel.

---




**120–2105**

1. Lower the reels
2. Raise the reels
3. Pull the knob out to engage the reels
4. Push the knob in to disengage the reels
5. Read the *Operator's Manual* for information on starting the engine—1)Sit in the operator's position; 2)Turn the key to the engine—preheat position; 3)Wait until the electrical preheat light turns off; 4)Turn the key to the engine—start position; 5)Disengage the parking brake.
6. Read the *Operator's Manual* for information on stopping the engine—1)Disengage the reels; 2)Turn the key to the engine—stop position; 3)Remove the key from the ignition; 4)Engage the parking brake.
7. Engine—stop
8. Engine—preheat
9. Engine—start
10. Lights
11. Fast
12. Slow

---




**Battery Symbols**

Some or all of these symbols are on your battery

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

---

# Setup

## Loose Parts

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

| Procedure | Description | Qty. | Use |
|---|---|---|---|
| 1 | No parts required | – | Install the cutting units |
| 2 | No parts required | – | Adjust the turf compensation spring |
| 3 | Warning decal (120–1686) | 1 | Install CE decals, if required. |
| 4 | Lock bracket<br>Rivet<br>Washer<br>Screw, 1/4 x 2 inches<br>Locknut, 1/4 inch | 1<br>2<br>1<br>1<br>1 | Install the Hood Latch (CE). |
| 5 | Cutting unit kickstand | 1 | Using the cutting unit kickstand |

## Media and Additional Parts

| Description | Qty. | Use |
|---|---|---|
| Ignition keys | 2 | Start the engine. |
| Operator's Manual<br>Engine Operator's Manual | 1<br>1 | Read before operating the machine. |
| Parts Catalog | 1 | Use to look up and order parts. |
| Operator Training Material | 1 | Review before operating the machine. |
| Cutting Performance Paper | 1 | Used for adjusting the cutting unit bedknife to reel |
| Shim | 1 | Used for adjusting the cutting unit bedknife to reel |

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

# 1

# Installing the Cutting Units

## No Parts Required

## Procedure

1. Remove the reel motors from the shipping brackets.
2. Remove the shipping brackets and discard.
3. Remove the cutting units from the cartons. Assemble and adjust as described in the cutting unit Operator's Manual.
4. Make sure the counter weight (Figure 3) is installed to the proper end of the cutting unit as described in the cutting unit Operator's Manual.

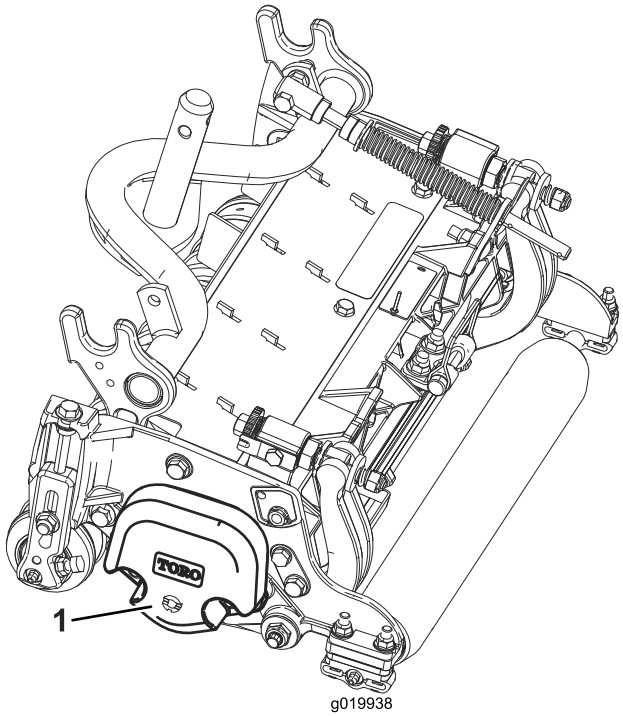



**Figure 3**

1. Counter weight

5. All the cutting units are shipped with the turf compensation spring mounted to the right side of the cutting unit. The turf compensation spring must be mounted to the same side of the cutting unit as the reel drive motor. Reposition the turf compensation as follows:
   A. Remove the 2 carriage bolts and nuts securing the rod bracket to the cutting unit tabs (Figure 4).

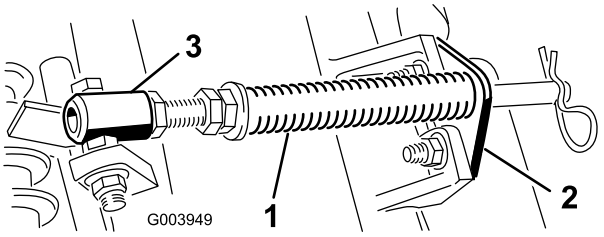



**Figure 4**

1. Turf compensation spring
2. Rod bracket
3. Spring tube

   B. Remove the flange nut securing the spring tube bolt to the carrier frame tab (Figure 4) Remove the assembly.
   C. Mount the spring tube bolt to the opposite tab on the carrier frame and secure with the flange nut. The bolt head is to be positioned to the outer side of the tab as shown in Figure 4.

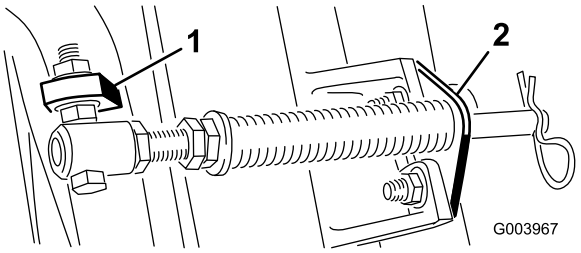



**Figure 5**

1. Opposite carrier frame tab
2. Rod bracket

   D. Mount the rod bracket to the cutting unit tabs with the carriage bolts and nuts (Figure 5).

**Note:** When installing or removing the cutting units, make sure the hairpin cotter is installed in the spring rod hole next to the rod bracket. Otherwise, the hairpin cotter must be installed in the hole in the end of the rod.

6. Lower all the lift arms completely.
7. Remove the snapper pin and the cap from the lift arm pivot yoke (Figure 6).

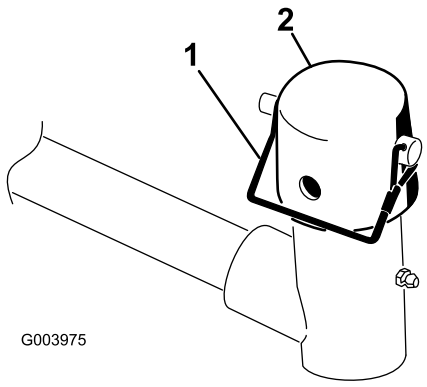



**Figure 6**

1. Snapper pin
2. Cap

8. For the front cutting units, slide a cutting unit under the lift arm while inserting the carrier frame shaft up into the lift arm pivot yoke (Figure 7).

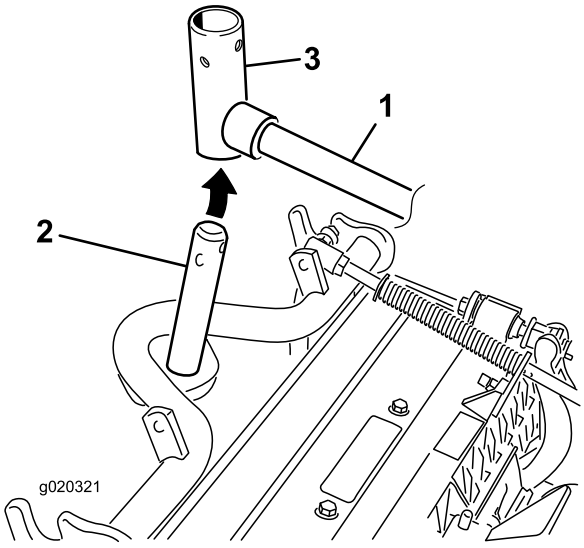



**Figure 7**

1. Lift arm
2. Carrier frame shaft
3. Lift arm pivot yoke

9. Use the following procedure on the rear cutting units when the height of cut is above 1.2 cm (3/4 inch).
   A. Remove the lynch pin and washer securing the lift arm pivot shaft to the lift arm and slide the lift arm pivot shaft out of the lift arm (Figure 8).

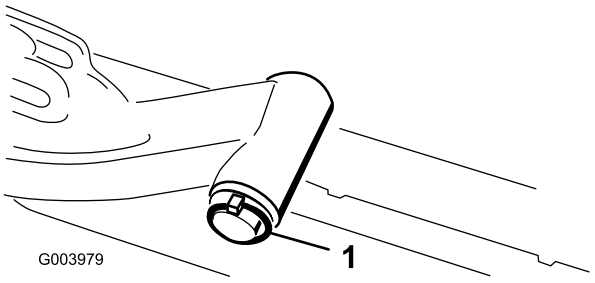



**Figure 8**

1. Lift arm shaft lynch pin and washer

   B. Insert the lift arm yoke onto the carrier frame shaft (Figure 7).
   C. Insert the lift arm shaft into the lift arm and secure it with the washer and lynch pin (Figure 8).
10. Insert the cap over the carrier frame shaft and lift arm yoke.
11. Secure the cap and the carrier frame shaft to the lift arm yoke with the snapper pin. Use the slot if a steering cutting unit is desired or use the hole if the cutting unit is to be locked in position (Figure 6).
12. Secure the lift arm chain to the chain bracket with the snapper pin (Figure 9). Use the number of chain links described in the cutting unit Operator's Manual.

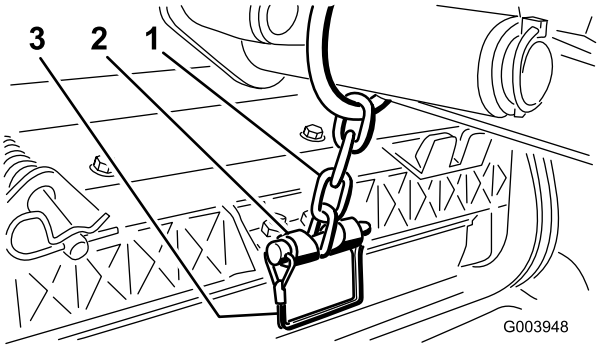



**Figure 9**

1. Lift arm chain
2. Chain bracket
3. Snapper pin

13. Coat the spline shaft of the reel motor with clean grease.
14. Oil the reel motor O-ring and install it onto the motor flange.
15. Install the motor by rotating it clockwise so that the motor flanges clear the lock nuts (Figure 10). Rotate the motor counterclockwise until the flanges encircle the nuts then tighten the nuts.

**Important: Make sure the reel motor hoses are not twisted, kinked or in the risk of being pinched.**

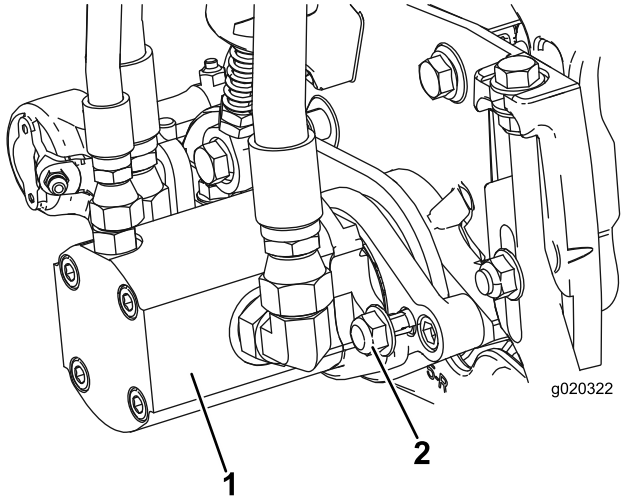



**Figure 10**

1. Reel drive motor
2. Mounting nuts

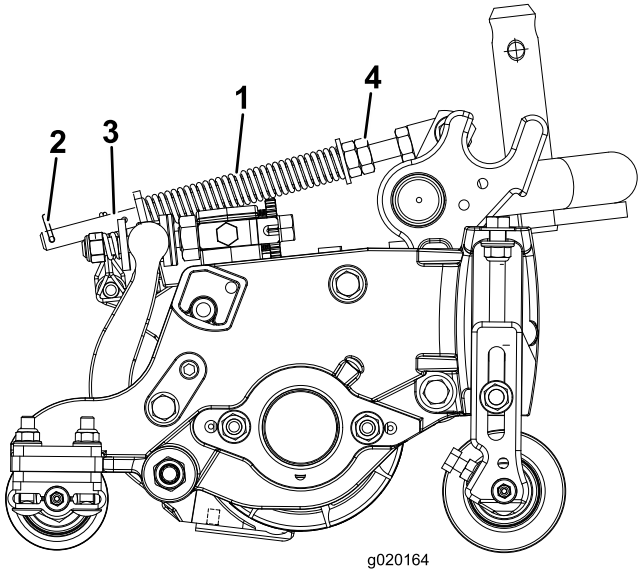



**Figure 11**

1. Turf compensation spring
2. Hair pin cotter
3. Spring rod
4. Hex nuts

# 2

# Adjusting the Turf Compensation Spring

## No Parts Required

## Procedure

The turf compensation spring (Figure 11) transfers weight from the front to the rear roller. (This helps to reduce a wave pattern in the turf, also known as marcelling or bobbing.)

**Important: Make spring adjustments with the cutting unit mounted to the traction unit, pointing straight ahead and lowered to the shop floor.**

1. Make sure the hairpin cotter is installed in the rear hole in the spring rod (Figure 11).
2. Tighten the hex nuts on the front end of the spring rod until the compressed length of the spring (Figure 11) is 12.7 cm (5 inches).

   **Note:** When operating on rough terrain decrease the spring length by 2.5 cm (1/2 inch). Ground following will be slightly decreased.

# 3

# Install CE Decals

## Parts needed for this procedure:

| | |
|---|---|
| 1 | Warning decal (120–1686) |

## Procedure

If this machine will be used for CE, affix the warning decal 120-1686 over English warning decal 120-1683.

# 4

# Installing the Hood Latch (CE Only)

## Parts needed for this procedure:

| | |
|---|---|
| 1 | Lock bracket |
| 2 | Rivet |
| 1 | Washer |
| 1 | Screw, 1/4 x 2 inches |
| 1 | Locknut, 1/4 inch |

## Procedure

1. Unhook the hood latch from the hood latch bracket.
2. Remove the (2) rivets securing the hood latch bracket to the hood (Figure 12). Remove the hood latch bracket from the hood.

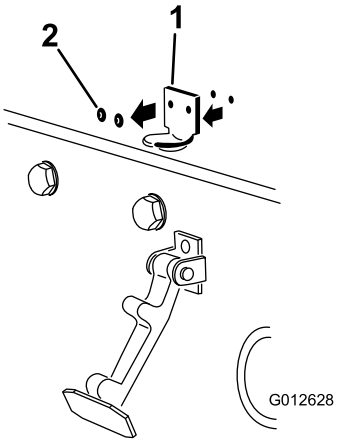



**Figure 12**

1. Hood latch bracket
2. Rivets

3. While aligning the mounting holes, position the CE lock bracket and the hood latch bracket onto the hood. The lock bracket must be against the hood (Figure 13). Do not remove bolt and nut assembly from the lock bracket arm.

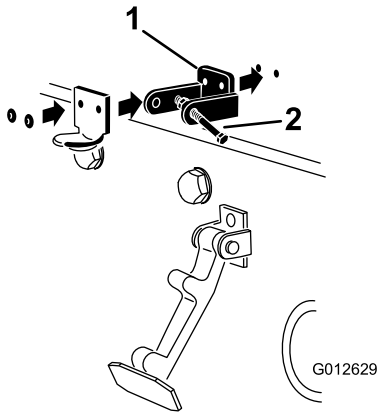



**Figure 13**

1. CE lock bracket
2. Bolt and nut assembly

4. Align the washers with the holes on the inside of the hood.
5. Rivet the brackets and the washers to the hood (Figure 13).
6. Hook the latch onto the hood latch bracket (Figure 14).

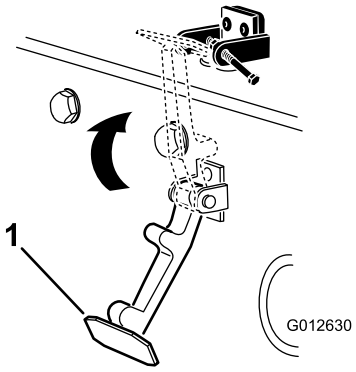



**Figure 14**

1. Hood latch

7. Screw the bolt into the other arm of hood lock bracket to lock the latch in position (Figure 15). Tighten bolt securely but do not tighten nut.

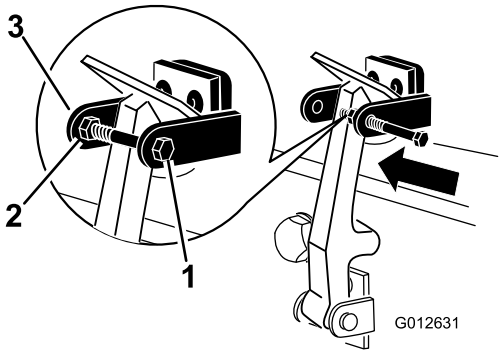



**Figure 15**

1. Bolt
2. Nut
3. Arm of hood lock bracket

# 5

# Using the Cutting Unit Kickstand

## Parts needed for this procedure:

| | |
|---|---|
| 1 | Cutting unit kickstand |

## Procedure

Whenever the cutting unit has to be tipped to expose the bedknife/reel, prop up the rear of the cutting unit with the kickstand to make sure the nuts on the back end of the bedbar adjusting screws are not resting on the work surface (Figure 16).

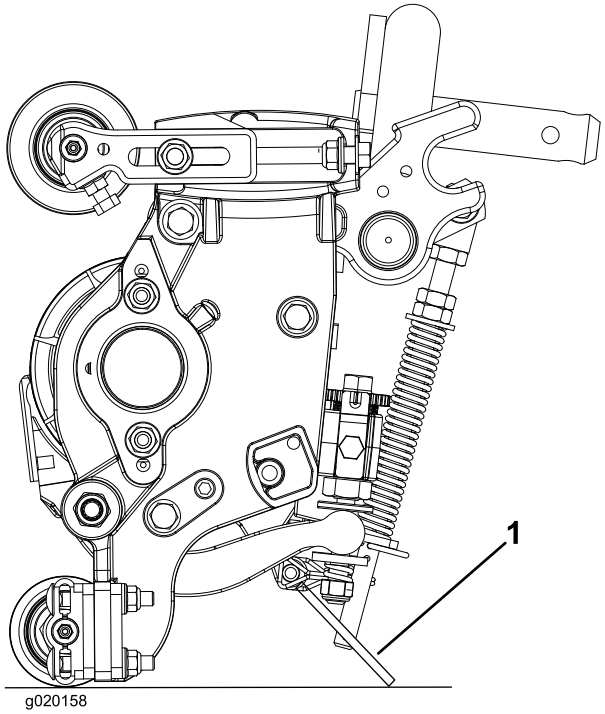



**Figure 16**

1. Cutting unit kickstand

Secure the kickstand to the chain bracket with the snapper pin (Figure 17).

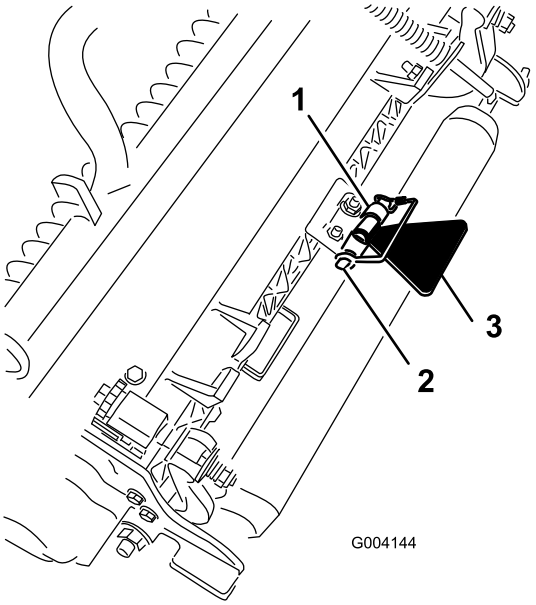



**Figure 17**

1. Chain bracket
2. Snapper pin
3. Cutting unit kickstand

# Product Overview

## Controls

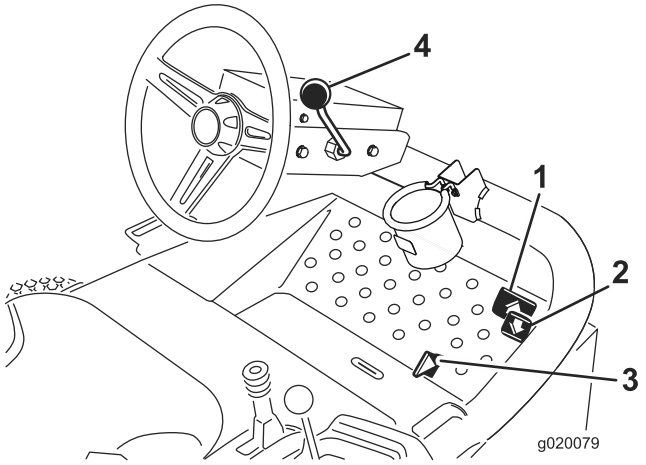



**Figure 18**

1. Forward traction pedal
2. Reverse traction pedal
3. Mow/transport slide
4. Tilt steering lever

### Traction Pedals

Press the traction forward pedal (Figure 18) to move forward. Press traction reverse pedal (Figure 18) to move backward or to assist in stopping when moving forward. Also, allow the pedal to move or move it to the neutral position to stop the machine.

### Mow/Transport Slide

Using your heel, move the mow/transport slide (Figure 18) to the left to transport and to the right to mow. **The cutting units will only operate in the mow position and not lower in the transport position.**

**Important: The mow speed is set at the factory to 9.7 km/h (6 MPH). It can be increased or decreased by adjusting the speed stop screw (Figure 19).**

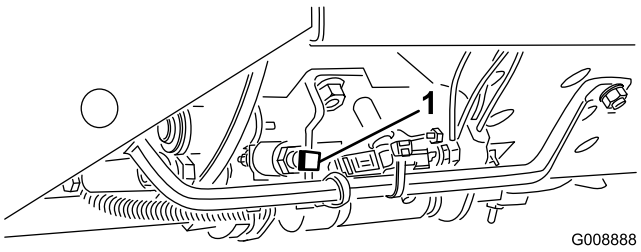



**Figure 19**

1. Speed stop screw

### Tilt Steering Lever

Pull the tilt steering lever (Figure 18) back to tilt the steering wheel to the desired position. Then push the lever forward to tighten.

### Ignition Switch

The ignition switch (Figure 20), used to start, stop, and preheat the engine, has three positions: Off, On/Preheat, and Start. Rotate the key to the On/Preheat position until the glow plug indicator light goes out (approximately 7 seconds); then rotate the key to the Start position to engage the starter motor. Release the key when the engine starts. The key will move automatically to the On/Run position. To shut the engine off, rotate the key to the Off position. Remove the key from the switch to prevent accidental starting.

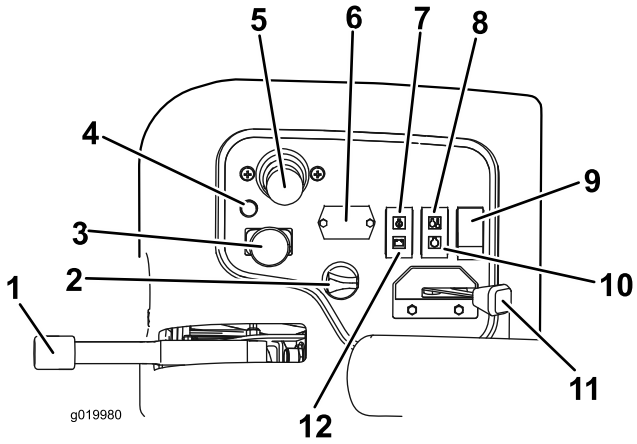



**Figure 20**

1. Parking brake
2. Ignition switch
3. Enable/Disable switch
4. Diagnostic light
5. Lower mow/raise control lever
6. Hour meter
7. Oil pressure light
8. Temperature light
9. Light switch
10. Glow plug indicator light
11. Throttle
12. Alternator light

### Throttle

Move the throttle (Figure 20) forward to increase the engine speed and rearward to decrease the engine speed.

### Enable/Disable Switch

Use the enable/disable switch (Figure 20) in conjunction with the lower mow/raise control lever to operate the cutterheads. **The cutting units cannot be lowered when the mow/transport lever is in the transport position.**

### Hour Meter

The hour meter (Figure 20) indicates the total hours of machine operation. The hour meter starts to function whenever the key switch is On.

## Lower Mow/Raise Control Lever

This lever (Figure 20) raises and lowers the cutting units and also starts and stops the cutterheads when the cutterheads are enabled in the mow mode. **The cutting units cannot be lowered when the mow/transport lever is in the transport position.**

**Note:** When the cutting units re enabled, the lever does not have to be held in the forward position while the cutting units are lowered or raised.

## Engine Coolant Temperature Warning Light

The temperature warning light (Figure 20) glows if the engine coolant temperature is high. The cutting units will disable, if the traction unit is not stopped and the coolant temperature rises another 10° F, the engine will kill.

## Oil Pressure Warning Light

The oil pressure warning light (Figure 20) glows if the engine oil pressure drops below a safe level.

## Alternator Light

The alternator light (Figure 20) should be off when the engine is running. If it is on, the charging system should be checked and repaired as necessary.

## Glow Plug Indicator

The glow plug indicator light (Figure 20) will glow when the glow plugs are operating.

## Parking Brake

Whenever the engine is shut off, engage the parking brake (Figure 20) to prevent accidental movement of the machine. To engage the parking brake, pull up on the lever. The engine will stop if you press the traction pedal with the parking brake engaged.

## Diagnostic Light

The diagnostic light (Figure 20) will illuminate should a system fault be recognized.

## Fuel Gauge

The fuel gauge (Figure 21) registers the amount of fuel in the tank.

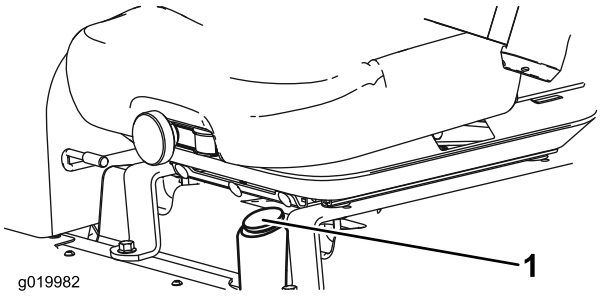



**Figure 21**

1. Fuel gauge

## Power Point

The power point, located on the outside of the control panel, is a 12 volt power supply for electronic devices (Figure 22).

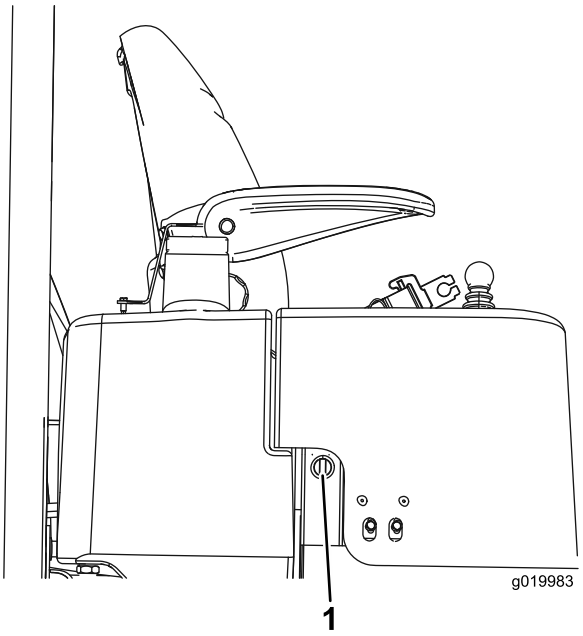



**Figure 22**

1. Power point

## Reel Speed Control Knob

The reel speed control controls the speed of the cutting units (Figure 23). The reel speed increases as the knob is turned counter clockwise. Refer to the reel speed chart decal (Figure 31), to determine the proper reel speed.

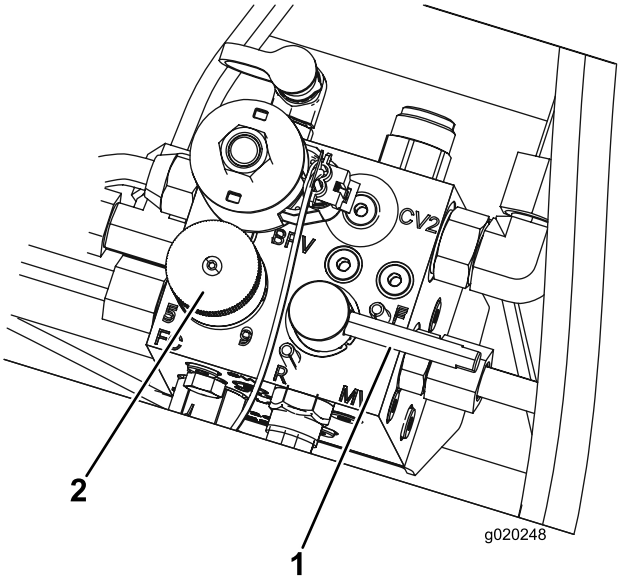



**Figure 23**

1. Backlap lever
2. Reel speed control knob

## Backlap Lever

Use the backlap lever in conjunction with the lower mow/raise control lever for the reels (Figure 23).

# Specifications

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

| | |
|---|---|
| Width of Cut | 208 cm (82 inches) |
| Overall Width | 239 cm (94 inches) |
| Transport Width | 231 cm (91 inches) |
| Overall Length | 295 cm (110 inches) |
| Height to top of ROPS | 188 cm (74 inches) |
| Wheel Base | 151 cm (59.5 inches) |
| Weight with 18 inch, 8 blade cutting units | 900 kg (1985 lbs) |
| Weight without cutting units | 708 kg (1560 lbs) |

## Attachments/Accessories

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

# Operation

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

# Checking the Engine Oil Level

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

The engine is shipped with oil in the crankcase; however, the oil level must be checked before and after the engine is first started.

Crankcase capacity is approximately 4 qt (2.8 l) 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 15W-40 (above 0ºF (-17ºC))
- Alternate oil: SAE 10W-30 or 5W-30 (all temperatures)

**Note:** Toro Premium Engine oil is available from your distributor in either 15W-40 or 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.

1. Position the machine on a level surface.
2. Remove the dipstick (Figure 24) and wipe it with a clean rag.

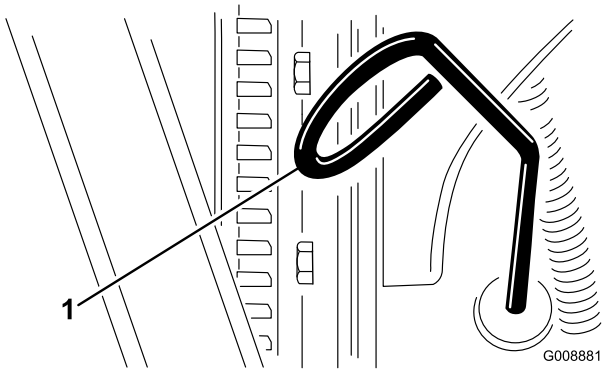



**Figure 24**

1. Dipstick

3. Push the dipstick down into the dipstick tube and make sure that it is seated fully. Pull the dipstick out and check the oil level.
4. If the oil level is low, remove the oil fill cap (Figure 25) and gradually add small quantities of oil, checking the level frequently, until the level reaches the Full mark on the dipstick.

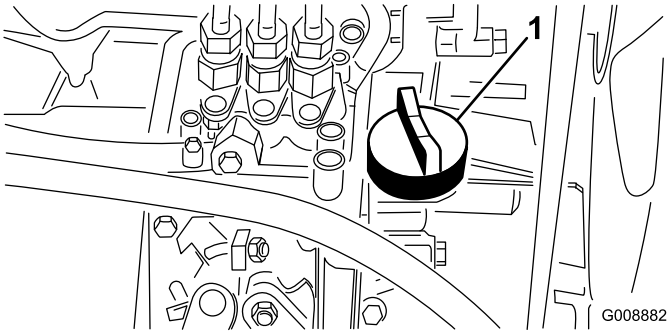



**Figure 25**

1. Oil fill cap

5. Install the oil fill cap and close the hood.

# 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.

The fuel tank capacity is approximately 42 liters (11 gallons).

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

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

**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

1. Clean the area around the fuel tank cap (Figure 26).
2. Remove the fuel tank cap.
3. Fill the tank to the bottom of the filler neck. **Do not overfill.** Install the cap.
4. To prevent a fire hazard, wipe up any fuel that may have spilled.

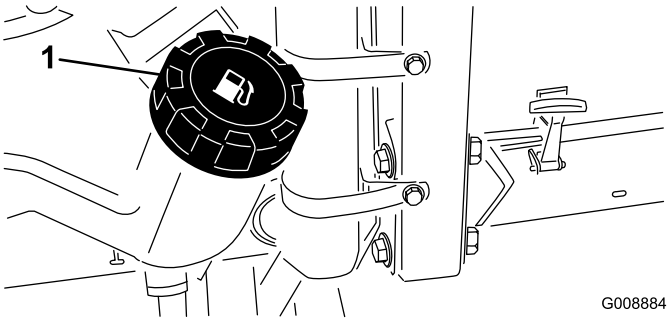



**Figure 26**

1. Fuel tank cap

**⚠ 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, safety-approved container and keep the cap in place.**

# Checking the Cooling System

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

Clean debris off of the radiator/oil cooler daily (Figure 27). Clean the radiator/oil cooler hourly if conditions are extremely dusty and dirty; refer to Cleaning the Engine Cooling System.

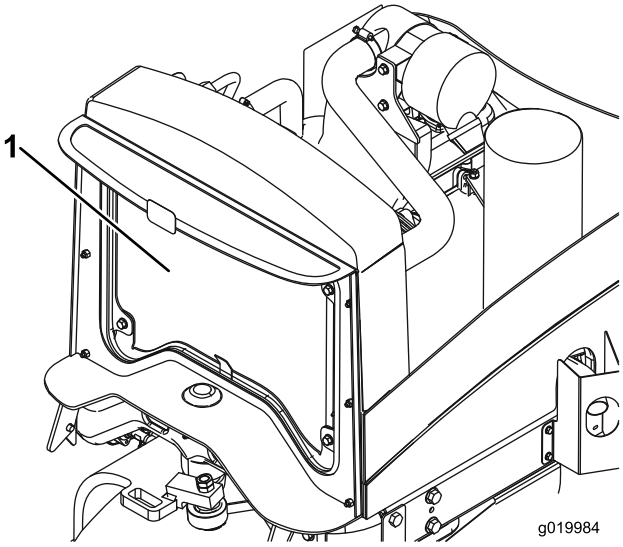



**Figure 27**

1. Radiator/oil cooler

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol anti-freeze. Check the coolant level at the beginning of each day before starting the engine.

The capacity of the cooling system is approximately 6 qt (5.7 l).

**⚠ 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. Check the coolant level in the expansion tank (Figure 28). With a cold engine, the coolant level should be approximately midway between the marks on the side of the tank.
2. If the coolant level is low, remove the expansion tank cap and replenish the system. **Do not overfill.**
3. Install the expansion tank cap.

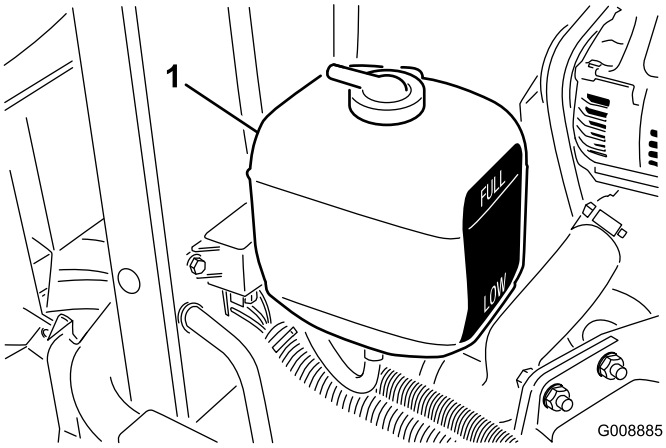



**Figure 28**

1. Expansion tank

# Checking the Hydraulic System

**Service Interval:** Before each use or daily—Check the hydraulic fluid level.

The machines reservoir is filled at the factory with approximately 13.2 liters (3.5 U.S. gallons) of high quality hydraulic fluid. **Check the level of the hydraulic fluid before the engine is first started and daily thereafter.** The recommended replacement fluid is **Toro Premium All Season Hydraulic Fluid** (Available in 5 gallon pails or 55 gallon drums. See parts catalog or Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, other fluids may be used provided they meet all the following material properties and industry specifications. Toro does not recommend the use of synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product Note: Toro will not assume responsibility for damage caused by improper substitutions, so use only products from reputable manufacturers who will stand behind their recommendation.

**High Viscosity Index/Low Pour Point Anti-wear Hydraulic Fluid, ISO VG 46**

Material Properties:

| | |
|---|---|
| Viscosity, ASTM D445 | cSt @ 40°C 44 to 48<br>cSt @ 100°C 7.9 to 8.5 |
| Viscosity Index ASTM D2270 | 140 to 160 |
| Pour Point, ASTM D97 | -34°F to -49°F |

Industry Specifications:

Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0

**Note:** Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 2/3 oz. (20 ml) bottles. One bottle is sufficient for 4-6 U.S. gallons (15-22 1) of hydraulic oil. Order part no. 44-2500 from your authorized Toro distributor.

**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 liter (5 gallon) containers or 208 liter (55 gallon) drums from your Mobil Distributor.**

1. Position the machine on a level surface, lower the cutting units, and stop the engine.
2. Clean the area around the filler neck and cap of the hydraulic tank (Figure 29). Remove the cap.

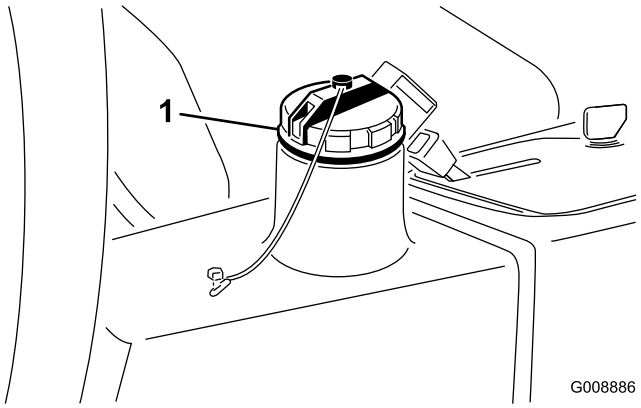



**Figure 29**

1. Hydraulic tank cap

3. Remove the dipstick from the filler neck and wipe it with a clean rag. Insert the dipstick into the filler neck; then remove it and check the fluid level. The fluid level should be within 6 mm (1/4 inch) of the mark on the dipstick.
4. If the level is low, add the appropriate fluid to raise the level to the full mark.
5. Install the dipstick and cap onto the filler neck.

# Checking the Reel to Bedknife Contact

Each day before operating, check reel to bedknife contact, regardless if the quality of cut had previously been acceptable. There must be light contact across the full length of the reel and the bedknife (refer to Adjusting the Reel to Bedknife in the cutting unit Operator's Manual).

# Checking the Tire Pressure

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

The tires are over-inflated for shipping. Therefore, release some of the air to reduce the pressure. The correct air pressure in the tires is 96 kPa (12 psi).

**Note:** Maintain the recommended pressure in all tires to ensure a good quality of cut and proper machine performance.

**⚠ DANGER**

**Low tire pressure decreases machine side hill stability. This could cause a rollover, which may result in personal injury or death.**

**Do not under-inflate the tires.**

# Torquing the Wheel Nuts

**Service Interval:** After the first hour

After the first 10 hours

Every 200 hours

Torque the wheel nuts to 61 to 88 N-m (45 to 65 ft-lb).

**⚠ WARNING**

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

# Positioning the Seat

## Changing the Seat Position

The seat can move forward and backward. Position the seat where you have the best control of the machine and are most comfortable

1. To adjust, move the lever sideways to unlock seat (Figure 30).
2. Slide the seat to the desired position and release lever to lock in position.

## Changing the Seat Suspension

The seat can be adjusted to provide a smooth and comfortable ride. Position the seat where you are most comfortable.

To adjust it, turn the knob in front either direction to provide the best comfort (Figure 30).

## Changing the Back Position

The back of the seat can be adjusted to provide a comfortable ride. Position the back of the seat where it is most comfortable.

To adjust it, turn the knob, under the right-side arm rest, in either direction to provide the best comfort (Figure 30).

## Changing the Arm Rest Position

The armrests of the seat can be adjusted to provide a comfortable ride. Position the armrests where they are most comfortable.

To adjust, raise the arm rest and turn the knob, in either direction, to provide the best comfort (Figure 30).

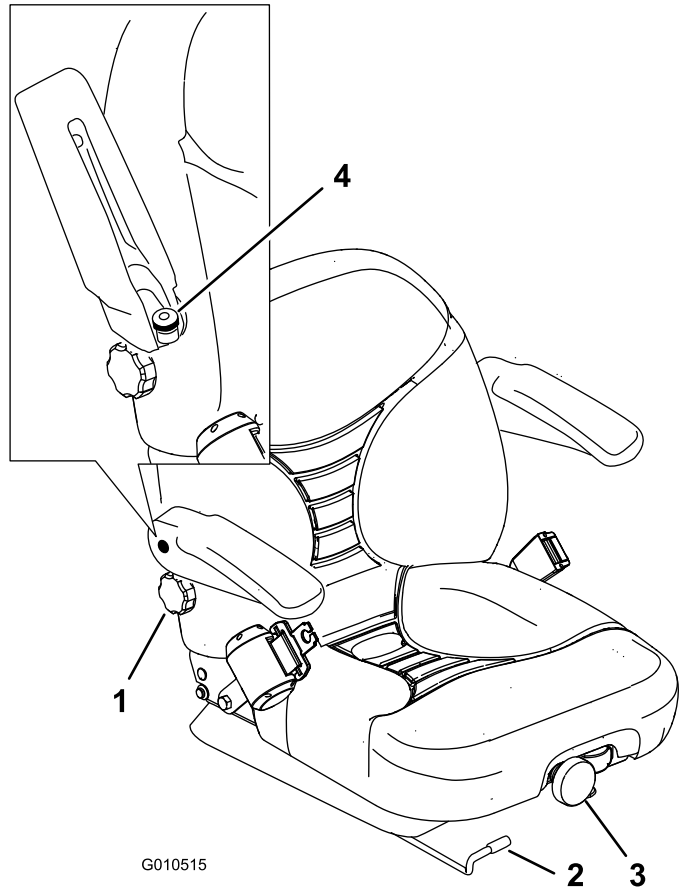



**Figure 30**

1. Back rest knob
2. Seat position adjustment lever
3. Seat suspension knob
4. Arm rest adjusting knob

# Starting and Stopping the Engine

You may need to bleed the fuel system if any of the following situations have occurred (refer to Bleeding the Fuel System):

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

## Starting the Engine

1. Be sure that the parking brake is set and the cutting unit drive switch is in the Disengage position.
2. Remove your foot from the traction pedal and make sure that the pedal is in the neutral position.
3. Move the throttle lever to the 1/2 throttle position.
4. Insert the key into the switch and rotate it to the On/Preheat position until the glow plug indicator light goes out (approximately 7 seconds); then rotate the key to the Start position to engage the starter motor. Release the key when the engine starts. The key will move automatically to the On/Run position.

   **Important: To prevent overheating of the starter motor, do not engage the starter longer than 15 seconds. After 10 seconds of continuous cranking, wait 60 seconds before engaging the starter motor again.**
5. When the engine is started for the first time or after an overhaul of the engine, operate the machine in forward and reverse for one to two minutes. Also operate the lift lever and cutting unit drive switch to be sure of proper operation of all parts.

   Turn the steering wheel to the left and right to check steering response; then shut the engine off and check for oil leaks, loose parts, and any other noticeable malfunctions.

**⚠ CAUTION**

**Stop the engine and wait for all moving parts to stop before checking for oil leaks, loose parts, and other malfunctions.**

## Stopping the Engine

Move the throttle control to the Idle position, move the cutting unit drive switch to Disengage, and rotate the starter key to Off. Remove the key from the switch to prevent accidental starting.

# Setting the Reel Speed

To achieve a consistent, high quality-of-cut and a uniform after cut appearance, it is important that you set the reel speed controls (located under the seat) correctly. Adjust the reel speed controls 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. Use the graph, on reel speed chart decal (Figure 31), to determine the proper reel speed setting.

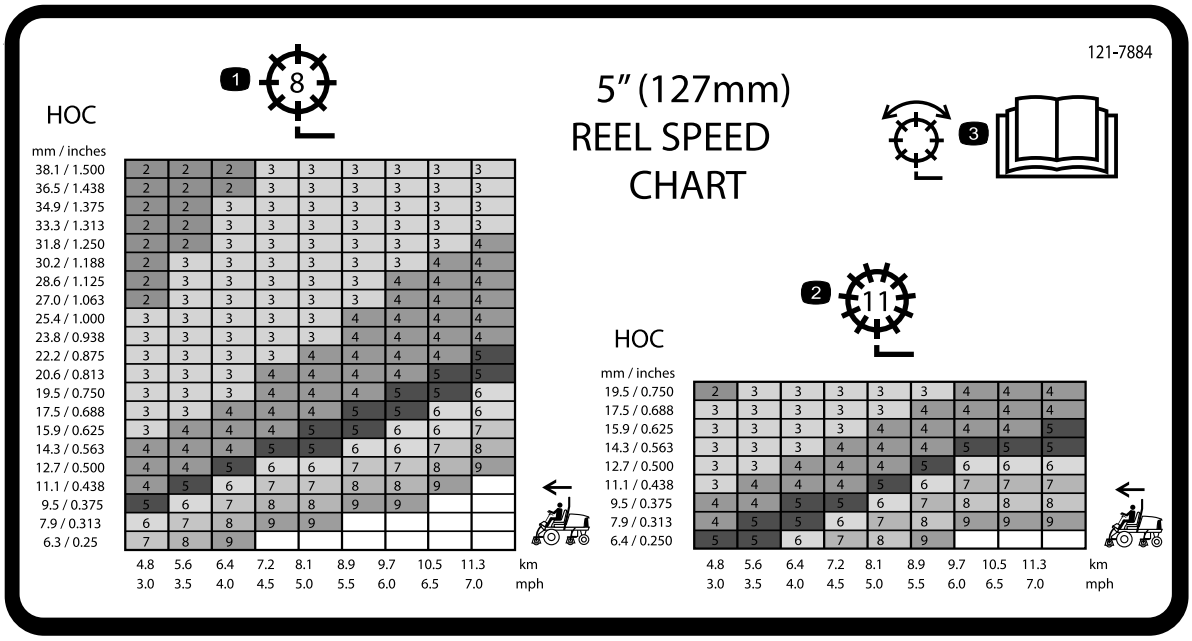



**Figure 31**

1. 8 blade reel adjustment
2. 11 blade reel adjustment
3. Read the *Operator's Manual* for information on adjusting the reel.

4. To set the reel speed, rotate the knob (Figure 32) until the indicator arrow is in line with the number designating the desired setting.

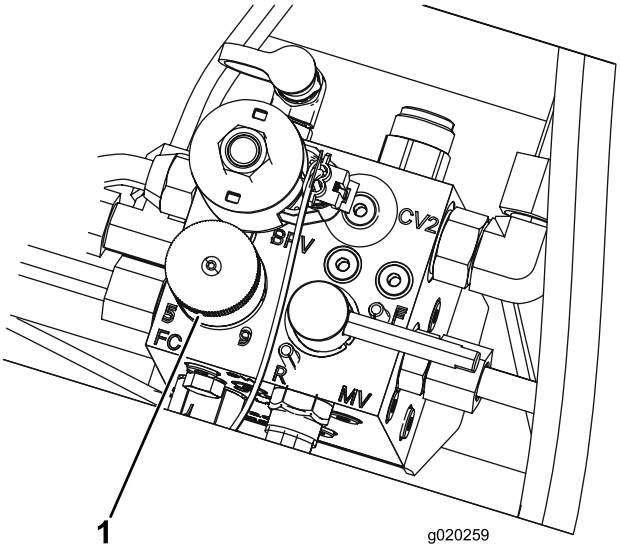



**Figure 32**

1. Reel speed control knob

**Note:** The reel speed can be increased or decreased to compensate for turf conditions. When using baskets, increase the reel speed to improve collection performance.

# Adjusting the Lift Arm Counterbalance

You can adjust the counterbalance on the rear cutting unit lift arms to compensate for different turf conditions and to maintain a uniform height-of-cut in the rough conditions or in areas of thatch build up.

You can adjust each counterbalance spring to one of four settings. Each increment increases or decreases counterbalance on the cutting unit by 1.4 kg (3 lb). The springs can be positioned on the back side of the first spring actuator to remove all counter balance (forth position).

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brakes, and remove the key from ignition switch
2. Insert a tube or similar object onto the long spring end to relieve the spring tension during the adjustment (Figure 33).

**⚠ CAUTION**

**The springs are under tension.**

**Use caution when adjusting them.**

3. While relieving the spring tension, remove the bolt and locknut securing the spring actuator to the bracket (Figure 33).

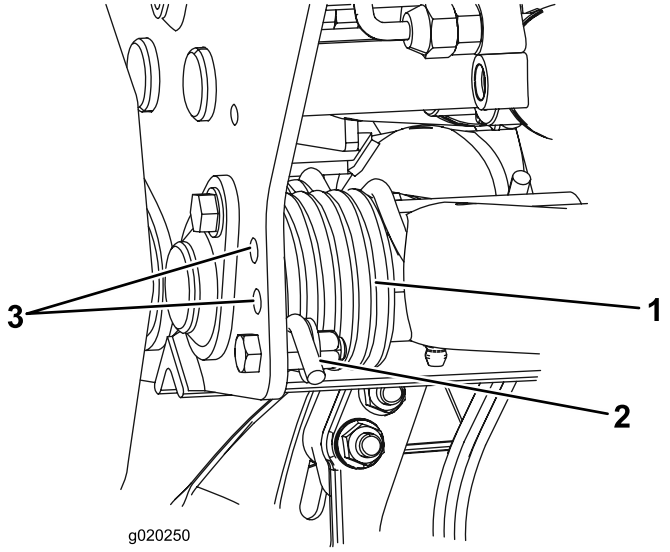



**Figure 33**

1. Spring
2. Spring actuator
3. Additional hole locations

4. Move the spring actuator to the desired hole location and secure with locknut.
5. Repeat the procedure on the remaining spring.

# Bleeding the Fuel System

1. Park the machine on a level surface. Make sure that the fuel tank is at least half full.
2. Unlatch and raise the hood.

**⚠ 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, safety-approved container and keep the cap in place.**

3. Open the air bleed screw on the fuel injection pump (Figure 34).

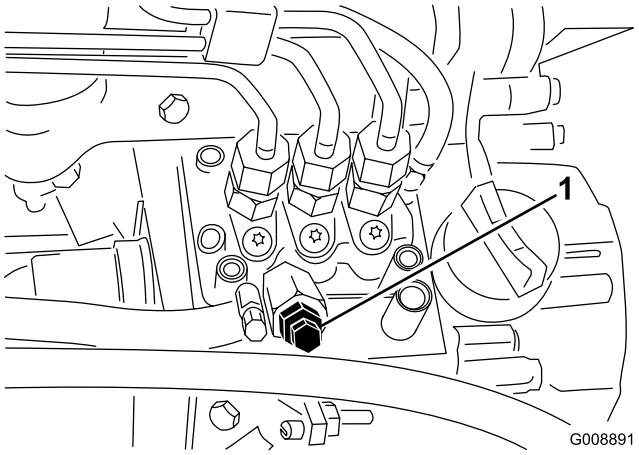



**Figure 34**

1. Fuel injection pump bleed screw

4. Turn the key in the ignition switch to the On position. The electric fuel pump will begin operation, thereby forcing air out around the air bleed screw. Leave the key in the On position until a solid stream of fuel flows out around the screw.
5. Tighten the screw and turn the key to Off.

**Note:** Normally the engine should start after the above bleeding procedures are followed. However, if the engine does not start, air may be trapped between the injection pump and injectors; refer to Bleeding Air from the Injectors.

# Understanding the Diagnostic Light

The machine is equipped with a diagnostic light which indicates if the electronic controller senses an electronic malfunction. The diagnostic light is located on the control panel (Figure 35). When the electronic controller is functioning correctly and the key switch is moved to the On position, the controller diagnostic light will turn ON for 3 seconds and turn OFF to indicate the light is working properly. If the machine kills the light will turn on steady until the key position is changed. The light will blink if the controller detects a malfunction in the electrical system. The light will stop blinking and automatically reset when the key switch is turned to the Off position once the fault has been resolved.

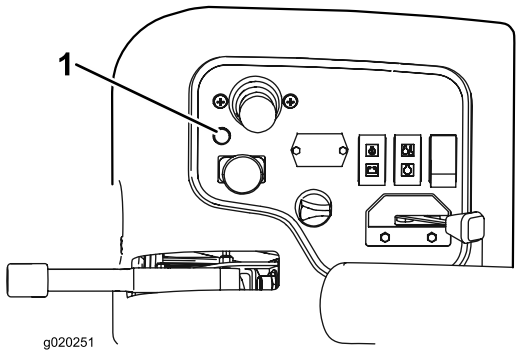



**Figure 35**

1. Diagnostic light

When the controller diagnostic light blinks, one of the following problems has been detected by the controller:

- One of the outputs has been shorted.
- One of the outputs is open circuited.

Using the diagnostic display, determine which output is malfunctioning; refer to Checking the Interlock Switches.

If the diagnostic light is not illuminated when the key switch is in the On position, this indicates that the electronic controller is not operating. Possible causes are as follows:

- Loop-back is not connected
- The light is burned out.
- Fuses are blown.
- It is not functioning correctly.

  Check the electrical connections, input fuses, and diagnostic light bulb to determine the malfunction. Ensure that the loop-back connector is secured to the wire harness connector.

# Diagnostic Ace Display

The machine is equipped with an electronic controller which controls most machine functions. The controller determines what function is required for various input switches (i.e. seat switch, key switch, etc.) and turns on the outputs to actuate solenoids or relays for the requested machine function.

For the electronic controller to control the machine as desired, each of the input switches, output solenoids, and relays must be connected and functioning properly.

Use the Diagnostic ACE display to help verify and correct electrical functions of the machine.

# Checking the Interlock Switches

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

The purpose of the interlock switches is to prevent the engine from cranking or starting unless the traction pedal is in the Neutral position, the Enable/Disable switch is in the Disable position, and the Lower Mow/Raise control is in the Neutral position. In addition, the engine should stop when the traction pedal is pressed with operator off of the seat or if the parking brake is left engaged.

**⚠ CAUTION**

**If 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.**

## Verifying the Interlock Switch Function

1. Park the machine on a level surface, lower the cutting units, stop the engine, and engage the parking brake.
2. Remove the cover from the control panel.
3. Locate the wire harness and loop back connector (Figure 36).

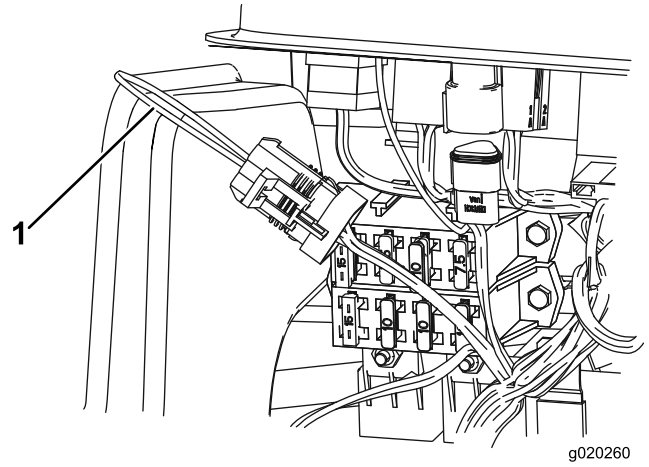



**Figure 36**

1. Loop back connector

4. Carefully unplug the loop back connector from harness connector.
5. Connect the Diagnostic ACE display connector to the harness connector (Figure 37).

   **Note:** Make sure correct overlay decal is positioned on Diagnostic ACE display.

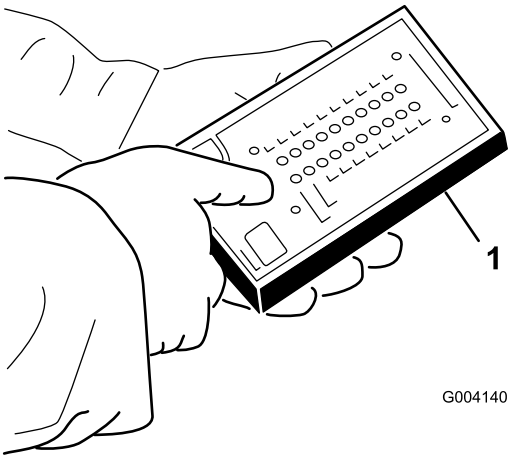



**Figure 37**

1. Diagnostic ACE

6. Turn the key switch to the On position, but do not start the machine.

   **Note:** The red text on the overlay decal refers to input switches and the green text refers to outputs.

7. The "inputs displayed" LED, on the lower right column of the Diagnostic ACE, should be illuminated. If the "outputs displayed" LED is illuminated, press the toggle button, on Diagnostic ACE, to change LED to "inputs displayed".

   The Diagnostic ACE will illuminate the LED associated with each of the inputs when that input switch is closed.

8. Individually, change each of the switches from open to closed (i.e., sit on seat, engage traction pedal, etc.), and note that the appropriate LED on Diagnostic ACE will blink on and off when corresponding switch is closed. Repeat this for all switches that you can change by hand.
9. If a switch is closed and the appropriate LED does not turn on, check all wiring and connections to the switch and/or check the switches with an ohm meter. Replace any defective switches and repair any defective wiring.

   **Note:** The Diagnostic ACE also has the ability to detect which output solenoids or relays are turned on. This is a quick way to determine if a machine malfunction is electrical or hydraulic.

## Verifying Output Function

1. Park the machine on a level surface, lower the cutting units, stop the engine, and engage the parking brake.
2. Remove the access panel from the side of the control arm.
3. Locate wire harness and connectors near controller.
4. Carefully unplug loop back connector from harness connector
5. Connect the Diagnostic ACE connector to the harness connector.

   **Note:** Make sure correct overlay decal is positioned on Diagnostic ACE.

6. Turn the key switch to the ON position, but do not start machine.

   **Note:** The red text on the overlay decal refers to input switches and the green text refers to outputs.

7. The "outputs displayed" LED, on lower right column of Diagnostic ACE, should be illuminated. If the "inputs displayed" LED is illuminated, press the toggle button, on the Diagnostic ACE, to change the LED to "outputs displayed".

   **Note:** It may be necessary to toggle between "inputs displayed" and "outputs displayed" several times to do the following step. To toggle back and forth, press the toggle button once. This may be done as often as required. Do not hold the button.

8. Sit on the seat and attempt to operate the desired function of the machine. The appropriate output LEDs should illuminate to indicate that the ECM is turning on that function.

   **Note:** If the correct output LEDs do not illuminate, verify that the required input switches are in the necessary positions to allow that function to occur. Verify correct switch function. If the output LEDs are on as specified, but the machine does not function properly, this indicates a non-electrical problem. Repair as necessary.

   **Note:** If each output switch is in the correct position and functioning correctly, but the output LEDs are not

correctly illuminated, this indicates an ECM problem. If this occurs, contact your Toro Distributor for assistance

**Important: The Diagnostic ACE display must not be left connected to the machine. It is not designed to withstand the environment of the machine's every day use. When done using the Diagnostic ACE, disconnect it from the machine and connect loop-back connector to harness connector. The machine will not operate without loopback connector installed on the harness. Store the Diagnostic ACE in dry, secure location in the shop, not on the machine**

# Towing the Traction Unit

In case of an emergency, the machine can be towed for a short distance; however, Toro does not recommend this as a standard procedure.

**Important: Do not tow the machine faster than 3 to 4 km/h (2 to 3 MPH) because the drive system may become damaged. If the machine must be moved a considerable distance, transport it on a truck or trailer.**

1. Locate the bypass valve on the pump (Figure 38) and rotate it 90°.

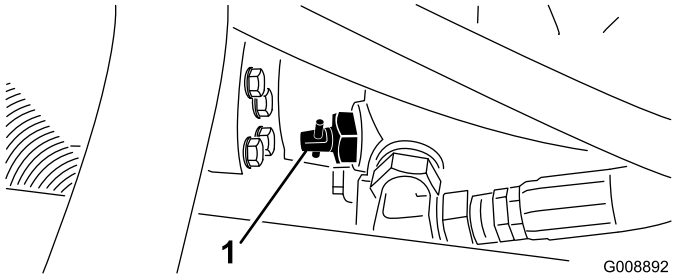



**Figure 38**

1. Bypass valve

2. Before starting the engine, close the bypass valve by rotating it 90° (1/4 turn). Do not start the engine when the valve is open.

# Operating Tips

## General Tips

## Familiarization

Before mowing grass, practice operating machine in an open area. Start and stop the engine. Operate in forward and reverse. Lower and raise cutting units and engage and disengage reels. When you feel familiar with the machine, practice operating up and down slopes at different speeds.

**⚠ DANGER**

**When operating the machine, always use the seat belt and ROPS together. Do not use a seat belt without a ROPS.**

## Warning System

If a warning light comes on during operation, stop the machine immediately and correct the problem before continuing operation. Serious damage could occur if you operate the machine with a malfunction.

## Mowing

Start the engine and move the throttle to the Fast position. Move the Enable/Disable switch to the Enable position and use the Lower Mow/Raise lever to control the cutting units (the front cutting units are timed to lower before the rear cutting units). To move forward and cut grass, press the traction pedal forward.

## Transport

Move the Enable/Disable switch to the Disable position and raise the cutting units to the transport position. Move the Mow/Transport lever to the transport position. Be careful when driving between objects so you do not accidentally damage the machine or cutting units. Use extra care when operating the machine on slopes. Drive slowly and avoid sharp turns on slopes to prevent roll overs. Lower the cutting units when going downhill for steering control.

# 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 | • Torque the wheel nuts. |
| After the first 10 hours | • Torque the wheel nuts.<br>• Check the condition and tension of all belts.<br>• Change the hydraulic filter. |
| After the first 50 hours | • Change the oil and oil filter. |
| Before each use or daily | • Check the engine oil level.<br>• Check the engine coolant level.<br>• Check the hydraulic fluid level.<br>• Check the tire pressure.<br>• Check the interlock system.<br>• Drain the water separator.<br>• Clean debris off of the radiator and oil cooler.<br>• Check the hydraulic lines and hoses. |
| Every 25 hours | • Check the electrolyte level. (If machine is in storage, check every 30 days.) |
| Every 50 hours | • Lubricate all bearings and bushings. (Lubricate all bearings and bushings daily when conditions are dusty and dirty.) |
| Every 100 hours | • Check the condition and tension of all belts. |
| Every 150 hours | • Change the oil and oil filter. |
| Every 200 hours | • Torque the wheel nuts.<br>• Service the Air Cleaner (More frequently in extreme dusty or dirty conditions)<br>• Check the parking brake adjustment.<br>• Change the hydraulic filter. |
| Every 400 hours | • Check the fuel lines and connections.<br>• Replace the fuel filter canister.<br>• Change the hydraulic fluid. |
| Every 2 years | • Drain and clean the fuel tank. |

**⚠ 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 before you do any maintenance.**

# 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 brake operation. | | | | | | | |
| Check the engine oil level. | | | | | | | |
| Check the cooling system fluid level. | | | | | | | |
| Drain the water/fuel separator. | | | | | | | |
| Check the air filter, dust cup, and burp valve. | | | | | | | |
| Check for unusual engine noises.[2] | | | | | | | |
| Check the radiator/oil cooler for debris | | | | | | | |
| Check for unusual operating noises. | | | | | | | |
| Check the hydraulic system oil level. | | | | | | | |
| Check the hydraulic hoses for damage. | | | | | | | |
| Check for fluid leaks. | | | | | | | |
| Check the fuel level. | | | | | | | |
| Check the tire pressure. | | | | | | | |
| Check the instrument operation. | | | | | | | |
| Check the height-of-cut adjustment. | | | | | | | |
| Lubricate all the grease fittings.[2] | | | | | | | |
| Touch-up any damaged paint. | | | | | | | |

[1]Check the glow plug and injector nozzles if starting is hard, there is excess smoke, or rough running is noted.

[2]Immediately **after every** washing, regardless of the interval listed.

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

## Notation for Areas of Concern

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

# Service Interval Chart

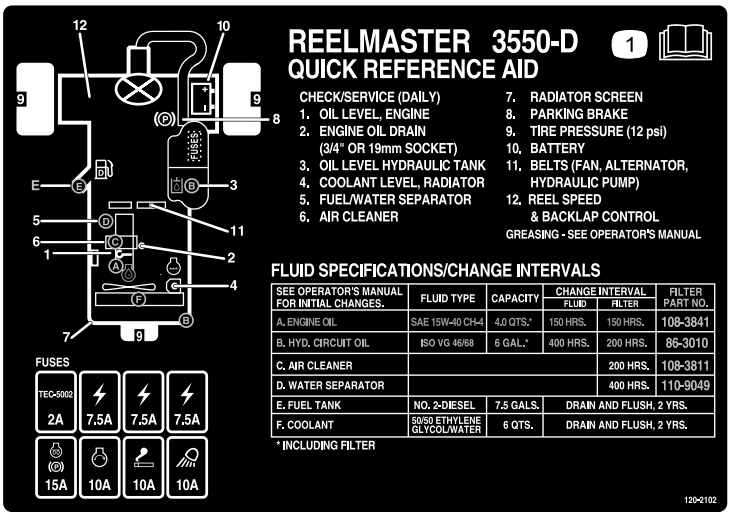



**Figure 39**

# *Premaintenance Procedures*

## Removing the Hood

The hood may be easily removed to ease maintenance procedures in the engine area of the machine.

1. Unlatch and raise the hood.
2. Remove the hairpin cotter securing the hood pivot to the mounting brackets (Figure 40).

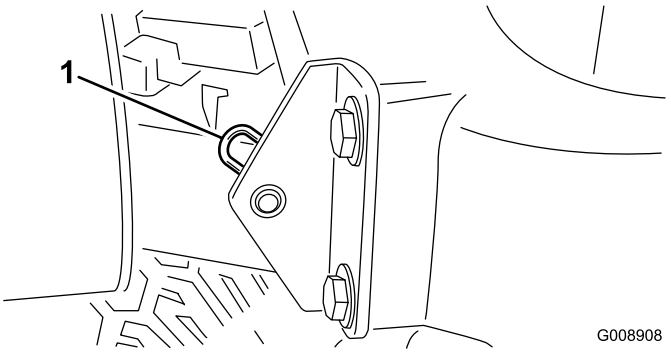



**Figure 40**

1. Hairpin cotter

3. Slide the hood to the right side, lift the other side, and pull it out of the brackets.

**Note:** Reverse the procedure to install the hood.

## Removing the Battery Cover

1. Open the hood.
2. Loosen the knobs and remove the battery cover (Figure 41).

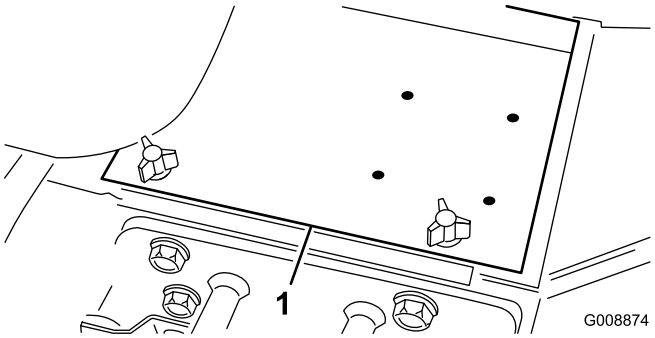



**Figure 41**

3. Refer to Caring for the Battery in the Electrical System Maintenance Section in the *Operator's Manual*.

# Lubrication

## Greasing the Bearings and Bushings

**Service Interval:** Every 50 hours (Lubricate all bearings and bushings daily when conditions are dusty and dirty.)

The machine has grease fittings that must be lubricated regularly with No. 2 General Purpose Lithium Base Grease. Bearings and bushings must be lubricated daily when operating conditions are extremely dusty and dirty. Dusty and dirty operating conditions could cause dirt to get into the bearings and bushings, resulting in accelerated wear. Lubricate grease fittings immediately after every washing, regardless of interval specified.

The grease fitting locations and quantities are:

- Steering pivot (Figure 42)

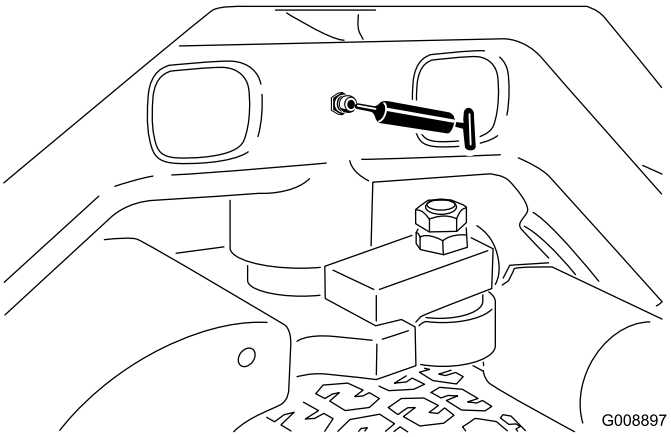



**Figure 42**

- Front lift arm pivots and lift cylinders (3 each) (Figure 43)

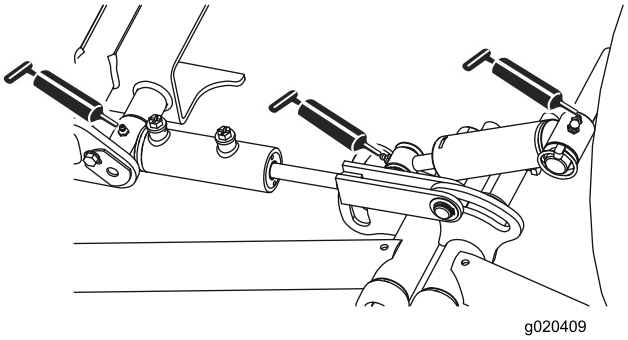



**Figure 43**

- Rear lift arm pivots and lift cylinders (3 ea.) (Figure 44)

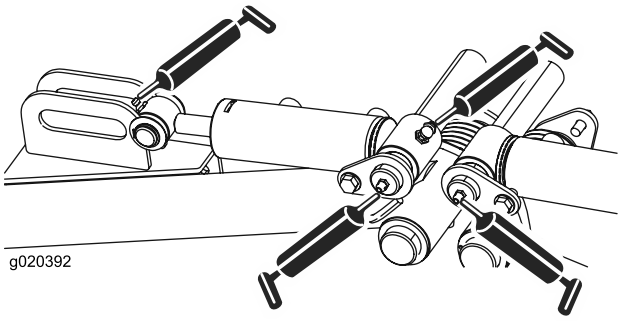



**Figure 44**

- Cutting unit pivots (2 each) (Figure 45)

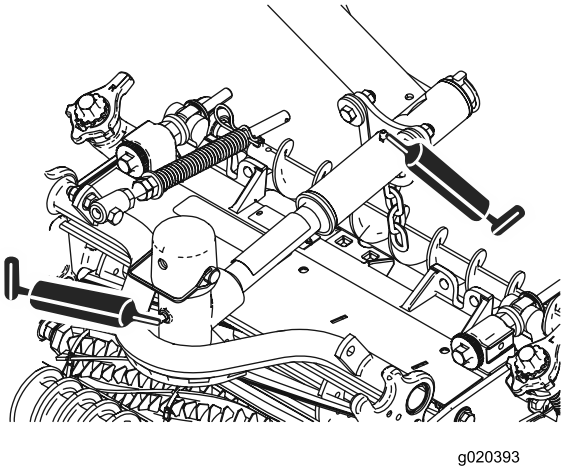



**Figure 45**

- Neutral adjust mechanism (Figure 46)

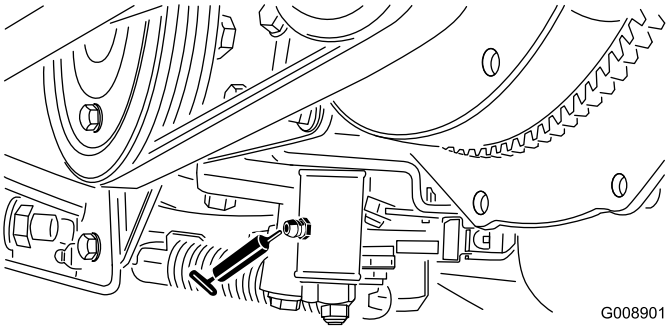



**Figure 46**

- Mow/transport slide (Figure 47)

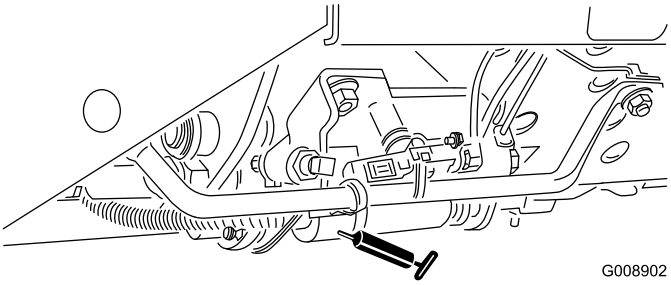



**Figure 47**

- Belt tension pivot (Figure 48)

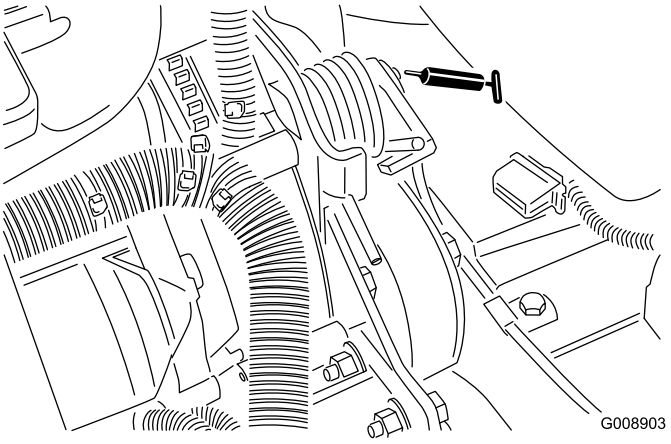



**Figure 48**

- Steering cylinder (Figure 49)

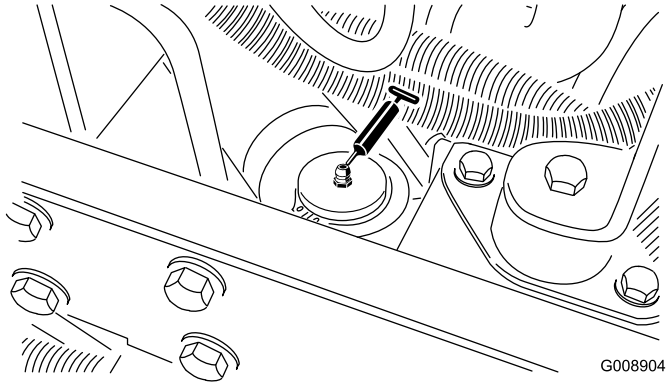



**Figure 49**

**Note:** If desired, an additional grease fitting may be installed in the other end of the steering cylinder. Remove the tire, install the fitting, grease the fitting, remove the fitting, and install the plug (Figure 50).

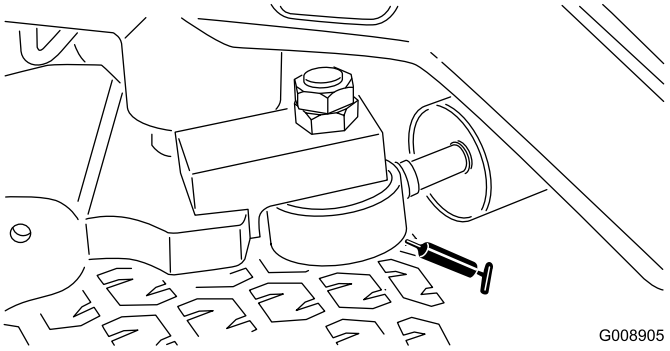



**Figure 50**

# Engine Maintenance

## Servicing the Air Cleaner

**Service Interval:** Every 200 hours (More frequently in extreme dusty or dirty conditions)

- Check the air cleaner body for damage which could cause an air leak. Replace if damaged. Check the whole intake system for leaks, damage, or loose hose clamps.
- Service at the recommended service interval or earlier if engine performance suffers due to extremely dusty, dirty conditions. Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.
- Be sure 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 51).
2. Remove the cover from the air cleaner body (Figure 51).
3. Before removing the filter, use low pressure air (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 the primary filter is removed.
4. Remove and replace the filter (Figure 51).

   Cleaning of the used element is not recommended due to the possibility of damage to the filter media.

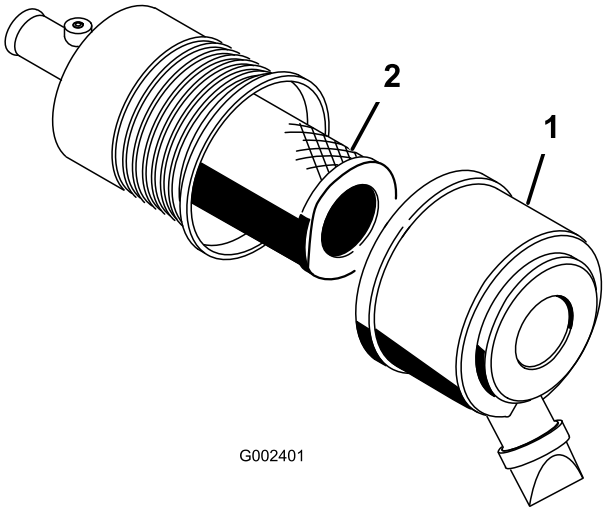



**Figure 51**

1. Air cleaner cover
2. Filter

5. Inspect the new filter for shipping damage, checking the sealing end of the filter and the body. **Do not use a damaged element.**
6. 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.**
7. Clean the dirt ejection port located in the removable cover. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.
8. Install the cover orienting the rubber outlet valve in a downward position—between approximately 5:00 to 7:00 when viewed from the end.
9. Secure the cover latches.

## Changing the Engine Oil and Filter

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

Every 150 hours

1. Remove either drain plug (Figure 52) and let the oil flow into a drain pan. When the oil stops flowing, install the drain plug.

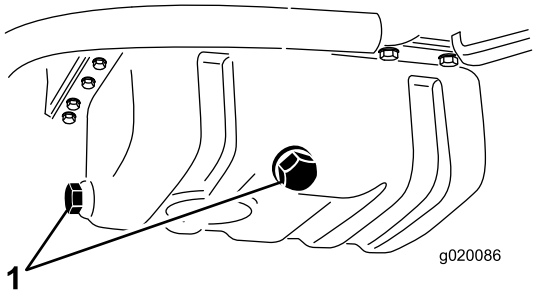



**Figure 52**

1. Engine oil drain plugs

2. Remove the oil filter (Figure 53). Apply a light coat of clean oil to the new filter seal before screwing it on. **Do not overtighten.**

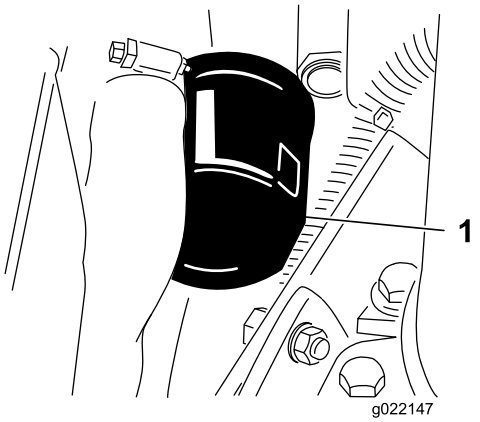



**Figure 53**

1. Engine oil filter

3. Add oil to the crankcase; refer to Checking the Engine Oil Level.

# *Fuel System Maintenance*

## Servicing the Fuel Tank

**Service Interval:** Every 2 years—Drain and clean the fuel tank.

Drain and clean the tank if the fuel system becomes contaminated or if the machine will be stored for an extended period of time. Use clean fuel to flush out the tank.

## Inspecting the Fuel Lines and Connections

**Service Interval:** Every 400 hours/Yearly (whichever comes first)

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

## Draining the Water Separator

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

1. Place a clean container under the fuel filter.
2. Loosen the drain valve on the bottom of the filter canister (Figure 54).

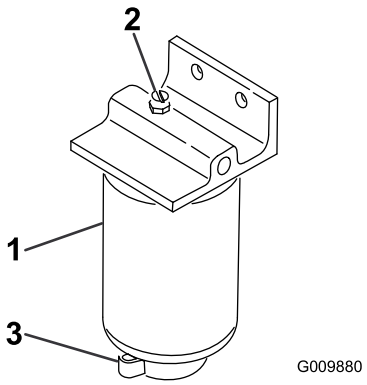



**Figure 54**

1. Water separator/filter canister
2. Vent plug
3. Drain valve

3. Tighten the valve after draining.

## Changing the Fuel Filter Canister

**Service Interval:** Every 400 hours

1. Clean the area where the filter canister mounts (Figure 54).
2. Remove the filter canister and clean the mounting surface.
3. Lubricate the gasket on the filter canister with clean oil.
4. Install the filter canister by hand until the gasket contacts the mounting surface; then rotate an additional 1/2 turn.

## Bleeding Air from the Injectors

**Note:** This procedure should be used only if the fuel system has been purged of air through normal priming procedures and the engine will not start; refer to Bleeding the Fuel System.

1. Loosen the pipe connection to the No. 1 nozzle and holder assembly.

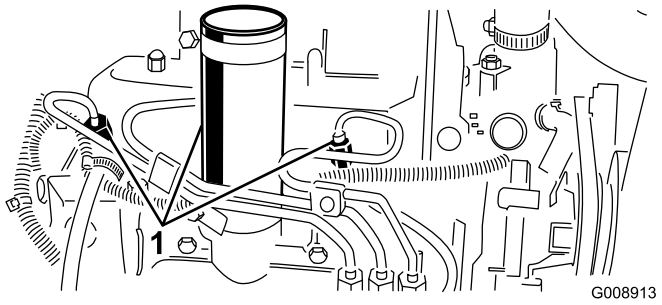



**Figure 55**

1. Fuel injectors

2. Move the throttle to the Fast position.
3. Turn the key in the key switch to the Start position and watch the fuel flow around the connector. Turn the key to the Off position when solid flow is observed.
4. Tighten the pipe connector securely.
5. Repeat the procedure on the remaining nozzles.

# *Electrical System Maintenance*

## Caring for the Battery

**Service Interval:** Every 25 hours—Check the electrolyte level. (If machine is in storage, check every 30 days.)

The battery electrolyte level must be properly maintained and the top of the battery kept clean. lf 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. Install the filler caps with the vents pointing to the rear (toward the fuel tank).

**⚠ DANGER**

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

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

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. Do not remove the filler caps while cleaning.

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

**⚠ WARNING**

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

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

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

**WARNING**

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

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

## Fuses

The fuses in machines electrical system are located under the control panel.

# Drive System Maintenance

## Adjusting the Traction Drive for Neutral

If the machine moves when the traction pedal is in the neutral position, the traction cam must be adjusted.

1. Park the machine on a level surface and turn the engine off.
2. Raise one front wheel and rear wheel off of the floor and place support blocks under the frame.

**⚠ WARNING**

**If the machine is not supported adequately, it may accidentally fall, injuring anyone under the machine.**

**One front wheel *and* rear wheel must be raised off of the ground or the machine will move during adjustment.**

3. Loosen the locknut on the traction adjustment cam (Figure 56).

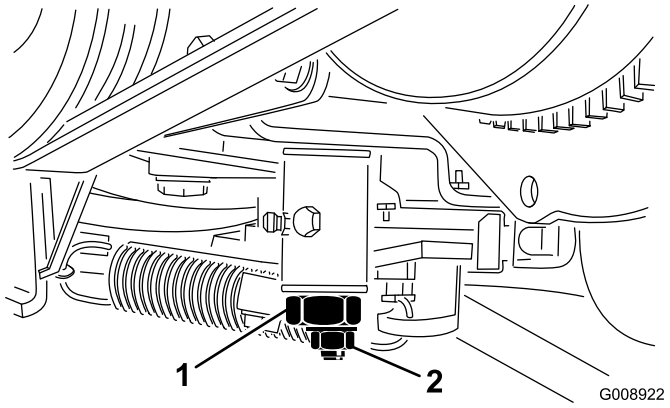



**Figure 56**

1. Traction adjustment cam 2. Locknut

**⚠ WARNING**

**The engine must be running so a final adjustment of the traction adjustment cam can be performed. Contact with hot or moving parts can result in personal injury.**

**Keep hands, feet, face, and other body parts away from the muffler, other hot parts of the engine, and other rotating parts.**

4. Start the engine and rotate the cam hex in both directions to determine the mid position of the neutral span.
5. Tighten the locknut securing the adjustment.
6. Stop the engine.
7. Remove the support blocks and lower the machine to the shop floor. Test drive the machine to make sure it does not move when the traction pedal is in neutral.

# Cooling System Maintenance

## Cleaning the Engine Cooling System

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

Remove debris from the radiator/oil cooler daily. Clean them more frequently in dirty conditions.

1. Turn the engine off and raise the hood. Clean the engine area thoroughly of all debris.
2. Clean both sides of the radiator/oil cooler thoroughly with compressed air (Figure 57).

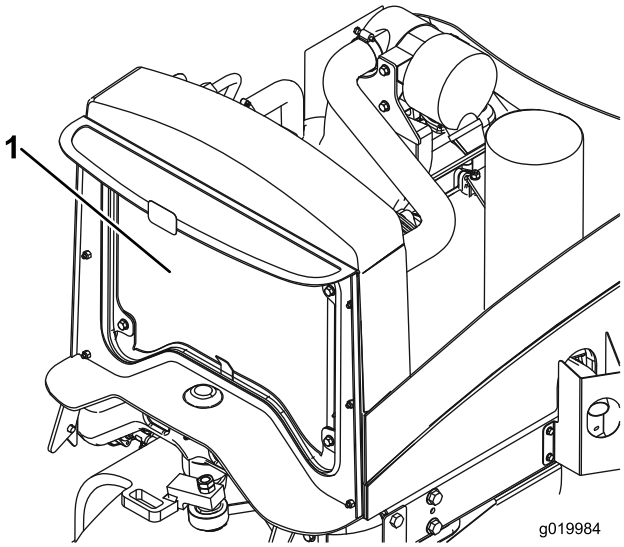



**Figure 57**

1. Radiator/oil cooler

3. Close the hood.

# Brake Maintenance

## Adjusting the Parking Brake

**Service Interval:** Every 200 hours—Check the parking brake adjustment.

1. Loosen the set screw securing the knob to the parking brake lever (Figure 58).

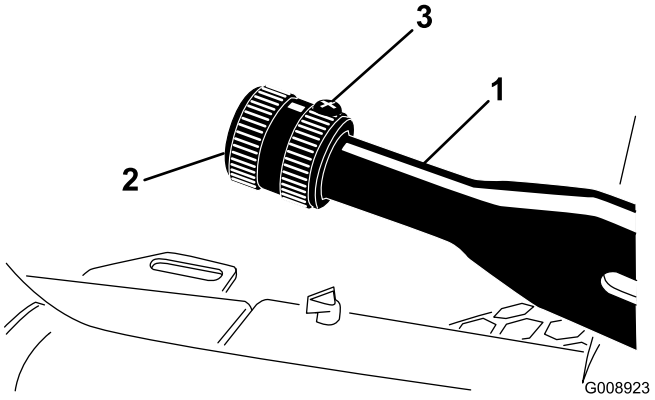



**Figure 58**

1. Parking brake lever
2. Knob
3. Set screw

2. Rotate the knob until a force of 130–140 N (30–40 lb) is required to actuate the lever.
3. Tighten the set screw after the adjustment has been attained.

# Belt Maintenance

## Servicing the Engine Belts

**Service Interval:** After the first 10 hours—Check the condition and tension of all belts.

Every 100 hours—Check the condition and tension of all belts.

### Tensioning the Alternator/Fan Belt

1. Open the hood.
2. Check the tension by depressing the belt midway between the alternator and crankshaft pulleys with 98 N (22 lb) of force. The belt should deflect 11 mm (7/16 inch).

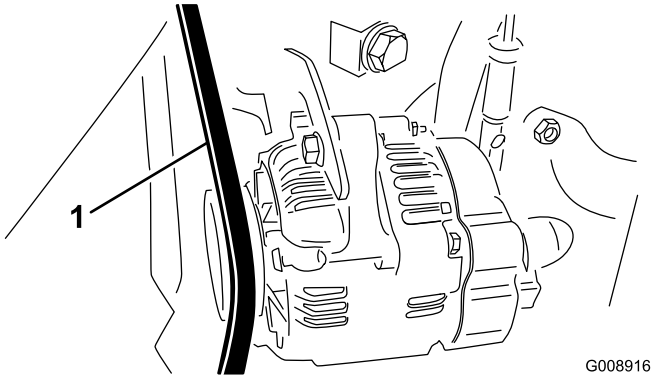



**Figure 59**

1. Alternator/fan belt

3. If the deflection is incorrect, complete the following procedure to tension the belt:
   A. Loosen the bolt securing the brace to the engine and the bolt securing the alternator to the brace.
   B. Insert a pry bar between the alternator and engine and pry out on the alternator.
   C. When the proper tension is achieved, tighten the alternator and brace bolts to secure the adjustment.

### Replacing the Hydrostat Drive Belt

1. Insert a nut driver or small piece of tubing onto the end of the belt tensioning spring.

**⚠ WARNING**

**Use caution when de-tensioning the spring, as it is under a heavy load.**

2. Push down and forward on the spring end (Figure 60) to unhook it from the bracket and release tension on the spring.

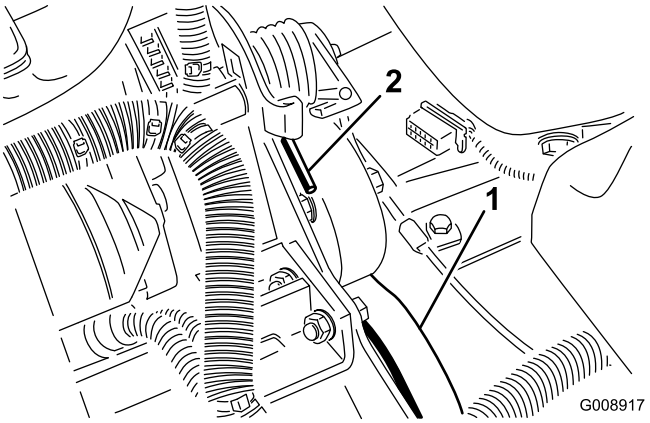



**Figure 60**

1. Hydrostat drive belt 2. Spring end

3. Replace the belt.
4. Reverse the procedure to tension the spring.

# Controls System Maintenance

## Adjusting the Throttle

1. Position the throttle lever rearward so it stops against the control panel slot.
2. Loosen the throttle cable connector on the injection pump lever arm (Figure 61).

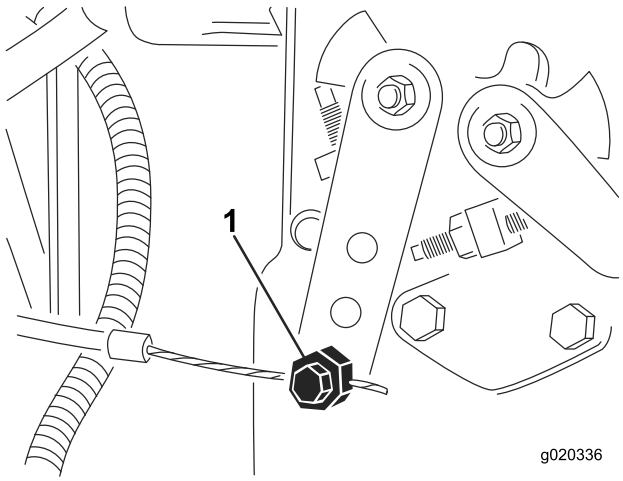



**Figure 61**

1. Injection pump lever arm

3. Hold the injection pump lever arm against the low idle stop and tighten the cable connector.
4. Loosen the screws securing the throttle control to the control panel.
5. Push the throttle control lever all of the way forward.
6. Slide the stop plate until it contacts the throttle lever and tighten the screws securing the throttle control to the control panel.
7. If the throttle does not stay in position during operation, torque the locknut, used to set the friction device on the throttle lever, to 40–55 inch-lb (5–6 N-m). The maximum force required to operate the throttle lever should be 89 N (20 lb).

# Hydraulic System Maintenance

## Changing the Hydraulic Filter

**Service Interval:** After the first 10 hours

Every 200 hours/Yearly (whichever comes first)

Use a genuine Toro replacement filter, Part No. 86-3010.

**Important: Use of any other filter may void the warranty on some components.**

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brake, and remove the key from the ignition switch.
2. Clean around the filter mounting area. Place a drain pan under the filter (Figure 62) and remove the filter.

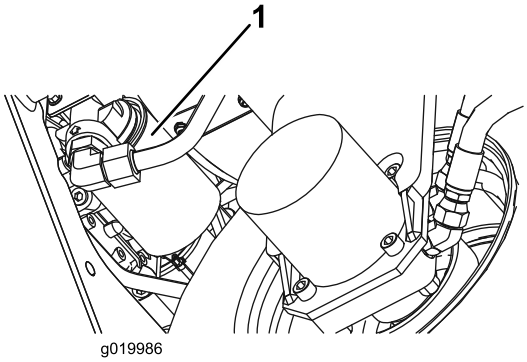



**Figure 62**

1. Hydraulic filter

3. Lubricate the new filter gasket and fill the filter with hydraulic fluid.
4. Ensure that the filter mounting area is clean. Screw the filter on until the gasket contacts the mounting plate; then tighten the filter 1/2 turn.
5. Start the engine and let it run for about two minutes to purge air from the system. Stop the engine and check for leaks.

## Changing the Hydraulic Fluid

**Service Interval:** Every 400 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 oil.

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brake, and remove the key from the ignition switch.
2. Disconnect the large hydraulic hose (Figure 63) from the reservoir and let the hydraulic fluid flow into a drain pan. Install the hydraulic hose when hydraulic fluid stops draining.

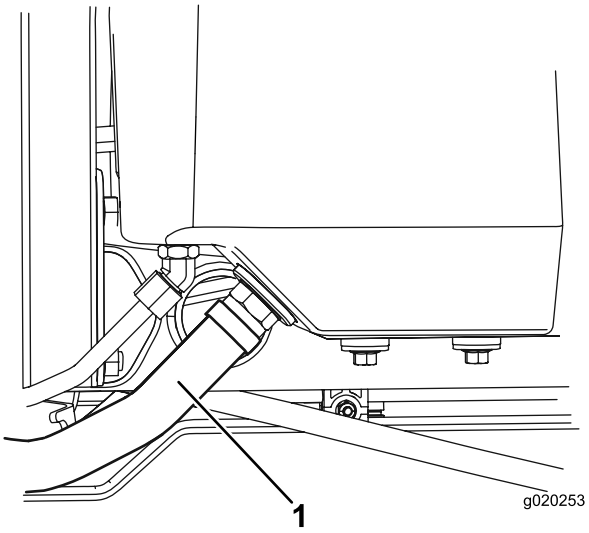



**Figure 63**

1. Hydraulic hose

3. Fill the reservoir (Figure 64) with approximately 13.2 liters (3.5 U.S. gallons) of hydraulic fluid; refer to Checking the Hydraulic System.

   **Important: Use only the hydraulic fluids specified. Other fluids could cause system damage.**

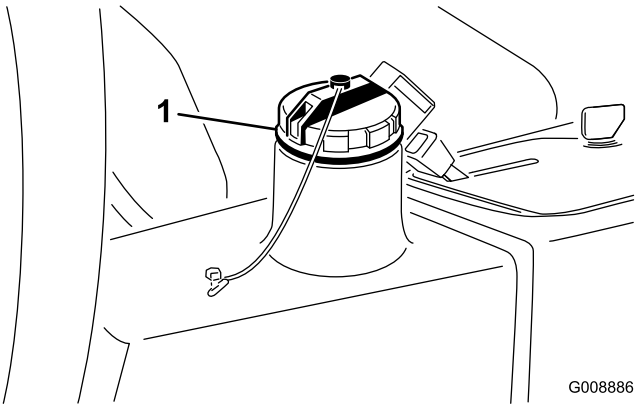



**Figure 64**

1. Hydraulic fill cap

4. Install the reservoir cap. Start the engine and use all of the hydraulic controls to distribute the hydraulic fluid throughout the system. Also check for leaks; then stop the engine.
5. Check the fluid level and add enough to raise the level to Full mark on the dipstick. **Do not overfill.**

# Checking the Hydraulic Lines and Hoses

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

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

**⚠ WARNING**

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

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

# *Cutting Unit System Maintenance*

## Using the Optional Gauge Bar

Use the gauge bar to adjust the cutting unit. Refer to the Cutting Unit Operator's Manual for the adjustment procedures (Figure 22).

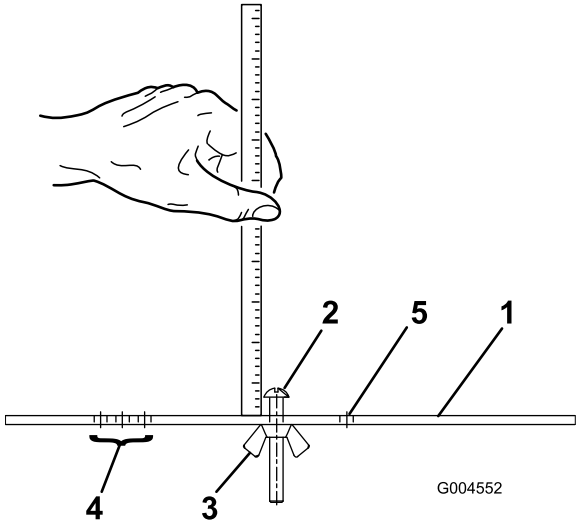



**Figure 65**

1. Gauge bar
2. Height adjusting screw
3. Nut
4. Holes used for setting Groomer HOG
5. Hole not used

## Backlapping the Cutting Units

**⚠ WARNING**

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

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

**Note:** When backlapping, all the cutting units operate together.

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brake, and move the Enable/Disable switch to disable position.
2. Raise the floor panel to expose the controls.
3. Make the initial reel to bedknife adjustments appropriate for backlapping; refer to the cutting unit Operator's Manual
4. Start the engine and run at low idle speed.

**⚠ DANGER**

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

- **Never change the engine speed while backlapping**
- **Only backlap at idle engine speed.**

5. Set the reel speed control to position 1 (Figure 66).

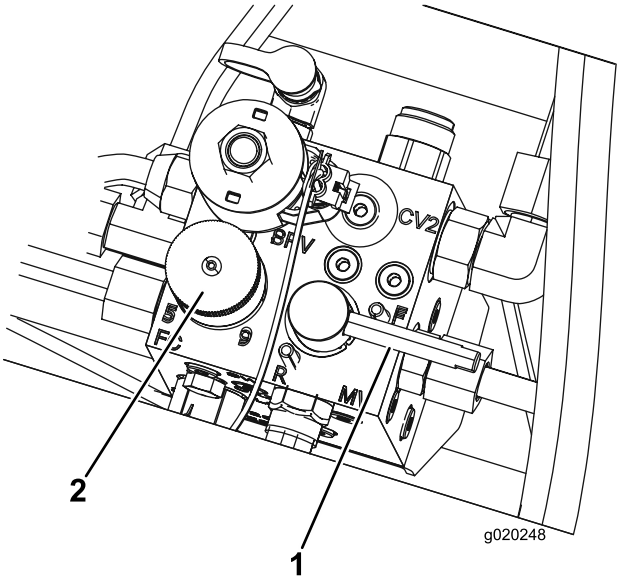



**Figure 66**

1. Backlap lever
2. Reel speed control knob

6. Move the backlap lever to the R (backlap) position (Figure 66).

**⚠ DANGER**

**To avoid personal injury, be certain that you are clear of the cutting units before proceeding.**

7. With the Mow/Transport lever in the mow position, move the Enable/Disable switch to the Enable position. Move the Lower Mow/Lift control forward to start the backlapping operation on the designated reels.
8. Apply lapping compound with a long handle brush. Never use a short handled brush.
9. If the reels stall or become erratic while backlapping, select a higher reel speed setting until the speed stabilizes, then return the reel speed to setting 1 or to your desired speed.
10. To make an adjustment to the cutting units while backlapping, turn the reels off by moving the Lower Mow/Raise lever rearward; the Enable/Disable switch to the Disable position, and stop the engine. After completing adjustments, repeat steps 5 through 9.

11. Repeat the procedure for all cutting units you want to backlap.
12. When finished, return the backlap lever to the Mow position, lower the floor panel, and wash all lapping compound off of the cutting units. Adjust cutting unit reel to bedknife as needed. Move the cutting unit reel speed control to the desired mowing position.

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

**Note:** For a better cutting edge, run a file across the front face of the bedknife after lapping. This will remove any burrs or rough edges that may have built up on the cutting edge.

# Storage

## Storing the Battery

If the machine will be stored more than 30 days, remove the battery and charge it fully. 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 1.265–1.299.

## Preparation for Seasonal Storage

Follow these procedures anytime you will be storing the machine for more than 30 days.

### Traction Unit

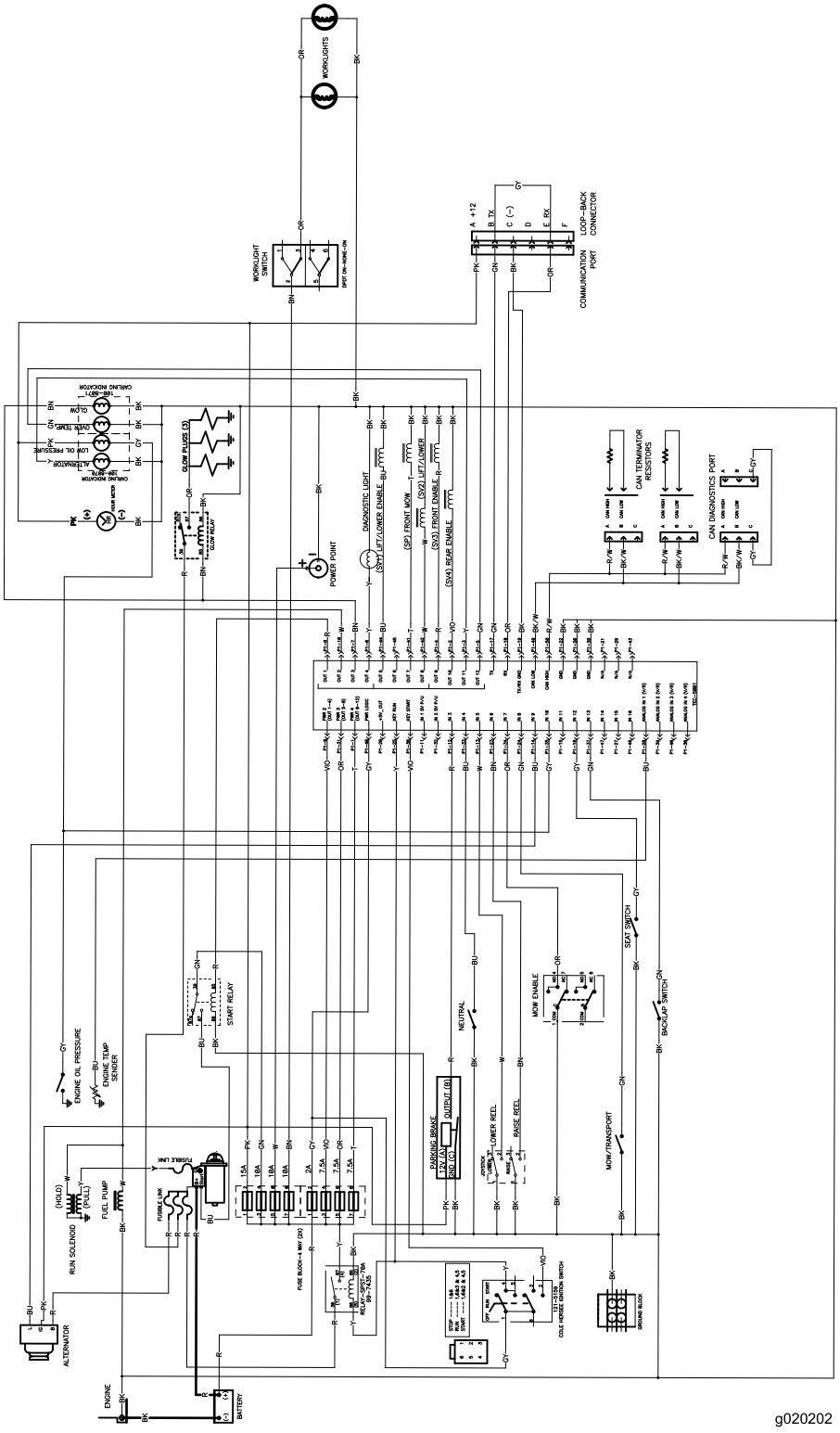
1. Thoroughly clean the traction unit, cutting units, and engine.
2. Check the tire pressure. Inflate all tires to 12 psi (96 kPa).
3. Check all fasteners for looseness; tighten as necessary.
4. Grease or oil all grease fittings and pivot points. Wipe up any excess lubricant.
5. Lightly sand and use touch-up paint on painted areas that are scratched, chipped, or rusted. Repair any dents in the metal body.
6. Service the battery and cables as follows:
   A. Remove the battery terminals from the battery posts.
   B. Remove the battery.
   C. Slowly recharge the battery before storage and every 60 days thereafter for 24 hours to prevent lead sulfation of the battery.

      To prevent the battery from freezing, make sure it is fully charged. The specific gravity of a fully charged battery is 1.265–1.299.
   D. Clean the battery, terminals, and posts with a wire brush and baking soda solution.
   E. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
   F. Either store it on the shelf or on the machine in a cool area. Leave the cables disconnected if it is stored on the machine.

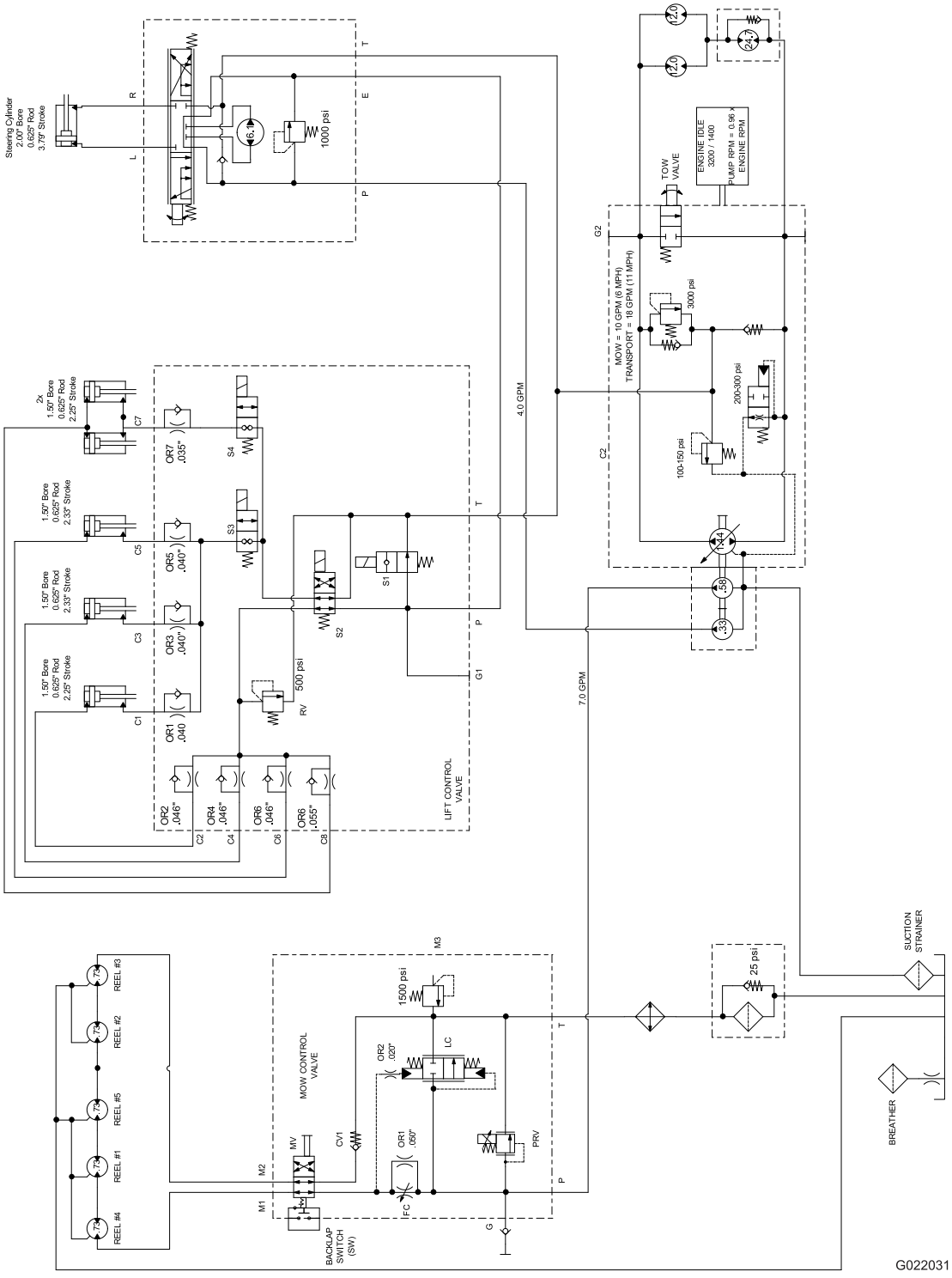
## Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Remove and discard the oil filter. Install a new oil filter.
3. Refill the oil pan with approximately 3.8 liters (4 qt) of SAE15W-40 motor oil.
4. Start the engine and run it at idle speed for approximately two minutes.
5. Stop the engine.
6. Thoroughly drain all fuel from the fuel tank, fuel lines, fuel filter, and water separator assembly.
7. Flush the fuel tank with fresh, clean diesel fuel.
8. Secure all fuel system fittings.
9. Thoroughly clean and service the air cleaner assembly.
10. Seal the air cleaner inlet and the exhaust outlet with weatherproof tape.
11. Check anti-freeze protection and add as needed for expected minimum temperature in your area.

# Schematics




**Electrical Schematic (Rev. B)**




**Hydraulic Schematic (Rev. B)**

# The Toro Total Coverage Guarantee

A Limited Warranty

## Conditions and Products Covered

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

## Instructions for Obtaining Warranty Service

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

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

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

## Owner Responsibilities

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

## Items and Conditions Not Covered

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

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

## Parts

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

## Deep Cycle and Lithium-Ion Battery Warranty:

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

## Maintenance is at Owner's Expense

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

## General Conditions

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

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

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

## Note regarding engine warranty:

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

## Countries Other than the United States or Canada

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

374-0253 Rev B

Form No. 3375-824 Rev C

TORO®

Count on it.

# Operator's Manual

# Reelmaster® 3550 Traction Unit

**Model No. 03910—Serial No. 313000001 and Up**

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

CE

*3375-824* C

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

**WARNING**

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

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

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

# 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.

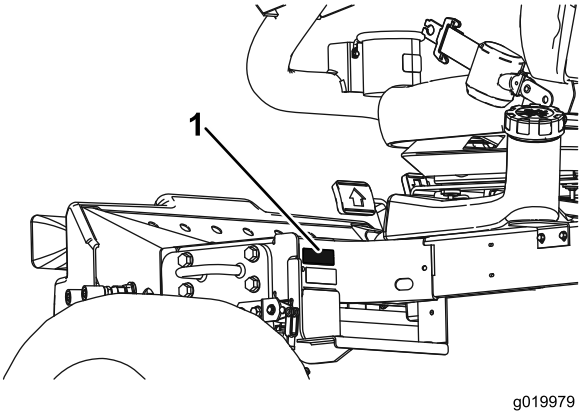



**Figure 1**

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.



**Figure 2**

1. Safety alert symbol

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

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**8111 Lyndale Avenue South**
**Bloomington, MN 55420**



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# Contents


Introduction ..... 2
Safety ..... 4
Safe Operating Practices ..... 4
Toro Mower Safety ..... 5
Sound Power Level ..... 7
Sound Pressure Level ..... 7
Vibration Level ..... 7
Safety and Instructional Decals ..... 8
Setup ..... 12
1 Installing the Cutting Units ..... 13
2 Adjusting the Turf Compensation Spring ..... 15
3 Install CE Decals ..... 15
4 Installing the Hood Latch (CE Only) ..... 15
5 Using the Cutting Unit Kickstand ..... 16
Product Overview ..... 18
Controls ..... 18
Specifications ..... 20
Attachments/Accessories ..... 20
Operation ..... 20
Checking the Engine Oil Level ..... 20
Filling the Fuel Tank ..... 21
Checking the Cooling System ..... 22
Checking the Hydraulic System ..... 22
Checking the Reel to Bedknife Contact ..... 23
Checking the Tire Pressure ..... 23
Torquing the Wheel Nuts ..... 23
Positioning the Seat ..... 23
Starting and Stopping the Engine ..... 24
Setting the Reel Speed ..... 25
Adjusting the Lift Arm Counterbalance ..... 25
Bleeding the Fuel System ..... 26
Understanding the Diagnostic Light ..... 27
Diagnostic Ace Display ..... 27
Checking the Interlock Switches ..... 27
Towing the Traction Unit ..... 29
Operating Tips ..... 29
Maintenance ..... 30
Recommended Maintenance Schedule(s) ..... 30
Daily Maintenance Checklist ..... 31
Service Interval Chart ..... 32
Premaintenance Procedures ..... 32
Removing the Hood ..... 32
Removing the Battery Cover ..... 32
Lubrication ..... 33
Greasing the Bearings and Bushings ..... 33
Engine Maintenance ..... 35
Servicing the Air Cleaner ..... 35
Changing the Engine Oil and Filter ..... 35
Fuel System Maintenance ..... 36
Servicing the Fuel Tank ..... 36
Inspecting the Fuel Lines and Connections ..... 36
Draining the Water Separator ..... 36
Changing the Fuel Filter Canister ..... 36
Bleeding Air from the Injectors ..... 36
Electrical System Maintenance ..... 37
Caring for the Battery ..... 37
Fuses ..... 37
Drive System Maintenance ..... 38
Adjusting the Traction Drive for Neutral ..... 38
Cooling System Maintenance ..... 39
Cleaning the Engine Cooling System ..... 39
Brake Maintenance ..... 39
Adjusting the Parking Brake ..... 39
Belt Maintenance ..... 40
Servicing the Engine Belts ..... 40
Controls System Maintenance ..... 41
Adjusting the Throttle ..... 41
Hydraulic System Maintenance ..... 41
Changing the Hydraulic Filter ..... 41
Changing the Hydraulic Fluid ..... 41
Checking the Hydraulic Lines and Hoses ..... 42
Cutting Unit System Maintenance ..... 43
Using the Optional Gauge Bar ..... 43
Backlapping the Cutting Units ..... 43
Storage ..... 44
Storing the Battery ..... 44
Preparation for Seasonal Storage ..... 44
Schematics ..... 46

# Safety

**This machine meets or exceeds CEN standard EN 836:1997 (when appropriate decals applied), and ANSI B71.4-2004 specifications in effect at the time of production.**

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

# Safe Operating Practices

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

## Training

- Read the *Operator's Manual* and other training material carefully. 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 following:
  - 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 as follows:
    - ◊ 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
    - ◊ Incorrect hitching and load distribution

## Preparation

- While mowing, always wear substantial footwear, long trousers, hard hat, safety glasses, and hearing protection. Long hair, loose clothing, or jewelry may get tangled in moving parts. Do not operate the equipment when barefoot or wearing open sandals.
- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- **Warning**—Fuel is highly flammable. Take the following precautions:
  - Store fuel in containers specifically designed for this purpose.
  - Refuel outdoors only and do not smoke while refueling.
  - Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel while the engine is running or when the engine is hot.
  - If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
  - Replace all fuel tank and container caps securely.
- 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 fumes 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. Only start the engine from the operator's position. Never remove the ROPS and always wear the seat belts during operation.
- Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times.
- Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care. Do the following to guard against overturning:
  - Do not stop or start suddenly when going up or downhill.
  - Keep machine speeds 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.
- Do the following 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 the drive to attachments, stop the engine, and remove the ignition key in the following conditions:
  - Before making height adjustments, unless the 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 (check immediately). Inspect the cutting units for damage and make repairs before restarting and operating the equipment.
- Disengage the drive to attachments when transporting or when not machine is not in use.
- Stop the engine and disengage the drive to attachments before the following:
  - Refueling
  - Making height adjustment, unless the adjustment can be made from the operator's position
- 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.
- Never raise the cutting units with the reels running.
- 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.
- 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.
- The operator shall turn on flashing warning lights, if provided, whenever traveling on a public road, except where such use is prohibited by law.

## Maintenance and Storage

- 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 fire hazard, keep the engine, silencer/muffler, battery compartment fuel storage area, cutting units and drives free of grass, leaves, or excessive grease. Clean up oil or fuel spillage.
- Replace worn or damaged parts for safety.
- If the fuel tank has to be drained, do this outdoors.
- When machine is to be parked, stored, or left unattended, lower the cutting units unless a positive mechanical lock is provided.
- Disengage drives, lower the cutting units, set parking brake, stop engine and remove key. Wait for all movement to stop before adjusting, cleaning or repairing.
- Shut off fuel while storing or transporting. Do not store fuel near flames.
- Park the machine on level ground. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- 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.

# Toro Mower Safety

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

**⚠ WARNING**

**Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you. Do not run engine indoors or in an enclosed area.**

## Preparation

Be sure to establish your own special procedures and work rules for unusual operating conditions (e.g., slopes too steep for operation). **Survey the complete mowing site to determine which hills can be safely operated on.** When performing this site survey, always use common sense and take into consideration the turf condition and the rollover risk. To determine which hills or slopes may be safely operated on, use the slope chart provided in the manual. To perform a site survey, follow the procedure outlined in the Operation section of the this manual. **The maximum side hill angle is detailed on the slope decal affixed on the machine.**

## Training

The operator must be skilled and trained in how to drive on hillsides. Failure to use caution on slopes or hills may cause the vehicle to tip or roll, possibly resulting in personal injury or death.

## Operation

- Know how to stop the machine and engine quickly.
- Do not operate the machine while wearing tennis shoes or sneakers.
- Wearing safety shoes and long pants is advisable and required by some local ordinances and insurance regulations.
- Keep hands, feet, and clothing away from moving parts and the mower discharge area.
- Fill the fuel tank until level is 1/2 inch (12 mm) below the bottom of the filler neck. Do not overfill.
- Check the safety interlock switches daily for proper operation. If a switch should fail, replace the switch before operating the machine.
- When starting the engine, engage the parking brake, put the traction pedal in neutral, and disengage the blade drive. After the engine starts, release the parking brake and keep your foot off of the traction pedal. The machine must not move. If movement is evident, refer to the Maintenance section of this manual to adjust the traction drive.
- Use extreme caution when operating close to sand traps, ditches, creeks, steep hillsides, or other hazards.
- Reduce speed when making sharp turns.
- Do not turn on hills.
- Do not operate on a side hill that is too steep. A rollover may occur before losing traction.
- The slope angle at which the machines will tip is dependent on many factors. Among these are mowing conditions such as wet or undulating terrain, speed (especially in turns), position of the cutting units (up or down), tire pressure, and operator experience. At side hill angles of 20 degrees or less, the risk of a rollover is low. As the slope angle increases to a recommended maximum limit of 25 degrees, the risk of a rollover increases to a moderate level. **Do not exceed a 25 degree side hill slope angle because the risk of a rollover and serious injury or death is very high.**
- For steering control, lower the cutting units when going down slopes.
- Avoid sudden stops and starts.
- Use the reverse pedal for braking.
- Watch for traffic when near or crossing roads. Always yield the right-of-way.
- Raise the cutting units when driving from one work area to another.
- Do not touch the engine, muffler, exhaust pipe, or hydraulic tank while the engine is running or soon after it has stopped because these areas could be hot enough to cause burns.
- This machine is not designed or equipped for on-road use and is a slow-moving vehicle. If you must cross or travel on a public road, you should be aware of and comply with local regulations, such as required lights, slow moving vehicle signs, and reflectors.

## Maintenance and Storage

- Before servicing or making adjustments, stop the engine and remove the ignition key.
- Ensure that the entire machine is properly maintained and in good operating condition. Frequently check all nuts, bolts, screws, and hydraulic fittings.
- 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. If fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.
- Before disconnecting or performing any work on the hydraulic system, all pressure in the system must be relieved by stopping the engine and lowering the cutting units to the ground.

- If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing, and any parts of the body away from the cutting units, attachments, and any moving parts. Keep everyone away.
- Do not overspeed the engine by changing governor settings. To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer.
- The engine must be shut off before checking the oil or adding oil to the crankcase.
- 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 101 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 85 dBA, which includes an Uncertainty Value (K) of 1 dBA.

Sound pressure level was determined according to the procedures outlined in EN 836.

# Vibration Level

**Hand-Arm**

Measured vibration level for right hand = 0.28 $m/s^2$

Measured vibration level for left hand = 0.26 $m/s^2$

Uncertainty Value (K) = 0.14 $m/s^2$

Measured values were determined according to the procedures outlined in EN 836.

**Whole Body**

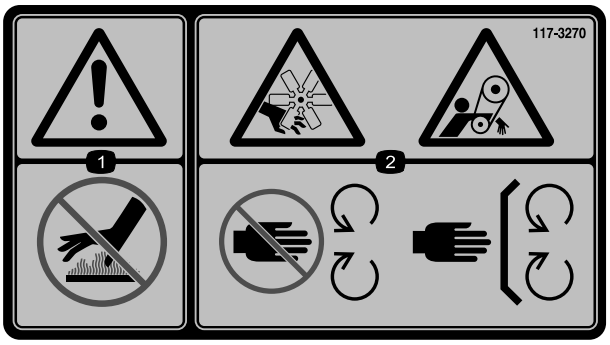
Measured vibration level = 0.2 $m/s^2$

Uncertainty Value (K) = 0.1 $m/s^2$

Measured values were determined according to the procedures outlined in EN 836.

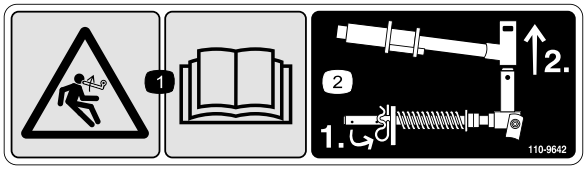
# Safety and Instructional Decals

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



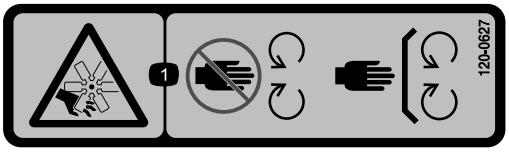

**117-3270**

1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, hand; entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.



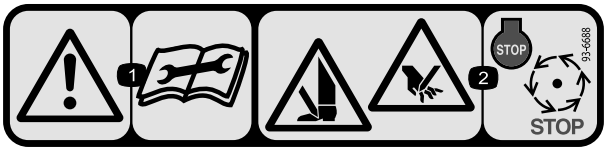

**110-9642**

1. Stored energy hazard—read the *Operator's Manual.*
2. Move the cotter pin to the hole closest to the rod bracket and then remove the lift arm and pivot yoke.




**120-0627**

1. Cutting/dismemberment hazard, fan—stay away from moving parts, keep all guards and shields in place.



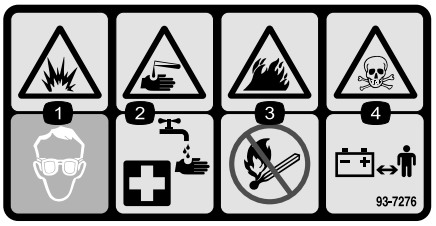

**93–6688**

1. Warning—read the *Operator's Manual* before performing maintenance.
2. Cutting hazard of hand or foot—stop the engine and wait for all moving parts to stop.



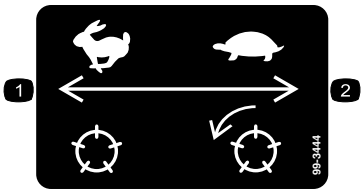

**106-6755**

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.*



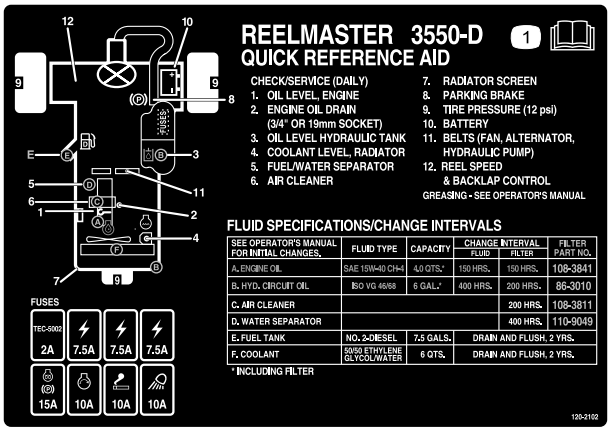

**93-7276**

1. Explosion hazard—wear eye protection.
2. Caustic liquid/chemical burn hazard—to perform first aid, flush with water.
3. Fire hazard—no fire, open flames, or smoking.
4. Poison hazard—keep children a safe distance from the battery.




**99–3444**

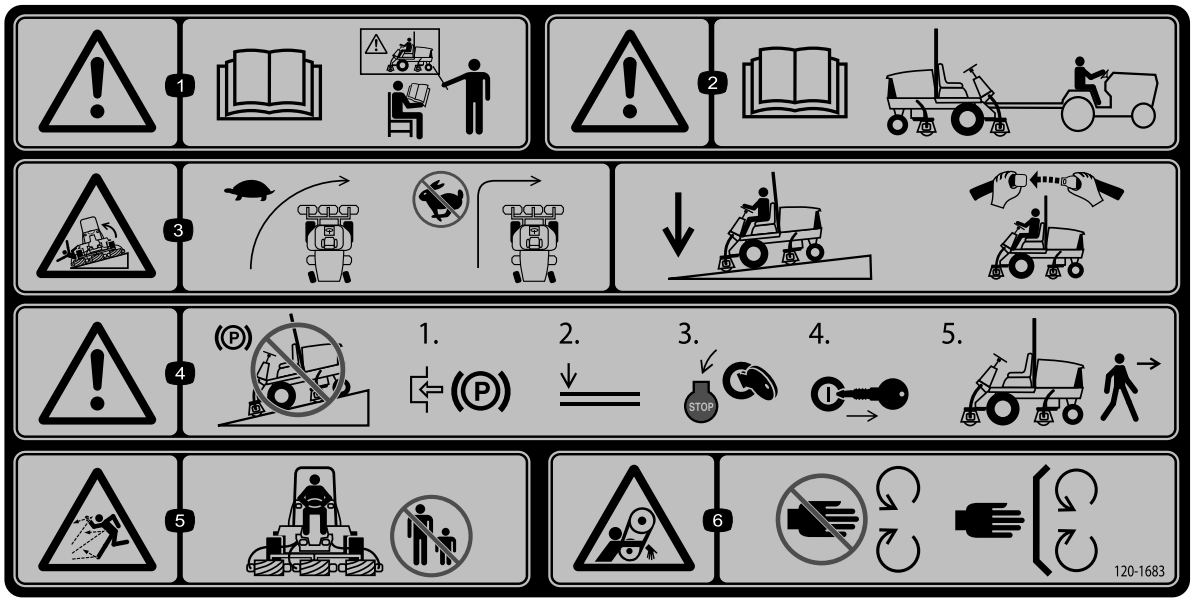
1. Transport speed
2. Mow speed




**120–2102**

1. Read the *Operator's Manual*

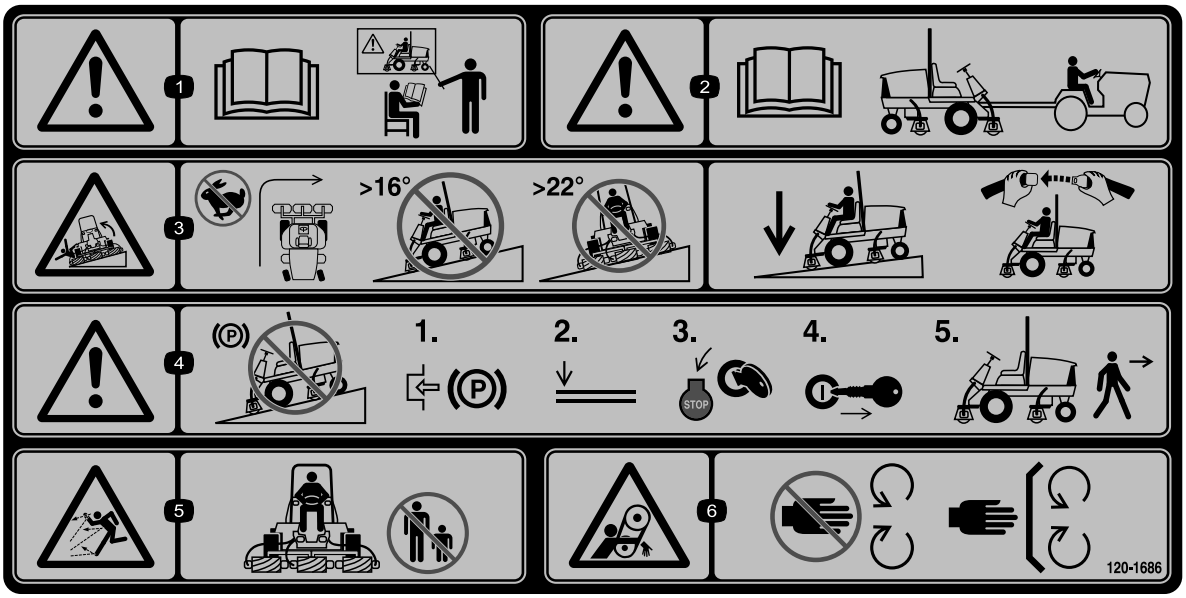
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**120–1683**

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Warning—read the *Operator's Manual* before towing the machine.
3. Tipping hazard—slow machine before turning, do not turn at high speeds; lower the cutting unit when driving down slopes; use a roll over protection system and wear the seat belt
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting units, stop the engine and remove the ignition key before leaving the machine.
5. Thrown object hazard—keep bystanders a safe distance from the machine.
6. Entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.

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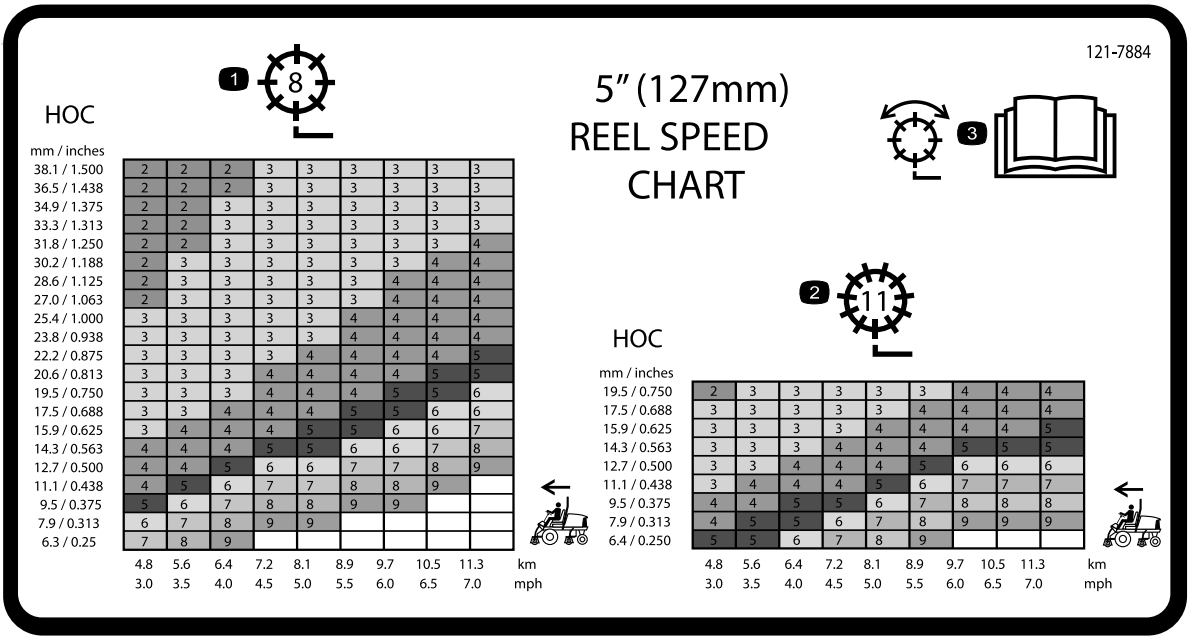

**120–1686**

(Affix over part no. 120–1683 for CE*)

* This safety decal includes a slope warning required on the machine for compliance to the European Lawn Mower Safety Standard EN836:1997. The conservative maximum slope angles indicated for operation of this machine are prescribed by and required by this standard.

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Warning—read the *Operator's Manual* before towing the machine.
3. Tipping hazard—do not turn at high speeds; do not drive up or down slopes greater than 16 degrees; do not drive across sloes greater than 22 degrees.
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting units, stop the engine and remove the ignition key before leaving the machine.
5. Thrown object hazard—keep bystanders a safe distance from the machine.
6. Entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.

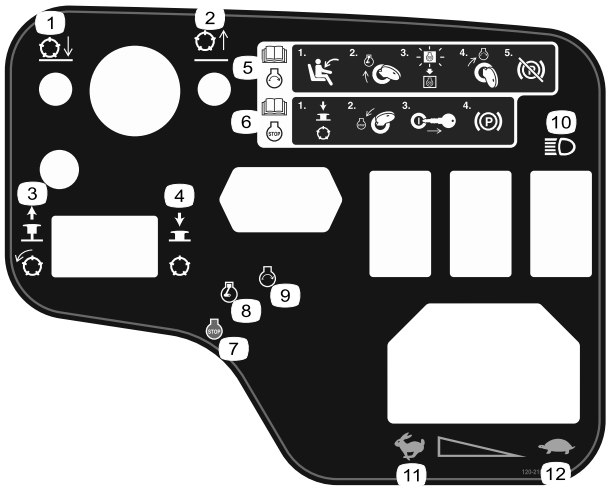
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**121–7884**

1. 8 blade reel adjustment
2. 11 blade reel adjustment
3. Read the *Operator's Manual* for information on adjusting the reel.

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**120–2105**

1. Lower the reels
2. Raise the reels
3. Pull the knob out to engage the reels
4. Push the knob in to disengage the reels
5. Read the *Operator's Manual* for information on starting the engine—1)Sit in the operator's position; 2)Turn the key to the engine—preheat position; 3)Wait until the electrical preheat light turns off; 4)Turn the key to the engine—start position; 5)Disengage the parking brake.
6. Read the *Operator's Manual* for information on stopping the engine—1)Disengage the reels; 2)Turn the key to the engine—stop position; 3)Remove the key from the ignition; 4)Engage the parking brake.
7. Engine—stop
8. Engine—preheat
9. Engine—start
10. Lights
11. Fast
12. Slow




**Battery Symbols**

Some or all of these symbols are on your battery

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

# Setup

## Loose Parts

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

| Procedure | Description | Qty. | Use |
|---|---|---|---|
| 1 | No parts required | – | Install the cutting units |
| 2 | No parts required | – | Adjust the turf compensation spring |
| 3 | Warning decal (120–1686) | 1 | Install CE decals, if required. |
| 4 | Lock bracket<br>Rivet<br>Washer<br>Screw, 1/4 x 2 inches<br>Locknut, 1/4 inch | 1<br>2<br>1<br>1<br>1 | Install the Hood Latch (CE). |
| 5 | Cutting unit kickstand | 1 | Using the cutting unit kickstand |

## Media and Additional Parts

| Description | Qty. | Use |
|---|---|---|
| Ignition keys | 2 | Start the engine. |
| Operator's Manual<br>Engine Operator's Manual | 1<br>1 | Read before operating the machine. |
| Parts Catalog | 1 | Use to look up and order parts. |
| Operator Training Material | 1 | Review before operating the machine. |
| Cutting Performance Paper | 1 | Used for adjusting the cutting unit bedknife to reel |
| Shim | 1 | Used for adjusting the cutting unit bedknife to reel |

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

# 1

# Installing the Cutting Units

## No Parts Required

## Procedure

1. Remove the reel motors from the shipping brackets.
2. Remove the shipping brackets and discard.
3. Remove the cutting units from the cartons. Assemble and adjust as described in the cutting unit Operator's Manual.
4. Make sure the counter weight (Figure 3) is installed to the proper end of the cutting unit as described in the cutting unit Operator's Manual.

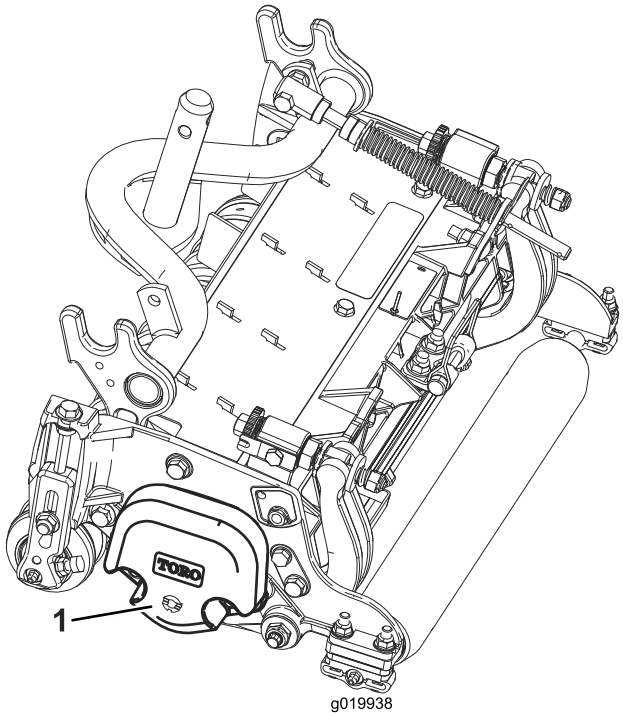



**Figure 3**

1. Counter weight

5. All the cutting units are shipped with the turf compensation spring mounted to the right side of the cutting unit. The turf compensation spring must be mounted to the same side of the cutting unit as the reel drive motor. Reposition the turf compensation as follows:
   A. Remove the 2 carriage bolts and nuts securing the rod bracket to the cutting unit tabs (Figure 4).

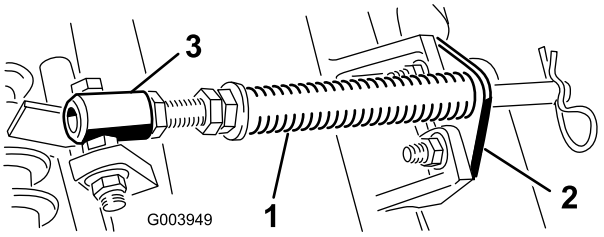



**Figure 4**

1. Turf compensation spring
2. Rod bracket
3. Spring tube

   B. Remove the flange nut securing the spring tube bolt to the carrier frame tab (Figure 4) Remove the assembly.
   C. Mount the spring tube bolt to the opposite tab on the carrier frame and secure with the flange nut. The bolt head is to be positioned to the outer side of the tab as shown in Figure 4.

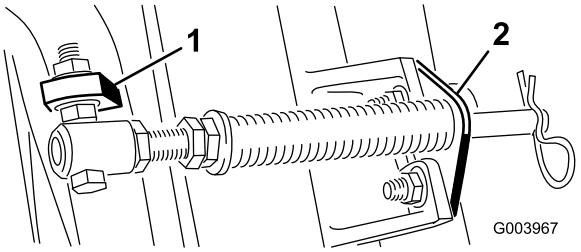



**Figure 5**

1. Opposite carrier frame tab
2. Rod bracket

   D. Mount the rod bracket to the cutting unit tabs with the carriage bolts and nuts (Figure 5).

**Note:** When installing or removing the cutting units, make sure the hairpin cotter is installed in the spring rod hole next to the rod bracket. Otherwise, the hairpin cotter must be installed in the hole in the end of the rod.

6. Lower all the lift arms completely.
7. Remove the snapper pin and the cap from the lift arm pivot yoke (Figure 6).

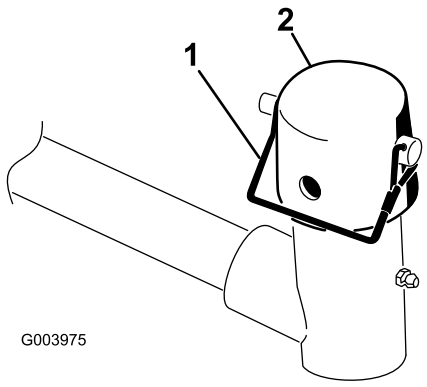



**Figure 6**

1. Snapper pin
2. Cap

8. For the front cutting units, slide a cutting unit under the lift arm while inserting the carrier frame shaft up into the lift arm pivot yoke (Figure 7).

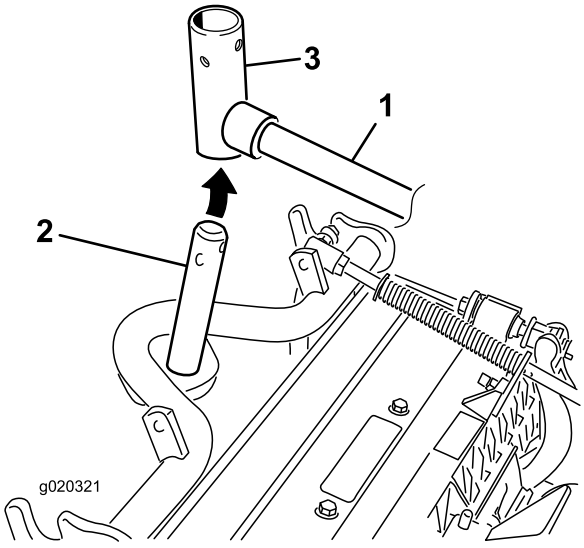



**Figure 7**

1. Lift arm
2. Carrier frame shaft
3. Lift arm pivot yoke

9. Use the following procedure on the rear cutting units when the height of cut is above 1.2 cm (3/4 inch).
   A. Remove the lynch pin and washer securing the lift arm pivot shaft to the lift arm and slide the lift arm pivot shaft out of the lift arm (Figure 8).

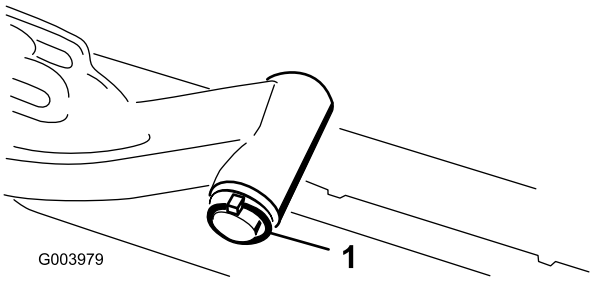



**Figure 8**

1. Lift arm shaft lynch pin and washer

   B. Insert the lift arm yoke onto the carrier frame shaft (Figure 7).
   C. Insert the lift arm shaft into the lift arm and secure it with the washer and lynch pin (Figure 8).

10. Insert the cap over the carrier frame shaft and lift arm yoke.
11. Secure the cap and the carrier frame shaft to the lift arm yoke with the snapper pin. Use the slot if a steering cutting unit is desired or use the hole if the cutting unit is to be locked in position (Figure 6).
12. Secure the lift arm chain to the chain bracket with the snapper pin (Figure 9). Use the number of chain links described in the cutting unit Operator's Manual.

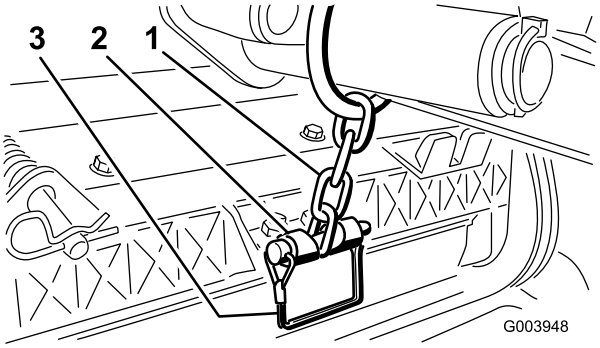



**Figure 9**

1. Lift arm chain
2. Chain bracket
3. Snapper pin

13. Coat the spline shaft of the reel motor with clean grease.
14. Oil the reel motor O-ring and install it onto the motor flange.
15. Install the motor by rotating it clockwise so that the motor flanges clear the lock nuts (Figure 10). Rotate the motor counterclockwise until the flanges encircle the nuts then tighten the nuts.

**Important: Make sure the reel motor hoses are not twisted, kinked or in the risk of being pinched.**

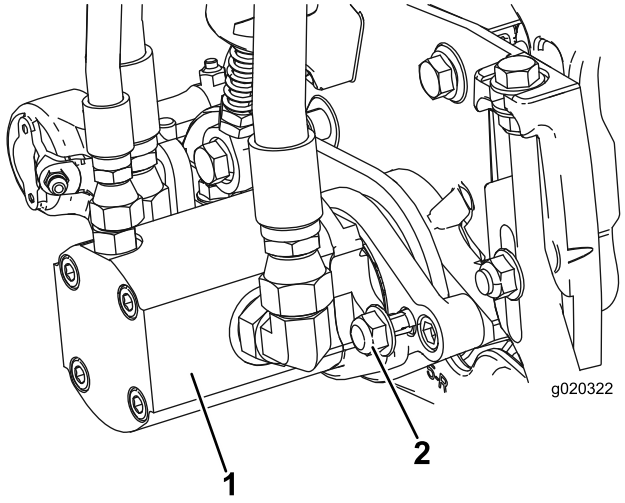



**Figure 10**

1. Reel drive motor
2. Mounting nuts

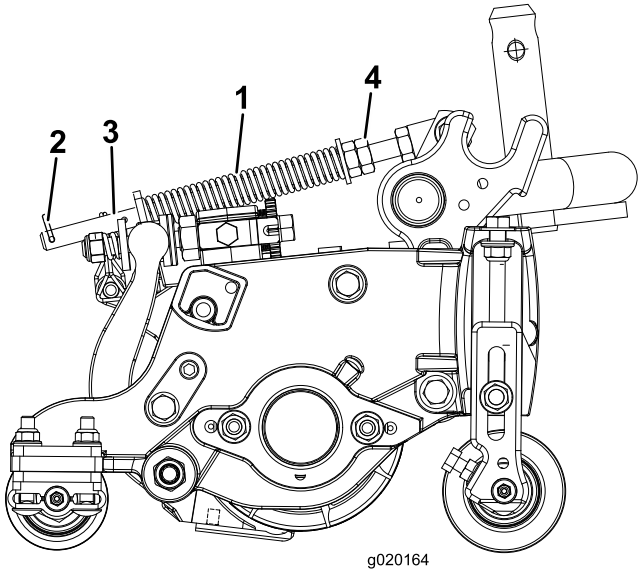



**Figure 11**

1. Turf compensation spring
2. Hair pin cotter
3. Spring rod
4. Hex nuts

# 2

# Adjusting the Turf Compensation Spring

## No Parts Required

## Procedure

The turf compensation spring (Figure 11) transfers weight from the front to the rear roller. (This helps to reduce a wave pattern in the turf, also known as marcelling or bobbing.)

**Important: Make spring adjustments with the cutting unit mounted to the traction unit, pointing straight ahead and lowered to the shop floor.**

1. Make sure the hairpin cotter is installed in the rear hole in the spring rod (Figure 11).
2. Tighten the hex nuts on the front end of the spring rod until the compressed length of the spring (Figure 11) is 12.7 cm (5 inches).

   **Note:** When operating on rough terrain decrease the spring length by 2.5 cm (1/2 inch). Ground following will be slightly decreased.

# 3

# Install CE Decals

## Parts needed for this procedure:

| | |
|---|---|
| 1 | Warning decal (120–1686) |

## Procedure

If this machine will be used for CE, affix the warning decal 120-1686 over English warning decal 120-1683.

# 4

# Installing the Hood Latch (CE Only)

## Parts needed for this procedure:

| | |
|---|---|
| 1 | Lock bracket |
| 2 | Rivet |
| 1 | Washer |
| 1 | Screw, 1/4 x 2 inches |
| 1 | Locknut, 1/4 inch |

## Procedure

1. Unhook the hood latch from the hood latch bracket.
2. Remove the (2) rivets securing the hood latch bracket to the hood (Figure 12). Remove the hood latch bracket from the hood.

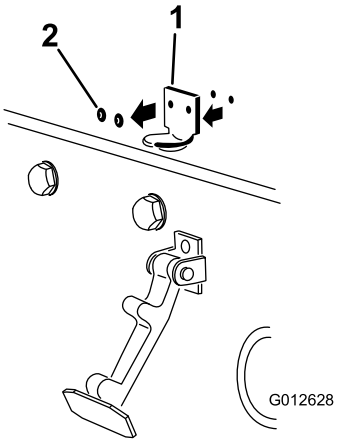



**Figure 12**

1. Hood latch bracket
2. Rivets

3. While aligning the mounting holes, position the CE lock bracket and the hood latch bracket onto the hood. The lock bracket must be against the hood (Figure 13). Do not remove bolt and nut assembly from the lock bracket arm.

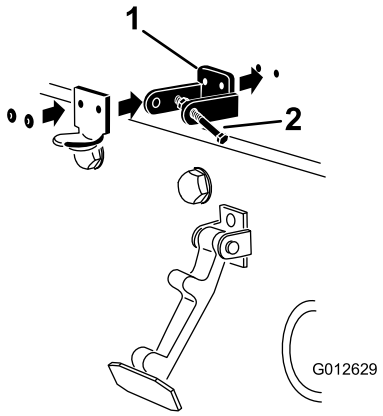



**Figure 13**

1. CE lock bracket
2. Bolt and nut assembly

4. Align the washers with the holes on the inside of the hood.
5. Rivet the brackets and the washers to the hood (Figure 13).
6. Hook the latch onto the hood latch bracket (Figure 14).

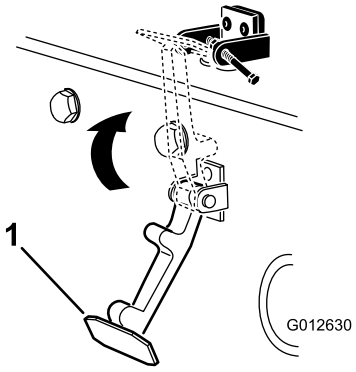



**Figure 14**

1. Hood latch

7. Screw the bolt into the other arm of hood lock bracket to lock the latch in position (Figure 15). Tighten bolt securely but do not tighten nut.

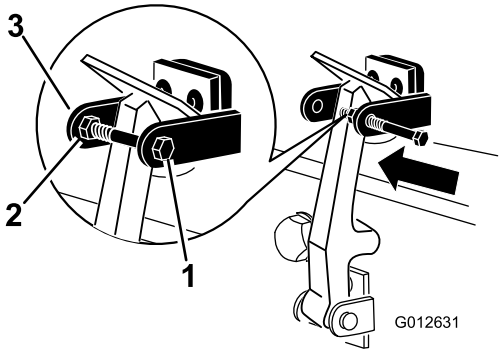



**Figure 15**

1. Bolt
2. Nut
3. Arm of hood lock bracket

# 5

# Using the Cutting Unit Kickstand

## Parts needed for this procedure:

| | |
|---|---|
| 1 | Cutting unit kickstand |

## Procedure

Whenever the cutting unit has to be tipped to expose the bedknife/reel, prop up the rear of the cutting unit with the kickstand to make sure the nuts on the back end of the bedbar adjusting screws are not resting on the work surface (Figure 16).

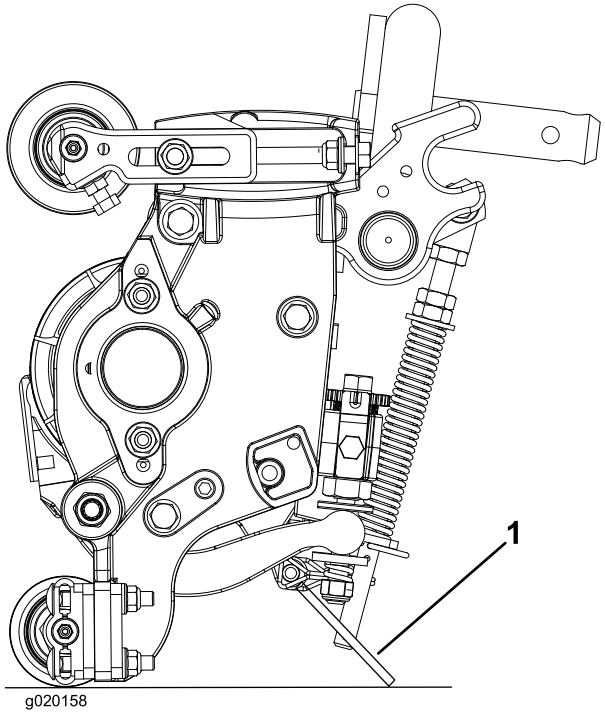



**Figure 16**

1. Cutting unit kickstand

Secure the kickstand to the chain bracket with the snapper pin (Figure 17).

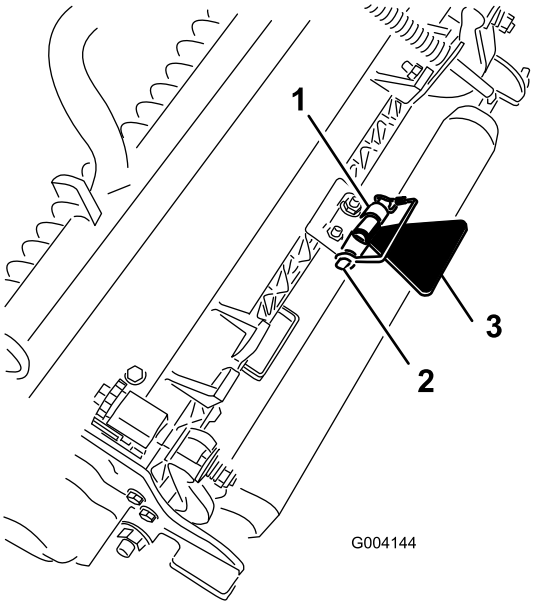



**Figure 17**

1. Chain bracket
2. Snapper pin
3. Cutting unit kickstand

# Product Overview

## Controls

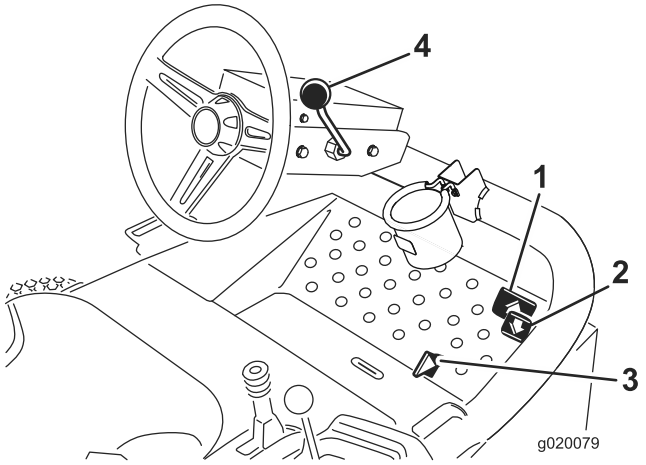



**Figure 18**

1. Forward traction pedal
2. Reverse traction pedal
3. Mow/transport slide
4. Tilt steering lever

### Traction Pedals

Press the traction forward pedal (Figure 18) to move forward. Press traction reverse pedal (Figure 18) to move backward or to assist in stopping when moving forward. Also, allow the pedal to move or move it to the neutral position to stop the machine.

### Mow/Transport Slide

Using your heel, move the mow/transport slide (Figure 18) to the left to transport and to the right to mow. **The cutting units will only operate in the mow position and not lower in the transport position.**

**Important: The mow speed is set at the factory to 9.7 km/h (6 MPH). It can be increased or decreased by adjusting the speed stop screw (Figure 19).**

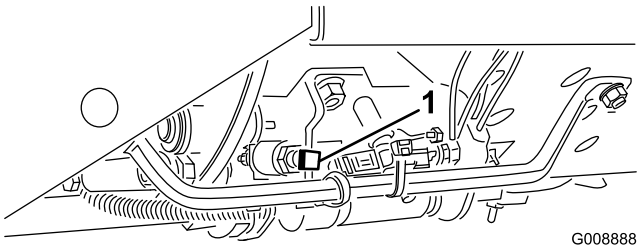



**Figure 19**

1. Speed stop screw

### Tilt Steering Lever

Pull the tilt steering lever (Figure 18) back to tilt the steering wheel to the desired position. Then push the lever forward to tighten.

### Ignition Switch

The ignition switch (Figure 20), used to start, stop, and preheat the engine, has three positions: Off, On/Preheat, and Start. Rotate the key to the On/Preheat position until the glow plug indicator light goes out (approximately 7 seconds); then rotate the key to the Start position to engage the starter motor. Release the key when the engine starts. The key will move automatically to the On/Run position. To shut the engine off, rotate the key to the Off position. Remove the key from the switch to prevent accidental starting.

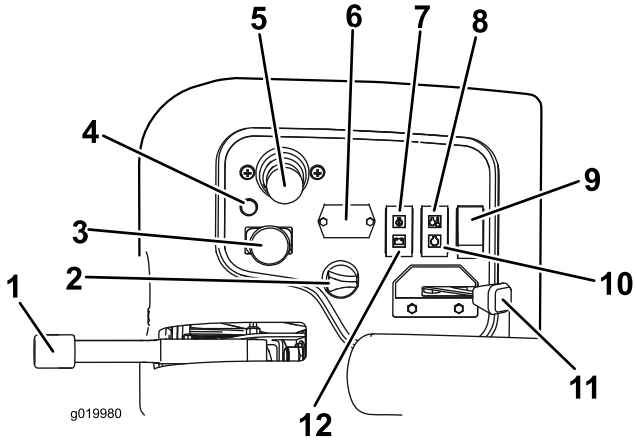



**Figure 20**

1. Parking brake
2. Ignition switch
3. Enable/Disable switch
4. Diagnostic light
5. Lower mow/raise control lever
6. Hour meter
7. Oil pressure light
8. Temperature light
9. Light switch
10. Glow plug indicator light
11. Throttle
12. Alternator light

### Throttle

Move the throttle (Figure 20) forward to increase the engine speed and rearward to decrease the engine speed.

### Enable/Disable Switch

Use the enable/disable switch (Figure 20) in conjunction with the lower mow/raise control lever to operate the cutterheads. **The cutting units cannot be lowered when the mow/transport lever is in the transport position.**

### Hour Meter

The hour meter (Figure 20) indicates the total hours of machine operation. The hour meter starts to function whenever the key switch is On.

## Lower Mow/Raise Control Lever

This lever (Figure 20) raises and lowers the cutting units and also starts and stops the cutterheads when the cutterheads are enabled in the mow mode. **The cutting units cannot be lowered when the mow/transport lever is in the transport position.**

**Note:** When the cutting units re enabled, the lever does not have to be held in the forward position while the cutting units are lowered or raised.

## Engine Coolant Temperature Warning Light

The temperature warning light (Figure 20) glows if the engine coolant temperature is high. The cutting units will disable, if the traction unit is not stopped and the coolant temperature rises another 10° F, the engine will kill.

## Oil Pressure Warning Light

The oil pressure warning light (Figure 20) glows if the engine oil pressure drops below a safe level.

## Alternator Light

The alternator light (Figure 20) should be off when the engine is running. If it is on, the charging system should be checked and repaired as necessary.

## Glow Plug Indicator

The glow plug indicator light (Figure 20) will glow when the glow plugs are operating.

## Parking Brake

Whenever the engine is shut off, engage the parking brake (Figure 20) to prevent accidental movement of the machine. To engage the parking brake, pull up on the lever. The engine will stop if you press the traction pedal with the parking brake engaged.

## Diagnostic Light

The diagnostic light (Figure 20) will illuminate should a system fault be recognized.

## Fuel Gauge

The fuel gauge (Figure 21) registers the amount of fuel in the tank.

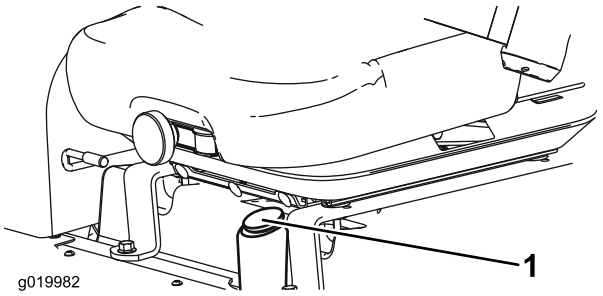



**Figure 21**

1. Fuel gauge

## Power Point

The power point, located on the outside of the control panel, is a 12 volt power supply for electronic devices (Figure 22).

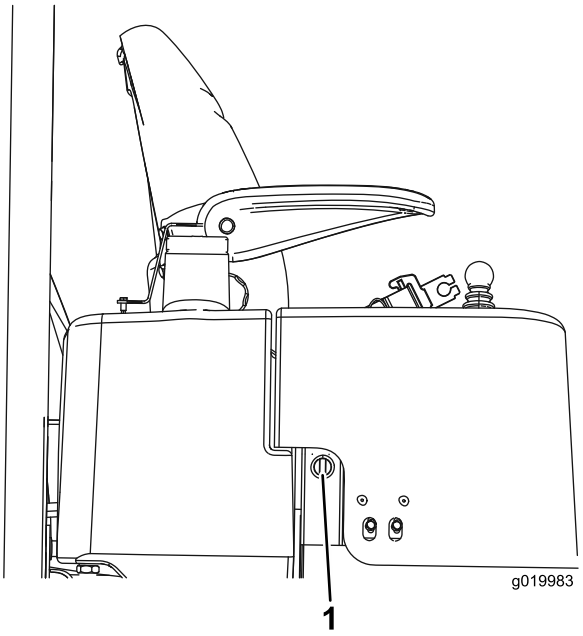



**Figure 22**

1. Power point

## Reel Speed Control Knob

The reel speed control controls the speed of the cutting units (Figure 23). The reel speed increases as the knob is turned counter clockwise. Refer to the reel speed chart decal (Figure 31), to determine the proper reel speed.

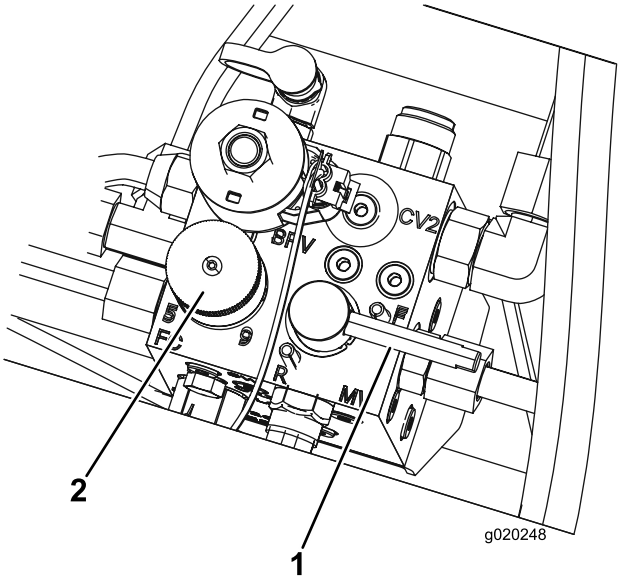



**Figure 23**

1. Backlap lever
2. Reel speed control knob

## Backlap Lever

Use the backlap lever in conjunction with the lower mow/raise control lever for the reels (Figure 23).

# Specifications

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

| | |
|---|---|
| Width of Cut | 208 cm (82 inches) |
| Overall Width | 239 cm (94 inches) |
| Transport Width | 231 cm (91 inches) |
| Overall Length | 295 cm (110 inches) |
| Height to top of ROPS | 188 cm (74 inches) |
| Wheel Base | 151 cm (59.5 inches) |
| Weight with 18 inch, 8 blade cutting units | 900 kg (1985 lbs) |
| Weight without cutting units | 708 kg (1560 lbs) |

## Attachments/Accessories

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

# Operation

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

# Checking the Engine Oil Level

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

The engine is shipped with oil in the crankcase; however, the oil level must be checked before and after the engine is first started.

Crankcase capacity is approximately 4 qt (2.8 l) 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 15W-40 (above 0ºF (-17ºC))
- Alternate oil: SAE 10W-30 or 5W-30 (all temperatures)

**Note:** Toro Premium Engine oil is available from your distributor in either 15W-40 or 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.

1. Position the machine on a level surface.
2. Remove the dipstick (Figure 24) and wipe it with a clean rag.

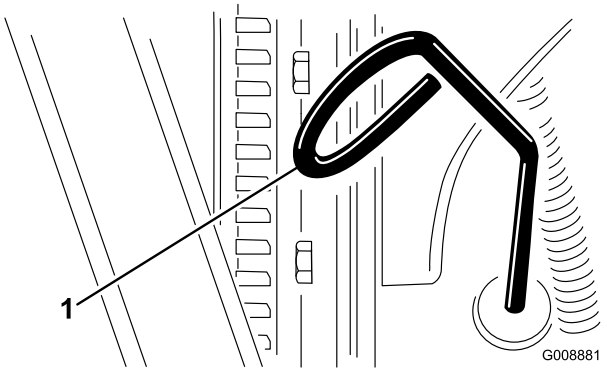



**Figure 24**

1. Dipstick

3. Push the dipstick down into the dipstick tube and make sure that it is seated fully. Pull the dipstick out and check the oil level.
4. If the oil level is low, remove the oil fill cap (Figure 25) and gradually add small quantities of oil, checking the level frequently, until the level reaches the Full mark on the dipstick.

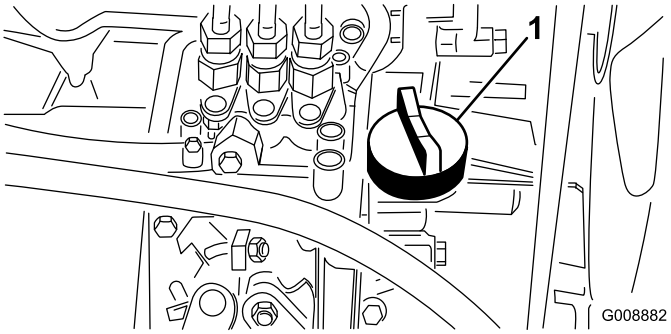



**Figure 25**

1. Oil fill cap

5. Install the oil fill cap and close the hood.

# 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.

The fuel tank capacity is approximately 42 liters (11 gallons).

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

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

**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

1. Clean the area around the fuel tank cap (Figure 26).
2. Remove the fuel tank cap.
3. Fill the tank to the bottom of the filler neck. **Do not overfill.** Install the cap.
4. To prevent a fire hazard, wipe up any fuel that may have spilled.

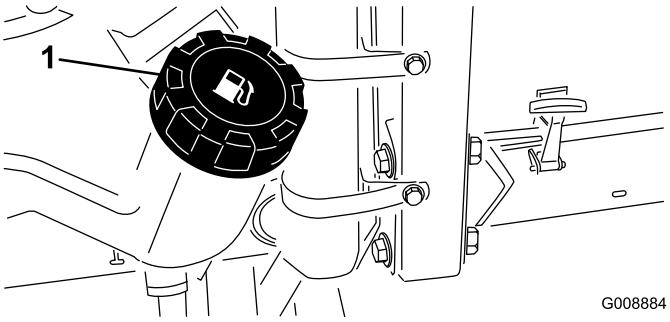



**Figure 26**

1. Fuel tank cap

**⚠ 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, safety-approved container and keep the cap in place.**

# Checking the Cooling System

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

Clean debris off of the radiator/oil cooler daily (Figure 27). Clean the radiator/oil cooler hourly if conditions are extremely dusty and dirty; refer to Cleaning the Engine Cooling System.

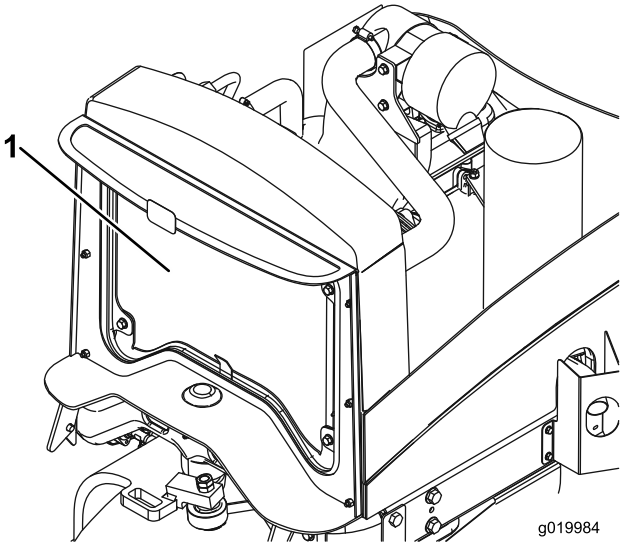



**Figure 27**

1. Radiator/oil cooler

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol anti-freeze. Check the coolant level at the beginning of each day before starting the engine.

The capacity of the cooling system is approximately 6 qt (5.7 l).

**⚠ 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. Check the coolant level in the expansion tank (Figure 28). With a cold engine, the coolant level should be approximately midway between the marks on the side of the tank.
2. If the coolant level is low, remove the expansion tank cap and replenish the system. **Do not overfill.**
3. Install the expansion tank cap.

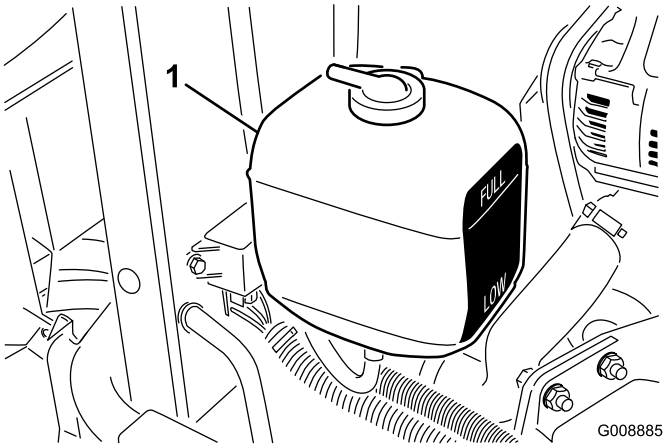



**Figure 28**

1. Expansion tank

# Checking the Hydraulic System

**Service Interval:** Before each use or daily—Check the hydraulic fluid level.

The machines reservoir is filled at the factory with approximately 13.2 liters (3.5 U.S. gallons) of high quality hydraulic fluid. **Check the level of the hydraulic fluid before the engine is first started and daily thereafter.** The recommended replacement fluid is **Toro Premium All Season Hydraulic Fluid** (Available in 5 gallon pails or 55 gallon drums. See parts catalog or Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, other fluids may be used provided they meet all the following material properties and industry specifications. Toro does not recommend the use of synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product Note: Toro will not assume responsibility for damage caused by improper substitutions, so use only products from reputable manufacturers who will stand behind their recommendation.

**High Viscosity Index/Low Pour Point Anti-wear Hydraulic Fluid, ISO VG 46**

Material Properties:

| | |
|---|---|
| Viscosity, ASTM D445 | cSt @ 40°C 44 to 48<br>cSt @ 100°C 7.9 to 8.5 |
| Viscosity Index ASTM D2270 | 140 to 160 |
| Pour Point, ASTM D97 | -34°F to -49°F |

Industry Specifications:

Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0

**Note:** Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 2/3 oz. (20 ml) bottles. One bottle is sufficient for 4-6 U.S. gallons (15-22 1) of hydraulic oil. Order part no. 44-2500 from your authorized Toro distributor.

**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 liter (5 gallon) containers or 208 liter (55 gallon) drums from your Mobil Distributor.**

1. Position the machine on a level surface, lower the cutting units, and stop the engine.
2. Clean the area around the filler neck and cap of the hydraulic tank (Figure 29). Remove the cap.

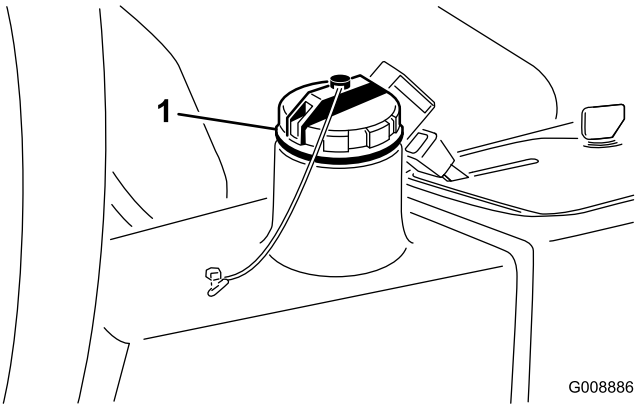



**Figure 29**

1. Hydraulic tank cap

3. Remove the dipstick from the filler neck and wipe it with a clean rag. Insert the dipstick into the filler neck; then remove it and check the fluid level. The fluid level should be within 6 mm (1/4 inch) of the mark on the dipstick.
4. If the level is low, add the appropriate fluid to raise the level to the full mark.
5. Install the dipstick and cap onto the filler neck.

# Checking the Reel to Bedknife Contact

Each day before operating, check reel to bedknife contact, regardless if the quality of cut had previously been acceptable. There must be light contact across the full length of the reel and the bedknife (refer to Adjusting the Reel to Bedknife in the cutting unit Operator's Manual).

# Checking the Tire Pressure

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

The tires are over-inflated for shipping. Therefore, release some of the air to reduce the pressure. The correct air pressure in the tires is 96 kPa (12 psi).

**Note:** Maintain the recommended pressure in all tires to ensure a good quality of cut and proper machine performance.

**⚠ DANGER**

**Low tire pressure decreases machine side hill stability. This could cause a rollover, which may result in personal injury or death.**

**Do not under-inflate the tires.**

# Torquing the Wheel Nuts

**Service Interval:** After the first hour

After the first 10 hours

Every 200 hours

Torque the wheel nuts to 61 to 88 N-m (45 to 65 ft-lb).

**⚠ WARNING**

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

# Positioning the Seat

## Changing the Seat Position

The seat can move forward and backward. Position the seat where you have the best control of the machine and are most comfortable

1. To adjust, move the lever sideways to unlock seat (Figure 30).
2. Slide the seat to the desired position and release lever to lock in position.

## Changing the Seat Suspension

The seat can be adjusted to provide a smooth and comfortable ride. Position the seat where you are most comfortable.

To adjust it, turn the knob in front either direction to provide the best comfort (Figure 30).

## Changing the Back Position

The back of the seat can be adjusted to provide a comfortable ride. Position the back of the seat where it is most comfortable.

To adjust it, turn the knob, under the right-side arm rest, in either direction to provide the best comfort (Figure 30).

## Changing the Arm Rest Position

The armrests of the seat can be adjusted to provide a comfortable ride. Position the armrests where they are most comfortable.

To adjust, raise the arm rest and turn the knob, in either direction, to provide the best comfort (Figure 30).

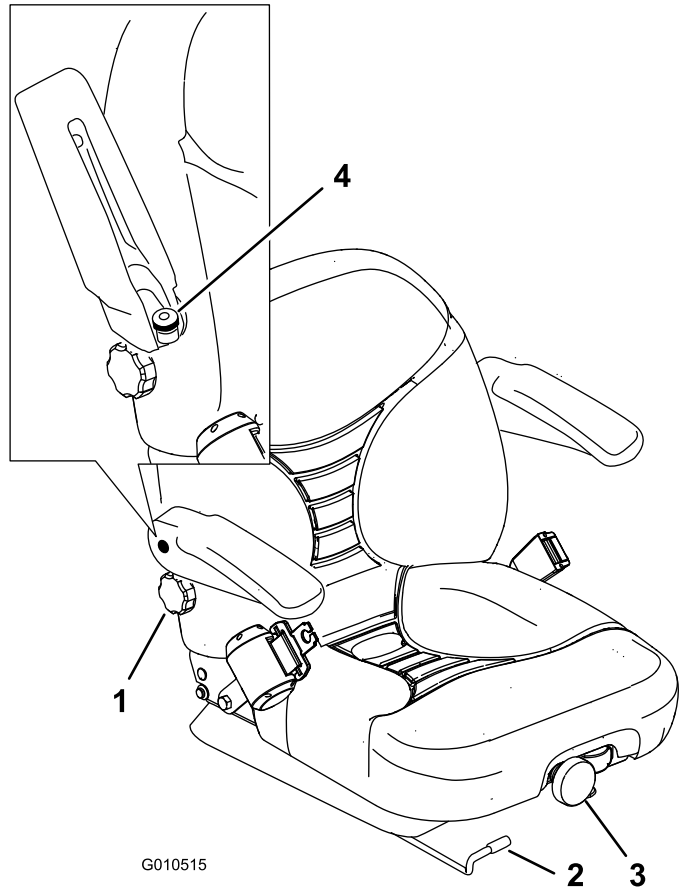



**Figure 30**

1. Back rest knob
2. Seat position adjustment lever
3. Seat suspension knob
4. Arm rest adjusting knob

# Starting and Stopping the Engine

You may need to bleed the fuel system if any of the following situations have occurred (refer to Bleeding the Fuel System):

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

## Starting the Engine

1. Be sure that the parking brake is set and the cutting unit drive switch is in the Disengage position.
2. Remove your foot from the traction pedal and make sure that the pedal is in the neutral position.
3. Move the throttle lever to the 1/2 throttle position.
4. Insert the key into the switch and rotate it to the On/Preheat position until the glow plug indicator light goes out (approximately 7 seconds); then rotate the key to the Start position to engage the starter motor. Release the key when the engine starts. The key will move automatically to the On/Run position.

   **Important: To prevent overheating of the starter motor, do not engage the starter longer than 15 seconds. After 10 seconds of continuous cranking, wait 60 seconds before engaging the starter motor again.**
5. When the engine is started for the first time or after an overhaul of the engine, operate the machine in forward and reverse for one to two minutes. Also operate the lift lever and cutting unit drive switch to be sure of proper operation of all parts.

   Turn the steering wheel to the left and right to check steering response; then shut the engine off and check for oil leaks, loose parts, and any other noticeable malfunctions.

**⚠ CAUTION**

**Stop the engine and wait for all moving parts to stop before checking for oil leaks, loose parts, and other malfunctions.**

## Stopping the Engine

Move the throttle control to the Idle position, move the cutting unit drive switch to Disengage, and rotate the starter key to Off. Remove the key from the switch to prevent accidental starting.

# Setting the Reel Speed

To achieve a consistent, high quality-of-cut and a uniform after cut appearance, it is important that you set the reel speed controls (located under the seat) correctly. Adjust the reel speed controls 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. Use the graph, on reel speed chart decal (Figure 31), to determine the proper reel speed setting.

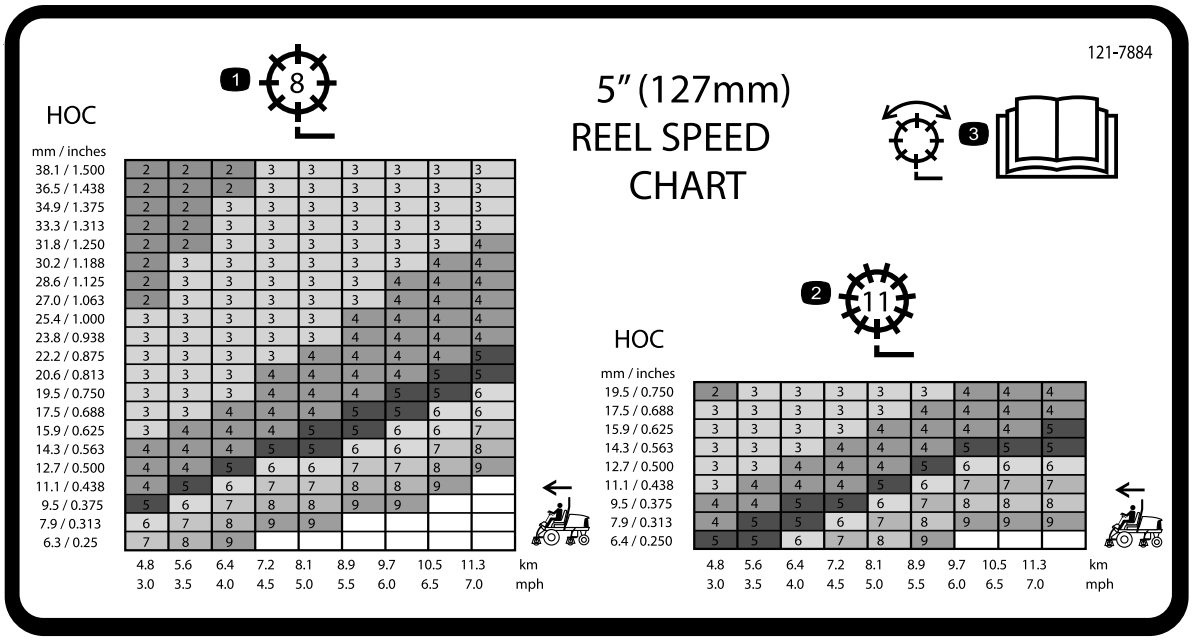



**Figure 31**

1. 8 blade reel adjustment
2. 11 blade reel adjustment
3. Read the *Operator's Manual* for information on adjusting the reel.

4. To set the reel speed, rotate the knob (Figure 32) until the indicator arrow is in line with the number designating the desired setting.

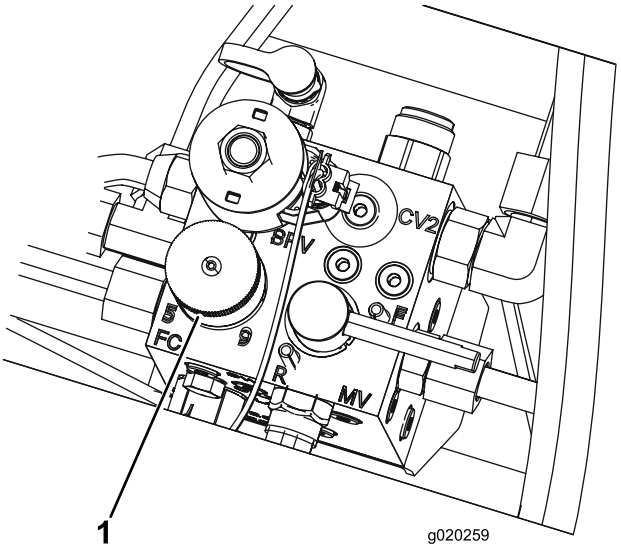



**Figure 32**

1. Reel speed control knob

**Note:** The reel speed can be increased or decreased to compensate for turf conditions. When using baskets, increase the reel speed to improve collection performance.

# Adjusting the Lift Arm Counterbalance

You can adjust the counterbalance on the rear cutting unit lift arms to compensate for different turf conditions and to maintain a uniform height-of-cut in the rough conditions or in areas of thatch build up.

You can adjust each counterbalance spring to one of four settings. Each increment increases or decreases counterbalance on the cutting unit by 1.4 kg (3 lb). The springs can be positioned on the back side of the first spring actuator to remove all counter balance (forth position).

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brakes, and remove the key from ignition switch
2. Insert a tube or similar object onto the long spring end to relieve the spring tension during the adjustment (Figure 33).

**⚠ CAUTION**

**The springs are under tension.**

**Use caution when adjusting them.**

3. While relieving the spring tension, remove the bolt and locknut securing the spring actuator to the bracket (Figure 33).

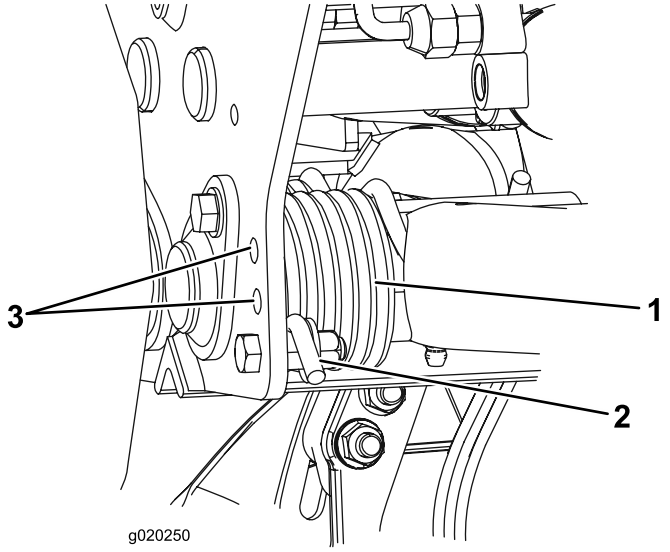



**Figure 33**

1. Spring
2. Spring actuator
3. Additional hole locations

4. Move the spring actuator to the desired hole location and secure with locknut.
5. Repeat the procedure on the remaining spring.

# Bleeding the Fuel System

1. Park the machine on a level surface. Make sure that the fuel tank is at least half full.
2. Unlatch and raise the hood.

**⚠ 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, safety-approved container and keep the cap in place.**

3. Open the air bleed screw on the fuel injection pump (Figure 34).

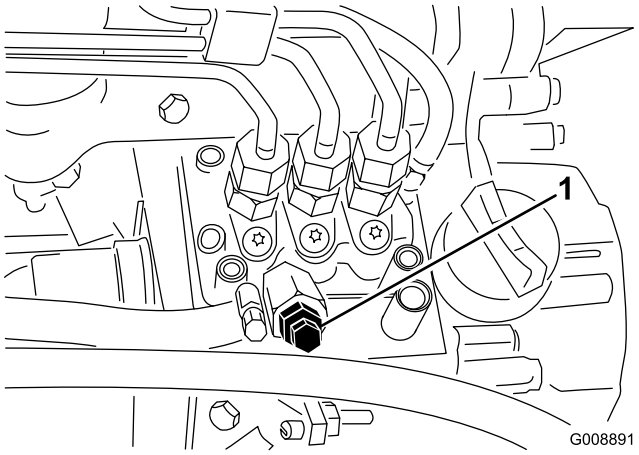



**Figure 34**

1. Fuel injection pump bleed screw

4. Turn the key in the ignition switch to the On position. The electric fuel pump will begin operation, thereby forcing air out around the air bleed screw. Leave the key in the On position until a solid stream of fuel flows out around the screw.
5. Tighten the screw and turn the key to Off.

**Note:** Normally the engine should start after the above bleeding procedures are followed. However, if the engine does not start, air may be trapped between the injection pump and injectors; refer to Bleeding Air from the Injectors.

# Understanding the Diagnostic Light

The machine is equipped with a diagnostic light which indicates if the electronic controller senses an electronic malfunction. The diagnostic light is located on the control panel (Figure 35). When the electronic controller is functioning correctly and the key switch is moved to the On position, the controller diagnostic light will turn ON for 3 seconds and turn OFF to indicate the light is working properly. If the machine kills the light will turn on steady until the key position is changed. The light will blink if the controller detects a malfunction in the electrical system. The light will stop blinking and automatically reset when the key switch is turned to the Off position once the fault has been resolved.

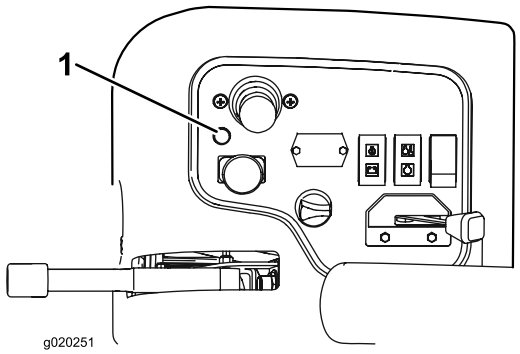



**Figure 35**

1. Diagnostic light

When the controller diagnostic light blinks, one of the following problems has been detected by the controller:

- One of the outputs has been shorted.
- One of the outputs is open circuited.

Using the diagnostic display, determine which output is malfunctioning; refer to Checking the Interlock Switches.

If the diagnostic light is not illuminated when the key switch is in the On position, this indicates that the electronic controller is not operating. Possible causes are as follows:

- Loop-back is not connected
- The light is burned out.
- Fuses are blown.
- It is not functioning correctly.

  Check the electrical connections, input fuses, and diagnostic light bulb to determine the malfunction. Ensure that the loop-back connector is secured to the wire harness connector.

# Diagnostic Ace Display

The machine is equipped with an electronic controller which controls most machine functions. The controller determines what function is required for various input switches (i.e. seat switch, key switch, etc.) and turns on the outputs to actuate solenoids or relays for the requested machine function.

For the electronic controller to control the machine as desired, each of the input switches, output solenoids, and relays must be connected and functioning properly.

Use the Diagnostic ACE display to help verify and correct electrical functions of the machine.

# Checking the Interlock Switches

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

The purpose of the interlock switches is to prevent the engine from cranking or starting unless the traction pedal is in the Neutral position, the Enable/Disable switch is in the Disable position, and the Lower Mow/Raise control is in the Neutral position. In addition, the engine should stop when the traction pedal is pressed with operator off of the seat or if the parking brake is left engaged.

**⚠ CAUTION**

**If 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.**

## Verifying the Interlock Switch Function

1. Park the machine on a level surface, lower the cutting units, stop the engine, and engage the parking brake.
2. Remove the cover from the control panel.
3. Locate the wire harness and loop back connector (Figure 36).

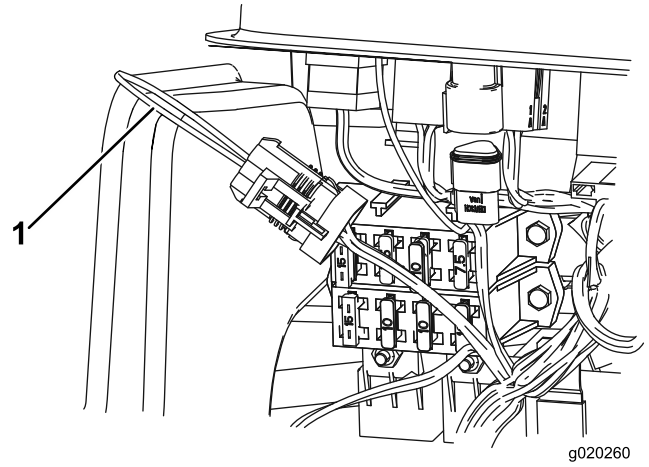



**Figure 36**

1. Loop back connector

4. Carefully unplug the loop back connector from harness connector.
5. Connect the Diagnostic ACE display connector to the harness connector (Figure 37).

   **Note:** Make sure correct overlay decal is positioned on Diagnostic ACE display.

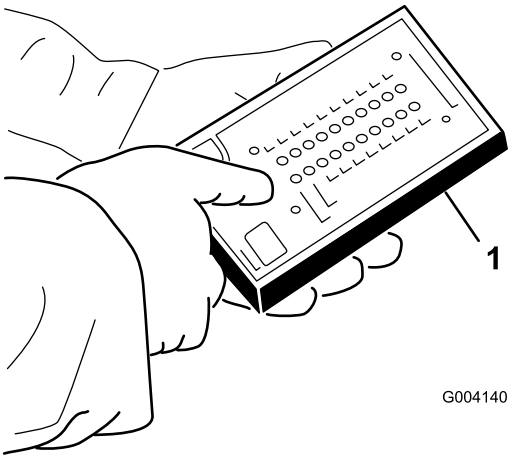



**Figure 37**

1. Diagnostic ACE

6. Turn the key switch to the On position, but do not start the machine.

   **Note:** The red text on the overlay decal refers to input switches and the green text refers to outputs.

7. The "inputs displayed" LED, on the lower right column of the Diagnostic ACE, should be illuminated. If the "outputs displayed" LED is illuminated, press the toggle button, on Diagnostic ACE, to change LED to "inputs displayed".

   The Diagnostic ACE will illuminate the LED associated with each of the inputs when that input switch is closed.

8. Individually, change each of the switches from open to closed (i.e., sit on seat, engage traction pedal, etc.), and note that the appropriate LED on Diagnostic ACE will blink on and off when corresponding switch is closed. Repeat this for all switches that you can change by hand.
9. If a switch is closed and the appropriate LED does not turn on, check all wiring and connections to the switch and/or check the switches with an ohm meter. Replace any defective switches and repair any defective wiring.

   **Note:** The Diagnostic ACE also has the ability to detect which output solenoids or relays are turned on. This is a quick way to determine if a machine malfunction is electrical or hydraulic.

## Verifying Output Function

1. Park the machine on a level surface, lower the cutting units, stop the engine, and engage the parking brake.
2. Remove the access panel from the side of the control arm.
3. Locate wire harness and connectors near controller.
4. Carefully unplug loop back connector from harness connector
5. Connect the Diagnostic ACE connector to the harness connector.

   **Note:** Make sure correct overlay decal is positioned on Diagnostic ACE.

6. Turn the key switch to the ON position, but do not start machine.

   **Note:** The red text on the overlay decal refers to input switches and the green text refers to outputs.

7. The "outputs displayed" LED, on lower right column of Diagnostic ACE, should be illuminated. If the "inputs displayed" LED is illuminated, press the toggle button, on the Diagnostic ACE, to change the LED to "outputs displayed".

   **Note:** It may be necessary to toggle between "inputs displayed" and "outputs displayed" several times to do the following step. To toggle back and forth, press the toggle button once. This may be done as often as required. Do not hold the button.

8. Sit on the seat and attempt to operate the desired function of the machine. The appropriate output LEDs should illuminate to indicate that the ECM is turning on that function.

   **Note:** If the correct output LEDs do not illuminate, verify that the required input switches are in the necessary positions to allow that function to occur. Verify correct switch function. If the output LEDs are on as specified, but the machine does not function properly, this indicates a non-electrical problem. Repair as necessary.

   **Note:** If each output switch is in the correct position and functioning correctly, but the output LEDs are not

correctly illuminated, this indicates an ECM problem. If this occurs, contact your Toro Distributor for assistance

**Important: The Diagnostic ACE display must not be left connected to the machine. It is not designed to withstand the environment of the machine's every day use. When done using the Diagnostic ACE, disconnect it from the machine and connect loop-back connector to harness connector. The machine will not operate without loopback connector installed on the harness. Store the Diagnostic ACE in dry, secure location in the shop, not on the machine**

# Towing the Traction Unit

In case of an emergency, the machine can be towed for a short distance; however, Toro does not recommend this as a standard procedure.

**Important: Do not tow the machine faster than 3 to 4 km/h (2 to 3 MPH) because the drive system may become damaged. If the machine must be moved a considerable distance, transport it on a truck or trailer.**

1. Locate the bypass valve on the pump (Figure 38) and rotate it 90°.

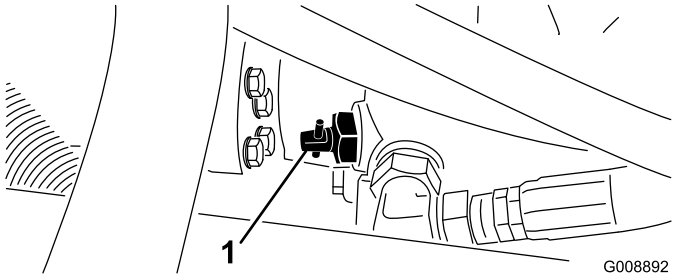



**Figure 38**

1. Bypass valve

2. Before starting the engine, close the bypass valve by rotating it 90° (1/4 turn). Do not start the engine when the valve is open.

# Operating Tips

## General Tips

## Familiarization

Before mowing grass, practice operating machine in an open area. Start and stop the engine. Operate in forward and reverse. Lower and raise cutting units and engage and disengage reels. When you feel familiar with the machine, practice operating up and down slopes at different speeds.

**⚠ DANGER**

**When operating the machine, always use the seat belt and ROPS together. Do not use a seat belt without a ROPS.**

## Warning System

If a warning light comes on during operation, stop the machine immediately and correct the problem before continuing operation. Serious damage could occur if you operate the machine with a malfunction.

## Mowing

Start the engine and move the throttle to the Fast position. Move the Enable/Disable switch to the Enable position and use the Lower Mow/Raise lever to control the cutting units (the front cutting units are timed to lower before the rear cutting units). To move forward and cut grass, press the traction pedal forward.

## Transport

Move the Enable/Disable switch to the Disable position and raise the cutting units to the transport position. Move the Mow/Transport lever to the transport position. Be careful when driving between objects so you do not accidentally damage the machine or cutting units. Use extra care when operating the machine on slopes. Drive slowly and avoid sharp turns on slopes to prevent roll overs. Lower the cutting units when going downhill for steering control.

# 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 | • Torque the wheel nuts. |
| After the first 10 hours | • Torque the wheel nuts.<br>• Check the condition and tension of all belts.<br>• Change the hydraulic filter. |
| After the first 50 hours | • Change the oil and oil filter. |
| Before each use or daily | • Check the engine oil level.<br>• Check the engine coolant level.<br>• Check the hydraulic fluid level.<br>• Check the tire pressure.<br>• Check the interlock system.<br>• Drain the water separator.<br>• Clean debris off of the radiator and oil cooler.<br>• Check the hydraulic lines and hoses. |
| Every 25 hours | • Check the electrolyte level. (If machine is in storage, check every 30 days.) |
| Every 50 hours | • Lubricate all bearings and bushings. (Lubricate all bearings and bushings daily when conditions are dusty and dirty.) |
| Every 100 hours | • Check the condition and tension of all belts. |
| Every 150 hours | • Change the oil and oil filter. |
| Every 200 hours | • Torque the wheel nuts.<br>• Service the Air Cleaner (More frequently in extreme dusty or dirty conditions)<br>• Check the parking brake adjustment.<br>• Change the hydraulic filter. |
| Every 400 hours | • Check the fuel lines and connections.<br>• Replace the fuel filter canister.<br>• Change the hydraulic fluid. |
| Every 2 years | • Drain and clean the fuel tank. |

**⚠ 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 before you do any maintenance.**

# 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 brake operation. | | | | | | | |
| Check the engine oil level. | | | | | | | |
| Check the cooling system fluid level. | | | | | | | |
| Drain the water/fuel separator. | | | | | | | |
| Check the air filter, dust cup, and burp valve. | | | | | | | |
| Check for unusual engine noises.[2] | | | | | | | |
| Check the radiator/oil cooler for debris | | | | | | | |
| Check for unusual operating noises. | | | | | | | |
| Check the hydraulic system oil level. | | | | | | | |
| Check the hydraulic hoses for damage. | | | | | | | |
| Check for fluid leaks. | | | | | | | |
| Check the fuel level. | | | | | | | |
| Check the tire pressure. | | | | | | | |
| Check the instrument operation. | | | | | | | |
| Check the height-of-cut adjustment. | | | | | | | |
| Lubricate all the grease fittings.[2] | | | | | | | |
| Touch-up any damaged paint. | | | | | | | |

[1]Check the glow plug and injector nozzles if starting is hard, there is excess smoke, or rough running is noted.

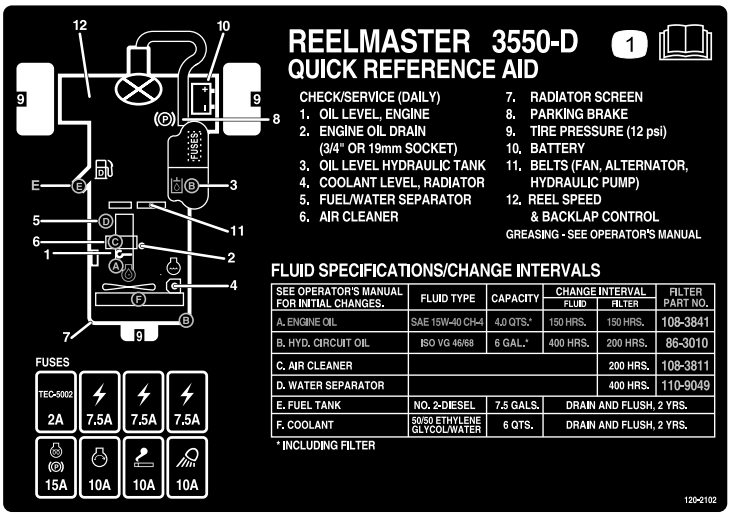
[2]Immediately **after every** washing, regardless of the interval listed.

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

### Notation for Areas of Concern

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

# Service Interval Chart




| SEE OPERATOR'S MANUAL FOR INITIAL CHANGES. | FLUID TYPE | CAPACITY | CHANGE INTERVAL FLUID | CHANGE INTERVAL FILTER | FILTER PART NO. |
|---|---|---|---|---|---|
| A. ENGINE OIL | SAE 15W-40 CH-4 | 4.0 QTS.* | 150 HRS. | 150 HRS. | 108-3841 |
| B. HYD. CIRCUIT OIL | ISO VG 46/68 | 6 GAL.* | 400 HRS. | 200 HRS. | 86-3010 |
| C. AIR CLEANER | | | | 200 HRS. | 108-3811 |
| D. WATER SEPARATOR | | | | 400 HRS. | 110-9049 |
| E. FUEL TANK | NO. 2-DIESEL | 7.5 GALS. | DRAIN AND FLUSH, 2 YRS. | | |
| F. COOLANT | 50/50 ETHYLENE GLYCOL/WATER | 6 QTS. | DRAIN AND FLUSH, 2 YRS. | | |

* INCLUDING FILTER

**Figure 39**

# *Premaintenance Procedures*

## Removing the Hood

The hood may be easily removed to ease maintenance procedures in the engine area of the machine.

1. Unlatch and raise the hood.
2. Remove the hairpin cotter securing the hood pivot to the mounting brackets (Figure 40).

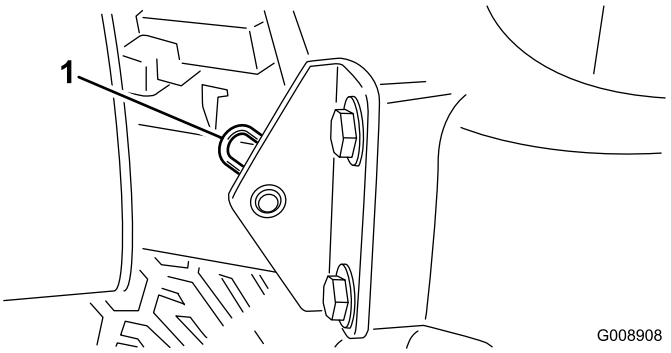



**Figure 40**

1. Hairpin cotter

3. Slide the hood to the right side, lift the other side, and pull it out of the brackets.

**Note:** Reverse the procedure to install the hood.

## Removing the Battery Cover

1. Open the hood.
2. Loosen the knobs and remove the battery cover (Figure 41).

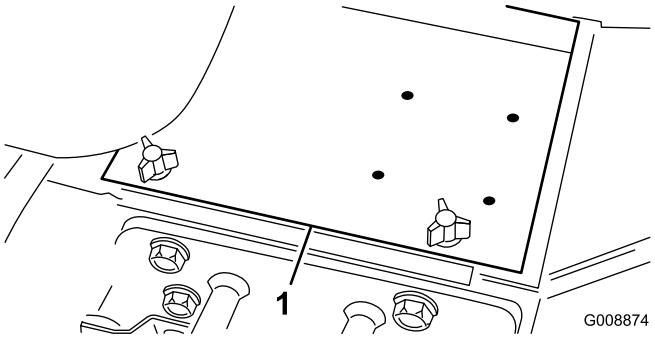



**Figure 41**

3. Refer to Caring for the Battery in the Electrical System Maintenance Section in the *Operator's Manual*.

# Lubrication

## Greasing the Bearings and Bushings

**Service Interval:** Every 50 hours (Lubricate all bearings and bushings daily when conditions are dusty and dirty.)

The machine has grease fittings that must be lubricated regularly with No. 2 General Purpose Lithium Base Grease. Bearings and bushings must be lubricated daily when operating conditions are extremely dusty and dirty. Dusty and dirty operating conditions could cause dirt to get into the bearings and bushings, resulting in accelerated wear. Lubricate grease fittings immediately after every washing, regardless of interval specified.

The grease fitting locations and quantities are:

- Steering pivot (Figure 42)

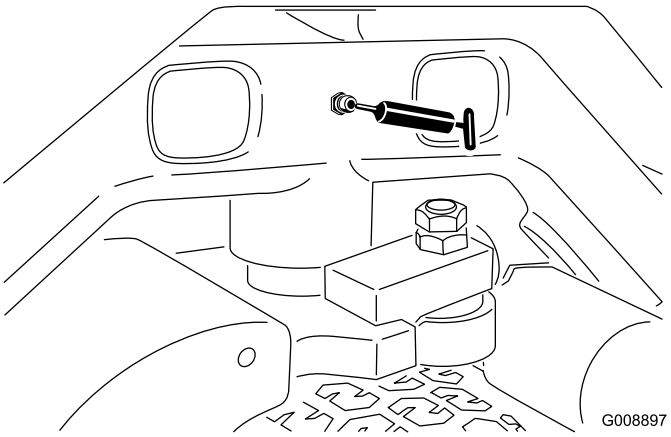



**Figure 42**

- Front lift arm pivots and lift cylinders (3 each) (Figure 43)

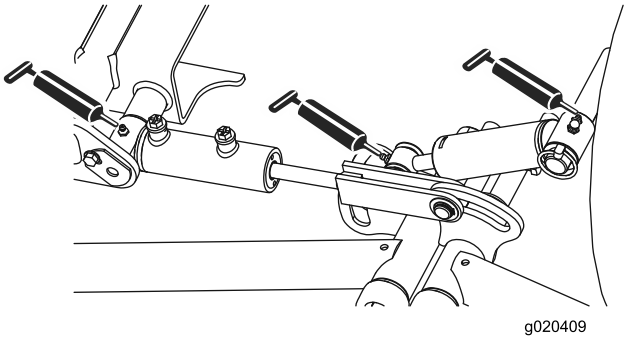



**Figure 43**

- Rear lift arm pivots and lift cylinders (3 ea.) (Figure 44)

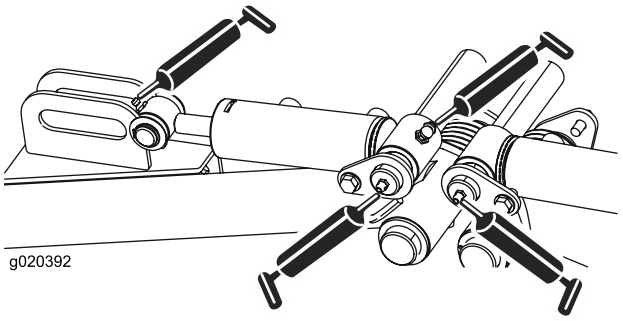



**Figure 44**

- Cutting unit pivots (2 each) (Figure 45)

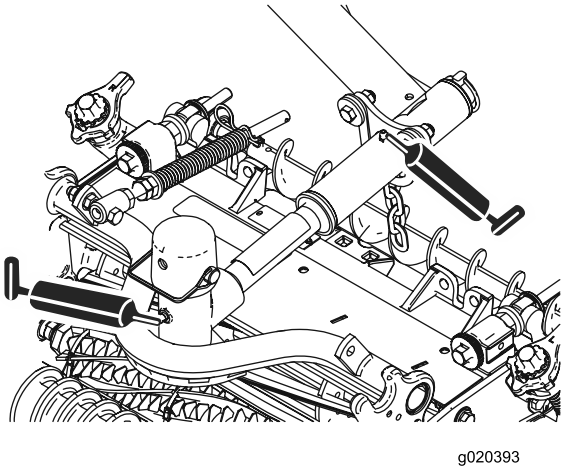



**Figure 45**

- Neutral adjust mechanism (Figure 46)

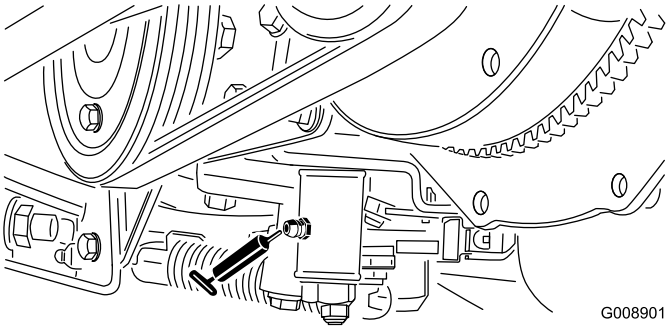



**Figure 46**

- Mow/transport slide (Figure 47)

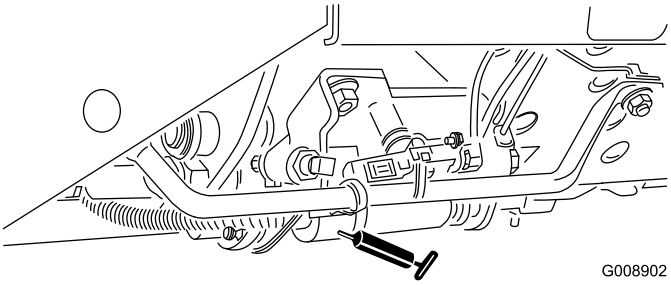



**Figure 47**

- Belt tension pivot (Figure 48)

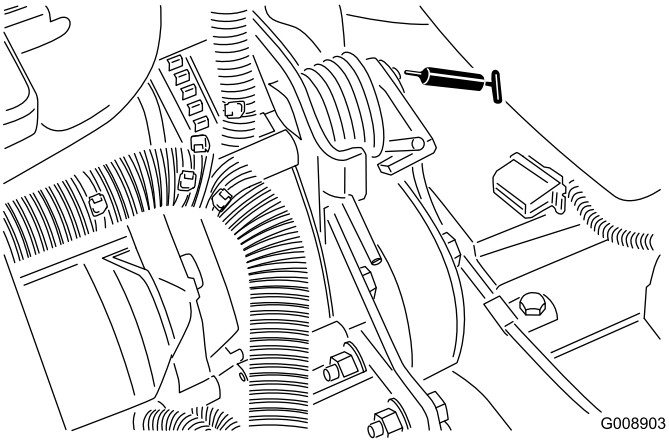



**Figure 48**

- Steering cylinder (Figure 49)

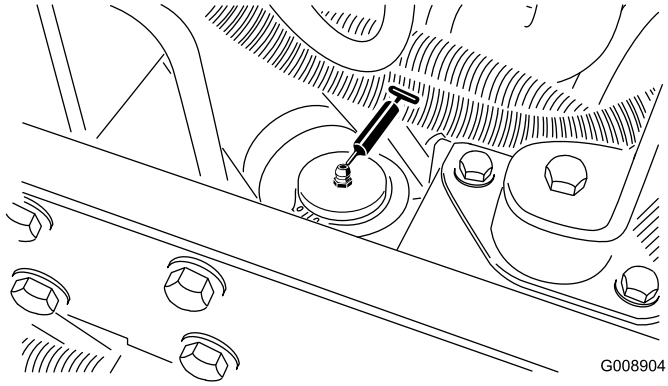



**Figure 49**

**Note:** If desired, an additional grease fitting may be installed in the other end of the steering cylinder. Remove the tire, install the fitting, grease the fitting, remove the fitting, and install the plug (Figure 50).

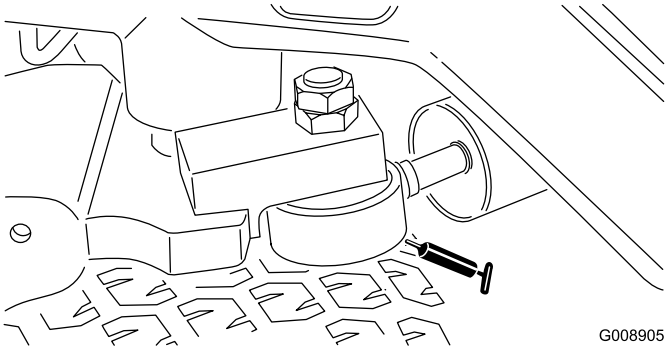



**Figure 50**

# Engine Maintenance

## Servicing the Air Cleaner

**Service Interval:** Every 200 hours (More frequently in extreme dusty or dirty conditions)

- Check the air cleaner body for damage which could cause an air leak. Replace if damaged. Check the whole intake system for leaks, damage, or loose hose clamps.
- Service at the recommended service interval or earlier if engine performance suffers due to extremely dusty, dirty conditions. Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.
- Be sure 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 51).
2. Remove the cover from the air cleaner body (Figure 51).
3. Before removing the filter, use low pressure air (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 the primary filter is removed.
4. Remove and replace the filter (Figure 51).

   Cleaning of the used element is not recommended due to the possibility of damage to the filter media.

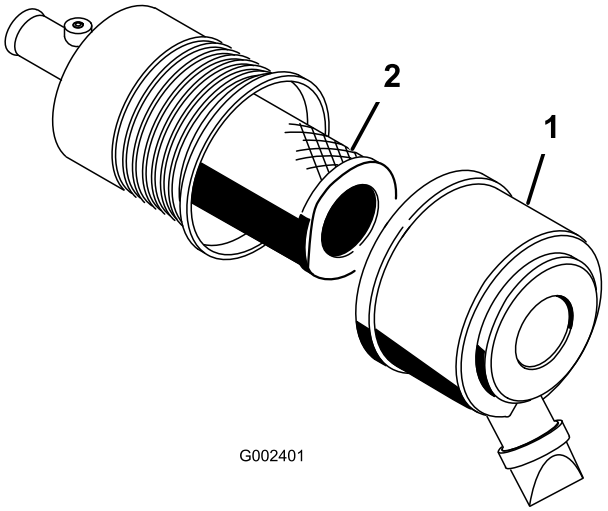



**Figure 51**

1. Air cleaner cover
2. Filter

5. Inspect the new filter for shipping damage, checking the sealing end of the filter and the body. **Do not use a damaged element.**
6. 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.**
7. Clean the dirt ejection port located in the removable cover. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.
8. Install the cover orienting the rubber outlet valve in a downward position—between approximately 5:00 to 7:00 when viewed from the end.
9. Secure the cover latches.

## Changing the Engine Oil and Filter

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

Every 150 hours

1. Remove either drain plug (Figure 52) and let the oil flow into a drain pan. When the oil stops flowing, install the drain plug.

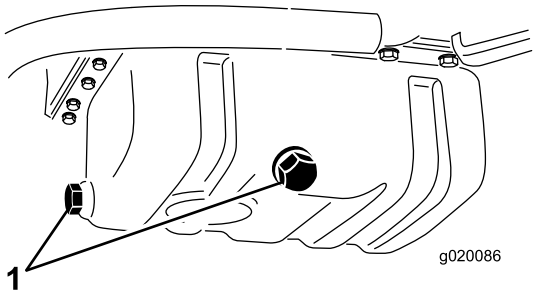



**Figure 52**

1. Engine oil drain plugs

2. Remove the oil filter (Figure 53). Apply a light coat of clean oil to the new filter seal before screwing it on. **Do not overtighten.**

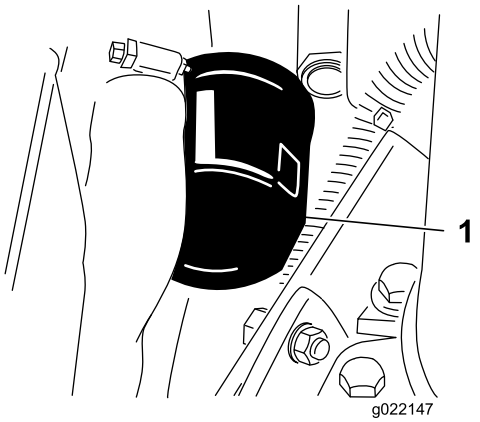



**Figure 53**

1. Engine oil filter

3. Add oil to the crankcase; refer to Checking the Engine Oil Level.

# *Fuel System Maintenance*

## Servicing the Fuel Tank

**Service Interval:** Every 2 years—Drain and clean the fuel tank.

Drain and clean the tank if the fuel system becomes contaminated or if the machine will be stored for an extended period of time. Use clean fuel to flush out the tank.

## Inspecting the Fuel Lines and Connections

**Service Interval:** Every 400 hours/Yearly (whichever comes first)

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

## Draining the Water Separator

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

1. Place a clean container under the fuel filter.
2. Loosen the drain valve on the bottom of the filter canister (Figure 54).

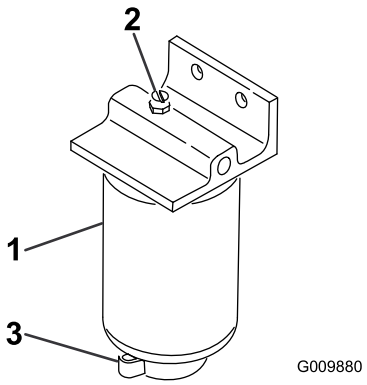



**Figure 54**

1. Water separator/filter canister
2. Vent plug
3. Drain valve

3. Tighten the valve after draining.

## Changing the Fuel Filter Canister

**Service Interval:** Every 400 hours

1. Clean the area where the filter canister mounts (Figure 54).
2. Remove the filter canister and clean the mounting surface.
3. Lubricate the gasket on the filter canister with clean oil.
4. Install the filter canister by hand until the gasket contacts the mounting surface; then rotate an additional 1/2 turn.

## Bleeding Air from the Injectors

**Note:** This procedure should be used only if the fuel system has been purged of air through normal priming procedures and the engine will not start; refer to Bleeding the Fuel System.

1. Loosen the pipe connection to the No. 1 nozzle and holder assembly.

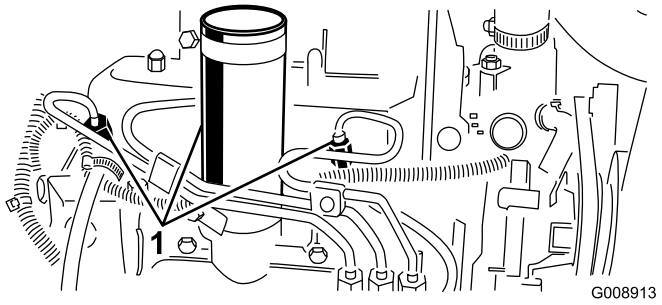



**Figure 55**

1. Fuel injectors

2. Move the throttle to the Fast position.
3. Turn the key in the key switch to the Start position and watch the fuel flow around the connector. Turn the key to the Off position when solid flow is observed.
4. Tighten the pipe connector securely.
5. Repeat the procedure on the remaining nozzles.

# *Electrical System Maintenance*

## Caring for the Battery

**Service Interval:** Every 25 hours—Check the electrolyte level. (If machine is in storage, check every 30 days.)

The battery electrolyte level must be properly maintained and the top of the battery kept clean. lf 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. Install the filler caps with the vents pointing to the rear (toward the fuel tank).

**⚠ DANGER**

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

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

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. Do not remove the filler caps while cleaning.

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

**⚠ WARNING**

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

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

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

**WARNING**

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

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

## Fuses

The fuses in machines electrical system are located under the control panel.

# Drive System Maintenance

## Adjusting the Traction Drive for Neutral

If the machine moves when the traction pedal is in the neutral position, the traction cam must be adjusted.

1. Park the machine on a level surface and turn the engine off.
2. Raise one front wheel and rear wheel off of the floor and place support blocks under the frame.

**⚠ WARNING**

**If the machine is not supported adequately, it may accidentally fall, injuring anyone under the machine.**

**One front wheel *and* rear wheel must be raised off of the ground or the machine will move during adjustment.**

3. Loosen the locknut on the traction adjustment cam (Figure 56).

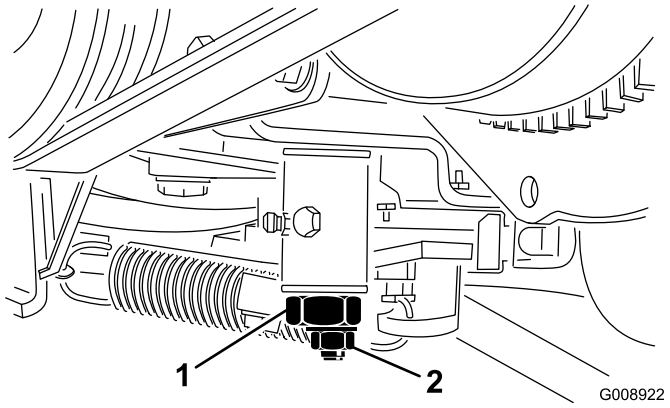



**Figure 56**

1. Traction adjustment cam 2. Locknut

**⚠ WARNING**

**The engine must be running so a final adjustment of the traction adjustment cam can be performed. Contact with hot or moving parts can result in personal injury.**

**Keep hands, feet, face, and other body parts away from the muffler, other hot parts of the engine, and other rotating parts.**

4. Start the engine and rotate the cam hex in both directions to determine the mid position of the neutral span.
5. Tighten the locknut securing the adjustment.
6. Stop the engine.
7. Remove the support blocks and lower the machine to the shop floor. Test drive the machine to make sure it does not move when the traction pedal is in neutral.

# Cooling System Maintenance

## Cleaning the Engine Cooling System

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

Remove debris from the radiator/oil cooler daily. Clean them more frequently in dirty conditions.

1. Turn the engine off and raise the hood. Clean the engine area thoroughly of all debris.
2. Clean both sides of the radiator/oil cooler thoroughly with compressed air (Figure 57).

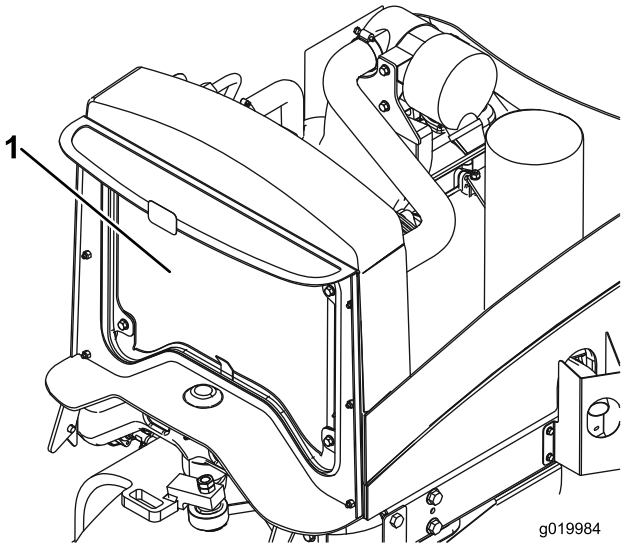



**Figure 57**

1. Radiator/oil cooler

3. Close the hood.

# Brake Maintenance

## Adjusting the Parking Brake

**Service Interval:** Every 200 hours—Check the parking brake adjustment.

1. Loosen the set screw securing the knob to the parking brake lever (Figure 58).

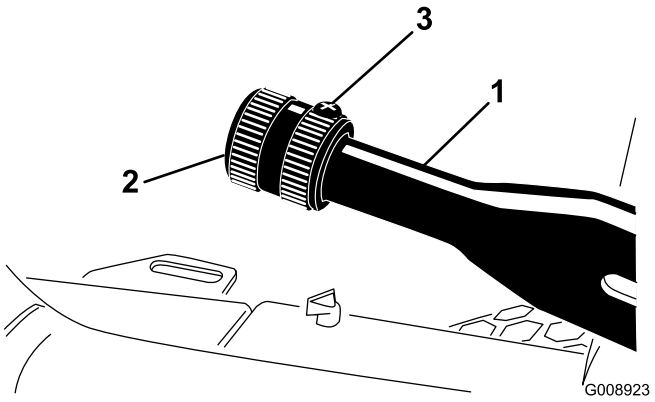



**Figure 58**

1. Parking brake lever
2. Knob
3. Set screw

2. Rotate the knob until a force of 130–140 N (30–40 lb) is required to actuate the lever.
3. Tighten the set screw after the adjustment has been attained.

# Belt Maintenance

## Servicing the Engine Belts

**Service Interval:** After the first 10 hours—Check the condition and tension of all belts.

Every 100 hours—Check the condition and tension of all belts.

### Tensioning the Alternator/Fan Belt

1. Open the hood.
2. Check the tension by depressing the belt midway between the alternator and crankshaft pulleys with 98 N (22 lb) of force. The belt should deflect 11 mm (7/16 inch).

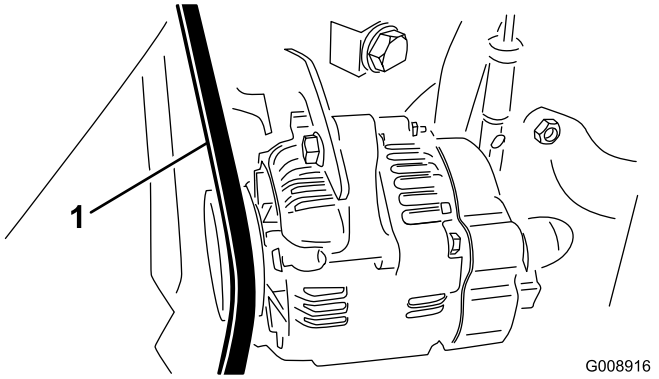



**Figure 59**

1. Alternator/fan belt

3. If the deflection is incorrect, complete the following procedure to tension the belt:
   A. Loosen the bolt securing the brace to the engine and the bolt securing the alternator to the brace.
   B. Insert a pry bar between the alternator and engine and pry out on the alternator.
   C. When the proper tension is achieved, tighten the alternator and brace bolts to secure the adjustment.

### Replacing the Hydrostat Drive Belt

1. Insert a nut driver or small piece of tubing onto the end of the belt tensioning spring.

**⚠ WARNING**

**Use caution when de-tensioning the spring, as it is under a heavy load.**

2. Push down and forward on the spring end (Figure 60) to unhook it from the bracket and release tension on the spring.

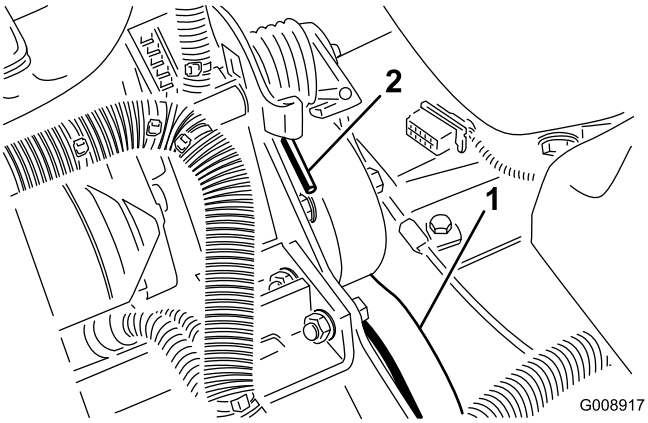



**Figure 60**

1. Hydrostat drive belt 2. Spring end

3. Replace the belt.
4. Reverse the procedure to tension the spring.

# Controls System Maintenance

## Adjusting the Throttle

1. Position the throttle lever rearward so it stops against the control panel slot.
2. Loosen the throttle cable connector on the injection pump lever arm (Figure 61).

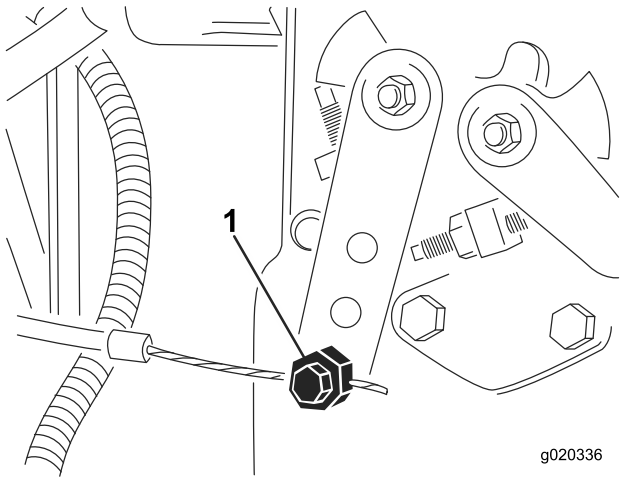



**Figure 61**

1. Injection pump lever arm

3. Hold the injection pump lever arm against the low idle stop and tighten the cable connector.
4. Loosen the screws securing the throttle control to the control panel.
5. Push the throttle control lever all of the way forward.
6. Slide the stop plate until it contacts the throttle lever and tighten the screws securing the throttle control to the control panel.
7. If the throttle does not stay in position during operation, torque the locknut, used to set the friction device on the throttle lever, to 40–55 inch-lb (5–6 N-m). The maximum force required to operate the throttle lever should be 89 N (20 lb).

# Hydraulic System Maintenance

## Changing the Hydraulic Filter

**Service Interval:** After the first 10 hours

Every 200 hours/Yearly (whichever comes first)

Use a genuine Toro replacement filter, Part No. 86-3010.

**Important: Use of any other filter may void the warranty on some components.**

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brake, and remove the key from the ignition switch.
2. Clean around the filter mounting area. Place a drain pan under the filter (Figure 62) and remove the filter.

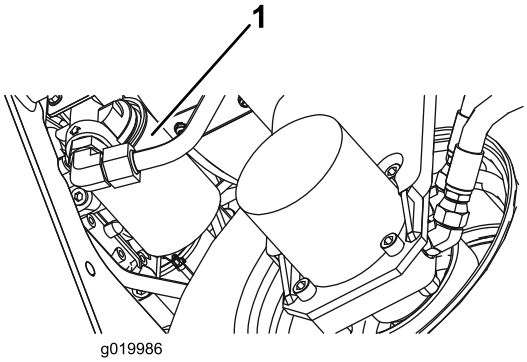



**Figure 62**

1. Hydraulic filter

3. Lubricate the new filter gasket and fill the filter with hydraulic fluid.
4. Ensure that the filter mounting area is clean. Screw the filter on until the gasket contacts the mounting plate; then tighten the filter 1/2 turn.
5. Start the engine and let it run for about two minutes to purge air from the system. Stop the engine and check for leaks.

## Changing the Hydraulic Fluid

**Service Interval:** Every 400 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 oil.

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brake, and remove the key from the ignition switch.
2. Disconnect the large hydraulic hose (Figure 63) from the reservoir and let the hydraulic fluid flow into a drain pan. Install the hydraulic hose when hydraulic fluid stops draining.

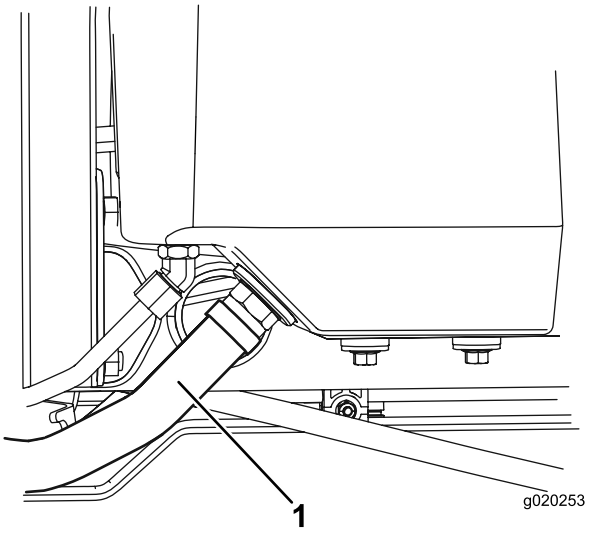



**Figure 63**

1. Hydraulic hose

3. Fill the reservoir (Figure 64) with approximately 13.2 liters (3.5 U.S. gallons) of hydraulic fluid; refer to Checking the Hydraulic System.

   **Important: Use only the hydraulic fluids specified. Other fluids could cause system damage.**

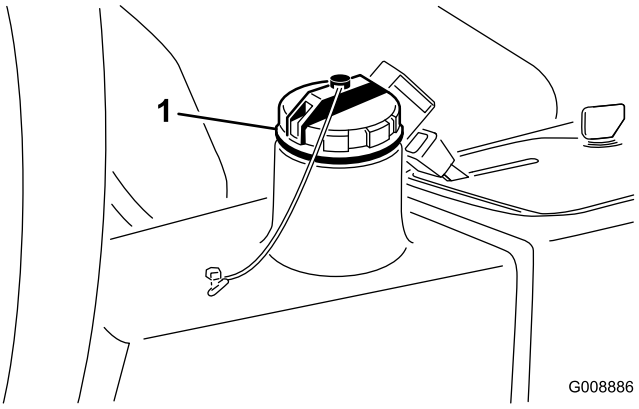



**Figure 64**

1. Hydraulic fill cap

4. Install the reservoir cap. Start the engine and use all of the hydraulic controls to distribute the hydraulic fluid throughout the system. Also check for leaks; then stop the engine.
5. Check the fluid level and add enough to raise the level to Full mark on the dipstick. **Do not overfill.**

# Checking the Hydraulic Lines and Hoses

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

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

**⚠ WARNING**

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

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

# Cutting Unit System Maintenance

## Using the Optional Gauge Bar

Use the gauge bar to adjust the cutting unit. Refer to the Cutting Unit Operator's Manual for the adjustment procedures (Figure 22).

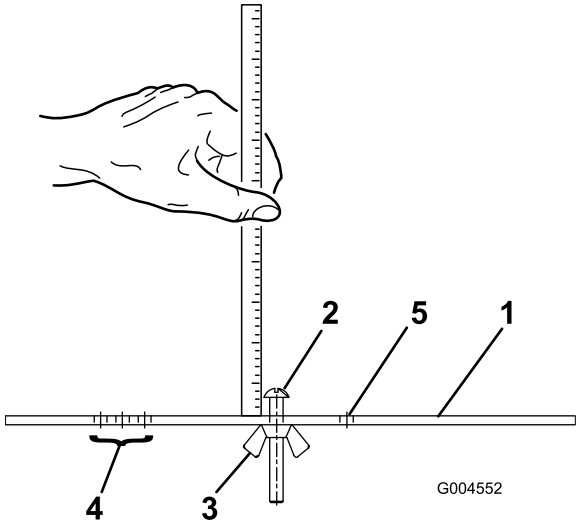



**Figure 65**

1. Gauge bar
2. Height adjusting screw
3. Nut
4. Holes used for setting Groomer HOG
5. Hole not used

## Backlapping the Cutting Units

**⚠ WARNING**

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

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

**Note:** When backlapping, all the cutting units operate together.

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brake, and move the Enable/Disable switch to disable position.
2. Raise the floor panel to expose the controls.
3. Make the initial reel to bedknife adjustments appropriate for backlapping; refer to the cutting unit Operator's Manual
4. Start the engine and run at low idle speed.

**⚠ DANGER**

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

- **Never change the engine speed while backlapping**
- **Only backlap at idle engine speed.**

5. Set the reel speed control to position 1 (Figure 66).

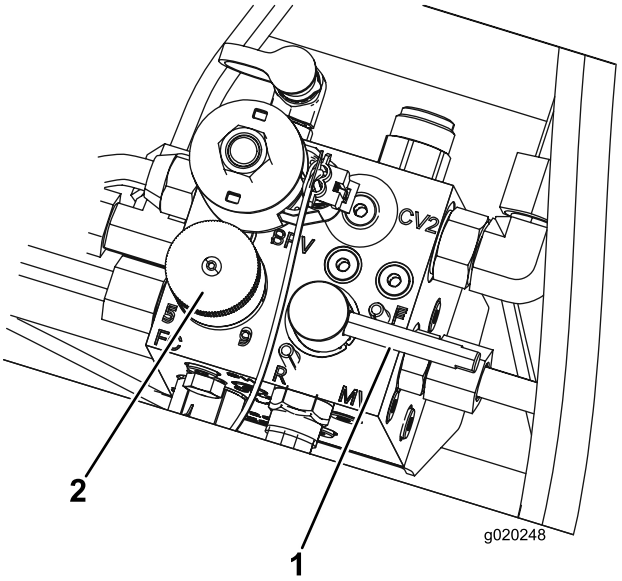



**Figure 66**

1. Backlap lever
2. Reel speed control knob

6. Move the backlap lever to the R (backlap) position (Figure 66).

**⚠ DANGER**

**To avoid personal injury, be certain that you are clear of the cutting units before proceeding.**

7. With the Mow/Transport lever in the mow position, move the Enable/Disable switch to the Enable position. Move the Lower Mow/Lift control forward to start the backlapping operation on the designated reels.
8. Apply lapping compound with a long handle brush. Never use a short handled brush.
9. If the reels stall or become erratic while backlapping, select a higher reel speed setting until the speed stabilizes, then return the reel speed to setting 1 or to your desired speed.
10. To make an adjustment to the cutting units while backlapping, turn the reels off by moving the Lower Mow/Raise lever rearward; the Enable/Disable switch to the Disable position, and stop the engine. After completing adjustments, repeat steps 5 through 9.

11. Repeat the procedure for all cutting units you want to backlap.
12. When finished, return the backlap lever to the Mow position, lower the floor panel, and wash all lapping compound off of the cutting units. Adjust cutting unit reel to bedknife as needed. Move the cutting unit reel speed control to the desired mowing position.

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

**Note:** For a better cutting edge, run a file across the front face of the bedknife after lapping. This will remove any burrs or rough edges that may have built up on the cutting edge.

# Storage

## Storing the Battery

If the machine will be stored more than 30 days, remove the battery and charge it fully. 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 1.265–1.299.

## Preparation for Seasonal Storage

Follow these procedures anytime you will be storing the machine for more than 30 days.

### Traction Unit

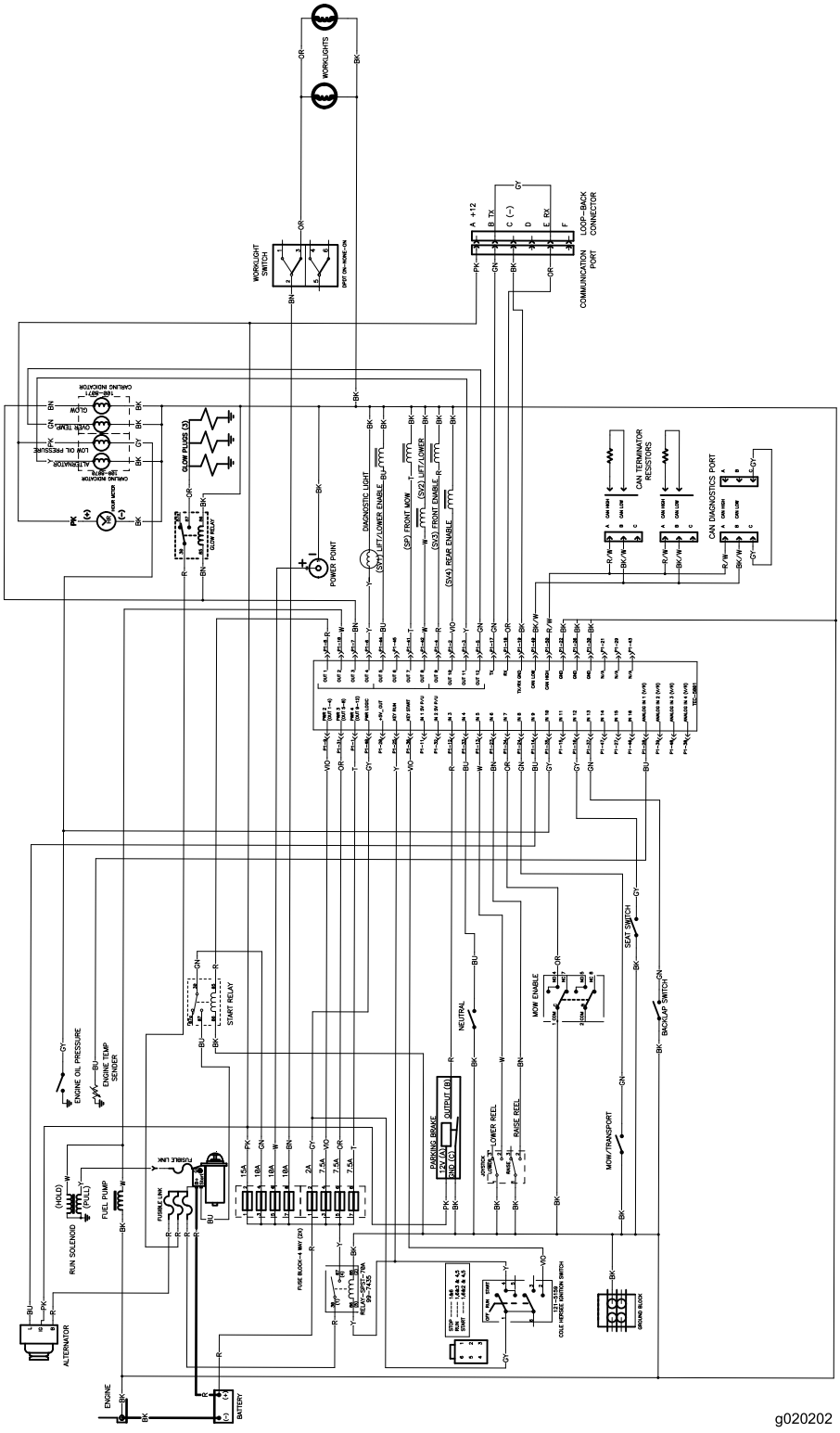
1. Thoroughly clean the traction unit, cutting units, and engine.
2. Check the tire pressure. Inflate all tires to 12 psi (96 kPa).
3. Check all fasteners for looseness; tighten as necessary.
4. Grease or oil all grease fittings and pivot points. Wipe up any excess lubricant.
5. Lightly sand and use touch-up paint on painted areas that are scratched, chipped, or rusted. Repair any dents in the metal body.
6. Service the battery and cables as follows:
   A. Remove the battery terminals from the battery posts.
   B. Remove the battery.
   C. Slowly recharge the battery before storage and every 60 days thereafter for 24 hours to prevent lead sulfation of the battery.

      To prevent the battery from freezing, make sure it is fully charged. The specific gravity of a fully charged battery is 1.265–1.299.
   D. Clean the battery, terminals, and posts with a wire brush and baking soda solution.
   E. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
   F. Either store it on the shelf or on the machine in a cool area. Leave the cables disconnected if it is stored on the machine.

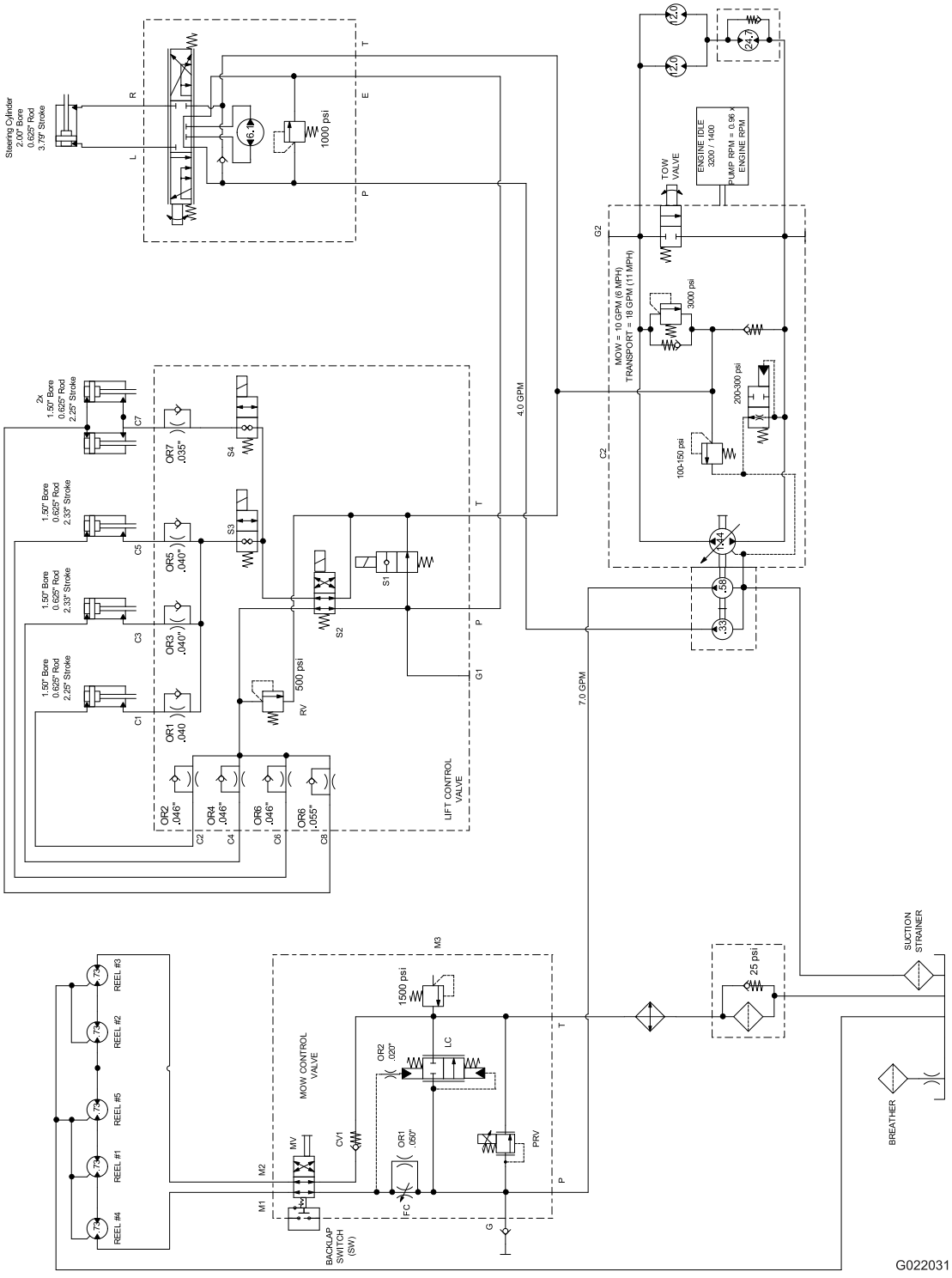
## Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Remove and discard the oil filter. Install a new oil filter.
3. Refill the oil pan with approximately 3.8 liters (4 qt) of SAE15W-40 motor oil.
4. Start the engine and run it at idle speed for approximately two minutes.
5. Stop the engine.
6. Thoroughly drain all fuel from the fuel tank, fuel lines, fuel filter, and water separator assembly.
7. Flush the fuel tank with fresh, clean diesel fuel.
8. Secure all fuel system fittings.
9. Thoroughly clean and service the air cleaner assembly.
10. Seal the air cleaner inlet and the exhaust outlet with weatherproof tape.
11. Check anti-freeze protection and add as needed for expected minimum temperature in your area.

# Schematics




**Electrical Schematic (Rev. B)**




**Hydraulic Schematic (Rev. B)**

# The Toro Total Coverage Guarantee

A Limited Warranty

## Conditions and Products Covered

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

## Instructions for Obtaining Warranty Service

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

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.